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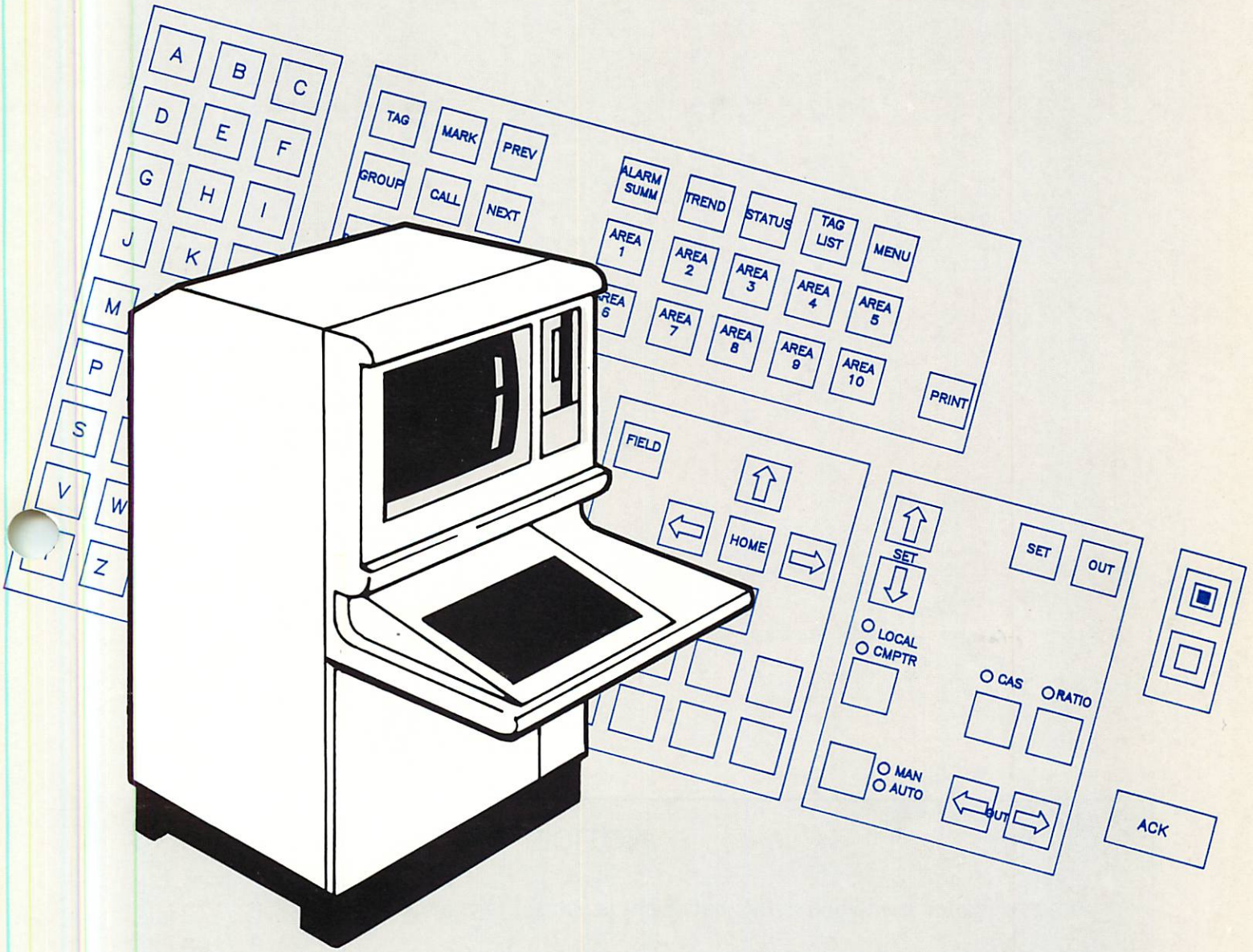

Operator Interface Unit Operation/Configuration Manual

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PREFACE

Your Operator Interface Unit is a NETWORK 90 subsystem providing you with a color graphic CRT monitor for observing and controlling plant operations. You need no computer/data processing background nor extensive training to operate the OIU because all commands are in simple English or use single letter codes.

This manual provides the necessary information for you to operate the Operator Interface Unit (OIU) successfully.

Part I contains a brief overview of the NETWORK 90 system, and an introduction to OIU configuration, operating theory, hardware and display elements.

Part II explains configuration for NETWORK 90 components using the OIU, as well as configuring the OIU, itself. This part of the manual explains how to customize the OIU to the exact needs of your plant or facility. Part II also explains how to use the Graphic Editor, as well as OIU logging and archival storage. The manual presents configuration details for your information, only. (Your process engineer, technician, or maintenance personnel perform necessary configuration tasks.)

Part III summarizes OIU operating procedures, including certain tasks common to all OIU applications. This part of the manual explains the procedures for monitoring, controlling, processing and recording process information.

The manual also includes a Glossary of OIU and NETWORK 90 terms, and various Appendices.

For additional information, refer to the following publications:

CE93-900	Bailey NETWORK 90
IE93-900-20	Function Code Application Manual
IE93-901-2	OIU Hardware Manual
IE93-901-6	NOIU BASIC Language Reference Manual
IE93-901-21	MCS Operation/Configuration Manual
IE93-902-1	Digital Control Station Manual
IE93-903	Configuration and Tuning Module
IE93-905-9	Enhanced CIU Programmer's Reference Manual
IE93-908-1	Loop and Bus Interface Modules
IE93-912-2	Analog Master Module (AMMO2) Manual
IE93-917-1	Sequential Events Recorder

For further information on the Process Control Unit (PCU), refer to those manuals that describe and explain its various modules.

TABLE OF CONTENTS

PART I: DESCRIPTION AND OPERATING THEORY

PART III: OPERATION

LIST OF FIGURES

LIST OF TABLES

SECTION I
USING THIS MANUAL

INTRODUCTION

This Section explains the organization of the manual. Read this Section carefully in order to use the manual properly.

WHO USES THIS MANUAL

This manual is a guide for the operator to the proper operation of the Operator Interface Unit. This manual also details proper configuration for the OIU to the system (process) engineer or technician. To use the OIU at maximum efficiency, follow the procedures in this manual carefully.

CAUTION

You as the operator cannot configure nor tune the OIU. You use the OIU for monitoring, controlling, and recording process information. The process engineer, technician, or maintenance person performs necessary configuration or tuning.

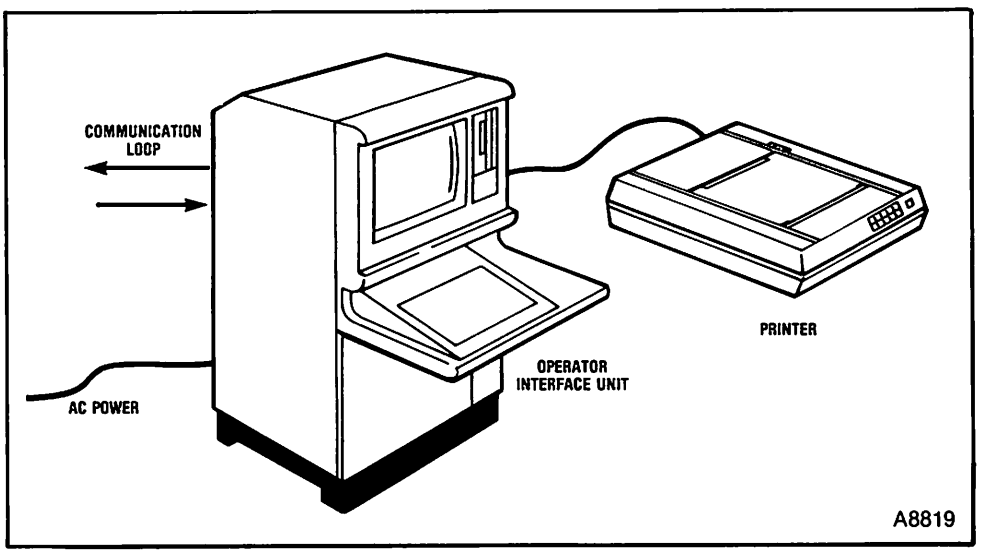

FIGURE 1.1 — The Operator Interface Unit

WHAT THIS MANUAL CONTAINS

The manual is divided into three parts:

- OIU hardware and operating theory
- OIU and NETWORK 90 system configuration
- OIU operating procedures.

Manual Organization
Each Part contains Sections. Each Section presents and explains its particular topics. Each Section is divided into concepts and tasks by subsection headings. Tables and diagrams also appear throughout the manual to supplement the text and/or illustrate OIU components. Finally, notes, cautions, and warnings appear to clarify text and to identify possibly hazardous situations.

A complete OIU Glossary is at the end of the manual. Here we present a partial list of common NETWORK 90 terms.

SOME COMMON NETWORK 90 TERMS

ACK	**Alarm Acknowledge:** refers to acknowledging an alarm state or message using a pushbutton key on the OIU fixed keyboard.
BLOCK	Specific numeric address of the memory area in a PCU module containing a NETWORK 90 function code.
BOOLEAN	**Mnemonic:** Descriptive word value showing logic states (1 and 0) for certain OIU points, or tags. (OFF/ON, OPEN/ CLOSED, etc.)
CIU	**Computer Interface Unit:** contains the necesary hardware and software to provide a link between the Plant Communication Loop (PCL) and a computer.
CO	**Control Output:** station control output value.
FUNCTION BLOCK	A user-configurable block in a PCU module containing a function code.
FUNCTION CODE	A NETWORK 90 algorithm containing specification data for performing specific functions.
HOST	Local computer interfacing through the CIU providing operating control for the NETWORK 90 system.
MASTER MODULE	Any one of a series of master controller modules that direct field processes through slave output modules.
MCS	**Management Command System** unit: integrated data acquisition system containing the necessary hardware and software to provide highly flexible control capabilities. (Similar in function to the OIU, but having enhanced capabilities.
MODE	**Station:** describes methods of station operation. (Also Digital Control Station.)
NODE	Any junction on the PCL through which information signals pass. (Commonly refers to Process Control Units, OIUs, CIUs, and PPG.) Such signals can pass in and out of any node.

OIU	**Operator Interface Unit:** work station that provides main control access to any point in the NETWORK 90 system. (Operations, engineering, and maintenance personnel use the OIU.)
PCU	**Process Control Unit:** a cabinet containing control, slave, and/or termination modules connected to user process. Can also refer to certain modules mounted in the cabinet itself.
PCL	**Plant Communication Loop:** the physical plant transmission media. Communication system connecting all nodes on the plant network.
PPG	**Plant-Loop-to-Plant-Loop Gateway:** NETWORK 90 module that can either interface any two plant loops or interface remote plant loops to a single local plant loop. This interface process lets exception reports, control, tuning, and configuration commands pass from one plant loop to another, or from remote loops to a local loop over the PCL.
PV	**Process Variable:** changeable process value.
RCM	**Remote Control Memory:** NETWORK 90 function code enabling logic information reporting and tag status changing.
REAL	**Analog:** Certain tags in OIU expressed as floating decimal point numeric values.
RI	**Ratio Index:** Analog value set by user in a station block compared to CO during system operation.
RMSC	**Remote Manual Set Constant:** NETWORK 90 function code providing adjustable real value (constant) entry into control scheme. Any function block receiving this command generates an exception report showing tag value change as it occurs.
SP	**Setpoint:** station value set by user compared to PV during system operation.
SPECS	Specification data contained in specific NETWORK 90 function codes. The spec data is required for setting up (configuring) user-configurable function blocks in the various modules used. Specs are also known as parameters.
STATION	A function code located at a specific block (address) in a NETWORK 90 module. The function code includes parameters determining its execution during system operation.

NOTES, CAUTIONS, AND WARNINGS

In this manual Notes, Cautions, and Warnings occasionally follow text paragraphs or Tables/Figures:

- A **NOTE** either clarifies the material above it or shows you pertinent additional information.
- A **CAUTION** alerts you to hazards or unsafe practices that can result in minor personal injury or property damage.
- A **WARNING** informs you of a hazard or unsafe situation that can result in severe personal injury or death.

Read all Notes, Cautions, and Warnings carefully before you try to operate any component of the OIU.

RELATED PUBLICATIONS

This manual details operation and configuration instructions for the NETWORK 90 Operator Interface Unit. You may find additional useful information in the following publications:

- E93-900-20 Function Code Application Manual
- E93-901-6 NOIU BASIC Reference Manual
- E93-901-10 OIU Product Specification
- E93-912-2 AMM02 Analog Master Module Manual
- E93-917-1 Sequential Events Recorder.

SECTION II
INTRODUCTION TO THE OIU

INTRODUCTION

This section introduces the OIU, describing its function in the NETWORK 90 system. The section also explains OIU operating theory, display organization, and graphic capabilities.

NETWORK 90 SYSTEM OVERVIEW

The NETWORK 90 system is a distributed process control system. Using a series of integrated control nodes, the NETWORK 90 system lets you monitor and control process variables such as flow rate, temperature, and pressure according to a control configuration that the process (system) engineer sets for your plant.

The major control Nodes of the NETWORK 90 system are:

- the Process Control Unit (PCU)
- the Operator Interface Unit (OIU)
- the Computer Interface Unit (CIU)
- the Management Command System unit (MCS)
- the Plant Loop to Plant Loop Gateway (PPG).

The Plant Communication Loop (PCL) ties the nodes together. The PCL enables communication among the nodes for:

- sharing control variables among modules in different nodes
- monitoring operation of control schemes in control nodes
- taking control action at an OIU, then a CIU, or the MCS
- configuring and maintaining PCU control schemes from an OIU, MCS, or CIU
- monitoring the status of system components from an OIU, MCS, or CIU
- monitoring and interfacing of PCUs by CIUs.

NOTE

The PPG, or PPG01, is a module supporting Plant Communication Loop (PCL) functions. Reference materials concerning PPG modules are currently under development to be released at a later date. The PPG01 fits into the Module Mounting Unit (MMU) of an OIU. (Refer to the OIU Hardware Manual, E93-901-2, for a complete description of the MMU.)

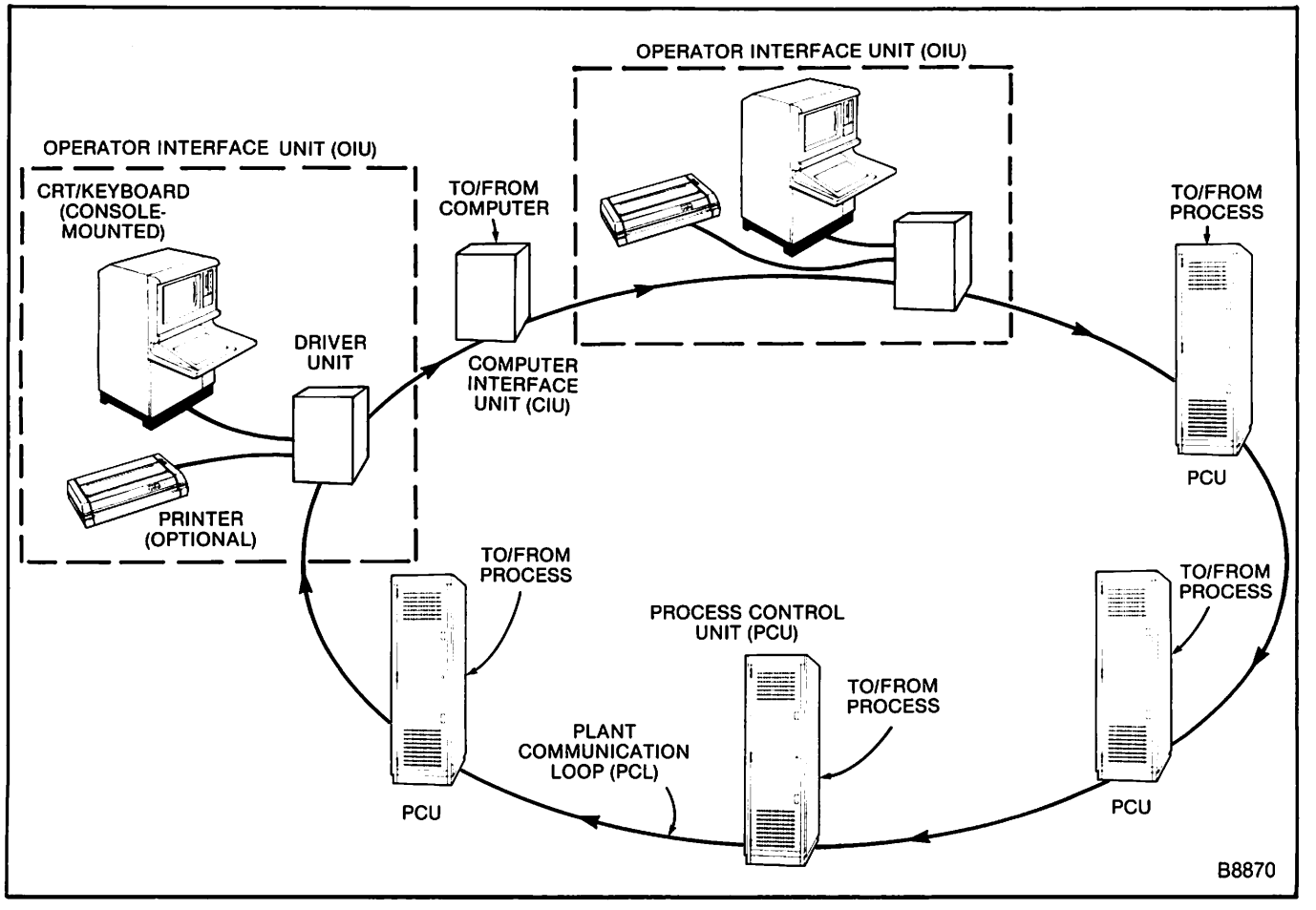

FIGURE 2.1 — NETWORK 90 Overview

The Process Control Unit

The Process Control Unit (PCU) is the fundamental control node of a NETWORK 90 system. A PCU can either refer to several NETWORK 90 control modules, or to any cabinet containing:

- power panels
- configurable control modules
- termination units.

Termination units link modules to user process.

NOTE

Individual modules store configuration data in on-board, nonvolatile memory (EEROM). It is also possible to back up (store) and download module configuration on floppy disks (diskettes).*

NETWORK 90 modules comprising a PCU can perform data manipulation and specific control functions. Certain modules contain a complete library of algorithms supporting system functions, as well as nonvolatile memory (EEROM) for storing configurable control schemes.

NOTE

A nonvolatile memory device retains data even if power is lost.

A PCU can be a stand-alone control system containing panelboard stations for system interfacing and a Configuration and Tuning Module (CTM) for configuring control schemes. A CTM enables local building and modifying of control schemes (configuration) into PCU modules.

The PCU connects directly to process field devices. The PCL links all PCUs together in series. This enables other PCUs in the plant to share control functions and data from any PCU in the system. It also lets OIUs, CIUs, and MCS units communicate with any PCU.

The point where the PCU connects to the PCL is a Node (any junction on the PCL is a node). (This NETWORK 90 version accommodates up to 63 nodes. Later versions will have even greater capacity.)

*The term floppy disk, or diskette, or sometimes even floppy diskette refers to the so-called soft sector, eight-inch diskette units used in OIU diskette drives. For a complete description of diskettes used in the OIU, refer to the OIU Hardware Manual, E93-901-2. This manual uses diskette more often than floppy or floppy disk. Certain OIU CRT displays also use the term diskette instead of floppy disk. However, both refer to the same thing.

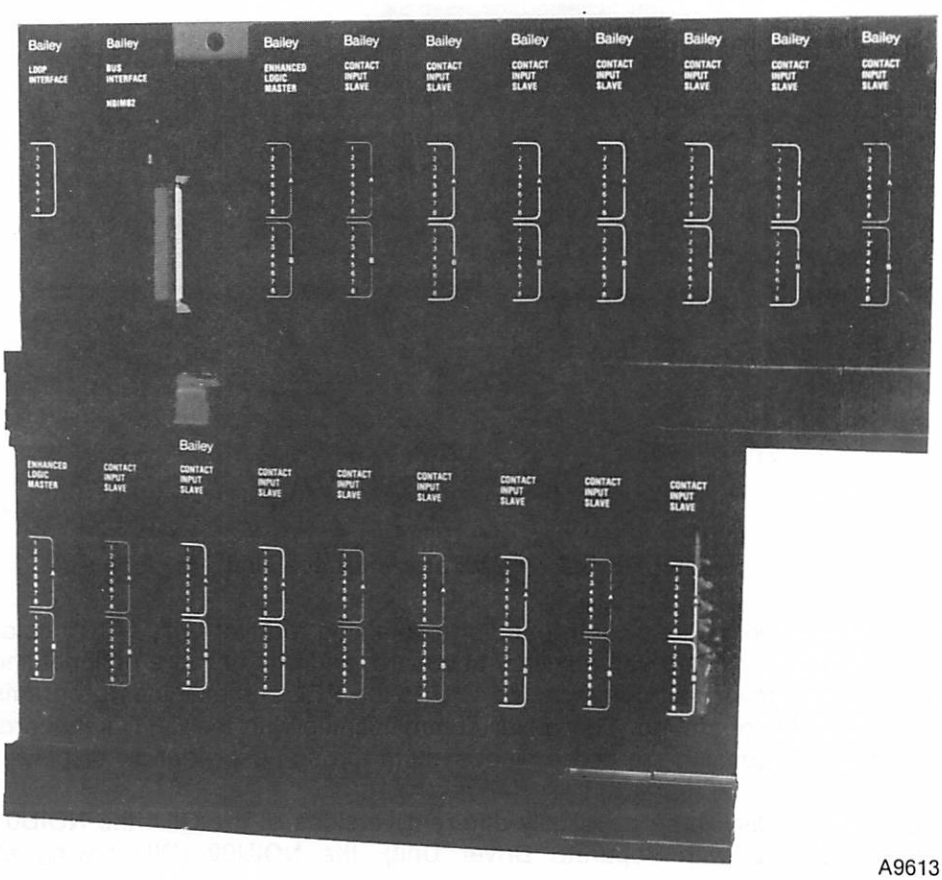

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FIGURE 2.2 — The Process Control Unit

The Operator Interface Unit

You as the operator can monitor and control overall plant operation using the OIU. The number of OIUs in a system varies depending on the overall control plan and size of a plant. An OIU can monitor and control an entire plant process. There are many other operator devices such as: Digital Control Station, Digital Indicator Station, Digital Logic Station, for example, that the OIU also enhances.

The process engineer, technician, or maintenance person can use the OIU to configure and maintain control schemes throughout the plant system. The OIU reads any module control scheme in the system and displays it. The engineer can modify any control scheme, having the OIU write it back to the module. He can also read module configuration and save it on a diskette or read a saved configuration from diskette, writing it back to the module. (See Sections V, X, and XIII.)

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FIGURE 2.3 — Operator Interface Unit

The OIU is an integrated control station containing a driver unit, a CRT color graphic display, a fixed and auxiliary keyboard, and one or more optional line printers. The driver unit connects the OIU to the PCL and executes programs controlling OIU operation. The driver communicates with the CRT, keyboard, and printer, accessing the entire plant system through user-friendly displays.

There are actually three physically different versions of the OIU: the NOIU01 (Desk Top OIU with separate Driver Unit), the NOIU02 (OIU having all

components in same console) and the NOIU03 ruggedized version of the NOIU02. Refer to the OIU Hardware Manual and to the OIU Product Specification pamphlet (E93-901-2 and E93-901-10) for an example of each version. Figure 2.3 is a composite example of both NOIU01 and NOIU02 in one station.

The driver unit contains both a hard disk and a floppy disk or diskette drive. The diskette drive handles removable diskettes that can save and restore PCU and OIU configurations, as well as load OIU software. The hard disk drive provides on-line storage for OIU operating software, historical trend and OIU configuration data.

The CRT display provides a color graphic display using a 19-inch screen. The screen is the primary information device, using a variety of displays to perform all OIU functions. There are two types of displays: Operation and Configuration. Operation displays show plant process or system information. Configuration displays let the engineer design the operational displays for particular plant processes. The operator can display process information using a variety of predefined elements.

The fixed keyboard is a flat panel device (covered by a mylar membrane) located in front of the CRT screen, having alphabetic, numeric, and specialized function keys. The keyboard lets you access various displays and then interact with them (Section III). You can display and control any process loop in the NETWORK 90 system.

The optional auxiliary keyboard is a typewriter-style keyboard used for configuration and graphic editing (Section VII).

NOTE

When the term keyboard occurs alone it refers to the fixed keyboard, not the auxiliary one.

Authorized personnel can configure or tune most PCU modules, as well as troubleshoot the system using the fixed keyboard. The keyboard also has two keylock switches protecting configuration and tuning from accidental change or loss. The two keyswitches restrict configuration and tuning to authorized personnel. The switches are at the upper left of the keyboard, above the actual pushbuttons (Figure 2.4).

NOTE

The keylock switches are labeled as: tuning (TUNE) and configuration (CONF). The only way to change the switch positions is to insert a key into each and turn. After authorized personnel change switch positions they remove the keys. This locks the keyswitches into the proper position for operation. Operators do not change the keyswitch positions.

CAUTION

The operator must not try to change the keyswitch positions. After configuration and tuning are complete, the process engineer locks the switches removing the keys. During normal operation both switches stay locked.

WARNING

NEVER INSERT THE KEYS TO PERFORM CONFIGURATION OR TUNING YOURSELF! Entering unauthorized configuration details or tuning parameters can result in catastrophic loss to your plant or even in fatal injury. If you discover either key inserted in its lock, inform your plant manager or process engineer at once. Do not take any action on the OIU as long as the keys are in the locks.

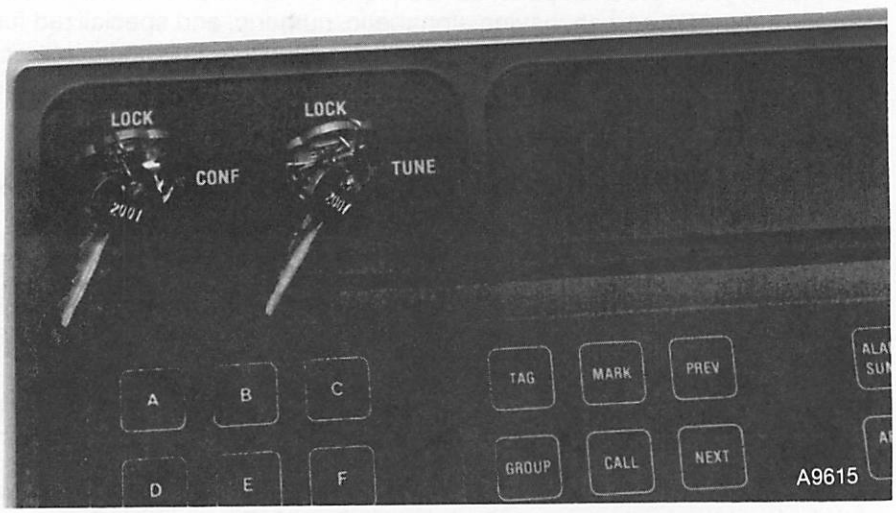

FIGURE 2.4 — The Configure and Tuning Keyswitches

The optional line printer logs alarm occurrences in the plant system, printing logs and copies of the various OIU displays. The line printer can copy any current CRT screen display using the same color scheme as the display itself. Figure 2.5 is an example of a printer produced CRT display.

NOTE

The current version of the OIU can support two line printers: the standard black-and-white and an optional color printer. Either printer may serve as an Event Log (Section IX). The process engineer sets black and white and/or color printing during configuration.

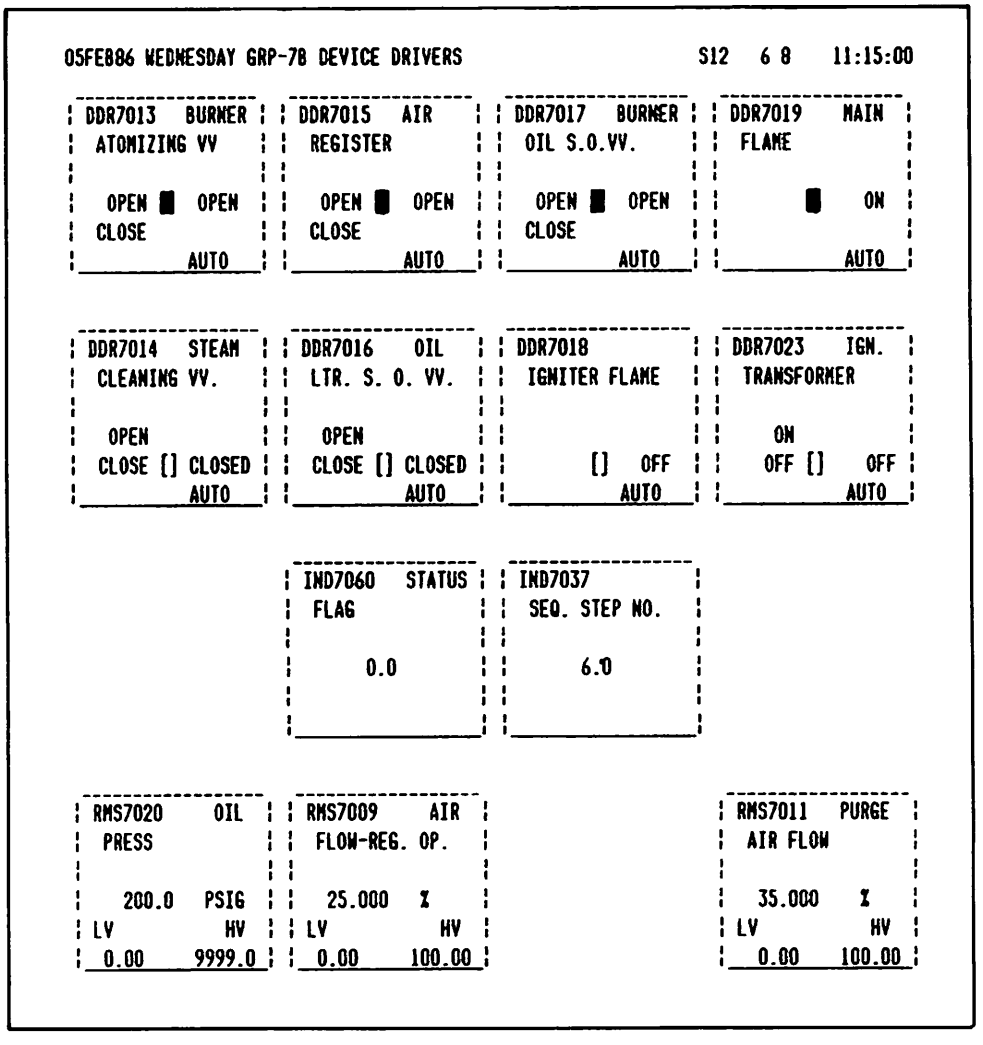

FIGURE 2.5 — Printed Hard Copy of CRT Display

The Computer Interface Unit

The Computer Interface Unit (CIU) is the host computer equivalent to the OIU. The CIU links a host computer with PCUs, OIUs, and MCS nodes throughout the PCL. Using the CIU, the host computer gathers process information, makes process decisions, and performs or recommends process changes. The CIU does not directly display any information.

The CIU is an automatically operating device for the host computer in your plant. The CIU lets the host perform process monitoring and controlling based on internal performance calculations. The CIU also serves as a data acquisition point for the host computer.

The CIU is programmable during configuration but the operator does not use it to interface with the system. The CIU interfaces automatically. The CIU reinforces NETWORK 90 data processing capability and enhances OIU performance.

NOTE

The CIU is optional and not necessary for plant operation. For a complete description of the CIU, refer to the Product Instruction Manual for the Enhanced CIU, E93-905-2.

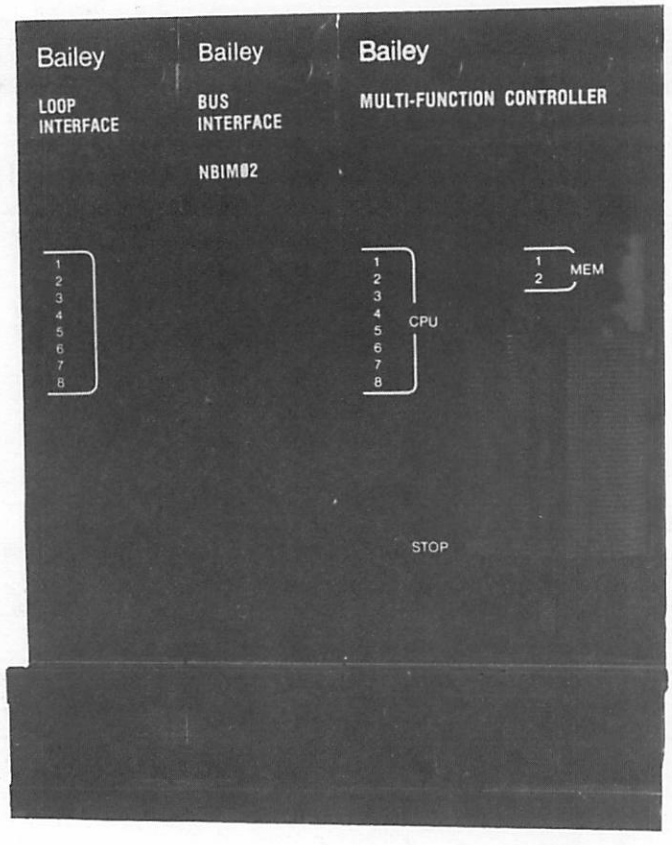

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FIGURE 2.6 — Computer Interface Unit

The Management Command System

The Management Command System (MCS) unit provides total plant control, monitoring, and applications programming (in optional FORTRAN and/or C languages) from single or multiple consoles. There can be more than one MCS on a system depending on user needs. The MCS acts similarly to the OIU but has enhanced functions and capabilities lacking in the OIU.

The MCS enables management personnel to take plant control from any display in the system (like operations personnel do using an OIU). The manager can configure specific display elements and use one-key access for up to 32 different displays (instead of using multi-key access as on the OIU). The MCS also lets the manager print, archive, and retrieve various logs (in a manner similar to the OIU).

Using the MCS, the manager can also list tag details, change various alarm limits, effect tuning functions, lockout plant control by password, and manipulate

files by various file management commands. The MCS has on-line utilities, on-line documentation capabilities, and diagnostics, as well.

NOTE

The OIU has most of the features above but the MCS can manipulate more tags than the OIU (up to 30,000 for the MCS as against 5,000 for the OIU).

The MCS is very similar to the OIU in appearance and function. The MCS also uses a color graphic CRT display screen and standard overlay pushbutton keyboard. But the MCS CRT uses more colors than an OIU CRT while the MCS keyboard has more control blocks for greater input/access flexibility.

For a complete description and configuration of the MCS, refer to the MCS Operation and Configuration Manual, E93-901-21.

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FIGURE 2.7 — Management Command System Unit

OIU OPERATING THEORY

The OIU processes information from messages it receives over the PCL. The OIU handles the following message types:

- Process reports or process points (The system also updates trending data every 30 minutes, updating it for display on demand every minute.)
- Exception reports (value and alarm state changes).

The OIU can display process points on the CRT or store them (archiving) on diskette. Historical process information is necessary for process trend analysis (trending). Exception reports appear on the CRT as alarms and data changes. There are many different alarm indicators. (See Alarm Handling below.)

The OIU permits access to the NETWORK 90 system for three uses:

- Control Engineering (process engineer)
- Plant Operation: (OIU operator)
  — Process Monitoring and Controlling
  — Alarm Handling
- System Troubleshooting (process engineer).

Control Engineering
The OIU accesses the configuration of PCU modules through the PCL. Using the PCL access, the OIU enables the following functions for creating and maintaining module configuration:

- Change module operating mode
- Modify a configuration (add, modify, tune, and delete)
- Copy a configuration from module to diskette (save)
- Copy a configuration from diskette to module (restore)
- Verify configuration against diskette
- List module configuration to printer
- Modify Red Tag Status.*

The CONF keyswitch on the keyboard protects these module configuration capabilities. While the CONF keyswitch stays locked the operator cannot make configuration changes. The TUNE keyswitch provides identical protection for tuning (Section V).

*OIU firmware must support Red Tag status in order to use this function.

Plant Operation
The OIU lets the operator monitor the process and take control action. Values and alarm states of selected variables travel to the OIU via the PCL. The OIU receives this data, displaying it on the CRT screen. The operator uses the keyboard to send messages to the PCU modules to take control action. PCU modules directly interface with the process after receiving information entered from the OIU. An OIU loss from the system has no effect on control scheme execution by PCU modules.

The module sends an exception report when a significant change occurs in the value or alarm state of a variable. The engineer decides what amount of change

is significant during module configuration. The exception report process enables the OIU to display current data without continuous polling.

> **NOTE**
>
> **There is a small number of variables which the OIU can poll to support PCU module configuration and diagnostics. These are engineering functions, only. Otherwise, the process engineer must configure all variables the OIU monitors for exception reporting by source modules.**

PCU modules can send exception reports for individual variables and collections of variables handling PID and ON/OFF control functions. (See Tuning Displays in Section IV.) A hardware address of the function block originating the report identifies each exception report. This address contains the PCU number, module number, and block number.

Each exception report represents a Tag in the OIU. The engineer defines each exception report item the OIU monitors as a tag during OIU configuration. Tags are basically points in the NETWORK 90 system that the operator can monitor and control.

Each tag has a name of up to eight alphanumeric characters. The tag name identifies the tag throughout the OIU. Depending on the OIU hardware you select, an OIU can handle from 500 up to 5000 tags. Each tag can also have tag descriptors of up to 21 alphanumeric characters. These descriptors help to identify a tag.

PROCESS MONITORING AND CONTROL ACTION. The OIU provides a structured view of the plant. To present this view, the OIU uses two main categories of operational (data) displays:

- Supervisory displays (providing a broad view of plant processes, tags, and alarms)
- Process Control displays (providing detailed information on individual processes with manual control means).

The two categories of operational displays are further divided into the following specific applications:

Supervisory

- **Alarm Summary** (reviews the status of last 100 alarms)
- Status pages:
  — **System** (overviews operational status of NETWORK 90 equipment on the PCL)
  — **Node** (reviews the status of each module within a PCU)
  — **Module** (reviews the status of a single module)
- **Tag Lists** (identify each tag and its hardware address, as well as state changes and various tag alarm suppressions)

Process Control

- **Area Display** (overviews the alarm status of up to 96 tags. Can also view combination of alarm status and values for fewer tags)
- **Group Display** (provides live process information to support control actions for up to 240 group displays)
- **Graphic Display** (provides live process information to support control actions of chosen schematic format display for up to 120 graphics)
- **Block Details Display** (provides access to a configured block in a PCU module: displays specifications for particular blocks)

Table 2.1 (next page) shows a summary of the maximum number of items that the three OIU hardware options can handle for Process Control displays. This manual describes the features of the 5000 Tag OIU hardware option. Except for the item maximums shown on Table 2.1, the three OIU options are virtually identical in operation and configuration.

NOTE

Refer to Table 2.1 to allow for the difference in the number of items for your OIU if not using the 5000 Tag unit.

TABLE 2.1 — Process Control Display Item Maximums

500 TAG OIU	1400 TAG OIU	5000 TAG OIU
10 Areas	10 Areas	10 Areas
12 Groups per Area	12 Groups per Area	24 Groups per Area
8 Tags per Group (Area Display)	8 Tags per Group (Area Display)	8 Tags per Group (Area Display)
16 Tags per Group (Groups Display)	16 Tags per Group (Group Display)	16 Tags per Group (Group Display)
100 Tags per Graphic	100 Tags per Graphic	100 Tags per Graphic
30 Graphics	60 Graphics	120 Graphics
64 Trends	500 Trends	1500 Trends

The process engineer arranges tags, groups, and graphics during OIU configuration. He can assign a graphic to more than one group; each group can have a graphic. There are several dynamic items available for graphics, as well (Section IV). He can select from 500 to 1500 variables for historical Trending during configuration (display in trend elements of group displays). Each trended

variable can have one of four display periods: 30 minutes, 2 hours, 8 hours, or 26 hours.

Trending uses a grid, or graph, on which several trended elements appear as lines. The graph shows these trend lines over a certain time interval (from left to right on the graph) and with certain scaling spans (the positions of the trend lines inside the graph between its bottom and top). Sections IV, VI, XI, and XII discuss trending elements in more detail.

Each trend line also has a resolution. Resolution refers to the width of a trend line as it appears on the graph over its certain time interval. Each resolution time interval has a Sample Time. The 30 minute interval has a Sample Time of 15 seconds; all the rest have a Sample Time of one minute. (See also Section XII.)

ALARM HANDLING. The OIU monitors values and alarm states coming from configured tags. The functions send exception reports (significant value or any alarm state changes) to ensure the OIU always has current alarm data. The engineer can configure the various alarm indicators, including their levels, colors, and suppression states as desired (Section VI).

NOTE

THIS MANUAL PRESENTS INFORMATION CONCERNING THE VARIOUS STANDARD (DEFAULT) CONFIGURATION ALARM INDICATORS. (See Also Sections VI, XI, XII, and XIII.)

Alarm information can include bad quality. This occurs when the value of a tag goes out of range or the system cannot access it. When the OIU cannot communicate with the module originating a tag, bad quality appears for that tag.

While the OIU is on-line, it monitors the alarm status of all defined tags, regardless of which display is currently on the CRT. A portion of the top line of each CRT display contains alphanumeric characters indicating alarm states in all plant areas. The OIU maintains a list of the 100 most recent alarms in order of occurrence. (See Alarm Summary Display in Section IV.)

When an alarm first occurs it is unacknowledged (its indicator flashes). After you acknowledge an alarm (Section XI), the alarm indicator stops flashing and changes to a steady state.

The OIU also logs alarm state changes on its line printer. You can turn the alarm logging function on or off as desired. (See Sections IX and XIII.)

System Troubleshooting

The various Supervisory Display Status pages allow you to monitor the operational status of NETWORK 90 equipment on the PCL. Table 2.2 shows the Status conditions.

TABLE 2.2 — Troubleshooting Status Features

STATUS PAGE	DEVICE MONITORED	OPERATING CONDITION
SYSTEM	All System Nodes	Normal or Problem
NODE	Each Individual Problem in Node	Nature of the Problem
MODULE	Detail of Single Problem in Module	Nature of Problem of Abnormalty

NETWORK 90 SYSTEM CONFIGURATION

Configuration consists of setting up the operating performance limits for the process and NETWORK 90 system. (It also includes programming for the CIU.) The process engineer can configure PCU modules and the OIU directly from the OIU itself. The OIU has a series of Configuration displays including the OIU General Function Menu.

Section IV briefly examines the General Function Menu while Sections V and VI explain it in more detail. The General Function Menu has two basic configuration choices:

- PCU CONFIGURATION
- OIU CONFIGURATION.

CAUTION

You as the operator must not try to configure the OIU yourself. This manual presents all configuration details (PART II) only for your information.Your plant process engineer performs all necessary configuration.

For PCU configuration, the process engineer programs all modules in the PCUs. The OIU has a control function library for each module type. A control function is an instruction program concerning a specific operation. A control function may specify a mathematical operation or a logical operation. A control function may also access a process control operation (Section V).

For OIU configuration,the process engineer defines the kinds of information necessary to collect and monitor (tags, groups, areas, nodes, etc.). He also designs the desired OIU display formats for the necessary information (graphics, screen element space, color scheme, etc.). Sections VI through X describe OIU configuration.

The process engineer must perform the following tasks to configure the OIU for any particular application:

- Define Logic State Descriptors, Engineering Units, and Tag Lists (Section VI) See also tag design hierarchy on the next page.
- Specify variables for Trending (Section VI)
- Design Area and Group displays (Section VI)
- Edit the necessary Graphics (Section VII)
- Define Logging and Archiving if used (Sections IX & X)
- Specify alarm management (Section VI)
- Save a configuration copy on diskette (Refer to File Utilities in the OIU Hardware Manual, E93-901-2.)
- Reset and load the system (Section XI).

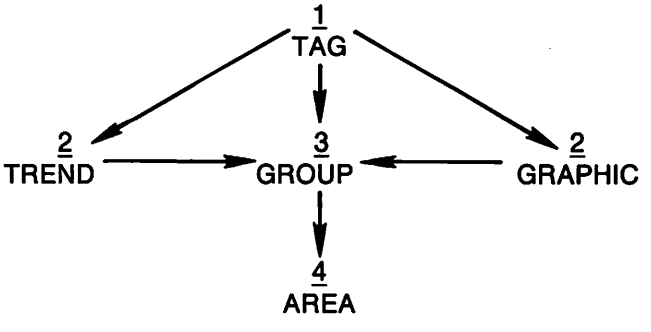
Each operation above occurs on a separate display. These configuration pages are easy to use, fill-in-the-blank, interactive displays. You use similar procedures on the Configuration displays to enter an initial configuration and to edit an existing one.

CAUTION

Remember, the CONF keyswitch above the OIU keyboard protects configuration from accidental loss or tampering. So long as the CONF switch is locked, the operator cannot use configuration commands nor change configuration functions.

For CIU configuration, refer to the Enhanced CIU Programmer Reference Manual, E93-905-9. For MCS configuration, refer to the MCS Operation/ Configuration Manual, E93-901-21.

The hierarchy for Tag design is:



SECTION III
THE KEYBOARD

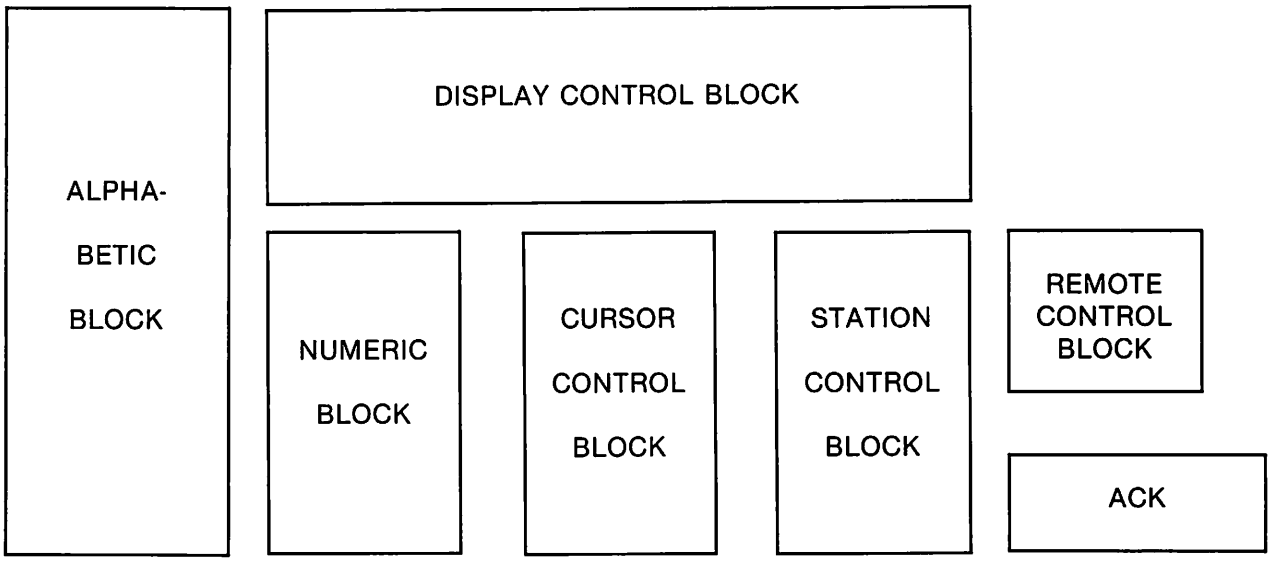
INTRODUCTION

The OIU can have two keyboards: fixed and auxiliary. This section describes each block of the fixed keyboard, identifying its keys and their functions. (For description of the auxiliary, or graphic editor keyboard, see Section VII.) The fixed OIU keyboard is a flat panel divided into blocks of mylar overlay pushbutton keys. Pressing any key provides both audible and visible feedback.

NOTE

When you press any console key a low tone (a soft beep) sounds.

The console has seven blocks:



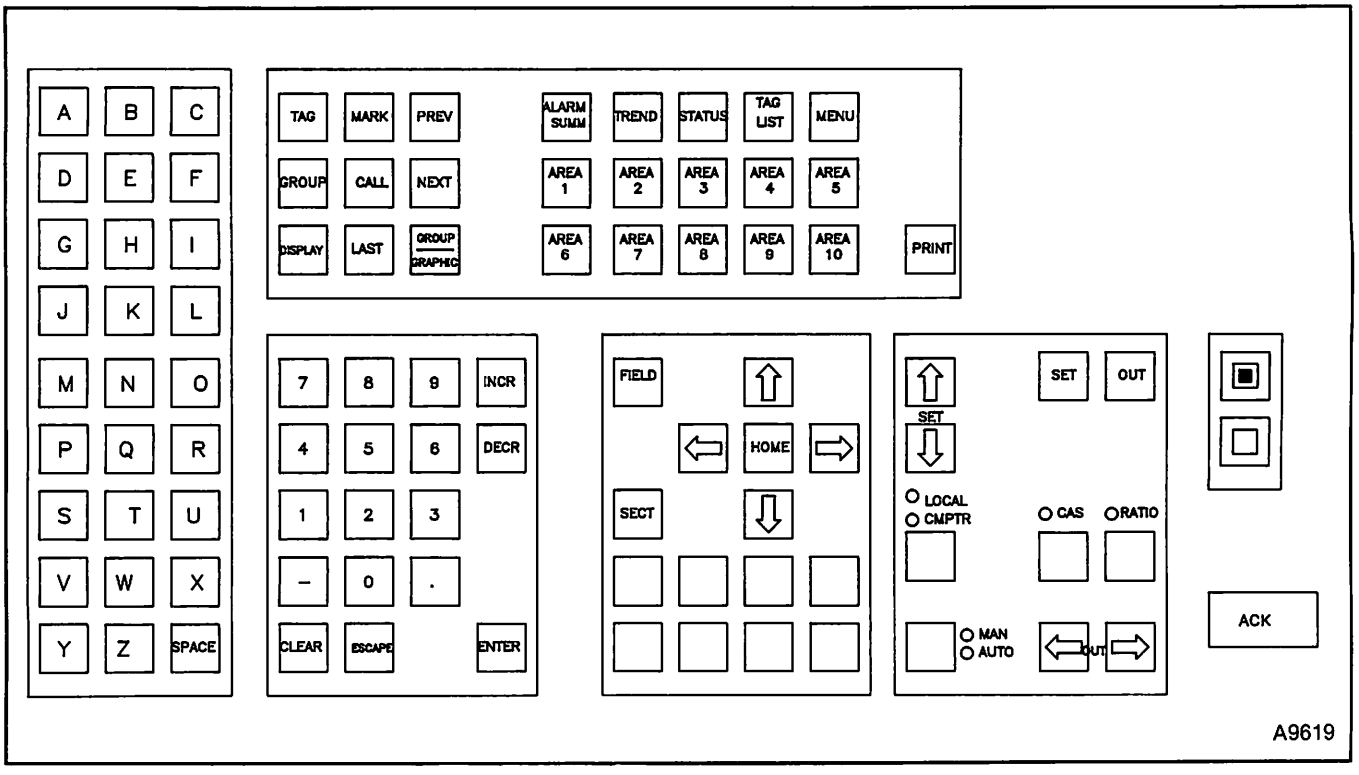


FIGURE 3.1 — Keyboard Console

Display Control Block

The Display Control block is at the top center of the console. This block has three groups of keys: left, center, and right. The nine left group keys let you access and page through the CRT displays. The 15 center group keys permit access to the following displays:

- Alarm Summary
- Tuning (and Block Details)
- System Status
- Node Summary
- Module Summary
- Tag Lists
- General Function Menu
- Areas.

The right group consists of the single PRINT key. This key directs the (optional) printer to produce a hard copy of the current CRT display.

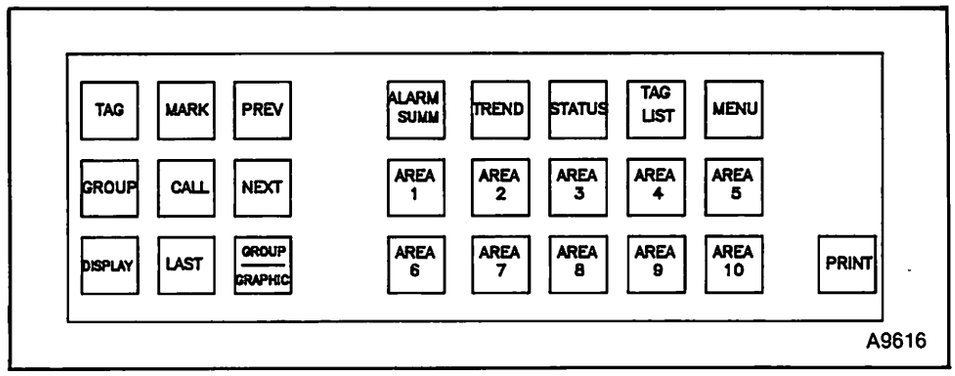


FIGURE 3.2 — Display Control

TABLE 3.1 — Display Control Key Functions

LEFT GROUP

KEY NAME	USE
TAG	Identifies the Primary Group Display accessed by tag name within the process group (Enter tag name using alphanumeric keys after pressing TAG.)
GROUP	Identifies the Group Display accessed by group name. (Enter group name using alphanumeric keys after pressing GROUP.)
DISPLAY	Complete the Group Display access sequence begun by pressing TAG or GROUP. Also accesses the Block Details Display from any Group/Graphic.
MARK	Flags the current display page for later access. (You can only flag ONE display page at a time using MARK.)
CALL	Access flagged page (MARK command) for immediate display.
LAST	Recalls the previously displayed page.
PREV	Accesses the previous page number for display (Scrolls backward one page) at a time.)
NEXT	Accesses the next page number for display. (Scrolls forward one page at a time.)
GROUP GRAPHIC	Accesses the graphic display for the currently displayed group page (if graphic exists).

The Keyboard

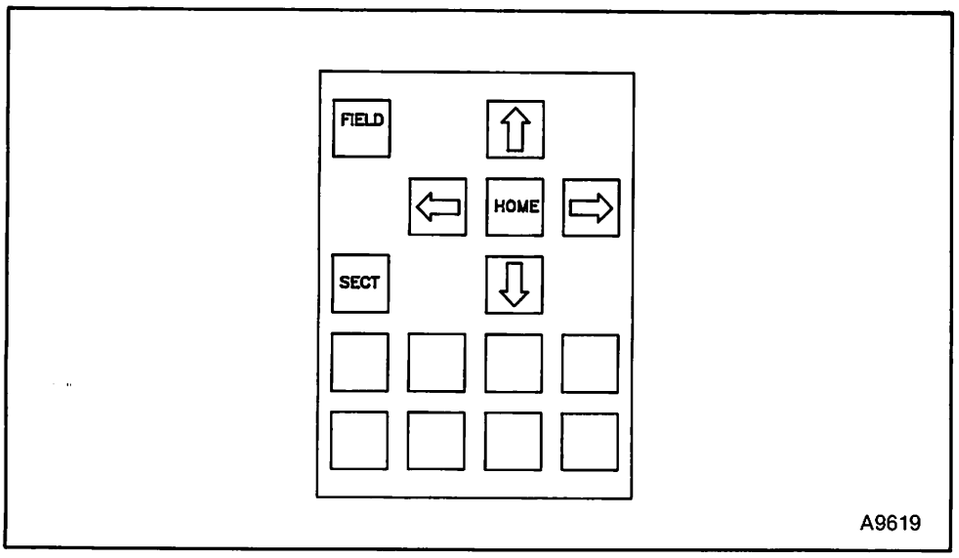


FIGURE 3.3 — Cursor Control

Station Control Block
The Station Control block is to the right of the Cursor Control block. The Station Control keys permit changing the control and operation modes of any station function block. They also enable manual changing of control output and setpoint values. (The Station Control block is similar to the faceplate of a Digital Control Station.)

The Station Control block also has three groups of keys: top, center, and bottom. The four top keys select setpoint and control output for numeric value insertion. These keys also permit manual changing of selected setpoint values. The three center keys permit mode changing. The three bottom keys change operating modes and permit manual changing of selected output values.

This block also has red LED indicators adjacent to certain keys. The indicators visually show the current control and operating modes.

TABLE 3.3 — Station Control LED Indicators

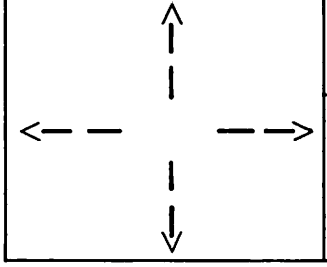
LED	UNMARKED KEY	OPERATION/ CONTROL
• LOCAL	(LOCAL)	Indicates local control mode.
• CMPTR	(CMPTR)	Indicates remote control mode.
CASCADE MODE SELECT		
• CAS	(CAS)	Indicates cascade station mode.

TABLE 3.2 — Cursor Control Key Functions

LEFT GROUP

KEY NAME	USE
FIELD	Moves cursor from field to field: left to right, and also vertically. Positions cursor on Tuning Displays.
SECT	Moves cursor from section to section: up or down, and also horizontally.

RIGHT GROUP

KEY NAME	USE
HOME	Returns the cursor to the HOME position on the CRT.
	Arrow keys move the cursor in the indicated directions.
	When activating Trend Display, vertical keys change the trend time interval; horizontal keys scroll back and forth through the time shown on the Trend graph display.

BOTTOM GROUP

KEY NAME	USE
(ELEMENT DISPLAYS)	Position cursor at desired element of Group Display.
	Also access control tags from station , remote control, and single point display elements on the Group Display page.

NOTE

Section XI explains cursor positioning on screen display elements in detail.

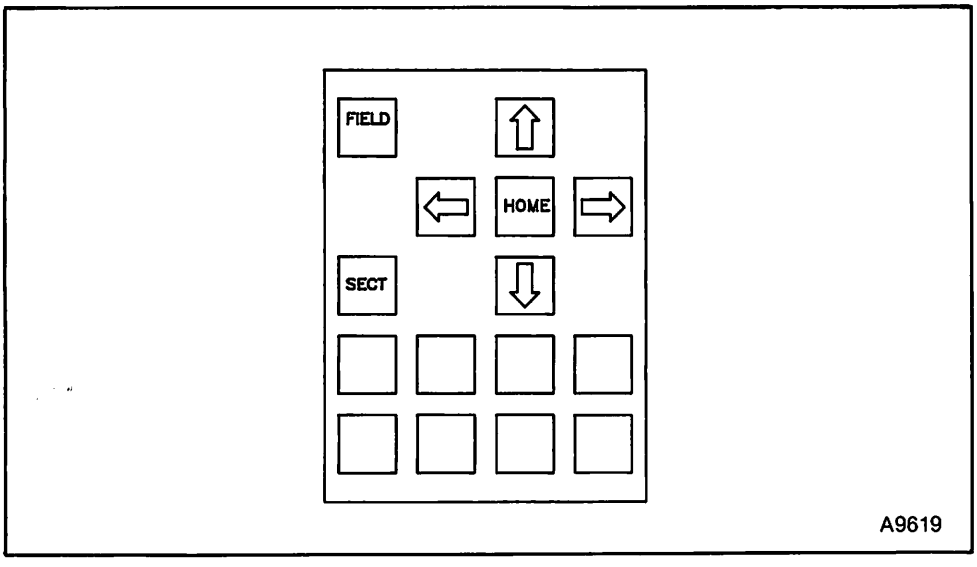


FIGURE 3.3 — Cursor Control

Station Control Block
The Station Control block is to the right of the Cursor Control block. The Station Control keys permit changing the control and operation modes of any station function block. They also enable manual changing of control output and setpoint values. (The Station Control block is similar to the faceplate of a Digital Control Station.)

The Station Control block also has three groups of keys: top, center, and bottom. The four top keys select setpoint and control output for numeric value insertion. These keys also permit manual changing of selected setpoint values. The three center keys permit mode changing. The three bottom keys change operating modes and permit manual changing of selected output values.

This block also has red LED indicators adjacent to certain keys. The indicators visually show the current control and operating modes.

TABLE 3.3 — Station Control LED Indicators

LED	UNMARKED KEY	OPERATION/ CONTROL
• LOCAL	(LOCAL)	Indicates local control mode.
• CMPTR	(CMPTR)	Indicates remote control mode.
CASCADE MODE SELECT		
• CAS	(CAS)	Indicates cascade station mode.

TABLE 3.3 — Station Control LED Indicators — continued

RATIO MODE SELECT		
• RATIO	(RATIO)	Indicates ratio station mode.
OPERATING MODE SELECT		
• MAN	(MAN)	Indicates manual operating mode.
• AUTO	(AUTO)	Indicates automatic operating mode.

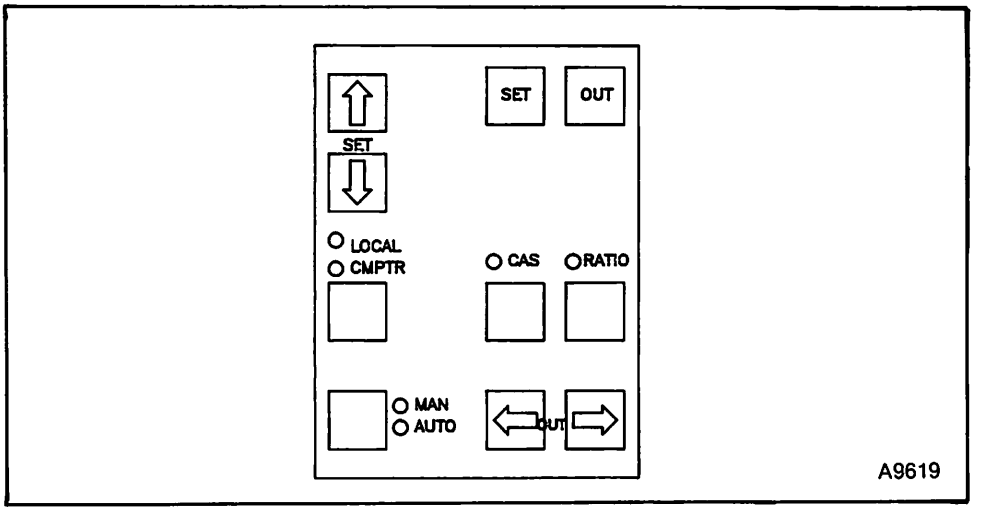


FIGURE 3.4 — Station Control

TABLE 3.4 — Station Control Key Functions

TOP GROUP

KEY NAME	USE
∧ SET ∨	Ramps the setpoint value up or down
	Light pressure on key changes the value at 2% of span/second (Touch key lightly and release). Heavy pressure at 20% per second (Hold key down and then release). Continuous pressure changes value at constant 2% or 20% per second* rate until you release the key.
SET	Selects setpoint target for value insertion using numeric keys.
OUT	Selects control output target for value insertion using numeric keys.

CENTER GROUP

KEY NAME	USE
(MODE SELECT)	Switches control mode between local and remote computer.
CAS	Switches station in or out of cascade operating mode.
RATIO	Switches station in or out of ratio operating mode.

BOTTOM GROUP

KEY NAME	USE
(MODE SELECT)	Switches the station between manual and automatic operating modes.
	If control output is tracking (COTK), system locks station in Manual mode (See Section IV).
<— OUT —>	Ramps the control output value up (right) or down (left). (Use identical to the Setpoint Ramp keys, as above.?

*Continuous light pressure changes the value at 2%; continuous heavy pressure at 20%.

When the Station module is in Cascade mode or in SPTK (setpoint tracking) mode the Set and setpoint ramp keys are non-functional. If the module is a ratio type and in Ratio mode, the keys increase or decrease the ratio index (in place of setpoint). The ratio index ranges between 0.0 and 10.0.

The Out (Top) and control output ramp keys (Bottom) function only when the Station module is in Manual mode. If the module is in COTK, the OUT and bottom ramp keys become non-functional. When the Station is locked in this manner, the LEDs for MAN and AUTO stay on simultaneously (See Sections IV and XI).

Alphabetic Block

The Alphabetic block occupies the left side of the console. This section has 27 keys arranged in three columns of nine. The keys include the 26 letters of the English alphabet, as well as a Space key at the lower right.

The alphabetic block enables access to Group Display pages by:

- entering an access letter from an Area or Alarm Summary Display page
- entering the alphabetic portion of Tag and Group names.

The alphabetic block also lets you access various operations using the General Function Menu. (See Section XI.)

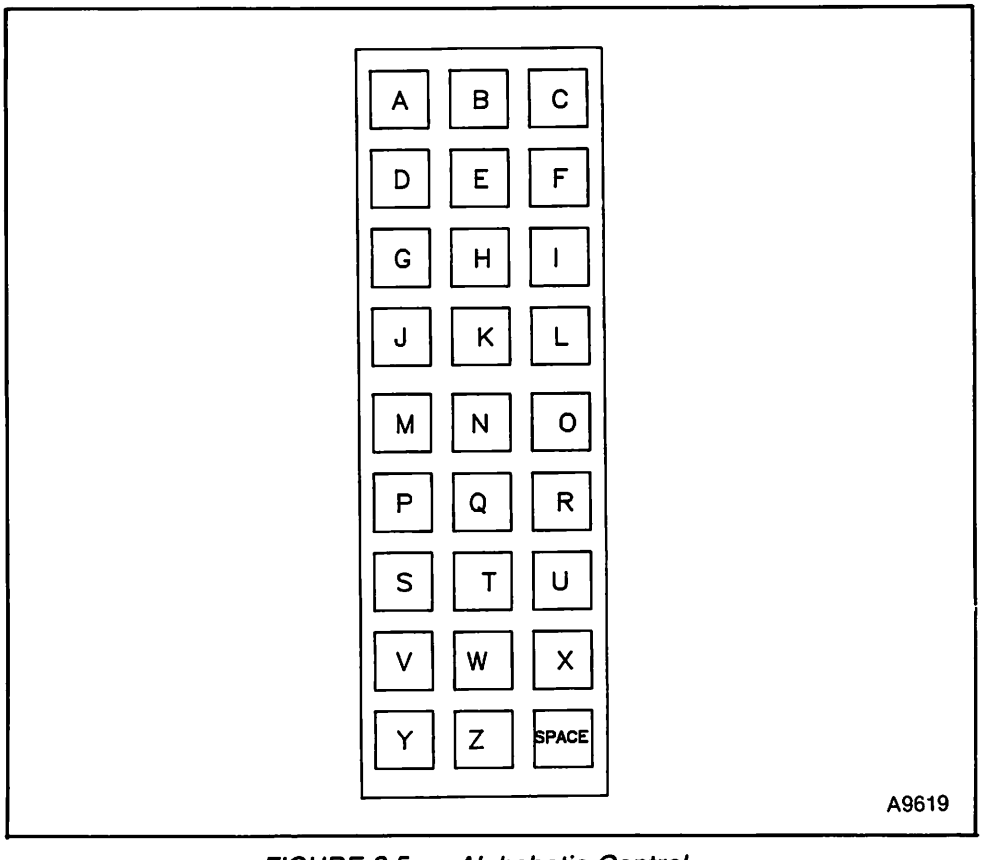


FIGURE 3.5 — Alphabetic Control

Numeric Block

The Numeric block is between the Alphabetic and Cursor Control blocks. The Numeric block has two groups of keys: 12 numeric keys arranged in three columns of four, and five special function keys (three below and two at the upper right).

The Numeric block enables the following operations:

- Entering the numeric portion of Tag and Group names
- Entering numeric setpoint and control output values
- Accessing Node and Module displays from System Status display pages
- Accessing Block detail elements on Tuning Display pages
- Scrolling the time cursor on the Trend display
- Erasing unwanted entries
- Aborting current operation and returning to a previous one.

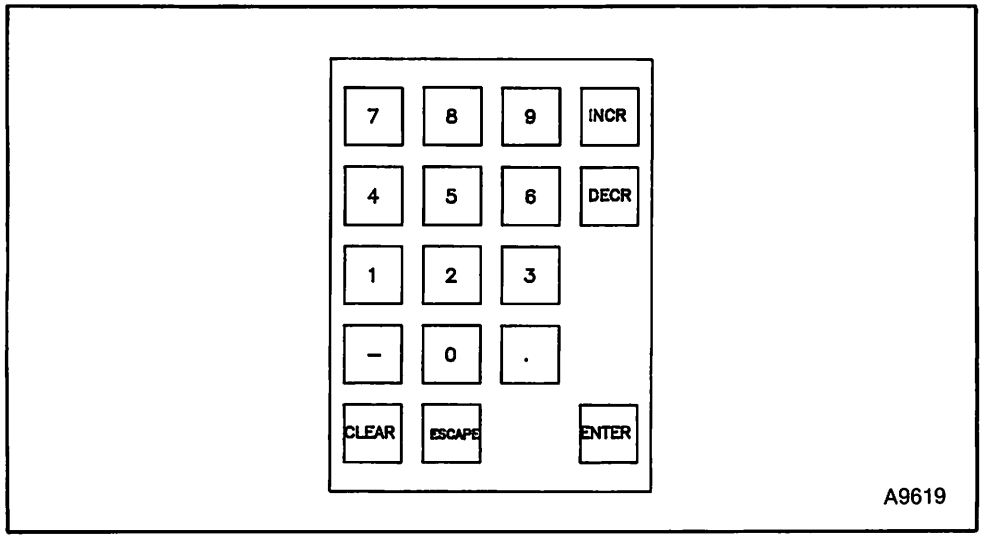


FIGURE 3.6 — Numeric Control

TABLE 3.5 — Numeric Key Functions

NUMERICS	USE
0 - 9	Enter numeric portions of Tag and Group names, as well as setpoint and control output values.
	Access Node display numbers from System Status page and Module display numbers from Node Status page.
	Also access Block detail elements from Tuning Displays.
(DECIMAL POINT	Enters decimal point for numeric values.
—	Indicates negative numbers.

TABLE 3.5 — Numeric Key Functions - continued

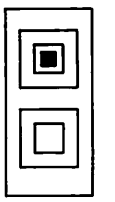
SPECIALS	USE
INCR	Scrolls time cursor forward on trend display.
DECR	Scrolls time cursor backward on Trend display.
ENTER	Completes entry process of numeric values. (Press ENTER after keying in numeric data.)
CLEAR	Erases keyboard entry errors and old data.
ESCAPE	Cancels current operation, returning to previous one.

NOTE

Both the INCR and DECR keys function similarly to the Ramp keys of the Station Control block. Light pressure on the keys moves the time cursor 2% of the total distance/second along the Trend Graph (Section IV). Heavy pressure moves it 20% of the total distance/second. Continuous light pressure moves it at a constant 2% (and continuous heavy pressure moves it at a constant 20%) of the total distance/second until release.

Remote Control Block

The Remote Control block is to the right of the Station Control block. The Remote Control block has two keys. They can change the existing position (status) of any remote control switch shown on the Remote Control display element of a Group Display page. The keys control these switch position changes depending on the current configuration of the switch element.



A9619

FIGURE 3.7 — Remote Control

NOTE

The engineer can configure Remote Control switch points to display feedback indicators in addition to (or instead of) status indicators (Section VI). Feedback indicators show the result of any feedback signal coming from changes in remote control switch positions. Device Driver Remote Control elements also have feedback indicators (Sections IV and VI).

NOTE

Remote Control Memory (RCM) points can display other indicators, as well (EXP: NP, OVR, TRGT, etc.). (See Section IV.)

TABLE 3.6 — Remote Control Key Functions

STATUS INDICATORS

DISPLAY	USE
■	Shows the switch element output (ON, NORMAL, RUN) when logic = 1.
□	Shows the switch element output (OFF, OVERRD, STOP) when logic = 0.

FEEDBACK INDICATORS

DISPLAY	USE
◄	Shows the switch element feedback, signal (logic = 1).
◁	Show the switch element feedback signal (logic = 0).

The various Single Point and Remote Control display elements also show Logic State Descriptors (LSDs) or mnemonic terms. Mnemonics display along with Status indicators to show element switch positions (or device conditions). Some mnemonics are: ON/OFF, NORMAL/OVERRD (OVERRIDE), and RUN/STOP.

NOTE

The engineer defines mnemonics, or LSDs, during OIU configuration (Section VI).

Alarm Acknowledge Block
The Alarm Acknowledge block is directly under the Remote Control block and has only one key (ACK). This key permits acknowledging process or system alarms (stopping alarm indicator flashing.)

A process alarm indicates a process value exceeded an alarm trip point set for it. A system alarm indicates a fault in the NETWORK 90 system itself. Upon either situation, an alarm display on the CRT begins flashing yellow.

NOTE

OIU default alarm indicators appear in yellow. The engineer can configure alarm indicators to another color during OIU configuration (Section VI).

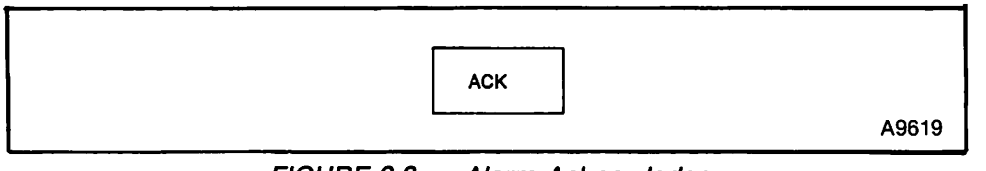


FIGURE 3.8 — Alarm Acknowledge

An alarm indicator continues flashing until you access its display page and press the ACK key. This acknowledges the alarm and stops the flashing. The alarm indicator remains on until you correct the problem causing the alarm or the process value leaves its alarm state.

Pressing the ACK key for any alarm on a display page also acknowledges **that** alarm for all other display pages where it appears (Section XI).

SECTION IV
OIU DISPLAYS

INTRODUCTION

Various display page formats are accessible for viewing on the CRT screen of the OIU. Each Operation display aids the monitoring and control of certain plant operations. This section describes each format and identifies the type of data presented. (To access the various displays, see Section XI.)

This section describes the following display pages (for other displays, see later Sections):

- Area Display:
  - — Process Groups
  - — Alarms
- Group Display:
  - — Trend Element
  - — Station Control Element
  - — Remote Control Elements:
    - — Device Drivers
    - — Remote Manual Set Constants
  - — Single Point Elements
- Graphic Display:
  - — Dynamic Items
- Alarm Summary Display
- System Status Display:
  - — Node Summary Display
  - — Module Summary Display
- Tag List Menu:
  - — Tag List Display
  - — Suppressed Tags Display
  - — Operator Suppressed Tags Display
  - — Alarm List
- General Function Menu
  (Lets you access other function menus.)
- Read Point Display
- Tuning Display:
  - — Station Control Element
  - — Trend Element
  - — Block Details Element
- Block Details Display.

Many different elements combine to form a complete display page but all pages share two common features. Each page uses a multicolored display (color scheme) and has a Title line.

Color Scheme
Display pages use various colors against a black background. The OIU displays specific types of information in the same color, regardless of the page on display. This lets you quickly recognize different information by its color.

Select the display color scheme desired during OIU configuration. You can configure your own scheme or just use the default (standard) scheme. TABLE 4.1 shows the standard color scheme.

> **NOTE**
>
> **This manual describes the standard color scheme for all display elements. Your OIU may use some other scheme, depending on its configuration.**

TABLE 4.1 — Standard Color Scheme

COLOR	INFORMATION	EXAMPLE
BLACK	Background	—
CYAN	Format information	Page title and Tag name.
GREEN	Process, date, and time information	Variables, output setpoint values, date, day, and time of delay.
YELLOW	Alarms	—
RED and MAGENTA*	Access letters and codes	Group identifiers on area display pages.
BLUE	Grid display outlines	Trend graph and display element limits
WHITE	Display page prompts	—

*Some OIUs do not use Magenta in their color scheme.

Title Line
The top line of every Display page is its Title line. The information on this line always has the same format, regardless of the page on display. From left to right it shows:

- current date (day/month/year)
- day of the week
- title (page name or number)

- action request indicator
- alarm status (system or process)
- current time of day (hour:minute:second).

With standard configuration the title appears in cyan; the action request in yellow; the alarm status in yellow and the remaining information in green.

NOTE

The action request indicator does not normally display. It appears only when archiving becomes necessary. When the indicator (a flashing yellow A just to the left of a System Alarm indicator as below) appears, press the MENU key to access the General Function Menu. After selecting the proper menu item and acting on it, the request indicator disappears. (See Sections IX, X, and XIII.)

The alarm portion indicates a flashing yellow **S** if a NETWORK 90 system fault occurs. Press the STATUS key to view the problem. Pressing the ACK key acknowledges the alarm. (The alarm indicator stops flashing.) When the problem becomes corrected the **S** disappears. (See Section XI.)

If a process value exceeds its alarm trip point, a flashing yellow number appears. This number identifies the area containing the process fault. Display the area in alarm and press the ACK key. When the value leaves its alarm state the yellow alarm number disappears. If no alarm exists on a display page, that portion of its Title line stays blank.

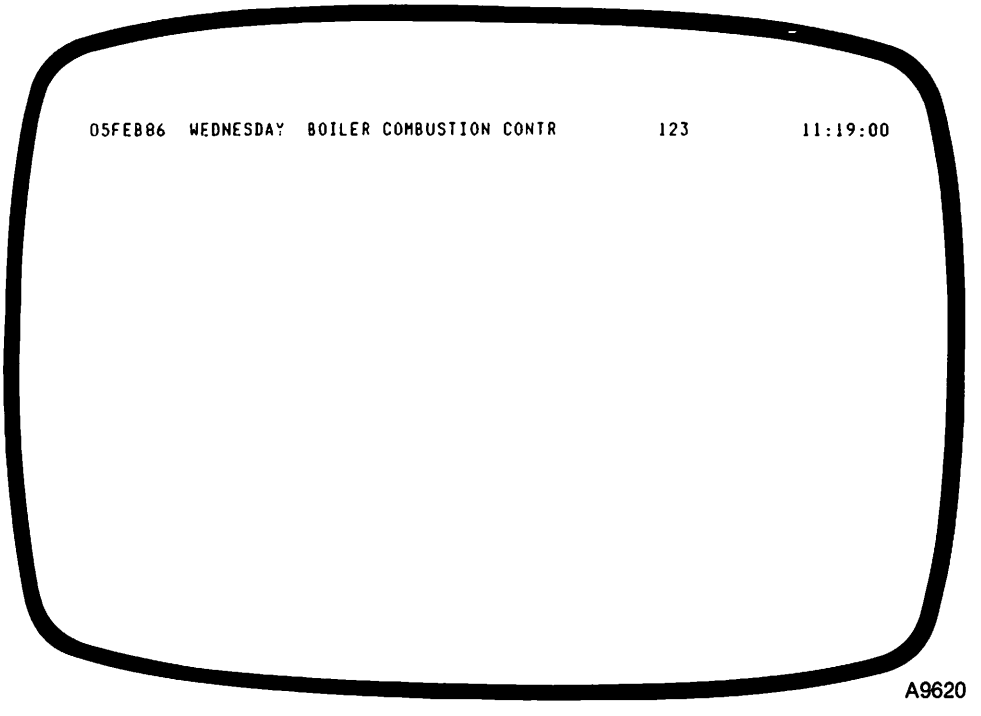


FIGURE 4.1 — Title Line Example

Area Display

You can access up to ten Area Display pages. Each page shows an overview of a process area. On a 1400 or 5000 Tag OIU each process area can contain up to 24 process groups, with each group having up to 16 Tags. (On the 500 Tag OIU each area can contain only 12 groups having 16 tags.)

> **NOTE**
>
> **A process area defines several groups in related processes, not necessarily a physical area or certain plant location. On Area Displays only a maximum of 8 tags of the 16 within the process group can appear. (See next page.)**

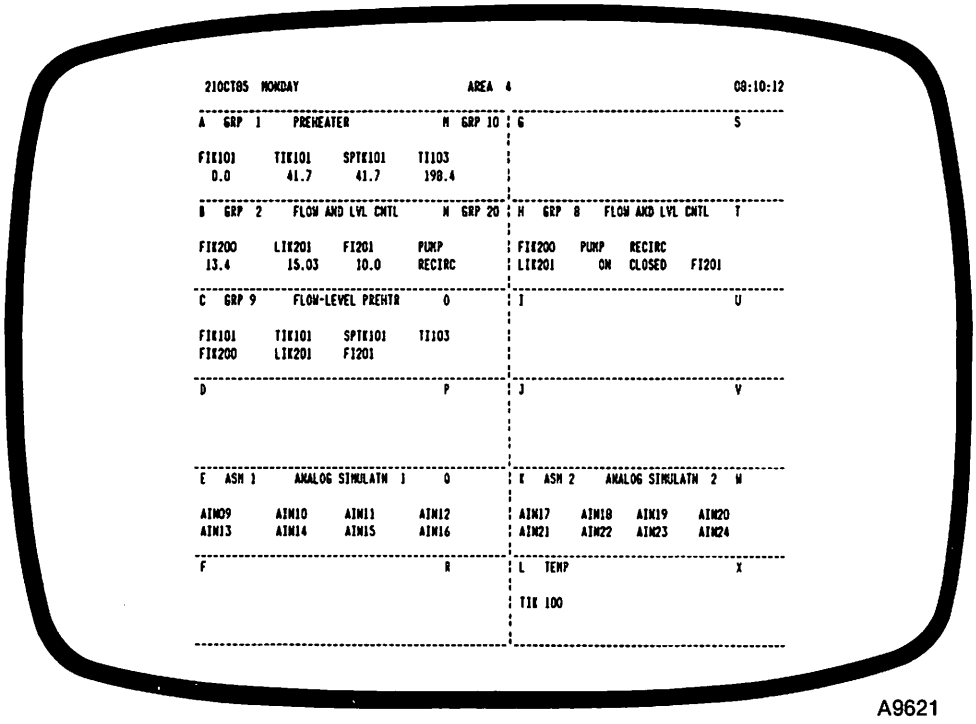


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FIGURE 4.2 — Typical Area Display Page

PROCESS GROUPS. The Area Display page of a 5000 Tag OIU is divided into 12 primary and 12 secondary Group information boxes (Process Groups). Each is limited by blue grid lines. There are six primary groups on the left and six on the right. (Each primary group also contains its own secondary group.) The access letters A through L identify the twelve primary boxes while M through X identify the 12 secondary boxes.

Both primary and secondary boxes also have alphanumeric group names. Secondary boxes contain only group names. To access details about any group, enter its group name or letter code (primary) or group name (secondary). (See Section XI.)

NOTE

When accessing a group box on an Area Display page having no configured Tags, that group Graphic display can appear (if any). Otherwise, the group is empty and you must access another box.

Each primary group information box can show eight of the 16 Tags within a Process Group. The box can show eight Tag names or eight process values. A section can also show a combination of Tag names and associated values. If showing a combination, up to four Tag names can appear above their accompanying values.

A Tag name can be up to eight alphanumeric characters displaying in cyan. A process value is a decimal numeric expression (an Analog (Real) value) for Station type tags, or a logic state descriptor (Boolean value) for Boolean and Remote Control tags, appearing in green. Group access letters appear in red.

NOTE

Some Group Information boxes can stay blank on an Area Display page. These are empty groups.

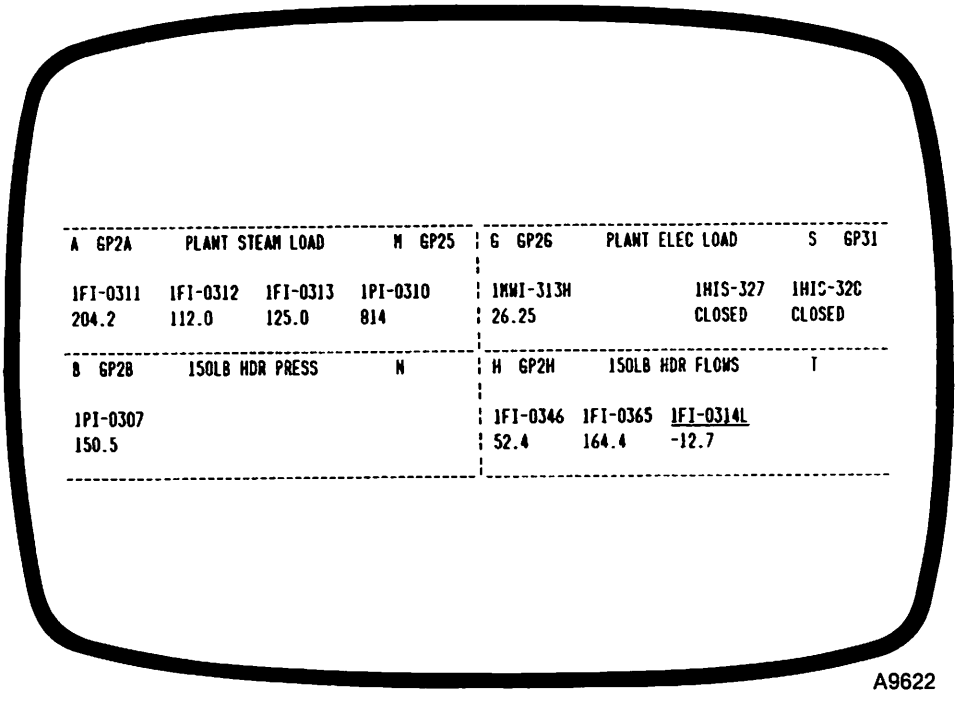

FIGURE 4.3 — Group Information Boxes

ALARMS. When a process value accompanying any displayed Tag name exceeds its alarm trip point, a yellow line traces directly below that Tag name. Depending on the trip point exceeded, a yellow **H** or **L** then displays to the right

of the tag to indicate either a High or Low alarm condition. If a Deviation or a Boolean alarm occurs, a yellow **D** or **A** appears in the same place as a High or Low alarm.

> **NOTE**
>
> **You can configure alarm indicators as desired (Sections VI and VIII). The indicators shown above are those of OIU standard (default) configuration.**

If communication between your OIU terminal and a PCU (or PCU module) fails, a system alarm occurs. On a system alarm a yellow asterisk (*) flashes beside all Tag names affected by communication failure. Flashing yellow asterisks can also display in place of the process values of the affected tags.

Finally, a flashing yellow **S** appears at the beginning of the alarm portion of the Title Line. The **S** appears regardless of whether the affected data is on the current Area Display page or not.

> **NOTE**
>
> **If no alarm state exists, that group alarm indicator area stays blank and no yellow line traces under its Tag name.**

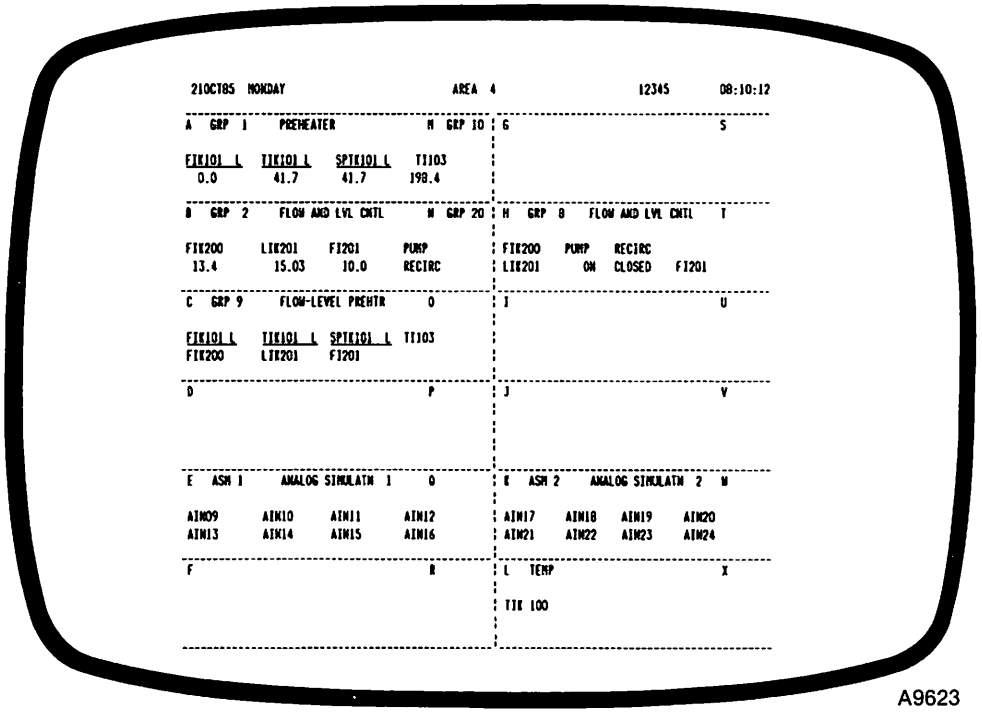

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FIGURE 4.4 — Area Display Showing Alarms

Group Display

The Group Display page shows a detailed picture of each control loop, control switch, and data acquisition point in the plant process. The Group Display format can vary the arrangement of data from page to page. This varies depending on the type and number of the display elements you configure for the page.

> **NOTE**
>
> **The CRT screen for any Group Display page forms a grid, four positions high by four wide. Each element of the display can occupy any part of this screen depending on OIU configuration.**

Many elements form the total display page. The elements of a Group Display page include:

- Trend Element (up to 2/page with 3 Trends each):
  - — Trend Graph
  - — Tag Blocks
- Station Control Element (up to 8/page):
  - — Station Operating Mode
  - — Station Control Mode
- Remote Control Element (up to 16/page):
  - — Device Driver
  - — Remote Manual Set Constant
- Single Point Element (up to 16/page):
  - — Analog Value
  - — Boolean Point.

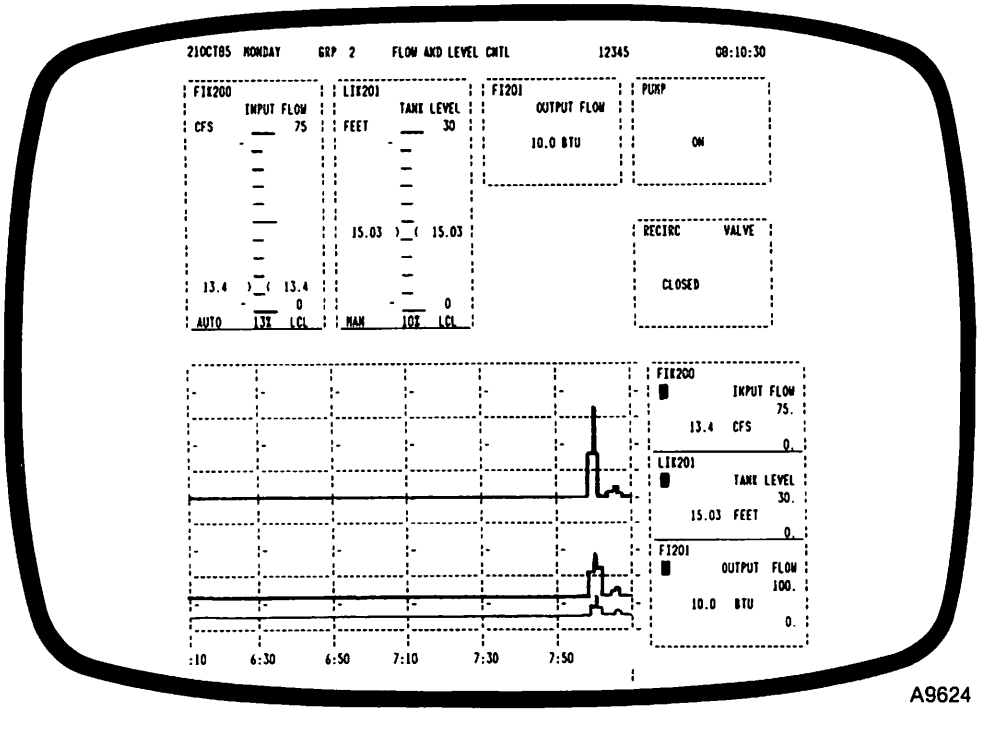

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FIGURE 4.5 — Typical Group Display Page

TREND ELEMENT. The Trend element graphically shows a portion of the previous 26-hour period in the history of a process value for up to three Tags. The Trend element contains a Trend Graph and Tag Blocks.

> **NOTE**
>
> **The Trend Element occupies one part of the Group Display and can be on the top or bottom half of the CRT screen. There can be no more than two Trend elements per page.**

Trend Graph. The Trend Graph shows its trend line and tag data over a time interval set during OIU configuration. The trend data for each Tag collects over a 26-hour period. You can display the data in its entirety or in its most recent segment, depending on the time interval set. The interval can be one half hour, two hours, eight hours, or the 26 hours.

The trend data for each tag appears as an automatically plotted colored line along the graph while tag identifying data and process values appear in blocks to the right. Each Tag Block has a color identifier square matching its colored trend line on the graph.

When first accessing any Group Display page having trend data, the most recent graph always appears. The OIU keyboard enables scrolling through the 26-hour timeline (moving back and forth along the trend graph) and changing the length of the time interval. (See Section XI.)

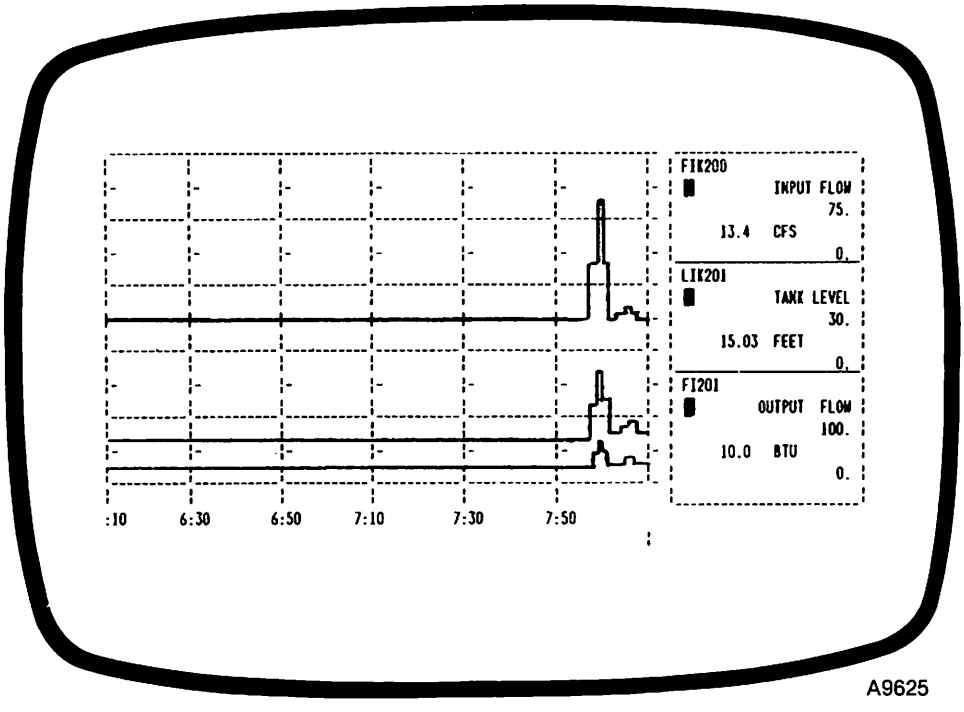

FIGURE 4.6 — Trend Display Element

Along and directly below the bottom horizontal line are the numeric time interval figures (shown as hour/minute). Each figure appears below a vertical line with the earliest time at the extreme left of the grid and the most recent at the right. Depending on the interval set during configuration, the time difference between each vertical axis of the graph varies as below:

TABLE 4.2 — Trending Time Intervals

INTERVAL	TIME DIFFERENCE
Half Hour	Five minutes between each vertical axis.
Two Hours	20 minutes between each vertical axis.
Eight Hours	80 minutes between each vertical axis.
26 Hours	4 hours & 20 minutes between each vertical axis.

Directly under the bottom horizontal line of the grid is a short vertical line in blue. This is the Time Cursor. You can move the Time Cursor to the left and right, positioning it directly under any point of the graph. (See Section XI.)

Moving the Time Cursor to the left causes the graph to display earlier trend data (earlier numeric process values inside the Tag Blocks). Time interval figures below the graph display in cyan. Moving the cursor to the right shows later (more recent) trend data. When the cursor is directly under the bottom right corner of the graph current process values display inside the Tag Blocks. Time interval figures display in green.

NOTE

You can only scroll Trend graphs set for two or eight hour time intervals (Section XII).

Tag Blocks. Directly to the right of the trend grid is the Tag Block area of the Trend Display. This consists of a large rectangle outlined in blue and horizontally divided into three smaller rectangles. Each small rectangle is a Tag Block and contains information about a particular process value (shown graphically on the trend grid).

Along the top (first line) of each block is its alphanumeric Tag name and description along with a small colored square on the left. The Tag name and description are in cyan. The square is the color identifier of that tag process value matching the colored trend line on the grid.

Along the next line of each block the current numeric process value of that tag and any engineering unit (%, ", DEGF, etc.) display in green. On the right side of each block are the tag upper and lower numeric setpoint range limits (corresponding to the top and bottom horizontal lines of the grid). The range limits also display in green.

If a system alarm occurs (a communication breakdown between a module in the PCU and your OIU), a Bad Quality indicator appears between the Tag name and description at the top of the block (station elements, only; on other elements the indicator appears at the bottom left).This indicator is a flashing yellow asterisk (*).

NOTE

Remember, you can choose desired alarm indicators using the OIU Configuration Menu (See Section VII). The alarm descriptions given here are those of the Standard configuration, only.

If a process alarm occurs (process value exceeds a high or low trip point), a yellow alphabetic alarm indicator appears below the block process value. You set this indicator during configuration to show high or low deviation from alarm trip points.

TABLE 4.3 — Tag Block Alarm Indicators (Standard)

INDICATOR	ALARM TYPE
A	Boolean
H/L	High/Low
HD/LD	High/Low Deviation
*	Bad Quality
* * * * * *	Out of Range (Value too large)
P	Partial data

Below the bottom Tag Block is the Trend Time indicator. When the Time Cursor is at the bottom right corner of the grid this indicator stays blank. (Refer to the current time displayed in the time of day area of the Group Display page Title line.) When the Time Cursor is elsewhere under the grid the indicator displays an alphanumeric message (TIME = 23:46:30 — for example) setting Trend time equal to the numeric value of the Time Cursor position.

When scrolling through the graph (moving the Time Cursor) no alarm indicator displays inside a Tag Block, except a yellow * if data quality at the Time Cursor position is bad, or * * * * * * if the data is too large to display. If data at the Time Cursor position is incomplete, a partial data indicator (a yellow **P**) appears.

NOTE

If the Trend Display shows fewer than three process values, a Tag Block remains blank (and the grid has fewer than three trend lines).

STATION CONTROL ELEMENT. The Station Control Element presents a detailed on-line display of a single process loop (tag). The Station element displays process and set-point values numerically against a vertical scale. This scale spans the tag range limits so that setpoint to process deviation displays analytically.

The Station element lets you monitor a process. To take manual control of a process, use the Station Control block of the OIU keyboard. (See Sections III and XII.)

NOTE

A Station Control element can be on the top or bottom half of the CRT screen. There can be no more than eight Station elements per Group Display page.

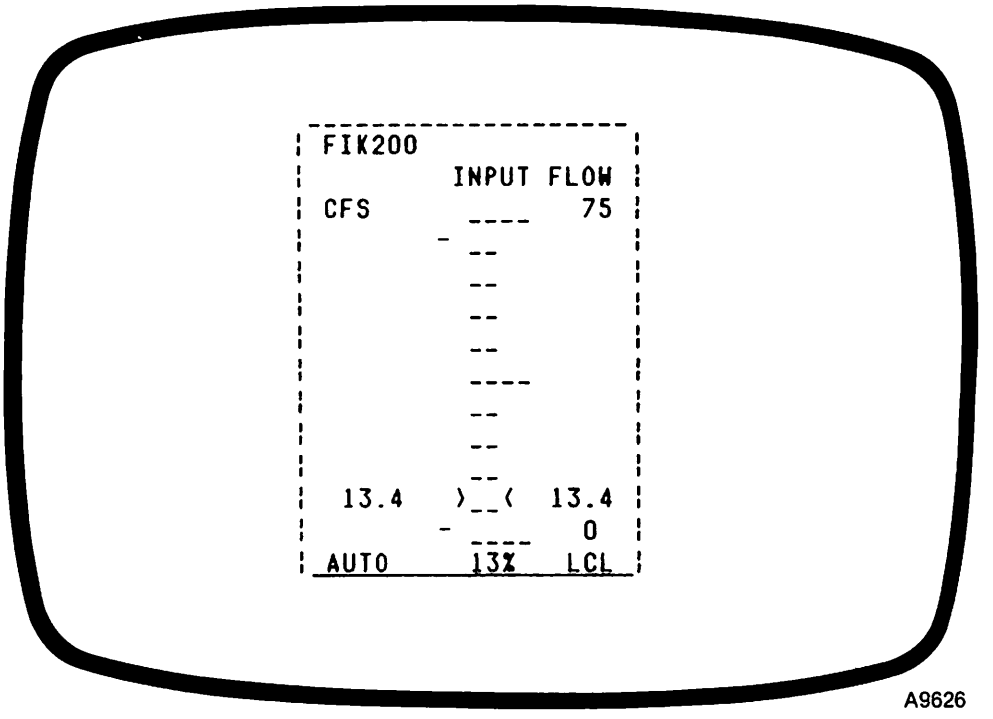

FIGURE 4.7 — Station Display Element

The Station element is a large rectangle outlined in blue. At the top of this rectangle are the tag name and description in cyan. The most prominent feature is its vertical scale. The scale occupies the central part of the rectangle consisting of a series of short horizontal lines arranged above each other from bottom to top. At the top left of the scale is a short horizontal line. This is the High Alarm trip point. A short line (the Low Alarm trip point) is at the bottom left of the scale.

On the right side of the Station element below the tag description is the numeric upper range limit. The lower range limit is at the bottom right of the element. At the bottom center of the element below the alarm indicator area is the numeric control output percentage value. At the upper left of the element below the Tag name is the Engineering Unit area.

An arrowhead indicator (>) on the left of the scale (just beyond the horizontal lines) moves vertically up and down to show current numeric process values. To the left and on the same horizontal plane as this indicator the numeric process value displays. As the process value indicator moves up or down the scale the numeric value display changes to match the indicator's position.

An arrowhead indicator (<) on the right of the scale also moves vertically up and down but shows current setpoint values. The numeric setpoint value displays to the right of the indicator and also changes to match the indicator position up or down the scale.

The numeric distance on the scale between these two indicators (the numeric difference) shows the actual process value to setpoint deviation. If the percentage difference between the defined process value and setpoint exceeds the one you set during configuration, a deviation alarm occurs. (A yellow **D** appears above or below the scale.)

The Station element shows:

- On-Line current data (not historic trend data) in green
- Current process variable and setpoint values
- Upper and lower range limits
- Engineering units (in green)
- Setpoint-to-process deviation
- High and Low alarm trip points (if applicable to the Tag)
- High and Low alarm indicators (yellow **H** or **L** above or below vertical scale when process value exceeds either trip point)
- Deviation alarm indicators (yellow **D** above or below vertical scale if percentage difference between process value and setpoint exceeded)
- Bad quality indicator (yellow * in place of process value)
- Target indicators (TRGT SET, TRGT OUT, TRGT R1), depending on configuration.

On this display element alarm and bad quality indicators flash until you acknowledge them (press ACK on the keyboard). They stay on until you correct the problem or the process leaves its alarm state. If no alarm state exists, alarm areas stay blank.

Station Operating Mode. The Station Operating Mode is a word indicator at the lower left corner of the Station Display. This word shows the operating mode of the current PCU module. During normal operation the indicator displays the word **AUTO**. (The current module in the PCU automatically controls the process.)

You can take manual control of the process using the Station Control block of the keyboard (See Section III.) and changing the control output. Or you can remain in the **AUTO** mode changing the setpoint value. You can also operate the module in either the cascade or ratio mode. (Depending on configuration, you can change the setpoint or ratio index when the station is in **MAN** mode.) Table 4.4 shows the Station operating modes. (See Section XII.)

TABLE 4.4 — Station Operating Modes (Standard)

MODE	EXPLANATION	USE STATION KEYS?
AUTO	Automatic control by current PCU module	YES
MAN	Manual control from the OIU keyboard (can alter the control output)	YES (OUT, and OUT Ramp keys function only in this mode)
	Depending on Block configuration, the SET and SET Ramp keys can also function in this mode.	
CAS	Cascade operating mode from OIU keyboard	YES (But not Set or Set Ramp keys)
RATIO	Ratio operating mode from OIU keyboard	YES
	(can alter the ratio index in place of setpoint)	
COTK	CO tracking lockout (Set by configuration)	YES: OUT only
SPTK	SP tracking lockout	YES: SET only
MNLK	Manual interlock	YES: OUT only
	The NETWORK 90 system locks the Station in MANUAL mode depending on configuration)	

NOTE

If the station mode (AUTO or MANUAL) differs from the station type, a letter indicator (C or R) preceded by a slash (/) follows the mode indicator. For example, a cascade station type in Manual mode indicates as MAN/C.

The engineer can set control output (or setpoint) tracking mode during configuration (Section VI). If the operating mode goes into **COTK**, the control output percentage adjusts to changes in its track reference signal. If the mode goes into **SPTK**, the setpoint adjusts similarly. (Whenever the track reference signal goes up or down, the setpoint (COTK) or control output (SPTK) value for that station changes, as well.)

When the system sets a station operating mode into COTK lockout, only the OUT key of the Station Control block is functional and the MAN and AUTO LEDs at the bottom of the block stay on simultaneously. (Depending on configuration, if the mode enters SPTK lockout, only the SET key is functional.)

Until the system releases the lockout (**COTK** or **SPTK** disappears at the lower left corner of the Station display and **AUTO** reappears), that station stays locked; you cannot change the mode.

Depending on operating logic, the NETWORK 90 system can also lock the mode in MANUAL. This occurs when the mode indicator **MNLK** (MANUAL INTERLOCK) appears. When this happens you cannot change the mode until the system releases the interlock.

Station Control Mode. The Station Control Mode is a word indicator at the lower right corner of the Station Display. This word shows you whether the current PCU module or another computer controls the process. When the current PCU module controls the process, the word **LCL** appears. If another computer controls the process, the word **CNTR** appears.

Depending on OIU configuration, a Station display element can have a Target indicator. This indicator appears whenever you enter any change to the existing values of a Station element. A target indicator serves as a visual reminder that you enter some change to that element and the OIU is currently implementing that change.

The Station element target indicators (appearing in white) are:

- TRGT SET (setpoint change)
- TRGT OUT (control output change)
- TRGT RI (ratio index change).

Each target indicator appears inside a horizontal, rectangular block (with a green background). The target block appears just below that Station element for which you enter a value change (See Section XII).

Once a target indicator appears it stays on the screen until you either move the cursor to another element on that display page or access another page. If you access another page and then return to the page where the target indicator displayed, that indicator disappears.

REMOTE CONTROL ELEMENT. The Remote Control element displays current switch status information for a particular tag, letting you monitor and control remote switches. It also identifies both states of a remote switch using descriptive words (logic state descriptors (LSDs) or mnemonics) and symbols. Finally, the element shows any alarm state, as well as certain control logic conditions.

NOTE

A Remote Control element occupies one part of the Group Display page. There can be more than one Remote Control element but no more than 16 on a page. Depending on configuration, the elements can be on the top or bottom of the CRT screen.

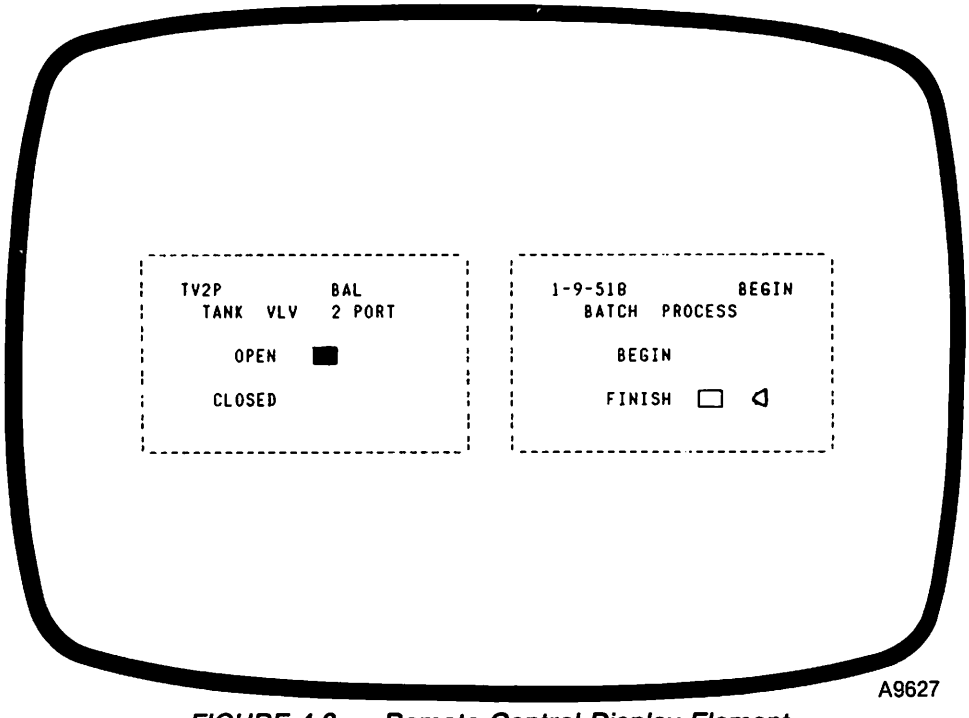

FIGURE 4.8 — Remote Control Display Element

A typical Remote Control element is a rectangular box outlined in blue. Its top display line has the tag name followed by tag description in cyan. Directly under the tag description is the status description (two mnemonics) also in cyan. To the right of the status mnemonics are the status (or feedback) indicator symbols also in green.

At the bottom left of the rectangle a yellow alarm indicator (**A**) displays when an alarm state occurs. When there is no current state, this area remains blank. To the right of the upper mnemonic the Non-Permissive indicator (**NP** in green) may display. At the bottom center of the rectangle the Override indicator (**OVR** in green) may display. Normally, the Permissive and Override indicators do not display (their areas stay blank). (But see Section XII.)

The engineer selects the status indicator to display for both switch positions during OIU configuration. He can configure the remote control switch to display feedback indicators instead of, or as well as, status indicators. Status indicators are solid (■) or empty (□) boxes. Feedback indicators are solid (◄) or empty (◁) triangles.

TABLE 4.5 — Remote Control Indicators

LSDs	STATUS	FEEDBACK
ON NORMAL RUN	■	◄
OFF OVERRD STOP	□	◁

NOTE

Depending on configuration, the solid box symbol (logic 1 status indicator) displays to the right of the upper mnemonic. (This matches the keyboard set up for the Remote Control block on the keyboard. See Section III.)

Remote Control elements can also have a target indicator configured. This target indicator also serves as a reminder (like the target indicators of a Station element) that you entered a change and the OIU is currently effecting it. The Remote Control target indicator (**TRGT** in white) appears inside a horizontal, rectangular block (with a green background) just below that Remote Control display element for which you enter a switch position change (See Section XII).

NOTE

The target indicator stays on display until you activate a different display element or move to another display page.

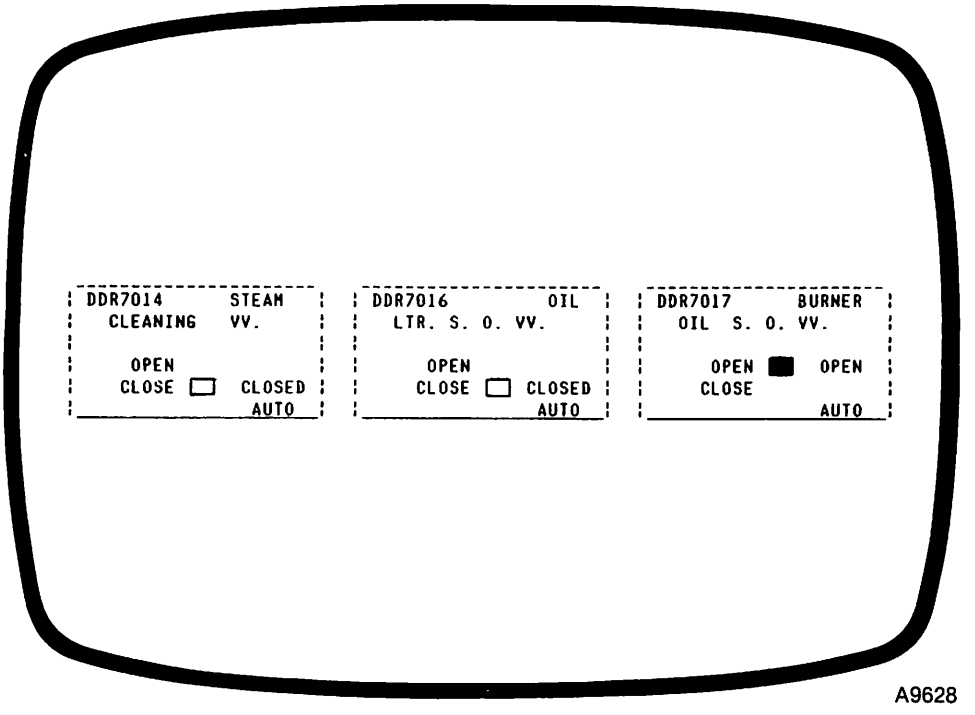

FIGURE 4.9 — Device Drivers

Device Driver. Device Drivers show tag name and description in cyan. Looking like other Remote Control elements, Device displays show logic state descriptors (LSDs) or mnemonics and status indicators in green. Some displays show LSDs on the left and right of the element (on both sides of the status symbols). Some show LSDs only on one side of the element.

The Device elements also use the LSDs **OPEN** and **CLOSE** (left of a status symbol) and **OPEN** and **CLOSED** (right of the symbol). The LSD matches its

symbol depending on configuration (**ON** or **OPEN** to the right of a solid box and **OFF** or **CLOSED** to the right of an empty box).

A Device element also shows the PCU-controlled mode in its lower right corner (AUTO or MAN). Depending on system logic, the Override indicator can appear at the bottom center of the element. Both the mode and override indicator appear in green.

If control output status is bad, a flashing yellow **AA** appears at the lower left corner of that element.

NOTE

Some Device Driver elements show point data for switches (OPEN/CLOSED) while others do not (ON/OFF).

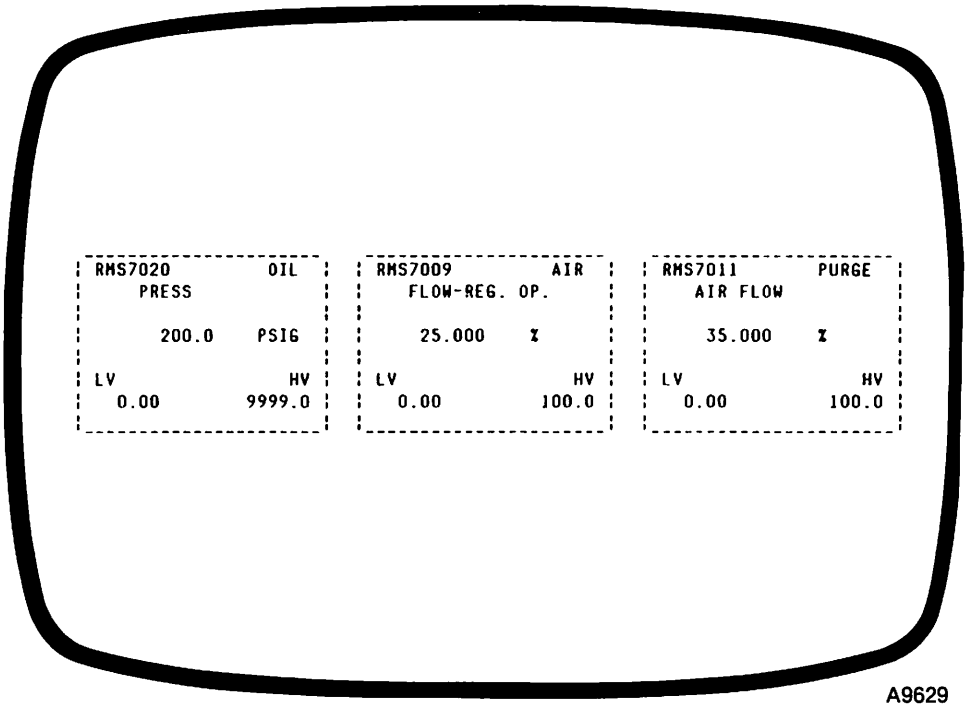

FIGURE 4.10 — Remote Manual Set Constants

Remote Manual Set Constant. These elements show Tag name and description in cyan. A current process value (in green) followed by an engineering unit (in cyan) appears at the center of the element. Along the bottom rows (left to right) are the Low Value (LV) and High Value (HV) shown as analog values appearing in cyan.

SINGLE POINT ELEMENTS. The Single Point Element displays data acquisition points as either analog (numeric values) or Boolean (descriptive words showing a condition or state). The Single Point display can also indicate high or low alarm and bad quality states. You can only monitor this display element; not take control action from it.

NOTE

A Single Point element occupies one CRT position and can be on the top or bottom half of the screen. Depending on configuration, more than one but no more than 16 such elements (a 4x4 array) can be on a Group Display page.

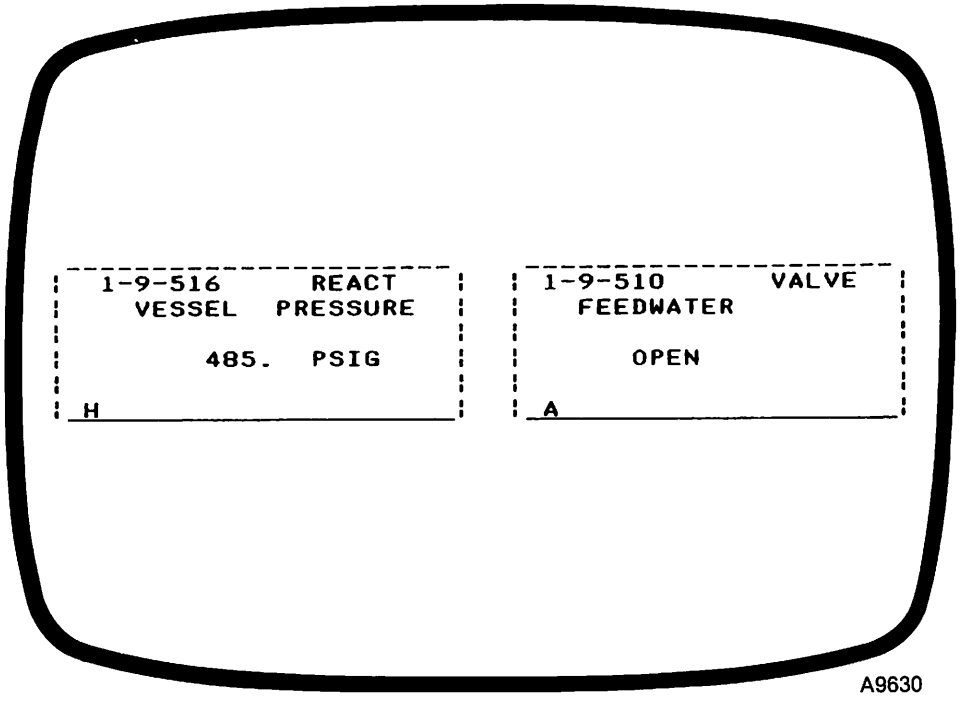

FIGURE 4.11 — Single Point Display Elements

The Single Point element is a rectangle outlined in blue. It is the same size as a Remote Control element (normally appearing adjacent to it on a Group Display page). At the top of the element the tag name and description display in cyan. Some Boolean elements have only a tag name.

The center section of an Analog element shows the current process value of that point (in green) usually followed on the right by an engineering unit (in cyan). The center section of a Boolean element shows a descriptive status word or LSD (OPEN, CLOSED; ON, OFF, etc.) in green.

A flashing yellow alarm indicator displays in the lower left corner on both types of elements if an alarm state exists. The alarm indicators are identical to those appearing with Trend element Tag Blocks.

NOTE

On a Boolean element the only alarm indicator appearing is the yellow A. Analog elements can have all other alarm indicators including the * for bad quality.

Additional Single Point Display elements (depending on OIU configuration) include:

- Analog Exception Outputs
- Digital (Boolean) Exception Outputs.

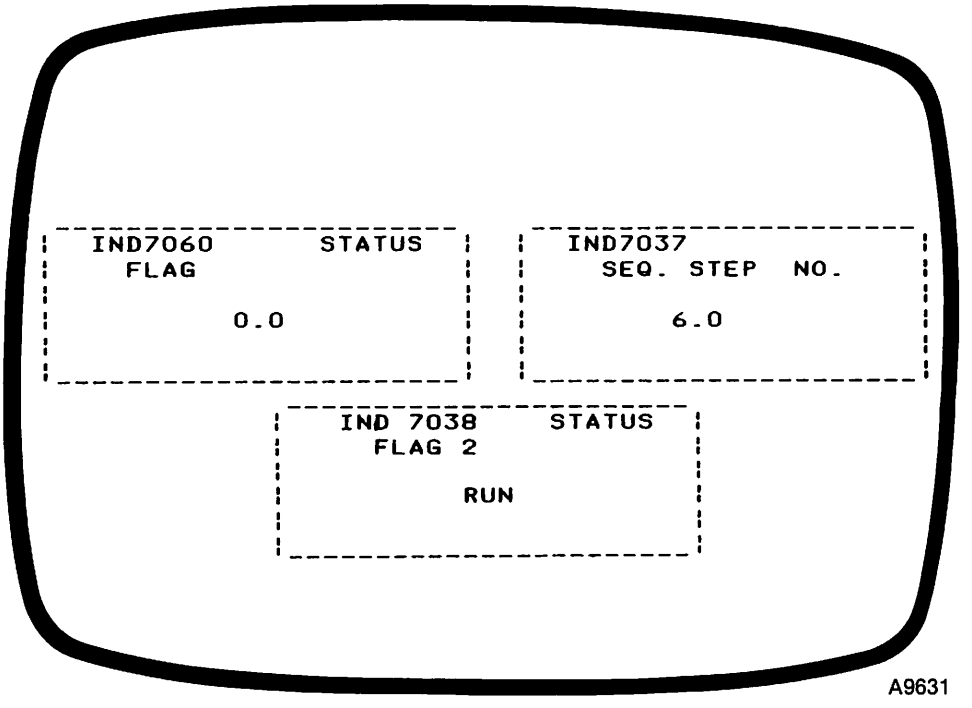

FIGURE 4.12 — Analog and Digital Outputs

Analog Value and Boolean Point. Both Output elements show Tag name and descriptions in cyan and either an analog or a descriptive word indicator in green.

Graphic Display

Graphic Display capability is standard for the OIU, but not all applications require the detail possible. A Graphic Display page can be a schematic picture of a process group, a set of instructions describing important procedures, or a customized process report. Your plant manager must provide you with specific instructions for using graphic displays. (See Section VII, Graphic Editor.)

You can access items from Graphic Display pages to monitor and control a process. (See Sections III, V, VIII, XI, and XII.) A Graphic page provides on-line process information, letting you take control action, depending on its configuration. (See Section VII for a description of Graphic formatting.)

When configuring a Graphic Display to represent a schematic of a process group, the following features are standard:

- Only current, on-line data appears.
- Process values can appear as:
  — Numeric data
  — a shrinking or expanding bar
  — a pipe changing color
  — a symbol changing shape or color

- Red control select numbers can appear to the left of each value or switch control state (LSD)/status indicator, identifying controllable process values
- A Control Box (a display element similar to Station or Remote Control) appears at the lower right corner of the page, allowing visual feedback and control action when you enter a control select number.

> **NOTE**
>
> **To take control action from the Graphic page Control Box, see Section XII.**

DYNAMIC ITEMS. A Graphic Display page shows four dynamic data items:

- Value
- Symbol Change
- Bar Length
- Pipe Color.

Each dynamic item is a tag updating when you access the Graphic Display and when the OIU receives data for that tag.

Value. You can configure each process variable to display a combination of the following data items:

- Values
- Engineering Units
- Alarms
- Control Access Numbers.

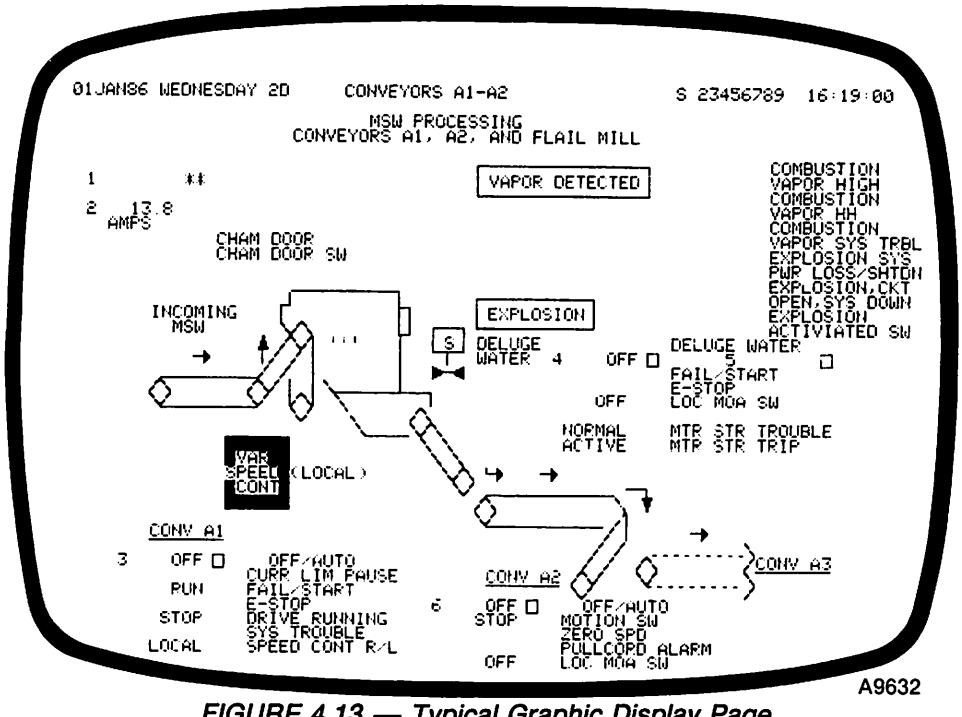

FIGURE 4.13 — Typical Graphic Display Page

NOTE

Make your choice of items and their relative positions on the page using the Graphic Editor (Section VII).

The value item is the process value or LSD/status indicator appearing in a Group Display page Single Point element. Alarms other than bad quality appear only if an alarm item exists. The following flashing yellow alarm indicators (Standard configuration only) can appear:

- **H** or **L** for High or Low
- **HD** or **LD** for High or Low Deviation
- **A** for Digital Alarm
- * for Bad Quality.

Alarm indicators continue to flash until you acknowledge them (Section XI).

Bad quality causes the asterisk to appear in the alarm item if the item exists on the page. If not, the asterisk appears at the extreme right of the value item. In the Control Box element (bottom right of the Graphic page) the asterisk appears to the right of the mnemonic, not the status indicator.

Symbol Change. A symbol can change depending on tag value and whether it is in an alarm state. Changing can replace an existing symbol with a completely different one. Typical symbol changes can involve:

- Color change
- Shape change
- Symbol appearing or disappearing
- Written text change
- Flashing symbol portion.

NOTE

A flashing symbol in this case does not indicate an alarm state. You cannot stop the flashing using the ACK key.

Each symbol has four conditions determining which symbol displays:

- Value low; tag not in alarm
- Value low; tag in alarm
- Value high; tag not in alarm
- Value high; tag in alarm.

Low and High values of Boolean Single Point or Remote Control elements can be logical 1 or 0 (**ON/OFF, OPEN/CLOSED**). The system determines high or low values for the process variable, setpoint, control output, or ratio index of

a Station element by comparing them against a boundary value set using the Graphic Editor (Section VII).

Alarm condition depends on an existing alarm state, not type. Bad quality for symbol changing is not an alarm state. Alarms do not cause all symbols to flash. For bad quality, a flashing yellow * displays at the symbol starting location.

Bar Length. Bar length can change depending on tag value. This value can be that of a process variable, setpoint, control output, or ratio index of a Station element. A bar can only indicate bad quality, not an alarm state. For bad quality, the flashing yellow * appears at the starting bar location.

Pipe Color. Pipe color changes depending on tag value. A pipe can only change between two colors. A Boolean or Remote element changes pipe color depending on whether the tag logic state is 1 or 0. Pipe color can also change depending on the value of a process variable, setpoint, control output, or ratio index of the Station element. This color change depends on whether the value is greater or lesser than the boundary value assigned using the Graphic Editor.

A pipe can only indicate bad quality, not an alarm. For bad quality, the flashing yellow * displays at the pipe starting location.

Alarm Summary Display

The Alarm Summary Display shows a five-page listing of the 100 most recent process alarms for each of 8 levels of alarms (0 - 7) as configured for alarm management (Section VI). Accessing the Alarm Summary displays its first page containing the most recent alarm listings. An access key letter identifies each single-line alarm listing. Each alarm line shows the following single point information:

- Group access letter (in red)
- Time of alarm indication (in green)
- Tag name (in cyan)
- Current value or status (in green)
- Engineering unit (in green)
- Alarm indication (in yellow) or
  Normal indication (in green)
- Tag description (in cyan).

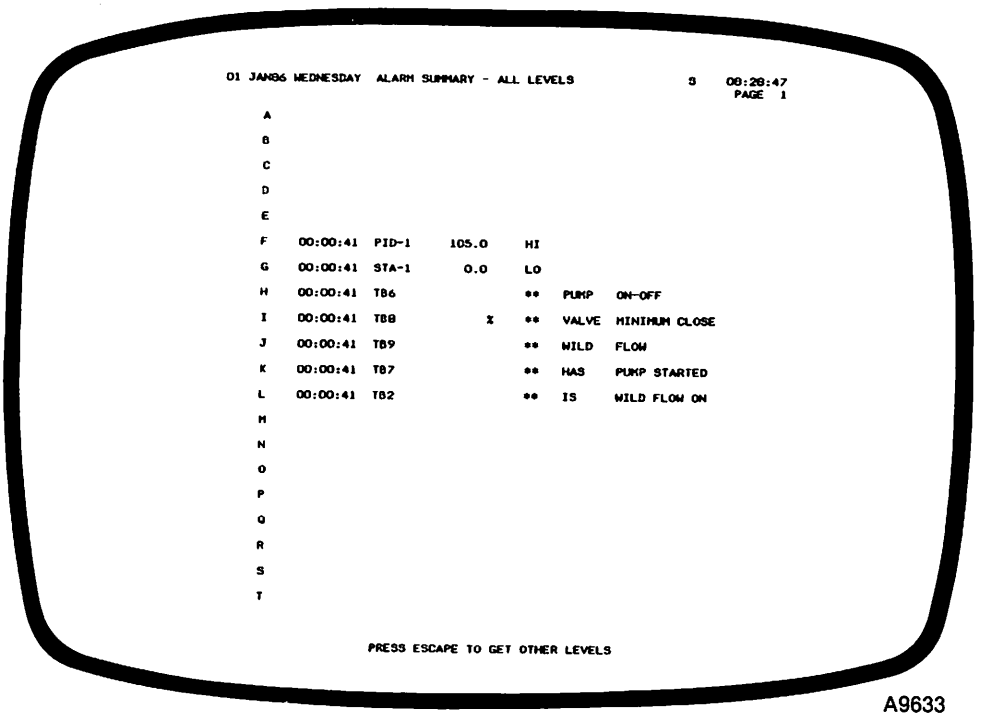

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FIGURE 4.14 — Typical Alarm Summary Display Page

The alarm identifying letter lets you quickly access the Group Display page containing the tag in alarm. There are five Alarm pages and 20 alarm lines per page (lettered in alphabetic order from A to T). When accessing the first page of the Alarm Summary Display 15 alarm lines display starting on line six (letter F). Only the first page of the display is dynamic. Incoming alarms fill the first five lines (A through E). Once the page is full, the display automatically scrolls down leaving the first five lines blank. This minimizes screen movement and eases readability.

Incoming alarms flash until acknowledged. During scrolling alarms condense (they disappear from the alarm page). Use the PREV/NEXT keys to scroll through the alarm pages (See Section XI). Information on the next four pages of the Alarm Display is not dynamic. Listings of current alarms (excluding current values) remain until you access another display. Table 4.6 lists the Alarm Summary features.

TABLE 4.6 — Alarm Summary Display Features

New alarms on the first five lines flash until acknowledged.
Each alarm line shows point value alarm time, tag name, value, alarm state, and tag description.
The display scrolls down five lines after the page fills, leaving the first five lines of the next page blank.
Page one is a dynamic display, showing tag values and current alarm indications.
Cleared alarms (previously shown in alarm state on page one) vanish when scrolling to page two.
Alarm indicators shown on pages two through five are not dynamic (and may not show current conditions) remaining as is until accessing another display.
ESCAPE prompts command to display alarm pages showing priority levels (0 to 7)

NOTE

A tag cannot be on the alarm list more than once at any time. (Section XI explains acknowledging an alarm from this Display.)

System Status Display

You can view the operating status of all process control (PCUs) and other units communicating on the plant communication loop (PCL) on a System Status Display page. The point where each unit interfaces (connects) with the PCL is a node. There can be a maximum of 63 nodes on any PCL. Nodes connected on the PCL can be any combination of PCUs, OIUs, CIUs, MCS units, and PPGs each having its own mode number.

The System Status Display page is a single-paged display listing all nodes on the PCL. The System Status Display primarily identifies a problem area after a system alarm occurs (a flashing yellow **S** on the current display Title Line). The system maintenance technician can use the page to isolate a fault quickly to a single node.

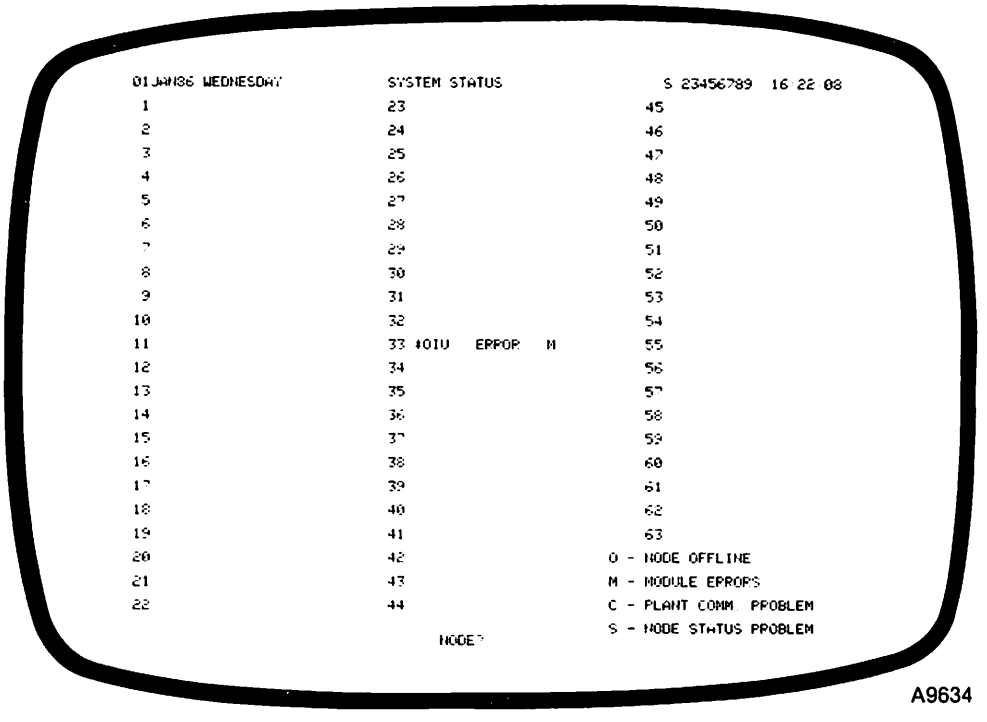
The System Status Display lists node information lines in three columns across the page. The left column lists zero to 21; the center column lists 22 to 42, and the right column lists 42 to 63. Each line of the display contains information for one node. The node information includes:

- Node number (0 - 63)
- Node type (PCU, OIU, CIU (CIU01), MCS (CIU02), and PPG)
- Node status (NORMAL, ERROR)

- Error codes:
  - — O = NODE OFFLINE
  - — M = MODULE ERROR
  - — C = COMMUNICATION SYSTEM ERROR
  - — S = NODE STATUS ERROR
    (POWER OR FAN PROBLEM).

NOTE

The first two Nodes (0 and 1) are reserved for the LIM and BIM modules of the PCU. Consult E93-908-1, Loop and Bus Interface Modules manual for more detail on these modules.



A9634

FIGURE 4.15 — Typical System Status Display Page

You define the node type during OIU configuration. If the node type entered conflicts with an actual type, a flashing yellow * displays to the left of the node in error during OIU operation. The asterisk flashes until you acknowledge the error. You must change the Define System Node (an OIU configuration) to enter the correct node type. Then restart the OIU (See Sections V and XI).

A node status has one of two states: NORMAL and ERROR. When a node error occurs, the word **ERROR** appears in yellow. Otherwise, the word **NORMAL** appears in green.

There are four error codes. Each code occupies a specific position to the right of the node status area. One or more codes can exist simultaneously. Error codes display as flashing yellow letters.

NOTE

An error code summary displays at the bottom right of each System Status page. (Section XI explains acknowledging the error codes.)

The message **NODE?** (in yellow) appears at the bottom center of each System Status page. To access the Node Summary Display, enter the desired node number. Use the Numeric block of the Keyboard and then press ENTER (See Section XI). The Node Summary Display consists of 63 separate pages, one node per page.

Node Summary Display

The Node Summary Display details the status of a node, communication system, and all modules (0-31) within that node. The node type and number (page title) appear in the center of the Title line. The node description (if any) appears on line two below the page title. Both display in cyan. The fourth line displays the PCL (node operating mode), communication, and power status also in cyan.

The current PCL status (node mode) appears as either **ONLINE** or **OFFLINE** (in cyan). If the node is OFFLINE, a flashing yellow **0** displays to the right of the unit status area of the System Status page. The current condition of the communication system and power status (node hardware) appears as either **OK** or **PROBLEM** (in green). If a problem exists with the communication system, a flashing yellow **C** displays to the right of the unit status area on the System Status page. If a power status problem exists with node hardware (fans, cabinet temperature, and so forth), a flashing yellow **S** appears in the unit status area.

NOTE

Remember, the first two nodes (0 and 1) are reserved for the LIM and BIM modules of the PCU. (See previous page.)

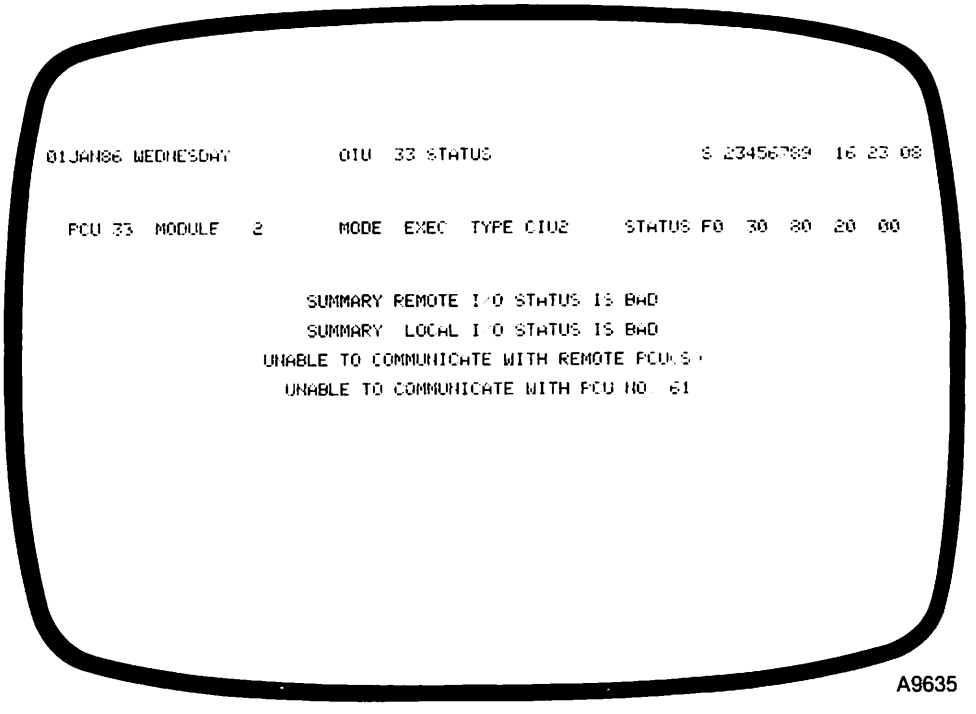


FIGURE 4.16 — Typical Node Summary Display Page

The Node Summary Display lists module information lines in two columns across the page. The left column shows lines zero to 15; the right column shows lines 16 - 31. Each information line contains the following information:

- Module number (0 - 31)
- Module type (BIM, COM, AMM, etc.)
- Module mode (EXEC, CONF, ERROR, FAILD)
- Error indicator (ERR).

A three-letter module code identifies all module types. Table 4.7 shows some of the module types (for a more complete list, consult the various PCU module manuals). Table 4.8 identifies the module modes.

TABLE 4.7 — Module Types

TYPE	EXPLANATION
BIM	Bus Interface Module
COM	Controller Module
AMM	Analog Master Module
LMM	Logic Master Module
MFC	Multi-Function Controller

TABLE 4.8 — Module Modes

MODE	EXPLANATION
EXEC	Execute
CONF	Configuration
ERROR	Error occurred
FAILD	Fault detected

If a module is incorrectly defined, a flashing yellow * displays to the left of the module type. The asterisk continues to flash until acknowledged (See Section XI).

The information line error indicator does not appear when there are no problems with a module. If a module error occurs, a flashing yellow **ERR** appears to the right of the module mode. A flashing yellow **M** appears to the right of the unit status area of that node on the System Status page (See Section XI).

(For scrolling through the Node Summary pages, see Section XI.)

On the bottom of the Node page (between the two columns) the message **MODULE?** (in yellow) appears. To access the Module Summary Display, enter the desired module number. Use the numeric block on the keyboard and press ENTER (See Section XI). The Module Summary Display consists of 31 separate pages, one module per page.

Module Summary Display

The Module Summary Display is a listing of engineering diagnostics applying to a module. The display shows the standard Title line, a Status line, and multiple abnormal/error lines. The Module title appears in the center of the Title line in cyan. The first, or Status, line listed under the Title line contains the following information (in cyan and green):

- Hardware address (PCU number and Module number)
- Module mode (EXEC, CONF, FAILD)
- Module type (AMM, BIM, COM, etc.)
- Status bytes (five hexadecimal numbers).

NOTE

For more detail on the hexadecimal status bytes, consult the CTM Instruction Manual, E93-903.

The hexadecimal status bytes are identical to those a CTM device in a PCU reads. Below the Status line are the block/error message lines. These lines appear in green. Abnormal or bad quality messages appear before error messages. For example, the message:

SUMMARY STATION STATUS IS BAD

can display, followed by individual block messages using the format:

LOCAL I/O BLOCK (number) HAS BAD QUALITY.

The number of Block messages displaying depends on the number of blocks currently having abnormal or bad quality.

After all block messages display, error messages (if any) appear. Error messages appear using the format:

UNABLE TO COMMUNICATE WITH (device name and number) FOR BLOCK (number).

(For scrolling through the Module Summary pages, see Section XI.)

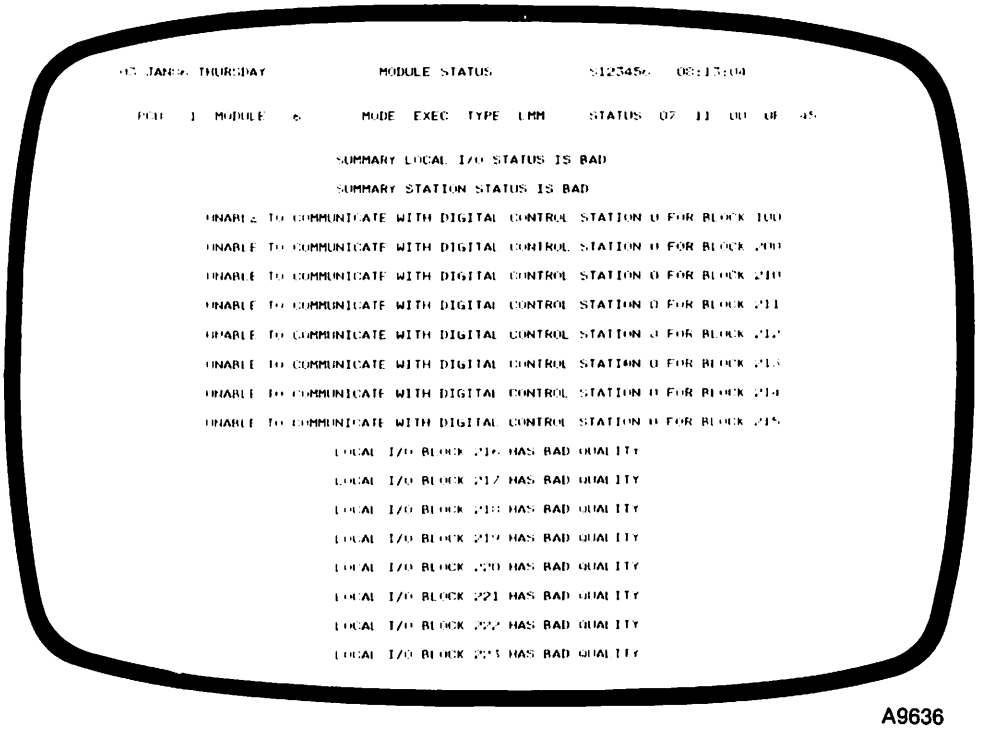


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FIGURE 4.17 — Typical Module Summary Display Page

Tag List Displays

Tag List Displays show detailed listings of all tag names defined during OIU configuration (Section VI). When you press the TAG LIST key (Display Control block on the keyboard), the Tag List Menu appears.

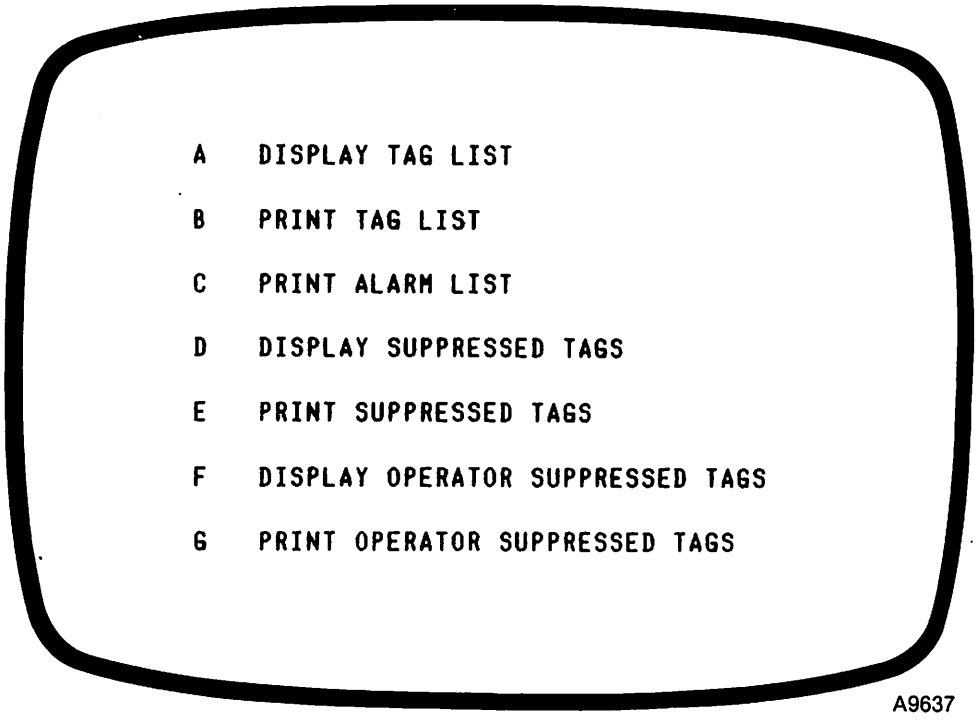

FIGURE 4.18 — Tag List Menu

You can view three separate Tag list displays:

A — Tag List
D — Suppressed Tags
F — Operator Suppressed Tags.

You can also use your (optional) printer to print four separate Tag lists:

B — Tag List
C — Alarm List
E — Suppressed Tags
G — Operator Suppressed Tags.

To access the first page of any list, choose A, D, or F from the menu (Section XI). All information (in standard configuration) on a Tag list page appears in cyan. To scroll through Tag list pages, use the PREV/NEXT keys (Section XI).

TAG LIST DISPLAY. The Tag List Display shows a complete listing of all tag names defined during OIU configuration. You determine the number of tags to display on each page (up to 12) when accessing this display from the Tag List Menu (Section XI).

Each Tag List page has Tag Heading lines under its Title line. Twelve Tag information lines per page appear under the Heading lines. A Tag information line contains the details concerning a particular Tag.

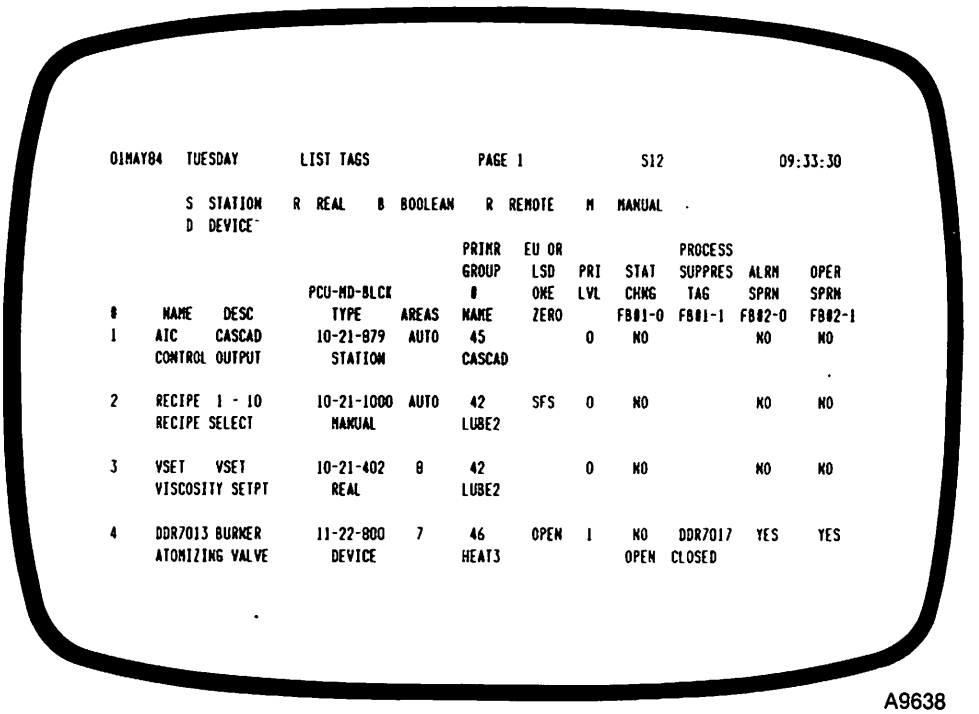

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FIGURE 4.19 — Typical Tag List Display Page

The Heading lines provide identification for details in the tag information lines that follow. The heading lines (left to right) contain:

- # Tag access number (1 - 5000)
- NAME (tag name up to eight characters)
- DESC (tag descriptor up to 21 characters)
- PCU-MD-BLCK TYPE (Tag hardware addresses or PCU-MODULE-BLOCK and Tag type)
- AREAS (Where Tag and Group located)
- PRIMR GROUP # NAME (Primary Group number and name)
- EU OR LSD ONE ZERO (Process engineering units or Logic State Descriptor)
- PRI LVL (Alarm priority level; default = 0)
- STAT CHNG (Alarm Status change for Remote Control Memory and Boolean tags)
- PROCESS SUPPRES TAG (Tag controlling system suppression of secondary alarms)
- ALRM SPRN (Tells if current tag has suppressed alarms)
- OPER SPRN (Tells if operator can suppress non-critical alarms for current tag).

NOTE

Under the STAT CHNG to OPER SPRN headings the Device Driver Feedback headings appear: FB #1 - 0 FB #1 - 1 FB #2 - 0 and FB #2 - 1. The number to the left of the hyphen is the actual feedback indicator; the number to the right is the logic state (1 or 0) for that indicator.

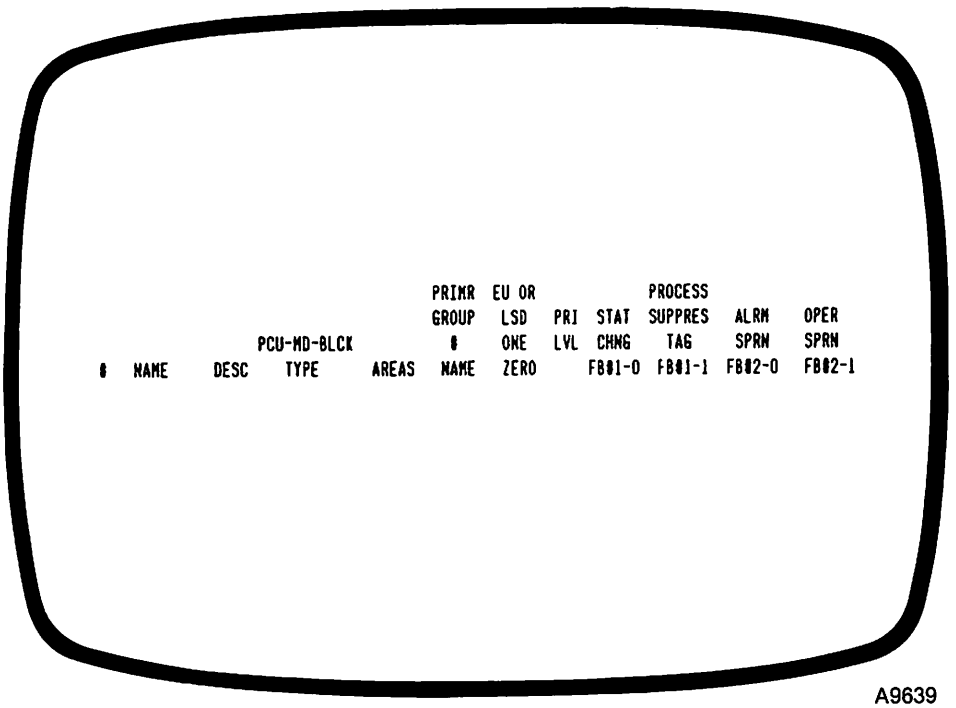

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FIGURE 4.20 — Tag List Heading Lines

Each Tag information line lists (left to right):

- Tag access number (1 - 5000)
- Tag name (up to 8 characters) and description (up to 6 and 15 characters)
- Tag hardware address:
  PCU node number (2 - 63)
  Module slot number (2 - 31)
  Function block number (0 - 1023)
  and tag type:
  STATION, REAL, BOOLEAN, REMOTE (RCM), MANUAL (RMSC), or DEVICE driver
- Area number (1 - 10)
- Primary Group name and number (1 - 24/ up to 6 characters)
- Engineering Unit or Logic State Descriptor
- Primary alarm level number (0 - 7; 0 = default)
- Status Change word (YES or NO)
- Process suppression word (YES or NO)

- Alarm suppression word (YES or NO)
- Operator alarm suppression word (YES or NO).

SUPPRESSED TAGS DISPLAY. The Suppressed Tags Display shows details concerning any tags for which the system currently suppresses alarms. To access the first page of this display, enter D from the Tag List Menu (Section XI). Each page of this display has a standard Title line. Just below the Title line and to the right the current page number appears as: PAGE ##. Below this the suppressed tag heading line appears. This heading line shows (left to right):

- # (tag number)
- NAME (tag name)
- DESCRIPTOR (tag description)
- PRIMARY GROUP (tag primary group)
- SUPPRESSED BY (what suppresses alarm for tag).

The suppression information lines (if any) appear below the heading line. If the system is not currently suppressing alarms for any tags, the message: NO SUPPRESSED TAGS appears below the heading line in place of any suppression information. At the bottom of each page the message: PRESS ⟨ESCAPE⟩ FOR MENU appears.

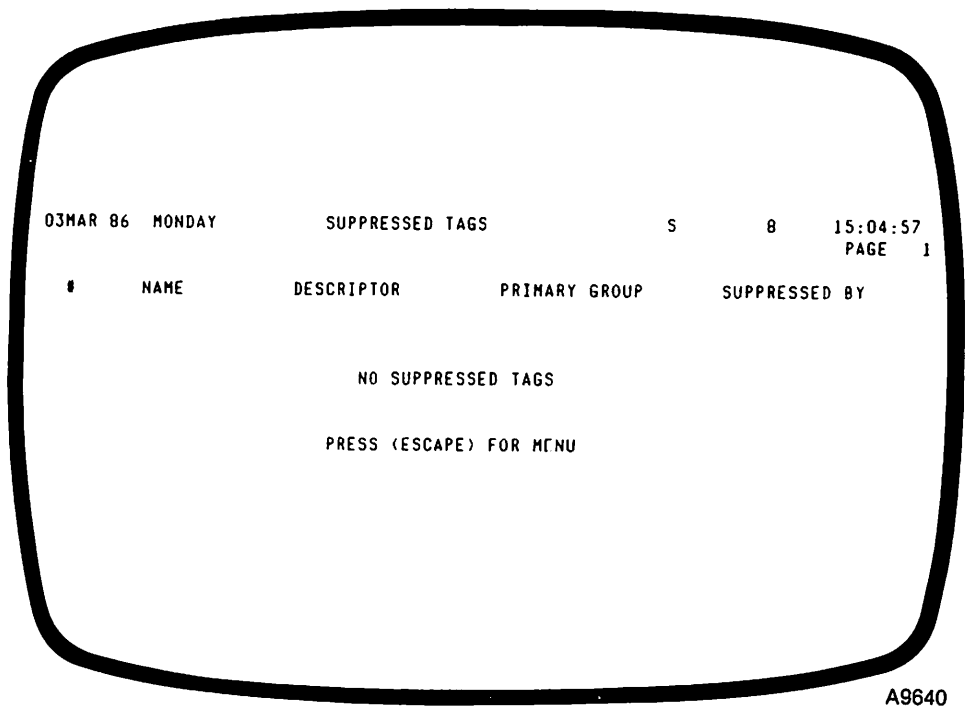

FIGURE 4.21 — Suppressed Tags Display

OPERATOR SUPPRESSED TAGS DISPLAY. The Operator Suppressed Tags Display shows details concerning any tags for which you currently suppress non-critical alarms. This display is almost identical to the Suppressed Tags Display. To access the first page of the Operator Suppressed Tags Display, enter F from the Tag List Menu (Section XI).

Each page of this display has a Title and Page number line. Following the Page number line is the Heading line. The heading line shows (left to right):

- # (tag number)
- NAME (tag name)
- DESCRIPTOR (tag description)
- PRIMARY GROUP (tag primary group).

Information lines (if any) for tag suppression follow the heading line. If you are currently not suppressing non-critical alarms for tags, the message: NO OPERATOR SUPPRESSED TAGS appears instead of the information lines.

At the bottom of the page the message: PRESS 〈ESCAPE〉 FOR MENU appears.

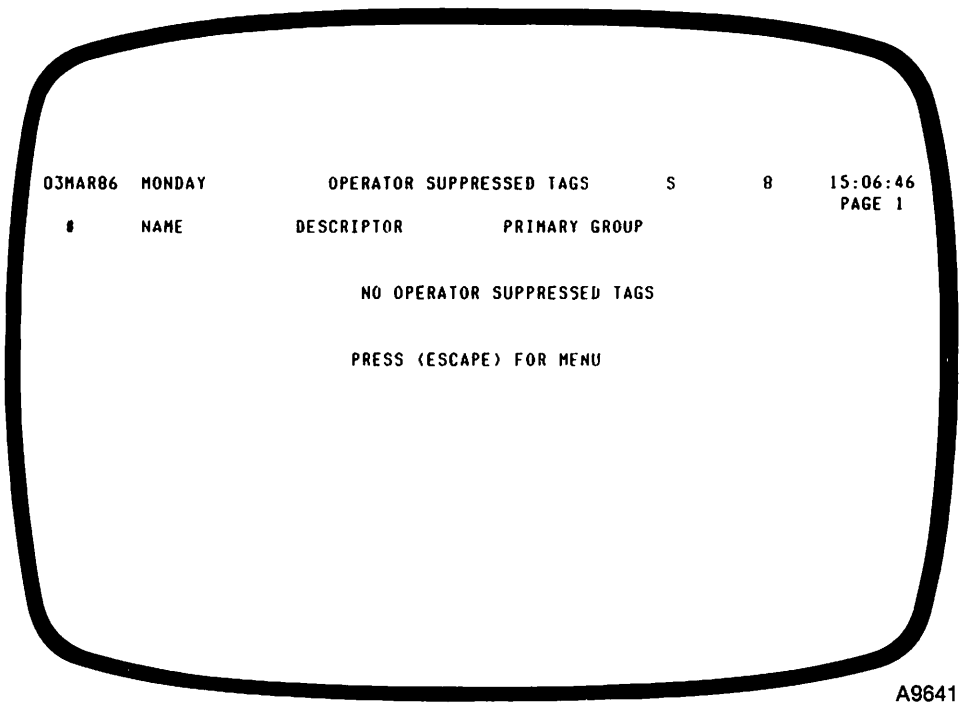

TABLE 4.22 — Operator Suppressed Tags Display

ALARM LIST. The Alarm List printout is very similar to an Alarm Summary Display printout. (To print any of the Tag List displays, see Section V.) The Alarm List has a Title line containing (left to right):

- Date (dd/mm/yy)
- Alarm Level (Alarm priority level; 0 = default)
- Time of Day (hh:mm:sec).

Tag alarm information lines immediately follow the Title line. Each line shows details for its tag as (left to right):

- Time tag went into alarm state (hh:mm:sec)
- Tag Name (and description if any)

- Logic State (OPEN/CLOSED, etc.) or Real value (###.##)
- Engineering Unit (DEG C, %, etc.)
- Alarm Status (green N = NORMAL; yellow letter or * = ALARM state)
- Tag Name or Description
- Action Message (cause of alarm or action to take if alarm occurs).

Each printout page can contain up to 35 tag alarm information lines. An Alarm List produces all information lines for the tag total you enter from the Tag List Menu (Section XI) when accessing the list to print.

NOTE

The other three printouts from the Tag List Menu are identical to their respective Display pages.

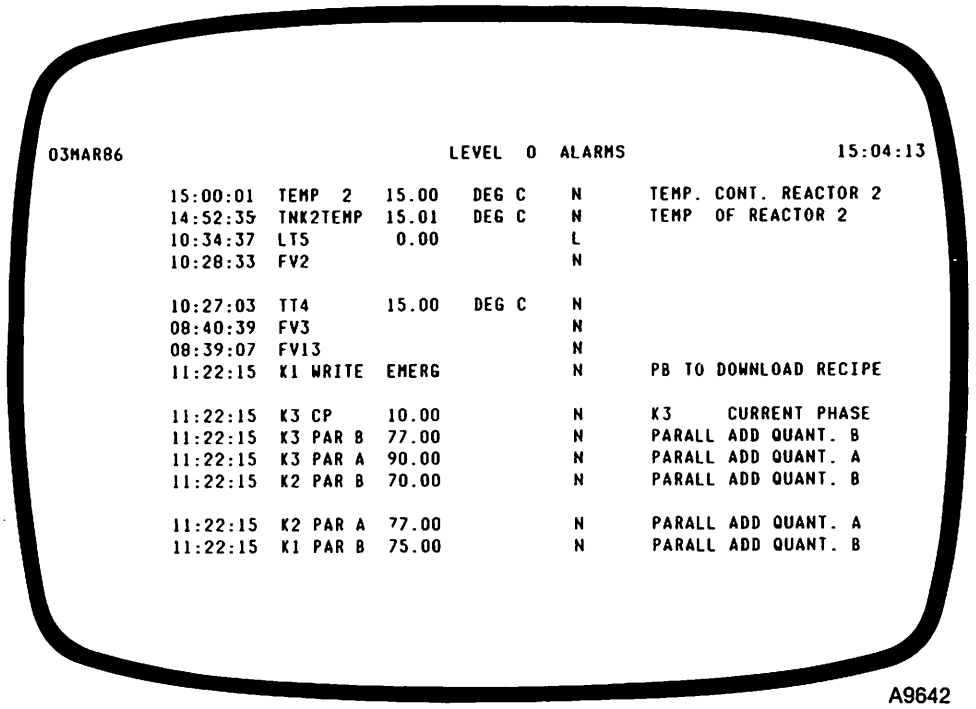

FIGURE 4.23 — Typical Alarm List Printout

General Function Menu

The General Function Menu is actually a Configuration display. This menu display allows you to select the following functions:

- Respond to OIU Action Request (Sections IV, X, and XIII)
- Read Point Value (Sections IV and XI)
- PCU and OIU Configuration (Sections V and VI)
- Set System Time and Date (Section VI)
- Store or Retrieve Archived Data (Sections X and XIII)
- Display Log Status (Sections IX and XIII)
- Suppress Tags (Section VI).

The bottom line of this display also shows the software revision level. The engineer primarily uses the General Function Menu for OIU/PCU configuration. We briefly saw its Action Request feature under the Title line of this Section. Later Sections of this manual explain the rest of the menu in detail. This Section examines the Read Point Value function; Section XI explains monitoring the Read Point Value Display.

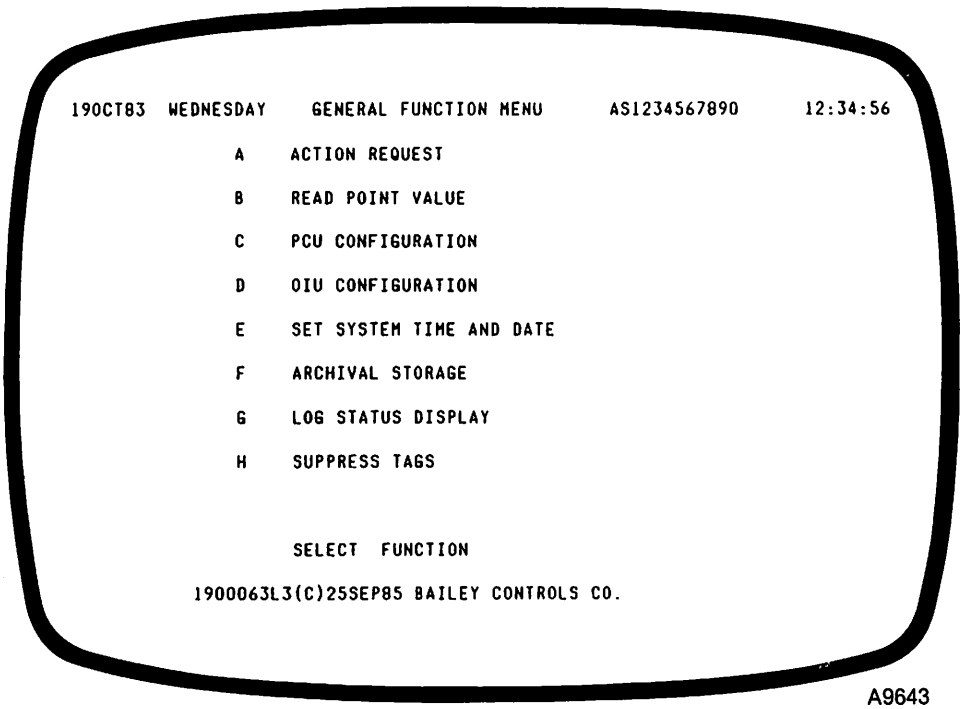

FIGURE 4.24 — General Function Menu Display

Read Point Value Display

The Read Point Value Display lets you view the exact value of any point in the NETWORK 90 system. The Read Point Display consists of two pages, the Prompt page and the Value page. After accessing this display from the General Function Menu, the Prompt page appears. The Prompt page has a normal Title line but no name. (Messages on this and the Value page appear in cyan.)

At the lower center of the screen the message READ POINT VALUE appears. Several lines under the value message the hardware address prompts appear after the word ENTER:

- PCU (number)
- MODULE (number)
- BLOCK (number).

Each prompt already has a numeric address following it (entered during OIU configuration). The screen cursor stops under the first prompt (PCU address), waiting for a new entry. At the bottom of the screen the message TYPE 'ESC' TO EXIT CURRENT OPERATION appears.

NOTE

After initial configuration it is possible for the address areas to be blank. You can enter specific addresses now. The hardware address numbers are: 2-63 (PCU), 2-31 (MODULE), and 0-1023 (BLOCK).

The Value page lists the current logic (for Boolean points) or numeric (for Analog points) value of the hardware devices already on or entered from the Prompt page. The Value page has a Title line and the name READ POINT VALUE. At the center of the screen the message CURRENT VALUE FOR THE POINT: appears followed by the hardware device and address of the items (from the Prompt page):

PCU ADDR. — (number)
MODULE NO. — (number)
BLOCK NO. — (number).

Under the devices the actual logic value appears as:

- => 1 or 0 (Boolean)
- => ##.## (Analog).

The logic value depends on OIU configuration; you only monitor it from this display, not change it. The system updates Analog values every 50 seconds.

At the bottom of the screen the message TYPE 'ESC' TO EXIT CURRENT OPERATION appears.

If a point is in an alarm state, an alarm message appears below the logic or analog value (Section XI).

Tuning Display

The Single Point Tuning Display consists of three elements: a Station element, a Trend element (with Tag Blocks), and a Block details element. Each display element occupies a fixed position on the CRT screen. The Trend element displays across the top of the screen. The Station element displays along the bottom right and the Tuning Block along the bottom left. (Access the Tuning Display using TREND on the keyboard. See Section XII.)

CAUTION

Tuning is possible only when the TUNE keylock switch is unlocked. Only your plant manager or process engineer can perform any tuning. Do not attempt to tune the OIU yourself.

STATION ELEMENT. The Station element is identical to that of a Group Display page. But only one Station element can appear on a Tuning display. (Remember that a Group display can have more than one Station element.) The Station element shows current data, allowing you to take control action using the Station Control block on the keyboard. (See Section XII.)

In certain cases the ramp keys of the Station Control block are non-functional with Station elements of a Group display (Sections III and XI). With a Tuning display Station element the ramp keys are always functional.

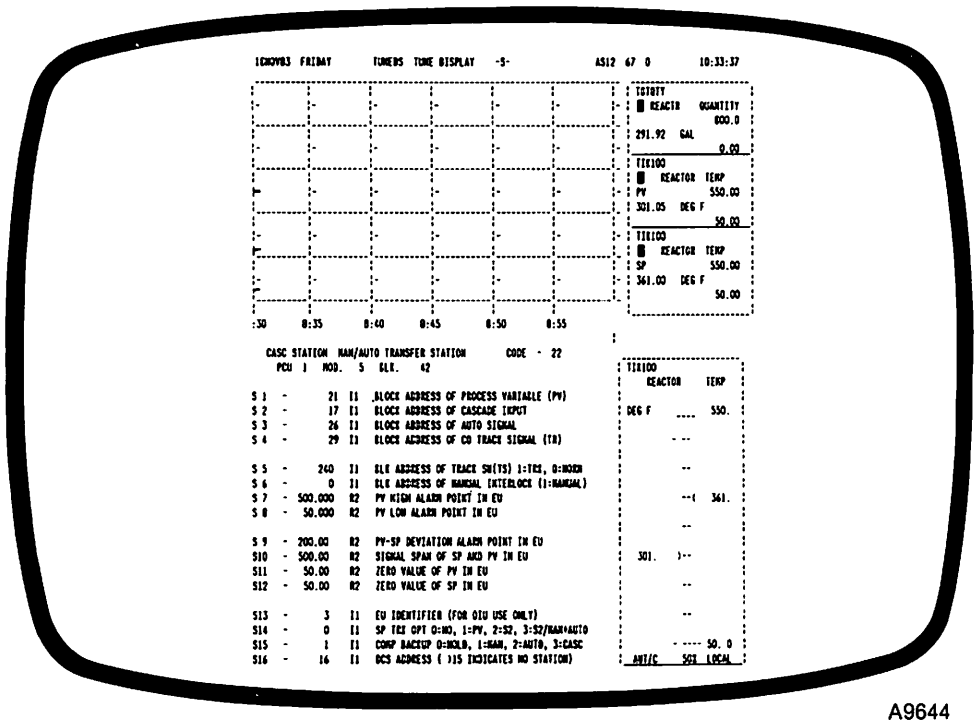

FIGURE 4.25 — Typical Tuning Display Page

TREND ELEMENT. You can trend any OIU process variable, setpoint or control output (PV, SP, or CO) of a Station control tag on a Tuning Display page. The trend element shows trending for up to three tags (variables). The Trend element is similar to that of a Group Display page. The left side of the screen shows the grid and trend lines while the right side shows the three tag blocks.

The tag blocks show the static information, current numerical and alarm data. Notice that PV, SP, or CO can now display under each tag block color identifier square, as well.

The Trend element uses a 12-minute grid (time figures along the bottom of the graph display in green). The time interval between each vertical axis of the grid becomes two minutes. When the Time cursor is at the current position (bottom right of the graph, no time message appears beneath the last tag block. (Consult the current time displayed at the right of the Title line.)

When moving the time cursor along the graph (back or forth) to view an earlier (or more recent) time using the INCR and DECR keys (See Section XII.), the cursor positions to the time you select. The time indicator then displays an alphanumeric message (TIME = 12:30:15, for example). If a certain time position you select is no longer displayable, the time cursor automatically returns to the current position.

NOTE

You cannot scroll on the Tuning display as you can with a Trend element of a Group Display page. Trends only collect when the Tuning Display is on the screen. Its Trend element has no historical data beyond that on the screen.

Trending on the Tuning Display page uses a polling scheme to provide samples in one-second multiples. The Trend graph contains 120 samples or a minimum period of two minutes. When trend lines stretch completely across the graph (the graph is FULL), the trend graph becomes redrawn dropping at least 30 seconds of the earliest (oldest) data. This gives the graph a 30-second expansion (scrolling) WINDOW. The amount of old data dropped depends on the sample multiple.

This special scrolling occurs only once every 30 seconds. The time of the next scroll is a multiple of the trend sample greater than or equal to 30 seconds from the time of the last scroll. Table 4.9 shows the Tuning Display scrolling times.

TABLE 4.9 — Tuning Display Scrolling Times

Display Period (minutes)	Sample Time (seconds)	Next Scroll (seconds)	Samples from Next Scroll
2	1	30	30
4	2	30	15
12	6	30	5
40	20	16	1

The Tuning Display Trend element does not enable control capability. The INCR and DECR keys are relevant only to the Trend element. The Tuning Display has only one Trend element so the INCR/DECR keys are always functional.

NOTE

The cursor control keys (arrow and element display) are not relevant to the Tuning display Trend element.

BLOCK DETAILS ELEMENT. The Block details element shows a specification list of the function block and allows access to its parameters.(This function block format is identical to one used when modifying Module configuration through the PCU Configuration Menu. See Section V.)

NOTE

The function block configured as Station auto input can sometimes be a Proportional Integral Derivative (PID) block. (PID refers to parameter values.) This block can also contain any other function code. (Refer to the Function Code Reference Manual, E93-900-2, for a description of all function codes.)

The Block element has only enough screen space to show 16 parameter specifications (specs) at any time. When there are more specs a reminder message displays. If there is an error on the display or you enter incorrect data, an error message appears. Error messages appear in the screen space of an affected element when relevant while other display elements stay as is. Reminder messages appear at the bottom of the Block display. Table 4.10 lists the error and reminder messages.

NOTE

Use the FIELD key to view additional specs. (See Tuning Display Cursor Control in Section XI.)

Tag alphanumeric identifying data displays on the first line of the Block element in cyan. The next line shows hardware addresses in cyan (the Block address for the PCU, Module, and Block) in the format: PCU (number), MOD (number), and BLK (number).

NOTE

When modifying a module using the PCU Configuration Menu, you must enter the Block address numbers. When accessing the Tuning Display, the addresses are already present.

Underneath the Block identifying lines the 16 parameter information lines appear. (Notice that some Block elements can have only a single spec, such as function code 2.) Each line contains an alphanumeric parameter and its specs. The actual parameters (S1 - S16) appear at the left or beginning of each line. Tunable parameters display in yellow; non-tunable ones in red.

NOTE

When unlocking the TUNE keyswitch, only the tuning parameters are accessible. When unlocking the CONF keyswitch, all parameters become accessible. Use the FIELD key to position the cursor at the accessible parameters (Section XI). However, you cannot change the module mode from the Tuning Display.

A cyan hyphen follows each parameter. The parameter specs (numeric value and alphabetic descriptor in green and alphanumeric address and constant name (or logic state) in cyan) appear to the right of the hyphen.

Numeric specs can be integers or real values and can also be negative numbers. You as the operator can only real value specs. These specs can include:

- PID constants
- High and Low output limits
- Integral changes.

Integer specs are PV and SP addresses and can also be index numbers for EUs (Sections V and VI). You cannot change integer specs from the Block element. The engineer can change them during PCU configuration (Section V).

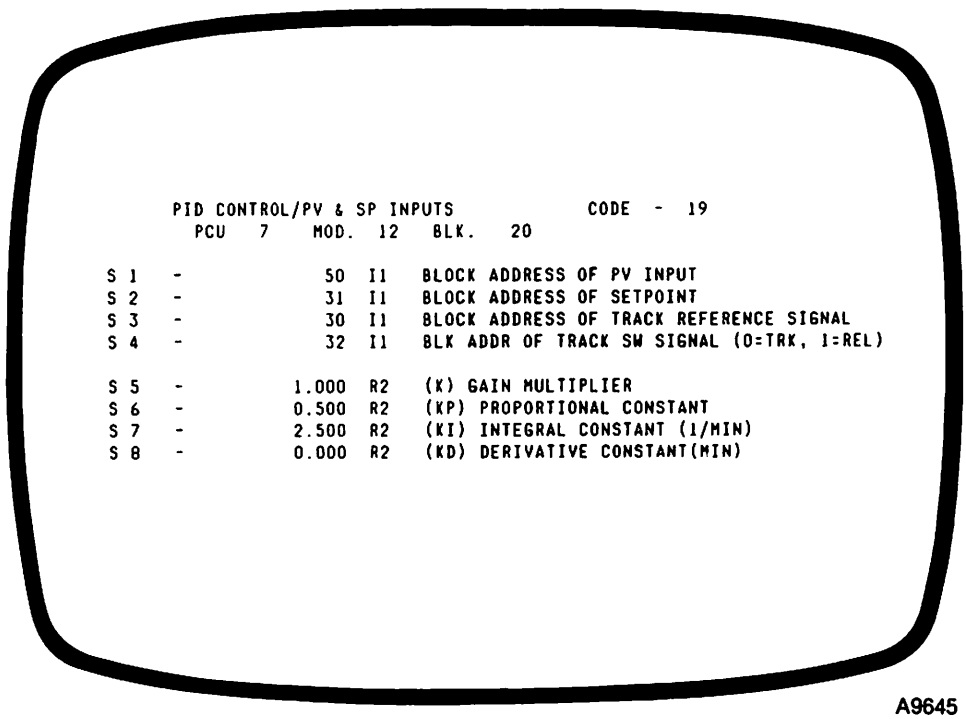

FIGURE 4.26 — Typical Block Details Element

TABLE 4.10 — Tuning Display Error and Reminder Messages

ERROR MESSAGE	EXPLANATION
NO VALID TUNING DISPLAY SAVED	All display elements are undefined.
INVALID TAG TYPE	Non-control type Station element tag or non-control, non-analog type tag.
UNDEFINED TAG	Tag referred by display element undefined or no longer exists.
INVALID TAG	Bad tag number or tag number must be > 0 or < the maximum tag number in OIU configuration.
INVALID HARDWARE ADDRESS	Relevant to Block Details and other Tuning display elements.
COMM LOOP MESSAGE ERROR	Relevant to Block Details element.
	Tuning display element meeting communication loop message causes tuning data to define as BAD QUALITY.
ILLEGAL ENTRY	Tuning parameter edit error.
—??	Command edit (ESC key response) or Numeric entry for Station element in error.
REMINDER MESSAGE	**EXPLANATION**
MORE SPECS ON NEXT PAGE. PRESS (FIELD) TO ACCESS FIRST PAGE.	Field key repositions Cursor to beginning of next page of specifications.
LAST PAGE OF SPECS. PRESS (FIELD) TO ACCESS FIRST PAGE.	Field key repositions Cursor to beginning of specifications list.

TABLE 4.11 — Tuning Display Summary

Accessing the Tuning Display from a Group or Graphic page automatically configures the display.
Selecting a control tag from a Group or Graphic page and pressing the TREND key builds a Tuning Display from that tag.
The Trend Display element traces a 12-minute graph of the control tag, displaying the process variable, setpoint, and control output values.
The Block Display element shows the tag Block specifications.
The Station Display element displays the current tag data.
If the selected tag is not a station type, the Block element shows the tag Block specifications but no Station element nor valid trend data appears.

Block Details Display

The Block Details Display is identical in format to a Block Details element of a Tuning Display (Figure 4.22). This display allows the engineer to tune a block without displaying the other elements of a Tuning Display (Section XII).

NOTE

The Block Details Display also lets the engineer modify a block (Section V) and verify module block configuration details after a power failure (See the end of Section XI).

SECTION V
NETWORK 90 SYSTEM CONFIGURATION

INTRODUCTION

This section describes configuring the NETWORK 90 system through the OIU using the PCU Configuration Menu and floppy disks (or diskettes). As long as necessary modules are in the PCU and the process engineer knows the module hardware addresses, he can configure PCU module blocks using the OIU instead of a Configuration and Tuning Module (CTM).

NOTE

This and the other Configuration Sections (PART II of the manual) explain configuration for operator information. The steps explained in Sections V through X are addressed NOT to the operator but to the process engineer.

Before the engineer configures PCU modules, he must have all configuration data to enter into the system written out on paper records (worksheets). The OIU must be in operation and he must set the address switches of each module of the PCU. These switches must correspond to the addresses assigned on configuration worksheets. (Refer to the manuals concerning the various PCU modules and to E93-903, the Configuration and Tuning Module.)

CREATING PCU MODULE CONFIGURATION

The OIU provides the following control engineering capabilities:

- Modify and/or create a module configuration:
  - — Add a new module block configuration
  - — Modify an existing configuration:
    - — Configure or Tune a block
  - — Delete a block
- Change the operating mode of a module
- Save a module configuration onto diskette
- Restore a saved module configuration from diskette
- Verify a module configuration against diskette
- List a module configuration
- Modify Red Tag status for tags in a module.

CAUTION

Two keylock switches protect module tuning and configuration changes. Configuration and tuning are only possible when the respective keyswitch is unlocked. The engineer performs all configuration and tuning. **The operator must NOT try to perform configuration or tuning at any time.**

The most important configuration display for control engineering is the Block Details Display. This display lets you access all necessary information for a single function block. Each of the PCU configuration functions also has its own configuration display. The various displays let you input necessary data for configuring or tuning.

NOTE

Some PCU configuration functions require the use of diskettes in the OIU diskette drive. (Refer to the OIU Hardware Manual, E93-901-2 for a complete description of diskettes and instructions on their use.)

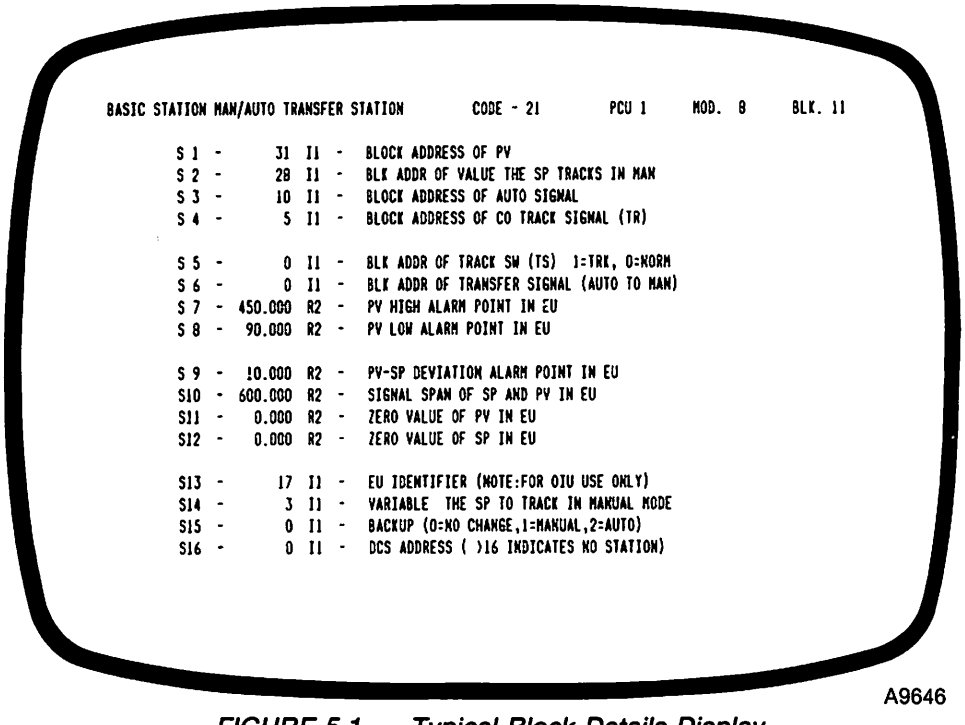

FIGURE 5.1 — Typical Block Details Display

Table 5.1 shows a summary of certain key functions common to PCU configuration.

TABLE 5.1 — PCU Configuration Key Functions

KEY	FUNCTION
FIELD or SECT	Tabs from field to field or from line to line (both keys function identically)
ENTER	Completes an entry sequence.
A - Z, 0 - 9, -, and .	Entering actual alphanumeric (including real) data values
<- and ->	Move cursor left/right one space
CLEAR	Erases data from current cursor position to allow new data entry
PREV or NEXT	Scrolls (pages through) Block Details displays defined for requested hardware addresses.
HOME	Recalls previous contents of data field at current cursor position.
ESCAPE	Returns the PCU Configuration Menu to the CRT

Accessing the PCU Configuration Menu

Access the General Function Menu and enter choice **C** (press C). The PCU Configuration Menu appears on the CRT. This menu lists all PCU configuration functions. If you enter a letter code not included in the menu, the following error message appears on the CRT:

FUNCTION SELECT ERROR

Re-enter a letter code listed on the menu (**A** through **G**).

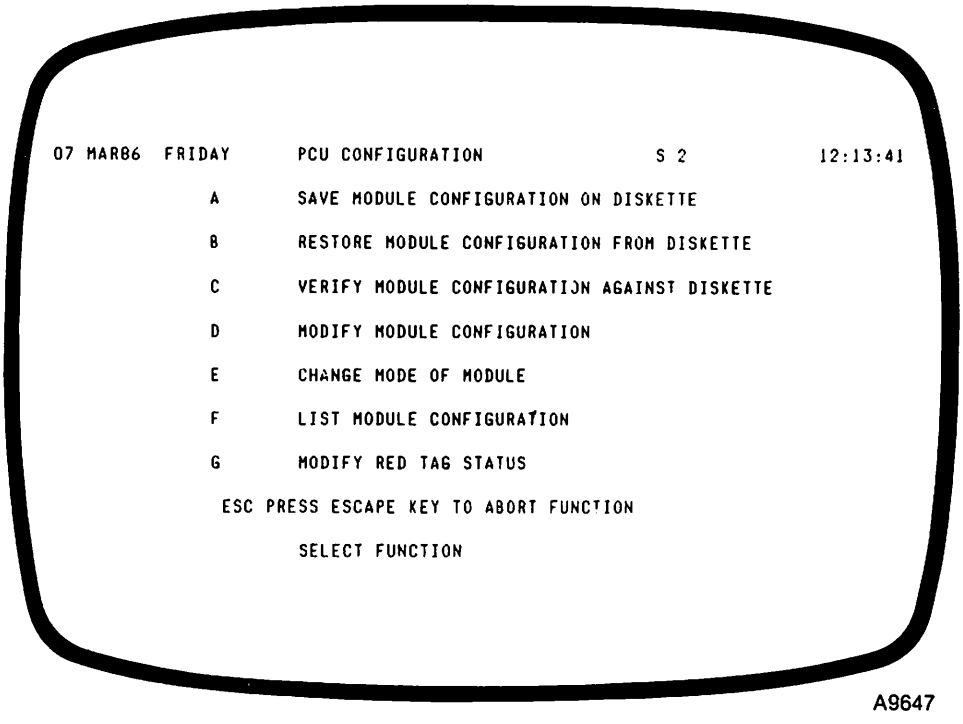

FIGURE 5.2 — PCU Configuration Menu

NOTE

The default colors for this display show the letter choices in red, the function descriptions in cyan, error messages in yellow, and prompts in white (or magenta and green).

While on the PCU Configuration Menu display you can abort any function or operation you begin by simply pressing ESCAPE. When you enter a choice from the menu (enter a letter code) hardware address prompts and/or diskette prompts appear below the menu. Error messages (if any) appear at the bottom of the screen.

Changing Module Modes

Before you enter changes to a PCU Module configuration you must change its operating mode. For most configuration changes a module must be off-line. Some changes require the module to be on-line.

To change a module operating mode, enter choice **E** (press E) from the PCU Configuration Menu. Hardware address prompts then appear on the CRT below the menu.

TABLE 5.2 — PCU Module Operating Modes

A PCU Module can be in ONE of the following FOUR modes:	
RESET	Resets the module from the OIU.
	(Use this mode only after OIU restart. Module times out, resetting its MFT (Module Fault Timer) circuit.
CONFIGURE	Puts the module off-line.
	Module uses the most recent configuration entry values.
EXECUTE	Puts the module on-line.
	Module uses the most recent configuration entry values.
INIT	Erases the function code specification parameters (configuration) of current PCU module shown on CRT, replacing it with default parameters.

SETTING MODULE INTO CONFIGURE MODE. After entering choice E from the menu, you must respond to the hardware address prompts. The prompts can already have address numbers (from a previous configuration change). If you wish to configure the module having the addresses shown, simply press FIELD to move the cursor below them and press ENTER.

If you want to configure a different module, enter its address numbers (PCU number between 2 and 63; module number between 2 and 31). Press CLEAR to erase any previous PCU number. Enter the PCU number of the module you want to configure and then press FIELD to move the cursor to the Module number prompt. Press CLEAR to erase any previous Module number. Enter the number of the module you want to configure and press ENTER.

If you enter an invalid PCU or module number, an error message appears. Re-enter the valid address and press ENTER again. A message showing the current mode of the module (whose addresses you entered) appears, as for example:

PCU NO. 01, MODULE NO. 03
IN EXECUTE MODE

If the CONF keyswitch is unlocked, the following messages then appear below the mode message:

CHANGE MODE OF MODULE

ENTER COMMAND TO CHANGE MODE

RESET, CONFIGURE, EXECUTE, OR INIT

A prompt appears below the mode names. Enter the first letter of the desired operating mode command (C for CONFIGURE). To complete the entry, press ENTER. The OIU sends the mode change command to the PCU module. After the mode change is complete, the current mode message reappears:

PCU NO. 01, MODULE NO. 03
IN CONFIGURE MODE

The cursor appears at the command prompt field below the mode command messages. If you are now starting up the OIU for the first time, or you want to add a new module, or to restore a module configuration from diskette, you must change the mode to initialize. If you want to perform any other PCU configuration function, press ENTER at this point and return to the PCU Configuration Menu (See below).

To initialize a module, enter I and press ENTER. The prompt field disappears from the CRT and then reappears. When the prompt field reappears the PCU module is initialized. In other words, all previous configuration data in that module is erased and it is now ready to receive new data.

CAUTION

Initializing a module erases its previous data. Do NOT initialize (enter I for) any module whose data you want to keep or only slightly change. Otherwise, its data completely disappears.

After initializing the module (or pressing ENTER when you are not initializing a module), the message showing the current mode of the module appears on the CRT. If the CONF keyswitch is locked, the current mode displays but you cannot make any changes to the module. The message: FUNCTION IS KEYLOCKED appears on the CRT. Unlock the CONF keyswitch and this message disappears. You can then proceed to modify the present module as desired.

NOTE

During module configuration it is possible for communication loop and module errors to occur. (Consult the Troubleshooting section of the OIU Hardware Manual, E93-901-2, for the proper corrective actions.)

To return to the PCU Configuration Menu, press ESCAPE.

SETTING MODULE INTO EXECUTE MODE. After entering choice E from the menu, you respond to the hardware address prompts. To configure the module having the addresses shown, press FIELD to move the cursor below the prompts and press ENTER. To configure a different module, enter its address numbers, pressing CLEAR to erase previous data and FIELD to move the cursor to the next prompt. When done entering address numbers, press ENTER.

The current mode message then appears, as for example:

PCU NO. 01, MODULE NO. 03
IN CONFIGURE MODE

With the CONF keyswitch unlocked the mode command messages appear below the current mode message:

CHANGE MODE OF MODULE

ENTER COMMAND TO CHANGE MODE

RESET, CONFIGURE, EXECUTE, OR INIT

A prompt appears below the mode names. Enter the first letter of the desired command (**E** for EXECUTE). Press ENTER to complete the entry. The OIU sends the mode change command to the module.

After the mode change is complete, the current mode message reappears:

PCU NO. 01, MODULE NO. 03
IN EXECUTE MODE

To return to the PCU Configuration menu, press ESCAPE.

Modifying PCU Module Configuration
There are four module modification tasks:

- Add a new module block
- Modify an existing module block (configure)
- Modify an existing module block (tune)
- Delete an existing module block.

Each of the tasks above are similar. All require you to respond to hardware address prompts in order to effect your desired configuration changes. To add, modify (configure), or delete a module, that module must first be in the CONFIGURE mode. To modify (tune) a module, that module must be in the EXECUTE mode. After you finish changing any module (except for tuning) you must put it back into the EXECUTE mode.

ADDING A NEW MODULE BLOCK. Change the desired module to the CONFIGURE mode. Reaccess the PCU Configuration Menu and press choice **D**. The following messages appear at the bottom of the CRT:

SPECIFY ACTION DESIRED
ADD, DELETE, OR MODIFY BLOCK

A prompt appears below the second message. The prompt field can contain a previous command. If so, press CLEAR to erase it and enter the first letter of the command desired (**A** for ADD). To complete the entry, press ENTER.

The hardware address prompts now appear below your entered command letter:

PCU. NO — (##)
MODULE NO — (##)
BLOCK NO — (####)

Previous address numbers can be in these prompt fields. If so, press CLEAR to erase the previous address and enter desired address numbers (2 - 63 for PCU; 2 - 31 for Module; 1 - 1023 for Block). Move the cursor between prompts using the FIELD key.

After entering desired addresses, press ENTER. If you enter an invalid PCU or Module address, an error message appears:

INVALID PCU INPUT (2-63 INCLUSIVE)

or

INVALID MODULE INPUT (2-31 INCLUSIVE)

Press FIELD to move the cursor to the field having the invalid data and press CLEAR to erase the data. Enter the correct number and press ENTER again. The error message then disappears.

After entering valid hardware addresses and pressing ENTER, the prompt for the Module function block appears below the address prompts:

FUNCTION CODE — (###)

If a previous function code number is in this field, press CLEAR to erase it. Then enter the desired function code number. (See the Function Code Reference manual, E93-900-2, for a complete listing of the function code numbers.) To complete the entry, press ENTER.

The OIU now displays the following messages:

PRESS 〈 ENTER 〉 TO ADD BLOCK

〈 ESCAPE 〉 WILL ABORT THE FUNCTION

You can abort your previous entries (and return to the PCU Configuration Menu) by pressing ESCAPE. Pressing ENTER again adds the new block to the module. If the CONF keyswitch is locked, the function keylocked message appears on the CRT. If the keyswitch is unlocked, the OIU sets the module to your specified function code (with default values for all parameters). The menu and messages disappear from the CRT and the Block Details Display for the block you entered appears in its place. Figure 5.1 shows a typical Block Details Display.

The cursor is now at the first (top) parameter specification (spec). (Configurable parameter specs are RED; tunable specs are YELLOW.) If you do not want to change any parameters on this display, press ESCAPE. This returns the PCU menu to the CRT.

If you want to enter a new spec value for any parameter (configurable or tunable), press CLEAR to erase its default value and enter the desired value. Press FIELD to move the cursor to the next parameter and repeat the process. To complete parameter entries for the current block, press ENTER when done entering all desired values.

If you enter an invalid (non-numeric) parameter, the message: INVALID INPUT appears. Erase the invalid spec (press CLEAR) and enter a valid value. Press ENTER again and the error message disappears.

After pressing ENTER the Block Details display updates (disappears and reappears) showing any new parameters entered, as well as unchanged ones. During this process communication loop errors can occur. (Refer to the OIU Hardware Manual for corrective action.) If this is the only block you want to add, return to the PCU Configuration Menu by pressing ESCAPE (See next page).

If you want to add new spec values to another block of the same module and the blocks are in numeric sequence, press PREV or NEXT. When adding module blocks you must enter a function code for each new block. To add new parameters to a block of a different module, you must return to the PCU Configuration Menu (See next page).

NOTE

When modifying (configuring or tuning) existing module blocks, you need not enter new function codes. (See Modifying a Module Block later in this Section.)

After pressing PREV or NEXT the current Block Details Display disappears and the previous menu and message display reappear. The cursor is at the FUNCTION CODE prompt. Erase the previous function code (press CLEAR) and enter a new function code for the previous or next block. Press ENTER.

The previous or next Block Details Display now appears on the CRT. Repeat the steps for entering parameters as above and press ENTER when done. To enter values for more blocks follow the same procedure. When done adding desired parameters for all new blocks, return to the PCU Configuration Menu (See next page).

NOTE

There can be more than one block per module but normally only one function code per block. A Station element tag (function code 21) occupies its block of placement and the next five consecutive blocks. Other tag elements occupy only one block.

After pressing PREV or NEXT, entering a new function code, and pressing ENTER the OIU checks to see if the previous or next block is one of the Station tag blocks. If so, the message: BLOCK ALREADY EXISTS appears on the CRT. You cannot add new parameter values to this block.

You must press ESCAPE to reaccess the PCU Configuration Menu. Then press **D**. Since the ADD command is already in effect, the cursor reappears at the PCU hardware address prompt. Move the cursor to the Block address prompt. Erase the previous block number (press CLEAR). Enter a new block address at least six greater than the previous one and press ENTER. The Function Code prompt now reappears and the cursor moves to it. Erase the previous code

(21 in this case) and enter the desired new code. Press ENTER. The Block Details Display of the new Block then appears on the CRT. At this point you can enter the new parameter values as before.

After you finish entering parameter values to all desired new blocks, return to the PCU Configuration Menu by pressing ESCAPE. Then change the module back to the EXECUTE mode (See Changing Module Modes).

MODIFYING A MODULE BLOCK. There are two modification functions: configuring and tuning. For configuring an existing module block, change the desired module to the CONFIGURE mode. Reaccess the PCU Configuration Menu and press choice **D**. The action message appears at the bottom of the CRT:

SPECIFY ACTION DESIRED
ADD, DELETE, OR MODIFY BLOCK

If the prompt below the message contains a previous command, press CLEAR to erase it and enter **M** (for MODIFY). Press ENTER to complete the entry.

The hardware address prompts now appear below the command prompt. Previous address numbers can be in each prompt. If you want to modify a module block having different addresses than currently shown, erase previous addresses and enter the desired new ones. (Press CLEAR to erase data at a prompt, enter the new data, and press FIELD to move to the next prompt.) When done, press ENTER. If you want to modify a module block having addresses currently shown, move the cursor to the BLOCK NO. prompt and press ENTER.

If you enter an invalid address, its error message appears on the CRT. Correct any invalid address entry and press ENTER again (See page 8). The error message disappears.

After pressing ENTER (if there is no address error), the Block Details Display for the block number you entered appears on the CRT. The cursor is now at the first configurable parameter of the display. If you decide you do not want to change any parameters on the display, press ESCAPE. This returns the PCU menu to the CRT.

To change any configurable parameter values, press CLEAR to erase a previous value. Enter the new value and press FIELD to move to the next configurable parameter. Repeat this process for all values on the display that you want to change. When done changing parameters for this block, press ENTER.

If you enter an invalid parameter, its error message appears on the CRT. Correct the error and go on to the next parameter you want to change (or press ENTER if you are done changing values).

After pressing ENTER, the Block display updates showing the new values you entered, as well as those unchanged. If this is the only block you want to modify, return to the PCU menu by pressing ESCAPE (See below).

If you want to change parameters of another block of the same module and the blocks are in numeric sequence, press PREV or NEXT. To modify

parameters for a block of a different module, you must return to the PCU menu (See below).

When modifying module blocks, pressing PREV or NEXT does not erase the Block display replacing it with the menu display and a FUNCTION CODE prompt (as when you are adding module blocks). The current Block display disappears and the previous or next Block Display appears in its place.

NOTE

As each new Block display appears its number (in yellow) appears at the top right of the CRT.

After you press PREV or NEXT the OIU checks to see if the previous or next block is part of a Station tag. If so, the message: BLOCK NOT READABLE appears instead of a Block display. You cannot access the Block display of this block. Just press PREV or NEXT until the next readable Block display appears on the CRT. Then modify the parameters of that block.

NOTE

If the previous or next block that you want to modify is not in numeric sequence, press PREV or NEXT until that Block display appears on the CRT. Check the display numbers at the top right of the CRT each time you press PREV or NEXT.

After you finish modifying all blocks of the current module press ESCAPE. This returns the PCU Configuration Menu to the CRT. Change the current module back to the EXECUTE mode (See Changing Module Modes).

If you want to modify the blocks of a different module, press **D** from the PCU menu. Since the MODIFY command is already in effect, the cursor reappears at the PCU hardware address prompt. Move the cursor to the MODULE NO prompt. Erase the previous address and enter the desired new address. Move the cursor to the BLOCK NO prompt. Erase its previous address and enter the new one. Press ENTER.

The Block Details display of this block now appears on the CRT.If this block is part of a Station tag, that error message appears in place of the Block display. Press PREV or NEXT to access the first readable Block display. When a Block display appears, you can modify its configurable parameters as before. When done, press ENTER to update the block. When done modifying all blocks in that module press ESCAPE to reaccess the PCU menu. Then change that module back to the EXECUTE mode (See Changing Module Modes).

TUNING A MODULE BLOCK. For tuning an existing module block, lock the CONF keyswitch and unlock the TUNE keyswitch. Then change the desired module to the EXECUTE mode. Notice that the module can already be in EXECUTE mode. If so, press ENTER and then ESCAPE (See Changing Module Modes). When the PCU Configuration menu reappears, press **D**.

When the action message appears below the menu display enter **M** (for MODIFY) in the command prompt. Press ENTER to complete the entry. The hardware address prompts now appear below the command prompt.

If you want to tune a module block having different addresses than currently shown, go through the prompts erasing old addresses and entering new ones. When done, press ENTER. If you want to tune a module block having the currently shown addresses, move to the BLOCK NO. prompt and press ENTER.

Correct any invalid address (when entering new ones) and press ENTER again.

After pressing ENTER (if there is no address error), the Block Details display for the block you entered appears on the CRT. The cursor now appears at the first (top) tunable parameter. If you decide not to change any parameters on this display, press ENTER and then ESCAPE.

To change any tunable parameters, press CLEAR to erase a previous value. Enter the new value and press ENTER. The Block display then updates. Now press FIELD. The cursor moves to the next tunable parameter, skipping any configurable ones. Repeat this process for all tunable parameters on the display that you want to change. When done press ESCAPE.

NOTE

When modifying tunable parameters you can only change one parameter at a time. Press ENTER after changing each new parameter. When modifying configurable parameters press ENTER only after done entering all desired new parameters.

To tune different blocks of the same (or different) modules, you must enter new block numbers at the BLOCK NO address prompt. Then repeat the tuning process for that block as above, returning to the PCU menu when done tuning each block.

The current module is still in the EXECUTE mode so you do not have to change its mode when done tuning all its blocks. But when done tuning all blocks for all modules desired, lock the TUNE keyswitch and remove the TUNE key.

DELETING A MODULE BLOCK

Unlock the CONF keyswitch. Change the desired module to the CONFIGURE mode. Reaccess the PCU menu and press **D**. When the command prompt appears enter **D** (for DELETE) and press ENTER.

The hardware address prompts then appear below the command prompt. If you want to delete a module block having different addresses than currently shown, erase the previous addresses and enter the desired new ones. When done, press ENTER. If you want to delete the module block having the addresses currently shown, move the cursor to the BLOCK NO prompt and press ENTER.

NOTE

If you enter an invalid address, correct the error and ENTER again.

The OIU now displays the following messages:

PRESS 〈 ENTER 〉 TO DELETE BLOCK

〈 ESCAPE 〉 WILL ABORT THE FUNCTION

You can abort your previous entries and return to the PCU menu by pressing ESCAPE. Pressing ENTER again deletes the current module block from the PCU module configuration. If the CONF keyswitch is locked, the function keylocked message appears. If the CONF key is unlocked, the OIU deletes the current module block.

When the OIU finishes deleting this module block the following message appears:

OPERATION COMPLETE

To delete blocks of the same module, reaccess the hardware address prompts. Press ESCAPE and the cursor reappears at the PCU NO prompt. Move the cursor to the BLOCK NO prompt. Erase the previous number and enter the new number. Press ENTER. Press ENTER again to delete that module block.

When done deleting all desired blocks for the current module press ESCAPE to reaccess the PCU menu. Change the current module back to the EXECUTE mode (See Changing Module Modes).

NOTE

To delete blocks from a different module, follow the procedure above, entering the hardware addresses of the new module and its blocks. Put the new module back into EXECUTE mode when done deleting its desired blocks.

Saving PCU Module Configuration

This function lets you save (back up) any PCU module configuration onto a floppy disk (diskette). You can restore the module configuration to the PCU or verify a PCU module configuration against the contents of the diskette at a later time (See the next two functions of this Section). To perform this function, the module must be in CONFIGURE or EXECUTE mode.

Unlock the CONF keyswitch. Reaccess the PCU Configuration Menu. Press choice **A**. If the CONF keyswitch is locked, the function keylocked message appears. Unlock the CONF keyswitch. Press choice **A** again. Insert an initialized, named diskette into the diskette drive of the OIU. The following items appear under the menu display:

SAVE

PCU NO. — (##)

MODULE NO. — (##)

Previous data can be in the hardware address prompts. If the addresses shown match those of the module you want to save, move the cursor to the MODULE NO prompt and press ENTER. Otherwise, erase the previous data and enter the addresses of the PCU module you want to save. Move the cursor between the prompts by pressing FIELD. Press ENTER when done.

The OIU now displays the DISKETTE VOLUME NAME - (AAAA) prompt under the hardware address prompts. If the name shown matches the name of the diskette you inserted, press ENTER. Otherwise, enter the name of the diskette you inserted. Press ENTER when done.

The OIU now checks the name you entered against the name on the diskette in its diskette drive. If the names match, the OIU copies the module configuration of the addresses you entered onto the diskette. The red LED on the diskette drive begins flashing to show the operation is in progress. When the operation is complete the OIU displays the message:

OPERATION COMPLETE

NOTE

During the save operation communication loop and module errors can occur.

If the diskette volume name you entered does not match that on the diskette in its diskette drive, the OIU displays the error message:

VOLUME NAME NOT FOUND

Remove the diskette and check its label. Insert it back into the diskette drive. Enter the name on the diskette label. Press ENTER again. After the OIU rechecks the volume names and finds a match the error message disappears and the save operation begins.

If the OIU displays the error message: DISKETTE FILLED while the save operation is in progress, the LED on the diskette drive stops flashing and the save operation ends. Remove the diskette in the drive and replace it with another. Enter the volume name of this diskette in its prompt field and press ENTER when done. After the OIU rechecks the names and finds a match, the save operation restarts.

If a write error occurs during the save operation, the OIU displays the message: DISKETTE ERROR. Remove the diskette and replace it with another. Enter the volume name of the new diskette and press ENTER again. When the OIU finds a match of the diskette names the save operation restarts.

If you want to abort the save operation during its progress, press ESCAPE. The save operation stops. The data on the diskette is now incomplete. The OIU displays the message:

OPERATION ABORTED

Repeat the save procedure for all module configurations you want to save on diskette. When all done saving, remove the diskette and store it in the proper place. Press ESCAPE to reaccess the PCU Configuration Menu. If you are done with all configuration, lock the CONF keyswitch and remove the CONF key.

Restoring PCU Module Configuration
This function lets you restore (rewrite) any PCU module configuration from a diskette back to the PCU module.

Unlock the CONF keyswitch. Insert the proper diskette into the OIU diskette drive. Change the module mode to CONFIGURE and then to INITIALIZE.

Reaccess the PCU Configuration Menu. Press choice **B**. If the CONF keyswitch is locked, the function keylocked message appears. Unlock the CONF keyswitch. Press choice **B** again.

The following items appear under the menu display:

RESTORE

PCU NO. — (##)

MODULE NO. — (##)

Previous data can be in the prompts. If the addresses shown match those of the module you want to restore, move the cursor to the MODULE NO prompt and press ENTER. Otherwise, erase the previous data and enter the addresses of the module you want to restore. Press ENTER when done.

The DISKETTE VOLUME NAME - (AAAA) prompt now appears under the address prompts. If the name shown matches the name of the diskette you inserted, press ENTER. Otherwise, erase the current name and enter the name of the diskette you inserted. Press ENTER when done.

The OIU then checks to see if the volume names match. If they do, the OIU copies the configuration data from the diskette of the addresses you entered to the PCU module. The red LED starts flashing on the diskette drive to show the operation is in progress. When the operation is complete the OIU displays the message:

OPERATION COMPLETE

NOTE

During the restore operation the same errors can occur as during the save operation (except DISKETTE FILLED).

If the OIU cannot find the data to restore on the diskette, the restore operation stops and the following error message appears:

NO MODULE DATA ON DISKETTE

Remove the diskette and replace it with the proper diskette having the data to restore. Repeat the restore operation.

Repeat the restore procedure for all module configurations you want to restore from diskette. When done restoring a module configuration from diskette put the module back into EXECUTE mode. When all done restoring, remove the diskette and store it. Press ESCAPE to reaccess the PCU menu. If all configuration is done, lock the CONF keyswitch and remove the CONF key.

Verifying PCU Module Configuration

This function lets you verify a PCU module configuration against that on a diskette. To perform this function, the module must be in CONFIGURE or EXECUTE mode.

Unlock the CONF keyswitch. Insert the proper diskette into the diskette drive. Reaccess the PCU Configuration Menu. Press choice **C**. If the CONF keyswitch is locked, the function keylocked message appears. Unlock the CONF keyswitch. Press **C** again.

The following items appear under the menu display:

VERIFY

PCU NO. — (##)

MODULE NO. — (##)

Previous data can be in the hardware prompts. If the addresses shown match those of the module you want to verify, move the cursor to the MODULE NO prompt and press ENTER. Otherwise, erase the previous data and enter the addresses of the PCU module you want to verify. Press ENTER when done.

The OIU now displays the DISKETTE VOLUME NAME - (AAAA) prompt under the address prompts. If the name shown matches the name of the diskette you inserted, press ENTER. Otherwise, enter the name of the diskette you inserted. Press ENTER when done.

The OIU checks the name you entered against the name on the diskette in its drive. If the names match, the OIU compares the PCU module configuration of the addresses you entered against the configuration data on the diskette. The red LED begins flashing on the diskette drive. When the operation is complete the OIU displays the message:

OPERATION COMPLETE

NOTE

The same errors can occur during the verify operation as can occur during a save or restore operation (except DISKETTE FILLED).

Repeat the verify procedure for all module configurations you want to verify against diskette. When done verifying remove the diskette and store it. Press ESCAPE to reaccess the PCU menu. If all configuration is done, lock the CONF keyswitch and remove the CONF key.

Listing Module Configuration
This function lets you print out a hard copy of PCU module configurations on the OIU line printer. The module must be in CONFIGURE or EXECUTE mode.

Unlock the CONF keyswitch. Reaccess the PCU Configuration Menu. Press choice **F**. If the CONF keyswitch is locked, the function keylocked message appears. Unlock the CONF keyswitch. Press **F** again.

The following items appear under the menu display:

LIST MODULE CONFIGURATION

PCU NO. — (##)

MODULE NO. — (##)

Previous data can be in the prompts. If the addresses shown match those of the module for which you want a listing, move the cursor to the MODULE NO prompt and press ENTER. Otherwise, erase previous data and enter the addresses of the module you want to list. Press ENTER when done.

If you want a listing of all active modules in a PCU, enter the PCU address and the letter **A** (for ALL) in the MODULE prompt. Press ENTER when done.

If you enter an invalid address, its error message appears. Enter the correct address and complete by pressing ENTER.

After you press ENTER the OIU reads back the entire configuration from the module whose addresses you entered. After a short delay the listing from the selected module begins printing out on the printer. When the listing is finished the OIU displays the message:

OPERATION COMPLETE

If the OIU cannot find the configuration for the selected module in the given PCU it displays the message:

MODULE NOT RESPONDING

If the entire PCU configuration is listing and this message appears on the CRT, the OIU tries to list the next available module in the PCU. Otherwise, the listing stops and the PCU Configuration Menu reappears on the CRT.

Sometimes the OIU exceeds the capacity of the printer. When this occurs the message: PRINTER BUSY appears on the CRT. When the printer catches up to the OIU the message disappears.

You can abort the listing while it is in progress by pressing ESCAPE. The CRT displays the message:

OPERATION ABORTED

Any data yet to print does not print out. The PCU Configuration Menu reappears on the CRT.

If you decide to access another function or a different menu during a listing before the OPERATION COMPLETE message appears, the listing stops and the message above displays on the CRT. Any data yet to print does not print out.

If you list module configuration separately (do not enter **A** in the MODULE prompt), press ESCAPE after done listing all configurations desired. This returns the PCU menu to the CRT. If done with all configuration, lock the CONF keyswitch and remove the CONF key.

Modifying Red Tag Status

This function allows you to add or remove Red Tag status to a controllable tag (Block) in the PCU module configuration. The OIU indicates Red Tag status on the following controllable display elements: Remote Control Memory, Device Driver, and Station. Red Tag status appears after the OIU receives an exception report from such a point (Section XI).

Unlock the CONF keyswitch. Put the current module into the EXECUTE mode. Reaccess the PCU Configuration menu. Press choice **G**. If the CONF key is locked, the function keylocked message appears. Unlock the CONF keyswitch and press **G** again.

The address prompts now appear under the menu display:

MODIFY RED TAG STATUS

PCU NO. — (##)

MODULE NO. — (##)

BLOCK NO. — (####)

Previous data can be in the prompts. If the addresses shown match those of the module where you wish to modify Red Tag status, move the cursor to the BLOCK prompt and press ENTER. Otherwise, erase previous data and enter the addresses of the module where you want to modify Red Tag status. Press ENTER when done.

The OIU now displays the Key prompts and the cursor reappears to the right of the first prompt:

KEY # 1: (AAA)

KEY # 2: (AAA)

KEY # 3: (AAA)

To add Red Tag status to a point, enter up to three alphabetic characters into Key prompt #1, three into Key #2, and three into key #3. Press ENTER.

NOTE

You can add Red Tag status to the module block simply by entering a minimum of a single alphabetic character into any one key field, leaving all the rest blank. The alphabetic data can be your initials, a code, or some other identifying combination of letters.

NOTE

When the Key prompts appear on the CRT they can already contain previous data. If so, that block already has Red Tag status. If this occurs, press ESCAPE and return to the PCU menu. (To remove the status, see next page.)

The following messages now appear below the Key prompts:

PRESS 〈 ENTER 〉 TO CHANGE RED TAG STATUS

〈 ESCAPE 〉 WILL ABORT THE FUNCTION

To abort your entries, press ESCAPE. This returns the PCU menu to the CRT. Pressing ENTER again adds Red Tag status to that block of the module.

To add Red Tag status to other blocks of the same module, reaccess the PCU menu and repeat the procedure above. Enter the Block address of each new block where you want to add the status. To add the status to blocks of a different module, enter the new Module address, as well as the new Block address and repeat the steps above.

When done adding Red Tag status for all module blocks, press ESCAPE to return to the PCU menu. If done all configuration, lock the CONF keyswitch and remove the CONF key.

To remove Red Tag status from a block, erase any previous data in the Key prompts. When done press ENTER. The OIU then displays the messages to let you decide whether to abort your entries or to remove the status from the block.

Pressing ENTER again removes the status from that module block. To remove the status from other blocks of the same module, follow the same procedure. Enter the Block address of each new block where you want to remove the status. Erase any previous data in the Key prompts for that block. When done press ENTER twice.

NOTE

If the Key prompts for that block are already empty, that block does not have Red Tag status. Press ESCAPE to return to the PCU menu. (To add the status to that block, see previous page.)

To remove the status from blocks of a different module, reaccess the PCU menu and the Red Tag function. Enter new module addresses, as well as new Block addresses and then follow the steps as above.

When done removing Red Tag status from all module blocks, press ESCAPE to return to the PCU Configuration Menu. When done with configuration, lock the CONF keyswitch and remove the CONF key.

SECTION VI
OIU CONFIGURATION

INTRODUCTION

This section describes configuring the OIU. The basic OIU configuration functions concern defining information for OIU Tags. When configuring the OIU you must also define many other items (as shown below.) Later sections detail procedures for configuring the graphics, Color and Phrase, Logging, and Archiving functions. This section details the remaining functions.

Before configuring the OIU the engineer must write down all configuration data to enter into the system on paper records (worksheets). The OIU must also be reset and in operation before configuration occurs.

CREATING OIU CONFIGURATION

The engineer must perform the following operations to configure the OIU for any application:

- Specify a Name, a Descriptor, a hardware address, a variable type, and other information for each TAG
- Specify trends
- Lay out Group displays
- Edit graphics and assign them to Groups (Section VII)
- Lay out Area displays
- Specify Color and Phrase (Section VIII)
- Define System nodes, the PCU, and Peripheral parameters
- Configure Logs (if using logging option - Section IX)
- Configure Archiving (if using this option - Section X)
- Write plant programs in BASIC (if using this option)
- Specify alarm management
- Set system time and date.

Each operation above uses separate configuration displays on the CRT. Except for the Graphic Editor (Section VII), these displays are interactive, fill-in-the-blank types. Similar procedures and identical displays enable the entry of an initial configuration, as well as the editing of an existing one.

CAUTION

The CONF keyswitch protects configuration changes. Configuration is only possible when this keyswitch is unlocked.

Table 6.1 shows a summary of certain key functions common to OIU configuration. (Section VII explains the auxiliary keyboard.)

TABLE 6.1 — OIU Configuration Key Functions

KEY	FUNCTION
FIELD	Tabs between fields within a section (with wraparound)*
SECT	Tabs between lines (sections) within in a page (with wraparound)
	Displays most recently entered data for a section you exit using SECT or ESCAPE**
ENTER	Enters data for current section into OIU (If current field contains an error, entry does not occur until corrected)
	Accepts current field into OIU when CRT in COMMAND? mode
A - Z, 0 - 9 -, and .	Entering actual alphanumeric (including real) data values
SPACE	Moves cursor one space forward
<- and ->	Move cursor left/right on space.
CLEAR	Erases data from current cursor position to allow new data entry.
	Moves cursor to leftmost position of current data field***
PREV or NEXT	Scrolls (pages through) displays
HOME	Recalls previous contents of data field at current cursor position
ESCAPE	Puts CRT into COMMAND? mode for command code entry
	Also returns the OIU Configuration Menu to the CRT

* An error in a field keeps the cursor from moving on to the next field when you press FIELD until you correct the error.

** If the section has any errors and you want to reaccess its previous data (prior to current entries), exit the section by pressing SECT or ESCAPE.

*** When clearing (erasing) previous data, press CLEAR and enter new data. Press ENTER to complete the entry.

Accessing the OIU Configuration Menu

Access the General Function Menu and enter choice **D** (press D). The OIU Configuration Menu appears on the CRT. This menu lists all OIU configuration functions. If entering a letter code not included in the menu, the Function Select error appears on the CRT. Re-enter a letter code listed on the menu (**A** through **O**).

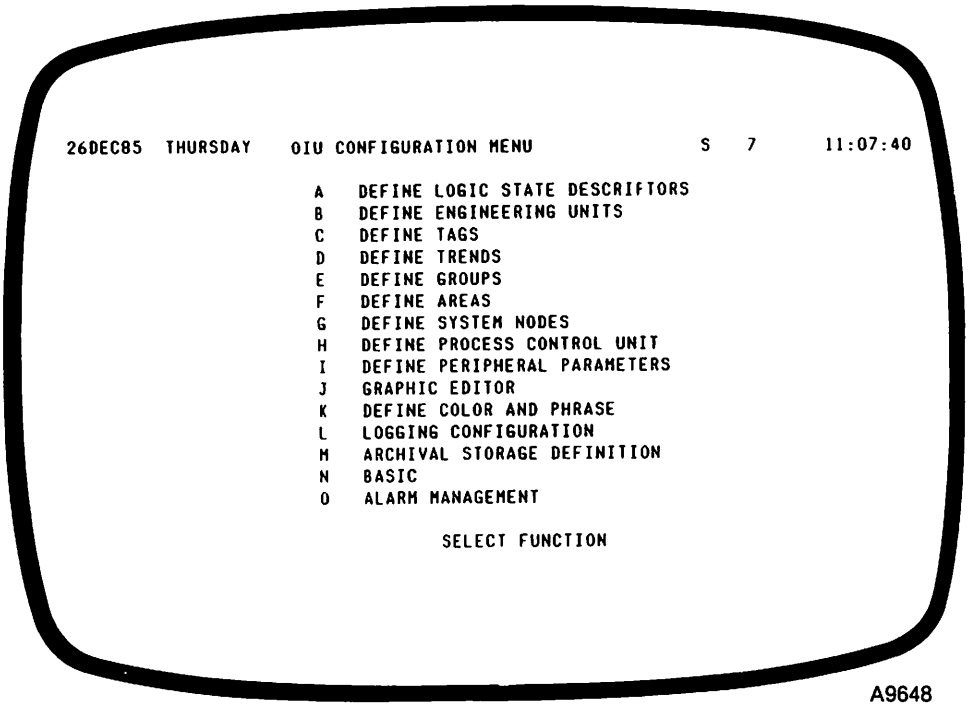

FIGURE 6.1 — OIU Configuration Menu

NOTE

The default colors for this display show the letter choices in red, the function descriptions in cyan, error messages in yellow, and prompts in white (or magenta and green).

While on the OIU Configuration Menu display you can abort any function or operation you begin by pressing ESCAPE. When you enter a choice from the menu (enter a letter code) either prompts appear below the menu or, the menu disappears and a configuration display appears in its place.

Some functions have multiple display pages; the rest only one page. For displays having multiple pages you must select them using either a name or a number. This lets you update that particular page of the selected configuration function. For displays having only one page, the selected function accesses that page directly. Error messages (if any) appear at the bottom of the CRT.

NOTE

Certain OIU configuration functions require the use of diskettes. (See Sections IX and X.) (Refer to the OIU Hardware Manual, E93-901-2 for a complete description of diskettes and instructions on their use.)

When configuring the OIU for Tags perform the following functions in the sequence shown for all new Tags you want to add.

1) Define Logic State Descriptors (LSDs) and/or Engineering Units (EUs)
   [choices **A** and **B** on OIU Configuration Menu]
2) Define the Tags (name, descriptor, hardware address, type, etc.)
   [choice **C** on the menu]
3) Define Trends (Tag name, trend type, etc.)
   [choice **D** on the menu]
4) Define Groups (Group number, Tag name, display element types, etc.)
   [choice **E** on the menu]
5) Define Areas (Area number, Group number, descriptor, Tag name, value, etc.)
   [choice **F** on the menu]
6) Perform the remaining OIU configuration functions (independent of Tag information)
   [choices **G**, **H**, **I**, **N**, and **O**]
7) Copy configuration to diskette (Backup configuration: See File Utilities in the OIU Hardware Manual.)
8) Reset/load the system (Section XI).

Make necessary modifications directly on appropriate displays. To delete tags from OIU configuration, reverse the sequence shown above starting with step 5 (Define Areas) and work through to step 1. Then do steps 7 and 8. (Skip step 6 unless you want to change existing items using those functions.)

When done configuring Alarm Management re-access the General Function Menu. You can now set the OIU system Time and Date (choice **E**). You can set the system Time and Date at any time independently of all other other OIU configuration functions.

DEFINE LOGIC STATE DESCRIPTORS. The OIU provides definition space for up to 64 Logic State Descriptors (LSDs). Of these LSDs, 16 are pre-defined (you cannot change them) while the other 48 are user-defined (you can change them). Unlock the CONF keyswitch. (Keep the TUNE keyswitch locked.) Enter **A** (press A) from the OIU Configuration menu. The menu disappears and the Define Logic States Display appears with the cursor positioned at the first definable LSD, or mnemonic (See below).

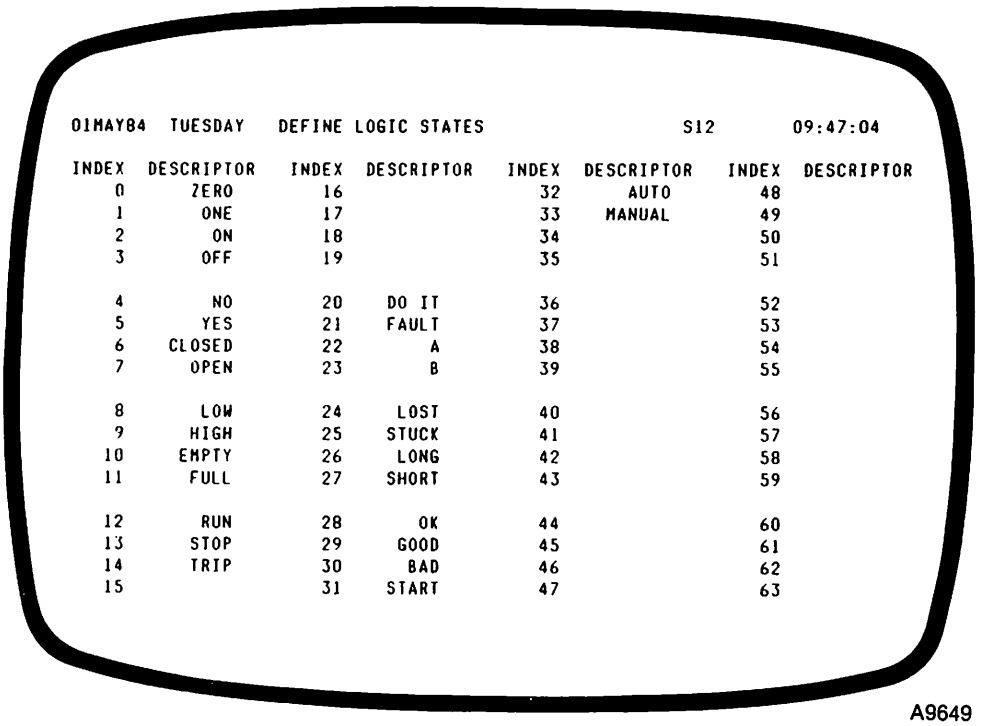

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FIGURE 6.2 — Define Logic States Display

This single-page display shows four pairs of columns (left to right) with each pair having the heading:

INDEX DESCRIPTOR

Under the column heading line are the LSD information lines (top to bottom). These information lines list the individual LSD item numbers (0 - 63) in the INDEX columns and the predefined and user-defined LSDs in the DESCRIPTOR columns. These lines are set off in groups of four with two empty lines between each group for easier readability. The LSD numbers (top to bottom, left to right) in the INDEX columns go from 0 - 15, 16 - 31, 32 - 47, and 48 - 63.

Predefined LSDs (ZERO, ONE, ON, OFF, etc.) appear in cyan. The user-defined LSDs (your choice of mnemonic) appear in green. When you first access this display the cursor positions itself at LSD number 16 (the top LSD input field below the second DESCRIPTOR heading). Notice that many of the user definable LSD fields can be blank when you first access this display.

Each LSD is a section having only one input field. This field can contain up to 6 alphanumeric characters. All user-defined LSD inputs become right-justified when entered on this display. Notice that all predefined LSDs are right-justified, as well. The 16 predefined LSDs are:

0 ZERO	4 NO	8 LOW	12 RUN
1 ONE	5 YES	9 HIGH	13 STOP
2 ON	6 CLOSED	10 EMPTY	14 TRIP
3 OFF	7 OPEN	11 FULL	15 (blank)

Some examples of user-defined LSDs are: A, B, MANUAL, FAULT, NORMAL, OK, GOOD, BAD, LONG, SHORT, etc.

Press SECT to move the cursor between LSD input fields. (Notice that the cursor can only move between LSDs 16 and 63.) Enter a new LSD or modify an existing one using the alphanumeric keys. Press ENTER after entering or changing each LSD. Pressing SECT to move away from any updated LSD field without first pressing ENTER to add that change erases the entry. The previous LSD input (if any) then reappears in place of your new (or changed) entry.

Define all LSDs you want to use on your OIU according to your particular plant setup. You can also skip some LSD fields (leaving them blank) as desired.

When done defining all LSDs on this display return to the OIU Configuration menu using either of the following methods:

- Press ESCAPE to put the CRT into COMMAND? mode
- Enter **M** (menu)
- Press ESCAPE again.

— or —

- Press ESCAPE twice.

When the OIU Configuration Menu reappears on the CRT you can now access another configuration choice or perform some other task as desired. If all OIU configuration is done, lock the CONF keyswitch and remove its key.

NOTE

If not done defining all LSDs desired when putting the CRT into COMMAND? mode, you can move the cursor to a specific LSD field by entering the index number of that field in the COMMAND? prompt and pressing ENTER.

DEFINE ENGINEERING UNITS. The OIU provides 64 Engineering Units (EUs). Of these EUs, 16 are predefined and unchangeable while the other 48 are user-definable or changeable (similar to LSDs). Unlock the CONF keyswitch. Enter **B** from the OIU Configuration menu. The menu disappears and the Define Engineering Units Display appears with the cursor positioned at the first definable EU (See below).

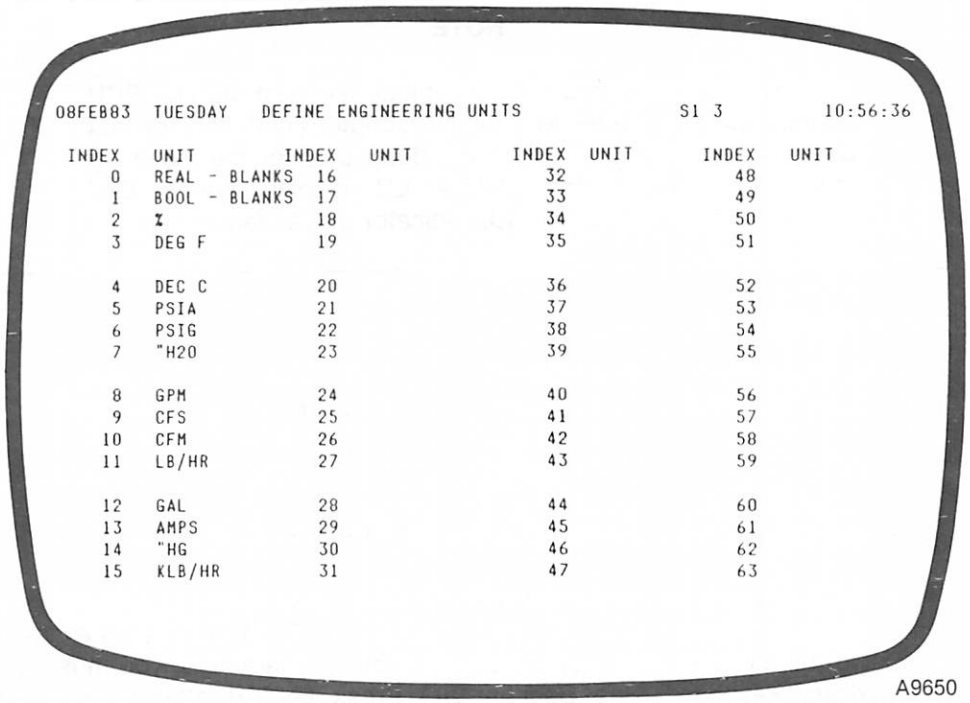

FIGURE 6.3 — Define Engineering Units Display

This single-page display is almost exactly identical to the Define Logic States Display, showing four pairs of columns (left to right). But each pair of columns on this display has the heading:

INDEX UNIT

Under the column heading line are the EU information lines (top to bottom). These lines list the individual EU item numbers (0 - 63) in the INDEX columns and the predefined and user-defined EUs in the UNIT columns. These information lines are also set off in groups of four with two empty lines between each group. The EU numbers (top to bottom, left to right) in the INDEX columns go from 0 - 15, 16 - 31, 32 - 47, and 48 - 63.

Predefined EUs (REAL, BOOL, %, DEG F, etc.) appear in cyan. The user-defined EUs (your choice) appear in green. When you first access this display the cursor positions itself at EU number 16 (the top EU input field below the second DESCRIPTOR heading). It is also possible that many of the user-definable EUs can be blank when you first access this display.

Each EU is a section having only one input field. This field can contain up to 6 alphanumeric or special characters. All EUs you enter on this display become left-justified. The 16 predefined EUs are also left-justified.

For an EU to appear on any operational display page, you must define it during OIU configuration. When a tag (display element) appears having an undefined EU the OIU automatically fills that display field with blanks. For example: a Station display element appears as part of a Group display page. The EU field of that Station element is blank because it has no defined EU.

NOTE

An integer spec of a module block entered during PCU configuration can refer to an EU descriptor (identifier) for that module. Unless you enter an EU descriptor for the matching index number on the Define EU display during OIU configuration, that element EU indicator stays blank.

The 16 predefined EUs are:

0 I REAL — BLANKS	4 I DEG C	8 I GPM	12 I GAL
1 I BOOL — BLANKS	5 I PSIA	9 I CFS	13 I AMPS
2 I %	6 I PSIG	10 I CFM	14 I "HG
3 I DEG F	7 I "H2O	11 I LB/HR	15 I KLB/HR

Some examples of user-defined EUs are: VOLTS, OHMS, #, RPM, etc.

Press SECT to move the cursor between EU input fields. (Notice that the cursor can move only between EUs 16 - 63.) Enter a new EU or modify an existing one using the alphanumeric keys. (To enter special characters, you must use the auxiliary keyboard: See Section VII.) Press ENTER after entering or changing each EU. Moving away from an entry without pressing ENTER causes that entry to disappear (erase). The previous EU input (if any) then reappears in place of your new (or changed) entry.

Define all EUs you want to use on your OIU. You can also skip some EU fields as desired, but see the NOTE above.

When done defining all EUs on this display return to the OIU Configuration menu by pressing ESCAPE twice, or by pressing ESCAPE, entering **M**, and then pressing ESCAPE again. If not done defining when the CRT is in COMMAND? mode, enter the EU index number of the desired EU input field in the command prompt and press ENTER.

When the OIU Configuration menu reappears on the CRT, access another configuration choice or perform some other function as desired. If done with all OIU configuration, lock the CONF keyswitch and remove its key.

DEFINE TAGS. The OIU can contain up to 5000 tags. (See Table 2.1 in Section II.) Unlock the CONF keyswitch. Enter **C** from the OIU Configuration menu. The word: TAG ? appears directly under the menu. Below this appear two prompts requesting tag name and number (1- 5000) entries: NAME NUMBER. (The cursor is positioned under the NAME prompt.)

There are two ways to access the multi-page Define Tags Display depending on whether the OIU contains any defined tags.

When first configuring tags there are no defined tags in OIU memory. To define tags, press FIELD to move the cursor to the NUMBER prompt and then press ENTER. The OIU Configuration menu disappears and the Define Tags Display replaces it with the cursor positioned at the first undefined tag number (tag definition line number 1 in this case).

NOTE

If you enter a tag number in the NUMBER prompt and then press ENTER, the Define Tags Display appears on the CRT with the cursor positioned at the tag number entered. In this case (no defined tags yet in OIU memory) the tag definition line where the cursor is positioned can be other than the top line of the page.

Do not enter a tag name in the NAME prompt if OIU memory does not yet contain defined tags. If you do, and then press ENTER, the OIU displays the error message: UNDEFINED TAG. The cursor cannot move away and no further action for that tag is possible. Instead, leave the NAME field blank, moving to the NUMBER field as above.

You can access any defined tag on the Define Tags Display using either its name or number (or both if desired). When OIU memory contains defined tags enter a tag name in the NAME field and then press ENTER. In this case, the Define Tags Display appears on the CRT with the cursor positioned at the number of the defined tag entered. Or move the cursor to the NUMBER field and enter the tag number. Then press ENTER. The display appears with the cursor positioned as above.

NOTE

If you enter a tag number larger than current OIU capability, the error message: ILLEGAL ENTRY appears. Press CLEAR to erase the invalid entry. Enter the correct number and then press ENTER to access that tag number on the Define Tags Display.

19JUN84 TUESDAY DEFINE TAGS SI 11:14:31

STATION REAL BOOLEAN MANUAL SET CONSTANT REMOTE CONTROL MEMORY
DEVICE DRIVER

#	NAME	DESC	PCU-ND-BLCK TYPE	AUTO/ MAN AREAS	PRIMR GROUP # NAME	EU OR LSD ONE ZERO	PRI LVL	STAT CHNG FB#1-0	PROCESS SUPPRES TAG FB#1-1	ALRM SPRN FB#2-0	OPER SPRN FB#2-1
1	STAMDARD SW 1		3-9-99 REMOTE	AUTO	45 SOE	ON OFF	0	NO		NO	NO
2	AIC CASCAD CONTROL OUTPUT		10-21-100 STATION	AUTO	42 LUBE2		0	NO		NO	NO
3	RECIPE 1-10 RECIPE SELECT		10-21-200 MANUAL	8	42 LUBE3	SFS	0	NO		NO	NO
4	VSET VSET VISCOSITY SETPT		10-21-402 REAL	8	42 LUBE4		0	NO		NO	NO
5	DDR7013 BURNER ATOMIZING VALVE		11-22-500 DEVICE	7	46 HEAT3	OPEN	1	NO OPEN	DDR7017 CLOSED	YES	YES
6	P-500P GENERIC TREND		17-41-900 REAL	6	50 SERS		1	NO		NO	NO

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FIGURE 6.4 — Define Tags Display

This display has several headings (appearing in cyan). The first two lines show the tag type summary (left to right):

STATION REAL BOOLEAN MANUAL SET CONSTANT
REMOTE CONTROL MEMORY DEVICE DRIVER

The next five lines show the main headings providing details for tag information lines that follow. The main headings show (left to right):

- # (Tag number)
- NAME (Tag name)
- DESC (Tag descriptor)
- PCU-MD-BLCK TYPE (Tag hardware addresses: PCU-MODULE-BLCK and tag type)
- AUTO/MAN AREAS (Alarm updating method: AUTO or MAN) (Areas where alarm appears using MAN)
- PRIMR GROUP # NAME (Primary group containing the tag) (Primary group number) (Primary group name)
- EU OR LSB ONE ZERO (Process engineering units or) (Logic State Descriptors for logic state 1 and logic state 0)
- PRI LVL (Alarm priority level; 0 - 7)
- STAT CHNG FB#1-0 (Alarm status change for Remote Control Memory or Boolean tags) (Device Driver feedback indicator #1, logic state 0)
- PROCESS SUPPRESS TAG FB#1-1 (Tags for which system suppresses secondary alarms) (Device Driver feedback indicator #1, logic state 1)
- ALRM SPRN FB#2-0 (Tags having suppressed alarms) (Device driver feedback indicator #2, logic state 0)
- OPER SPRN FB#2-1 (Tags for which operator can suppress non-critical alarms) (Device driver feedback indicator #2, logic state 1).

NOTE

The Define Tags Display is almost identical to the operational Tag List Display (Section IV). But the Define Tags display can only show nine tags per page, instead of 12. If your OIU has up to 5000 defined tags, the Define Tags Display can have up to 556 pages. If your OIU has up to 1400 defined tags, the display can have up to 156 pages.

Each tag definition line (in groups of three down the page) actually consists of two information lines showing the following in green (left to right):

- tag number (1 - 5000)
- tag name (up to eight alphanumeric characters)
- tag descriptor (1st & 2nd Lines) (up to six alphanumeric characters on first line; up to 15 characters on 2nd line)
- tag addresses (1st line) (PCU = 2 - 63; MODULE = 2 - 31; BLOCK = 0 - 1023)*

- tag type(2nd line) (Station, Real, Boolean, Remote (RCM), Manual (RMSC), or Device driver)

*Trend blocks cannot exceed 1023; MFC blocks can go up to 2047.

- alarm update (1st line) (AUTO updates tag alarms in all areas; MAN updates tag alarms only in areas you enter)
  areas (2nd line) (1 - 10 if using MAN as above)
- primary group # (1st line) (1 - 120)*
  primary group name (2nd line) (up to 6 alphanumeric characters)

*(Secondary groups go from 121 - 240.)

- engineering unit (1st line) (predefined or user-defined) (cursor skips by and OIU updates if current tag = Station, Real, or Manual)

— — — or — — —

- logic state descriptor (1st line) (2nd line) (predefined or user-defined) (skipped by OIU if current tag = Station, Real, or Manual) (LSD for logic state 1) (LSD for logic state 0)
- priority alarm level (0 - 7; default = 0)
- status change word (1st line) Device FB# 1-0 (2nd line) (YES or NO; default = NO) (1st feedback indicator state 0)
- process suppress tag (1st line) Device FB# 1-1 (2nd line) (tag name up to 8 characters; default = blank) (1st feedback indicator state 1)
- alarm suppression word (1st line) Device FB# 2-0 (YES or NO; default = NO) (2nd feedback indicator state 0)
- operator suppression word (1st line) Device FB# 2-1 (2nd line) (YES or NO: default = NO) (2nd feedback indicator state 1)

NOTE

Unless defining a Device driver tag, you cannot enter LSDs in any of the feedback indicator fields. (The cursor does not move to them.)

After accessing the desired tag number, you can begin entering new tag data or modify data for an existing tag. Enter the information written down on your worksheets in the appropriate input fields of the Define Tags Display (See next page). To move from field to field, press FIELD. To move between one tag line and the next, press SECT.

NOTE

When moving between fields on the Define Tags Display the cursor sometimes moves slowly and can disappear from the CRT momentarily. Do not press FIELD (or SECT) repeatedly. Wait a moment and the cursor then reappears at the next field.

Remember, before adding any tags to the tag list on the Define Tags Display, all modules in the PCUs on your system must be configured first. You must know to which group number (not group name) you want to assign your tags. When you access enough blank space on the Define Tags Display to add desired tag information complete the steps below. Start with the first tag on your worksheet and work sequentially through to the last.

STEP 1 — Position the cursor to the first tag definition line where you want to add a new tag by pressing SECT (or by pressing ESCAPE, entering the desired tag number and then pressing ENTER).

STEP 2 — Position the cursor at the Tag name field (press FIELD) and enter the tag name. Press FIELD to move the cursor to the right (next input field).

NOTE

Do not use the -V- (representing a tag value on the Define Area Display) as a tag name when defining tags on the Define Tags Display. If you do and then use it later on the Define Area Display, that tag then appears as a value instead of a name on its operational Area Display.

STEP 3 — Enter identifying information for the tag descriptor. Press FIELD to move the cursor down to the second tag descriptor input field.

STEP 4 — Enter further tag information in the second descriptor field, including any EU multiplier as it may apply. (Or skip this entry as desired by pressing FIELD once again.) Press FIELD to move the cursor up and to the right when done.

NOTE

A multiplier (such as x100, x50, x150, etc.) helps to show flow rates with EUs such as GPM, CFM, GALS, etc. You enter the multiplier in the second tag descriptor field after the descriptor, itself. For example: to show 100 CFM, enter 100 in the tag descriptor field and enter CFM in the engineering units field.

STEP 5 — Enter the PCU number of the tag location. Press FIELD.

STEP 6 — Enter the Module number in which the tag is configured. Press FIELD.

STEP 7 — Enter the Block number that identifies the tag. Press FIELD (cursor moves down to next field).

NOTE

If you enter a duplicate hardware address, the OIU permits the entry. But two tags having the same hardware address causes the lower tag number to receive any exception report.

STEP 8 — Enter tag type identifying word or abbreviation as follows: **S** (or **STATION**), **REA** (or **REAL**), **B** (or **BOOLEAN**), **REM** (or **REMOTE**), **MAN** (or **MANUAL**), **DEV** (or **DEVICE**). Press FIELD (cursor moves up and to the right).

> **NOTE**
>
> Any tag type entered must correspond to that function code assigned to the particular block during PCU module configuration. The OIU does not check this correspondence; you must.

STEP 9 — Enter either **AUTO** or **MAN**, depending on which alarm update method you want for this tag. If entering AUTO, press FIELD to move the cursor to the right. If entering MAN, press FIELD to move the cursor down. Enter the Areas in which you want the tag to alarm (any five or fewer of the ten Areas). Press FIELD to move the cursor up and to the right.

> **NOTE**
>
> When entering **AUTO** in the alarm update field, the following message appears on the CRT: UPDATING TAG AREA MAPS. When that operation is complete the message disappears from the CRT.

STEP 10 — Enter either the group number of the tag assignment or its group name in these two input fields. When entering either the number or name the other becomes updated:

Enter the group number. The cursor moves down to the group name field. The group name associated with the number entered now appears in the name field. Press FIELD to move the cursor up and to the right.

Or press FIELD to move the cursor to the group name field. Enter the primary group name of the tag assignment. The cursor moves up to the group number field. The number associated with the name entered now appears in the number field. Press FIELD to move the cursor to the right.

STEP 11 — If this tag type is Station, Real, or Manual (Set Constant), the OIU updates this field and the cursor skips past it to the next field to the right. Other wise, the cursor stops at this field and the OIU displays a predefined engineering unit (if any). You can enter one of your own previously defined EUs here if the OIU does not display one. If so, press FIELD to move the cursor to the right when done.

If this tag type is Boolean, Remote (Control Memory), or Device (Driver), the cursor stops and the OIU displays the predefined logic state ONE LSD (if any). The cursor moves down and the

OIU displays the predefined logic state ZERO LSD (if any). Press FIELD to move the cursor up and to the right.

If the OIU does not display a predefined LSD in the ONE (top) field, you can enter one of your own previously defined logic state ONE LSDs. Press FIELD to move to the ZERO (bottom) field. Enter one of your logic state ZERO LSDs. Press FIELD to move the cursor up and to the right.

STEP 12 — Enter the priority alarm level. Press FIELD to move the cursor to the right.

STEP 13 — Enter status change word (YES) to have this tag included on the Event Log (Section IX). Otherwise press FIELD to move the cursor to the right. (If you do not enter YES in this field, it defaults to NO.)

STEP 14 — Enter an alarm suppression tag name (if any) in this field to suppress alarm indication for the current tag you are defining. Press FIELD to move the cursor to the right when done.

If you do not want to suppress alarm indication for the current tag you are defining, skip this field (It defaults to blanks) by pressing FIELD to move the cursor to the right.

When the suppression tag enters logic state one, it causes alarm indicators (for the current tag you are defining) not to appear when that tag enters an alarm state. While the suppression tag stays in logic state zero, the alarm indicators of the current tag are unaffected. (See the SUPPRESS TAGS function of the General Function Menu at the end of this Section.)

STEP 15 — Enter the alarm suppression word (YES) if you want the OIU to suppress alarm indication on its CRT for the current tag you are defining. (See also Suppress Tags in Section XII.) Press FIELD to move the cursor to the right. If you do not want the CRT to suppress alarm indication for this tag, skip this field (It defaults to NO) and press FIELD to move the cursor to the right.

STEP 16 — Enter the operator alarm suppression word (YES) to let the operator suppress alarm indication for this tag. (Section XII) Press ENTER when done. If you do not want the operator to be able to suppress this tag, press ENTER. (The field defaults to NO.)

If the type of the current tag you are defining is DEVICE, enter your own previously defined LSDs in those feedback indicator fields that apply. (If not, see next page.) If you want the display element feedback indicators to show LSDs, enter the desired LSDs in each of the applicable feedback indicator fields on the Define Tags Display. (Insert the steps below into the proper order above.)

STEP 13A — After entering YES in the status change field (or skipping it for the default NO) press FIELD to move the cursor down to the FB# 1-0 field. Or skip the feedback by pressing FIELD again.

Enter the LSD desired for this feedback indicator (if any). Press FIELD to move the cursor up and to the right.

STEP 14A — After entering a tag name for alarm suppression (or skipping it for the default blanks) press FIELD to move the cursor down to the FB# 1-1 field. Or skip the feedback by pressing FIELD again.

Enter the LSD desired for this feedback indicator (if any). Press FIELD to move the cursor up and to the right.

STEP 15A — After entering YES for OIU alarm suppression (or skipping it for the default NO) press FIELD to move the cursor down to the FB# 2-0 field. Or skip the feedback by pressing FIELD again.

Enter the LSD desired for this feedback indicator (if any). Press FIELD to move the cursor up and to the right.

STEP 16A — After entering YES for operator alarm suppression (or skipping it for the default NO) press FIELD to move the cursor down to the FB# 2-1 field. Or skip the feedback by pressing ENTER.

Enter the desired LSD for this feedback indicator (if any). Press ENTER when done.

You are now done defining the current tag. Press SECT to advance to the next tag definition line. Or press ESCAPE to put the CRT into the COMMAND ? mode. Enter the tag number to which you want to move in the COMMAND prompt and press ENTER. To scroll through the Define Tags Display pages, press PREV or NEXT.

When done defining all tags on this display return to the OIU Configuration menu by pressing ESCAPE twice. Or press ESCAPE, enter **M** and then press ESCAPE again. If not done defining when the CRT is in COMMAND ? mode, enter the desired tag number in the command prompt and press ENTER.

When the OIU Configuration menu reappears on the CRT, access another configuration choice or perform some other function. If done with all OIU configuration, lock the CONF keyswitch and remove its key.

After pressing ENTER during tag definition and the cursor moves away from the previous section, the OIU updates (rewrites) the contents of all fields in a section with the most recent entries. If you make invalid entries during tag definition, the OIU displays error messages (shown on Table 6.2). To recover from errors, press CLEAR and re-enter correct values. After correcting any error the cursor can then move on to the next input field.

TABLE 6.2 — Tag Definition Error Messages

MESSAGE	ERROR
TAG ALREADY EXISTS	You entered a duplicate tag name.
ADDRESS ALREADY EXISTS	You entered a duplicate hardware address number.
TAG UNDEFINED	You entered an undefined tag name.
ILLEGAL ENTRY	You made an invalid entry that exceeded its numeric limit (such as a hardware address, a tag number, or a primary group number.)
GROUP UNDEFINED	You entered an undefined primary group name.
ENGINEERING UNIT UNDEFINED	You entered an undefined engineering unit.
LOGIC STATION UNDEFINED	You entered an undefined logic state descriptor.

DEFINE TRENDS. The OIU can contain up to 1500 trends. (See Table 2.1 in Section II.) Unlock the CONF keyswitch. Enter **D** from the OIU Configuration menu. The menu disappears and the Define Trends Display appears on the CRT. The cursor is positioned at the topmost PCU input field (trend definition line 1 on this display).

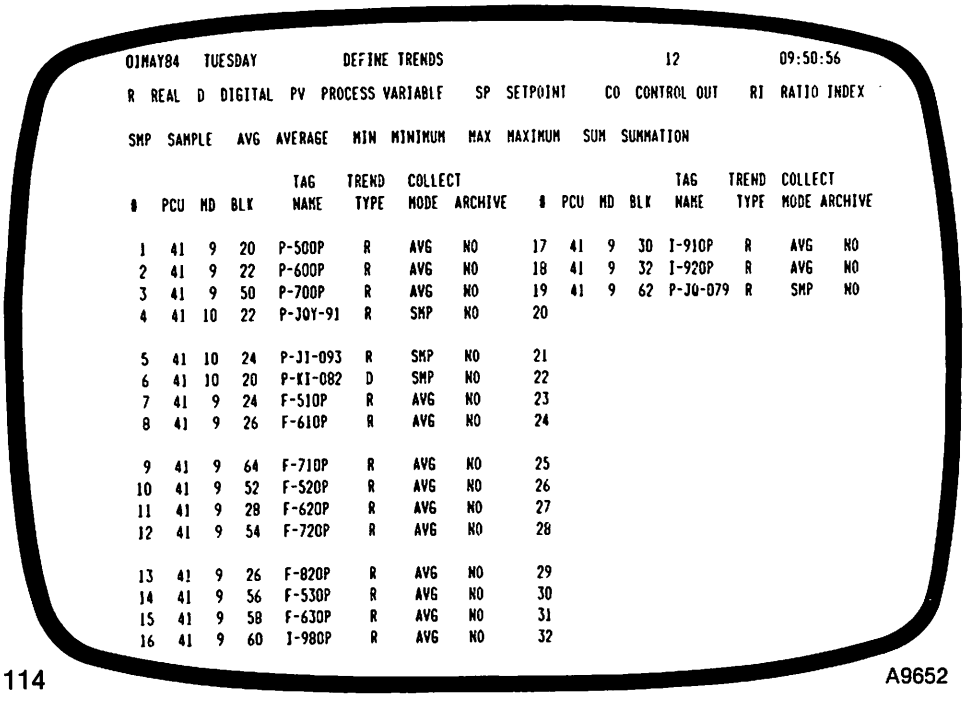

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FIGURE 6.5 — Define Trends Display

Each of the following OIU functions use trend data:

- A Trend line on a Trend display element of a Group Display page
- A tag on a Trend or Trip Log
- A suffix on a Periodic Log
- A trend being archived.

You can use one trend in any number of the above functions without duplicating it. To configure a trend for the OIU, specify the trend block (of the PCU module), specify its associated tag (Define Tags Display) and specify how the OIU is to collect tag data for trending (Define Trends Display).

Before defining trends on the Define Trend Display you must set up the module configuration (put function code 66 into the specific hardware address of a module in the PCU (Section V)) and define an associated tag for that block (Define Tags Display).

Trending any tag begins in its module block. This block must generate exception reports (like all blocks configured as tags). There must also be a block that collects trend data (function code 66).

NOTE

Trend data collects differently in analog master modules than in controller or multi-function controller modules. (For proper trend function codes for analog master modules refer to manual E93-912-2.)

Trending collect analog (real) data from some analog input block for which you provide the proper hardware address during PCU module configuration (Section V). Using the Define Trends Display, you then put in the proper hardware address of blocks having function code 66 and the associated tag name of the analog input block from which to collect the data.

Trending can also collect digital (Boolean) data from a Boolean or RCM input block. Specify the proper input block during PCU module configuration (Section V). Using the Define Trends Display, put in the proper hardware address of the block to collect the trend data. Then enter the tag name of the input block and set its collection mode to **SMP**. (Do not set the collection mode to **AVG**.)

NOTE

The OIU uses this data it recognizes to trend as Boolean because it is associated with a Boolean or RCM tag. The OIU expects analog data (which it receives from the trend block). Any other values become bad quality.

Once you know the block numbers and are done configuring all tags in the OIU you can then configure the trends. Configuring a trend on the Define Trends Display causes the OIU to collect the trend data. (To display the trend data see Sections XI and XII. To log the trend data, see Sections IX and XIII. To archive the trend data, see Sections X and XIII.)

One page of the Define Trends Display provides space to define up to 32 trends: 1 - 16 on the left 17 - 32 on the right side of the page. On the 5000 tag OIU this display can have up to 157 pages.

The display has three headings (appearing in cyan). The first two show a summary of trend types and collection modes:

(line 1)	R REAL	SP SET POINT
	D DIGITAL	CO CONTROL OUT
	PV PROCESS VAR	RI RATIO INDEX
(line 2)	SMP SAMPLE	MAX MAXIMUM
	AVG AVERAGE	SUM SUMMATION
	MIN MINIMUM	

The third shows trend definition line information. This heading appears on the fourth and fifth lines and is identical over both the left and the right sides of the page:

#	PCU	MD	BLK	TAG NAME	TREND TYPE	COLLECT MODE	ARCHIVE

To define trends on this display, follow the steps below:

STEP 1 — Enter the proper hardware address of the trend collection block (PCU - MODULE - BLOCK). This is the input block of an analog master module and a trend collection block for other modules. Press FIELD to move the cursor between the fields. Press FIELD to move to the tag name field.

NOTE

Trends from modules other than analog masters have a trend block number different from the block number of the tag. They can even have different module and PCU numbers.

STEP 2 — Enter the tag name of the data input block associated with the trend. The OIU uses information configured with this tag when displaying the trend in a Group Display and when reporting the tag on a Log. This tag also determines if the OIU interprets the trend as digital. This tag name must be previously defined on the Define Tags Display. Press FIELD to move the cursor to the trend type field.

STEP 3 — Enter the letter code for the trend type (**R**, **D**, **PV**, **CO**, **SP**, or **RI**). These trend types define which type of tag is trended and, if the tag is a station, which station parameter is trended. A REAL tag must be type **R**. Digital (Boolean) and RCM tags must be type **D**. Press FIELD to move the cursor to the collection mode field.

STEP 4 — Enter the collection mode for the trend. A digital trend must have collection mode **SMP**. The collection mode normally matches that of the collection block in the PCU module but this is not necessary. Press FIELD to move the cursor to the archive field.

The collection mode configured in the OIU determines how the OIU reduces data when displaying a trend of eight or 26 hours or when printing out a Trend log with collection intervals of greater than one minute (Section IX).

The OIU does not compare this collection mode with that of the module trend block. This can maximize module usage. A Trend log can, for example, log hourly maximums, minimums, and averages of a value using only **one** sample trend block of a module. You can define three trends using this trend block. Each trend can have the same tag and trend type each having a different collection mode (**AVG**, **MAX**, and **MIN**).

> **NOTE**
>
> **These values are based on one-minute samples rather than 15 second ones. The combination of tag, trend type, and collection mode identifies a trend to a Group Display and to Logging. This combination is unique for each specific trend.**

STEP 5 — Enter **Y** to archive the trend. Press ENTER. If you do not want to archive the trend (or your OIU does not have an archiving package), skip this field and press ENTER. (The field defaults to **NO.**)

To define the next trend, press SECT to go to the next definition line. To access a particular trend definition line, press ESCAPE to put the CRT into COMMAND ? mode. Enter the desired trend number and then press ENTER. To scroll through the display pages, press PREV or NEXT.

When done defining all trends on this display return to the OIU Configuration menu by pressing ESCAPE twice. Or press ESCAPE, enter **M** and then press ESCAPE again.

When the OIU Configuration menu reappears on the CRT, access another configuration choice or perform some other function. If done all OIU configuration, lock the CONF keyswitch and remove the CONF key.

DEFINE GROUPS. The OIU can contain up to 240 Group Displays divided equally into 10 Areas each. Unlock the CONF keyswitch. Enter **E** from the OIU Configuration menu. The word: GROUP ? appears directly under the menu. Below this appear two prompts requesting group name and number (1 -240) entries: NAME NUMBER. (The cursor is positioned under the NAME prompt.)

There are two ways to access the multi-page Define Groups Display depending on whether the OIU contains any defined groups.

When first configuring groups there are no defined groups in OIU memory. To define groups, press FIELD to move the cursor to the NUMBER prompt and then press ENTER. The OIU Configuration menu disappears and the Define Groups Display replaces it with the cursor positioned at the first (top) input field of that page.

After accessing the desired group number, you can begin entering new group data or modify for an existing group. Enter the information written down on your worksheets in the appropriate input fields of the Define Groups Display. To move from field to field, press FIELD. To move between one group box (section) and the next, press SECT.

To define a group on this display page, follow the steps below:

STEP 1 — Enter the group name selected for the current group. Press ENTER. Press FIELD to move the cursor to the group descriptor field.

STEP 2 — Enter the group descriptor name as desired. If used, the descriptor must cover a single process unit or a related group of units. (For example: FEEDWATER CONTROL, HEATER CONTROL, and so on.) Press ENTER.

NOTE

You must always make an entry in the name field, but the group descriptor is optional. If not using a descriptor, press FIELD to move to the next input field.

STEP 3 — Enter Y (or YES) in the MONITOR ONLY field if you want to prevent the operator from taking control action from this group. Press ENTER. Move the cursor to the next field. (If not entering Y here, move the cursor to the next field. MONITOR ONLY then defaults to NO.)

NOTE

When defining a Basic group element, you must enter **Y** in the MONITOR ONLY field.

STEP 4 — Enter Y (or YES) in the PRIMARY GRAPHIC field if you want to assign a graphic to this group later on (Section VII). Press ENTER. Move the cursor to the first type definition box below (number two) by pressing SECT.

If you do not want to assign a graphic to this group, press SECT to go on to the first definition box. (The GRAPHIC field then defaults to NO.)

Each of the 16 type definition boxes can stand alone on a Group Display or form one of several components on that display page. Each box contains the words: TYPE ? and TAG ? The TYPE field lets you specify the display element type for that box. The TAG field lets you enter the tag name for that box.

STEP 5 — Enter a single character in the TYPE field of each box (S, P, T, (space), M, or B). Wait for the CRT to adjust the page to the element type entered (See below). Press FIELD to move the cursor to the TAG field.

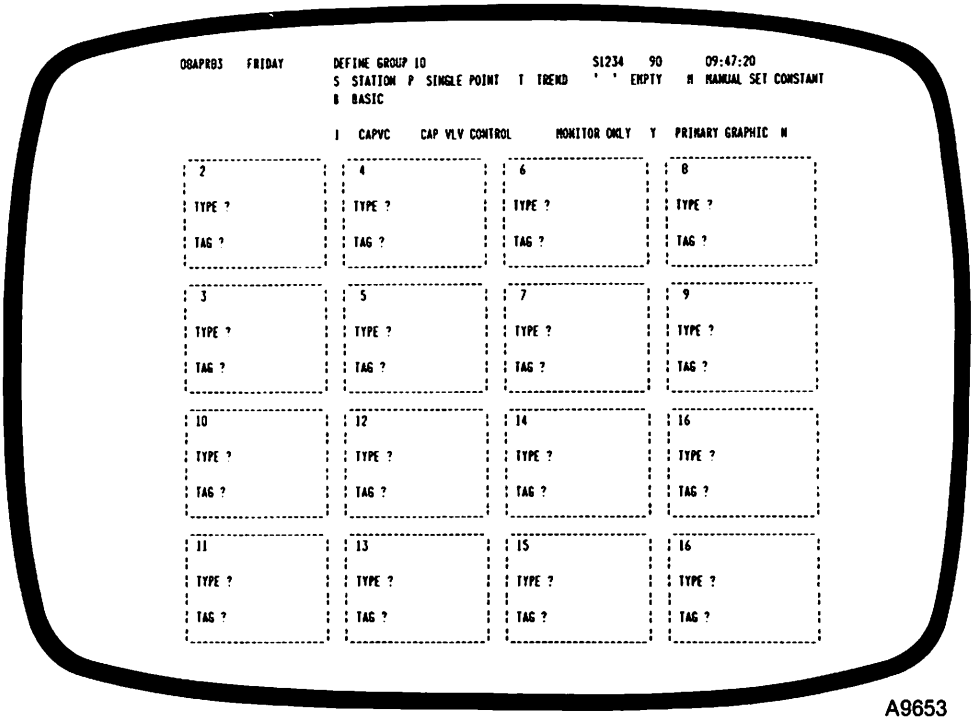

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FIGURE 6.6 — Define Groups Display

The Define Groups Display has 240 pages, one group per page. Each page is divided into a grid or array of four boxes across by four boxes down.

This display has two headings (appearing in cyan). The first line shows (left to right):

DEFINE GROUP (###)

The next two lines show a summary of the display element types you can define for any group display:

S STATION P SINGLE POINT T TREND ' ' EMPTY
M MANUAL SET CONSTANT B BASIC

Below the group summary heading is the first section of the display. This section contains four input fields:

- group name (up to 6 alphanumeric characters)
- group descriptor (optional, up to 17 characters)
- monitor only(YES or NO)
- primary graphic (YES or NO)

Below this first section are the 16 element type definition boxes. Each box is also a section. The boxes are numbered (left to right, top to bottom):

2	4	6	8	(Upper half of CRT)
3	5	7	9	
10	12	14	16	(Lower half of CRT)
11	13	15	17	

The Define Groups Display allows you to configure a standard Group Display. You cannot create a graphic on this display, nor assign a graphic directly to the group. (Create and assign graphics using the Graphic Editor — See Section VII.)

After accessing the desired group number, you can begin entering new group data or modify for an existing group. Enter the information written down on your worksheets in the appropriate input fields of the Define Groups Display. To move from field to field, press FIELD. To move between one group box (section) and the next, press SECT.

To define a group on this display page, follow the steps below:

STEP 1 — Enter the group name selected for the current group. Press ENTER. Press FIELD to move the cursor to the group descriptor field.

STEP 2 — Enter the group descriptor name as desired. If used, the descriptor must cover a single process unit or a related group of units. (For example: FEEDWATER CONTROL, HEATER CONTROL, and so on.) Press ENTER.

NOTE

You must always make an entry in the name field, but the group descriptor is optional. If not using a descriptor, press FIELD to move to the next input field.

STEP 3 — Enter Y (or YES) in the MONITOR ONLY field if you want to prevent the operator from taking control action from this group. Press ENTER. Move the cursor to the next field. (If not entering Y here, move the cursor to the next field. MONITOR ONLY then defaults to NO.)

NOTE

When defining a Basic group element, you must enter Y in the MONITOR ONLY field.

STEP 4 — Enter Y (or YES) in the PRIMARY GRAPHIC field if you want to assign a graphic to this group later on (Section VII). Press ENTER. Move the cursor to the first type definition box below (number two) by pressing SECT.

If you do not want to assign a graphic to this group, press SECT to go on to the first definition box. (The GRAPHIC field then defaults to NO.)

Each of the 16 type definition boxes can stand alone on a Group Display or form one of several components on that display page. Each box contains the words: TYPE ? and TAG ? The TYPE field lets you specify the display element type for that box. The TAG field lets you enter the tag name for that box.

STEP 5 — Enter a single character in the TYPE field of each box (S, P, T, (space), M, or B). Wait for the CRT to adjust the page to the element type entered (See below). Press FIELD to move the cursor to the TAG field.

STEP 6 — Enter the tag name of the element in its TAG field. (Tag name must match that on Define Tags Display.) Press ENTER to add the element type and tag name into OIU memory. This completes definition for one element on this page of the Define Groups Display.

Press SECT to advance to the TYPE field of the next box on the page (Box 4 if Box 2 is a Station; box 10 if box 2 is a Trend; see below). (If Box 2 is a Basic element, you must advance to another display page.) Repeat STEPS 5 and 6 for each element to define on the current display page.

If you want the operator to be able to access a graphic directly from this group on an Area or Alarm Summary Display, leave all display elements (boxes) on this page empty. Press ESCAPE to put the CRT in COMMAND ? mode. Enter the group number of the next Define Groups Display page you want to access. Press ENTER and that page appears on the CRT.

To scroll through the pages of this display, press PREV or NEXT. To return to the OIU Configuration menu, press ESCAPE. Enter **M** and press ENTER. Or just press ESCAPE twice.

Each element type you enter (STEP 5) can occupy a varying amount of the total page grid as below.

Group Page Adjustment For Element Type. After entering a type letter (or space) in the TYPE field of a box, the CRT adjusts the display page (rewrites) to show the updated page as below.

A Station occupies two boxes vertically. Both boxes making up a station element must be either in the UPPER or LOWER half of the display page. When entering **S** in the TYPE field, the OIU erases the top box selected and the one directly below it. The two boxes reappear connected together to form one large vertical box. This represents the station. (The previous two sections are now one section.)

There can be a maximum of eight station elements on a page. (Select for the top row of boxes in the upper (2,4,6,8) or lower row (10,12,14,16). If you enter S (for Station) in any box of the bottom rows (3,5,7,9 or 11,13,15,17), the message: CANNOT PUT STATION THERE appears.

NOTE

When selecting a Station and a Single Point element that is already defined in the box directly below the station, the station element overwrites the single point box. The message:

POINT BOX OVERWRITTEN

appears.

A Single Point and/or a Manual (Set Constant) element use only a single box and can occupy any (or all) of the 16 grid positions on a page. You can select

a single point element for tags defined as Boolean, Analog, RCM points (including Device Drivers). There can be a maximum of 16 single point or 16 manual set constant elements (or some combination of them) on any page.

When entering **P** and/or **M** for either element in the TYPE field of a box that box stays as before. Proceed to the tag name field for that the box (STEP 6.)

An Empty type (skip both the TYPE and TAG fields) is simply one grid box having no type letter or tag name. (Press FIELD for both.) The box stays as is having no information. (Empty boxes do not appear on a Group Display page during operation.) To convert a defined element to an empty one, position the cursor to the TYPE field of the section to be empty. Press CLEAR to erase the current tag type. Then press ENTER.

To convert a defined group to an empty group, position the cursor on the group name (of section 1 above the type boxes). Press CLEAR to erase the previous group name. Then press ENTER. The OIU erases the previous group page and rewrites it as an empty group display.

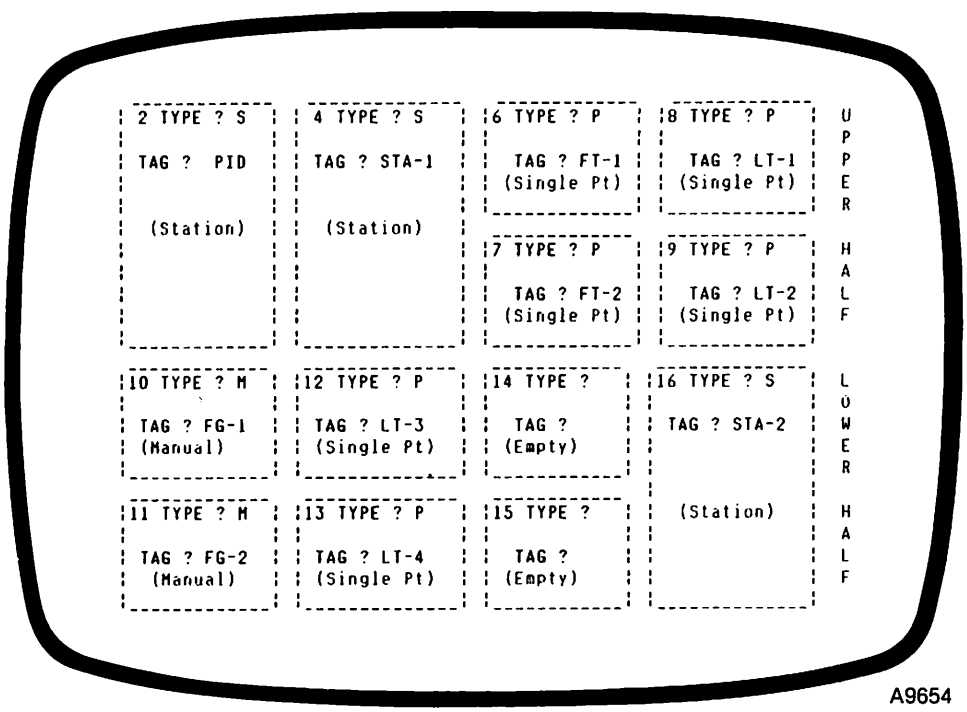

FIGURE 6.7 — Station, Single Point, Manual, & Empty Group Elements

A Trend element occupies eight grid boxes (two vertically by four across) on either the upper or lower half of the display page. A trend can contain up to three trend variables. You can select a trend for boolean, analog, or station tags. A page can have a maximum of two trend elements.

Enter **T** in the TYPE field of any box on the page. The OIU rewrites that half of the page. (The OIU erases that half of the page and rewrites the trend element.)

Trend elements require you to enter the following additional information (See next page):

- Display Interval (30 MINS, 2 HRS, 8 HRS, or 26 HRS)
- Tag name (up to 3 tag names, each up to 8 characters in length)
- Trend Type for each tag (R, D, PV, SP, CO, or RI)
- Collection mode for each tag (SMP, AVG, MIN, MAX, or SUM)
- Scaling Zero & Span for each tag (0.00 (bottom) - 500.0 (top) on the Trend Graph).

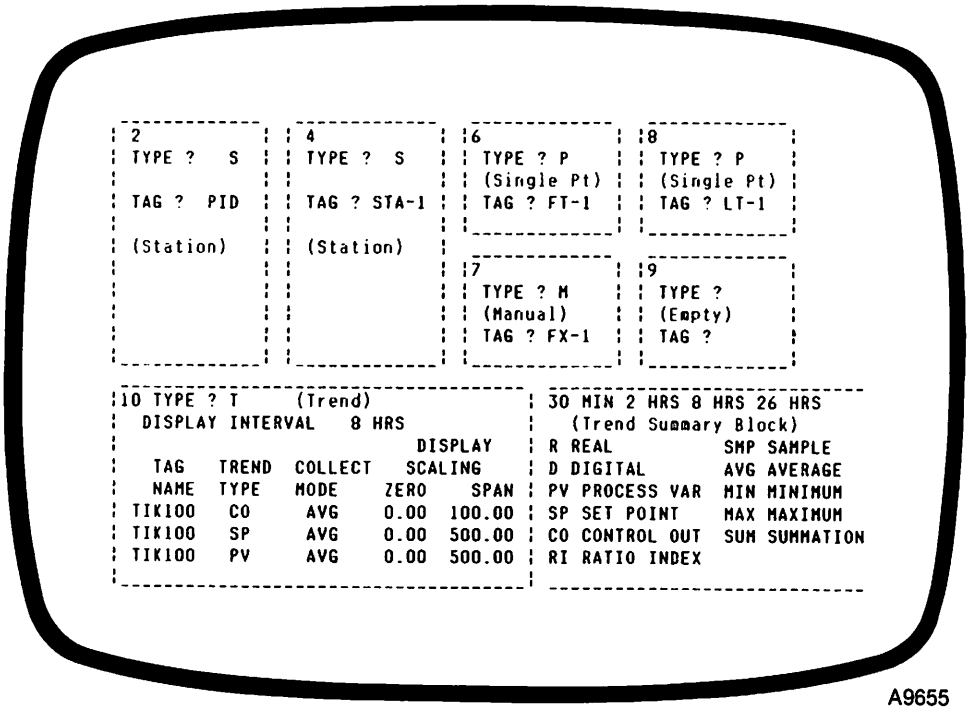

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FIGURE 6.8 — Define Groups Display Showing Trend Element

Notice that a trend element also has a summary block to its right. This summary block is your reminder of the choices for trend element detail entries. Also notice that the same tag name can be used for up to three separate trends per trend element on this display. But in this case, each trend must have a different type.

Now enter up to three trends in the trend element. Each trend you enter must match a previously defined trend on the Define Trends Display. (Any trend element on the Define Groups Display must have a minimum of at least one trend.):

STEP 6A — Press FIELD to move the cursor to the display interval field. Enter the display interval. This is the time interval shown on the trend graph when the operator accesses this Group Display during OIU operation.

NOTE

All three tags in a trend element must have the same display interval. The operator can zoom from the interval entered on the Define Groups Display to any of the longer or shorter intervals during operation. But when you select the 30 MINS interval (or the operator selects it during operation), only those trends configured in modules with 15-second collection resolution appear on the trend element of that Group Display.

NOTE

The 30 MINS interval is available only for fast trending defined in trend function block 66.

STEP 6B — Press FIELD to move the cursor to the first tag name. Enter the tag name associated with the trend.

STEP 6C — Press FIELD to move to the trend type. Enter the single or double letter for trend type.

STEP 6D — Press FIELD to move to the collection mode field. Enter the three letter collection mode.

STEP 6E — Press FIELD to move to the first scaling field. Enter 0.00 in the ZERO field. Press FIELD to move to the second field. Enter the desired upper scaling limit in the SPAN field. (Format = ###.###).

NOTE

The ZERO (0.00) is the trend value at the bottom of the Trend Graph on a Group Display. The SPAN is the range of values of the trend between the bottom and top of the Trend Graph. If you configure scaling fields for a tag as zeroes (0.00 and 0.00), its trend automatically uses the zero and span values configured in the tag station block of the module. The scaling for that point on the trend element of a Group Display then coincides with its zero and 100 % limits.

NOTE

Digital (Boolean) trends do NOT use zero and span entries. For these trends, simply skip the ZERO and SPAN input fields.

STEP 6F — Press FIELD to move to the next tag name and repeat Steps 6B to 6E to enter further trends. If done defining trends for this element, proceed to STEP 6G.

STEP 6G — Press ENTER to add trend element information to OIU memory. Press SECT to move to the next element box on the current display page (if any) or access a subsequent display page by pressing PREV or NEXT. If done defining all groups, return to the OIU Configuration menu.

A Basic element occupies an entire Define Groups Display page below its first section. Because of this you can use only the upper left box (Box 2) on any display page when defining a Basic element. When entering section 1 data (Group name, etc.) you can skip past the descriptor field if desired. You must also let the primary graphic field default to NO.

Enter **B** in the TYPE field of box 2. Press ENTER. The OIU erases the current display page and rewrites it as below combining all 16 type boxes into one large box with the cursor positioned at the PROGRAM NAME field:

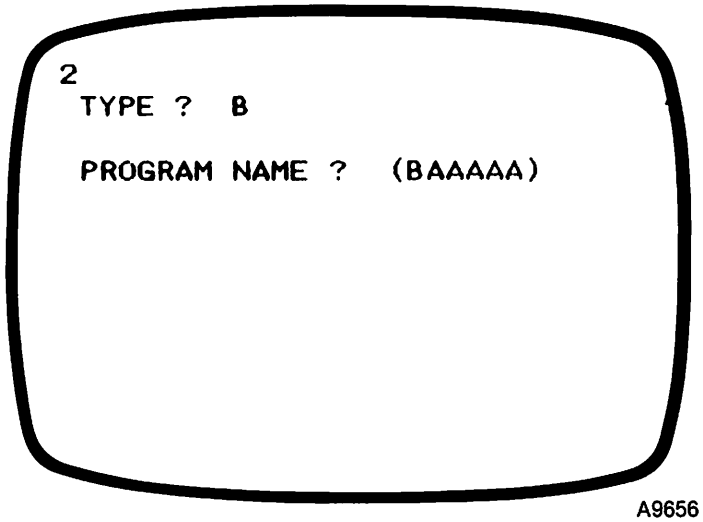

FIGURE 6.9 — Define Groups Display Showing Basic Element

Notice that the next input field under TYPE requests a BASIC PROGRAM NAME, not a tag name. This program name can be up to six alphanumeric characters long. Its first character must be **B**. The remaining five characters can be any combination of letters, numbers, or blanks.

Enter the program name. (The name must match that of a BASIC program defined using the BASIC interpreter function of the OIU Configuration menu. See later in this Section.)

When done, access the next Define Groups Display page or, if done defining all groups, return to the OIU Configuration menu.

NOTE

For more information about BASIC programming functions, consult the BASIC programming Reference Manual, E93-901-6.

DEFINE AREAS. The OIU can contain up to 10 Areas. (See Table 2.1 in Section II.) Unlock the CONF keyswitch. Enter **F** from the OIU Configuration menu. The word: AREA ? appears directly under the menu. Below this appears a prompt requesting an area number entry. (The cursor is positioned under the number prompt.)

There are two ways to access the multi-page Define Areas Display depending on whether the OIU contains any defined areas.

When first configuring areas the OIU has no defined areas in memory. To define areas, press ENTER (leaving the number prompt blank). The menu disappears and the first page of the Define Areas Display then appears. The cursor is positioned at the the first (top left) group name input field (GROUP letter A).

NOTE

If you enter a number in the number prompt and then press ENTER, the page of the Define Areas Display matching the number entered appears on the CRT.

Access the display page of a <u>defined</u> area by entering its number and pressing ENTER. The cursor is positioned at the first group name input field of that page (group A). If you enter an area number outside the legal range (1 - 10), the OIU displays: ILLEGAL ENTRY. Press CLEAR to erase the invalid number and enter the correct area number. Then press ENTER to access that page of the display.

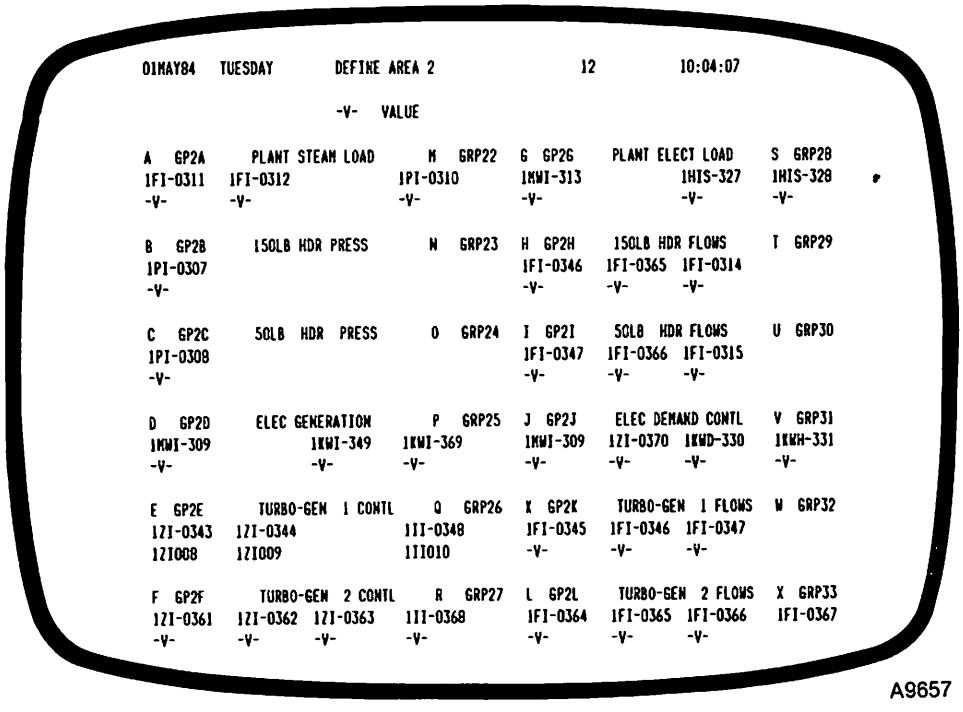

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FIGURE 6.10 — Define Areas Display

When done defining all groups assemble them into sets of similar items. For example: devoting an area to some process unit so that the groups can be feedflow, temperature, composition, and so on. Assign each group to its appropriate area and then select the specific location each group is to have in its particular area (letters A through X). Remember each Area can contain up to 24 Groups. (See Table 2.1 in Section II.)

Each Area allows you to display up to eight items. These items can be up to eight tag names and their alarm status, or up to four tag names, their alarm status and numeric values, or some combination of same. The only limitation is that each tag name must be directly above its corresponding value. When you want to display a value, enter **-V-** below the appropriate tag name.

NOTE

Only primary groups (letters A - L) can contain the tag name and value items as above. Secondary groups (letters M - X) can contain only group names. Also notice that you can assign a group to more than one area if desired.

NOTE

After defining areas as above, any unused groups or areas can have assigned trends or special operating displays (specifically for startup, monitoring, and so on). You must use existing tag names (as on the Define Tags Display) when creating all area displays.

The Define Areas Display has only one heading (in cyan):

-V- VALUE

The display page is divided into a left and right half. Group access letters (in red) appear down both halves of the page as:

A	M	G	S
B	N	H	T
C	O	I	U
D	P	J	V
E	Q	K	W
F	R	L	X

Each access letter makes up one section on this display. Each primary group (A - L) has three definition lines making eighteen lines per page. After each primary group there is one input field on the first line (Group name) and four input fields on the next two lines (for tag names and/or values). Each secondary group (M - X) is also a section but has only one input field.

NOTE

The cursor moves a bit slowly on the Area Display when you press FIELD. Do not press FIELD repeatedly. The cursor may disappear briefly but soon returns to the CRT at the next input field.

To define areas for any page follow the steps below:

STEP 1 — Enter the Group name of the first group you want to assign to this area in the group name field of group A. Press FIELD to move to the next line. After you enter the group name the OIU displays its descriptor (if any).

STEP 2 — Enter the first tag name in this field. Press FIELD. Enter the second tag name. Press FIELD. Enter the third tag name. Press FIELD. Enter the fourth tag name. Press FIELD to go to line three.

NOTE

The second definition line in each primary group must contain tag names only.

STEP 3 — Enter the fifth tag name in this field (or **-V-** for its analog value). Press FIELD. Enter the sixth tag name (or **-V-**). Press FIELD. Enter the seventh tag name (or **-V-**) Press FIELD. Enter the eighth tag name (or **-V-**).

STEP 4 — Press ENTER to add all information for primary group A into OIU memory. Press SECT to go to the first line of the next section (primary group B). If you move the cursor to the next section without first pressing ENTER, the previous data of that section becomes rewritten over your current entries.

STEP 5 — Repeat STEPS 1 through 4 for each group you want to include in this Area (Groups B through L). Press SECT to move to secondary group M from the last line of primary group L.

STEP 6 — Enter the group name (if any) for secondary group M. Press ENTER. Press SECT to go the next secondary group.

STEP 7 — Repeat STEP 6 for each secondary group you want to include on this Area (Groups M through X).

NOTE

If you do not want to include any secondary groups, access the next page of the Define Areas Display by pressing NEXT. Or press ESCAPE to put the CRT into COMMAND ? mode. Then enter the Area number of the page you wish to access. Press ENTER. That display page then appears on the CRT with the cursor positioned at the group name input field of Group A.

NOTE

If you enter a group name that is not previously defined (on the Define Groups Display), the OIU displays the error message: GROUP DOES NOT EXIST. Press CLEAR to erase the invalid name and enter a defined group name. Then proceed normally.

When done defining all areas, return to the OIU Configuration menu.

DEFINE SYSTEM NODES. Current OIU memory can contain up to 63 nodes. Defining system nodes tells the OIU what nodes are on your Plant Communications Loop (PCL) and with which nodes it can communicate. Currently, there are only six node types:

- CIU1 (Computer Interface Unit #1)
- CIU2 (Computer Interface Unit #2; can also represent the MCS)
- OIU (Operator Interface Unit)
- PCU (Process Control Unit)
- PPG (Plant Loop to Plant Loop Gateway)
- ' ' (empty node).

Unlock the CONF keyswitch. Enter **G** from the OIU Configuration menu. The menu disappears and the Define System Nodes Display appears on the CRT with the cursor positioned at the first (top left) undefined node type input field.

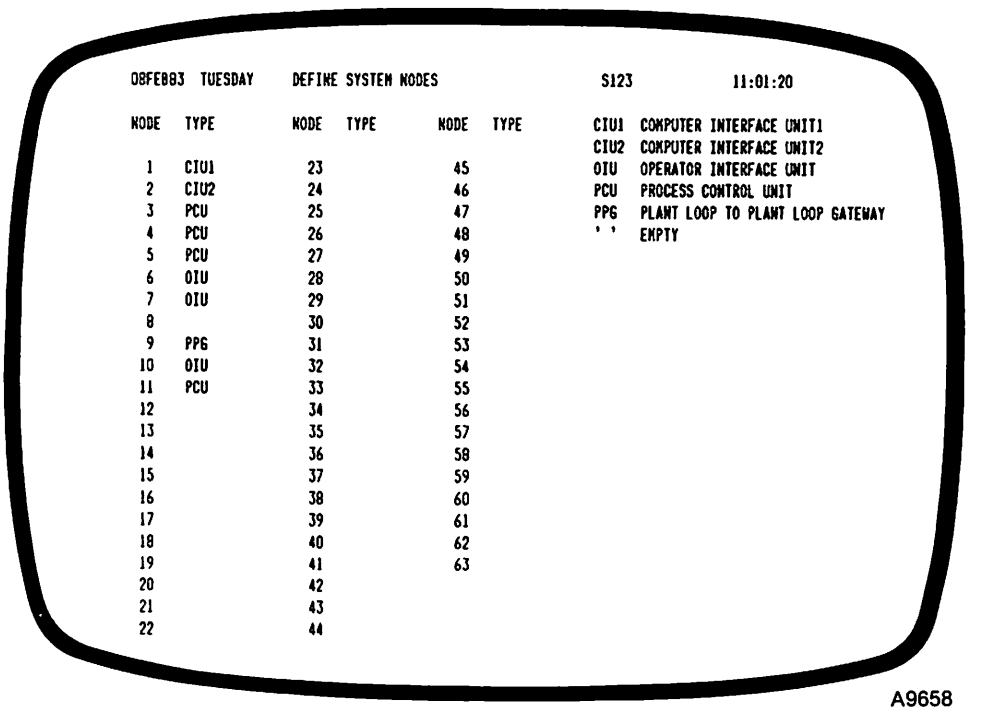

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FIGURE 6.11 — Define System Nodes Display

This display has only one heading (in cyan):

NODE TYPE NODE TYPE NODE TYPE

Under the heading the display page is divided into three numbered columns (left to right): 1 - 22, 23 - 44, and 45 - 63. Each number has one input field for node type, making 63 fields on the page.

To the right of the third numbered column, listed top to bottom are the six node types:

- CIU1 COMPUTER INTERFACE UNIT1
- CIU2 COMPUTER INTERFACE UNIT2
- OIU OPERATOR INTERFACE UNIT
- PCU PROCESS CONTROL UNIT
- PPG PLANT TO PLANT GATEWAY
- ' ' EMPTY.

To define system nodes, follow these steps:

STEP 1 — Move the cursor to the specific node number of the PCL on this display that you want to define (Press SECT).

STEP 2 — Enter the alphanumeric node type (AAAA) in the node type field. Press ENTER.

STEP 3 — Press SECT to go to the next node number or press ESCAPE to put the CRT in COMMAND ? mode. Enter the desired node number in the COMMAND prompt and press ENTER. The cursor then moves to the node number entered.

STEP 4 — Repeat STEPS 1 - 3 for each node you want to define on this display. (Refer to your Define System Nodes worksheet.) You need not define empty nodes. By not defining any node number on this display it automatically defaults to empty.

NOTE

Depending on your PCL and plant loop setup, many nodes on this display can stay empty.

If you enter an invalid node type (one not matching your actual hardware), the OIU accepts the entry but it becomes a flagged error when you reset and load the system at some later date. The error appears on the System Status Display page (Section IV).

When done defining system nodes, return to the OIU Configuration menu.

DEFINE PROCESS CONTROL UNIT. Defining a PCU tells the OIU how many and which particular modules that PCU contains. Each PCU can contain up to 31 modules. Remember, however, that modules 0 and 1 are reserved for the BIM and LIM modules. (Refer to the OIU Hardware Manual, E93-901-2.) An OIU can also contain memory for more than one PCU.

Unlock the CONF keyswitch. Enter **H** from the OIU Configuration menu. The word: PCU ? appears directly below the menu. Below this is the PCU number prompt. (The cursor is positioned at this prompt.)

To access any page of the multi-page Define PCU Display, enter the number of the PCU for which you want to define modules. Press ENTER. The menu disappears and the Define PCU Display for the PCU number entered appears. (The cursor is positioned at the PCU name/descriptor input field at the top of the page.)

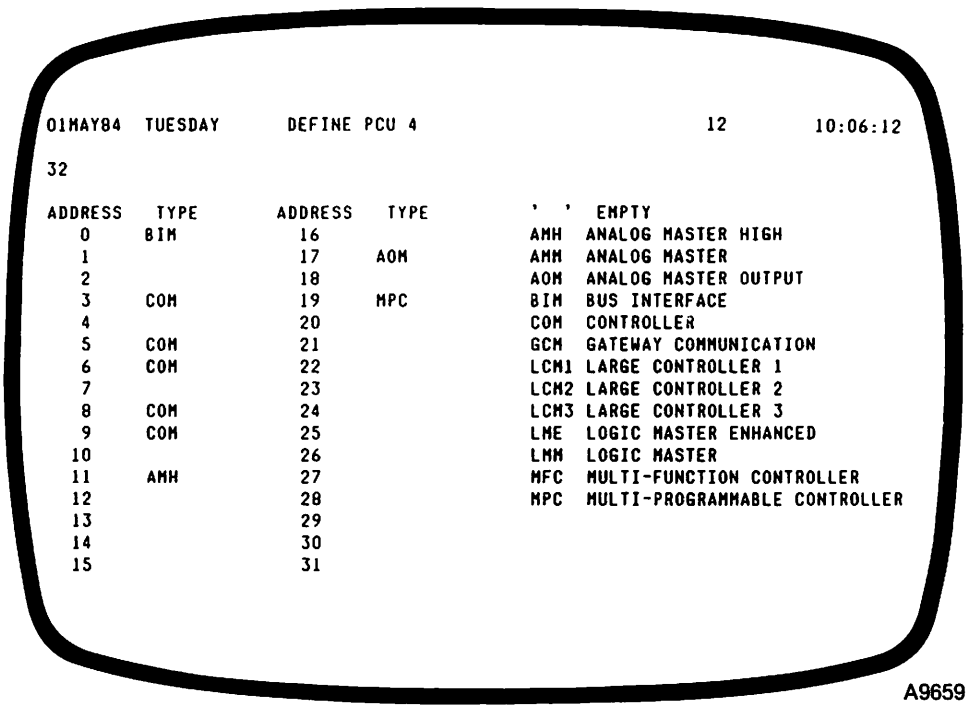

FIGURE 6.12 — Define PCU Display

The top line of this display contains a command prompt number for the PCU name/descriptor (See below):

32 (PCU name or descriptor)

Under the name field is the following heading (left to right) appearing in cyan:

ADDRESS TYPE ADDRESS TYPE

Under each ADDRESS is a numbered column. The left column goes down the page from 0 to 15; the right column goes from 16 to 31. Each number (PCU hardware address) has a type input field to its right (15 fields per column).

To the right of the second column is a list (in cyan) of the 14 possible PCU module type codes (top to bottom):

' '	EMPTY
AMH	ANALOG MASTER HIGH
AMM	ANALOG MASTER
AOM	ANALOG MASTER OUTPUT
BIM	BUS INTERFACE
COM	CONTROLLER

GCM	GATEWAY COMMUNICATION
LCM1	LARGE CONTROLLER 1
LCM2	LARGE CONTROLLER 2
LCM3	LARGE CONTROLLER 3
LME	LOGIC MASTER ENHANCED
LMM	LOGIC MASTER
MFC	MULTI-FUNCTION CONTROLLER
MPC	MULTI-PROGRAMMABLE CONTROLLER.

NOTE

The PCU name field is an optional feature. You can leave it blank if desired. If using it, you can enter up to 15 alphanumeric characters to name or describe the PCU for that page.

To define modules for a PCU, follow these steps:

STEP 1 — Enter desired PCU name/descriptor. (If you do not want to make an entry here, proceed with STEP 2 below.) Press SECT when done. The cursor moves to module address (type input field) 0.

STEP 2 — Press SECT to move the cursor to the address (type input field) of the module you want to define. Or press ESCAPE to put the CRT into COMMAND ? mode. Enter the desired module address in the COMMAND prompt and press ENTER.

NOTE

If you enter 32, the cursor goes to the PCU name field above the headings at the top of the current display page. Do this if you want to modify the PCU name or if you want to erase it (by pressing CLEAR). Then press SECT or ESCAPE as above.

STEP 3 — Repeat STEP 2 for each module on the current page that you want to define. (Refer to your Define PCU worksheets.)

NOTE

Module address 0 must always contain BIM if you make an entry for it, but you cannot make any entry for module address 1.

STEP 4 — Access subsequent pages of this display using PREV or NEXT and repeat STEPS 1 to 3. Or return to the OIU Configuration menu (press ESCAPE twice) when done defining modules for all PCUs.

If you enter an incorrect module type (one not matching your actual hardware), the error becomes flagged on the System Status Display page (Section IV) when the system is reset and loaded.

DEFINE PERIPHERAL PARAMETERS. This configuration function defines OIU equipment and certain NETWORK 90 system aspects for your plant. Some of these aspects include:

- printer availability
- event log status
- alarm lines per page
- event log header
- OIU-to-OIU alarm acknowledgment
- color printing
- high resolution CRT displays.

If your OIU does not have a line printer (or it is not connected), you must disable all event log and print functions. Then at startup or reset the OIU automatically defaults to NO printer available.

Unlock the CONF keyswitch. Enter **I** from the OIU Configuration menu. The menu disappears and the Define Peripheral Parameters Display appears with the cursor positioned at the first (topmost) input field.

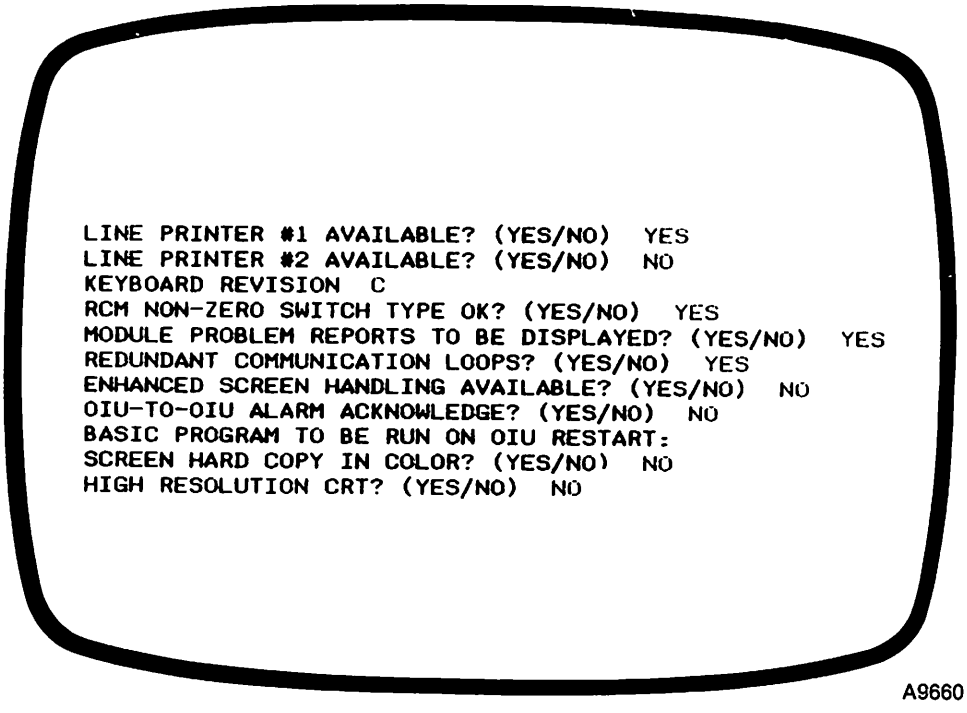

FIGURE 6.13 — Define Peripheral Parameters Display

This display has no headings (other than its Title line). Instead, it shows eleven messages (top to bottom) requesting input with default answers in the prompts after them:

To define OIU peripheral parameters, follow these steps:

STEP 1 — If your OIU has a printer connected, set the first printer input field to YES. Press ENTER. Then press SECT and proceed to STEP 2. Otherwise, press ENTER (the field defaults to NO) and then SECT.

STEP 2 — If you have another printer connected, set the second printer input field to YES, as well. This devotes that printer to producing only Event Logs (Section IX). Press ENTER and then SECT to go to STEP 3. Otherwise, press ENTER (the field defaults to NO) and then SECT.

STEP 3 — OIU fixed keyboard revision A and B shows the PREV and NEXT keys under the AREA 1 and AREA 2 keys (Display Control Block in Section III). Revision C (and later) keyboards show the AREA 6 and AREA 7 keys under the AREA 1 and AREA 2 keys. Enter the revision letter that applies for your OIU (A, B, C, or higher). Press ENTER and then SECT.

STEP 4 — The format for all RCM display elements defaults to that of switch type 0, regardless of the actual switch type of a point. To enable non-zero switch type displays, enter YES in the RCM OK field. To disable such displays, enter NO. Press ENTER and SECT when done.

CAUTION

If your system has Logic Master modules with NLMM01 firmware revisions A or B, always set this field to NO. Otherwise, the values from these modules can appear on the CRT.

STEP 5 — Set the MODULE PROBLEMS field to NO if your system contains any Logic Master Modules with NLMM01 firmware revisions A or B. This prevents such modules from failing when their module status displays on the OIU. If your system does not have any LMMs with such firmware, set this field to YES. Press ENTER and SECT when done.

STEP 6 — If your PCL does not have redundant cables, set the REDUNDANT COMMUNICATION field to NO. This prevents the System Status Display from showing redundant loop errors. Press ENTER and SECT to go to STEP 7. Otherwise, set the field to YES and then proceed as above.

STEP 7 — Set the ENHANCED SCREEN HANDLING field to NO if the CRT Enhancement package is not installed. Otherwise, set it to YES if you want compression of screen images for faster response in the display of graphics. Press ENTER and SECT when done.

STEP 8 — Set the OIU-TO-OIU field to YES if you want your OIU to share alarm acknowledgement with other OIUs on your plant loop and PIM firmware revision K or later is installed in your OIU. Otherwise, press ENTER and then SECT (the field defaults to NO).

NOTE

When the operator acknowledges alarms on an OIU with this feature selected, other operators can acknowledge the same alarms on their OIUs that are on the same plant loop. Any OIUs on the same plant loop not having this feature selected neither send alarm acknowledgments to other OIUs nor accept such acknowledgments from other OIUs.

STEP 9 — Enter the BASIC program name (B plus up to 5 characters) that you want run on OIU restart in this field. This program name you enter must match that of the BASIC program you define (write) using the Basic function (choice **N** on the OIU Configuration menu). Press ENTER then SECT to go to STEP 10.

If you do not want any BASIC program run on OIU restart, leave this field blank (its default state), proceeding as above.

NOTE

If your OIU does not have the BASIC package (board) installed, always leave this field blank. Press ENTER and then SECT to go to STEP 10.

STEP 10 — If you have a color capable printer connected to your OIU, set the SCREEN HARD COPY field to YES. Press ENTER then SECT to go to the last step. Otherwise, leave this field blank (it defaults to NO) and proceed as above.

STEP 11 — Set the HIGH RESOLUTION field to YES if you want the OIU to display and/or print out large, thick letters and graphics (as on the MCS). Then press ENTER. Otherwise, skip this entry (the field defaults to NO) and press ENTER as above. When done return to the OIU Configuration menu.

DEFINE BASIC PROGRAMMING. Your OIU can have an optional BASIC programming package installed. Using this programming function you (or the BASIC programmer) can write/edit various BASIC programs. The programs written enable the OIU to perform special functions and produce customized displays/printouts. The BASIC option also enhances overall OIU operation. (If your OIU does not have this function, skip this part of Section VI and proceed to that explaining Alarm Management.)

NOTE

Refer to the OIU BASIC Programming Language Reference Manual, E93-901-6, for further details concerning BASIC programming and its commands as applicable to the OIU.

Unlock the CONF keyswitch. Enter **N** from the OIU Configuration menu. The menu disappears. Depending on the current mode of the BASIC interpreter, the CRT then displays either of the following:

[Title line] (date) (day) BASIC (areas) (time)

RUNNING PROGRAM (BAAAAA)

[This is the RUN mode]

[Title line] (date) (day) BASIC (areas) (time)

EDIT

[This is the EDIT mode].

NOTE

If the your OIU does NOT have the BASIC interpreter package (board) installed and you access function N from the OIU Configuration menu, the message: BASIC BOARD NOT INSTALLED appears. If this occurs, you must reset the OIU (Section XI) and wait about two minutes. Then press MENU to access the General Function Menu. You can then proceed to other functions as desired.

If a BASIC program is running when you access the function (interpreter is in RUN mode), you can wait until that program finishes and the interpreter reverts to the EDIT mode (RUNNING PROGRAM (BAAAAA) disappears and EDIT appears on the CRT). Or, you can interrupt or break the program run by pressing ESCAPE.

NOTE

BASIC programming is under keylock protection. While the CONF keyswitch is locked the operator cannot interrupt the program run by pressing ESCAPE. Nor can he change any program instructions at the program function (choice N on the OIU Configuration menu).

If you break the program run, the program immediately stops running. The OIU displays the program line number of the currently executing program instruction (at the point where you break the program run):

(line number) (BASIC instruction or command) (input 1) (input 2)

Then the interpreter goes into the EDIT mode. The word: EDIT appears below the displayed line number.

Once the interpreter is in the EDIT mode the programmer can do any of the following tasks:

- write a new program
- edit/debug an existing program

- run another program
- save a program on hard or floppy disk
- load a program from hard or floppy disk.

For further details concerning these tasks, consult the BASIC Reference Manual, E93-901-6.

There are three ways to start a BASIC program run:

- restart the OIU (Program starts automatically if Peripheral Parameter contains valid BASIC program name) [operator task]
- access a Group Display containing a Basic element having a valid BASIC program name [operator task]
- select the Basic interpreter function from the OIU Configuration menu and then enter a RUN command for any selected BASIC program [programmer/ engineer task].

During BASIC program run it is possible that inherent program errors may abort the run. If this occurs, an error message displays on the Node Summary Display (Section IV) of the OIU. If the abort occurs when the CRT is not displaying the program, **S** at the alarm portion of the current page Title line begins flashing. The System Status Display page (Section IV) then displays:

BASIC PROGRAM ABORTED WITH ERROR _____.

(The actual error appears to the right of the message.)

A BASIC program error acts like a system alarm. When this happens, acknowledge the alarm by pressing ACK on the fixed keyboard.

NOTE

If a BASIC program aborts while on CRT display, the error message above displays directly on the CRT and not on the System Status page.

For automatic program run on OIU restart, the engineer must enter a valid BASIC program name in the BASIC peripheral parameter field. When the operator resets the OIU the program then automatically starts running after about one minute.

If you do not want this program to run after restart, you must access the BASIC program name input field of the Define Peripheral Parameters Display and erase the name (Press CLEAR).

Whatever name is in this field must match the name of the program to run defined using the BASIC interpreter. If the program names do not match, the program does not run on OIU restart and the following message appears on the CRT:

CANNOT FIND PROGRAM (BAAAAA)

For program run from a Basic element of any Group Display, the basic element of that display must contain a valid BASIC program name. If it does not, no program runs.

If another BASIC program is already running when accessing a Group Display containing a Basic element with a valid program name, the previous program stops and the new program just accessed begins its run. If the operator accesses some non-BASIC display while a BASIC program is running, that program continues to run but no longer appears on the CRT.

If an already running program has an override inhibit command (See the BASIC Reference Manual) when you access a Group Display BASIC program, the previously running program continues its run until done. While this continues the OIU displays the following message:

CANNOT RUN PROGRAM (BAAAAA) [← program name just accessed]
ALREADY RUNNING PROGRAM (BAAAAA)

When the previously running program finishes the newly accessed program begins its run.

If an accessed program is not currently on file (in OIU memory), the OIU displays the message:

CANNOT FIND PROGRAM (BAAAAA)

Consult the BASIC Reference Manual for examples of BASIC programs and complete instructions on OIU BASIC commands.

Table 6.3 (next page) shows the NETWORK 90 system features that the BASIC programming option enables for the programmer/engineer. Notice that the operator can perform only the first, second, third, sixth, seventh and last tasks. The programmer/engineer performs or sets up all the tasks.

When done performing all BASIC tasks, return to the OIU Configuration menu. (Press MENU. Enter **D** to reaccess OIU configuration.)

TABLE 6.3 — OIU Basic Programming NETWORK 90 Features

BASIC programs enable:
Running ONE BASIC program at a time — Up to 48K of combined code and variable space; Up to 2047 statement lines with 140 distinct variable names
Accessing a BASIC program run by accessing the Group Display of which that program is an element
Starting a BASIC program run by restarting the OIU
Using the fixed (and auxiliary) keyboard to edit/debug existing BASIC programs
Accessing up to 3 MB of hard disk storage
Receiving up to 50 separate lists (each with up to 100 tags) of exception report values
Reading up to 1500 trends covering the past 26 hours
Sending exception reports to the line printer using RS232C interface & parallel ports (currently under development)
Adding special functions to OIU (setting up macros)
Creating special reports drawing information from process values, alarm states, tag lists, and trend log files
Supporting batch control by modifying module parameters for your particular operation (setting alarm monitoring limits for example)
Creating your own operation guides
Storing information for later retrieval
Enhancing your plant operation via OIU

NOTE

Information storage and retrieval is very similar to the same functions as applied to PCU module Configuration (Section V) and OIU Archival Storage (Section X).

DEFINE ALARM MANAGEMENT. The Alarm Management function lets you decide which alarm levels (0 - 7) to use, what alarm indicators to use, and/or to set colors and phrases to OIU standards as desired. Unlock the CONF keyswitch. Enter **O** from the OIU Configuration menu. The menu disappears and the Alarm Management Menu appears on the CRT.

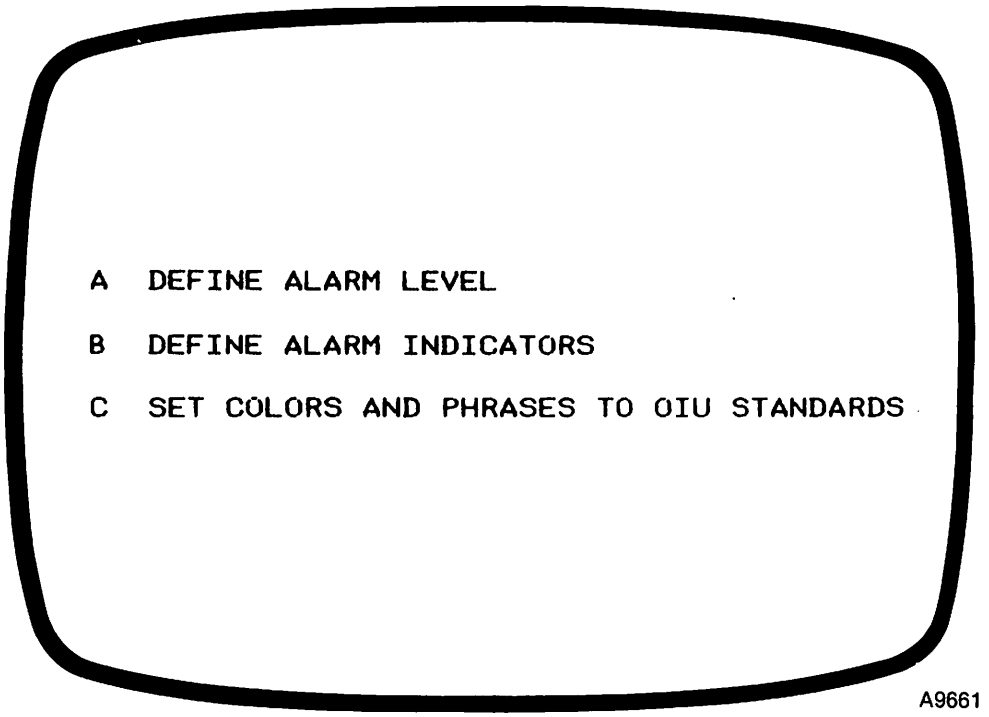

FIGURE 6.14 — Alarm Management Menu

To define alarm levels, enter **A**. The Define Alarm Levels Display appears under the Alarm Management Menu (with the cursor positioned at the topmost input field).

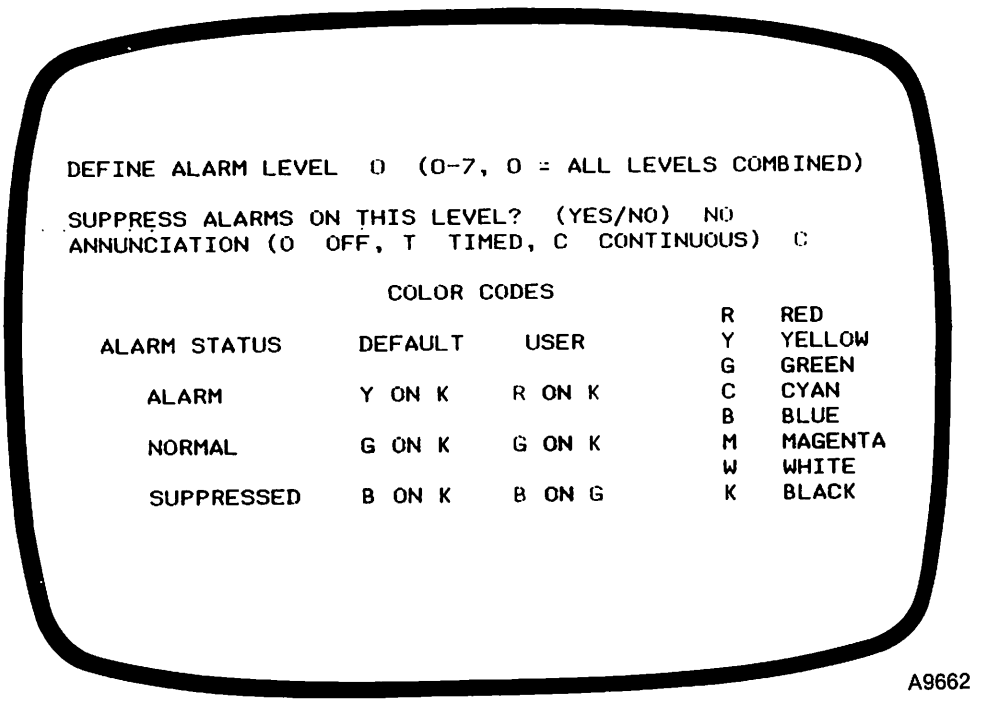

FIGURE 6.15 — Define Alarm Levels Display

To define alarm levels, follow these steps:

STEP 1 — There are eight alarm levels (0 - 7) in which you can set up tag alarm indication for Alarm Summary Display pages. If you only want a single alarm level, press FIELD and go on to STEP 2. (The alarm level field defaults to 0.)

STEP 1A — If you want more than one level, enter the level number. Press FIELD to go to the second input field. Proceed with all alarm definition on the page (STEPS 2 - 6) and then return (See below) to enter the next alarm level and so forth. (Press ESCAPE when done defining all alarm levels desired.)

STEP 2 — The second input field lets you suppress alarm indication on the level (number) entered in field one. To suppress alarm indication, enter YES in this field. Press FIELD to go on.

STEP 2A — If you do not want to suppress alarm indication on the current level, press FIELD to go further. (This field defaults to NO.)

STEP 3 — The third input field lets you vary alarm annunciation (alarm indicator flashing). If you do not want alarm indicators on the current level to flash, enter O (for OFF) in this field.

STEP 3A — If you want alarm indicators on this level to flash for some timed interval, enter T (for TIMED). If you want the ind icators to flash continuously (default state), press FIELD to go on. (The field defaults to C for CONTINUOUS.)

Below the third input field are the COLOR CODE prompts. The OIU color codes are summarized (top to bottom) at the extreme right. Notice that every possible color has a single-letter code (R, Y, G, C, B, M, W, and K).

Under the ALARM STATUS heading are the three possible states for any process alarm indicator (ALARM, NORMAL, and SUPPRESSED). Each state has its own line showing (left to right) predefined (default) and user-defined color code combinations for its indicator. The color combinations list a foreground color (first code letter) ON a background color (second code letter).

For example: **Y ON K** of the ALARM state line means all process alarm indicators on this level appear on the CRT in YELLOW against a BLACK background (default combination).

The combinations listed under the DEFAULT column are unchangeable. You can change the foreground and background colors under the USER column. After pressing FIELD from the third input field, the cursor moves to the first foreground color code input field (ALARM state line).

STEP 4 — Enter the code ALARM foreground code desired. Press FIELD. Enter the ALARM background code desired. Press FIELD. The cursor moves to the foreground color field on the NORMAL state line.

STEP 5 — Enter the NORMAL foreground code desired. Press FIELD. Enter the NORMAL background code desired. Press FIELD. The cursor moves to the foreground color field on the SUPPRESSED state line.

STEP 6 — Enter the SUPPRESSED foreground code desired. Press FIELD. Enter the SUPPRESSED background code desired. Now press ENTER. The entries you made on this display now go into OIU memory for this alarm level. The cursor now positions it self back to the first input field (DEFINE ALARM LEVEL).

If you want to define for more alarm levels, repeat STEPS 1 - 6 as above. Otherwise, go on to the next alarm management function by pressing ESCAPE once. (The current page disappears and the Alarm Management Menu reappears.)

If done defining all alarm management, press ESCAPE twice. The current page disappears and the OIU Configuration Menu then reappears.

To define alarm indicators, enter **B**. The Define Alarm Indicators Display then appears under the menu (with the cursor at the topmost input field).

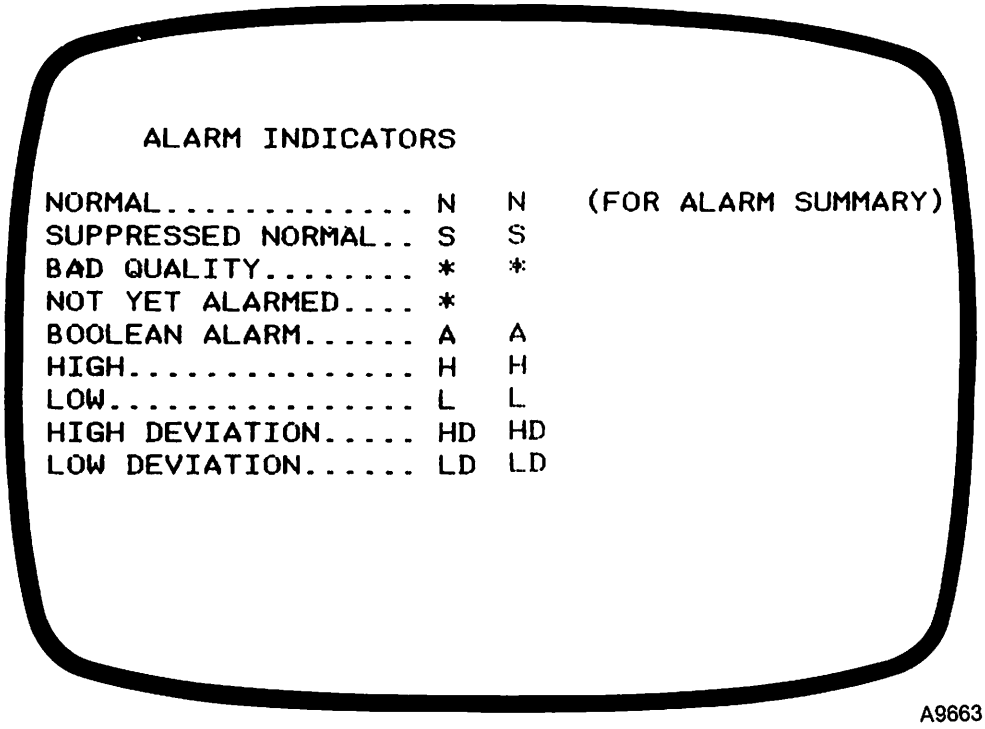

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FIGURE 6.16 — Define Alarm Indicators Display

The two columns to the right of the indicator descriptions show the character codes for the various process alarm indicators. The left column (in cyan) shows the predefined (default) indicators. The right column (in green) shows the user-defined indicators.

To define all process alarm indicators for your OIU, follow these steps (to use default values, simply press FIELD for each field and then press ENTER when done):

STEP 1 — Enter the desired character code for NORMAL indicators. Press FIELD.

STEP 2 — Enter the desired character code for SUPPRESSED NORMAL indicators. Press FIELD.

STEP 3 — Enter the desired character code for BAD QUALITY indicators. Press FIELD.

STEP 4 — Enter the desired character code for NOT YET ALARMED indicators. (You can enter * for this or just leave it blank.) Press FIELD.

STEP 5 — Enter the desired character code for BOOLEAN ALARM indicators. Press FIELD.

STEP 6 — Enter the desired character code for HIGH indicators. Press FIELD.

STEP 7 — Enter the desired character code for LOW indicators. Press FIELD.

STEP 8 — Enter the desired character code for HIGH DEVIATION indicators. Press FIELD.

STEP 9 — Enter the desired character code for LOW DEVIATION indicators. Press ENTER.

The cursor positions itself back at the topmost input field (NORMAL indicators). Go on to the next alarm management function or return to the OIU Configuration menu.

To set colors/phrases to OIU standards, enter **C** from the Alarm Management Menu. The following messages then appear on the CRT below the menu (the Set Colors and Phrases Display):

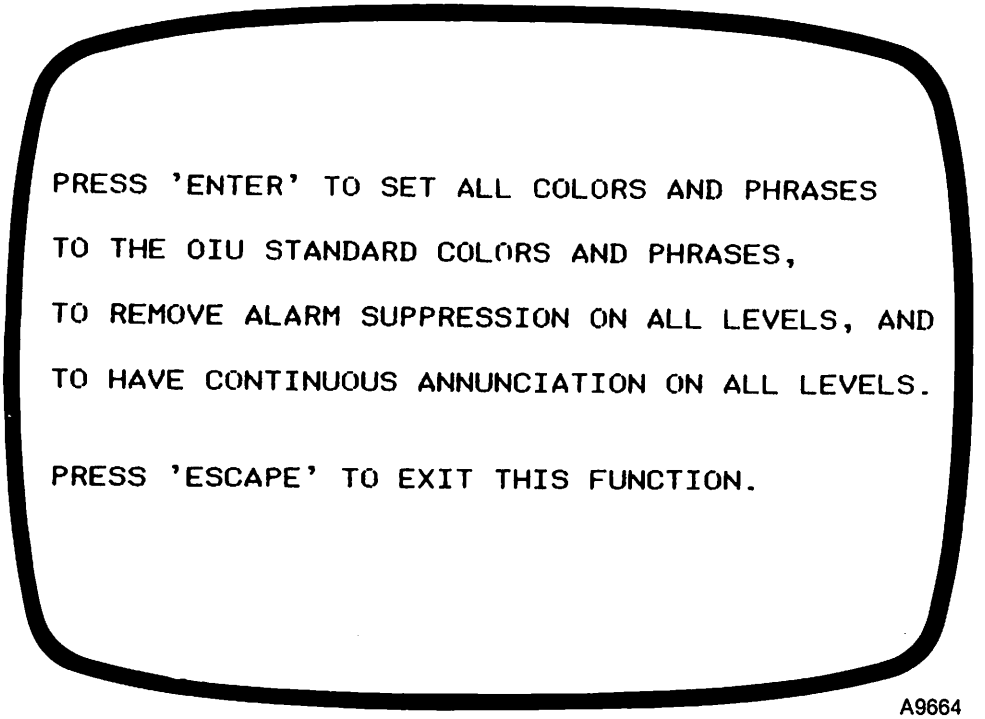


FIGURE 6.17 — Set Colors and Phrases Display

Use this function of the Alarm Management Menu only as a quick method to implement the alarm management changes mentioned, rather than using functions **A** and/or **B** and actually changing all parameters one by one. Function **C** lets you make all changes to OIU default values with one step. You need only press ENTER and then ESCAPE. The OIU then makes all changes automatically. Remember that all alarm level parameters now revert to the OIU default parameters, however. (See also Section VIII.)

NOTE

If you want to make alarm management changes without using default values, you must use functions A and/or B.

If you do not want to set alarm parameters to default values (or you access this function by mistake), simply press ESCAPE once to return to the Alarm Management Menu for some other function. Or press ESCAPE twice to re-access the OIU Configuration menu.

If done with all OIU configuration, lock the CONF keyswitch and remove the CONF key. Access the General Function Menu. Otherwise, return to the OIU Configuration menu. Now access the General Function Menu.

Accessing the General Function Menu
When the OIU Configuration Menu is on the CRT press MENU. The OIU menu disappears and the General Function (or MAIN) Menu appears in its place.

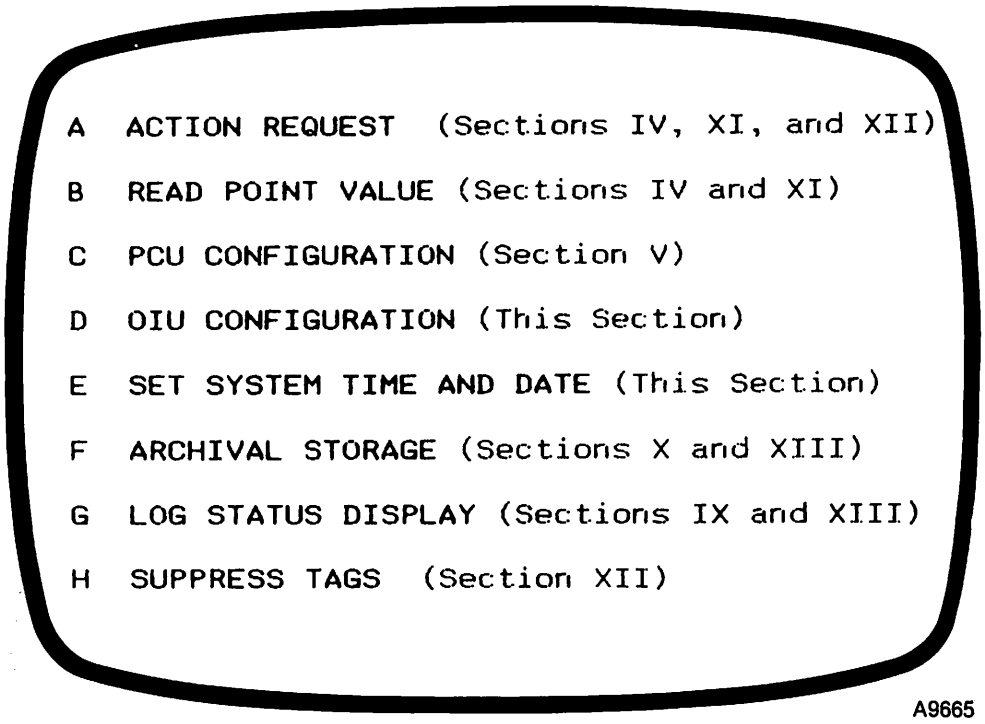


FIGURE 6.18 — General Function Menu

This manual explains the various functions of this menu in the Sections shown. Apart from that OIU configuration already examined, this Section examines the following configuration function:

E SET SYSTEM TIME AND DATE

SETTING SYSTEM TIME AND DATE. The OIU provides a calendar period for the years 1980 through 2079. The time is designed for a 24-hour clock (also known as military time). The following are examples of 12-hour clock times and their corresponding 24-hour clock times:

12-Hour Clock	24-Hour Clock
05:17:31 AM	05:17:31
Noon	12:00:00
08:30:00 PM	20:30:00
11:59:59 PM	23:59:59
Midnight	00:00:00

NOTE

To convert 12-hour clock times to 24-hour clock times, simply add 12 to the 12-hour clock times past 12 Noon.

NOTE

The system time and date is under keylock protection. As long as the CONF keyswitch is locked the operator cannot change system time nor date.

Access this function by entering **E** from the General Function Menu. On the bottom of the CRT the SET SYSTEM TIME AND DATE Display appears with the cursor positioned at the topmost input field:

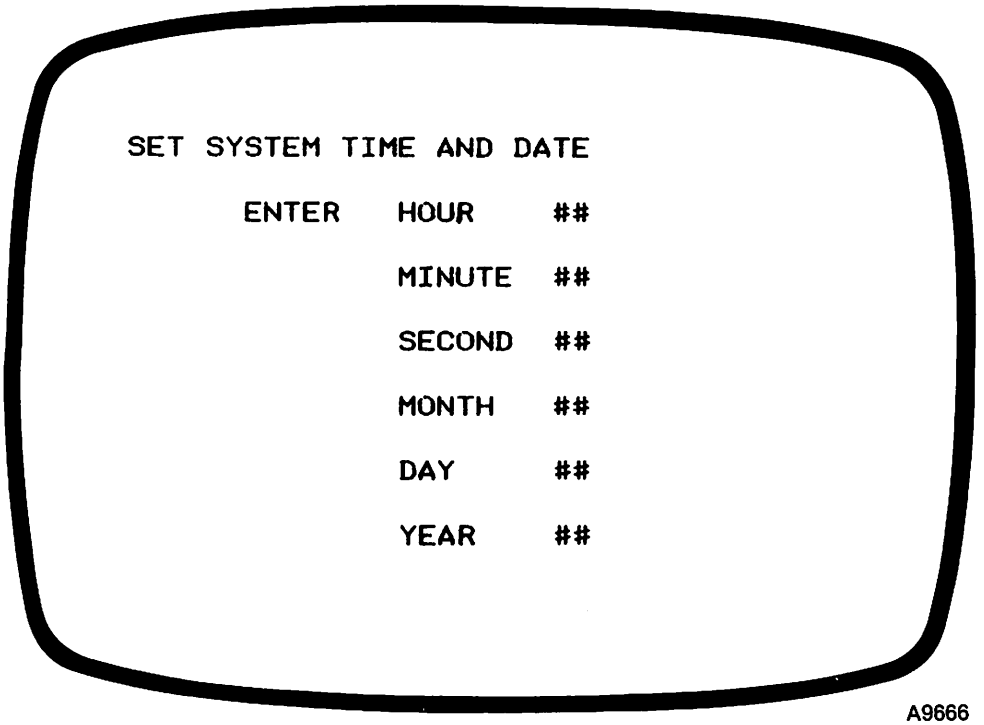


FIGURE 6.19 — Set System Time and Date Display

Using the numeric and FIELD keys, enter the two-digit numeric inputs for system time and date. Follow each entry by pressing FIELD to move the cursor to the next input field. After entering the YEAR digits, press ENTER to put all entries into OIU memory.

Each input field lets you enter up to two digits. You can enter integer values including zeroes or you enter only the significant integers (omitting zeroes) at your option. Only those fields for which you enter a value change (become updated) when you press ENTER at the end.

After any power failure, the system date automatically reverts to January 1, 1980, shown as: 01JAN80. You must reset the date after restoring and resetting the OIU (Section XI).

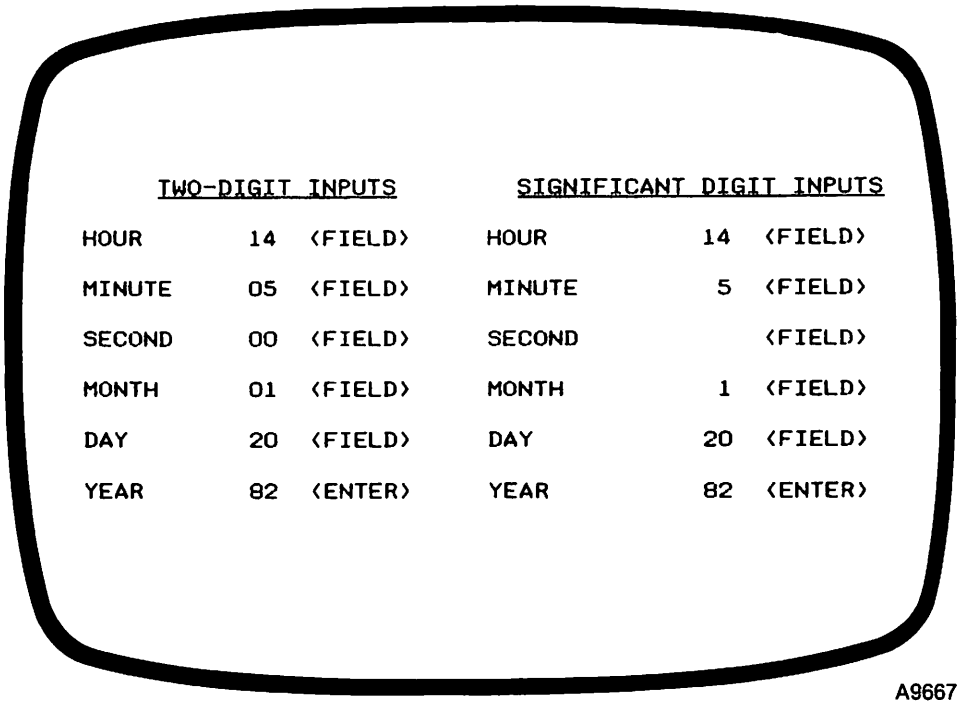


FIGURE 6.20 — System Time and Date Input Examples

NOTE

〈FIELD〉 and 〈ENTER〉 mean PRESS FIELD and PRESS ENTER after making value entry. Notice that any field having only zeroes can be left blank when making significant digit value entries.

Erase previous field values using the CLEAR key (the cursor then positions itself at the leftmost part of the field). Move between input fields using the FIELD key. Move inside an input field using the ← and → keys on the Cursor Control Block (Section III).

Return to the General Function Menu when done. (Press ESCAPE once.) If done all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, select some other function or access an operational display.

SECTION VII
GRAPHIC EDITOR CONFIGURATION

INTRODUCTION

This Section describes the Graphic Editor, the Auxiliary keyboard, and configuring graphics on the OIU. The Graphic Editor lets you create and modify Graphic displays, as well as assign or remove graphics to/from Group displays. The Graphic Editor also lets you format information for Periodic Logs. (See also Section IX.)

NOTE

The Graphic Editor does not distinguish between graphics for other uses and graphics for use on Periodic Logs. You must do this when assigning graphics to Group displays or to Periodic Logs. This Section also lists other limitations to Periodic Logs (See Table 7-9).

The Graphic Editor provides functions to assign/remove graphics to/from Group displays. Assign previously defined graphics to Periodic Logs using the Define Periodic Logs function of Logging configuration (choice **E** from the Logging Configuration Menu - See Section IX). Any Graphic display appearing on the CRT has all the capabilities this Section describes except it cannot display suffix values (Section IX).

AUXILIARY KEYBOARD

When using the Graphic Editor you must use the Auxiliary, or Graphic, keyboard. The Graphic keyboard is a separate panel keyboard containing the keys necessary for graphic use. The key arrangement on this panel is similar to the QWERTY key arrangement of a typewriter. The keys of the auxiliary keyboard extend above its actual panelboard, unlike the keys covered by membrane on the flat panel of the fixed keyboard.

When using the auxiliary keyboard either set its panel on top of the fixed keyboard or onto the horizontal shelf that pulls out from below the fixed keyboard (Refer to the OIU Hardware Manual).

Before using the Graphic Editor package, you must connect the auxiliary keyboard to your OIU. The auxiliary keyboard panel contains a ribbon cable. This cable has a multi-pin metal connector at its end. Your OIU has a J3 auxiliary keyboard connector plate (plug) into which you insert the connector from the auxiliary keyboard.

NOTE

The NOIU02 has its J3 plug to the right of the OIU contrast knob (behind the slide up door below the vertically mounted floppy disk drive). The NOIU01 has its own ribbon cable extending from its J3 plug (in the rear of the unit). This OIU cable has a connector plate (plug) at its end into which you can insert the cable connector from the auxiliary keyboard. (Refer to the OIU Hardware Manual.)

Plug the auxiliary keyboard into the OIU by gently pushing the auxiliary keyboard cable connector into the OIU J3 connector plate (NOIU02) or J3 ribbon connector plate (NOIU01) as far as the connector can go. When done with the Graphic Editor you must unplug the auxiliary keyboard cable connector. To unplug the auxiliary keyboard, simply pull its cable connector out of the OIU J3 plug.

After unplugging the auxiliary keyboard place it aside for possible later use. If you had it set up on the pull-out shelf, push the shelf all the way back under the fixed keyboard.

NOTE

The fixed keyboard is not functional as long as the auxiliary keyboard remains plugged into the OIU. To use the fixed keyboard, you must first unplug (disconnect) the auxiliary keyboard.

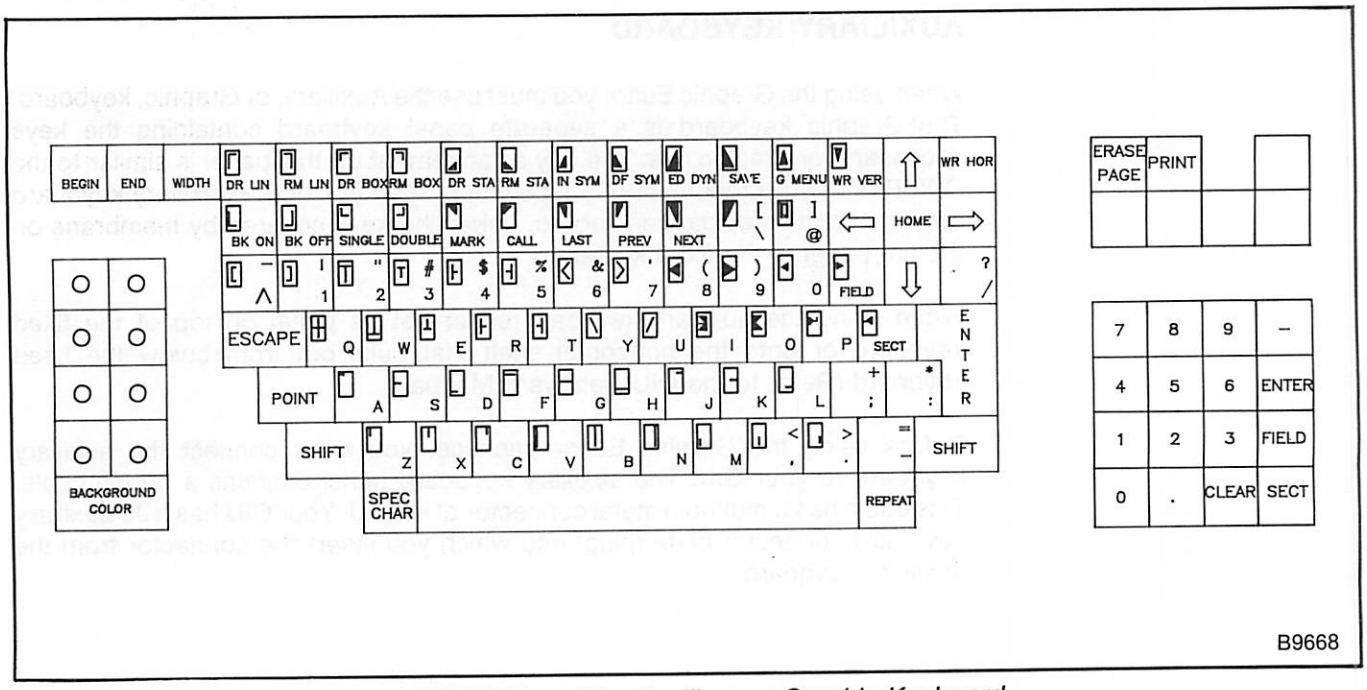


FIGURE 7.1 — The Auxiliary or Graphic Keyboard

The auxiliary, or graphic, keyboard is divided into five key groups:

- Function and Command group (1)
- Typewriter group (2)
- Number and Command group (Number Pad) (3)
- Color/Point group (4)
- Erase and Print group (5).

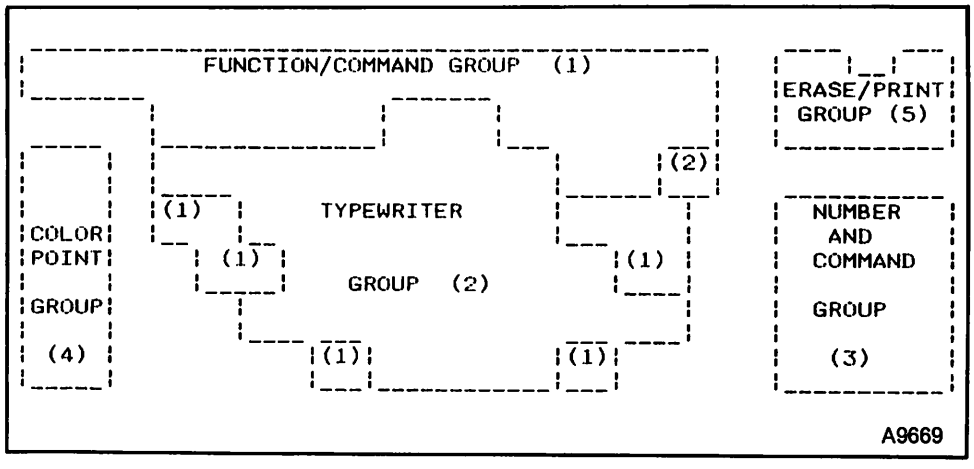


FIGURE 7.2 — Auxiliary Keyboard Key Groups

Most keys in the Function and Typewriter groups have several characters. All keys in the other three groups only have one character. To access the different characters in either of the first two groups, you must hold a certain key down while simultaneously pressing the key having the character you want to use.

The color key group lets you choose foreground and background colors for the various graphics. To choose a background color, hold down the background color key while pressing one of the color keys. To choose a foreground color, you need only press a single color key. For all other groups, you need only press the key of the character or command you want to use.

The Tables on the following pages detail the keys of the groups and their various uses.

TABLE 7.1 — Auxiliary Keyboard Features

Any key on the auxiliary keyboard that matches any key on the fixed keyboard performs the same function.
G MENU returns you to the Graphic Editor Menu from any graphic editor activity or other function.
Alphabetic and numeric keys have a typewriter layout. To input any lower case character, press any Ttypewriter group key. To input any upper case character, hold down either SHIFT key while pressing any Typewriter group key.
Many function keys are only functional when you are performing the EDIT GRAPHIC, DEFINE SYMBOL, and/or EDIT/REVIEW VALUE FORMATS tasks.
To use the Special Characters on certain keys, you must lock the SPEC CHAR key (press it once).
If entering Special Characters (the SPEC CHAR key is locked) and you want to use a Command key (having any Special Character), unlock the SPEC CHAR key (press it once) before pressing that command key.
You can input Special Characters in the EDIT GRAPHIC and DEFINE SYMBOL tasks.
The eight color keys on the left of the auxiliary keyboard let you enter the foreground colors for graphics. (EDIT GRAPHIC task).
Using any of the eight color keys while holding down the BACKGROUND COLOR key lets you enter a background color for a graphic. (EDIT GRAPHIC task).
Using any of the eight color keys whild holding down the POINT key lets you specify graphic BEGIN and END plot points. (EDIT GRAPHIC task)
To input repetitive characters, hold down the REPEAT key while pressing any other typewriter group or Special Character key. (EDIT GRAPHIC task)
To erase any input error, press the CLEAR key. To overwrite any error with a space, press the SPACE bar. to erase a complete display page, press the ERASE PAGE key. (EDIT GRAPHIC task)
To get a hard copy of any current display page, press the PRINT key.
To put a current display page into OIU memory, press the SAVE key.

TABLE 7.2 — Function/Command Group Keys

(TOP ROW, LEFT TO RIGHT)

FUNCTION KEY	USE
BEGIN	Enters the beginning plot point for a dynamic line, box, bar, or pipe.
END	Enters the ending plot point for a dynamic line, box, bar, or pipe.
WIDTH	Sets up the number of plot points (thickness) for a dynamic line, box, bar, or pipe.
DR LIN (DRAW LINE)	Draws a line from the specified BEGIN to the specified BEGIN to the specified END plot point.
RM LIN (REMOVE LINE)	Removes the line between the specified BEGIN and END plot points
DR BOX (DRAW BOX)	Draws a box using the specified BEGIN and END plot points as as opposite corners of the box.
RM BOX (REMOVE BOX)	Removes the box between the specified BEGIN and END plot points (the opposite corners of the box).
DR STA (DRAW STATION)	Places a box (20 x 11 character spaces) in the lower right corner of the CRT. (This is the Graphic Display Control Box.) The box appearing only reserves the necessary SPACE for the Graphic Control Box.
	This box lets you see where the station element appears on this Graphic Display during operation. (The box is not the station itself.)
	The box is an aid to show you where it appears so you do not insert anything in its reserved space. Remove this box before you save the display.
RM STA (REMOVE STATION)	Remove the Control Box. Remove the box before you save the display.
IN SYM (INSERT SYMBOL)	Begin sequence necessary to insert a symbol into the Graphic page from the Symbol Library.

TABLE 7.2 — Function/Command Group Keys (Continued)

FUNCTION KEY	USE
DF SYM (DEFINE SYMBOL)	Begins sequence to create NEW symbol and to add it to Symbol Library while in EDIT GRAPHIC task. Used only while in the EDIT GRAPHIC task.
ED DYN (EDIT DYNAMIC)	Begins sequence to create a NEW (or to edit or delete an EXISTING) dynamic item. Used only while in the EDIT GRAPHIC task.
COMMAND KEY	**USE**
SAVE	Causes Editor to scan current page and record its contents to OIU hard disk memory.
G MENU	Either returns Graphic Editor Menu to CRT or begins sequence to do so.
FUNCTION KEY	**USE**
WR VER (WRITE VERTICAL)	Causes cursor to move from top to bottom of CRT after character entry rather than from left to right. Used in EDIT GRAPHIC and DEFINE SYMBOL tasks.
	Press WR HOR before saving any display.
(UP ARROW) ↑	Moves cursor ONE character space UP (toward top of CRT). To move cursor further, hold down REPEAT key while pressing the UP arrow key.
WR HOR (WRITE HORIZONTAL)	Causes cursor to move from left to right of CRT after character entry rather than from top to bottom. USED in EDIT GRAPHIC and DEFINE SYMBOL tasks.

* The DEFINE SYMBOL function from the Graphic Editor Menu (choice H) lets you create new symbols and add them to the symbol library without being in the EDIT GRAPHIC function. While in the GRAPHIC EDIT function, however, you can only define symbols by using the DF SYM key.

TABLE 7.2 — Function/Command Group Keys (Continued)

(SECOND ROW, LEFT TO RIGHT)

FUNCTION KEY	USE
BK ON (BLINK ON)	Causes all subsequent entry items to blink continuously on and off. Used in EDIT GRAPHIC & DEFINE SYMBOL tasks.
BK OFF (BLINK OFF)	Turns off the BK ON function so that all subsequent entry items do not blink on and off. Used in EDIT GRAPHIC & DEFINE SYMBOL tasks.
SINGLE	Causes display characters to appear in single height (one character space high). Also standard character height for printing.
DOUBLE	Causes display characters to appear in double height (two character spaces high). Printer produces duplicate lines (each one character space high) for each line of double height characters.
USE	**COMMAND KEY**
MARK	Marks current graphic page for later display. (Like the MARK key on the fixed keyboard — See Section III.)
	Can only MARK one page at a time.
CALL	Retrieves marked graphic page and redisplays it on CRT. (Like CALL key on fixed keyboard).
LAST	Redisplays the graphic page on the CRT prior to the current one you are viewing. (Like the LAST key on the fixed keyboard).
PREV	Lets you scroll through multi-page display (like the symbol library) from the last page to the first (Like the PREV key on the fixed keyboard).
NEXT	Lets you scroll through multi-page displays from the first page to the last. (Like the NEXT key on the fixed keyboard.
FUNCTION KEY	**USE**
(LEFT ARROW) <——	Moves cursor ONE character space to LEFT (toward left of CRT). To move cursor further, hold down REPEAT key while pressing the LEFT arrow key.
HOME	Returns cursor to its HOME position in upper left corner or CRT (grid column 1, row 1, or position 1,1)
(RIGHT ARROW) ——>	Moves cursor ONE character space to RIGHT (toward right of CRT). To move cursor further, hold down REPEAT key while pressing the RIGHT arrow key.

TABLE 7.2 — Function/Command Group Keys (Continued)

(THIRD ROW, ON THE RIGHT)

COMMAND KEY	USE
FIELD	Moves the cursor from one input character space (inside a prompt) to next WITHIN A SECTION. (Fields are contained inside sections; sections cannot be contained inside fields.) (Like FIELD on the fixed keyboard.
	You cannot define fields and sections. They are part of OIU software.
(DOWN ARROW) ↓	Moves cursor ONE character space DOWN (toward bottom of CRT). To move cursor further, hold down REPEAT Key while pressing the DOWN arrow key.

(FOURTH ROW, ON LEFT and ON RIGHT)

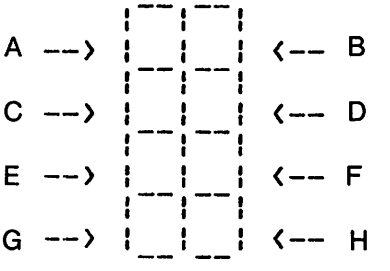
COMMAND KEY	USE
ESCAPE (On left side)	Causes Graphic Editor to abort any action about to execute or causes Editor to exit current task (function) and return the Graphic EDITOR MENU to the CRT. You can only use ESCAPE during GRAPHIC EDIT tasks when responding to Editor prompts. (Like ESCAPE on fixed keyboard).
SECT (On right side)	Causes the cursor to move from one prompt in a section to the first field (character space) of the prompt in the next section (in sequence). (Like SECT on fixed keyboard).
ENTER (large key on right)	Executes a prompt request from the Graphic Editor or adds recent entry data to a field witin a section.
	First function is a command to the Editor to execute an indicated action. The most frequent action associated with this function is: 'ENTER' TO MENU, 'ESC' TO CANCEL This gives you one last chance to decide whether to execute or to abort the action requested.
	Second function lets you rewrite new data over any previous data in an input field within a section. When you press ENTER the Editor stores the new data on OIU hard disk. If you do not press ENTER after making a new data entry and displays input field with its previous data (if any).
	When moving from field to field within a section you need not press ENTER. Before you move from one section to another, however, you MUST press ENTER or all data you entered in the first section is lost.

TABLE 7.2 — Function/Command Group Keys (Continued)

NOTE

While in the EDIT GRAPHIC function pressing ENTER causes the cursor to move to the first character space of the current row (left margin). This is similar to the carriage return of a typewriter except the cursor does not move down; it just moves to the left and stays on the same row.

(FIFTH ROW, ON LEFT)

COMMAND KEY	USE
POINT	Lets you specify a PLOT POINT while holding it down and pressing one of the eight COLOR keys. This puts the PLOT POINT into one of its eight possible positions (A-H) in any 2x4 point character space: 

NOTE

Placing a BEGIN and END plot point within a character space in any of the eight possible positions is critical for drawing dynamic lines, boxes, bars, or pipes.

(BOTTOM ROW, LEFT & RIGHT ENDS OF THE SPACEBAR)

COMMAND KEY	USE
SPEC CHAR (Left of spacebar)	While in the EDIT GRAPHIC or DEFINE SYMBOL functions this key lets you access the Special Characters at the upper left of certain keys in both the FUNCTION/COMMAND and TYPEWRITER group keys.
	This is a locking key. Once you press and release it you can only input Special Characters into the Graphic display. To reaccess other (non-special) characters, you must press and release the SPEC CHAR key again. (See NOTE on next page.)

NOTE

As an example of using the SPEC CHAR key note the following:

Lock the SPEC CHAR key. Now press this key: < $ 6

The result on the CRT is: <.

Now press this key:] ! 1

The result on the CRT is:].

While entering Special Characters you can also make repetitive entries. With the SPEC CHAR key locked, hold down the REPEAT key and any Special Character key. The Special Character enters repeatedly until you release both keys. As an example, hold down the REPEAT key and the second key above. The result on the CRT is: **]]]]]]]]]]]]]]]]]]** (and so on) until you release both keys.

TABLE 7.3 — Typewriter Group Keys (Left to Right)

SECOND ROW												
Upper Case Lower Case									[\	] @		
THIRD ROW												
Upper Case Lower Case	— A	! 1	" 2	# 3	$ 4	% 5	& 6	' 7	(8	) 9	- 0	? /
FOURTH ROW												
Upper Case Lower Case	Q	W	E	R	T	Y	U	I	O	P		
FIFTH ROW												
Upper Case Lower Case	A	S	D	F	G	H	J	K	L	+ ;	* :	
SIXTH ROW												
	SHIFT	Z	X	C	V	B	N	M	,	.	-	SHIFT =
LAST ROW												
		SPACEBAR)										

NOTE

To access any upper case character, you must hold down either SHIFT key while pressing the character key desired. Notice that some keys have no upper case characters. Pressing the SPACEBAR fills in the character space at the current cursor position with a space in the current background color. This is useful when you want to erase an error. To enter repetitive spaces, hold down both the SPACEBAR and the REPEAT key.

TABLE 7.4 — Number and Command Group Keys (Number Pad)

KEY	USE
0 - 9	For entering numeric data input
—	For marking NEGATIVE numeric data input
(decimal point)	For entering REAL (analog) numeric data input
ENTER	Same as in the FUNCTION/COMMAND group
FIELD	Same as in the FUNCTION/COMMAND group
SECT	Same as in the FUNCTION/COMMAND group
CLEAR	Lets you erase any error or previous data.

TABLE 7.5 — Color/Point Group Keys

KEY	DOT COLOR Plot Point	USE
A	RED 	Set foreground (FG) color for any graphic to RED; sets Plot Point to upper left when pressing it while holding down POINT key.
B	CYAN 	Sets FG color for any graphic to CYAN; sets Plot Point to upper right when pressing it while holding down POINT key.
C	GREEN 	Sets FG color for any graphic to GREEN; sets Plot Point to upper left center when pressing it while holding down POINT key.
D	MAGENTA 	Sets FG color for any graphic to MAGENTA; sets Plot Point to upper right center when pressing it while holding down POINT Key.
E	BLUE 	Sets FG color for any graphic to BLUE; sets Plot Point to lower left center when pressing it while holding down POINT key.
F	YELLOW 	Set FG color for any graphic to YELLOW; sets Plot Point to lower right center when pressing it while holding down POINT key.
G	BLACK 	Sets FG color for any graphic to BLACK; sets Plot Point to lower left when pressing it while holding down POINT key. (BLACK is usually the graphic background (BG) color.)
H	WHITE 	Sets FG color for any graphic to WHITE; sets Plot Point to lower right when pressing it while holding down POINT key. (WHITE usually avoided because it shows too much contrast.)

KEY	USE
BACKGROUND COLOR	Holding this key down while pressing any of the above eight color keys sets the BG color for any graphic to the color matching that of the color key you press.

NOTE

Pressing color keys sets graphic colors and plot points only when you are doing EDIT GRAPHIC tasks. Any printer hard copy of a Graphic Display ignores current background colors.

TABLE 7.6 — Erase and Print Group Keys

KEY	USE
ERASE PAGE	Causes the OIU to remove the current display page from Editor working storage. You must press ENTER after pressing ERASE PAGE. By just pressing ERASE PAGE alone you do not remove the current display page from the hard disk.
	While creating a new display if you do not save it onto hard disk (using the SAVE task of the EDIT GRAPHIC function) and then press ERASE PAGE followed by ENTER, you remove the contents of that display from the OIU hard disk as a result.
	If working on a new display that you save onto the hard disk at any point and you press ERASE PAGE followed by ENTER, you merely clear (erase) the current display. The hard disk still keeps the original display in Editor memory.
PRINT	Causes the OIU to scan the current display page and send its contents to a printer buffer to produce a hard copy of the display on a line printer (if one is connected and is ON LINE).
FIVE REMAINING UNMARKED KEYS	Reserved for future functions/commands; not presently used. Pressing an unmarked key does not affect the current display in any way.

Special Characters

Figure 7.3 (next page) shows the 64 Special Characters of the auxiliary keyboard. On the keyboard itself each Special Character shape appears in WHITE against a BLACK rectangle. The Special Characters are to the left of the upper case character on any key. Figure 7.3 also shows the Special Characters in the same order as on the keyboard.

At first some of these characters may look identical, especially the characters showing single vertical or horizontal lines. A few characters looking like some form of the letter **T** are also very similar. Notice that some characters are shorter in length or height or have bars that are shorter or longer than others.

There are three groups of single horizontal line characters. Each group has three characters (top, middle, and bottom).

The first horizontal line group (three keys on the left in the fifth row of the keyboard) shows short lines extending partially across each rectangle from the left. The third horizontal group (three keys on right of same row) shows short lines extending partially across each rectangle from the right. The second group (three keys in center of same row) shows long lines extending completely across each rectangle.

There are also three groups of single vertical line characters. Each vertical group also has three keys (left, center, and right).

The first and third vertical line groups (on the left and right of the sixth row of the keyboard) show short lines extending partially down/up each rectangle. The second vertical group (in the center of the same row) shows long lines extending completely across each rectangle from top to bottom.

Some of the characters shaped like a letter T have the long bar extending down, up, to the left, or to the right. Some long bars extend completely across each rectangle while some extend only partially.

Some characters are filled in triangles extending up, down, left, or right. Some characters show small or large corners and others show large slashes, brackets, or carets. (\, /, [,], <, >). One character is a large cross (+). One character shows a box (□). The remaining characters show a combination of triangles and lines.

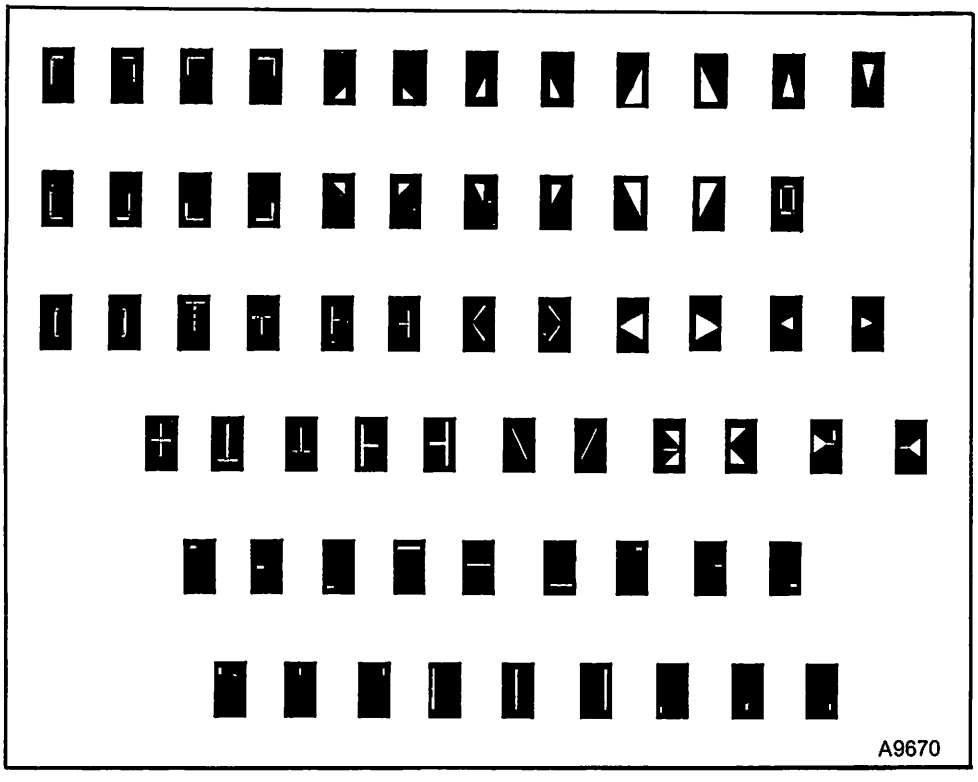


FIGURE 7.3 — The Special Characters of the Auxiliary Keyboard

GRAPHIC DESCRIPTIONS

A graphic display page on the CRT (also known as a template) can show the operator any of the following:

- a picture of a configuration loop, several process related loops, or any related plant system.
- a report containing text explanations of dynamic process information.
- a sequence of operations telling the operator which step to perform next.

Each 1400 and 5000 tag OIU can contain up to 120 different graphic displays (See Table 2.1 in Section II). The operator accesses Graphic displays by

accessing the Group display to which any Graphic is assigned (Section XI and Appendix A). A Graphic is always linked to an associated Group for displaying on the CRT.

NOTE

There can be up to 240 Group displays on a 5000 tag OIU.

Assigning Graphics

During configuration you may assign any Graphic to more than one group as desired. It is possible for a Group to have no associated Graphic. You can also assign any Graphic to an EMPTY Group (a Group having no configured tags). When the operator accesses such an empty group the assigned Graphic appears in place of the Group.

During graphic configuration you must establish and follow a standard convention for assigning Graphics to Groups. You do this so the operator can access Graphic displays consistently and without confusion. For example, you can use one of the following:

CONVENTION ONE: Assign all Graphics to empty Groups (The operator can access each Graphic directly.)

— or —

CONVENTION TWO: Assign all Graphics to Groups having configured tags (The operator can access each Graphic by accessing its associated Group.)

If you do not use some convention as above when assigning Graphics to Groups, the operator can become confused. For example, when scrolling through Graphic display pages the operator may access a Graphic from an associated Group but then access a Group (having no assigned Graphic) when pressing the PREV or NEXT key instead of the expected Graphic display.

Graphic Characters

Each Graphic display (template on the CRT) contains graphic characters (or graphics). Graphic characters can be either fixed or dynamic (Section IV). Fixed graphics do not change during operation; dynamic ones do change depending on current process changes.

A fixed graphic can be a data description (tag name, tag descriptor, condition indicator, interpretation diagram, etc). A dynamic graphic is linked to a tag value. As the value or state of a tag changes the dynamic graphic item also changes. Dynamic graphics show the operator a picture of currently changing processes.

DYNAMIC ITEMS. There are four types of dynamic graphic items:

1) Dynamic Value (V)
2) Dynamic Symbol (S)
3) Dynamic Bar (B)
4) Dynamic Pipe (P).

Table 7.7 below gives of summary of the dynamic graphic items. The Table shows the item, its tag type(s), the changes it makes, and the cause of the changes.

TABLE 7.7 — Dynamic Graphic Item Summary

DYNAMIC ITEM	TAG TYPE	ITEM CHANGE	CAUSE
VALUE	REAL or STATION	numeric value showing tag alarm status	Tag value increase or decrease
	BOOLEAN or RCM	logic state showing tag alarm status	Tag value increase or decrease
SYMBOL	REAL, STATION, BOOLEAN, & RCM	symbol changing color or shape, and/ or blinking ON and OFF	Tag alarm and non-alarm value increase or decrease
BAR	REAL or STATION	bar growing or shrinking in width and length	Tag value increase or decrease
PIPE	REAL, STATION, BOOLEAN,	pipe segment changing color	Tag value increase or decrease

THE CHARACTER SPACE. The graphic characters used on the CRT occupy rectangular character spaces. Each character space contains a number of square points. There are actually two character spaces used on the graphic page: the basic and the drawing character space.

The basic character space contains 48 points in a 6x8 point array, forming a large rectangle. This 6x8 point character space can contain a letter, number, sign, Special Character, or symbol. The points of this character space usually contain fixed graphic items but can contain dynamic ones, as well.

The drawing character space contains eight points in a 2x4 point array, forming a small rectangle. This 2x4 point character space can contain dynamic lines, boxes, bars, and pipe segments. The points of this character space match the eight color/point keys (Table 7.5) of the auxiliary keyboard. When drawing pictures you must specify plot points for this character space. Notice that six drawing character spaces can fit inside one basic character space.

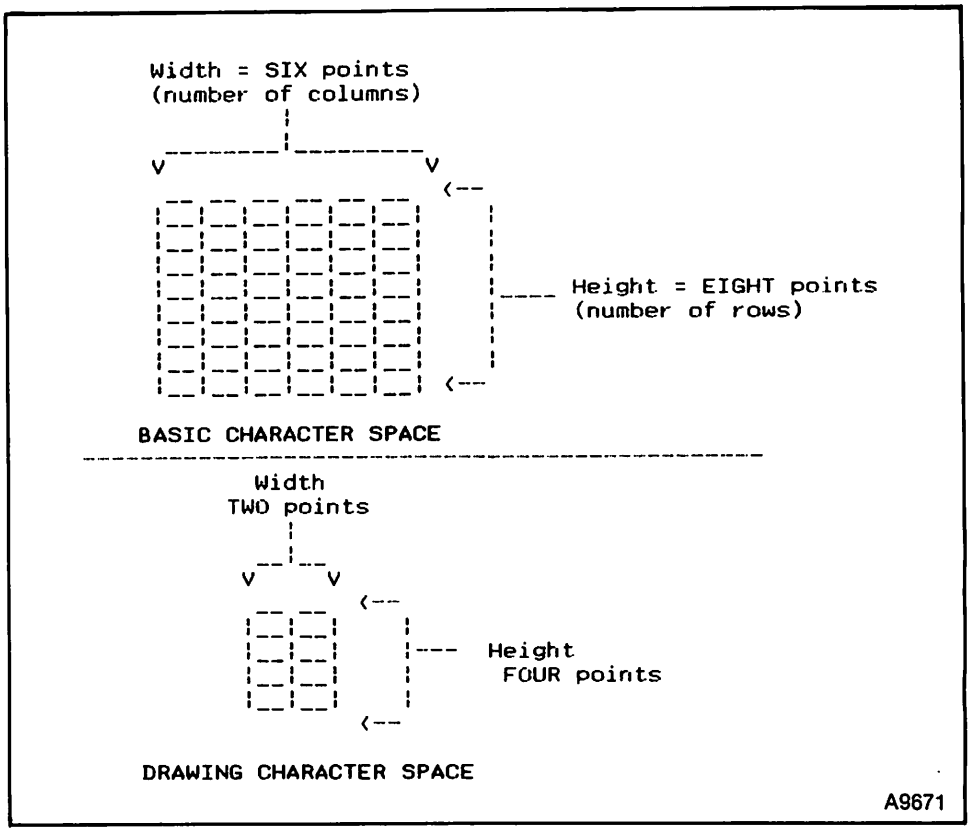


FIGURE 7.4 — Basic and Drawing Character Spaces

NOTE

Unless stated otherwise, the term character space refers to the basic character space.

THE SYMBOL LIBRARY. The Graphic Editor contains a memory area known as the Symbol Library. The symbol library stores all symbols used with Graphic displays (both your own defined symbols and the OIU default ones). The library can contain up to 250 different symbols. Each symbol can contain up to 120 keystrokes. Figure 7.5 shows the OIU standard graphic symbols.

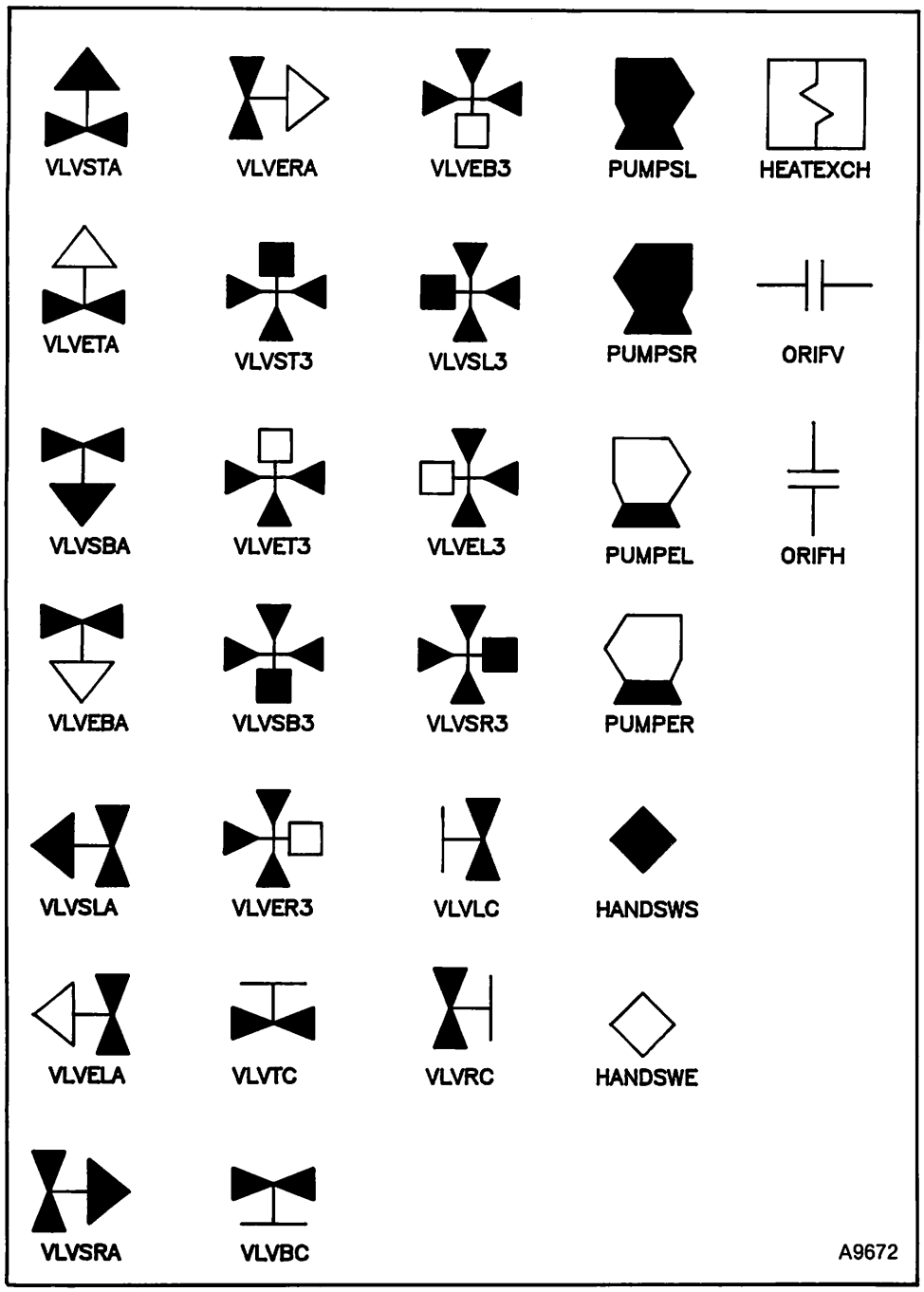


FIGURE 7.5 — Standard OIU Graphic Symbols

NOTE

The names under each symbol are standard abbreviations for the following terms:

VLV = VALVE; PUMP = PUMP; HANDSW = HANDSWITCH; ORIF = ORIFICE; S = SOLID; E = EMPTY; T = TOP; B = BOTTOM; L = LEFT; R = RIGHT; A = ANGLE; C = CONNECTOR; V = VERTICAL; H = HORIZONTAL; HEATEXCH = HEAT EXCHANGER

Thus, VLVSTA (symbol at top left of figure above) = Solid top angle valve. Whatever names you use for your own symbols must be meaningful to the operator.

You can define your own symbols and add them to the symbol library either through the DEFINE SYMBOL function or the DEFINE SYMBOL task of the EDIT GRAPHIC function. Each symbol you define must have a name (up to eight alphanumeric characters). Your own symbols may consist of any of the following features:

- alphanumeric text
- Special Characters
- different colors
- cursor movement
- horizontal or vertical writing
- single or double height characters
- blinking or non-blinking characters.

The Graphic Editor uses the starting point (character space) of any symbol definition on the CRT as a reference. Therefore, you must use a consistent starting point in every symbol, like its upper left corner for example. You can make changes to any of your own symbols but, even when you make such changes, no automatic correction occurs to any symbol used in fixed items of existing graphic templates.

So if you change any previously defined symbol in the library after using that symbol as a fixed graphic item, the originally defined version stays as is in that graphic display. If you use a symbol as a dynamic item in any graphic template, the OIU displays the most current (updated) version of that symbol.

DYNAMIC VALUE FORMATS. The Graphic Editor can contain up to ten different dynamic item formats (0 - 9). Format 0 is the default format; you can vary formats 1 through 9 as desired (See the EDIT/REVIEW VALUE FORMATS function later in this Section). When working with any dynamic format its Graphic template readout appears as explained in the following pages.

A dynamic value displays a real numeric value or logic state that changes as the value of its tag changes. The default format for a REAL variable display shows:

- **DDD.D AA**
  ENGUNT

	= Sign of variable
DDD.D	= Numeric value (followed by a blank space)
AA	= Alarm indicator (H ,L ,HD, LD, or *)
ENGUNT	= EU (DEFINE EU DISPLAY).

The REAL display appears in the following default colors:

- digits are GREEN
- alarm indicator is YELLOW
- Engineering Unit is CYAN.

The default format for a BOOLEAN variable display shows:

LSTATE A **LSTATE** = Six-character LSD (Defined in Tag List) followed by a space
A = Alarm indicator (A or *).

The BOOLEAN readout appears in the following default colors:

- LSD in GREEN
- alarm indicator in YELLOW.

The REAL display of a control station can show any or all of the following:

CC -DDD.D AA (PV or SP Station) **CC** = Control Select (access) number (1 - 99) for those stations on the Graphic Display from which the operator can take control actions.
ENGUNT

CC -DDD% (CO Station)

CC D.DDD (RI Station)

CC MODES(for Station Mode) **MODES** = AUTO, MAN, MNLK, SPTK, COTK

CC STATS (for Station Status) **STATS** = LCL, CNTR, CAS, RATIO.

The numeric display appears in the following default colors:

- Control Select Number in RED
- digits in GREEN
- alarm indicator in YELLOW
- Engineering Unit in CYAN.

The display for a Remote Control Memory switch shows:

CC LSTATE A □ **CC** = Control Select Number (1-99) of those RCM elements on a Graphic Display from which the operator can take control action

LSTATE = Six-character LSD (Defined in Tag List) followed by two spaces

A = Alarm indicator (A or *)

□ = State descriptor (■ or □).

The logic state display appears in the following default colors:

- Control Select Number in RED
- LSD and State Descriptor in GREEN
- alarm indicator in YELLOW.

GRAPHIC COLOR SCHEME. When drawing any Graphic template you must first consider the colors (both FG and BG) to use for the various items you want to include. The color scheme you choose must be consistent within itself (all steam pipes for example must be the same color for all templates) and consistent with your current OIU color scheme (Section VI). Table 7.8 shows the default graphic color scheme.

TABLE 7.8 — Standard Graphic Color Scheme

COLOR	USE
• BLUE	Display boundaries (dark blue FG on black BG). Blue is normally not visible enough to show detail information.
• GREEN	Variable (dynamic) data (numeric values, LSDs, etc.) and also used as FIRST trend color on any Trend element graph.
• RED	Menu function select letters and Control select numbers. Also SECOND trend color.
• MAGENTA	THIRD Trend color.
• CYAN	Fixed, configurable items (tag names, descriptors, EUs, etc.).
• YELLOW	Alarm conditions and operator messages.
• WHITE	Data entry cursor (prompt).
• BLACK	Normally the background (BG) color.

NOTE

The color abbreviations used on graphic template Status lines are: BLU, GRN, RED, MGN, CYN, YEL, WHT, and BLK.

At any given location on the template (for a tag symbol) a symbol can change its shape and color depending on its associated tag value and alarm state change. For example, a CLOSED (solid) valve symbol in BLUE showing tag state 0 can change to an OPEN (empty) valve symbol in CYAN to show tag state 1.

Alarm indication does not display with dynamic symbols. To show alarm and non-alarm states, alternate symbols appear on the CRT. Any alarm state time can appear for the dynamic value of these states, however. Incoming alarms do not cause the dynamic symbol for any tag to blink (flash). Nor can the operator stop dynamic symbols from blinking by pressing the ACK key on the fixed keyboard. If you define it as such, an alarm condition can cause a symbol to blink for as long as the alarm condition lasts.

You can re-use or change any graphic template for a different Group display. Therefore you may also use all or just a portion of any Graphic display for another Group display. When you use colors any symbol foreground (FG) color can be the same as its background (BG) color. In this case the symbol can be invisible on the CRT but still appears on any hard copy.

If using different symbols to show different values or states, make sure that each symbol you use fully overlays (erases) any other if that is necessary. (See the EDIT GRAPHIC function later in this Section.)

SYMBOL CHANGES. Table 7.7 briefly mentioned the causes for symbol changes. Here we examine this in greater detail. Symbol changes can occur as a result of value/state changes in:

- REAL tags
- STATION tags
- BOOLEAN tags
- RCM tags.

Real Tag Symbol Changes. You can specify four different symbols and/or symbol colors based on the following tag value/state changes:

- Tag value = LOW and IN alarm
- Tag value = LOW and NOT in alarm
- Tag value = HIGH and NOT in alarm
- Tag value = HIGH and IN alarm.

You must also specify the boundary value between tag LOW and HIGH values (See the SPECIFY DYNAMIC VALUES task of the EDIT GRAPHIC function.) The OIU uses the alarm values from the module function block parameters for that tag (Section V).

Station Tag Symbol Changes. The PV (Process Variable), SP (Set-point), or CO (Control Output) station tag values may cause symbol changes as for REAL tags.

Boolean and RCM Tag Symbol Changes. You can specify four different symbols and/or symbol colors based on the following tag value/state changes:

- Tag state = 0 and IN alarm
- Tag state = 0 and NOT in alarm
- Tag state = 1 and NOT in alarm
- Tag state = 1 and IN alarm.

DYNAMIC BARS. A dynamic bar is a bar graph figure (line having changing width and length) based on the value of its associated REAL or STATION tag. You must specify the following items for all dynamic bars (See the SPECIFY DYNAMIC BARS task of the EDIT GRAPHIC function.):

- Tag name
- BEGIN point
- END point (equal to the ZERO plus SPAN range)
- Width
- BG color
- FG color
- ZERO and SPAN range.

You can use the ZERO and SPAN values as configured in the module function block for any tag. The BEGIN and END points determine the direction of growth/shrinkage for a bar (its length) while the Width determines the growth/shrinkage of the width of that bar.

DYNAMIC PIPE SYSTEMS. A dynamic pipe system is a group of up to ten individual lines or segments showing one tag and having the SAME color at any time. You can specify dynamic pipes to change color based on the state of a BOOLEAN or RCM variable, or on the range of a REAL or STATION variable. However, dynamic pipe systems can only have TWO colors. (See the SPECIFY DYNAMIC PIPES task of the EDIT GRAPHIC function.)

Graphic Template and Screen Use

The graphic template (the CRT) is a grid array 80 character spaces (columns) wide by 48 character spaces (rows) high. The first (top) row on every CRT page is reserved for either a display Title line (Section IV) or a graphic display Status line. This leaves 47 character space rows down the CRT.

Therefore, the template (CRT) has 80 × 47, or 3,760 basic character spaces (3,760 × 6 = 22,560 drawing character spaces) for graphic item entry. For most applications this entry space is more than sufficient, though it does have its limits (See below).

Remember that the Editor reserves a large rectangular box (20 character spaces wide by 11 high) in the lower right corner of any template when you draw a station (See the EDIT GRAPHIC function later in this Section). This Control Box appears so you can avoid inserting any items into its reserved space.

You can determine the remaining template space after entering any dynamic item by multiplying its factor below by the number of items entered, totaling all products, and then subtracting that total from 100.

Dynamic Item	Factor
VALUE (V) [REAL or BOOLEAN]	1.0
SYMBOL (S)	2.4
BAR	2.2
PIPE	0.8

For dynamic pipes you must also ADD **0.6** per line segment to the product of any pipe multiplication.

> **NOTE**
>
> **It is also possible for any template to have a total screen value of 101 as a result of the steps above.**

GRAPHIC PREPARATION. Think about the different ways to present any process or information graphically and make some rough sketches. Select the most effective of your sketches to use as a guideline when actually creating your graphic on the CRT. Draw the Graphic display on Bailey Form #E1325 (grid paper matching the OIU CRT template area). Drawing your Graphic display on paper makes it much easier to transfer your design onto the CRT itself. When all your desired Graphic displays exist on this grid paper you are ready to actually create them on the screen.

Status Line

At the top (first row) of any graphic template is its Status line. The Status line uses special symbols and codes to show you information about the current display. When you perform certain EDIT GRAPHIC tasks or other Graphic Editor functions questions and prompts replace the Status line temporarily. After you reply to the prompts the Status line reappears at the top of the display.

From left to right the Status line shows:

- **+** The Graphic Editor cursor. The cursor marks the position where your next character entry appears on the template. (When you first access an empty template the cursor appears in the upper left corner of the CRT (column 1, row 1, or 1,1). This is the cursor HOME position.) Notice that the cursor always blinks on and off.
- **FOR or BCK** Foreground or Background designation. (When you first access an empty template, the designation is **FOR**.)
- **or D** Character height designation. If this is blank, you can make single height character entries. If **D** appears here, you can make double height entries. (When you first access the template this is blank.)

NOTE

Double height characters appear as two duplicate lines of single height characters on any Periodic Log.

- **> or V** — Cursor direction symbol. > indicates the cursor moves horizontally to the right after any entry. **V** indicates the cursor moves vertically downward after any entry. (When you first access the template > appears.)

NOTE

This must be > if you want to SAVE a current template, otherwise the Editor may not save some parts of your display.

- **GRN ON BLK** — CRT color designations. Tells you what foreground and background colors are used for your next entry. (When you first access the template the default FG and BG colors appear (Green on Black).)

NOTE

Periodic Logs always print out in Black and White, regardless of current template colors (including BLK ON BLK).

If the FG color is blinking, any character you enter also blinks.

- **CURSOR= 1,1** — Tells you the current CRT position of the cursor, giving you its screen coordinates (column and row). (When you first access the template the cursor is HOME (1,1).)

NOTE

For your easier reference, here are the column and row coordinates for the following CRT locations:

Top left corner 1,1	**Top right corner** 80,1
Bottom left corner 1,48	**Bottom right corner** 80,48.

-  — Plot Point indicator. The Drawing Character Space (eight plot points in a 2x4 rectangular area): □□ □□ □□ □□

is the Editor reference for drawing lines, boxes, bars, and pipes. (See Table 7.5.)

You must designate exactly which of the eight plot points is the BEGIN and END point for any line, box, etc. The filled in square symbol shows which of the plot points the Editor currently recognizes.

- **WIDTH= 1** Shows the number of plot points the Editor uses to draw the width (thickness) of a line, box, bar, or pipe.
- **BEGIN= 1,2**  Shows the coordinates and plot point at which you want your drawing item to start. (Use for lines, boxes, bars, and pipes.)
- **END= 1,2**  Shows the coordinates and plot point at which you want your drawing item to end. (Use for lines, boxes, bars, and pipes.)

ACCESSING THE GRAPHIC EDITOR MENU

With the OIU Configuration Menu on the CRT press **J**. Instructions to attach the auxiliary keyboard appear at the bottom of the OIU Configuration Menu:

PLUG IN GRAPHIC EDITOR KEYBOARD
PRESS 'ENTER' ON GRAPHIC EDITOR KEYBOARD TO CALL GRAPHIC EDITOR
PRESS 'ESCAPE' ON CONSOLE KEYBOARD TO RETURN TO OIU CONFIGURATION MENU

To abort your Graphic Editor request, press ESCAPE on the fixed keyboard. To access the Editor by pressing ENTER on the auxiliary keyboard, you must first plug the keyboard in to the OIU.

After connecting the auxiliary keyboard to the OIU and setting the board either on its shelf or over the fixed keyboard, press either of its ENTER keys. After you connect the auxiliary keyboard and press ENTER the OIU ignores any fixed keyboard inputs. The OIU does not respond to fixed keyboard inputs until you exit the Graphic Editor (See the end of the Section).

The OIU loads the Editor for several seconds after you press ENTER. When done the OIU Configuration Menu disappears and the Graphic Editor Menu appears in its place. To perform any graphic tasks or function, you must select them from this menu.

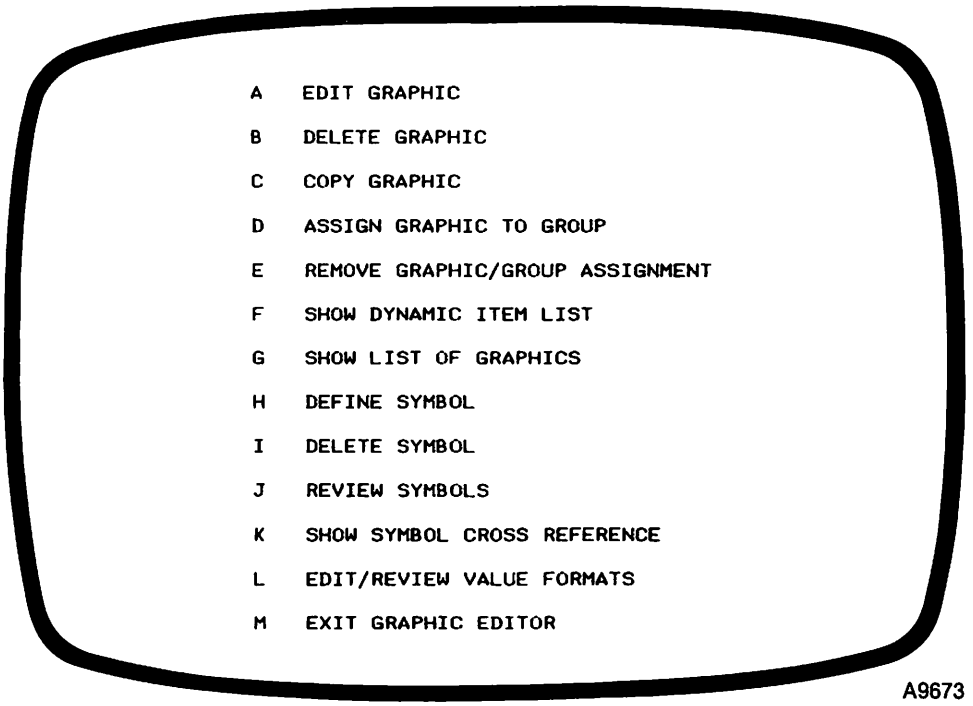


FIGURE 7.6 — Graphic Editor Menu

Graphic Edit Tasks

The first function of the Graphic Editor Menu (EDIT GRAPHIC) is the most important. This function lets you create new graphic templates or modify existing ones. The Edit Graphic function consists of many editing tasks. Many of these editing tasks are also usable with other functions from the menu, as well. These tasks are:

- Moving the cursor
- Setting the plot point
- Setting the BEGIN and END points
- Setting the width
- Drawing/removing a line
- Setting foreground and background colors
- Using BLINK ON and BLINK OFF
- Writing horizontally and vertically
- Using single and double height characters
- Drawing/removing a station
- Drawing/removing a box
- Inserting a symbol
- Defining a symbol
- Specifying/editing dynamic values
- Specifying/editing dynamic symbols
- Specifying/editing dynamic bars
- Specifying/editing dynamic pipes
- Deleting dynamic items
- Saving a display
- Returning to the Graphic Editor Menu.

(For specific examples of these tasks and for practice in performing them, see Appendix N, Quick Graphic Exercise Guide.)

MOVE THE CURSOR. To move the cursor (blinking + on the CRT), press any of the Arrow keys. The arrow keys are identical to those of the Cursor Control Block on the fixed keyboard (Section III). Pressing an Arrow key moves the cursor ONE character space in the direction shown by the arrow. The HOME key returns the cursor to its HOME position (coordinates 1,1 - the upper left corner of the template) from any current CRT position.

To move the cursor in the desired direction more quickly, hold down the REPEAT key while pressing the Arrow key desired. Holding both keys down causes the cursor to move rapidly across the template in the desired direction until you release the keys.

Remember the CRT corner coordinates (See page 27). Since pressing any Arrow key moves the cursor ONE character space, if the cursor is currently at a corner and you press an Arrow key that moves it off the CRT, the cursor temporarily disappears. The cursor then reappears as in the examples below. The examples explain how to move the cursor around corners.

If the cursor is at HOME (CURSOR= 1,1 on the Status line) and you press the UP Arrow, the cursor reappears at the bottom left corner of the CRT (1,48). If you now press the LEFT arrow, the cursor reappears in the lower right corner (80,47). Pressing the DOWN Arrow twice puts the cursor in the upper right (80,1). Now pressing the RIGHT Arrow now puts the cursor just to the right of HOME (1,2).

SET THE PLOT POINT. You must use the plot point whenever drawing lines, boxes, dynamic bars, or dynamic pipes. The drawing character space is the 2x4 point array as shown on pages 18 and 27. Setting a plot point tells the Graphic Editor in what part of the character space you want it to draw your line, box, bar, or pipe. You can only set ONE plot point at any time.

To set the plot point, follow these steps:

STEP 1 — Press POINT and hold it down.

STEP 2 — While holding down the POINT key press any one of the eight color keys and look at the plot point designator to the right of the cursor coordinates on the Status line. The designator matches the plot point you entered.

To set different plot points, repeat the process above but press different color keys. Observe the plot point designator change after you press each separate color key. (See also Table 7.5.)

SET THE BEGIN AND END POINTS. You must use the BEGIN and END points when drawing lines, boxes, bars, and pipes. These are references showing the Graphic Editor by coordinates and plot points exactly where to draw the desired items.

To set the BEGIN point, follow these steps:

STEP 1 — Move the cursor to the CRT coordinates desired. Check the cursor coordinates in the Status line to verify the cursor is in the desired position.

STEP 2 — Press POINT and hold it down.

STEP 3 — While holding down the POINT key press the color key representing the plot point you desire (See Set the Plot Point). Check the plot point designator in the Status line to verify the plot point is in the desired position.

STEP 4 — Release the POINT and color keys. Press BEGIN.

The cursor coordinates and plot point designator transfer to the BEGIN coordinates and plot point designation in the Status line. Compare the cursor coordinates and plot point designation with those of the BEGIN area. Both areas on the Status line must be identical.

To set the END point, follow these steps:

STEP 1 — Move the cursor to the coordinates desired. Check the cursor coordinates in the Status line to verify the cursor is in the desired position.

STEP 2 — Press POINT and hold it down.

STEP 3 — While holding down the POINT key press the color key representing the plot point you desire.

STEP 4 — Verify the plot point designator is in the position desired.

STEP 5 — Release the POINT and color keys. Press END.

The cursor coordinates and plot point designator transfer to the END coordinates and plot point designation in the Status line. Compare the cursor coordinates and plot point designation with those in the END area. Both areas must be identical.

SET THE WIDTH. The width tells the Editor how many plot points (not characters) wide to draw a line, box, bar, or pipe. (Remember a character space is TWO plot points wide by FOUR plot points high).

To set the width, follow these steps:

STEP 1 — Press WIDTH. A prompt appears to the right of **WIDTH**= in the Status line (The Editor highlights this part of the Status line).

STEP 2 — Press CLEAR to erase previous data in the prompt.

STEP 3 — Enter the number of plot points wide you want the line (or box, etc.) to be (from 1 to 188).

STEP 4 — Press ENTER. The prompt disappears and the Status line containing the new width returns to the CRT.

DRAW/REMOVE A LINE. To draw a line, you must set the WIDTH, BEGIN, and END points, as well as setting the FG and BG colors. When drawing a line the BEGIN and END points define the LEFT corners of a vertical (I) or greater than 45 degrees diagonal (/ or \) line and the bottom corners of a horizontal (—) or less than 45 degrees diagonal line (⌐ or ¬).

The Editor draws the line to the specified width TO THE RIGHT OF or ON TOP OF the BEGIN and END points. The Editor never draws the line so wide that it exceeds the template edge (goes past 80 columns or 48 rows).

NOTE

Lines never appear on Periodic Logs.

To draw a line, follow these steps:

STEP 1 — Move the cursor to the coordinates where you want the line to start.

STEP 2 — Set the plot point at the position desired within the character space of the coordinates containing the cursor. (See Set the Plot Point.)

STEP 3 — Set the BEGIN point (See Set the BEGIN and END Point).

STEP 4 — Move the cursor to the coordinates where you want the line to end.

STEP 5 — Set the plot point at the position desired within that character space of the coordinates containing the cursor.

STEP 6 — Set the END point.

STEP 7 — Set the WIDTH.

STEP 8 — Set the FG and BG colors as desired (See next task).

STEP 9 — Press DR LIN.

The Editor now connects the BEGIN and END points with a line (one plot point wide). The editor draws the line by individual plot points FROM BEGIN moving column by column or row by row (depending on whether the line is horizontal, vertical, or diagonal) TO END.

When removing a line, you must again specify the BEGIN, END, and WIDTH for that line as above. When removing a line the Editor erases whatever characters were previously drawn in (or are currently occupying) the character spaces you specify by BEGIN, END, and WIDTH, replacing them with whatever background color is currently on the Status line.

To remove a line, follow these steps:

STEP 1 — Set the BEGIN and END points.

STEP 2 — Set WIDTH to the desired width of the line you want to remove.

STEP 3 — Set the FG and BG colors to those desired (See next task).

STEP 4— Press RM LIN.

The Editor now erases the line specified.

> **NOTE**
>
> **The Editor overwrites whatever exists in the character spaces within your specified parameters (between BEGIN and END) with spaces of the current BG color. So even if no line exists between your BEGIN and END points, the Editor still erases whatever is there when you perform this task.**

> **NOTE**
>
> **Whatever BG color you designate appears on the CRT but not on any printer hard copy. BG colors are invisible to the OIU.**

SET FOREGROUND AND BACKGROUND COLORS. The Status line shows the foreground (FG) and background (BG) colors used when you enter characters onto the template (color indicators are to the left of the cursor coordinates). The default colors (those appearing in the Status line when you access a new graphic template) are green foreground on black background (GRN ON BLK). You can change the FG and BG colors by using any of the color keys at the left of the auxiliary keyboard. (See also Table 7.5.)

> **NOTE**
>
> **The foreground color is that color in which the actual character appears; the background color is that of the space remaining in which the character appears.**

To change the foreground color, do this step:

STEP 1 — Press the color key of the color you want to use for the foreground. Observe the color indicator on the Status line. Verify that the Editor changed the FG color (**FOR**) to the same color as that of the key you pressed.

To change the background color, do these steps:

STEP 1 — Press and hold down BACKGROUND COLOR.

STEP 2 — While holding this key down press the color key of the color you want to use for the background. Observe the background color indicator on the Status line. Verify that the Editor changed the BG color (**BCK**) to the same color as that of the key you pressed.

STEP 3 — Release both keys.

The Status line shows (at the extreme left) which was the most recent color chosen, either FOR (for foreground color) or BCK (for background color).

NOTE

Periodic Logs only print out in Black and White.

Colors used in Graphic displays must follow the scheme or convention used in your plant. This must be self-evident and as simple as possible so the operator can quickly recognize the meaning of any character by its color. (See also Table 7.8.)

USE BLINK ON AND BLINK OFF. To enter characters, symbols, lines, etc., that continually blink on and off like the cursor, you must use the BK ON and BK OFF keys. When you set the blink feature ON the foreground color indicator in the Status line also blinks.

To make characters blink, press BK ON. The FG color indicator in the Status line now blinks. Enter the characters (letters, numbers, symbols, etc.) you want to blink, or draw the line (box, etc.) that you want to blink.

NOTE

The operator cannot stop blinking graphic characters from blinking by pressing ACK on the fixed keyboard. The operator cannot stop any blinking graphic character from blinking at all.

To stop characters from blinking, press BK OFF. The FG color indicator in the Status line stops blinking. This is another way to show that the blink feature is off. Any characters you enttered while the blink feature was on continues to blink even after you turn off this feature. To stop characters from blinking in this case, you must erase (overwrite) the character(s) (See Table 7.6) and then redraw the character(s) with the blink feature off.

NOTE

Characters entered after you turned off the feature do not blink.

WRITE HORIZONTALLY AND VERTICALLY. The Status line indicator for CRT writing direction is an arrow (> or V) located to the left of the color indicators. When the CRT is in Write Horizontal, the arrow points to the right (>). When the CRT is in Write Vertical the arrow points down (V). In WR HOR the cursor moves from left to right across the CRT as you enter characters. In WR VER the cursor moves from top to bottom of the CRT as you enter characters. To change from WR HOR to WR VER, press the WR VER key. Observe the writing direction indicator on the Status line. Verify that the Editor changed the writing direction (from > to V).

To change from WR VER to WR HOR, press the WR HOR key. Observe the writing direction indicator on the Status line. Verify that the Editor changed the writing direction (from **V** to >).

> **NOTE**
>
> **Before you SAVE any display or ENTER any symbol, be sure the writing direction is WR HOR (>). If not in WR HOR when you save a display or enter a symbol, changes can occur to the graphic material you are trying to add to OIU memory.**

USE SINGLE AND DOUBLE HEIGHT CHARACTERS. The default height of graphic characters is one character space (eight plot points high). This is SINGLE height. When you first access the Edit Graphic CRT its character height is always single. Using the DOUBLE key you can change character height to TWO character spaces (16 plot points high). This is DOUBLE height.

The top of any DOUBLE height character is always on an odd numbered row; the bottom is always on an even numbered row. If the cursor is on an odd numbered row, the top of a DOUBLE height character appears on the same row as the cursor while its bottom appears on the even numbered row below the cursor. If the cursor is on an even numbered row, the top of the DOUBLE height character is on the odd numbered row above the cursor while its bottom is on the same row as the cursor.

Whenever you press DOUBLE the cursor moves to an even numbered row. While in DOUBLE mode the cursor moves only to even numbered rows.

To enter characters at double height, press DOUBLE. A **D** now appears in the Status line to the left of the writing direction arrow. This shows that the double height feature is on. Enter the characters (letters, numbers, symbols) that you want to appear at twice the normal height.

To enter characters at single height, press SINGLE. The **D** disappears from the Status line. This shows the double height feature is off. Enter the characters that you want to appear at the normal height.

> **NOTE**
>
> **Double height characters appears as duplicate lines of single height characters on Periodic Logs.**

DRAW/REMOVE A STATION. For the operator to take control action from an active Graphic display, a control station must appear in the lower right corner of the display. The Editor automatically draws this station when the operator requests it (by entering its control select number).

However, when you create the display, you must reserve space for the control station in the lower right corner of the template. Reserving this space when you create the display ensures the station and the rest of that display do not overlap each other.

To draw a station, press DR STA. A blue box (20x11 character spaces) appears at the lower right corner of the template. This is the control box showing you where the control station appears when that Graphic display becomes active during operation. This box is only a picture of the control station.

NOTE

An active Graphic display is one containing dynamic values (stations) and is assigned to some Group display.

To remove a station, press RM STA. The blue box in the lower right corner of the template disappears. When you want to save the Graphic display just created BE SURE you first remove the control box. If you save the display while the control box is on the template, the box appears every time the operator accesses the display. It is desirable that this box does NOT appear during OIU operation.

Press DR STA to see the control box reappear. Then press RM STA to remove it.

NOTE

Removing the station control box has no effect on any dynamic station values that may appear in that reserved space during operation.

Remember, the only reason to draw the control box (DR STA) is to let you see what room is necessary for any control station on that template. You do this so you do not enter any other graphic items into the control box reserved space. This box is only a reminder to you when you create that Graphic display. When you are done with that display, do NOT forget to remove the box (RM STA).

When the Editor removes the station control box it fills the reserved area with spaces in the current BG color as on the status line.

DRAW/REMOVE A BOX. To draw rectangles and squares on the template, use the DR BOX key. Drawing a box requires you to set the width, BEGIN, and END points in order to define the boundaries (shape) of that box. BEGIN and END define opposite corners of the box. WIDTH determines how thick the sides of the box can be.

When drawing a box of any width the Editor draws the specified width toward the INSIDE area of that box; not toward the outside area. The Editor NEVER draws a box outside its BEGIN and END parameters.

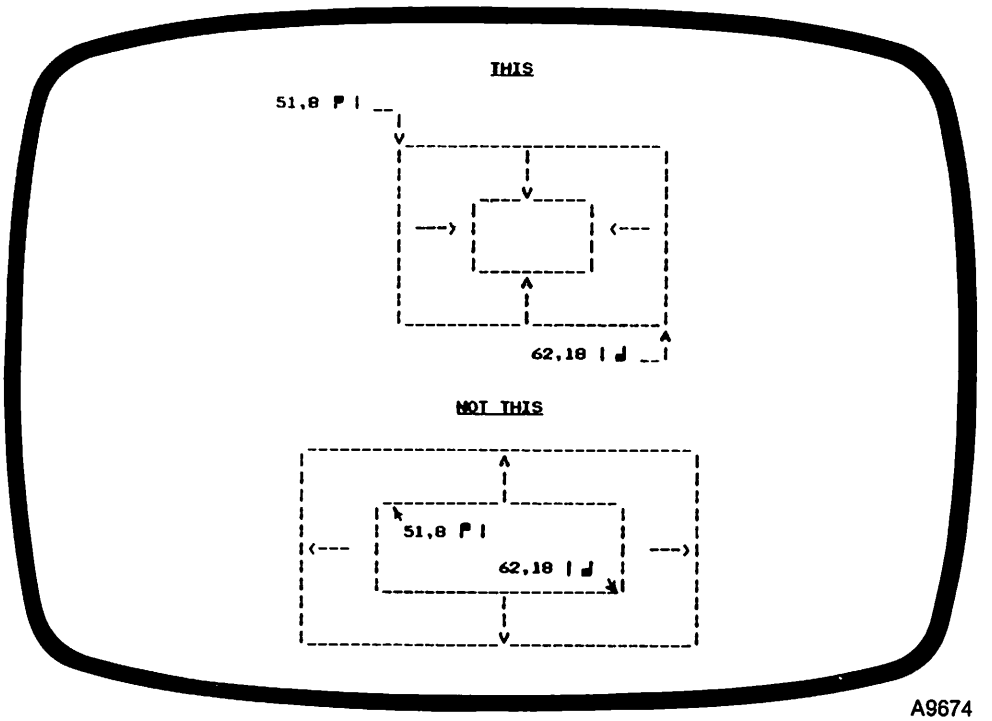


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FIGURE 7.7 — Drawing A Box

The Editor does not let the width (thickness) of the sides of a box to EXCEED the box perimeter defined by BEGIN and END. The Editor does let you completely fill a box in, however.

To draw a box, follow these steps:

STEP 1 — Set the WIDTH.

STEP 2 — Move the cursor to the position where you want a corner of the box to appear. Set BEGIN.

STEP 3 — Move the cursor to the position where you want the opposite corner of the box to appear. Set END.

STEP 4 — Set the FG and BG colors desired.

STEP 5 — Press DR BOX.

The Editor fills in the other corners of the box and draws the box to the specified width.

NOTE

Boxes do not appear on Periodic Logs.

When removing a box, you must specify the WIDTH, BEGIN, and END points as above. Just like removing a line, the Editor erases whatever characters are

drawn in (or are currently occupying) the character spaces defined by WIDTH, BEGIN, and END, replacing them with whatever BG color is currently on the Status line.

To remove a box, follow these steps:

STEP 1 — Set the WIDTH.

STEP 2 — Move the cursor to the position (corner) where you want the erasing to start. Set Begin.

STEP 3 — Move the cursor to the position (opposite corner) where you want the erasing to end. Set END.

STEP 4 — Set the FG and BG colors desired.

STEP 5 — Press RM BOX.

The Editor now erases the box between the BEGIN and END points specified. (It fills that area in with spaces of the current BG color as on the Status line.)

INSERT A SYMBOL. You can insert any existing symbol from the symbol library onto the current template (the static background of the Graphic display). To view the symbols already in the symbol library, perform the REVIEW SYMBOLS function (choice J from the Graphic Editor Menu). Once you insert any symbol onto the template from the symbol library, you can still change it on the template without affecting it in the library.

To insert a symbol onto the graphic template, follow these steps:

STEP 1 — Move the cursor to the position where you want the symbol to appear.

STEP 2 — Set the FG and BG colors desired.

STEP 3 — Set BLINK ON or OFF as desired.

STEP 4 — Press the IN SYM key.

The Editor temporarily replaces the Status line with:

SYMBOL NAME ?

followed by a prompt.

STEP 5 — Enter the name of the symbol you want to insert. Press ENTER.

The Editor now retrieves the symbol you named from the library and inserts it at the current cursor position. When done, the Status line reappears at the top of the CRT.

A symbol can contain predefined changes to color and/or blinking that can override selections you set up in the beginning steps above. Such predefined changes contained within the symbol are lost after it appears on the template.

DEFINE A SYMBOL. You can define your own symbols and add them to the symbol library using the DEFINE SYMBOL function (choice H on the Graphic Editor Menu). Or you can define your own symbols while in the EDIT GRAPHIC function as below. By defining your symbols during the EDIT GRAPHIC function you can see the surrounding graphic template at the same time.

To define a symbol while in the EDIT GRAPHIC function, follow these steps:

STEP 1 — Move the cursor to the position where you want the symbol to appear on the template. The Editor does NOT save this cursor position in the symbol library and it has no effect when you want to insert this symbol elsewhere.

STEP 2 — Press the DF SYM key. The Editor temporarily replaces the Status line with:

SYMBOL NAME ?

followed by a prompt.

STEP 3 — Enter the name of the symbol you want to create. Press ENTER.

The Editor now displays: DEFINE SYMBOL in the upper right corner of the CRT. This tells you to begin drawing your symbol.

While entering your symbol there is no Status line on the CRT. Before you begin set the desired FG and BG colors. If you are using any of the Special Characters, lock the SPEC CHAR key.

Each symbol can contain a maximum of 120 characters. Try to draw your symbols with as few keystrokes as possible so you do not run out of space. If you reach the limit while drawing, the message: LIMIT 120 CHARACTERS, ENTER TO SAVE appears at the upper right corner of the CRT.

If you do not like the symbol drawn and do not want to add it to the symbol library, press ESCAPE. The SYMBOL NAME ? and prompt reappear at the top of the CRT and you can start over. If you DO like the symbol drawn and DO want to add it to the symbol library, press ENTER. The SYMBOL NAME ? and prompt appear again as above. At this point you can either create another symbol or go on to some other task or menu function.

Colors, blinking, cursor direction, and character height in effect BEFORE the symbol name prompt appears on the CRT do NOT go into the symbol library, even though they DO affect the appearance of your symbol when you draw it. To add such additional features to your symbol (and to the symbol library), you must enter them AFTER you enter your symbol name.

To go on to another task or function, press ENTER when the SYMBOL NAME ? prompt is on the CRT. The Editor stores your symbol (if any) and then replaces the Status line.

NOTE

The _| or |‾ marks at the corner of each symbol (as shown in the symbol library — See the REVIEW SYMBOLS function) point to the starting character space of that symbol. This point appears as the blinking + (cursor) on the template.

CREATE DYNAMIC ITEMS. Dynamic items are those items on the graphic template that change as their associated tags change. Each dynamic item corresponds to a tag you previously defined for the OIU (Section VI). To create a dynamic item, you must know its tag, its purpose in your control scheme, and its function block specs (Section V). You cannot create a dynamic item for any undefined tag. Consult your configuration worksheets to enter this information into the Graphic Editor when creating dynamic items.

You can create (and edit) four types of dynamic items on any graphic template: value, symbol, bar, and pipe. To abort the entry of any dynamic item, press ESCAPE for any prompt. This prevents the item from going into Editor memory.

NOTE

Each dynamic value item uses 1% of the graphic capacity of any template.

A value item does not display any tag name, descriptor, or which parameter of a Station tag it represents on the Graphic display. You must enter such identification when drawing the template. Use a convention such that all items in your plant system have a uniform identification scheme.

Specify Dynamic Values. You can create dynamic values for all Real, Station, Boolean, and RCM tags. For Station and RCM tags you can create the item to let the operator take control action from the Graphic display. To include this feature, remember to reserve space for the control element to appear using the DR STA and RM STA keys.

You can display the value of any tag on a template. Each value item can display one of the following:

- Process Variable (PV)
- Setpoint (SP)
- Control Output (CO)
- Ratio Index (RI)
- Station Mode
- Station Status
- Analog Single Point
- Remote Control Memory
- Digital Point.

NOTE

Periodic Logs can also show data accumulated over time configured in the OIU as Suffix Tags (Section IX). Graphic displays appearing on the CRT cannot display suffix values.

Each value item can contain one (or more) of the following data:

- Value
- Engineering Units (if they apply to that value type)
- Alarm Indicator
- Control Select Number (if you want the operator to be able to take control action).

You choose which of these data to include in the value item by selecting the proper value format (See pages 20 - 22 and the EDIT/REVIEW VALUE FORMATS function later in this Section). The format also lets you know where each data item is positioned on the CRT relative to the cursor and the color in which each item appears. You can create (or edit) up to nine value formats before editing a graphic template using them (See EDIT/REVIEW VALUE FORMATS).

To create a dynamic value for a REAL or STATION tag, follow these steps:

STEP 1 — Move the cursor to the position on the CRT where you want the value to appear. The coordinates for this position label the dynamic value in the OIU. The coordinates serve as its address on that template. This position cannot match that of an existing item.

NOTE

To edit (or delete) an existing dynamic value, you must position the cursor at the starting coordinates for that item (its address). You can NOT assign any dynamic item to the SAME coordinates as another dynamic item.

STEP 2 — Press ED DYN. The Editor temporarily replaces the Status line with the following prompt line:

DYNAMIC ITEM: TYPE? (V,S,B,P,' ' TO DELETE).

asking you what type of dynamic item you want to create (V = value; S = symbol; B = bar; P = pipe; ' '= delete the dynamic item already at these coordinates. (Leaving this field blank and pressing ENTER deletes the item.)

STEP 3 — Enter V and press ENTER. A new prompt line now overwrites the previous one, asking for a tag name:

VALUE ITEM: TAG NAME?

STEP 4 — Enter the tag name you want this dynamic value to represent. Press ENTER. The next prompt line now asks for the format number:

FORMAT NUMBER? (0..9)

NOTE

Different layouts for values are part of the Graphic Editor. You can review value formats using the EDIT/REVIEW VALUE FORMATS function from the Graphic Editor Menu. The Editor stores all predefined formats under format number 0. The Editor stores your defined formats under format numbers 1 - 9.

STEP 5 — Enter the number of the format you want to use. The number you enter MUST match a previously defined format number. (If you are unsure of which to use, enter **0.)**

NOTE

If this value item has a control selection number (1-99), all data in its format appear on the CRT THREE character spaces to the RIGHT of the normal position. This makes room for the Control Select number(s) to appear on the Graphic display during operation.

STEP 6 — Press ENTER.

If you are creating a value for a REAL tag, the OIU now returns the Status line to the CRT and the dynamic value just created appears on that template. You can go on to another dynamic item or perform some other task or function. If you are creating a value for a STATION tag, proceed to Step 7. The Editor displays a new prompt line:

STATION PARAMETER? (PV, SP, CO, RI, MO, ST).

STEP 7 — Enter the 2-letter code for the Station parameter you want this dynamic value to represent (PV, SP, CO, RI, ST = Station Status, or MO = Station Mode). Press ENTER.

STEP 8 — The Editor now writes the next prompt line:

SUFFIX? (TOT, AVG, MIN, MAX, ' ' FOR TAG)

asking for a suffix type.

NOTE

The ' ' in the parentheses of this prompt shows you can exit this prompt (skip it) by leaving the field blank and then pressing ENTER.

STEP 8a — If you want this value to show the current value of its tag, leave this prompt blank and press ENTER. Proceed to Step 10.

STEP 8b — If you want this value to show a suffix value of its tag (used on a Periodic Log), enter the desired 3-letter suffix type. Press ENTER.

> **NOTE**
>
> **During operation suffix values do NOT appear on Graphic displays. Suffix values appear only on Periodic Logs or on hard copies of Periodic Logs.**

STEP 9 — The Editor now overwrites the previous prompt line with:

SUFFIX? (HR, SFT, DAY, WK, MON)

(XXX = your suffix type entry above) asking for a suffix period.

STEP 9a — Enter the suffix period. Press ENTER.

> **NOTE**
>
> **Before you can enter any suffix response here suffix tags must be already defined under the DEFINE SUFFIX TAGS function of Logging Configuration (Section IX). Otherwise, the Editor displays the error message: SUFFIX NOT DEFINED IN THIS OIU on the upper right of the CRT and rewrites the prompt line of Step 8. You must either enter a defined suffix or go to the DEFINE SUFFIX TAGS function of Logging Configuration (Section IX) to continue.**

STEP 10 — The Editor now writes the next prompt line:

CONTROL WANTED? (Y/N)

STEP 10a — If you want the operator to be able to take control action from this station while viewing this Graphic display, enter **Y**. Press ENTER. Proceed to Step 12.

STEP 10b — If you want the operator to be able only to monitor this station while viewing this Graphic display, enter **N**. Press ENTER.

STEP 11 — The Editor now replaces the Status line and the value just created now appears on the CRT. You can now go on to create more dynamic items or proceed to some other task or menu function.

STEP 12 — The Editor now overwrites the previous prompt line with:

CONTROL SELECT NUMBER? (1..99)

Enter the desired control select number for this dynamic value. Press ENTER. The Editor replaces the Status line and the value just created then appears at the designated cursor coordinates on the CRT. You can now go on to create more dynamic items or proceed to some other task or menu function.

NOTE

The control select number appears (in RED) in front of (to the left of) the dynamic value during operation. The operator can enter this number to access any control station of this Graphic display in the lower right corner of the CRT. The control select number can be any between 1 and 99 (including a matching number of any other value item OF THE SAME Tag) but dynamic values of DIFFERENT tags MUST have different control select numbers.

To create a dynamic value for a BOOLEAN or RCM tag, follow these steps:

STEP 1 — Move the cursor to the position where you want the value to appear. These coordinates are the address for that value (as for creating values for Station or Real tags).

STEP 2 — Press ED DYN. The Editor replaces the Status line with a prompt line asking for dynamic item:

DYNAMIC ITEM: TYPE? (V, S, B, P, ' ' TO DELETE).

STEP 3 — Enter **V** and press ENTER. A new prompt line overwrites the previous one, asking for a tag name:

VALUE ITEM: TAG NAME?

STEP 4 — Enter the tag name you want this value to represent. Press ENTER. The next prompt line asks for the format number:

FORMAT NUMBER? (0..9).

STEP 5 — Enter the desired format number (as for a Station or Real tag dynamic value). If you are unsure of the proper number to use, enter **0**.

If you are creating a value for a BOOLEAN tag, the Editor now replaces the prompt with the Status line and the value just created appears on the CRT. You can go on to create more items or proceed to some other task or menu function. Otherwise, proceed to Step 6.

STEP 6 — The Editor then writes a new prompt line:

CONTROL WANTED? (Y/N).

STEP 6a — If you want the operator to be able to take control action from the Remote Control item while viewing this Graphic display, press **Y**. Press ENTER. Proceed to Step 8.

STEP 6b — If you want the operator to be able only to monitor this RCM element while viewing this Graphic display, press **N**. Press ENTER.

STEP 7 — The Editor now replaces the Status line and the value just created now appears on the CRT. You can go on to create more dynamic items or proceed to some other task or menu function.

STEP 8 — The Editor now overwrites the previous prompt line:

CONTROL SELECT NUMBER? (1..99).

Enter the desired control select number for this dynamic value. Press ENTER. The Editor replaces the Status line and the value just created now appears on the CRT. You can go on to create more dynamic items or proceed to some other task or menu function.

Specify Dynamic Symbols. You can create dynamic symbols for all types of tags. When creating dynamic symbols, you combine previously defined symbols from the symbol library with FG and BG colors. You can select a different symbol and color for each of the four symbol change conditions for a tag (low range, low range in alarm, high range in alarm, and high range).

Pressing ESCAPE at any prompt aborts any symbol entry (as in creating dynamic values). Use some plant convention in creating dynamic symbols so that the operator can easily understand symbol shape or color change.

NOTE

Each dynamic symbol uses 2.4% of the capacity of any Graphic display.

NOTE

Symbols do not appear on Periodic Logs.

To create a dynamic symbol for a Real or Station tag, follow these steps:

STEP 1 — Move the cursor to the position where you want the symbol to appear. (The coordinates of this position form the address of this symbol.)

STEP 2 — Press ED DYN. The Editor replaces the Status line with a prompt line asking you what type of dynamic item you want to create:

DYNAMIC ITEM: TYPE? (V, S, B, P, ' ' TO DELETE).

STEP 3 — Enter **S** and press ENTER. The Editor overwrites the previous prompt line with a new one asking for a tag name:

DYNAMIC SYMBOL: TAG NAME?

STEP 4 — Enter the name of the tag your symbol represents. Press ENTER. The Editor now writes ONE of the two prompt lines below, depending on the tag type for which you are currently creating a symbol.

— — FOR A STATION TAG — —

The Editor writes the following prompt line asking for a Station parameter:

STATION PARAMETER? (PV, SP, CO).

STEP 4a — Enter the 2-letter Station parameter. Press ENTER. Proceed to Step 5.

— — FOR A REAL TAG — —

The Editor writes the following prompt line asking for a boundary value (separating LOW and HIGH tag values):

RANGE BOUND?

STEP 4b — Enter the desired value that separates the tag low and high values. Press ENTER. The Editor now writes one prompt line for symbol and color change based on each of the four tag values (LOW, LOW IN ALARM, HIGH IN ALARM, and HIGH).

STEP 5 — Enter the name of the symbol for the tag Low value. Set the FG and BG colors for this value. Press ENTER. (The symbol whose name you entered now appears on the template in the colors you set.)

NOTE

You must enter the name of a previously defined symbol in this prompt. Otherwise, you get an error message.

STEP 6 — Enter the name of the symbol for the tag LOW IN ALARM value. Set the FG and BG colors for this value and press ENTER. (This symbol now appears on the template.)

STEP 7 — Enter the name of the symbol for the tag HIGH IN ALARM value. Set the FG and BG colors for this value and press ENTER. (This symbol now appears on the template.)

STEP 8 — Enter the name of the symbol, for the tag HIGH value. Set the FG and BG colors for this value and press ENTER. (This symbol also appears on the graphic template.) The Editor now returns the Status line to the CRT and you can go on to more dynamic items or proceed to other tasks or menu functions.

To create dynamic symbols for a Boolean or RCM tag, follow these steps:

STEP 1 — Move the cursor to the position where you want the symbol to appear. (This is the address of that symbol.)

STEP 2 — Press ED DYN. The Editor now replaces the Status line with the item type prompt.

STEP 3 — Enter **S**. Press ENTER. The Editor now overwrites the item type prompt with the tag name prompt.

STEP 4 — Enter the name of the tag the symbol represents. Press ENTER. The next prompt line asks for the ZERO value (0) of that tag:

VALUE=0 SYMBOL?

STEP 5 — Enter the name of the symbol to show the tag 0 value. Enter the 0 value FG and BG colors. Press ENTER. The next prompt asks for the 0 ALARM value:

ALARM, VALUE=0 SYMBOL?

STEP 6 — Enter the name of the symbol to show the tag 0 Alarm value. Enter the FG and BG colors. Press ENTER. The next prompt asks for the 1 ALARM value:

ALARM, VALUE=1 SYMBOL?

STEP 7 — Enter the name of the symbol to show the tag 1 Alarm value. Enter the FG and BG colors. Press ENTER. The last prompt asks for the ONE VALUE (1) of that tag.

STEP 8 — Enter the name of the symbol to show the tag 1 value. Enter its FG and BG colors. Press ENTER. The Editor now returns the Status line to the CRT. You can go on to more dynamic items or proceed to some other task or menu function.

Specify Dynamic Bars. You can only create dynamic bars for Real or Station tags. A dynamic bar is actually a line that can grow or shrink based on its changing tag value. You can create dynamic bars that are either horizontal or vertical; never diagonal.

A dynamic bar can grow (or shrink) UP, DOWN, LEFT, or RIGHT. The other elements on the template and/or the CRT itself are the only bounds to the bar width. To abort any dynamic bar entry, press ESCAPE at any prompt as below.

NOTE

Periodic Logs ignore dynamic bars.

Dynamic bars occupy 2.2% of the graphic capacity of any template. To create a dynamic bar, follow these steps:

STEP 1 — Set the WIDTH of the bar. Set the BEGIN, and END coordinates (including plot points) for the space you want the bar to occupy on the template (like drawing a line).

NOTE

The BEGIN point is the base of the dynamic bar while the END point is the portion of the bar that grows or shrinks.

STEP 2 — Set your desired FG and BG colors for the bar.

STEP 3 — Move the cursor to the BEGIN coordinates set for the bar. (This is the address of this bar.) This must not match the coordinates of some other existing item.

STEP 4 — Press ED DYN. The Editor now replaces the Status line with the item type prompt.

STEP 5 — Enter **B**. Press ENTER. The tag name prompt now appears.

STEP 6 — Enter the tag name the bar represents. Press ENTER.

The Editor now writes ONE of the two prompt lines on the next page, depending on the tag type for which you are currently creating a bar. If the current tag is Real, proceed to Step 6b.

— — FOR A STATION TAG — —

The Editor writes the following prompt line asking for a Station parameter:

STATION PARAMETER? (PV, SP, CO).

STEP 6a — Enter the 2-letter Station parameter. Press ENTER.

— — FOR A REAL TAG— —

The Editor writes the following prompt line asking for the ZERO (0) value of the bar (its base value):

ZERO?

NOTE

Normally, this is the same as the 0 value for this tag in its function block specs (Section V).

STEP 6b — Enter the ZERO value (Enter **0**) for this tag. Press ENTER. Now the Editor writes in the following prompt line asking for the SPAN value of the tag.

NOTE

Normally, this is also the same as the Span value in the function block specs for this tag.

STEP 7 — Enter the Span value for this tag (three integers). To use the Zero & Span values of the tag function block specs, enter **0**. (In this case the Editor ignores the value entered in Step 6b.) To have a bar grow as the tag value DECREASES, enter a negative Span value (–###). To have a bar grow as the tag value INCREASES, enter a positive Span value (###). Press ENTER.

The Editor now returns the Status line to the CRT and displays the full length bar. You can go on to more dynamic items or proceed to some other task or menu function.

The Editor draws the dynamic bar in the foreground color, using the background color in those spaces through which the bar grows or shrinks. If the BG color of the bar is identical to an adjacent portion of the template there is no unusual effect.

A bar cannot share character spaces with anything other than lines, boxes, or other bars. Within character spaces a bar cannot intersect any of these items. The bar must use the same FG and BG colors as any item with which it shares character spaces.

NOTE

A bar cannot share character spaces with dynamic pipes because dynamic pipes change colors.

Figure 7.9 (next page) shows some examples of dynamic bars.

For any dynamic bar, WIDTH is the number of plot points in the direction perpendicular to that of its growth or shrinkage. So, bar width is at right angles to bar growth. The width is either UP from BEGIN and END or TO THE RIGHT of BEGIN and END.

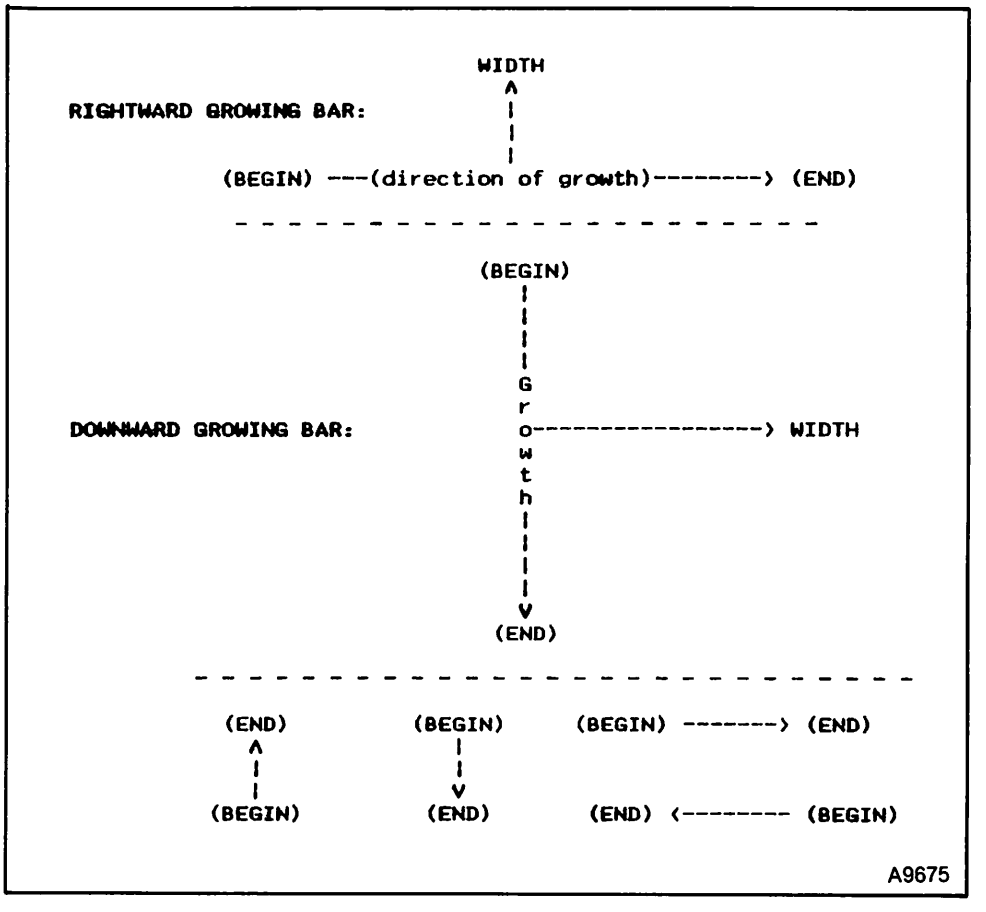


FIGURE 7.8 — Bar Growth and Width

The BEGIN point specifies a corner of the edge of the bar corresponding to its ZERO value. The bar grows FROM the BEGIN point (and shrinks from the END point). For any dynamic bar growing UP or DOWN the ZERO edge has the BEGIN point at its LEFT corner and is WIDTH plot points wide. For any dynamic bar growing LEFT or RIGHT the ZERO edge has the BEGIN point at its BOTTOM and is WIDTH plot points high.

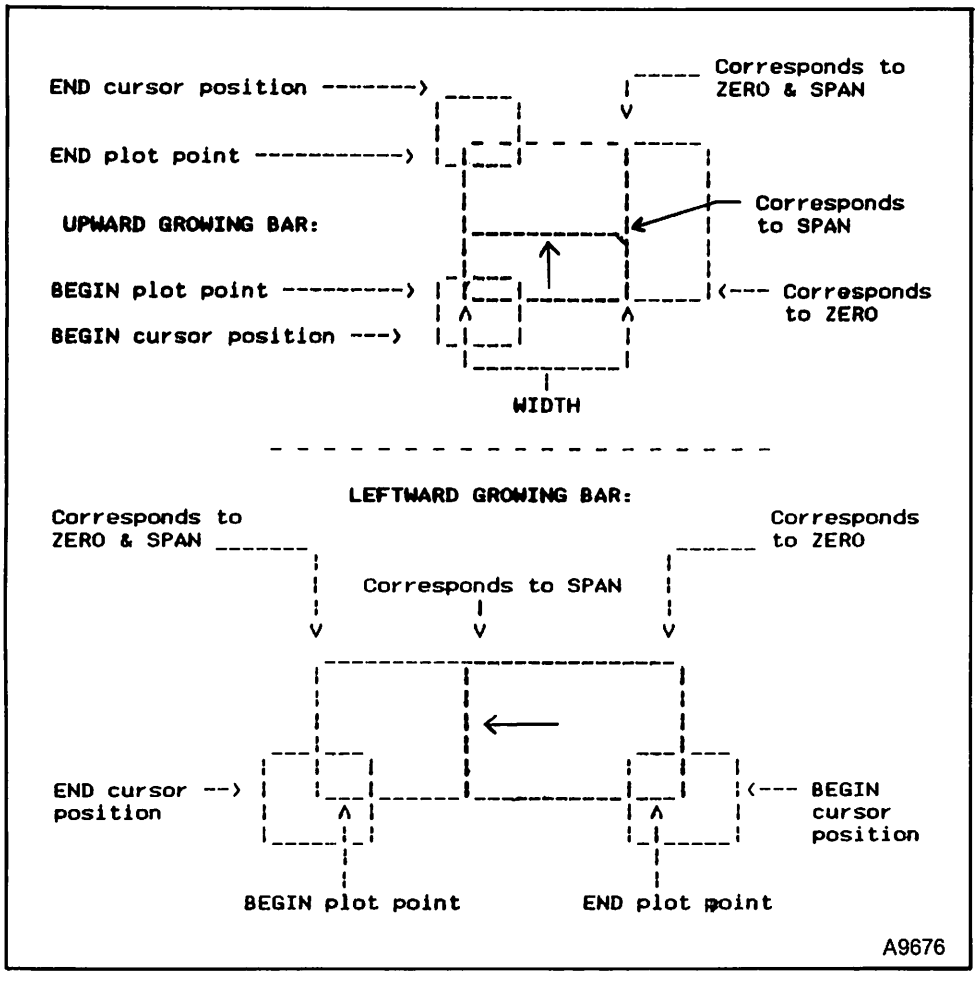


FIGURE 7.9 — Examples of Dynamic Bars

Specify END to indicate a corner of the edge of the bar corresponding to the ZERO PLUS SPAN value. The END corner is the corner adjacent to BEGIN and is ALONG an edge in the direction of bar growth. END is NOT the corner diagonally opposite from BEGIN.

For an upward growing bar, END must be directly above BEGIN. For a downward growing bar, END must be directly below BEGIN. For a rightward growing bar, END must be directly to the right ofBEGIN. For a leftward growing bar, END must be directly to the left of BEGIN. Any other placement of END results in the error message: OBLIQUE BAR. (Re-enter the proper END coordinates.)

Zero is the tag value causing the bar to disappear (the Editor erases it completely). If the Span value is positive, any tag value less than the Zero value

causes the bar to disappear. If the Span value is negative, any value greater than the Zero value causes that bar to disappear.

Span is the tag value change corresponding to the full growth (or shrinkage) of the bar. Zero Plus Span is the tag value causing the maximum bar growth (or shrinkage) from BEGIN to END (or END to BEGIN). If the current tag value is between Zero and Span, the bar grows from BEGIN for a proportional distance toward END (or shrinks from END toward BEGIN).

The dynamic bar item is all that appears. You must enter the other identification (tag name, etc.) onto the template separately so that the operator can easily understand the meaning of that bar.

Specify Dynamic Pipes. You can create dynamic pipes for all types of tags. A dynamic pipe is actually a line that changes color based on its changing tag value. You can create dynamic pipes that are either horizontal or vertical; never diagonal.

You can combine dynamic pipe systems of up to ten segments in length. A pipe segment is a portion of a pipe system that you define by setting its BEGIN, END, and WIDTH. You can create pipe segments of different widths and either connect them or not as desired. Fixed graphic items can also separate the various pipe segments as desired. Two or more segments can be adjacent to each other forming a line that turns (makes an angle).

NOTE

Periodic Logs ignore dynamic pipe systems. A pipe system uses 1.4% of the graphic capacity of any template plus 0.6% for each segment. For example, a one-segment pipe uses 1.4% + 1 × 0.6% = 2.0%. A ten-segment pipe uses 1.4% + 10 × 0.6% = 7.4%.

A dynamic pipe can be one color when its corresponding tag value is below its specified boundary value and a different color when its tag value is above the specified boundary value.

NOTE

A dynamic pipe system can NEVER exceed ten segments.

To create a dynamic pipe system for a Real or Station tag, follow these steps:

STEP 1 — Move the cursor to the position where you want the BEGIN point of the first pipe segment to be. (This is the address of that pipe system.)

NOTE

This position can be anywhere on the template other than a position already occupied by some other item. Use the convention of positioning the cursor to the BEGIN point of the FIRST segment of that pipe system.

STEP 2 — Press ED DYN. The Editor replaces the Status line with the item type prompt.

STEP 3 — Enter **P**. Press ENTER. The Editor replaces the previous prompt line with the tag name prompt.

STEP 4 — Enter the tag name of the tag the pipe system represents. Press ENTER. The Editor overwrites the previous prompt with one of the two prompt lines below depending on the tag type for which you are currently creating a pipe system. If the current tag is Real, proceed to Step 5.

— — FOR A STATION TAG — —

The Editor writes the Station parameter prompt.

STEP 4b — Enter the 2-letter Station parameter (PV, SP, or CO). Press ENTER.

— — FOR A REAL TAG — —

The Editor writes the boundary value prompt (asking for a value separating the LOW and HIGH tag values).

STEP 5 — Enter the desired value that separates the tag low and high values. Press ENTER. The next prompt line asks for the LOW range (value) colors.

STEP 6 — Enter the desired FG and BG colors for the tag LOW values. Press ENTER. The next prompt asks for the HIGH range colors.

STEP 7 — Enter the desired FG and BG colors for the tag HIGH values. Press ENTER. The next prompt line tells you the total number of segments yet available for the current pipe system and asks you to press ENTER to begin specifying the segments, or ESCAPE to abort the task:

SEG AVAIL: ## 'ENTER' TO START, 'ESC' TO ABORT.

NOTE

The number of segments starts at ten unless the number of dynamic items already on the current template restricts it. When editing an existing pipe system the Editor shows this as:

 # SEG TO GO: ##.

This is the number of segments specified for that pipe system at the last edit and remain for further editing. (See the EDIT DYNAMIC ITEMS task.)

STEP 8 — Press ENTER. The Editor now displays a simplified Status line for the first segment showing the current cursor, BEGIN, and END coordinates and plot points, the segment WIDTH, and the SEGMENT #.

STEP 9 — Set the WIDTH, and BEGIN and END coordinates and plot points for this segment as if drawing a line. Press ENTER when done. The Editor then draws the pipe segment on the template and replaces the modified Status line with a prompt showing the number of segments yet available (or TO GO if you are editing an existing pipe system). This prompt line also asks if you want to specify another segment, end the current system, or delete the segment just entered:

NEXT, END, DELETE LAST SEGMENT (N,E,D) # SEG AVAIL: #.

STEP 10 — To go on to the next segment, enter **N**. Press ENTER. The Editor returns an updated version of the simplified Status line to the CRT. Repeat Steps 9 and 10 for each pipe segment you want to specify (up to a total of ten).

STEP 11 — When done specifying all desired segments of the current dynamic pipe system, enter **E** and press ENTER. The Editor now returns the normal Status line to the CRT. You can go on to more dynamic items or proceed with another task or menu function.

To create a dynamic pipe system for Boolean or RCM tags, follow these steps:

STEP 1 — Move the cursor to the position where you want the first segment of the pipe system to start (the address of this system).

STEP 2 — Press ED DYN. The Editor replaces the Status line with the item type prompt.

STEP 3 — Enter **P** and press ENTER. The Editor overwrites the previous prompt with the tag name prompt.

STEP 4 — Enter the tag name the pipe system represents. The Editor replaces the previous prompt with one asking for the colors for the Zero (0) tag state:

VALUE=0 COLOR?

STEP 5 — Enter the FG and BG colors for the tag ZERO state. Press ENTER. The Editor overwrites the previous prompt with the One (1) tag state color prompt.

STEP 6 — Enter the FG and BG colors for the tag ONE state. Press ENTER. The Editor now displays the number of segments yet available (or TO GO if editing an existing pipe system). This prompt also asks you to press either ENTER or ESCAPE.

STEP 7 — Press ENTER. The simplified Status line for the first segment now appears on the CRT.

STEP 8 — Set the WIDTH, and BEGIN and END (and plot) points for this segment as if drawing a line. Press ENTER when done.

The Editor then draws this segment on the template. The NEXT/ END/DELETE prompt now appears, showing you the number of segments yet available (or TO GO).

STEP 9 — To specify another segment, enter **N** and press ENTER. The updated, simplified Status line reappears. Repeat Steps 8 and 9 for each segment you want to specify (up to a total of ten).

STEP 10 — Enter **E** when done specifying all segments of the current pipe system. Press ENTER. The normal Status line reappears on the template. You can go on to more dynamic items or proceed to another task or menu function.

The Editor draws your pipe segments in the specified foreground color through spaces in the specified background color. If the background color is identical to the BG color of an adjacent portion of the template, there is no unusual effect.

If the pipe shares a character space with another pipe, bar, line, or box, the color change of the pipe can interfere with the other item or the other item can interfere with the pipe.

Specify BEGIN and END to show the ENDS of the LEFT edge of any vertical pipe segment or the BOTTOM ends of a horizontal segment. Specify WIDTH to show the number of plot points of width (at right angles to the length) of that segment. Remember to enter the fixed identification of all pipe segments (tag name, etc.) to let the operator know the meaning of pipe color change.

EDIT DYNAMIC ITEMS. To edit any existing dynamic item, you must know its address (starting coordinates used when the you created the item on a template). The Dynamic Item List shows all dynamic item addresses for each graphic template under its SCREEN POSITION column. (See the SHOW DYNAMIC ITEM LIST function of the Graphic Editor Menu.)

To edit any existing dynamic item, follow these steps:

STEP 1 — Access the graphic template containing the dynamic item(s) you want to edit. (See the EDIT GRAPHIC function of the Graphic Editor Menu.)

STEP 2 — Move the cursor to the address of the item you want to edit.

STEP 3 — Press ED DYN. The Editor replaces the Status line with the item type prompt line. The prompt should already contain the letter code for that item.

NOTE

If there is no letter in the prompt, you did not move the cursor to the proper address coordinates for the item you want to edit. Check the address and try again.

STEP 4 — If the proper letter appears in the prompt, press ENTER. The appropriate prompt lines appear for the specific dynamic item you are editing. The prompt lines contain the existing parameters for the dynamic items.

STEP 5 — Work through the parameters and prompt lines using the ENTER key until you reach the part you want to edit. Make any change(s) as if creating new dynamic items.

Follow these additional steps for each specific dynamic item:

— — FOR DYNAMIC VALUES, SYMBOLS, and BARS — —

STEP 5a — Delete the item or change it to a different item type. Or enter a different response to the appropriate prompt then when originally creating the item.

When re-editing an item the Editor fills each prompt with the previous response (from the last edit). You can either change the response and press ENTER or you can accept the response (leave it as is) and press ENTER. When re-editing and you press ESCAPE, any response stays as is (from last edit) regardless of which prompts you answered differently.

— — FOR DYNAMIC PIPE SEGMENTS — —

STEP 5b — Accept or modify prompt responses as above. To leave a segment as is, press ENTER without changing its WIDTH, BEGIN, or END parameters. Go on to the next segment.

STEP 5c — Change a segment by changing its WIDTH, BEGIN, and END parameters. Go on to the next segment.

STEP 5d — Delete a segment by pressing ENTER without changing segment parameters and then enter **D** at the DELETE prompt. Go on to the next segment.

STEP 5e — Repeat steps 5b to 5d for each segment you want to edit. When done all segment editing enter **E** at the END prompt. The Editor does not change any remaining unedited segments.

STEP 6 — Repeat Steps 1 through 5e for each dynamic item you want to edit. When done, proceed to some other task or menu function.

DELETE DYNAMIC ITEMS. To delete any dynamic item, you must know its address. (View the Dynamic Item List. See the SHOW DYNAMIC ITEM LIST function of the Graphic Editor Menu.)

To delete dynamic items, follow these steps:

STEP 1 — Access the graphic template containing the dynamic item(s) you want to delete.

STEP 2 — Move the cursor to the address of the dynamic item you want to delete.

STEP 3 — Press ED DYN. The item type prompt replaces the Status line. The prompt should already contain the proper letter code of the item type you want to delete.

NOTE

If the prompt does not contain the proper letter code, you did not position the cursor to the correct item address. Check the address and try again.

STEP 4 — If the proper letter code is in the prompt, enter a space (or press CLEAR) and then press ENTER. The Editor then deletes that dynamic item from the template.

NOTE

If the item you want to delete is a symbol, the Editor does not erase it from the template. However, it becomes a fixed item, losing its dynamic status.

STEP 6 — Repeat steps 1 through 6 for each dynamic item you want to delete. When done, proceed to another task or menu function.

SAVE A DISPLAY. Saving a display stores it (records it) on the OIU hard disk. When you save Graphic displays they become part of the List of Graphics that the Graphic Editor maintains. (You must perform certain steps to remove any saved graphic from this list (See the DELETE GRAPHIC function.)

When you request any graphic template for editing (the EDIT GRAPHIC function) the Editor displays the most recently saved version of that template. Remember, the OIU stores only the most recently entered version of any graphic template on its hard disk.

You can save a Graphic display at any time that its template is currently on the CRT. When creating any template it is recommended that you habitually save your Graphic display from time to time while building more and more items into it. If you create a significant portion of your graphic (saving it periodically) and then make an error, you need only re-access the saved version to resume drawing. This eliminates having to begin the template all over again.

Whenever you save any template the Editor automatically erases the edit versions of all dynamic values, bars, and pipes. It saves your display and the list of dynamic items at the same time. Then it redraws the edit version of those dynamic items.

The Editor never automatically saves any display. You can only save displays by pressing the SAVE key. Notice that you also cannot accidentally leave any template (to perform some other function or to view another display) without saving it. If you try to do so, the Editor displays the Exit prompt (See below).

To save a Graphic display, follow these steps:

STEP 1 — Ensure the template is in the **WR HOR** mode. (Check the Status line for >.) If the indicator shows **V**, press the WR HOR key.

STEP 2 — Press SAVE. The cursor scans the current template (You should see a series of quickly moving white marks traveling horizontally across the CRT from top to bottom (similar to when a display becomes printed).) The Editor records the contents of the CRT onto OIU hard disk.

STEP 3 — You can continue creating/editing when the cursor finishes its scanning. (The white marks disappear.)

NOTE

You can make further edits on this template. If you make further changes, you must save the display again to add the changes to OIU memory. To stop editing, press G MENU (See below).

To stop editing a display, press G MENU.

RETURN TO GRAPHIC EDITOR MENU. To return to the Graphic Editor Menu from the EDIT GRAPHIC function, follow these steps:

STEP 1 — Ensure the current template is in the **WR HOR** mode. (See above.)

STEP 2 — Press G MENU. The Editor now displays the EXIT prompt:

SAVE DISPLAY? (Y/N)

in the upper left corner of the CRT.

STEP 3 — If you made any changes to the current template or if this is the first time you are saving it, you MUST enter **Y**. Then press ENTER. Proceed to Step 4.

If you made no changes or you do not want to save this template, enter **N**. Then press ENTER.

If you entered **Y** in Step 3, the Editor scans the CRT and then saves the display. The prompt line:

'ENTER' TO MENU, 'ESC' TO CANCEL

appears in the upper right corner of the CRT.

NOTE

If you entered N in Step 3, the above prompt line appears immediately (The Editor does not save the display).

This prompt gives you a last chance to change your mind about staying at this display or exiting the EDIT GRAPHIC function.

STEP 4 — Press ENTER. The Graphic Editor Menu (See page 28) now reappears on the CRT. You can now select some other Graphic Editor Menu function (or even exit the Graphic Editor). (To stay at this display, press ESCAPE.)

Graphic Editor Functions

When you access the Graphic Editor Menu you can select the desired menu function. This portion of the Section explains the Graphic Editor configuration using the various functions from the Editor menu. Remember that the Edit Graphic function (choice A) actually consists of all the previously explained tasks. Therefore, refer back to those pages when following the Edit Graphics steps shown here. Unlock the CONF keyswitch before performing any graphic ending.

EDIT GRAPHIC. Use this function to create new graphic templates and to make any changes in existing templates. You can also define symbols while editing any template (This is in addition to the Define Symbol function from the menu).

Press **A** from the menu. The prompt: GRAPHIC NAME appears below the menu with the cursor positioned in the reply field to the right of the word NAME.

To create a new graphic, follow these steps:

STEP 1 — Leave the prompt blank and press ENTER. This tells the Editor you want to create a new Graphic display.

NOTE

If you enter the name of the Graphic display you want to create, the Editor displays the message: GRAPHIC UNDEFINED.

The Editor menu now disappears and a new screen appears with the words: GRAPHIC NAME in the upper left corner followed by a prompt.

STEP 2 — Enter the 6-character name you want to assign to this Graphic display. Press ENTER when done.

NOTE

This name also appears on the list of graphics (See the Show List of Graphics function) and serves to identify this particular template for all uses, including assigning it to a Periodic Log (Section IX).

If you do not enter a name for your new graphic here and then press ENTER, the OIU locks up and does nothing, ignoring further key inputs. To correct this, you must reset the OIU (Section XI). After resetting wait about two minutes before resuming further key inputs. (After the time indicator of the Title line resumes digit changing in its seconds area.)

After pressing ENTER in Step 2 above the Editor overwrites the previous prompt line with one asking for the descriptor for your new template:

GRAPHIC DESCRIPTOR.

STEP 3 — Enter the 17-character graphic descriptor that applies to your new template. Press ENTER when done.

NOTE

This descriptor also appears on the list of graphics. If you assign this Graphic display to a Periodic Log, the OIU automatically fills in the Graphic Descriptor field of that Log (with this descriptor data) when you enter the Graphic Name (See DEFINE PERIODIC LOGS in Section IX).

After pressing ENTER in step 3 above the prompt line disappears. The Editor replaces the previous screen with a Status line and a blank template for drawing your new Graphic display. The total drawing area is 80 characters wide by 47 characters high Figure 7.10 (next page) shows a typical blank template.

STEP 4 — Draw your graphic template using the various Edit Graphic tasks that apply.

STEP 5 — Return to the Graphic Editor Menu when done. Press G MENU. The Editor displays the EXIT prompt.

STEP 5a — If you want to save the current template, enter **Y** in this prompt and press ENTER. Proceed to Step 5b. If you do not want to save this template, enter **N** and press ENTER. Proceed to Step 5c.

STEP 5b — If you entered **Y**, the Editor scans the screen, saving the display. Then the EXIT prompt appears again. To remain in this function, press **N**. Proceed to Step 4. To return to the Graphic Editor Menu, press **Y**. Now proceed to some other menu function.

STEP 5c — If you entered **N**, the Editor displays the EXIT prompt again without saving the current template. To remain in this function, press **N**. Proceed to Step 4. To return to the Graphic Editor Menu, press **Y**. Now proceed some other menu function.

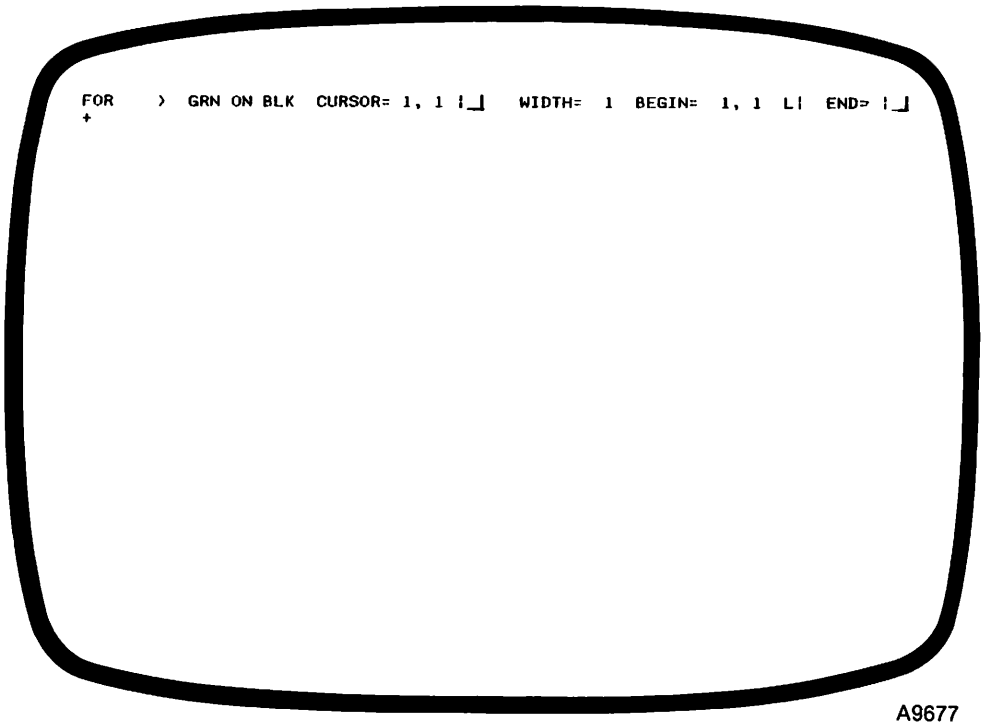


FIGURE 7.10 — Typical Blank Template With Status Line

To edit an existing Graphic display, follow these steps:

STEP 1 — Press **A** from the Graphic Editor Menu. The graphic name prompt appears below the menu.

STEP 2 — Enter the name of the graphic template you want to edit. Press ENTER. The menu screen disappears. In its place the words: GRAPHIC NAME appear at the upper left corner of the CRT followed by a prompt containing the graphic name just entered.

NOTE

If you enter an invalid graphic name or an undefined one, the Editor displays the error message: GRAPHIC UNDEFINED. To correct this, enter a valid or defined graphic name and press ENTER again.

STEP 3 — Press ENTER. The Editor overwrites the previous line with one showing the words: GRAPHIC DESCRIPTOR followed by a prompt containing the existing descriptor for that template.

STEP 4 — Press ENTER. The Editor now searches for this Graphic display and then displays it with its Status line on the CRT.

STEP 5 — Edit this graphic as desired (See pages ## - ##).

STEP 6 — Return to the Graphic Editor Menu when done editing (see Steps 5 through 5c under creating a new graphic).

As a reminder of how various graphic features relate to Periodic Logs, see Table 7.9 on the next page.

DELETE GRAPHIC. Use this function to erase any Graphic template from the OIU hard disk. (This is in addition to the Delete Dynamic Items task of the EDIT GRAPHIC function.) Press **B** from the Graphic Editor Menu. The words: GRAPHIC NAME appear at the bottom of the menu. Underneath this is a prompt.

To delete any existing graphic, follow these steps:

STEP 1 — Enter the name of the graphic template you want to delete in the prompt at the bottom of the menu. Press ENTER.

If this Graphic is NOT assigned to any Group display, the Editor removes it from OIU memory. When done the message: OPERATION COMPLETE appears at the upper right corner of the CRT. Proceed to Step 3.

If the Graphic you want to delete IS assigned to a Group, the Editor displays the message: GROUP(S) ASSIGNED, ENTER TO DELETE.

STEP 2 — Press ENTER again to delete this Graphic. Or press ESCAPE to keep the Graphic.

STEP 3 — Return to the Graphic Editor Menu either by pressing G MENU (and doing steps 5 - 5c under creating a new graphic) or by pressing ESCAPE. Pressing ESCAPE erases all prompts from below the menu so only the menu remains on the CRT. Proceed to some other menu function.

TABLE 7.9 — Graphics Summary For Periodic Logs

The Graphic Editor does NOT distinguish between Graphic displays and Periodic Logs.
You must assign previously defined Graphic displays to Periodic Logs using the Define Periodic Logs function, NOT the Graphic Editor.
Periodic Logs print out only ASCII text in BLACK and WHITE, regardless of colors existing on assigned Graphic displays.
Double height graphic characters print out as duplicate lines of SINGLE height characters on Periodic Logs.
Graphic display do NOT show suffix values, but such values DO appear on Periodic Logs.
Periodic Logs can display data accumulated over time (configured in the OIU as Suffix Tags).
When specifying dynamic values enter suffix values for a tag ONLY IF the Graphic containing the tag is to appear on a Periodic Log.
Periodic Logs ignore lines and boxes.
Periodic Logs IGNORE dynamic SYMBOLS, BARS and PIPE systems.

COPY GRAPHIC. You can always copy one graphic template to another. This creates two independent graphic templates. Any edits to one do not affect the other. To copy any existing graphic, follow these steps:

STEP 1 — Press **C** from the menu. The Editor asks for the name of the existing graphic you want to copy, displaying a prompt under the words:

FROM
GRAPHIC NAME

beneath the menu.

STEP 2 — Enter the name of the existing graphic template you want to copy. Press ENTER. The Editor now asks for the graphic name you want to use for the new graphic template, displaying a prompt under the words:

TO
GRAPHIC NAME

on the same lines beneath the menu (and to the right) as the previous words and prompt. The message: ENTER A GRAPHIC NAME also appears at the upper left of the CRT.

STEP 3 — Press FIELD to move the cursor to the TO prompt. Enter the name of the new graphic template. This name must NOT be one assigned to an already existing graphic template. Press ENTER.

The Editor now copies the existing graphic to the empty (new) graphic. When done, the message: OPERATION COMPLETE appears at the upper right of the CRT.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

ASSIGN GRAPHIC TO GROUP. You must assign Graphics to Groups to design a convention letting the operator access/scroll the various displays (Section IV).

Each Group display can have an assigned Graphic. You can assign the same Graphic display to any number of Groups. The tags in any Graphic does NOT restrict its assignment to any Group. There are two Graphic assignment strategies:

1) Graphic accessible from Group with configured tags
2) Graphic directly accessible from empty Group (Group with no configured tags).

Graphic Assignment Strategies. Since you can assign any Graphic to more than one Group, a Graphic can be a higher level summary display.

When you assign a Graphic to a Group having configured tags the operator accesses that Graphic by first accessing the Group. The operator can access the Group from an Area or from an Alarm Summary. Or he can access the Group by entering the Tag or Group name (See Section XI and Appendix A).

After accessing the desired Group the operator presses the GROUP/ GRAPHIC key to display the assigned Graphic. To return to the Group, he need only press the GROUP/GRAPHIC key again. Pressing the GROUP/GRAPHIC key one more time re-accesses the assigned Graphic display.

You can configure the OIU to let the operator access a Graphic display directly from an Area or Alarm Summary. To allow this, assign the Graphic to an empty Group. Even though the Group has no configured tags, the assigned Graphic can contain dynamic tag items.

Configure the particular Area to contain the empty Group having the assigned Graphic. You may still configure tags into this Area even though you do not configure tags into the empty Group. Using the Assign Graphic to Group function from the Editor menu, assign the Graphic to this empty Group. When the operator accesses this Area he can access the Graphic by entering the letter access code for the empty Group. Because this Group has no tags the assigned Graphic immediately appears on the CRT.

The operator can also access a Graphic from an Alarm Summary by entering a tag access letter for the Primary Group of that tag. To allow this, define an empty Group. Then define a tag to have this empty Group as its Primary Group. Then assign a Graphic to that Primary Group. When the operator accesses the Alarm Summary and enters the tag access letter the assigned Graphic immediately appears on the CRT.

Assignment Conventions. When assigning Graphics to Groups establish and follow a convention that lets the operator use the PREV, NEXT, and GROUP/ GRAPHIC keys to access/scroll through the Groups and Graphics with consistent results (Section XI and Appendix A). One such convention is that all Graphics be directly accessible. For this convention, assign all Graphics to empty Groups. You can define other Groups to have configured tags but these Groups can never have assigned Graphics. With this convention when the operator presses NEXT he goes from Group to Group, Group to Graphic, Graphic to Group, and Graphic to Graphic. Groups and Graphics appear all on the same access level. Pressing NEXT and then PREV returns the operator to the same display. For this convention, the GROUP/GRAPHIC key has no effect.

Another such convention is to assign Graphics to Groups having configured tags. Using PREV and NEXT, the operator then goes strictly from Group to Group and Graphic to Graphic. To go directly from Group to Graphic or from Graphic to Group, the operator must use the GROUP/GRAPHIC key.

Under this convention it is possible to have a Graphic assigned to a Group adjacent to a Group having no assigned Graphic. When the operator accesses an assigned Graphic and then presses NEXT the the next GROUP appears on the CRT. But if he then presses PREV, the previous GROUP appears instead of the previous Graphic.

To assign a Graphic to a Group, follow these steps:

STEP 1 — Press **D** from the Graphic Editor Menu. The Editor displays the following messages (each having a prompt) under the menu:

ASSIGN GRAPHIC

GRAPHIC NAME

TO GROUP

GROUP NAME GROUP NUMBER.

The cursor is positioned at the prompt under GRAPHIC NAME.

STEP 2 — Enter the name of the Graphic you want to assign. Press ENTER. Now enter either the Group Name (Step 3a) or the Group Number (Step 3b) in the prompts below:

— — Group Name — —

STEP 3a — Press SECT to move the cursor to the prompt under GROUP NAME. Enter the name of the Group to which you want to assign the Graphic. Press ENTER. The Editor automatically inserts the Group number in the GROUP NUMBER prompt. The message: OPERATION COMPLETE appears at the upper right of the CRT after the Graphic is assigned to the Group. Proceed to Step 4.

— — Group Number — —

Step 3b — Press SECT to move the cursor to the Group Name prompt. Press FIELD to move the cursor to the Group Number prompt. Enter the number of the Group to which you want to assign the Graphic. Press ENTER. The Editor automatically inserts the Group name (if any) in the GROUP NAME prompt. The message: OPERATION COMPLETE appears at the upper right corner of the CRT when the Graphic is assigned to the Group.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

REMOVE GRAPHIC/GROUP ASSIGNMENT. To remove a Graphic from any Group assignment, follow these steps:

STEP 1 — Press **E** from the Graphic Editor Menu. The Editor displays the following messages (each having a prompt) under the menu:

GROUP NAME GROUP NUMBER.

The cursor is at the GROUP NAME prompt. The Editor asks you to enter either the Name or Number of the Group to which the graphic is currently assigned. If you know the Name of the Group (but not its Number), proceed to Step 3.

STEP 2 — Press FIELD to move the cursor to the Group Number prompt. Enter the number of the Group where the Graphic is assigned. Press ENTER. When the Editor is done removing the Graphic from this Group the message: OPERATION COMPLETE appears in the upper right corner of the CRT. Proceed to Step 4.

STEP 3 — Enter the name of the Group where the Graphic is assigned. Press ENTER. When the Editor is done removing the Graphic from this Group the message: OPERATION COMPLETE appears in the upper right corner of the CRT.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

SHOW DYNAMIC ITEM LIST. The Editor generates a list of dynamic items used in each Graphic display you create. The total list of all dynamic items for each Graphic consists of four separate screens (lists) in the following order:

- one for dynamic values
- one for dynamic symbols
- one for dynamic pipe systems
- one for dynamic bars.

To view the list of dynamic items currently in OIU memory, follow these steps:

STEP 1 — Press **F** from the Graphic Editor Menu. The Editor displays: GRAPHIC NAME followed by a prompt under the menu. The Editor asks you to enter the name of the Graphic for which you want to view dynamic items.

STEP 2 — Enter the name of the Graphic whose dynamic item list you want to view. Press ENTER. The first list now appears on the CRT replacing the menu (the list of dynamic values).

NOTE

If the entered Graphic has no dynamic items, the Editor displays the message: DYNAMIC LIST IS EMPTY in the upper right corner of the CRT. In this case, you must enter the name of a different Graphic to see any dynamic item lists.

NOTE

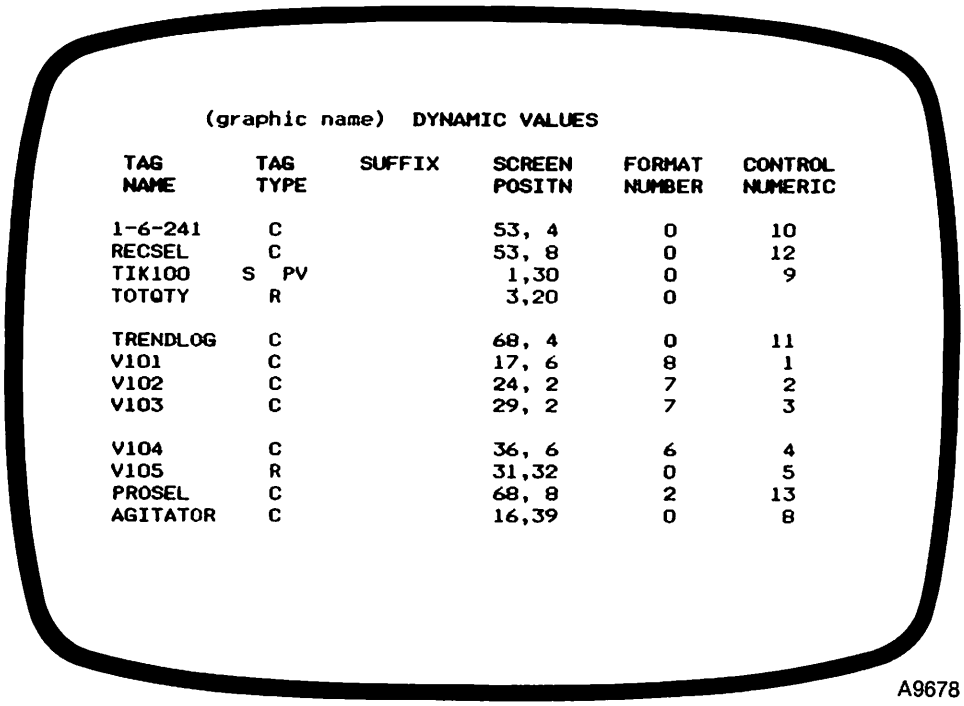
When there are more dynamic items on a list than room to show them, extra items appear on a subsequent screen (page). If there are no items of any type, that list does not appear.

STEP 3 — To view other lists (and extra pages), press NEXT. Continue using NEXT to scroll through each list. To view previous lists (or pages), press PREV. Continue using PREV to scroll through each list.

NOTE

Pressing NEXT while on the last list (dynamic bars) only redisplays the last list. Pressing PREV while on the first list (dynamic values) only redisplays the first list.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE. The Graphic Editor Menu then reappears on the CRT, replacing whatever list was previously on display. Figures 7.11, 7.12, 7.13, and 7.14 show examples of the various dynamic item lists.



(graphic name) DYNAMIC VALUES

TAG NAME	TAG TYPE	SUFFIX	SCREEN POSITN	FORMAT NUMBER	CONTROL NUMERIC
1-6-241	C		53, 4	0	10
RECSEL	C		53, 8	0	12
TIK100	S	PV	1,30	0	9
TOTQTY	R		3,20	0	
TRENDLOG	C		68, 4	0	11
V101	C		17, 6	8	1
V102	C		24, 2	7	2
V103	C		29, 2	7	3
V104	C		36, 6	6	4
V105	R		31,32	0	5
PROSEL	C		68, 8	2	13
AGITATOR	C		16,39	0	8

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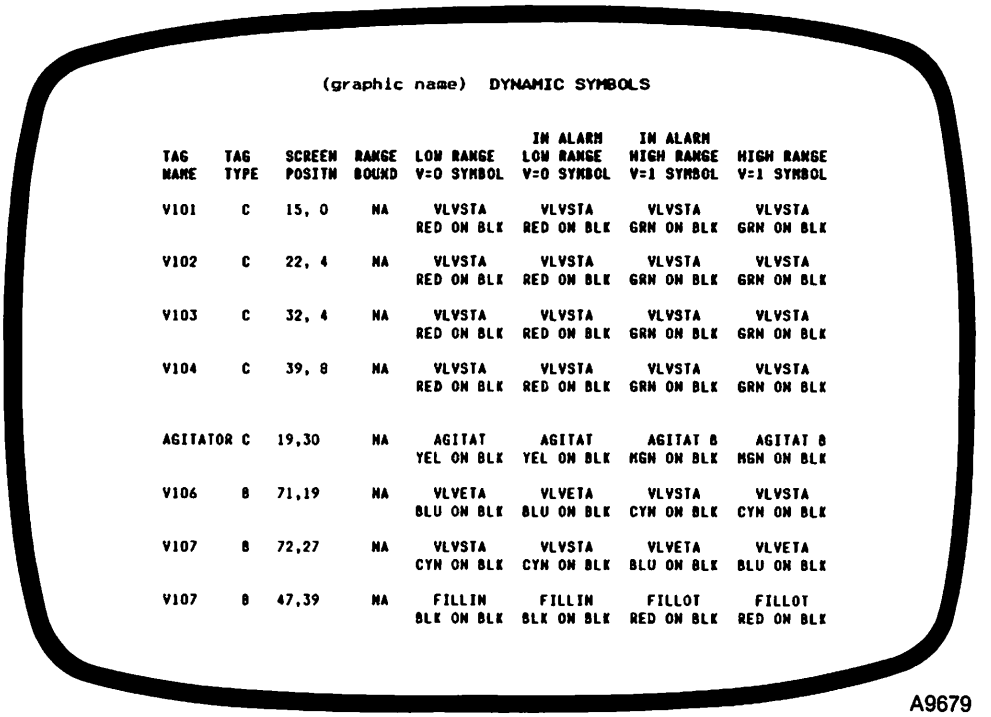
FIGURE 7.11 — Typical Dynamic Value List

NOTE

If any space for a tag line under the Control Numeric heading is blank, the operator cannot take control action from the Graphic for that tag.



(graphic name) DYNAMIC SYMBOLS

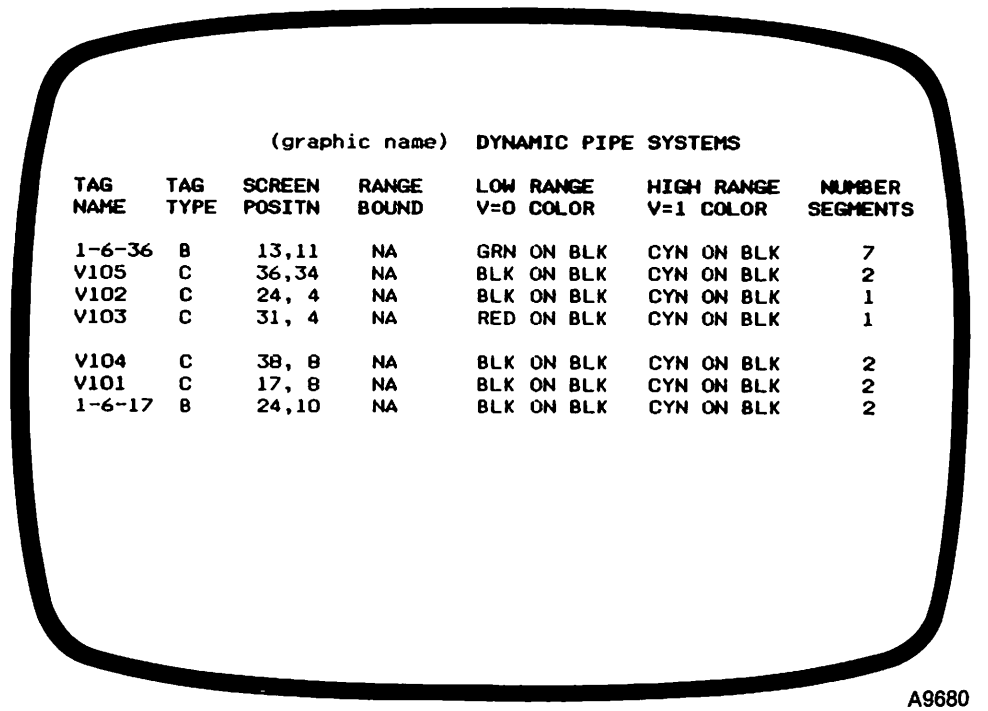
TAG NAME	TAG TYPE	SCREEN POSITN	RANGE BOUND	LOW RANGE V=0 SYMBOL	IN ALARM LOW RANGE V=0 SYMBOL	IN ALARM HIGH RANGE V=1 SYMBOL	HIGH RANGE V=1 SYMBOL
V101	C	15, 0	NA	VLVSTA RED ON BLK	VLVSTA RED ON BLK	VLVSTA GRN ON BLK	VLVSTA GRN ON BLK
V102	C	22, 4	NA	VLVSTA RED ON BLK	VLVSTA RED ON BLK	VLVSTA GRN ON BLK	VLVSTA GRN ON BLK
V103	C	32, 4	NA	VLVSTA RED ON BLK	VLVSTA RED ON BLK	VLVSTA GRN ON BLK	VLVSTA GRN ON BLK
V104	C	39, 8	NA	VLVSTA RED ON BLK	VLVSTA RED ON BLK	VLVSTA GRN ON BLK	VLVSTA GRN ON BLK
AGITATOR	C	19,30	NA	AGITAT YEL ON BLK	AGITAT YEL ON BLK	AGITAT B MGN ON BLK	AGITAT B MGN ON BLK
V106	B	71,19	NA	VLVETA BLU ON BLK	VLVETA BLU ON BLK	VLVSTA CYN ON BLK	VLVSTA CYN ON BLK
V107	B	72,27	NA	VLVSTA CYN ON BLK	VLVSTA CYN ON BLK	VLVETA BLU ON BLK	VLVETA BLU ON BLK
V107	B	47,39	NA	FILLIN BLK ON BLK	FILLIN BLK ON BLK	FILLOT RED ON BLK	FILLOT RED ON BLK

A9679

FIGURE 7.12 — Typical Dynamic Symbol List

NOTE

Symbol names can be both default and user-defined. For the different tag range/alarm states a symbol can both change color AND shape. NA always lists under the RANGE BOUND heading.



(graphic name) DYNAMIC PIPE SYSTEMS

TAG NAME	TAG TYPE	SCREEN POSITN	RANGE BOUND	LOW RANGE V=0 COLOR	HIGH RANGE V=1 COLOR	NUMBER SEGMENTS
1-6-36	B	13,11	NA	GRN ON BLK	CYN ON BLK	7
V105	C	36,34	NA	BLK ON BLK	CYN ON BLK	2
V102	C	24, 4	NA	BLK ON BLK	CYN ON BLK	1
V103	C	31, 4	NA	RED ON BLK	CYN ON BLK	1
V104	C	38, 8	NA	BLK ON BLK	CYN ON BLK	2
V101	C	17, 8	NA	BLK ON BLK	CYN ON BLK	2
1-6-17	B	24,10	NA	BLK ON BLK	CYN ON BLK	2

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FIGURE 7.13 — Typical Dynamic Pipe System List

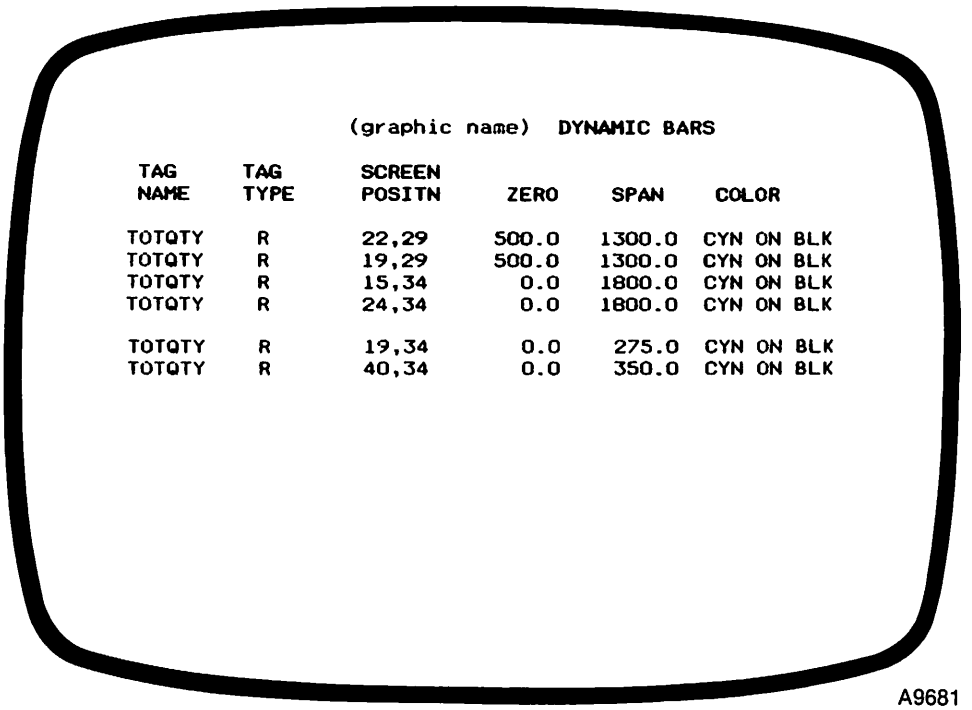


FIGURE 7.14 — Typical Dynamic Bar List

SHOW LIST OF GRAPHICS. The Editor generates a multipage list of all Graphic displays created and currently stored on OIU hard disk. This list also shows Group assignments for all Graphics.

To view this list of Graphics, follow these steps:

STEP 1 — Press **G** from the Graphic Editor Menu. The menu disappears and the first page of the Graphic list appears in its place.

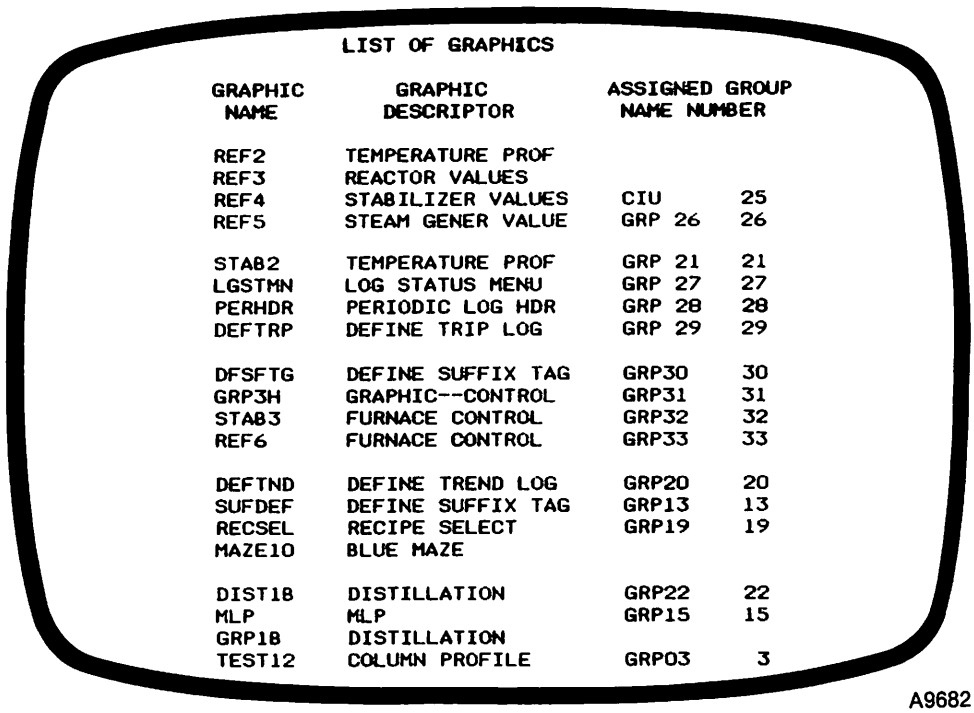
STEP 2 — To view the next page of the list, press NEXT. Continue using NEXT to scroll through the list pages.

> **NOTE**
>
> **If there are not enough Graphics in OIU memory to require more than one page for the list, pressing NEXT redisplays the first page.**

STEP 3 — Press PREV to scroll page by page back to the first page of the list.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

Figure 7.15 (on the next page) shows a typical Graphics List page.



LIST OF GRAPHICS

GRAPHIC NAME	GRAPHIC DESCRIPTOR	ASSIGNED GROUP NAME	NUMBER
REF2	TEMPERATURE PROF		
REF3	REACTOR VALUES		
REF4	STABILIZER VALUES	CIU	25
REF5	STEAM GENER VALUE	GRP 26	26
STA82	TEMPERATURE PROF	GRP 21	21
LGSTMN	LOG STATUS MENU	GRP 27	27
PERHDR	PERIODIC LOG HDR	GRP 28	28
DEFTRP	DEFINE TRIP LOG	GRP 29	29
DFSFTG	DEFINE SUFFIX TAG	GRP30	30
GRP3H	GRAPHIC--CONTROL	GRP31	31
STA83	FURNACE CONTROL	GRP32	32
REF6	FURNACE CONTROL	GRP33	33
DEFTND	DEFINE TREND LOG	GRP20	20
SUFDEF	DEFINE SUFFIX TAG	GRP13	13
RECSEL	RECIPE SELECT	GRP19	19
MAZE10	BLUE MAZE		
DIST18	DISTILLATION	GRP22	22
MLP	MLP	GRP15	15
GRP18	DISTILLATION		
TEST12	COLUMN PROFILE	GRP03	3

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FIGURE 7.15 — Typical Graphics List Page

NOTE

If a Graphic is not assigned to a group its line under the Group assignment heading is blank. Notice that when a Graphic is assigned to a Group the Group number (if part of the Group name) appears in both the Group name and number fields.

DEFINE SYMBOL. Each symbol can contain up to 120 characters. Try to draw all symbols with a minimum of keystrokes so you do not exceed available space. Some keystrokes cause TWO characters to be part of the symbol when you add it to the symbol library:

- FG and BG color selection
- Special characters.

A symbol can contain the following keystroke entries:

- Letters, numbers, punctuation
- Special characters
- FG and BG colors
- Blink ON or Blink OFF
- Single or Double height characters
- Cursor movements
- Horizontal and/or vertical cursor direction.

To define a symbol using this function, follow these steps:

STEP 1 — Press **H** from the Graphic Editor Menu. The Editor replaces the menu with a blank template. At the top left corner the words: SYMBOL NAME (followed by a prompt) appear. The blinking cursor (+) appears in the middle of the CRT.

STEP 2 — Enter the name of the symbol you want to define and press ENTER. The words: DEFINE SYMBOL appear in the upper right corner of the CRT. This tells you to begin drawing your symbol.

NOTE

When drawing your symbol, the Editor does not display any Status line (so you must remember to set FG and BG colors, etc.).

STEP 3 — Draw your symbol using the Edit Graphic tasks for symbol definition (See pages 29 - 40).

NOTE

If you reach the 120-character limit, the message:

LIMIT 120 CHARACTERS, ENTER TO SAVE

appears in the upper right corner of the CRT.

STEP 4 — If you do not like the current symbol and do not want to add it to the symbol library, press ESCAPE. The Symbol Name prompt reappears on the CRT and you can start Step 3 over again or proceed to Step 6.

STEP 5 — If you do like the symbol and want to add it to the symbol library, press ENTER. The Editor now adds this symbol to its library and the SYMBOL NAME prompt (with another blank template) now overwrites the CRT. Proceed to Step 2 (to start drawing another symbol) or go to Step 6.

STEP 6 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

DELETE SYMBOL. To delete an existing symbol from the symbol library, follow these steps:

STEP 1 — Press **I** from the Graphic Editor menu. The Editor displays the words: SYMBOL NAME (followed by a prompt) under the menu.

STEP 2 — Enter the name of the symbol you want to delete. Press ENTER. The message: CHECKING FOR SYMBOL IN USE appears at the upper right corner of the CRT.

If this symbol (whose name you entered) is not a dynamic item in any existing Graphic, the Editor erases it from its library. When done the message: OPERATION COMPLETE overwrites the previous message. Repeat this Step to delete another symbol, or proceed to Step 4.

If this symbol is a dynamic item in any existing Graphic, the message:

IN USE, ENTER DELETES, ESC CANCELS

appears in the upper right corner of the CRT. Proceed to Step 3a to abort or to Step 3b to delete.

STEP 3a — To keep the symbol, press ESCAPE. Proceed to Step 2 (to start deleting another symbol) or to Step 4.

STEP 3b — To delete the symbol, press ENTER. Proceed to Step 2 or to Step 4.

NOTE

Deleting as symbol that is a dynamic item can cause NO symbol or even a DIFFERENT symbol to appear on the Graphic(s) where the symbol was in use.

STEP 4 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

REVIEW SYMBOLS. The Editor can display all symbols in its library sequentially to let you see each one. While viewing the symbols you can also move the cursor away from the symbol and insert another symbol from the library. This is useful when you want to compare several symbols. You can review symbols in the symbol library by starting either at the FIRST symbol or at some other symbol.

To review the content of the symbol library from its start, follow these steps:

STEP 1 — Press J from the Graphic Editor Menu. The words: STARTING SYMBOL NAME (followed by a prompt) appear below the menu.

STEP 2 — Leave the prompt blank by pressing ENTER. The menu disappears and the first symbol in the symbol library appears on the CRT. The cursor (+) appears over the symbol starting position. To view the complete symbol, move the cursor one CRT position away from the symbol (UP, DOWN, LEFT, or RIGHT, depending on the symbol starting position).

STEP 3 — To view the next symbol in the library, press NEXT. The next symbol overwrites the previous one. Continue using NEXT to scroll forward through the library.

NOTE

When you reach the last symbol in the library, pressing NEXT again redisplays the last symbol.

STEP 4 — To view the previous symbol, press PREV. Continue using PREV to scroll backward through the library.

NOTE

When you reach the first symbol in the library, pressing PREV again redisplays the first symbol..

STEP 5 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE. To review the symbols in the library starting at some other symbol, enter the specific symbol name in the Symbol Name prompt (Step 2) and then press ENTER. Proceed with all other Steps (3 to 5).

SHOW SYMBOL CROSS REFERENCE. This function provides a list for each symbol in the symbol library. This list tells you what Graphics use the symbol as dynamic items and to which Group by name and number that Graphic using the symbol is assigned.

To view the Symbol Cross Reference list, follow these steps:

STEP 1 — Press **K** from the Graphic Editor Menu. The words: SYMBOL NAME (followed by a prompt) appear at the bottom of the menu.

STEP 2 — Enter the name of the symbol for which you want to see cross references. Press ENTER. The symbol cross reference headings overwrite the CRT.

The Editor can take several minutes to build this list (fill in the values below its headings). While doing so, the message: BUILDING DISPLAY appears in the upper right corner of the CRT.

This tells you the Editor is scanning its memory to find out where this symbol (whose name you entered) is in use as a dynamic item. The Editor lists only those Graphics containing this symbol assigned to Groups. When done scanning the previous CRT message disappears as the cross reference list overwrites the CRT.

STEP 3 — After viewing this cross reference list return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

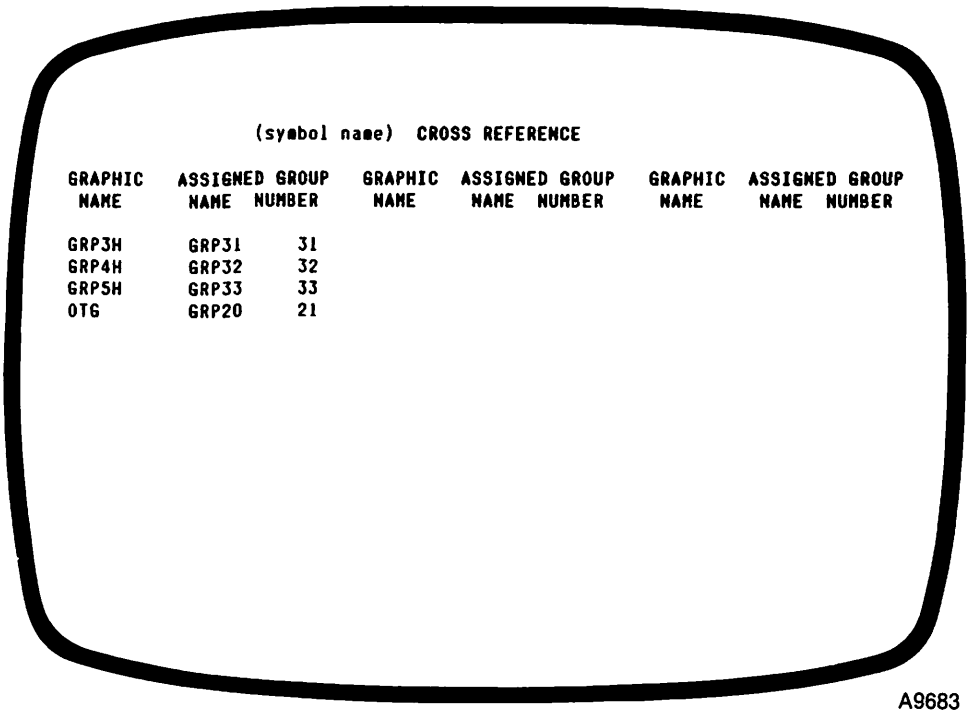


FIGURE 7.16 — Typical Symbol Cross Reference List

NOTE

This list repeats its headings to make nine columns across the CRT. Most cross reference lists do not have data in all columns. All data on the list starts under the leftmost columns.

EDIT/REVIEW VALUE FORMATS. When creating a dynamic value in any template you must have an idea how you want that value to appear on the display during operation (what its format must be). The Graphic Editor has a predefined set of standard or default formats ready for use (Format 0). Or you can create your own formats (Formats 1 through 9) and store them in OIU memory. You can also review/edit existing formats using this function.

NOTE

You must define each format (for dynamic value creation) before you edit any graphic. When entering any dynamic value into a template the format for that value must already exist in OIU memory.

To review the default value formats, follow these steps:

STEP 1 — Press L from the Graphic Editor Menu. The Editor overwrites the menu with the standard format page (Figure 7.17), Format 0. You can never edit the formats on this page.

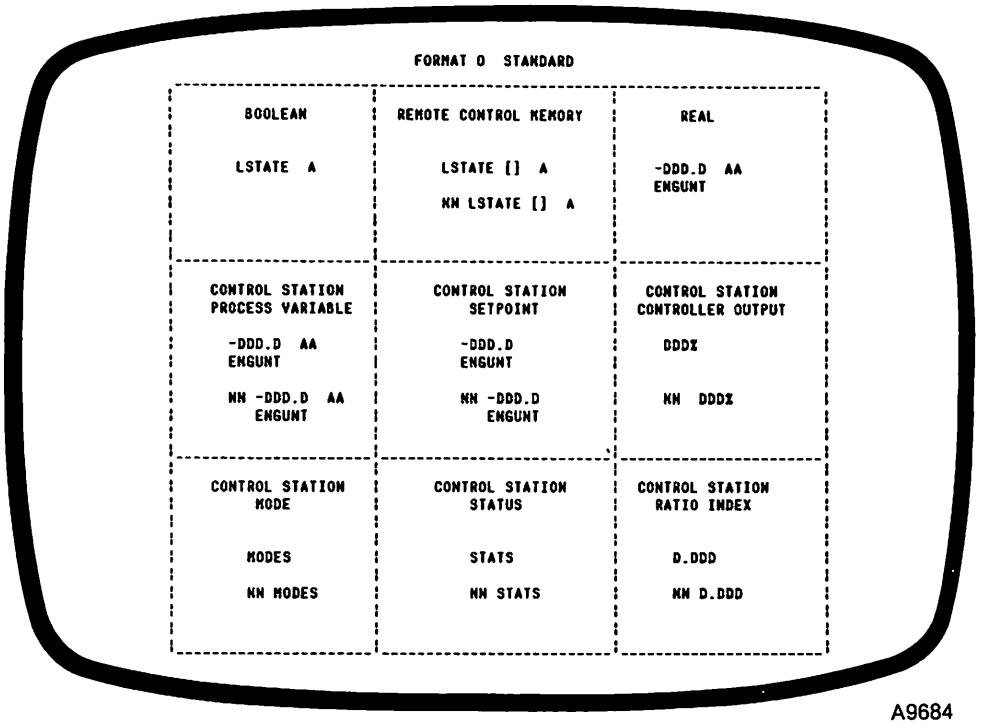


FIGURE 7.17 — Standard Value Format Page

STEP 2 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

You can also create/edit your own value formats. When doing so you define the positions of the value, engineering units, alarm indicators, and their colors.

The alarm indicator field is two characters long. During operation this field is right-justified.

The value field displays as six Vs (VVVVVV). When editing any Graphic the value field appears as appropriate to the current tag type. The length of such value fields differs. Regardless of the field length, the LEFT end begins at the position defined when you edit its format. The value appearing during operation is right-justified in the same size field as during editing.

The engineering units field is six characters long. During operation the engineering units field is left-justified (unlike the other two fields above).

To delete any field from your own format, move the cursor to the starting position of that field and press the spacebar.

The colors of the fields default to YELLOW alarm, GREEN value, and CYAN engineering units. To set different colors for any of the fields, move the cursor to the starting position of that field and then change its FG and BG colors as desired. After changing the colors for that field the next field appears in the default colors. You can change its colors as desired, as well.

To create your own format, follow these steps:

STEP 1 — Press **L** from the Graphic Editor Menu. The standard format page appears.

STEP 2 — Press NEXT. The Editor overwrites the standard format page with a new template. This template is the page for designing your own value format. The new page shows a modified Status line at its top and the relative positions of value, alarm, and engineering units. The modified Status line shows:

```
STANDARD  CURSOR=##,##    FORMAT #
ANCHOR=##,##    A ALARM    V VALUE    E ENGINEERING UNIT    ' ' DELETE ITEM
```

An example of the relative indicator positions on the page is:

```
+VVVVVENGUNT
 AA
```

NOTE

The ANCHOR shows you the cursor (+) position at which a value item without a control numeric enters onto a template. (So when editing the value item above onto a template using this format, the AA displays at the cursor position of that dynamic value. Notice that the value field displays three spaces to the right of the item cursor position.)

NOTE

When assigning a control numeric to a value item that numeric appears on the template as two digits. In this case, all fields appear three spaces to the right of the position where they normally appear (if the value had no control numeric).

STEP 3 — Enter the desired format. While entering your own format onto this template the auxiliary keyboard responds only to the keys A, V, E, and ' ' (spacebar). These keys let you position the necessary spaces reserved for the alarm field (A), value field (V), and engineering units field (E), and to delete fields by pressing the spacebar:

STEP 3a — To enter an alarm indicator, press **A**. The cursor moves to the starting alarm indicator space. Now change its colors as desired. Now enter the alarm indicator. To delete an alarm indicator, press the spacebar at its starting position. Proceed to the next field or go to Step 4.

STEP 3b — To enter the value, press **V**. The cursor moves to the starting value space. Now change its colors as desired. Now enter the value indicator. To delete a value, press the spacebar at its starting position. Proceed to the next field or go to Step 4.

STEP 3c — To enter the engineering units, press **E**. The cursor moves to the starting engineering units space. Now change its colors as

desired. Now enter the engineering units indicator. To delete it, press the spacebar at the starting position of the item. Proceed to the next field or go to Step 4.

STEP 4 — Repeat Step 3 for each field you want to create/edit in the current format. When done, press ENTER. This saves that format.

STEP 5 — If you want to create/edit more formats, press NEXT. Then proceed to Step 3. If you are done creating and/or editing all formats, proceed to Step 6.

NOTE

Do not forget to save any format before going on to the next. If you press PREV, NEXT, or ESCAPE without pressing ENTER to save the current format you just edited, the OIU displays a reminder to press ENTER. Until you do, you cannot leave that format. If you press ESCAPE, the Editor displays the EXIT prompt.

STEP 6 — Return to the Graphic Editor Menu by pressing either G MENU or ESCAPE.

To review existing formats, follow the same steps as above but do NOT enter any changes. Scroll between the formats using PREV and NEXT. Remember to press ENTER each time you leave any format.

EXIT GRAPHIC EDITOR. To exit the Graphic Editor, press **M** from the Graphic Editor Menu. After a brief pause the OIU Configuration Menu reappears. Notice this is the only way to leave the Graphic Editor. After the OIU Configuration Menu appears on the CRT unplug the Auxiliary keyboard and place it to one side or to its appropriate storage area. At this point you must resume using the fixed keyboard.

If you are now done with all configuration, lock the CONF keyswitch and remove its key. Otherwise, access some other configuration function.

SECTION VIII
COLOR AND PHRASE CONFIGURATION

INTRODUCTION

Section VI briefly examined configuring color and phrase for the different alarm levels (Alarm Management). This Section examines configuring color and phrase for all other OIU purposes in greater detail.

COLOR AND PHRASE DEFINITIONS

The various color and phrase functions list both default and userdefined items. These items define:

- color codes
- alarm log format
- manual set constant (MSC) indicators
- digital control station (DCS) indicators
- remote control memory (RCM) indicators
- days of the week
- month abbreviations.

There is also a function for resetting all of the above items to OIU standard (default) values. Unless designing your own scheme, all OIU colors and phrases revert to default values (standard OIU color and phrases).

Accessing the OIU Configuration Menu

Access the General Function Menu and press **D**. The OIU Configuration Menu appears on the CRT. To access color and phrase configuration functions, press **K** from this menu. This menu disappears and the Define Color and Phrase Menu appears on the CRT in its place.

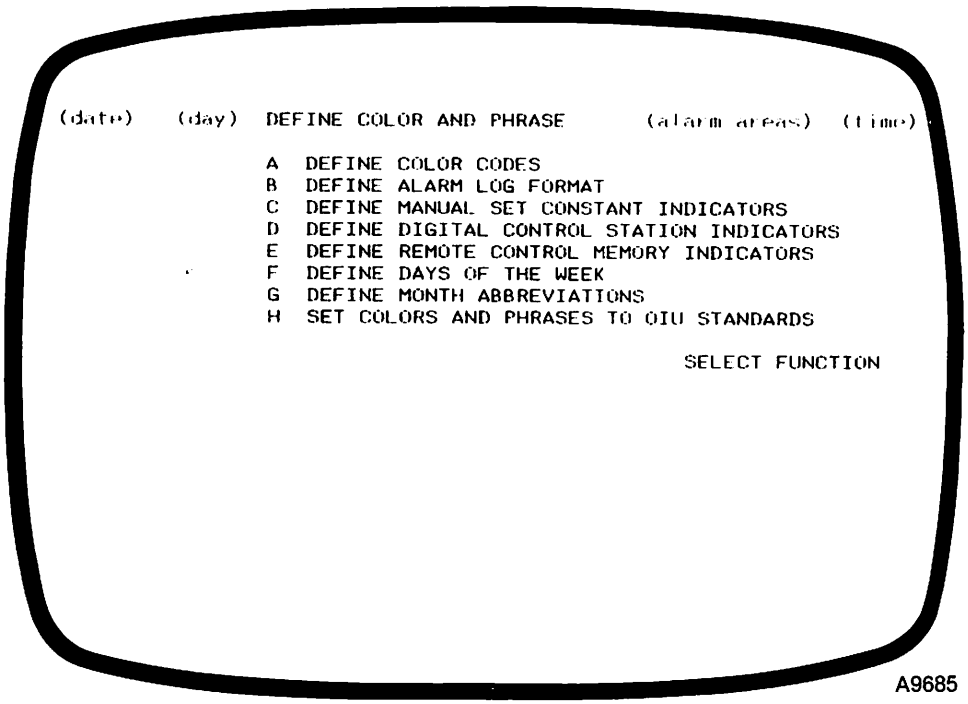


FIGURE 8.1 — Define Color and Phrase Menu

CAUTION

The CONF keyswitch protects all configuration changes. OIU configuration is only possible when this keyswitch is unlocked.

DEFINE COLOR CODES. The OIU provides definition for all color codes in use on its displays. Some of these include: display page title lines, area, group, graphics, alarm summary, tag list, and system status displays. Unlock the CONF keyswitch. Enter **A** (press A) from the Define Color and Phrase Menu. The menu disappears and the Define Color Codes Display appears with the cursor positioned at the first (topmost) definable color code.

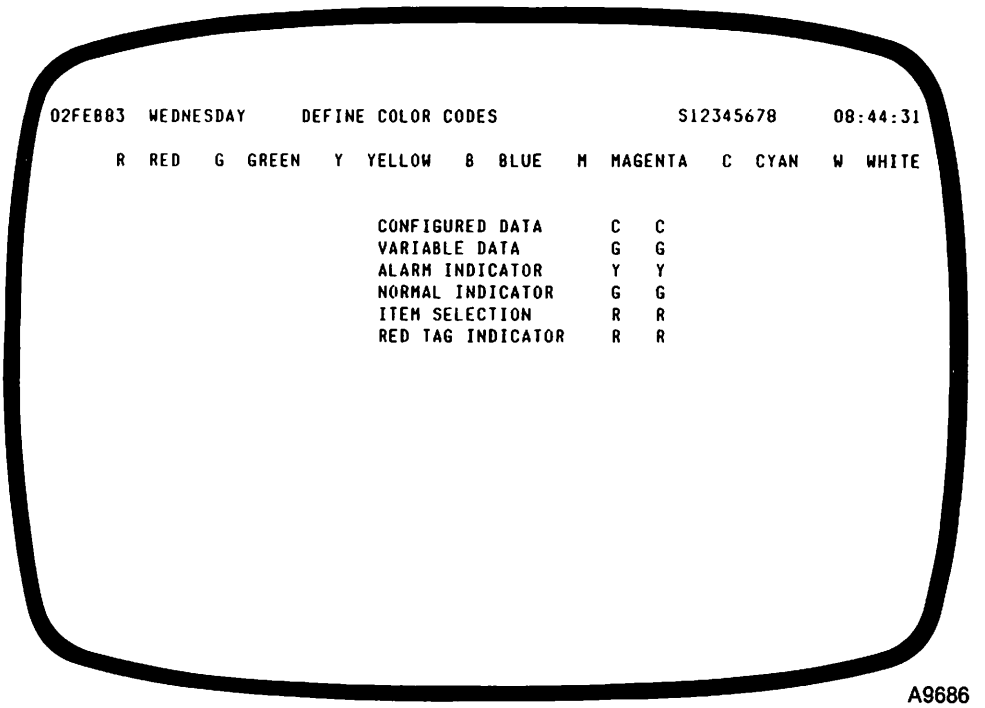


FIGURE 8.2 — Define Color Codes Display

This display has a heading (in cyan) showing the OIU color code summary:
R RED G GREEN Y YELLOW B BLUE M MAGENTA C CYAN W WHITE

Below this heading are six description lines (also in cyan) showing data for color code definition. Each line has two color code letters following its description. The first code letter (in cyan) shows the OIU default color for that data. The second (in green) shows the current, or user-definable, color for that data. The second code is the actual input field.

The OIU provides a default color code for each of the following data types:

- configured data (configurable information including tags, descriptors, engineering units, range limits for display items, and titles.)
  [default color is **cyan**]
- variable data (variable information including analog values, logic state descriptors, digital state indicators, date and time of title lines.)
  [default color is **green**]
- alarm indicators (information showing the state of a point, a module or a node in alarm.)
  [default color is **yellow**]
- normal indicators (information showing the normal or return to normal state of a point, module, or node.)
  [default color is **green**]
- item selection (characters representing corresponding keyboard entry for a menu, display, or control selection.)
  [default color is **red**]

- red tag indicator (information showing a point that is in monitor only status. The operator can take no control actions from such a point.)
  [default color is **red**].

To define color codes follow these steps:

STEP 1 — Press FIELD to position the cursor to the desired color code input field.

STEP 2 — Press CLEAR to erase any previous code. Enter the single alphabetic character for the color desired in the color code field. (**R, G, Y, B, M, C,** or **W**).

> **NOTE**
>
> **If you enter a code letter that is not one of the above, the OIU displays this error message at the bottom of the CRT: INVALID COLOR CODE. In this case, erase the error and then enter a correct code letter.**

STEP 3 — Repeat STEPS 1 and 2 for all color codes you want to define on this display. Press ENTER only after you are done defining all desired color codes.

> **NOTE**
>
> **If you do not enter a color code for the Red Tag indicator, the OIU sets it to red. This indicator (Section V) can be any other color of those available, at your option.**

When done defining all color codes on this display, return to the Define Color and Phrase Menu (press ESCAPE). Proceed from this menu to the next color and phrase function. If done all color and phrase configuration, return to the OIU Configuration Menu (press ESCAPE twice).

If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, access another configuration function.

DEFINE ALARM LOG FORMAT. The Alarm Management function let you define alarm features global to the OIU, including the different alarm levels of the Alarm Summary display pages (Section VI). The Alarm Log Format function lets you print out Event Log data either in color (if your OIU has a color printer connected) or in black and white (default).

Unlock the CONF keyswitch. Enter **B** from the Define Color and Phrase Menu. The menu disappears and the Define Alarm Log Format display appears on the CRT. The cursor is positioned at the first (top left) definable data input field.

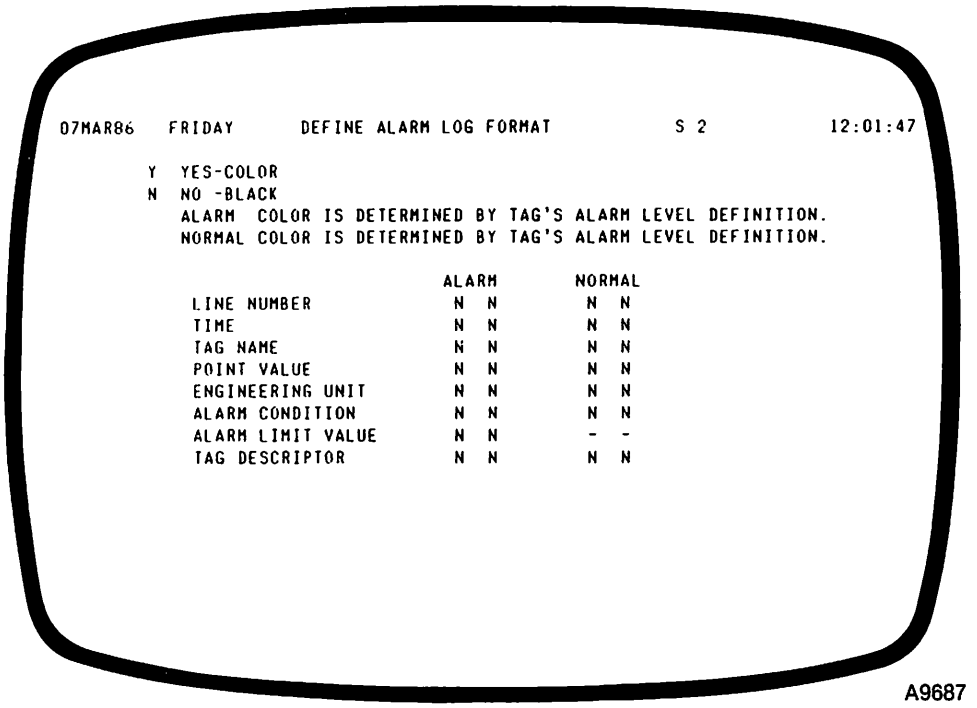


FIGURE 8.3 — Define Alarm Log Format

This display has the following headings (in cyan):

Y YES - COLOR

N NO - BLACK

ALARM COLOR IS DETERMINED BY TAG'S ALARM LEVEL DEFINITION.

NORMAL COLOR IS DETERMINED BY TAG'S ALARM LEVEL DEFINITION.

These headings explain the two input code choices for this display:

Y (YES) (item prints out in color)

N (NO) (item prints out in black and white).

> **NOTE**
>
> **The heading also reminds you that the color of tag output data in any colored Event Log printout is that previously defined using the alarm level definition function of the Alarm Management Menu (Section VI).**

Below the heading sentences are eight description lines showing data (in cyan) for Alarm Log color definition. Each data line also shows four tag status code letters (Y or N) divided into two groups. The first group (under the cyan heading ALARM) shows the tag alarm status. The group on the right (under the heading NORMAL) shows tag normal status.

In each group the default code (N) is the left letter and the user-defined code is the right letter (input field). The tag status codes form four columns down the page to the right of the data item descriptions. The two central columns

are under the heading: ALARM while the two right columns are under the heading: NORMAL.

To define Alarm Log Format, follow these steps.

ALARM STATE

STEP 1 — Enter line number code (Y for color printout; N for black and white). Press FIELD.

STEP 2 — Enter time code. Press FIELD.

STEP 3 — Enter tag name code. Press FIELD.

STEP 4 — Enter point value code. Press FIELD.

STEP 5 — Enter engineering unit code. Press FIELD.

STEP 6 — Enter alarm condition code. Press FIELD.

STEP 7 — Enter alarm limit value code. Press FIELD.

STEP 8 — Enter tag descriptor code. Press SECT. (This moves the cursor to the top right input field under the NORMAL heading.)

NORMAL STATE

STEP 9 — Enter line number code. Press FIELD.

STEP 10 — Enter time code. Press FIELD.

STEP 11 — Enter tag name code. Press FIELD.

STEP 12 — Enter point value code. Press FIELD.

STEP 13 — Enter engineering unit code. Press FIELD.

STEP 14 — Enter alarm condition code. Press FIELD.

STEP 15 — Enter alarm condition code. Press FIELD.

STEP 16 — Enter alarm limit value code. Enter the character (-) in this field. Press FIELD.

NOTE

Only the ALARM state alarm limit value appears on an Event Log (that tag is in the alarm state); otherwise, this item is unnecessary.

STEP 17 — Enter tag descriptor code. Press ENTER.

You are now done defining the alarm log format. If you make an invalid entry or want to change any entry, position the cursor back to the desired entry field

and press CLEAR. Then enter the correct entry code. Press ENTER when done defining to put the format (including your recent entries) into OIU memory.

> **NOTE**
>
> **Pressing FIELD moves the cursor down one entry. Pressing SECT moves the cursor to the top right input field. If the cursor is currently at the bottom left input field and you press SECT, the cursor moves to the top right field. However, if the cursor is at the bottom right input field and you press SECT, the cursor then moves to the top left field.**

When done defining on this display, return to the Define Color and Phrase Menu. Proceed to the next function. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, access another configuration function.

DEFINE MANUAL SET CONSTANT INDICATORS. This function lets you define the Manual Set Constant (MSC) indicators global to OIU display pages (Section IV). Unlock the CONF keyswitch. To define MSC indicators, press **C** from the Define Color and Phrase Menu. The Define MSC Indicators Display appears under the menu with the cursor postioned at the topmost input field.

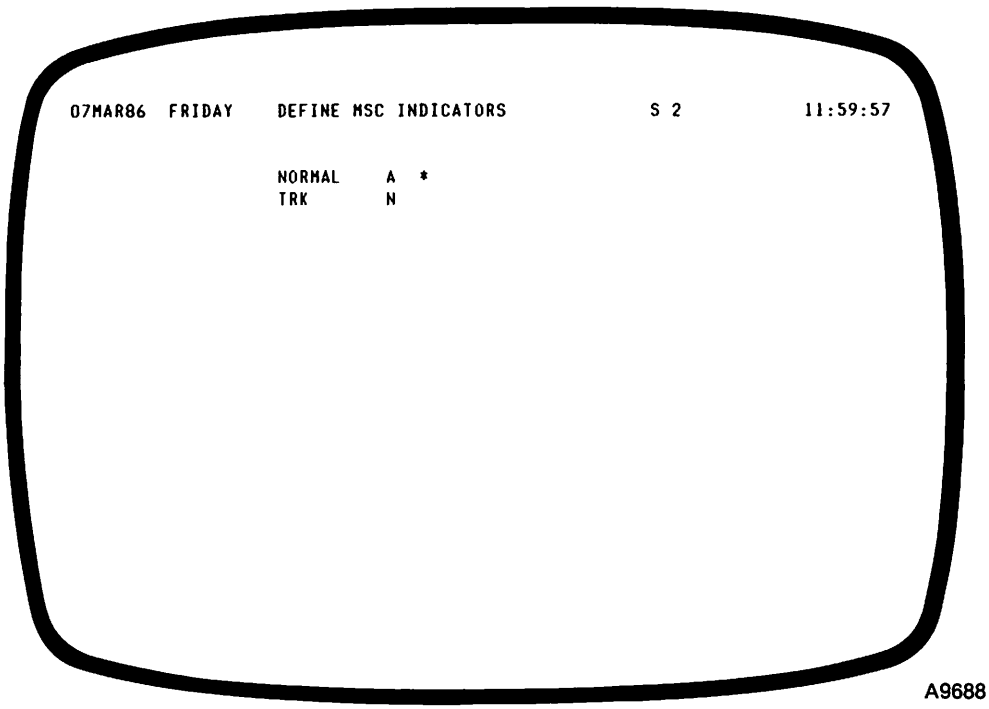


FIGURE 8.4 — Define MSC Indicators Display

There are two input fields on this display. The top one shows the MSC NORMAL indicator; the bottom one shows the tracking mode indicator(TRK). The top field defaults to blanks while the bottom field defaults to **N** (in green) unless you enter characters into either field. Each field can contain up to three alphanumeric characters (including an asterisk (*)).

Either field may contain previous data when you first access this display. In this case, simply press CLEAR to erase the old data and then enter desired characters (if any).

Whatever character you enter must be useful or descriptive to the operator when he accesses the Group Display page containing the MCS item faceplates. Notice that for MSC normal state you do not need to configure an indicator (when the MSC item is in normal state no indicator need appear on its faceplate). But you can configure such an indicator if desired.

NOTE

To enable the operator to change the value of MSC items in Graphic Display page Control Boxes using the SET key (Section XII), however, you must clear out (erase) the top input field, leaving it blank.

To define MSC indicators, follow these steps:

STEP 1 — Enter desired MSC Normal state indicator. Press FIELD. Or leave this field blank by pressing FIELD. (The field defaults to blanks.)

STEP 2 — Enter the MSC Tracking Mode state indicator. Press ENTER. Or leave this field blank and just press ENTER. (The field defaults to **N**.)

You are now done defining MSC indicators. Return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

DEFINE DIGITAL CONTROL STATION INDICATORS. This function lets you configure Digital Control Station (DCS) indicators global to OIU display pages (Section IV). Unlock the CONF keyswitch. Press **D** from the Define Color and Phrase Menu. The menu disappears and the Define DCS Indicators Display appears on the CRT. The cursor is at the top input field.

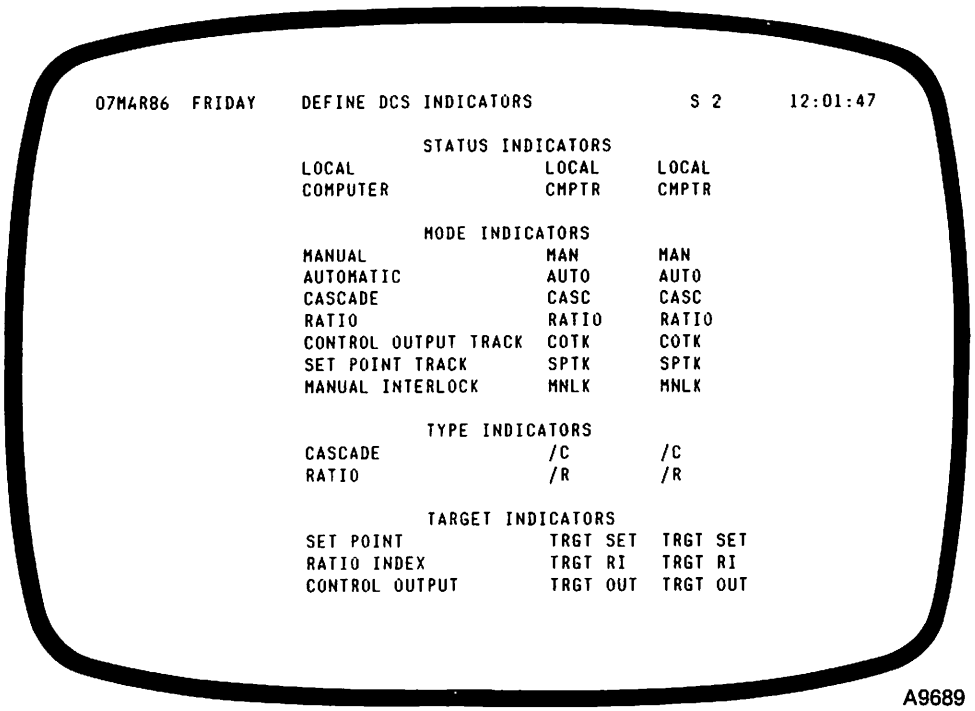


FIGURE 8.5 — Define DCS Indicators Display

This display provides definition of the status, mode type, and target indicators for the DCS display element of Group and Graphic displays. DCS status and mode indicators are alphanumeric and can contain up to five characters each. Target indicators can be up to eight characters in length.

A type indicator is a single letter appearing on a DCS element faceplate only when the station mode differs from its type. The type indicator appears to the right of the DCS element mode indicator following a slash (/) separating the two. For example: a CASCADE type element in MANUAL mode shows the following mode and type indicator combination on its faceplate: **MAN/C**. (Remember this when defining the mode indicators.)

This display lists the indicator default values in cyan and the current (user-definable) values in green. Press FIELD to position the cursor to the desired input field. Enter alphanumeric values in each field using the Alphabetic Block on the keyboard. Press ENTER after defining all indicators as desired.

To use OIU default values for any field, just leave it blank (press FIELD without first making any entry) and go to the next field. To return to the Define Color and Phrase Menu, press ESCAPE at any point in the operation. If you press ESCAPE without first pressing ENTER, the OIU overwrites any entries made on this display with previous values.

This display shows fourteen data item lines under its Title line. The data lines are divided into four groups (STATUS, MODE, TYPE, and TARGET INDICATORS). The information forms three columns down the page. The first column lists the data input items. The second column lists the OIU default values for those input items. The third column lists the current values for the input items.

To define DCS indicators, follow these steps:

STEP 1 — Enter the status indicators:

1A) Enter the Local indicator. Press FIELD.
1B) Enter the Computer (remote) indicator. Press Field.

STEP 2 — Enter the mode indicators:

2A) Enter the Manual indicator. Press FIELD.
2B) Enter the Automatic indicator. Press FIELD.
2C) Enter the Cascade indicator. Press FIELD.
2D) Enter the Ratio indicator. Press FIELD.
2E) Enter the Control Output Tracking indicator. Press FIELD.
2F) Enter the Set Point Tracking indicator. Press FIELD.
2G) Enter the Manual Interlock indicator. Press FIELD.

STEP 3 — Enter the type indicators:

3A) Enter the Cascade indicator. Press FIELD.
3B) Enter the Ratio indicator. Press FIELD.

STEP 4 — Enter the target indicators:

4A) Enter the Set Point target indicator. Press FIELD.
4B) Enter the Ratio Index target indicator. Press FIELD.
4C) Enter the Control Output target indicator. Press ENTER.

NOTE

Whenever entering your own indicators (not using OIU default values), such indicators must be useful and meaningful to the operator.

When done defining all DCS indicators return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

DEFINE REMOTE CONTROL MEMORY INDICATORS. This function lets you configure Remote Control Memory (RCM) indicators global to OIU display pages (Section IV). Unlock the CONF keyswitch. Press **E** from the Define Color and Phrase Menu. The menu disappears and the Define RCM Indicators Display appears on the CRT. The cursor is positioned at the top input field.

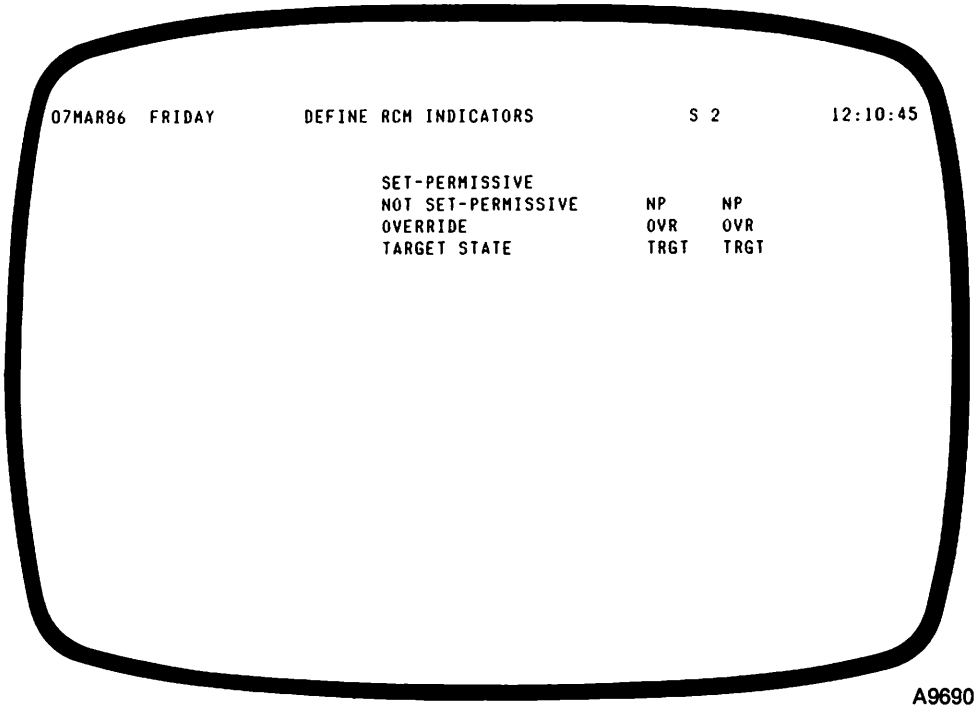


FIGURE 8.6 — Define RCM Indicators Display

This display provides definition of set-permissive, not set-permissive, override, and target indicators for the RCM display element of Group and Graphic displays. These indicators are alphanumeric. The set-permissive and not set-permissive indicators can be two characters long. The override indicator can be three characters and the target indicator can be up to four characters.

This display lists the indicator default values in cyan and the current, or user-definable, values in green. Press FIELD to position the cursor to the desired input field. Enter alphanumeric values in each field using the Alphabetic keys. Press ENTER after defining all indicators.

You can use the OIU default values for any field by skipping it and going on to the next one. To return to the Define Color and Phrase Menu, press ESCAPE at any point in the operation. If you press ESCAPE without first pressing ENTER, the OIU replaces your current entries with previous values.

NOTE

The default set-permissive indicator is two blanks.

This display shows four data item lines under its Title line. Each line has two data fields after its description. The field on the left is the default value; that on the right is the user-definable input value.

To define RCM indicators, follow these steps:

STEP 1 — Enter the Set-Permissive indicator. Press FIELD. (Or just skip this item by pressing FIELD.)

STEP 2 — Enter the Not Set-Permissive indicator. Press FIELD. (The default value is **NP**.)

STEP 3 — Enter the Override indicator. Press FIELD. (The default value is **OVR**.)

STEP 4 — Enter the Target indicator. Press ENTER. (The default value is **TRGT**.)

NOTE

Whenever entering your own indicators (not using the default ones), such indicators must be meaningful to the operator.

When done defining all RCM indicators return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

DEFINE DAYS OF THE WEEK. This function lets you configure the days of the week global to OIU display page Title lines (Section IV). A day of the week item is alphabetic and can be up to ten characters long. Unlock the CONF keyswitch. Press **F** from the Define Color and Phrase Menu. The menu disappears and the Define Days of the Week Display appears on the CRT. The cursor is positioned at the top input field.

NOTE

The default values are the names of the days of the week completely spelled out (SUNDAY, MONDAY, and so on). This display lets you enter your own names (DIMANCHE, LUNDI, and so forth), as well.

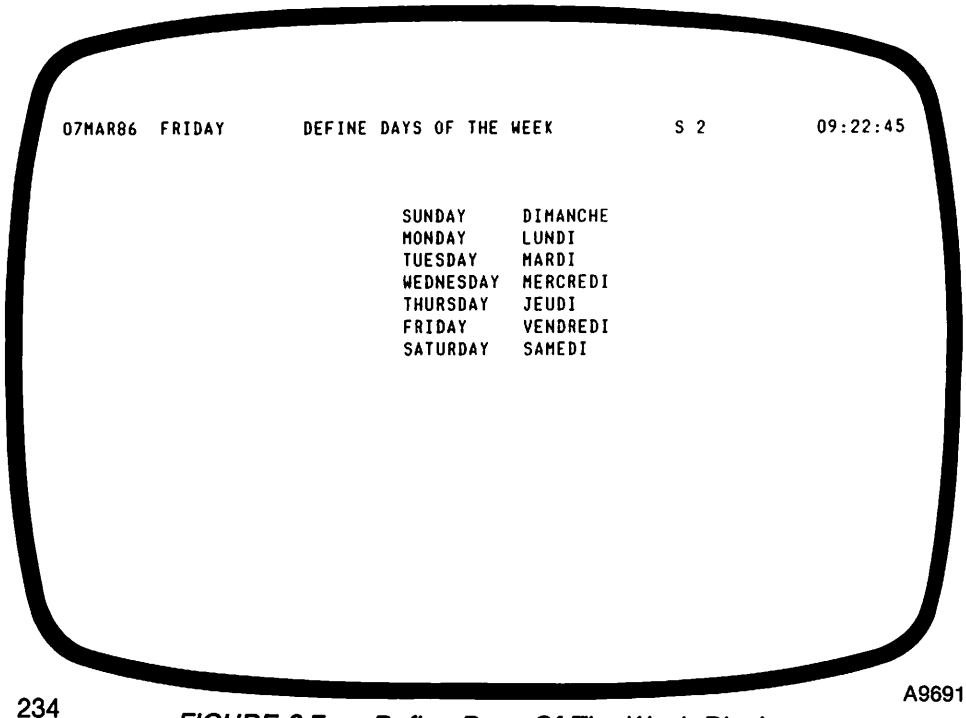


FIGURE 8.7 — Define Days Of The Week Display

The Define Days of the Week Display lists the OIU default day names in cyan and the user-definable ones in green. Press FIELD to position the cursor at the desired input field. Enter the alphabetic characters for the day names. Press ENTER when done defining all day names. Then return to the Define Color and Phrase Menu.

You can use default values for any field by skipping it (pressing FIELD to move on to the next input field). If you press ESCAPE without first pressing ENTER, the OIU replaces current entries (if any) with previous ones.

The display shows two columns of day names (SUNDAY - SATURDAY). The column on the left shows the default values; the one on the right shows the user-definable ones.

To define Days of the Week, follow these steps:

STEP 1 — Enter the value for Sunday. Press FIELD.

STEP 2 — Enter the value for Monday. Press FIELD.

STEP 3 — Enter the value for Tuesday. Press FIELD.

STEP 4 — Enter the value for Wednesday. Press FIELD.

STEP 5 — Enter the value for Thursday. Press FIELD.

STEP 6 — Enter the value for Friday. Press FIELD.

STEP 7 — Enter the value for Saturday. Press ENTER.

NOTE

Whenever entering your own values they must be meaningful to the operator.

When done defining all Days of the Week, return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

DEFINE MONTH ABBREVIATIONS. This function lets you configure the month abbreviations global to OIU display page Title lines (Section IV). Month abbreviations are alphabetic and can be up to three characters long. Unlock the CONF keyswitch. Press **G** from the Define Color and Phrase Menu. The menu disappears and the Define Month Abbreviations Display appears on the CRT. The cursor is positioned at the top input field.

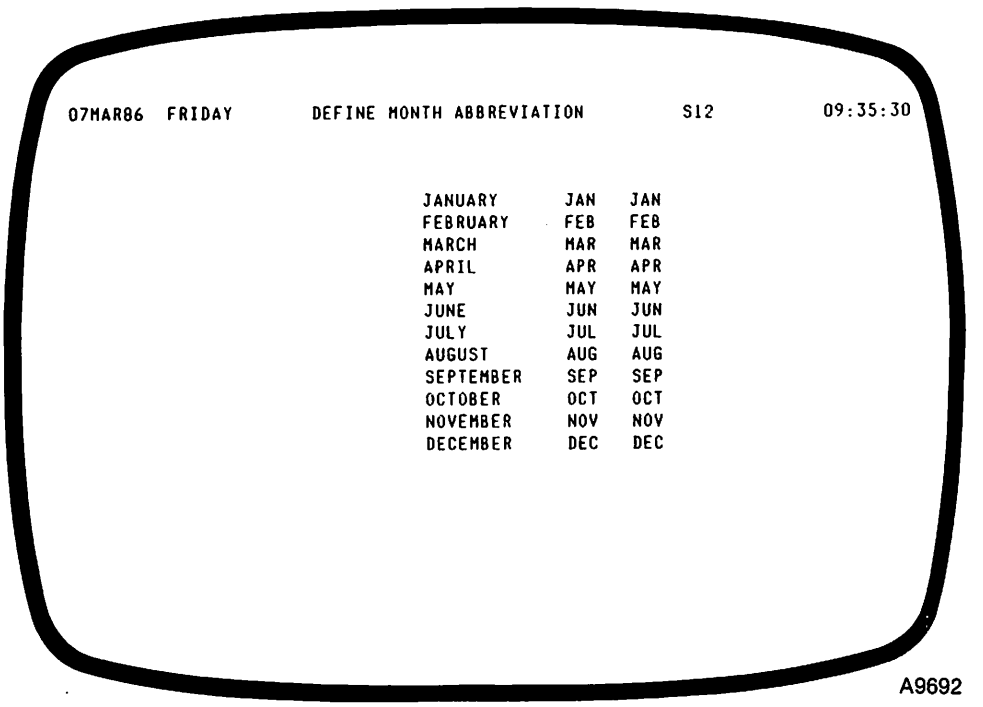


FIGURE 8.8 — Define Month Abbreviations Display

This display lists the default values in cyan and the user-definable values in green. Below the Title line are three columns (12 lines). The column on the left shows the months of the year completely spelled out (JANUARY, FEBRUARY, and so on). The column in the center shows the three-character default value month abbreviations. The column on the right shows the user-defined month values.

Press FIELD to position the cursor at the desired input field. Enter the abbreviation desired for each month. You can use the default values by skipping a field (pressing FIELD to bypass it), as well. When done defining all month abbreviations press ENTER. Return to the Define Color and Phrase Menu.

The OIU replaces any current month entry with the previous value if you press ESCAPE before first pressing ENTER.

To define Month abbreviations, follow these steps:

STEP 1 — Enter the abbreviation for January. Press FIELD.

STEP 2 — Enter the abbreviation for February. Press FIELD.

STEP 3 — Enter the abbreviation for March. Press FIELD.

STEP 4 — Enter the abbreviation for April. Press FIELD.

STEP 5 — Enter the abbreviation for May. Press FIELD.

STEP 6 — Enter the abbreviation for June. Press FIELD.

STEP 7 — Enter the abbreviation for July. Press FIELD.

STEP 8 — Enter the abbreviation for August. Press FIELD.

STEP 9 — Enter the abbreviation for September. Press FIELD.

STEP 10 — Enter the abbreviation for October. Press FIELD.

STEP 11 — Enter the abbreviation for November. Press FIELD.

STEP 12 — Enter the abbreviation for December. Press ENTER.

NOTE

Whatever entries you make must be meaningful to the operator.

When done defining all Month abbreviations, return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

SET COLORS AND PHRASES TO OIU STANDARDS. This function is exactly identical to the same function (choice C) of the Alarm Management Menu (choice O from the OIU Configuration Menu). The same procedures apply as for that function. (See the latter part of Section VI.)

NOTE

Use the Set Colors and Phrases function from the Alarm Management Menu, rather than from the Define Color and Phrase Menu. Either function performs the same operations. It is not necessary to perform both functions when configuring the OIU. (Use one or the other, not both. The Set Colors and Phrases function from the Define Color and Phrase Menu is to be removed at a later date.)

If using this function from this menu rather than from Alarm Management, proceed as below.

Unlock the CONF keyswitch. Press **H** from the Define Color and Phrase Menu. The Set Colors and Phrases Display appears under the menu.

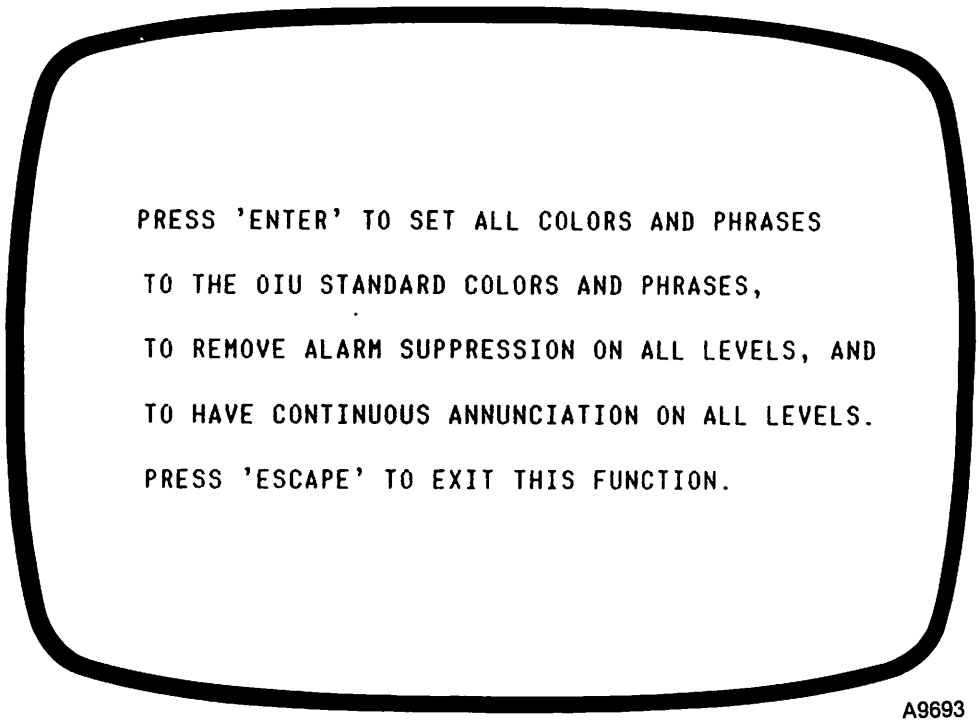


FIGURE 8.9 — Set Colors and Phrases Display

If you press ENTER, the OIU automatically fulfills the operations shown above. The Define Color and Phrase Menu then reappears on the CRT.

If you press ESCAPE, the OIU does not fulfill the operations shown above. The Define Color and Phrase Menu immediately reappears on the CRT.

When done proceed to another Color and Phrase configuration function. If done all Color and Phrase configuration, return to the OIU Configuration Menu (press ESCAPE again). If done all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise proceed to some other configuration function.

SECTION IX
LOGGING CONFIGURATION

INTRODUCTION

Various logging features are available with the OIU both for display on the CRT and for hardcopy printout using line printers. Each log provides a printed listing of various system data. Logging information provides updates of current system events, enabling alterations of plant control strategy as necessary. The system data in a log can be instantaneous (as events occur) or data collecting over a period of time (set during configuration).

This Section describes the various OIU logging features and how to configure them. This Section also describes various log status displays. Access the log status displays using the General Function Menu. Each status display shows current information regarding its log type on the CRT. A log status display lets you alter various printed features of its log type as desired depending on configuration.

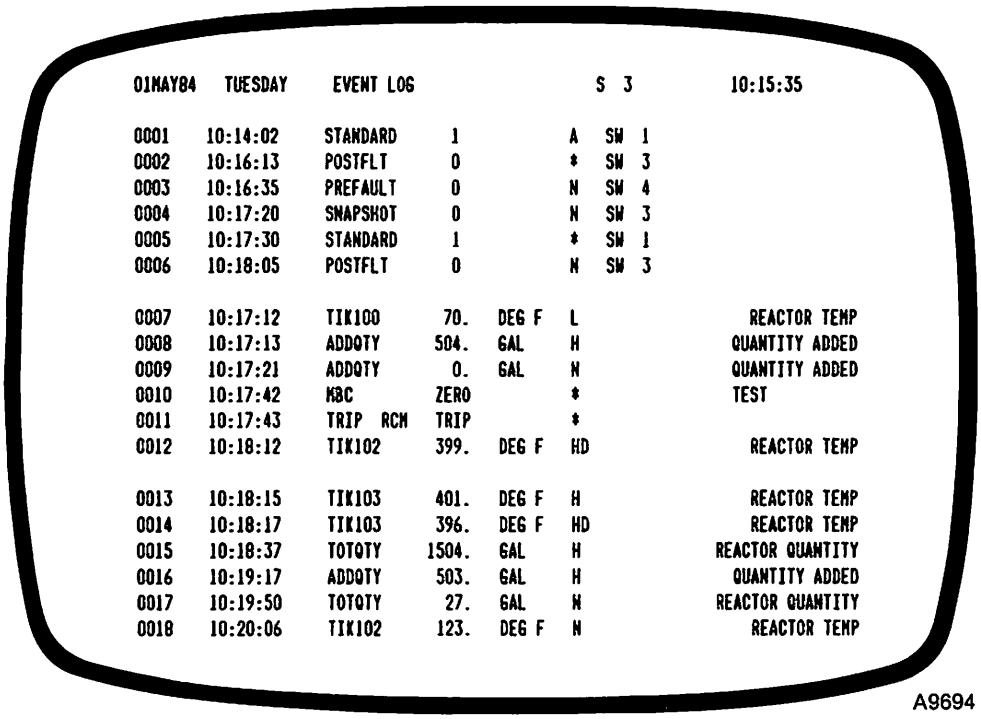
Logging Descriptions
The OIU uses several different logs, including a special report log:

- Event (listing of alarms, state changes, and operator actions as they occur)
- Trend (listing of real/Boolean values over time based on Trending and internal system scheduling)
- Trip (listing of values triggered by Boolean events in system)
- Periodic (special graphic reports and/or listings)
- Sequence of Events (listing of sequential events data similar in format to an Event Log).

EVENT LOG. An Event log is similar to the Alarm Summary Display (Section IV). An Event log prints out events (as above) at the time they occur (Section XII). This provides you with a dynamic printout of all tags entering and leaving an alarm state, or otherwise changing state as a result of operator actions. The Event Log also treats tags having bad quality as tags in an alarm state. (See Section IV for an example of bad quality.)

An Event Log prints out event information lines below a standard Title line (heading). Each information line contains the following items (left to right):

- Line number (0001 and up)
- Time of alarm (hh:mm:sec)
- Tag name
- Value (Real or Boolean)
- Engineering Unit (if any)
- Alarm indicator (A, *, etc., or N (non-alarm state))
- Boolean State changes
- Tag descriptor/Operator control action messages.



01MAY84 TUESDAY EVENT LOG S 3 10:15:35

0001	10:14:02	STANDARD	1		A	SW 1	
0002	10:16:13	POSTFLT	0		*	SW 3	
0003	10:16:35	PREFAULT	0		N	SW 4	
0004	10:17:20	SNAPSHOT	0		N	SW 3	
0005	10:17:30	STANDARD	1		*	SW 1	
0006	10:18:05	POSTFLT	0		N	SW 3	
0007	10:17:12	TIK100	70.	DEG F	L		REACTOR TEMP
0008	10:17:13	ADDQTY	504.	GAL	H		QUANTITY ADDED
0009	10:17:21	ADDQTY	0.	GAL	N		QUANTITY ADDED
0010	10:17:42	KBC	ZERO		*		TEST
0011	10:17:43	TRIP RCM	TRIP		*		
0012	10:18:12	TIK102	399.	DEG F	HD		REACTOR TEMP
0013	10:18:15	TIK103	401.	DEG F	H		REACTOR TEMP
0014	10:18:17	TIK103	396.	DEG F	HD		REACTOR TEMP
0015	10:18:37	TOTQTY	1504.	GAL	H		REACTOR QUANTITY
0016	10:19:17	ADDQTY	503.	GAL	H		QUANTITY ADDED
0017	10:19:50	TOTQTY	27.	GAL	N		REACTOR QUANTITY
0018	10:20:06	TIK102	123.	DEG F	N		REACTOR TEMP

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FIGURE 9.1 — Example of Event Log

When a bad quality point occurs its time of occurrence and its value also print out (including the * in the alarm indicator field of that line). When a value exceeds its defined space (goes out of range) six asterisks ****** print out in the value field.

If your system has more than one printer, you can dedicate one to print out only Event logs. Use the other printer to printout other displays while continuously printing the Event log. Otherwise, an Event Log fills its print buffers and waits until a currently printing hardcopy is complete before printing out itself.

When not dedicating one printer to making a continuous Event Log, other display printouts take precedence. After another display printout finishes, the Event Log heading prints out followed by all information in its buffer.

NOTE

You can configure the Event Log to print (ON) or not (OFF) as desired. (See Section X for discussion on archiving event data.)

TREND LOG. The OIU can generate up to 50 separate Trend logs, each reporting stored trend data containing up to 12 tags in a tabular format. The engineer schedules Trend Log printing through logging configurations. Trend logs can print out:

- when trending data collection is complete
- at the end of a shift
- at the end of a day
- on demand.

```
07MAR86  FRIDAY        FEEDWATER HEATERS  3    TREND LOG 12     COLLECTION COMPLETED 07:01

               2T524     FEDWTR     2C521     FEDWTR
               HEATER 23 DRAIN       FROM  HEATER 11

               2L120     DEAERA     2C522     FEDWTR
                    TANK LEVEL      HEATER 11 DRAIN

               2T524   2L120        2C521     2C522

                 DEG F   FEET        DEG F     DEG F
06MAR86 08:00  76.750 6.4063        77.250    77.250
        09:00  76.500 6.4219        77.000    77.000
        10:00  77.000 6.4219       P63.500   P63.750
        11:00  77.250 6.4219        13.000    13.000
        12:00  77.500 7.2969        78.000    78.000
        13:00  77.250 7.7500        78.000    78.000

        14:00  77.000 7.7500        77.500    77.500
        15:00  77.000 7.2500        77.500    77.500
        16:00  77.250 5.8438        77.500    77.500
        17:00  77.250 6.1719        77.500    77.500
        18:00  77.250 7.8282        77.750    77.750
        19:00  77.250 7.8282        77.750    77.750

        20:00  76.750 7.8282        77.500    77.500
        21:00  76.000 7.8438        76.750    76.750
        22:00  76.000 7.8438        76.250    76.500
        13:00  75.750 7.8438        76.250    76.250
07MAR86 00:00  76.000 7.8438        76.000    76.250
        01:00  76.250 7.8438        76.000    76.250
                                                                                    A9695
```

FIGURE 9.2 — Trend Log Example

The date and time of a Trend Log heading show the date and time the log data collection completed (with the log printing out shortly afterwards). The log number (1 - 50) appears to the right of the log title. To the right of the log number is the log explanation message. The message can be one of the following:

- Collection completed
- Shift end
- Day end
- Demanded.

Below the heading line are the nine tag identification lines. The identification lines list out tag data for each trend (up to 12) on the log. The identification lines list (top to bottom) the following information:

Information	Line	Example
1st Tag name	one	2T524 FEDWTR
and descriptor	two	HEATER 23 DRAIN
(blank line)	three	
2nd Tag name	four	2L120 DEAERA
and descriptor	five	TANK LEVEL
(blank line)	six	

1st & 2nd Tag name	seven	2T524	2L120
(station parameter) (collection mode)	eight	SP AVG	MIN
(engineering unit)	nine	DEG F	FEET.

From left to right across the Trend Log the identification lines form up to six blocks, each listing two trended tags, for the maximum 12 tags per log.

The tags appear in each block so that the first (top) tag descriptor refers to the tag name on the left of line seven while the second (bottom) tag descriptor refers to the tag on the right. Under each tag name in line seven there can be two other items. The left item is the station parameter (PV, SP, CO, or RI). The right item is the trend collection mode (SMP, AVG, MIN, or MAX). Line nine lists any engineering unit under each tag name of line seven.

When a station tag PV is logged the station parameter stays blank. The parameter also stays blank if the tag is not a station type. The trend collection mode appears only for real or station tags. AVG does not appear for real or station tags because this is their normal collection mode. SMP does not appear for Boolean or Remote Control Memory (RCM) tags because they are always samples. Engineering units appear only for real or station tags.

Underneath each tag identification block are the two tag columns of data value lines. Each data line (in groups of six down the printed log page) also has a collection time (in a column to the left of the first tag column). Each collection time shown depends on the configuration. (For example, if each data value collects every hour and the first data collection was at 08:00, then the next data line collection time is 09:00, and so on.)

NOTE

The time between each data line in the log is the configured collection period. This collection period can range from a minimum of one minute to as much as 24 hours (Section VI).

Each tag value in a data line can be real (analog) or Boolean (digital). In the SAMPLE (SMP) collection mode each data line shows the tag value at that particular collection time. In MAX or MIN modes each data line shows the maximum or minimum tag values over the specified time interval. The AVG mode shows the average tag values for the time interval, while the TOT mode shows the total tag values.

The partial indicator (**P**) appears directly to the left of a real value to show that data was not available at some time during the collection period. The value appearing in the data line on the log is only a partial accumulation of values during the collection (AVG, MIN, or MAX). A single * indicator appearing at the extreme right of the value field (in place of the value) shows the data was bad quality throughout the collection period. When six asterisks (******) fill the value field that value exceeds the limit of the field.

The date the log began data collection appears at the extreme left of the first data line (and at the extreme left of any other data line in which the date changes).

TRIP LOG. A process event (depending on configuration) can trigger a Trip Log causing a Trip Log to print out. The OIU can generate up to 50 Trip logs, each reporting the trend data of up to 12 tags. One process event (or several) can trigger more than one Trip Log.

12JUL84 THURSDAY MOTOR TRIP FOR PLANT 1-A TRIP LOG 1 COLLECTION COMPLETED 18:03

	G-KI-082 START DEMAND PERIOD	G-J0-079 LAST PERIODS DEMAND	G-J0-079 LAST PERIODS DEMAND	G-PT-800 800LB HEADER PRESSURE	G-FT-510 TG-1 THROTTLE FLOW	G-FT-630 150 TO 50LB PRV FLOW
	G-FT-710 TG-1 50LB EXH. FLOW	G-JI-092 DEMAND SET POINT	G-ME-041 PLANT PURCHASED POWER	G-PT640 150LB HEADER PRESSURE	G-FT-720 TG-2 50LB EXT FLOW	G-FT-610 TG-1 150LB EXT FLOW

		G-KI-082	G-FT-710	G-J0-079 MIN	G-JI-092	G-J0-079 MAX	G-ME-041	G-PT-800	G-PT-640	G-FT-510	G-FT-720	G-FT-630	G-FT-6
			KLB/HR	KW	KW	KW	KW	PSIG	PSIG	KLB/HR	KLB/HR	KLB/HR	KLB/HR
12JUL84	17:23:00		76.750	9024.0	*	9024.0	8928.0	804.00	149.50	163.00	46.875	0.0000	86.000
	17:24:00		71.500	9042.0	*	9024.0	9056.0	810.00	149.50	164.00	53.625	0.0000	92.500
	17:25:00		66.750	9024.0	*	9024.0	9024.0	816.00	150.00	160.50	47.625	0.0000	93.500
	17:26:00		61.875	9024.0	*	9024.0	10048.	814.00	150.00	158.00	43.500	0.0000	96.000
	17:27:00		57.375	9024.0	*	9024.0	10592.	804.00	149.50	155.50	39.250	0.0000	98.250
	17:28:00	START	60.500	7104.0	*	7104.0	9856.0	800.00	149.00	165.50	49.375	0.0000	105.25

A9696

FIGURE 9.3 — Trip Log Example

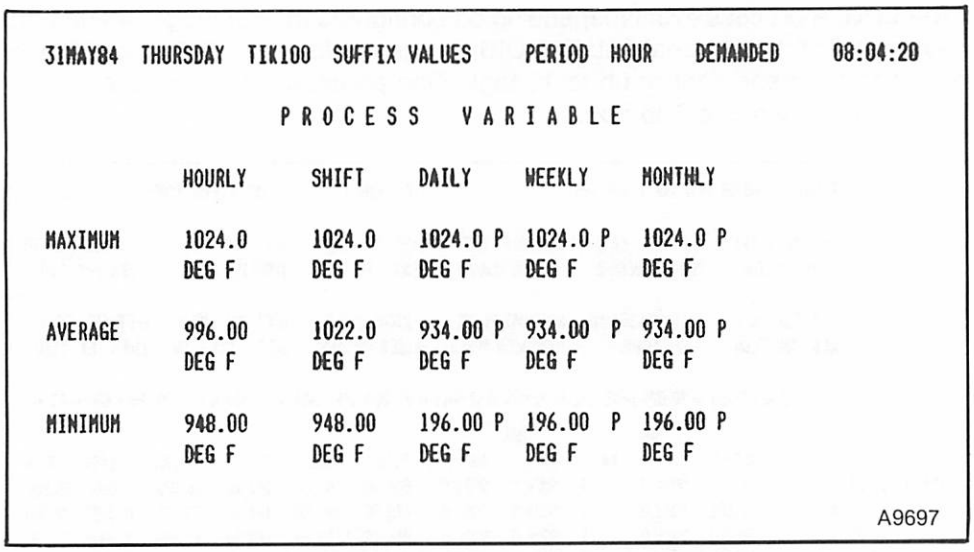
The format of the Trip Log heading line and tag identification lines is similar to that of the Trend Log. Unlike a Trend Log, however, a Trip Log explanation can only be COLLECTION COMPLETED or DEMANDED. Tags, tag descriptors, trend column headers, and trend data values are identical to those of a Trend Log. The Trip Log prints the trip event on a separate line (between the groups of six data lines) at the appropriate time relative to the trend data. The trip event line shows the time of event occurrence, tag name, logic state descriptor, and tag descriptor.

NOTE

The configured collection period for trend data on a Trip Log (time between each data line) can only be 15 or 60 seconds.

PERIODIC LOG. A Periodic Log reports both instantaneous values (on demand) and values summarized over a period of time. The OIU schedules the printing of Periodic Logs depending on logging configuration. Periodic log printing can occur on demand or automatically at one of the following periods:

- hourly
- at shift end
- daily
- weekly
- monthly.



31MAY84 THURSDAY TIK100 SUFFIX VALUES PERIOD HOUR DEMANDED 08:04:20

PROCESS VARIABLE

	HOURLY	SHIFT	DAILY	WEEKLY	MONTHLY
MAXIMUM	1024.0 DEG F	1024.0 DEG F	1024.0 P DEG F	1024.0 P DEG F	1024.0 P DEG F
AVERAGE	996.00 DEG F	1022.0 DEG F	934.00 P DEG F	934.00 P DEG F	934.00 P DEG F
MINIMUM	948.00 DEG F	948.00 DEG F	196.00 P DEG F	196.00 P DEG F	196.00 P DEG F

A9697

FIGURE 9.4 — Periodic Log Example

NOTE

Since the engineer customizes the format for each Periodic Log using the Graphic Editor during configuration, each Periodic Log can look considerably different from another. Use the Graphic Editor to configure graphics for a Periodic Log. Use the Define Logging Parameters function to access a previously configured graphic for printing as a Periodic Log. Consult Logging Definitions in this Section and the Graphic Editor in Section VII.

The OIU can generate up to 30 such logs, each having up to 100 tag values. Each Periodic Log can also contain various suffix tags (up to 250). A suffix tag is a tag having an associated data collection mode (or suffix type). The suffix types are: SMP, AVG, TOT, MAX, and MIN (sample, average, total, maximum, and minimum).

Each Periodic Log has a heading listing the date, day, and time of day the log prints out, the log tag name and descriptor, and the collection period for a single printing.

The tag values for all time intervals or data collection periods: hourly, daily, weekly, monthly, and shift end appear under the heading along with suffix types. Depending on the configuration of value formats (Section VII), engineering units can also appear under each tag value.

Print out instantaneously updated samples of tag values for the elements of a Periodic Log using the DEMAND function from a Periodic Log Status Display. (See Log Status Displays in this Section.)

NOTE

It is also possible to have a NOT SCHEDULED data collection period with any log. (See Define Logging Parameters.)

SEQUENCE OF EVENTS REPORTS. A Sequence of Events (SOE) Report log is a special log listing data in a format similar to an Event log. The OIU can generate up to 80 different SOE reports. (This can require your OIU setup to have up to 16 Multi-Function Controller/SOE front end processor pairs. See the Sequential Events Recorder manual, E93-917-1, for more detail on the hardware setup of these devices.)

```
STANDARD      SOE REPORT     1      DESC

01MAY84   TUESDAY      02:39:14

**:**:**:***            1          SER NO          17
14:04:04:384             1          SER NO          18
14:04:04:384             1          SER NO          19
14:04:04:384             1          SER NO          20
14:04:04:384             1          SER NO          21
14:04:04:384             1          SER NO          22

14:04:04:384             1          SER NO          23
14:04:04:384             1          SER NO          24
14:04:04:788             0          SER NO          17
14:04:04:788             0          SER NO          18
14:04:04:788             0          SER NO          19
14:04:04:788             0          SER NO          20
                                                    A9698
```

FIGURE 9.5 — Typical SOE Report

Each SOE report has a two line heading. The first line lists (left to right):

- Report type (STANDARD, PRE-FAULT, POST-FAULT, SNAPSHOT, SUMMARY)
- Title (SOE REPORT)
- OIU report index number (index number from the Define SOE Reports Display)
- Report (up to 32 alphanumeric descriptor characters).

The second line lists the date (dd/mm/yy), day of the week, and time of day (hh:mm:sec) at which the first line (data item) arrived at the OIU.

The data item lines (in groups of six) under the headings list (left to right):

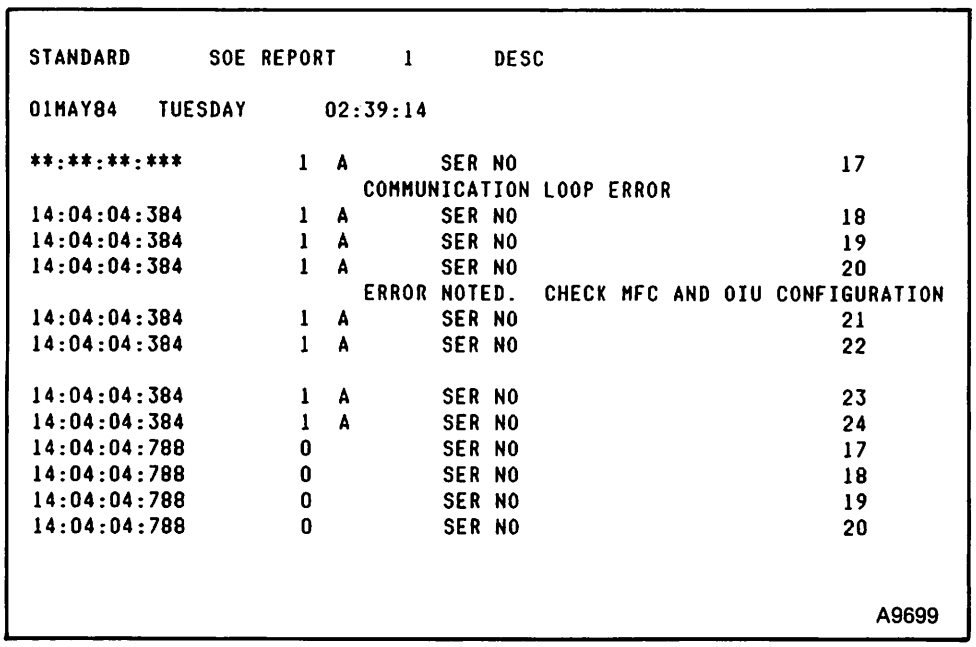
- Time of event occurence (hours (0-23):minutes:seconds:milliseconds; if time is invalid, this field appears as: **:**:**:***)
- Logic State Descriptor (The OIU prints a LSD for each data item. When a point is inactive or deleted this field stays blank.)
- Alarm indicator (If the point is in alarm, **A** appears. If the point is inactive or deleted, **I** or **D** appears (SNAPSHOT reports, only). For all other report types no data item generates or prints.)
- OIU SOE point descriptor (up to 32 alphanumeric characters)
- OIU SOE point number (Must correspond to the point number in the SOE front end processor).

The OIU receives and collects data from the MFC module and then formats and prints out the report, depending on configuration. Data prints in the order it arrives at the OIU. The OIU does not sort the data (the MFC does this). While the SOE report prints out the printer producing it continues until the report is complete. The SOE report is never interrupted during printing.

Data prints on every line with one line skipped in every six. The report includes four blank lines at the top (1/2 inch top margin) and three blank lines at the bottom (3/8 inch bottom margin). The maximum number of data event lines is 66 per page.

Only one report prints at a time. Even if several different SOE front end processors trip at once, the OIU finishes printing one SOE report before beginning another. Whenever the OIU first receives notice that the MFC has SOE data for collection, the OIU waits for a configurable period of time (REPORT WAITING TIME) before collecting the data for printing. There is an additional one to two minute delay between SOE data notification and transfer of data to the print buffer. If the printer is currently busy, the report does not print until the current printing finishes. If the MFC has SOE data overflow, it automatically saves the oldest data for printing.

Certain conditions cause error messages to print. An error message prints on a single line and mixes with printed event data, showing the time when the OIU detects the error condition. Table 9.1 shows the SOE error messages.



```
STANDARD      SOE REPORT     1      DESC

01MAY84   TUESDAY      02:39:14

**:**:**:***          1  A       SER NO                          17
                        COMMUNICATION LOOP ERROR
14:04:04:384          1  A       SER NO                          18
14:04:04:384          1  A       SER NO                          19
14:04:04:384          1  A       SER NO                          20
                        ERROR NOTED.  CHECK MFC AND OIU CONFIGURATION
14:04:04:384          1  A       SER NO                          21
14:04:04:384          1  A       SER NO                          22

14:04:04:384          1  A       SER NO                          23
14:04:04:384          1  A       SER NO                          24
14:04:04:788          0          SER NO                          17
14:04:04:788          0          SER NO                          18
14:04:04:788          0          SER NO                          19
14:04:04:788          0          SER NO                          20


                                                                  A9699
```

FIGURE 9.6 — SOE Report Showing Error Messages

TABLE 9.1 — SOE Error Messages

ERROR MESSAGE	EXPLANATION
'Communication Loop Error'	The OIU cannot communicate with the MFC-SOE front end processor or the OIU receives a garbled message.
'Some data below was lost. Check OIU Report wait time and MFC aging time'	MFC aging time is too short compared to OIU Report wait time. Data ages out of the MFC before the OIU can collect it. The data prints if MFC overflow occurs. This happens if the MFC receives too much data to hold, filling it before data ages.
'Problem detected on SOE fron end processor'	MFC detects a problem with the SOE front end processor or link between MFC and SOE front end processor. OIU tries to collect and print whatever good data it can.
'MFC block number is invalid or undefined. Check MFC and OIU configuration.	OIU tries to obtain SOE data using block number outside legal range of MFC block numbers or one undefined. If OIU tries to obtain SOE using defined block number not in SOE block, no error appears. Check OIU configuration of tags for reports, SOE reports, and MFC configuration.
'Invalid op code, Check MFC and OIU configuration.	OIU tries to obtain SOE data using MFC block number with invalid op code. Check MFC configuration and then OIU configuration of tags for reports and SOE reports.
'Error noted. Check MFC and OIU configuration.'	OIU detects indecipherable error. May be an error in MFC or OIU configuration.

Log Status Displays

The various Log Status Displays let you monitor a variety of information regarding the different logs and take certain control actions for each (Section XIII). Access the Log Status Display Menu from the General Function Menu (item selection **G**). There are three Log Status Displays:

- Trend Log Status
- Trip Log Status
- Periodic Log Status.

TREND LOG STATUS. A Trend Log Status Display has a heading line that shows its title and page number. Below the heading is a line showing:

DEMAND TREND LOG DD and CANCEL TREND LOG CC

Below this are two additional headings showing (left to right):

#	TITLE	ON OFF	COLLECTION PERIOD	NEXT	PRINT	SCHED	WAITING TO PRINT

Under the headings the log information lines print out with a skipped line between each information line as (left to right):

- Log number (1 - 50)
- Log title (from the logging configuration)*
- Log state (log turned ON or OFF)
- Log data collection period (hour, day, minute, etc.)
- Next scheduled log print time (time/date/scheduled option)
- Log waiting to output to a printer (YES or NO).

NOTE

An undefined log appears as a blank line after the log number.

*The data appears as:

(Title)	(Collection period - # of samples)		(Print time).
TRENDLOG	(mins/hrs/day)	(1 to 120 CLLCT)	(SHIFT/DAYS END/COMPLETE).

TREND LOG STATUS PAGE 1

DEMAND TREND LOG DD CANCEL TREND LOG CC

#	TITLE	ON OFF	COLLECTION PERIOD	NEXT PRINT	SCHED	WAITING TO PRINT
1	TRENDLOG 5MIN-12OCLCT DAYS END	ON	5 MINUTE	08:00 19JUN84	DAYS	NO
2	TRENDLOG 1HOUR 24CLCT DAYS END	ON	1 HOUR	08:00 19JUN84	DAYS	NO
3	TRENDLOG 1DAY-2COLLCT DAYS END	ON	1 DAY	08:00 18JUN84	DAYS	NO
4	TRENDLOG 5MIN-12OCCT SHIFT END	ON	5 MINUTE	12:00 18JUN84	SHIFT	NO
5	TRENDLOG 1HOUR 24CLCT SHIFT END	ON	1 HOUR	12:00 18JUN84	SHIFT	NO
6	TRENDLOG 1DAY 2CLLCT SHIFT END	ON	1 DAY	23:00 17JUN84	SHIFT	NO
7	TRENDLOG 5MIN-12OCLLCT COMPLETE	ON	5 MINUTE	13:07 18JUN84	CMPLT	NO
8	TRENDLOG 1HOUR-24CLCT COMPLETE	ON	1 HOUR	16:02 18JUN84	CMPLT	NO
9	TRENDLOG 1DAY-2 COLLCT COMPLETE	ON	1 DAY	15:02 20JUN84	CMPLT	NO
10	TRENDLOG 5MIN-12OCLCT NOT SCHED	ON	5 MINUTE	NOT SCHEDULED		NO
11	TRENDLOG 1HOUR-24CLCT NOT SCHED	ON	1 HOUR	NOT SCHEDULED		NO
12	TRENDLOG 1DAY-2COLCT NOT SCHED	ON	1 DAY	NOT SCHEDULED		NO

A9700

FIGURE 9.7 — Typical Trend Log Status Display

If a Trend Log is not scheduled to print out (the log is turned OFF), the message NOT SCHEDULED appears in the Collection Period field. You print this log only on demand (See below.) so it also has no print time shown. When you first turn ON a log the message INITIALIZING LOG can occasionally appear in the Collection field. This message stays on the CRT until that log collects a data sample and then disappears.

The DD and CC prompt fields (first subheading line) are inputs to DEMAND or CANCEL log printing (Section XIII). CANCEL (CC) removes all cycles of the log currently waiting to print but does not affect future log printing. DEMAND (DD) does not immediately produce a log printout unless that log currently (or previously) collected at least one sample. A log printed on demand contains only the data collected since the previously scheduled printout (up to the maximum number of samples specified by configuration). A scheduled print of a log clears the collected data from that log but DEMAND does not.

To view additional Trend Log Status pages, use the PREV/NEXT keys.

TRIP LOG STATUS. The Trip Log Status Display heading lines are similar to a Trend Log display. The two subheading lines (left to right) show:

#	TITLE	TRIP?	TRIPTAG	DATA COLLECTN COMPLETN TIME	SCHED PRINT?	WAITING TO PRINT

Each log information line shows (left to right):

- Log number (1 - 50)
- Log title (from logging configuration)*
- Log tripped (YES or NO)
- Boolean or RCM tag name
- End time for data collection and time of log reset (time of day and date)
- Log print out after collection (YES or NO)
- Log waiting for output to a printer.

> **NOTE**
>
> **If a log is undefined its line stays blank following its number.**

*The data appears as:

(Title)	(Print option)	(# of samples)	(collection time)	(tag name)
TRIPLOG	(YES or NO)	(1 - 120)	(15 or 60 secs)	TRIPRCM

The message NOT SCHEDULED appears in the Data Collection/Reset field of data lines for Trip logs not currently collecting data from a trip event. When a Trip Log activates, the time and date of data collection appears. If the engineer configured a Trip Log for post-trip collection, the message IMMEDIATE appears.

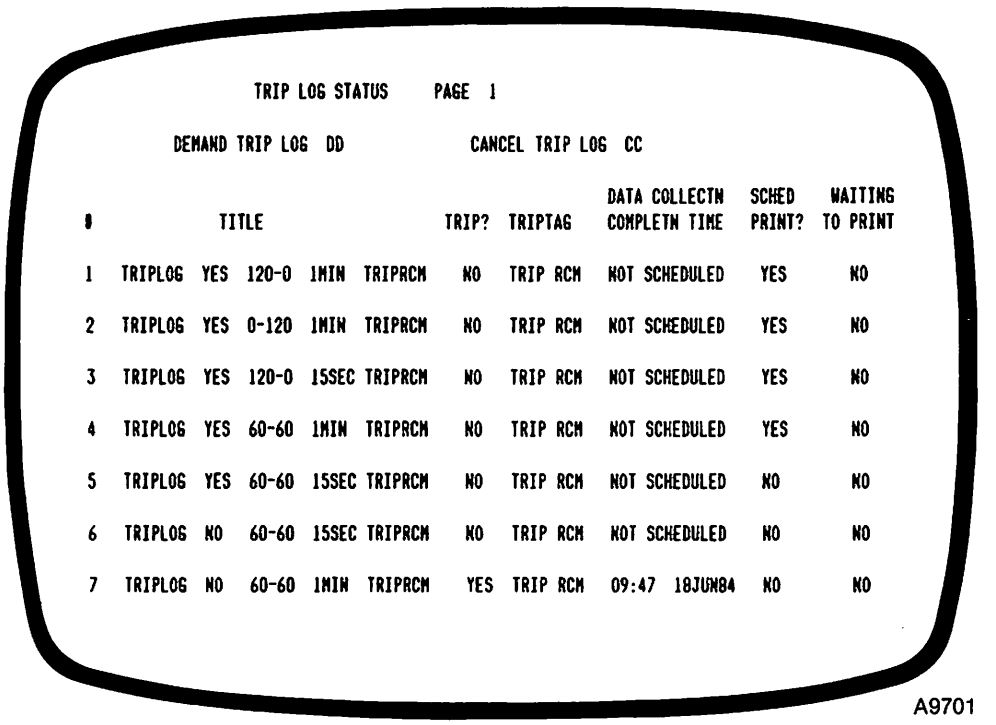


FIGURE 9.8 — Typical Trip Log Status Display

The CANCEL and DEMAND functions are similar to a Trend Log display. CANCEL removes only logs printing or waiting to print. Depending on the current state of a Trip Log, a DEMAND can cause one of the following to occur:

- A Trip Log which never tripped cannot print on demand because it contains no data.
- A Trip Log currently collecting data for a trip prints on demand only after collection is complete.
- A Trip Log printing when data collection is complete prints its current trip data on demand until a new trip event occurs.

To view additional Trip Log display pages, use the PREV/NEXT keys.

PERIODIC LOG STATUS. The Periodic Log Status Display has heading lines similar to the other two Log displays. Its two subheadings show (left to right):

#	NAME	DESCRIPTOR	ON OFF	NEXT PRINT SCHEDULED	WAITING TO PRINT

Each log information line shows (left to right):

- Log number (1 - 30)
- Graphic display name for Periodic Log
- Graphic display descriptor for log
- Log state (ON or OFF)
- Next scheduled print time (time/date/print option)
- Log waiting to output to a printer (YES or NO).

NOTE

An undefined log appears as a blank line following its number.

CANCEL and DEMAND functions operate similarly to the other two log displays. DEMAND causes a snapshot (sample) of the values of the various elements of the log (including suffix tags updated at the time of demand) to print on demand.

To view additional pages, use the PREV/NEXT keys.

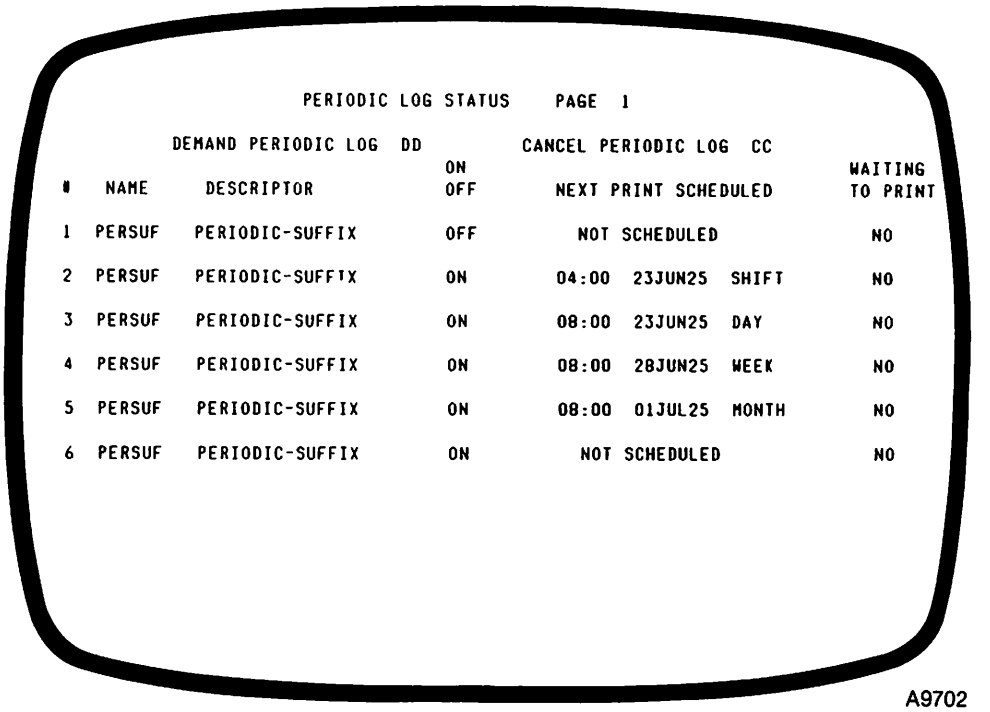


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FIGURE 9.9 — Periodic Log Status Display Example

Logging Definitions

The engineer configures logs using the Logging Configuration choice from the OIU Configuration Menu. Access the General Function Menu and then enter **D** to access the OIU Configuration Menu. The logging information to enter includes:

- OIU global logging parameters
- Suffix tag definitions
- Trend and Trip Log definitions
- Periodic Log definition using the Graphic Editor
- Other parameters for Periodic logs
- Sequence of Events Point List definitions
- Tag additions to list associated with SOE reports
- SOE report definitions.

CAUTION

All logging configuration is under keylock protection.

Unlock the CONF keyswitch. Press **L** on the OIU Configuration Menu. This accesses the Logging Configuration Menu. Logging configuration entries on this menu appear in the order in which you must perform them. For example, the engineer must configure the global parameters (including shift and day end times) before he can configure Trend Logs. He must define Suffixes before he can use them in a Periodic Log. Before he can put any tag into a log, he must define its trend (Section VI).

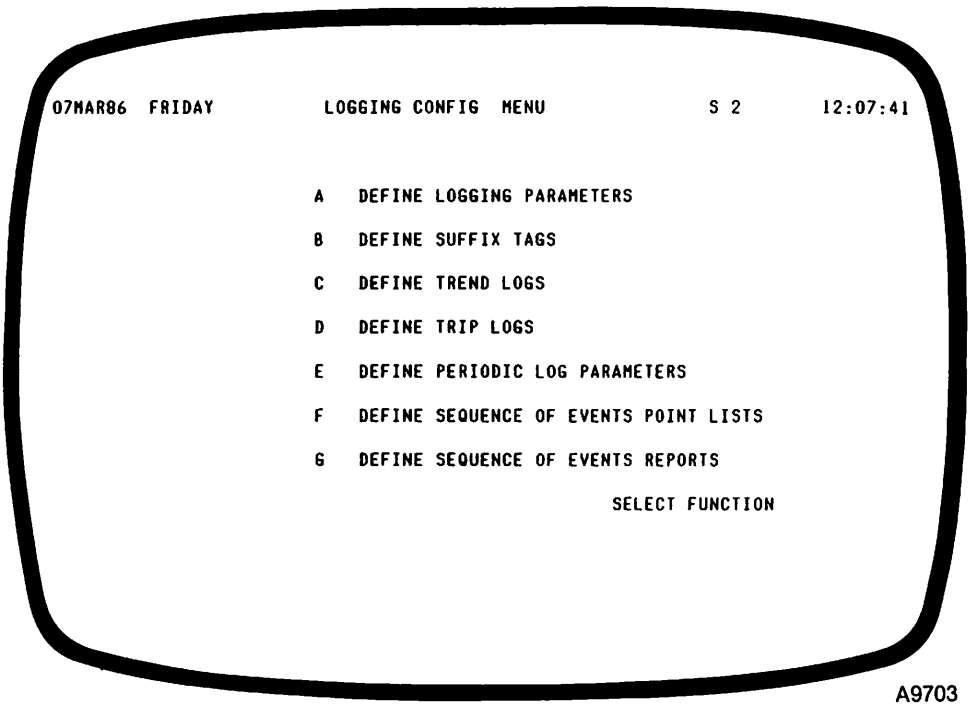

FIGURE 9.10 — Logging Configuration Menu

DEFINE LOGGING PARAMETERS. Enter choice **A** from the Logging Configuration Menu. The Define Logging Parameters Display now appears on the CRT with the cursor positioning itself at the first prompt. This display enables definition of global OIU logging information.

NOTE

If your OIU does not have the logging package installed, entering choice L from the OIU Configuration Menu simply causes the first part of the Define Logging Parameters display (See below) to appear on the CRT. (The page title becomes: DEFINE EVENT LOG.) This part of the display pertains only to an Event Log, enabling only the definition functions for that log.

This display has five parts or configurable choices (labeled with a cyan number from one to five):

1 Event Log definitions

2 Operator log canceling

3 Shift ending times

4 End of Day times

5 End of Week Day.

SECT advances the cursor from section to section while FIELD advances the cursor within a section. After entering data in a section, press ENTER to put it into OIU memory. Pressing ESCAPE puts the display into COMMAND ? mode without entering current data. Then move the cursor to any section or press ESCAPE again to return to the Logging Configuration Menu.

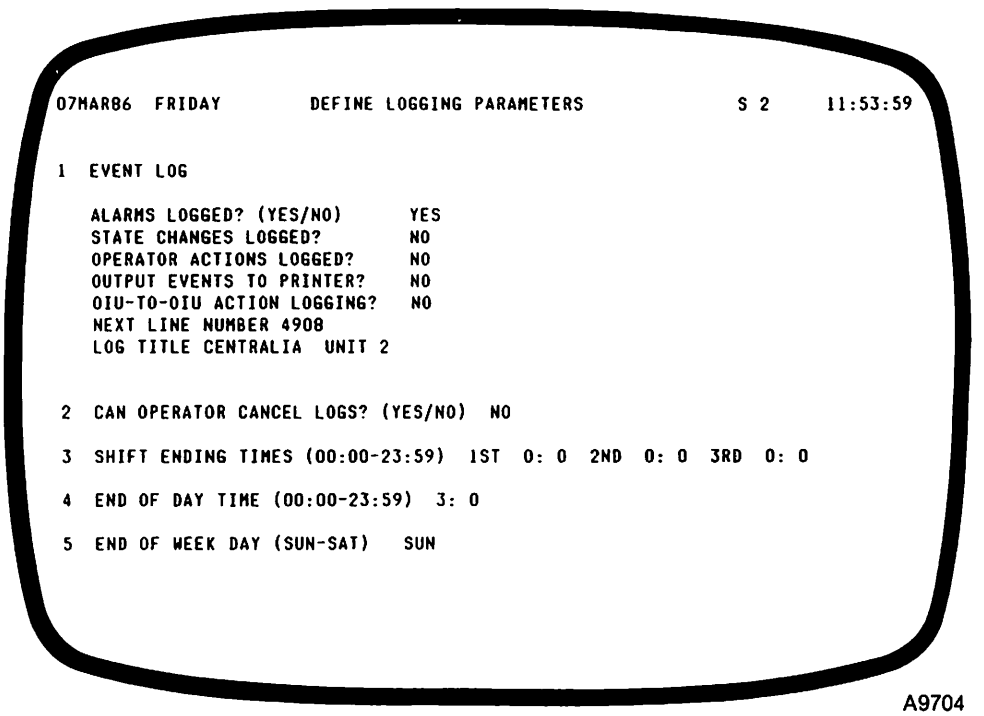

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FIGURE 9.11 — Define Logging Parameters Display

For the Event Log, choose whether the printing of each function is to be ON or OFF:

- Alarms logged (printed) YES or NO (ON or OFF)
- State changes logged YES or NO
- Operator actions logged YES or NO
- Output events to printer YES or NO
- OIU-to-OIU action logging YES or NO.

The first prompt field controls the printing of alarm events, returns to normal, and acknowledge events. The second field lets the Event Log print out Boolean state changes (not intended to be alarms but to be logged). The third field must be YES to let the operator display archived event changes (Section XIII).

The fourth field can be NO if your OIU has an Archiving package (Sections X and XIII). Without archiving capability the operator cannot examine events for later review unless this field is set to YES. The last field shares events on your OIU with all other OIUs on the PCL when set to YES.

The Event Log Line Number (####) field identifies the sequence of logged events and lets you reset the counter if desired (at the beginning of every shift, for instance). Modifying the line number changes the number that the next alarm, event, or operator action prints. The counter rolls over (returns to 0000) after 9999. The log title permits the entry of up to 32 alphanumeric characters to identify your installation name on the Event Log heading.

Specify whether the operator can cancel logs (using the CANCEL function from the Log Status displays).

Specify the ending times of each shift and day at your installation using the 24-hour (military) clock times. Shifts can be of varying lengths and need not be even. There can be one, two, or three shifts per day. Shift ending times must be in ascending order. If your installation has more than one shift per day, enter the ending time for the last shift (second or third) first. Then enter the ending time for each previous shift (first or second and then first). If a shift ends at midnight, enter 00:00 for the 1st shift.

End of day (00:00 to 23:59) determines when daily suffixes and daily Periodic logs occur. End of week (SUN or SAT) determines when weekly suffixes and weekly Periodic logs occur.

DEFINE SUFFIX TAGS. Suffix tags collect averages (AVG), totals (TOT), minimums (MIN), or maximums (MAX) over time periods varying from hourly (HR), daily (DAY), weekly (WK), or monthly (MON), to shift end (SFT). Press choice **B** from the Logging Configuration Menu. Prompts appear at the bottom of the menu, enabling suffix definition to begin at a specific suffix. Entering the proper suffix data at the prompts accesses the Define Suffixes Display.

To start at a specific suffix, enter either the Tag, Station parameter, and suffix that identify an existing suffix or enter that suffix number. To enter a new suffix, simply leave these prompts blank. In either case, move among the prompts using FIELD. After either entering specific suffix data or leaving all data fields blank, press ENTER. The Define Suffixes Display now appears on the CRT. To move among the input fields of this display, use FIELD.

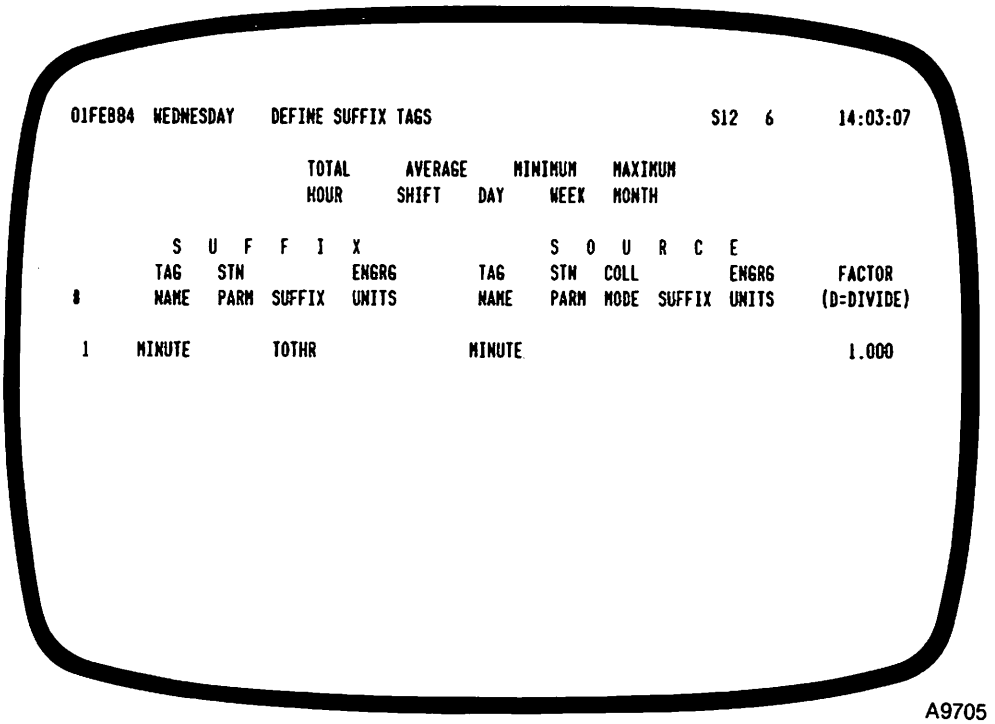

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FIGURE 9.12 — Define Suffixes Display

The first two subheadings under the Title line of this display show the suffix types and collection time intervals:

TOTAL	AVERAGE	MINIMUM		MAXIMUM
HOUR	SHIFT	DAY	WEEK	MONTH

The next subheading shows the suffix and source tag data columns:

	SUFFIX				SOURCE					
	TAG	STN		ENGRG	TAG	STN	COLL		ENGRG	FACTOR
#	NAME	PARM	SUFFIX	UNITS	NAME	PARM	MODE	SUFFIX	UNITS	(D=DIVIDE)

The suffix tag information lines below this last subheading contain the various input fields:

- Tag number (1 - 250)
- Suffix Tag name (same as source)
- Suffix Station parameter (same as source parameter)
- Suffix (data collection mode and time interval) — some combination of AVG/TOT/MIN/MAX and HR/SFT DAY/WK or MON.
- Suffix Engineering units (usually same as source but can change when suffix starts with TOT).

The next two fields receive the same data as that entered for the corresponding suffix fields at the beginning of the line:

- Source Tag name
- Source Station parameter.

The next two fields are input areas:

- Collection mode (a trend)
- Source collection and interval (ignored if the source tag is a trend and used only if the source is a suffix tag).

The next field receives the same engineering units data as entered at the beginning of the line:

- Source Engineering units.

The last field is a prompt that keeps the value of the suffix entered consistent with: engineering units, units of the source, method of collection from the source, and time ratio of the suffix interval to source interval:

- Conversion factor (also changes the engineering units of the suffix tag).

To define a suffix, first identify it and specify the source of its data (either a trend or another suffix tag). Then specify its conversion factor. The tag, station parameter, suffix collection and interval identify a specific suffix. Each suffix has its own unique set of these identifying items.

Enter the tag of the suffix. This tag is identical to the tag of the suffix data source. Next enter the suffix station parameter (also identical to the source station parameter). The station parameter is actually the same as the trend type. The Define Suffixes Display recognizes that real (analog value) tags have no station parameter choices and skips this field when the engineer enters a real tag.

The first SUFFIX column contains two fields. Enter TOT, AVG, MAX, or MIN into the first. This specifies how the data collects from the source. The OIU does not compare this entry with the corresponding field of the source. (There is no restriction on this entry.)

Enter HR, SFT, DAY, WK, or MON into the second field. This specifies the suffix collection interval. This interval is the time period over which data collects for the suffix. Though the OIU does not check it, this interval must be the same as the one for the Periodic Log that reports the suffix unless incomplete values are desired.

Enter the suffix Engineering units. The OIU uses these units only for reporting on the Periodic Log. The OIU does not compare the suffix Engineering units with those of the source. Normally, these units are identical, except when the suffix converts a flow rate source to some accumulation value (for instance: LBS/M → LBS) or converts to some larger units (for instance: LBS → TONS).

NOTE

The engineer must define Engineering units using the Define Engineering Units function of OIU configuration (Section VI) before he can enter such units when defining suffix tags. If Engineering units contain non-alphanumeric characters, he must enter them into configuration using the auxiliary keyboard.

The Define Suffixes Display fills the tag and station parameter fields of the source using the same entries as those made for the suffix. The cursor then automatically advances to the collection mode field. Remember, the source data must be either a trend or a previously defined suffix. Enter the collection mode (AVG, MIN, etc.) to indicate a trend or leave this field blank and enter suffix collection and interval in the next two fields to indicate a suffix.

The Define Suffixes Display now fills the source Engineering units field with the same entry as made for the suffix.

Now enter a value into the conversion factor field. The conversion factor can be a whole integer, a fraction, or a mixed number. If a fractional factor with one as its numerator (1/3, 1/60, 1/1000, etc.) is necessary, use **D** followed by the denominator (D3, D60, D1000, etc.). Notice that D2 and 0.5 provide the same result. Using the D feature avoids calculating decimal fractions.

NOTE

The default conversion factor is 1.0. This serves as the correct factor in most cases.

If the suffix collection is MAX or MIN and the engineering units are identical for the suffix and the source (the normal situation), the correct factor is 1. To desk check the conversion factor, use the following steps:

STEP 1. Assume a situation in which the source value stays constantly at 1.0 throughout the suffix collection interval. (It does not matter if this is unrealistic at the moment.)

STEP 2. Perform the collection (specified by suffix collection and interval) and write down the result. If the suffix collection is AVG, MAX, or MIN, the result of this step is 1.0, regardless of the source or collection interval. If the suffix collection is TOT, the result is the number of collection intervals of the source in one collection interval of the suffix.

NOTE

The collection interval of a trend is always one minute so the result of a suffix from a trend source equals the number of minutes in the suffix interval.

A suffix collection interval with a suffix as its source has a result equal to the suffix interval (in minutes) divided by the source (also in minutes).

STEP 3. Multiply the result of Step 2 by the conversion factor unless using **D**. If **D** preceded the factor, divide the result of Step 2 by the conversion factor.

STEP 4. Write down the 1.0 (Step 1) and label it using the source engineering units. Next, write the word FOR. Now write the suffix interval (one hour, one shift, etc.). Then write the word IS. Finally, write the result of Step 4, labeling it with the suffix engineering units.

If the resulting sentence is correct and makes sense, the factor is also correct. If it is incorrect, change the factor and repeat the steps. If it does not make sense, it can be wrong even if the result seems correct. In this case, check everything including the source configuration.

Try this out with the following example to show a factor of 1.0 used when averaging a flow rate over any time interval. The result of Step 4 must resemble: 1 LBS/M FOR 1 DAY IS 1 LBS/M. (The time interval, 1 DAY in this case, is irrelevant.)

Try totaling the rate of flow in pounds/hour with a trend as a source over a day. Using a factor of D60, the result of Step 2 is 1440. The result of Step 4 is 1 LBS/HR FOR 1 DAY is 24 LBS. This factor (D60) considers the number of minutes/hour. (Remember, a trend collects in minutes and its units are in hours.)

Try totaling the units (LBS) with an hourly suffix as a source over a day, giving the result in TONS. Using the factor D2000, the result of Step 2 becomes 24 and Step 4 becomes 1 LBS FOR 1 DAY IS .012 TONS. (Remember 1 LBS is really 1 LBS/HOUR. So change Step 1 to 2000 units and change the other steps accordingly. This results in Step 4 becoming: 2000 LBS FOR 1 DAY is 24 TONS.)

DEFINE TREND LOGS. Press choice **C** from the Logging Configuration Menu. A Trend Log prompt appears at the bottom of the CRT. Entering the proper input at this prompt accesses the Trend Log Display. If entering a number, the Define Trend Logs Display of that specific Trend Log appears on the CRT. If leaving this field blank and just pressing ENTER, the first available Trend Log of the Define Trend Logs Display appears. The FIELD key moves the cursor among the input fields of this display.

```
07MAR86  FRIDAY          DEFINE TREND LOGS              S1234567890   00:15:23
                                                      PRINT WHEN:
COLLECTION  PERIOD   UNITS    MINUTE   HOUR   DAY      COMPLETE
                                                      SHIFT END
 #  ON,OFF                                 COLLECTION    DAY END        NUMBER OF
    CLEAR              TITLE                 PERIOD    NOT SCHEDULED   COLLECTIONS

AA  AAAAA   AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA  NNN  AAAAAA   AAAAAAAAA          NNN

    TAG NAME  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA
    STATION
     PARM     AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA
    COLLECT
     MODE     AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA

 2  ON     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA  101  MINUTE   COMPLETE          120
    TAG NAME  FIK10001  PV  AVG   FIK10002  SP  SMP   FIK10003  CO  MIN  FIK10004  PV  MAX
    STATION
     PARAM    REAL0005     AVG   REAL0006     AVG   BOOL0007         BOOL0003
    COLLECT
     MODE     FIK10009  PV  AVG   FIK10010  PV  AVG  FIK10011  PV  AVG  FIK10012  PV  AVG

                                  COMMAND?  NN
```

A9706

FIGURE 9.13 — Define Trend Logs Display

Below the display Title line are five subheadings showing (left to right):

```
                                                    PRINT WHEN:
COLLECTION PERIOD UNITS MINUTE HOUR DAY             COMPLETE
                                                    SHIFT END
  ON,OFF                              COLLECTION    DAY END          NUMBER OF
# CLEAR    TITLE                        PERIOD     NOT SCHEDULED    COLLECTIONS
```

Under these lines are the format lines. The top (first) line shows (left to right):

- AA (Trend Log number: 1 - 50)
- AAAAA (ON/OFF/CLEAR)
- AAAA on up to 32 characters (Trend Log title)
- ### AAAAAA (Trend collection period)
- AAAAAAAAA (print option)
- ### (number of collections).

The next five format lines show two identical formats per line for each line (left to right):

```
TAG NAME        AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA
STATION
PARAM           AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA
COLLECT
MODE            AAAAAAAA  AA  AAA  AAAAAAAA  AA  AAA
```

The engineer must enter the following information for each Trend Log:

- ON/OFF/CLEAR (A log turned OFF does not collect data and does not print. Turning a log OFF clears all data from it. To modify a log configuration, you must turn the log off.)
- Title (A title of up to 32 characters appearing as the log heading.)
- Collection period (This can be minutes, hours, or up to one day. This is the period of time between two lines of the log.)
- Print option (Whether the log prints automatically when collection is complete, automatically at shift or day end, or is not scheduled to print at all.)
- Number of collections (The number of collections for the log (up to 120). For Shift or Day end print options, the time between log printouts is independent of the number of samples. This time is that between shifts (SHIFT END) or 24 hours (DAY END). For a log set to print upon completion, the time between printouts is the collection period multiplied by the number of samples.)

NOTE

For example: 1 hour x 10 samples = 10 hours.

Move the cursor to the ON/OFF/CLEAR field and enter OFF. Then press ENTER. An operator message then appears at the bottom of the CRT:

'ENTER' turns off log and clears data, 'ESC' cancels operation

Press ENTER again to turn off the log. This prevents accidental clearing of the data in a log. To clear the log from configuration and to clear its data, press CLEAR and then ENTER. The operator message:

'ENTER' turns off log and clears data, 'ESC' cancels operation

reappears. Press ENTER to clear the log.

Move the cursor to the Title field and enter the title. Move the cursor to the Collection Period field and enter the specific alphanumeric data desired (10 minutes, 1 hour, 1 day, etc.). Move the cursor to the Print option field and enter the option desired (COMPLETE, SHIFT END, DAY END, or NOT SCHED). Move the cursor to the Collections field and enter the number of samples desired (up to 120).

NOTE

The number of collections must be greater than the collection period. For example: A 1-minute collection period prints out 60+ collections at the end of an hour.

The engineer may define up to 12 trends for the log in the remaining three data lines of this section. The four trends of the first line appear in the first four columns of the Trend Log printout. The four of the second data line appear in the middle columns of the printout and the four of the last line appear as the rightmost columns on the printout.

Three fields identify each of these 12 trends. (The engineer must define each of these trends during OIU configuration (Section VI) before he can enter them here.) Enter the trend tag name into the first field. If the tag is a station, enter its station parameter (PV, SP, CO, RI) into the second field. If the tag is not a station, leave the second field blank and move on to the third one. (The second field is similar to the trend type field of the Define Trends Display (Section VI), except that the OIU uses blanks for real, Boolean, and RCM tags.) Enter the collection mode in the third field (AVG, TOT, MAX, MIN, or SMP).

When moving to the next set of three trend fields, the OIU searches for the trend and SEARCHING FOR TREND appears on the CRT. If the OIU cannot find the next trend (previously defined during OIU configuration), it does not advance to the next field.

After making all changes to the section defining one complete Trend Log, move the cursor to the ON/OFF/CLEAR field of that section. Enter ON and press ENTER. This causes the log to start collecting data. Press ENTER again. This OIU now accepts the log and the cursor disappears briefly. Wait for the cursor to reappear before accessing another display or the changes entered may not go into effect. To a advance among the Trend Logs sequentially, press SECT after pressing ENTER.

Another way to go to a different Trend Log is to press ESCAPE. The message: COMMAND? appears at the bottom of the CRT. Enter the log number desired and press ENTER. That Trend Log now appears as the Define Trend Logs Display.

To return to the Logging Configuration Menu when COMMAND? is not at the bottom of the CRT, press ESCAPE. When COMMAND? is on the screen press ESCAPE again. The Logging Configuration Menu then appears on the CRT.

DEFINE TRIP LOGS. Press choice **D** from the Logging Configuration Menu. A Trip Log prompt appears at the bottom of the CRT. Entering the proper input accesses the Trip Logs Display. Either enter a log number or define a new Trip Log by leaving the prompt field blank and pressing ENTER. The Define Trip Logs Display appears on the CRT. The FIELD key moves the cursor among the various fields of this display.

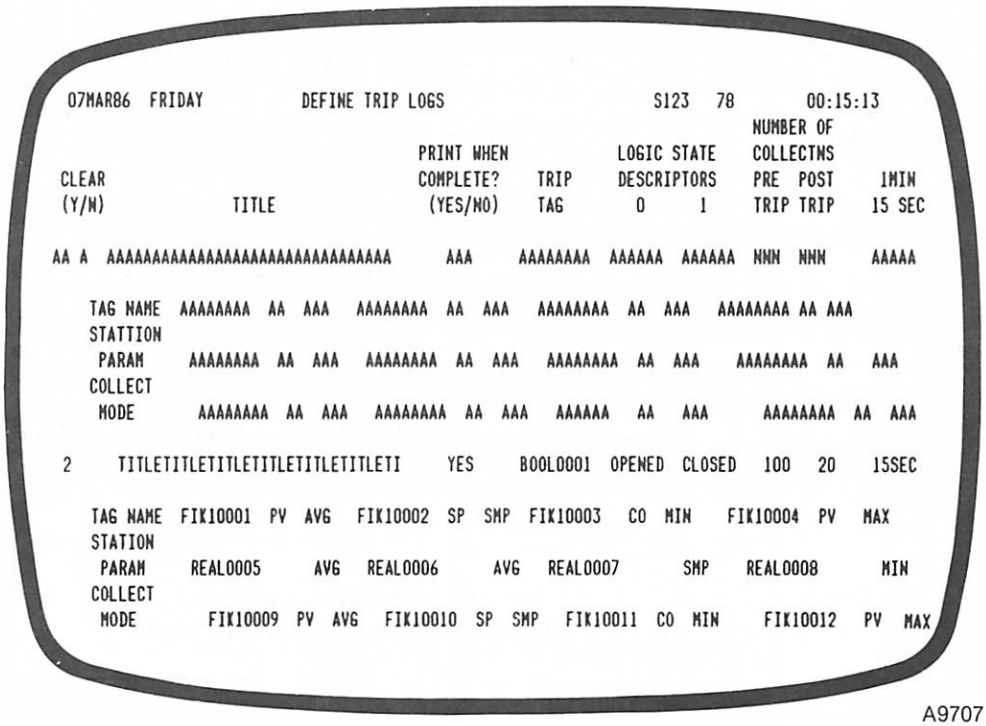

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FIGURE 9.14 — Define Trip Logs Display

Below the Display Title line are four subheadings similar to the subheadings of a Trend Log Display showing (left to right):

CLEAR (Y/N)	TITLE	PRINT WHEN COMPLETE? (YES/NO)	TRIP TAG	LOGIC STATE DESCRIPTORS 0	1	NUMBER OF COLLECTNS PRE TRIP	POST TRIP	1 MIN 15 SEC

Under these lines are the format lines. The first line shows (left to right):

- AA (Trip Log number: 1 - 50)
- A (Y/N)
- AAAA on up to 32 characters (Trip Log title)
- AAA (Trip print option)
- AAAAAAAA (Trip tag)
- AAAAAA (LSD for 1 state)
- AAAAAA (LSD for 0 state)
- ### (Pre-trip collections)
- ### (Post trip collections)
- AAAAA (Trip time interval).

The next five format lines are identical to those of a Trend Log, showing alphanumeric input fields for Tag names, Station parameters, and collection modes.

The engineer must enter the following information for each Trip Log:

- Y or N (To remove an existing Trip Log or to begin defining or modifying a log)
- Title (A title of up to 32 characters appearing as the log heading.)
- Print option (Whether the log prints automatically when collection is complete or on demand upon occurrence of the trip event.)
- Trip tag (Must be a Boolean or RCM tag.) This tag must be in logic state 1 to start a trip. It must also be in an alarm state.
- Pre-trip collections (The number of 15-second or 1-minute intervals reported on the log before trip occurrence.)
- Post trip collections (The number of intervals reported on the log after trip occurrence.)
- Collection rate (Either 15SEC or 1MIN, the time interval between lines on the log.)

NOTE

The number of pre- and post trip collections cannot exceed 120. The collection rate must also agree with the trend type.

Move the cursor to the CLEAR field. To remove an existing Trip Log from OIU configuration, enter **Y** and press ENTER. To begin defining or modifying a log, enter **N** and press ENTER. Then press FIELD to move to the next input field (title).

Enter the log heading title. Now move the cursor to the print option field. Enter **Y** if you want the the log to print when data collection is complete. Enter **N** if you want to print the log on demand. In this case, the log collects data on occurrence of the trip event but does not print until you turn it on from the Trip Log Status Display (Section XIII).

Move the cursor to the trip tag field and enter the tag name. The Trip Log collects data when this tag goes into an alarm state. The OIU shows the LSDs for this tag (configured during tag definition (Section VI)). Next, enter the number of pre- and post trip collections. In actual operation, the Trip Log cannot gather all 120 pretrip collections at a 15-second interval. Those collections it misses appear as asterisks on the log printout (*** ***). Then enter the collection rate for the log.

The engineer can enter up to 12 trends on a Trip Log in a manner similar to that for a Trend Log. He must define each trend during OIU configuration before he can enter them here (Section VI).

After making all changes to the section defining one complete Trip Log, press ENTER. The OIU now accepts the log. To scroll among the logs sequentially, press SECT after pressing ENTER. Another way to go to a different Trip Log

is to press ESCAPE. The message: COMMAND? appears at the bottom of the CRT. Enter the log number desired and press ENTER. That Trip Log now appears as the Define Trip Logs Display.

To return to the Logging Configuration Menu when COMMAND? is not at the bottom of the CRT, press ESCAPE. When COMMAND? is on the screen press ESCAPE again. The Logging Configuration Menu then appears.

DEFINE PERIODIC LOG PARAMETERS. Press choice **E** from the Logging Configuration Menu. The Define Periodic Log Parameters Display appears on the CRT.

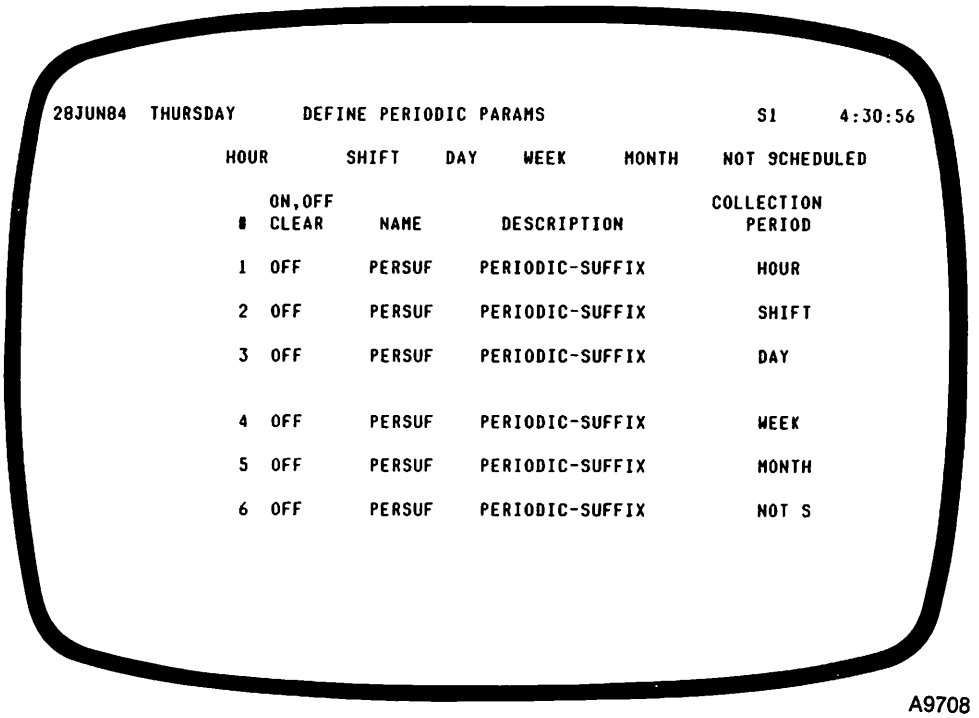

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FIGURE 9.15 — Define Periodic Log Parameters Display

Below the display title line are three subheadings. (Between the first subheading and the other two are four blank lines.) The headings show (left to right):

HOUR	SHIFT	DAY	WEEK	MONTH	NOT SCHEDULED
#	ON,OFF CLEAR	NAME	DESCRIPTION		COLLECTION PERIOD

Under the third subheading are the parameter input lines. The engineer must enter the following information for each Periodic Log:

- Periodic Log number (1 - 30)
- ON/OFF/CLEAR (Remove an existing Periodic Log entering CLEAR; define or modify a log entering ON; prevent a log from printing without deleting it from this display entering OFF.)
- Title (Edited Graphic name defining format and data for the Periodic Log. OIU enters the Graphic description.)
- Collection period. (Period of time in which the Periodic Log is printed once.)

NOTE

The collection intervals of suffixes normally match the collection period of the log into whose graphic the engineer edits them. The OIU does not compare suffix collection intervals with the collection period of the Periodic Log.

Move the cursor to the first input parameter field. Enter ON, OFF, or CLEAR, depending on which function you want for that Periodic Log. Press ENTER. Press FIELD to go to the next input field. Enter the edited Graphic name in the Title field and the OIU enters its description in the description field.

NOTE

This assigns that previously created Graphic display to a Periodic Log (See Table 7.9 in Section VII).

Move to the last input field and enter the collection parameter (HOUR, SHIFT, DAY, WEEK, MONTH, or NOT S (Not Scheduled)). Press ENTER and the OIU accepts the log. To scroll sequentially through the logs, press SECT after pressing ENTER. Another way to go to a different log is to press ESCAPE. The message: COMMAND? appears at the bottom of the display. Enter the Periodic Log number desired. That Periodic Log now appears as the Define Periodic Log Parameters Display.

To return to the Logging Configuration Menu when COMMAND? is not at the bottom of the CRT, press ESCAPE. When COMMAND? is on the screen press ESCAPE again. The Logging Configuration Menu then appears.

Configuring Sequence of Events (SOE)
To configure the OIU for SOE log printout, the engineer must:

- Define a list of points matching the point list of each SOE front end processor
- Enter tags associated with each report into the Tag List
- Define all SOE report logs you want to print.

DEFINE SOE POINT LIST. An OIU can have one SOE Point List. This point list contains 512 points and must correspond to the point numbers in the SOE front end processor. For example, point #1 in an OIU point list represents point #1 of the SOE front end processor.

NOTE

The points of the SOE point list are not the same as tags in the OIU. Consult the Sequential Events Recorder manual, E93-917-1.

Enter choice **F** from the Logging Configuration Menu. A prompt appears below the menu:

```
SEQUENCE OF EVENTS
POINT LIST NUMBER?
```

Enter **1** and press ENTER. The OIU now checks for any errors. If there is an error one of the following error messages can appear below the prompt:

- NOT ENOUGH OIU MEMORY FOR POINT LIST
- VALUE MUST BE 1 - 1 (Your input was something other than **1**).

If the second message appears, enter **1** and press ENTER. If the first message appears, check OIU configuration. If there is an error, the cursor stays on the prompt field until the engineer either corrects the error or presses ESCAPE to go to another menu function. Pressing FIELD or SECT has no effect (and no error message appears).

When entering 1, the first page of the SOE Point List appears after pressing ENTER. The cursor appears under the first LSD field (See below).

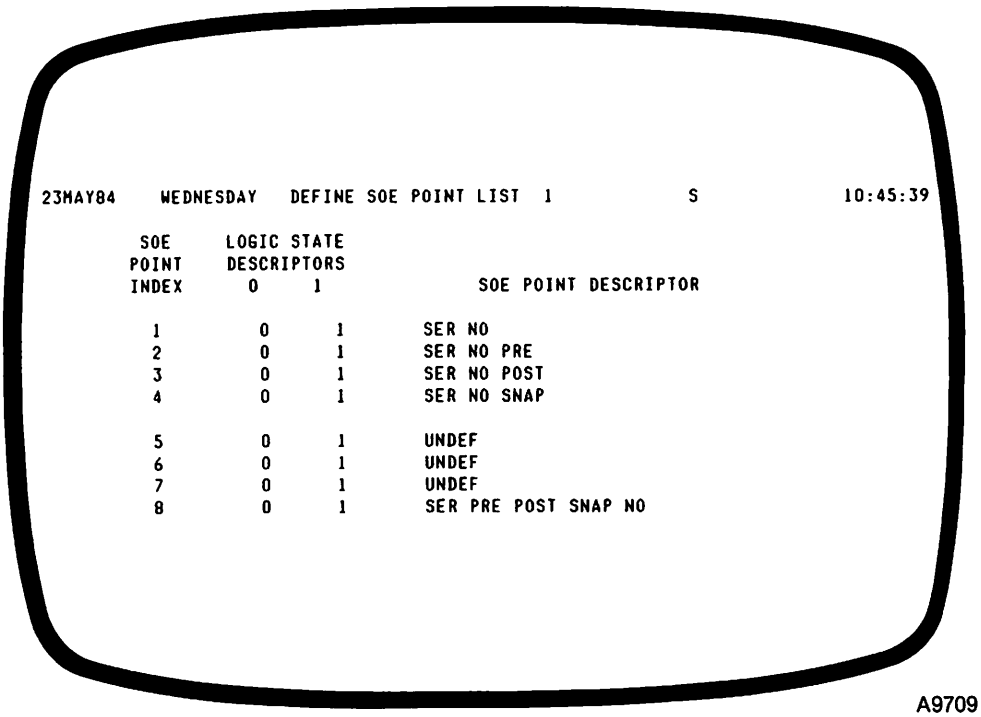

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FIGURE 9.16 — Define SOE Point List Display

Below the Title line of the display are three subheadings (left to right):

```
SOE                LOGIC STATE
POINT              DESCRIPTORS
INDEX               0     1      SOE POINT DESCRIPTOR
```

Below the subheadings are the point list information lines (left to right):

- # (Point index number; 1 - 512)
- # (LSD for 0 state)
- # (LSD for 1 state)
- AAAA on up to 32 (SOE point description).

For each point on the list you enter LSDs for logic 0 and 1 states and an optional point descriptor of up to 32 characters.

NOTE

SOE Points are Boolean or RCM types.

When the SOE Point List appears, its title includes the number of the point list for identification. The cursor appears on the logic 0 state field of SOE point #1 (Index #1). Enter the LSD for the logic 0 state (ON or OFF, etc.) and move the cursor to the input field of the logic 1 state using the FIELD key. Enter the LSD for this logic state.

The OIU checks for the presence of the LSDs entered. (The OIU checks its Define Logic State Descriptors Display (Section VI) for the presence of the appropriate LSDs.) If a certain LSD is not previously defined, the engineer cannot enter the SOE point with that LSD. The OIU performs this LSD checking as the engineer moves the cursor away from the LSD input field. If the LSDs exist in OIU configuration, the engineer can move the cursor to the point descriptor field and enter a descriptor of up to 32 characters.

Pressing FIELD repeatedly advances the cursor (with wraparound) within a section (information line). Pressing ENTER enters the point and returns the cursor to the leftmost input field (LSD 0 state). If any data in the current section is invalid, the cursor moves to that field and and an appropriate error message appears on the CRT. Pressing SECT moves the cursor to the next section (point information line) on the page (with wraparound). The most recently entered data (of the point the cursor was on prior to pressing SECT) then appears. If current data on the screen is not yet entered, the previous data for that point appears in its place. (The point can also be blank.)

Pressing ESCAPE at any point shows the most recently entered data for the current point (similar to pressing SECT). But the message: COMMAND? also appears at the bottom of the CRT. You can now do one of the following:

- enter **M** and press ENTER or press ESCAPE again to return to the OIU Configuration Menu.
- Enter any SOE point number (1 - 512) and press ENTER (accesses that specific page of the display and that specific point).

For the second choice above, if the value is not M or 1 - 512, error messages appear showing either: ENTRY MUST BE M or VALUE MUST BE 1 - 512. In this case the cursor stays at the COMMAND? prompt.

Pressing PREV/NEXT accesses the previous or next pages of the SOE Point List but without wraparound. The cursor repositions itself to the topmost LSD 0 state input field on any page.

DEFINE SOE REPORTS. The OIU can have up to 80 SOE Reports. Enter choice **G** from the Logging Configuration Menu. A prompt similar to that of the SOE Points List appears at the bottom of the CRT (except this prompt is: SEQUENCE OF EVENTS REPORT NUMBER?). Enter the number of the SOE Report you want to create or modify and press ENTER. To create or to modify the lowest numbered empty SOE Report, leave the prompt blank and just press ENTER.

After pressing ENTER the OIU checks for any error (like on the SOE Point List). If there is an error one of the following messages can appear below the prompt:

- VALUE MUST BE 1 - 80 (Input was out of range)
- NO EMPTY SOE REPORTS IN THIS OIU (Asked for an empty SOE report (left the prompt blank and pressed ENTER) and none is currently available).

If the first message appears, enter 1 through 80 and press ENTER. If the second message appears, either enter 1 through 80 and press ENTER or perform an operation other than the SOE Report. The cursor stays on the prompt field until the engineer either corrects the error or presses ESCAPE to go to some other menu. Pressing FIELD or SECT has no effect (and no error message appears).

If the OIU does not detect any error after the engineer enters the desired SOE Report number (or a blank field) and presses ENTER, the page entered appears on the CRT. The cursor appears at the first (topmost) SOE Report descriptor field (See below).

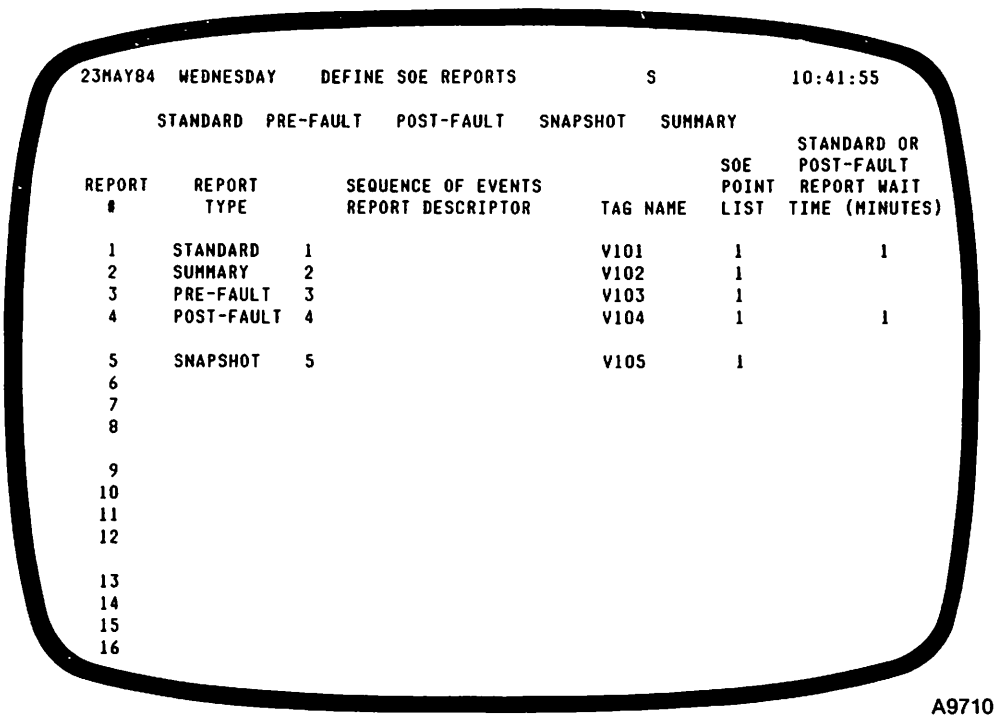

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FIGURE 9.17 — Define SOE Reports Display

Each report line on the Define SOE Reports Display represents a separate report for printing. Each Report has its own unique identifying number and can have a maximum 32-character descriptor. A Remote Control Memory (RCM) tag in the Tag List associated with each SOE Report has a PCU/Module/Block

number identifying the MFC SOE front end processor and block number serving as the source of report data. Each SOE Report also has its own unique SOE Point List number identifying which OIU SOE Point List is used for printing the report.

> **NOTE**
>
> **At the current time this number is always 1.**

Each SOE Report must have an associated OIU tag whose PCU Module block is the MFC address of the report block. This tag must be an RCM type. Enter this tag on the display. The engineer need not restart the OIU (for proper SOE reporting) after entering this tag. For an area (process) alarm indicator (on the Title line) to work properly, however, it is desirable to restart the OIU after entering the RCM tags.

Below the Title line of this display are six subheadings (left to right):

STANDARD	PRE-FAULT	POST-FAULT		SNAPSHOT	SUMMARY
REPORT #	REPORT TYPE	SEQUENCE OF EVENTS REPORT DESCRIPTOR	TAG NAME	SOE POINT LIST	STANDARD OR POST-FAULT REPORT WAIT TIME (MINUTES)

Below the subheadings are the report information lines (left to right):

- # (SOE Report number; 1 - 80)
- Report type (STANDARD, SUMMARY, PRE- and POST-FAULT, SNAPSHOT (sample))
- # (MFC front end processor number for RCM type tag associated with that report)
- AAAA on up to 32 (SOE Report description)
- AAAAAAAA (Tag name)
- # (SOE Point List number)
- ### (Report wait time in minutes).

Now enter a descriptor of up to 32 alphanumeric characters. Press FIELD to move the cursor to the Tag name input field. Enter the name of the RCM tag associated with this SOE Report. The OIU now checks the existence of this tag against its existing Tag List.

If the entered tag name does not match one on the OIU list, the error message: UNDEFINED TAG appears. If the entered tag name does match one on the OIU list but this tag is not the RCM type, the error message: TAG IS NOT RCM TYPE appears. If either of these messages display on the CRT, the cursor stays on the tag name input field (using the FIELD key does not move the cursor in this case).

NOTE

The OIU does not check to see if the tag PCU, Module, and Block address relates to an SOE block. The engineer must do this.

If the tag does exist and if it is the RCM type (neither error message above appears on the CRT), then move the cursor to the SOE Point List input field. Enter a number from 1 to 16 in this field. If the entry is out of range, the error message:

VALUE MUST BE 1 - 16

appears (and the cursor cannot move to another field).

NOTE

Simply enter 1 in this input field. The OIU does not check for the existence of an SOE Point List (whether or not there is a file for this number in the OIU or whether an existing list has any points.)

After entering the point list number advance to the Report Wait Time field. Enter a time (in minutes) if the report is a standard or postfault type. Otherwise, skip this field entirely. The value in this field tells the OIU how long to continue collecting report data after notification of standard data in the MFC or after a trip event.

Enter a value in this field at least five minutes greater than the associated MFC aging time. The range of values for this field is 1 - 540 (one minute to nine hours). Nine hours is slightly less than maximum MFC aging time.

All SOE Reports have a maximum length of three pages, or 198 events. When a great deal of post-fault data occurs, more data can arrive at the OIU than can fit into one SOE Report. In this case, several reports then print out.

If data in the current section (report line where entering data) is all valid, pressing ENTER puts it into the OIU data structures. After entering the last data and pressing ENTER, the cursor returns to the leftmost input field of the next line on the display (SOE descriptor). The previous line of data entered successfully. If any of the data in a current section is invalid, the cursor moves to that field and the appropriate error message appears on the CRT.

Pressing SECT also displays the most recently entered data for the current section before the cursor moves to the next section. If current data on screen is not yet entered, old data (which can be blank fields) can appear.

Pressing FIELD advances the cursor to the next input field on the current line (in the section) with wraparound. Pressing SECT repeatedly advances the cursor with wraparound through sections (report lines) on the current page of the display.

Pressing ESCAPE displays the most recently entered data for the current report (like SECT) but also displays the: COMMAND? prompt at the bottom of the screen. At this point the engineer can do one of the following:

- Enter **M** and press ENTER or press ESCAPE again to return to the OIU Configuration Menu
- Enter any report number from 1 - 80 (accesses that page and report)

If entering anything else, error messages appear showing either: ENTRY MUST BE M or VALUE MUST BE 1 - 80. In this case the cursor stays at the COMMAND? prompt until the engineer enters correct data and presses ENTER.

Pressing PREV/NEXT accesses the previous or next page of the display (without wraparound) and the cursor appears at the topmost SOE Report descriptor input field of that page.

If now done with all Logging configuration, lock the CONF keyswitch and remove the CONF key.

MODIFICATION TO SOE CONFIGURATION. Any change to OIU configuration involving Sequence of Events automatically cancels all SOE Reports. Specifically, if pressing ENTER while on the Define Tags (Section VI), Define SOE Point Lists, or Define SOE Reports Displays, cancellation of SOE Reports occurs whether or not the engineer actually changed SOE configuration.

NOTE

This does not apply if the COMMAND? prompt is on the screen after cancellation occurs, or if an SOE Report is currently active. (Its MFC aging time or OIU data wait time is not yet expired. In this case the data for the report does not collect again until MFC aging time expires.)

SECTION X
ARCHIVAL STORAGE CONFIGURATION

INTRODUCTION

Archival storage provides the OIU with the capability to save process data on a removable storage medium (floppy disks, or diskettes). You can retrieve and display, or print out stored trend or event data on your OIU at a later date (like next week, for example). You can also do this on another OIU having a completely different configuration.

This Section describes configuring Archival Storage using the Archival Storage Definition function of the General Function Menu, as well as diskettes used for archival storage operations. Section XIII explains the steps necessary to perform the various archiving operations.

NOTE

Archival Storage is an optional feature. You can only use archiving if your OIU has the archiving package installed. Archival Storage configuration is under keylock protection.

Archival Storage Definition

The OIU supports two archiving features: trends and event data. To configure archival trends, the engineer defines whether or not it is necessary to archive each trend (up to 500) and then defines the necessary global parameters. To configure archived event data, turn the event archiving function ON (see below). For archiving operations (Section XIII), a certain number of floppy disks (diskettes) is necessary. The number of diskettes necessary for archived trends is proportional to both the collection interval and the number of trends necessary to archive.

With a collection interval of one minute, the OIU can archive up to 64 trends on a single diskette per day. To archive all 500 trends at one minute collection intervals, eight diskettes are necessary. When the collection interval is eight minutes the OIU can archive all 500 trends on a single diskette per day. Table 10.1 shows the trend/diskette summary for archiving.

The engineer selects which trends to archive by so indicating them from the Define Trends Display (Section VI). He cannot take trends from nor add them to archiving unless he turns the archiving function OFF (See below). You cannot modify the parameters of trends while the OIU currently archives them.

TABLE 10.1 — Archiving Trends/Diskette Summary

Collection Interval (Minutes)	Maximum Number of Trends per Diskette Per Day	Number of Diskettes Required per Day to Archive 500 Trends
1	64	8
2	128	4
3	192	3
4	256	2
5	320	2
6	383	2
7	448	2
8	500	1

The number of diskettes necessary for archiving events depends on the maximum number of events on the OIU hard disk event file not yet archived. Tables 10.2 and 10.3 show the event/diskette summaries for archiving.

TABLE 10.2 — Archived Event Maximums

MAXIMUMS	
Events per Diskette:	2900
Archives per Diskette:	10
Events per Archive	290
Events archived per Minute:	290
Events archived period per Diskette (minutes):	10

NOTE

It takes a maximum of 10 minutes to completely fill one Diskette (2900 archived events).

TABLE 10.3 — Archived Events Diskette Summary

Number of Events on Hard Disk Event File	Number of Diskettes To Archive Events	Time Necessary for Archiving (In Minutes)
1000 or less	1	about 3.5
2000	1	about 7.0
3000	2	about 10.3
4000	2	about 14.0
5000	2	about 17.3
6,000	3	about 21.0
7000	3	about 24.2
8000	3	about 28.6
9000	4	about 31.0
10,000	4	about 34.5

Unlock the CONF keyswitch. Enter choice **M** from the OIU Configuration Menu (Archival Storage Definition). The Archival Storage Definition Display now appears on the CRT with the cursor at the first (topmost) input field, ARCHIVING ON/OFF. (The OIU automatically fills in current values for all data fields.)

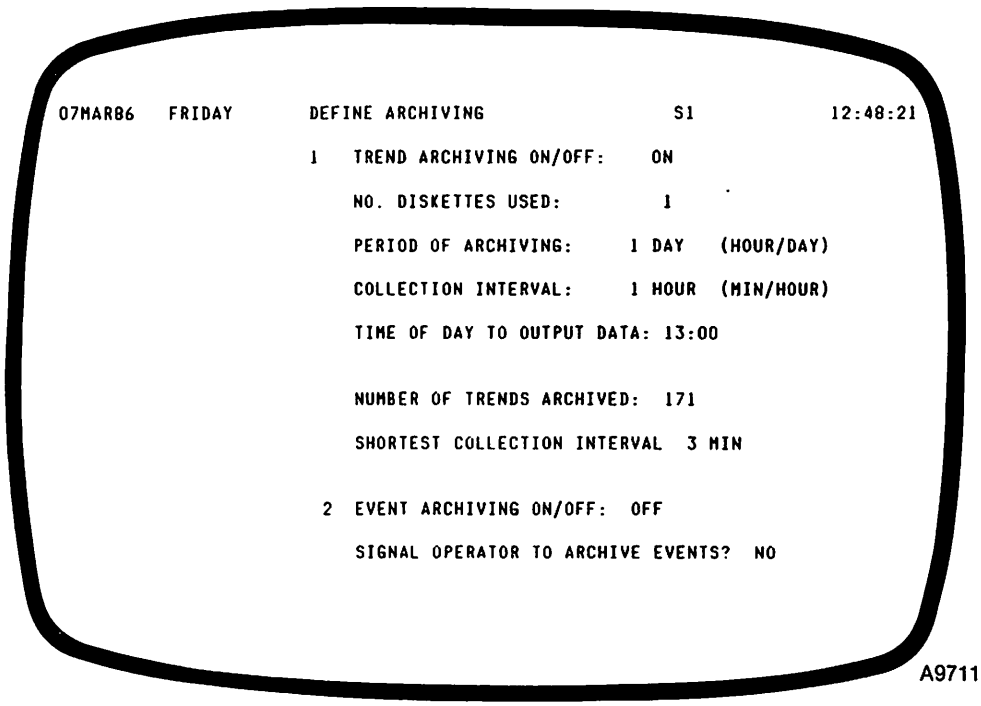

FIGURE 10.1 — Archival Storage Definition Display

This display begins with configurable items for archived trends for which the engineer can enter values (input item 1). The last two trend items on this display indicate the results of the configurable items. The OIU fills in these values depending on:

NUMBER OF TRENDS ARCHIVED:(###) — Total of the trends selected for archiving on the Define Trends Display (Section VI).

SHORTEST COLLECTION INTERVAL: (# MIN) — OIU calculates this using value entries from this display.

The Shortest Collection Interval shows the unused time remaining (slack) in the following three configurable items:

- NO. DISKETTES USED (1 to 8)
- PERIOD OF ARCHIVING (normally one day)
- COLLECTION INTERVAL (1 to 8 minutes).

The first input field of this display lets the engineer turn the archiving function ON or OFF. Enter OFF and press ENTER before making any changes to archiving parameters from this display or to any archived trend from the Define Trends Display (Section VI). Enter ON and press ENTER when finished changing archiving parameters.

Press FIELD to move the cursor to the next input field. Enter the NO. DISKETTES USED (Figure 10.1). Notice that the PERIOD OF ARCHIVING is already set at 24 hours (1 DAY). If entering a number other than 1, the OIU automatically sets the PERIOD OF ARCHIVING at 24 hours.

When entering a number in the NO. DISKETTES USED field the OIU calculates and displays the SHORTEST COLLECTION INTERVAL. This figure (in minutes) shows the shortest interval in which the OIU can store the number of trends archived onto the number of diskettes used for the period or archiving. If this interval value is longer than that in the current collection interval field, the error message: INSUFFICIENT ROOM ON DISKETTES appears.

NOTE

In this case, enter another value for the COLLECTION INTERVAL field until the error message disappears. (The Shortest Collection Interval value becomes equal to or shorter than the value in the COLLECTION INTERVAL field.)

When entering 1 as the NO. DISKETTES USED, press FIELD to move to the PERIOD OF ARCHIVING. Enter this field as a number followed by a unit descriptor (HOUR or DAY, or just H or D). When entering this value the OIU recalculates the SHORTEST COLLECTION INTERVAL and displays a new value. If this recalculated value is longer than that in the COLLECTION INTERVAL field, the insufficient error message (as above) reappears.

Press FIELD to move the cursor to the COLLECTION INTERVAL field. Enter a number followed by a unit descriptor (MIN or HOUR, or just M or H). Enter a COLLECTION INTERVAL value equal or greater than the SHORTEST COLLECTION INTERVAL calculated by the OIU.

Press FIELD to move the cursor to the TIME OF DAY TO OUTPUT DATA field. If the period of archiving is 24 hours, enter the hour of the day using military time (24-hour clock) when storage of archival trends is to occur. When that time of day occurs, the OIU displays the Action Request indicator (flashing **A** in a display Title line) as a signal for the operator to store the trends on diskette (to perform archiving).

The OIU then gives the operator a two-hour period in which to complete the archiving. When storing data during this period no data can be lost because 26 hours of data becomes archived.

If the period of archiving entered on this display is other than 24 hours, the OIU requests data storage (archiving) at intervals equal to that period of archiving entered. In this case, the operator must complete the archiving within that period in order not to lose any data.

When using more than one diskette to archive trends, the OIU fills the first diskette to capacity with trends. The OIU fills up subsequent diskettes from the point where the previous diskette ended. For example, if the collection interval is one minute, the first 64 trends go onto the first diskette. The next 64 trends go onto the next diskette, and so forth.

The operator can determine which trends the OIU stores on which diskettes by storing the trends once and then displaying the Trend Diskette Directory for all archived diskettes (Section XIII).

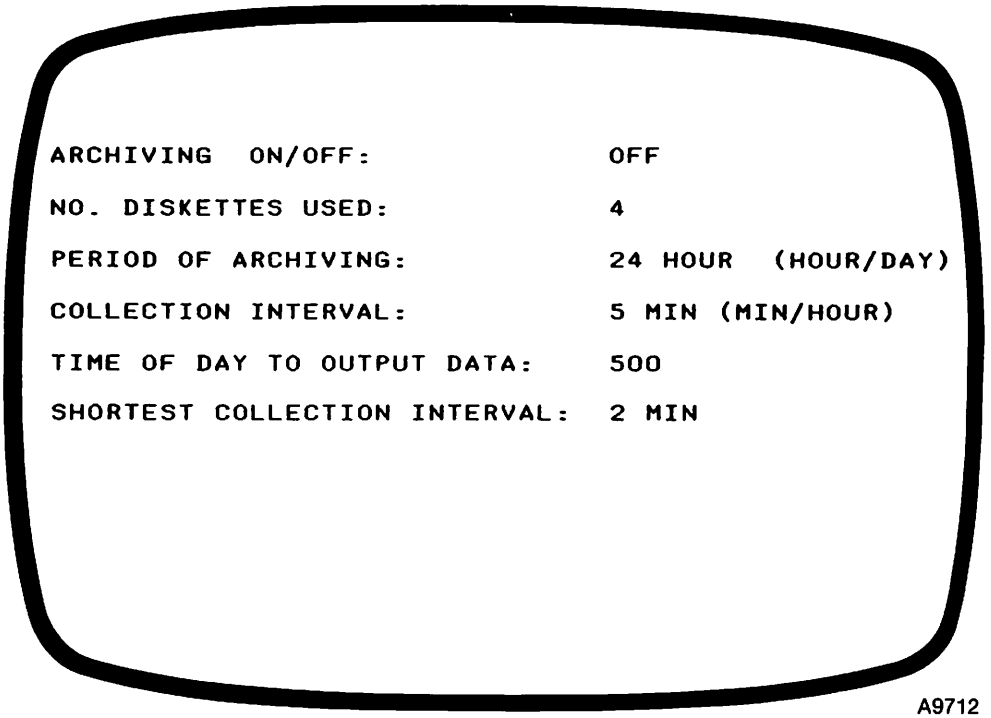

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FIGURE 10.2 — Archival Storage Definition Example

After completing all changes for archiving trend data, move the cursor to the topmost input field for archiving event data (2). This field lets the engineer turn event archiving ON or OFF. To perform any event archiving (Section XIII), enter ON and press ENTER for this input field.

The next input field lets the engineer determine whether or not the OIU signals when to begin event archiving (OIU displays the flashing **A** indicator on any display page Title line) during system operation. If the engineer enters NO and presses ENTER for this field, the OIU never signals the need for event archiving. If he enters YES and presses ENTER, the action request indicator can denote the need for either trend or event archiving (Section XIII).

To return to the OIU Configuration Menu after finishing with the Archival Storage configuration, either enter **M** and press ENTER or press ESCAPE. To go to the General Function Menu, press MENU. When done with all Archival Storage configuration, lock the Conf keyswitch and remove the CONF key.

Diskette Description

For a complete description of Handling, Storing, Inserting, and Removing the diskettes necessary for archiving on the OIU, refer to the OIU Hardware Manual, E93-901-2.

SECTION XI
MONITORING A PROCESS

INTRODUCTION

Previous Sections explained process data display formats and keyboard layout. You need to understand the different displays and key functions before proceeding. This Section presents procedures for using the keyboard and displays to monitor processes.

POWER ON AND RESET

Section III (Installation and Startup) of the OIU Hardware Manual (E93-901-2) explains the proper procedures for installing, starting up, and performing various file utilities on your OIU.

> **NOTE**
>
> **OIU startup and reset are normally beyond the scope of your tasks on an OIU. However, for your information, this portion of the manual discusses them briefly. For greater detail, consult the OIU Hardware Manual.**

The POWER and RESET switches on all OIU versions are located behind console access doors. These front and rear access doors (behind the CRT and keyboard) of the OIU are normally locked during operation so you cannot open them.

Figure 11.1 shows the NOIU01 front and rear access with doors removed. Notice that the the main AC POWER switch consists of two circuit breaker disconnects. These are actually one unit fixed together so that changing the position of one also changes the position of the other. The rear access shows the hard disk drive POWER switch on the upper right (on the rear of the hard disk enclosure).

Figure 11.2 shows the NOIU02 front and rear access with doors removed. Notice that the POWER switch (circuit breakers and power disconnects) on this version is on the lower left access below the keyboard shelf.

The NOIU01 actually has three Reset/Load switches, all identical to each other. Each one is located on a Multi-Function Process Module board (MFPM). Each MFPM board is located vertically in the Card Cage Assembly on the center front access (Figure 11.1) having its Reset switch mounted at the top of its board (Figure 11.3).

The NOIU02 has an additional global Reset/Load switch. It is behind a small rectangular, movable access door to the right of the CRT (below the unit Diskette drive (Figure 11.2). (Refer to the OIU Hardware Manual for more detail on the MFPM boards and Card Cage Assembly.)

To start process monitoring with the OIU, set its main POWER switch (circuit breakers) to ON. Next reset the OIU. To turn on the NOIU01 and the NOIU02, set each unit POWER switch to the ON (UP) position. Reset each unit after turning it on. To reset, use a Reset/Load switch.

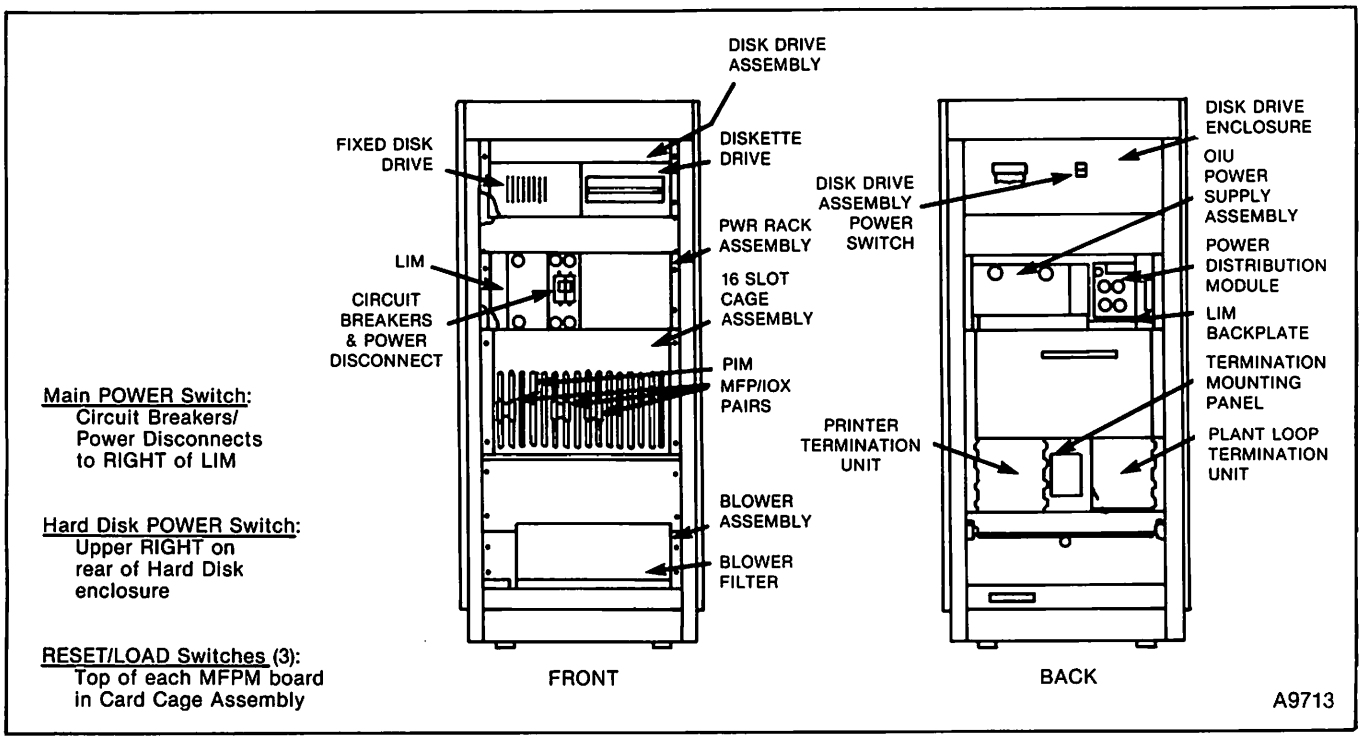


FIGURE 11.1 — NOIU01 Access (Power and Reset/Load Switches)

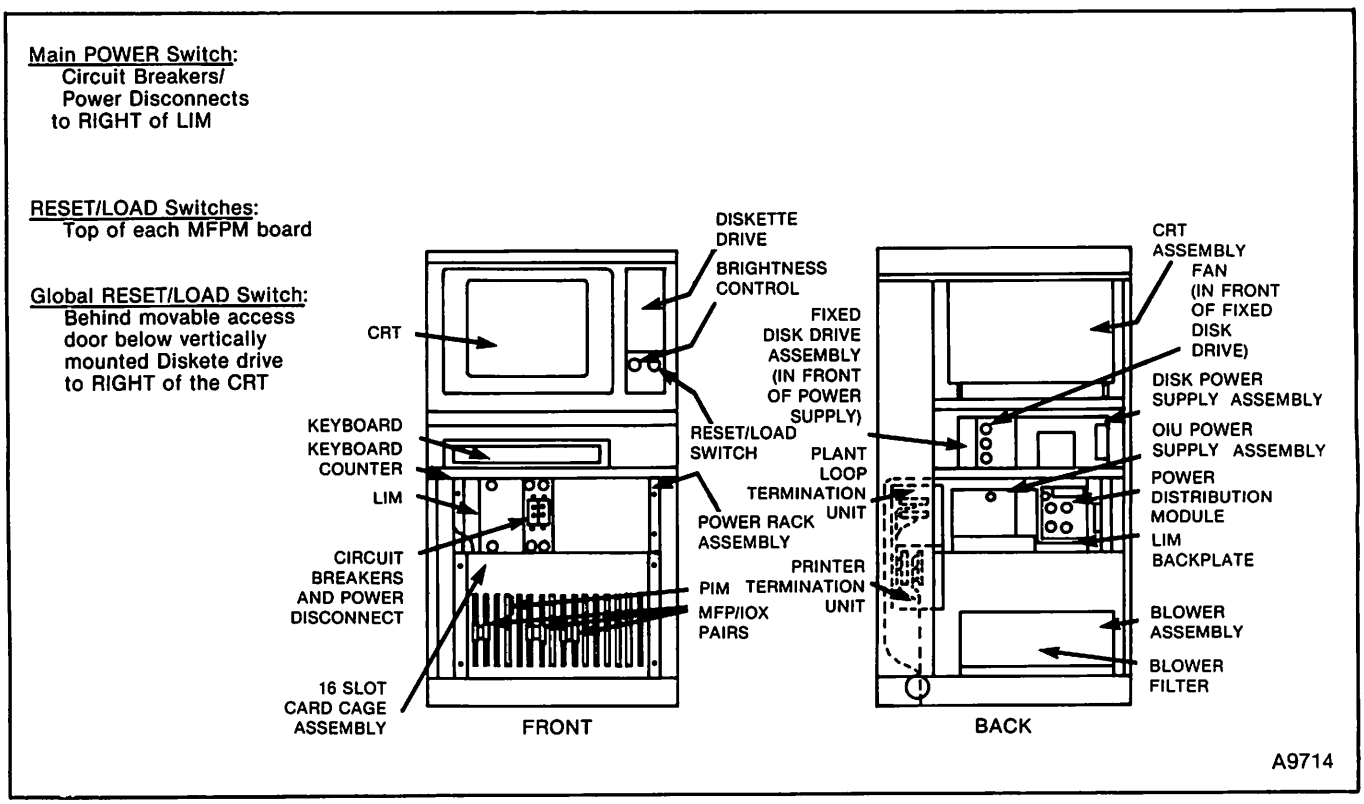


FIGURE 11.2 — NOIU02 Access (Power and Reset/Load Switches)

There are two ways to reset either OIU version, depending on Dipswitch settings on its **Multi-Function Process Module** boards (See The OIU Hardware Manual, E93-901-1, for a description of the **MFPM** dipswitch settings.) If the MFPM dipswitches are set for Auto Load After Reset, you can use the AUTO method. If the switches are not set to Auto Load, you must use the MANUAL method.

In either case, you must toggle the Reset/Load (S1) switch handle of any one MFPM board. Each Reset/Load switch has a bat handle projecting outward from its board. Figure 11.3 shows a typical Reset/Load switch handle.

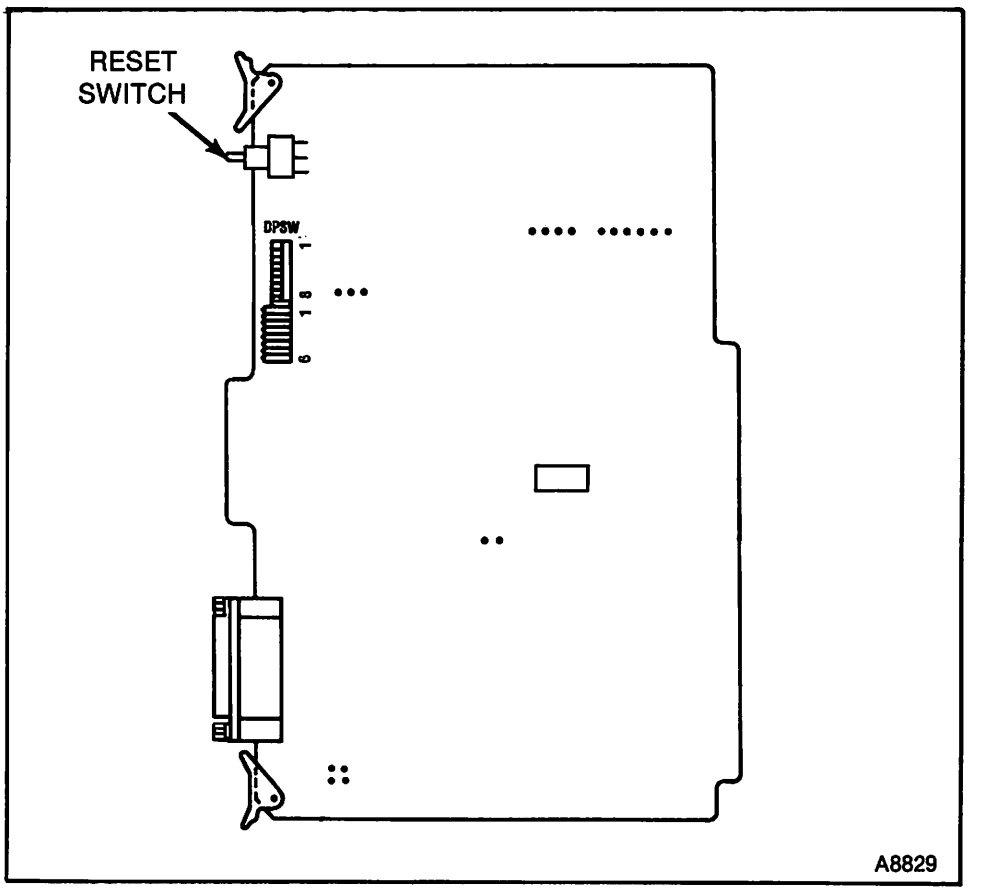


FIGURE 11.3 — Typical Reset/Load Switch Handle

For the AUTO method, toggle any one Reset/Load switch momentarily UP and then release its handle. For the MANUAL method, toggle any Reset/Load switch momentarily UP then DOWN. Now release it. Each switch is spring loaded and automatically returns to its normal OFF position when you release it.

To reset the NOIU02, grasp the bottom of the Reset/Load access door and pull it out and up until it is perpendicular to the CRT screen. Then push the door into the OIU console itself (under the Diskette drive). Now toggle the Reset/Load switch in the same manner as for the NOIU01.

After turning the OIU on and resetting it, its CRT screen displays the NETWORK 90 Logo (Figure 11.4). After a short delay of about a minute, your plant AREA ONE Display page then appears on the screen. The OIU is now ready for operation.

File Utilities
The OIU can be in two modes: Normal or Utility. The Utility Mode lets you use the File Utilities Menu for several useful OIU functions (initializing the Hard Disk, loading system software, and various Diskette tasks). To use any File Utilities, the OIU must be in the Utility Mode (Refer to the OIU Hardware Manual for more detail on the use of the File Utilities). When through using OIU utilities, the OIU must be back in Normal Mode.

Every time the OIU switches Modes you must Reset it, using the AUTO or MANUAL reset methods, as above. You must also reset the OIU if it is in manual mode after any interrupt in AC power supply (power failure), or whenever you turn it on after turning it off.

NOTE

If a PCU module suffers a power failure, it is necessary to compare its current configuration whenever it comes back on-line. (See Recovery From Power Failure at the end of this Section.)

PROCESS MONITORING

To monitor any plant process, you must first access the various display pages and then scroll through them. To take any control action, you must position the screen cursor on that element you wish to control. To acknowledge any alarm (System or Process), you must also first access the display page where the alarm occurs. (See Section XII for Controlling a Process.)

Accessing Displays
Accessing the various display pages allows you to view any current plant process to make any necessary decisions for control action. Basically, you use the standard keyboard while carefully viewing the CRT screen to do this. In this Section we examine the step by step procedure to access each of the Operation Displays mentioned in Section IV.

NOTE

For the proper steps in acknowledging alarms from the various displays, see Alarming at the end of this Section.

AREA DISPLAY. The Area Display is an overall view of the group organization of tags in a given area, as well as their alarm status. To access any of the 10 AREA Display pages, press any of the 10 Area keys (1 - 10) of the Display Control block on the keyboard.

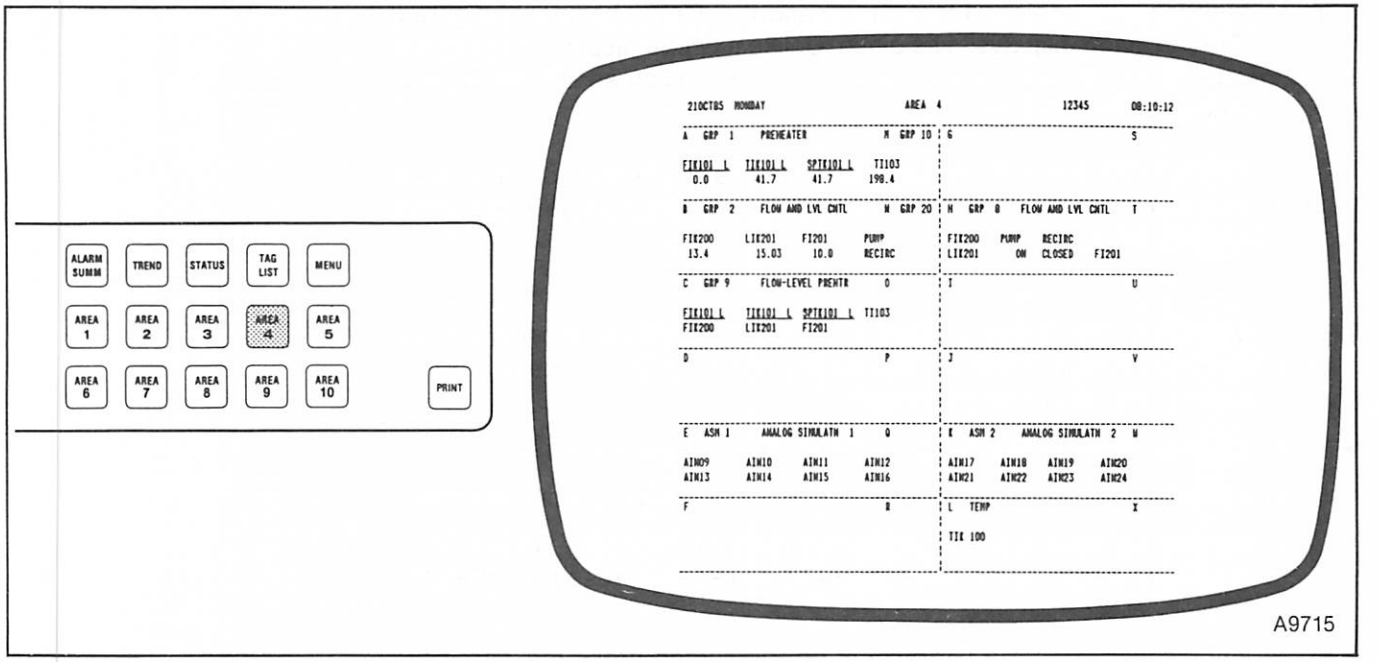


FIGURE 11.4 — Accessing The Area Display

To access a Group or Graphic Display page from an Area Display, press any red access letter (A - L) (Alphabetic block on the keyboard) of the Area page corresponding to the Group you wish to access. The Group indicators (letters) remain constant until you display another Area or function on the screen. Instead of returning to the previous Area page, press another access letter (A - L) and its Group displays. When another Area or function displays, the Area One group indicator data becomes overwritten.

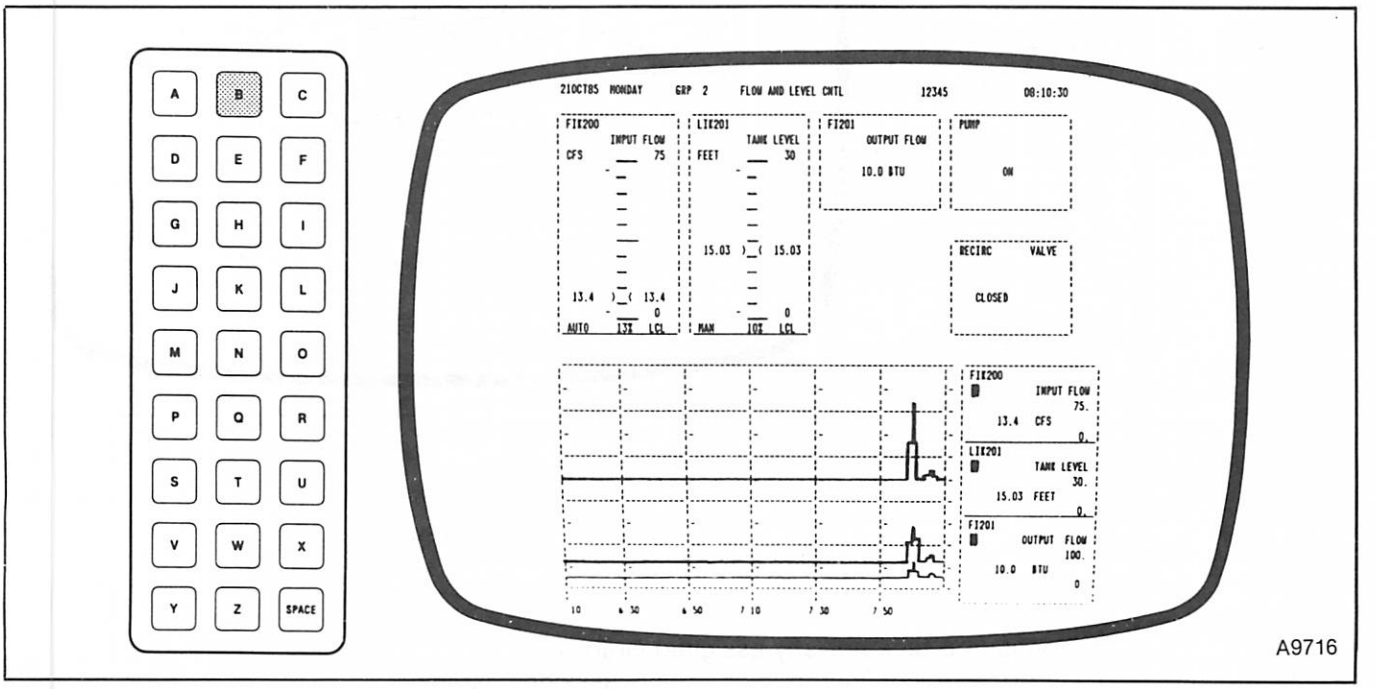


FIGURE 11.5 — Accessing Group Display From An Area Display

If a Graphic Display is assigned to a Group and that Group has no configured Tags, its Graphic page displays in its place. Unlike a Group display, the Graphic does not change to another Graphic (or Group) when you press another access letter; it simply remains on the screen.

Use the PREV/NEXT keys to display the numerically previous or next Area page. Notice that there is no wraparound with Area Display pages when using the PREV/NEXT keys.

GROUP DISPLAY. The Group Display provides live process information for monitoring, acknowledging alarms, and taking control actions. There are five ways to access any Group Display page:

- Press a group access letter while an Area Display is on the screen
- Press a group access letter while an Alarm Summary Display is on the screen
- While any display (except a Graphic) is on the screen press the GROUP key. Enter the Group name, using the Alphabetic block, and press the DISPLAY key
- While any display (except a Graphic) is on the screen press the TAG key. Enter the Tag name, using the Alphabetic block, and press the DISPLAY key
- While a Graphic Display is on the screen press the GROUP/GRAPHIC key.

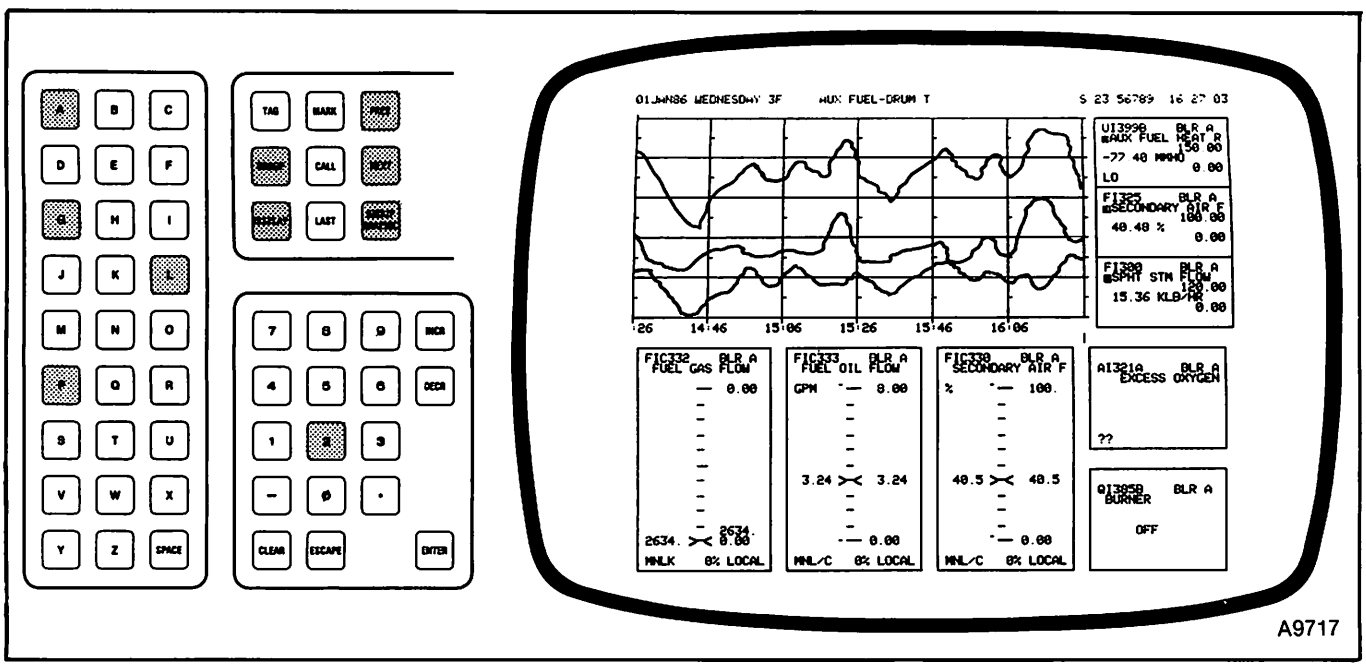


FIGURE 11.6 — Accessing A Group Display

Pressing the NEXT key while a Group or Graphic Display is on the screen causes the next configured Group or Graphic page to display with the following exceptions:

- Groups with neither configured tags nor any assigned Graphic are skipped (Instead, the next Group with configured tags or an assigned Graphic displays.)

- If the next Group has configured tags but no assigned Graphic, the Group displays
- If the next Group has no configured tags but has a Graphic assigned, the Graphic displays
- If the next Group has both configured tags and an assigned Graphic, the Group appears when a Group Display is currently on the screen. When the current display is a Graphic, the next Graphic appears.

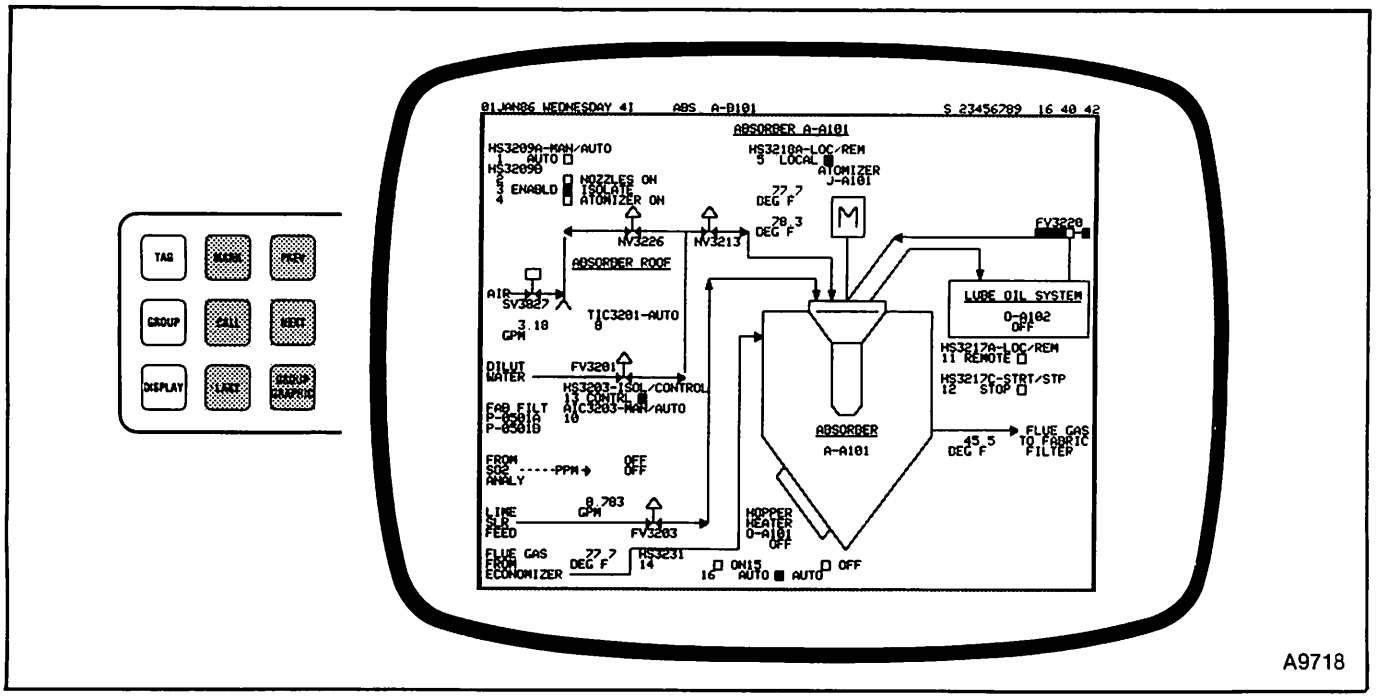
Pressing NEXT lets you move from Group to Group or from Graphic to Graphic. Remember, the OIU automatically switches the display from Group to Graphic if the next Group has no configured tags. The OIU switches from Graphic to Group if the next Group has no assigned Graphic.

The PREV key acts like NEXT, except it allows you to view the previous Group (and Graphic) Displays with the same conditions.

GRAPHIC DISPLAY. The Graphic Display has a customized format that provides dynamic plant process information letting you take control action in a manner similar to a Group Display (See Section XII). There are four ways to access a Graphic Display:

- Press the GROUP/GRAPHIC key (accesses an assigned Graphic from a Group) Pressing GROUP/GRAPHIC again accesses the Group
- Press the PREV or NEXT key (accesses a Graphic from a Group or Graphic as under GROUP DISPLAY)
- Press the CALL key (accesses a Graphic page previously flagged by a MARK key)
- Press the LAST key (if a Graphic was the previously displayed page on the screen).

When a Group has an assigned Graphic but no configured tags, its assigned Graphic displays when you access that Group (as under GROUP DISPLAY). If the engineer sets the PRIMARY GRAPHIC of a Group to YES during OIU configuration, the Graphic appears when you first access its Group. The GROUP/GRAPHIC key then lets you cycle between the faceplate display and the graphic.

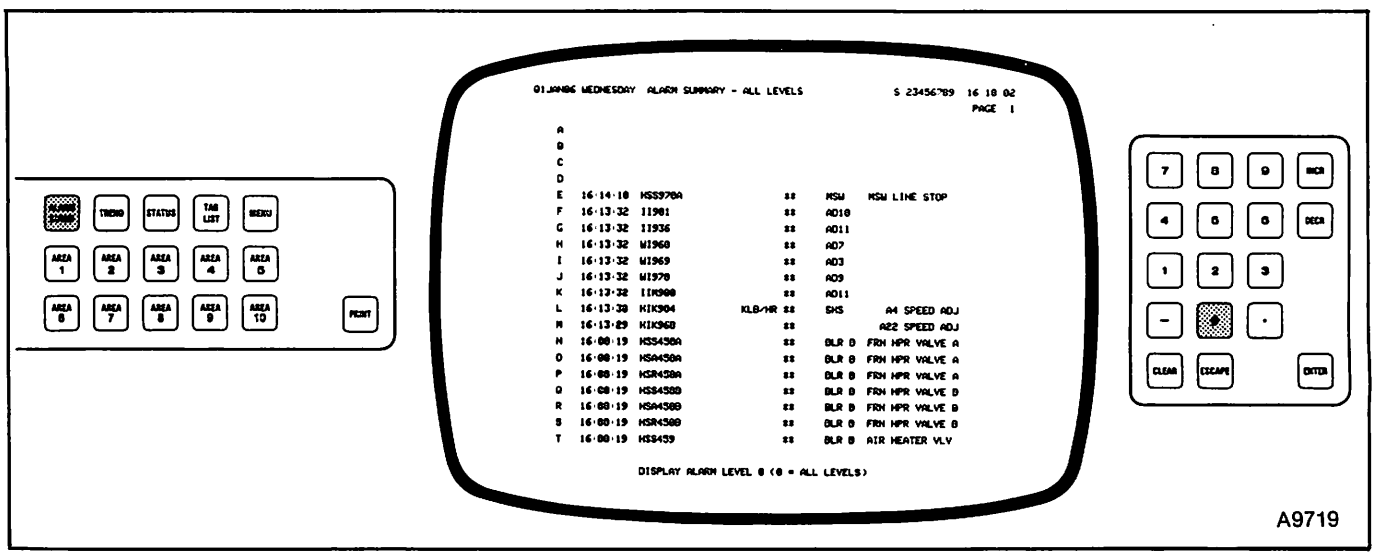


A9718

FIGURE 11.7 — Accessing A Graphic Display

ALARM SUMMARY DISPLAY. The Alarm Summary Display shows you the 100 most recent alarms on your system. To access the first page of this display, press the ALARM SUMM key. (Use the PREV/NEXT keys to go through the 5 pages of this display.)

Notice that the alarm levels (0 - 7) also list at the bottom of the first page of this display. To view the up to five pages of alarms for the various levels (0 - 7), press ESCAPE. Next, enter the alarm level number. Then press ENTER.



A9719

FIGURE 11.8 — Accessing An Alarm Summary Display

To access a Group Display from an Alarm Summary page, press the access letter (at the beginning (left side) of each line on the Alarm Summary page) for that Group. This displays the Primary Group assigned to that tag. Remember, if that Group has no configured tags but does have an assigned Graphic, its Graphic displays. Notice that the primary group does not necessarily include the tag in an alarm state. A series of tags previous to the current alarm can cause that alarm. It depends on OIU configuration.

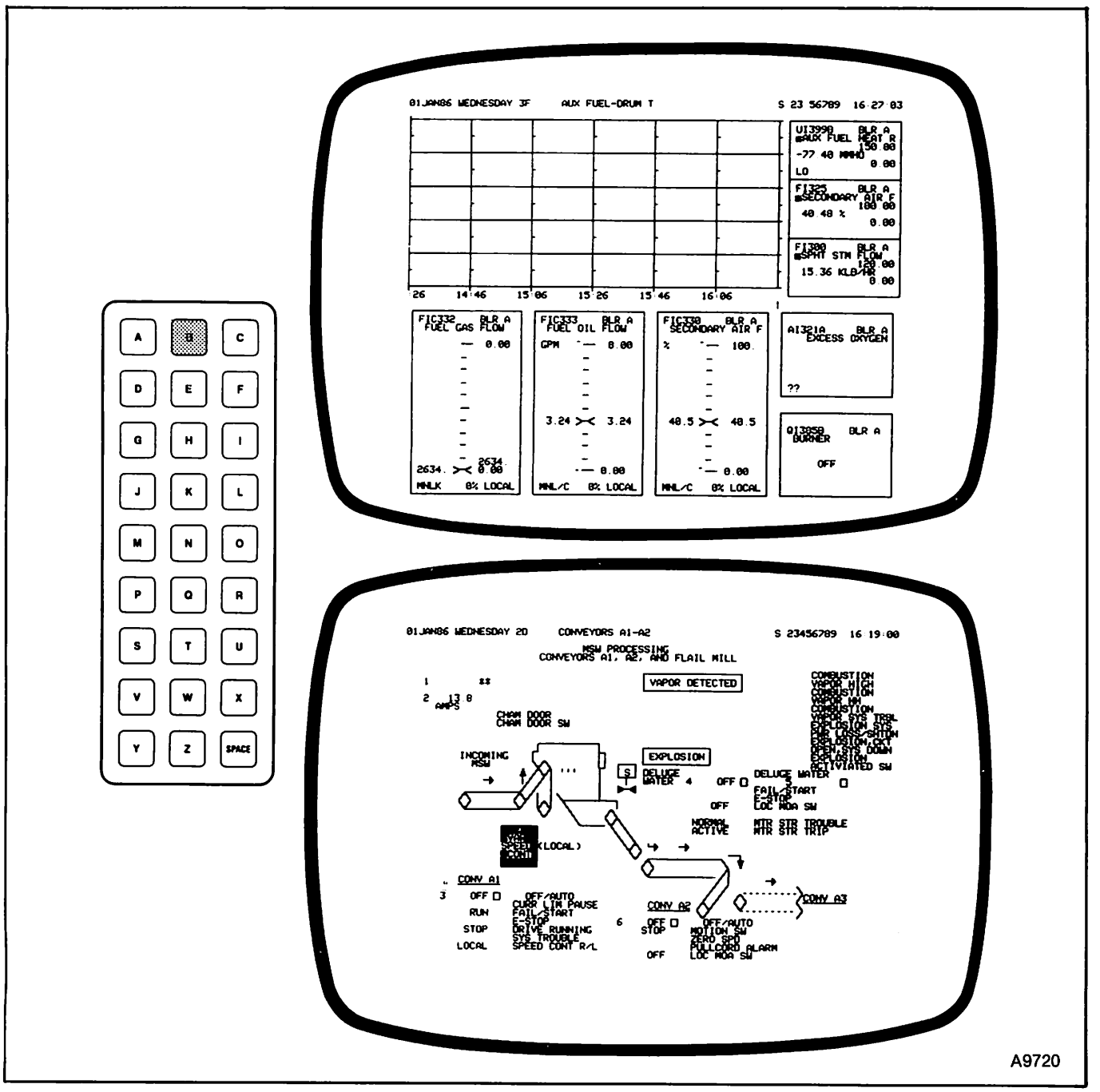


FIGURE 11.9 — Accessing Group (Graphic) Display From The Alarm Summary

SYSTEM STATUS DISPLAY. The System Status Display shows you up to 63 nodes on your plant loop. To access this display, press the STATUS key.

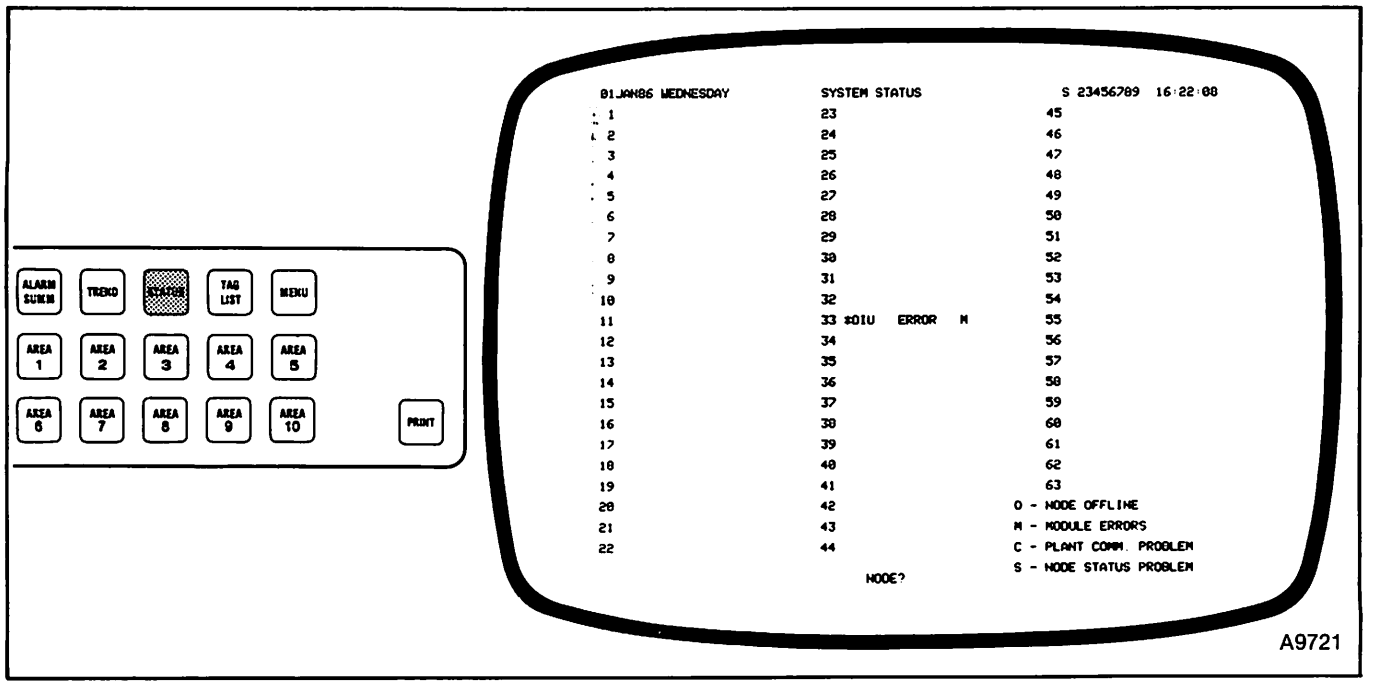


FIGURE 11.10 — Accessing The System Status Display

NODE SUMMARY DISPLAY. The Node Summary Display shows you the status of a node, its communication system, and up to 31 modules within that node. To access any Node Summary Display page, position the screen cursor to the Node prompt at the bottom of the System Status page (See Section IV.) and use the Numeric keys to enter the Node number. Then press the ENTER key. The Node Summary page entered appears, replacing the System Status page currently on the screen.

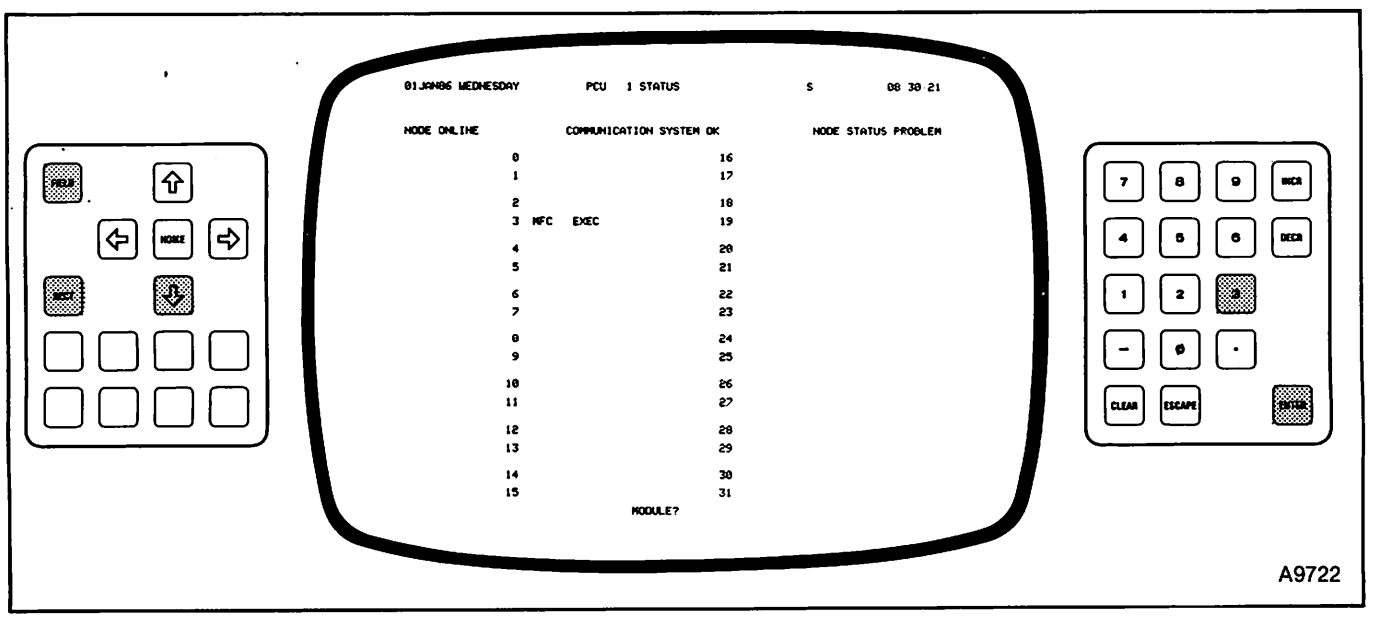


FIGURE 11.11 — Accessing The Node Summary Display

Pressing the PREV/NEXT keys accesses the numerically previous or next Node Summary page. To return to the System Status page, press the ESCAPE key.

MODULE SUMMARY DISPLAY. The Module Summary Display shows you the detailed status of any Module in a PCU. To access a Module Summary page, position the screen cursor to the Module prompt at the bottom of a Node Summary page (See Section IV.) and enter the Module number. Then press the ENTER key. The Module Summary page entered appears, replacing the Node Summary page currently on the screen.

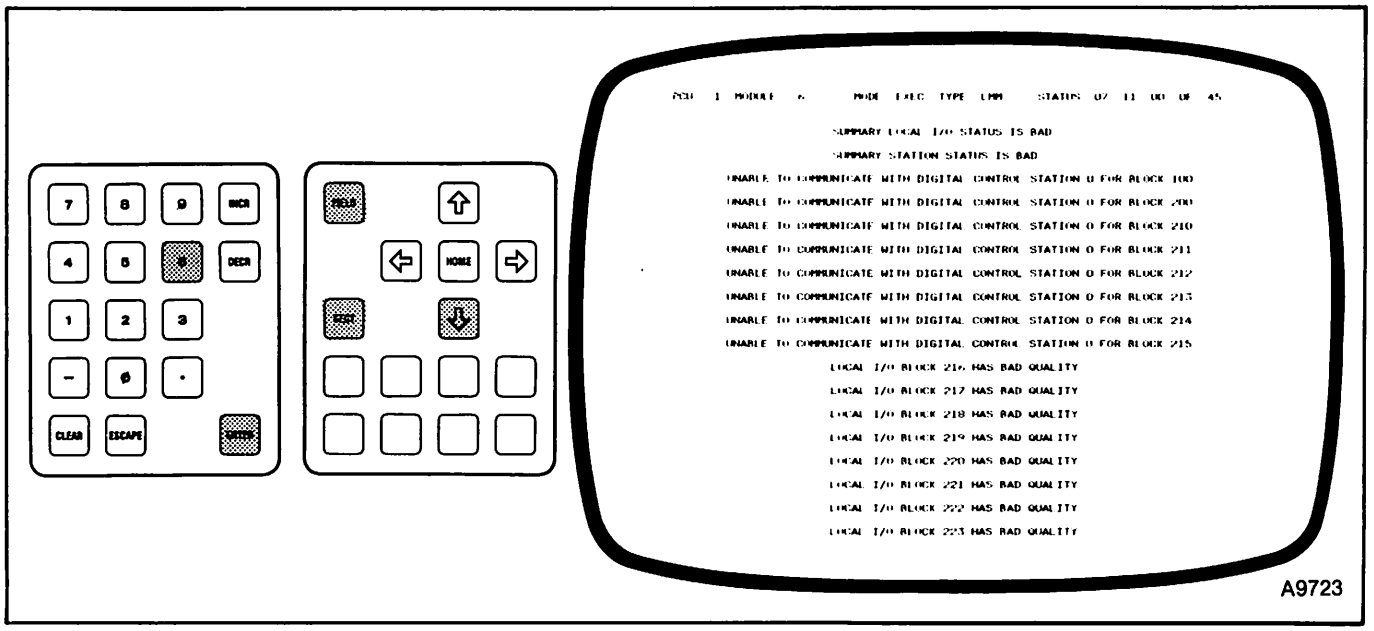


FIGURE 11.12 — Accessing The Module Summary Display

Use the PREV/NEXT keys to view the numerically next or previous Module Summary pages. To return to the Node Status Display, press the ESCAPE key.

TAG LIST DISPLAYS. The Tag List Menu lets you access the various Tag List displays and print them using your (optional) printer. To access the Tag List Menu, press the TAG LIST key. After the menu appears, enter the letter shown for the display or printout desired.

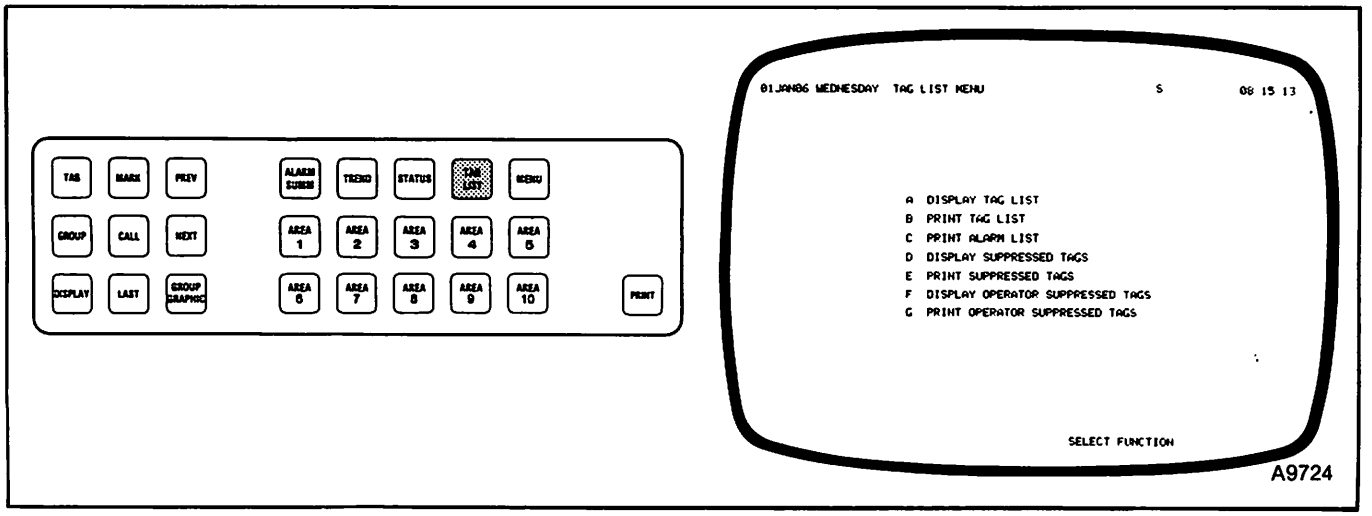


FIGURE 11.13 — Accessing The Tag List Menu

Tag List Display. The Tag List Display shows you a listing of the tags within your system. To access the first page of this display, enter A from the Tag List Menu. Use the PREV/NEXT keys to view the numerically next or previous pages of this display. Notice that the Tag List pages allow wraparound. (You can scroll to the first page after viewing the last page, using the NEXT key, for example.)

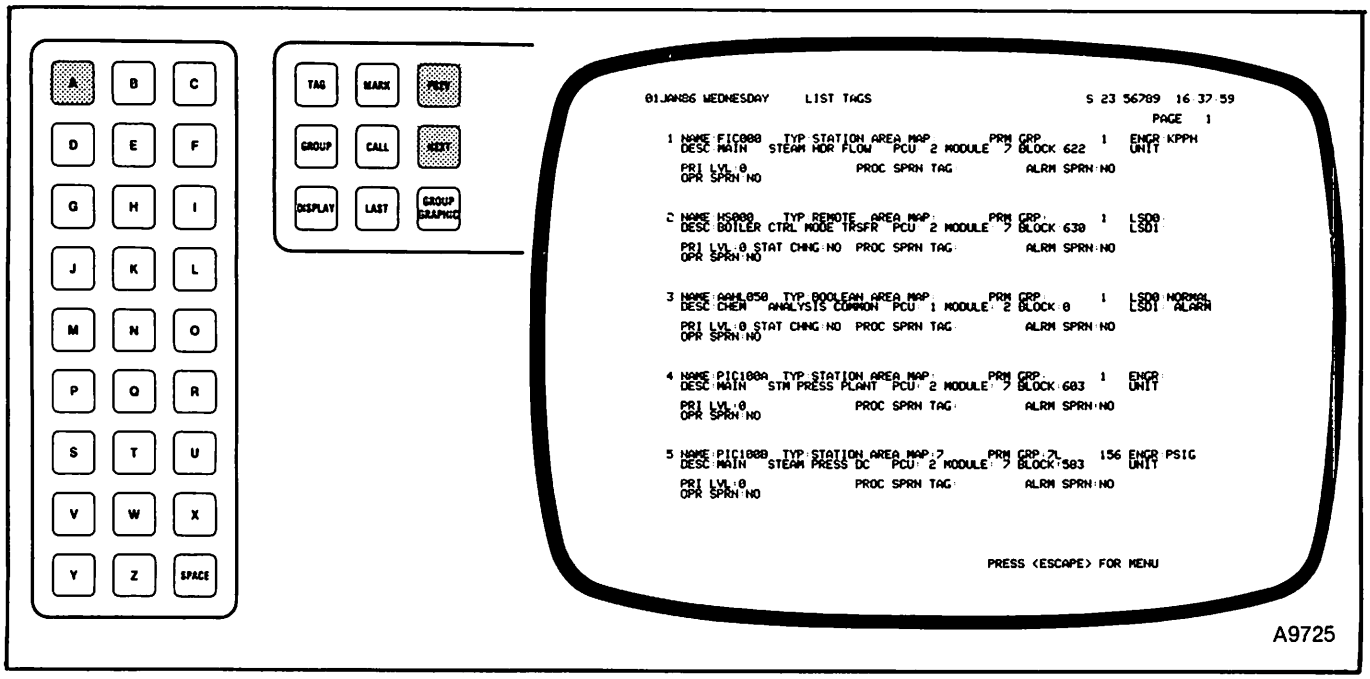


FIGURE 11.14 — Accessing The Tag List Display

To access a Group Display from a Tag List page, press the TAG key. Enter the Tag name and then press the DISPLAY key. The primary group for that tag appears on the screen, replacing the Tag List page. Remember, a Graphic Display can appear, instead of a Group Display. (See under GROUP DISPLAY.)

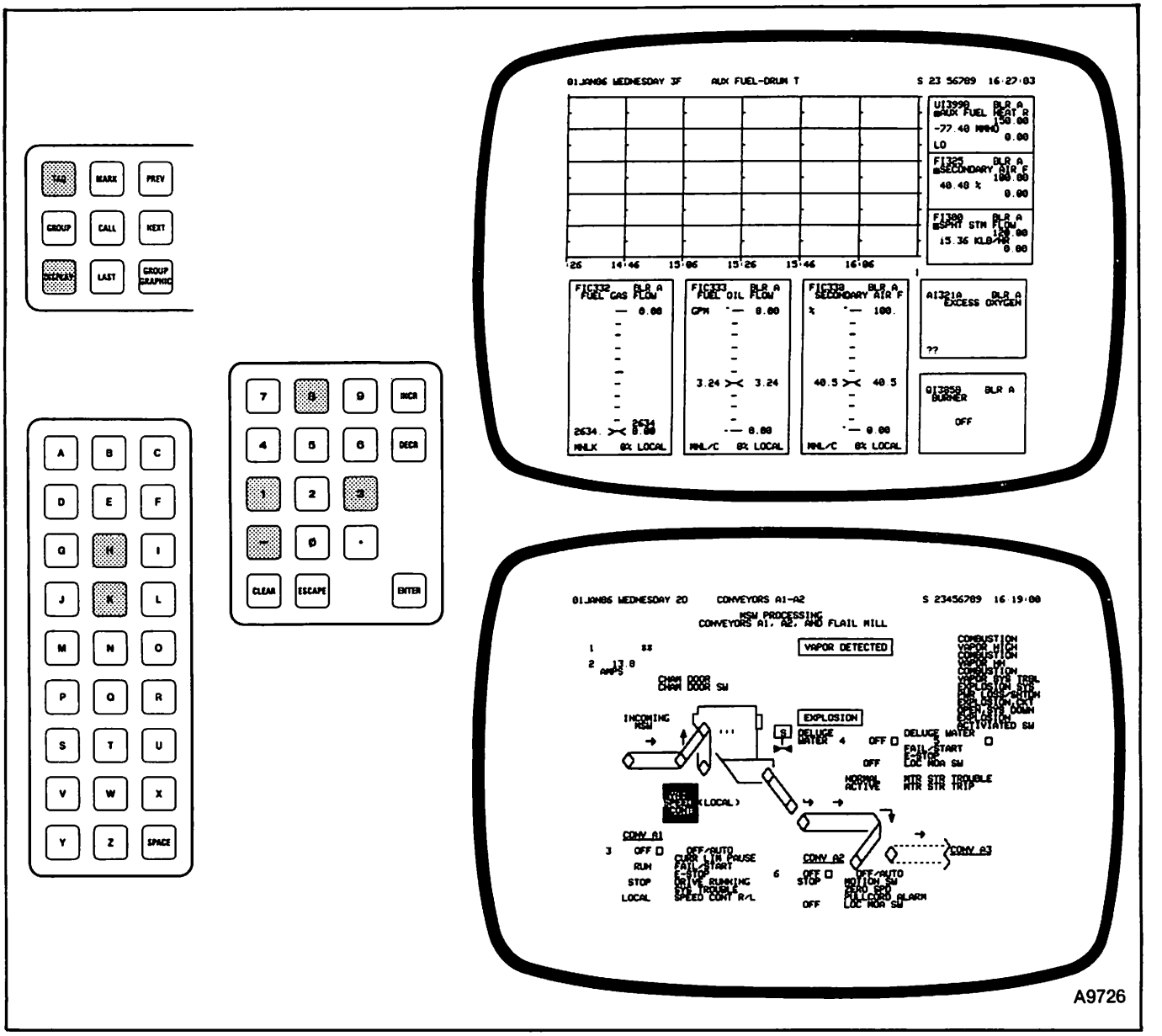


FIGURE 11.15 — Accessing A Group (Graphic) From A Tag List Page

Suppressed Tags Display. This display shows you all tags for which the system currently suppresses alarms. To access the first page of this display, enter D from the Tag List Menu. Use the PREV/NEXT keys for scrolling. To return to the Tag List Menu, press the ESCAPE key.

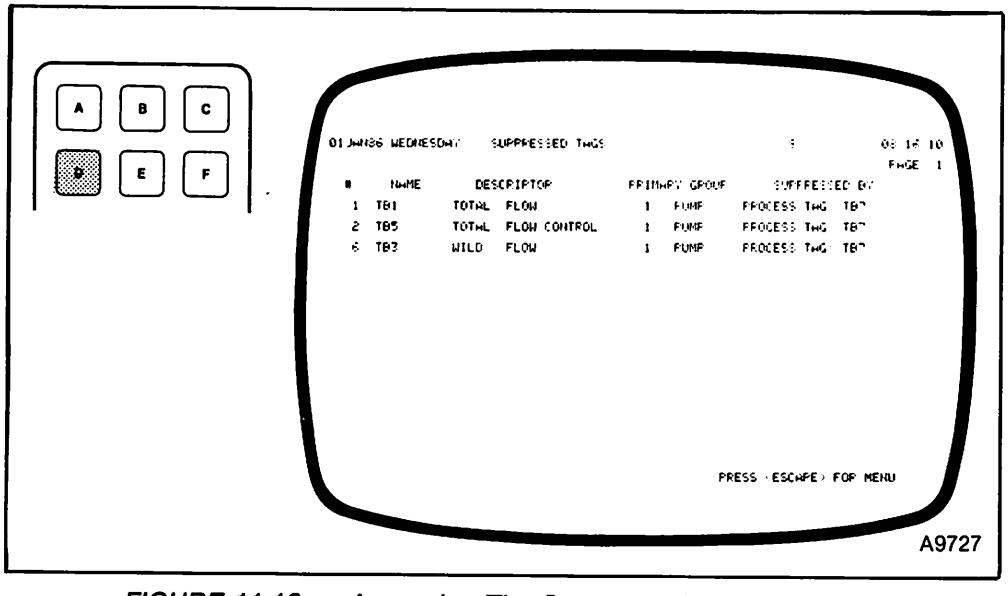


FIGURE 11.16 — Accessing The Suppressed Tags Display

Operator Suppressed Tags Display. This display shows you all tags for which you currently suppress non-critical alarms. To access the first page of this display, enter F from the Tag List Menu. Use the PREV/NEXT keys for scrolling. To return to the Tag List Menu, press the ESCAPE key.

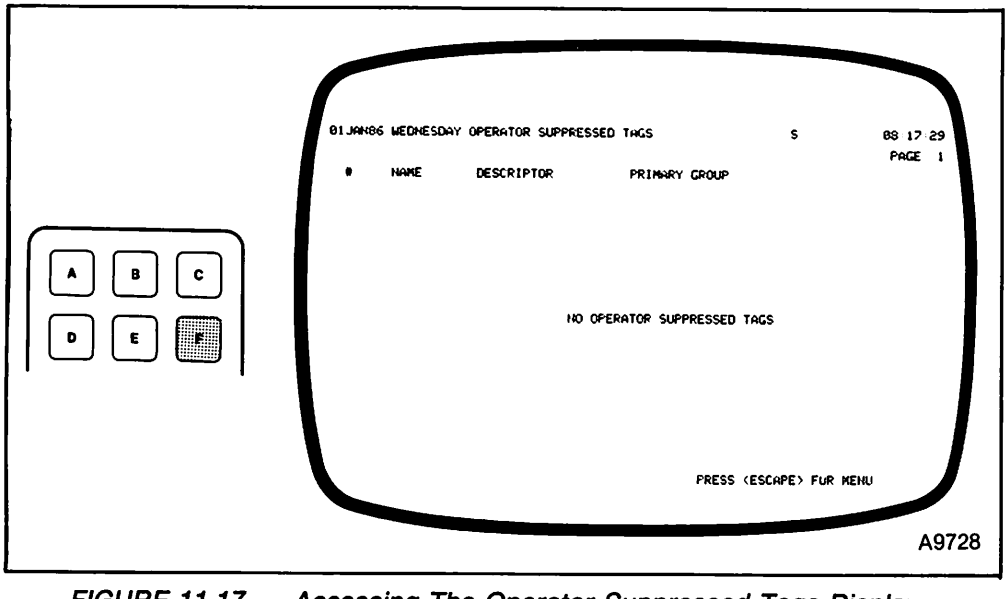


FIGURE 11.17 — Accessing The Operator Suppressed Tags Display

Tag List Printout. The Tag List printout gives you a hardcopy of the tags within your system. To access this printout, enter B from the Tag List Menu. The following prompt message appears:

PRINT TAG DATA FROM TAG: (prompt) TO TAG: (prompt)
OR 'A' FOR ALL TAGS

NOTE

In standard configuration each prompt field appears as a white and green rectangle.

Next, enter the starting Tag number in the FROM TAG: prompt (the number of the tag that you want at the beginning of the printout). Then enter the ending Tag number in the TO TAG: prompt (the number of the tag that you want at the end of the list). You must enter the tag range (from ## to ##) in these prompts or you cannot create a Tag List printout. (If you want to print out every tag in your system, simply enter A at the FROM TAG: prompt and press ENTER.) After entering each tag prompt, press the ENTER key.

Next, press the PRINT key. The Tag List prints out, stopping after the last tag (entered at the TO TAG: prompt). If you entered A, the Tag List prints from tag number 1 all the way to the very last tag in your system.

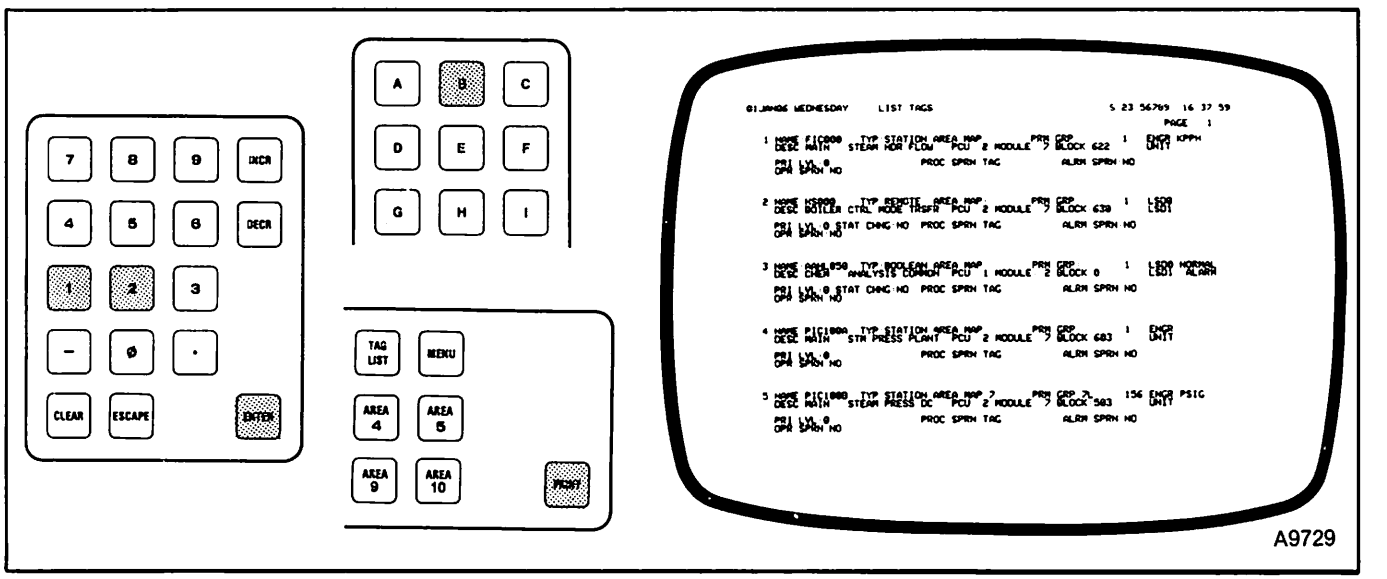


FIGURE 11.18 — Accessing And Printing The Tag List

Alarm List Printout. The Alarm List printout gives you a hardcopy report showing the alarm state (of a chosen priority level) for all tags within your system. (See Part II of this manual for more detail on alarm priority levels.) To access the Alarm List, enter C from the Tag List Menu. The following prompt message appears:

PRINT ALARMS FOR LEVEL: (0 = ALL LEVELS)

Enter the alarm priority level number desired at this prompt. (Level 0 is the standard alarm level. If you enter 0 at this prompt, the Alarm List prints all the current alarm state of all tags within your system. If you enter a different level number, the list prints out only those tags of that priority level.)

After entering the priority number, press ENTER. Next, press the PRINT key. The Alarm List prints out, stopping at the last tag of that priority level within your system (entered at the prompt).

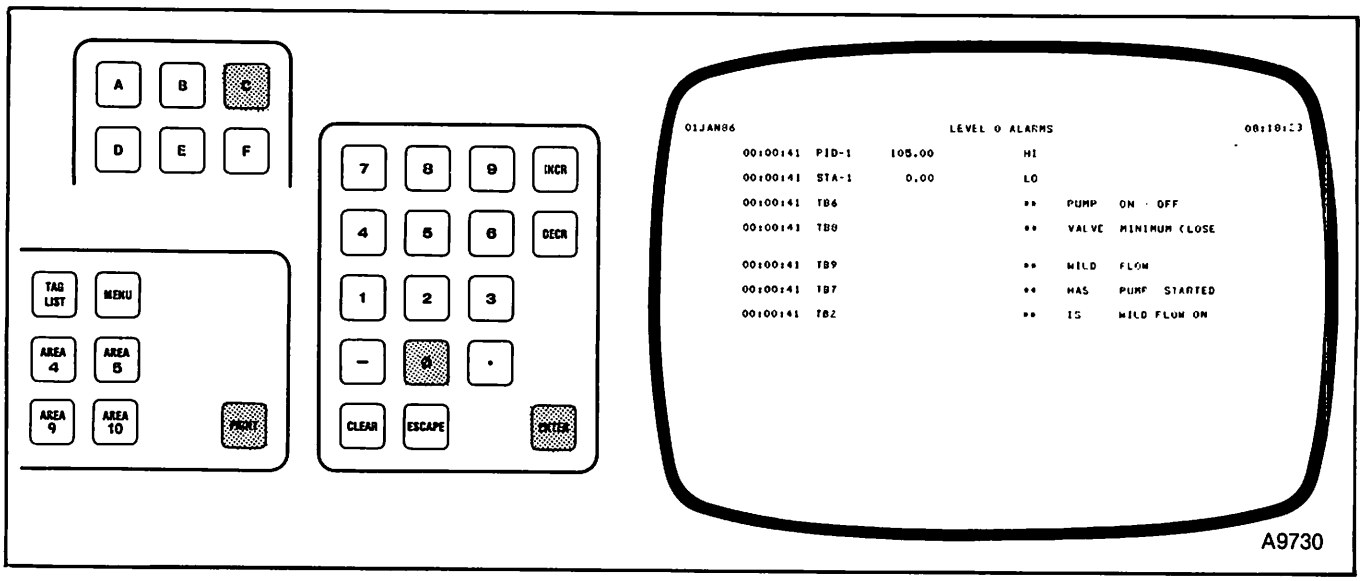


FIGURE 11.19 — Accessing And Printing The Alarm List

Suppressed/Operator Suppressed Tag Printouts. Each of these printouts give you a hardcopy report showing which tags have either system suppressed or operator suppressed alarm states. To access the Suppressed Tag printout, enter E from the Tag List Menu. To access the Operator Suppressed Tag printout, enter G from the Tag List Menu.

Both printouts use the exact same Tag prompts as a Tag List printout. Respond to the Suppressed Tag printout prompts in the same way as for the Tag List. After entering the starting and ending (or A) tag numbers, press ENTER. Next, press the PRINT key. The Suppressed Tag printout you access then prints out, stopping at the last tag (entered at the TO TAG: prompt). (If you entered A, the printout stops after the last tag in your system.)

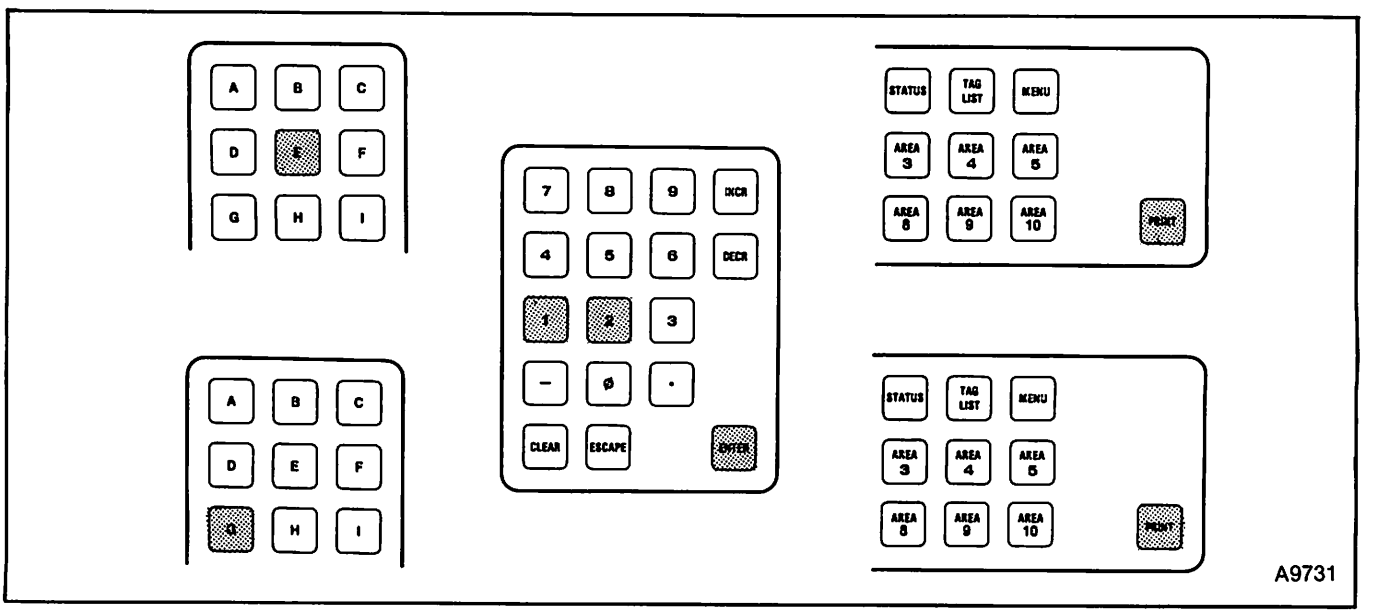


FIGURE 11.20 — Accessing And Printing Suppressed Tags

GENERAL FUNCTION MENU. The General Function Menu lists mostly configuration functions. To access the menu, press the MENU key.

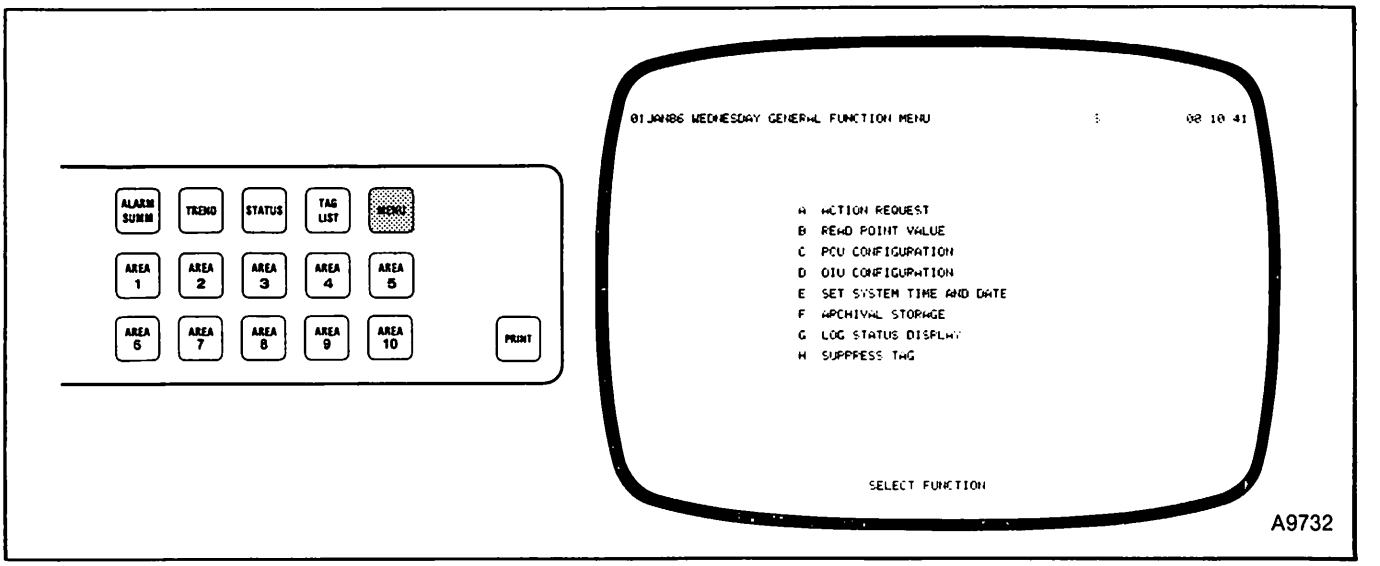


FIGURE 11.21 — Accessing The General Function Menu

After accessing the General Function Menu, you can perform various configuration tasks (See Sections VI through XI.), respond to any action requests (from a Display page Title line - See Section IV.), or access the Read Point Value Display.

READ POINT VALUE DISPLAY. The Read Point Value Display allows you to monitor any defined point in your system. To access this display, enter B from the General Function Menu.

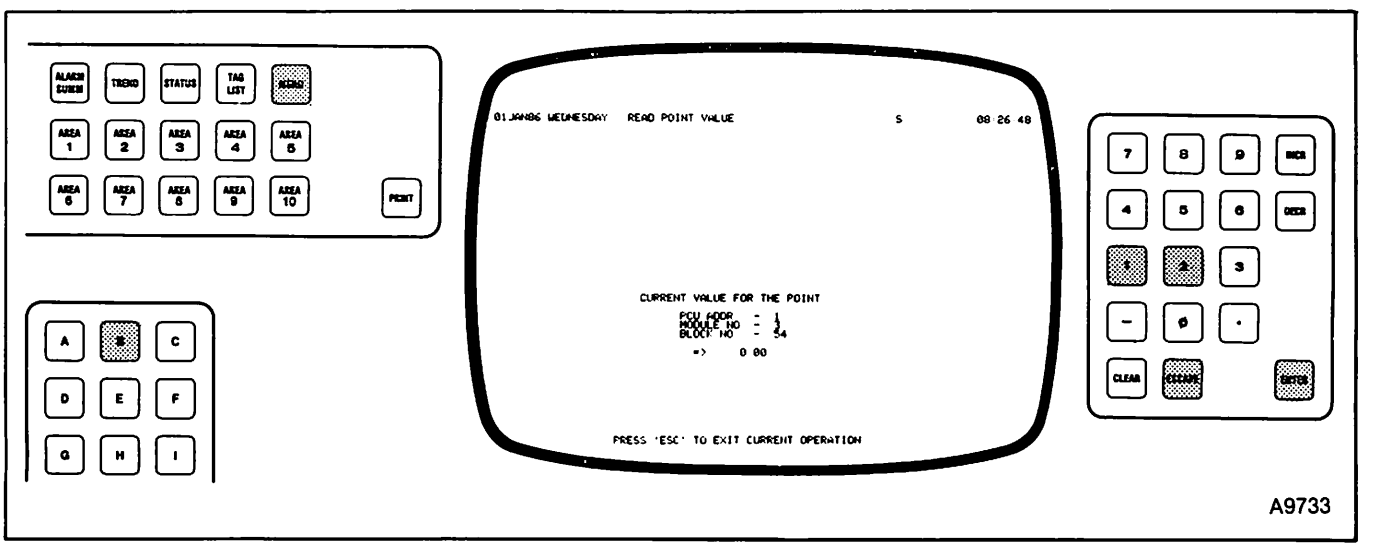


FIGURE 11.22 — Accessing The Read Point Value Display

After the prompt (first) page of this display appears you return to some other operation (or a different display), by pressing the ESCAPE key twice. Otherwise, enter the desired numeric hardware address after each prompt (using the numeric keys and pressing ENTER). Then move to the next prompt using the FIELD key. Skip address numbers by pressing the FIELD key at that prompt item. The cursor positions itself to the next prompt (or back to the PCU prompt if you skip the Block item). After entering the last prompt item (Block address), press the ENTER key. The Prompt page disappears and the Value page appears.

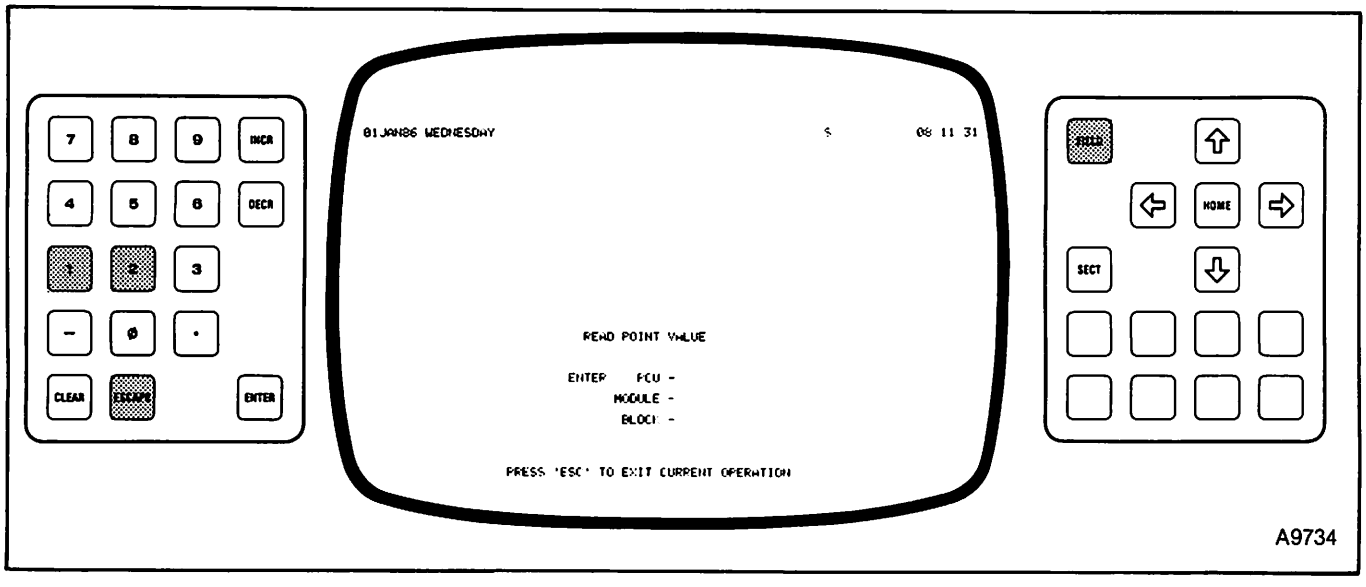


FIGURE 11.23 — Read Point Current Value

To go to another operation or view a different display, press the ESCAPE key twice. This brings you back to the General Function Menu. Pressing ESCAPE once returns you to the Prompt page to read another point value (by responding to the address prompts).

TUNING DISPLAY. The Tuning Display shows the trend, station, and block details elements of any current control loop tag. To access the Tuning Display for any desired tag, first access a Group or Graphic Display. Then position the screen cursor on the controllable tag element (station, remote control, device driver, or manual set constant). Next, press the TREND key.

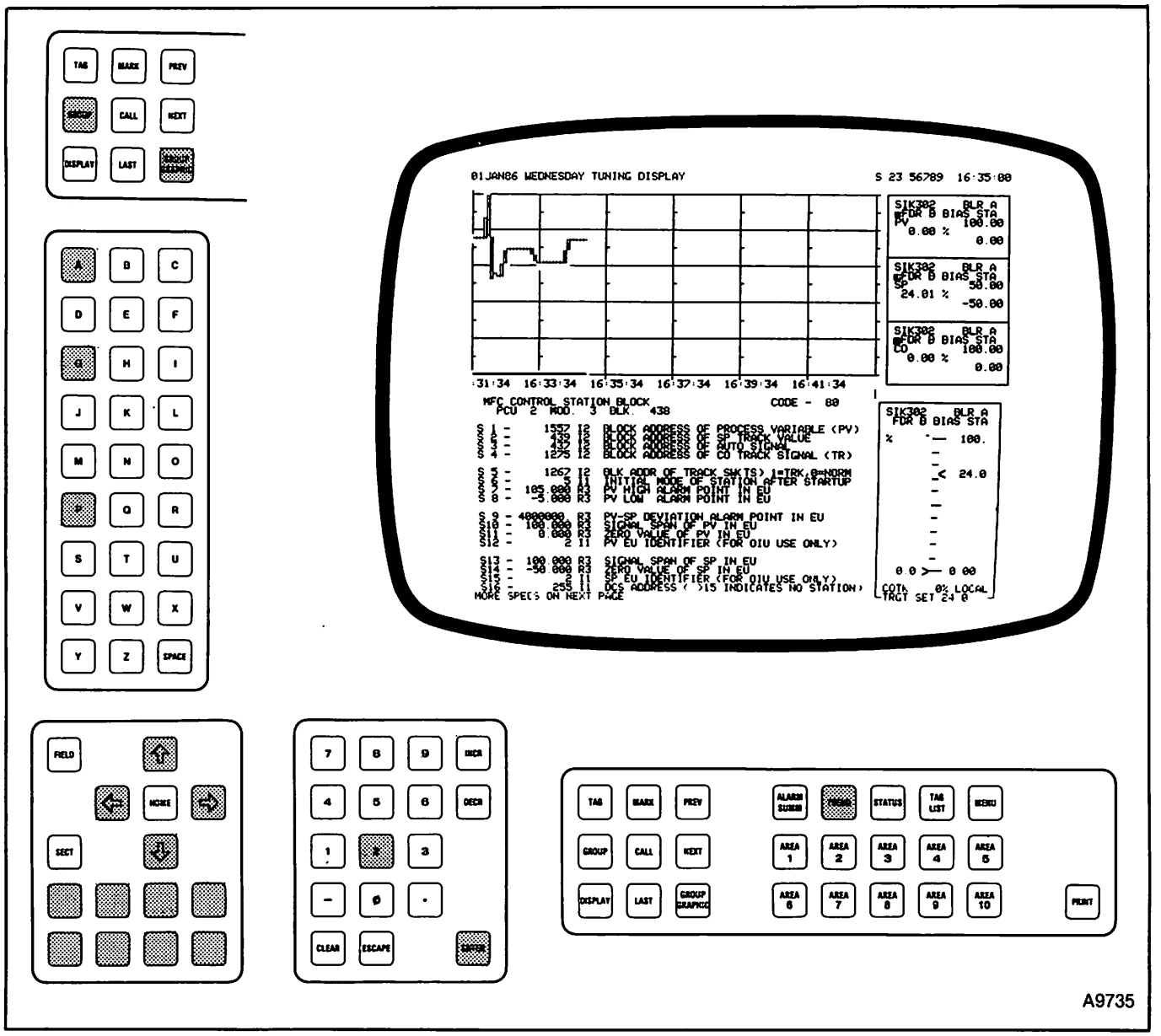


FIGURE 11.24 — Accessing The Tuning Display

When the Tuning Display appears the screen cursor positions itself on the first tunable parameter. You reposition the cursor using the FIELD key. (See Tuning Display Cursor Control later in this Section.)

BLOCK DETAILS DISPLAY. The Block Details Display lists the various parameters for an associated tag and is identical to the Block Details element of a Tuning Display. You can access the Block Details Display alone by using the PCU Configuration Menu (Section V). You can also access this display from a Group or Graphic Display page. While in either display, position the screen cursor to the desired controllable tag element and press the DISPLAY key. The Block Details Display for that tag appears on the screen.

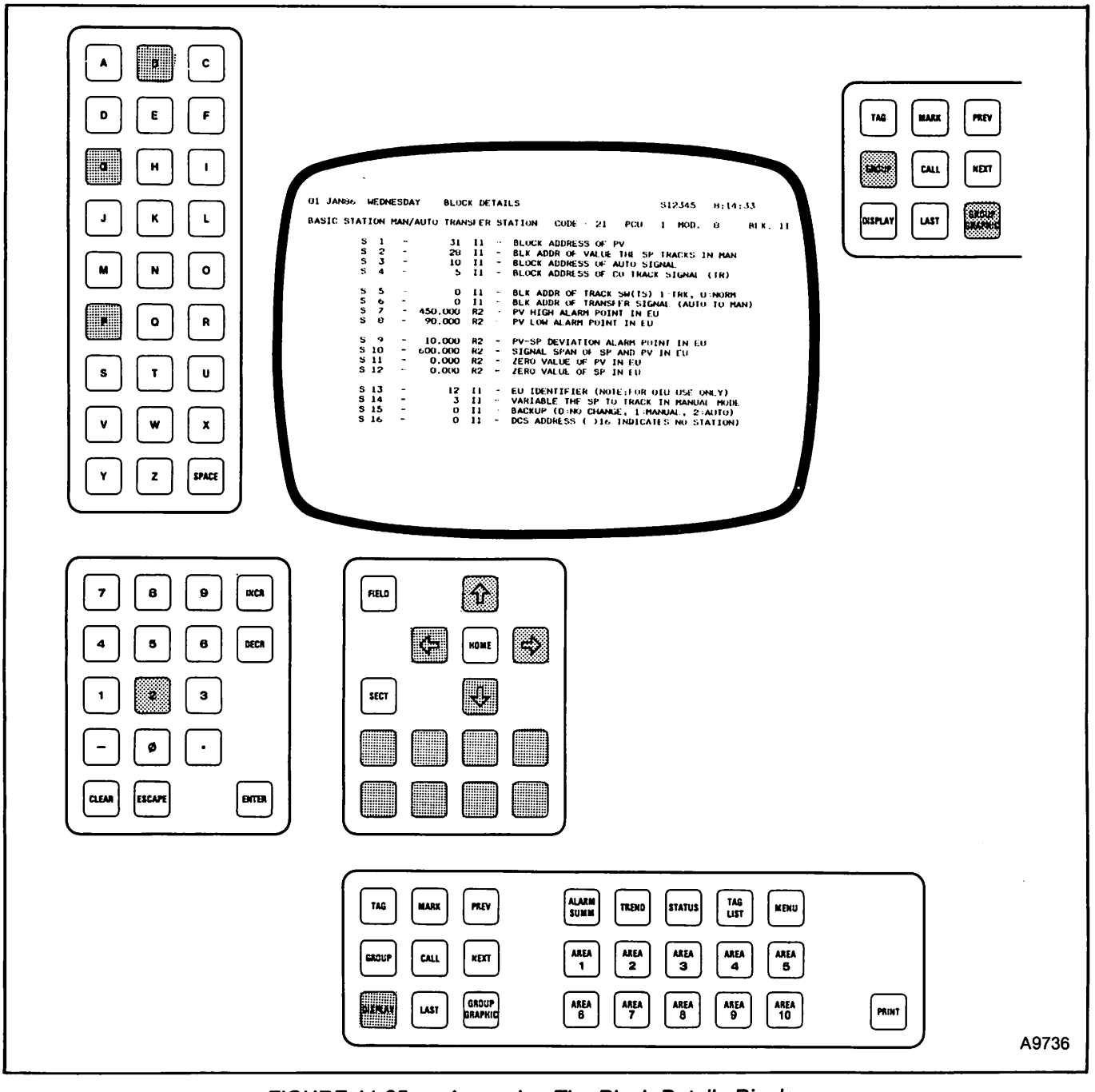


FIGURE 11.25 — Accessing The Block Details Display

Scrolling and Marking

To view the various pages of multi-page displays (scrolling), use the PREV/ NEXT keys on the Display Control block of the keyboard. When you scroll to the last page of a display, simply press the NEXT key. Most display pages have a wraparound feature. This automatically returns you to the first page of that display so you can continue scrolling.

NOTE

The same feature also exists when you use the PREV key. When you scroll back to the first page of a display, simply press the PREV key again. This causes the last page of that display to appear.

The display pages having a wraparound feature for scrolling are:

- Group Display
- Graphic Display
- Alarm Summary
- Node and Module Summaries
- Tag Lists.

You can also access any display page by marking it for later display and then calling it, regardless of the current page on the screen. (This is similar to using a bookmark when reading a book.) To mark a page for later display, press the MARK key while that page is currently on the screen. To recall the marked page (display the marked page at some future time), simply press the CALL key.

NOTE

You can mark and call only one display page at any time.

You reaccess a previous display using the LAST key. If you wish to view the display page that was on the screen prior to the current page, simply press the LAST key. This enables you to view a display page that is different than that currently on the screen. You can view an Alarm Summary Display, for example, while having a Tag List page currently on the screen (if the Alarm Summary page was previously on the screen).

Group Display Cursor Control

When accessing a Group Display page, position the screen cursor on display elements using the Cursor Control block section of the keyboard (the Arrow and Element display keys). When accessing a Graphic Display page, enter the control select number at the prompt (if any) on the bottom of the screen.

The cursor (a cyan outlined box) has two states:

- HOME position (off the screen)
- Display element activation (at display element).

When in HOME, any non-HOME key in the Cursor block can start cursor movement to a display element. (Movement begins at screen grid 1 proceeding downwards.) When a display element has more than one grid position on the screen, the cursor positions itself to the upper left grid position of that element.

When activating a Trend element, the Arrow movement keys (up, down, left, and right) become ZOOM UP/DOWN and PAGE LEFT/RIGHT trend display keys. To position the cursor to some other display element, use the HOME key or one of the eight, unmarked Element display keys.

Use the element display keys for direct cursor control while a Group display is currently on the screen. Figure 11.26 shows the screen grid positions.

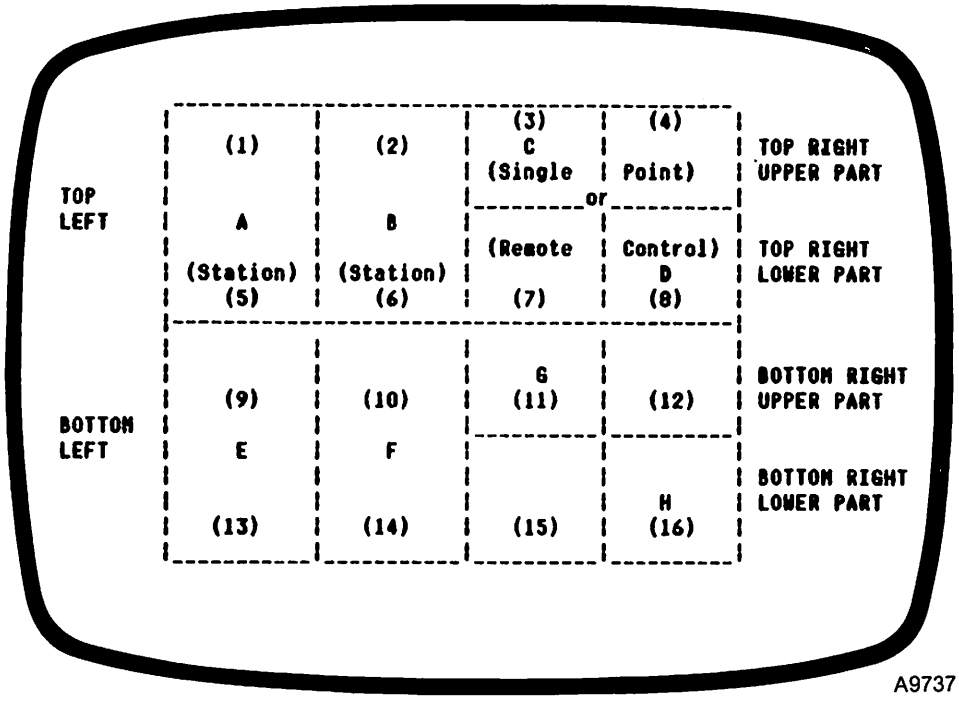


FIGURE 11.26 — CRT Screen Grid Positions

NOTE

Letters correspond to the Element keys of the Cursor block; numbers show the 16 grid positions for cursor movement using the Arrow keys of the Cursor block.

Examining the two rows of Element display keys in the Cursor Control block, consider the top row to be A through D and the bottom row to be E through H (matching the lettered sections of the Figure screen above). To position the cursor to the second grid of the screen, for example, press the second Element key in the top row (the B key).

The Cursor always positions itself to the upper part of any grid. To position it to the lower part, press the same key again (or the DOWN arrow). To move the cursor to the Top Right lower part of the screen, for example, press the D key. (The cursor moves to the top part of the fourth grid.)

Then press the D key again (The cursor moves to the lower part of the fourth grid.) or the DOWN Arrow key. (To return to the upper part of this grid, press the UP Arrow key.)

When the cursor positions into a grid containing any element, the cursor moves to that element and highlights its box. If the grid does not contain a display element, the cursor disappears (HOME position).

When a Trend element is in a Group Display, any key in the first (top) row of Element keys positions the cursor to a Trend in the top half of the screen. Any key in the second (bottom) row of Element keys positions the cursor to a bottom Trend.

Using the LEFT/RIGHT Arrow keys, cursor movement and wrap is horizontal. Starting from the Top Left upper part of the CRT and using the RIGHT Arrow key, the cursor moves to the right (from numbered grid one to four). From grid four the cursor wraps back to the lower portion of the upper part of the CRT (numbered grid five) and moves on to numbered grid eight. From grid eight it wraps to grid nine (top portion of Lower part of CRT), moving to grid 12. From grid 12 the cursor wraps to grid 13, moving to the last grid (Bottom Right lower part of CRT), number 16. From grid 16 the cursor wraps back to grid one. The reverse movement and wrap occurs when using the LEFT Arrow key.

Using the UP/DOWN Arrow keys, cursor movement and wrap becomes vertical, rather than horizontal. (Starting in grid 1 using the DOWN key, cursor moves to grid five, nine, and 13 and then wraps to grid two, moving down to grid 14. The cursor then wraps to grid three, moving down to grid 15. Next the cursor wraps to grid four, moving down to grid 16. From grid 16 the cursor returns to grid one. The reverse movement and wrap occurs when using the UP Arrow key.

TABLE 11.1 — Cursor Control Summary

CURSOR KEY	CURSOR MOVEMENT
PRESS HOME	Moves to HOME position
PRESS ELEMENT KEY (A - H) FIRST TIME	Moves to TOP portion element (upper part of screen)
PRESS ELEMENT KEY SECOND TIME	Moves to BOTTOM portion element (lower part of the screen)
PRESS UP OR DOWN ARROW KEY	Moves and wraps through CRT screen vertically
PRESS LEFT OR RIGHT ARROW KEY	Moves and wraps through CRT screen horizontally

Red Tag Status

The OIU indicates Red Tag status on certain elements of Operation display pages that allow controlling a process (Group, Graphic, or Tuning Displays, see Section XII). (Module firmware must support Red Tag status in order for any module to have it.) Red Tag status does not affect other Operation displays. You set Red Tag status for any tag during PCU configuration (Section V). This status does not indicate for an element until an exception report occurs from that element.

Normally, when the screen cursor positions on a display element, the element outline highlights in cyan. When you position the cursor onto an element indicating Red Tag status, the element outline changes to the color you set during configuration. This indicates that you can only monitor this element; not take any control action from it. Its value and alarms display normally, however.

Those display elements for which you can configure Red Tag status are:

- Station Control
- Remote Control Memory
- Device Driver.

NOTE

You cannot change Red Tag status unless the CONF keyswitch is unlocked. The TUNE keyswitch has no effect on Red Tag status. To remove this status from any tag having it, you must unlock the CONF keyswitch and access the PCU Configuration Menu. (Section V explains this in detail.)

Tuning Display Cursor Control

With the CONF keyswitch unlocked, pressing the FIELD key positions the screen cursor to the next parameter specification. The cursor highlights and becomes a prompt for numerical, text, or control value entries.

When the cursor is at the last parameter spec on the display and more specs exist, press the FIELD key to access the next page of specs. The cursor moves to the first spec on the new page. When the cursor is at the last spec of the Block, press FIELD to return to the first spec. The first spec is always at the top of the first page of the Block.

With the TUNE keyswitch unlocked, the FIELD key moves the cursor to the next tunable parameter shown or to the next page of the Block. The FIELD key moves the cursor to the first tunable parameter of a new page if there are more than 16 specs. If no tunable parameters display, the cursor disappears from the screen. Pressing the FIELD key again accesses the next Block page. The cursor moves to the first tunable parameter (if any).

When the Display element is in numerical entry mode the cursor disappears. The Station element allows numerical entry for setpoint or control output only, using the SET or OUT key. (Press ENTER to process an entry.) When the cursor repositions, the entry parameter reverts back to the last valid value.

For example, the cursor is at parameter S 7 (value of 10.00). You change the value to 20.00 but do not press ENTER. (The parameter still has a value of 10.00, its last entry.) You must reposition the cursor using the FIELD, SET, or OUT key.

NOTE

You can only update one parameter at a time.

When using the screen cursor with the Station element, pressing the FIELD key moves the cursor to the first tunable parameter of the Block element. If there are no tunable parameters, the next Block page displays (if any). If at the last Block page with no tunable parameters, the cursor moves back to the first tunable parameter of the first Block page.

Using the NEXT and PREV keys, you access the previous and next Block Details display (relative to the current one). You can also access details directly from another Block. Pressing the ESCAPE key repositions the cursor to the bottom of the page and a prompt appears. The prompt asks for a Block number. Access any block within the same PCU and Module by entering the Block number and pressing ENTER.

Alarming (Acknowledging Alarms)

As seen in Section IV, the OIU indicates alarm states using flashing indicators. The default color for alarms is yellow but you can set another color during configuration as desired (See Section IX).

The System Alarm indicator appears in a display page Title line. The various process alarm indicators appear next to, or in place of, process values reported on the display page elements.

You set high and low alarm trip points during OIU configuration. You can also configure alarms for Remote Control switches. When a Remote switch exceeds its set limits, its display element shows that an alarm state exists.

NOTE

Your plant Manager or process engineer instructs you if and how you need to take corrective action when a process value enters an alarm state.

TABLE 11.2 — OIU Alarm Indicators

INDICATOR	EXPLANATION
S	System communication fault (either in a PCU or elsewhere)
H	Process exceeds its acceptable upper range value
L	Process exceeds its acceptable lower range value
D	High or Low Deviation (difference between setpoint and process variable exceeds that set by configuration)
A	Digital (Boolean) Alarm (on Group Display Tag Blocks and Boolean Single Point elements)
	Alarm state exists (on Group Display Remote Control element)
	Digital (Boolean) alarm (on Graphic Display value item)
AA	Control output bad (on Device Driver Single Point element)
*	Bad Quality data

IDENTIFYING/ACKNOWLEDGING ALARMS. To acknowledge an alarm (stop its flashing), you must access the display page containing that alarm and press the ACK key on the keyboard. The two types of OIU alarms are System and Process.

System Alarms. A System Alarm alerts you to communication faults in the system. The alarm appears as a flashing **S** in a display page Title line. To acknowledge a System alarm, access the System Status Display by pressing the STATUS key. Examine the display to determine which node is faulty (in an error condition). The faulty node has the yellow word **ERROR** to the right of its number.

If no PCU module fault exists on the display (the fault is in a unit other than a PCU), simply press the ACK key. The **S** stops flashing but stays on display until the fault becomes corrected. Notify maintenance personnel of the alarm after you acknowledge it so they can take the appropriate corrective action.

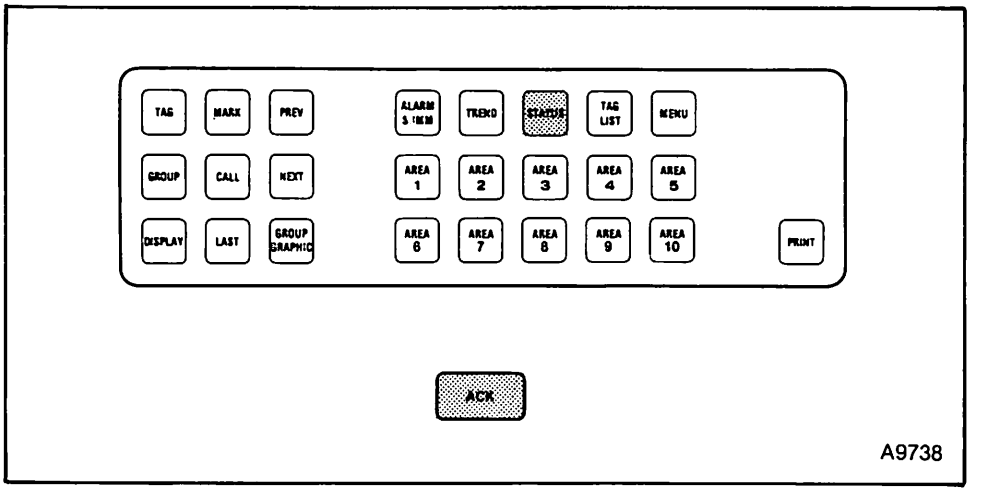


FIGURE 11.27 — Acknowledging Non-PCU Module System Alarm

If the system fault is in a PCU, identify the correct PCU Node number from the System Status Display. Next, position the cursor at the Node prompt (bottom of the System Status page). If there is some Node address already at the prompt, press CLEAR to erase it. Otherwise, enter the PCU node number and press ENTER. When the Node Summary Display appears on the screen press the ACK key. The **S** stops flashing but stays on display until the fault becomes corrected. Notify maintenance personnel to take the corrective action.

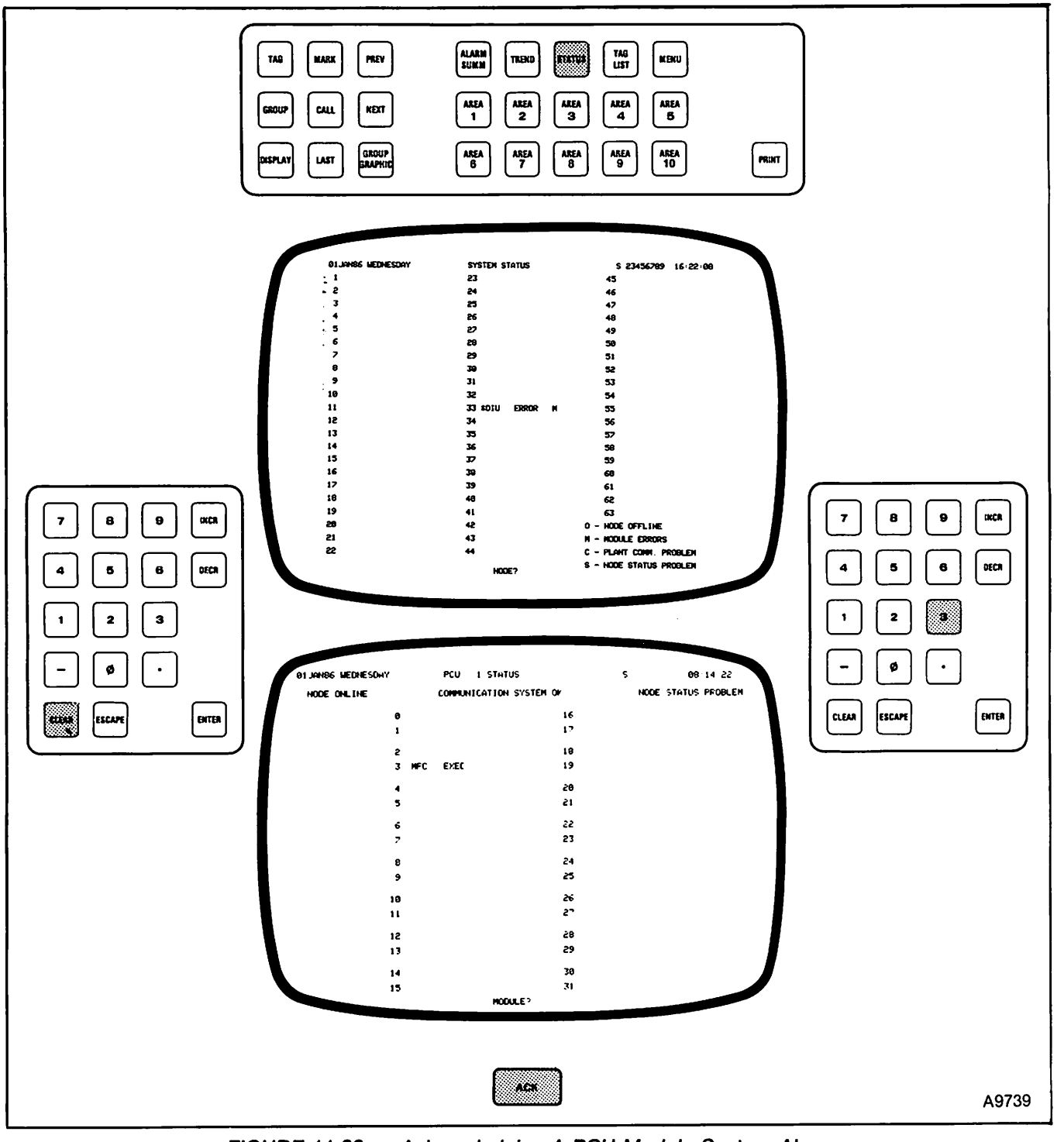


FIGURE 11.28 — Acknowledging A PCU Module System Alarm

Process Alarms. A Process Alarm lets you know when a process value in any Area exceeds its preset trip points or has bad quality. When a process (tag) goes into an alarm state, its associated Area Display page number flashes in yellow on the Title line of the current page on display. If the current display page on screen contains the tag in alarm, simply press the ACK key. The alarm indicator for that tag and its Area page number stop flashing but stay on display until you take corrective action or the tag leaves the alarm state.

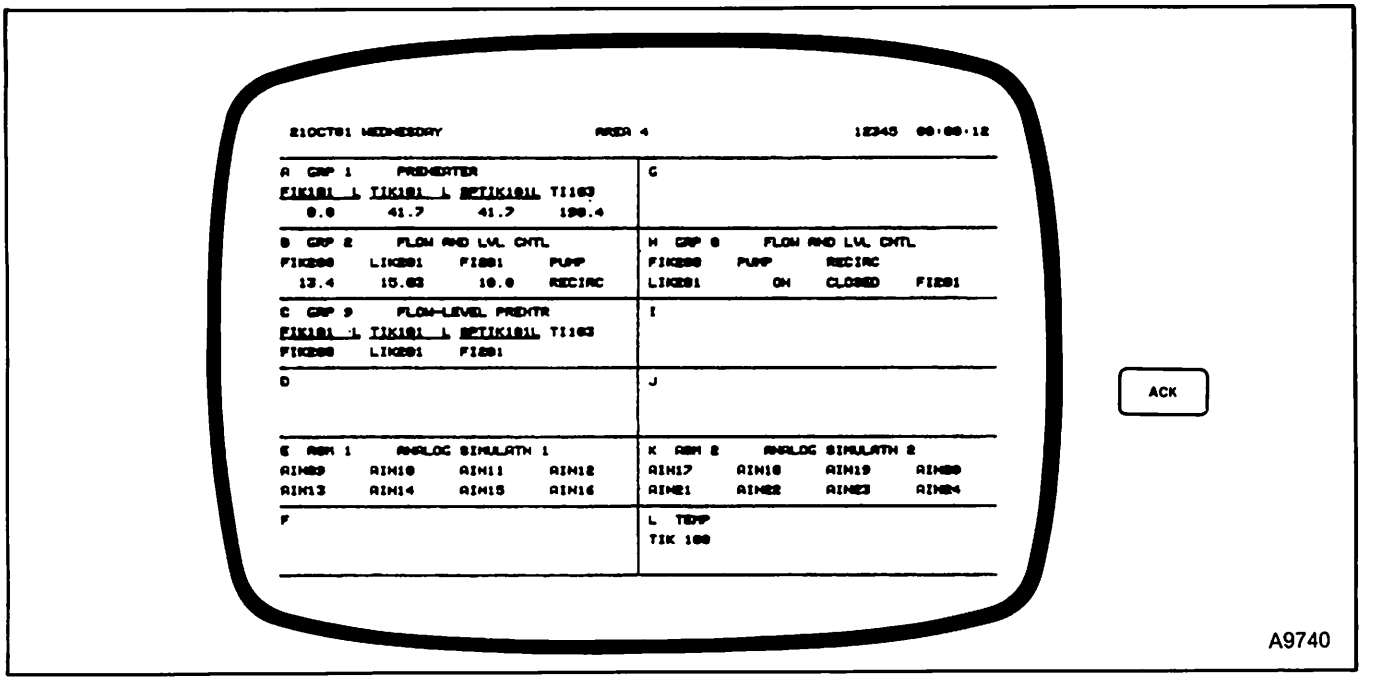


FIGURE 11.29 — Acknowledging A Process Alarm (Current Display Page)

When the tag in alarm is not on a display page currently on screen, you must perform any ONE of the following steps:

STEP 1. Access the Area Display page containing the tag in alarm. A flashing yellow line directly underlines the tag in alarm on that page. The tag also has its specific flashing yellow alarm indicator (See Table 5.2) to the right of its name. To stop the flashing, press the ACK key.

STEP 2. If you need to examine the tag in alarm more closely, access its Group Display page (enter the Group page access letter). When the Group Display page appears, press the ACK key.

STEP 3. Access the Alarm Summary page (press the ALARM SUMM key) to view the five most recent alarms (appearing on the first five lines of this page). Perform Step 1 or 2 and then return to the Alarm Summary page. When the acknowledged alarm returns to the normal state, its alarm indicators disappear.

There are three ways in which alarms clear from the Alarm Summary page:

- Perform Step 3 above.
- If an acknowledged tag returns to its normal state but then goes back into an alarm state, its entry disappears. The entry reappears at the first line of the Alarm Summary display.
- When an alarm list exceeds 100 tags, the entries become overwritten.

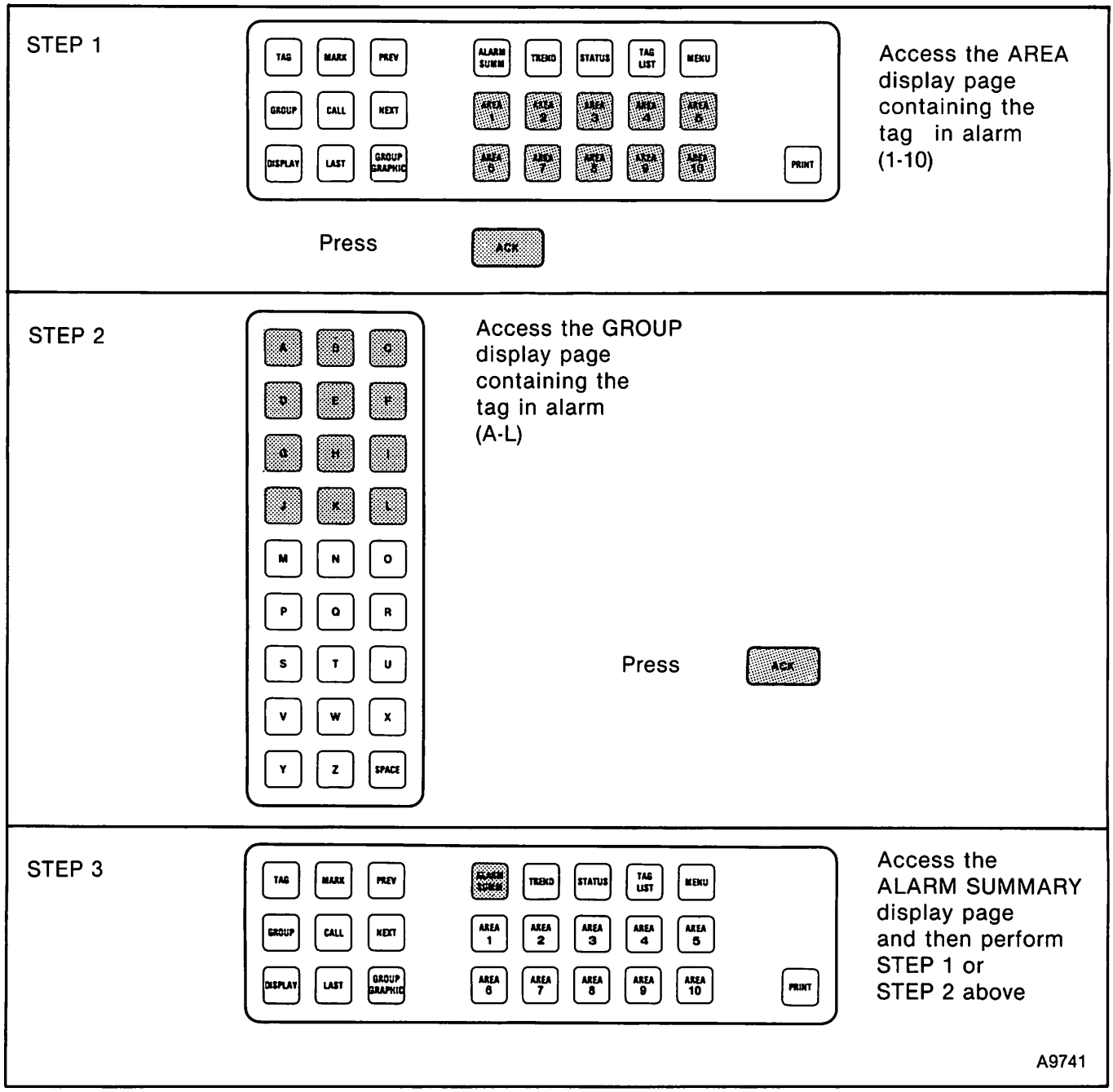


FIGURE 11.30 — Acknowledging A Process Alarm (Non-Current Display Page)

Status Errors. A Status Error alerts you to any problem with OIU, PCU, CIU, and MCS nodes on your system. Though such errors are not exactly alarms, as above, their indicators flash yellow and you must acknowledge them. Table 11.3 lists the three Status error conditions, that can occur and how to acknowledge them.

TABLE 11.3 — Status Error Conditions

ERROR	INDICATOR	EXPLANATION	TO ACKNOWLEDGE
NODE	O	Node offline	With the System Status page on display, simply press the ACK key to stop the flashing of the error indicators
	M	Module Error	
	C	Communication System Error	
	S	Node Error (Power/Fan)	
MODULE TYPE	*	Module is incorrectly defined	Access Define PCU in OIU configuration and correct the Module type. Then restart the CIU.
MODULE	ERROR	Module Error (PCU)	With the Node Summary page on display, press the ACK key. The error idicators (M on the System and ERROR on the Node page) stop flashing

Read Point Value Alarm Messages. If a point on the Value page of the Read Point Display is in alarm one of the error messages below appears below the point value:

- **LOW ALARM** (STATION/REAL POINT)
- **HIGH ALARM** (STATION/REAL POINT)
- **LOW DEVIATION** (STATION)
- **HIGH DEVIATION** (STATION)
- **A** (BOOLEAN POINT).

NOTE

You can only monitor such a message on this display. To acknowledge the alarm, you must access the proper display page containing it and press the ACK key. (See page 28 in this Section.)

RECOVERY FROM POWER FAILURE

When a module returns on-line after a power failure, you must verify its current configuration against your original configuration sheet for that block. Normally, this is beyond the scope of your tasks on the OIU. This is a part of troubleshooting done by the process engineer. This part of the OIU Manual discusses verification procedure for your information. Verification is useful to determine if any module configuration block detail is gone because of a power failure.

STATION ELEMENT. To activate a controllable Station element, position the cursor to that element (its outline highlights in cyan). Use the Station Control block keys of the keyboard to:

- Ramp (increase or decrease) the Setpoint (SP) or Control Output (CO) values
- Change the station Operating mode (AUTO, MAN, CAS, RATIO)
- Change the station Control mode (LCL or CNTR).

Use the Numeric block keys to insert specific SP and CO values:

- 0 to 9 and the decimal point (.)
- CLEAR (to erase entry mistakes or old data)
- ENTER (to input values to the system)
- ESC (to abort present operation and return to previous one).

The MAN/AUTO mode select key lets you change the station operating mode. If the system is tracking CO, however, the operating mode becomes locked in MANUAL and COTK displays on the lower left corner of that station element. Until the system stops tracking (releases the COTK lockout), you cannot change the operating mode.

When COTK displays, both the AUTO and MAN LEDs of the Station Control Block on the keyboard stay on simultaneously and all keys of that block become non-functional.

When the station is in CAS or RATIO operating mode, the lower left corner of the station element displays AUTO.

The LCL/CMPTR mode select key lets you change the station control mode between LOCAL control (PCU Module controls the process) and REMOTE control (remote computer controls the process). When you set LCL, the lower right corner of the station element displays LCL. When you select CMPTR, the element displays CNTR.

NOTE

CMPTR appears by the Station Control block control mode select key (LCL or CMPTR). CNTR appears in the lower right corner of the activated station display element when you set that element to Remote computer control.

You can only use the CAS (Cascade operating mode) key when the station is a Cascade type (Set during configuration). With the station in AUTO operating mode, press CAS. The station changes from AUTO to CAS mode.

NOTE

If the current mode of the cascade station is not Cascade, press the CAS key to change it to Cascade.

SECTION XII
CONTROLLING A PROCESS

INTRODUCTION

Section XI explained how to access and monitor the various display pages and how to position the screen cursor on display elements. This Section examines the procedures necessary for using the keyboard and displays to control a process. This Section also explains suppressing tag alarm indication and producing printed hardcopies of any OIU display.

PROCESS CONTROL

You control processes using display elements from Group, Graphic, and Tuning Display pages. Certain display elements are not controllable depending on configuration. Table 12.1 details the controllable and non-controllable display elements:

TABLE 12.1 — Controllable Display Elements

CONTROLLABLE	NON-CONTROLLABLE
STATION CONTROL	REG TAGGED ELEMENTS: Station Control Remote Control Device Driver Remote Manual Set Constant
REMOTE CONTROL, DEVICE DRIVER, REMOTE MANUAL SET CONSTANT	
TREND	SINGLE POINT ELEMENTS
BLOCK DETAILS (TUNABLE PARAMETERS)	ALL GRAPHIC ITEMS WITHOUT CONTROL SELECT NUMBERS
	ANY GROUP DISPLAY SET AS MONITOR ONLY DURING OIU CONFIGURATION

Control from a Group Display
Most control activity occurs using the controllable elements of a Group Display page. These elements are:

- Station Control
- Remote Control:
  — Device Driver
  — Remote Manual Set Constant
- Trend.

STATION ELEMENT. To activate a controllable Station element, position the cursor to that element (its outline highlights in cyan). Use the Station Control block keys of the keyboard to:

- Ramp (increase or decrease) the Setpoint (SP) or Control Output (CO) values
- Change the station Operating mode (AUTO, MAN, CAS, RATIO)
- Change the station Control mode (LCL or CNTR).

Use the Numeric block keys to insert specific SP and CO values:

- 0 to 9 and the decimal point (.)
- CLEAR (to erase entry mistakes or old data)
- ENTER (to input values to the system)
- ESC (to abort present operation and return to previous one).

The MAN/AUTO mode select key lets you change the station operating mode. If the system is tracking CO, however, the operating mode becomes locked in MANUAL and COTK displays on the lower left corner of that station element. Until the system stops tracking (releases the COTK lockout), you cannot change the operating mode.

When COTK displays, both the AUTO and MAN LEDs of the Station Control Block on the keyboard stay on simultaneously and all keys of that block become non-functional.

When the station is in CAS or RATIO operating mode, the lower left corner of the station element displays AUTO.

The LCL/CMPTR mode select key lets you change the station control mode between LOCAL control (PCU Module controls the process) and REMOTE control (remote computer controls the process). When you set LCL, the lower right corner of the station element displays LCL. When you select CMPTR, the element displays CNTR.

NOTE

CMPTR appears by the Station Control block control mode select key (LCL or CMPTR). CNTR appears in the lower right corner of the activated station display element when you set that element to Remote computer control.

You can only use the CAS (Cascade operating mode) key when the station is a Cascade type (Set during configuration). With the station in AUTO operating mode, press CAS. The station changes from AUTO to CAS mode.

NOTE

If the current mode of the cascade station is not Cascade, press the CAS key to change it to Cascade.

You can only use the RATIO (Ratio operating mode) key when the station is a Ratio type (Set during configuration). With the station in AUTO operating mode, press RATIO. The station changes from AUTO to RATIO mode.

NOTE

If the current mode of the ratio station is not Ratio, press the RATIO key to change it to Ratio.

The SP Ramp keys (raise ↑ and lower ↓ with the word SET between them) let you increase and decrease the station setpoint by a percent of the total station SP span (Section III). When the station is in CAS or RATIO operating mode, the SP Ramp keys are non-functional.

NOTE

A Ratio station (Set during OIU configuration), in Ratio mode changes the Ratio Index (RI), rather than the setpoint.

The CO Ramp keys (← lower and raise → with the word OUT between them) let you increase and decrease the station control output by a percent of the total station CO span (Section III). The CO Ramp keys are only functional when the station is in the MANUAL operating mode and control output is not tracking (COTK does not appear as the mode indicator).

NOTE

When the System puts a station into Manual Interlock (MNLK) or Control Output Tracking Lockout (COTK), the CO Ramp and Operating mode select keys become non-functional. However, the SP Ramp and mode select keys stay functional.

To change the SP or CO (or RI) to some specific value directly, use the SET (SP) or OUT (CO) key. Using the SET key on a ratio station (in Ratio mode) changes the Ratio Index, rather than the Setpoint.

When changing the SP (or RI) and CO, activate the station element. Then press the SET (or OUT) key. Enter the new value using the Numeric keys and press ENTER. The SP (or RI) and CO then adjust to the new value.

NOTE

The SET and OUT keys only function if the station is in LCL control mode.

TABLE 12.2 — Station (Module) Operating Modes

MODE	EXPLANATION	TO ACCESS
MAN	Modify CO directly from keyboard (MAN LED by MAN/AUTO key stays on)	PRESS: LCL/CMPTR (if station not in Local) PRESS: MAN/AUTO
AUTO	CO = S3	PRESS: LCL/CMPTR (if station not in Local) PRESS: MAN/AUTO (if station in manual)
	AUTO LED near the MAN/AUTO selection key stays on; CAS and RATIO LEDs above their keys stay off	PRESS: MAN/AUTO twice (if station in CAS or RATIO - once to return to MANUAL and once to return to AUTO)
		PRESS: ratio or CAS (to leave either mode and return to AUTO
CASCADE	CO = S3	PRESS: LCL/CMPTR (if station not in Local) PRESS: CAS
	CAS LED and AUTO LED stay on simultaneously	Pressing CAS again transfer back to AUTO
RATIO	CO = 53, SP = S2 x RI	PRESS: LCL/CMPTR (if station not in
	Multiplication factor is the Ratio Index (RI)	
	RATIO LED and AUTO LED stay on simultaneously	Pressing CAS again transfer back to
COTK	CO tracks and automatically adjusts to Digital Control Station (PCU Module) control output signal	System locks station in MANUAL mode (You cannot change the operating mode)
	(CO tracking bypasses the station analog control output)	
MNLK	SP is tracking from PCU Module DCS (depends on configuration)	System locks operating mode in MANUAL

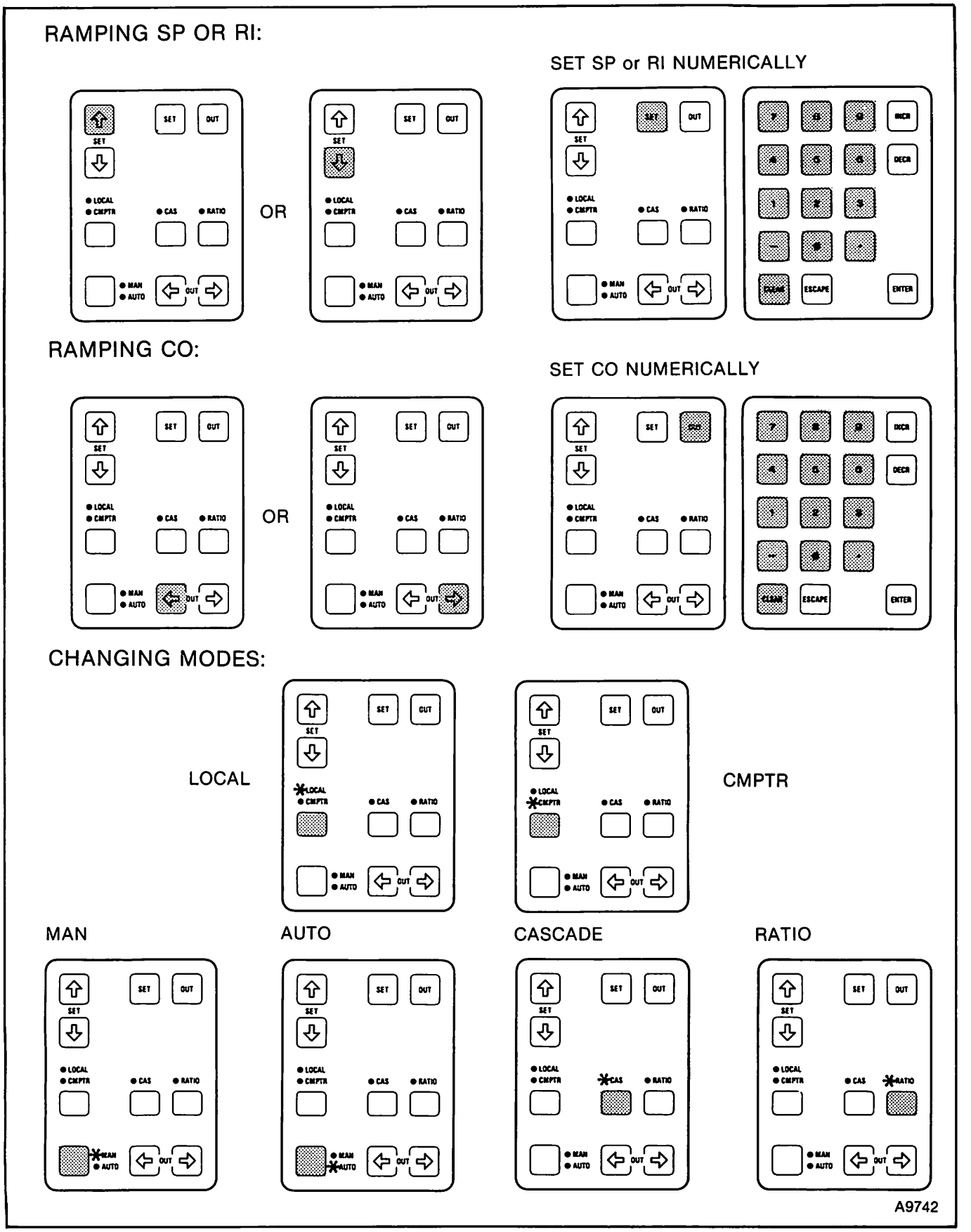


FIGURE 12.1 — Controlling Station Elements

NOTE

After accessing control of a process, you can select the station operating mode of its PCU module from the keyboard. The operating mode determines the derivation of control output.

REMOTE CONTROL ELEMENT. To activate a controllable Remote Control element, position the cursor to that element. Use the Remote Control block keys to change the position (logic state) of that element switch.

The mnemonic, status and/or feedback indicators of the element show its current switch position (logic state). To change the element state, press the Remote Control key (■ or □) that is opposite to the indicator appearing in the display element.

For example, a Remote Control element displays the (□) indicator. This indicates its tag is in logic state 0 (its switch is OFF). Pressing the ■ key changes its state to 1 (switch is ON) and its status indicator changes to ■. If this element also has a configured feedback indicator, that indicator changes from (◁) to (◀). The element mnemonic also changes to its opposite state. (In this case, from OFF to ON.)

The non set permissive (NP) indicator can appear inside the element to the right of a status indicator. If NP appears, you cannot change the element state until the NP disappears. For example, NP appears to the right of (■) (switch ON) while the element state is currently (□) (switch OFF). You cannot change the element state to (■) until the NP disappears. The ■ key becomes non-functional while the NP displays. (The reverse is also true. If the NP appears to the right of the □ indicator, then the □ key becomes non-functional and the element must stay in the ■ state until the NP disappears.)

NOTE

The set permissive indicator (a blank display) exists in a Remote Control element until NP appears. As long as NP does not appear you can freely change the element state.

If the override indicator (OVR) appears at the bottom of an element, system logic forces that element state to ■ or □ (depending on configuration). You cannot change the element state until OVR disappears.

NOTE

OVR and NP can appear on an element simultaneously. The set permissive (blank) indicator appears when the permissive signal is in logic state 1 while the point is in logic state 0. The non set permissive (NP) indicator appears when the signal and point are both in logic state 0. Neither indicator displays if the point is in logic state 1. The override (OVR) indicator appears when set, reset, and permissive signals are all in logic state 1 (the override state).

Device Driver. To control a Device Driver, activate that element (position the cursor to that element). Use the Remote Control block keys to change that element logic state (switch position, device state, etc.) from 0 to 1, like a Remote Control element. Use the MAN/AUTO mode select key of the Station Control block to change the element operating mode.

Remote Manual Set Constant. There are two ways to control a Set Constant element: entering a specific set value or ramping the set value. To control a Set Constant element, first activate it.

To enter a specific set value, press SET. Now using the Numeric keys, enter any real (analog) value desired within the configured range shown on the element. Press ENTER after keying in the new value. If you enter a value not within the range shown, an error message appears on the screen below the element. Press CLEAR to erase the invalid entry. Then enter a corrected value and press ENTER again.

To ramp the set value, use one of the SP ramp keys (↑ SET ↓). Press (and hold down) either key until the desired value appears inside the Set Constant element. Then release the key.

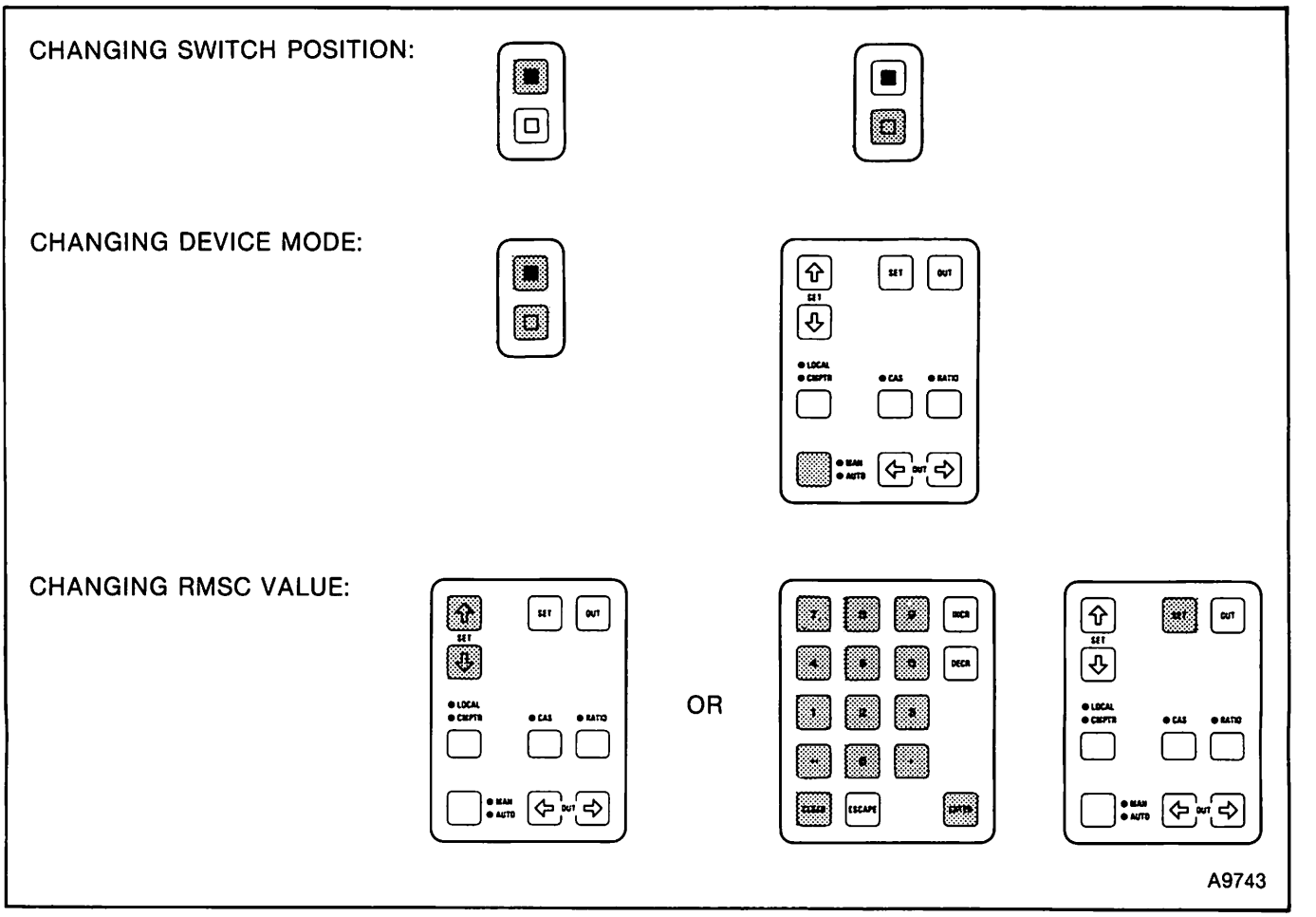


FIGURE 12.2 — Controlling Remote Elements

TRENDING (CONTROLLING A TREND ELEMENT). Set Trend element time interval length during OIU configuration. You can change the interval during operation any time you activate a Trend element from a Group Display page. You can expand the time interval for an overall view of tag history or you can narrow the interval to view a smaller portion. (The shorter the time segment shown, the greater the detail.)

A Trend element grid shows the tag history as a continuous line of plotted values over time while its tag block shows tag value corresponding to that of its trend line on the grid. Tag values record (for display in the element) about once every minute. The OIU discards previously recorded tag values on the Trend grid to make room for fresh information when recording capacity is full.

Activating the Trend Element. To activate the Trend element of any tag (configured for trend data display), access the Group Display page. If the Trend element is on the top half of the page, press any key in the top row of the Cursor Control block element display group. If the Trend element is on the bottom half of the page, press any key in the bottom row of the element display group.

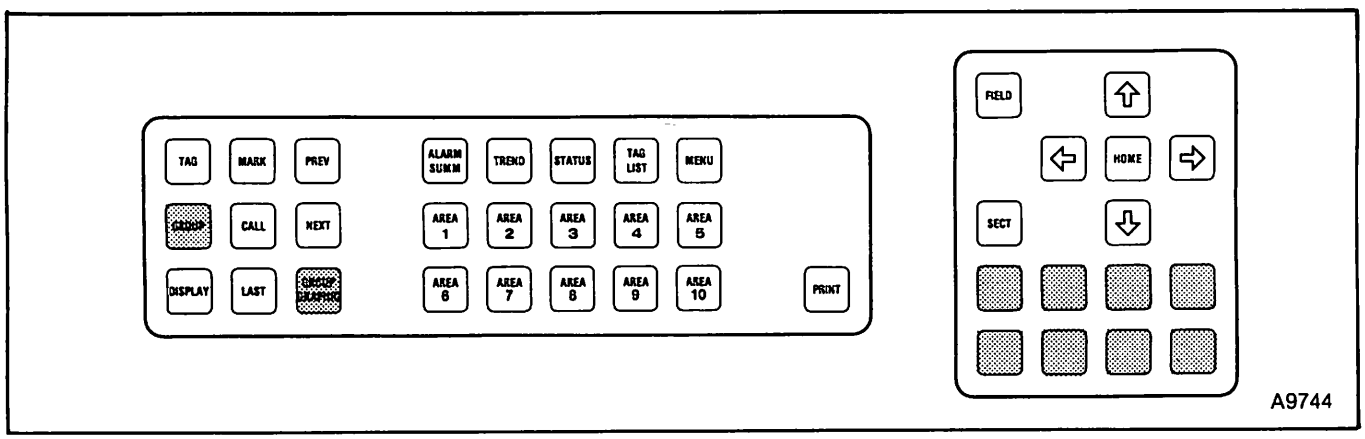


FIGURE 12.3 — Activating Trend Display Element

Changing the Time Interval. You can change the Time interval (recording period) to a maximum of 26 hours or to a minimum of 30 minutes. When you activate the Trend element, the ZOOM UP and ZOOM DOWN arrow keys let you change the Time interval. To increase the Time interval, press the ZOOM UP key. The Time interval changes to the next higher recording period (for example, from two to eight hours). To decrease the Time interval, press the ZOOM DOWN key. The interval changes to the next lower recording time (for example, from eight to two hours).

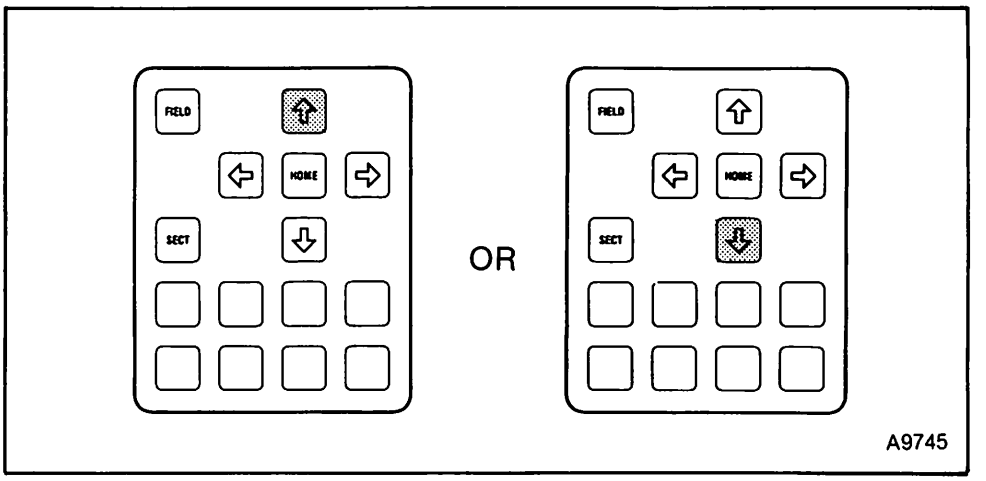


FIGURE 12.4 — Changing The Time Interval

Scrolling the Time Interval. There are two methods for scrolling through the Trend grid (moving its Time cursor backward and forward in time):

- use the INCR and DECR keys (Numeric block). This method shows changing analog values inside the Trend element Tag blocks.
- use the PAGE LEFT and PAGE RIGHT arrow keys (Cursor Control block) This method shows the trend line data during different time intervals.

Using the INCR/DECR keys lets you page anywhere through the Trend grid, depending on the pressure you apply when you press on either key. Pressing the DECR key scrolls backward along the grid; the INCR key scrolls forward. The Time cursor can move forward up to Current time (as on the upper right of the display page). The cursor can move backward no further than the present limit of the time interval. (For example, if the interval limit is eight hours, then the cursor cannot go beyond eight hours previous to the current time.)

Remember, light pressure on either key moves the Time cursor 2% of the span along the grid. Heavy pressure moves the cursor 20% of its span. Continuous light pressure moves the cursor at a constant 2% while continuous heavy pressure moves the cursor at a constant 20% of it span until you release the key or the cursor reaches its backward or forward movement limit.

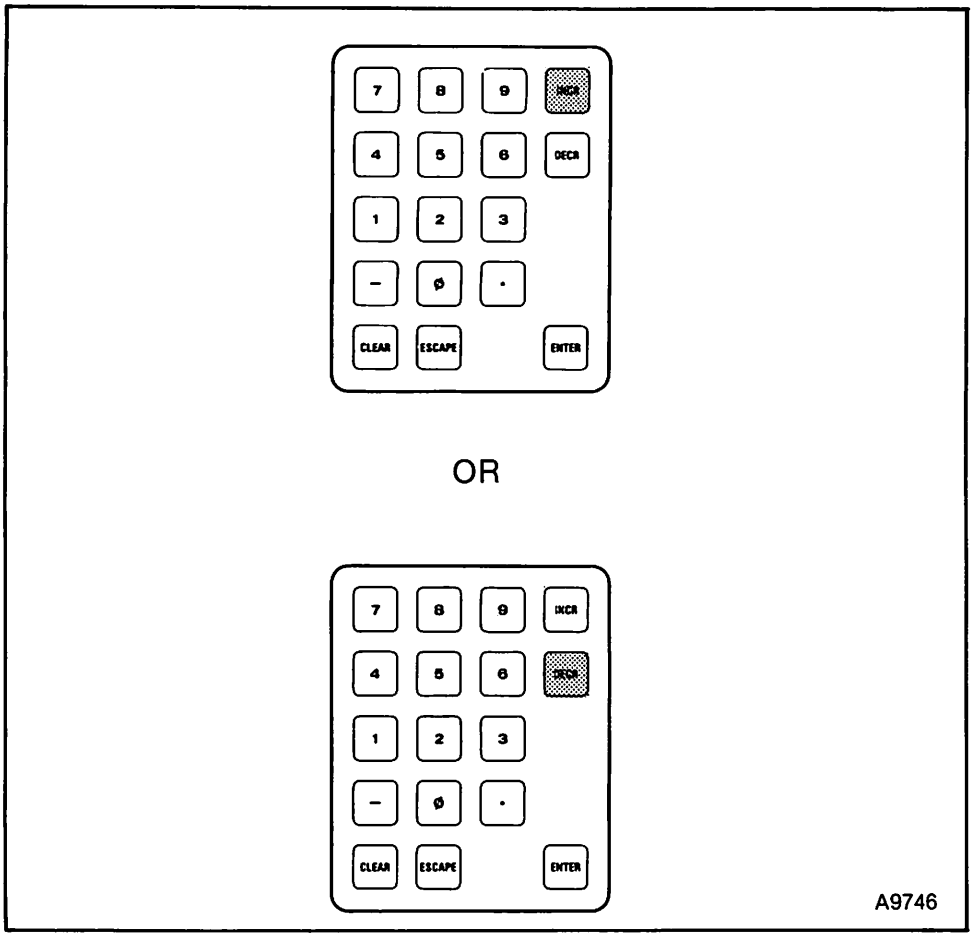


FIGURE 12.5 — Using INCR/DECR To Scroll The Time Interval

Using the left and right arrow keys moves the Time cursor backward and forward by one half of the current recording period rounded up to the nearest hour boundary. The backward movement limit is 26 hours prior to current time. The forward movement limit is current time (as on the Title line of the page). Note that you can only use the PAGE LEFT and PAGE RIGHT arrow keys when the current time interval is either **two** or **eight** hours.

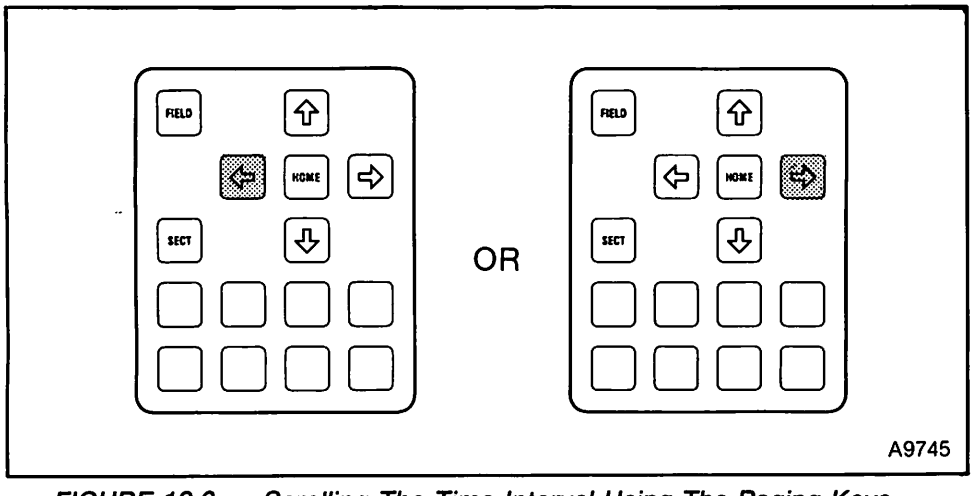


FIGURE 12.6 — Scrolling The Time Interval Using The Paging Keys

The INCR/DECR keys let you move the Time cursor along the Trend grid to any point desired. The Paging keys let you quickly move the Time cursor halfway along the grid when scrolling two and eight-hour interval grids. In either case, the trend line value at the Time cursor position displays inside the Tag block. The time indicator displays under the Tag block to show the time equivalent of the cursor position along the Trend grid. When the cursor returns to the current position (the bottom right of the grid), the time indicator becomes blank.

TABLE 12.3 — Trend Element Recording Data

TIME INTERVAL	SAMPLE TIMES	NO. SAMPLES STORED
30 minutes	15 seconds	120 (in module)
2 hours	1 minute	1560
8 hours	1 minute	1560
26 hours	1 minute	1560

NOTE

The engineer sets recording periods during OIU configuration.

Control From a Graphic Display

To take control action from a Graphic page, a controllable value item must have a control select number (set during configuration). If there are no control select numbers for items on a Graphic page, you cannot take any control action from that page.

CONTROL SELECT. A two-digit control select number appears to the left of each value or switch mnemonic/status indicator to identify items you can control from the Graphic page. Enter the item control select number using the Numeric keys. As you key in the selection your entry appears at the lower right of the screen under the message **CONTROL SELECT:**. If some other message appears above your entry, press ESC to stop entering a wrong item. Then re-enter the correct selection number. When you finish keying in the select number press ENTER.

CONTROL BOX. After you press ENTER the Control Box for the tag value appears in the lower right corner of the Graphic page. This Control Box is similar to a Station, Remote Control, Device Driver, or Remote Manual Set Constant element of a standard Group Display page. To take control of the element appearing in the Control Box, follow the procedure for that element described under Control From a Group Display.

To leave the Control Box or to scroll or to access another display, follow the appropriate procedure described in Section XI.

Control From a Tuning Display
You can access a Tuning Display for any activated non-trend Group display element by pressing the TREND key. You access a Tuning Display for the tag you select for control from a Graphic page in the same way. Controlling from a Tuning Display (or tuning) actually concerns changing the tunable parameters of the Block Details element of that display (See Tuning Display Cursor Control in Section XI).

BLOCK DETAILS. You can access a Block Details display for any activated non-trend element of a Group or Graphic page by pressing the DISPLAY key on the keyboard.

> **CAUTION**
>
> Do not perform any tuning yourself. The Process engineer makes any necessary tuning changes for any activated display element. (The TUNE keyswitch must be unlocked to perform any tuning.) **Never attempt to tune any parameters yourself.**

SUPPRESS TAGS

This function lets you suppress alarm indication for certain previously defined tags (Section VI). For example, you may want to suppress secondary, or non-critical alarms from appearing in certain alarm levels on the Alarm Summary Display, for example. Access the General Function Menu and press **H**. The Suppress Tags Display appears under the menu:

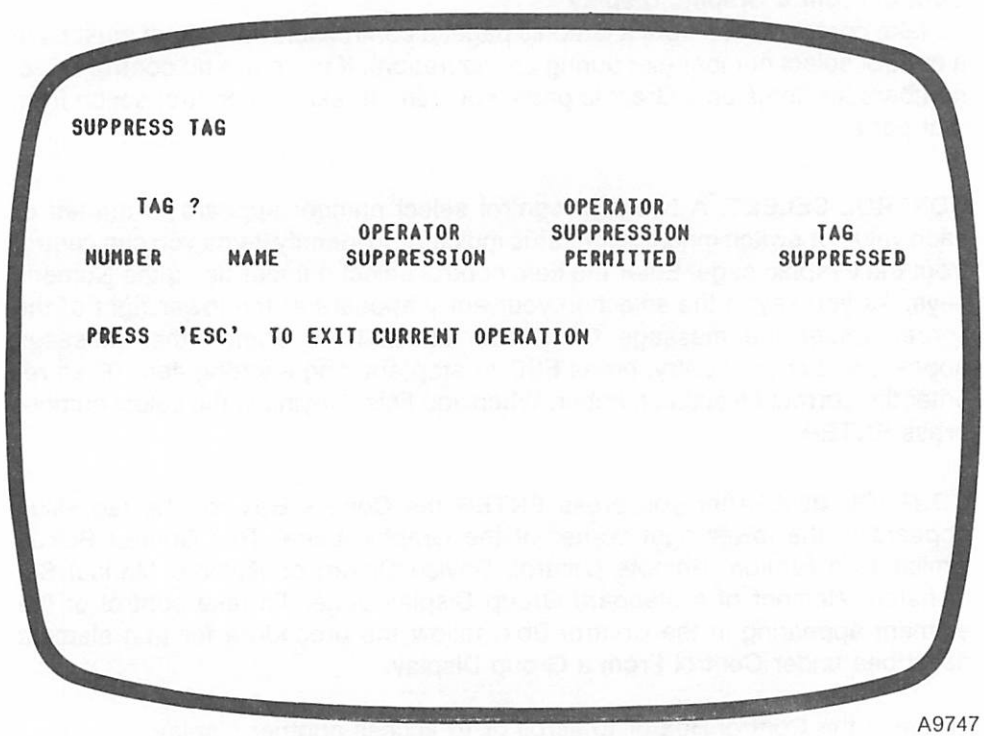


FIGURE 12.7 — Suppress Tags Display

This display (in cyan) consists of the headings:

SUPPRESS TAG

TAG

and a single line showing the prompts:

NUMBER	NAME	OPERATOR SUPPRESSION	OPERATOR SUPPRESSION PERMITTED	TAG SUPPRESSION
(####)	(AAAAAAAA)	(YES/NO)	(YES/NO)	(YES/NO)

as well as the message: PRESS 'ESC' TO EXIT CURRENT OPERATION at the bottom of the display.

The cursor is at the first (left) input field (NUMBER). The tag number and name prompts are the input fields that let you access any previously defined tag for alarm suppression.

The next two prompts to the right (OPERATOR SUPPRESSION and OPERATOR SUPPRESSION PERMITTED) are the actual alarm suppression fields.

The field on the extreme right shows the alarm suppression state for the currently accessed tag on this display (YES = tag alarm indicators suppressed; NO = tag alarm indicators NOT suppressed). The OIU automatically sets this field during tag configuration (Section VI). When you suppress any tag on this display the OIU updates this field automatically; you do not change it.

There are three ways to access any tag on this display, depending on which access item you want to use.

First, enter the number (1 - 5000) of the desired tag in the NUMBER prompt. Press ENTER. The OIU fills in the tag name corresponding to the number you entered (from the Tag List). Then the cursor moves to the first tag suppression prompt (OPERATOR SUPPRESSION).

Or press FIELD and enter the tag name (up to 8 alphanumeric characters) in the NAME prompt. Press ENTER. The OIU fills in the number corresponding to the tag name you entered. Then the cursor moves to the OPERATOR SUPPRESSION prompt.

Finally, if desired, enter the tag number in the NUMBER prompt and press FIELD. Now enter the corresponding tag name in the NAME prompt and press ENTER. The cursor moves to the OPERATOR SUPPRESSION prompt.

NOTE

If you enter a tag number out of range or if you enter an incorrect or undefined tag name, the OIU displays the appropriate error message. Consult your tag list and enter the corrections. Then press ENTER to resume the operation.

NOTE

If you enter neither tag item in the prompts, the cursor moves to the NUMBER prompt (if not already there) and nothing happens. To access a tag for alarm suppression, you must enter one of its access items as above.

The OIU automatically fills the two tag suppression prompts after tag access with YES or NO depending on tag configuration (Section VI). Look at the OPERATOR SUPPRESSION PERMITTED field. If YES appears there, it means the engineer configured that tag so you can suppress its alarm indication as desired. If NO appears there, it means either:

- the engineer configured that tag to prevent you from suppressing its alarm indication, or
- its suppression was removed during a previous suppression operation.

If this prompt displays YES, enter YES in the OPERATOR SUPPRESSION prompt. Press ENTER. You are now done suppressing alarm indication for this tag. The OIU now changes the TAG SUPPRESSION field from NO to YES. (If you access the appropriate page of the Tag List Display for this tag, notice that its ALARM SUPPRESSION and OPERATOR SUPPRESSION fields also display YES.

If you want to suppress more tags, move the cursor back to one the tag access prompts and access the next tag to suppress. Then proceed as above. If done suppressing tags, return to the General Function Menu.

If the OPERATOR SUPPRESSION PERMITTED prompt for the currently accessed tag displays NO, move the cursor to it and enter YES.

One of two possible results can occur:

If the engineer configured this tag so you can not suppress its alarms (the OPERATOR SUPPRESSION field on the Tag List contains NO), the OIU automatically replaces your YES entry with NO after you press ENTER. The OIU then displays this error message (in yellow) at the bottom of the CRT:

OPERATOR SUPPRESSION NOT PERMITTED

If this occurs, you cannot suppress alarm indication for this tag. The TAG SUPPRESSION field stays at NO. Access another tag or press ESCAPE to return to the General Function Menu.

If alarm suppression for this tag was removed during a previous suppression operation, the OIU accepts your YES entry after you press ENTER and no error message appears. In this case, move the cursor to the OPERATOR SUPPRESSION prompt and enter YES. Now press ENTER. The TAG SUPPRESSION field changes to YES. You are now done suppressing alarm indication for this tag.

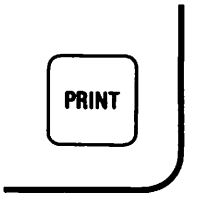
Access another tag or return to the General Function Menu.

To remove alarm suppression for any previously defined tag, access the desired tag as above. Enter NO in the OPERATOR SUPPRESSION prompt for that tag. The OIU changes the OPERATOR SUPPRESSION PERMITTED and TAG SUPPRESSION fields to NO. You can now access another tag or return to the General Function Menu.

To return to the General Function Menu, press ESCAPE at any point during the suppression operation. Any tag for which you did not press ENTER after entering a change reverts to its previous suppression state (suppressed or not suppressed).

HARD COPY PRINTOUT

If your OIU has a line printer connected and the engineer so configured it (Section VI), you can make a hard copy printout of data currently on the CRT. Press the PRINT key (Display Control block). The line printer immediately advances its paper to the top of the next page and begins its hardcopy, reproducing the current CRT display on paper. You cannot access another display page nor take any other control action until the printer completes its hardcopy.



NOTE

You may see several white marks flashing across the CRT just before the printout starts. The system is scanning the information to print, line by line.

Color Option

If you have a color printer connected and the engineer so configured it (Section VI), you can make a color hard copy of current CRT screen data. To differentiate between the color coded trends on a black and white printout, plot characters of any trend or graphic print out using unique plot patterns based on colors. Figure 12.8 shows the color plot patterns.

NOTE

On some OIU setups having more than one printer the engineer can dedicate one printer to make only event logs, while setting the other printer for other hardcopy printouts. (See Sections IX, X, and XIII.)

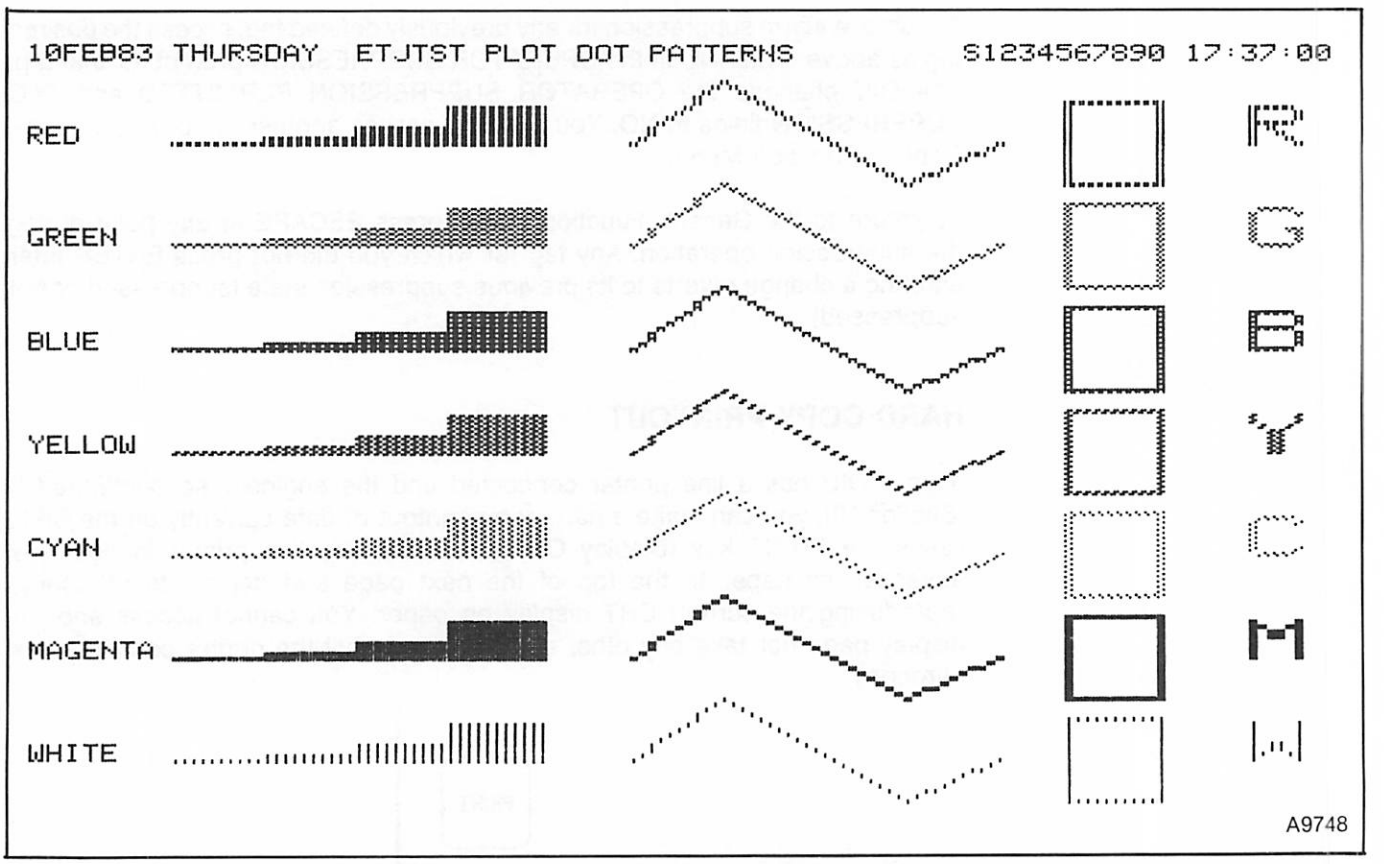


FIGURE 12.8 — Color Plot Patterns For Color Hardcopy

SECTION XIII
RECORDING PROCESS DATA

INTRODUCTION

Section XII explained how to use the keyboard to control various processes from certain operation displays. This chapter explains how to use the keyboard and certain displays to control logging and archiving. Refer also to the OIU Hardware manual, E93-901-2, for a complete discussion on floppy disks (diskettes) used in archiving operations.

Logging

To control logging on the OIU, access the various Log Status displays from the General Function Menu and implement either a DEMAND or a CANCEL from each (Section IX). Enter choice **G** (Log Status Display) from the General Function Menu.

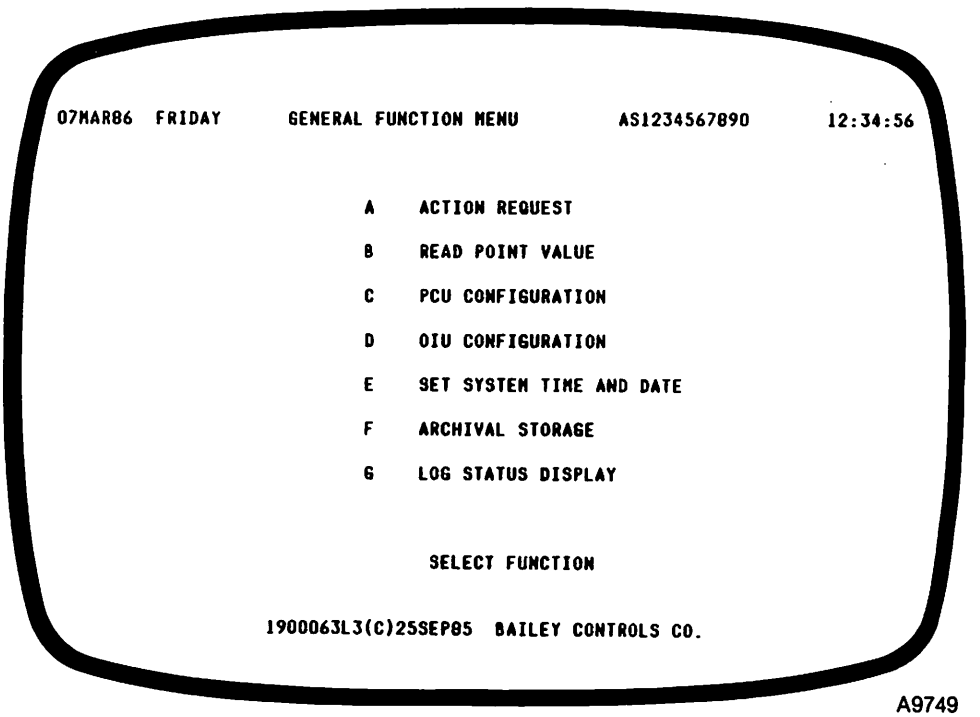


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FIGURE 13.1 — General Function Menu

NOTE

If your OIU does not have a logging package installed, you can only produce an Event Log (printout of dynamic alarms).

If your OIU has more than one printer, you can dedicate one printer to producing only Event Logs while the additional printer produces all other hardcopies. (Enter choice I on the OIU Configuration Menu to access Define Peripheral Parameters and then enter **YES** to the second printer option.) Otherwise, with only one printer, the Event Log prints out only when any other currently printing hardcopy is complete. On an OIU with only one printer all other hardcopies have precedence over an Event Log.

If your OIU does have the logging package, it can produce the other logs, as well as an Event Log. Remember, the engineer can turn a log on or off (including SOE Reports) during configuration (Section IX). During configuration he can set the logs to print at scheduled times (or not at all). Here we examine the procedures for canceling or printing the following logs **on demand:**

- Trend Log
- Trip Log
- Periodic Log.

NOTE

You can only cancel a log from a Log Status display using CANCEL if you set YES to the: CAN OPERATOR CANCEL LOGS? input field of the Define Logging Parameters display (See Section IX). Otherwise, CANCEL has no effect.

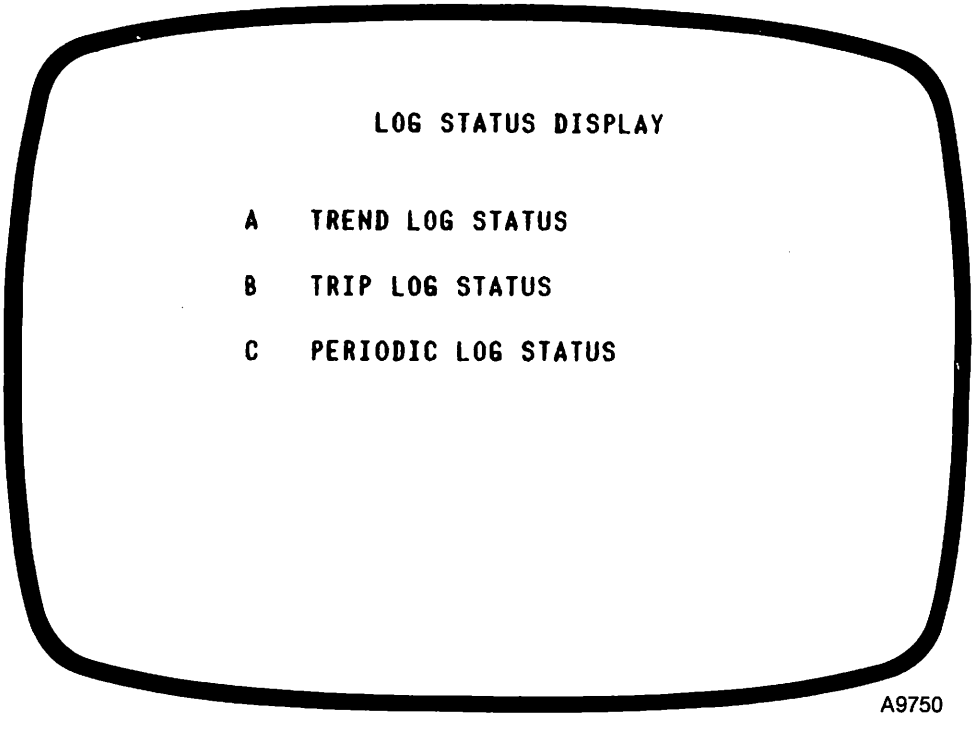

FIGURE 13.2 — Log Status Display Menu

NOTE

The engineer must turn logs ON (Section IX) before you can print them on demand.

USING TREND LOGS. Enter choice **A** from the Log Status Display Menu (TREND LOG STATUS). The first page of the Trend Log Status Display appears on the CRT (Section IX).

TREND LOG STATUS PAGE 1

DEMAND TREND LOG DD CANCEL TREND LOG CC

#	TITLE	ON OFF	COLLECTION PERIOD	NEXT PRINT SCHED	WAITING TO PRINT
1	TRENDLOG 5MIN-120CLCT DAYS END	ON	5 MINUTE	00:00 19JUN84 DAYS	NO
2	TRENDLOG 1HOUR 24CLCT DAYS END	ON	1 HOUR	00:00 19JUN84 DAYS	NO
3	TRENDLOG 1DAY-2COLLCT DAYS END	ON	1 DAY	12:00 18JUN84 DAYS	NO
4	TRENDLOG 5MIN-120CCT SHIFT END	ON	5 MINUTE	12:00 18JUN84 SHIFT	NO
5	TRENDLOG 1HOUR 24CLCT SHIFT END	ON	1 HOUR	12:00 18JUN84 SHIFT	NO
6	TRENDLOG 1DAY 2CLLCT SHIFT END	ON	1 DAY	23:00 17JUN84 SHIFT	NO
7	TRENDLOG 5MIN-120CLLCT COMPLETE	ON	5 MINUTE	13:07 18JUN84 CMPLT	NO
8	TRENDLOG 1HOUR-24CLCT COMPLETE	ON	1 HOUR	16:02 18JUN84 CMPLT	NO
9	TRENDLOG 1DAY-2 COLLCT COMPLETE	ON	1 DAY	15:02 20JUN84 CMPLT	NO
10	TRENDLOG 5MIN-120CLCT NOT SCHED	ON	5 MINUTE	NOT SCHEDULED	NO
11	TRENDLOG 1HOUR-24CLCT NOT SCHED	ON	1 HOUR	NOT SCHEDULED	NO
12	TRENDLOG 1DAY-2COLCT NOT SCHED	ON	1 DAY	NOT SCHEDULED	NO
13					
14					
15					
16					
17					
18					
19					

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FIGURE 13.3 — Typical Trend Log Status Display

Use the SECT key to move the cursor to the DD (DEMAND) or CC (CANCEL) input field on this display. Enter the number (1 - 50) of the Trend Log you want to demand or cancel. For example, enter the number **10** in the DD (demand) input field and press ENTER. Trend Log number 10 then prints out on your

printer (if that log has any collected samples). To cancel its print, move the cursor to the CC (cancel) input field using the SECT key and enter **10**. Then press ENTER. The log ceases to print.

> **NOTE**
>
> CANCEL does not affect any scheduled print of that log; only the immediate printing from a DEMAND. If the engineer set that log during configuration for some future printing, that printing occurs as scheduled.

You repeat the process above for as many Trend Logs as you want to print on demand. You can only demand one log at a time, however. The currently printing log must complete its printout before another demanded log can print.

Use the PREV and NEXT keys to scroll through the Trend Log Status Display pages. To change the status of any log shown, the engineer must access Trend Log configuration (Section IX).

> **CAUTION**
>
> Logging configuration is under keylock protection. Do not attempt to change any logging configuration. Your system engineer performs all configuration.

To return to the Log Status Display Menu, press ESCAPE. Press ESCAPE again or enter **M** and press ENTER to return to the OIU Configuration Menu. Press MENU to return to the General Function Menu.

USING TRIP LOGS. Enter choice **B** from the Log Status Display Menu (TRIP LOG STATUS). The first page of the Trip Log Status Display appears on the CRT (Section IX).

TRIP LOG STATUS PAGE 1

DEMAND TRIP LOG DD CANCEL TRIP LOG CC

#	TITLE	TRIP?	TRIPTAG	DATA COLLECTN COMPLETN TIME	SCHED PRINT?	WAITING TO PRINT
1	TRIPLOG YES 120-0 1MIN TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	YES	NO
2	TRIPLOG YES 0-120 1MIN TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	YES	NO
3	TRIPLOG YES 120-0 15SEC TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	YES	NO
4	TRIPLOG YES 60-60 1MIN TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	YES	NO
5	TRIPLOG YES 60-60 15SEC TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	NO	NO
6	TRIPLOG NO 60-60 15SEC TRIPRCM	NO	TRIP RCM	NOT SCHEDULED	NO	NO
7	TRIPLOG NO 60-60 1MIN TRIPRCM	YES	TRIP RCM	09:47 18JUN84	NO	NO
8						

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FIGURE 13.4 — Trip Log Status Display

Use the SECT key to move the cursor to the demand and cancel input fields on this display (similar to that of the Trend Log Status Display). Enter the number (1 - 50) of the Trip Log you want to demand or cancel. For example, enter the number **5** in the DD (Demand) field and press ENTER. Trip Log number 5 then prints out on your printer if it was tripped (has data). If that log is currently collecting data for a trip, it prints when the collection is complete. If that log is tripped and its data collection is complete, it prints out its last trip data until a new trip event occurs.

To cancel the printing of the log, enter its number in the CANCEL field and press ENTER. This stops the printing of that log if it is currently printing or waiting to print. Cancel does not stop any future scheduled printing of that log.

Repeat the process above for as many Trip Logs as you want to print on demand. You can only demand one log at a time (as with the Trend Logs). The currently printing log must complete its printout before another demanded log can print.

Use the PREV and NEXT keys to scroll through the Trip Log Status Display pages. To change the status of any log shown, the engineer must access Trip Log configuration (Section IX).

CAUTION

Logging configuration is under keylock protection. Do not attempt to change any logging configuration. Your system engineer performs all configuration.

To return to the Log Status Display Menu, press ESCAPE. To return to the OIU Configuration Menu, enter **M** and press ENTER or press ESCAPE again. To go to the General Function Menu, press MENU.

USING PERIODIC LOGS. Enter choice **C** from the Log Status Display Menu (PERIODIC LOG STATUS). The first page of the Periodic Log Status Display appears on the CRT.

Use the SECT key to move the cursor to the DEMAND or CANCEL input fields of this display. Enter the number (1 - 30) of the Periodic Log you want to demand or cancel. For example, enter the number **15** and press ENTER. Periodic Log number 15 then prints out on your printer. To cancel this printing, enter **15** in the CANCEL input field and press ENTER. The log ceases to print. Remember, the cancel function only stops the printing of a demanded log, not a log with a future scheduled printing.

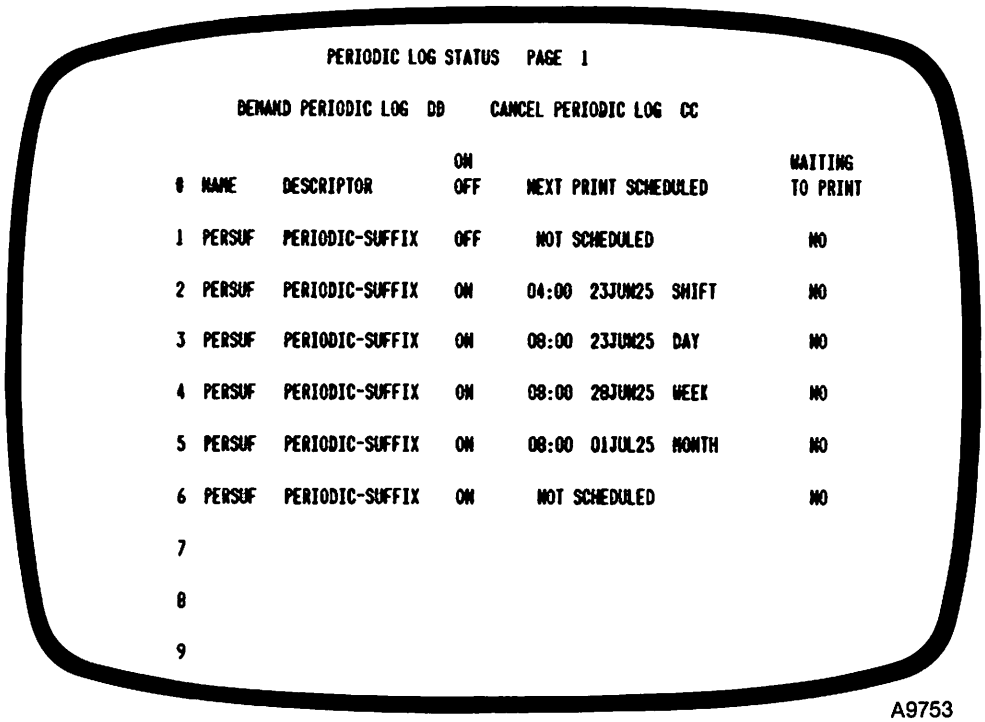

FIGURE 13.5 — Periodic Log Status Display

Repeat the process above for as many Periodic Logs as you want to print on demand. You can only demand one log at a time. A currently printing log must complete its printout before another demanded log can print.

Use the PREV and NEXT keys to scroll through the Periodic Log Status Display pages. To change the status of any Periodic Log, the engineer must access Periodic Log configuration (Section IX).

CAUTION

Logging configuration is under keylock protection. Do not attempt to change any logging configuration. Your system engineer performs all configuration.

To return to the Log Status Display Menu, press ESCAPE. Press ESCAPE again or enter **M** and press ENTER to return to the OIU Configuration Menu. To go to the General Function Menu, press MENU.

Archiving

To control archiving on the OIU, access the Archival Storage Menu choices from the General Function Menu using floppy disks (diskettes) in the OIU diskette drive and implement the various archiving procedures below. Enter choice **F** (Archival Storage) from the General Function Menu (Figure 13.1).

NOTE

For archiving to occur, however, your OIU must have the archiving package installed. The engineer must also define Archival Storage as part of archiving configuration (Section X).

CAUTION

Archiving configuration is under keylock protection. Do not attempt to change any archiving configuration. Your system engineer performs all configuration.

If your OIU does not have the archiving package installed, the error message: ARCHIVING PACKAGE NOT INSTALLED appears on the CRT when you enter choice **F** from the General Function Menu. Here we examine the procedures for the following archiving tasks:

- Storing trend data
- Retrieving trend data for display
- Displaying trend data on the CRT
- Displaying the trend diskette directory
- Printing trend data
- Printing the trend diskette directory
- Storing event data*
- Displaying event data.

*Event data includes all data occurring on an Event Log (See Section IX).

NOTE

The engineer can turn trend and event archiving on and off from the Archival Storage Definition Display (Section X). If he turns either function off, you cannot perform its operations as explained below.

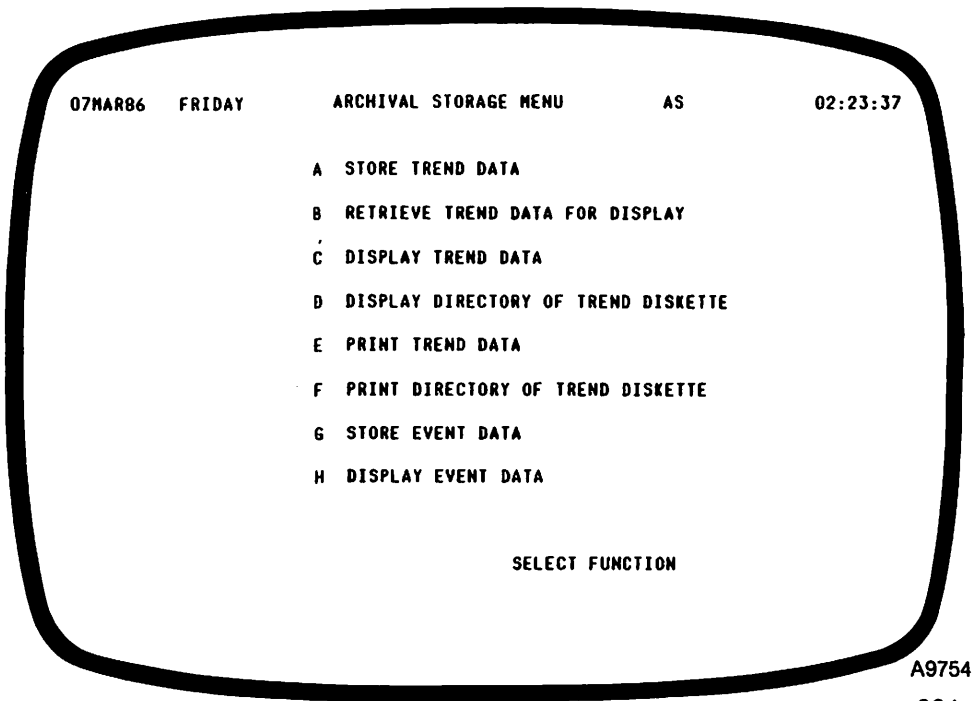

FIGURE 13.6 — Archival Storage Menu

STORE TREND DATA. Enter choice **A** from the Archival Storage Menu (STORE TREND DATA). The Store Trend Data Display appears on the CRT with the cursor at the DISKETTE VOLUME NAME input field.

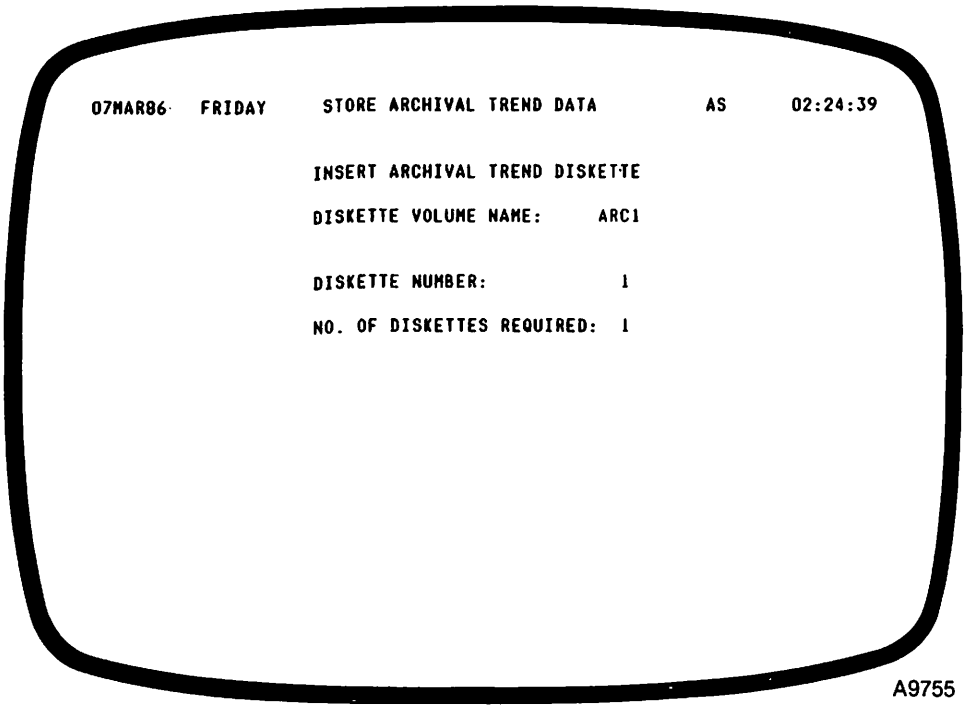

FIGURE 13.7 — Store Trend Data Display

The display shows two diskette messages below the DISKETTE VOLUME NAME input field:

DISKETTE NUMBER:

NO. OF DISKETTES REQUIRED:

The OIU automatically displays the number of diskettes necessary to store the current entire set (volume) of trends and the number of the currently requested diskette.

NOTE

This information is part of archival storage configuration (Section X). You do not enter anything into either field during archiving operations.

Insert the diskette (or the first of several) onto which you want to store trend data into the OIU diskette drive. (See the OIU Hardware Manual for an explanation of how to insert diskettes into the Diskette drives of the various OIU versions, NOIU01 and NOIU02.)

Enter the Diskette volume name (four alphanumeric characters) in the name input field and press ENTER. The OIU now verifies that the volume name of the Diskette in its Diskette Drive matches the volume name you enter on the display.

If the names do not match, the following prompt message appears:

DISKETTE NAME DOES NOT MATCH
PRESS 'ENTER' TO INITIALIZE DISKETTE
PRESS 'ESCAPE' TO ABORT

If you must initialize the diskette, press ENTER and the OIU performs the initializing task (see below). If you decide to do some other task or replace the diskette currently in the OIU diskette drive with another diskette, press ESCAPE.

If the diskette names match during OIU verification, the prompt messages do not appear. The action request indicator (flashing **A** on the Title line) now stops flashing if this was the only action request waiting for intervention.

When storing archival trend data, the OIU first initializes the diskette in its diskette drive, giving it the name you enter in the display name input field. This operation lasts about two minutes. While initializing occurs the following message appears on the CRT:

INITIALIZING DISKETTE

After initializing is complete, the initializing message disappears. The OIU now transfers the definitions and data of the archival trends to the diskette. This operation lasts about two minutes. While the data transfer continues, the following message appears on the CRT:

TRANSFERRING DATA FOR TREND (volume name)

When the data transfer is complete, the transfer message disappears. You can now remove the current diskette and insert a new one and then enter the volume name for the new diskette.

Also, if there are more diskettes to be used to complete the storage of the current trend volume (depending on the number the OIU displays after the NO. OF DISKETTES REQUIRED: message on the display), the action request indicator starts flashing again.

In this case, remove the diskette currently in the diskette drive and place it in the proper storage area. Insert a new diskette into the diskette drive. Enter a new diskette volume name (same volume name but having the next higher number) in the DISKETTE VOLUME NAME: input field and press ENTER. The OIU now verifies this diskette and transfers data to it as above.

Repeat this process until you complete all storage necessary for the current archival trend volume (the request indicator disappears).

CAUTION

Do not try to perform any other operation or try to access some other display until the storage operation is complete. Otherwise, you can lose part of the data or cause diskette read/write errors.

RETRIEVE TREND DATA. Enter choice **B** from the Archival Storage Menu (RETRIEVE TREND DATA FOR DISPLAY). The Retrieve Archived Trend Data Display appears on the CRT with the cursor on the topmost DISKETTE NAME input field.

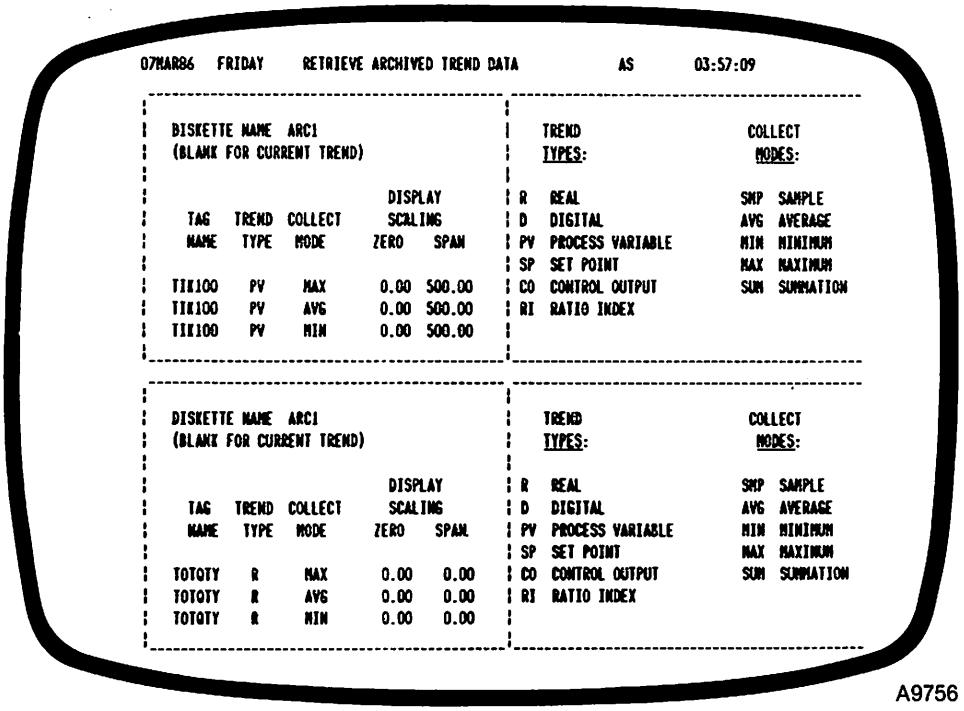

FIGURE 13.8 — Retrieve Archived Trend Data Display

This display shows two large rectangular boxes, one above the other. These are the trend definition boxes. Each trend box is divided into two halves. The left half contains data input fields for up to three different trends. The right half contains trend type and collection mode symbol summaries. Each box also has an input field for a diskette volume name at its top as follows:

DISKETTE NAME (name input)
(BLANK FOR CURRENT TREND)

Below the volume name are three lines each containing five data input fields (one line per trend) for the trends on that volume under the following headings:

TAG NAME	TREND TYPE	COLLECT MODE	DISPLAY SCALING ZERO	SPAN

The format for each input line per trend box is:

AAAAAAAA (tag name)

AA (trend type)

AAA (collect mode)

#.## (zero value - set at 0.00)

###.# (span value - up to 500.0).

In the right half of each trend box are the headings:

TREND TYPES:	COLLECT MODES:

Under these heading are the trend and collection symbols and summaries:

R	REAL	SMP	SAMPLE
D	DIGITAL	AVG	AVERAGE
PV	PROCESS VARIABLE	MIN	MINIMUM
SP	SET POINT	MAX	MAXIMUM
CO	CONTROL OUTPUT	SUM	SUMMATION
RI	RATIO INDEX		

NOTE

When you access this display the OIU may already have values filled into all data input fields from a previous archiving operation.

Enter the diskette volume name. Press FIELD to move the cursor to each of the other input fields and to move it between the lines. Press SECT to move from one trend box to the other. Enter the tag name, trend type, collection mode, zero and span values for each trend.

NOTE

You can also enter one tag name for all three lines with each line having a different collection mode. In this case the three trend types must all be identical.

When you finish defining all archived trends to retrieve, press ENTER. The OIU now searches the archived diskette (currently in the diskette drive) for matches to all the archived trends you enter on this display. If the OIU does not find all trends, the cursor moves to the tag name field of the undefined trend and the message: UNDEFINED TREND appears on the CRT below the trend boxes. In this case, re-enter all data for a different trend and press ENTER again. When the OIU finds a match for the new entry the error message disappears. (You may have to repeat this process a few times.)

When the OIU finds matches for all trends you enter on this display it retrieves the data for each trend from the diskette. (No error message appears.)

DISPLAY TREND DATA. Enter choice **C** from the Archival Storage Menu (DISPLAY TREND DATA). The Archived Trend Display appears on the CRT. This display shows two Group Display page trend elements (complete with trend graphs and tag blocks), one above the other. These elements are the archived trends you entered on the Retrieve Archived Trend Data Display.

NOTE

You cannot take any control actions from this display except to scroll through the trend graph using the arrow keys of the keyboard (Section III, XI, and XII).

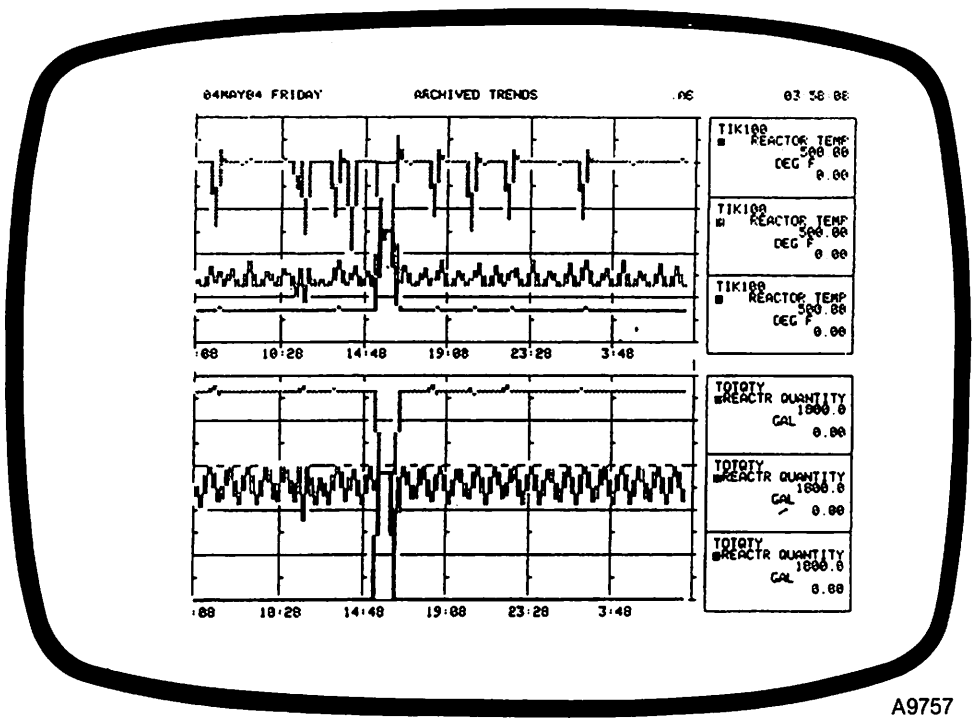

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FIGURE 13.9 — Archived Trend Display

DISPLAY TREND DIRECTORY. Insert an archived diskette into the diskette drive. Enter choice **D** (DISPLAY DIRECTORY OF TREND DISKETTE) from the Archival Storage Menu. The Directory of Archived Trends appears on the CRT.

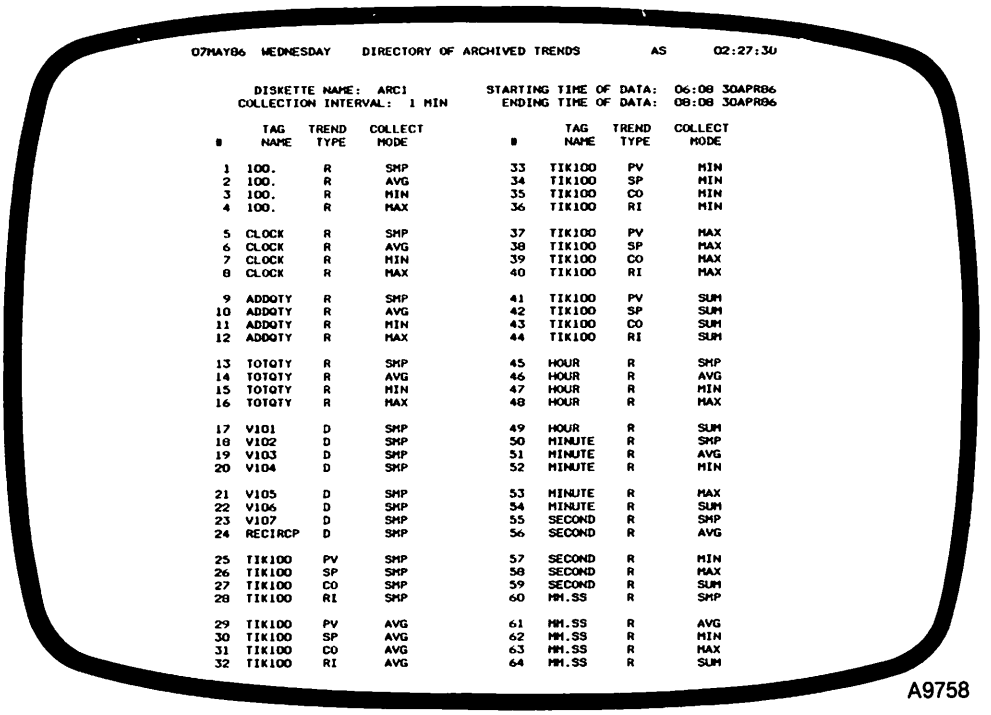


FIGURE 13.10 — Directory Of Archived Trends Display

This display has the following headings:

DISKETTE NAME: (AAAA) STARTING TIME OF DATA: (##:## ddmmyy)

COLLECTION INTERVAL: (## AAA) ENDING TIME OF DATA: (##:## ddmmyy)

#	TAG NAME	TREND TYPE	COLLECT MODE	#	TAG NAME	TREND TYPE	COLLECT MODE

This display lists up to 64 archived trends per volume in 32 lines. Each line shows the following information:

(trend number)

AAAAAAAA (tag name)

AA (trend type)

AAA (collection mode).

Use PREV and NEXT to scroll through the Trend Directory pages.

NOTE

Depending on the collection interval (1 - 8 minutes), the archived diskette can have up to 500 trends. The Trend Directory can have up to eight pages in this case. If the diskette has only 64 trends (collection interval is 1 MIN), the directory has only one page. (See Table 10.1 in Section X for a summary of trends and their collection intervals per diskette.)

PRINT TREND DATA. To retrieve archived trend data from a diskette and then print it, enter choice **E** from the Archival Storage Menu (PRINT TREND DATA). The Print Trend Data Display appears on the CRT with the cursor at the DISKETTE NAME input field.

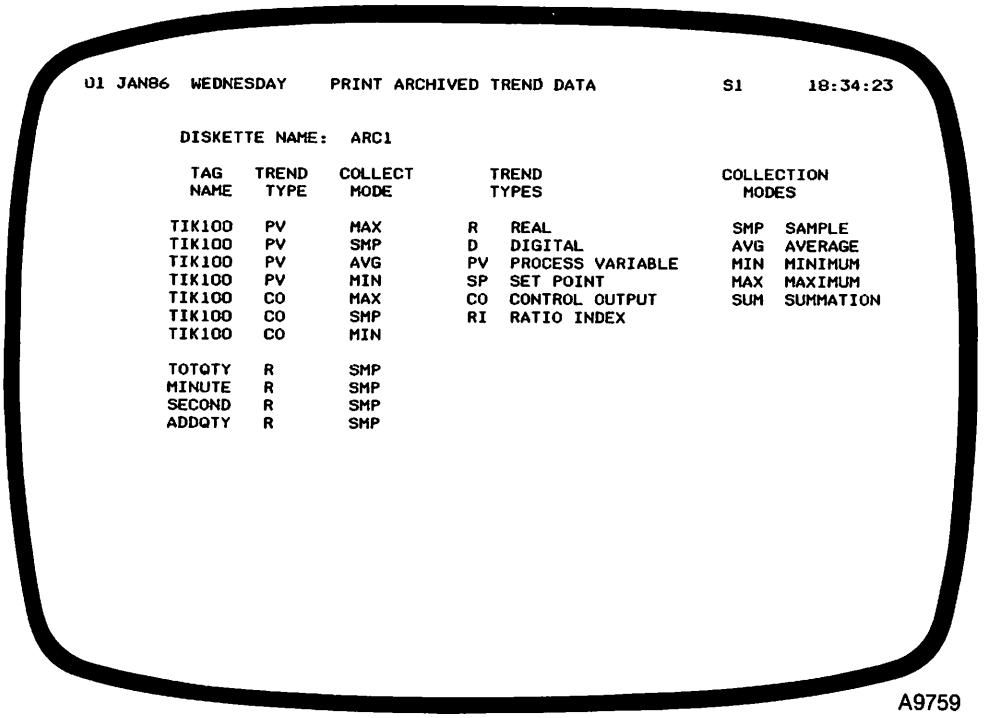


FIGURE 13.11 — Print Trend Data Display

This display has the following headings:

DISKETTE NAME: (AAAA)

TAG NAME	TREND TYPE	COLLECT MODE	TREND TYPES	COLLECTION MODES

A summary of the trend types and collection modes identical to that in a trend definition box of a Retrieve Archived Trend Data Display appear under those headings on the right side of this display.

NOTE

When you access this display the OIU may already have values filled into all the data input fields from a previous archiving operation.

Enter the diskette volume name. You can now enter the tag name, trend type, and collection mode for up to 12 trends using FIELD to move the cursor from field to field on each line and SECT to move between each line.

When you finish defining which archived trends to print, press ENTER. The OIU searches the diskette to find matches for each trend you enter on this display. If the OIU does not find all the trends the cursor moves to the tag name field of the undefined trend and the error message: UNDEFINED TREND appears

on the CRT below the display. In this case, re-enter values for another trend and press ENTER again. When the OIU finds a match for the new trend the trend data prints out and the error message disappears.

If the OIU finds matches on the diskette for all trends you enter, a log of all archived data values for those trends prints out on your printer. The number of data values printing out depends on the data resolution and the number of trends defined on the diskette.

PRINT TREND DIRECTORY. To print the trend directory of an archived diskette, insert the diskette into the diskette drive. Enter choice **F** from the Archival Storage Menu (PRINT DIRECTORY OF TREND DISKETTE). The printer then prints out the diskette trend directory.

This trend directory printout looks almost the same as the trend directory display (choice **C**) except that each page of the printout can list up to 200 trends. The trend data lists in groups of four columns across the page (lines 1 - 50; 51 - 100; 101 - 150; and 151 - 200 from top to bottom). Each printout contains information only for the total number of trends on that diskette volume directory (many columns of the printout are blank).

DISKETTE NAME : ARC1 STARTING TIME OF DATA: 06:08 30APR86
COLLECTION INTERVAL: 1 MIN ENDING TIME OF DATA: 08:00 30APR86

#	TAG NAME	TREND TYPE	COLLECT MODE	#	TAG NAME	TREND TYPE	COLLECT MODE	#	TAG NAME	TREND TYPE	COLLECT MODE	#	TAG NAME	TREND TYPE	COLLECT MODE
1	100	R	SMP	51	MINUTE	R	AVG								
2	100	R	AVG	52	MINUTE	R	MIN								
3	100	R	MIN	53	MINUTE	R	MAX								
4	100	R	MAX	54	MINUTE	R	SUM								
5	CLOCK	R	SMP	55	SECOND	R	SMP								
6	CLOCK	R	AVG	56	SECOND	R	AVG								
7	CLOCK	R	MIN	57	SECOND	R	MIN								
8	CLOCK	R	MAX	58	SECOND	R	MAX								
9	ADDQTY	R	SMP	59	SECOND	R	SUM								
10	ADDQTY	R	AVG	60	MM SS	R	SMP								
11	ADDQTY	R	MIN	61	MM SS	R	AVG								
12	ADDQTY	R	MAX	62	MM SS	R	MIN								
13	TOTQTY	R	SMP	63	MM SS	R	MAX								
14	TOTQTY	R	AVG	64	MM SS	R	SUM								
15	TOTQTY	R	MIN												
16	TOTQTY	R	MAX												
17	V101	D	SMP												
18	V102	D	SMP												
19	V103	D	SMP												
20	V104	D	SMP												
21	V105	D	SMP												
22	V106	D	SMP												
23	V107	D	SMP												
24	RECIRCP	D	SMP												
25	TIK100	PV	SMP												
26	TIK100	SP	SMP												
27	TIK100	CO	SMP												
28	TIK100	RI	SMP												
29	TIK100	PV	AVG												
30	TIK100	SP	AVG												
31	TIK100	CO	AVG												
32	TIK100	RI	AVG												
33	TIK100	PV	MIN												
34	TIK100	SP	MIN												
35	TIK100	CO	MIN												
36	TIK100	RI	MIN												
37	TIK100	PV	MAX												
38	TIK100	SP	MAX												
39	TIK100	CO	MAX												
40	TIK100	RI	MAX												
41	TIK100	PV	SUM												
42	TIK100	SP	SUM												
43	TIK100	CO	SUM												
44	TIK100	RI	SUM												
45	HOUR	R	SMP												
46	HOUR	R	AVG												
47	HOUR	R	MIN												
48	HOUR	R	MAX												
49	HOUR	R	SUM												
50	MINUTE	R	SMP												

A9760

FIGURE 13.12 — Directory Of Archival Trends Printout

STORE EVENT DATA. To store event data, enter choice **G** from the Archival Storage Menu (STORE EVENT DATA). The first Store Archival Event Data Display appears with the cursor at the DISKETTE VOLUME NAME: input field.

FIGURE 13.13 — First Store Archival Event Data Display

Insert a diskette into the diskette drive. Enter the diskette volume name in its input field and press ENTER. The OIU verifies the diskette volume name (checks to see if your name matches that on the diskette in its diskette drive). If there is no match, one of the following error messages can appear below the display:

SYSO IS THE HARD DISK or VOLUME NAME DOES NOT MATCH

In this case, remove the current diskette from the diskette drive and insert the proper one. Now enter the proper diskette volume name and press ENTER. If the OIU finds a match, the next event display appears on the CRT.

If the OIU verifies the diskette volume name after you press ENTER, the second Store Archival Event Data Display appears on the CRT. The OIU begins storing event data onto the diskette in its diskette drive.

FIGURE 13.14 — Second Store Archival Event Data Display

In the center of this display the following message appears:

ARCHIVE EXECUTING

Three additional messages appear below the executing message. The OIU fills in the data for each of these additional messages as the event archiving operation continues.

The first message shows the number of events the OIU is archiving during this archive period. Ten archives are possible with a maximum number of 2900 events per diskette (See Table 10.2 in Section X).

The second message shows the total number of events left in the hard disk event file that the OIU still has to archive. The maximum number of events in this file is 10,000. The number of events left can increase as the OIU logs more events or the number can decrease as the OIU archives more events (the store archived events task). The change in this number is unpredictable. (See Table 10.3 in Section X.)

The last message shows the total number of events stored onto the diskette, including multiple archives (if any). This number begins where it previously ended if the archive was interrupted. It changes like the number in the first message except its counter is global for all archives on the currently inserted diskette.

Event storage on the current diskette ends when the number in the first message reaches (or exceeds) 2900. The number starts at zero when the operation begins and changes in increments of 100 at a time up to the maximum 2900. If the starting number of the second message was greater than 2900, you must remove the current diskette after the first number reaches 2900 (Table 10.3 in Section X). Then insert a new diskette and press ENTER.

The storing operation then continues. You must continue this process until the OIU finishes archiving all events (See Table 10.3 in Section X). When the first message number stops changing (between 0000 and 2900) while you have the last necessary diskette in the diskette drive after the specified time (as shown in Table 10.3) the storage operation is complete. The following message appears on the CRT:

EVENT ARCHIVE COMPLETE

CAUTION

Wait until the storage operation is complete before you access any other display. Otherwise, you can lose up to 100 events.

DISPLAY EVENT DATA. To display stored event data on the CRT, enter choice H from the Archival Storage Menu (DISPLAY EVENT DATA). The Archived Events Menu Display appears on the CRT:

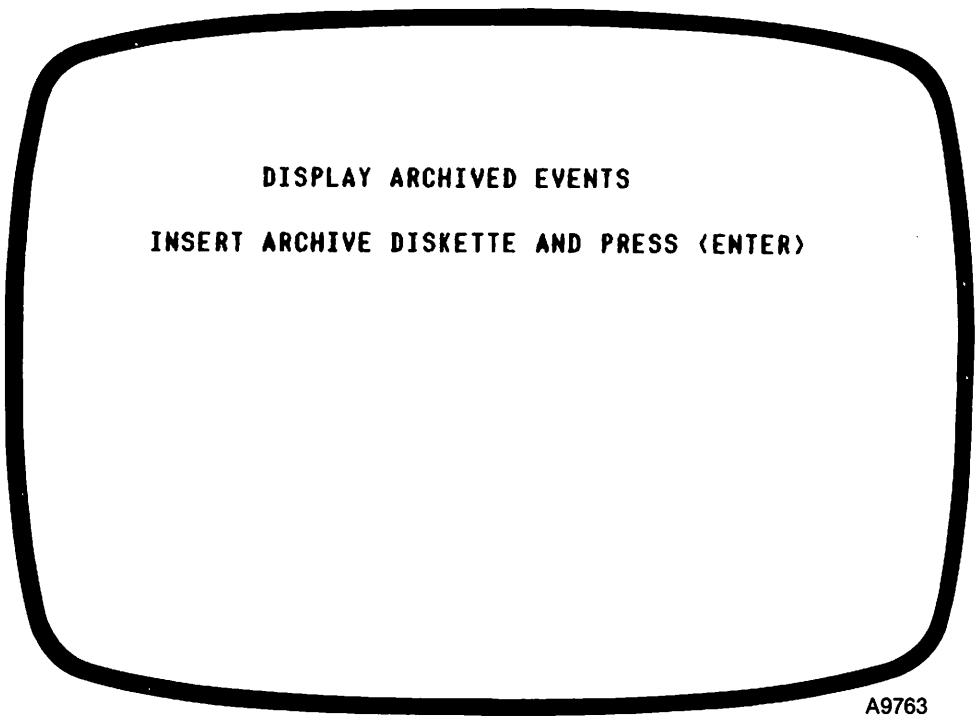


FIGURE 13.15 — Archived Events Menu Display

Insert a diskette having archived event data into the diskette drive. Press ENTER. The OIU immediately reads the diskette directory and tries to open two files on it (AEHEAD and AEDATA). If the OIU successfully opens the two files on the diskette, the Archived Events List Menu appears on the CRT.

If the OIU cannot open the AEHEAD and AEDATA files, the error message: DISKETTE ERROR appears. If the diskette has no archived event data, the message: NO EVENT DATA ON DISKETTE appears. In either error situation the Archived Events Menu Display stays on the CRT.

If the first message appears, remove the diskette in the drive and replace it with a new diskette. Then press ENTER again.

If the second message appears, you can do one of the following:

- remove the diskette, replacing it with one containing archived event data, and press ENTER again.

— or —

- choose function **G** and store events on the diskette. When done storing archived events resume function **H**. Press **H** and then ENTER.

If the OIU successfully opens the diskette files (or you correct either file opening error and press ENTER again) the Archived Events Display List Menu appears with the cursor positioned at the archive number field on the lower half of the page. This page first lets you choose any archive on the diskette and then the desired events of that archive for display.

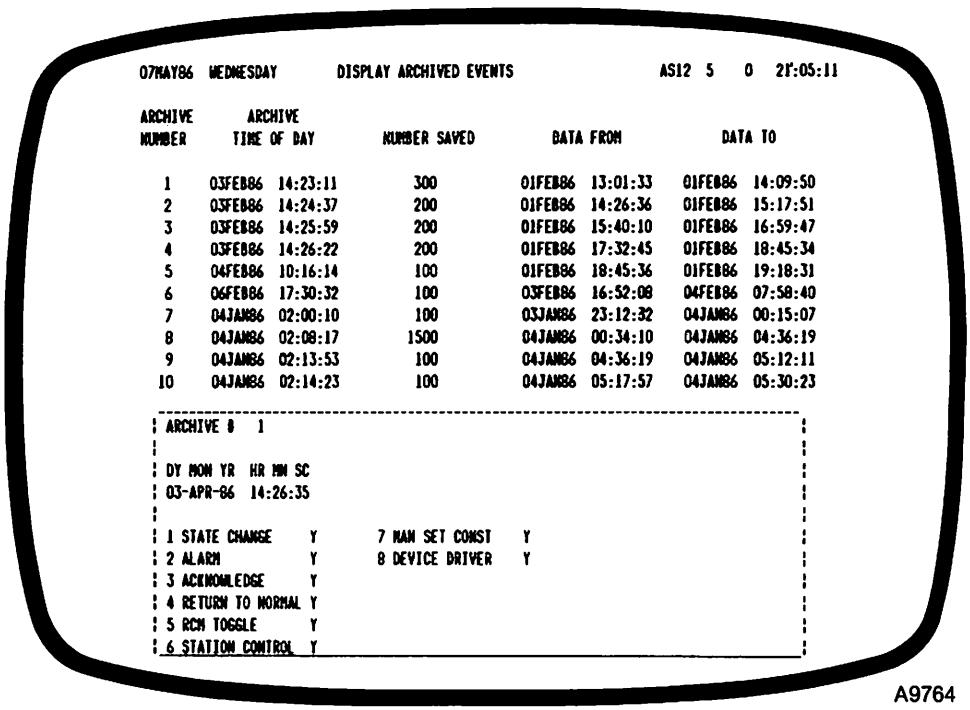


FIGURE 13.16 — Typical Archived Events Display Menu Page

NOTE

Some diskettes may have less than the maximum of ten archives. If so, you can only display archived event data for the current range of archives on the diskette. For example, if the current number of archives is 6 (1 to 6), you cannot display events for archives 7 through 10. If you try to do so, the error message: VALUE MUST BE 1 TO 6 appears.

The List Menu page has an upper and lower half. The upper half shows the list of archives currently stored on the diskette. The lower half shows the event display menu for events in the diskette archives.

The heading of the menu page shows the following (left to right):

ARCHIVE NUMBER | ARCHIVE TIME OF DAY | NUMBER SAVED | DATA FROM | DATA TO

The NUMBER field shows the specific archive (up to ten) stored on the diskette using function **G** of the Archival Storage Menu.

The TIME OF DAY field shows the specific date and time (day-month-year and hr-min-sec) when the storing operation started for that archive.

The NUMBER SAVED field shows the total archived events making up the particular archive on the diskette.

The DATA FROM field shows the specific date and time of the FIRST event in the particular archive.

The DATA TO field shows the specific date and time of the LAST event in the particular archive.

NOTE

The DATA FROM and DATA TO fields show the particular time RANGE of all the archived events (NUMBER SAVED) for the particular archive. For example, archive number 3 above has 200 events ranging from 01FEB86 at 15:40:10 to 01FEB86 at 16:59:47.

The lower half of the page contains the archived events menu enclosed in a large rectangular box. The box contains 15 prompt fields. The most important prompt is the ARCHIVE # field. This field controls all menu choices for a particular archive.

Entering any archive number from those on the upper half of the page into this field lets you choose which archive to display. When you first access the menu page the OIU automatically sets this field to archive 1. Then it retrieves archived event data from the DATA FROM area of memory for that archive.

Notice that the archive number on the upper half of the page that matches the number in this field appears in cyan while the remaining numbers on the upper half appear in red. When you enter a different number in the ARCHIVE NUMBER field its matching number on the upper half of the page changes to cyan. (The previous number in cyan reverts back to red.) This helps you identify the particular archive on display. This number in cyan must always match the number in the ARCHIVE NUMBER field. To enter a different number first press CLEAR. Then enter the new number.

If you enter a number out of range (see the first NOTE on the previous page) in the ARCHIVE NUMBER field, the value error message appears on the CRT. Re-enter any number within the listed range and the error message then

disappears. If three archives list out on the upper half of the page, the archive range is 1 to 3. If four list out, the range is 1 to 4, and so on.

Remember a diskette can hold a maximum of ten archives. You can never store more than this on any diskette but you can display archived events for any diskette having only one archive. The maximum number of events that can be stored (and displayed) on any diskette is 2900 (Section X).

After entering a different archive number (or accepting the default number 1), you must press ENTER to proceed down the menu. If you try to move the cursor from the ARCHIVE NUMBER field without first pressing ENTER, the message: PRESS 〈 ENTER 〉 appears. Pressing FIELD or SECT then has no effect. Pressing ENTER frees the cursor and also keeps default time within the archive selected. (Starts event data display from the DATA FROM memory area.)

Move the cursor to any field of the next section (line) by pressing SECT. This section contains six prompts making up the fields for date and time (left to right):

DY	Day	(##)
MON	Month	(AAA)
YR	Year	(##)
HR	Hour	(##)
MN	Minute	(##)
SC	Second	(##)

Move among these fields by pressing FIELD. You need not press ENTER after changing the alphanumeric content of any field in this section. To change the contents of any field, first press CLEAR. Then enter the new data desired. When moving the cursor away from any field containing changes the field keeps the data just entered.

When changing the MON field be sure to enter enough letters to easily distinguish one month from another. For example, entering J, M, A, JU, or MA causes the OIU to display the message:

KEY IN MORE CHARACTERS

J can be JAN, JUN, or JUL. M can be MAR or MAY. A can be APR or AUG. JU can be JUN or JUL and MA can be MAR or MAY.

One convention to avoid confusion is simply to always enter the maximum number of letters for any month (three).

NOTE

If you enter something other than the possible month letters in this field, the message: ILLEGAL ENTRY appears. Simply press CLEAR and enter the proper month abbreviation.

Do not enter digits less than 80 in the year field. If you do, the error message: 00 THROUGH 79 DENOTE 21ST CENTURY appears. (The OIU base year is 1980.)

If you enter a date and time that is NOT within the range of the current archive (See the second NOTE on page 353), the error message: DATE AND TIME NOT IN ARCHIVE appears. Go back and enter a date and time that is included within the range for that archive. Examine the archive listing on the upper half of the page to do this.

If you enter an invalid number in any numeric field, an error message appears telling you the proper entry range. For example, if you enter 75 in the MN field, the message:

VALUE MUST BE 01 TO 60

appears. Press CLEAR and enter a number from the range shown.

When done changing any field in the Date and Time section (or leaving the section as is), move the cursor further down the menu by pressing SECT.

You can now choose which archived events (of the current archive selected) to display by moving the cursor to any of the eight prompts following the choices listed below the Date and Time section.

To display any of the listed events, change its prompt from **N** to **Y**. Move between choice prompts by pressing SECT. When you first access the menu page, all choices default to **Y**. To cause any listed event NOT to display, simply move the cursor to its prompt and enter **N**.

To see only one event type for any archive, set its choice to **Y** and set all remaining choices to **N**. (Press CLEAR before changing any selection.) If you set all choices to **N**, and later try to display (see below), the error message:

AT LEAST ONE EVENT MUST BE DISPLAYED

appears. Go back and set at least one choice to Y.

If you enter a choice other than Y or N, the error message: ILLEGAL ENTRY appears. Re-enter either Y or N for that choice.

Another way to move the cursor among these fields is to press ESCAPE once. The CRT goes into the COMMAND ? mode. At the COMMAND prompt, enter the number of the event you want to change (disply or not display by entering Y or N). After entering the desired event number, press ENTER. The cursor then moves to the prompt of that event. You can then enter Y or N for that event as desired. If you enter a number out of range (a number other than 1 through 8) in the COMMAND prompt, the error message: VALUE MUST BE 1 TO 8 appears. Press CLEAR and enter a choice number between 1 and 8. Then press ENTER.

Pressing ESCAPE twice causes the menu page to disappear and returns the Archival Storage Menu to the CRT. Another way to return to the Archival Storage Menu is to press M and then ENTER.

After working through the menu or lower half of the menu page, you can now display the archived events chosen. To do this, move the cursor back to section one in the menu (the ARCHIVE NUMBER prompt). Now press ENTER.

The first page of the archived events chosen on the menu now appears on the CRT (next page). Each archived events display can show up to 20 events. So

if a particular archive has 50 events of the type chosen for display, you must scroll through three pages to see them all. (Page one has 1 - 20, page 2 has 21- 40, and page 3 has 41 - 50 in this case.)

The OIU can take a few minutes to build the display chosen. The OIU searches memory for archived events on that archive at the specific date and time you entered. If the OIU cannot find the specific time you entered (it may not be archived), the message: TIME FOR EVENT NOT FOUND appears. In this case, the OIU starts the display with the event at the closest time after your choice.

If the OIU finds the time you entered but the event at that time is not one of those you chose on the menu, the message: TIME FOUND-EVENT NOT DISPLAYED appears.

If the OIU finds the time you entered and the event at that time is one you chose to display, the starting event data (top line of the page) appears in YELLOW. The OIU then searches for consecutive events following the starting one and tries to fill the rest of the page (from top to bottom) with those events you chose for display.

There can be no further events of the type chosen in that archive. If so, no more appear. When you reach the end of the events chosen for that archive (See next page) the messages:

NO MORE EVENTS THIS ARCHIVE and PRESS ESCAPE TO RECONFIGURE

appear at the bottom of the event page.

NOTE

At the bottom of each page of any archived events display the message: PRESS ⟨ESCAPE⟩ TO RECONFIGURE appears. If you press ESCAPE, the archived events page disappears and the display Menu page reappears (Figure 13.16). This is how you return to the menu page to choose different archived events for display.

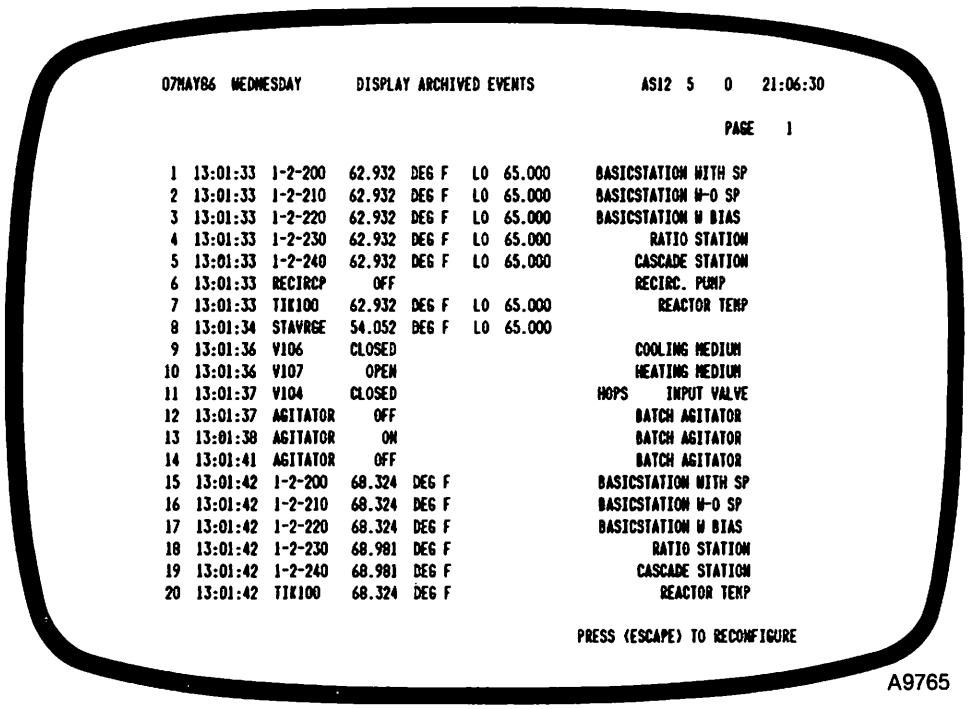


FIGURE 13.17 — Typical Archived Events Display (All Events)

Scroll through the pages of any events display using PREV and NEXT. Paging is calculated from the first (top) event on page one. Remember, each page can contain up to 20 events. If you chose not to display all events in an archive, the paging may seem to work incorrectly.

For example, event number 27 is the last event on one page while event number 52 is the first event on the next page (and not number 28), and so on. This occurs because certain events to display can be at different locations in that archive.

When scrolling backwards through a display (using PREV), the OIU builds each page backwards from the bottom to the top. This lets its search for events appear in reverse order.

Notice that events pages do NOT have wraparound. If you try to scroll previous to the first event in an archive or beyond the last event in an archive, the message:

REQUESTED EVENT # OUT OF BOUNDS

appears. In either case, the current page redisplays.

If you want to view events out of the bounds of the current archive, you must return to the display menu page and choose new parameters. Then press ENTER to begin displaying a new series of archived events (if any).

When scrolling through the display pages let the OIU completely build each page before you take any other action. The OIU must search for and find either the last event on any page (if you pressed NEXT) or the first event (if you pressed PREV) before it can proceed to another page in the same direction. Otherwise, you may get unexpected (and unwanted) results on the display.

To return to the Archival Storage Menu for some other operation or to insert another diskette), press ESCAPE twice after any display page completes.

Figures 13.18 and 13.19 (the next two pages) show examples of the Menu display page and the first events display page for viewing ONLY alarm events.

```
07MAY86  WEDNESDAY        DISPLAY ARCHIVED EVENTS                AS12  5    0   21:05:11

ARCHIVE       ARCHIVE
NUMBER      TIME OF DAY          NUMBER SAVED        DATA FROM           DATA TO

   1     03FEB86  14:23:11          300          01FEB86  13:01:33   01FEB86  14:09:50
   2     03FEB86  14:24:37          200          01FEB86  14:26:36   01FEB86  15:17:51
   3     03FEB86  14:25:59          200          01FEB86  15:40:10   01FEB86  16:59:47
   4     03FEB86  14:26:22          200          01FEB86  17:32:45   01FEB86  18:45:34
   5     04FEB86  10:16:14          100          01FEB86  18:45:36   01FEB86  19:18:31
   6     06FEB86  17:30:32          100          03FEB86  16:52:08   04FEB86  07:58:40
   7     04JAN86  02:00:10          100          03JAN86  23:12:32   04JAN86  00:15:07
   8     04JAN86  02:08:17         1500          04JAN86  00:34:10   04JAN86  04:36:19
   9     04JAN86  02:13:53          100          04JAN86  04:36:19   04JAN86  05:12:11
  10     04JAN86  02:14:23          100          04JAN86  05:17:57   04JAN86  05:30:23

 ARCHIVE #   1

 BY MON YR  HR MN SC
 03-APR-86  14:26:35

 1 STATE CHANGE     N        7 MAN SET CONST    N
 2 ALARM            Y        8 DEVICE DRIVER    N
 3 ACKNOWLEDGE      N
 4 RETURN TO NORMAL N
 5 RCN TOGGLE       N
 6 STATION CONTROL  N
```

A9766

FIGURE 13.18 — Typical Archived Events Display Menu Page

```
07MAY86  WEDNESDAY        DISPLAY ARCHIVED EVENTS                AS12  5    0   21:06:30

                                                                              PAGE   1

  1  13:01:33  1-2-200   62.932  DEG F   LO  65.000     BASICSTATION WITH SP
  2  13:01:33  1-2-210   62.932  DEG F   LO  65.000     BASICSTATION W-O SP
  3  13:01:33  1-2-220   62.932  DEG F   LO  65.000     BASICSTATION W BIAS
  4  13:01:33  1-2-230   62.932  DEG F   LO  65.000           RATIO STATION
  5  13:01:33  1-2-240   62.932  DEG F   LO  65.000        CASCADE STATION
  7  13:01:33  TIK100    62.932  DEG F   LO  65.000           REACTOR TEMP
  8  13:01:33  STAVRGE   54.052  DEG F   LO  65.000
 56  13:02:15  63-2-235  111111          H                  PERIODIC ALARM
122  13:11:44  1-2-200   115.53  DEG F   LO  -60.00     BASICSTATION WITH SP
123  13:11:44  TIK100    115.53  DEG F   LO  -60.00           REACTOR TEMP
191  13:23:39  63-2-233  111111          A                  PERIODIC ALARM
196  13:26:32  63-2-237  111111          A                  PERIODIC ALARM
197  13:28:06  63-2-230  111111          A                  PERIODIC ALARM
199  13:28:39  63-2-238  111111          A                  PERIODIC ALARM
218  13:35:43  63-2-232  111111          A                  PERIODIC ALARM
237  13:43:34  63-2-234  111111          A                  PERIODIC ALARM
270  14:00:43  63-2-231  111111          A                  PERIODIC ALARM
281  14:03:51  1-2-200   109.02  DEG F   LO  -60.00     BASICSTATION WITH SP
292  14:03:51  TIK100    109.02  DEG F   LO  -60.00           REACTOR TEMP

NO MORE EVENTS THIS ARCHIVE                    PRESS (ESCAPE) TO RECONFIGURE
```

A9767

FIGURE 13.19 — Typical Archived Events Display (Alarms Only)

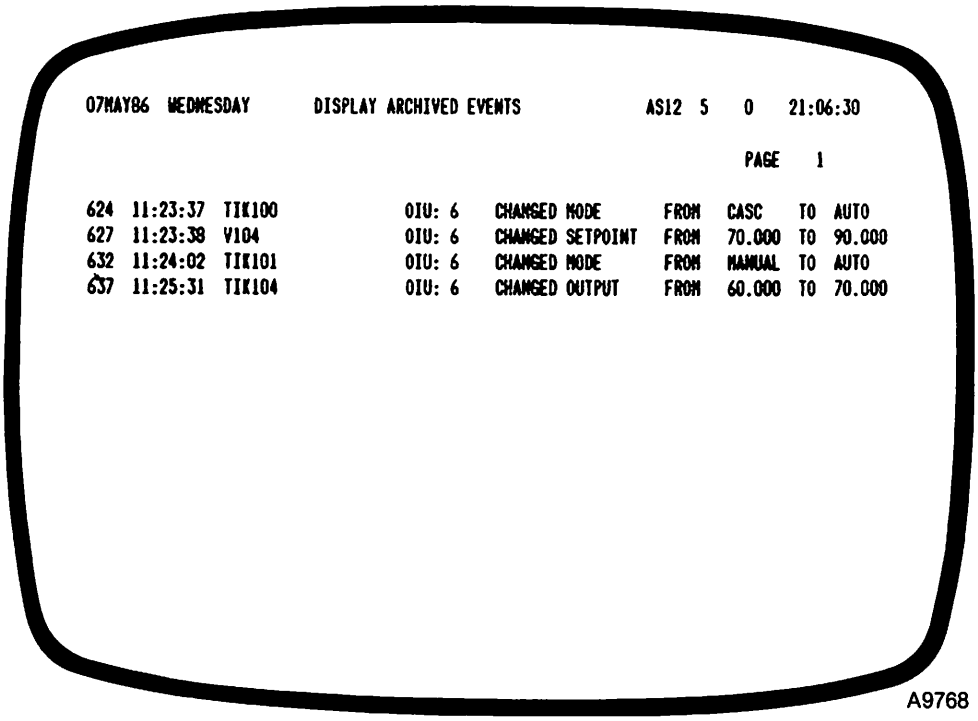
Figures 13.20, 13.21, and 13.22 (next page) are examples of archived events display pages showing Station Control, RCM Toggle, and Manual Set Constant changes.

NOTE

Item choices 5 through 8 on the Menu display page are Operator Actions. In order for any archived events display pages to show such operator action changes, the engineer must configure logging parameters (page 233 in Section IX) to allow it. The OPERATOR ACTIONS LOGGED field under the Event Log definition must be set to YES.

NOTE

Choice number eight (Device Driver) is not yet implemented. Changing this field between **Y** and **N** has no effect.



A9768

FIGURE 13.20 — Archived Events Display (Station Control Changes)

NOTE

On this display the OIU where the change occurred is shown by OIU: 6.

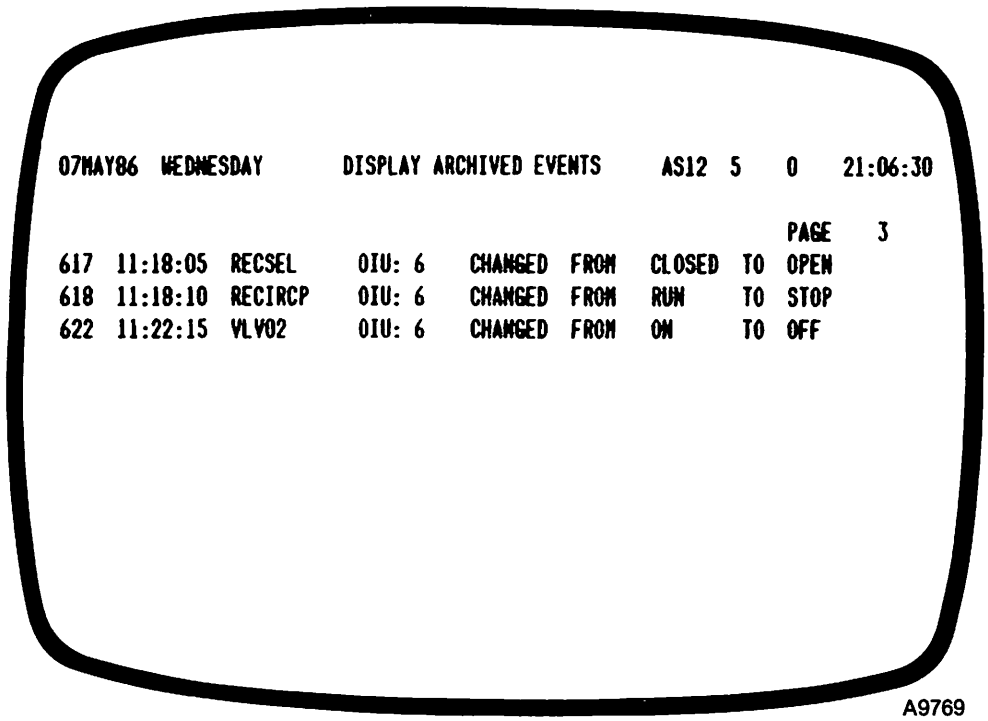


FIGURE 13.21 — Archived Events Display (RCM Toggle Changes)

NOTE

For this display the various RCM logic state descriptors list in the changed fields.

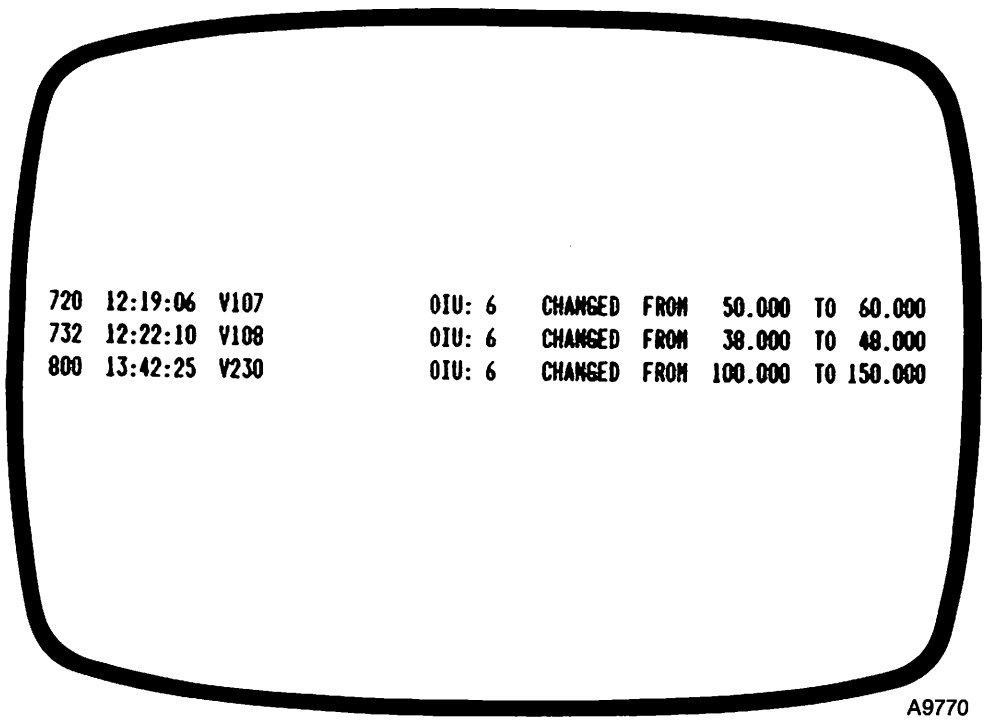


FIGURE 13.22 — Archived Events Display (Man Set Const Changes)

NOTE

For this display the Manual Set Constant values appear in the changed fields.

Table 13.1 shows a summary of possible (error) messages that can occur during archiving operations. Table 13.2 shows the error messages that can appear during event archiving operations.

TABLE 13.1 — Archiving Messages

INITIALIZING DISKETTE — TAKES 2 MIN
FLOPPY HEADER FILE HAS BAD DATA INITIALIZING HEADER FILE
SYSO IS THE HARD DISK
DISKETTE NAME DOES NOT MATCH PRESS (ENTER) TO INITIALIZE DISKETTE PRESS (ESCAPE) TO ABORT
DISKETTE IS FULL
DISKETTE ERROR
INITIALIZATION COMPLETE
EVENT ARCHIVE COMPLETE
NO EVENTS TO ARCHIVE
ERROR READING DIRECTORY
ERROR INITIALIZING FLOPPY
ARCHIVE TERMINATED
ERROR IN FLOPPY FILE I/O
ERROR OPENING TAGREC
FILE OPER ERROR PRESS (ENTER) TO INITIALIZE PRESS (ESCAPE) TO ABORT

TABLE 13.2 — Event Archiving Error Messages

MESSAGE	CAUSE
DISKETTE ERROR	Diskette has no AEHEAD AND AEDATA files
NO EVENT DATA ON DISKETTE	Diskette has no stored event data
REQUESTED EVENT # OUT OF BOUNDS	You tried to scroll beyond the first or last event in the current archive
NO MORE EVENTS THIS ARCHIVE	You reached the end of the current archive during scrolling
ILLEGAL ENTRY	You entered a number or letter that is out of range or otherwise invalid
KEY IN MORE CHARACTERS	You have not entered enough letters to distiguish a month properly
PRESS (ESCAPE) TO RECONFIGURE	You can return to the Menu display page to choose different events or a different archive to display
BAD DATA ON DISKETTE	Current diskette in OIU was not properly initialized
PRESS (ENTER)	You changed the archive number and then pressed SECT to move the cursor to the other sections before pressing ENTER
00 THROUGH 79 DENOTE 21st CENTURY	You entered a value in the YR field of the Data and Time section between 00 and 79 (The OIU base year is 1980)
AT LEAST ONE EVENT MUST BE DISPLAYED	You set all event choices to N
ARCHIVE SELECTION NOT INPUT	You cleared out the ARCHIVE NUMBER field and tried to move the cursor to other sections
DATE AND TIME NOT IN ARCHIVE	Values entered in the Date and Time fields do not exist in the current archive
TIME FOR EVENT NOT FOUND	Values entered in the Time field do not exist in the current archive
TIME FOUND-EVENT NOT DISPLAYED	OIU found the event time specified but event at that time is not one of those you chose to display for this archive
VALUE MUST BE__ TO __	You entered a value that is out of range

Regarding the format of the FILE OPER ERROR message, the system files include: AEHEAD, AEDATA, LOGVAR, and AEVFIL. The system operations include: OPEN, READ, and WRITE. The system error is always ERROR.

An example of a FILE OPER ERROR can be: AEDATA WRITE ERROR.

CAUTION

If a FILE OPER ERROR message appears, notify your system engineer as soon as possible. Take no other action yourself.

Access	To call up any OIU display or routine.
Access Code	The RED alphanumeric characters on displays or menus allowing you to call up that display or function when entering that character into the OIU.
ACK	Alarm Acknowledge; acknowledge an alarm state by pressing the ACK key on the fixed keyboard.
Acknowledge	To stop alarm annunciation (flashing) of alarm indicators on the OIU operational displays.
Alarm Management	OIU configuration that lets the user design specific alarm indicators and their appearance as desired.
Alarm Management Menu	Menu giving the user functions for designing Alarm Management (Section VI).
Alarm Suppression	A function of Alarm Management and Tag configuration allowing the user to stop alarm indication for certain tags as desired.
Alarm Trip Point	Value of a tag that causes its alarm indicator to annunciate (flash) on an OIU operational display.
Alarming	Handling alarms; acknowledging the various process or status alarms on the OIU (Section XI).
Alphabetic Control	A block of keys on the OIU fixed keyboard enabling alphabetic character entry (Section III).
AMH	Analog Master High; a NETWORK 90 module.
Analog	A Real numeric value containing a floating decimal point. Many OIU tags contain analog values.
Annunciate	Visible (and/or audible) indication of certain events. On the OIU this refers to flashing alarm indicators on operational displays.
AOM	Analog Master Output; a NETWORK 90 module.
Archiving	Recording OIU data by means of floppy disks for later display or manipulation.
Archiving Events	Recording alarm data (Section X).
Archiving Trends	Recording trend data (Section X).
Area	Configuration grouping of Tags and Groups (Section IV). Also an OIU operational display showing that grouping.

Audible Feedback — Soft beep occurring when the operator enters any character or presses any key on the OIU fixed keyboard.

AUTO — Automatic; a Station operating mode (Section IV). In this mode the control output equals the difference between setpoint value and process variable from the field.

Auxiliary Keyboard — The Graphic keyboard used for graphic editing during OIU configuration (Section VII).

AVG — Average; a trend data collection mode (Section IX).

Background (BG) — Color of the background spaces on the OIU CRT over which graphic characters or symbols appear.

Bad Quality — Condition where the module in the PCU containing the function block for a tag determines current tag value to be bad. (An input value is out of range.) Or a condition showing some communication failure. Can also appear in Station elements during OIU startup (not yet alarmed).

Basic Character Space — A 6 x 8 grid array space on the OIU CRT used in graphic editing (Section VII).

BASIC Group — A group set up during OIU configuration containing a user-defined BASIC program (Section VI).

BEGIN Point — The starting position within a drawing character space on the OIU CRT for graphic editing.

BIM — Bus Interface Module; a NETWORK 90 communication module working in conjunction with the LIM to enable message flow to and from the OIU over the plant communication loop.

Blink — Graphic characters set up to blink (flash) on and off during OIU operation.

Block — A user-configurable block in a PCU module containing a function code. A section of module memory containing a predefined algorithm designed to perform a specific task. The specific numeric address of the block in a module containing a specific function code. Can also refer to a key group on the OIU fixed keyboard.

Block Details — Display showing all specifications or parameters of a specific block containing a function code in a module (Sections IV & V).

BOOLEAN — A mnemonic word descriptor showing logic states 1 and 0 for any tag. Also known as digital; a non-numeric tag value.

Boolean Point — A single point display element for a tag showing the boolean tag value (Section IV).

Calling — Accessing a previously marked page for display on the OIU CRT.

Card Cage Assembly — Hardware assembly below the OIU CRT and fixed keyboard allowing the mounting of communication board devices.

Cascade — A station operating mode. Control output equals the difference between setpoint value and process variable from the field (as in AUTO), except that an external source establishes the setpoint value (like the output from a different module).

CIU — The Computer Interface Unit. Contains the necessary hardware and software to provide a link between the PCL and a computer.

CNTR — Indicator on the Station element showing its control by remote computer, or Host. This indicator appears on that display element when the operator presses the control mode select key in the Station Control Block of the OIU fixed keyboard (Sections III and XII).

CO — Control Output; station control output value. A value expressed as a percentage of span between the upper and lower range limits of the tag (Section IV).

Collection Mode — Method of data collection for any trend used in logging. Determines the amount of data the trend collects over time (Section IX).

Collection Rate — Time period over which trend data collects (Section IX).

Color and Phrase — Configuration on the OIU allowing the user to accept OIU standard colors and phrases or to design his own (Section VIII).

Color Code — Three-letter abbreviation of any color used on the the OIU. (RED, GRN, CYN, BLU, YEL, MGN, BLK, & WHT).

Color Scheme — Using standard or user-defined colors for display items on the OIU.

COM — Controller; a NETWORK 90 module.

COMMAND ? Mode — Indicator appearing at the bottom of the CRT during OIU configuration allowing the user to leave the particular configuration function and return to a menu. Also lets the user enter some other command (such as moving the cursor to a particular field or section on the current display).

CONF — The configuration keyswitch (Section II).

Configuration Displays — Various CRT display pages letting the user configure the OIU.

Configure — Set up the various functions and displays of the OIU.

CONFIGURE MODE — A module operating mode used in configuring PCU modules (Section V).

Constant — A value that is fixed or unchanging throughout OIU operation.

Control Box — A display element appearing on controllable Graphic display pages.

Control Numeric — The number the user must enter to display the Control Box for any controllable Graphic display.

Controllable Element — Any element appearing on an OIU display from which the operator can take control action.

Conversion Factor — A numeric factor entered when defining suffix tags that keeps suffix values consistent with source units, engineering units, source collection modes, and time ratio of suffix and source intervals (Section IX).

COTK — Control Output Tracking; a station operating mode (Section IV).

CRT — The OIU display screen (using an 80 column by 48 row grid array).

CTM — Configuration and Tuning Module; a NETWORK 90 module.

Cursor Control Block — A keygroup on the OIU fixed keyboard letting the user control cursor movement and trend graph scrolling (Section III).

Customize — To set up a display as desired. Periodic logs are Graphic displays that can be differently customized.

Data Overflow	Condition where a device contains maximum data collectible. Excess data can not be collected until current data is manipulated. Can occur with SOE reports (Section IX).
DCS	Digital Control Station indicators (Section VIII). Can also refer to the Digital Control Station module.
DECR	Decrement key; used to decrease a value or scroll back the time cursor (Section III).
Dedicated Printer	A line printer that produces only Event Logs (Sections VI and IX).
Descriptor	Input field on certain OIU displays that provides alphabetic identification for items such as Tags, Groups, and Trends.
DEV	Device Driver. A remote control display element appearing on Group display pages.
Digital	Variable, point, or value defined by two states (i.e. ON/OFF, etc.).
Diskette	Refers to the eight-inch soft sector floppy disks used on the OIU for PCU module configuration and archiving.
Display Control Block	Keygroup on the OIU fixed keyboard letting the user take control action from controllable station and remote control elements (Section III).
Display Page	Any OIU display appearing on the CRT. Some displays have more than one page.
Double Height Characters	Characters that are twice the normal height (sixteen plot points rather than eight). Appears on any hard copy as duplicate lines of Single height characters.
Download	To transfer data from memory to a storage device (Read data from the OIU to a diskette, for example).
Drawing Character Space	The 2×8 plot point grid array used in graphic editing for character entry and dynamic item drawing (Section VII).
Driver	Unit containing the OIU hard disk and various diskettes.
Dynamic Bar	An indicator showing changing tag values on a Graphic display.

Dynamic Items — Display items graphically showing changing tag values on a Graphic display page.

Dynamic Pipe — An indicator showing changing tag values on a Graphic display.

Dynamic Symbol — An indicator showing changing tag values on a Graphic display.

Dynamic Value — An indicator showing changing tag values on a Graphic display.

EEROM — Electrically Erasable Read Only Memory; memory that is not lost if any power failure occurs.

END Point — The ending position within a drawing character space on the OIU CRT for graphic editing.

Engineering Units — Predefined and user-defined units identifying current process for any tag. Expressed as a percentage of span on station display elements.

Enhanced — To add value to certain features for display (such as making readouts larger or brighter).

ENTER — Key on the OIU fixed and auxiliary keyboards used to enter information into OIU memory.

ESCAPE — Key on the OIU fixed and auxiliary keyboards used to abort any data entry and to return to menus.

EU — Engineering units abbreviation.

EU Multiplier — Numeric data used with EUs when defining tags to identify flow rates (gallons per minute, cubic feet per minute, etc.).

Event — Refers to alarms such as on an Event Log.

Exception Report — A NETWORK 90 message generated as a result of an alarm or some significant change in output value for any tag.

EXECUTE MODE — A module operating mode used when setting PCU modules for operation (Section V).

FIELD — A key on the OIU fixed and auxiliary keyboards used to move the cursor on the CRT between input fields. Also refers to such an input area.

File Utilities — Series of functions letting the user set up the OIU for operation (OIU Hardware Manual, IE93-901-2).

Firmware — Preprogrammed functions contained in hardware that the user cannot change.

Fixed Keyboard	Main or standard keyboard of the OIU. Called fixed because it is an integral part of the OIU that the user cannot remove.
Flagged	A display page marked for later recall.
Flash	An alarm indicator appears to blink on and off on any OIU display page to let the operator know an alarm condition exists.
Floppy Disk	Another term for diskette.
Foreground (FG)	Color of any character appearing against the background of the OIU CRT.
Function Code	An algorithm containing specification data for performing specific functions.
GCM	Gateway Communication; a NETWORK 90 module.
General Function Menu	The main menu of the OIU letting the user access various configuration and operation functions.
Graphic	Any character used on Graphic displays; also any Graphic display.
Graphic Characters	Characters, symbols, lines, boxes, bars, and pipe segments used in graphic editing.
Graphic Editor	Part of OIU memory that lets the user design Graphic display pages.
Graphic Editor Menu	Menu letting the user access the various graphic editing functions (Section VII).
Graphic Template	Another term for the CRT during graphic editing.
Group	A display page on the CRT. Contains series of display elements (tags) and is part of an Area (Section IV).
Hard Copy	Any printout of an OIU display produced by a line printer.
Hard Disk	The OIU main memory device contained in the Driver unit.
Hardware Address	The numerical reference points for PCU, Module, and Block that the OIU uses.
High Deviation	If the defined percentage difference between the setpoint and process variable for any tag is exceeded, a deviation alarm occurs. A High Deviation is one exceeding the upper range limit.

High Resolution Causing the OIU to display its characters and lines, etc., thicker, larger, and brighter than normal for easier readability.

HOME When referring to the screen cursor, the top left corner of the CRT (coordinates 1,1).

Host Local computer interfacing through the CIU providing operating control for the NETWORK 90 system.

INCR Key on the Cursor Control Block of the fixed keyboard letting the user increase values or scroll up the Time Cursor on trend graphs.

INITIALIZE MODE A module operating mode used to set up PCU modules for new data entry (Section V).

Initialize Setting up for data entry. Initializing erases all previous data.

Integrated Control Station Control station (or work console) containing all necessary hardware devices for continuous operation.

LCL Local; indicator on the Station Control Block of the fixed keyboard. Also appears on any station display element to let user know that tag is under control by the Host.

LCM1 Large Controller 1; a NETWORK 90 module.

LCM2 Large Controller 2; a NETWORK 90 module.

LCM3 Large Controller 3; a NETWORK 90 module.

LIM Loop Interface Module; used in conjunction with the BIM module.

LME Logic Master Enhanced; a NETWORK 90 module.

LMM Logic Master; a NETWORK 90 module.

Logging Option used on the OIU to record process data (Section IX).

Logic State Descriptor A descriptive word or mnemonic identifying logic state 0 or 1 for any tag.

Low Deviation The opposite of a High Deviation.

LSD Logic State Descriptor.

MAN Manual; a station operating mode (Section IV). In this mode the user can directly modify control output from the keyboard.

Marking	Marks an OIU display page for later recall using the MARK (and CALL) keys of the Display Control Block (Section III).
Master Module	Any one of a series of master controller modules that direct field processes through slave output modules.
MAX	Maximum; a trend collection mode.
MCS	The Management Command System unit. Integrated data acquisition system containing the necessary hardware and software to provide highly flexible control capabilities. Similar in function to an OIU but used by Management personnel.
MFC	Multi-function Controller; a NETWORK 90 module.
MFC Aging Time	Time period in which event data collects in the MFC for later printing on the SOE Report.
MFPM	Multi-Function Processor Module; an OIU module mounted in the Card Cage Assembly enabling the operation of OIU applications software.
MFT	Module Full Timer; a timing circuit in a module used during module reset (Section V).
MIN	Minimum; a trend collection mode.
MMU	Module Mounting Unit; hardware assembly providing module operating power, module bus communication, and the expander bus for slave module inputs.
Mnemonics	Descriptive words for tag logic states 0 and 1; also known as LSDs.
MNLK	Manual Interlock; condition where the NETWORK 90 system locks a station into MANUAL operating mode depending on tag configuration.
Mode	Method of module or station operation; also method of data collection for any trend.
Module	A plug-in unit of hardware containing function codes and/or programs having a sequence of instructions for performing specific tasks.
MPC	Multi-Programmable Controller; a NETWORK 90 module.

MSC — Manual Set Constant; also known as Remote Manual Set Constant. NETWORK 90 function code (68) providing adjustable real value (constant) entry into control scheme. Any function block receiving this command generates an exception report showing tag value change as it occurs.

Mylar — Trademark name for thin sheet of polyester covering the OIU fixed keyboard surface.

NOIU01
NOIU02
NOIU03 — The various versions of OIU hardware. Each has a similar component arrangement to the other. The NOIU03 is the so-called ruggedized version used in hazard environments.

Node — Any junction on the plant communication loop through which information signals pass. (Commonly refers to PCUs, CIUs, OIUs, and the PPG.)

Node Status — Current state or condition for any node on the PCL.

Nonvolatile — Another description of EEROM memory. Memory that is not erased or lost when a power failure occurs.

NP — Non-Permissive; a remote control memory tag condition preventing the user from changing the current state of that tag (from ■ to □ or from □ to ■) as long as the condition lasts. (The control logic sets and removes the NP condition.)

Numeric Control — Key group on the fixed keyboard (and a similar group on the auxiliary keyboard) letting the user enter numeric values and increase and decrease such values.

OIU — The Operator Interface Unit. Work station providing main control access to any point in the NETWORK 90 system. Used by engineering, operations, and maintenance personnel.

OIU Configuration Menu — Menu letting the user configure the OIU for various functions (Color and Phrase, Tag definition, Logging, Archiving, Graphic Editing, Alarm Management, etc.).

On Demand — Refers to print option for any log from its Log Status Display. Printing On Demand lets the user print out any log immediately, not just at its configured print time.

OVR — Override; remote control memory tag condition that sets tag into its override state (depending on tag configuration). This prevents the user from changing the tag state as long as the condition lasts. (The control logic sets and removes the OVR condition.)

Parameters — Data limits for configuration and operation. Also known as specifications or specs. Can also refer to a range of data values.

PCL — Plant Communication Loop; the physical plant transmission media. Communication system connecting all nodes on the plant network.

PCU — The Process Control Unit. A cabinet containing the control, slave, and/or termination modules connected to user process. Can also refers to certain modules mounted in the cabinet itself.

PCU Configuration Menu — Menu letting the user access the various PCU module configuration functions (Section V).

Periodic Log — A graphic display designed during graphic editing and assigned during logging configuration to print out as a log during OIU operation (Sections VII and IX).

PID — Proportional Integral Derivative; refers to function code specifications.

Plot Point — The specific point inside the 2×8 drawing character space used in graphic editing.

PPG — Plant-to-Plant Gateway; a NETWORK 90 module mounted in an OIU letting exception reports and control commands pass from one plant loop to another over the PCL.

Predefined — Data or item or sequence of instructions provided by manufacturer in any hardware. Also known as firmware.

Primary Group — Main group containing active tags. The user can assign tags to more than one Group as desired but any tag can have only one Primary Group.

Print Scan — Short rectangular white marks flashing from left to right across the CRT starting from its top and going to its bottom immediately before printing. The scan marks appear as the OIU scans the contents of a current display page adding it to the print buffer.

Process Control — Letting the user take control action of any process during OIU operation.

Process Control Displays — Operational OIU display pages (Area, Group, Graphic).

Process Loop — A serial data link constantly updated at regular intervals with fresh data inputs. Represented on OIU by a tag.

Prompt — A reply field on certain displays awaiting user response or data entry before proceeding.

PV — Process Variable; changeable plant process value.

QWERTY — Typewriter-style keyboard. So called because of its arrangement of alphabetic keys (Q-W-E-R-T-Y-etc.).

Ramping — Control action wherein the user changes the station parameter values using keys on the Station Control Block of the fixed keyboard (Section XII).

Ratio — Station operating mode. In this mode the control output is a ratio or multiple of the setpoint value. The multiplication factor is the Ratio Index (between 1.0 and 10.0).

RCM — Remote Control Memory; NETWORK 90 function code enabling logic information reporting and tag status changing.

Read Point — An OIU supervisory display letting the user view the current value of any point (tag) by entering its hardware address. That tag must be in a module set to EXECUTE mode to be able to read its value on this display (Sections IV and XI).

Real — Another description of an analog, or floating point decimal numeric tag value.

Red Tag Status — Shows any normally controllable display element to be temporarily (or permanently) non-controllable. OIU must support Red Tag Status in its firmware in order to use it (Section V).

Redundant — Refers to additional OIUs on user PCL.

Report WaitingTime — Configurable time period that the OIU waits before collecting data for SOE Report printing (Section IX). Report Waiting Time begins as soon as the OIU detects any SOE data to collect in the MFC.

RESET MODE — A module operating mode used to clear out (erase) previous data before entering new data during OIU startup (Section V).

Resolution — Refers to the width of a trend graph line as it appears on its graph over its time interval (Section II).

Restore — To upload recorded information from diskette to the OIU memory. Such as restoring PCU module configuration.

RI — Ratio Index; analog value set by user in a station block compared to CO during OIU operation.

RMSC — Remote Manual Set Constant. See MSC.

Sample Time — Each trend graph line resolution has a Sample Time. This is a certain time period over which the line appears on its graph (usually 30 seconds but can also be up to a minute).

Save — To add the contents of a current display page to OIU memory (hard disk).

Save Scan — Similar to a Print Scan only the OIU adds the contents of the current display page to its memory, rather than printing it.

Scaling Span — The vertical distance on the trend graph from its base value (0.0) to its span value (top or highest value). The scaling span for every tag is contained in its PCU module specs.

Scrolling — Moving back and forth through the various OIU display pages using the PREV and NEXT keys of the keyboards.

Secondary Group — Another group containing configured tags. See Primary Group.

SECT — Key on either keyboard letting the user move the screen cursor between display page sections.

Significant Integers — All integers other than 0. On System Time and Date displays leading zeroes (**01**, **05**, etc., are treated as insignificant and suppressed).

Single Height Characters — Characters normally appear as eight plot points high. See Double Height Characters.

SMP — Sample; a trend collection mode.

SOE — Sequence of Events. A special logging option on the OIU recording alarms (events) over a configurable period of time (Section IX).

SP — Setpoint; a station value set by user compared to PV during OIU operation.

Special Characters — Set of 64 special characters used in graphic editing that are on the left upper case of certain keys on the auxiliary keyboard (Section VII).

Specs — Specifications; specification data contained in specific NETWORK 90 function codes. The spec data is required for configuring user-configurable function blocks in the various modules used. Specs also known as parameters.

SPTK — Setpoint Tracking; a station operating mode (Section IV).

State — Refers to tag logic state 0 or 1. (A boolean point)

Station — A function code located at a specific block (address) in a NETWORK 90 module. Contains specs determining module operation. Also refers to a station tag and a Station display element of a Group display.

Station Control Block — Keygroup of the OIU fixed keyboard letting the user take control action from any controllable station display element (Sections III and XII).

Station Control Mode — A station can be in LOCAL (Host computer operation) in remote (CNTR) computer operation. This indication appears on the Station Control Block of the fixed keyboard and on the Station display element of the Group display.

Station Operating Mode — A station can be in one of the various station operating modes (AUTO, MAN, CAS, RATIO, MNLK, COTK, or SPTK).

Station Parameter — Refers to the CO, SP, or RI process variable of any station. See process variable.

Status — Another description of State for a boolean or RCM tag.

Status Line — Title line on any graphic template showing direction of cursor movement (> or V), FG and BG colors, the current cursor coordinates, the current BEGIN and END coordinates and the current WIDTH of any line, box, bar, or pipe segment.

STN — Station abbreviation on certain OIU configuration displays.

Suffix Tags — Tags configured to contain suffix values for trending (Section IX).

SUM — Summation; a trend collecting mode.

Supervisory Displays	OIU operational displays (System Status, Node Summary, Module Summary, Read Point Value, etc.).
Symbol Cross Reference	Listing accessed during graphic editing showing the assignment and/or use of any symbol.
Symbol Library	Portion of OIU memory containing predefined and user-defined symbols used for graphic editing.
System Fault	Communication error or hardware fault. The user can check on these by accessing the various supervisory displays. Section XI details acknowledging system alarms.
Tag	Any point in the NETWORK 90 system representing a process or process loop.
Tag Block	The function code block containing the specs in the PCU module for any tag.
Tag History	Trending or archiving for any tag.
Tag Suppression	Refers to suppressing the alarm indication for any tag during OIU operation (Sections IX and XII).
Time Cursor	The cursor (↑) shown on the bottom of any Trend graph. The user can scroll the Time cursor backward and forward to view any period in the trend (tag history) for that tag. See INCR and DECR.
Time Interval	Configured time period for trending (Sections IV and IX).
Title Line	The first (top) line on any OIU display showing the display title, time and date, day, current time, and any system and/or process (Area) alarms.
Toggle	To change the position of any switch or indicator by pressing a pushbutton key on either OIU keyboard.
Trend	Recording of tag activity and changing values over a configurable time interval (Sections IV and IX).
Trend Diskette Directory	Recording of all archived trend data on current loaded diskette in OIU (Sections X and XIII).
Trend Graph	Graph forming part of any Group display showing configured tag history (Section IV).
Trend Log	Logging option letting the user print out log of certain trend data collected over configured time interval.

Trending — Recording tag history over time. See Trend.

TRGT — Indicator on Station and RCM tags configured to show certain set values for manual input when user takes control action from that tag.

TRGT OUT — CO tag input.
TRGT RI — RI tag input.
TRGT SET — SP tag input.

Trip Log — Logging option letting user print out log showing collection of alarm trip points and time occurrences over configured time interval.

TUNE — Refers to Tuning display and to the tuning keyswitch.

Tuning — Changing the parameters of a function code during OIU configuration using either the Tuning or Block Details display.

User-definable — Any data or input information that the user designs for OIU configuration and/or operation as opposed to that predefined in OIU firmware.

Value Format — One of ten possible format pages for designing the appearance of dynamic values used in graphic editing. Format 0 is predefined; the rest are user-definable.

Variable — A changeable data item used in the OIU. See process variable. Can also refer to graphic dynamic items.

Verify — To check existing PCU module configuration (Section V). Also refers to checking items or displays against the previous inputs.

Visible Feedback — Any indicator appearing as a result of inputting information on the OIU.

WIDTH — The thickness of a line, box, bar, or pipe segment set by the user during graphic editing.

Wraparound — Refers to returning to the beginning or ending display page or display page section during page scrolling or page configuration.

Quick Access Guide
A) Process Control

DISPLAY PAGE	TO ACCESS
AREA	PRESS: AREA (1,2,...10) key
AREA (Other pages)	PRESS: PREV/NEXT keys (No wraparound)
GROUP (from Area)	PRESS: Red Access letter
GROUP (from Alarm Summary)	PRESS: Red Access letter
GROUP (from Tag List)	PRESS: TAG ENTER: TAG Name PRESS: Display
GROUP (from any page other than Graphic)	PRESS: GROUP ENTER: Group Name PRESS: DISPLAY PRESS: TAG ENTER: Tag Name PRESS: DISPLAY
GROUP (from Graphic page)	PRESS: GROUP/GRAPHIC
GROUP (Other pages)	PRESS: PREV/NEXT (If next Group has no configured tags, any assigned Graphic displays in its place)
GRAPHIC	PRESS: GROUP/GRAPHIC PRESS: GROUP/GRAPHIC again to access Group to which this Graphic assigned
GRAPHIC (Other pages) (* Depends on the prior keystrokes)	PRESS: PREV/NEXT (Next Group may appear in its place) PRESS: CALL (recalls marked page)* PRESS: LAST (recalls previous page on display)*
GENERAL FUNCTION MENU	PRESS: MENU
READ POINT VALUE	PRESS: MENU PRESS: B
(View Value page)	PRESS: CLEAR and . . . Enter data for each Prompt
(Skip a Prompt)	PRESS: ENTER at that prompt
(Other Prompt page)	PRESS: ESCAPE once
(Back to Menu)	PRESS: ESCAPE twice

Quick Access Guide
B) Supervisory

DISPLAY PAGE	TO ACCESS
ALARM SUMMARY	PRESS: ALARM SUMM
ALARM SUMMARY (Other pages)	PRESS: PREV/NEXT
ALARM SUMMARY (Alarm levels on all pages)	PRESS: ESCAPE ENTER: Level number (0-7) PRESS: ENTER
SYSTEM STATUS	PRESS: STATUS
NODE SUMMARY	PRESS: CLEAR ENTER: Node number (2-63) PRESS: ENTER
NODE SUMMARY (Other Pages) (Back to System)	PRESS: PREV/NEXT PRESS: ESCAPE
MODULE SUMMARY	PRESS: STATUS PRESS: CLEAR ENTER: NODE number (2-63) PRESS: CLEAR ENTER: MODULE number (1-31) PRESS: ENTER
MODULE SUMMARY (Back to Node page)	PRESS: PREV/NEXT PRESS: ESCAPE
TAG LIST MENU	PRESS: TAG LIST
TAG LIST	PRESS: A
SUPPRESSED TAGS	PRESS: D
OPR. SUPPRESSED TAGS	PRESS: F
(other pages)	PRESS: PREV/NEXT
TO PRINT: TAG LIST SUPPRESSED TAGS OPR. SUPPRESSED TAGS	PRESS: B...E...or...G; then — ENTER: Tag #s or A at prompts PRESS: ENTER PRESS: PRINT
RETURN TO TAG LIST MENU	PRESS: ESCAPE (From Suppressed and Operator Suppressed Tags)

Quick Access Guide
B) Supervisory

DISPLAY PAGE	TO ACCESS
TO PRINT: ALARM LIST	PRESS: C ENTER: Alarm Priority Level # PRESS: ENTER PRESS: PRINT
TUNING	Position cursor on controllable, Non-Trend element and ... PRESS: TREND
BLOCK DETAILS	USE PCU CONFIGURATION MENU or Access a GROUP or GRAPHIC page. Position cursor on controllable non-Trend element and ... PRESS: DISPLAY

Appendix A

Quick Control Guide

A) GROUP DISPLAY CURSOR CONTROL	
1) Move cursor: RIGHT/LEFT	PRESS: → / ←
UP/DOWN	↑ / ↓
2) Position cursor to controllable element:	PRESS: One of eight unmarked element keys first time
TOP OF SCREEN	([a] [b] [c] [d])
BOTTOM OF SCREEN	([e] [f] [g] [h]
	PRESS: One of eight unmarked element keys second time
BOTTOM PART/TOP HALF	([a] [b] [c] [d])
BOTTOM PART/BOTTOM HALF	([e] [f] [g] [h])
3) Position cursor to Trend display element:	PRESS: any of eight unmarked element keys
TOP HALF OF SCREEN	([a] [b] [c] [d]
BOTTOM HALF OF SCREEN	([e] [f] [g] [h]
4) Return cursor to HOME:	PRESS: HOME
B) TUNING DISPLAY CURSOR CONTROL	
1) Move cursor between tuning parameters on Block display element:	PRESS: FIELD
2) View additional tuning parameters	
SAME TUNING DISPLAY PAGE	PRESS: FIELD
DIFFERENT DISPLAY PAGE	PRESS PREV or NEXT
3) View different Block Display:	PRESS: ESCAPE ENTER: New Block # PRESS: ENTER
C) RAMPING FROM GROUP DISPLAY (CONTROLLABLE STATION ELEMENT	
1) Ramping Setpoint (SP) or Ratio Index (RI):	
PRESS: ↑ SET ↓	(OR)
Pressure on arrow key produces the following change of span value - - - LIGHT = 2%; HEAVY = 20% CONTINUOUS = a constant 2% (light) or 20% (heavy)	PRESS: SET PRESS: CLEAR ENTER: New SP or RI Value PRESS: ENTER

Quick Control Guide

C) RAMPING FROM GROUP DISPLAY (Continued)	
2) Ramping Control Output (CO):	
PRESS: ← OUT →	(OR)
Pressure on arrow key produces the following change of span value - - - LIGHT = 2%; HEAVY = 20% CONTINUOUS = a constant 2% (light) or 20% (heavy)	PRESS: OUT PRESS: CLEAR ENTER: New CO Value PRESS ENTER.
D) CHANGE STATION OPERATING MODE	
1) Enter CNTR Mode:	PRESS: LCL/CMPTR key
2) ENTER LCL Mode:	PRESS: LCL/CMPTR key
E) CHANGE STATION OPERATING MODE	
1) Enter MANUAL Mode:	PRESS: LCL/CMPTR key (If station not in Local) PRESS: MAN/AUTO KEY
2) Enter AUTO Mode:	PRESS: LCL/CMPTR key (if station not in local) PRESS: MAN/AUTO Key (if station not in manual) PRES: MAN/AUTO key twice (if station in CAS or RATIO) OR PRESS: CAS or RATIO once (to leave and enter AUTO)
3) Enter CAS Mode:	PRESS: LCL/CMPTR key (if station not in local) PRESS: CAS key once PRESS: CAS key twice (to return to AUTO mode)
4) Enter RATIO Mode:	PRESS: LCL/CMPTR key (if station not in local) PRESS: RATIO key once PRESS: RATIO key twice (to return to AUTO mode)

Quick Control Guide

F) RCM ELEMENT	
1) Change RCM switch position: IF INDICATOR IS ■ IF INDICATOR IS □	 PRESS: □ key PRESS: ■ key
2) Change Device Driver Mode: Change device Change device position as for RCM element above	PRESS: MAN/AUTO key
3) Change RMSC real value:	PRESS: SET ENTER: New Value PRESS: ENTER
(To erase an invalid entry —	PRESS: CLEAR)
	OR PRESS; ↑ SET ↓ (To ramp the RMSC value uo or down)
G) CONTROL GRAPHIC ELEMENT	
1) Access Controllable element:	ENTER: Control Select Number (If error, press: ESCAPE and re-enter proper number) PRESS: ENTER
2) Control Graphic Element; Station element . . . . RCM Element	 SEE SECTIONS C,D, & E SEE SECTION F
3) Scroll or Access another display:	SEE APPENDIX A
4) Leave Control Box:	SEE APPENDIX A
H) CONTROL BLOCK SPECIFICATION TUNING A BLOCK*	
(General Function Menu)	PRESS: H
SEE SECTION B AND ENTER: new specification parameter PRESS: ENTER after done entering (editing) each new tuning parameter	

*Refer also to Section V (NETWORK 90 System Configuration) in manual and to APPENDIX G (QUICK PCU CONFIGURATION GUIDE)

Quick Control Guide

I) SUPPRESSING TAGS		
(General Function Menu)		PRESS: H
1) Access tag for alarm suppression		
	USING TAG number:	ENTER: tag number PRESS: ENTER (OIU fills in tag name)
(OR)	USING TAG name:	PRESS: FIELD ENTER: tag name PRESS: ENTER (OIU fills in tag number)
(OR)	USING BOTH:	ENTER: tag number PRESS: FIELD ENTER: tag name PRESS: ENTER
2) Suppressing alarms for tag - -		
a) If operator suppression permitted for this tag (OPERATOR SUPPRESSION PERMITTED = YES):		
(To suppress this tag, enter YES in its OPERATOR SUPPRESSION input field. Otherwise, do step d.)		ENTER: YES PRESS: ENTER (go to step d)
b) If operator suppression NOT permitted for this tag (OPERATOR SUPPRESSION PERMITTED = NO):		
(To try to suppress this tag, move to the OPERATOR SUPPRESION PERMITTED input field and enter YES.)		PRESS: FIELD ENTER: YES (wait for any error message)
(If no error message results, move back to OPERATOR SUPPRESSION input field and enter YES.)		PRESS: FIELD ENTER: YES PRESS: ENTER (go to step d)
Otherwise, do step d.)		
c) To remove alarm suppression from a tag already under suppression (both tag input fields = YES):		
(Enter NO in the OPERATOR SUPPRESSION input field.)		ENTER: NO PRESS: ENTER

Quick Control Guide

I) SUPPRESSING TAGS (continued)	
d) Two continue suppressing tags (If done or you have no more tags to suppress, go to step e.):	
(Move to the tag access field desired and perform step 1 for the next tag.)	PRESS: FIELD [DO STEP ONE AGAIN]
(Move to the tag suppression field(s) necessary and perform steps 2a, 2b, or 2c for this tag.)	PRESS: FIELD [DO STEP ONE AGAIN]
(Move to the tag suppression field(s) necessary and perform steps 2a, 2b, or 2c for this tag	PRESS: FIELD [DO STEP 2A, 2B, OR 2C]
(If done, do step e; otherwise repeat step d.)	(repeat step d or go to step e)
e) Return to the General Function Menu —	PRESS: ESCAPE
J) PRINT HARDCOPY OF DISPLAY	
PRESS: PRINT key (SEE ALSO APPENDICES E and F)	

Appendix B

Quick Alarming Guide

ALARM	TO ACKNOWLEDGE
SYSTEM (Non-PCU module fault)	Accces SYSTEM STATUS page PRESS: ACK (Inform Maintenance)
SYSTEM (PCU module fault)	Access SYSTEM STATUS page Identify faulty Node Number PRESS: CLEAR ENTER: Faulty Node NUMBER PRESS: ACK when NODE SUMMARY page appears (Inform Maintenance)
PROCESS (and BAD QUALITY)*	STEP 1) Access AREA page PRESS: ACK OR STEP 2) Access GROUP page (from AREA page) PRESS: ACK key OR STEP 3) Access ALARM SUMMARY Perform STEP 1 and 2 Return to ALARM SUMMARY page (Take corrective action)
NODE STATUS ERROR (O, M, C, S) M = Non-PCU error	Access SYSTEM STATUS page PRESS: ACK (Inform Maintenance)
MODULE TYPE ERROR (*)	PRESS: MENU PRESS: D (OIU CONFIGURATION MENU) PRESS H (DEFINE PROCESS CONTROL UNIT ENTER: Corrected Module Type RESTART THE OIU (Inform Maintenance)
MODULE STATUS ERROR (M) (Here M = PCU error)	Access SYSTEM STATUS page Identify Faulty Node NUMBER PRESS: CLEAR ENTER: Faulty Node NUMBER PRESS: ACK when NODE SUMMARY page appears (Infor Maintenance)

*If alarm appears when screen cursor currently at Group or Graphic page display element, simply press the **ACK** key to acknowledge the alarm. Otherwise, follow the steps listed above. Notice that this is a corrective action, not an alarm acknowledgement.

Appendix C

Quick Trending Guide

A) CONTROL TREND ELEMENT
1 ACCESS GROUP DISPLAY PAGE: SEE APPENDIX A
2) ACCESS CONTROLLABLE TREND DISPLAY ELEMENT: SEE APPENDIX B.3
3) CHANGE TREND TIME INTERVAL: INCREASE INTERVAL . . . . . PRESS: ZOOM UP ↑ DECREASE INTERVAL . . . . . PRESS: ZOOM DOWN ↓
4) SCROLL TREND TIME INTERVAL:
Page anywhere through trend Graph (To pinpoint time/value on the graphs)
From current to previous time . . . . PRESS: DECR From previous to current time . . . . PRESS: INCR
Pressure on keys causes following changes of span: LIGHT . . . . . 2% HEAVY . . . . . 20% CONTINUOUS . . a constant 2% (light) or a constant 20% (heavy)
Page through half of current graph recording period
From current to previous time . . . PRESS: PAGE LEFT ← From previous to current time . . . PRESS: PAGE RIGHT →
You can only scroll with the paging keys as above when the current Time Interval is either 2 or 8 hours

Appendix D

Quick Logging Guide

A) PRINT LOGS ON DEMAND*	
1) ACCESS LOG STATUS DISPLAY	PRESS: MENU ENTER: G PRESS: ENTER
2) USED TREND LOG: Move Cursor to DEMAND or CANCEL . . . . . . Print Trend Log . . . . . . Cancel Trend Log	PRESS: A (Log Status) PRESS: SECT ENTER Log # (1 - 50) PRESS: ENTER ENTER: Log # (1 - 50)
3) USE TRIP LOG: Move Cursor to DEMAND or CANCEL . . . . . . Print Trio Log . . . . . . Cancel Trip Log	PRESS: B (Log Status) PRESS: SECT ENTER: Log # (1 - 50) PRESS: ENTER ENTER: Log # (1 - 50) PRESS: ENTER
4) USE PERIODIC LOG: Move cursor to DEMAND or CANCEL . . . . . . Print Periodic Log . . . . . . Cancel Periodic Log	PRESS: C (Log Status) PRESS: SECT ENTER: Log # (1 - 30) PRESS: ENTER ENTER: Log # (1 - 30)
5) SCROLL THROUGH LOG PAGES . . .	PRESS: PREV or NEXT
6) RETURN TO LOG STATUS MENU . . .	PRESS: ESCAPE once or PRESS: ESCAPE twice (COMMAND? on CRT) or ENTER: M PRESS: ENTER (COMMAND?) on CRT
7) GO TO THE GENERAL FUNCTION MENU:	PRESS: MENU

*For printing of the Event Log, see Section IV of the manual and Appendix K.

Appendix E

Quick Archiving Guide

A) Performing Archiving	
1) Access Archival Storage Menu:	PRESS: MENU ENTER: F PRESS: ENTER
2) STORE TREND DATA:	ENTER: A (Archiving) PRESS: ENTER INSERT FLOPPY INTO DISKETTE DRIVE ENTER: Diskette Volume Name PRESS: ENTER
If error message displays, remove floppy and replace it with the correct floppy. Then . . .	ENTER: Diskette Volume Name PRESS: ENTER
For next (or new) diskette to receive additional trend data, remove current floppy and replace it with next or new floppy. Then enter its diskette volume name and press ENTER.	
3) RETRIEVE TREND DATA:	INSERT FLOPPY INTO DISKETTE DRIVE ENTER: B (Archiving) PRESS: ENTER ENTER: Diskette Volume Name
If error message displays, remove floppy and replace it with correct floppy. Then . . .	ENTER: Diskette Volume Name PRESS: ENTER
Move cursor between input fields and between lines . . .	PRESS: FIELD
Move cursor between boxes . . .	PRESS: SECT
Enter each trend input item per line per definition box (tag name, trend type, collection mode, span values)	
To put information into the OIU:	PRESS: ENTER when you finish defining
4) DISPLAY TREND DATA:	ENTER: C (Archiving) INSERT FLOPPY INTO DISKETTE DRIVE PRESS: ENTER.
To position the cursor to an element and scroll through the trend graphs, see APPENDIX B and D.	

Quick Archiving Guide

5) DISPLAY TREND DIRECTORY	INSERT FLOPPY INTO DISKETTE DRIVE ENTER: D (Archiving) PRESS: ENTER
To scroll through the directory	PRESS: PREV or NEXT
6) PRINT TREND DATA	INSER FLOPPY INTO DISKETTE DRIVE ENTER E (Archiving) PRESS: ENTER ENTER: Diskette Volume Name
To move cursor from field to field:	PRESS: FIELD
To move cursor from line to line:	PRESS: SECT
Enter each trend input, item per line for up to 12 trends (tag name, trend type, and collection mode)	
To print out the trend data:	PRESS: ENTER when you finish defining
7) PRINT TREND DIRECTORY:	INSERT FLOPPY INTO DISKETTE DRIVE ENTER: F (Archiving) PRESS: ENTER
8) STORE EVENT DATA:	INSERT FLOPPY INTO DISKETTE DRIVE ENTER: G (Archiving) PRESS: ENTER ENTER Diskette Volume Name PRESS: ENTER
If error message displays, see procedure under 1) above.	
If more diskettes are necessary, see procedure under 1).	
9) DISPLAY EVENT DATA	INSERT FLOPPY INTO DISKETTE DRIVE ENTER: H (Archiving) PRESS: ENTER
If error message displays, remove diskette and replace it with the proper diskette and then press ENTER. Or redo function 8 above (in case diskette has no archived event data) and then proceed with function 9.	

NOTE: The Event Log prints event data. (See APPENDIX K.)

Quick Archiving Guide

9) Displaying Event Data (continued)	
9A) To display archive number 1:	PRESS: ENTER (Go to 9B)
To display different archive: (Enter number in range of those listed on Menu page)	PRESS: CLEAR ENTER: archive number desired PRESS: ENTER
9B) To move cursor to the DATE/TIME section:	PRESS: SECT
9C) Accept Date/Time shown: - OR-	PRESS: SECT (Go to 9E)
9D) Change Date/Time shown — 1) Move cursor among fields: 2) Change field data: (MONTH field = 3 letters; all other fields = 2 digits)	 PRESS: FIELD PRESS: CLEAR ENTER: 2-digit or 3-letter value
3) Move cursor to next field:	PRESS: FIELD
Repeat Step 9D.2 for all fields you want to change. When done, proceed to event data sections.	
9E) Choose event to display for current archive — 1) Move cursor to event section:	PRESS: SECT
(Move cursor among event sections by pressing SECT.)	
2) Choose event to display:	PRESS: CLEAR ENTER: Y (to display) - or - ENTER: N (to remove)
Repeat 9E.2 for all events you want to add to display (or remove from display). Entering N for any event removes it from display. Remember, you must always have AT LEAST ONE event in any display. To leave any event field as is, just press SECT to skip by it. When done selecting events, move cursor back to the archive number section. (Press SECT until cursor returns to archive number section.)	
Another way of choosing specific sections on the Menu page is to press ESCAPE to put COMMAND ? at bottom of CRT. Then enter the number (1 - 8) of the event choice desired. Change the field status (Y or N) and then press ESCAPE again for next command. Or press SECT to return to the archive number section.	

Quick Archiving Guide

9) Displaying Event Data (continued)	
9F) Display events for this archive:	PRESS: ENTER
View other event pages:	PRESS: PREV or NEXT
Return to Archival Event Menu Display after viewing a page.	PRESS: ESCAPE once
Return to Archival Storage Menu	Press: ESCAPE twice - or - ENTER: M PRESS: ENTER

Quick PCU Configuration Guide

Configuring PCU Modules (continued)	
1) ACCESSING THE PCU CONFIGURATION MENU:	
(General Function Menu)	PRESS: MENU UNLOCK CONF Keyswitch
(PCU Configuration Menu)	
2) CHANGING MODULE MODE:	
(Change Mode of Module)	PRESS: E
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE #
	PRESS: ENTER
A) To put module into the configure mode — (To initialize a new module; else press: ENTER as at bottom)*	PRESS: CLEAR ENTER: C (CONFIGURE)
	PRESS: CLEAR ENTER: I (INITIALIZE)
B) To put module into the execute mode	PRESS: CLEAR ENTER: E (EXECUTE)
	PRESS: ENTER PRESS: ESCAPE
(Only if configuration done)	LOCK CONF Keyswitch
*Enter I after entering C ONLY IF adding new module, if performing initial OIU startup, or if restoring module configuration from floppy. Else press: ENTER and ESCAPE.	
3) MODIFYING MODULE CONFIGURATION:	

Quick PCU Configuration Guide

A) Adding new PCU module block —	
	(Change module mode to C — See function 2 above)
(Modify Module Conf.)	PRESS: D PRESS: CLEAR ENTER: A (ADD) PRESS: ENTER
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: :FIELD PRESS: CLEAR ENTER: MODULE # PRESS: FIELD PRESS: CLEAR ENTER: BLOCK # PRESS: ENTER
A1) To add new module block	PRESS: CLEAR ENTER: FUNCTION CODE* PRESS: ENTER PRESS: ENTER again (and perform the steps under A2 below)
To abort the function — (Returns to PCU menu)	PRESS: ESCAPE
A2) Repeat these steps for all parameters you want to enter	PRESS: CLEAR ENTER: New Spec value PRESS: FIELD PRESS: ENTER
(If blocks are in numeric sequence)	(PRESS: PREV or NEXT and repeat steps under A1 above; else do the steps under A3 below)

Quick PCU Configuration Guide

Adding new Module block (continued)	
A3) When done changing all parameters	PRESS: ENTER
(Put module back into execute mode when done adding all blocks)	(Change module mode to E - See function 2)
(Return to PCU menu for more additions or when done adding)	PRESS: ESCAPE
*There can be more than one block per module but only one function code per block. A station element (Function Code 21) occupies the block of placement and the next five consecutive blocks. Other elements occupy only one block.	
B) Modifying existing PCU module block (configure)	
	(Change module mode to C - See function 2)
(Modify Module Conf.)	PRESS: D PRESS: CLEAR ENTER: M (MODIFY) PRESS: ENTER
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: FIELD PRESS: CLEAR ENTER: BLOCK # PRESS: ENTER
B1) Repeat these steps for all Spec values you want to enter	PRESS: CLEAR ENTER: New Spec Value PRESS: FIELD PRESS: ENTER
(If blocks are in numeric sequence)	(PRESS: PREV or NEXT and repeat steps under B1 above; else do the steps under B2 below)

Quick PCU Configuration Guide

Modifying Module block (continued)	
B2) When done changing all parameters	PRESS: ENTER
(Return to PCU menu for more modifications or when done modifying	PRESS: ESCAPE
(Put module back into execute mode when done modifying all blocks)	(Change module mode to E - See function 2)
C) Modifying existing PCU module block (tune)	
	LOCK CONF Keyswitch UNLOCK TUNE Keyswitch (Change module mode to E - see Function 2)
(Modify Module Conf.)	PRESS: D PRESS: CLEAR ENTER: M (MODIFY) PRESS: ENTER
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: FIELD PRESS: CLEAR ENTER: BLOCK #
	PRESS: ENTER
(Repeat these steps for all parameters you want to tune (enter)	PRESS: CLEAR ENTER: New Spec value PRESS: ENTER* PRESS: FIELD
*When done tuning the block press: ESCAPE; else press: FIELD to move to the next tunable parameter and continue tuning.	
(Return to PCU menu only if tuning complete; else repeat function 3C Ifor all blocks to tune)	PRESS: ESCAPE LOCK TUNE Keyswitch

Quick PCU Configuration Guide

D) Deleting existing module block	
	(Change module mode to C - See function 2)
(Modify Module Conf.)	PRESS: D PRESS: CLEAR ENTER: D (DELETE) PRESS: ENTER
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: FIELD PRESS: CLEAR ENTER: BLOCK # PRESS: ENTER
To delete module block OR To abort the function	PRESS: ENTER again and perform Step D1 below PRESS: ESCAPE (Returns to the PCU menu)
D1) After operation complete, return to the PCU menu for more deletions, or when done deleting)	PRESS: ESCAPE
(Put module back into execute mode when done deleting)	(Change module mode to E - See function 2)
4) SAVING MODULE CONFIGURATION ON DISKETTE:	
(Saving Module) (module can be in C or E mode)	UNLOCK CONF Keyswitch PRESS: A INSERT initialized, named Diskette into Diskette Drive
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRES: CLEAR ENTER: MODLE # PRESS: ENTER

Quick PCU Configuration Guide

(Enter diskette name or press: ENTER if existing name OK.)	PRESS: CLEAR ENTER: DISKETTE Volume Name (If No Error Displays) PRESS: ENTER
(To abort the operation)	PRESS: ESCAPE
After operation completes:	REMOVE (and STORE) DISKETTE
5) RESTORING MODULE CONFIGURATION FROM DISKETTE:	
(Enter new hardware address or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: ENTER
(Enter Diskette name or press: ENTER if existing name OK.)	PRESS: CLEAR ENTER: DISKETTE Volume Name (If No Error Displays) PRESS: ENTER
(To abort operation)	PRESS: ESCAPE
After operation completes:	REMOVE (and STORE) DISKETTE
(To return to PCU menu for more restoring or when done restoring)	PRESS: ESCAPE
(Put module back into execute mode)	(Change module mode to LE - See function 2)
(If all PCU configuration is finished)	LOCK CONF keyswitch
6) VERIFYING MODULE CONFIGURATION AGAINST DISKETTE:	
(Verifying module) (Module can be in C or E mode)	UNLOCK CONF keyswitch INSERT Proper Diskette into Diskette drive PRESS: C

Quick PCU Configuration Guide

Verifying Module Configuration Against Diskette (continued)	
(Enter new hardware addresses or skip through and press ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE #
(Enter diskette name or press; ENTER if existing name OK.)	PRESS: CLEAR ENTER: DISKETTE Volume Name (If No Error Displays) PRESS: ENTER
(To abort operation)	PRESS: ESCAPE
After operation completes:	REMOVE (and STORE) DISKETTE
(To return PCU menu for more verifying or when done verifying)	PRESS: ESCAPE
(If all PCU configuration is finished)	LOCK CONF Keyswitch
7) LISTING MODULE CONFIGURATION:	
(Listing configuration) (Module can be in C or E mode)	UNLOCK CONF Keyswitch PRESS: F
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE #
(To get printout of one module block)	PRESS: ENTER
(To get listing of ALL active module blocks in PCU)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: A

Quick PCU Configuration Guide

(To abort operation) before listing is done)	PRESS: ESCAPE
After operation completes:	PRESS: ESCAPE
(If all PCU configuration is finished)	LOCK CONF keyswitch
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: ENTER
(Enter diskette name or press: ENTER if existing name OK.)	PRESS: CLEAR ENTER: DISKETTE Volume Name (If No Error Displays) PRESS: ENTER
(To abort the operation)	PRESS: ESCAPE
After operation completes:	REMOVE (and STORE) DISKETTE
8) MODIFYING RED TAG STATUS:	
	UNLOCK CONF Keyswitch (Change module mode to E - See function 2)
(Modify Red Tag)	PRESS: G
(Enter new hardware addresses or skip through and press: ENTER if existing addresses are OK.)	PRESS: CLEAR ENTER: PCU # PRESS: FIELD PRESS: CLEAR ENTER: MODULE # PRESS: FIELD PRESS: CLEAR ENTER: BLOCK # PRESS: ENTER

Quick PCU Configuration Guide

Adding Red Tag Status (1, 2, or 3 letters) (1, 2, or 3 letters) (1, 2, or 3 letters)	PRESS: CLEAR ENTER: Key Value #1 PRESS: FIELD ENTER: Key Value #2 PRESS: FIELD PRESS: CLEAR ENTER: Key Value #3
	PRESS: ENTER PRESS: ENTER again (to add Red Tag Status to the point, then perform the Steps under R1 below) _____ OR _____ PRESS: ESCAPE (To abort the function and return to the PCU menu)
Removing Red Tag Status	PRESS: CLEAR PRESS: FIELD PRESS: CLEAR PRESS: FIELD PRESS: CLEAR
	PRESS: ENTER PRESS: ENTER again (To remove Red Tag Status from the point; then perform the Steps under R1 below) _____ OR _____ PRESS: ESCAPE (To abort the function and return to the PCU menu)
R1) To return to the PCU menu for more Red Tag operations or when done all Red Tag Operations or	PRESS: ESCAPE
MODIFYING RED TAG STATUS (continued)	
(If all PCU configuration is finished)	LOCK CONF Keyswitch
Each Key Value field can contain up to 3 alphabetic characters. You can add Red Tag Status to any point by entering a minimum of a single alphabetic character in any one Key Value field (leaving the remaining fields blank) if desired.	
9) DISKETTE ERROR OPERATIONS: (Functions 4, 5, and 6)	

Quick PCU Configuration Guide

A) When entering new Diskette Volume Name and the following error message appears on the CRT:

VOLUME NAME NOT FOUND

Remove diskette and replace it with the one having the proper volume name. Go back and re-enter the correct volume name. Then press: ENTER again.

B) When saving-module-configuration-to-diskette operation is in progress and the following error message appears on the CRT:

DISKETTE FILLED

Removing (and store) the diskette and replace it with another properly initialized diskette. Press: ENTER again and rest of data transfer continues, saving the remaining data on the subsequent diskette.

C) When restoring operation is in progress and the following error message appears on the CRT:

NO MODULE DATA ON DISKETTE

Remove diskette and replace it with a proper diskette containing module configuration data. Press: ENTER again to restart the operation.

10) ABORTING THE OPERATION: (FUNCTIONS 4, 5, and 6)

To ABORT the function, press: ESCAPE. The message:

OPERATION ABORTED

appears on the CRT. Remove and replace the Diskette

OR

Perform some other PCU configuration function.

Quick OIU Configuration Guide

CONFIGURING THE OIU	
1) ACCESSING THE OIU CONFIGURATION MENU:	
(General Function Menu) (OIU Configuration Menu	PRESS: MENU UNLOCK CONF Keyswitch PRESS: D
2) DEFINING LOGIC STATE DESCRIPTORS:	
(OIU Configuration Menu) [User-definable LSDs, only]	PRESS: A ENTER: desired LSD in first LSD field PRESS: ENTER PRESS: SECT
Go through LSD fields sequentially	2a) ENTER: desired LSD in next LSD field 2b) PRESS: ENTER 2c) PRESS: SECT
Repeat steps 2a to 2c for all LSDs you want to define. Skip any LSD field (leave it blank) by pressing SECT and return to step 2a. When done see below.	
Go to a specific LSD field (Proceed from step 2a)	PRESS: ESCAPE ENTER: number of LSD field desired in prompt PRESS: ENTER
Return to OIU Configuration Menu	PRESS: ESCAPE ENTER: M into COMMAND prompt PRESS: ENTER or PRESS: ESCAPE twice
If all OIU configuration done, LOCK CONF keyswitch and remove its key. Otherwise, proceed to next function.	
3) DEFINING ENGINEERING UNITS:	
(OIU Configuration Menu)	PRESS: B ENTER: desired EU in first field PRESS: ENTER PRESS: SECT
Go through EU fields sequentially	3a) ENTER: desired EU in next EU field 3b) PRESS: ENTER 3c) PRESS: SECT

Quick OIU Configuration Guide

3) Defining Engineering Units (continued)	
Repeat steps 3a to 3c for all EUs you want to define. Skip any EU field (leave it blank) by pressing SECT and return to step 3a. When done see next page.	
3) Defining Engineering Units (continued)	
Go to a specific EU field (Proceed from step 3a)	PRESS: ESCAPE ENTER: number of EU field desired in prompt PRESS: ENTER
Return to OIU Configuration Menu	PRESS: ESCSAPE ENTER: M in COMMAND prompt PRESS: ENTER or PRESS: ESCAPE twice
If all OIU configuration done, LOCK CONF keyswitch and remove its key. Otherwise, proceed to next function.	
4) DEFINING TAGS:	
(OIU Configuration Menu)	PRESS: C
(Access Define Tags Display for specific defined tag — —)	
Using tag Name: Using tag NUMBER: Using BOTH:	ENTER: name of tag in NAME Prompt PRESS: ENTER or PRESS: FIELD ENTER: number of tag in NUMBER prompt PRESS: ENTER or ENTER: name of tag in NAME prompt PRESS: FIELD ENTER: Number of tag in NUMBER PROMPT PRESS: ENTER
(Access Define Tags Display (no defined tags)	
To position cursor at top tag number on first page	PRESS: FIELD PRESS: ENTER or
To position cursor at other tag number on first page	PRESS: FIELD ENTER: tag number PRESS: ENTER

Quick OIU Configuration Guide

4) Defining Tags (continued):	
4a) To position cursor at desired tag definition line —	PRESS: SECT or PRESS: ESCAPE ENTER: number of tag in prompt PRESS: ENTER
(Define tags on page —— work through tag definition line)	
	PRESS: FIELD ENTER: tag name PRESS: FIELD ENTER: 1st tag descriptor PRESS: FIELD
(If desired, skip the 2nd tag descriptor and move to the PCU input field)	ENTER: 2nd tag descriptor and any multiplier PRESS: FIELD
(Enter hardware addresses of module block containing this tag)	ENTER: PCU addres PRESS: FIELD ENTER: Module address PRESS: FIELD ENTER: Block address PRESS: FIELD ENTER: tag type PRESS: FIELD ENTER: AUTO or MAN
(If entering AUTO, move to the Group input field) (If entering MAN, move down and enter AREA numberes in which you want tag to alarm. Then move to Group input field)	PRESS: FIELD
	ENTER: Group name
(Enter Group Name)	PRESS: FIELD or PRESS: FIELD
(Enter Group Number)	ENTER: Group number PRESS: FIELD or ENTER: GROUP name
(Enter BOTH)	PRESS: FIELD ENTER: Group number PRESS: FIELD

Quick OIU Configuration Guide

4) Defining Tags (continued)	
(If tag not Station, Real, or Manual and OIU does not display a predefined)	ENTER: your EU PRESS: FIELD (cursor moves to priority level field)
(If tag not one of above types and OIU displays predefined LSD for ONE and then ZERO state)	PRESS: FIELD (cursor moves to priority level field)
(If OIU does not display pre-defined LSDs)	ENTER: your LSD for state ONE PRESS: FIELD
	ENTER: your LSD for state ZERO PRESS: FIELD
	ENTER: priority alarm level PRESS: FIELD
(To include this tag on any Event Log)	ENTER: YES in status change field*
(otherwise)	PRESS: FIELD
(To suppress alarm indication for current tag)	ENTER: alarm suppression tag name*
(otherwise)	PRESS: FIELD
(To suppress alarm indication on CRT for current tag)	ENTER: YES in alarm suppression field*
(otherwise)	PRESS: FIELD
(To allow operator suppression of alarm indication for current tag)	ENTER: YES in operator suppression field* PRESS: ENTER
(otherwise)	PRESS: ENTER
*If current tag is DEV, insert these steps under each field so marked above; otherwise go to next tag definition line or return to OIU Configuration Menu (See next page).	
(add FB#1 — 0 LSD under Status Change field)	ENTER: LSD PRESS: FIELD or PRESS: FIELD
(go to Process Suppress field)	
(add FB#1 - 1 under Process Suppress Tag field)	ENTER: LSD PRESS: FIELD or PRESS: FIELD
(go to Alarm Suppress Field)	ENTER: LSD PRESS: FIELD or PRESS: FIELD

Quick OIU Configuration Guide

4) Defining Tags (continued) ——	
(go to Operator Suppress field)	ENTER: LSD
(add FB#2 - 2 under Operator Suppress field)	PRESS: ENTER or PRESS: ENTER
If not done defining tags ——	Return to step 4a or
To scroll to another page ——	PRESS: PREV or NEXT Return to step 4a or Return to OIU Configuration Menu
If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	
5) DEFINING TRENDS:	
(OIU Configuration Menu)	PRESS: D
5a) Enter hardware addresses of Module containing this trend	ENTER: PCU address PRESS: FIELD ENTER: Module address PRESS: FIELD ENTER: Block address PRESS: FIELD
(Tag associated with this trend)	ENTER: tag name PRESS: FIELD
(Real tag must be 'R') (Boolean tag must be 'D')	ENTER: trend type PRESS: FIELD
(Boolean trend must have 'SMP')	ENTER: collection mode PRESS: FIELD
(To archive this trend)	ENTER: Y in archive field PRESS: ENTER
(otherwise)	PRESS: ENTER
If not done defining all trends ——	
(go to next trend)	PRESS: SECT and proceed from 5a
(go to specific trend)	or PRESS: ESCAPE ENTER: trend number in prompt PRESS: ENTER
(scroll to other page)	or PRESS: PREV or NEXT (Return to step 5a)
If done defining all trends ——	Return to OIU Configuration Menu
If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	

Quick OIU Configuration Guide

6) DEFINING GROUPS:	
(OIU Configuration Menu)	PRESS: E
(Access Define Groups Display for specific defined group ——)	
Using group NAME:	ENTER: name of group in NAME prompt PRESS: ENTER OR PRESS: FIELD
Using group NUMBER	ENTER: number of group in NUMBER prompt PRESS: ENTER or ENTER: name of group in NAME prompt
Using BOTH:	PRESS: FIELD ENTER: number of group in NUMBER prompt PRESS: ENTER
(Access Define Groups Display (not defined groups) ——	
To position cursor at top section of first page	PRESS: FIELD PRESS: ENTER or
To position cursor at top section of other page	PRESS: FIELD ENTER: group number PRESS: ENTER
6a) Define groups on page —— work through first section —	
	ENTER: group name PRESS: ENTER PRESS: FIELD
(If you want to have a group descriptor)	ENTER: group descriptor PRESS: ENTER PRESS: FIELD or
(otherwise)	PRESS: FIELD
(To allow monitoring only) (You must enter Y for a Basic group)	ENTER: Y in MONITOR PRESS: ENTER PRESS: FIELD or
(To allow controlling, as well)	PRESS: FIELD
(To assign a graphic to this group using Graphic Editor)	ENTER: Y in GRAPHIC PRESS: ENTER PRESS: SECT or
(otherwise)	PRESS: SECT

Quick OIU Configuration Guide

6) Defining Groups (continued):	
6b) work through section 2 to 17 —— rest of group page)	
(If type is P, or M)	ENTER: group type PRESS: FIELD ENTER: tag name PRESS: ENTER (see 6c)
(If type is ' ' empty)	PRESS: FIELD PRESS ENTER (see 6c)
(If type is S)	ENTER: group type (wait for page update) PRESS: FIELD ENTER: tag name PRESS: ENTER (see 6c)
(If type is T) (30 MINS applicable only for fast trending) (If trend type is Boolean (digital), skip the scaling span fields and return to 6b1 as appropriate)	ENTER: group type (wait for page update) PRESS: FIELD ENTER: display interval PRESS: FIELD 6b1) ENTER: tag name PRESS: FIELD ENTER: trend type PRESS: FIELD ENTER: collection mode PRESS: FIELD ENTER: ZERO value PRESS: FIELD 6b2) ENTER: SPAN value
To use module default scaling values, skip the scaling span entries and return to 6b1 as appropriate	
(If adding more trends) (If not adding more trends)	PRESS: FIELD Repeat steps 6b1 - 6b2 for each new trend PRESS: ENTER when done PRESS: ENTER (see 6c)
(If type is B)	ENTER: group type PRESS: ENTER (wait for page update) ENTER: program name
6c) When done defining a group section [If section was P, M, or empty, cursor goes to next box] [If section was S, cursor moves to box 4, etc.] if section was T, cursor moves to box 10, etc] [If section was B, cursor moves to section 1 of next page]	PRESS: SECT repeat 6b for each new section

Quick OIU Configuration Guide

6) DEFINING GROUPS (continued):	
(access subsequent group page)	PRESS: PREV or NEXT
6d) To convert a defined group page to an empty group	
(position cursor to section 1 group name field)	PRESS: FIELD PRESS: CLEAR PRESS: ENTER access subsequent page
6e) To convert a defined group element to an empty element	
(position cursor to section box TYPE field)	PRESS: CLEAR PRESS: ENTER PRESS: SECT or access subsequent page
If done defining all groups, return to OIU Configuration menu. If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise proceed to next function.	
7) DEFINING AREAS:	
(OIU Configuration Menu)	PRESS: F
(Access Define Areas Display for specific defined area)	
	ENTER: area number
(Access Define Areas Display (no defined areas) ——)	
To access first page of display To access other page of display	PRESS: ENTER PRESS: area number PRESS: ENTER
(Define areas on page — work through one page)	
(PRIMARY GROUPS) (If desired, skip any tag name entry by just pressing FIELD to go to the next one. Or press SECT to go to next group when done entering tag names or values desired in current group.)	7a) ENTER: group name PRESS: FIELD ENTER: 1st tag name PRESS: FIELD ENTER: 2nd tag name PRESS: FIELD ENTER: 3rd tag name PRESS FIELD ENTER 4th tag name PRESS: FIELD

Quick OIU Configuration Guide

7) DEFINING AREAS (continued):	
	ENTER: 5th tag name or - v - PRESS: FIELD ENTER: 6th tag name or - v - PRESS: FIELD ENTER: 7th tag name or - v - PRESS: FIELD ENTER: 8th tag name or - v -
(To go to next group)	7b) PRESS: ENTER PRESS: SECT Repeat steps 7a - 7b for all necessary entries in group
(SECONDARY GROUPS) (Skip groups by pressing SECT)	PRESS: SECT (from group L) ENTER: group name PRESS: ENTER PRESS: SECT (to go to next group)
If you have no secondary groups for this area, access subsequent area page. If done entering for groups on current area page, access subsequent page	
	PRESS: PREV or NEXT or PRESS: ESCAPE ENTER: new area page number in prompt PRESS: ENTER
If done defining all areas, return to OIU Configuration Menu.	
If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	
8) DEFINING SYSTEM NODES:	
(OIU Configuration Menu) (position cursor to desired node number)	PRESS: G PRESS: SECT 8a) or PRESS: ESCAPE ENTER: node number PRESS: ENTER

Quick OIU Configuration Guide

8) DEFINING SYSTEM NODES (continued)	
	8b) ENTER: node type (for empty, just press SECT) Repeat steps 8a and for each node you want to define
When done, return to OIU Configuration Menu. If all OIU configuration done, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	
9) DEFINING PROCESS CONTROL UNIT:	
(OIU Configuration Menu)	PRESS: H
(Access Define PCU Display)	
(Access first PCU page) (Access specific PCU page	PRESS: ENTER or ENTER: PCU number in prompt PRESS ENTER
(To name/describe this PCU) (Otherwise)	ENTER: PCU name/descriptor in 32 field PRESS: SECT and go to 9a PRESS: SECT
(position cursor to desired module number	
	PRESS: SECT 9a or PRESS: ESCAPE ENTER: module number in prompt PRESS: ENTER 9b ENTER: module name (for empty, just press SECT) PRESS: ENTER Repeat steps 9a and 9b for each module you want to define on this page
(To rename this PCU)	PRESS: ESCAPE ENTER: 32 PRESS: ENTER PRESS: CLEAR ENTER: new PCU name or descriptor PRESS: ENTER Proceed to step 9a or access subsequent PCU page

Quick OIU Configuration Guide

9) Defining Process Control Unit: (continued)		
(Access subsequent PCU page)		PRESS: PREV or NEXT
When done, return to OIU Configuration Menu. If all OIU configuration done, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.		
10) DEFINING PERIPHERAL PARAMETERS:		
(OIU Configuration Menu		PRESS: I
(If OIU has printer connected and you want OIU to make printouts)	(10a)	ENTER: YES PRESS: ENTER PRESS: SECT (go to 10b)
(Otherwise)		PRESS: ENTER PRESS: SECT
(If OIU has 2nd printer connected and you want to dedicate it to Event Logs)	(10b)	ENTER: YES PRESS: ENTER PRESS: SECT (go to 10c)
(Otherwise)		PRESS: ENTER PRESS: SECT
(If OIU fixed keyboard is revision level C or higher)	(10c)	ENTER: revision level PRESS: ENTER PRESS: SECT (go to 10d)
(If keyboard is revision level A or B)		ENTER: A or B PRESS: ENTER PRESS: SECT
(To enable RCM non-zero switch type displays)	(10d)	ENTER: YES PRESS: ENTER PRESS: SECT (go to 10e)
(To disable such displays)		ENTER: NO PRESS: ENTER PRESS: SECT
(If OIU has LMM modules with NLMM01 firmware revisions A or B, this field MUST be NO)	(10e)	ENTER: NO PRESS: ENTER PRESS: SECT (go to 10f)

Quick OIU Configuration Guide

10) Defining Peripheral Parameters (continued)		
(Otherwise)		ENTER: YES PRESS: ENTER PRESS: SECT.
(If OIU does NOT have redundant cables)	(10f)	ENTER: NO PRESS: ENTER PRESS: SECT (go to 10g)
(If OIU does have such cables)		ENTER: YES PRESS: ENTER PRESS: SECT
(If CRT enhancement package not installed)	(10g)	ENTER: NO PRESS: ENTER PRESS: SECT (go to 10h)
(If enhancement installed and you want a quicker graphic display on OIU)		ENTER: YES PRESS: ENTER PRESS: SECT
(If OIU has firmware revision level K or higher and you want OIU to share alarm acknowledgement with other OIUs in plant)	(10h)	ENTER: Yes PRESS: ENTER PRESS: SECT (go to 10i)
(otherwise)		PRESS: ENTER PRESS: SECT
(To run BASIC program at OIU restart)	(10i)	ENTER: valid program name PRESS: ENTER PRESS: SECT (go to 10J)
(otherwise)		PRESS: ENTER PRESS: SECT
(If OIU has color printer connected and you want OIU to make color printouts)	(10j)	ENTER: YES PRESS: ENTER PRESS: SECT (go to 10k)
(otherwise)		PRESS: ENTER PRESS: SECT

Quick OIU Configuration Guide

10) Defining Peripheral Parameters (continued)		
(If you want OIU to use letter/ graphic font larger than normal	(10k)	ENTER: YES PRESS: ENTER (to to 10L)
(If you want OIU to use normal letter/ graphic font)		PRESS: ENTER
10L) Return to the OIU Configuration Menu. If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.		
11) DEFINING BASIC PROGRAMMING:		
(OIU Configuration Menu)		PRESS: N
BASIC interpreter can be in one of two modes		
11a) Wait for currently running program to finish and revert to EDIT mode (11b) Break current program run —— or BASIC interpreter in EDIT mode —		PRESS: ESCAPE
11b) Access desired BASIC program —		ENTER: valid program name
11c) Programmer can now do any of the following tasks using OIU BASIC commands (as in BASIC Programming Language Reference Manual, E93-901-6): 1) write a NEW program 2) edit/debug EXISTING program 3) save a program on hard or floppy disk 4) load a program from hard or floppy disk 5) run a program (go to 11d when done)		
If OIU does not have BASIC programming package installed and you accidentally access this function, you must RESET OIU. After OIU is reset, press MENU to exit the function.		
11d) Repeat steps 11a - 11c for each BASIC program you want to write/edit/run. When done with all BASIC programs, return to the OIU Configuration Menu:		PRESS: MENU PRESS: D
If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.		
12) DEFINING ALARM MANAGEMENT:		
(OIU Configuration Menu)		PRESS: 0

Quick OIU Configuration Guide

12) Defining Alarm Management (continued):		
12a) Define Alarm Levels —— (Alarm Management Menu)		PRESS: A
(only one level)		PRESS: FIELD (go to 2)
(more than one level)	1)	ENTER: alarm level PRESS: FIELD
(Suppress alarm indication on this level)	2)	ENTER: YES PRESS: FIELD (go to 3)
(Allow alarm indication on this level)		PRESS: FIELD
(Suppress alarm annunciation on this level)	3)	ENTER 0 (for OFF) PRESS: FIELD (go to 4)
		or
(Have alarm annunciation for timed interval)		ENTER: T (for TIMED) PRESS: FIELD (go to 4)
		or
(Have continuous alarm annunciation)		PRESS: FIELD
(Set indicator colors)	4)	
a) ALARM state indicators ——		ENTER: foreground code PRESS: FIELD ENTER: background code PRESS: FIELD
b) NORMAL state indicators ——		ENTER: foreground code PRESS: FIELD ENTER: background code PRESS: FIELD
c) SUPPRESSED state indicators ——		ENTER: foreground code PRESS: FIELD ENTER: background code PRESS: ENTER

Quick OIU Configuration Guide

12) Defining Alarm Management (continued)	
To accept default codes, press FIELD at any code input field. (Press ENTER at suppressed state background code.)	
If defining more than one alarm level, repeat steps 1-4 for each level. Return to Alarm Management Menu when done.	
Return to Alarm Managment Menu:	PRESS: ESCAPE
Return to OIU Configuration Menu:	PRESS: ESCAPE twice
12b) Define Alarm Indicators for all alarm levels —— Alarm Management Menu	PRESS: B
1) NORMAL.....	ENTER: character code PRESS: FIELD
2) SUPPRESSED NORMAL.....	ENTER: character code PRESS: FIELD
3) BAD QUALITY.....	ENTER: character code PRESS: FIELD
4) NOT YET ALARMED.....	ENTER: character code PRESS: FIELD or
5) BOOLEAN ALARM.....	PRESS FIELD ENTER: character code PRESS: FIELD
6) HIGH.....	ENTER: character code PRESS: FIELD
7) LOW.....	ENTER: character code PRESS: FIELD
8) HIGH DEVIATION.....	ENTER: character code PRESS: FIELD
9) LOW DEVIATION.....	ENTER: character code PRESS: ENTER
To accept default values for any indicator, press FIELD at any character field. When done return to Alarm Management Menu. If done all Alarm Management configuration, return to OIU Configuration Menu.	
12c) Set colors/phrases for all alarm levels to OIU standards —— Alarm Management Menu ——	PRESS: C
To set to OIU standards	PRESS: ENTER (returns to Alarm Management Menu) or
To bypass this function	PRESS: ESCAPE (returns to Alarm Management Menu

Quick OIU Configuration Guide

12) Defining Alarm Management (continued)	
If done defining Alarm Management, return to OIU Configuration Menu:	PRESS: ESCAPE
If done all OIU configuration, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	
13) SETTING SYSTEM TIME AND DATE:	
Access General Function Menu —	PRESS: MENU PRESS: E
13a) Setting System Time ——	
set hour.....	ENTER: hour (##) PRESS: FIELD
set minute.....	ENTER: minute (#) PRESS: FIELD
set second.....	ENTER: second (##) PRESS: FIELD
13b) Setting System Date ——	
set month.....	ENTER: month (##) PRESS: FIELD
set day.....	ENTER: day (##) PRESS: FIELD
set year.....	ENTER: year (##) PRESS: ENTER
Erase invalid entries by pressing CLEAR. Move within any input field by using◄and/or►(Cursor Control Block).	
Return to General Function Menu	PRESS: ESCAPE once
If all OIU configuration done, lock CONF keyswitch and remove its key. Otherwise, proceed to next function.	

Quick Graphic Configuration Guide

CONFIGURING THE GRAPHIC EDITOR	
1) ACCESSING THE GRAPHIC EDITOR MENU:	
Unlock the CONF keyswitch	
(OIU Configuration Menu)	PRESS: MENU Connect Auxiliary Keyboard to OIU
(When Auxiliary Keyboard connected (OIU loads the Graphic Editor)	PRESS: ENTER
(When Graphic Editor Menu appears select desired function)	
(To abort your request)	PRESS: ESCAPE
(When OIU Configuration Menu returns to CRT)	Disconnect Auxiliary Keyboard from OIU
2) EDITING A GRAPHIC (DISPLAY):	
(Graphic Editor Menu)	PRESS: A
A) To Create a NEW Graphic Display ——	PRESS: ENTER at Graphic Name prompt ENTER: Your new Graphic Name PRESS: ENTER
(If you leave this prompt blank and press ENTER, the OIU locks up. Reset the OIU and wait a few minutes. Then resume key inputs.)	
	ENTER: Your new Graphic Descriptor PRESS: ENTER
The Editor gives you a blank template with a Status line. Draw your new Graphic (See Section VII and Appendix M).	
RETURN TO GRAPHIC EDITOR MENU	
When done creating your new Graphic ——	PRESS: G MENU
A1) To SAVE your new Graphic ——	ENTER: Y PRESS: ENTER Go to A3
A2) To stay in this function (not saving your Graphic) ——	ENTER: N PRESS: ENTER Go to A4

Quick Graphic Configuration Guide

2) Editing Graphic (continued)

A3) OIU scans CRT & Saves your Graphic and then lets you return to the Graphic Editor Menu or not as desired:

To remain in this function and make further edits to your new Graphic ——	ENTER: N PRESS: ENTER

(Resume drawing your Graphic. Proceed to A1 when done.)

To leave this function ——	ENTER: Y PRESS: ENTER

(Graphic Editor Menu returns to CRT.)

B) To edit EXISTING Graphic display:

(Graphic Editor Menu)	PRESS: A ENTER: Name of Graphic in name prompt PRES: ENTER
(When new prompt appears with existing Graphic name)	PRESS: ENTER again
(When new prompt appears with existing Graphic descriptor	PRESS: ENTER again

Editor searches for this Graphic and displays it on CRT. Begin editing after this display appears (See Section VII and Appendix M). Return to the Graphic Editor Menu when done (See steps A1 - A3 above).

3) DELETING A GRAPHIC:

(Graphic Editor Menu)		PRESS: B
	1)	ENTER: Name of Graphic to delete PRESS: ENTER

If this Graphic is NOT assigned to any Group, the Editor removes it from memory showing: OPERATION COMPLETE when done. Return to Graphic Editor Menu by pressing G MENU or ESCAPE. (Pressing ESCAPE lets you directly access another Graphic to delete (return to Step 1); pressing G MENU returns only the Graphic Editor Menu to the screen without the Name prompt below.)

If this Graphic IS assigned to any Group, the Editor displays the message: GROUP(S) ASSIGNED, ENTER TO DELETE.

To keep this Graphic	PRESS: ESCAPE Go back to Step 1
To delete this Graphic	PRESS: ENTER
Return to Graphic Editor Menu ——	PRESS: G MENU or ESCAPE

Quick Graphic Configuration Guide

4) COPYING A GRAPHIC:	
(Graphic Editor Menu) (Name must be that of an existing Graphic)	PRESS: C ENTER: Name of old Graphic you want to copy from PRESS: ENTER PRESS: FIELD
(Name must NOT be one already assigned to an existing Graphic)	ENTER: Name of new Graphic you want to copy to PRESS: ENTER
Editor copies old Graphic to new template having name you just assigned. When done OPERATION COMPLETE appears on CRT.	
Return to Graphic Editor Menu ——	PRESS: G MENU or ESCAPE
5) ASSIGNING GRAPHIC TO GROUP:	
(Graphic Editor Menu)	PRESS: D ENTER: Name of Graphic to assign PRESS: ENTER
Enter EITHER Group Name or Number	(Group Name) PRESS: SECT ENTER: Group Name PRESS: ENTER
(Editor inserts Group number in NUMBER prompt)	
When Editor done assigning Graphic to Group, OPERATION COMPLETE appears. Return to menu. (Press G MENU or ESCAPE.)	
OR	
(Group Number) PRESS: SECT PRESS: FIELD ENTER: Group Number	
(Editor inserts Group Name in NAME prompt)	
When Editor done assigning Graphic to Group, OPERATION COMPLETE appears on CRT. Return to Menu. (Press G MENU or ESCAPE.)	

Quick Graphic Configuration Guide

6) REMOVING GRAPHIC/GROUP ASSIGNMENT:	
(Graphic Editor Menu)	PRESS: E
(Enter EITHER the Name or Number to which the Graphic is assigned)	
	(Group Number) PRESS: FIELD ENTER: Group Number PRESS: ENTER
When done removing the Graphic from its Group assignment, OPERATION COMPLETE appears. Return to the Menu.)	
	OR (Group Name) ENTER: Group Name PRESS: ENTER
(When done removing the Graphic from its Group assignment, OPERATION COMPLETE appears. Return to this menu.)	
7) SHOWING DYNAMIC ITEM LIST:	
(Graphic Editor Menu)	PRESS: F ENTER: Name of Graphic for which you want to see list PRESS: ENTER
(If this Graphic has no dynamic items, the message: DYNAMIC LIST IS EMPTY appears on CRT. Enter name of different Graphic and press ENTER again.)	
Editor displays first list (dynamic values).	
To scroll forward through list To scroll backward through list	PRESS: NEXT PRESS: PREV
Return to Graphic Editor Menu	PRESS: G MENU or ESCAPE
8) SHOWING LIST OF GRAPHICS:	
(Graphic Editor Menu)	PRESS: G
(Editor displays first page of List) To scroll through the lists Return to Graphic Editor Menu	 PRESS: NEXT or PREV PRESS: G MENU or ESCAPE

Quick Graphic Configuration Guide

9) DEFINING A SYMBOL:	
(Graphic Editor Menu)	PRESS: H
9A)	ENTER: Name of symbol you want to define PRESS: ENTER
Editor displays blank template and words: DEFINE SYMBOL. Draw your new symbol (See Appendix M). The Editor does not display any status line on this template so remember to set FG and BG colors, etc. When done go to 9B or 9C.	
If: LIMIT 120 CHARACTERS, ENTER TO SAVE appears, you reached maximum number of characters you can include in your symbol. Either save it or abort and redraw it.	
9B) To abort current symbol	PRESS: ESCAPE Redraw symbol as above.
9C) To save current symbol (add to symbol library)	PRESS: ENTER Return to 9A or go to 9D.
9D) Return to Graphic Editor Menu	PRESS: G MENU or ESCAPE
10D) DELETING A SYMBOL:	
(Graphic Editor Menu)	PRESS: I
10A)	ENTER: Name of symbol you want to delete PRESS: ENTER
Editor displays: CHECKING FOR SYMBOL IN USE	
10) Deleting a Symbol (contined)	
If this symbol is NOT a dynamic item in any existing Graphic, the Editor deletes it (erases it) from library. When done, OPERATION COMPLETE appears on the CRT. Repeat 10A to delete another symbol or go to the CRT.	
If th is symbol IS a dynamic item in any existing Graphic, IN USE, ENTER DELETES, ESC CANCELS appears on the CRT.	
10B) To keep the symbol	PRESS: ESCAPE Repeat 10A or go to 10D
10C) To delete the symbol	PRESS: ENTER Repeat 10A or do to 10D
10D) Return to the Menu	PRESS: G MENU or ESCAPE

Quick Graphic Configuration Guide

11) REVIEWING SYMBOLS:	
(Graphic Editor Menu)	PRESS: J
11A) To review symbol library starting from FIRST symbol	PRESS: ENTER
Editor displays first symbol in library on CRT with cursor (blinking +) over symbol starting coordinates	
To view COMPLETE symbol	Move cursor away (Press an Arrow key)
To insert another symbol on same page for comparison	Move cursor to desired symbol position PRESS: IN SYM ENTER: Symbol name PRESS: ENTER
To view subsequent symbols	PRESS: NEXT or PREV
When done viewing all symbols return to Menu.	
11B) To review symbol library starting From SPECIFIC symbol	ENTER: Symbol name PRESS: ENTER
Editor displays specific symbol from library on CRT with cursor (blinking +) over symbol starting coordinates.	
Proceed as under 11A. When done viewing all symbols return to Graphic Editor Menu.	
12) SHOWING SYMBOL CROSS REFERENCES:	
(Graphic Editor Menu)	PRESS: K
To View list for any symbol	ENTER: Symbol name PRESS: ENTER
Editor overwrites CRT with Cross Reference List headlines above blank template. Editor takes several minutes to fill in this display. BUILDING DISPLAY appears on CRT. When done, message disappears and display fills with the name of every Graphic using this symbol as a dynamic item and its Group assignment. Only Graphics assigned to Groups appear on this list.	
13) EDITING/REVIEWING VALUE FORMATS:	
(Graphic Editor Menu)	PRESS: L to view Format 0
Editor displays page showing the O FORMAT (OIU Default value formats). You cannot edit these formats. Return to Menu by pressing G MENU or ESCAPE.	
To create your own formats (1-9):	PRESS: L from Menu PRESS: NEXT while Format 0 page is on the CRT to access new page.

Quick Graphic Configuration Guide

13) Editing/Reviewing Value Formats (continued):	
Editor overwrites Standard format page with blank template having modified Status line and showing starting value format at cursor anchor position (+). Enter your desired format.	
To enter an alarm indicator (See Section VII) To delete existing indicator	PRESS: A Set its FG & BG colors ENTER: Alarm indicator PRESS: spacebar
To enter the value To delete existing value	PRESS: V Set its colors ENTER: value indicators PRESS: spacebar
To enter engineering units To delete existing EU	PRESS: E Set its colors ENTER: EU indicator PRESS: spacebar
Repeat above steps for each value format you want to create/edit on this page. When done PRESS: ENTER. This saves that format page in OIU memory.	
To create/edit more format pages	PRESS: NEXT
Repeat steps on previous page for each format page you want to create or edit. When done, return to Menu.	
To review existing formats, follow previous steps but make no changes. Return to Graphic Editor Menu by pressing G MENU or ESCAPE when done.	
14) EXITING GRAPHIC EDITOR MENU:	
(Graphic Editor Menu)	PRESS: M
After a brief pause the OIU Configuration Menu appears on the CRT. Disconnect Auxiliary Keyboard and store it in appropriate place.	
If now done with all configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to some other menu function.	

Appendix I

Quick Color/Phrase Configuration Guide

CONFIGURATING COLOR AND PHRASE		
1) ACCESSING OIU CONFIGURATION MENU: (OIU Configuration Menu) (Define Color/Phrase Menu)		PRESS: MENU ENTER: D ENTER: K
2) DEFINING COLOR CODES (Define Color/Phrase Menu)		Unlock the CONF keyswitch PRESS: A
	2a)	PRESS: FIELD
	2b)	PRESS: CLEAR
(Use your own color code)	2c)	ENTER: color code (go to 2nd) or
(Use OIU default color code)	2d)	PRESS: FIELD Repeat steps 2a-2c for each color you want to define.
When done defining all color codes:		PRESS: ENTER
Return to the Define Color/Phrase Menu:		PRESS: ESCAPE
If done with all color and phrase configuration, return to the OIU Configuration Menu:		PRESS: ESCAPE again
If done with all color and phrase configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.		
3) DEFINING ALARM LOG FORMAT:		
Unlock the CONF keyswitch		
(Define Color/Phrase Menu)		PRESS: B
(Define ALARM state indicators) (Use default N for any field by skipping it rather than making an entry in it.)		ENTER: Line number code (Y or N) PRES: FIELD ENTER: Time code PRESS: FIELD ENTER: Tag name code PRESS: FIELD PRESS:Point value code PRESS: FIELD ENTER: Engineering unit code PRESS: FIELD ENTER: Alarm condition code PRESS: FIELD

Quick Color/Phrase Configuration Guide

3) Defining Alarm Log Format continued		
		ENTER: Alarm limit value code PRESS: FIELD ENTER: Tag descriptor code PRESS: SECT
(Define NORMAL state indicators) (Use default N for any field by skipping it rather than making an entry in it.)		ENTER Line number code PRESS: FIELD ENTER: Time code PRESS: FIELD ENTER: Tag name code PRESS: FIELD ENTER: Point value code PRESS: FIELD ENTER: Engineering unit code PRESS: FIELD ENTER: Alarm condition code PRESS: FIELD ENTER: Alarm limit value code PRESS: FIELD ENTER: Tag descriptor code PRESS: ENTER
Return to the Define Color and Phrase Menu. If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.		
4(DEFINING MANUAL SET CONSTANT INDICATORS:		
Unlock The CONF keyswitch		
(Define Color/Phrase Menu)		PRESS: C
	4a)	ENTER: MSC NORMAL state code PRESS: FIELD (Got to 4b)
(To enable the operator to change MSC element value on Graphic display using the SET key):		OR PRESS: FIELD
	4b)	ENTER: MSC tracking state code PRESS: ENTER (Go to 4c) or PRESS: ENTER
4c) Return to the Define Color and Phrase Menu		

Quick Color/Phrase Configuration Guide

If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

5) DEFINING DIGITAL CONTROL STATION INDICATORS:

Unlock the CONF keyswitch

(Define Color/Phrase Menu)

(Use default values by skipping any field and going on to the next one)

PRESS: D
(STATUS indicators)

5a) ENTER: local code
PRESS: FIELD
ENTER: Remote Code
PRESS: FIELD
(MODE indicators)

5b) ENTER: Manual code
PRESS: FIELD
ENTER: Automatic code
PRESS: FIELD
ENTER: Cascade mode
PRESS: FIELD
ENTER: Ratio Mode
PRESS:FIELD
ENTER: Control Output Tracking Code
PRESS: FIELD
ENTER: Set Point Tracking code
PRESS: FIELD
ENTER: Manual Interlock code
PRESS: FIELD
(TYPE indicators)

5c) ENTER: Cascade type code
PRESS: FIELD
ENTER: Ratio type code
PRESS: FIELD
(TARGET indicators)

5d) ENTER: Set Point Target code
PRESS: FIELD
ENTER: Ratio Index Target code
PRESS: FIELD
ENTER: Control Output Target code
PRESS: ENTER

Return to the Define Color and Phrase Menu.

If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.

6) DEFINING REMOTE CONTROL MEMORY INDICATORS:

Unlock CONF keyswitch

(Define Color/Phrase Menu) PRESS: E

Quick Color/Phrase Configuration Guide

6) DEFINING REMOTE CONTROL MEMORY INDICATORS (continued):		
(Set-Permissive indicator) (Use default values for any field by just pressing FIELD and going on to next item)	6a)	ENTER: SP code PRESS: FIELD (go to 6b) or (Skip this item by pressing FIELD)
(Not Set-Permissive indicator)	6b)	ENTER: NP code PRESS: FIELD
(Override indicator)	6c)	ENTER: OVR code PRESS: FIELD
(Target indicator)	6d)	ENTER: TRGT code PRESS: ENTER
Return to the Define Color and Phrase Menu.		
If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.		
7) DEFINING DAYS OF THE WEEK:		
Unlock CONF keyswitch		
(Define Color/Phrase Menu)		PRESS: F
(You can enter your own day values, instead of thee default values, as desired)		ENTER: SUNDAY PRESS: FIELD ENTER: MONDAY PRESS: FIELD ENTER: TUESDAY PRESS: FIELD ENTER: WEDNESDAY

Quick Color/Phrase Configuration Guide

7) Defining Days of the Week (continued)	
	PRESS: FIELD ENTER: THURSDAY PRESS: FIELD ENTER: FRIDAY PRESS: FIELD ENTER: SATURDAY PRESS: ENTER
Return to the Define Color and Phrase Menu.	
If done all color and phrase configuration, return to the OIU Configuration Menu. If done all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.	
8) DEFINING MONTH ABBREVIATIONS:	
Unlock the CONF keyswitch	
(Define Color/Phrase Menu)	PRESS: G
(You enter your own month abbreviations, instead of these default values, as desired)	ENTER: JAN PRESS: FIELD ENTER FEB PRESS: FIELD ENTER: MAR PRESS: FIELD ENTER: APR PRESS: FIELD ENTER: MAY PRESS: FIELD ENTER: JUN PRESS: FIELD ENTER: JUL PRESS: FIELD ENTER: AUG PRESS: FIELD ENTER: SEP PRESS: FIELD ENTER: OCT PRESS: FIELD ENTER: NOV PRESS: FIELD ENTER: DEC PRESS: ENTER

Quick Color/Phrase Configuration Guide

Return to the Define Color and Phrase Menu.	
If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.	
9) SETTING COLORS AND PHRASES TO OIU STANDARDS:	
Unlock the CONF keyswitch	
(Define Color/Phrase Menu)	PRESS: H
(If you already performed this function from the Alarm Management Menu, skip it here. Go to 9b.)	
9a) To set to OIU standards	PRESS: ENTER (returns to Define Color/Phrase Menu)
9b) To bypass this function	PRESS: ESCAPE (returns to Define Color/Phrase Menu)
Return to the Define Color and Phrase Menu.	
If done with all color and phrase configuration, return to the OIU Configuration Menu. If done with all OIU configuration, lock the CONF keyswitch and remove its key. Otherwise, proceed to another configuration function.	

Quick Logging Configuration Guide

A) CONFIGURATION LOGGING	
1) ACCESS LOGGING CONFIGURATION MENU	PRESS: MENU
(OIU Configuration Menu)	PRESS: D
(Logging Configuration Menu	PRESS: L
2) ACCESS DEFINE LOGGING PARAMETERS* DISPLAY:	
Move cursor from section to section:	PRESS: SECT
Move cursor within a section:	PRESS: FIELD
Put display into COMMAND? mode:	PRESS: ESCAPE
Return to Logging Configuration Menu while display in COMMAND? mode:	PRESS: ESCAPE
To log events (alarms)	ENTER: YES or NO
To log state changes	ENTER: YES or NO
To log operator actions	ENTER: YES or NO
To output events to printer	ENTER: YES or NO
To have OIU - OIU logging	ENTER: YES or NO
To identify log sequence	ENTER: Line ###
To identify plant log title	ENTER: Log Title
To let operator cancel logs	ENTER: YES or NO
To specify Shift ending times:	
1st	ENTER: Time #:#
2nd	ENTER: Time #:#
3rd	ENTER: Time #:#
To specify End of Day time:	ENTER: Time #:#
To specify End of Week Day:	ENTER: Day (SAT — SUN)
To input definitions to OIU:	PRESS: ENTER

*If your OIU does not have the logging package installed, this display defines EVENT LOG only. After you enter plant log title you press ENTER and then return either to the General Function Menu (pressing MENU) or some other display or function. Ignore the rest of this Appendix. If your OIU does have the logging package, continue with the rest of the Appendix.

3) DEFINE SUFFIX TAGS:	
To access Suffix Tag Menu:	PRESS: B (Log Cf)
To move cursor from field to field	PRESS: FIELD
To access Define Suffix Tag Display	
EITHER	
	ENTER: Tag name
	ENTER: Station Parameter
(For specific suffix)	ENTER: Suffix
	PRESS: ENTER

Quick Logging Configuration Guide

3) Define Suffix Tags (continued):		
(For new suffix)	OR	(Leave above fields blank) PRESS: ENTER
(For each suffix you wish to define line by line)		
Move cursor between fields . . . . . . Move cursor between lines		PRESS: FIELD PRESS: SECT
(SOURCE SUFFIX)		ENTER: Tag number (1-250) ENTER: Tag name (LSD) ENTER: The SUFFIX (Station Parameter: SP, PV, RI, OR CO) (Collection Mode: TOT, AVG, MIN, OR MAX) (Time Interval: HR, SFT, DAY,WK, or MON) ENTER: Engineering Units
(IF SUFFIX IS A TREND) or (IF USING SOURCE SUFFIX)		ENTER: Collection Mode ENTER: Collection & Interval
		ENTER: Conversion Factor (1.00 or D/####)
When done defining all suffixes:		PRESS: ENTER
Advance sequentially through suffixes:		PRESS: SECT
Go to another suffix display: (COMMAND? appears at bottom of CRT)		PRESS: ESCAPE ENTER: Suffix # PRESS: ENTER
Return to Logging Configuration Menu (COMMAND? not on screen) (COMMAND? is on screen):		 PRESS: ESCAPE PRESS: ESCAPE again
4) DEFINE TREND LOGS:		
To access Trend Log # displays:		PRESS: C (Log Cf)
To access Define Trend Log Display (Specific Trend Log 1-50) (First Available Log)	EITHER OR	 ENTER: Log # PRESS: ENTER (Leave field blank) PRESS: ENTER
Move cursor between fields . . . . . . Move cursor between lines		PRESS: FIELD PRESS: SECT

Quick Logging Configuration Guide

4) Define Trend Logs (continued):	
To modify a log: Move cursor to ON/OFF/CLEAR field	ENTER: OFF PRESS: ENTER
Following message appears on CRT: (ENTER TURNS OFF LOG AND CLEAR DATA, ESC CANCELS OPERATION) To turn log off: (This prevents accidental clearing of Log) To clear log from configuration and to clear the log data: Following message appears on CRT: (ENTER CLEARS LOG, ESC CANCELS OPERATION) To clear log:	 PRESS: ENTER again ENTER: CLEAR PRESS: ENTER PRESS: ENTER again
(For each Trend Log (number) you want to define)	ENTER: Log Title ENTER: Collection Period (## MIN, HOUR or DAY) ENTER: Print Option (COMPLETE, SHIFT END, DAY END, or NOT SCHED) ENTER: Number of Collections (1-120)
(For each of the twelve trends you want to define per Trend Log number) SEARCHING FOR TREND appears on CRT	ENTER: Tag Name ENTER: Station Param. (if tag is stn) ENTER Collection Mode
If there is an Undefined Trend, cursor stops at its tag name and you cannot advance to next trend until you enter tag name of a Defined trend.	
After completely defining all trends for one log, move cursor to ON/OFF/CLEAR field and	ENTER: ON PRESS: ENTER
To advance sequentially through logs	PRESS: SECT
To go to another Trend Log display (COMMAND? appears at bottom of CRT)	PRESS: ESCAPE ENTER: Log # PRESS: ENTER

Quick Logging Configuration Guide

Defining Trend Logs (continued)	
To go to Logging Configuration Menu (COMMAND? not on screen) (COMMAND? is on screen)	 PRESS: ESCAPE PRESS: ESCAPE again
5) DEFINE TRIP LOGS:	
To access Trip Log # display:	PRESS: D (Log Cf)
To access Define Trip Logs Display: EITHER (Specific Trip Log 1-50) OR (New Trip Log)	 ENTER: Log # PRESS: ENTER (Leave field blank) PRESS: ENTER
Move cursor between fields . . . . . . Move cursor between lines	PRESS: FIELD PRESS: SECT
To remove existing log from the display:	Move cursor to CLEAR field ENTER: Y PRESS: ENTER
To define/modify a log:	Move cursor to CLEAR field ENTER: N PRESS: FIELD
(For each Trip Log (number) you want to define)	ENTER: Log Title ENTER: Print Option (Y to print on completion; N to print on demand) ENTER: Trip tag (Must be BOOLEAN or RCM type)

Quick Logging Configuration Guide

Defining Trip Logs (continued)	
(For each Trip Log (number) you want to define)	ENTER: Number of pre-trip collections ENTER: Number of post trip collections (Total number of collections cannot exceed 120) ENTER: Collection rate (15 SEC or 1 MIN)
(For each of the twelve trends you want to define per Trip Log number) SEARCHING FOR TREND appears on CRT	ENTER: Tag Name ENTER: Stn. Param. ENTER: Collection Mode
If there is an Undefined Trend, cursor stops at its tag name and you cannot advance to the next trend until you enter tag name of a Defined Trend.	
After completely defining all trends for one log	PRESS: ENTER
To advance sequentially through logs:	PRESS: SECT
To go to another Trip Log display (COMMAND? appears at bottom of CRT)	PRESS: ESCAPE ENTER: Log # PRESS: ENTER
To go to Logging Configuration Menu (COMMAND? not on screen) COMMAND? is on screen)	 PRESS: ESCAPE PRESS: ESCAPE again
6) DEFINE PERIODIC LOG PARAMETERS:	
To access Define Periodic Log Parameters Display:	PRESS: E (Log Cf)
Move cursor between . . . . . . Move cursor between lines	PRESS: FIELD PRESS: SECT
To remove existing log from the display	Move cursor to CLEAR field ENTER: CLEAR PRESS: ENTER
To define/modify a log:	Move cursor to CLEAR field ENTER: ON PRESS: FIELD

Quick Logging Configuration Guide

Defining Periodic Log Parameters (continued)	
To prevent log from printing and to keep it on display:	Move cursor to CLEAR field ENTER: OFF PRESS: FIELD
(For each Periodic Log number you wnat to define)	ENTER: Graphic name ENTER: Collection Period (HOUR, SHIFT, DAY, WEEK, MONTH, or NOT S)
After completely defining all Graphics for one log	PRESS: ENTER
To advance sequentially through logs	PRESS: SECT
To go to another Periodic Log display. (COMMAND? appears at the bottom of CRT)	PRESS: ESCAPE ENTER: LOG # PRESS: ENTER
To go to Logging Configuration Menu (COMMAND? not on screen) (COMMAND is on screen)	 PRESS: ESCAPE PRESS: ESCAPE again
7) DEFINE SEQUENCE OF EVENTS POINT LISTS:	
To access SOE Point List Menu:	PRESS: F (Log Cf)
To access Define SOE Point List Display:	ENTER: Point List number (1-1) PRESS: ENTER
If message: NOTE ENOUGH OIU MEMORY FOR POINT LIST appears, check OIU configuration and try again.	
If message: VALUE NUMBER MUST BE 1-1 appears, re-enter the correct point list number (1-1) and press ENTER	
Pressing SECT or FIELD has no effect (except that no error message appears).	
When first page of Define SOE Point List Display appears: Move cursor between fields by pressing: FIELD	
(For each of the up to 512 points you define)	ENTER: LSD for Logic State 0 ENTER: LSD for Logic State 1
If any LSD is Undefined, you cannot move cursor to the next one until you enter a Defined LSD.	

Quick Logging Configuration Guide

Defining SOE Point List (continued)	
(For each of the up to 512 points you define	ENTER: SOE Point descriptor PRESS: ENTER
Pressing ENTER puts point into OIU memory and moves cursor to leftmost input field of next line (LSD for Logic State 0). If any entry on current line is invalid, cursor stops there and you must re-enter a valid value.	
To advance to next point on display page (Displays most recently entered data for present cursor location. If you did not yet enter data for this point (press ENTER), the old data displays. The line can also be blank, however.	PRESS: SECT
To display most recently entered data and and put COMMAND? at bottom of CRT	PRESS: ESCAPE
To return to Logging Configuration Menu (COMMAND? on screen)	ENTER: M PRESS: ENTER or PRESS: ESCAPE
To go to a different SOE Point display	ENTER: Point # PRESS: ENTER
If messages, ENTRY MUST BE M or VALUE MUST BE 1-512 appears, re-enter the proper value and PRESS ENTER again	
To scroll through display pages (No wraparound)	PRESS: PREV or NEXT
8) DEFINE SEQUENCE OF EVENTS REPORTS:	
To access SOE Report Menu:	PRESS: G (Log Cf)
To access Define SOE Report Display: EITHER (Specific SOE Report) OR (For lowest numbered Report)	ENTER: Report # (1-80) PRESS: ENTER (Leave field blank) PRESS: ENTER
If message: VALUE MUST BE 1-80 appears, re-enter the proper value and press ENTER again.	

Quick Logging Configuration Guide

Defining SOE Reports (continued):	
If message: NO EMPTY SOE REPORTS IN THIS OIU appears, you must enter a report number between 1 and 80 and press ENTER again.	
Pressing SECT or FIELD has no effect (except that no error message appears).	
When Define SOE Report Display appears: Move cursor between fields by pressing FIELD	
(For each Report you want to define)	ENTER: SOE Report Descriptor ENTER: Tag Name
If you do not enter a tag name or you enter an Undefined tag name, the message: UNDEFINED TAG appears and the cursor stays at that tag name field. Enter a Defined name.	
If the tag name exists but the tag is not an RCM type, the message: TAG IS NOT RCM TYPE appears. Re-enter a RCM tag name	
(For each Report you want to define)	ENTER: SOE Point List # (The range is designed for 1 to 16 but enter 1 for now)
If the message: VALUE MUST BE 1-16 appears, re-enter the proper Point List Number. (Just enter 1.)	
(For each Report you want to define)	ENTER: Report Waiting time (### of minutes)
Enter this value only if configuring for standard or post-fault type SOE Reports. Otherwise, leave this field blank. The Report Waiting time must be at least FIVE minutes greater than the associated MFC data aging time. (Check MFC configuration.) The Report Waiting time has a range of between 1 and 540 minutes.	
After completely defining all Report data on a line: This puts the data on the line into OIU memory and moves the cursor to the leftmost Report descriptor of the next line on the display page.	PRESS: ENTER
If any data on the line is invalid, the cursor moves to that field, and the appropriate error message displays on CRT. Enter a proper value and press ENTER again.	
To display the most recently entered data for a line: PRESS: SECT (the cursor then moves to Report descriptor on next line of the page.)	
If you did not yet enter current line data and pressed SECT, the old data displays. The line can also be blank, however.	
To advance through fields (with wraparound) on any Report line	PRESS: FIELD

Quick Logging Configuration Guide

Defining SOE Reports (continued)	
To advance through lines (with wraparound) on Report page	PRESS: SECT
To display most recently entered date (putting COMMAND? at bottom of CRT)	PRESS: ESCAPE
To return to Logging Configuration Menu (COMMAND? on screen)	ENTER: M PRESS: ENTER or PRESS: ESCAPE
To go to a different SOE Report display	ENTER: REPORT # PRESS: ENTER
If message: ENTRY MUST BE M or VALUE MUST BE 1-80 appears, re-enter proper value and press ENTER again	
To scroll through display pages: (no wraparound)	PRESS: PREV or NEXT

Quick Archiving Configuration Guide

A) CONFIGURING ARCHIVAL STORAGE	
1) ACCESS ARCHIVAL STORAGE MENU: (OIU Configuration Menu) (Archival Storage Definition Display)	PRESS: MENU ENTER: D PRESS: ENTER ENTER: M PRESS: ENTER
2) DEFINE TREND ARCHIVING:*	ENTER: OFF PRESS: ENTER
Move cursor between fields on display:	PRESS: FIELD
	ENTER: Number of Trends to archive (See APPENDIX H) ENTER: Number of Diskettes to use (See Table 10.1; Section X)
PERIOD OF ARCHIVING set to 24 hours. After you enter the value in the NO. DISKETTES USED field, the OIU calculates and displays the shortest COLLECTION INTERVAL that lets the number of trends to archive store on the number of diskettes used for the PERIOD OF ARCHIVING shown on the display. If this interval is longer than the current interval shown on the display, this message appears: INSUFFICIENT ROOM ON DISKETTES Move the cursor to the Collection Interval field. Enter another collection interval value. (See Table 10.1 in Section X.)	
When the NO. DISKETTES USED value is 1, the OIU lets you enter a PERIOD OF ARCHIVING value:	ENTER: Period of Archiving (a number followed by HOUR or DAY or just H or D)
When you enter this value the OIU recalculates and displays the value for the SHORTEST COLLECTION INTERVAL field. If this value is longer than the current collection interval shown on the display this message appears: INSUFFICIENT ROOM ON DISKETTES Move the cursor to the Collection Interval field. Enter another collection interval value. (See Table 10.1 in Section X.)	

*If your OIU does not have the archiving package installed, you cannot perform any archiving operations. Ignore the rest of this Appendix. If you OIU does have the archiving package, you can perform the archiving operations. You may decide to turn off either Trend or Event archiving, however. To define/modify trend archiving, you must first turn it off. When done defining you can then turn it back on.

Quick Archiving Configuration Guide

Defining Trend Archiving (continued)	
	ENTER: Collection Interval (A number followed MIN or HOUR, or just M or H)
Enter a collection Interval value greater than or equal to the SHORTEST COLLECTION INTERVAL value on the display.	
	ENTER: Time of Day to Output Data (##:## hour of day when archival trend storage is to occur)
When specified time occurs, OIU signals operator with the Action Request Indicator (flashing A) on any display page title line. When period of archiving is other than 1 day (24 hours), OIU requests archival storage operation at intervals equal to period of archiving value.	
After completely configuring trend archiving Move cursor to the TREND ARCHIVING ON/OFF field and:	ENTER: ON PRESS: ENTER
3) DEFINE EVENT ARCHIVING: Move the cursor to the EVENT ARCHIVING ON/OFF field to define Event Archiving	ENTER: OFF*
To have OIU signal operator to archive events	ENTER: YES or NO
After configuring event archiving Move cursor to EVENT ARCHIVING ON/OFF field and:	ENTER: ON PRESS: ENTER
To return to the OIU Configuration Menu	ENTER: M PRESS ENTER OR PRESS: ESAPE
To go to the General Function Menu:	PRESS: MENU

*To define/modify Event Archiving, you must first turn it off. When you finish, turn it back on. If, on the other hand, you do not want to perform any event archiving, simply turn Event Archiving off. Remember, the Event Log prints all events. (See Appendix K and Section IX.)

Quick Edit Graphic Guide

1) MOVING THE CURSOR:	
To move the cursor ONE space to RIGHT	PRESS: RIGHT Arrow key
To move the cursor ONE space to LEFT	PRESS: LEFT Arrow key
To move the cursor ONE space UP	PRESS: UP Arrow key
To move the cursor ONE space DOWN	PRESS: DOWN Arrow key
To return the cursor to HOME	PRESS: HOME key
To move the cursor MORE THAN ONE space in any direction	HOLD DOWN REPEAT key while pressing any Arrow key
When done moving cursor	Release both keys
Verify cursor coordinates observing Status line each time cursor moves.	
2) SETTING THE PLOT POINT:	
FG COLOR/PLOT POINT KEYS a —> ▣▣ <— b c —> ▣▣ <— d e —> ▣▣ <— e f —> ▣▣ <— g	Move the cursor to desired character space HOLD DOWN POINT key PRESS: any of the 8 FG color keys Release keys when done
Verify plot point set by observing Status line.	
3) SETTING THE BEGIN AND END POINTS:	
To set BEGIN point — —	Move the cursor to desired coordinates Set Plot point PRESS: BEGIN Observe Status line
To set END point — —	Move the cursor to desired coordinates Set Plot Point PRESS: END Observe Status line
4) SETTING THE WIDTH:	
	PRESS: WIDTH PRESS: CLEAR ENTER: Number of Plot Points desired PRESS: ENTER Observe Status line

Quick Edit Graphic Guide

5) DRAWING/REMOVE A LINE:	
To DRAW a line	To REMOVE a line
Move the cursor to Set the Plot Point Set the BEGIN point	Move the cursor to Set the Plot Point Set the BEGIN point.
Move the cursor to desired coordinates Set the Plot Point Set the END point	Move the cursor to desired coordinates Set the Plot Point Set the END point
Set the WIDTH Set the FG and BG colors (next task) PRESS: DR LIN	Set the WIDTH Set the FG and BG colors (next task) PRESS: RM LN

6) SETTING FOREGROUND AND BACKGROUND COLORS:	
To change the foreground (FG) color FG COLOR KEYS RED —> ◙ ◙ <— CYN GRN —> ◙ ◙ <— MGN BLU —> ◙ ◙ <— YEL BLK —> ◙ ◙ <— WHT	PRESS Any of the 8 FG Color keys Observe the Status lin
To change the background (BG) color	HOLD DOWN the BACKGROUND COLOR key PRESS: Any of the FG Color keys Release Keys Observe the Status line

7) USING BLINK ON AND BLINK OFF:	
To make characters blink on and off To stop characters from blinking	PRESS: BK ON PRESS: BK OFF

8) WRITING HORIZONTALLY AND VERTICALLY:	
To change from horizontal to vertical	PRESS: WR VER Observe Status line for —— V
To change from vertical to horizontal	PRESS: WR HOR Observe Status line for — —>

REMEMBER TO PLACE TEMPLATE IN HORIZONTAL MODE BEFORE YOU SAVE ANY DISPLAY.

Quick Edit Graphic Guide

9) USING SINGLE AND DOUBLE HEIGHT CHARACTERS:	
To change from SINGLE to DOUBLE Height	PRESS: DOUBLE Observe Status line for —— D
To change from DOUBLE TO SINGLE Height	PRESS: SINGLE Observe Status line to see that the D disappears
REMEMBER ALL HARD COPIES OF DOUBLE HEIGHT CHARACTERS APPEAR AS DUPLICATE LINES OF SINGLE HEIGHT CHARACTERS.	
10) DRAWING/REMOVING A STATION:	
To DRAW a Station	To REMOVE a STATION
PRESS: DR STA	PRESS: RM STA
(Observe lower right corner of template)	
To make Control Box on template appear and disappear PRESS: DR STA PRESS: RM STA	
11) DRAWING/REMOVING A BOX:	
To DRAW a Box	To REMOVE a Box
Set the WIDTH Move the cursor to desired coordinates Set the BEGIN point	Set the WIDTH Move the cursor to desired coordinates Set the BEGIN point
Move the cursor to desired coordinates Set the END point	Move the cursor to desired coordinates Set the END point
Set the colors PRESS: DR BOX	Set the colors PRESS: RM BOX
12) INSERTING A SYMBOL:	
	Move the cursor to desired coordinates Set the FG and BG colors PRESS: BK ON or BK OFF PRESS: IN SYM
Editor asks for a symbol name:	ENTER: Name of existing symbol to insert PRESS: ENTER

Quick Edit Graphic Guide

13) DEFINING A SYMBOL:

	Move the cursor to desired coordinates PRESS: DF SYM
Editor asks for a symbol name:	ENTER: Name of new symbol PRESS: ENTER
DEFINE SYMBOL appears on CRT. Begin drawing your new symbol (See Section VII and Appendix I — DEFINING A SYMBOL).	
When done defining your symbol Editor adds new symbol to library.	PRESS: ENTER

14) CREATING DYNAMIC ITEMS:

14A) Specifying Dynamic Values

1) FOR REAL TAG	2) FOR STATION TAG
Move the cursor to desired coordinates PRESS: ED DYN ENTER: V (for value) PRESS: ENTER ENTER: Tag name PRESS: ENTER ENTER: Format number	Move the cursor to desired coordinates PRESS: ED DYN ENTER: V (for value) PRESS: ENTER ENTER: Tag Name PRESS: ENTER ENTER: Format number
[IF UNSURE OF FORMAT NUMBER, ENTER 0]	
PRESS: ENTER (Go to some other task)	PRESS: ENTER ENTER: Station parameter (PV, SP, CO, RI MO, ST) PRESS: ENTER
If tag to show CURRENT value	PRESS: ENTER (at Suffix) PRESS: ENTER (at Period) GO TO CONTROL PROMPT
If tag to show SUFFIX	ENTER: Suffix PRESS: ENTER ENTER: Period PRESS: ENTER
If Operator to take Control Action from this Graphic	ENTER: Y PRESS: ENTER GO TO NUMERIC PROMPT
If Operator to Monitor only	ENTER: N PRESS: ENTER (Go to some other task)
AT NUMERIC PROMPT	ENTER: Control numeric PRESS: ENTER (Go to some other task)

Quick Edit Graphic Guide

14A) Specifying Dynamic Values (continued)	
3) FOR BOOLEAN TAG	4) FOR RCM TAG
Move the cursor to desired coordinates PRESS: ED DYN ENTER: V PRESS: ENTER ENTER: Tag name PRESS: ENTER ENTER: Format number PRESS: ENTER (Go on to some other task)	Move the cursor to desired coordinates PRESS: ED DYN ENTER V PRESS: ENTER ENTER: Tag name PRESS: ENTER ENTER: Format number PRESS: ENTER
If Operator to take Control Action from this Graphic	ENTER: Y PRESS: ENTER ENTER: Control Numeric PRESS: ENTER (Go on to some other task)
If Operator to monitor only	ENTER: N PRESS: ENTER (Go on to some other task)
To abort this task at any point	PRESS: ESCAPE
14B) Specify Dynamic Symbols	
FOR ALL TAG TYPES	Move the cursor to desired coordinates PRESS: ED DYN ENTER: S (for symbol) PRESS: ENTER ENTER: Tag name PRESS: ENTER
Perform the following for each specific tag type—	
STATION TAG	REAL TAG
ENTER: Station parameter PRESS: ENTER ENTER: Symbol name for LOW tag value Set the colors PRESS: ENTER ENTER: Symbol name for HIGH ALARM value Set the colors PRESS: ENTER	ENTER: Boundary value PRESS: ENTER ENTER: Symbol name for LOW tag value Set the colors PRESS: ENTER ENTER: Symbol name for HIGH ALARM value Set the colors PRESS: ENTER

Quick Edit Graphic Guide

14b) Specifying Dynamic Symbols (continued):

ENTER: Symbol; name for
HIGH tag value
Set the colors
PRESS: ENTER

ENTER: Symbol name for
HIGH tag value
Set the colors
PRESS: ENTER

(Go to some other task)

BOOLEAN TAG

ENTER: Symbol name for
tag 0 value
Set the colors
PRESS: ENTER
ENTER: Symbol name for
tag 0 ALARM value
Set the colors
PRESS: ENTER
ENTER: Symbol name for
tag 1 ALARM value
Set the colors
PRESS: ENTER
ENTER: Symbol name for
tag 1 value
Set the colors
PRESS: ENTER

RCM TAG

ENTER: Symbol name for
tag 0 value
Set the colors
PRESS: ENTER
ENTER: Symbol name for
tag 0 ALARM value
Set the colors
PRESS ENTER
ENTER: Symbol name for
tag 1 ALARM value
Set the colors
PRESS: ENTER
ENTER: Symbol name for
tag 1 value
Set the colors
PRESS: ENTER

(Go to some other task)

To abort this task at any point — PRESS: ESCAPE

14c) Specify Dynamic Bars

FOR REAL AND STATION TAGS

Set the bar WIDTH
Set the BEGIN and END points
Set the colors
Move the cursor to the BEGIN coordinates
PRESS: ED DYN
ENTER: B (for bar)
PRESS: ENTER
ENTER: Tag name
PRESS: ENTER

REAL TAG

ENTER: Tag 0 value
PRESS: ENTER
ENTER: Tag Span value
PRESS: ENTER
(Go to some other task)

STATION TAG

ENTER: Station parameter
PRESS: ENTER
ENTER: Tag 0 value
PRESS: ENTER
ENTER: Tag Span value
PRESS: ENTER
(Go to some other task)

To use the Zero & Span values of the tag function block specs, enter 0.0 in the SPAN prompt. (The Editor then ignores the value entered in the ZERO prompt.)

Quick Edit Graphic Guide

14c) Specify Dynamic Bars (continued):	
To have the bar grow as tag value DECREASES, enter a negative span value (—###.#). To have the bar grow as tag value INCREASES, enter a positive span value.	
To abort this task at any point	PRESS: ESCAPE
14d) Specifying Dynamic Pipes	
FOR ALL TAGS	Move the cursor to desired coordinates PRESS: ED DYN ENTER: P (for pipe) PRESS: ENTER ENTER: Tag name PRESS: ENTER
REAL TAG	STATION TAG
ENTER: Boundary value PRESS: ENTER Set the colors for tag LOW values PRESS: ENTER Set the colors for tag HIGH values PRESS: ENTER PRESS: ESCAPE (to abort) OR PRESS: ENTER (for segments)	ENTER: Station parameter PRESS: ENTER ENTER: Boundary value PRESS: ENTER Set the colors for tag LOW values PRESS: ENTER Set the colors for tag HIGH values PRESS: ENTER PRESS: ESCAPE (to abort) OR PRESS: ENTER (for segments)
Editor displays modified Status line for FIRST segment.	
FOR BOTH TAGS D1)	Set the WIDTH Set the BEGIN and END points PRESS: ENTER
Editor draws in the first pipe segment	
To go on to the NEXT segment	ENTER: N PRESS: ENTER Repeat D1 for each pipe segment you want to draw (up to maximum of 10)
When done with all segments	ENTER: E PRESS: ENTER (Go to some other task)
FOR BOOLEAN AND RCM TAGS	Set colors for tag 0 state PRESS: ENTER Set colors for tag 1 state PRESS: ENTER

Quick Edit Graphic Guide

14D) Specifying Dynamic Pipes		
To abort task		PRESS: ESCAPE OR PRESS: ENTER
To draw segments	D2)	Set WIDTH SET BEGIN and END points PRESS: ENTER
Editor draws in the first pipe segment		
To go on to the NEXT segment		ENTER: N PRESS: ENTER Repeat D2 for each pipe segment you want to draw (up to maximum of 10)
When done WITH all segments		ENTER: E PRESS: ENTER (Go to some other task

15) EDITING DYNAMIC ITEMS:	
Access Graphic template containing dynamic items you want to edit (Graphic Editor Menu)	PRESS: A ENTER: Name of Graphic PRESS: ENTER
(When Graphic Name appears on CRT)	PRESS: ENTER again
(When Graphic Descriptor appears	PRESS: ENTER again
(When entered Graphic appears on CRT)	Move the cursor to address of dynamic item to edit PRESS: ED DYN
(If no item letter appears in the Status line item prompt field, you did not move the cursor to the proper item address. Re-position the cursor to the proper item address and press ED DYN again.)	
Work through the parameters and lines using the ENTER key until you reach the part you want to change. Make changes as for new items.	PRESS: ENTER

Follow these specific steps for dynamic symbols, bars, and pipes

Delete the specific item or change it to a different item type. Or enter a different response at the appropriate prompt (than when item originally created).

You can either leave an item as is by pressing ENTER at any prompt or change the item and then press ENTER. If you press ESCAPE at any prompt the previous data stays as is.

Quick Edit Graphic Guide

15) Editing Dynamics Items (continued)

FOR DYNAMIC PIPE SEGMENTS

Accept/Modify responses as above.

To leave a segment as is, press ENTER without changing it. Go on to next pipe segment

Change a segment by changing its WIDTH, BEGIN, and END points. Go on to next segment.

Delete a segment by pressing ENTER without changing it parameters and enter D at NEXT prompt and press ENTER. Go on to next segment.

Repeat steps above until done editing all segments. Enter E at NEXT prompt and press ENTER.

Repeat all EDIT steps above for all dynamic items you want to edit. When done, go to some other task.

16) DEFINING DYNAMIC ITEMS:

Access Graphic containing dynamic item you want to delete.
Move cursor to dynamic item address.
PRESS: ED DYN

(If proper item letter is in Status line prompt field proceed as below. Otherwise, reposition cursor and press ED DYN again.

PRESS: spacebar at item to delete
or

PRESS: CLEAR

PRESS: ENTER

Editor now deletes dynamic item from current template.

The Editor does not erase dynamic symbols from the template. However, they LOSE their dynamic status.

Repeat all delete steps above for every dynamic item you want to delete. When done go to some other task.

Quick Edit Graphic Guide

17) SAVING A DISPLAY

Ensure desired template is in WR HOR
If not, press WR HOR
PRESS: SAVE

Editor scans current template. When scanning marks disappear the template is added to OIU memory.

You can now go on working on this template. If you make further changes, you must save this display again before you can leave it to do some other task or function.

To stop editing — PRESS: G MENU

18) RETURNING TO THE GRAPHIC EDITOR MENU:

Ensure the template is in WR HOR mode
If not, press WR HOR
PRESS: G MENU

If you made any changes to the template, or this is the first time you worked on it, you must save it.

A) ENTER: Y
PRESS: ENTER (Go to C)

If you did not make changes to the template (since you last saved it)

B) ENTER: N
PRESS: ENTER (Go to D)

C) The editor scans and save the display. Then it asks if you want to stay at the display or return to the menu.

If you want to stay at the display — PRESS: ESCAPE
If you want to return to the Menu — PRESS: ENTER

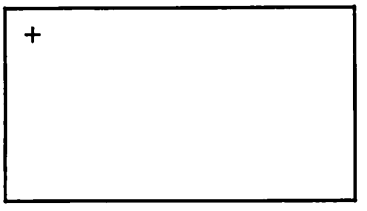
D) The Editor asks if you want to return to the Menu or stay at this display.

If you want to stay at the display — PRESS: ESCAPE
If you want to return to the Menu — PRESS: ENTER

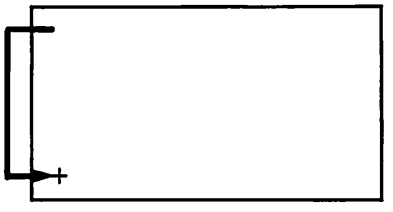
Quick Graphic Exercise Guide

1) MOVING THE CURSOR AROUND CORNERS:

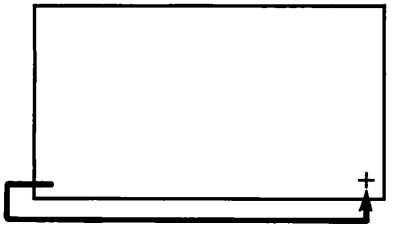
Perform the following steps, observing the changing position of the cursor (blinking +) on the CRT. Compare the coordinates in the template Status line with those given below after each cursor move.



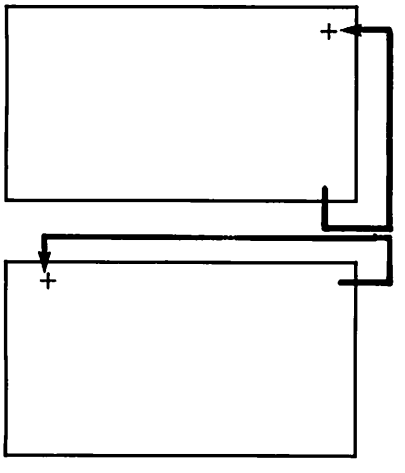
PRESS: HOME — (Puts cursor (+) at top left corner, or coordinates 1, 1)



PRESS: ↑ — once (cursor moves to botom left corner, or coordinates 1, 48)



PRESS: ← — once (cursor moves to bottom right corner, or coordinates 80, 47)

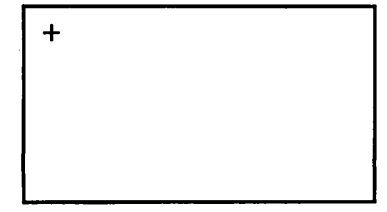


PRESS: ↓ — twice (cursor moves to top right corner, or coordinates 80, 1)

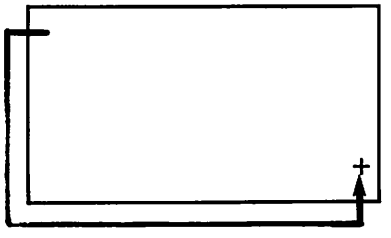
PRESS: → — once (cursor moves to left or to coordinates 1, 2)

Exercise #2 — Move the cursor around the CRT (down and to the right, up, down and to the left, and back up again)

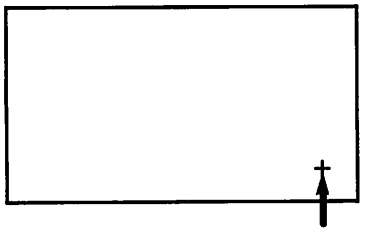
Quick Graphic Exercise Guide



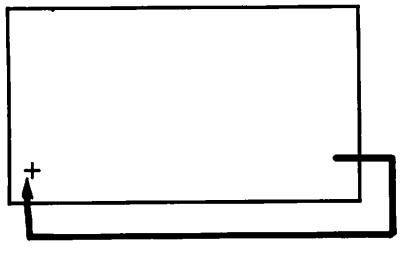
PRESS: HOME (Puts cursor (+) at top left corner, or coordinates 1, 1)



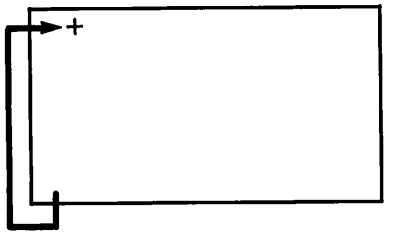
PRESS: ← once (cursor moves to bottom right corner, or coordinates 80, 48)



PRESS: ↑ once (cursor moves up one character space to coordinates 80,47



PRESS: → once (cursor moves to bottom left hand corner, or coordinates, 1,48)

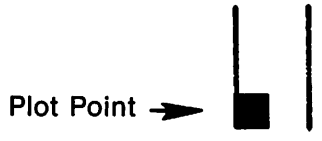


PRESS: ↓ once (cursor backs to upper left corner, or HOME, coordinates 1,1)

Quick Graphic Exercise Guide

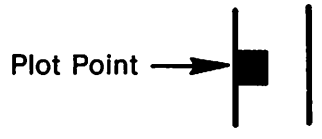
2) SETTING PLOT POINTS:

While observing the plot point descriptor (▙ |) in the template Status line, press and hold down the POINT key and then press down the BLACK foreground color key. Now release both keys. The plot point looks like this:

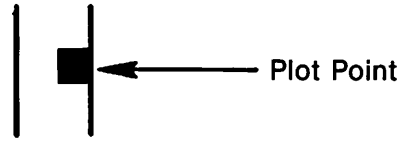


(The plot point appears enlarged here so you can better see the relationship. It is only letter-sized on the template Status line.)

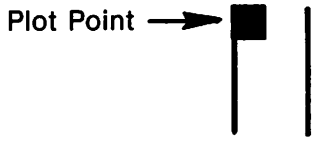
Now press and hold down the POINT key while pressing the BLUE foreground color key. Now release both keys. The plot point looks like this:



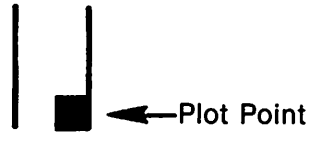
Now press and hold down the POINT key while pressing the MAGENTA foreground color key. Now release both keys. The plot point looks like this:



Now press and down the POINT key while pressing the RED foreground color key. Now release both keys. The plot point looks like this:



Now press and hold down the POINT key while pressing the WHITE foreground color key. Now release both keys. The plot point looks like this:



Repeat these steps for the remaining color keys and observe the changes in position of the Status line Plot Point designator.

Quick Graphic Exercise Guide

3) SETTING BEGIN AND END POINTS:

Exercise #1:

Move the cursor to coordinates 14, 39
Set the Plot point at MGN (| ■)
PRESS: BEGIN
Move the cursor to coordinates 1, 2,
Set the Plot point BLK (■ |)

Now compare the template Status line with that below ——
(They should be identical.)

For > GRN ON BLK CURSOR = 14, 39 | ■ WIDTH = 1 BEGIN = 14,39 | ■ END = 1,2 ■ |

Exercise #2:

Move the cursor to coordinates 45, 27
Set the Plot point at WHT (|■)
PRESS BEGIN
Move the cursor to coordinates 45, 4
Set the Plot point to CYN (|■)
PRESS: END

Now compare the template Status line with that below —
(They should be identical)

FOR > GRN ON BLK CURSOR = 45,27 |■ WIDTH = 1 BEGIN = 45,27 |■ END = 45,4 |■

Exercise #3:

Move the cursor to coordinates 4, 12
Set the Plot point to RED (■ |)
PRESS: BEGIN
Move the cursor to coordinates 71, 37
Set the Plot Point to BLK (■ |)
PRESS: END

Now compare the template Status line with that below ——
(They should be identical.)

FOR > YEL ON BLK CURSOR = 4,12 ■| WIDTH = 1 BEGIN = 4,12 ■| END = 71,37 ■|

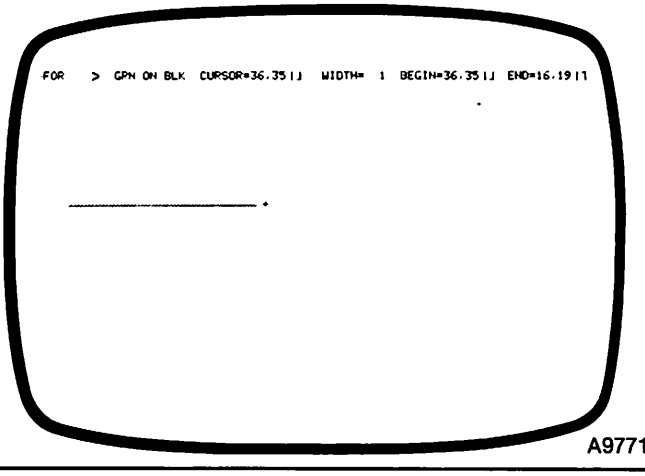
Quick Graphic Exercise Guide

4) DRAWING A LINE:

Exercise #1:

Create a clean template by pressing ERASE PAGE
PRESS: ENTER
Move the cursor to coordinates 7,15
Set the Plot point at BLK
PRESS: BEGIN
Move the cursor to coordinates 33,15
Set the Plot point to WHT ( )
PRESS: END
PRESS: DR LIN

Your template should look like ——



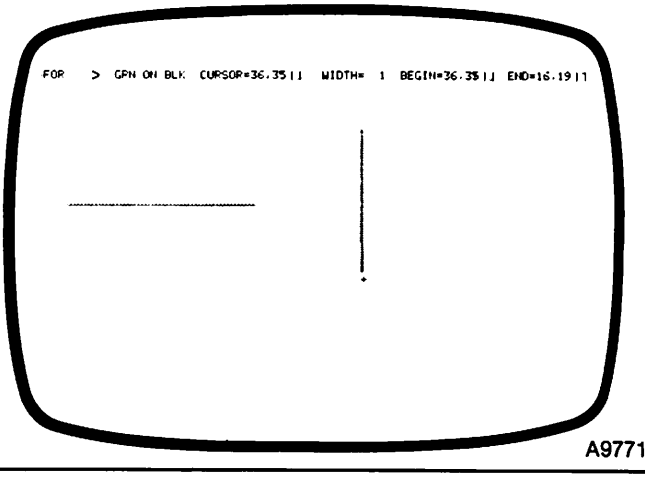
A9771

Exercise #2:

SET BEGIN AND END

Move the cursor to coordinate 48,8
Set the Plot point to RED ( )
PRESS: BEGIN
Move the cursor to coordinates 48,24
Set the Plot point to BLK ( )
PRESS: END
PRESS: DR LIN

Your template should look like ——



A9771

Quick Graphic Exercise Guide

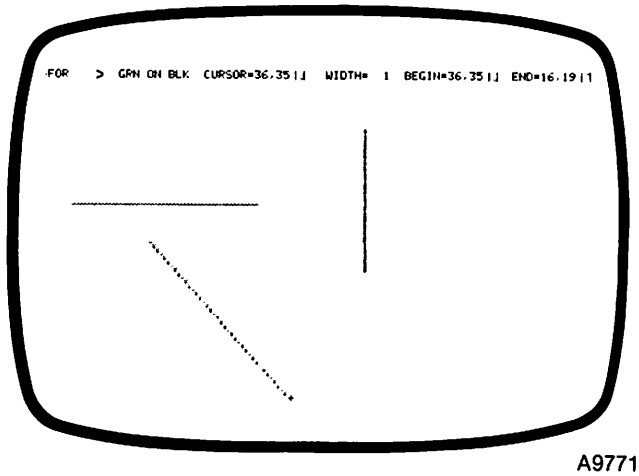
4) Drawing a Line (continued)

Exercise #3:

SET
BEGIN
AND
END

- Move the cursor to coordinates 36,35
- Set the Plot point to WHT (| ▟)
- PRESS: BEGIN
- Move the cursor to coordinates 16,19
- Set the Plot point to CYN (| ▛)
- PRESS: END
- PRESS: DR LIN

Your template should look like ——



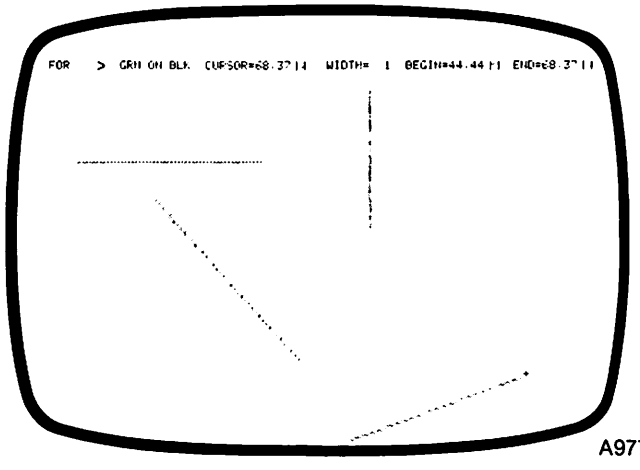
A9771

Exercise #4:

SET
BEGIN
AND
END

- Move the cursor to coordinates 44,44
- Set the Plot point to GRN (▛ |)
- PRESS: BEGIN
- Move the cursor to coordinates 68,37
- Set the Plot point to YEL (| ▟)
- PRESS: END
- PRESS: DR LIN

Your template should look like ——



A9772

Quick Graphic Exercise Guide

5) SETTING WIDTH AND DRAWING LINES:

While completing these exercises carefully watch to see the Editor draws the lines specified on the template. The Editor fills in the line by individual plot point, starting at BEGIN and moving row by row (or column by column) to END.

Exercise #1: Create a clean template by pressing ERASE PAGE
PRESS: ENTER

PRESS: WIDTH
PRESS: CLEAR
ENTER: 5
PRESS: ENTER
(SET WIDTH)

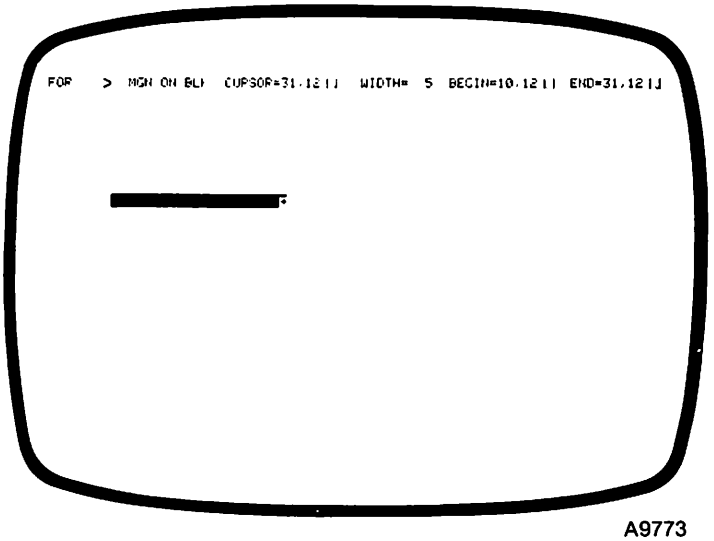
SET BEGIN AND END

Move the cursor to coordinates 10,12
Set the Plot point to BLK (▙ |)
PRESS: BEGIN

Move the cursor to coordinates 31,12
Set the Plot point to WHT (| ▟)
PRESS: END

PRESS: DR LIN

Your template should look like the one below



A9773

Quick Graphic Exercise Guide

5) Setting Width and Drawing Lines (continued)

Exercise #2:

PRESS: WIDTH
PRESS: CLEAR
ENTER: 12
PRESS: ENTER

SET WIDTH

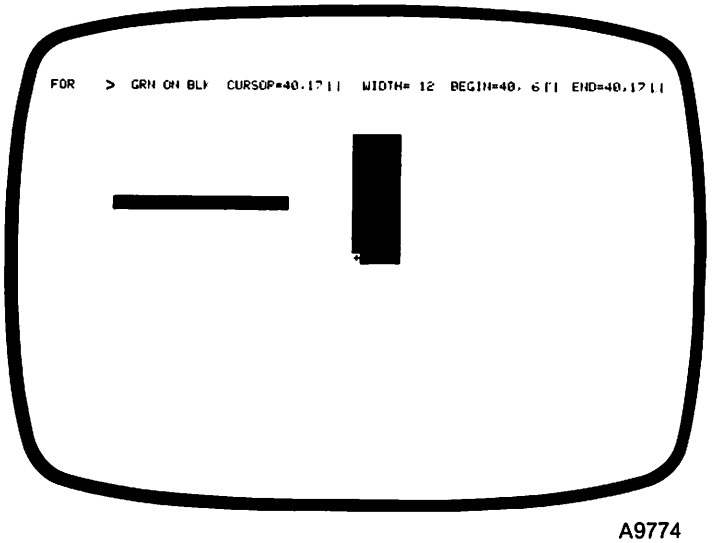
Move the cursor to coordinates 40,6
Set the Plot point to RED (▛ |)
PRESS: BEGIN

SET BEGIN AND END

Move the cursor to coordinates 40,17
Set the Plot point to BLK (▙ |)
PRESS: END

PRESS: DR LIN

Your template should look like the one below ——



A9774

Quick Graphic Exercise Guide

5) Setting Width and Drawing Lines (continued)

Exercise #3:

PRESS: WIDTH
PRESS: CLEAR
ENTER: 24
PRESS: ENTER

SET WIDTH

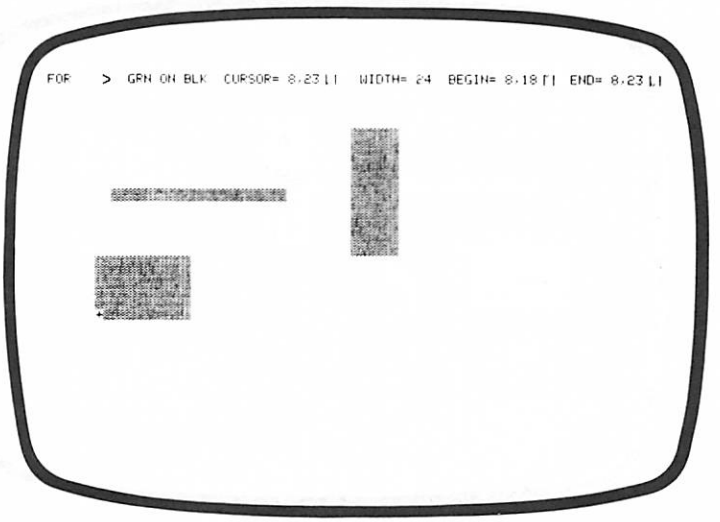
SET BEGIN AND END

Move the cursor to coordinates 8,18
Set the Plot point to RED (|)
PRESS: BEGIN

Move the cursor to coordinates 8,23
Set the Plot point to BLK (|)
PRESS: END

PRESS: DR LIN

You template should look like the one below



A9775

Quick Graphic Exercise Guide

5) Setting Width and Drawing Lines (continued)

Exercise #4:

PRESS: WIDTH
PRESS: CLEAR
ENTER: 4
PRESS: ENTER

SET WIDTH

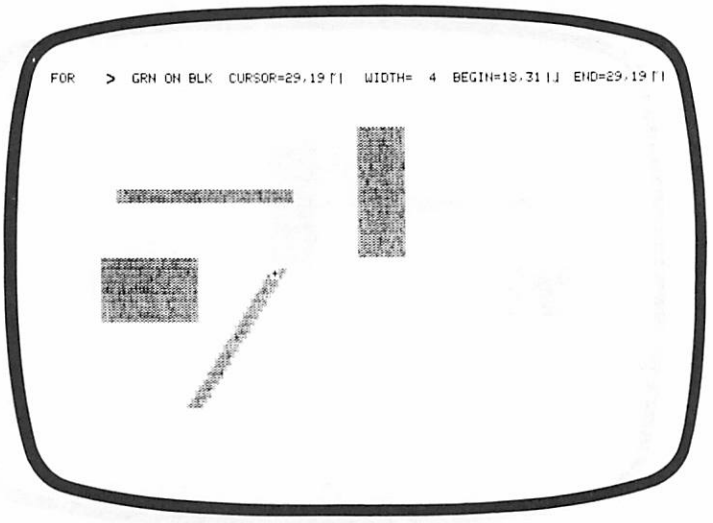
SET BEGIN AND END

Move the cursor to coordinates 18,31
Set the Plot point to WHT ( )
PRESS: BEGIN

Move the cursor to coordinates 29,20
Set the Plot point to RED ( )
PRESS: END

PRESS: DR LIN

Your template should look like the one below ——



A9776

Quick Graphic Exercise Guide

5) Setting Width and Drawing Lines (continued)

Exercise #5:

PRESS: WIDTH
PRESS: CLEAR
ENTER: 2
PRESS: ENTER

SET WIDTH

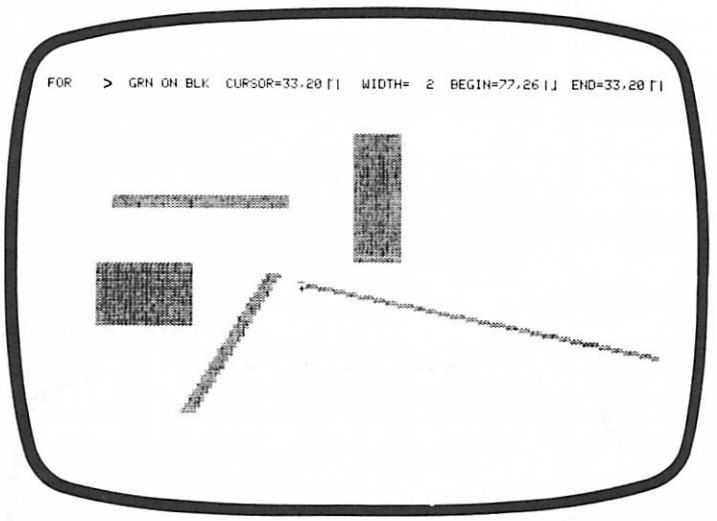
Move the cursor to coordinates 77,26
Set the Plot point to WHT ( )
PRESS: BEGIN

SET BEGIN AND END

Move the cursor to coordinates 33,20
Set the Plot point to RED ( )
PRESS: END

PRESS: DR LIN

Your template should look like the one below ——



A9777

Quick Graphic Exercise Guide

6) SETTING FG/BG COLORS AND USING BK ON AND BK OFF:

Exercise #1: Drawing a blinking LINE ——

Create a clean template by pressing ERASE PAGE
PRESS: ENTER

PRESS: WIDTH
PRESS: CLEAR
ENTER: 7
PRESS: ENTER
(SET WIDTH)

SET THE COLORS:
PRESS: MGN color key
PRESS: HOLD DOWN BACKGROUND COLOR key while pressing YEL color key
Release both keys

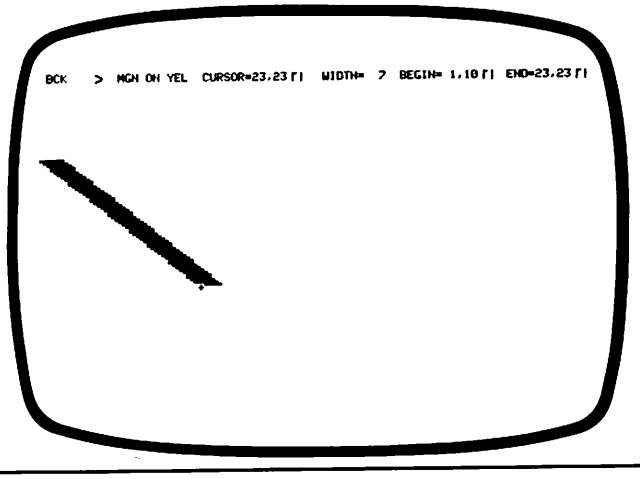
PRESS: BK ON

SET BEGIN AND END:
Move the cursor to coordinates 1,10
Set the Plot point to RED ( )
PRESS: BEGIN

Move the cursor to coordinates 23,23
Set the Plot point to RED ( )
PRESS: END

PRESS: DR LIN

Your line should appear as below but should also BLINK and have yellow triangular shapes on either side ——



A9778

Quick Graphic Exercise Guide

6) Setting FG/BG colors and using BK on and BK OFF: (continued):

Exercise #2: Draw a blinking LINE ——

SET WIDTH:
PRESS: WIDTH
PRESS: CLEAR
ENTER: 12
PRESS: ENTER

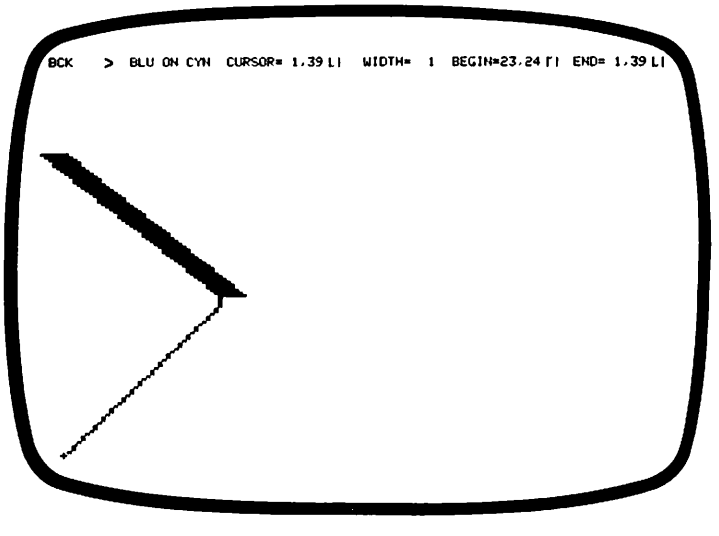
SET THE COLORS:
PRESS: BLU color key
PRESS: HOLD DOWN BACKGROUND COLOR key while pressing CYN color key
Release both keys

SET BEGIN AND END:
Move the cursor to coordinates 23,24
Set the Plot point to RED (|)
BEGIN

Move the cursor to coordinates 1,39
Set the PLot point to BLK (|)
PRESS: END

PRESS: DR LIN

Your line should appear as below but should also BLINK and have cyan triangular shapes on either side ——



A9779

Quick Graphic Exercise Guide

6) Setting FG/BG colors and using BK on and BK OFF:(continued)

Exercise #3: Draw a blinking LINE ——

SET WIDTH:
PRESS: WIDTH
PRESS: CLEAR
ENTER: 20
PRESS: ENTER

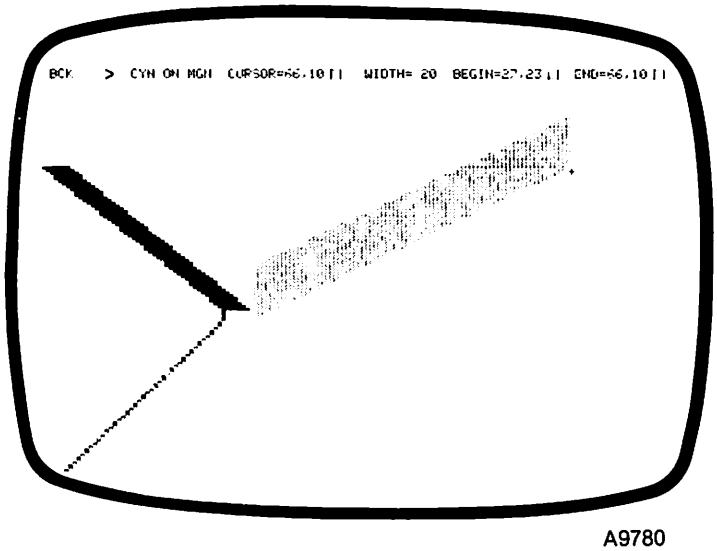
SET THE COLORS:
PRESS: CYN color key
PRESS: HOLD DOWN BACKGROUND COLOR key while pressing MGN color key
Release both keys

SET BEGIN AND END:
Move the cursor to coordinates 27,24
Set the Plot point to BLK ( )
BEGIN

Move the cursor to coordinates 66,10
Set the PLot point to RED ( )
PRESS: END

PRESS: DR LIN

Your line should appear as below but should also BLINK and have magenta triangular shapes on either side ——



A9780

Quick Graphic Exercise Guide

6) Setting FG/BG Colors and Using BK ON and BK OFF

Exercise #4: Draw a blinking LINE ——

SET WIDTH:
- PRESS: WIDTH
- PRES:: CLEAR
- ENTER: 1
- PRESS: ENTER

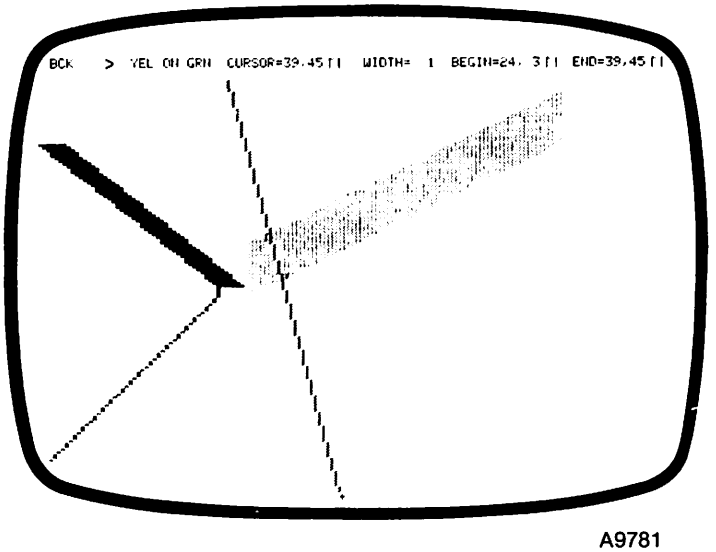
SET THE COLORS:
- PRESS: YEL color key
- PRESS: HOLD DOWN BACKGROUND COLOR key while pressing GRN color key

Release both keys

SET BEGIN AND END:
- Move the cursor to coordinates 24,3
- Set the Plot point to RED (▛)
- PRESS: BEGIN
- Move the cursor to coordinates 39,45
- Set the Plot point to BLK (▙)
- PRESS: END

PRESS: DR LIN

Your line should appear as below but should also BLINK and have green shapes on either side ——



A9781

Quick Graphic Exercise Guide

7) REMOVING A LINE:

Exercise #1: Remove a blinking LINE ——

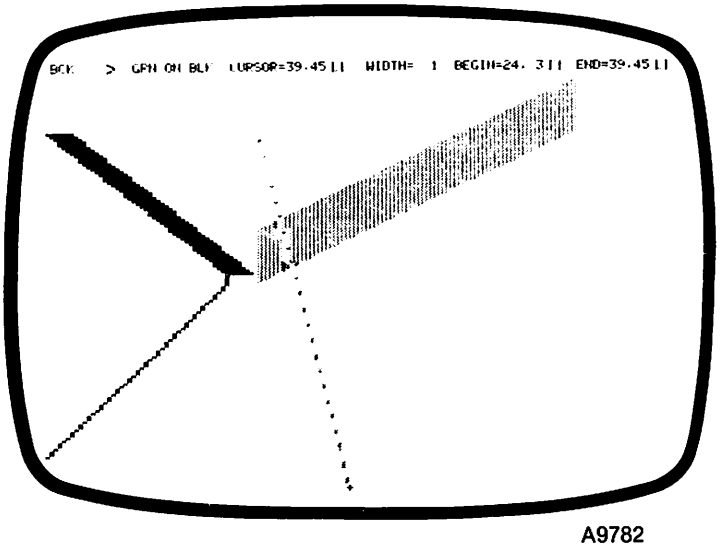
SET WIDTH:
- PRESS WIDTH
- PRESS: CLEAR
- ENTER: 1
- PRESS: ENTER

SET THE COLORS:
- PRESS: GRN color key
- PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
  Release both keys

SET BEGIN AND END:
- Move the cursor to coordinates 24,3
  Set the Plot point to RED ( )
  PRESS: BEGIN
- Move the cursor to coordinates 39,45
  Set the Plot point to BLK ( )
  PRESS: END

PRESS: RM LIN

Your line should appear as below (like that of Exercise #3)



A9782

Quick Graphic Exercise Guide

8) DRAWING/REMOVING A BOX:

Exercise #1: Draw a BLUE Box ——

Create a clean template by pressing ERASE PAGE
PRESS: ENTER

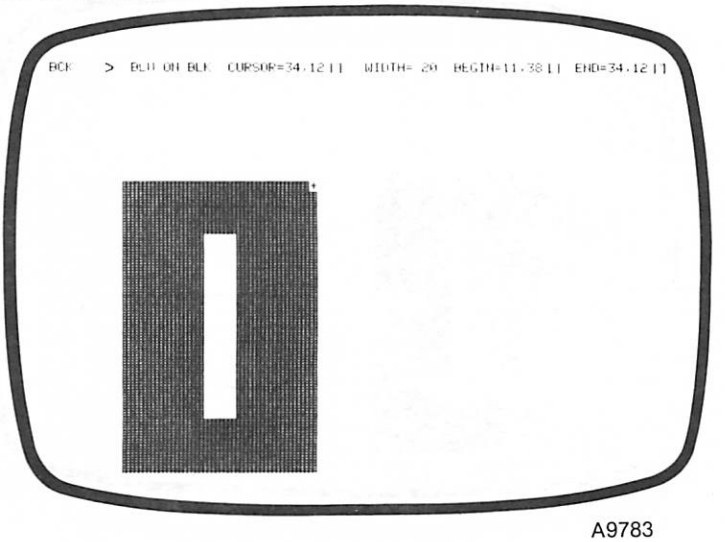
SET WIDTH
- PRESS: WIDTH
- PRESS: CLEAR
- ENTER: 20
- PRESS: ENTER

SET THE COLORS
- PRESS: BLU color key
- PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
  Release both keys

SET BEGIN AND END
- Move the cursor to coordinates 11,38
  Set the Plot point to BLK ( )
  PRESS: BEGIN
- Move the cursor to coordinates 34,12
  Set the Plot point to CYN ( )
  PRESS: END

PRESS: DR BOX

Your template should like that below ——



A9783

Quick Graphic Exercise Guide

8) Drawing/Removing a Box (continued):

Exercise #2: Draw a RED box ——

SET WIDTH:
PRESS: WIDTH
PRESS: CLEAR
ENTER: 2
PRESS: ENTER

SET THE COLORS:
PRESS: RED color key

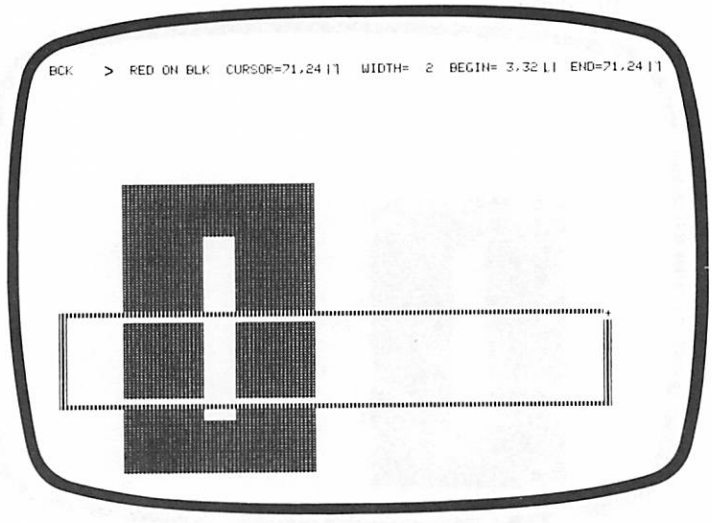
PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
Release both keys

SET BEGIN AND END:
Move the cursor to coordinates 3,32
Set the Plot point to BLK (▙ |)
PRESS: BEGIN

Move the cursor to coordinates 71,24
Set the Plot point to CYN (| ▛)
PRESS: END

PRESS: DR BOX

Your template should appear as below ——



A9784

Quick Graphic Exercise Guide

8) Drawing/Removing a Box (continued):

Exercise #3: Remove a box ——

PRESS: WIDTH
PRESS: CLEAR
ENTER: 3
PRESS: ENTER
(SET WIDTH)

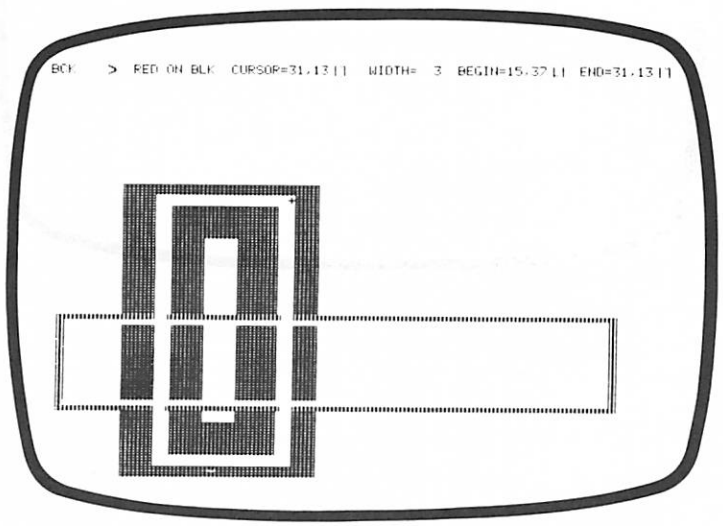
SET THE COLORS:
PRESS: RED color key
PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
Release both keys

SET BEGIN AND END:
Move the cursor to coordinates 15,37
Set the Plot point to BLK (▙ |)
PRESS: BEGIN

Move the cursor to coordinates 31,13
Set the Plot point to CYN (| ▛)
PRESS: END

PRESS: DR BOX

Your template should appear as below ——



A9785

Quick Graphic Exercise Guide

9) INSERTING SYMBOLS:

Exercise #1: Insert a RED valve (VLVSTA) at 16,21 ——

Create a clean template by pressing ERASE PAGE
PRESS: ENTER

Move the cursor to coordinates 16,21

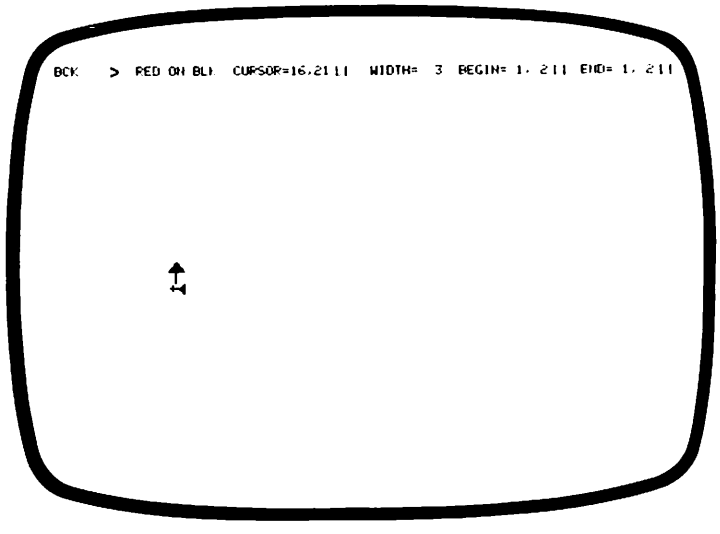
SET THE COLORS

- PRESS: RED color key
- PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key

Release both keys

PRESS: IN SYM
ENTER: VLVSTA (Name of symbol to insert)
PRESS: ENTER

Your template should appear as below ——



Quick Graphic Exercise Guide

9) Inserting Symbols (continued):

Exercise #2: Insert BLUE valves (VLVSTA) at 52,12 and 56,16 ——

Move the cursor to coordinates 52,12

SET THE COLORS

PRESS: BLU color key

PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
Release both keys

PRESS: IN SYM
ENTER: VLVSTA (Name of symbol to insert)
PRESS: ENTER

Move the cursor to coordinates 52,12

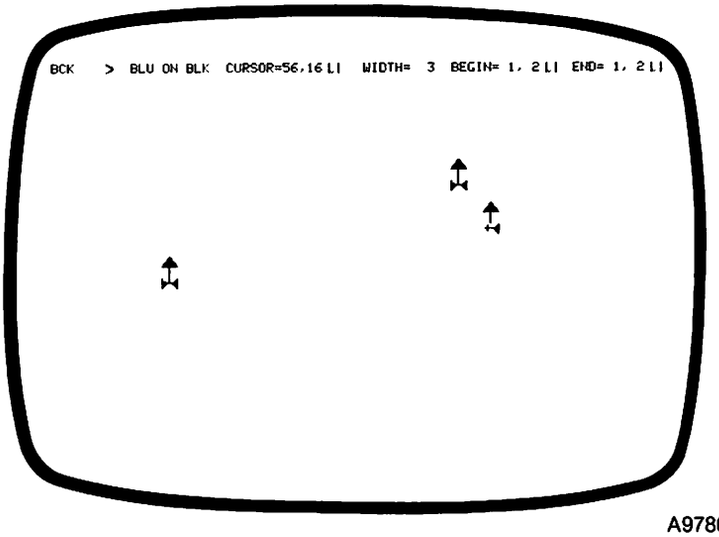
SET THE COLORS

PRESS: BLU color key

PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
Release both keys

PRESS: IN SYM
ENTER: VLVSTA (Name of symbol to insert)
PRESS: ENTER

Your template should appear as below ——



A9786

Quick Graphic Exercise Guide

9) Inserting Symbols (continued):

Exercise #3: Insert a YELLOW blinking pump (PUMPER) at coordinates 27,38 ——

Move the cursor to coordinates 27,38

SET THE COLORS

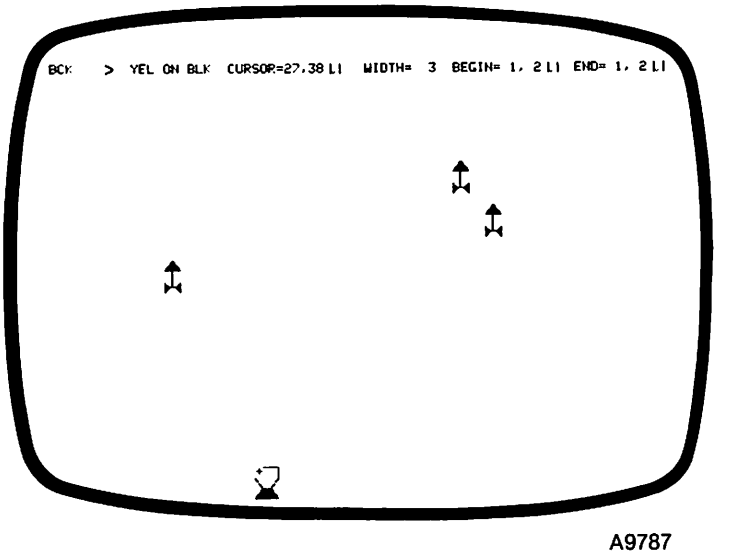
PRES: YEL color key

PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
Release both keys

PRESS: BK ON

ENTER: IN SYM
ENTER: PUMPER (Name of symbol to insert)
PRESS: ENTER

Your template should appear as below ——



A9787

Quick Graphic Exercise Guide

10) CREATING DYNAMIC VALUE (REAL TAG):

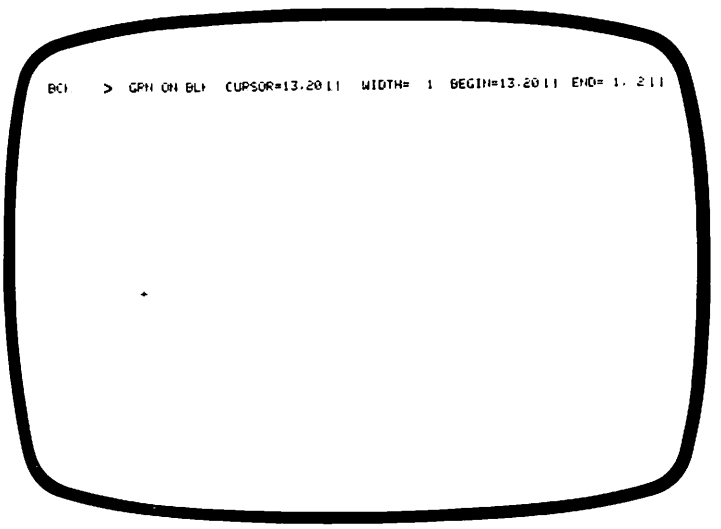
Exercise #1: Create a clean template by pressing ERASE PAGE
PRESS: ENTER

Move the cursor to coordinates 13,20

SET THE COLORS →
- PRSS: GRN color key
- PRESS: HOLD DOWN BACKGROUND COLOR key while pressing BLK color key
  Release both keys

PRESS: ED DYN
ENTER: V (for value)
PRESS: ENTER
ENTER: AMM-1 (Tag name)
PRESS: ENTER
ENTER: 0 (format number)
PRESS: ENTER

Your template should look like that below ——



A9788

Quick Graphic Exercise Guide

11) CREATING DYNAMIC VALUE (RCM TAG):

Exercise #1:

Create a clean template by pressing ERASE PAGE
PRESS: ENTER

Move the cursor to coordinates 13,10

PRESS: ED DYN
ENTER: S (for symbol)
PRESS: ENTER
ENTER: RECIRC (Tag name)
PRESS: ENTER
ENTER: HEATEXCH (Symbol name = tag 0 value)
Set the FG and BG colors for symbol
PRESS: ENTER
ENTER: HEATEXCH (Symbol name = tag 0 Alarm value)
Set the FG and BG colors
PRESS: ENTER
ENTER: HEATEXCH (Symbol name = tag 1 Alarm value)
Set the FG and BG colors
PRESS: ENTER
ENTER: HEATEXCH (Symbol name = tag 1 value)
Set the FG and BG colors
PRESS: ENTER

Each time you press ENTER after entering Symbol name and colors, the particular symbol (predefined or user-defined) from the symbol library appears on the template at the coordinates you specified above and in the colors you entered. After entering the final values (tag 1 non-alarm value) the last symbols appears and the Editor replaces the Status line.

12) CREATING DYNAMIC BAR (STATION TAG):

Exercise #1:

Create a clean template by pressing ERASE PAGE
PRESS: ENTER

PRESS: WIDTH
PRESS: CLEAR
ENTER: 28
PRESS: ENTER
Set the colors (YEL ON BLK) for the bar

Move the cursor to coordinates 13,35
Set the Plot point to BLK ( )
PRESS: BEGIN
Move the cursor to coordinates 13,13
Set the Plot point to RED ( )
PRESS: END

Quick Graphic Exercise Guide

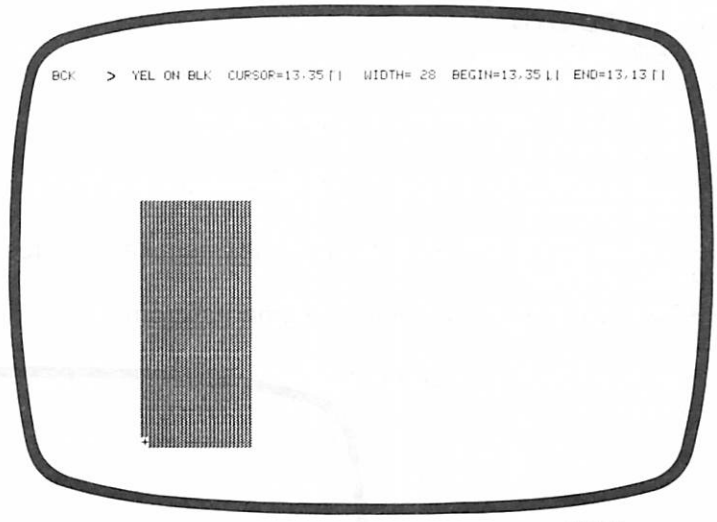
12) Creating Dynamic Bar (STATION TAG) (continued):

Move cursor to BEGIN coordinates
PRESS: ED DYN
ENTER: B (for bar)

PRESS: ENTER
ENTER: STA-1 (Tag name)
PRESS: ENTER

ENTER: SP (Station parameter)
PRESS: ENTER
ENTER: 0.0 (Tag ZERO value)
PRESS: ENTER
ENTER: 100.0 (Tag SPAN value)
PRESS: ENTER

Your template should look like that below ——



A9789

Quick Graphic Exercise Guide

13) CREATING DYNAMITE PIPE (BOOLEAN TAG):

Exercise #1:

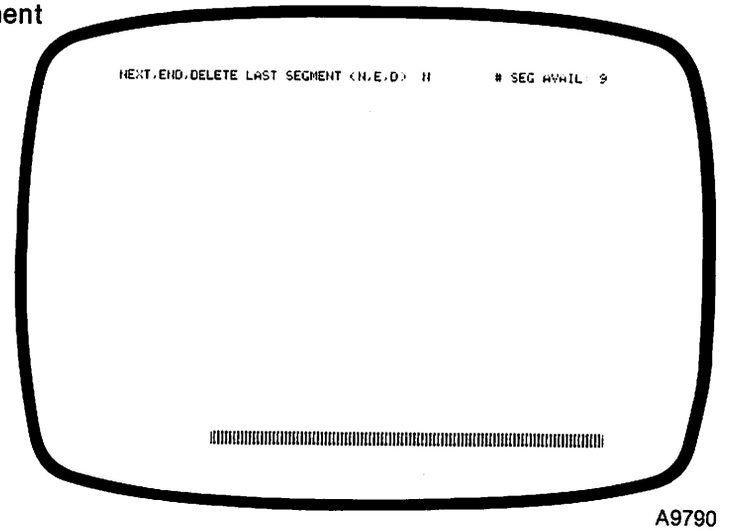
Create clean template by pressing ERASE PAGE
PRESS: ENTER

PRESS: WIDTH
PRESS: CLEAR
ENTER: 5
PRESS: ENTER

Move the cursor to coordinates 13,35
Set the Plot poing to BLK (▙ |)
PRESS: BEGIN
Move the cursor to coordinates 61,35
Set the Plot pointer to WHT (| ▟)
PRESS: END

Move the cursor to BEGIN coordinates
of FIRST pipe segment
PRESS: ED DYN
ENTER: P (for pipe)
PRESS: ENTER
ENTER: LT-1 (Tag name for pipe system)
PRESS: ENTER
Set colors (RED ON BLK) for pipe segment tag 0 value
PRESS: ENTER
Set colors (CYN ON BLK) for pipe segment tag 1 value
PRESS: ENTER
PRESS: ENTER (at number of segments prompt)

Editor now draws your first specified line segment
Your template should look like



A9790

To create more pipe segments, enter N at the N,E,D prompt.
PRESS: ENTER

To end the task, enter E at the N,E,D prompt
PRESS: ENTER

See also Appendix I and M, as well as Section VII.

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