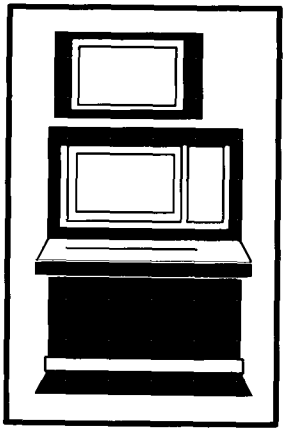
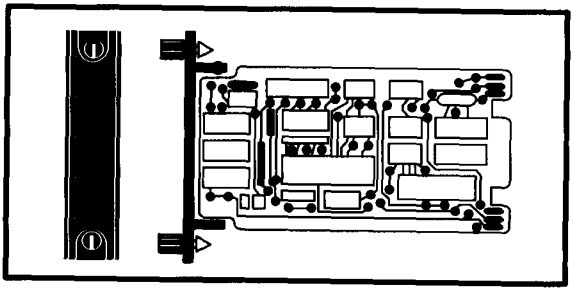
Bailey infi 90®

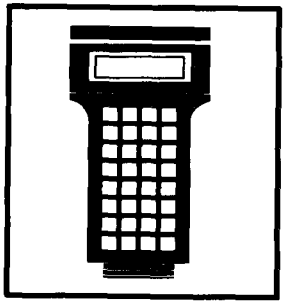
E96-701

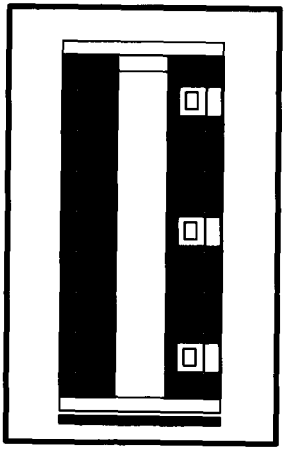
Instruction

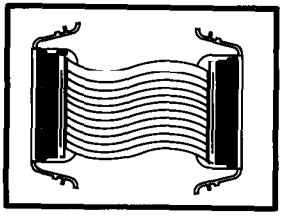
Personal Computer Software
Computer-Aided Drawing/Text (CAD/TXT)
(Release 4.2)

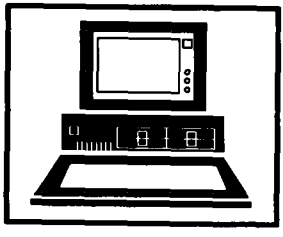












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Preface

This manual explains the features and commands of CAD software release 4.2. It is intended for users who will install and use this software. This manual is not a tutorial nor an application guide. The reader is presumed to have PC and DOS experience.

Key enhancements in this software release are:

- Support for C-Itoh, Genicom 4440 and HP Laserjet II printers.
- Support for Function Codes 113, 180, 181, 182, 183, 200, 201 and 210.
- Support for these modules: NGCMO2, INIPT01, CLC03 and CLC04.
- TEXTEWS has been enhanced considerably.

This revision supersedes and replaces Instruction I E93 916 1B (release date 3/89).

List of Effective Pages

Total number of pages in this manual is 218, consisting of the following

Page No.	Change No.
Preface	Original
List of Effective Pages	Original
iii through ix	Original
1 1 through 1 12	Original
2 1 through 2 6	Original
3 1 through 3 69	Original
4 1 through 4 5	Original
5 1 through 5 16	Original
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7 1 through 7 46	Original
8 1	Original
9 1 through 9 3	Original
A 1 through A 4	Original
B 1 through B 2	Original
C 1 through C 2	Original
D 1 through D 3	Original
E 1 through E 2	Original
F 1	Original
G 1 through G 6	Original
H 1 through H 4	Original
I 1 through I 2	Original
J 1 through J 2	Original
K 1 through K 2	Original
L 1 through L 2	Original
M 1 through M 2	Original
N 1 through N 3	Original
O 1 through O 9	Original

When an update is received, insert the latest changed pages and dispose of the superseded pages

NOTE On an update page the changed text or table is indicated by a vertical bar in the outer margin of the page adjacent to the changed area A changed figure is indicated by a vertical bar in the outer margin next to the figure caption The date the update was prepared will appear under the page number

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SECTION 1 — INTRODUCTION

OVERVIEW

SCAD Engineering Workstation (EWS) software is an integrated control system engineering package It allows you to do the following for process control strategies in an on line or off line environment:

design	trend
configure	tune
modify	verify
moniter	troubleshoot

SCAD runs on the IBM® Personal Computer XT® and AT®, Bailey XT and AT industrial computers and the Intel 30□™ series with the following basic configuration:

- 640 Kilobytes of RAM
- Color Graphics Monitor (refer to Section 2 for list)
- IBM Color Graphics Adapter Card
- Bailey Graphics Card

The following components are optional

- Mouse
- Plotter
- Dot Matrix Printer
- Genicom Graphics Printer (34XX or 4440)
- HP Laserjet II Printer
- Modem
- Enhanced Monitor and Graphics Card

When each program starts, it displays its version and copyright notice

INTENDED USER

This manual is intended for users who are familiar with Network 90/Infi 90 logic and configuration and also the IBM XT or AT system, or the Intel 30□™ It assumes the users are also familiar with the commands of the Disk Operating System (DOS)

RELATED DOCUMENTS

Computer Interface Unit Product Instruction, E93 905
Function Code Application Manual, E93 900 20

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STANDARD DOCUMENT CONVENTIONS

This manual uses the following conventions to illustrate a typical prompt sequence between the user and the computer

Prompt **user response** [Key]

where

Prompt	Actual text of a system prompt is given in italics
user response	Text typed after the *Prompt*
Key	Key to press

Example *Enter macro nm* **MACRO 1** [Enter]

The user responds to the prompt *Enter macro nm* by typing **MACRO 1** and pressing the [Enter] key

NOTE. [Enter] refers to the Return or Enter key

Ctrl [Key	Depress and hold down the Control key [Ctrl] while pressing another key Key
Example Ctrl [P	Hold down the [Ctrl key while pressing the **P** key
(max n)	Maximum characters allowed in a string

ENGINEERING WORK STATION CONCEPTS AND DEFINITIONS

EWS

The computer has a main directory containing the Disk Operating System (DOS), utility programs, a user configured autoexecute (AUTOEXEC BAT) file and a computer config uration file (CONFIG SYS) There are also subdirectories (\EWS, \EWS2) of all executable files assoc ated with SCAD, the system shape library, data files and all master drawing files (e g , Termination Unit Master drawings)

The system operates all the programs and accesses all data files, master drawings, and the shape libraries while in a user defined subdirectory This allows easy back up of all drawing files without having to waste disk space when backing up the execute and data files associated with SCAD

Drawing Files

Creation of a drawing or changes to an existing one, are accomplished within a drawing file (Refer to Appendix I for file extensions)

SCAD runs under DOS (Disk Operating System) This manual assumes the user is familiar with the basic DOS commands If you are not, please study both the DOS User's Guide and the DOS Reference Manual before proceeding with this manual To make **full use** of the SCAD package, including PC to PC Communication, you must have DOS Version 3 0 or later, although SCAD operates with any DOS Version 2.0 or later.

HOW THE EWS WORKS

The EWS programs are designed to be used together in the EWS system to·

1. Create job header and module header definitions (JHD, MHD).

2 Create new, or modify existing sheet drawings (CADEWS)

3. Cross-reference the drawing (N90XREF and Module binding).

4. Compile the drawing (N90CPLR)

5. Plot or print the drawing.

6. Download the configuration (TXTEWS).

7. Verify the configuration (TXTEWS)

8 Modify or tune (CADEWS) or (TXTEWS)

9 Monitor your system (Trend program).

This is typical of the way many users work with the SCAD system While individual needs may differ, this explanation gives an overview of how the system is designed to operate

All EWS programs may be executed from drives other than drive C:. Job Header files must reside in the path (drive and directory) specified in the Module Header file

STRUCTURES

You must use one of the directory structures that follow Never store your own files nor modify any files in the \EWS or \EWS2 directories

The EWS programs work when you have files in any of these environments Deep Structure, Semi Deep Structure or Flat Structure Programs such as Job Header Definition (JHD), Cross Reference (N90XREF) and Binder (NET90BND) all require these structures to operate properly

DEEP STRUCTURE This means that a particular job directory has exactly two levels of subdirectories In Figure 1 1, directory \JOB01 has a deep structure

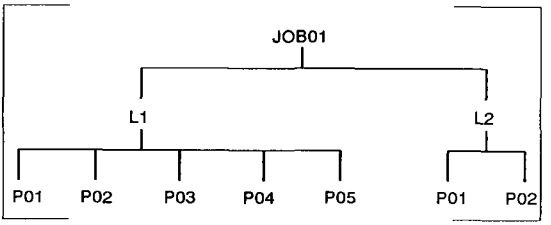


Figure 1 1 Deep Structure

NOTE The system follows the Loop PCU Module structure defined in the module header file The subdirectories must be named LX and PXX as shown in Figure 1 1

SEM DEEP STRUCTURE This means that a particular job directory contains exactly one level of subdirectories A semi deep structure is shown in Figure 1 2 The semi deep structure is used if a job has only one loop

Figure 1 2 Semi Deep Structure

FLAT STRUCTURE This means that a particular job directory has no sub directories; it contains drawing files This structure is used for small jobs

THE MAIN MENU

At the C prompt, type: **CMM** Enter to call the main menu After the copyright screen, SCAD automatically displays the main menu Refer to Table 1-1

Table 1-1 Main Menu and Section Reference

Selection	Name	Section
A	Job Header Def n t on	1
B	Modu e Header Def n t on	1
C	CAD	3
D	Compı at on	4
E	Cross Reference	8
G	Text	7
H	Utilit es	5

NOTE The vers on number and ser a number of the ent re EWS package is shown at the bottom of th s menu

SET UP JOB HEADER

Job Header Definition (JHD) is a program used to define job related information and maintain job specific details, e g , job number, job directory, customer name Pertinent information from this file is copied to newly created module headers

Type **A** from the main menu to execute the Job Header Defi nition program Alternatively, type **JHD** Enter directly from DOS The program prompts for a job number, directory and drive for where to place the JHD file The data entry fields are highlighted with the field width indicated Use the ↑ ,↓ and Enter keys to toggle between the data entry fields Press F10 to enter data. After the data is entered, the program asks if it should open a new file. If you reply with a **Yes**, the program presents a new display that allows you to fill in job related information.

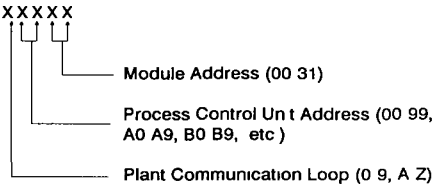
customer name
plant site
control engineer
customer order number

After entering this information, press F10 to create the JHD file

Set Up Module Header

Module Header Definition (MHD) is a program used to define module related information The Module Header Definition includes such information as module file name, job number, job directory, and job directory drive A second screen asks for additional information

Type **B** to execute the Module Header Definition program from the main menu Alternatively, type **MHD** Enter from DOS The first entry prompted for is the file name This format is required



NOTE: Refer to Append x N for an explanation of A0 A9 etc

The other fields prompt for the job number and the location of the JHD file Press F10 to enter the data The program then asks if it should create a new file After a **Yes** reply, it pres ents a menu asking for module related information Some of the fields have already been copied from the JHD file

customer name
plant site
contract number
job number

This information is decoded from the MHD file name

loop address
PCU address
module address

The remainder of the information is entered by the user

configuration description
drawing title
drawing number
module type
module ID
software revision

Most of the fields are optional The only information that CAD requires is a correct MHD file name, module type and software revision number The latter two items must match one of the modules in Appendix D

NOTE: f you are go ng to cross reference draw ngs you must enter a modu e D

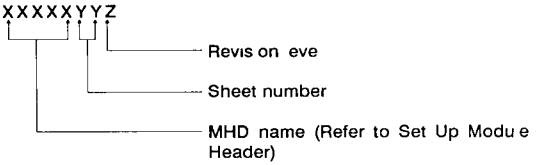
You must create a separate MHD file for each module ap pearing in a set of drawings

CREATE CAD DRAWINGS

1 Execute the CADEWS program

Type **C** from the main menu, or
Type **CADEWS** Enter from the DOS prompt

2 When the prompt asks for a file name, enter the name of the drawing file to be edited The format for a drawing file name is



NOTE: The ast 3 characters of the f e name **MUST BE** sheet num ber and rev s on eve Th s a ows the Network 90 comp er and the cross reference programs to run proper y for down oad ng of mod u es Sheet numbers shou d be consecut ve start ng at 01

When the name of an existing file is entered, the system retrieves that file, displays it on the screen, and enters the DB mode of the drawing file environment

To enter the name of a file which does not exist, include on the same line the option **/n** for new file There must be no spaces between the file name and the **/n** CAD asks for a **user-library name** To use an existing user library, enter the user library name The system creates the drawing file and begins an editing session as already described If the **/n** is omitted, the system gives a message that the file was not found, and prompts for a valid file name

When a user library file name that does not exist is entered, CAD asks to initialize this user library Answer **Y**, and CAD creates the user library Answer **N**, and CAD asks again for a user library name Press Enter to bypass the creation of a new library.

When entering the /n option for a file that already exists, the system asks to delete the file A **Y** response causes the existing file to be overwritten when you save the new file An **N** response prompts for a new entry

NOTICE	A Y response PERMANENTLY ERASES the file CANNOT be RECOVERED

Examples

1010201A System searches for file 1010201A DBF

1010202A/n System creates a new file 1010202A DBF (if it does not already exist)

The Status Line

The line of information that appears at the top of the screen is called the status line It gives in order the file name, module type, module software revision level, loop number, PCU number, Module Address, magnification number, utilization factors (which consist of the percentage of bytes of non volatile memory used, percentage of bytes of RAM used, and number of non fixed blocks available)

Entities

The objects that are placed on a drawing are known as entities The entities that can be placed are as follows

Lines	Defined by two or more points
Rectangles	Defined by points in opposite corners
Circles	Defined by a center point and a point on the circumference
Connection + Points	Single points where lines connect
Arcs	Defined by the arc center, a start point, and end point
Text	Alphanumeric information placed on the drawing
Shapes	Groups of entities

Layers

Creating a drawing works on a specific layer in CAD Layers are overlays on a drawing There are 16 available layers in CAD, represented by different colors on the screen (use the Status command **ST** to see the available colors for each of the layers) When you are creating Infi 90 configuration drawings, we recommend that you always work on layer 1

Shapes and Shape Libraries

Shapes are entity groups that can be referenced and placed in the drawing as a single entity System shapes are stored in a shape library The CAD software system comes with a complete Infi 90/Network 90 shape library

Libraries of user shapes and user macros can be created as described by the UL command in Section 3 Macros are collections of individual shapes put together in a particular way This is very useful for recalling a frequently used configuration of shapes

In addition, there are several Infi 90/Network 90 master termination unit drawings available in the CAD directory For a complete listing of these drawings, refer to Appendix C

Modes

There are four modes of operation

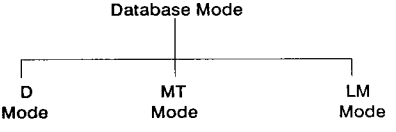
1 **DB** (Database) mode DB is the top level mode You must enter this mode before other modes Most display related and status commands are entered from this mode

2 **ID** (Identify) mode Enter ID mode from DB mode It is the primary editing mode

3 **MT** (Monitor/tune) mode Enter MT mode from DB mode It is the primary mode in which on line tuning and monitoring is done

4 **LM** (Library Manager) mode LM mode allows the user to list the contents of the system and user libraries, and delete/undelete user shapes from user libraries

The diagram below summarizes the organization of the CAD modes



Cursor Movement

Use either a keyboard input (via the positioning arrows) or a mouse to position the cursor You can also choose to display a grid of points on the screen This is an array of points in multiples of 1/1000th of an inch (1 mil), when printed on a standard D size (22 inches x 34 inches) drawing Gridlock (command **GL**) is a mode of operation that constrains the cursor to moving only on the grid points It is always best to leave the gridlock on when editing drawings, since symbols are difficult to connect unless they are placed on grid points

The Infi 90/Network 90 logic configuration symbols are on a scale of 1/10 Symbols must be placed on a grid of 100,100 (Function Key 1, F1) to allow the easy connection of sym bols with lines, lines are designed to be placed using a grid of 20 20 F2 All blocks (function codes) must be on a grid of 100,100

Command Entry

CAD commands can be entered by typing the mnemonic for a command, or using the appropriate function key (Refer to Table 1 2)

Function Keys

Function keys execute single commands that are frequently used Table 1 2 defines the Function Keys

Table 1 2 Keyboard Function Keys F1 through F10

Key	Function	Mnemonic
F1	GR D 100 100	GR 100 100
F2	GR D 20 20	GR 20 20
F3	FUNCT ON NAME	FN
F4	DENT FY	D
F5	MOVE	(D) MO
F6	DELETE	(D) DE
F7	ADD CONNECT ON	AC
F8	CHANGE ATTR BUTE	(ID) CA
F9	PAN	PA
F10	DATA ENTRY	NONE

Screen Control

The graphics screen is a window into the drawing The size and location of this window can be controlled CADEWS provides commands to:

- Zoom in on a section of the drawing, or
- Move the window around the drawing without changing scale

Identify

Before entities in the drawing are modified, select or identify them by entering **ID** or **IW** When one or more entities are identified, they are highlighted to distinguish them from other entities in the drawing Once identified, CAD asks for the command to perform on the entities

Scaling

Scaling refers to the multiplication of all distance vectors drawn from a common reference point, by the same scale factor Scaling expands a shape equally in all directions about the reference point All vectors drawn from the scaling reference point to points on the entity are multiplied by the user defined scale factor

With CAD, two distinct classes of graphic entities can be scaled· (1) any system or user shapes that do not contain Network 90 compilatory shapes, and (2) text string entities

Direct scaling of lines, rectangles, circles, and arcs is not allowed However, a shape can be created from any of these entities, and then scaled A shape may also contain other shapes that have been previously scaled Refer to the **SC** command in Section 3 for more information

ENDING A CADEWS EDITING SESSION

Commands	Action
EXIT (EX)	Saves edit, returns to main menu or DOS prompt
RESET (RS)	Abandons edit prompts for new file
QUIT (Q)	Abandons edit returns to main menu
SAVE (SA)	Saves edit returns to same drawing

The Save command may be used at any time to retain file edits Bailey recommends that drawings are saved from time to time to reduce the chance of accidental erasure.

MONITORING AND TUNING

When EWS is connected to a Infi 90/Network 90 System, on line monitoring and tuning of Infi 90/Network 90 System configuration can be done while viewing the drawing on the monitor Refer to the **MT** command in Section 3 for more information

These commands can be used while monitoring under the **MT** command

Command Name	Mnenomic
Cont nue	C
Escape	Esc
Ex t	Esc Esc
Pan	PA
Refresh Screen	RF
Set V ew	SV
Tune	TU
Zoom	ZO

COMPILING AND DOWNLOADING

After all configuration drawings associated with a module have been completed, the compiler can be run The compiler is entered through option **D** on the main menu (Refer to Section 4 for more details) This allows the drawings associ ated with a module to be compiled into a format that can be downloaded using the TEXT program (option **G** on the main menu), or type **NET90CMP** Enter from the DOS prompt

Refer to Section 7 for information on the TEXT program

PLOTTING

The CAD Utilities also permit printing or plotting from a DBF file Refer to Section 5, CAD Utilities, for more information on these utility programs

SECTION 2 — INSTALLATION

INTRODUCTION

This section explains the steps for installing the SCAD software. Follow these steps thoroughly and carefully.

When installing EWS Software for the FIRST time:

a. On a new Bailey EWS XT, Bailey EWS AT or Intel 30□ series, start at Step 1.

b. With a Bailey EWS Enhancement Kit when DOS is already on the hard disk, start at Step 6.

NOTICE	Instruction Steps 1 through 5 will result in the LOSS OF ALL DATA currently on the hard disk Drive C:\

c. With a Bailey EWS Enhancement Kit when DOS has not yet been loaded onto the hard disk, start at Step 1.

Current CAD users installing an updated release, start at Step 6.

1. Load DOS into computer memory (RAM) by placing the DOS disk (Version 2.0 or later) in Drive A and turning on the computer. If your computer is already on, place the DOS disk in Drive A and press Ctrl, Alt, and Del simultaneously.

2. Partitioning is a procedure that divides the Hard Disk (Drive C) into separate areas (up to 4 partitions), so more than one operating system can be used. One partition is allocated for CAD software, because only one operating system (DOS) is used. To partition the hard disk drive:

   Type **FDISK** Enter

A prompt appears on the screen. Press Enter. Press Enter again to allocate the entire hard disk to DOS.

3. Before the DOS hard disk partition can be used, it must be formatted by the FORMAT command. The FORMAT command sets up a File Allocation Table and a directory on the hard disk.

   Type **FORMAT C:/S/V** Enter

4 Copy COMMAND COM onto the hard disk

Type **COPY COMMAND.COM C:** Enter

5 Log on to Drive C

Type **C:** Enter

6 Copy DOS into its own directory on the disk

Type **MD DOS** Enter

Type **CD\DOS** Enter

Type **COPY A:*.*** Enter

7 Ensure that the \DOS direcory is on the path

Type **PATH** Enter

If \DOS is not part of the path,

Type **PATH \DOS,** [previous path setting if any] Enter

NOTICE	TO PRIOUS SCAD USERS Step 9 will DELETE all DBF SPC and MHD files in the \EWS directory Move any user files in the \EWS directory to another directory or disk before proceeding

8 Insert the first SCAD floppy into drive A

9 Type **A:INSTALL** Enter

Follow the instructions displayed

NOTE Several files may be split between 2 disks A program named PATCHEWS puts them back together This is done automatically during installation

If it becomes necessary to reload a file from the CAD disks to your EWS following the initial installation, be sure to look in PATCHEWS BAT (on a release floppy) to see if the needed file is one that was split up If it was

a Load all parts of the file into your \EWS directory File parts are identified by the appropriate base file name appended with @XX (where XX is an alphanumeric combination) For example, CADEWS EXE may be split into CADEWS @A1 and CADEWS @2 on the SCAD disks

b Invoke the CAT program that was loaded into your EWS directory Use the same format as found in the PATCHEWS.BAT file.

c Delete the file parts exactly as done by the PATCHEWS.BAT file

DO NOT execute PATCHEWS BAT

10 With DOS, a single directory is created on the hard disk when formatted This directory is known as the root, system, or main directory The root directory simply contains the name of files and subdirectories that exist on the hard disk

Return to the root directory

11 When DOS is started, it searches the root directory for a file named AUTOEXEC BAT If this file exists, it executes each time the system starts Refer to the DOS manual for more information on the AUTOEXEC BAT file

If an AUTOEXEC BAT file does not exist in the root direc tory, execute the following command

COPY \EWS\AUTOEXEC.EWS AUTOEXEC.BAT Enter

If an AUTOEXEC BAT file exists in the root directory, add the commands from the AUTOEXEC EWS file to the begin ning of the BAT file in the same sequence If there is an existing PATH command in the AUTOEXEC BAT file, ap pend the existing PATH command to the PATH command copied from AUTOEXEC EWS, and delete the old PATH command

12 Each time DOS is started, a search is also made for a file named CONFIG SYS If the file is found, DOS reads the file and interprets the commands within the file If the file is not found, DOS assigns default values for the configuration com mands Type

COPY \EWS\BAILEY.EWS BAILEY.SYS Enter

If you are installing CAD on an Intel 301 refer to Step 13, otherwise proceed to Step 14

13 For memory management, the Intel 301 requires a driver called CTRL386 There are two types Partition Loading and CONFIG SYS Loading Refer to the label on the CTRL386 disk provided with the Intel 301 to determine the type

NOTE. To re nsta CTRL386 (due to d sk fa ure etc refer to Append x L for CTRL386 nsta at on nstruct ons

If type is Partition Loading, all installation has been done by Bailey Proceed to Step 15

If type is CONFIG SYS Loading, a statement must be included in your CONFIG SYS file If a CONFIG SYS file does not exist in the root directory

type **COPY \EWS\CONFIG2.EWS\CONFIG.SYS** Enter

If a CONFIG SYS file exists in the root directory, edit the file to contain

```
device  =  \ctrl386\ctrl386.sys
device  =  bailey.sys
device     ansi sys
f les      20
```

If you cannot determine the CTRL386 type, or have difficulties with installation, contact Bailey Technical Support

Go to Step 15

14 If a CONFIG SYS file does not exist in the root directory,

type **COPY \EWS\CONFIG1.EWS\CONFIG.SYS** Enter

If a CONFIG SYS file exists in the root directory, edit the file to contain

```
device  –  bailey.sys
device     ansi.sys
f les      20
```

15 Restart the system

16 Identify the monitor to SCAD

a Verify that you are in the \EWS directory

Type **CD\EWS** Enter

b Select the configuration file for the monitor you are using from Table 2-1

NOTE: f your mon tor s not sted here use the conf g cga f e

Table 2 1. Configuration files

File	Monitor
conf g cga	BM Color Monitor
conf g cpq	Compaq 286 with Bai ey Enhancement Kit H KT03
conf g ega	IBM Enhanced Co or Monitor
conf g m81	Mitsub sh AUM 1831A Co or Monitor[1]
conf g m71	Mitsubish AUM 1371A Co or Monitor[1 2]
config m2	Mitsubish JUM 1471A Co or Monitor Japan only[1 2]
conf g nec	NEC Mult sync Co or Monitor[1]
conf g pn	Princeton Ultrasynch Co or[1]
conf g toe	Toe FTC 1461 Graph cs Monitor Japan only[1 2]

NOTE·
1 These mon tors are capab e of runn ng f cker free
2 f you are us ng any of these you must contact Ba ey to have mod f cat ons done to the Graph cs Card

c Type **COPY [monitor-configuration-file] CONFIG.BIN.**

Exa~p e If you are using a NEC Multisync II,

type **COPY CONFIG.NEC CONFIG.BIN** Enter

17 Determine the Genicom 34□□ printer firmware level With the printer on

a If the printer is on line, press the <on line> key to place it in the local mode

b Press the <PRG> key The Printer Configuration Menu should print out. An example of the first line is

THE PRESENT CONFIGURATION IS (00506103)

The number between the parentheses is the printer firm ware level

c If the firmware level number is 00403404 or higher, continue with Step 18 If the number is less than 00403404, execute Step 17d

d Type **COPY PRNEWS2.CHK PRNEWS EXE** Enter

e Take the printer out of program mode by pressing the ← key

18 Create a drawing directory (refer to Create CAD Drawings in Section 1) If this is the first time CAD software is being loaded on the computer, do Steps 18a, b and c Otherwise, go to Step 18c

a Type **CD** Enter

b Type **MD** [directory name (1 8 characters)] Enter

c Type **CD**[directory name] Enter

19 Begin CAD

Type **CMM** (CAD Main Menu) Enter
to initiate the main menu and see the following list of options

A Job Header Definition
B Module Header Definition
C CAD
D Compilation
E Cross Reference
F Module Binding
G Text
H Utilities

20 Fill out the software registration card (use the serial number at the bottom of the main menu) at the end of this manual and return it to Bailey Controls

SECTION 3 — CAD COMMAND REFERENCE

INTRODUCTION

The CAD command reference section is organized in alphabetical order by command name Mnemonics for each command appear in **boldface** below the command name

USE OF DELIMITERS IN COMMAND LISTS

Many CAD commands include a list as part of the command input In general, CAD recognizes either spaces or commas as valid list separators The reference manual uses spaces as separators, commas may be used if desired

The hyphen character, -, can be used in many lists to indicate a continuous series of numbers For example, 1 4 is the same as specifying 1 2 3 4 in a parameter list

EXAMPLES

Examples are given for many commands A look at an exam ple may be the fastest way to get the needed information about a command

NOTE: When add ng NETWORK 90 shapes from the system brary the current ayer shou d always be layer 1

ADD CONNECTION

MODES: DB

COMMAND: **AC** or F7

USAGE: Adds a connecting point at a desired location between NET WORK 90 function codes If two or more lines are connected logically, they must be connected with a connection point Note that a connection point may have, at the most, 4 lines emerging from it

Examp e This is a cursor controlled command

1 Ensure that the grid is set to 20, 20

2 Position the cursor at the connecting point location

3 Type: **AC** Enter or F7

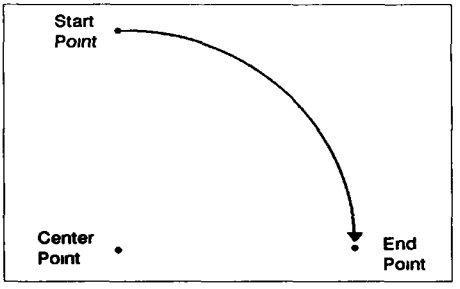
A connecting point appears at the cursor location

MODES: DB

COMMAND: **A**

USAGE: Draws an arc around a center point defined by two end points. After entering the command, CAD prompts for the arc center, arc start point, and arc end point. After entering the start point, a circle is outlined in gray. Select a second point from this circle, and the arc is drawn between the points.

Example



NOTE: Arcs are always drawn in a clockwise direction

ASSIGN NAME

MODES: DB

COMMAND: **AN**
AN name

USAGE: Allows a new name to be assigned to a drawing file when in DB Mode When EXIT or SAVE is used, the drawing file is saved on disk using the new name, the original file IS NOT overwritten

If the command is entered without a name, CAD prompts for one

This command is useful for creating backups or new files from existing files

Example In DB mode editing drawing 1234567A

1 Type **AN 1234568A** Enter

2 The current drawing is now assigned the name 1234568A and is stored under that name when saved with an EXIT or SAVE command

3 Drawing 1234567A remains unchanged

NOTE: File names may contain up to 8 alphanumeric characters plus a DBF extension

MODES: DB MT

COMMAND:

AP - Toggle switch
AP ON Activate autopanning function
AP OFF Deactivate autopanning function

DEFAULTS: Autopan On

USAGE: The Autopan function allows the user to continue panning the screen, once the current disp ay edge has been reached The next display is determined by the length of time the cursor key is pressed, once the edge has been reached

Examp e If the AP toggle is on and the user wishes to move the current display window to another part of a drawing (outside the current window), the user would move the cursor in that direction Once the display edge is reached, the user would continue to press the chosen cursor key. This action causes the message **Scrolling** to appear above the command line, indicating to the user that he is still panning Once the key is released, the new location is drawn with the cursor at its center. The user has to experiment with this feature to learn the length of time needed to move a necessary distance off screen.

CHANGE ATTRIBUTE

MODES: ID

COMMAND: **CA** or F8

USAGE: Enter or change the attributes (e g , block number, text, etc) of the identified entity

Enter **CA** and CAD prompts for·

1 On/off page reference
2 30 Character I/O description
3. Block number.

The prompts vary depending on the type of symbol that was identified

Example For a digital input (Function Code 41) to be labeled block number 70.

1. Enter ID mode.
Type: **CA** Enter or F8.

2. Type: **3** Enter.
CAD prompts for block number.

3 Type: **70** Enter.

CHANGE LAYER

MODE: ID

COMMAND: **CL**
CL n

USAGE: Places an identified shape on a new layer When the command is entered without the layer, CAD prompts for the new layer number.

CIRCLE

MODES: DB

COMMAND: **C**

USAGE: This command draws a circle

Example
1 Type **C** Enter
CAD asks for the center point of the circle

2 Type in the center point of the circle
CAD asks for a point on the circumference of the circle

3 Type in a circumference point
Once both points are entered, the circle is drawn

MODES: ID

COMMAND: **CO**

USAGE: This command copies an identified entity to a specified location The entity must be identified using ID or IW before executing COPY

Example 1 Type **CO** [Enter]
CAD prompts for the marking of two points a shape reference point and a to point A copy of the identified entity is placed at a position determined by the displacement of the two reference points

2 Type in the shape reference point and the to point
After placement, CAD continues to prompt for copy to points
Copying can continue until [Esc] is pressed

CURSOR INCREMENT

MODES. DB, ID

COMMAND: **CI**
CI X Y

(X and Y are positive integers, X sets cursor step movement in the x direction, Y sets cursor step movement in the y direction Units are drawing file units)

DEFAULTS· X 10 Y 10

Sets the cursor step size in terms of user drawing file units This command is useful for cursor placement when inserting user documentation (text strings) into the drawings The cursor increment should always be 100,100 when inserting NETWORK 90 compilatory shapes Type in X and Y to set the desired step sizes If an X and Y are not typed in, CAD prompts for them

GRIDLOCK overrides this command When GRIDLOCK is on, the cursor automatically moves to grid points defined by the GRID command

Example Type **CI 1000 1000** [Enter

The cursor moves in steps of 1000 units in both the X and Y directions The units are in mils, corresponding to a step of one inch in both the X and Y directions

MODES: ID

COMMAND: **DE** or F6

USAGE: Deletes an entity or window identified using the ID or IW commands Once an entity or window is identified, enter the DE command, and the system deletes the identified entity or window

CAD returns to DB mode after the command has been com pleted

Examp e Type **DE** Enter
The identified entity or window d sappears from the display

DISTANCE BETWEEN CURSOR POINTS

MODES: DB ID

COMMAND: **DI**

USAGE: Determines the distance between two points on a drawing

Example 1 Type **DI** Enter

CAD prompts for one cursor point, then a second cursor point
The distance is measured in mils

2 Type in the two points

MODES: DB LM

COMMAND: **EX**

USAGE· If in DB mode, saves the current drawing to disk and exits CAD If in LM mode, exits LM mode and returns to DB mode CAD is not exited

Example If in DB mode, type **EX** Enter

The System exits CAD, saves the drawing file, and returns to the CAD main menu

EXPLODE

MODES: ID

COMMAND: **XP**

USAGE: Use XP to break a shape into its component parts. The individual parts can then be manipulated. Identify the shape by using the ID or IW commands.

Example To break a system shape into its component parts:

1. Enter ID mode.
   Type **ID** **Enter**
2. Identify the shape.
3. Type **XP** **Enter**
4. CAD identifies the number of exploded shapes. Now the individual lines, shapes, or text can be manipulated.

NOTE NETWORK 90 Compatory shapes cannot be exploded.

MODES: DB

COMMAND: **FE**
FE search category search string

USAGE: Used to identify

NETWORK 90 function code by its block number, or its I/O text string

CAD responds with the found count and enters ID mode The first entity is highlighted Once a shape is highlighted, any standard ID command is recognized The command NX can be used to highlight the next found shape

Example Type. **FE** [Enter]

Prompt 1
Specify search type
1(blk#) 2(NETWORK 90 description) 3(alias name)

Prompt 2
Search for Blk # or
Search for Text (max 30) or
Search for alias name (max 8)

Example Type **FE 1,20** [Enter]

The system does a Type 1 (as shown in Prompt 1) search for block 20

NOTE: Max 30 and max 8 refer to the number of characters that can be typed in

FORM MACRO

MODES: DB

COMMAND: **FM**
FM macname

USAGE: A macro is a collection of entities that may be referenced as a single unit Form Macro saves this collection of entities as a single unit in a user library Type in FM, CAD prompts

1 Enter Macro nm (1st Alpha, max 8)

2 Mark window point 1 Draw a window around the symbols to be included in the macro

3 Complete window After the window is completed, the symbols are highlighted to indicate the shapes or entities that are in macro To correct a mistake, press Esc and start over

4 Mark macro origin This is the macro reference point to be used when the macro is recalled

5 Enter macro description (max 60)

CAD tells when it is saving the macro and its description

Example Type **FM** Enter, receive the following prompts

1 *Enter macro nm*
Type in the Text file name Enter

2 *Mark window point 1*
Move cursor to window point 1 Enter

3 *Complete window*
Move cursor to expand window (rubber band) Enter

4 *Mark macro origin*
Move cursor to reference point Enter

5 *Enter macro description*
Type **Single-ended input dipshunt** Enter

CAD responds *SAVE MACRO Textfile Single-ended input dipshunt*

NOTE: When a macro is saved NETWORK 90 shapes must have block numbers assigned If the user wishes block numbers to be assigned when the User Macro (UM) command is used to recall the macro

MODE: DB

COMMAND: **FS**
FS user shape name

USAGE: Saves a shape in the user library As it does with the FM command, CAD responds with several prompts

Example 1 *Enter shape name*
Type in the Shapename Enter (8 characters maximum)

2 *Mark window pt 1*
Move cursor to window point 1 Enter

3 *Complete window*
Move cursor to expand window (rubberband) Enter

4 *Mark pnt shape origin*
Move cursor to origin point of shape Enter

5 *Mark pnt lower left extent*
Move cursor to lower left extent point Enter

6 *Mark pnt upper right extent*
Move cursor to upper right extent point Enter

CAD displays the reference points and asks what to do next

Next? 1(save) 2(edit fields) 3(edit shape)

Option 1 Saves the shape,
Option 2 Allows the reference points to be changed,
Option 3 Allows the shape to be edited

NOTE: User shapes cannot contain NETWORK 90 compatory shapes

FUNCTION NAME

MODES: DB

COMMAND. **FN**
FN shape name/function code number
FN shape block #

USAGE: Gets a NETWORK 90 function code from the library list for placement in the current drawing file If the FN command is entered without the shape name parameter, CAD prompts for the name, and blk # (optional) The reference origin point of the shape is placed at the current cursor position

Example 1 Type **FN 37** Enter
Function Code 37 is retrieved from the library list and placed on the drawing

2 Type **FN** Enter
CAD prompts for the shape name No block number is assigned (Use the CA command to assign a block number)

3 Type **FN fx, 100** Enter
CAD recalls shape fx and assigns block 100 to it

MODES: DB, ID

COMMAND:

GR
GR ON
GR OFF
GR X Y

(X is the number of drawing units per grid division in the x direction (horizontal), Y is the number of drawing units per grid division in the y direction (vertical)

DEFAULTS:

GR ON
GR 100 100

USAGE: Establishes grid spacing in user drawing units and controls the display of the grid

1 GR
This command toggles the grid display ON/OFF

2 GR ON
This command turns grid display on

3. GR OFF
This command turns the grid display off

4. GR X Y
This command sets the grid spacing in the x and y directions respectively, and turns the grid display on

Examples Type **GR ON** Enter

Type **GR** Enter

Type: **GR 100 100** Enter
Grid points appear on the display at every 100 units in the x direction and every 100 units in the y direction

NOTES

1 CAD overrides the grid display setting and disables grid display if the spacing is such that points would run together on the display

2 The cursor can be locked to grid points using the GR DLOCK command

3 The current value of the grid setting can be observed by using the STATUS command

4 With GR DLOCK on the cursor steps locks to the GR delta x y if GR DLOCK is off the cursor steps is locked to the C delta x y

GRIDLOCK

MODES: DB, ID

COMMAND:
GL
GL ON
GL OFF

DEFAULTS: GRIDLOCK ON

USAGE: Locks cursor movement to grid points The command toggles the current setting If GRIDLOCK is off, cursor movement is controlled by the cursor increment setting entered using the CI command

Example Assume GRIDLOCK is in the default ON condition

Type **GL** Enter
GRIDLOCK is now disabled

NOTE. Use of the GL command in NETWORK 90 configuration creation is **NECESSARY** to ensure proper connection between shapes Connections are made only at coincident vertices and points GL ensures the proper connections are made by restricting connections to grid points

The system is designed to drop shapes on the drawing with grid lock on and = 100 100 F1

Lines are designed to be drawn with grid lock on and 20 20 F2

MODES: Refer To USAGES

COMMAND: **HC** or Ctrl P

USAGES: Hard Copy allows the contents of a graphics display to be printed on a graphics printer, communicating through either parallel port 1 or 2 The highest print head speed is used, to allow for fast printing

In CAD, use either HC or Ctrl P The print can be made in both DB and MT modes

In TREND, only the Ctrl P command can be used The printed output has 5 different line types to distinguish between each point being trended

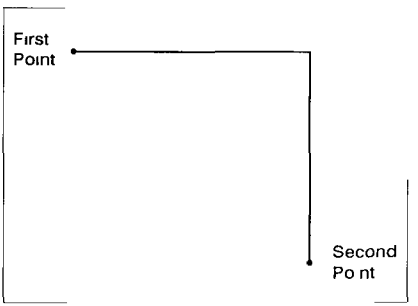
HORIZONTAL-ORTHOGONAL (Solid Line)

MODES: DB

COMMAND: **H**

USAGE: Sets CAD to the HORIZONTAL ORTHOGONAL command to allow drawing solid lines Angles are allowed only in 90° increments Digitized points are connected by first completing the horizontal segment of the line

Example



NOTE: HORIZONTAL ORTHOGONAL can be used to draw straight lines This saves time when inputting combinations of straight lines and horizontal orthogonal lines

Refer to **Line Command** for further details

MODES: DB

COMMAND: **H1**

Used for drawing digital logic/configuration dashed connection lines on an analog drawing. Angles are allowed only in 90° increments. Digitized points are connected by first completing the horizontal segment of the line.

Example See the Example for Horizontal Orthogonal (Solid Line).

NOTE: HORIZONTAL ORTHOGONAL can be used to draw straight lines. This saves time when inputting combinations of straight lines and horizontal orthogonal lines.

Refer to **Line Command** for further details.

HORIZONTAL ORTHOGONAL (Dotted Line)

MODES: DB

COMMAND: **H2**

USAGE: Used for drawing dotted connection lines from adapt blocks on a configuration drawing. Angles are allowed only in 90° increments. Digitized points are connected by first completing the horizontal segment of the line.

Example See the Example for Horizontal Orthogonal (Solid Line).

NOTE HORIZONTAL ORTHOGONAL can be used to draw straight lines. This saves time when inputting combinations of straight lines and horizontal orthogonal lines.

Refer to **Line Command** for further details.

MODES: DB

COMMAND: **H3**

USAGE: Used for drawing miscellaneous dotted/dashed lines on a logic/configuration drawing Angles are allowed only in 90° increments Digitized points are connected by first complet ing the horizontal segment of the line

Examp e See the Example for Horizontal Orthogonal (Solid Line)

NOTE: HOR ZONTAL ORTHOGONAL can be used to draw stra ght nes Th s saves t me when nputt ng comb nat ons of stra ght nes and hor zonta orthogona nes

Refer to **Line Command** for further details

IDENTIFY

MODES: DB

COMMAND **ID** or **F4**

DEFAULTS: Searches the current working layer

USAGE· Identifies an entity and puts the system in ID mode

CAD then searches the current working layer for the vertex or shape origin nearest to the selected point The identified entity is then highlighted, and the system is in ID mode, ready to edit the entity

Esc can be used to terminate ID and return to the DB mode When eaving ID mode, identified entities return to their orig inal co or and all edits made are saved in the database The identifying editing commands are now active (e g , delete, move, rotate, etc)

Examp e Type **ID ALL** Enter
Closest entity on any layer is identified

Type **ID 2,4** Enter
Closest entity on layer 2 or 4 is identified

Type **ID 6 - 10** Enter
Closest entity on layer 6, 7, 8, 9, or 10 is identified

HORIZONTAL ORTHOGONAL (Dot Dashed Line)

MODES: DB

COMMAND: **H3**

USAGE: Used for drawing miscellaneous dotted/dashed lines on a logic/configuration drawing Angles are allowed only in 90° increments Digitized points are connected by first complet ing the horizontal segment of the line

Examp e See the Example for Horizontal Orthogonal (Solid Line)

NOTE: HOR ZONTAL ORTHOGONAL can be used to draw stra ght nes Th s saves t me when nputt ng comb nat ons of stra ght nes and hor zonta orthogona nes

Refer to **Line Command** for further details

IDENTIFY

MODES. DB

COMMAND: **ID** or **F4**

DEFAULTS: Searches the current working layer

USAGE· Identifies an entity and puts the system in ID mode

CAD then searches the current working layer for the vertex or shape origin nearest to the selected point The identified entity is then highlighted, and the system is in ID mode, ready to edit the entity

Esc can be used to terminate ID and return to the DB mode When leaving ID mode, identified entities return to their original color and all edits made are saved in the database The identifying editing commands are now active (e g , delete move, rotate, etc)

Example Type **ID ALL** Enter
Closest entity on any layer is identified

Type **ID 2,4** Enter
Closest entity on layer 2 or 4 is identified

Type **ID 6 - 10** Enter
Closest entity on layer 6, 7, 8, 9, or 10 is identified

MODES: DB ID

COMMAND: **IP**

USAGE: Reports the coordinates of a selected point

Example 1. Type **IP** Enter.
CAD prompts for a point

2. Move the cursor to the point desired Press Enter
The system responds with coordinates of the point

IDENTIFY WINDOW

MODES: DB

COMMAND: **IW**

DEFAULTS: Searches the current working layer

USAGE: Similar to the ID command, except IW defines a window in which all entities are identified

CAD prompts for a point This point becomes the corner of a rectangle which defines the identify window

As the cursor is moved to select the second window point, CAD continuously draws a rectangle which outlines the current size of the window When the second point is selected, CAD identifies all of the shapes and entities whose reference points l e within the window

The identified entities are each highlighted This group of identified entities is sometimes referred to as a window The identify editing commands (e g , MOVE, COPY, DELETE, etc) apply to this window as a whole group IW is the preferred command when more than one entity needs to be edited at one time

Example Type **IW** Enter

CAD prompts for two points defining a window Entities and shapes on the working layer that lie within the window are identified

NOTES

1 Only entities whose vertices or origin reference points are inside the window are identified

2 Use Esc to exit from the IW command prior to entering the second point of the window definition

3 Use Esc to terminate ID mode and return to DB mode

4 WALL Win Wjk or Wj can be used to identify entities on layers other than the current layer

MODES: DB

COMMAND: **LA**
LA n

USAGE: Indicates the current layer and allows switching to a different layer.

Example While in DB mode,
Type: **LA** Enter.

CAD responds with:
Layer set current layer
LAYER ? ___

and indicates the current layer If another layer is wanted, type in the number of the new layer.

LIBRARY MANAGER

MODES: DB

COMMAND: **LM**

USAGE: Enters into Library Manager Mode

Example Type **LM** Enter
CAD gives a new screen and asks, *System/user?*

One of the following commands can then be entered

System/user

LI	Lists symbol names on the CRT
LI/P	Lists symbol names on the CRT and prints listing
EX	Exits from the Library Manager
Esc	also exits from the Library Manager

User only

SD	Deletes shapes from the user library
UN	Undeletes shapes from the user library

NOTE: The category number for each shape is as follows

1 NETWORK 90 function code shapes
2 Other miscellaneous shapes
3 Other miscellaneous shapes
4 Other miscellaneous shapes
5 System macros
6 User shapes
7 User macros

MODES: DB

COMMAND: **L**

USAGE. Draws a line at any angle

Examp e 1 Type **L** [Enter]

CAD displays the following prompt

Point

2 Key in and enter the actual coordinates of the beginning point of the line If you press Enter without keying in coordinates, the current cursor coordinates are used

3 After you press [Enter] the **Point** prompt is displayed again You may now key in coordinates or press Enter A line segment will be drawn connecting the two points

4 You may now continue to draw line segments in this manner When done, press Esc All segments of the line are drawn in the current layer color

5 Press [Esc to cancel the command before the second point is entered No line will be drawn

6 After one or more line segments are drawn, you may type **UN** Enter to **undraw** the last segment drawn

LIST LIBRARY

MODES: DB

COMMAND: **LI**
LI/P

USAGE: LI allows users to list System/user library shapes to a CRT. LI/P allows users to list system/user library shapes to a CRT and a printer (assuming a printer exists).

MODE: DB

COMMAND: **LS**

DEFAULT: LS OFF

USAGE: Lists specifications of function blocks on the screen Specification descriptions can also be listed This is a toggle on/off command

Example 1 Type. **LS** [Enter]

CAD indicates
Specs off or *Specs on Display Descriptions with Specs (y/n)?*

Each time LS is entered, status is reversed Use the Refresh command (RF) to redraw the screen with the new status

2 If the specifications are on, answer either **y** or **n** depending upon whether or not the specifications and their descriptions are listed together

NOTE: The Refresh command (RF) must be used to see the screen with its new status

MODIFY BLOCK

MODES: DB

COMMAND: **MB**

USAGE. Allows the user to MODIFY specifications of NETWORK 90 function blocks Use the MODIFY BLOCK command by placing the cursor next to the block to be modified

Example 1 Type **MB** Enter

The specification information appears in a window at the bottom of the screen

2 Specifications can be modified by entering specification number and value Use the **Pg Up** and Pg Dn keys to display specifications if they do not fit in the display window

3 When all of the specifications have been modified to your satisfaction press F10 to enter the data To end the modify ing block session without making any changes, use Esc

4 To remove the window, use the Refresh (RF) command

NOTE: The input output character st c of a Funct on Generator b ock (funct on code 1) can be d sp ayed graph ca y on the screen Th s c sp ay opt on s ava ab e for both the MB and MT commands The effect of each spec f cat on change can be graph ca y v sua zed

After return ng to the DB or MT mode command ne the d sp ayed graph can be pr nted by typ ng HC or us ng Ctrl P These pr nt commands work however on y f the Gen com 3400 or 3410 pr nter s be ng used

MODES: DB

COMMAND: **MT**

USAGE: Monitor and tune NETWORK 90 blocks When selected, the blocks displayed on the screen are updated with live data from the NETWORK 90 System

Example 1 To tune a block, move the cursor to the symbol to be tuned, press Esc and type **TU** Enter

The block is highlighted and the specifications are displayed on the bottom of the screen Tuning parameters may then be modified and entered to the system using F10

2 While in the monitor mode, the Zoom, Pan, and Set View commands are active Pressing Esc once, freezes the screen, but leaves CAD in monitor mode, typing a C causes the monitoring to continue Pressing Esc twice causes the MONITOR/TUNE mode to be terminated and the system returns to DB mode

NOTES:

1 The following commands can be used while monitoring under the MT command

Continue (C)	Set View (SV)
Hard Copy (HC) or Ctrl P	Tune (TU)
Pan (PA)	Zoom (ZO)
Refresh (RF)	

Tuning parameters may be modified and entered in the module through these commands by pressing F10

2 To exit the tuning session without saving the changes press Esc

3 See the note under the MB command for a discussion of the function generator graph

MOUSE

MODES: DB

COMMAND: **MS**

USAGE: Selects or deselects the mouse as the input device

Example **MS**

The mouse is selected as the cursor control input device If the mouse is already on, this command turns off, or deselects, the mouse

NOTE The cursor keys on the keyboard work in parallel with the mouse

MODES: ID

COMMAND: **MO** or [F5]

USAGE: Moves an identified entity or window to a new location The entity or window must be identified by using ID or IW prior to using this command

Example 1 Type. **MO** [Enter]
CAD prompts for a *from* point and then a *to* point

2 Type in the from and to points
The identified entity or window is moved to a new location determined by the displacement of the two reference points entered CAD remains in the MOVE command and a new reference point can be selected to move the entity again

3. Press [Esc] to terminate the MOVE command and remain in ID mode.

NOTE When applied to an identified window every entity in the window is moved

PAN

MODES: DB MT

COMMAND: **PA** or F9
PA X Y

USAGE: Shifts the screen display such that the cursor location, or a given x,y coordinate, becomes the new center of the display screen

Example Place the cursor in the desired location,
Type **PA** Enter

The display is redrawn with the chosen point at the center of the display

NOTES:
1 Magnification is not affected by the PAN command

2 The REDRAW command returns the original display except that the magnification factor is set to 1

MODES: DB

COMMAND: **PL**
PL f
(f = plot scale factor; a positive number)

USAGE: Generates a plot of a specified window in the drawing file. The command can be issued with or without the plot scale factor. If a scale factor parameter (f) is omitted, CAD prompts for it.

Example: The PLOT command uses the following steps:

1. Ready the plotter. Baud rate should be set to 9600.

   NOTE: For a D size drawing, the drawing must be oriented so that the width is larger than the height.

2. Turn on the plotter, remove the pen cap, and load paper into the plotter.

3. Select the size paper to be used. Small is C size, large is D size. Pressing either of these buttons causes the paper to cycle back and forth and insures the paper is properly loaded.

4. Type **PL** [Enter]

5. CAD prompts for a scale factor. A scale factor of 1 implies 1 x scale, 2 implies 2 x scale, etc. A scale factor of .5 implies a .5 x scale factor (half size).

   NOTE: The NETWORK 90 drawings are in 1/10th scale.

6. CAD prompts for the layers to be plotted. Type in the desired layer numbers, or type **all** to plot all layers.

7. CAD prompts for the plot window. Type in two points to define the plot window.

8. CAD asks if the drawing is to be rotated 90°. Any vertical drawings which are being plotted at a scale greater than 5 must be rotated.

9. CAD prompts for a paper size.

10. CAD prompts for a plotter margin. Type in two numbers. The first refers to the x-margin, and the second refers to the y margin. CAD assumes these to be in drawing file units.

PLOT (continued)

11 CAD asks to change pens for each layer of the plot If answered **N**, CAD plots all the selected layers with the same pen Plotting begins now if a plot file has not been created

12 If a plot file has been created by typing Y at Step 10 exit to the main menu by typing **EX**

NOTE: The following steps are applicable for Plot option D CAD Utilities Menu (option D of the main menu) for plotting from an external file created through the PL command (Steps 1 13)

13 Insert the file disk in drive A, if it has been saved on a floppy disk

14 Type in D from the CAD Utilities menu

15 CAD asks to

Enter Plotter Model Code
1 (DMP 41) 2 (DMP 51) 3 (EXIT)

16 Type in the appropriate number

17 CAD prompts

Enter Baud Rate
1 (1200) 2 (9600) 3 (EXIT)

9600 is the recommended baud rate, however, the baud rate must match the baud rate of the plotter Type in the appropriate baud rate

18 CAD prompts, *Enter the Plot Disk File Name* Type the file name to be plotted

The plotter should begin plotting immediately

NOTES.
1 The scale factor chosen applies to all layers to be plotted

2 Choose only the layers that contain data If a layer without data (as part of a range for example) is chosen the system must still examine the drawing file for entities on that layer This can increase plot time

QUICK CURSOR

COMMAND: QC

MODES: **DB, ID**

USAGE: Increases cursor speed as the cursor key is held down The acceleration allows moving the cursor rapidly across the screen and still make small adjustments to the cursor position when close to the cursor destination

Examples Type **QC** [Enter]. Toggles Quick Cursor on/off

Type **QC** **ON** [Enter] Turns Quick Cursor on

Type **QC** **OFF** [Enter] Turns Quick Cursor off

QUIT

MODES: DB

COMMAND: **Q**

USAGE: Abandons the current drawing file without updating disk files

Issuing QUIT in DB mode returns to the CAD main menu The drawing **IS NOT** saved! Before aborting the drawing file, CAD prompts for confirmation

NOTE: A ed ts to the current draw ng are ost when QU T s exe cuted and abort s conf rmed w th a **Y** response D sk f es are not upd ated

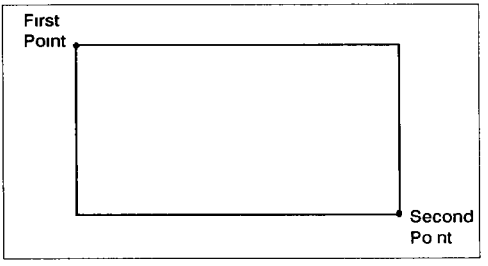
RECTANGLE

MODES: DB

COMMAND: **R**

USAGE: Draws a rectangle. After the command is entered, CAD prompts for one point, then a second point The second point MUST be the corner of the rectangle opposite the first point

Example



REDRAW

MODES: DB

COMMAND: **RE**

USAGE: Redraws the screen display at 1X magnification

Examp e Type **RE** Enter

The display is redrawn at a magnification factor of 1X

MODES: DB

COMMAND: **RF**

DEFAULTS: Current visible layers prior to rf command

USAGE: Redraws the current display view without changing the current scale and magnification factors

Example Type **RF** Enter

The display is redrawn at the current scale and magnification factors All visible layers are redrawn

RESET

MODES: DB

COMMAND: **RS**

USAGE: Quits the current drawing and allows the user to begin editing a different drawing without exiting CAD Resets and reinitializes the program

The program prompts for confirmation before executing the command ANY WORK DONE SINCE THE LAST TIME A SAVE COMMAND WAS EXECUTED IS LOST!

Example Type **RS** Enter

CAD prompts for confirmation of a system reset Enter **Y** to confirm, enter **N** to return to the DB environment If **Y** CAD prompts for the drawing file name to be edited

NOTE: This is a powerful command Changes made since the last SAVE command are lost Drawing files saved to disk prior to using the RS command are not affected

This saves time when another drawing edit is required since the shape library is not loaded again

MODES: ID

COMMAND: **RO**
RO n
RO n

(n degrees in 90° increments)

USAGE: Rotates the identified entity or window around a selected point. Rotation angles must be in increments of 90° A positive angle implies counterclockwise rotation about the selected point, a negative angle implies clockwise rotation

If the angle is not supplied as a parameter, CAD prompts for it (0° is the default)

If the number of degrees entered is not a multiple of 90 degrees, the system truncates the input to the next lowest 90° increment

Example 1 Type **RO** (the angle of rotation) Enter
CAD prompts for a reference point

2 Type in the reference point
The identified entity or window is rotated about this reference point

SAVE

MODES: DB

COMMAND: **SA**

USAGE: Compacts the drawing file by removing all entries marked for deletion, and saves the current drawing file on disk under the currently assigned file name.

Example When in DB mode,

Type **SA** Enter
Saves the current drawing file to disk

NOTE. It is a good idea to SAVE files periodically as they are worked on.

MODES: ID

COMMAND: **SC**

USAGE: Multiplies all distance vectors, drawn from a common refer ence point, by the same scalar factor This allows a shape to be evenly expanded in all directions about the reference point Any system or user shapes that do not contain NET WORK 90 compilatory shapes or text string entities can be scaled Lines, rectangles, circles, or arcs may NOT be di rectly scaled although shapes made from these entities can be scaled Shapes that contain other previously scaled shapes may also be scaled

Shapes can be assigned a scale factor from 1 to 100, text character size can be scaled from 10 to 4095

In DB mode, specify scale when using either SS or US com mands, using the format COMMAND, SHAPE NAME, SCALE FACTOR, e g , **SS PRIR6 4** Enter

Examp e In ID mode,

1 Type **SC** Enter
There are three scaling choices +N, scale upwards by a fac tor of N, -N, scale downwards by a factor of N, N, replace current scale factor by N If no scale factor is entered when SC is entered (e g , SC 5), the system prompts for it

2 Type in the scale factor

SET VIEW

MODES: DB MT

COMMAND: **SV**

USAGE: Gives an enlarged view of a section of the present display window

CAD prompts for a first point to define the view window As the cursor is moved to define the second point the system draws a rectangle on the screen showing the extent of the view window When the second point is entered, the display is redrawn to the new view

CAD computes an integer magnification factor based on the window size selected The resulting factor is displayed on the status line after the command executes

Example Type **SV** Enter,

CAD prompts for two points defining the desired view window After the second point is entered, the system redraws the screen such that the window selected occupies most of the display

NOTES.

1 A REFRESH command can be used to redraw a SET VIEW window without altering its size or magnification

2 REDRAW command redraws the current page at 1X magnification

MODES: LM

COMMAND: **SD**
SD NAME

USAGE: Deletes shapes from the user library Type in SD and CAD prompts for the shape name Type in the shape name (wild cards are acceptable) and it is deleted from the user library

Example 1 Type **SD** Enter,
CAD responds. *Delete Shape(s), Name*

2 Type in the shape name
CAD responds· *1 shape(s) deleted*

SHAPE REFERENCE

MODES: DB

COMMAND:

SR
SR ON
SR OFF

DEFAULT: SR OFF

USAGE: Controls the display of the shape reference fields in the visible layers. The reference points appear as crosses (They may appear as dots at 1X magnification.)

Entering SR toggles the SHAPE REFERENCE display. Entering SR ON or SR OFF explicitly sets the display mode of shape references.

Example: Type **SR ON** Enter
Turns on the display of shape reference fields.

Type **SR** Enter
Toggles the display of shape reference fields off.

NOTE The NET90 COMP LER program uses the shape reference fields to determine if shapes can be connected. The SR command can be used to make these references visible for the purposes of checking continuity.

MODES: DB

COMMAND: **ST**

USAGE: Lists the user drawing file units, current layer, grid and cursor increments, and other important information about the current drawing Also displays the colors and line type in which each layer is shown The following information is contained in the display listing

Working Drawing File Name

The name under which the current drawing is saved on disk when an EXIT or SAVE command is given

Drawing Units
MILS, INCHES, CM, or MM

Current Layer
The working layer

X org, Y org
The lower left hand coordinate of the current screen view

Delta x, Delta y.
The digitizing cursor increment as set by the user

Grid x, Grid y
The current grid point increment as set by the user

Scale Factor.
The display factor of the current screen view

Color Map
Shows color and line type for each layer

Press any key to return to DB mode

STRAIGHT LINE

MODES: DB

COMMAND: **S**

USAGE: Allows straight lines to be drawn at multiples of 45 degree angles

Example 1 Type **S** Enter
CAD prompts to mark the end points of the desired line segments An Esc before the second point is marked exits the command The escape terminates point markings and causes the line to be drawn in the current layer color If an attempt is made to draw a line in other than a 45 degree increment, CAD automatically draws the line to the nearest 45 degree increment

2 Type in the end points
Refer to **Line Command** for further details

MODES: DB

COMMAND: **SM**
SM macro name

USAGE: Gets a System Macro from the shape library and places it at the cursor location CAD prompts for the macro name and asks if a starting block number is to be assigned to blocks in the macro

Example 1 Type: **SM** Enter
CAD prompts for the macro name

2 Type in any macro name
CAD prompts for a starting block number (optional)

3 If block numbers are not to be assigned, press Enter No block numbers are assigned, although fixed blocks get their fixed numbers, if available If the fixed block numbers are not available, the request is rejected However, if other fixed block numbers for the same function code are available, then the fixed block numbers are assigned

4 If a starting block number is assigned, the blocks begin with that number

Example 1 Recall a macro named Test When it was saved, the block numbers assigned were 184, 185, 186, 187, 190 and fixed blocks 15-19

2 Type **SM Test** Enter

3 CAD asks for a starting block number Press Enter, and no block numbers are assigned, although the fixed blocks are numbered 15 19

4 After each block is validated, the macro appears (from its origin point) at the cursor position

SYSTEM MACRO (continued)

Examp e Same as the first example, except start with block number 62

1 When CAD prompts for a starting block number, Type **62** Enter

2 The blocks are then numbered 62, 63, 64, 65, 68, and fixed blocks 15 19.

NOTES.

1 f the b ocks are not ava ab e CAD asks for a new sta t ng b ock number or press Enter and ass gn no b ock number F xed b ocks however a ways keep the r ass gned numbers for that funct on code

2 Reca ng a macro s s m ar to execut ng FN commands and each b ock s va dated

MODES: DB

COMMAND: **SS**
SS shape name

USAGE: Gets a specified shape from the library list and places an instance of it in the drawing at the current cursor position If an SS command without the shape name parameter is entered, CAD prompts for the name The reference origin point of the shape is placed at the cursor position existing when SS is entered If it is NOT a NETWORK 90 compilatory shape, an optional parameter to the SS command is the scale factor (e g , SS 3) If none is entered the scale factor is 1

Example 1 Type **SS DBORD** Enter
Shape DBORD is retrieved from the library list and placed on the drawing

2 Type **SS** Enter
CAD prompts for the shape name The user types in the shape name and presses The shape specified is retrieved from the library list and placed on the drawing

TEXT

MODES: DB

COMMAND: T

USAGE: Sets CAD to the TEXT command in order to type text onto the drawing This text is only ornamental and not associated with any symbols or lines

Example 1 Type **T** Enter

2 CAD prompts for

a A character size Determines the text display size that is used A typical size is 20

b Text angle Determines the angle in which the text is drawn

If the number of degrees entered is not a multiple of 90°, the system truncates the input to the next lowest 90° increment

c Justification point Point at which the text origin is placed The text origin is at the lower left hand corner of the text string

3 Type in the text

MODES: DB

COMMAND: **TE**
TE ON
TE OFF

DEFAULTS: ON

USAGE: Controls the display of text in the drawing When text is off, drawing (including refreshing) is faster The command affects all text on all layers A change in the setting of TEXT DISPLAY only shows up after a command which redraws the screen

Text display can be toggled by typing TE

Drawings containing a lot of text refresh much faster when TEXT DISPLAY is off

Example Assume text display is on,

Type. **TE** Enter
Text display is off, but text is still shown in current view

Type **RF** Enter
Screen is redrawn with text no longer visible

NOTES:
1 CAD warns when the T command is entered when text display is off

2 TE applies to text on all layers

UNDELETE SHAPE

MODES: LM

COMMAND: **UN**

USAGE: Restores a deleted user library shape providing the library has not been compressed since the shape was marked for deletion. Type UN, and CAD prompts for the shape name to restore or unerase. Type in the shape name and it is restored to the user library. (Wild cards are acceptable.)

Example Undelete shape joy

1 Type **UN** Enter
CAD prompts for the shape name

2 Type **JOY** Enter
The shape is marked active

MODES: DB

COMMAND: **UL**
UL (library name)

USAGE: Initializes and associates a user library name to a drawing file Use this command to create your own library of frequently used Shapes and Macros CAD asks for the User Library Name (maximum of 8 characters) to be entered

Example 1. Type **UL** Enter
CAD asks for a library name

2 Type. **SMITH** Enter
CAD creates a User Library named SMITH, if it does not already exist If it does exist, the user library name SMITH.LBR is associated with the current drawing

NOTE: A drawing file (DBF) is associated with one user library A user library however can be associated with multiple DBF files

USER MACRO

MODES: DB

COMMAND: **UM**
UM (MACRO NAME)

USAGE: Gets a Macro from the User Library

Example 1 Type **UM** Enter
CAD prompts for the Macro name and asks to assign a start ing block number The Macro appears on the CRT with its origin point at the cursor location See the SM command for an example of how to work with the Block Number designa tions

2 Type in the Macro name, and the starting block number, if desired

USER SHAPE

MODES: DB

COMMAND: **US**
US (shape name)

USAGE: This command gets a shape from the User Library and places it on the drawing at the cursor location Like the System Shape (SS) command, CAD prompts for shape name A scale factor may be entered with the command, e g , **US shapename 3.**

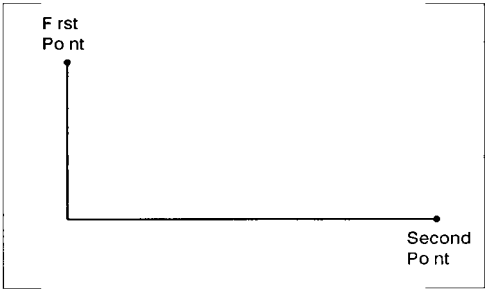
VERTICAL ORTHOGONAL (Solid Line)

MODES: DB

COMMAND: **V**

USAGE: Sets CAD to the VERTICAL ORTHOGONAL command for inputting solid lines Angles are allowed only in 90° increments Digitized points are connected by first completing the vertical segment of the line

Example



NOTE. VERTICAL ORTHOGONAL can be used to draw straight lines This saves time when inputting combinations of straight lines and vertical orthogonal lines

Refer to **Line Command** for further details

MODES: DB

COMMAND: **V1**

USAGE: Sets CAD to the VERTICAL ORTHOGONAL command for inputting dashed lines This is used for drawing dashed digital logic/configuration connection lines on an analog drawing Angles are allowed only in 90° increments Digitized points are connected by first completing the vertical segment of the line.

Example See the Example for Vertical Orthogonal (Solid Line)

NOTE: VERTICAL ORTHOGONAL can be used to draw straight lines This saves time when inputting combinations of straight lines and vertical orthogonal lines

Refer to **Line Command** for further details

VERTICAL-ORTHOGONAL (Dotted Line)

MODES: DB

COMMAND: **V2**

USAGE: Sets CAD to the VERTICAL ORTHOGONAL command for inputting dotted lines This is used for drawing dotted connection lines from adapt blocks on a configuration drawing Angles are allowed only in 90° increments Digitized points are connected by first completing the vertical segment of the line

Example See the Example for Vertical Orthogonal (Solid Line)

NOTE: VERTICAL ORTHOGONAL can be used to draw straight lines This saves time when inputting combinations of straight lines and vertical orthogonal lines

Refer to **Line Command** for further details

MODES: DB

COMMAND: **V3**

USAGE: Sets CAD to the VERTICAL ORTHOGONAL command for inputting dot dashed lines This is used for drawing miscellaneous separation lines on a logic/configuration drawing Angles are allowed only in 90° increments Digitized points are connected by first completing the vertical segment of the line

Example See the Example for Vertical Orthogonal(Solid Line)

NOTE: VERTICAL ORTHOGONAL can be used to draw straight lines This saves time when inputting combinations of straight lines and vertical orthogonal lines

Refer to **Line Command** for further details

VISIBLE LAYER

MODES: DB

COMMAND: **VL**
VL n

USAGE· Displays which layers are currently visible, or chooses the layers to be made visible

Examp e To see which layers are visible, use either one of these forms at the prompt,

1 Type **VL** Enter or
2 Type **VL ?**

CAD lists the numbers of the current visible layers in numer ical order If there are more than 10 visible, they are listed 10 at a time, and the system prompts if you want to see more

To choose layers to be visible, use any of the following forms

Example At the prompt, type VL and layer or layers

1 Type **VL n** Enter

2 Type **VL n1 n2 .. n16** Enter

3 Type **VL n1** Enter

4 Type **VL nl - n8** Enter

5 Type **VL 1 - 8, 12, 16** Enter

MODES: DB MT

COMMAND: **ZO**
ZO n
ZO n

(n integer magnification factor)

USAGE: Magnifies or reduces the size of the current display view The cursor location becomes the center of the screen

When entering the ZO command without a parameter, CAD prompts for a zoom factor Positive zoom factors result in a zoom in (the display is enlarged) Negative zoom factors result in a zoom out (the display is reduced)

Successive ZOOM applications result in the previous ZOOM factor being multiplied (ZOOM in), or divided (ZOOM out), by the new factor The resulting zoom factor cannot be less than 1X

Example Type. **ZO 8** [Enter]
Zoom in, magnification of 8X

Type **ZO -2** [Enter]
Zoom out, magnification now 4X

Type **ZO -4** [Enter]
Zoom out, magnification now 1X

SECTION 4 — THE NETWORK 90 COMPILER

INTRODUCTION

The Network 90 compiler allows compilation from one mod ule to the entire job The compiler may be initiated by one of several methods

1 Choose *Compilation* (item D) from the main menu This causes the SELECT program to run SELECT enables you to conveniently select which files you want to compile It then starts the compilation process Instructions for selecting modules are displayed when the program is initiated

2 You can initiate SELECT directly from the DOS prompt Type **SELECT** [Enter] The SELECT program creates the MSTR LST and module LST files used by the compiler pro gram

3 To initiate the Network 90 compiler directly from the DOS prompt, type **N90CPLR** and press [Enter] The LST files cre ated by SELECT must be present for the compiler to work

To use the SELECT program

SELECT BY JOB Press [Enter] to select/deselect all modules for the entire JOB

SELECT BY LOOP Press [Enter] to select/deselect all modules that are in the same LOOP as the module under the cursor

SELECT BY PCU Press [Enter] to select/deselect all modules that are in the same PCU as the module under the cursor

SELECT BY MODULE Press [Enter] to select/deselect only the MODULE under the cursor

Selected modules are shown in black text on a green back ground Deselected modules are shown in green text on a black background The selection cursor is shown by black text on a cyan background The cursor text is highlighted if the module under the cursor is currently selected

Use the [←], [↑], [→], [↓], [Home] and [End] keys to move the cursor Use [Pg Up] and [Pg Dn] to change pages, if there are multiple pages (this is shown in the lower right corner of the screen)

Below is a summary of the allowable keystrokes and their meanings Press the Alt H key to view these in the program

Alt H	Display key usage information (HELP)
↓ ↑ ← →	Move the cursor around the screen
Enter	Select/deselect modules based on selection method
Ins	Change to SELECTION mode
Del	Change to UNSELECTION mode
F1	Change to SELECT BY JOB method
F2	Change to SELECT BY LOOP method
F3	Change to SELECT BY PCU method
F4	Change to SELECT BY MODULE method
Esc	Abort selection and return to DOS
F10	Finished selecting modules

Using the Module Selection Methods Efficiently

Following are examples that give you an idea of what the selection process for Binder and Compiler can do In all examples, assume that you have a large job, with more than one loop, multiple PCUs in each loop and more than one module in each PCU Press Esc at any time to abort the selection process without selecting any modules Press F10 to accept any selections made and proceed to compile or bind those modules

NOTE: The initial select on mode is always SELECT BY MODULE

Example 1 To select every module

1 Press F1 to change mode to SELECT BY JOB
2 Press Enter to select all modules

Example 2 To select every module in Loop 1

1 Press F2 to change mode to SELECT BY LOOP
2 Position the cursor over any module in Loop 1
3 Press Enter to select all modules in Loop 1

Example 3 To select every module in PCU 10, Loop 1

1 Press F3 to change mode to SELECT BY PCU
2 Position the cursor over any module in PCU 10, Loop 1
3 Press Enter to select all modules in PCU 10 Loop 1

Example 4 To select an individual module

1 Press [F4] to change mode to SELECT BY MODULE
2 Position the cursor over the desired module
3 Press [Enter] to select that module

Example 5 To select every module except those in PCU 10, Loop 1

1 Press [F1] to change mode to SELECT BY JOB
2 Press [Enter] to select all modules
3 Press [F3] to change mode to SELECT BY PCU
4 Press [Del] to change mode to UNSELECT BY PCU
5 Position the cursor over any module in PCU 10, Loop 1.
6 Press [Enter] to deselect all modules in PCU 10, Loop 1

Example 6 To select every module except one individual module

1 Press [F1] to change mode to SELECT BY JOB
2 Press [Enter] to select all modules
3 Press [F4] to change mode to SELECT BY MODULE
4 Press [Del] to change mode to UNSELECT BY MODULE
5 Position the cursor over the desired module
6 Press [Enter] to deselect that module

The drawings are then compiled to an lppmm cfg file for downloading to the Network 90 System (lppmm is standard Bailey format 1 loop identifier, usually 0, pp PCU number, mm module address)

The lppmm cfg file can be loaded into the Network 90 System using the TEXT Program in a BAILEY EWS, connected to the Network 90 System with a Computer Interface Unit (CIU) or a Serial Port Module (SPM)

An lppmm log file is also created containing error messages and other pertinent data The messages can be viewed on screen by using the **TYPE** command and then printed by pressing [Print Scrn]

Hints about creating a drawing

1 The Compiler does not accept a mismatched point, so use a grid of 20, 20 [F2] with Gridlock on when connecting lines Use a 100, 100 grid [F1] to drop shapes onto a drawing

2 Add connection points when branching from input or output lines

3 When moving from one sheet to another, use the Change Attribute **(CA)** command, and note the limit of 30 characters in the description of the off sheet connecting shapes

4 Do not try to compile a drawing containing function blocks that have been saved in a rotated position

Network 90 COMPILER ERROR MESSAGES

The following are common error messages and descriptions Make necessary corrections to the drawing files and recompile the drawings until an error free lppmm cfg file is created

1 Shape [shape name] Multiple Definition
Same name appears more than once in Shape Library

2 Sheet No [n] Shape [shape name]
No block number assigned

3 Sheet No [n] Shape [shape name]
Illegal I/O descriptor, the first character must be a phabetic

4 Sheet No [n] Block No [bn] Spec No [sn]
Input undefined, other end of the line fed into the specified block/specification does not coincide with an output connection (shape reference) point

5 Sheet No [n] Block No [bn] Spec No [sn]
Data conflict, block feeding the specified block/type is not of the correct data type

6 Sheet No [n] Block No [bn] Spec No [sn]
Overlaying connection points, connection (shape reference) point must not coincide with any other connection point

7 Sheet No [n] Block No [bn] Spec No [sn]
Multiple inputs, more than one block feeds into the specified block/spec

8 Sheet No [n] Block No [bn]
Block number previously used

9 Sheet No [n] at ([x] [y])
Erroneous flow line connection, such as a line joining two input connection (shape reference) points ([x], [y]) gives the end point coordinates of one line entity

10 Sheet No [n] at ([x], [y])
Too many lines joining at this point, a junction point can have at most 4 lines emerging from t This error can often be caused by doing an **Add Connection** on line segments overlaying each other

11 EEPROM utilization exceeds limit

12 RAM utilization exceeds limit

13 Too many segment control blocks

14 Too many executive blocks

15 Too many extended executive blocks

The preceding is not a complete and exact listing of all the errors put out by the Network 90 Compiler Most of the error messages given out by the Network 90 Compiler are descriptive enough to indicate where the problem has occurred

SECTION 5 — CAD UTILITIES

INTRODUCTION

Type **H** Enter from the main menu to enter CAD Utilities The submenu shown in Figure 5 1 appears on the screen

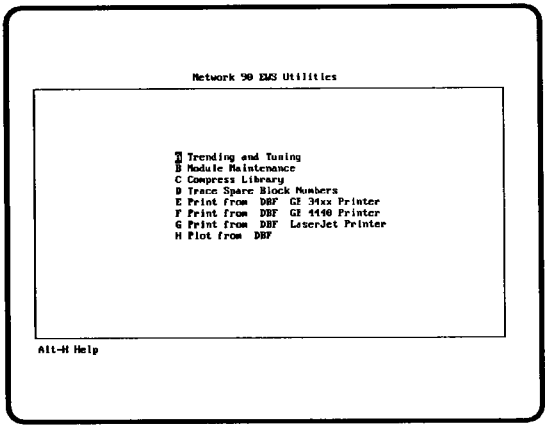


Figure 5 1 Network 90 CAD Utilities Submenu

TRENDING AND TUNING

The Trending/Tuning function for the Engineering Workstation is designed to collect trending data from the Network 90 System and to tune Network 90 modules on line On line means that the Process Control Unit (PCU) is active, i e the modules are executing a control strategy

The capabilities of the Trending/Tuning function include

1 Monitoring/Trending point values in real time, either connected directly to a Network 90 System, or remotely through a modem

2 Tuning control parameters in Network 90 modules

3 Changing the trending points and files

4 A hard copy display of the trend screen may be generated at any time Refer to the Hard Copy (HC) command

START-UP

Before start up, confirm that the EWS is connected to the Network 90 System through a Computer Interface Unit (CIU) or a Serial Port Module (SPM) To start the program

1 From the Utilities Menu, type **A** Enter

2 In response to the prompt, enter the name of the file to trend Standard DOS filenames are used, except that CAD adds the extension TRN. The trending file is created on the hard disk when the first trending is initiated If the name of an existing file is entered, CAD retrieves that file, and displays it on the screen If a file name which does not exist is entered, CAD prompts for a trending display period

3 If a new file is being created, at the prompt enter the display period (2 998 minutes) to trend CAD displays the trending configuration format on the screen Point data can be entered in the point data display area after first moving the cursor to that area

TRENDING

The trending display consists of two display elements a trend graph display and a point data display It uses a polling scheme and provides a sample resolution in one second multiples The trend graph has a total of 120 samples, or a minimum period of two minutes, and a maximum of 5 trending points

When the trend graph is full, it scrolls a quarter window at a time The trend graph is redrawn with the oldest data dropped, one quarter window (30 samples) at a time The display period can be as high as 998 minutes, set in two minute increments The following is an example (assume the current time is 12 00 00)

Table 5 1 Sample Trend Graph Data

Display Period	Sample Resolution	Next Scroll Time	Sample From Next Scroll
2 minutes	1 second	12 00 30	30
10 minutes	5 seconds	12 02 30	30
30 minutes	15 seconds	12 07 30	30
60 minutes	30 seconds	12 15 00	30
120 minutes	60 seconds	12 30 00	30

The trends only start collecting when this function is selected It has no historical data beyond that displayed on the screen

TUNING

The tuning parameters display shows the tunable specifica tion list of a function block This display cannot change the module mode

This display only has enough screen space to display eight parameter specifications at a time When there are more tunable specifications, a message displays to indicate this

The cursor keys are dedicated to the tuning parameters dis play and are used to access the allowable parameters of the block A closer look at the Tuning Parameter Display is shown in Figure 5 2

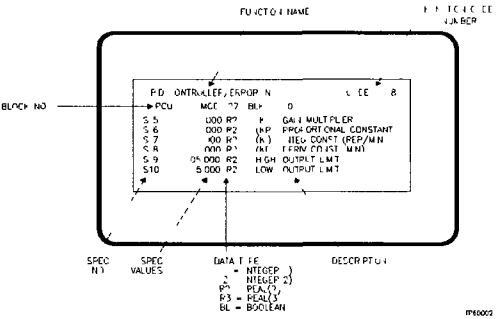


Figure 5 2 Tuning Parameter Display

SCREEN LAYOUT

The trending/tuning function screen layout is shown in Figure 5-3

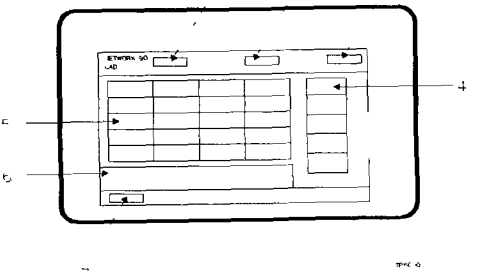


Figure 5-3 Screen Layout Trending/Tuning Function

1 Current function in Trending/Tuning
2 File Name
3 Current Date and Time
4 Point Data Display
5 Trend Graph Display
6 Tuning Parameter Display
7 User Prompt and Error Message Display

FUNCTION KEYS

The following function keys must be used to execute the Trending/Tuning functions. The function keys are defined as follows:

F1 Help Menu
F2 Modify Display Period
F3 Not Used
F4 Change Trending File
F5 Tune Block
F6 Change Trending Point
F7 Start Trending
F8 Return to Main Menu
F9 Clear the Field at the Cursor Location
F10 Initiate Command
Esc Exit the Help Menu or Escape from Tuning Function

The following examples show how each Function key works

F1 Help Menu
Presents the help menu Press Esc to exit the help menu

F2 Modify Display Period
CAD prompts for the display period time

Example

TREND PERIOD (2 998 [MIN]) (_ _)
STEP 2_[MIN]

The display period can be specified from 2 to 998 minutes in 2 minute increments Press F7 to start trending with the new display period

F3 Not used

F4 Change Trending File
Type in the file name (8 characters maximum) and press F10 The trending display appears on the screen Press F7 to start trending

F5 Tune Block
Type in the PCU address, Module address, and Block number to be tuned Press F10 to display the tuning parameters of the specified block Specification data similar to that shown in Figure 5 4 appears on the screen

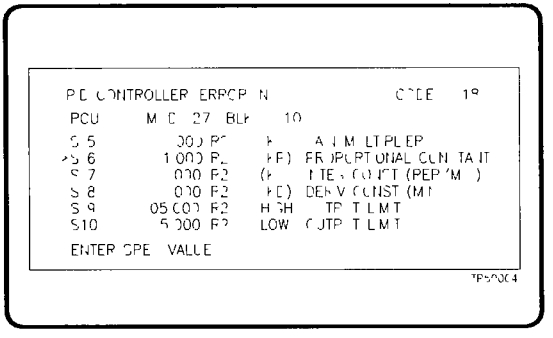


Figure 5 4 Specification Data

Move the cursor to the specification to be changed, and type in the new specification value. Press F10 to send the new data to the target module. Press Esc to tune the next block, press Esc twice to return to the trending function.

F6 Change Trending Point

The trending point data display is shown in Figure 5-5. Move the cursor to the desired location, using the cursor keys. Then change the data as needed. The various elements of the trending point data display are explained as follows:

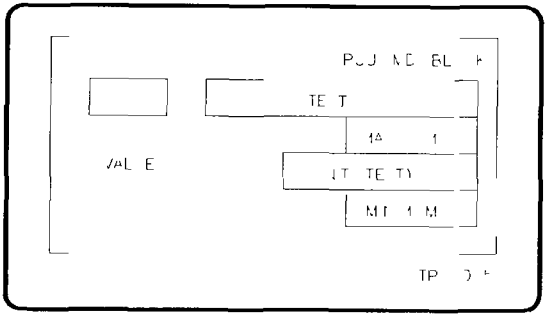


Figure 5-5. Trending Point Data Display

PCU-MD-BLOCK The address of a trending point in the Network 90 System. Hyphens should be used as delimiters between address numbers. Pressing F10 writes the point data into the trending file on the disk.

TEXT: Trending point descriptions (14 characters maximum).

MAXIMUM: Maximum value of the signal range.

MINIMUM. Minimum value of the signal range.

UNIT. Unit description (9 characters maximum).

Analog points and digital points can be displayed on the screen Digital points are displayed within one of the 20% range lines, i e , between 80% and 100%, between 60% and 80%, etc A logic zero is displayed at 20% of the range (20% of the 20%), a logic one is displayed at 80% of the range (80% of the 20%) The display is shown in Figure 5 6

[F7] Start Trending
Trending restarts when you press [F7]

[F8] Return to Main Menu
The system prompts for confirmation of a trending reset Type a **Y** (yes) to confirm; type an **N** (no) to return to trending

F9 Clear the field at the Cursor Location
Clears the field at the cursor location

F10 Initiate Command
Initiates the current command using the data in the input field

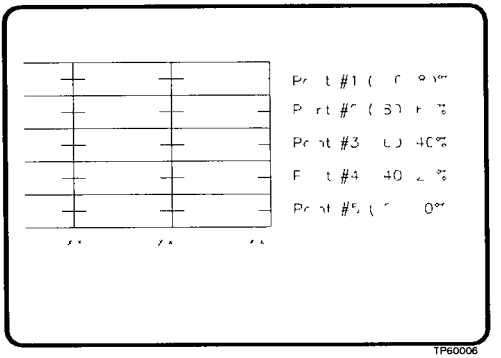


Figure 5 6 Digital Point Display

MODULE MAINTENANCE UTILITY

Module Maintenance (MODMAINT) allows the user to man age utilization factors on a module basis Beginning with CAD version 3 0, utilization factors displayed on the status line refer to module values Earlier versions of CAD displayed sheet values The Module Maintenance utility performs the following functions

1 Display and/or calculate the utilization factors of a given module on a sheet by sheet basis The output can be dis played to the screen or written to a file If written to a file, the file name has the extension UTL When MODMAINT calculates utilization values, it also calculates block counts

Bailey strongly recommends that the CALCULATE OPTION BE RUN FOR ALL DRAWINGS CREATED PRIOR TO CAD 3 0 This ensures correct utilization factors on both the mod ule and sheet basis

2 Copy one or more drawing sheets of one module to an other module If the destination sheets exist, CAD asks if the file is to be overwritten

3 Delete one or more drawing sheets of one module The module utilization factors are correctly maintained

How To Use The Module Maintenance Utility

First select option **B** *Module Maintenance*, from the CAD Utilities Menu, or from DOS, type MODMAINT **Enter** The program prompts throughout the various screens

File names must be in standard format LPPMMSSR, where

L	Loop identifier(normally 0)
PP	PCU number(01 63)
MM	Module address(02 31)
SS	Sheet No of this module(01 Z9)
R	Revision letter of the sheet(upper or lower case)

The copy/delete function requires the start end sheet revi sion numbers to be input (e g , 12A 50A) Sheets are numbered 00 99, A0 A9, B0 Z9 For example if copying source module sheets 10A 50A to destination module sheets 30A 70A, sheet 10A would be copied to sheet 30A sheet 11A would be copied to sheet 31A, etc Only the most recent revi sion of a drawing file is processed

NOTE: f a process s term nated ear y as a resu t of a cut or error condit on changes may a ready have taken p ace to the curren t d rectory Some of the draw ng sheets may have a ready been cop ed

Error Codes:

2	File specified is not found.
3	Path specified is not found
8	No more files found
89	Drive specifier contains an invalid character
90	Directory name contains a backslash This is an illegal character
92	File name (module name) not specified

COMPRESS LIBRARY UTILITY

This utility compresses user libraries, thereby improving ac cess time and reducing disk space requirements To use it, select item **E** from the CAD Utilities Menu CAD prompts for the name of the library to be compressed

Type in the name of the library to compress, or press Enter to exit without compressing a library The user library to com press must be in the current directory Once a library is compressed, shapes marked for deletion **CANNOT** be recov ered

NOTE: Do not use the extension O D for any brar es as the ut ty automat ca y renames a brary w th the extens on OLD f the brary compress on s successfu the OLD f e s de eted f not successfu OLD is renamed LBR and the f e rema ns ntact A f e cannot be ost f a fi e OLD s a ready n use an error message appears *errtyp 1 retrn 5* f this happens rename the OLD f e and start aga n

TRACE UTILITY

TRACE is a CAD utility which analyzes a CFG file to pro duce a report There are two types of reports available

The first report type is a listing of all spare, fixed and config ured blocks for a particular module as defined by the CFG file This report is a useful tool for locating available (spare) blocks when additional function code logic needs to be added to the module

The second report available through the TRACE utility is a listing of all configured blocks and the associated specifica tion values for input to a DBASE III Plus™ database This report is stored in a format called SDF (Standard Delimited Format) which can be read into a properly structured DBASE DBF file Included with the TRACE utility is a CFGSPECS DBF file which accepts the TRACE SDF format specification listing This facility allows the CFG data to be

easily ordered, searched, etc. as required to analyze a module configuration

Operation

1 TRACE can be started from the CAD Utilities Menu or from the DOS prompt.

If starting from the CAD Utilities Menu,

Type **H**

TRACE prompts for the name of a CFG file

Enter CFG filename [filename] **Enter**

If starting from the DOS prompt,

Type **TRACE** **Enter**

or

Type **TRACE** [filename] **Enter**

If TRACE was started from the CAD Utilities Menu, TRACE prompts for the name of a CFG file

Type [filename] **Enter**

2 TRACE displays the available report types and prompts the user to choose one

Available report types

1 Spare and configured blocks report
2 SDF Specification Listing

Select Report type

Type **1** or **2** **Enter**

TRACE analyzes the specified CFG file and generates the requested report If the Spare & Configured Block listing was requested, the report is stored in the file

filename blk — where filename is the CFG file name (e g , 12345 cfg generates 12345 blk)

TM DBASE Plus s a trademark of Ash on Ta e

Any print function can be used to generate a hard copy of this report If the SDF format specification listing was requested, the listing is stored in the file

filename.sdf where filename is the CFG file name (e g , 12345 blk generates 12345 sdf)

To use the data stored in this file, it must be read into a DBASE III Plus DBF file The CFGSPECS DBF file stored in the EWS directory is structured to accept the TRACE SDF listing

To generate a DBASE III Plus database from the TRACE listing

1 Type **CD**[directory with DBASE III Plus] Enter

2 Type **COPY\EWS\CFGSPECS.DBF** [filename F2BDBF] Enter (where filename is the CFG file name)

3 Type **DBASE** Enter

4 Type. **USE** [filename] Enter

5 Type **SET PATH TO** [directory of filename sdf] Enter

6 Type **APPEND FROM** [filename **SDF**] **SDF** Enter

The DBF file now contains all of the configured blocks and their associated specification values Use DBASE III Plus functions to order, sort, analyze, etc , the data as needed

For those users who need to load the specification data into an application program other than DBASE III Plus, the structure of the TRACE SDF format file is as follows

Each line of the SDF file is 1228 characters long and contains the complete specification data for one function code

Character Positions		Function
1	4	Start Block
5	8	End Block (if more than 1 block used)
9	11	Function Code Number
10	28	S1 Value
29	47	S2 Value
.		
1210	1228	S64 Value

NOTE: A specification values (S1 S2 etc) are stored as real numbers in a 19 3 format Each value occupies 19 character positions with the last 4 positions being a decimal point and three decimal place

PRINT/PLOT UTILITIES

E through **H** on the CAD Utilities menu give print/plot options

Print from .DBF Genicom Printers

Select **E** from the CAD Utilities menu to print on the Genicom 3400 or 3410 or **F** to print on the Genicom 4440 The program prompts for DBF file names to print Enter file names individually in response to program prompts, or list them in a batch file To enter a batch file, type @[file name] Enter, do not enter the BAT extension After you enter the last file, type **STOP** [Enter] The program then prompts for a scale factor Enter 100 to get a full size drawing To get a B size (11 inches x 17 inches) drawing, the scale factor should be 84 for the 34XX series printers and 83 for the 4440 printer

Print from .DBF LaserJet II Printer

To use the LaserJet II printer, the Print A-Plot™ program, written by the Insight Development Corporation (1024 Country Club Drive, Suite 140, Moraga, CA 94556, phone 415/375 9451), must be purchased Copy the PP EXE program from their master disk to the \EWS directory

NOTE. The LaserJet must have a 1 Megabyte or larger expansion board installed

Select item **G** from the CAD Utilities Menu The program presents a menu for choosing a settings file A settings file specifies size and resolution of the plots to be made Menu items A through D are CAD provided settings files Menu item E allows selection of user created settings file The Print A Plot documentation describes creation of settings files See Figure 5 7

Next, the program allows you to select which files to print Enter the path of the directory that has the files to print (the default is the current directory) Choose **D** or **R** **D** displays all files in the chosen directory that match the pattern **R** removes the files from the list Press F10 to display the list Use [←], [→], [↑], [↓] to move to the desired file name, then press [Enter] to select the files to plot Press F10 again after making all the selections See Figure 5 8 Call up this program from the directory that has the files you want to print Press F10 and choose the file to print

Prompts asking whether specification values and descriptions appear on the drawings, replace the menu After that, the plotting process begins The program alternates between creating plot files and sending them to the printer, so plotting does not begin immediately At any time before you answer the last question, press to move back to the previous menu or question if you want to make different choices

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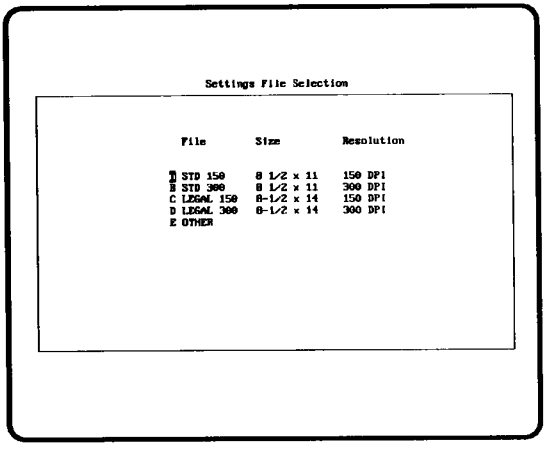

Figure 5 7 Settings File

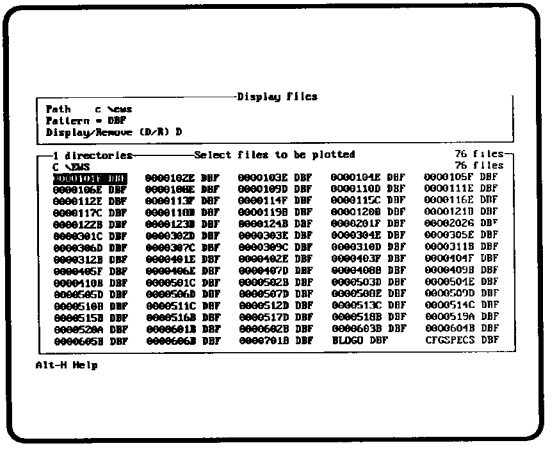

Figure 5 8 Display Files Select Menu

C-Itoh Printer

The SCAD package supports the C Itoh printer (models 600Q, 3500, 310 and 315) This is not a menu item, you must invoke the printer program from the DOS command line Enter CIEPRN or SCIEPRN to invoke a driver for the C Itoh printer CIEPRN allows keyboard entry of print file names, while SCIEPRN expects those names to appear in a file called PRNLIST BAT

Plot from .DBF

This utility allows plotting directly from a DBF file to a Bausch & Lomb DMP41/42 or Houston Instruments DMP51/52 sheet plotter No other plotters are supported by CAD, nor may CAD be reconfigured to support other plotters If other plotters are 100 percent compatible with those mentioned, they may work

After selecting item **H** from the CAD Utilities menu, CAD prompts for the name of the drawing file to plot To terminate a plot in progress, press Ctrl C When the plot is completed, a prompt appears for the next drawing file name Press Ctrl C to end

For both printing or plotting from a DBF file, the largest rectangle on the drawing (usually a border) is used to define the plot window This window is subsequently scaled and rotated (if necessary) to produce a D size plot

How To Create A Batch File

A batch file can be built by either of two methods

1 Create a file named **prnlst.BAT** Prnlst can be any name up to 8 characters The BAT file contains a list of DBF file names The names are listed one per line For example, the list might look like this

```
3830032B
3830001B
\job01\3830032C
\job02\sub\3830003B
3830012B
```

2 Use the utility MKBAT to build a new list of file names Type **MKBAT name1.DBF** name2 **DBF > prnlst BAT** Enter, where **prnlst** is a 1 8 character file name, and **name** can include path names, ?, or * For example,

MKBAT \JOB1*.DBF \JOB2\101*.DBF > FILE.BAT Enter

builds a file called FILE.BAT FILE BAT contains a list of all the DBF file names in directory JOB1 and all the DBF file

names in directory JOB2 whose first three characters are 101 To append file names to an existing list, replace the > character with >> characters For example,

MKBAT \JOB3\?????01a.dbf > > FILE.BAT Enter

appends to FILE BAT the names of all the DBF files in direc tory JOB3, whose 6th 8th characters are **01a**

The Printer/Plotter software can print specs and/or descrip tions for each drawing Specify this in the PRNLIST BAT file To print specs only, insert a **/S** after each file name that you wish to print specs for To print specs and descriptions, insert a /SD after each file name that you want to print specs or specs and descriptions for To print specs or specs and descriptions for all files in a batch, invoke MKBAT as fol lows

MKBAT -S C [files to be printed]) [batch file name (specs only)]

MKBAT -S -D C·[files to be printed]) [batch file name (specs and descriptions)]

Plot from DMP-60

If you have a Houston Instruments DMP 60™ plotter, you must configure it per Steps 1 through 6 for it to work with CADEWS

1. Press the control panel ENTER and SCALE UP keys (see Figure 5 9) This activates the DM/PL menu mode The plot ter plots the DM/PL option select line

2 When the plotter parks the pen by the help option, press ENTER to plot the help listing

3 Use the right and left arrow keys to move the pen to the list option select line Press ENTER to list menu options

4 Set the options as shown in Table 5 2.

NOTE· After you make a se ect on press ENTER to save your se ect on then use the r ght and eft arrow keys to move the next opt on

5 After you complete the settings of Table 5 2, press the SCALE UR or CLIP UR key to exit DM/PL menu mode The plotter is now in the active plotting language

6 Save the plotted menu (open the left and right pinch roller arms, remove menu).

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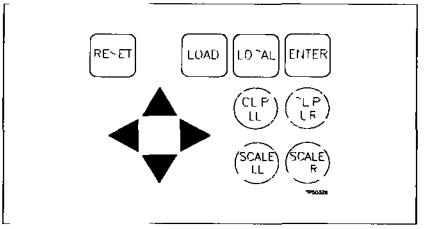


Figure 5 9 DMP 60 Control Panel

Table 5 2 DMP 60 Plotter Options

Option	Setting
1) UP VELOC TY	16 (ps)
2) UP ACCELERAT ON	4 0 (g)
3) UP DELAY	25 (msec)
4) DOWN VELOC TY	16 (ps)
5) DOWN ACCE FRAT ON	4 0 (g)
6) DOWN DELAY	40 (msec)
7) PEN CHANGE	GNORE
8) PLOT OR G N	R GHT
9) CONSTANT VELOC TY	ON
10) ADDRESS NG	001 n
11) MENU UN TS	ENGL SH
12) TEXT FONT	F0
13) CHARACTER SET	G1
14) AUTO PEN CAPP NG	120 (sec)
15) BAUD RATE	9600 (baud)
16) UART PAR TY	B T 8 0
17) HANDSHAKE RTS/DTR	TOGGLE
18) PASS THROUGH PORT	TOGGLE
19) OUTL NED FONTS	F LLED
20) NUMBER OF PENS	1
21) ZERO CHARACT R	PLA N
22) COMM ERRORS	GNORED
23) OPT ON BOARD	ON
24) TEXT SPAC NG	NON PROPORT ONAL

SECTION 6 — PC TO PC COMMUNICATIONS

INTRODUCTION

This program allows the transfer of files between two PCs, either via direct cable hookup or through two Hayes compatible modems

MODEM SETUP

If using modems to transfer the files, it is important that the modems have their switch settings properly set to allow transfer. On the Hayes external modem, the 8 switches should be set as follows (See the manual for definitions)

Switches

1	2	3	4	5	6	7	8
Up	Up	Down	Up	Up	Down	Up	Down

The important switches to note here are switch 1 and switch 6 Switch 1 causes the computer to recognize the DTR signal and Switch 6 causes the Carrier Detect signal to be held high at all times. These switches **MUST** be set as shown If DTR is not recognized (Switch 1), the modem does not properly disconnect the call If the Carrier Detect signal is not held high at all times (Switch 6) on the receiver modem, no transfer is enabled For Hayes board modems, set the switch to assure Carrier Detect is held high.

HOW TO RUN THE PROGRAM

To run the program, type the following command

C > **PCPC** Enter

THE SCREEN

When PCPC starts, the screen is cleared and then it displays five formatted windows as shown in Figure 6 1

The First Window (number 1 on Figure 6 1)
This window is used to display the name of the program and the copyright information

The Default Setting Window (number 2)
This window displays the current defaults

The Menu Window (number 3)
This window displays the various program options At start up, the *Send File* option is highlighted

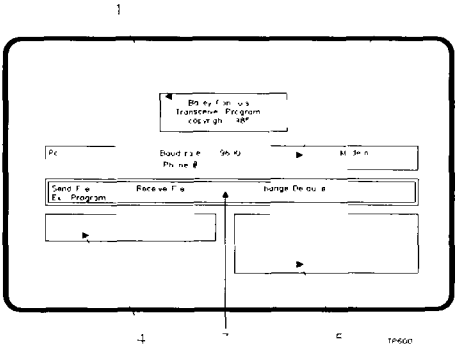


Figure 6 1 PC to PC Communications Screen

The File Prompt Window (number 4)
This window is used to prompt the user for the name of the file to send or receive At start up, it is blank

The Status Window (number 5)
This window is used to display the various program status messages At start up, this window is blank

OPERATION

To transmit a file, the PCPC EXE program must be on both PCs. Then, start the program on both PCs Once started, the program defaults can be changed, if necessary, to enable the two programs to communicate

CHANGING DEFAULTS

To change the defaults, use the [↑] [↓] [←] [→] arrow keys on the right side of the keyboard Press the [→] key and notice that the highlighted area, in the menu window, moves to the right Press this key until the *Change Defaults* option is high lighted Then press [Enter] The menu window clears and the cursor is positioned under the port number, in the default window

To change the port number, press the [↑] or [↓] key and the port number changes to either 1 or 2 Once the port number is correct, press [Enter]. The cursor is then positioned under the baud rate default

To change the baud rate, press the [↑] or [↓] key and the baud rate changes to either 300, 1200, or 9600 Once the baud rate is correct, press [Enter] The cursor is now positioned under the modem present default

To change the present modem default, press the ↑ or ↓ keys The default is changed to either **Y** or **N** The **Y** indicates there is a modem connected to the port, the **N** means no modem is connected. Once, the proper default is selected, press [Enter] The cursor is now positioned under the Phone number slot

At this point, type in a phone number or just press Enter If the you press [Enter], then the current phone number (if any) is left undisturbed.

NOTE: If the present modem default s **N** then a phone number need not be typed n If the modem default is **Y** and the program s to be set up for receiv ng then the phone number need not be typed n When you have finished with the phone number then the menu w ndow s d sp ayed and the *Send File* opt on s h gh ighted

TRANSMITTING A FILE

Preparing the Receive Side

Once the defaults are set up, the user on the receive side must use the → key to highlight the *Receive File* option Once highlighted, you must press Enter. Then the following prompt appears in the file prompt window

Receive file

At this point enter a file name or just press @ \ Enter] If the latter is chosen, then the program gets the name from the sender After the file name is entered, or Enter is pressed, the program enters a state that establishes contact with the sender If, after 15 minutes, contact has not been made, the program times out with an error Once contact is made, it reports the status of the transmit in the status window

Preparing the Sender

Once the defaults are set up, the user must move to the *Send File* option and press Enter The following prompt appears in the file prompt window

Send file

Type in the name of the file to be sent Once the file name has been typed in, the program establishes contact with the receiver It times out in 15 minutes if no contact is made Once contact is made, it displays transmit status messages in the status window

After the Transmit

After the transmit is finished, the menu is redisplayed (menu window 3) At this point, transmit another file, or move to the Exit Program option and exit out by pressing Enter

SAMPLE DEFAULTS FOR TYPICAL USERS

PC to PC Direct Connect

Receiver:		Sender:	
Port	1	Port	1
Baud rate	9600	Baud rate	9600
Modem.	N	Modem·	N
Phone #		Phone #	

PC to PC Through a Modem

Receiver:		Sender:	
Port.	1	Port	1
Baud rate	1200	Baud rate	1200
Modem·	Y	Modem	Y
Phone		Phone	886 2048

SECTION 7 — TEXT ENGINEERING WORKSTATION

INTRODUCTION

Network 90 Text Engineering Workstation (TEXT) allows you to interface with Network 90 systems while on line (PCU is active, connected to an EWS), or during system configuration Use the TEXT package to

- modify module modes
- configure Network 90 blocks
- list/save/load module configurations
- monitor and tune system blocks
- verify configurations (both in the module and on the EWS)
- define monitor groups

You must connect the EWS to the Network 90 System through either a Computer Interface Unit (CIU) or a Serial Port Module (SPM) to do these functions Refer to product instruction I E93 916 for set up information

Menu screens identify all possible actions to take while input screens identify information needed from the user to proceed TEXT adheres to the User Interface standards for key strokes and operation

START-UP

NOTE f nsta ng the TEXT program w thout SCAD refer to Sect on 2 of th s manua comp ete Steps 1 through 7

You can invoke the Text Engineering Workstation program either from the CAD Main Menu or directly from the DOS prompt If you use the CAD Main Menu do the following

From the DOS prompt of your EWS, type

CMM [Enter] or
CAD [Enter]

Select **G** (TEXT) from CAD Main Menu (Figure 7 1)

If you are calling the program directly, do the following

From the DOS prompt of your EWS, type

TXTEWS [Enter] or
TEXT [Enter]

Either of these methods leads directly to the TEXT CONFIG URATION Main Menu (see Figure 7 2) TEXT prompts you throughout the various screens

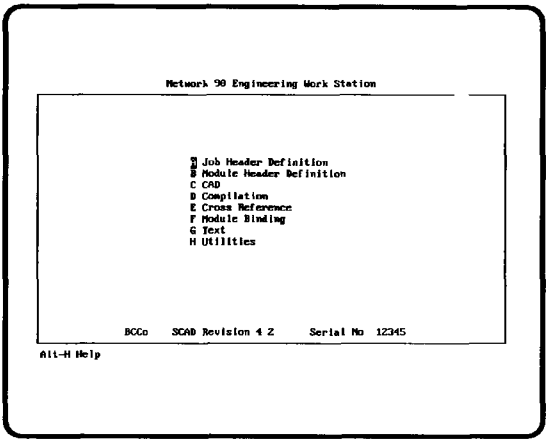


Figure 7 1 CAD Main Menu

SELECTING THE COMMUNICATIONS PORT

TEXT uses communications port 1 on your Engineering Workstation by default to communicate with the CIU or SPM If it becomes necessary to use communications port 2, you must invoke the TEXT software via the DOS command line as follows

TXTEWS 2 Enter

The number 2 following the TXTEWS name informs TXTEWS to use communications port 2

RESTARTING THE CIU/SPM

The first time you begin module communications, TEXT prompts you for the BAUD rate input

BAUD RATE 9600

The default is 9600, but you can request 300, 1200 or 2400 Key in the desired baud rate or press F10 to accept the rate shown TEXT prompts

Do you wish to restart SPM/CIU (Y/N) ?

If you want to restart the Serial Port Module (SPM) or Com puter Interface Unit (CIU), answer Y(es) This prompt appears once during the TEXT session Following your deci sion to restart or not, TEXT continues as outlined later in this section

USING A MODEM

When using a modem, TXTEWS asserts these RS 232 com munication signals RTS (Request to Send) and DTR (Data Terminal Ready) Versions of TXTEWS prior to Version 4 0 do not check the presence of DSR (Data Set Ready) and CTS (Clear to Send) Version 4 0 and later require them These signals are normally asserted on the modem side and should not be a factor However, in setups where the modem is not asserting these signals, communications will fail (time out) To correct this assert these signals from the modem side (usually by setting a dipswitch) or patch the connection by asserting CTS and DSR from an active signal (in this case, either RTS or DTR)

SCREEN EDITING

TXTEWS follows the Bailey Controls User Interface Stan dards for operation The F10 key is the general purpose acceptance key and the Esc key ends a process or backs the user up to the preceding menu or nput screen Error message or audible tones note bad inputs or keystrokes The following is a list of inputs and values that TXTEWS requires

Input	Valid Response
Ring Address	0 250
PCU Address	0 250
Module Address	1 31 (1 is valid in some cases)
Block Address	0 9998
Function Code	1 255
Baud Rate	300, 1200, 2400, 9600
Scan Interval	001 86400

TEXT CONFIGURATION MAIN MENU

Entering a value of zero into ring number indicates either plant loop operation or communication strictly to the ring on which the EWS resides

File name fields expect only the base part of the name and never expect a path to be input The system assumes the file name extension during operation. For example, the system assumes configuration files to have CFG extensions, pro grams NBS extensions and monitor group files MON extensions Therefore, the user need only enter the base part of the f lename

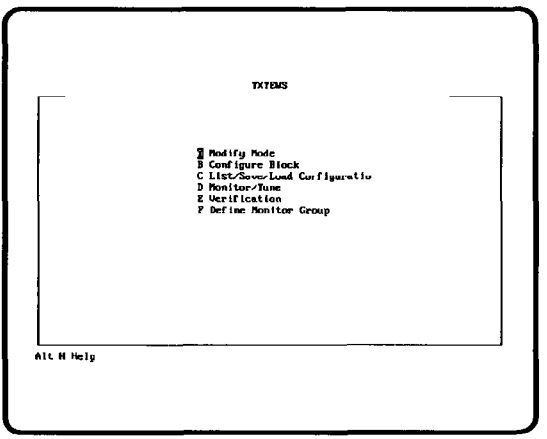


Figure 7-2 TXTEWS Main Menu

MODIFY MODE

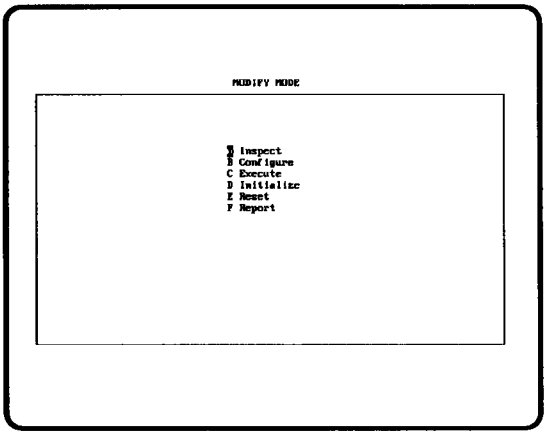


Figure 7 3 Modify Mode Menu

Inspect

The Inspect function lists all modules contained within a specified PCU. This function lists each module address, module type and module mode. To inspect a certain range within the PCU, input the proper data into the following screen.

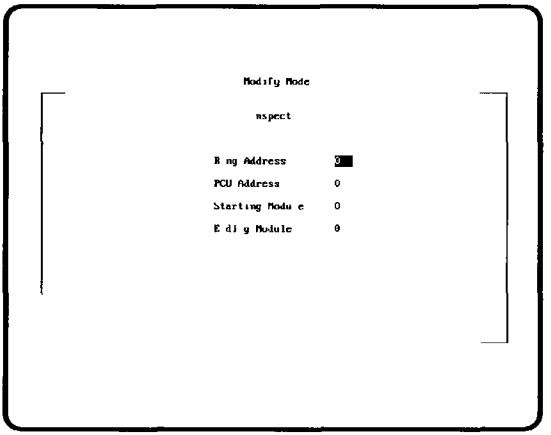


Figure 7-4. Inspect Input Screen

The start address must be a module address lower than the ending address, unless you are inspecting only one module In this event, leave the end module address zero and enter only the start module If an entire PCU inspection is needed, enter a 1 into the starting address field Following this, TXTEWS presents the list shown in Figure 7 5 A > seen for the module type signifies an available address A to the right of each address shows the current inspect location The indica tor moves to the next address once it has polled that address

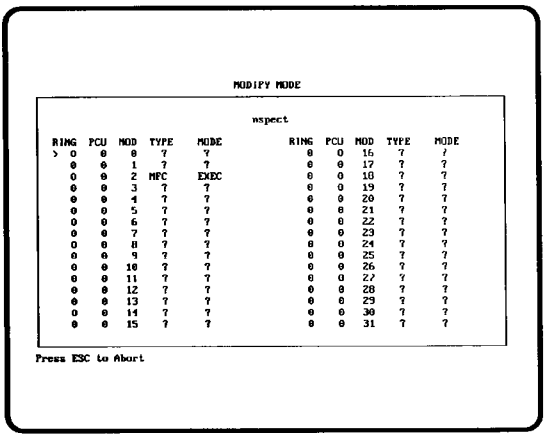


Figure 7 5 Inspect Sample Screen

Setting Module Modes

This function operates similarly to the Inspect function It allows the alteration of module mode instead of just retriev ing its current state The available modes are CONFIGURE, EXECUTE, INITIALIZE and RESET You can place either one or several sequential modules in a particular mode in one operation See Figure 7 6 for the screen to set Configure mode (This screen is identical for other mode functions)

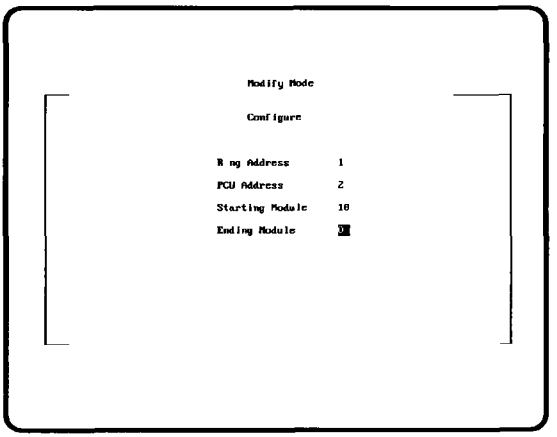


Figure 7 6 Configure Input Screen

This f inction issues the requested mode command to the module and follows with an inspection of the module's mode A ? seen at an occupied module address may mean that the module has not yet completed the mode change Mode up dates on the next iteration of the module range As before, it may also represent a vacant module address

Module Problem Reports

The report function called from MODIFY MODE provides the user with the ability to detect the presence of module or configuration problems Select an address This function presents a depiction of that module's status bytes Modules with type codes of 31 and less display 5 bytes of status Extended module types display 16 bytes In addition to the status bytes, this function identifies the module name, type, mode and status See Figure 7 7

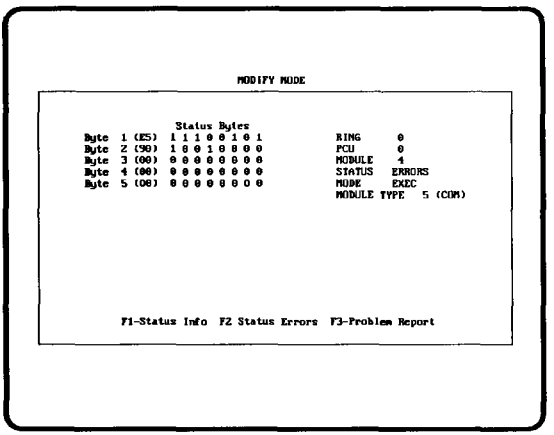


Figure 7 7 Status Byte Display Page

The EWS can generate three reports for the selected module Press F1 to invoke the first report Status Information Re port This report describes the set bit flags in the status bytes and any byte conditions The descriptions include the byte number, bit number, current value and the interpretation of the condition Use Pg Up, Pg Dn, ↑ and ↓ to scan this report and those that follow See Figure 7 8

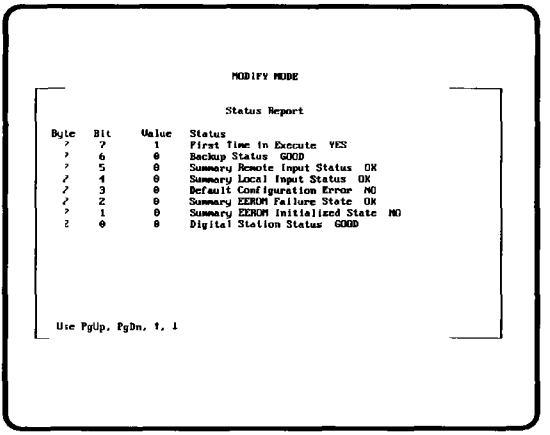


Figure 7 8 Status Info Report

Press F2 to invoke the Status Errors Report This report occurs only if the error summary bit in the status byte is set to binary one If the error summary bit is zero, this option does not appear on the status byte display page It is different from the status information report in that it identifies only error conditions (It does not give information such as byte numbers, byte values, etc) This report is for users looking to determine any non default or error conditions within the module See Figure 7 9

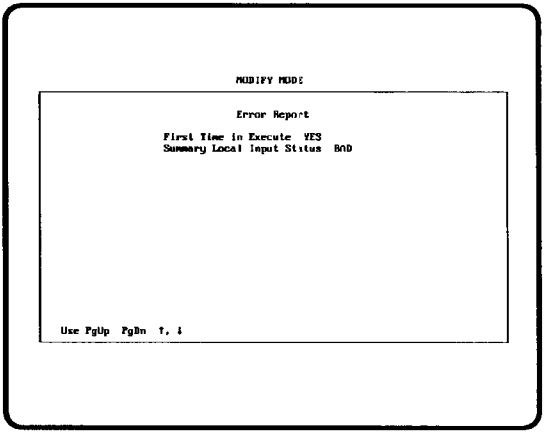


Figure 7 9 Status Error Report

Press F3 from the Status Byte Display page to invoke the Module Problem Report This report gathers all module prob lem reports and displays them The system numbers and present Module Problem Reports in the order they originated from the module It also presents the total number of reports If there is a large number of reports, all may not be presented If this condition occurs, clear the initially reported problems to view the rest of them See Figure 7 10

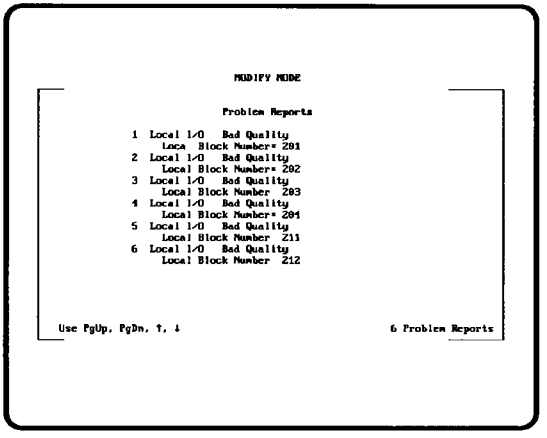


Figure 7 10 Module Problem Report

All reports can be output to a printer The printing option appears when you press Esc to return to the Status Byte Display page Type **Y** and then press F10 to print the report

CONFIGURE BLOCK

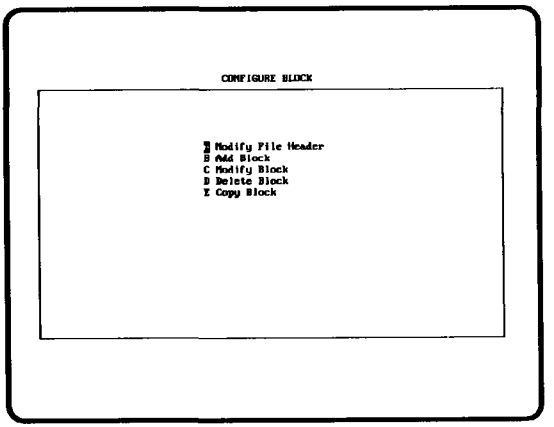


Figure 7 11. Configure Block Menu

Modify File Header

This function allows the user to edit a configuration file header This may be either a CFG file (function code blocks) or a NBS file (program blocks) You must enter the base name of an existing configuration file If both a CFG and NBS file exist with the entered file name, the system in quires if the file to edit is the CFG file, the NBS file or both Choose the type of file you want to edit If you specify the **both** option, the CFG file comes up first, the NBS file sec ond See Figure 7 12

Module type and module revision validity are verified The revision must be valid for the specified module type The system verifies any other fields (identified in the section on **Screen Editing)** that require range checks The system ac cepts all other information without checks

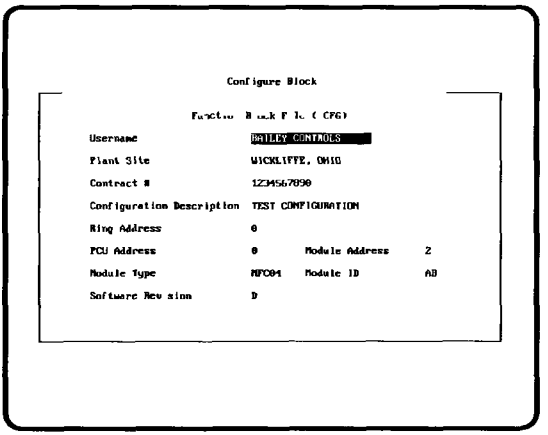


Figure 7 12 Configuration Header Screen

Add, Modify, Delete Blocks

The next three CONFIGURE BLOCK options are Add Block, Modify Block and Delete Block, respectively These functions do the required module operations necessary to change a module configuration The module must be in configure mode to do one of these functions If the selected module is not in the configure mode, the system gives you the opportunity to change modes

To add a block to a module, input the ring, PCU, module, block number and function code number on the screen shown in Figure 7 13

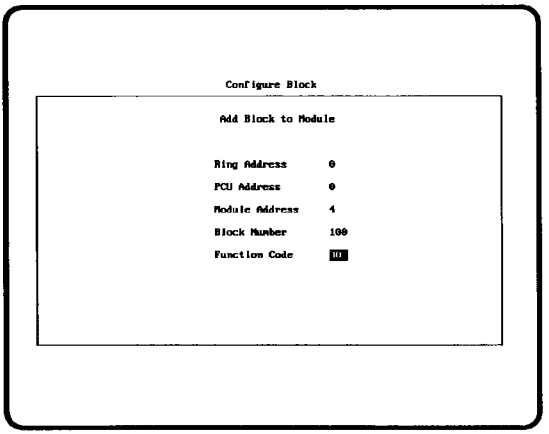


Figure 7 13 Add Block Input Screen

The specified function code appears with the default values contained within their specs You can edit any specification values as needed If function code information does not fit on one page, the message *Use PgUp, PgDn* appears in the lower left corner. Press the Pg Up or Pg Dn keys to view the rest of the specs Press F10 to write the block to the module when you are done editing

Use the same steps to modify blocks The selected block must be present in the module In this case, it is unnecessary to input a function code, as reading the block number returns that information When editing is done, press F10 to write the modifications back to the module

The ring, PCU, module and block range are needed to delete blocks from the module To remove a single block, input that block's number in the starting block number field and leave the ending block number field zero See Figure 7 14

As the system deletes blocks, a message indicating deletion appears in the lower right hand corner

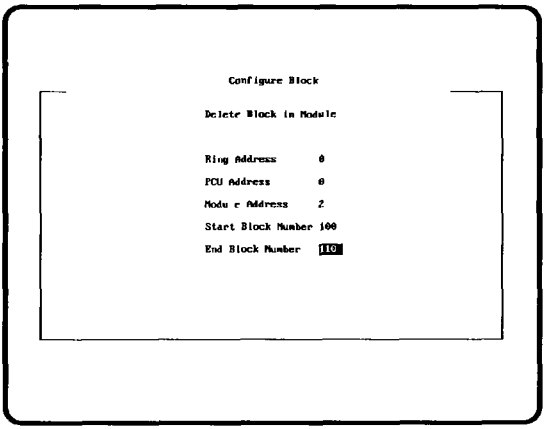


Figure 7 14 Delete Block Screen

Copying Blocks

The next feature of the CONFIGURE BLOCK menu is the Copy Block function This allows the copy of a block from a module to either another block address or a range of block addresses. The source address is the first required parame ter See Figure 7 15

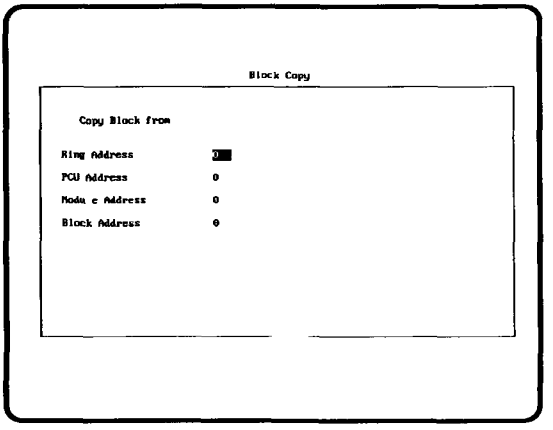


Figure 7 15 Copy Blocks Source Input

Enter the source address (Copy Block From) parameters and press F10 Next, enter the destination The destination may be a single block address or a block address range If the copy is done to a single block address, the system requires only the ring, PCU, module and block addresses If the source block is to be copied to a range of block addresses, the system re quires the ending block address and offset The offset field specifies the number of block addresses to skip before mak ing the next copy For example, to copy the block at address 100 to addresses 120 through 140, the offset specifies how many addresses to skip before writing the next copy of block 100 An offset of one is used when the blocks are to occupy consecutive addresses However, function codes with multi ple outputs cannot occupy consecutive address If a function code has two block outputs, then the offset must be two or greater An offset of one generates an error when the system attempts to write the block to the module As the blocks are added, a system message informs the user of the progress of the operation See Figure 7 16

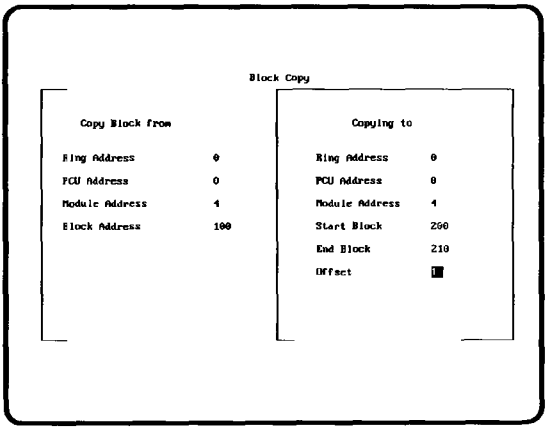


Figure 7 16 Copy Blocks Destination Input

LIST/SAVE/LOAD CONFIGURATION

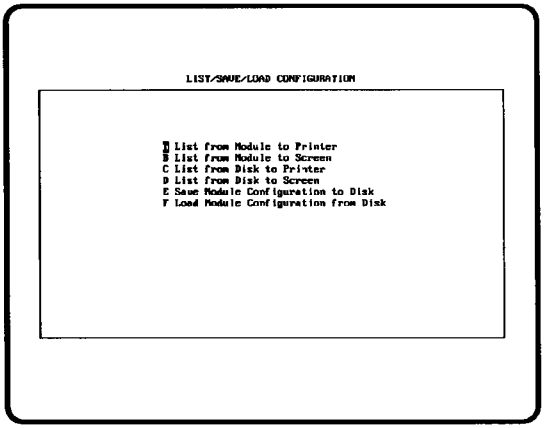


Figure 7 17 List/Save/Load Configuration Menu

Listing a Module Configuration

You can list module configurations to either the screen or a printer Select option A from the List/Save/Load Configura tion menu to list a module to a printer Option B displays the configuration on the screen Once you choose a destination, the next step is to choose the type of listing required Figure 7 18 lists the types

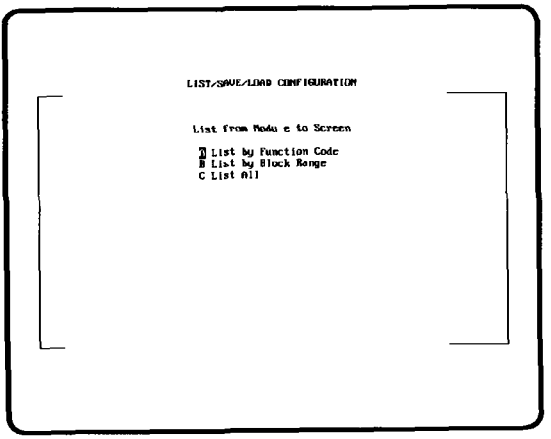


Figure 7 18 Listing Types

There are three ways to list a module. Option A lists all blocks with a function code matching the one you selected As with all options, these listings may span either a single module or cover a range of modules To list from a single module only, either leave the ending module set to zero or enter the same module number set for starting module The parameters required for that listing type are shown in Figure 7 19

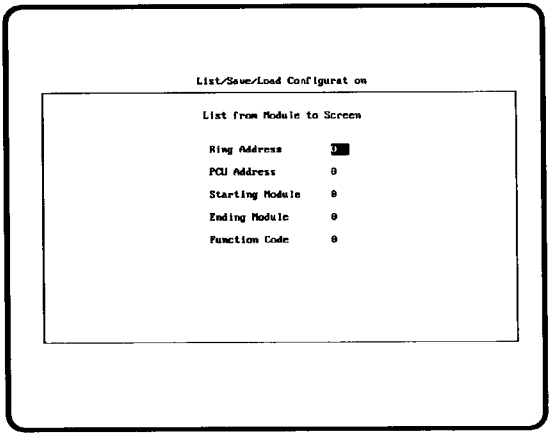


Figure 7 19 List by Function Code

Option B lists a specified block range only The EWS determines the range based on the starting and ending blocks you set If the ending block number is set to zero the range will go from the starting block number to the module's end This is the only condition in which the ending block number can be less than the starting block number See Figure 7 20

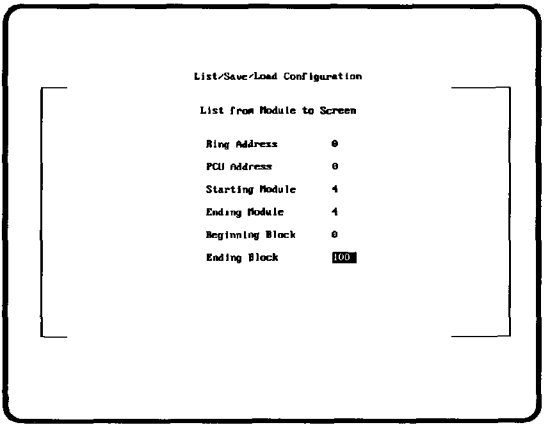


Figure 7 20 List by Block Range

The last option is the listing of the entire module For this option, enter only the ring, PCU and module This option lists all of the module's blocks. See Figure 7 21

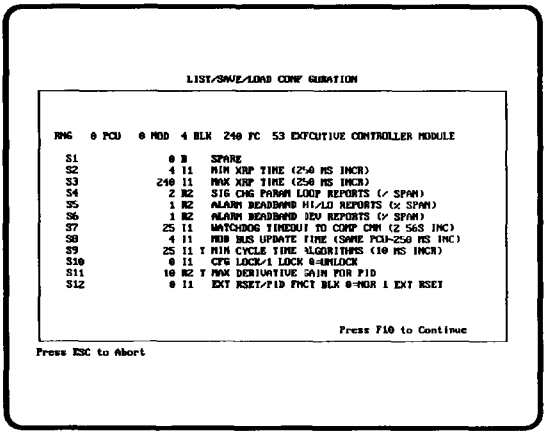


Figure 7-21. Example Block Listing

Listing Configuration Files

Listing configuration files follow the same pattern as module listings The only difference is that a configuration filename replaces the ring, PCU and module addresses As with all filenames, only the base part of the filename is entered The CFG extension is assumed. You can direct configuration file listings to either the screen or a printer and any of the previ ous listing options may be selected with these files

Saving (Uploading) Module Configurations

Uploading is the process of saving a module configuration to a disk file Option E of the List/Save/Load/Configuration menu allows a user to upload configurations to a disk file This process creates a configuration file with either a CFG or NBS extension, depending on the saved blocks Function code blocks are saved in a CFG file Program blocks, consisting of either BASIC, C, BATCH language or file system blocks, are stored in a NBS file

After selecting the upload option, enter the ring PCU and module address to save, and the filename that will contain the configuration See Figure 7 22 for an example

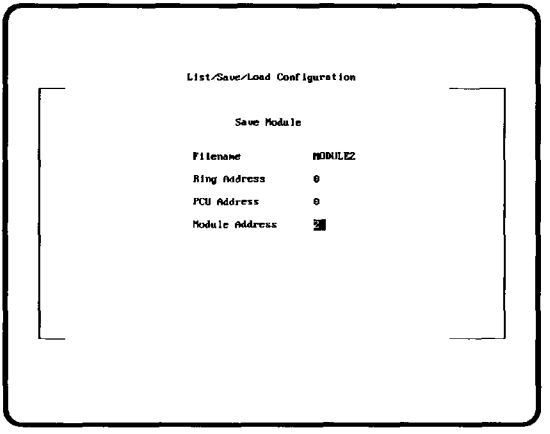


Figure 7 22 Save Module Screen

Upon acceptance of the address and filename, the system checks to see if the module falls within the group of modules requiring additional information (refer to **Enhanced Module Processing**) Next, the system searches to see if the selected configuration file exists If so, it acknowledges this and asks if you want to continue If you want to continue or if the configuration file does not exist, edit the configuration header (refer to **Modifying File Headers**) If you decide not to continue (do not want to overwrite the current CFG/ NBS file), press **N** then **F10** to abort

Upload begins when the file header has been edited (optional when a configuration file exists) and you press F10. The header remains on the screen and an indicator line is displayed. This line shows which block is currently being uploaded (see Figure 7-23). Once the process is complete, the message *Complete* appears. The program returns to the upload input screen.

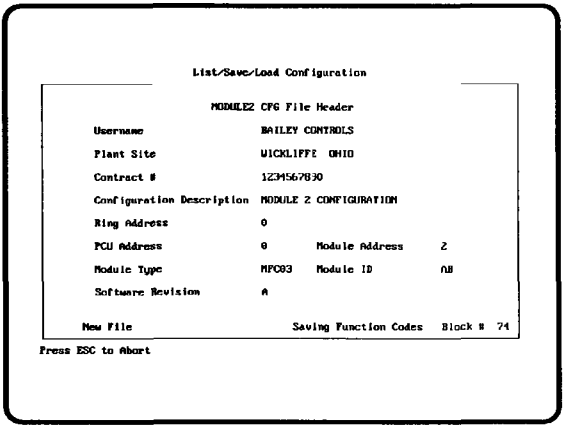


Figure 7-23. Uploading Function Codes

If saving both function codes and program space, the system repeats the preceding steps for program space after saving the function codes. You have the option to edit the header. Upload begins when you accept the header. The program returns to the upload input screen when done.

Press Esc if it becomes necessary to abort an upload. The upload stops and an abort acknowledgment appears. Press **Y** to complete the abort. Press **N** if you do not want to abort and continue the uploading.

If an error occurs during the upload, an error message appears on the screen. Following this, a *Retry?* query appears. If you answer **Y**, TXTEWS attempts to once again save the block which generated the error. If you do not wish to retry, answer **N**. Another query then appears asking whether an abort of the save is requested. If you answer **Y**, TXTEWS aborts the upload. Answer **N** and TXTEWS ignores the block which produced the error and continues with the upload.

Loading Module Configurations

Downloading is the process of transmitting configuration disk files to the module. Option F of the List/Save/Load/Configuration allows you to download either function codes, BASIC program, C language, BATCH or file system blocks C, BATCH and file system blocks are done in a single download They cannot be done separately. .CFG files store function code blocks NBS files store program space

To download enter the module address and file containing the configuration See Figure 7 24

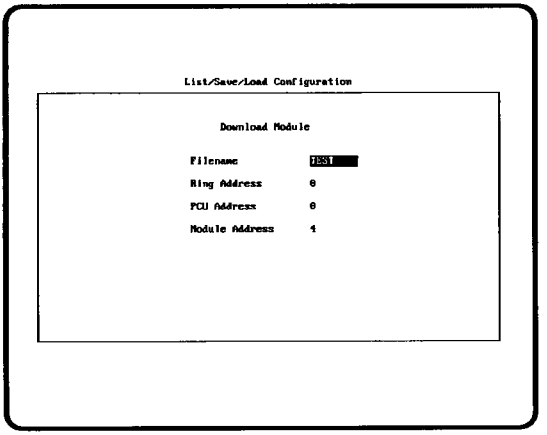


Figure 7 24 Download Module Screen

The download process depends on the following

1 If the module needs further identification (refer to **Enhanced Module Processing**), choose the exact module type from a menu selection If it does not need further identification, proceed to Step 2

2 If the module has programming capabilities (refer to **Enhanced Module Processing**), choose the download type from the menu selection in Figure 7 25 If not, proceed to Step 3

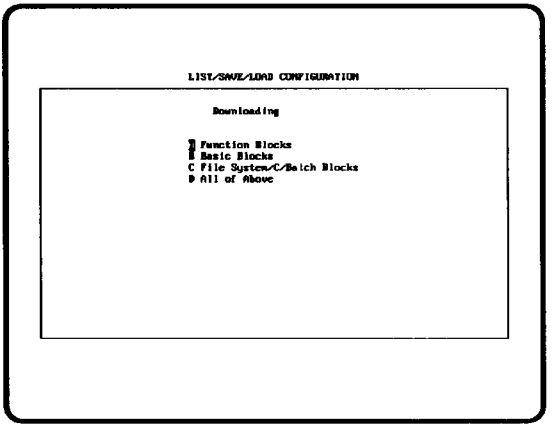


Figure 7 25 Programmable Module Options

3 If function codes are to be downloaded, the system asks you to acknowledge module initialization with the prompt *Erase Old Configuration.*

If **YES**, proceed to Step 5
If **NO**, proceed to Step 4

If function codes are not to be downloaded, proceed to Step 7

4 The system asks you to acknowledge an **on line** configuration process (refer to Appendix A in your MFC product instruction).

If **YES** (on line configuration intended), proceed to Step 7
If **NO**, abort the download, return to download input screen

5 If the module supports BASIC programming, BASIC blocks are saved in file BASIC @#$ If the module does not support BASIC, proceed to Step 6

NOTE: TXTEWS uses the BAS C @#$ for internal purposes

6 If the module is not using on line configuration, the system initializes it If it is using on line configuration, proceed to Step 7

7 Download begins with Function Codes first followed by Program Space or saved BASIC (in file BASIC @#$) next

8 If BASIC was saved in file BASIC @#$ (Step 5), TXTEWS deletes this file

The configuration file header is displayed when download starts A progression line shows the block number just written and percentage complete to keep you informed of download status (see Figure 7 26) When complete, a download complete message appears and the program returns to the download input screen If downloading both function codes and program space, the downloading of the program space immediately follows the downloading of the function codes

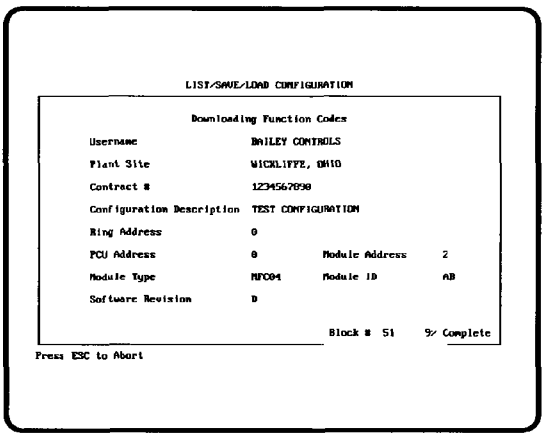


Figure 7 26 Download in Progress

For certain modules, restoring program space may write a configuration to the module with a different format table When the module receives the new, conflicting format table, the system writes the table, completes the format operation and the module enters Error mode with a CPU LED code of 20 (hex) It is important to note this process because it deletes all existing configuration data in the non volatile memory After the module changes to Configure mode, it accept the entire configuration

TXTEWS automates this procedure First, it verifies whether the format tables differ If they are identical, the download proceeds normally If they are different, the system tells you of the difference and asks whether you want to continue (remember that continuing destroys all data in NVM) If you continue, the table is written, the module Status LED turns red and the module goes back into Configure mode as the download begins

If an error occurs during the download, an error message appears on the screen Following this, a *Retry?* query appears If you answer **Y**, TXTEWS attempts to once again download the block which generated the error If you do not want to retry, answer **N** Another query then appears asking whether an abort of the download is requested If you answer **Y**, TXTEWS aborts the download Answer **N** and TXTEWS ignores the block which produced the error and continues with the download

MONITOR/TUNE

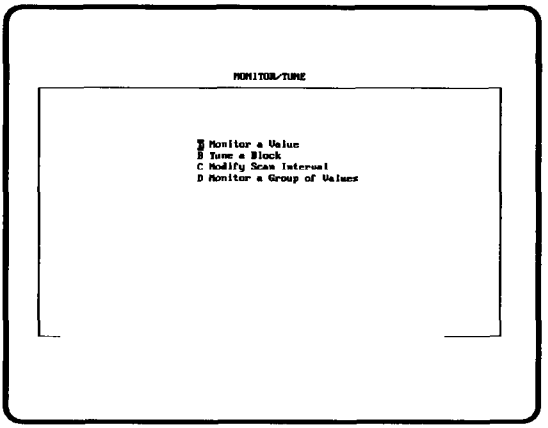


Figure 7 27 Monitor/Tune Menu

Monitoring a Value

This function permits the monitoring of a single block output When you enter the ring, PCU, module and block address and press F10, the current block output value appears If the output has any status condition other than OK the status condition code will appear below the value See Figure 7 28

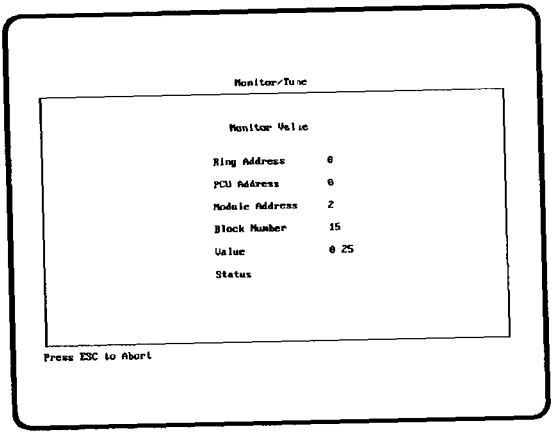


Figure 7 28 Monitoring a Block

The status displays one or more of the following codes

blank		OK
*		Bad Quality
H		High Alarm (may be preceded by alarm level, e g , **3H)**
L		Low Alarm (may be preceded by alarm level, e g , **2L)**
HD		High Deviation
LD	-	Low Deviation
S		Point out of Service
C		Calibration Error

Press Esc to abort monitoring

Tuning a Value

Tuning a value is similar to adding or monitoring a block The tune function allows modification of tunable block specifica tions while the module is in execute mode The system displays the block when you enter the ring, PCU, module and block address and press F10 See Figure 7 29

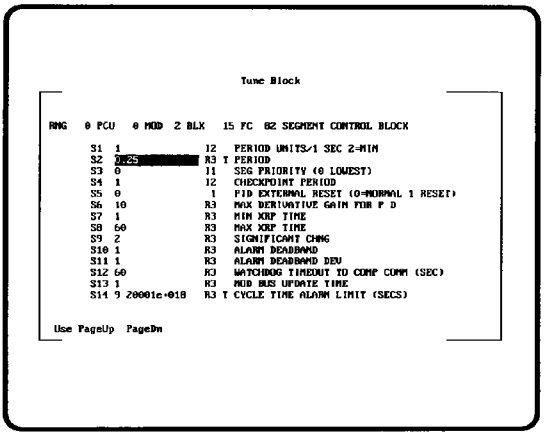


Figure 7 29 Tuning a Block

You can modify only those specifications marked with a T In Figure 7 29, only specifications 2 and 14 can be modified If you attempt to tune a block containing no tunable specifica tions, the system tells you that no tunable specifications are available It then allows you to inspect the block specifica tions with no modifications possible It is poss ble that a specifications page may not have any tunable specifications In this case, the non tunable specifications are displayed but you are not permitted to modify them You must page for ward or backward for the tunable specifications

After you are done with the modification, press F10 to write the change(s) to the module

Modifying the Scan Interval

The scan interval is the time period to update all points in a monitor group This includes scanning the points and displaying their values If the scan interval is set too low for the file the message *Scan Interval Too Short* appears in the lower right corner of the screen If no such message occurs, the current scan interval is sufficient for the group monitor on screen The default value is 3 seconds To change this, enter the necessary value in the field located on the scan interval screen and press **F10**. See Figure 7 30

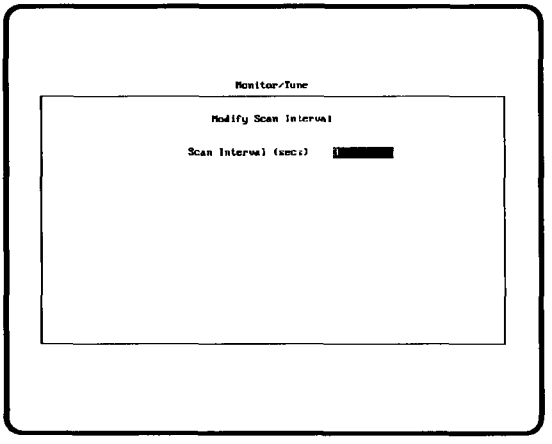


Figure 7 30 Scan Interval Screen

Monitoring a Group of Points

The last option in the MONITOR/TUNE menu is the MONI TOR GROUP function MONITOR GROUP allows you to monitor up to 32 block outputs To monitor a group of points you must first define the monitor group using the MONITOR GROUP DEFINITION function (called from the TXTEWS main menu) This function is held in a file The base name of the file is chosen by the user The extension MON is ap pended to that name See Figure 7 31

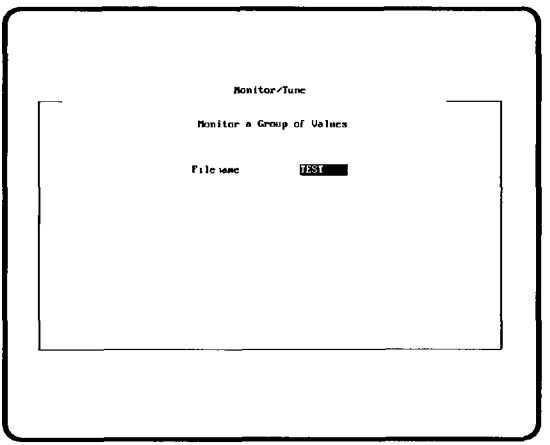


Figure 7 31 Monitor Group Input Screen

To monitor the group of points, enter the base name of the MON file in the file name field and press [F10]. The monitor group screen appears. This screen displays the block name, ring address, PCU address, module address and block address as defined in the monitor group definition function. Following this is the block output value and status aligned in two columns. The status uses the same codes that are recognized in the MONITOR BLOCK function. A maximum of sixteen of the 32 possible values are displayed on a page. There can be two pages of block outputs. If more than sixteen values have been defined, use the page up/page down keystrokes to move from page to page. The page number is displayed in the lower left corner of the screen. See Figure 7-32.

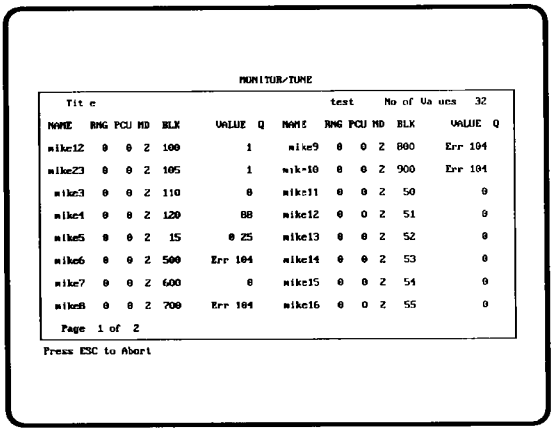


Figure 7-32 Monitor Group Display

If the scan interval time in effect is too short to display the page of defined blocks, the message *Scan Interval Too Short* appears in the lower right corner of the screen. To correct this, exit the MONITOR GROUP function and set the scan interval to a higher value through the Modify Scan Interval option of the MONITOR/TUNE menu.

Errors detected for blocks defined in the Monitor Group Definition appear in the value field of the display.

VERIFICATION

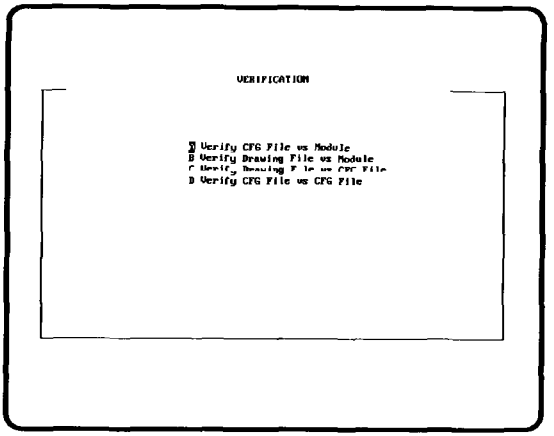


Figure 7-33 Verification Menu

Verifying Configuration File vs Module

It often becomes necessary to verify whether the configura tion in a module is the same as the configuration file on your EWS This is easily accomplished through option A of the VERIFY menu

First select option A of the VERIFY menu A screen request ing the configuration filename and the ring, PCU and module address appears See Figure 7 34

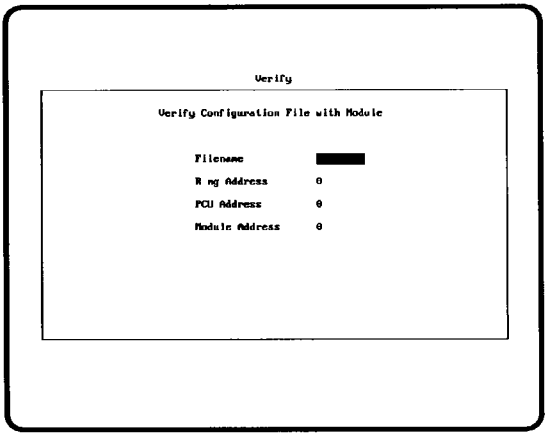


Figure 7 34 Verify CFG File vs Module

Similar to the actions taken by the uploading and downloading process, TXTEWS determines if it needs en hanced module identification If so, these steps are taken (refer to the **Enhanced Module Processing** Section)

The verification begins A log screen appears that displays any verification errors Do not be concerned if these errors scroll by quickly on the screen A log file using the configura tion file base name with the extension **.VFY** will be built containing all verification problems encountered At the end of verification, this file can be inspected or printed to gather all differences For example, if verifying configuration file 10101 CFG with a module, any verification errors found are put in file 10101 VFY

The verification process checks for specification differences, block differences, function code inconsistencies and configuration file problems Specification differences are defined as any INTEGER or BOOLEAN specifications not equal in value, or any REAL specifications not within 005 of one another Block differences are instances such as the same block number from each source being assigned a different function code Function code inconsistencies are situations where the data files used by EWS to define function codes differ in definition to the module Finally, this function checks all configuration files for valid data

An update line appears giving the current block under verification and the percentage complete Since the percentage complete is based on the contents of the configuration file, differences between the sources will affect this number Do not be alarmed if the verification ends prior to recognition of 100 percent complete This happens if the block totals between the module and CFG file are not identical See Figure 7 35

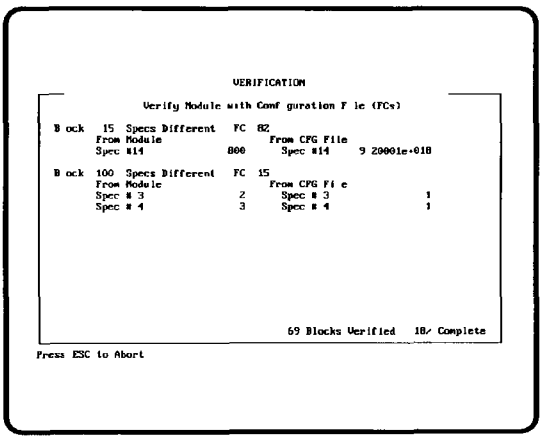


Figure 7 35 Verification in Progress

The process completes with a count of block totals for both the module and the configuration file No totals are given for verification of program space This information is also included in the verification file

If you need to abort from verification, press the Esc key and acknowledge the abort request

Verifying Drawing File vs Module

This option performs a verification between the contents of a module and a series of drawing files The drawing files should be the set used to build the configuration file that was downloaded to the module Any differences between these two sources may be the result of on line tuning or changes performed directly to the module Another use of this function is to record any changes made to the drawing files prior to a download This function allows for identification and file update

Select option B from the VERIFY menu to invoke this function Enter the module address and 5 character drawing file identifier into the appropriate fields Once complete, the system presents the update option If you want to update the drawing files with any differences detected in the module, answer **Y** to the to the following question

Update Specifications in Drawing Files?

If no update is necessary, answer **N** to the question Verification follows the same guidelines as outlined for option A It analyzes one drawing file at a time It uses the total number of blocks found in the drawing files as a base for the percent age complete variable Note that differences from a **100 percent complete** finale are due to differences in block counts.

The verify file uses the drawing file name as the base name with the **.VFY** extension

Verifying Drawing File vs Configuration File

This function allows for the verification of a set of drawing files with a configuration file If a module has just been up loaded, the advantages to using this operation are the same as those for option B of VERIFY This function provides a means to identify any module changes made on line from the original drawing files or as a means to record any changes made to the drawing files prior to a re configuration

Select option C from the VERIFY menu to invoke this function Enter the 5 character drawing file name and configuration file name into the appropriate fields

All functionality is identical to option B

Verifying Configuration File vs Configuration File

The final option of verification is verification between two configuration files This function verifies all function code information between the two CFG files Select option D from the VERIFY menu to invoke this function Enter the two configuration file names to verify Press F10 to begin verification

The verify file created uses configuration file name number 1 as the base name of the VFY file It also uses CFG file number 1 as the base for the block total for percentage complete calculations Note that differences from a **100 percent complete** finale are due to differences in block counts

The process completes with a count of block totals for both the configuration files The system includes this information in the verification file

If you need to abort from verification, press the Esc key and acknowledge the abort request

MONITOR GROUP DEFINITION

Option **F** of the TXTEWS Main Menu is the MONITOR GROUP DEFINITION function. This function builds and maintains group definition files (MONs) for the MONITOR GROUP selection within MONITOR/TUNE. See Figure 7-36.

This function builds and maintains group definition files (MONs) for the MONITOR GROUP selection within MONITOR/TUNE.

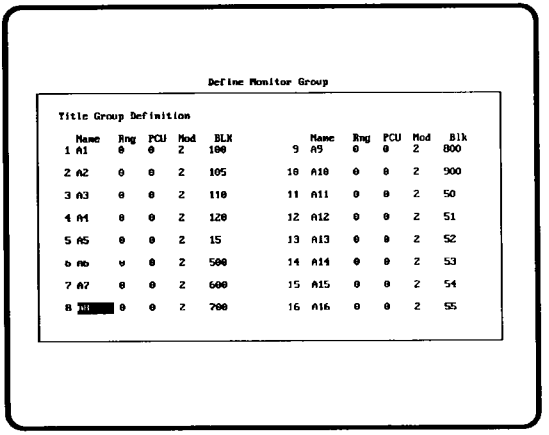


Figure 7-36 Monitor Group Definition Page

To define a Monitor Group Enter an appropriate MON file name and press F10 The group definition page appears Key in the monitor group title The title is shown on the MONI TOR GROUP display when you invoke Monitor a Group of Points using this file Next, key in up to 32 point definitions for this group The point definitions must be made sequentially starting from definition number one Since the Module Num ber must always be non zero, when this field is non zero, a point is considered to be defined The Name field is a 6 char acter alphanumeric field that identifies the block output It is optional Enter the ring, PCU, module and block address fields for each point to be defined

Press F10 when you are done defining the points to be mon itored The file is saved with only the number of points correctly defined You can now monitor this group of points using the Monitor a Group of Points function, called from the MONITOR/TUNE menu

Press Esc to exit from the monitor group definition without saving the file

Enhanced Module Processing Section

When operating TXTEWS, it is sometimes necessary to bet ter identify either a module or its characteristics At the present, there are three places in which this is necessary They are during uploading (option E of the LIST/SAVE/LOAD menu), downloading (option F of the LIST/SAVE/LOAD menu) and verification (option E of the main menu) The reason for further identification of a module is that there exists certain families of modules that are iden tified by the same module type but have differing capabilities When this particular module type is chosen, then further identification will be needed from the user At the present, this group includes only the MFC family As an example of such an instance, the menu in Figure 7 37 appears during downloading·

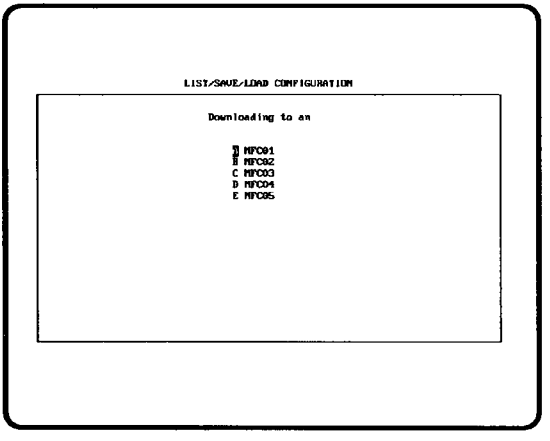


Figure 7 37 Download Module Identification

As the example shows, there are 5 modules in the MFC family Since each module has its own abilities, the correct module must be identified to proceed Coinciding with this identification is the actual list of module capabilities All MFC modules contain function codeinformation However, the MFC family, depending on the particular module, may contain programming blocks as well These blocks may be either BASIC, C, or BATCH blocks Table 7 1 identifies the mod ule and its capabilities

Table 7 1 MFC Capabilities

	Function Codes	BASIC	C	BATCH
MFC01	X			
MFC02	X	X		
MFC03	X	X	X	X
MFC04	X			X
MFC05	X			

As Table 7 1 shows, certain MFCs contain a number of pro gramming capabilities In the three TXTEWS functions mentioned earlier, it must be known on which type of blocks an operation is to be performed Therefore, you may encoun ter another menu asking for this identification These identification requirements are only necessary on the the modules in Table 7-1 See Figure 7 38

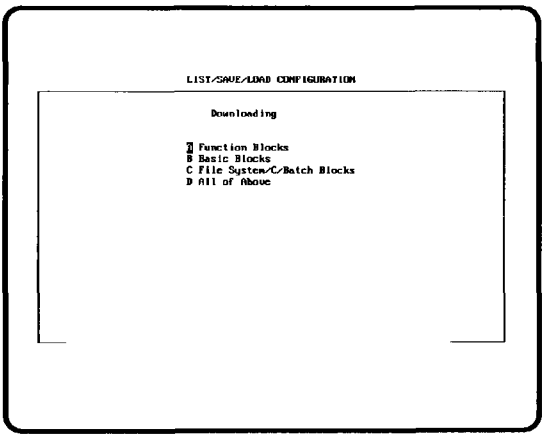


Figure 7 38 Download Options

STANDARD TEXT FILES

The following files come with the Network 90 Text Engi neering Workstation These files must be in the \EWS directory

TXTEWS.EXE: The Text Engineering Workstation program

TDF.DAT: Text Description File Function code specification descrip tions

STT.DAT: Specification Text Table Pointers to the Text Description File

MDT.DAT: Module Description Table Function code headers and de scriptions

MFC.SDT: Specification Description Table for the Multi Function Controller

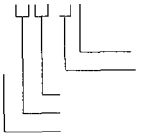
LAC.SDT: Specification Description Table for the Logic Master Mod ule, Analog Master Module, and Controller Modules

TEXT.BAT: Batch file used to invoke TXTEWS EXE Change this file as desired

MXX.PRF: Module Problem Report files TEXT uses these files to identify module error conditions XX is the module type number (i e , MFC M11 PRF)

The following files may be used or created by TEXT

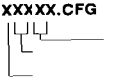
XXXXXYYZ.DBF
XXXXXYYZ SPC These are the drawing files created by CADEWS software They have the following format



Revision Number (A Z)
Sheet Number (00 99, A0 Z9)
Module Address (00 31)
Process Control Unit Address (01 99, A0 09)
Plant Communication Loop (0 9, A Z)

XXXXX.CFG: Configuration Files Compiling the CADEWS drawing files using the Network 90 compiler or by saving the configuration stored in a module using TEXT creates this file

XXXXX.CFG



Module Address (00 31
Process Control Unit Address (01 63, A0 Z9)
Plant Communication Loop (09. A Z)

XXXXX.VFY Text verification file Contains any verification errors de tected during this function

XXXXX NBS Program block configuration file This is a configuration file containing a BASIC program, C program or file system blocks

The following files must be present in the \EWS2 directory

I SCR100 This file identifies the input screens used by the TEXT software Do NOT edit or change this file under any cir cumstances

M SCR100 This file identifies the menu screens used by the TEXT software Do NOT edit or change this file under any cir cumstances

KEYS HLP This is the keystroke help menu It should not be altered under any circumstances

TXTXXX HLP These files are the help menus for the various TXTEWS functions They should not be altered under any circum stances

SECTION 8 — MODULE BINDING UTILITY

INTRODUCTION

The NET90BND (Binder) program is a utility that links mod ule bus and plant loop inputs found in CAD drawing files to outputs that lie across module boundaries Without Binder, you must enter module bus and plant loop input parameters manually Binder automates this process It matches module bus or plant loop input text descriptions with OREF text descriptions and places the appropriate input address in the CAD drawing files It also detects any unmatched inputs or any type mismatches between matched input/OREF pairs

Binder requires that all modules are compiled The compiler generates BND and REF files for each module These files contain the information needed by the Binder program If your CFG files were not generated by versions 1 2 or later of the compiler (contained in SCAD 4 1), they must be recom piled for the binding process to work properly Also, if you did not keep the BND and REF files after compilation, the mod ules must be recompiled before B nder can be used

The program produces a log file (N90BIND LOG) This file lists all errors found during the binding process It also cre ates a batch file (N90CMPL BAT) This file is used to recompile all changed modules Delete it once the binding process is complete When N90CMPL BAT is run, all changed modules will be compiled even if there were errors in the binding process

Change the DOS current directory to the main job directory to use Binder Binder works from this directory down into all of its subdirectories Type NET90BND to start the binder The program scans the directory tree and displays all modules found (MHD files) for selection Module selection for Binder is identical to that used in the compiler

SECTION 9
NETWORK 90 CROSS-REFERENCE UTILITY (N90XREF)

INTRODUCTION

The N90XREF utility resolves the references between drawing sheets of a module, PCU, and loop. The resolved references contain the module ID, sheet number, and row column of the reference This information becomes a permanent part of the drawing file

N90XREF automatically completes cross reference data for these symbols.

IREF	input reference
IREFO	used for outputs which exit the left side of the page
OREF	output reference
AI/B	FC 25
AI/L	FC 26
DI/B	FC 41
DI/L	FC 42
DIL	FC 46
AIL/B	FC 63
DIL/B	FC 64

The 30-character text strings associated with input and out put symbols are used in cross referencing the NETWORK 90 drawings Output symbols (IREFO, OREF) are cross refer enced to input symbols with the AASS YY XX format, where.

AA - Two unique characters identifying each module
SS - Sheet number of module.
YY - Y Coordinates
XX - X Coordinates

The drawing borders have even numbers (x,y coordinates) printed in the margins These numbers are used as a guide to find input/output symbols

Use the following basic rules to be for cross referencing

1. Fill in the module ID field before you use the Module Header Definition program This field requires two unique user defined alpha characters for each module in the system

2 Use a 30 character size to print two alpha characters on each drawing sheet associated with a module, above the drawing number

3 Print sheet numbers above the drawing number Ensure that they are the same as the last two numbers of the drawing file The N90XREF program uses the drawing file to fill in the module sheet number in the input/output symbol

4 The 30 character text string associated with input and output symbols must be unique for the cross reference program to work The program allows an output symbol to reference input symbols within a module, and input symbols between modules using the same 30 character string See Figure 9 1

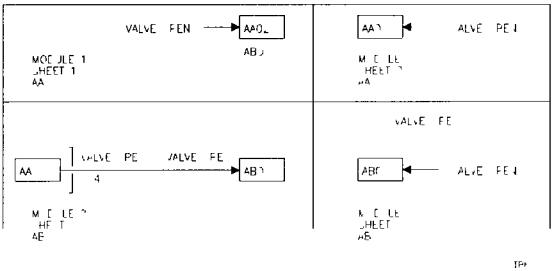


Figure 9 1 Symbol Cross Reference

How To Use The Cross Reference Utility

First, go to the proper directory For example,

CD \[deep structure directory] or
CD \[semi deep structure directory] or
CD \[flat structure directory]

Type **CD** **JOB02** **Enter**

Now type **CAD** **Enter** At the main menu type **E** A series of screens then prompts for the necessary information throughout the program

N90XREF gives the option of generating a text cross reference list of each input and output signal on a drawing sheet, the origin location of the signal and any destination locations for the signal

Error Messages

If N90XREF detects an error when opening or creating a file, a message identifies the file causing the error N90XREF attempts to continue executing. If the directory does not con tain the necessary files, N90XREF prompts to change to the correct directory.

Common error messages include:

Duplicate output description in file skipping
Blank description in file.
Major error no room in drawing

If the last error message above appears, *Major error no room in drawing,* the drawing must be made smaller before continuing

APPENDIX A — CAD COMMAND SUMMARY

NAME	COMMAND	MODES
ADD CONNECTION	AC or F7	DB
ARC	A	DB
AUTO PAN	AP	DB MT
ASSIGN NAME	AN or AN name	DB
CHANGE ATTRIBUTE	CA or F8	D
CHANGE LAYER	CL	D
CIRCLE	C	DB
CONTINUE	C	MT
COPY	CO	ID
CURSOR NCREMENT	CI X Y	DB ID
DELETE ENTITY	DE or F8	D
DISTANCE BETWEEN CURSOR POINTS	DI	DB ID
EXIT	EX	DB LM
EXPLODE	XP	ID
FIND ENTITY	FE	DB
FORM MACRO	FM	DB
FORM SHAPE	FS	DB
FUNCTION NAME	FN F3 or FN shape name	DB
GRID	GR GR ON GR OFF GR X Y	DB D
GR DLOCK	GL	DB ID
HARD COPY	HC or Ctr P	DB MT

NAME	COMMAND	MODES
H ORTHO solid l ne	H	DB
H ORTHO dashed line	H1	DB
H ORTHO dotted line	H2	DB
H ORTHO dot dashed Line	H3	DB
DENT FY	ID or F4	DB
DENTIFY POINT	IP	DB ID
IDENTIFY WINDOW	W	DB
LAYER	LA	DB
LIBRARY MANAGER	LM	DB
L NE	L	DB
LIST LIBRARY	L	LM
LIST SPECS	LS	DB
MODIFY BLOCK	MB	DB
MONITOR/TUNE	MT	DB
MOUSE	MS	DB
MOVE	MO or F5	D
NEXT ENTITY	NX	D
PAN	PA or F9 PA X Y	DB MT
PLOT	PL PL f	DB
QU CK CURSOR	QC	DB
QUIT	Q	DB
RECTANGLE	R	DB
REDRAW	RE	DB

NAME	COMMAND	MODES
REFRESH	RF	DB MT
RESET DATABASE	RS	DB
ROTATE	RO RO n, n	ID
SAVE	SA	DB
SCALE ENT TIES	SC	D
SET VIEW	SV	DB MT
SHAPE DELETE	SD	LM
SHAPE REFERENCE	SR SR ON SR OFF	DB
STATUS	ST	DB
STRA GHT L NE	S	DB
SYSTEM MACRO	SM	DB
SYSTEM SHAPE	SS	DB
TEXT	T	DB
TEXT D SPLAY	TE TE ON TE OFF	DB
TUNE	TU	MT
UNDELETE	UN	LM
USER LIBRARY	UL	DB
USER MACRO	UM	DB
USER SHAPE	US	DB
V ORTHO sol d ne	V	DB
V ORTHO dashed ne	V1	DB
V ORTHO dotted ine	V2	DB

NAME	COMMAND	MODES
V ORTHO dot dashed line	V3	DB
V S BLE LAYER	VL or VL n	DB
ZOOM	ZO	DB MT

Note.
1. For an exp anat on of th s command efer to Monitor/Tune n Sect on 3

APPENDIX B — GLOSSARY

TERM	DEFINITION
Attribute	Defin tions of propert es associated w th an object Ex amp es of attributes are the b ock number and text assoc ated w th an nput or output
Connect on	A po nt at wh ch two or more objects are og ca y jo ned The k nds of objects that can be connected are nes and shapes L nes are connected on y f they have co ncident vertices A ne is connected to a shape f it has a vertex at the same po nt as one of the I/O p ns of the shape
Dest nat on Point	A reference po nt n the draw ng to wh ch an dent f ed object s copied or moved
Draw ng	A co ect on of ent t es form ng a log ca des gn such as a NETWORK 90 conf gurat on draw ng
Endpoint	The f na vertex of a ne
Entity	A ne or shape
Gr d	A matrix of reference points mark ng mu t p es of the database units and used to p ace and ocate ent t es n a draw ng The grid may or may not be d sp ayed on the screen
Gr d Lock	A mode of operat on n which the cursor s constra ned to move on gr d points (whether the gr d po nts are current y d sp ayed or r ot)
He p W ndow	An on screen d sp ay of nformat on about a g ven command
H gh ght	D sp ays draw ng or text n wh te
Hor zontal-Orthogona	L nes drawn n wh chpo nts entered are connected by nes at r ght ang es the f rst ne be ng para e to the horizonta ax s
dentify	To mark an object or cbjects so they can be man pu ated with one of th dent fy mode commands dentif ed objects are h gh ghted after be ng se ected
dentify Mode	The mode n wh ch an ax st ng ent ty or ent t es can be mod f ed cop ed de eted etc dent fy mode s en tered v a the D/ W Command
Justif cat on Po nt	The po nt at wh ch the beg nn ng of a text str ng s ocated The ower eftmost part of the text s p aced at the just f cat on po nt
L brary Manager	The CAD mode n wh ch the contents of system/user brar es can be sted and user brar es can mark shapes for de et on/recovery

TERM	DEFINITION
L brary Manager	The CAD mode n wh ch the contents of system/user l braries can be l sted and user l brar es can mark shapes for de et on/recovery
L ne	An object wh ch has a def n ng path Lines are used n CAD both as graph c e ements and as e ectr ca connec t ons
L ne Segment	The port on of a ne between two adjacent vert ces
Macro	A comb nat on of shapes and/or pr mary ent t es stored n either the user or system brary
Magn f cat on Factor	The current scale of the v ew w ndow re at ve to 1 X nteger va ues on y
Or g n	The po nt correspo nd ng to coord nates (0 0) n the draw ng
Or g n Po nt	The po nt on a macro or shape when ca ed from the brary wh ch s mapped to the cursor pos t on on the CRT
Pan	To move the v ew ng w ndow temporar y n the draw ng REDRAW restores the prev ous w ndow
Redraw	To d sp ay the currer t page of the draw ng at a magn f cat on of 1
Refresh	Redraws the page at current magn f cat on
Set V ew	To def ne a port on of the draw ng n wh ch to zoom
Shape	A co ect on of objects that s stored n a brary Mu t p e nstances of a shape can be p aced n a draw ng A shape nstance s a s ng e object regard ess of the number of pr mary entit es that make up the shape n the brary
Shape Reference	A po nt on the shape wh ch determ nes how an nstance of that shape s p aced n a draw ng
Stra ght	A ne wh ch may be entered w th ang es wh ch are nte ger mu t p es of 45
Surface	See ne segment
Text	Character data p aced n a draw ng
Vector	A ne wh ch may be entered at arb trary ang es
Vertex	The po nt of ntersect on of two ne segments
Vert ca Orthogona	A ne n wh ch po nts entered are connected by nes at r ght ang es the f rst ne be ng para e to the vert ca ax s
W ndow	The port on of a draw ng wh ch s d sp ayed on the screen W ndow s a so used to descr be the h gh ghted rectang e that s d sp ayed n SETV EW and D W NDOW
Work ng F e	The database f e current y be ng ed ted
Zoom	To change the v ew ng sca e of the draw ng re at ve to the current sca e

APPENDIX C — TERMINATION UNIT DRAWINGS

The folowing master termination unit drawings are available in CAD

File No.	Description
0000401	NAOM01 and NTAO01
0000402	NAOM01 and NTAO01 (2 per draw ng)
0000403	NASM01 and NTA 01
0000404	NASM02 and NTA 02
0000406	NASM01 and N AI01
0000407	NASM02 and NTTA01
0000405	NASM03 and NTA 03
0000101	NCIS01 and NTCS02
0000114	NC S01 w th N CS01 and N DS01
0000201	NCOM0 and TCS
0000202	NCOM0 w th N CSC1 and N DS01
0000110	D g tal Log c Stat on master for MFC
0000116	NDSI01 with MFC or NLMM02 and N D 01
0000307	NDS 01 w th MFC or NLMM02 and NTD 01
0000115	NDS 01 w th MFC or NLMM02 and NTD 01
0000301	NDSM03 w th LMM and NTD 01
0000108	NDSM03 w th LMM or MFC and no term nat on un t
0000102	NDSM03 w th MFC or NLMM02 and NTD 01
0000112	NDSM03 w th MFC or NLMM02 and N D 01
0000305	NDSM03 w th MFC and no term nat on un t
0000105	NDSM04 and NTD 01
0000111	NDSM04 and N D 01
0000302	NDSM05 w th LMM and NTD 01
0000306	NDSM05 w th LMM and no term nat on un t
0000113	NDSM05 w th MFC and N D 01
0000103	NDSM05 w th MFC or NLMM02 and NTD 01 for 16 outputs
0000109	NDSM05 w th MFC or NLMM02 for 16 outputs and no term nat on un t
0000104	NDSM05 w th MFC or NLMM02 and NTD 01 for 8 nputs and 8 outputs
0000310	NDSO0 w th NLMM02 and N D 01
0000309	NDSO0 w th NLMM02 and N D 01 (nc udes funct on code 83)
000011	7NDSO0 w th MFC or NLMM02 and N D 01
0000303	NTD001 w th LMM (f rst)
0000304	NTD001 (Second)
0000106	NTD001 w th MFC or NLMM02

NOTE Refer to the README DBF f e for the atest rev s on eve s and ava ab e draw ngs

Use the following procedure when working with the master termination unit drawings

1 Change to the job directory where the work is to be done

2 Type **CAD** Enter.

3 When the prompt *Database File* appears, type the file number of the master drawing to be accessed

4 After the drawing is displayed on the screen, use the ASSIGN NAME (AN) command to rename the drawing for the job

5 Modify the drawing to meet the job requirements

6 Use the SAVE (SA) command The drawing is then saved in the job directory under the name entered in Step 4

APPENDIX D — FIRMWARE REVISION LEVELS

This appendix is a listing of current revision levels for the Network 90 Engineering Workstation The easiest way to use this listing is to first look at the assembly number on the PC Board in the module Find the number on the chart on the next two pages, and then find the appropriate revision level

Revision Level Output

Module	Block Number	Nomen. Hardware 1000s	Nomen. Hardware 100s	Firmware 10s	Firmware 1s	PCB Assembly Number	Firmware Revision Level(s)
NAMM01	N/A	1	0	0	0	D3078063	A B
NAMM02	N/A	2	0	0	0	D5634882	A D 1
	97	2	0	0	1	D5634882	E 0
	97	2	0	0	2	D5634882	E 1
	97	2	0	0	3	D5634882	E 2
	97	2	0	0	4	D5634882	E 3
	97	2	0	0	5	D5634882	E 4
	97	2	0	0	6	D5634882	E 5
NAMM02A	97	2	1	0	0	D6635334	A 0
NAMM03	97	3	0	0	0	D6637204	A 0
	97	3	0	0	1	D6637204	A 1
NAOM01	N/A	1	0	0	0	D6631966	A B
NCLC01	252	3	1	0	2	D6636740	B 1
NCLC02	252	4	1	0	0	D6636740	B 1
NCOM02	N/A	2	0	0	0	D6631942	A E
NCOM02A	N/A	2	1	0	0	D6634882	F K 3
NCOM02B	N/A	2	2	0	0	D6635405	A 0 A_1
NCOM03	N/A	3	0	0	0	D6634882	A J 3
NCOM03A	N/A	3	1	0	0	D6635405	A 0 A 2
NCOM04	N/A	4	0	0	0	D6634882	A - D
NCOM04A	N/A	4	1	0	0	D6635405	A 0
NCSC01	13	1	0	0	0	D6637427	A 0

Revision Level Output

Module	Block Number	Nomen. Hardware 1000s	Nomen. Hardware 100s	Firmware 10s	Firmware 1s	PCB Assemly Number	Firmware Revision Level(s)
NLMM01	N/A	1	0	0	0	D6631948	A F
	2	1	0	0	1	D6631948	F 1
NLMM01A	2	1	1	0	0	D6635814	A 0
	2	1	1	0	1	D6635814	A 1
NLMM02	13	2	0	0	0	D6635814	A 0
	13	2	0	0	1	D6635814	B 0
	13	2	0	0	2	D6635814	B 1
	13	2	0	0	3	D6635814	C 0
	13	2	0	0	4	D6635814	C_1
	13	2	0	0	5	D6635814	C 2
	13	2	0	0	6	D6635814	C 3
	13	2	0	0	7	D6635814	D 0
	13	2	0	0	8	D6635814	D 1
NMFC01	N/A	1	0	0	0	D6635334	A 0 C 0
	13	1	0	0	1	D6635334	D 0
	13	1	0	0	2	D6635334	E 0
	13	1	0	0	3	D6635334	E 1
	13	1	0	0	4	D6635334	F 0
	13	1	0	0	5	D6635334	G 0
	13	1	0	0	6	D6635334	J 0
	13	1	0	0	7	D6635334	J 1
	13	1	0	0	8	D6635334	K 0
	13	1	0	0	9	D6635334	K 1
	13	1	0	1	0	D6635334	K 2
	13	1	0	1	1	D6635334	K 3
	13	1	0	1	2	D6635334	K 4
	13	1	0	1	3	D6635334	L 0
	13	1	0	1	4	D6635334	L 1
	13	1	0	1	5	D6635334	M_0
	13	1	0	1	6	D6635334	M 1
NMFC02	N/A	2	0	0	0	D6635334	A 0 A 2
	13	2	0	0	1	D6635334	B 0
	13	2	0	0	2	D6635334	C 0
	13	2	0	0	3	D6635334	C 1
	13	2	0	0	4	D6635334	D 0
	13	2	0	0	5	D6635334	E 0
	13	2	0	0	6	D6635334	F 0
	13	2	0	0	7	D6635334	F 1
	13	2	0	0	8	D6635334	G 0
	13	2	0	0	9	D6635334	G 1
	13	2	0	1	0	D6635334	G 2

Revision Level Output

Module	Block Number	Nomen. Hardware 1000s	Nomen. Hardware 100s	Firmware 10s	Firmware 1s	PCB Assembly Number	Firmware Revision Level(s)
NMFC02	13	2	0	1	1	D6635334	G 1
	13	2	0	1	2	D6635334	G 2
	13	2	0	1	1	D6635334	G 3
	13	2	0	1	2	D6635334	G 4
	13	2	0	1	3	D6635334	J 0
	13	2	0	1	4	D6635334	J 1
	13	2	0	1	5	D6635334	K 0
	13	2	0	1	6	D6635334	K 1
NMFC03	13	3	0	0	1	D6636896	B 0
	13	3	0	0	2	D6636896	B 1
	13	3	0	0	3	D6636896	C 0
	13	3	0	0	4	D6636896	C 1
	13	3	0	0	5	D6636896	C 2
	13	3	0	0	6	D6636896	C 3
	13	3	0	0	7	D6636896	D 0
	13	3	0	0	8	D6636896	E 0
NMFC04	13	4	0	0	0	D6637133	A 0
NMPC01	13	1	0	0	4	D6635334	F 0
	13	1	0	0	5	D6635334	G 0
	13	1	0	0	6	D6635334	J 0
	13	1	0	0	7	D6635334	J 1
	13	1	0	0	8	D6635334	K 0
	13	1	0	0	9	D6635334	K 1
	13	1	0	1	0	D6635334	K 2
	13	1	0	1	1	D6635334	K 3
	13	1	0	1	2	D6635334	K 4
	13	1	0	1	3	D6635334	L 0
	13	1	0	1	4	D6635334	L 1
	13	1	0	1	5	D6635334	M 0
	13	1	0	1	6	D6635334	M 1
NQRC01	N/A	3	0	0	0	D6634882	J 3
NQRC01A	N/A	3	1	0	0	D6635405	A 0 A 2
	N/A	3	1	0	1	D6635405	B 0
	N/A	3	1	0	2	D6635405	B 1

APPENDIX E — TEXT ERROR MESSAGES

Most Text Engineering Workstation messages are self ex planatory Error messages define problem situations and sta tus messages describe actions.

Text Engineering Workstation error messages can be grouped into six classifications: CIU Reply Code and Module Bus Er rors, CIU Driver Error Messages, Screen Error Messages, Module Status Error Messages, List/Save/Load Error Mes sages, and Module Configuration Error Messages

Some common error messages, causes, and remedies are listed in the following chart

Error Message	Probable Cause	Possible Remedy
Wa t ng for P ant Loop	These errors usua y nd cate a conf ct with data traffic	Retry command
T me out of Plant Loop Response		
Modu e Bus Busy		
Modu e Conf ct	Wrong modu e mode for the command	Change Mode
Modu e Not Re sponding	Modu e not connected	Check PCU number P ug n modu e
Invalid Block Number	Block number out of range for that mo du e	Use val d block number
Undef ned B ock Number	Tr ed to access a non conf gured b ock	Conf gure b ock
nval d Funct on Code	Funct on code not def ned for that modu e	Use va d funct on code number

The following errors can result from improper setup, bad cable connections, or hardware failure

Error Message	Possible Remedy
Need a Restart Command	Check C U or SPM switch settings Baud Rate Stop B t
Repeat C U Restart Command	
nput Time Out	
Dev ce Error	
Received Data Error	
Data Bits	
Checksum Error	
Parity	
Output T me Out	Check cab es and cable connections Check cab e to the Async Port 1
Unable to n tia ze Commun cation Port	
PTM not Responding	

NOTE After the errors *Need a Restart Command through PTM Not Responding*, perform a manua hardware reset of the C U or SPM Refer to Product nstruct ons E93 905 or E93 905 1 for deta s

APPENDIX F — TEXT STATUS MESSAGES

Engineering Workstation status messages report problems and confirm the completion of tasks The following is a list of Text Engineering Workstation messages

Block added
Block deleted
Block modified
Block tuned
Configuration verified
Failed verification
Loading Function Description
Loading Text Description
Module type does not exist in MDT file
More specs
Restart CIU, Stand by .
Start loading configuration

APPENDIX G — FUNCTION BLOCK SHAPE LIBRARY

Function Code			Applicab e Module								
Number	Name	Mnemonic	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
1	Funct on Generator	FX		X	X	X		X	X	X	
2	Manua Set Constant	A		X	X	X	X	X	X	X	X
3	Lead/Lag	FT			X	X	X	X	X	X	
4	Pu se Pos t one	PULPOS			X	X	X	X	X	X	
5	Pu se Rate	PULSE			X	X	X	X	X	X	
6	H gh/Low L m ter	L MIT			X	X	X		X	X	
7	Square Root	SQRT		X	X	X	X	X	X	X	
8	Rate L m ter	VELL M			X	X	X		X	X	
9	Ana og Transfer	T AN			X	X	X	X	X	X	X
10	H gh Se ect	H SEL		X	X	X	X	X	X	X	
11	Low Se ect	LOSEL		X	X	X	X	X	X	X	
12	H gh/Low Compare	H/L		X	X	X	X	X	X	X	X
13	nteger Transfer	T NT			X	X	X	X	X	X	
14	Four nput Summer	SUM4		X	X	X	X	X	X	X	
15	Two nput Summer	SUM		X	X	X	X	X	X	X	X
16	Mu t p y	MULT		X	X	X	X	X	X	X	X
17	D v de	D V		X	X	X	X	X	X	X	X
18	P D Error nput	P D		X	X	X	X		X	X	
19	P D (PV and SP	DELP D			X	X	X		X	X	
20	nd cator Stat on	ND			X	X	X		X	X	X
21	M/A Stat on (Bas c)	M/A BAS			X	X	X				
22	M/A Stat on (Cascade)	M/A CAS			X	X	X				
23	M/A Stat o~ (Rat o)	M/A RAT			X	X	X				
24	Adapt	ADAPT		X	X	X	X	X	X	X	X
25	Ana og nput/Bus (Same PCU)	A /B		X	X	X	X	X	X	X	X
26	Ana og nput/Loop (D fferent PCU)	A /L		X	X	X	X	X	X	X	X
27	Ana og nput	A		X	X	X					
28	Ana og Output/3us (Same PCU)	AO/B			X	X	X		X	X	X
29	Ana og Output	AO			X	X	X				
30	Ana og Except on Report	AO/L		X	X	X	X	X	X	X	X
31	Test Qua ty	TSTQ	X	X	X	X	X	X	X	X	X
32	T p	TRP	X	X	X	X	X	X	X	X	X
33	NOT	NOT	X	X	X	X	X	X	X	X	X
34	Memory	SR	X	X	X	X	X	X	X	X	X
35	T mer	TD-D G	X	X	X	X	X	X	X	X	X

Function Code			Applicable Module								
Number	Name	Mnemon c	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
36	Qua f ed OR (8 nput)	QOR	X	X	X	X	X	X	X	X	X
37	AND (2 nput)	AND2	X	X	X	X	X	X	X	X	X
38	AND (4 nput)	AND4	X	X	X	X	X	X	X	X	X
39	OR (2 nput)	OR2	X	X	X	X	X	X	X	X	X
40	OR (4 nput)	OR4	X	X	X	X	X	X	X	X	X
41	D g ta nput/Modu e Bus	D /B	X	X	X	X	X	X	X	X	X
42	D g ta nput/Loop	D /L	X	X	X	X	X	X	X	X	X
43	TCS D g ta nput	D	X	X	X	X	X	X	X	X	X
44	TCS D g ta Output	DO			X	X	X				
45	D g ta Except on Report	DO/L	X	X	X	X	X	X	X	X	X
46	D g ta nput L st	D L	X	X							
47	Ana og nput Except on Report	A /ASM	X								
48	RESERVED										
49	D g ta Output Buffer	DOBUFF	X	X							
50	Manua Set Sw tch	ON/OFF	X	X	X	X	X	X	X	X	X
51	Manua Set Constant (Nontunab e)	A REAL		X	X	X	X	X	X	X	X
52	Manua Set nteger	A NT			X	X	X	X	X	X	X
53	Execut ve B ock (COM)	EX/COM			X	X	X				
54	Execut ve B ock (LMM01)	EX/LMM	X								
55	RESERVED										
56	Execut ve B ock (AMM01)	EX/AMM1									
57	RESERVED										
58	T me De ay (Ana og)	DELAY			X	X	X		X	X	
59	D g ta Transfer	T D G	X	X	X	X	X	X	X	X	X
60	Group /O Def n t on	G O/LMM	X								
61	B nk	BL NK	X	X				X	X	X	X
62	Remote Contro Memory	HCM	X	X	X	X	X	X	X	X	X
63	Ana og nput L st (Modu e Bus)	A L/B			X	X	X	X	X	X	X
64	D g ta nput L st (Modu e Bus)	D L/B	X	X	X	X	X	X	X	X	X
65	D g ta Sum W th Ga n (4 nput)	DSUM		X	X	X	X	X	X	X	X
66	Ana og Trend	TREND			X	X	X		X	X	
67	RESERVED										
68	Remote Manua Set Constant	REMSET		X	X	X	X	X	X	X	
69	Test A arm	TSTALM			X	X		X	X	X	X

Function Code			Applicable Module								
Number	Name	Mnemonic	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
70	Ana og Po nt Def n t on	ASO/L	NOTE Funct on Codes 70 through 78 are ava ab e for the Ana og Master Modu es (NAMM02 NAMM03) on y								
71	Ana og Execut ve B ock	EX/AMM									
72	Ana og S ave Def n t on	EXS/AMM									
73	Ca brat on	CAL/AMM									
74	Ca brat on Command	CMD/AMM									
75	Four Ana og Ca brat on Status	CALST/A									
76	Thermocoup e Temperature	TUTEMP									
77	Ana og Po nt Serv ce Status	PTSST									
78	Trend Def n t on	ATREND									
79	Contro nterface S ave	C S /O							X	X	X
80	Contro Stat on (MFC)	M/A M							X	X	X
81	Execut ve (MFC and MPC)	EX/MFC						X	X	X	
82	Segment Contro (MFC and MPC)	SEGCRM						X	X	X	X
83	D g ta Output Group	DOGRP		X				X	X	X	X
84	D g ta nput Group	D GRP		X				X	X	X	X
85	Up/Down Cou nter	UP/DN		X	X	X	X	X	X	X	X
86	E apsed T mer	ET MER			X	X	X	X	X	X	X
87	DLS nterface	DLS		X				X	X		
88	D g ta Log c Stat on	DLS		X				X	X		
89	RESERVED										
90	Extended Execut ve	EEX/MFC						X	X	X	X
91	BAS C Conf gurat on	BASCFG							X[1]		
92	nvoke BAS C	NVBAS							X[1]		
93	BAS C Rea Output	BASRO							X[1]		
94	BAS C Boo ean Output	BASBO							X		
95	Modu e Status Mon tor	MODSTAT				X	X	X	X[1]	X	X
96	Redundant Ana og nput	REDA							X	X	
97	Red ndant D g ta nput	REDD						X	X	X	X
98	S ave Se ect	SLSEL						X	X	X	X
99	Sequence of Events Log	SOELOG							X[1]		
100	D g ta Output Readback Check	DOREAD						X	X	X	X
101	Exc us ve OR	XOR		X		X	X	X	X	X	X
102	Pu se nput/Per od	P PER						X	X	X	X
103	Pu se nput/Frequency	P FREQ						X	X	X	
104	Pu se nput/Tota zat on	P TOT						X	X	X	
105	Execut ve B ock (LMM02)	EX/LMM2		X							
106	Segment Contro B ock	SEGCRL		X							
107	Group /O Def n t on	G O/LMM2		X							
108	Extended Execut ve	EEX/LMM2		X							
109	Pu se nput Du rat on	P DUR						X	X		
110	F ve nput Rung	RNG5		X				X	X	X	X

[1]MFC02/03 on y

Function Code			Applicable Module								
Number	Name	Mnemonic	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
111	Ten nput Rung	RNG10		X				X	X	X	X
112	Twenty nput Rung	RNG20		X				X	X	X	X
113	ASC I Str ng Descr ptor	ASCI SD								X	
114	BCD nput	BCD N		X				X	X	X	X
115	BCD Output	BCDOUT		X				X	X	X	X
116	Jump/Master Contro Re ay	JUMP		X				X	X	X	X
117	Boo ean Rec pe Tab e	REC PB		X				X	X	X	X
118	Rea Rec pe Tab e	REC PR		X				X	X	X	X
119	Boo ean S gna Mu t p exer	BMUX		X				X	X	X	X
120	Rea S gna Mu t p exer	RMUX		X				X	X	X	X
121	Ana og nput/Super oop	A /S							X[2]		
122	D g ta nput/Super oop	D /S							X[2]		
123	Dev ce Dr ver	DDR VE						X	X	X	X
124	Sequence Mon tor	SEQMON						X	X	X	X
125	Dev ce Mon tor	DEVMON						X	X	X	X
126	Rea S gna Demu t p exer	REDEMUX						X	X	X	X
127	P ant Loop Gateway Node Map	GCMMAP									
128	S ave Defau t Def n t on	D GDEF		X				X	X	X	
129	Mu t State Dev ce Dr ver	MSDVDR		X				X	X	X	X
130	P ant Loop Gateway Execut ve	EX/GCM									
131	P ant Loop Gateway Po nt Def n t on	GPDEF					X	X	X		
132	Ana og nput/S ave	A S									
133	W se Transm tter Def n t on	W SE						X	X[2]	X	X
134	Mu t Sequence Mon tor	MULT MON						X	X	X	X
135	Sequence Manager	SEQMGF									
136	Remote Motor Contro	RMC						X	X	X	X
137	BAS C Rea Output W th Qua ty	BASROQ							X		
138	BAS C Boo ean Output W th Qua ty	BASBOQ							X		
139	Pass ve Stat on nterface	PS							X	X	
140	Restore	RESTR							X[3]	X	
141	Sequence Master	SEQMST							X[2]	X	X
142	Sequence S ave	SEQSLV							X[2]	X	X
143	nvoke C	NVKC							X[4]		
144	C A ocat on	CALLOC							X[4]		
145	Frequency Counter/S ave	FCS							X[4]		

[1]MFC02/03 on y
[2]MFC03/04/05 on y
[3]MFC03/04 on y
[4]MFC03 on y

Function Code			Applicable Module								
Number	Name	Mnemonic	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
146	Remote /O nterface	R /O							X[2]		
147	Remote /O Def n t on	R /OD							X[2]		
148	Batch Sequence	BSEQ							X[3]		
149	Ana og Output/S ave	ASO							X[2]		
150	Hydrau c Servo S ave	HSS							X[2]		
151	Text Se ector	TEXT							X[2]		
152	Mode Parameter Est mator	PAREST				X	X		X[2]		
153	SC Parameter Converter	SCCON				X	X		X[2]		
154	Adapt ve Parameter Schedu er	PARSCH				X	X		X[2]		
155	Regress on	REGRES							X	X	
156	Advanced P D Contro er	AP D				X	X		X[2]	X	
157	Genera D g ta Contro er	DTF							X		
158	Enhanced Ana og Po nt Def n t on	EASO/L									
159	Po ynom a Adjustment	A3POLY									
160	Sm th Pred ctor	SM TH				X	X		X	X	
161	Sequence Generator	SEQGEN		X		X	X	X	X	X	X
162	D g ta Segment Buffer	DSNAP		X		X	X	X	X	X	X
163	Ana og Segment Buffer	ASNAP		X		X	X	X	X	X	
164	Segment Contro	SEGCRC				X	X				
165	Mov ng Average	MOVAVG				X	X		X	X	
166	ntegrator	NTEGR				X	X		X	X	X
167	Po ynom a	POLY				X	X		X	X	
168	nterpo ator	NPOL				X	X		X	X	
169	Matr x Add t on	[ADD]				X	X	X	X	X	X
170	Matr x Mult p cat on	[X]				X	X	X	X	X	X
171	Tr gonometr c	TR G				X	X	X	X	X	
172	Exponent a	EXP				X	X	X	X	X	
173	Power	POWER				X	X		X	X	
174	Logar thm	LOG				X	X		X	X	
175	Sequence Execut ve (CSC)	EX/CSC									X
176	Sequence Stat on (CSC)	M/A CSC								X	X
177	Data Acqu s t on Ana og	DAA							X[2]		
178	Data Acqu s t on Ana og nput/Loop	DAA/ L							X[2]		
179	RESERVED										
180	Batch nput/Output	CBC /O								X	
181	Batch Stat on (CBC)	M/ACBC								X	
182	Ana og nput Def n t on	A DEFCBC								X	
183	Batch Exec t ve (CBC)	EXECCBC								X	
184	through 189 RE SERVED										

[1]MFC02/03 on y
[2]MFC03/04/05 on y
[3]MFC03/04 on y
[4]MFC03 on y

Function Code			Applicable Module								
Number	Name	Mnemonic	LMM01	LMM02	COM02	CLC01/02 COM03/04 QRC01	CLC03/04	MPC01	MFC01/02 /03/04/05	CBC01	CSC01
190	User Def ned Funct on Dec arat on	UDFDEC							X[3]		
191	User Def ned Funct on One	UDF1							X[3]		
192	User Def ned Funct on Two	UDF2							X[3]		
193	through 197 RESERVED										
198	Aux ary Rea User Def ned Funct on	ARUDF							X[3]		
199	Aux ary D g ta User Def ned Funct on	ADUDF							X[3]		
200	Loca nf Net/P ant Loop Gateway Execut ve	NFGATEX							X[3]		
201	nf Net Data Po nt Def n t on	DPDEF							X[3]		
210	Sequence of Events S ave	SOE/S									

[2]MFC02/03 on y
[2]MFC03/04/05 on y
[3]MFC03/04 on y
[4]MFC03 on y

UTILIZATION

Use the following to determine how to figure out the memory utilization for Function Codes 30, 45 and 140

Calculating Function Codes 30 and 45 RAM utilization (NMFC03/04/05)

RAM utilization depends upon S1 In CAD release 4 2, each time Function Code 30 is dropped, 102 bytes are added to RAM If Function Code 45 is dropped, 66 bytes are added to RAM

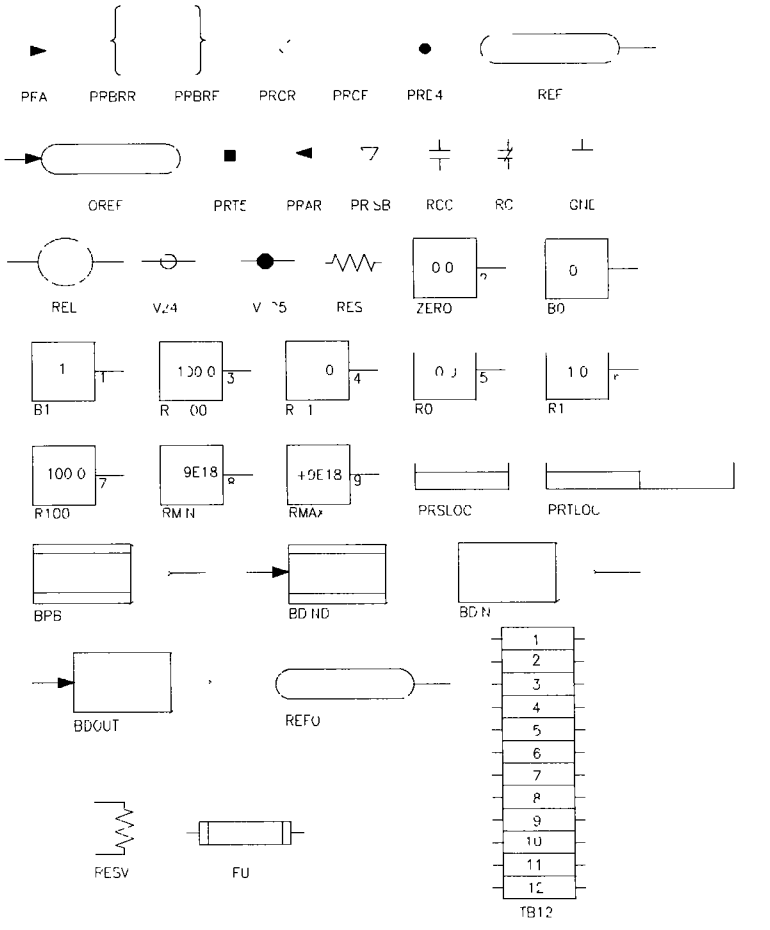
These are the correct values if S1 does not refer to a program e , if S1 does not equal 2 If S1 2, the correct RAM for Function Code 30 is 130 and for Function Code 45, 90

Calculating Function Code 140 Non-Volatile Memory (NVM) utilization (NMFC03/04/05)

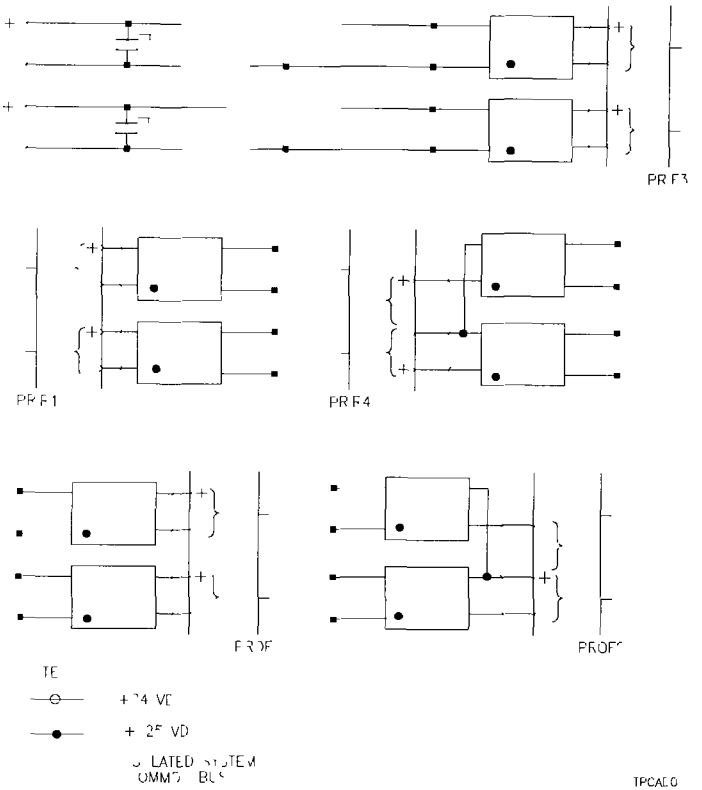
NVM utilization depends upon S1 In CAD release 4 2, each time Function Code 140 is dropped 66 bytes are added to NVM

Refer to Function Code Application Manual, E93 900 20 for the correct NVM value

APPENDIX H — CAD SYMBOL LIBRARY



TP ADJ1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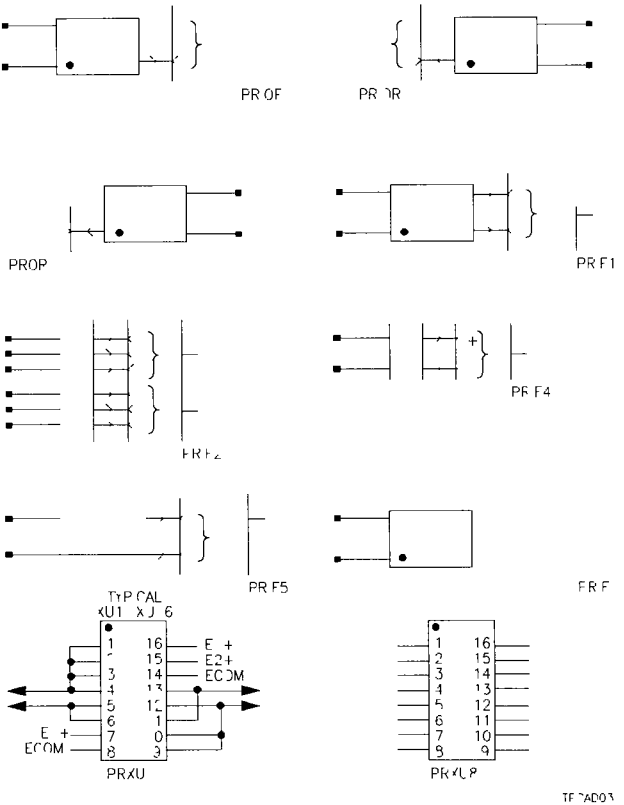
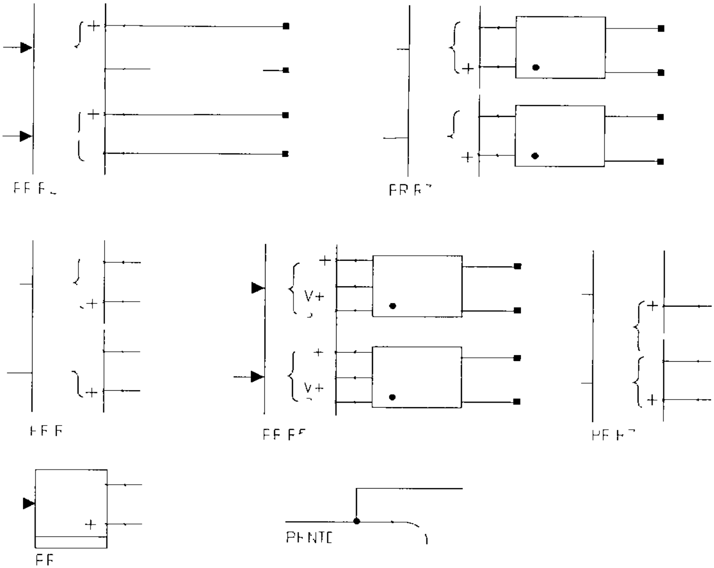
PR F1
PR F4
PROF
PROF
TE
+24 VD
+ 25 VD
ISOLATED SYSTEM
COMMON BUS
TPCAD0


PROF
PROR
PROP
PRF1
PRF4
PRF5
TYPICAL
XU1 XJ6
E+
E2+
ECOM
E+
ECOM
PRXU
PRXLP



A\ A LABLE B_FDEF_

LB FDV   VEFT(AL BA LE B FDEF
LB FDH   H(R Z ITAL BALE B FDEF
B HDVD   VEFT(AL BLA   B FDEF
B FDHD   H F   AL BLANK B(FDEF

TP AD 34

APPENDIX I — FILE GENERATION

Various files are created by the different aspects of CAD These file names use the standard Bailey configuration of LPPMMSSR ext, where

L		Loop identifier, normally 0 9
PP		PCU #. 00 99
MM		Module address, 01 31
SS		Sheet # of this module, A0 Z9
R	-	Revision # of this sheet, A Z

The file extensions are

CAD. LPMMSSR DBF
LPMMSSR SPC
LBR Shape library extensions, nnbcc lbr, shape lbr
LPMMSSR PLT If executing a **PL** command, and using write to file option

TRENDING AND TUN NG· TRN

COMPILATION. LPPMMSSR SPD A temporary file until a CFG is created, a copy of .SPC LPPMM CFG
LST - Used to store sheet data, output of SELCT, input to compiler
MSTR LS Holds list of modules to compile
BND Created by compiler for binder Left on disk
REF Created by compiler for binder Left on disk
LOG Log file created by compiler for user, errors, etc
SDT Database files
DAT Database files

JOB HEADER DEFINITION. JHD

NETWORK 90 CROSS-REFERENCING· XRF LOG Created by XREF, contains all messages generated by the program

XRF OUT Created by XREF, contains text cross reference list

The following files are created by XREF and deleted at its termination, they are data files used internally

INPTINDX DAT
INPTFILE DAT
OUPTINDX DAT
OUPTFILE DAT
FILEINFO DAT
DIRECT DAT
LIST DAT

MODULE MAINTENANCE LPPMM UTL

COMPRESS LIBRARY. OLD Generated if compress fails

TXEWS

CFG	Function Code Configuration File
VFY	Verify File
NBS	Basic/C Configuration File
MON	Monitor Group File

APPENDIX J — ENHANCED COLOR DISPLAY

The following information is for EWS users with Enhanced Color Displays

1. CADEWS displays have a screen resolution of 640 x 400 with 16 colors See Figure J 1 for cable hook up

2 When CAD is not being executed, the resolution of the screen is 640 x 350 The cable connection of Figure J 1 produces a 16 color palette For a 64 color palette, connect the cables as in Figure J 2

3 When CAD is not being executed, adjust Brightness and Contrast to a comfortable level For optimum display during CAD execution

a Invoke the **ST** command

b Adjust the Brightness and Contrast controls until the colors associated with each layer are as shown in Table J 1

Table J 1 Layer Colors

Layer	Color
1	Brownish go d
2	B ue
3	Magenta (purp ish red)
4	Dark Gray
5	Light Red
6	Light B ue
7	L ght Magenta
8	Green
9	Red
10	Cyan (greenish b ue)
11	Light Gray
12	L ght Green
13	Yel ow
14	L ght Cyan
15	Wh te
16	Wh te

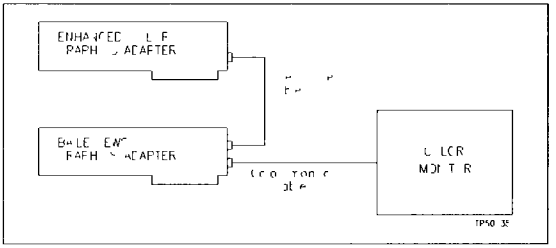


Figure J 1 Cabling for 16 Color Palette

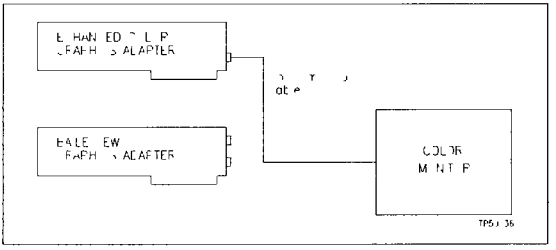


Figure J 2 Cabling for 64 Color Palette

APPENDIX K — PASSWORD SECURITY

Password (PW) security has been added to CADEWS, TXTEWS and TREND software Password security allows a program to be called up by authorized individuals only The PW program, included in the CADEWS and TXTEWS software, allows passwords to be set Usage is as follows

PW program name Enter

where **program_name** is the software you want to password protect No program name extension is necessary When the PW software is executed, it responds with the following

Enter password (maximum 8 characters, ESC to quit)

As you key in the password, your keystrokes do not appear on the screen When you complete keying in the password press Enter Another prompt follows

Retype password

Once again, you enter the password just given This is done so that an errant keystroke is not saved in the password If the passwords do not match, this message appears

Passwords not the same retype again

If this happens, you must start the process again

If a password already exists for the software, the old password is shown by executing PW

PW TXTEWS Enter

Old password is 'hubba'

Enter password (maximum 8 characters, ESC to quit)

This way, you can retrieve a forgotten password if necessary A password can be removed from a program by simply typing Enter when prompted for a password For example type

PW TXTEWS Enter

Enter password (maximum 8 characters, ESC to quit) Enter

Retype password Enter

This removes password protection from TXTEWS

The PW software is part of the EWS software It is loaded when the EWS software is loaded For those users planning to use password protection for one or more of the programs, the person responsible for setting passwords should do so once the EWS has been loaded on the computer Once complete, the PW program should be deleted from the \EWS directory This keeps unauthorized personnel from viewing or changing the password If passwords need to be changed, the PW program can be restored from the original EWS floppies of a backup copy

Since a password is embedded directly into the software, care must be taken when moving source If a version of TXTEWS containing a password is overwritten by a version with none at all, password protection is lost Remember, passwords are associated with each program, not the EWS Also, PW sets up only the programs found in directory \EWS with a password It does not protect any software found in other directories

Programs set up with a password halt after version information and prompt the user for password entry After proper password entry, type Enter to gain full software functionality Invalid password entry terminates the program without user access

NOTE: Spaces and certain other non printable keystrokes are accepted as password characters The backspace key eliminates a mistyped character However since no keys are seen on the display it is best to Esc and start again

APPENDIX L — INSTALLING CTRL386

Bailey Engineering Work Station software requires 640 kbytes of conventional RAM The Intel 301 computers cur rently available from Bailey have only 512 kbytes of conventional RAM, and 2 Mbytes of extended RAM

For Bailey EWS software to run, the 512 kbytes RAM must be filled to 640 kbytes The Intel 301 is supplied with a driver to handle this called **CTRL386** CTRL386 accomplishes this by causing 128 kbytes of extended RAM to effectively be moved down to the conventional RAM area This process is called **Memory Backfill**

Two types of CTRL386 have been supplied with Intel 301 computers: **Partition Loading** and **CONFIG.SYS Loading** The type provided is printed on the label of the CTRL386 disk supplied with the computer Locate this disk and determine the type This appendix covers only the **CONFIG.SYS Load ing CTRL386** If Partition Loading is provided, contact your local Bailey Field Service Office

Installing CONFIG SYS Loading CTRL386

1 Make a CTRL386 directory by typing

mkdir c:\ctrl386 Enter

2 Insert the CTRL386 disk in drive A· and close the drive door Copy all files to the CTRL386 directory by typing

copy a:*.* c:\ctrl386 Enter

3 Change to the CTRL386 directory by typing

cd\ctrl386 Enter

4 Execute the CTRL386 setup program by typing

setup386 Enter

5. The CTRL386 Setup Menu will be displayed to the screen Fill in each field as shown in Figure L 1

For further information on each CTRL386 option, refer to the CTRL386 manual provided

When complete, press [Esc] to exit Type **Y** to save

6 Verify the line

device=\ctrl386\ctrl386.sys

is in the CONFIG SYS file in the root directory Installation is now complete

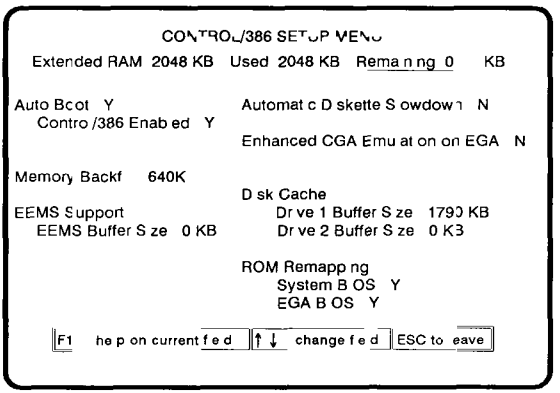


Figure L 1 Control/386 Setup Menu

APPENDIX M — QUICK REFERENCE

Data Base Commands

A	Arc	MT	Mon tor/Tune
AC	Add Connect on	PA	Pan
AN	Assign Name	PL	P ot
AP	Autopan (toggle)	Q	Quit
C	C rcle	QC	Quick Cursor (toggle)
CI	Cursor Increment	R	Rectangle
D	Distance between po nts	RE	Redraw
EX	Ex t (saves then ex ts)	RF	Refresh Draw ng
FE	F nd Ent ty	RS	Reset
FM	Form Macro	S	Stra ght L ne
FN	Function Name	SA	Save Drawing
FS	Form Shape	SM	System Macro
GL	Gr d Lock (togg e)	SR	Shape Reference (togg e)
GR	Grid (togg e)	SS	System Snape
H	H Ortho (sol d ne)	ST	Status
HC	Hard Copy or Ctrl P	SV	Set V ew
H1	H Ortho (dot dashed)	T	Text
H2	H Ortho (dotted l ne)	TE	Text D sp ay (togg e)
H3	H Ortho (dashed line)	UL	User Library
ID	Identify	UM	User Macro
IP	Identify Cursor Coord nates	US	User Shape
IW	Identify Window	V	V Ortho (so d ne)
L	Line	V1	V Ortho (dashed l ne)
LA	Layer Select on	V2	V Ortho (dotted ine)
LM	Library Manager	V3	V Ortho (dot dashed)
LS	List Specs	VL	Vis b e Layer
MB	Modify Block	Z	Zoom
MS	Mouse (togg e)		

Identify Commands

CA	Change Entity Attribute	IP	dentify Cursor Coord nates
C	Cursor Increment	MO	Move Entity
CL	Change Entity Layer	NX	Se ect Next Ent ty
CO	Copy	QC	Qu ck Cursor
DE	Delete Ent ty	RO	Rotate Ent ty
D	Distance Between Points	SC	Sca e Ent ty
GL	Gridlock (toggle)	XP	D sconnect a Shape s Ent ty
GR	Grid (togg e)		

Library Commands

EX	Exit Library Manager	SD	Shape Delete (user library command)
L	L st to CRT	UN	Undelete (user brary command)
L /P	L st to CRT and Printer		

Monitor / Tune Commands

C	Cont nue	SV	Set V ew
HC	Hard Copy	TU	Tune Block
PA	Pan	ZO	Zoom
RF	Refresh		

Function Keys

F1	Gr d 100 100	F6	Delete
F2	Gr d 20 20	F7	Add Connect on
F3	*Funct on Name*	F8	*Change Attr bute*
F4	Ident fy	F9	Pan
F5	Move	F10	Data Entry

APPENDIX N — SHEET NUMBER AND ADDRESS TRANSLATION TABLES

The table below shows how to translate the two character field for sheet number and PCU address Note that valid number for PCU go up to 250, for sheets to 369

Two Char. Field	Decimal Number	Sheet Number	PCU Address	Sheet Number	PCU Address
A0	100	E0	140	0	180
A1	101	E1	141	I1	181
A2	102	E2	142	2	182
A3	103	E3	143	3	183
A4	104	E4	144	4	184
A5	105	E5	145	I5	185
A6	106	E6	146	6	186
A7	107	E7	147	7	187
A8	108	E8	148	8	188
A9	109	E9	149	9	189
B0	110	F0	150	J0	190
B1	111	F1	151	J1	191
B2	112	F2	152	J2	192
B3	113	F3	153	J3	193
B4	114	F4	154	J4	194
B5	115	F5	155	J5	195
B6	116	F6	156	J6	196
B7	117	F7	157	J7	197
B8	118	F8	158	J8	198
B9	119	F9	159	J9	199
C0	120	G0	160	K0	200
C1	121	G1	161	K1	201
C2	122	G2	162	K2	202
C3	123	G3	163	K3	203
C4	124	G4	164	K4	204
C5	125	G5	165	K5	205
C6	126	G6	166	K6	206
C7	127	G7	167	K7	207
C8	128	G8	168	K8	208
C9	129	G9	169	K9	209
D0	130	H0	170	L0	210
D1	131	H1	171	L1	211
D2	132	H2	172	L2	212
D3	133	H3	173	L3	213
D4	134	H4	174	L4	214
D5	135	H5	175	L5	215
D6	136	H6	176	L6	216
D7	137	H7	177	L7	217
D8	138	H8	178	L8	218
D9	139	H9	179	L9	219

Two Char. Field	Decimal Number	Sheet Number	PCU Address	Sheet Number	PCU Address
M0	220	Q0	260	T0	300
M1	221	Q1	261	T1	301
M2	222	Q2	262	T2	302
M3	223	Q3	263	T3	303
M4	224	Q4	264	T4	304
M5	225	Q5	265	T5	305
M6	226	Q6	266	T6	306
M7	227	Q7	267	T7	307
M8	228	Q8	268	T8	308
M9	229	Q9	269	T9	309
N0	230	R0	270	U0	310
N1	231	R1	271	U1	311
N2	232	R2	272	U2	312
N3	233	R3	273	U3	313
N4	234	R4	274	U4	314
N5	235	R5	275	U5	315
N6	236	R6	276	U6	316
N7	237	R7	277	U7	317
N8	238	R8	278	U8	318
N9	239	R9	279	U9	319
O0	240	S0	280	V0	320
O1	241	S1	281	V1	321
O2	242	S2	282	V2	322
O3	243	S3	283	V3	323
O4	244	S4	284	V4	324
O5	245	S5	285	V5	325
O6	246	S6	286	V6	326
O7	247	S7	287	V7	327
O8	248	S8	288	V8	328
O9	249	S9	289	V9	329

Two Char. Field	Decimal Number	Sheet Number	PCU Address	Sheet Number	PCU Address
P0	250	T0	290	W0	330
P1	251	T1	291	W1	331
P2	252	T2	292	W2	332
P3	253	T3	293	W3	333
P4	254	T4	294	W4	334
P5	255	T5	295	W5	335
P6	256	T6	296	W6	336
P7	257	T7	297	W7	337
P8	258	T8	298	W8	338
P9	259	T9	299	W9	339
X0	340	Y0	350	Z0	360
X1	341	Y1	351	Z1	361
X2	342	Y2	352	Z2	362
X3	343	Y3	353	Z3	363
X4	344	Y4	354	Z4	364
X5	345	Y5	355	Z5	365
X6	346	Y6	356	Z6	366
X7	347	Y7	357	Z7	367
X8	348	Y8	358	Z8	368
X9	349	Y9	359	Z9	369

APPENDIX O — STANDARDS

OVERVIEW

This appendix explains the standard user interface conventions which the Engineering Work Station uses This includes the significance of menu/display colors, inputting of data, moving around within displays, etc Note that not all EWS programs comply with all standards in this appendix

STANDARD COLORS

Different colors convey different information There are a limited number of colors used on any display The standard colors are

cyan All static text including headers Standard prompts that come up each time you call a given function are cyan It is also used as a border to show the active window, if there is any question about which is the active window For example, a screen with only one window would not have a cyan outline.

green All dynamic data On input screens, this means data that you may key in or that has been keyed in On screens where data is not keyed in, green is used to show data that may change when a screen comes up For example, a screen that has headers and shows contents of files would have the headers in cyan (same whenever the screen comes up) and the contents of the files in green (different depending on the file contents)

yellow To get your attention Used for messages including errors special attention getting prompts, etc

red Alphabetic characters or keys ([F1]–[F10]) in menus i e , the key that you press to make a menu choice

blue or dark blue Outlines, borders

highlight For special emphasis, items may be highlighted in the same color

DATA STATES

Data in the system can be in one of several states The state depends upon input fields and key functions The states are Defau t, Original, Entered, Active and Accepted

Default Each data field has a default value It is the value given by the programmer The system uses this value is if you do not enter any data for the field It can be blanks When a screen page comes up for the first time, the fields show default values

Or g nal Fields contain original data when a screen appears The original data remains unchanged until you accept it If you enter data in one or more of the fields, but do not Accept, you can recall the original data by pressing Alt O

Entered When you key data into the input field and then move away by any means other than Esc , the data is entered If you key in data, but do not enter it (by leaving the field), you can recall the last entered value with the Undo Alt U function

Active When the input field is on a given field, it is active and can be modified

Accepted After the Accept function is done for a screen, the system accepts all fields on the screen

In the following example, an underline shows the active field

Examp e Begin on a menu page.

A Choose Hardware Address

B

Select A The system takes you to a page to enter the hard ware address The page has four fields Loop, PCU, Module and Block When the page first comes up, the default values are shown in the fields

Loop 1_
PCU 1
Module 1
Block 1

Modify the Loop value to 2 Do the Undo function, the loop returns to 1

Modify the Loop value to 3 Move to the next field by tabbing

Loop 3
PCU 1
Module 1
Block 1

The Loop value of 3 is entered If you move the cursor to the Loop field and do the Undo function, the value will not change

Modify the PCU value to 2

Loop 3
PCU 2
Module 1
Block 1

Press Esc The message *Data has been changed, do you really want to Escape* (Y/N)? appears Press **Y** This takes you back to the menu page you started with These values are accepted

Loop 3
PCU 1
Module 1
Block 1

At the menu, press A again to call up the Hardware Address page. The display shows these values

Loop 3
PCU 1
Module 1
Block 1

Tab to the PCU field and modify the value to 3

Loop 3
PCU 3
Module 1
Block 1

Press F10 to accept the data The system returns to the page on which you began The accepted values are

Loop 3
PCU 3
Module 1
Block 1

Do other functions, but do not return to the Hardware Address page again The system shows

Loop 3
PCU 3
Module 1
Block 1

At this point, the default values are 1 1 1 1, the original, entered and accepted values are 3 3 1 1

Tab to the Module field and modify the value to 3 Tab to the Block field and modify the value to 3 The page looks like

Loop 3
PCU 3
Module 3
Block 3

At this point, the accepted and original values are 3 3 1 1 The entered values are 3-3 3 1 Do a Page Set to Original Values (Alt O) and the page looks like

Loop 3
PCU 3
Module 1
Block 1

If you do a Page Set to Defaults (Alt D) function now, the values shown return to their defaults, and the page looks like

Loop 1
PCU 1
Module 1
Block 1

INPUTTING DATA

The Input Field is the standard method for inputting data The Input Field is a green backlit field It is as long as the maximum allowable input for the field (e g , 32 characters) The cursor within the field is a blinking line or space

When entering text, the cursor does not wrap around That is, when entering text, the cursor stays at the last (rightmost) character of the field, rather than wrapping back around to, and overwriting the first character These functions are available for editing text within the input field

Move the cursor within the input field one space, with wraparound

Move cursor to first/last character in the input field

Toggle insert mode on/off When insert is on characters go in the field at the current cursor position, shifting existing characters over When insert is off, characters overwrite the existing characters in the field When insert is off, the cursor is a single, blinking line When insert is on, the cursor is a blinking full space

Delete the character to the left of the current cursor location

Delete the character under the cursor

Clear to blanks the current input field Return the cursor to the left in the input field

Undo the input field to the last entered value If the last entered value is what is shown, no action occurs If the last entered value is an empty string, then the current selected field is emptied

Note that data is entered whenever you leave a field (except via [Esc]) Therefore this function works only as illustrated in the case below

User arrives at a field with the value 1
User changes the field to 2
Without leaving the field he presses [Alt] [U]
The change is *undone* back to 1

Set the current input field to its original value If the last entered value is what is shown, no action occurs If the last entered value is an empty string, the current selected field empties

Escape from the field without entering data

Set the current input field to its default value (may be blanks)

STANDARD FUNCTIONS

Help

Press Alt H to bring up a help screen that provides information about the function This help screen is context sensitive where practical

Press Alt K to bring up a help information screen that defines the standard keystrokes If a help screen is on the display, press Esc to exit, then press Alt K to bring up the standard keystrokes help screen

Clearing Configurations

Press Alt D to clear the current page to defaults Press Alt O to clear the current page to original data

Printing Configurations

Press A t P to print the configuration If the logical piece to print is the one screen you are working on, the print is done If it is reasonable that you may wish to print more than is shown on one page, you are given a prompt so that you may determine how much should be printed Press Esc to abort the request to print operation

If the printer is offline, not connected or not functional, the system displays an error message and the print is not done

Leaving Current Page

Press Esc to leave the current page without saving data when appropriate, escape one level up in the menu hierarchy If you try to escape and leave data changed but not entered on the screen, the system displays *Are you sure?* You must answer the prompt to continue

Input Field Checking

The system checks input to prevent erroneous information from being entered This checking covers invalid characters and invalid field contents

Most checking is done when you tab away from the field The system displays an error message if it finds an error You cannot tab away from the erroneous field The erroneous data stays in the field so that you may see what you did wrong Press Esc to clear the error message If you cannot correct the data, you may escape, and the last correct data entered is shown on the display

In some cases, further error checking is done when you press F10. Complex error checks on those that depend on the data in several different fields are done when you press F10.

Justification

Some fields are right justified, some are left justified and some are not justified. Justification depends on final use.

Error Tones

It is common to sound a tone when an error message displays. Such tones help direct your attention to the error message.

Clearing Input Field

After you tab to a field, if the first key you press is an alpha numeric, the field automatically clears. The key pressed becomes the first character in the field. This is done so that when you are inputting a new field, you do not need to clear it first. Note that if you do any other function first (e.g. move the cursor), the auto clear does not work. The program assumes that you wish to edit the field, not clear it, and therefore works in normal character replace mode. If you wish to edit the first character of the field without clearing it you may move the cursor right, then left, then proceed.

KEY FUNCTIONS

Edit Input Field Keys

The following keys allow input field editing

Backspace	Delete the character to the left of the current cursor location
Ctrl Home, Ctrl End	Move cursor to first/last character in input field
Del	Delete the character under the cursor
ns	Toggles insert mode on/off When insert is on, characters are placed in the field at the current cursor position, pushing the characters When insert is off, characters overwrite the existing characters in the field When insert is off, the cursor is a single, blinking line When insert is on, the cursor is a blinking full space
→, ←	Move the cursor within the input field one space, with wraparound, in the direction specified
Alt B	Clear to blanks the current input field Return the cursor to the left in the input field

Move, Enter and Go to Another Page Keys

Enter	Enters data into the system, and moves the input field, with wraparound, to the next logical field (same as Tab)
Esc	Escape from current page without saving data escape one level up in the menu hierarchy If you try to escape and leave data changed but not entered on the screen, the system displays *Are You Sure?* You must answer the prompt to continue Note that the entered data comes back after the escape Additionally, you must press Esc to clear an error message Doing so does not escape from the current page or jump up one level in the menu hierarchy
F10	System Accept Typically used when you finish keying in all data on a page and wish to save it
Home, End	Move input field to the logical first/last input field on page
Pg Up, Pg Dn	Accept current page of data and go to the next logical page of data, with wraparound
Tab	Enters data into the system, and moves the input field, with wraparound, to the next logical field (same as Enter)
Shift Tab	Enters data into the system, and moves the input field, with wraparound, to the previous logical field

Ctrl → , Ctrl ← , ↑ , ↓ — Move the input field in the direction specified with wrap around, on the given column or row that you are working in. Data is entered as you leave the field.

Restore Active Input Field Keys

The following keys allow you to restore the active input field or entire screen to earlier values.

Alt D — Set all input fields on the current screen to defaults. Note that defaults may be blanks.

Alt E — Set the current input field to its default value. Note that the default may be blanks.

Alt O — Set all values on the screen to the original values they had when the screen came up for the first time.

Alt R — Set the input field to its original value. If the original value is what is shown, no action occurs. If the original value is an empty string, then the current selected field will be emptied.

Alt U — Undo the last data keyed into the active field. Set the contents of the Active field back to the last entered value. This can only be done while still on the field. Note that data is entered when you move away from a field (except with Esc).

The following keys facilitate other functions.

Alt H — Pop up a Help screen for the presently active field.

Alt L — If appropriate, do a forced load of given configuration file from disk.

Alt P — Print current page.

Alt S — If appropriate, save to disk all data for the page on which you are, return user to previous editing position.

Alt Y — Initiate a copy function, if appropriate. This generally is a copy of a page of data. The system prompts for the page to copy from (pressing Esc aborts the operation) and then for confirmation (*Are you sure?*) before the copy takes place. When completed, the current page is overwritten with data from the **copy from** page. The details of how this works vary from program to program.