Operator Interface Unit
Hardware Manual
WARNING notices as used in this manual apply to hazards or unsafe practices which could result in personal injury or death. CAUTION notices apply to hazards or unsafe practices which could result in property damage. NOTES highlight procedures and contain information which assist the operator in understanding the information contained in this manual.

### WARNING

**INSTRUCTION MANUALS**

DO NOT INSTALL, MAINTAIN OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING AND FOLLOWING THE PROPER Bailey Controls INSTRUCTIONS AND MANUALS, OTHERWISE INJURY OR DAMAGE MAY RESULT.

**RADIO FREQUENCY INTERFERENCE**

MOST ELECTRONIC EQUIPMENT IS INFLUENCED BY RADIO FREQUENCY INTERFERENCE (RFI). CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA AROUND SUCH EQUIPMENT. PRUDENT PRACTICE DICTATES THAT SIGNS SHOULD BE POSTED IN THE VICINITY OF THE EQUIPMENT CAUTIONING AGAINST THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT.

**POSSIBLE PROCESS UPSETS**

MAINTENANCE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AND ONLY AFTER SECURING EQUIPMENT CONTROLLED BY THIS PRODUCT. ADJUSTING OR REMOVING THIS PRODUCT WHILE IT IS IN THE SYSTEM MAY UPSET THE PROCESS BEING CONTROLLED. SOME PROCESS UPSETS MAY CAUSE INJURY OR DAMAGE.

### AVERTISSEMENT

**MANUELS D'OPERATION**

NE PAS METTRE EN PLACE, REPARER OU FAIRE FONTIONNER CE MATERIEL SANS AVoir LU, COMPRIS ET SUIVI LES INSTRUCTIONS REGLEMENT AIRES DE Bailey Controls TOUTE NEGLIGENCE A CET EGARD PURRAIT ETRE UNE CAUSE D'ACCIDENT OU DE DEFAILLANCE DU MATERIEL.

**PERTURBATIONS DE LA FREQUENCE RADIOPHONIQUE**

LA PLUPART DES EQUIPEMENTS ELECTRONIQUES SONT SINSIBLES AUX PERTURBATIONS DE LA FREQUENCE RADIO. DES PRECAUTIONS DEVRAIENT ETRE PRISES LORS DE L'UTILISATION DE MATERIEL DE COMMUNICATION PORTATIF. LA PRUDENCE EXIGE QUE LES PRECAUTIONS A PRENDRE DANS CE CAS SOIENT SIGNALEES AUX ENDROITS VOULOUS DANS VOTRE USINE.

**PERTES PROCEDE RENVERSEMENTS**

L'ENTRETIEN DOIT ETRE ASSURE PAR UN PERSONNEL QUALIFIE ET EN CONSIDERATION DE L'ASPECT SECURITAIRE DES EQUIPEMENTS CONTROLES PAR CE PRODUIT. L'ADJUSTEMENT ET/OU L'EXTRACTION DE CE PRODUIT LORSQU'IL EST INSERE A UN SYSTEME ACTIF PEUT OCCASIONNER DES A-COUPS AU PROCEDE CONTROLE. SUR CERTAINS PROCEDES, CES A-COUPS PEUVENT EGALEMENT OCCASIONNER DES DOMMAGES OU BLESSURES.

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Foreword

This manual provides installation, setup, and servicing information for the 500/1400/5000 Tag Operator Interface Units (NOIU01/02/03) by trained personnel. Additional installation information for Console Array Assembly units and printers are also provided.

Related hardware and printer information can be found in the following Bailey manuals:

IE93-901-1 OIU Operation/Configuration Manual
IE93-900-5 NETWORK 90 Site Planning, Preparation and Equipment Installation Instructions
IE93-911 Termination Unit Manual (and Cable Supplement)
IE93-908-1 Loop Interface Module (NLIM01/02
IE93-905-2 Enhanced Computer Interface Unit (NCIU02/03)

The information contained herein was accurate at the time of its publication. However, Bailey Controls (Bailey) reserves the right to revise the design of the OIU Hardware without prior notification.

If this manual does not address any difficulties met in the installation, setup, or servicing of the OIU Hardware, notify the nearest Bailey service center or sales office and request assistance. NOTE: Service charges may accompany any services provided.

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SAFETY SUMMARY

General Warnings

System Maintenance

System maintenance must be performed by qualified personnel and only after securing equipment controlled by the circuit. Altering or removing components from an active circuit may upset the process being controlled.

Electrical Shock Hazard During Maintenance

Disconnect power or take precautions to ensure that contact with energized parts is avoided when servicing.

Equipment Environment

All components, whether in transportation, operation, or storage must be in a noncorrosive environment.

L'entretien du Systeme

L'entretien du systeme doit etre effective par des personnes competentes et uniquement a partir du moment ou les elements controles par le circuit ont ete isoles. Le fait d'enlever ou d'alterer les composants d'un circuit sous tension peut perturber le processus controle.

Risques de chocs electriques lors de l'entretien

S'assurer de debrancher l'alimentation ou de prendre les precautions necessaires a eviter tout contact avec des composantes sous tension lors de l'entretien.

Environnement de l'equipment

Ne pas soumettre les composantes a une atmosphere corrosive lors du transport, de l'entreposage ou de l'utilisation.
SAFETY SUMMARY (continued)

Specific Warnings

CAUTION

Although a DB-25 connector is used, damage will occur if connected to an RS-232 device. On the NOIU01 this connector joins in the rear of the unit. On the NOIU02 the connector joins in the front just below the diskette drive (pg. 4).

Do not operate the OIU with doors or covers opened or removed. Figures 2.3 and 2.4 are only for illustration (pg. 10).

Do not insert or remove circuit cards with the power on (pg. 17).

These modules contain metal oxide semiconductor (MOS) devices. MOS devices require attention during shipping and handling to avoid damage from static discharge and improper grounding. Bailey Controls Ships the card in a special anti-static bag. Do NOT remove the card from its bag until ready to put into service. Save the bag for future use. Ground the bag before opening. NEVER touch the circuitry when handling the card (pg. 18).

Due to RS-232C published distance limitations, NOIU03 systems are commonly (and NOIU01 less commonly) furnished with wire or fiber-optic short-haul modems. However, opto-isolated, wired short-haul modems with 38.4 Kbaud capability are frequently required when console and driver safety grounds and chassis are not directly connected to the same junction point. Intermittent data errors can result if this practice is not followed (pg. 18).

Do NOT try to remove a floppy diskette from its drive when the diskette drive LED is lit. While the LED is lit the diskette operates, either storing or transmitting data. Removing the diskette from its drive while the LED is lit interrupts diskette operation. Data going onto the diskette can be lost or damaged. On later style diskette drives, a module reset is required to release the door if the system crashes with LED still illuminated (pg. 39).

Figures 7.3 through 7.9 detail only the MINIMUM recommended clearances for each component. Local building, electrical, and/or fire safety codes may require additional clearances (pg. 45).

Disconnect from electrical supply before attempting repair or replacement (pg. 66).

WARNING

Exercise extreme caution when performing the following checks. Circuit must be energized while performing checks (pg. 21).
SAFETY SUMMARY (continued)

ATTENTION

Malgré qu'une fiche de type DB-25 soit utilisée ici, ne pas y relier un périphérique de type RS-232 sous peine d'endommager le circuit. Dans le cas d'un NOIU01, cette fiche se trouve à l'arrière de l'appareil, tandis que dans le cas d'un NOIU02, elle se trouve à l'avant, au bas de l'unité de disque souple (pg. 4).

Ne pas faire fonctionner le OIU lorsque les portes ou les panneaux d'accès sont ouverts ou enlevés. Le OIU n'est représenté à la figure 2.3 et 2.4 qu'a titre d'illustration seulement (pg. 10).

Ne pas insérer ou retirer les cartes de circuits imprimés sans interrompre l'alimentation (pg. 17).

Ces modules sont munis de dispositifs MOS. Les dispositifs MOS sont susceptibles d'être endommagés par de décharges statiques et une mauvaise mise à la terre; elles nécessitent donc des précautions particulières lors de l'expédition et de la manutention. Les cartes de circuits imprimés sont expédiées par Controle Bailey dans des sacs spéciaux anti-statiques. Ne retirer la carte de son sac qu'au moment l'installation. Conserver le sac pour usage ultérieur. Effectuer la mise à la terre du sac avant d'ouvrir celui-ci. Ne JAMAIS toucher directement aux circuits de la carte (pg. 18).

A cause des restrictions quant à la distance maximale de communication des circuits RS-232C, de modems à courte distance à fils ou à fibres optiques sont fréquemment fournis avec les systèmes NOIU03 (moins fréquemment dans la cas des systèmes NOIU01). Lorsque des modems de 38.4 Kbaud à courte distance à fils sont utilisés et que les mises à la terre de sécurité du pupitre et de l'armoire de commande ne sont pas reliées à un point commun, les modems doivent être dotés de coupleurs optiques. Sans cette isolation, des erreurs de transmission pourraient survenir (pg. 18).

NE PAS tenter de retirer le disque souple de l'unité de disque lorsque le témoin a DEL est allumé. Ce témoin indique que l'unité enregistre ou lit des données sur le disque souple. L'interruption de ces opérations par le retrait du disque peut provoquer la perte ou l'endommagement des données. Dans le cas des modèles récents d'unités de disques, un verrou éteint l'ouverture de la porte de l'unité lors de son fonctionnement. Dans l'éventualité d'une défaillance du système pendant que le témoin est encore illumine, actionner l'interrupteur RESET pour degager le disque (pg. 39).

Les figures 7.3 a 7.9 n'illustrent que l'espace MINIMUM requis entre chaque élément. Les codes du bâtiment, de l'électricité, et/ou de prevention des incendies peuvent dicter des espaces plus importants (pg. 45).

Interrompe l'alimentation avant de proceder a la reparation ou au remplacement (pg. 66).

AVERTISSEMENT

Faire preuve d'une grande vigilance en effectuant les tests suivants. Le circuit doit être sous tension au moment des tests (pg. 21).
Section I
Introduction

Overview — Network 90/Operator Interface Unit

Figure 1.1 shows an example of a NETWORK 90 plant control system. The three major system elements are the Process Control Units (PCUs), the Plant Communication Loop (PCL), Management Command System (MCS) and the Operator Interface Units (OUIs).

The PCU equipment interfaces to the process, executing control algorithms. The process interface uses conventional signal wiring (e.g., 1-5 V dc, 4-20 mA, and contact closure). Modules supporting both sequential and modulating control are available. The microprocessor-based modules select control and signal processing algorithms from a library and link them together for execution. Each module contains a complete library of algorithms to support its system function, as well as nonvolatile memory to store its control scheme.

A PCU can be a stand-alone control system using panelboard devices for operator interface and a Configuration and Tuning Module (CTM) for building/maintaining control schemes. The CTM lets the user build his control scheme in the PCU modules and modify it as necessary. Each module stores the selected control scheme in its on-board, nonvolatile memory. PCU modules can also communicate with each other to share control information.

The Plant Communication Loop connects plant system PCUs and OUIs enabling communication between these elements for the following.

- sharing control variables among modules of different PCUs.
- monitoring PCU control scheme operations with and OIU or MCS

FIGURE 1.1 — NETWORK 90 Plant Control System Major Elements
• controlling plant process from an OIU or MCS
• configuring/maintaining PCU control schemes from an OIU or MCS
• monitoring PCU equipment status from an OIU or MCS

The OIU enables access to the NETWORK 90 PCUs for process control, control engineering, and system troubleshooting. The operator uses the OIU to monitor the control schemes in any PCU, taking control action as necessary. The OIU displays control variables and alarm status to the operator via its color graphic CRT screen.

The plant engineer uses the OIU to configure and to maintain control schemes throughout the plant loop. The OIU can read and display the control configuration of any module in a PCU. The engineer can modify the control configuration having the OIU write it back to the module. The engineer can also use the OIU to read a module configuration, saving it onto diskette, or he can read a configuration previously saved on diskette, writing it to a module.

**OIU Hardware**

The OIU hardware consists of either the NOIU01, NOIU02, or NOIU03 Operator Interface Units, and any optional Printers (Figures 1.2, 1.3, 1.4).

The NOIU01 consists of a Driver Cabinet and a CRT/Keyboard Console. The NOIU02 integrates the NOIU01 Driver Cabinet and CRT/Keyboard Console into a single assembly but performs the same functions as the NOIU01.

The NOIU03 consists of a Driver Cabinet and a stand-up CRT/Keyboard console designed for process (NEMA 4) environments.

The driver cabinet is the main component of the NOIU01/03. The Driver executes all programs controlling OIU operation. The Driver communicates with the user through the CRT and printer. The Driver accesses NETWORK 90 PCU's through the Plant Communication Loop. The Driver enables all interaction between the OIU user and the NETWORK 90 Plant Communication Loop. The NOIU02 also performs the same functions, but has integral CRT/Keyboard and external printer.

![Diagram of OIU01 Hardware](image_url)
A disk system consisting of a 256k byte diskette (floppy) drive, and a 10M byte Winchester fixed rigid-disk drive is part of 500 and 1400 tag versions of the NOIU01/03 Driver Cabinet and the NOIU02. (5000 tag OIU hardware uses a 20M byte Winchester.) The diskette drive uses removable floppy diskettes for
such functions as saving PCU and OIU configurations. The Winchester drive uses a fixed (non-removable) rigid-disk for online storage of OIU operating software, historical trend and archiving data, and OIU configuration data.

The CRT provides color graphic display capability on a 19-inch screen. The CRT is the primary means for presenting information to the user. The OIU uses a variety of displays to accomplish its full range of functions.

The Keyboard lets the user access and interact with OIU displays. The Keyboard also has two keylock switches that can restrict OIU configuration and tuning capabilities to authorized personnel.

**NOTE:** All OIU versions also have an Auxiliary Keyboard used for graphic editing. (The OIU Operation/Configuration Manual (IE93-901-1) explains this keyboard and its use in detail.) The Auxiliary Keyboard console connects to the console in all OIU versions.

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**CAUTION**

Although a DB-25 connector is used, damage will occur if connected to an RS-232 device. On the NOIU01 this connector joins in the rear of the unit. On the NOIU02 the connector joins in the front just below the diskette drive.

**ATTENTION**

Malgré qu’une fiche de type DB-25 soit utilisée ici, ne pas y relier un périphérique de type RS-232 sous peine d’endommager le circuit. Dans le cas d’un NOIU01, cette fiche se trouve à l’arrière de l’appareil, tandis que dans le cas d’un NOIU02, elle se trouve à l’avant, au bas de l’unité de disque souple.

The NOIU01 and NOIU02 Printers can produce copies of CRT displays and various logs. Some logs note the occurrence of alarm and event conditions in the PCUs while other logs show collections of trended or archived data.

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**FIGURE 1.5 — Typical Console Array Assembly**
Section II
Description

Overview — Operator Interface Unit

OIU hardware conducts all interaction between the OIU user and the NETWORK 90 PCUs. OIU hardware consists of the following devices (See Figure 2.1):

"Console" Functions
Operator's keyboard
Color graphic terminal

"Driver Cabinet" Functions
Four Multi-Function Processor Module (MFPM) Boards
Three I/O Expander Module (IOXM) boards (4 for 5000 tag units)
Loop Interface Module (LIM)
Processor Interface Module (PIM), (BTM for 5000 tag units)
Loop Storage Module (NLSM02 - 5000 tag use only)
"Winchester" fixed rigid-disk drive
"Floppy" diskette drive
Disk Controller Board
DC Power supplies and cooling system
Termination Units (Plant Loop, Printer) Racks

NOTE: The preceding listings show the standard hardware. Options can add additional pairs of boards (such as OIU BASIC programming and/or auxiliary printer).

In the NOIU01/03, all hardware except the CRT/Keyboard console is contained inside the Driver Unit. The keyboard, associated power supply, and color graphic terminal form the CRT/Keyboard console.

Each of the MFPM/IOXM pairs is identical in physical hardware. Each MFPM is a TI 9900-based microcomputer containing 32K bytes of Electrically Programmable Read Only Memory (EPROM) and a single serial I/O diagnostic port. Each MFPM also has identical file utilities, diagnostics, and monitor firmware resident in its EPROM in addition to the hardware.

NOTE: The 500/1400 OIU contains an NMFP01 with 128 K byte of Random Access Memory (RAM), while the 5000 tag unit contains and NMFP02 with 512 K byte of RAM. Some recent 500/1400 tag OIUs contain an NMFP02.

An IOXM does not contain a processor but connects to its associated MFPM via a ribbon cable. Each IOXM provides both serial and parallel I/O ports, form-C dry relay contacts, and a Watchdog Timer.

The MFPM/IOXM pairs have very distinct functions when configured into an OIU. The module dipswitch configuration and the software operating in each MFPM defines the functional differences for each board pair.

The MAIN MFPM/IOXM pair operates the main OIU application software including:

- display generation
- display updating
- data collection
- data base updating
- alarm handling
- keyboard servicing
- process control
- tuning interfacing

The OIU operator's keyboard connects to the IOXM board of the Main MFPM/IOXM pair. This module pair also provides the four alarm contacts and the crystal-controlled oscillator that drives the OIU main real-time clock.

The DataBase MFPM/IOXM pair (DBP) is a data manager providing interface between the NCIU02 modules and the OIU. The DBP MFPM changes the form of point table data extracted from the NCIU02 LSM02 module to a form emulating OIU Processor Interface Module (PIM) semaphore. This MFPM also improves message throughput by maintaining a buffer of the most frequently or recently used information.

NOTE: The PIM is used on 1400 and 500-tag OIUs. The NCIU02 arrangements replaces it on all 5000-tag OIUs.
NOIU01/03 UNIT DRIVER

(1)

NOIU01/03 CRT/KEYBOARD CONSOLE

KEYBOARD

CRT

PRINTER

FROM ALARM CONTACTS

FIXED DISK DRIVE

DISKETTE DRIVE

DISK CONTROLLER

IOXM DISK

MFPM DISK

IOXM LP/CRT

MFPM LP/CRT

PARALLEL BUS

MFPM

DATABASE MFPM/IOXM PAIR (DBP)

IOXM

MODULE BUS

SERIAL CABLE

PLANT COMMUNICATION LOOP — SERIAL DATA

NOTE: (1) — FOR NOIU02 THESE ARE ONE ASSEMBLY

FIGURE 2.2 — OIU Hardware Functional Interface (5000 tag)
The DBP IOXM serves as a serial port for the RS-232C connection of this board pair with the NCIU02 modules.

The Disk MFPM/IOXM pair (associated with the OIU disk hardware) serves along with the separate Disk Controller to implement the necessary I/O operations for the Winchester fixed rigid-disk and floppy diskette drives. The Disk board pair operates OIU file management software enabling programs running on the Main MFPM to access files on both the Winchester and floppy disks.

The OIU File Manager Utilities program enables the following functions in addition to those above:

- initializing both disks
- creating files
- deleting files
- saving & restoring for either disk
- transferring data from one disk to the other

This software also "caches" certain highly accessed RAM files on the MFPM. Caching a file refers to the MFPM maintaining a copy of that file in its RAM. This provides fast access to the data in that file. Whenever these files are updated they are also written to the disk.

The Disk IOXM provides the parallel interface for communicating with the Disk Controller.

The LP/CRT MFPM/IOXM pair provides communication with the Color Graphic Terminal and the Printer. The LP/CRT MFPM operates the software that provides both Terminal and Printer output buffering. This software also performs the Terminal screen read and information formatting for Printer output for the OIU screen copy function.

This board pair handles all direct communication with the Color Graphic Terminal and Printer (such as interrupt handling, handshaking and so forth). The LP/CRT MFPM/IOXM provides a serial port to the Terminal as well as the necessary parallel port for communicating with the Printer.

The second printer option utilizes an additional MFPM/IOXM pair and printer termination. Screen data is accessed from the first LP/CRT pair allowing dedication of one printer for logging functions.

The 5000-tag OIU has a NCIU02 to increase point table size compared to the PIM. The NCIU02 contains the modules necessary to interface between the Plant Communication Loop and the OIU DBP MFPM/IOXM board pair. These modules are:

- Loop Interface Module (LIM)
- Bus Transfer Module (BTM)
- Loop Storage Module (LSM02)

The OIU LIM consists of an SDLC half-board and a processor board. The processor is joined to the BTM by a Direct Memory Access (DMA) ribbon cable. The LIM and BTM thus form a communication link between the PCL and the LSM02. The BTM is a single printed circuit board. The LSM02 consists of two printed boards: the CPU and the MEM (memory) boards. The 68000 microprocessor of the CPU board actually controls the LSM02. The MEM board contains battery-backed Random Access Memory, (RAM), and on-board ROM. The LSM02 is the interface between messages from the PCL and the OIU via a special serial cable to the DBP IOXM board.

The LIM transmits outgoing messages to the PCU. The LIM places all converted incoming messages directly into the BTM board. In addition, the LIM monitors PCU status and retries failed messages.

The BTM transfers the incoming data from the LIM via its module bus connection to the LSM02 while placing outgoing messages in an output buffer. (The LIM transmits such messages to the PCL.) The BTM also monitors the status of the LIM and LSM02, as well as exchanging information with the LIM.

The LSM02 captures incoming module bus data from the BTM, sending it via the serial port to the DBP MFPM/IOXM board pair. The LSM02 also sends outgoing messages from the OIU via the module bus to the BTM.

Plant Communication Loop data can include:

- exception reports
- tuning and control requests
- configuration information.

The operating software in the NCIU02 controls the communication over these interface modules, providing data buffering between the OIU and the PCL. To do this, the software supporting the NCIU02 interfacing operations uses its module microprocessors and their associated RAM and ROM.
Physical Description — Operator Interface Unit

An NOIU01 consists of a Driver cabinet and a CRT/Keyboard console (Figure 1.2). The NOIU02 consists of a single unit, integrating the NOIU01 Driver unit and CRT/Keyboard console functions into one assembly (Figure 1.3). The NOIU03 is an NOIU01 with CRT and Keyboard in an air conditioned NEMA-4 enclosure bringing OIU functions to a standing plant operator (Figure 1.4). All OIUs may also include an optional NPRT02 or NPRT03 (color) printer.

NOIU01/03 Driver Cabinet Description

The NOIU01/03 Driver Cabinet dimensions are 51 inches high x 24 inches wide x 26 inches deep. Front and rear door locks are keyed alike. The doors have slotted sections to aid the front intake and rear exhaust of the internal cabinet cooling system. The cabinet has bottom access openings for interconnecting cabling. Cabinet entry cables normally include four or six data cables and an AC power input cord. Most of the internal cabinet subassemblies mount on standard 19-inch rails. Figure 2.3 identifies the NOIU01/03 Driver Cabinet subassemblies and locations.

NOIU01 Console Description

The NOIU01 CRT/Keyboard console dimensions are 19 inches high x 26 inches wide x 37 inches deep. This console is an integrated enclosure designed for tabletop use. The console contains a Color Graphic Terminal, a Keyboard, and associated electronics. The Keyboard also has two keylocks that prevent/permit system configuration/tuning changes from the OIU. Interface cabling associated with the CRT/Keyboard console includes two RS232 cables, one for the CRT and one for the Keyboard, as well as an AC power cord.

The NOIU02 dimensions are 53 inches high x 28 inches wide x 46 inches deep. The NOIU02 also has front and rear swing-out doors with individual locks keyed alike. The rear door and the keyboard undersurface have slotted sections to aid air intake and exhaust for the internal cooling system. The NOIU02
also has a stabilizer that must attach to its front when
the unit is not secured to the floor (Figure 7.3). The
unit has two cable entry areas: a 2.5-inch diameter
entry at its bottom right rear and one at the top right
rear. Figure 2.4 identifies the NOIU02 subassemblies
and locations.

**NOIU01/03 Driver Cabinet and NOIU02
Subassembly Views**

Figure 2.3 shows front and rear views of the
NOIU01/03 Driver Cabinet with its doors removed.
Figure 2.4 shows front and rear views of the NOIU02
Unit with its doors removed. The figures show the
physical relationship between the subassemblies of
each Unit. Figures 7.1, 7.2, and 7.3 show the
associated details for installation, air flow, and inter-
face of the NOIU01/03 Driver Cabinet, NOIU01 and
NOIU03 CRT/Keyboard Consoles, and NOIU02.

**CAUTION**

Do not operate the OIU with doors or covers
opened or removed. Figures 2.3 and 2.4 are only
for illustration.

**ATTENTION**

Ne pas faire fonctionner le OIU lorsque les portes
ou les panneaux d’accès sont ouverts ou enlevés.
Le OIU n’est représenté a la Figure 2.3 et 2.4 qu’a
titre d’illustration seulement.

**NOIU03 Console Description**

In the NOIU03 Console, the previously described
NOIU01 Console electronics are supplemented by an
air conditioner and optional fiber optic modems.
These link the CRT and keyboard to the Driver cabinet
which is in an equipment room environment.

**NPRT01/02/03 Description**

The NPRT01 consists of an NPRT02 printer plus
stand. The NPRT02 Printer dimensions are 7 inches
high x 25 inches wide x 31 inches deep with paper
basket installed. NPRT02 specifications appear in
Figure 7.4. The NPRT03 is the color version of this
printer and requires a “Genicom 3404” four color pro-
cess ribbon for use with the OIU. Refer to the Genicom
User’s Manual for a detailed description of these
printers.

**NOIU01/03 Driver Cabinet Disk Drive Assembly/
NOIU02 Disk System**

The NOIU01/03 Disk Drive Assembly (Figure 2.3
and 7.16) contains the OIU disk system elements. This
assembly contains the following components:
• Disk Drive Enclosure (including the fan and the +5 V dc, —5 V dc, and +24 V dc disk power supply)

• Floppy diskette drive

• Winchester fixed rigid-disk drive

• Disk controller.

The NOIU02 contains the same components as NOIU01/03 but front mounts the diskette drive. The NOIU02 fixed disk drive assembly contains the Winchester fixed rigid-disk drive and the disk controller. Figure 2.4 shows the location of this assembly and the other components of the NOIU02 disk system.

Power Rack Assembly

The Power Rack Assembly (Figures 2.3 and 2.4) contains the OIU Power Supply Assembly, Power Distribution Module, and Connector Plate Assembly for the plant interface modules.

The OIU Logic Power Supply Assembly (Figure 7.20) consists of the +5 V and ±12 V dc power supply.

The Power Distribution Module (Figure 7.20) includes the circuit breaker, varistor, indicator, outlet, and fuse elements of the cabinet power distribution circuit. A module front panel indicator signals live AC at the module rear panel J1 BLOWER and J2 UTILITY outlets. Rear panel fuse F1 is overload protection for the J2 UTILITY outlet circuit. The Driver Unit 120 V ac power cord interfaces to terminal block TB1. TB2 provides 120 V ac power to the Logic and Disk Power Supplies. An integral ±15 V dc supply provides power via TB3 to the plant interface modules.

NCIU02 Unit — Loop Interface Module (LIM)

The LIM is common to all data users communicating over the Plant Communication Loop (PCL). It enables the OIU to receive and transmit information. The LIM has plant loop functions of a receiver, transmitter, and two buffers. The buffers provide message storage in case the module is busy when new messages arrive. The OIU LIM handles incoming OIU information transfers by working with the Bus Transfer Module (BTM) and Loop Storage Module (LSM02).

Outgoing OIU information transfers (LSM02 to BTM/LIM to Plant Communication Loop) occur on an interrupt basis. The modules send out information only when a significant data change occurs and not as part of OIU module polling. Specific OIU loop interface functions including Startup, Message Format, Message Transmission, Security, Message Reception and Interrupts are identical to those of the NETWORK 90 Process Control Unit LIM. Product Instruction IE93-908-1 describes the LIM functions in greater detail.

The OIU LIM is the same module as that used in the NETWORK 90 System PCU. The LIM uses a 4 slot backplane in the Module/Power Rack Assembly. The LIM has a cable connection to the Plant Loop Termination Unit (NTPL01) and connects to the BTM via a Direct Memory Access (DMA) ribbon cable.

Human interfaces include two 8-pole dipswitches and 8 edge mounted LEDs. The LED function is dipswitch selectable. The dipswitch functions are:

S1 — sets memory for LED readout
S2 — sets node addresses

The Installation and Start-up Section of this manual (Section III) further describes the settings of dipswitches and the positioning of jumpers on the LIM.

NCIU02 Unit — Bus Transfer Module (BTM)

The BTM occupies a slot adjacent to the LIM and is connected to it by the DMA ribbon cable. The BTM consists of a microprocessor module bus interface, a direct memory access controller and associated circuits. It provides functional input and output buffers facilitating message transfer to/from the Plant Communication Loop and LSM02. The BTM transfers incoming messages from the Plant Communication Loop through the LIM to the module bus. The Loop Storage Module (LSM02) captures the information from the Module bus, transferring it to the DBP MFPM/IXM board pair. The BTM places outgoing messages in its output buffer, enabling the LIM to transfer them to the Plant Communication Loop. The BTM also monitors LIM and LSM02 status.

Components mounted on the PC board include one five-pole dipswitch (S1) for off-line testing and a module status LED. The LED is on the module front
plate and shows the current BTM operating state (Green = satisfactory and red = error/reset).

The S1 dipswitch provides a combination of off-line tests. The P1 edge connector at the rear edge of the BTM board provides power and Module Bus connections. The Installation/Start-up section of this manual describes the SW1 locations and settings.

**NCIU02 Unit — The Loop Storage Module (LSM02)**

The LSM02 interfaces with the DBP MFPM module by the special serial interface cable and with the BTM via the Module Bus. The LSM02 is a 68000 based module with two PC boards (CPU and MEM) connected to each other via ribbon cable and attaching to a double width faceplate.

The LSM02 sends incoming messages from the Plant Communication Loop to the DBP MFPM/IOXM board pair of the OIU. The LSM02 also sends outgoing OIU information to the Plant Communication Loop via the BTM and module bus.

LSM02 human interfaces include a Status LED at the top left side of the module faceplate, a column of eight LEDs on the left, and a column of two LEDs on the right side of the faceplate. The left side LEDs indicate CPU board operating/error code information while the right side LEDs categorize errors on the MEM Board.

**Processor Interface Module (PIM)**
(used on existing 500/1400 tag units)

The PIM interfaces with the main MFPM module by the 16 slot card cage bus, and with the LIM by a ribbon cable. It provides system initialization by establishing lines of communication to other nodes and also (by the LIM) transfers Plant Communication Loop data to and from the OIU. Transfers into the OIU are similar to those into the BIM of the NETWORK 90 PCU. Transfers out of the OIU (PIM to LIM to Plant Communication Loop) are performed on an interrupt basis rather than a polling basis.

The PIM mounts in slot 4 of the 16 slot card cage. P1 is the PIM main edge connector. It interfaces with the card cage backplane +5 V dc, +12 V dc, and -12 V dc buses and signal lines. P1 is keyed for the insertion of the PIM in the card cage with its components facing the OIU front right edge. P4 (the LIM cable interface) and P5 (test plug for communicating with a test CRT) are 40 pin front edge connectors.

The PIM components include display LEDs, an 8 switch dipswitch, and a reset switch. Normal periodic resetting of the LIM machine fault timer circuit is indicated by green on the PIM red/green LED. If the fault timer should fail to reset, the PIM shuts down and provides a red indication on the LED. The PIM 8 switch dipswitch may be set at various positions during start-up testing. Indications on the display port LEDs (8 red LEDs) verify normal or specific test mode operation. A manual pushbutton reset switch (located just below the 8 switch dipswitch) must be momentarily pushed in to reset the PIM each time it is to be operated in a different mode. Specific settings for PIM components are detailed in the PIM setup table in Section III.

**Multi-Function Processor Modules (MFPM)**

Each MFPM combines with an associated I/O Expander Module (IOXM). Each MFPM or MFPM/IOXM pair is mounted in the 16-slot Card Cage. Respective MFPM Card Cage locations are:

- 5000 Tag OIU Positions
- Slot 1 — Main MFPM
- Slot 4 — DBP MFPM
- Slot 7 — Disk MFPM
- Slot 10 — LP/CRT MFPM
- Slot 13 — BASIC option MFPM
- Slot 15 — AUX LP option MFPM

- 500/1400 Tag OIU Positions
- Slot 1 — Main MFPM
- Slot 6 — Disk MFPM
- Slot 9 — LP/CRT MFPM
- Slot 13 — BASIC MFPM
- Slot 15 — AUX LP MFPM
The descriptions given in the OIU Overview at the beginning of this section cover the specific functions of the MFPMs operating as Main MFPM/IOXM, DBP MFPM/IOXM, Disk MFPM/IOXM, and LP/CRT MFPM/IOXM pairs.

Jumper terminals, LEDs, dipswitches, resistors, and a timing adjustment potentiometer are key MFPM display and adjustment components. Section III of this manual details setups for dipswitches, jumpers, and resistors for the respective MFPM board pair applications.

A 100-pin rear edge connector on each MFPM interfaces with the Card Cage backplane. A 40-pin front edge connector on each MFPM interfaces with a similar 40-pin connector on an adjacent IOXM by short ribbon cable. Each MFPM also contains a RS-232 connector available for testing.

Six LEDs on the front edge of each MFPM display status information about data transfer in associated MFPM circuits.

A momentary toggle switch on each MFPM generates a reset in the UP position and a load vector in the DOWN position. Interfaces between this switch and the adjacent IOXM can make this local manual load/reset switch global. (This can generate an OIU Reset or OIU load — rear to Section III of this manual, OIU RESET, for the use of this switch.)

The top 3 switches of the MFPM dipswitch assign module address: 7 - main, 0 - disk, 1 - CRT/Printer, 4 - DBP, 6 - second printer. Switch position 4 is closed for main (master bus clock) and closed for others. See Section III for other switch settings. The Main MFPM must also have its bus terminator U47 (1.0 Kohms) installed and crystal connected (E18 jumpered to E19).

**Input/Output Expansion Modules (IOXM)**

The IOXM is the companion module in the MFPM/IOXM module pairs. The OIU Overview at the beginning of this section covers the specific functions of the IOXM when used in Main, DBP, Disk, and LP/CRT IOXM applications. The product instructions provided with the BASIC option IOXM cover the specific functions of that IOXM.

LEDs, dipswitches, resistors, and timing adjustment potentiometers are key IOXM display and adjustment components. Section III of this manual details the setups for dipswitches and resistors for the respective Main, DBP, Disk, LB/CRT, and Basic option IOXM applications.

Each IOXM (also the MFPM and PIM) uses MOS (metal oxide semiconductors) bipolar integrated circuit components to implement logic functions. A 100-pin connector on the rear edge of each IOXM provides electromechanical interface with the Card Cage backplane. A 40-pin connector on each IOXM front edge interfaces by ribbon cable to its adjacent MFPM. Other connectors on an IOXM module include:

- a RS-232 connector (P3)
- A 50-pin connector (P4) that interfaces with the Disk Controller or the Printer Termination Unit
- a 26-pin connector (P5) connecting the Main IOXM to the Printer Termination Unit for annunciator relay functions (see below).

Each IOXM has four FORM-C dry contact relays providing system and process alarm contact outputs, two of which have timed outputs. Software CRU (Communication Register Unit) operations control these relays. Variable resistors VR1 and VR2 at the front edge of the main IOXM module set the time periods of the timed relays. The timing period is continuously variable from a minimum of approximately one second to a maximum of approximately 48 seconds.

Eight LEDs on the front edge of each IOXM display the status of backplane signals: PRES—, and INT1— through INT7— when switch 1 of IOXM dipswitch A is open, and INT8— through INT15— when switch 1 is closed. The associated illuminated LED indicates activity in the respective signal line.

Dipswitch DPSA consists of eight switches located near the module front edge. DPSA-1 selects the display function of the 8 LEDs on the board front edge. DPSA-2 (open-enable, closed-disable) is the watchdog timer enable/disable switch. Its setting overrides all software commands. DPSA-3 (open-utility, closed-normal) is the utility mode/normal mode switch. DPSA-4 through 8 are local status switches.

Dipswitch DPSB, having 10 switches, (U34 on the module) is at the back edge of the IOXM. DPSB-1 through 5 are IOXM Communications Register Unit base address select switches for setting IOXM global functions (functions under module backplane and data line control). DPSB-6 through 9 are watchdog timer time out select switches. These switches are set for 3, 6, 11, and 21-second time out periods. (The par-
ticular time switch is set open and the other three are set closed.) DPSB-10 is not used.

DPSC (U22) is in the middle of the IOXM board and has 8 switches. DPSC-1 through -4 are the enable/disable switches for the backplane/relays interrupt output, alarm contact output, and real time clock functions. DPSC-5 and -6 select the MFPM module load and reset switch as either local (open) or global (closed) functions. DPSC-7 and -8 are not used.

Dipswitch DPSD (U27) is an 8-switch dipswitch in the middle section of the IOXM board. This dipswitch configures the the IOXM serial I/O port. DPSD-1 and -2 set to configure the serial port as a modem or a terminal. DPSD-3 through -6 provide the power and reset signals necessary for the module microterminal. DPSD-7 connects ground to pin 1 of the serial I/O connector. According to the needs of various terminals or equipment using the serial I/O port, DPSD-7 is enabled or disabled, DPSD-8 is not used.

16-Slot Card Cage Assembly

The 16-slot Card Cage provides electromechanical interface for the PIM, MFPMs and IOXMs. A terminal block, TB1, (Figure 7.25) mounts on back of the card cage backplane and has labeled terminals for the backplane wired-in external signal and power bus inputs. The backplane also has three power-on LEDs visible from the front of the card cage: CR1, CR2, and CR3. When power is applied during normal operation these LEDs turn on indicating +5, —12 and +12 V dc respectively. Other features of the card cage backplane (see the backplane schematic, Figure 7.24) include:

- 46 bus termination resistors
- a 100-pin bus interface
- Bus Mastership daisy chain jumpers.

Plant Loop Termination Unit (NTPL01)

The NTPL01 is a 7 in. x 7 in. printed circuit board assembly having terminal blocks (TB1 and TB2) for connecting Plant Communication Loop cabling and connector P1 for coupling the LIM cable. Key components on the board used in electrical isolation, surge protection, and bypass circuits are:

- Transformers
- relays
- arc suppressors

Push-on terminals (E1 and E2) connect to the +12 V and —12 V (respectively connected to the NTPL01 +24 V and COM terminals) from the OIU Power Supply Assembly.

Printer Termination Unit

The Printer Termination Unit (Part No. 6634274-1) is a 7 in. x 7 in. board. This board interfaces the printer cable (Part No. 6634320A30-25) with its P3 connector. Its P1 and P2 connectors are tie points for the LPI/CRT IOXM 50-pin cable and the Main IOXM 26-pin cable. Terminal blocks TB1 and TB2 on the board provide connection points linking external alarm contacts. Figure 7.21 shows interface details. Jumper J1 provides isolation for the printer chassis from the OIU cabinet chassis (J1-1 & J1-2 jumpered).

Blower

The main cooling system consists of a blower assembly with associated mounting hardware. The blower uses a fractional horsepower motor with two centrifugally operated fans that have vertical exhaust. For supplemental cooling, there is a fan in the NOIU01 Disk Drive Assembly and one located between the Fixed rigid-disk drive assembly and keyboard of the NOIU02.

The Blower draws air in through the door's lower slotted inlet, filters it, and propels it upward through the 16-slot Card Cage, finally exhausting it from slotted openings in an upper section of the cabinet rear door (and/or the bottom of the NOIU02 keyboard counter). Figure 7.1 shows the cabinet blower mounting and cabinet air cooling paths for the NOIU01/03 Driver Cabinet while Figure 7.3 shows the same for the NOIU02.

NOTE: The Blower Unit Filter must be cleaned periodically.
NOIU02 CRT/Keyboard

The NOIU02 unit also includes a color graphic terminal section and a keyboard section (for the NOIU01 CRT/Keyboard console, see the following heading). The terminal mounts inside the NOIU02 and functions as an independent unit except for sharing a common AC power input and interfacing data with the rest of the OIU. See the heading: Overview — Operator Interface Unit at the beginning of this section for a general description of the interface between the CRT and keyboard sections and of the OIU, including the printer.

The CRT is an Intecolor Model 8001 or Aydin Model 5219 Terminal adapted for OIU use with unique firmware and hardware options. The AC POWER input of the terminal connects to the output receptacle of the power supply assembly (Figure 7.15).

Major components of the keyboard section include:
- the keyboard assembly
- the keyboard housing
- console counter.

The keyboard assembly (Figure 7.23) consists of:
- a switchboard assembly
- a CPU board assembly
- two key switches
- a keyboard switch cable
- a keyboard
- keylock and logo graphic plates.

Additional subassemblies of the NOIU01/NOIU03 CRT/Keyboard console include (Figure 7.22):
- the keyboard/CPU power supplies
- the Shroud Assembly
- the Base Assembly
- the Upper Back Plate
- the Lower Back Plate

NOIU01/03 CRT/Keyboard Console

Each NOIU01/03 CRT/Keyboard Console is a separate unit from the NOIU01/03 Driver Cabinet (Figure 1.2, 1.3) and consists of a color graphic terminal and a keyboard. The Keyboard hardware includes the keyboard and power supply. The Terminal functions as an independent unit except for sharing a common AC power input. Refer to the Overview — Operator Interface Unit heading at the begin-

ning of this section for a general functional interface between the CRT and keyboard section of the CRT/Keyboard Console, and the Driver Unit and the Printer.

The CRT Terminal is an Intecolor Model 8001 Terminal adapted for OIU use. Internal wiring connects the AC POWER input of the terminal to the enclosure AC PWR input (See Figure 7.14).

The keyboard assembly (Figure 7.23) is the major component in the Keyboard section of the CRT/Keyboard Console. This assembly includes the following subcomponents:
- a switchboard assembly including a CPU board assembly
- a CPU board assembly
- a keyboard switch cable
- a keyboard
- keylock and logo graphic plates.

NOIU01 Console Mechanical Details

The Upper Back Plate holds the supplemental fan assembly and joins to the back of the Shroud. The Base Assembly supports the Shroud, the CRT Terminal (not shown in Figure 7.22), the Keyboard Assembly, and the Lower Back Plate.

The Lower Back Plate of the enclosure (Figure 7.22) contains the labeled cutouts for external interface connectors and provides mounting for the power switch and AC power input connector/filter.
The Keyboard Assembly (Figure 7.23) includes:

- the Decoder Board
- the Tuning Keyswitch
- the Configuration Keyswitch
- the Switchboard Assembly.

The Assembled Chassis (Figure 7.22) provides mounting for:

- the Keyboard 5 V and ±12 V dc supplies
- the CPU board (through 1982)
- the Keyboard RS-232 interface connector
- the fan cord receptacle
- fuses F1 and F2
- two power circuit terminal blocks.

NOIU03 Mechanical Details

Otherwise similar, the NOIU03 console sports short-haul modem mounting brackets and power outlets. The added air conditioner has a thermostat accessible when the external air filter is removed.

Printer

Refer to appropriate Model 3400, 3404, or 3410 Matrix Impact Printer Service Manual, Genicom No. GEK-884 □ □ (see printer label).

Console Array Assembly

The Console Array is a custom assembly. This assembly may include one or more Utility Console Cabinets (NUCC01), Console Work Stations (NCWS01), Console Printer Surfaces (NCPS01), 15-degree Wedge Consoles (NPIE01), and/or Operator Chair (NOCS01) either as a separate assembly or integrated with one or more NOIU02 Operator Interface Units (Figure 1.5).
Section III
Installation and Start-Up

Unpacking and Visual Inspection

Upon receipt of the OIU hardware, examine the shipping crates for damage. Report any observed damage immediately to the carrier. If immediate repair or replacement is necessary, notify the nearest Bailey sales office.

If the OIU hardware is not to go into service immediately, keep it packaged in the original shipping crates. If placing the OIU hardware in storage, maintain the storage environment as specified in Section V of this manual (Specifications).

OIU Installation

Refer to Bailey Controls Product Information PIE93-900-5 “Site Planning Preparation and Equipment Installation” for site selection, preparation, and hardware installation of the NETWORK 90 control system, including the OIU. PIE93-900-5 includes requirements and/or recommendations for the following items:

- load bearing of floors
- space around equipment
- temperature
- humidity
- shock and vibration
- AC power wiring
- AC power and DC signal common grounding
- uninterruptible power supplies
- radio frequency and electromagnetic interference
- electrostatic discharge
- lightning
- equipment protection
- equipment handling and storage.

Options

Input Power Other Than 120 V ac

Where the input power source is other than 120 V ac, a stepdown or stepup transformer (as applicable) must be installed external to the OIU Hardware. The external transformer must provide 102 to 132 V ac over the range of the available input power source. This transformer must also have sufficient power for the OIU hardware (See Section V for power requirements and consumption). Figure 7.10 shows the stepdown autotransformer, Bailey P/N 1947492-1, that is available for installation with the OIU for non-USA and non-Canadian 240 V ac input power sources.

BASIC Option

If the OIU is to have the BASIC option, insert the BASIC MFPM and IOXM pair (if not already installed) in slots 13 and 14 respectively of the 16-slot Card Cage. Verify that jumper J30 is removed. (J30 is on the Card Cage backplane and at the top left of J14 as viewed from the front of the NOIU01 Driver Unit or the NOIU02.)

Logging Option

If the OIU is to have the logging option, the Logging MFPM, if not already installed, should be inserted in slot 12 of the 16 slot card cage. Verify that jumper J28 (located on 16 slot card cage backplane and at the top left of J12 as viewed from the front of the NOIU01 Driver Unit or NOIU02) has been removed.

AUX LP Option

If the OIU is to have the AUX LP/CRT option, insert the AUX LP/CRT MFPM and IOXM pair (if not already installed) in slots 15 and 16 respectively of the 16-slot Card Cage. Verify that jumper J31 is removed.

**CAUTION**

Do not insert or remove circuit cards with the power on.

**ATTENTION**

Ne pas insérer ou retirer les cartes de circuits imprimes sans interrompre l'alimentation.
CAUTION

These modules contain metal oxide semi-conductor (MOS) devices. MOS devices require attention during shipping and handling to avoid damage from static discharge and improper grounding. Bailey Controls ships the card in a special anti-static bag. DO NOT remove the card from its bag until ready to put into service. Save the bag for future use. Ground the bag before opening. NEVER touch the circuitry when handling the card.

ATTENTION

Ces modules sont munis de dispositifs MOS. Les dispositifs MOS sont susceptibles d'être endommagés par des décharges statiques et une mauvaise mise à la terre; elles nécessitent donc des précautions particulières lors de l'expédition et de la manutention. Les cartes de circuits imprimés sont expédiées par Controle Bailey dans des sacs spéciaux anti-statiques. Ne retirer la carte de son sac qu'au moment l'installation. Conserver le sac pour usage ultérieur. Effectuer la mise à la terre du sac avant d'ouvrir celui-ci. Ne JAMAIS toucher directement aux circuits de la carte.

NOIU01 Driver Unit/NOIU02 Installation

Verify that power sources are de-energized. Install the NOIU01/03 Driver Cabinet per Figure 7.1, verifying cables and wiring are connected according to Figure 7.13. Install the NOIU02 per Figure 7.3, verifying cables and wiring are connected according to Figure 7.15.

Power Wiring and Grounding

The recommended minimum size for power wiring to the NOIU01 Driver Cabinet or NOIU02 is No. 12 AWG minimum with a 600 V, 75°C rating and thermoplastic insulation. Wire with a 300 V or 150 V rating is also usable provided it is acceptable by local wiring codes, is protected by cable trays or conduit, and is suitable for service voltage. Do not use wiring rated at 150 V for 240 V distribution. If the installation environment to contain the NOIU01 Driver Cabinet or NOIU02 does not allow internal equipment temperature to exceed 60°C, wiring rated at 60°C is also usable.

Power wiring to the NOIU01/03 Driver Cabinet or NOIU02 must include a third-wire grounding conductor. The grounding conductor must not be of smaller gauge than the power wiring, and must be either bare or green colored if insulated. The grounding conductor must terminate at the system safety ground connection. Figure 7.1 shows the location of this connection for the NOIU01/03 Driver Cabinet while Figure 7.3 shows it for the NOIU02.

Size the overcurrent protection (protects the power wiring) provided for your AC distribution to allow for the inrush current required by the OIU hardware. Section V details the peak inrush current and duration for each unit of the OIU hardware.

For other power wiring and grounding, such as line conditioning, electromagnetic interference (EMI) refer to Product Information PIE93-900-5, “Bailey NETWORK 90 Site Planning, Preparation, and Equipment Installation.

Plant Loop Termination

Wire the NKPL01 Plant Loop cable (see Product Instruction IE93-915-6) to the OIU Plant Loop Termination Unit (NTPL01) per Figure 7.12 wire list. Figure 7.12 contains details of a plant loop communication interconnection with a redundant loop. Figure 7.12 also details the TB1 and TB2 termination connections for the NTPL01. Figure 2.3 shows the location of the NTPL01 in the NOIU01/03 and Figure 2.4 shows the location for the NOIU02.
NOIU01/03 CRT/Keyboard Console Installation

Verify power sources are de-energized and install the Operator Console per Figure 7.2. Connect 120 V ac, 15 A power to the terminal blocks of the NOIU01/03 CRT/Keyboard Console. If the CRT/Keyboard Console does not have the optical isolation feature, it is suggested that the Console and Driver Cabinet have the same source of power and grounding. This prevents data errors due to a difference in ground potentials.
Connect CRT/Keyboard Console cables as in the following steps.

STEP 1 — "CRT" to LP/CRT IOXM (slot 11), P3.
STEP 2 — "OIU Keyboard" to Main IOXM (slot 2), P3.

**Inspection Before Operation**

Verify the following items before applying power (Step 6) and starting operation:

1. Modules and cards are secure within respective card cage or plug-in mountings.

2. Circuit boards are securely inserted into edge connectors.

3. Dark edge (or color strip on ribbon cables) corresponds with the first pin of respective connector junctions and connectors are securely joined.

4. All mounted components are securely in place.

5. Jumpers to the left of each MFPM board on the 16-slot Card Cage are removed. These jumpers are accessible from the front of the NOIU01/03 Driver Unit or NOIU02.

   Connect power cables to the NOIU01/03 cabinet and console or to the NOIU02.

   Set the power switch on the printer to OFF. Place the Disk Drive Assembly power switch of NOIU01/03 Driver Cabinet to the ON position.

   6. Apply power to the respective OIU units and verify that:

      - the NOIU01/03 Driver Cabinet and NOIU02 Cabinet Blower starts.
      - the Disk Drive Fan starts.
      - the three Card Cage power bus LEDs light up.
      - the NOIU01/03 CRT/Keyboard Console fan motors start.
      - the Power On indicator lights up

   7. Remove power from the OIU units.

---

**NOIU01/03 Driver Cabinet and NOIU02 Setup**

**Disk Drive Power Supply Setup**

**NOTE:** Bailey Controls sets these power supplies during factory checkout. Experience has shown that these supplies can be checked once annually.

Perform the following steps using a Digital Voltmeter for testing.

**STEP 1** (NOIU01/03 Driver Cabinet Only). Remove attaching screws and top cover of the Driver Unit. Remove attaching screws and Disk Drive Assembly top cover.

**STEP 2** Apply power to NOIU01 Driver Unit or NOIU02.

**STEP 3** Locate the 6-pin DC power connector to Diskette Drive. Using the voltmeter probes at the appropriate connector lead-in voltage and voltage return wires (Figure 3.2), measure the following voltages.

- 5 V ± 0.1 V dc - Pos. to brown (Pin 5); Ref. to blue (Pin 6)
- 5 to ± 0.1 V dc - Neg. to white (Pin 4); Ref. to blue (Pin 3)
- +24 V ± 0.2 V dc - Pos. to orange (Pin 1); Ref. to red (Pin 2).

**STEP 4** If voltages are out of tolerance, remove power from the NOIU01 Driver Cabinet or NOIU02 and complete steps 5 through 11. Otherwise, replace top covers of the NOIU01 Disk Drive Assembly and Driver Unit (NOIU01 only).

**STEP 5** (NOIU01/03 Driver Cabinet Only) Disconnect the line cord at the Power Distribution Module rear panel J3 DISK outlet. Cut any cable ties retaining the line cord. Disconnect ribbon cable from connector at the rear of the Disk Drive Assembly.
STEP 6 — (NOIU01 Driver Cabinet Only) Remove screws attaching the Disk Drive Assembly to the Driver Unit rails. Remove assembly from the Driver Unit, placing it upside down on work bench. Remove the seven screws holding the back of the disk enclosure in place. Slide back plate out of disk enclosure, locating the power supply (see Figure 7.16). Connect the line cord of NOIU01/03 Disk Drive Assembly to an energized 120 V ac receptacle or apply power to the NOIU02 as applicable. Referring to Figure 3.3 (NOIU01/03) or 3.4 (NOIU02), adjust the output voltages as below.

FIGURE 3.2 — Disk 6-Pin dc Supply Connectors with Leads Identified.

WARNING

Exercise extreme caution when performing the following checks. Circuit must be energized while performing checks.

AVERTISSEMENT

Faire preuve d'une grande vigilance en effectuant les test suivants. Le circuit doit être sous tension au moment des tests.

STEP 7 — +5 V adjustment — Connect the "ground" lead of the voltmeter to the "+5 RET" (NOIU01/03) or "±5 V COM" (NOIU02) terminal on the power supply. Connect the "+" lead of the voltmeter to the "+5 OUT" (NOIU01/03 or "+5 V" (NOIU02) terminal on the power supply. Using the "+5 V ADJUST" trim potentiometer on the power supply, adjust the output for 5 V, ±0.05 V dc.

STEP 8 — −5 V Adjustment — Connect the "ground" lead of the voltmeter to the "−5 V −12 RET" (NOIU01/03) or the "+5 V COM" (NOIU02) terminal of the power supply. Connect the "+" lead of the voltmeter to the "−5 −12 OUT" (NOIU01/03) or "−5 V" (NOIU02) terminal on the power supply. Using the "−5 V ADJUST" trim potentiometer, adjust the output voltage for −5 ±0.05 V dc.

STEP 9 — 24 V adjustment — Connect the "ground" lead of the voltmeter to the "+24 RET" (NOIU01/03) or "+24 V COM" (NOIU02) terminal on the power supply. Connect the "+" lead of the voltmeter to the "+24 OUT" (NOIU01/03)
FIGURE 3.3 — NOIU01/03 Driver Cabinet Disk Power Supply Adjustment

FIGURE 3.4 — NOIU02 Disk Power Supply Adjustment
or "+24 V" (NOIU02) terminal on the power supply. Using the "24 V ADJUST" trim potentiometer on the power supply, adjust the output voltage for 24 V, ±0.1 volts dc.

STEP 10 — Disconnect the NOIU01/03 Disk Drive Assembly line cord or remove power from the NOIU02 as applicable.

STEP 11 — (NOIU01/03 Driver Cabinet Only) Reassemble and reinstall the Disk Drive Assembly, reversing the operations of Steps 1, 5, and 6.

**Power Rack Assembly DC Power Supply Setup**

Perform the following steps using a digital voltmeter while referring to Figures 7.19 and 7.25.

STEP 1 — Open rear door of OIU cabinet, locate TB1 of the 16 slot card cage and the Power Rack supply units, and verify AC power is on.

STEP 2 — Connect voltmeter (Neg. to card cage TB1-1, Pos. to card cage TB1-4) and adjust "5 V ADJUST" for a voltmeter reading of 5 ±.05 V dc.

STEP 3 — Connect voltmeter positive lead to card cage TB1-8 and adjust upper lefthand power supply turnpot for a voltmeter reading of 12 ±.05 V dc.

STEP 4 — Connect voltmeter positive lead to card cage TB1-7 and adjust lower lefthand power supply turnpot for a voltmeter reading of −12 ±.05 V dc.

**NOTE:** Bailey Controls sets these modules up during factory checkout. Experience has shown that these supplies can be checked once annually.

**NOIU01/03 CRT/Keyboard Console Setup**

STEP 1 — Remove back (See Section IV procedure) for access to power supplies, CRT, and adjustments.

STEP 2 — Measure power supply voltages (Figure 3.5). The voltage must measure as below:

- 5 ±0.1 V dc
- 12 ±0.6 V dc
- ±12 ±0.6 V dc

Only the 5 V dc is adjustable. Readjust or replace as necessary.

**Module Setups (LIM, BTM, LSM02, MFPM, IOXM, PIM)**

**NOTE:** Bailey Controls sets these modules up during factory checkouts. The following information is useful where module replacement becomes necessary or switch settings become inadvertently changed.

**Loop Interface Module (LIM) Setup**

Refer to Figure 3.6 for locations of LIM setup components. Perform the setup as below.

**Switch S1** S1 selects the event or error counter to display on the LED Display Port. S1 can be set and not interfere with normal LIM operation. Set positions 1, 2, 5, 6, and 8 of S1 to a logic 0 (closed). Set positions 3, 4, and 7 to a logic 1 (open).

**Switch S2** S2 contains the address of the OIU. Set positions 1 and 2 to a logic 0 (closed). Set positions 3 through 8 to a binary value in the range 1 to 63.

**EXAMPLE:** 1 2 3 4 5 6 7 8 0 0 1 0 1 0 0 1 = 41

The Loop Interface Module Product Instruction, E93-908-1 provides the binary equivalents for 1 through 63.

**Jumpers** — Locate detail of J1 and J2 on Figure 3.6 and verify that posts 1 and 2 are connected for a standard U4 socket setting for Type 2532 and 25L32 EPROMs. Figure 3.6 also shows Type 2732 EPROM jumper settings.

**NOTE:** These jumpers are set at the factory and should not have to be changed. This information is provided for user's knowledge.
Bus Transfer Module (BTM) Setup

Refer to Figure 3.7. The BTM contains one pushbutton RESET switch and one 5-pole dipswitch. Perform the setup as below.

Switch S1  S1 selects either normal operation or testing conditions. For normal operation, set positions 1 through 5 to a logic 0 (closed). Position 2 through 4 can define software execution codes and offline testing (see the Product Instruction IE93-905-2, Enhanced Computer Interface Unit). The BTM does not use positions 1 and 5. The CIU firmware sets the module address rather than using a switch.

Loop Storage Module (LSM02) Setup

Refer to Figure 3.8. The LSM02 contains two PC boards: CPU and MEM. The CPU board has two 8-pole dipswitches (U72 and U73, one 5-pole dipswitch (U75), a STOP switch (SW2), a pushbutton RESET switch (SW1), and three jumpers (J1, J2, and J3). The MEM board has no user-configurable components. Figure 3.8 shows the LSM02 board and setup component locations.
TABLE 1

<table>
<thead>
<tr>
<th>P/N</th>
<th>25L32</th>
<th>2532</th>
<th>2732</th>
<th>COMP. DES.</th>
</tr>
</thead>
<tbody>
<tr>
<td>JUMPER</td>
<td>STD. POS.</td>
<td>ALT. POS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J1</td>
<td>2</td>
<td>2</td>
<td>+1</td>
<td>U4</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>J2</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IF 1947466-1 (25L32) IS NOT AVAILABLE
1947467-1 (2532) CAN BE SUBSTITUTED
OR 1947468-1 (2732) CAN BE USED BUT
REQUIRES ALTERNATE JUMPER POSITIONS
PER TABLE 1

FIGURE 3.6 — LIM Setup Components

FIGURE 3.7 — BTM Setup Components
FIGURE 3.8 — LSM02 Setup Components (CPU Board)

Perform LSM02 setup as below.

Switch U72  U72 selects I/O functions. For standard operation, set positions 2, 4, 7 to logic 1 (open).

Switch U73  U73 selects the transmission baud rates for the two RS232C ports of the NTMF01 termination unit (between 50 and 19,200). Set positions 1 through 8 to logic 1 (open).

Switch U75  U75 selects the NCIU02 binary port address corresponding to the decimal LSM02 module address equivalent (between 0 and 31). Set positions 1 through 5 to logic 0 (closed).

NOTE: Refer to Product Instruction IE93-095-2 for more detail on all options for the closed and open and pole positions of the LSM02 CPU board dipswitches. For the selected address port switch positions of U75 to be effective, pole 6 of switch U72 must be set to a logic 1 (Open or Off).
**TABLE 3.1 — Switch U73 Baud Rates**

1 = OPEN = OFF; 0 = CLOSED = ON

<table>
<thead>
<tr>
<th>POLE Settings</th>
<th>PORT 0</th>
<th>PORT 1</th>
<th>BAUD RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>Settings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>50</td>
</tr>
<tr>
<td>1</td>
<td>0 0 0 0</td>
<td>1 0 0 0</td>
<td>75</td>
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<tr>
<td>0</td>
<td>1 0 0 0</td>
<td>0 1 0 0</td>
<td>110</td>
</tr>
<tr>
<td>1</td>
<td>1 0 0 0</td>
<td>1 1 0 0</td>
<td>134.5</td>
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<tr>
<td>0</td>
<td>0 1 1 1</td>
<td>0 0 1 1</td>
<td>150</td>
</tr>
<tr>
<td>1</td>
<td>0 1 1 0</td>
<td>1 0 1 0</td>
<td>300</td>
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<td>600</td>
</tr>
<tr>
<td>1</td>
<td>1 1 0 1</td>
<td>1 1 1 0</td>
<td>1.2 K</td>
</tr>
<tr>
<td>0</td>
<td>0 0 1 1</td>
<td>0 0 0 1</td>
<td>1.8 K</td>
</tr>
<tr>
<td>1</td>
<td>0 0 1 1</td>
<td>1 0 0 1</td>
<td>2.0 K</td>
</tr>
<tr>
<td>0</td>
<td>1 0 1 1</td>
<td>0 1 0 1</td>
<td>2.4 K</td>
</tr>
<tr>
<td>1</td>
<td>1 0 1 1</td>
<td>1 1 0 1</td>
<td>3.6 K</td>
</tr>
<tr>
<td>0</td>
<td>0 1 1 1</td>
<td>0 0 1 1</td>
<td>4.8 K</td>
</tr>
<tr>
<td>1</td>
<td>0 1 1 1</td>
<td>1 0 1 1</td>
<td>7.2 K</td>
</tr>
<tr>
<td>0</td>
<td>1 1 1 1</td>
<td>0 1 1 1</td>
<td>9.6 K</td>
</tr>
<tr>
<td>1</td>
<td>1 1 1 1</td>
<td>1 1 1 1</td>
<td>19.2 K</td>
</tr>
</tbody>
</table>
### TABLE 3.2 — Switch U75 — Port Addresses

1 = OPEN = OFF; 0 = CLOSED = ON

<table>
<thead>
<tr>
<th>PORT ADDRESS DECIMAL</th>
<th>POLE NUMBER</th>
<th>PORT ADDRESS DECIMAL</th>
<th>POLE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 0 0 0 0</td>
<td>16</td>
<td>1 0 0 0 0</td>
</tr>
<tr>
<td>1</td>
<td>0 0 0 0 1</td>
<td>17</td>
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<td>0 0 0 1 0</td>
<td>18</td>
<td>1 0 0 1 0</td>
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<td>3</td>
<td>0 0 0 1 1</td>
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<td>4</td>
<td>0 0 1 0 0</td>
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<td>5</td>
<td>0 0 1 0 1</td>
<td>21</td>
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<tr>
<td>6</td>
<td>0 0 1 1 0</td>
<td>22</td>
<td>1 0 1 1 0</td>
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<tr>
<td>7</td>
<td>0 0 1 1 1</td>
<td>23</td>
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<tr>
<td>8</td>
<td>0 1 0 0 0</td>
<td>24</td>
<td>1 1 0 0 0</td>
</tr>
<tr>
<td>9</td>
<td>0 1 0 0 1</td>
<td>25</td>
<td>1 1 0 0 1</td>
</tr>
<tr>
<td>10</td>
<td>0 1 0 1 0</td>
<td>26</td>
<td>1 1 0 1 0</td>
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<td>11</td>
<td>0 1 0 1 1</td>
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<td>12</td>
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<td>13</td>
<td>0 1 1 0 1</td>
<td>29</td>
<td>1 1 1 0 1</td>
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<td>14</td>
<td>0 1 1 1 0</td>
<td>30</td>
<td>1 1 1 1 0</td>
</tr>
<tr>
<td>15</td>
<td>0 1 1 1 1</td>
<td>31</td>
<td>1 1 1 1 1</td>
</tr>
</tbody>
</table>

### Multi-Function Processor Module (MFPM) Setup

The MFPM module contains jumper posts, one resistor pack (U47) and one dipswitch (Figure 3.9). For proper OIU operation, all these components must be correctly set. Figure 3.9 shows the component setup for the NMFP01 Printed Circuit (PC) Board, while Figures 3.10 and 3.11 show the NMFP02 PC Board, and the NMFP01 Multiwire Board. Refer to Table 3.3 for standard MFPM component setups.
*Jumper posts E20, E21, E22 on NMFP03 only. (4/15/87 NMFP03 replaced NMFP02).

FIGURE 3.9 — NMFP01 Setup Components (PC Board)

FIGURE 3.10 — NMFP02 Setup Components (PC Board)
FIGURE 3.11 — NMFP01 Setup Components (Multiwire Board)
**TABLE 3.3 — MFPM Component Setup**

1 = OPEN = OFF; 0 = CLOSED = ON

<table>
<thead>
<tr>
<th>SWITCH</th>
<th>DESCRIPTION</th>
<th>1 = OPEN = OFF</th>
<th>0 = CLOSED = ON</th>
<th>MAIN MFP (SLOT 1)</th>
<th>DBP MFP (SLOT 4)</th>
<th>DISK MFP (SLOT 7)</th>
<th>LPICRT MFP (SLOT 10)</th>
<th>AUX LP MFP (SLOT 15)</th>
<th>BASIC MFP (SLOT 13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPSW-1</td>
<td>Module Address</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>DPSW-2</td>
<td>Module Address</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DPSW-3</td>
<td>Module Address</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DPSW-4</td>
<td>Master/Slave Control</td>
<td>Slave (1)</td>
<td>Master (0)</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DPSW-5</td>
<td>Auto Test Mode</td>
<td>Enabled (1)</td>
<td>Disabled (0)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DPSW-6</td>
<td>Auto Load After Reset</td>
<td>Enabled (1)</td>
<td>Disabled (0)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DPSW-7</td>
<td>Debug Baud Rate</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DPSW-8</td>
<td>Debug Baud Rate</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Resistor Pack U47 (1.0K ohms)  
Installed Removed Removed Removed Removed Removed

E18 - 19 or J18 - J19  
Installed Removed Removed Removed Removed

---

**Fixed Jumper Settings:**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>27128 (28-pin ROM)</strong></td>
<td>E1-E2, E3-E6,E9-E11,E11-E12,E14-E15</td>
<td></td>
</tr>
<tr>
<td><strong>1400 Tag/128 kbyte</strong></td>
<td>E20-E21</td>
<td></td>
</tr>
<tr>
<td><strong>5000 Tag/512 kbyte</strong></td>
<td>E21-E22</td>
<td></td>
</tr>
</tbody>
</table>

*Debug Baud Rate

| 19.2 K (Standard) | 0 | 0 |
| 9.6K              | 0 | 1 |
| 1.2 K             | 1 | 0 |
| .3 K              | 1 | 1 |

** NMFP02 and NMFP03
** NMFP03 only (4/15 NMFP03 replaces NMFP02)

---

**Processor Interface Module (PIM) Setup**

Verify that the PIM is set up according to Figure 3.12.

---

**Input/Output Expansion Module (IOXM) Setup**

The IOXM has four dipswitches and one resistor pack used to configure the module. Table 3.4 shows definitions, functions, and standard settings for the switches and resistors, while Figure 3.13 shows the setup component locations.
FIGURE 3.12 — PIM Setup Components

FIGURE 3.13 — IOXM Setup Components
<table>
<thead>
<tr>
<th>SWITCH</th>
<th>DESCRIPTION</th>
<th>1 = OPEN 1 = OFF</th>
<th>0 = CLOSED 0 = ON</th>
<th>Main IOX (SLOT 2)</th>
<th>DBP IOX (SLOT 5)</th>
<th>DISK IOX (SLOT 8)</th>
<th>LPI CRT IOX (SLOT 11)</th>
<th>AUX LP IOX (SLOT 15)</th>
<th>BASIC IOX (SLOT 14)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPSA-1</td>
<td>LED Display Control</td>
<td>Reset, Int 1-7</td>
<td>Int 8-15</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSA-2</td>
<td>&quot;Watch Dog&quot; Timer</td>
<td>Enable</td>
<td>Disable</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DPSA-3</td>
<td>System Mode</td>
<td>Utility Mode</td>
<td>Normal Mode</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DPSA-4</td>
<td>Main IOX</td>
<td>Reserved</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disk IOX</td>
<td>Floppy</td>
<td>Winchester</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>LPI CRT IOX CRT Baud Rate</td>
<td>38.4 K</td>
<td>9.6 K</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>BASIC IOX</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0</td>
</tr>
<tr>
<td>DPSA-5</td>
<td>Load Mode</td>
<td>Debug Mode</td>
<td>Normal Mode</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DPSA-6</td>
<td>Main IOX, Keyboard Type</td>
<td>Bailey Keyboard CPU</td>
<td>Data Panel Keyboard CPU</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Disk IOX</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>LPI CRT IOX Printer Type</td>
<td>Genicom 3404</td>
<td>Okidata</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>BASIC IOX</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>DPSA-7</td>
<td>Main IOX</td>
<td>Reserved</td>
<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td></td>
<td>Disk IOX</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>LPI CRT IOX Plot Char. Color Diff. on Hard Copy</td>
<td>Disable</td>
<td>Enable</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td>—</td>
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<td>BASIC IOX</td>
<td>Reserved</td>
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<td>—</td>
<td>0</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0</td>
</tr>
<tr>
<td>DPSA-8</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>0</td>
<td>*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*For 8 inch Winchester fixed drive and "1403" controller set to "Closed". Refer to Table 3.4B for variations based on drive, controller, and tag count capacity.
<table>
<thead>
<tr>
<th>SWITCH</th>
<th>DESCRIPTION</th>
<th>1 = Open = OFF</th>
<th>0 = Closed = ON</th>
<th>MAIN IOX (SLOT 2)</th>
<th>DBP IOX (SLOT 5)</th>
<th>DISK IOX (SLOT 8)</th>
<th>LPC/RT IOX (SLOT 11)</th>
<th>BASIC IOX (SLOT 14)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPSB-1</td>
<td>CRU Base Address</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>U34</td>
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<tr>
<td>DPSB-2</td>
<td>CRU Base Address</td>
<td>1</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSB-3</td>
<td>CRU Base Address</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSB-4</td>
<td>CRU Base Address</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSB-5</td>
<td>CRU Base Address</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSB-6</td>
<td>&quot;Watchdog&quot; Timeout Deselected</td>
<td>3 sec</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DPSB-7</td>
<td>&quot;Watchdog&quot; Timeout Deselected</td>
<td>6 sec</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DPSB-8</td>
<td>&quot;Watchdog&quot; Timeout Deselected</td>
<td>11 sec</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DPSB-9</td>
<td>&quot;Watchdog&quot; Timeout Deselected</td>
<td>21 Sec</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSB-10</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSC-1</td>
<td>Backplane Relay Control Enable Disable</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>U22</td>
</tr>
<tr>
<td>DPSC-2</td>
<td>Interrupt Control Enable Disable</td>
<td>1</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>DPSC-3</td>
<td>Alarm Contact Control Enable Disable</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>DPSC-4</td>
<td>Clock Control Enable Disable</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>DPSC-5</td>
<td>Load Control Local Global</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>DPSC-6</td>
<td>Reset Control Local Global</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>DPSC-7</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSC-8</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>
### TABLE 3.4 — IOXM Component Setup Continued (Standard Settings)

<table>
<thead>
<tr>
<th>Switch</th>
<th>Description</th>
<th>1 = OPEN = OFF</th>
<th>0 = CLOSED = ON</th>
<th>Main IOX (SLOT 2)</th>
<th>DBP IOX (SLOT 5)</th>
<th>DISK IOX (SLOT 8)</th>
<th>LPI/CRT IOX (SLOT 11)</th>
<th>BASIC IOX (SLOT 14)</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPSD-1</td>
<td>Tie RTS to CTS</td>
<td>Disable</td>
<td>Enable</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>U27</td>
</tr>
<tr>
<td>DPSD-2</td>
<td>CTS on Pin 16</td>
<td>Disable</td>
<td>Enable</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>All DPSD</td>
</tr>
<tr>
<td>DPSD-3</td>
<td>+12 V on Pin 12</td>
<td>Disable</td>
<td>Enable</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Functions</td>
</tr>
<tr>
<td>DPSD-4</td>
<td>+5 V on Pin 14</td>
<td>Disable</td>
<td>Enable</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Apply to</td>
</tr>
<tr>
<td>DPSD-5</td>
<td>-12 V on Pin 13</td>
<td>Disable</td>
<td>Enable</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>RS232</td>
</tr>
<tr>
<td>DPSD-6</td>
<td>Reset on Pin 16</td>
<td>Disable</td>
<td>Enable</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DPSD-7</td>
<td>Ground on Pin 1</td>
<td>Disable</td>
<td>Enable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DPSD-8</td>
<td>Reserved</td>
<td>—</td>
<td>—</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
</tr>
</tbody>
</table>

Resistor Pack U85 (4.7 K ohms): Installed Removed Removed Removed Removed

### TABLE 3.4B — Disk IOXM Settings for Fixed Drive Variations

<table>
<thead>
<tr>
<th>SWITCH DPSA-7</th>
<th>SWITCH DPSA-8</th>
<th>MFP TYPE</th>
<th>CONTROLLER</th>
<th>DRIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>MFP01 or MFP02</td>
<td>1403</td>
<td>SA 1004, SA 1002</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>MFP01</td>
<td>DTC 535</td>
<td>ST 212, TM 252</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>MFP02</td>
<td>OMTI 5200 (DTC 520D)</td>
<td>ST 212, TM 252</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>MFP01</td>
<td>OMTI 5200 (DTC 520D)</td>
<td>ST 212, TM 252</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>MFP02</td>
<td>OMTI 5200 (DTC 520D)</td>
<td>225*</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>MFP01 or MFP02</td>
<td>OMTI 5200 (DTC 520D)</td>
<td>ST213</td>
</tr>
</tbody>
</table>

MFP01 = 128 KB MFP Boards  
MFP02 = 512 KB MFP Boards (only on 5000 Tag Units)

ST 212 = 4 Heads, 306 cylinders, 10 Megabytes  
ST 225 = 4 Heads, 612 cylinders, 20 Megabytes  
ST 213 = 2 Heads, 612 cylinders, 10 Megabytes

*Not covered in 1400 Tag software, only 5000 Tag software
Printer Installation and Set Up

Genicom Printer
To set up the Printer, perform the steps below.

STEP 1 Prepare the printer for use, removing packaging material, installing printer ribbon and paper, and connecting the power cord per Chapter 2 of the Genicom Operator's Manual.

STEP 2 Turn the printer on (the power switch is at the rear of the printer and above the power cord connection).

STEP 3 The printer display now indicates either Lo (live off) or On (on-line). If the printer displays On, depress the ON LINE pushbutton momentarily. This changes the display to Lo.

STEP 4 Place both the LOAD and PROGRAM switches to the UP position. These switches are inside the printer at the right rear side (viewed from the front). Access the switches by lifting up the front edge of the top rear cover. After placing the switches to UP, the printer display indicates SU.

STEP 5 Depress the TEST pushbutton switch momentarily. The display changes first to IS and then to 8.8. After a few seconds the display reverts to SU.

STEP 6 Place the LOAD switch in the DOWN position. (The PROGRAM switch must stay in the UP position.) The display changes to Lo.

STEP 7 Depress the PRG pushbutton switch momentarily. The display changes to P9 and a listing of the printer configuration prints out.

STEP 8 Depress the No. 4 pushbutton switch momentarily. This selects Interface Controls for modification. A listing of Interface Controls modification options prints out.

STEP 9 Depress the No. 1 pushbutton switch momentarily. This selects Interface Type for modification. A listing of Interface Type modification options prints out.

STEP 10 Depress the No. 2 pushbutton switch momentarily. This selects “Centronics” as the interface type. The printer now lists the interface type as “Centronics.”

STEP 11 Depress pushbutton 2 momentarily to select LPI menu. Depress pushbutton 4 to select 8 LPI.

STEP 12 Depress the No. 0 pushbutton switch momentarily. This returns the printer to normal operation. The printer display now indicates Lo.

STEP 13 Depress the ON LINE pushbutton switch momentarily. The printer display now indicates On.

STEP 14 Connect one end of the printer cable, Bailey Controls P/N 6634330-3ON25, to the P3 connector of the Printer Termination Unit in the NOIU01 Driver Unit cabinet or in the NOIU02. Secure the male cable connector in place using the bail locks of P3. Connect the other end of the printer cable to the 36-pin “Centronics” type connector at the left rear (viewed from the rear) of the printer. Secure the male cable connector in place using the bail locks of the female printer connector.

NOTE: Do not use the 25-pin DB type connector at the rear of the printer.

STEP 15 Connect one end of the static ground strap (supplied with paper basket) to the paper basket and the other end to the terminal under the 25-pin DB type connector at the rear of the printer.

Handling/Inserting Floppy Diskettes

Handling floppy diskettes with care as detailed below extends their useful life and minimizes the risk of losing their valuable stored data.

When inserting a floppy diskette into the OIU diskette drive, insert it carefully. Do not force it in or use so much force that the diskette bends. If meeting resistance on insertion that causes the diskette to bend, check for misalignment of the diskette with the drive. Withdraw the diskette from the drive and reinsert it.
When handling floppy diskettes, do not bend nor fold them. Bending or creasing a diskette makes is unusable and renders any previously stored data thereon unretrievable. Although floppy diskettes are flexible, they are not designed to bend more than that necessary during normal operation in the diskette drive.

Never touch the exposed recording surface of a diskette. The surface is fragile and easily scratched by fingernails or other foreign objects. Scratching the magnetic recording surface causes loss of stored data rendering the diskette unusable. Touching the recording surface deposits body oils enabling dust particles to stick to it. Dust buildup under the diskette jacket or on the diskette drive head can scratch the diskette recording surface.

When a diskette is not in use, store it inside its envelope. The envelope protects the exposed diskette recording surface from accidental contact and dust buildup. Storing diskettes in hard plastic-enclosed diskette library cases provides additional protection. (Such diskette library cases are readily available from office and computer supply houses.)

Never try to clean the diskette recording surface. Brushing or rubbing the recording surface scratches it. Never smoke near diskettes. Carelessly dropped hot ashes or embers can damage the diskette.

Do not write on the plastic jacket using either pencils or ball point pens. Hard tipped writing implements can damage the recording surface under the jacket. Mark the necessary identification on adhesive backed labels before affixing such labels to the jacket. If wiring on labels already affixed to the jacket, press lightly using a felt tip pen.

Keep diskettes away from magnetic fields. Magnetic fields can accidentally erase or damage stored data. Never lay diskettes on electrical or electronic equipment (printers, computers, oscilloscopes, and so on). Motors, transformers, dot matrix printer heads, and other such equipment generate magnetic fields that can erase or damage data stored on diskettes if the diskettes are placed near them.

Keep bulk magnetic erasers away from the OIU work area. Keep such erasers in a separate, or service area. When required to erase diskettes, take them to the bulk eraser instead of bringing the bulk eraser to the OIU work area. Keeping the bulk eraser away from the OIU work area minimizes damage or accidental erasure of stored data.

Do not store or use diskettes at a temperature less than 10°C (50°F) or greater than 52°C (125°F). Diskettes become brittle and if flexed at extremely low temperature, can split or crack. At extremely high temperature the diskette jacket can warp. If the jacket warps, the diskette either cannot insert into the diskette drive or, if it does insert, cannot function properly. Always keep diskettes away from heat sources like direct sunlight or the heated exhaust of electrical equipment.

When required to store data on an OIU floppy diskette, always ensure the diskette has a Write Enable tag covering its Write Protect slot before inserting the diskette into its drive (see Figure 3.14).

When inserting a diskette into the NOIU01/03 diskette drive, orient the diskette horizontally so that its identification label is on the UPPER facing surface (faceup) and the edge having the Write Protect slot (covered by a Write Enable Tag if desiring data storage) fits into the drive first (Figure 3.15). Insert the diskette completely into the drive. While holding the diskette in position inside the drive, close and latch.

![Figure 3.14 — OIU Floppy Diskette](image-url)
the drive door. (Push the edge of the diskette gently upwards with your fingertips while sliding the diskette door downward with your thumb. After the drive door moves as far as it can go it latches in place.)

NOTE: Some Floppy Diskette do not have a Write Protect slot and do not require a Write Enable tag.

When inserting a floppy diskette into the NOIU02 diskette drive orient the diskette vertically so that its identification label is on the right facing surface (right side) and the edge having the Write Protect slot (covered by a Write Enable tag if desiring data storage) fits into the drive first (see Figure 3.16). Insert the diskette into the drive, close and latch the drive door. (Push the diskette gently to the left with your fingertips while sliding the drive door to the right with your thumb. After the door moves as far as it can go it latches in place.)
To remove a diskette from its drive, unlatch the drive door. The door slides open and the diskette moves slightly out of its position in the drive. Grasp the edge of the diskette between thumb and first finger, pulling the diskette completely out of the drive.

**CAUTION**

Do NOT try to remove a floppy diskette from its drive when the diskette drive LED is lit. While the LED is lit the diskette operates, either storing or transmitting data. Removing the diskette from its drive while the LED is lit interrupts diskette operation. Data going onto the diskette can be lost or damaged. On later style diskette drives, a module reset is required to release the door if the system crashes with LED still illuminated.

**ATTENTION**

NE PAS tenter de retirer le disque souple de l'unité de disque lorsque le témoin a DEL est allumé. Ce témoin indique que l'unité enregistre ou lit des données sur le disque souple. L'interruption de ces opérations par le retrait du disque peut provoquer la perte ou l'endommagement des données. Dans le cas des modèles récents d'unités de disques, un verrou échec l'ouverture de la porte de l'unité lors de son fonctionnement. Dans l'éventualité d'une défaillance du système pendant que le témoin est encore allumé, actionner l'interrupteur RESET pour dégager le disque.

**OIU Reset**

Reset the OIU under the following circumstances:

1. Whenever changing the OIU System Mode (See Table 3.4, switch DPSA-3):

   FROM Normal Mode to Utility Mode  
   or  
   FROM Utility Mode to Normal Mode

2. Whenever the AC power supply to the OIU becomes interrupted.

   To reset the NOIU01/03, push up the bat handle of any ONE reset/load switch on the DBP, Disk, or LP/CRT MFPM board (Figures 3.9 and 3.10, and 3.11, switch S1) momentarily and then release it. Each switch is spring-loaded and returns to its normal OFF position (handle is parallel to the floor) when released. If the Main, DBP, Disk, and LP/CRT MFPM boards are not set up for auto load after reset (switches DPSW-6 on the MFPM boards are set to the closed/auto load after reset disabled position), OIU load must be done manually after each reset. To load manually, push down the bat handle of any ONE of these reset/load switches momentarily and then release it.

   To reset the NOIU02, push up the bat handle of the global reset/load switch momentarily and release it. The global reset/load switch is behind the access door on the lower right front of the console just below the diskette drive (Figure 2.4). To open the access door, lift its bottom edge until the door is perpendicular to the console surface. Then slide the door inward, under the diskette drive. The global reset/load switch is spring-loaded and returns to its normal OFF position when released. If the NOIU02 MFPM boards are not set to the closed/auto load after reset (switches DPSW-6 on the MFPM boards set to "closed/Auto load after reset disabled position), OIU load must be done manually after each reset. To load manually, push down the bat handle of the global reset/load switch momentarily and then release it.

**NOTE:** The NOIU02 can be reset using any MFPM reset/load switch, (except "Main"), or its global reset/load switch. Using the global reset/load switch, located on the NOIU02 below the diskette drive, is the preferred method.

**OIU Startup**

To perform OIU startup, follow the steps below.

**STEP 1** - Set switch DPSA-3 (Figure 3.13) on all IOXM boards to the Normal Mode (closed) position (see Table 3.4).

**STEP 2** - Set the OIU power disconnects (main power switches shown in Figure 2.4) to the ON (UP) position.

**STEP 3** - (NOIU01 only) Set the power switch at the rear of the disk drive enclosure to the ON (UP) position (see Figure 2.3).

**STEP 4** - Reset the OIU (See OIU RESET above). After the NETWORK 90 Logo displays and
a short delay occurs, the AREA 1 display automatically appears on the CRT.

STEP 5 - Refer to the OIU Operation/Configuration Manual, Product Instruction IE93-901-1, for further details on operating and configuring the OIU.

Files Utilities

The OIU file utilities provide basic operations useful for maintaining OIU functions. The operations are:

- initializing the Winchester fixed rigid-disk
- loading system software
- loading (uploading) OIU configuration from diskette
- saving (downloading) OIU configuration to diskette
- initializing a floppy diskette
- saving data from a diskette
- restoring data to a diskette
- loading a blank configuration.

Before using any of the file utilities, place the OIU in the Utility Mode. To do this, set the DPSW-3 switches on all IOXM boards to the open/Utility Mode position (see Table 3.4 and Figure 3.13) and then reset the OIU (see OIU RESET above). After placing the OIU in Utility Mode the File Utility Operations Menu automatically appears on the CRT (Figure 3.17).

After completing all desired File Utility operations, return the OIU to the Normal Mode. Set the DPSA-3 switches on all IOXM boards to the closed/Normal Mode position and reset the OIU (See OIU STARTUP above).

NOTE: In all utility sequences the volume name SYS0 is reserved to identify the Winchester fixed rigid-disk. Do NOT use SYS0 to identify a floppy diskette.

Initializing Disk/Loading System Software Utilities

NOTE: These two utilities are necessary ONLY IF the Winchester fixed rigid-disk drive malfunctions and/or is replaced.

To perform these utilities, follow the steps below.

STEP 1 - Set switches DPSA-3 on all IOXM boards to the Open/Utility Mode position.

STEP 2 - Set switch DPSA-4 on the Disk IOXM board to the open/Floppy Diskette IPL Device position (see Table 3.4 and Figure 3.13).

File Utilities Operations

QQ - Quit (Return to Monitor)
HH - Help (Output Menu)
II - Initialize Disk
CX - Create Extensible File
DF - Delete File
DD - Delete File
LL - Load Memory Image from File
DD - Dump Memory Image from File
IP - IPL Disk Processor
MD - Map Disk
LU - Load and Run Utility Manager from SYS0
LD - Load and Run File from Diagnostic Floppy

FIGURE 3.17 — File Utility Operations Menu
STEP 3 - Insert the floppy diskette labeled SYS1 into the OIU diskette drive (see HANDLING/INSERTING FLOPPY DISKETTES above) and reset the OIU (see OIU RESET above). The File Utility Operations menu automatically appears on the CRT.

STEP 4 - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Name = SYS0</td>
<td>LL</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = ?????????</td>
<td>LL</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>Start Addr = 2000</td>
<td>LL</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>Stack Word = 4E20</td>
<td>LL</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>Auto Start = Y</td>
<td>LL</td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

The following now scrolls onto the screen:

Disk operation started OF - Normal completion
Disk operation started RF - Normal completion
Disk operation started CF - Normal completion
0000XXXX bytes processed (value varies acc. to software)
Program auto started

The File Utility Operations Menu automatically reappears.

STEP 5 - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Name = SYS0</td>
<td>XF</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = ?????????</td>
<td>INSYS0</td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

(Run time: 50 min)

If the OIU has Distributive Trending, a message now appears asking about establishing a Bad Track Table. If establishing a Bad Track Table, the information supplied with the replacement Winchester fixed disk is added to the initialization (for 8 inch fixed disk only).

STEP 6 - When initialization of the Winchester fixed rigid-disk is complete, the system creates files that list on the CRT.

STEP 7 - After file creation is complete the OIU is ready to copy/verify system software from SYS1, SYS2, SYS3, etc. floppy diskettes to the Winchester fixed rigid-disk. After transfer of files from the SYS1 floppy diskette is complete the CRT prompts for the SYS2 diskette. Remove the SYS1 diskette from the diskette drive, insert the SYS2 diskette, and press ENTER.

STEP 8 - After transfer of files from the installed floppy diskette is complete, the CRT prompts for the next diskette. Repeat the process for each of the diskettes supplied for your software type and revision, in ascending sequence.

STEP 9 - After transfer of files from the highest number floppy diskette is complete, the system is loaded.

STEP 10 - Set switch DPSA-4 on the Disk IOXM board to the closed/Winchester fixed Rigid-Disk IPL Device position (see Table 3.4 and Figure 3.13).

STEP 11 - To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/NORMAL Mode position and reset the OIU.

Utility Manager Operations

Load OIU Configuration Utility
To perform this utility, follow the steps below.

STEP 1 - Set the DPSA-3 switches on all IOXM boards to the Open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears (Figure 3.17).

STEP 2 - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU</td>
<td>PRESS: ENTER</td>
<td></td>
</tr>
</tbody>
</table>

After normal completion the Utility Manager Operations menu automatically appears (Figure 3.18).
QQ - Quit (Return to Monitor)
II - Initialize Disk
CF - Create Control File
RF - Restore Floppy
SF - Save Floppy
EF - Edit Floppy
VF - Verify Floppy
XC - Execute Command
DS - Disk Status
XF - Execute Control File
MD - Map Disk

FIGURE 3.18 — Utility Manager Operations Menu

STEP 3 - Load OIU Configuration from Floppy Diskette (perform the following keying sequence):

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Name = SYSO</td>
<td>XF</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = ???????</td>
<td>LDCFG</td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

STEP 4 - The CRT prompts for the CFG1 diskette. Insert the CFG1 diskette into the OIU diskette drive (see HANDLING/INSERTING FLOPPY DISKETTES above) and press ENTER.

STEP 5 - After CFG1 loads the CRT prompts for CFG2, CFG3, CFG4 . . . diskettes. As the prompt appears for each diskette, remove the previously inserted one from the drive, insert the currently requested one, and press ENTER. Repeat this process until all diskettes are loaded.

STEP 6 - To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/Normal Mode position and reset the IOU.

Save OIU Configuration Utility

To perform this utility, follow the steps below.

STEP 1 - Set the DPSA-3 switches on all IOXM boards to the open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears, after autoloading.

NOTE: This utility requires four initialized floppy diskettes. If the floppy diskettes to receive the OIU configuration are not initialized, proceed to Step 2 of the INITIALIZE FLOPPY DISKETTE utility before proceeding with the current utility.

STEP 2 — Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU</td>
<td></td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

After normal completion the Utility Manager Operations menu automatically appears.

STEP 3 — Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Name = SYSO</td>
<td>XF</td>
<td>PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = ???????</td>
<td>SVCFG</td>
<td>PRESS ENTER</td>
</tr>
</tbody>
</table>

STEP 4 - The CRT now prompts for the floppy diskette on which to save CFG1. Insert the initialized diskette into the diskette drive (see HANDLING/INSERTING FLOPPY DISKETTES above) and press ENTER. The OIU then saves CFG1 to the diskette.

STEP 5 - After saving is complete the CRT prompts in sequence for the floppy diskettes on which to save CFG2, CFG3, and CFG4. As the prompt appears for each diskette, remove the previously inserted one from the drive, insert the currently requested one, and press ENTER. Repeat this process until CFG1, CFG2, CFG3, and CFG4 are all saved.
STEP 6 - To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/Normal mode position and reset the OIU.

Initialize Floppy Diskette Utility

To perform this utility, follow the steps below.

STEP 1 - Set the DPSA-3 switches on all IOXM boards to the open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears.

STEP 2 - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Name = ???????</td>
<td>II</td>
<td>Insert desired floppy diskette into diskette drive and press: ENTER</td>
</tr>
<tr>
<td>Desired volume name - 4 chars (CFG1, CFG2, etc.)</td>
<td></td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

Disk Operation
Started II
Normal Completion

STEP 3 - To restore data (previously saved to the Winchester fixed rigid-disk from another floppy diskette) to this diskette, proceed to Step 2 of the Restore (Copy to) Floppy Diskette Utility.

STEP 4 - To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/Normal mode position and reset the OIU.

Save Floppy Diskette Utility

To perform this utility, follow the steps below.

STEP 1 - Set the DPSA-3 switches on all IOXM boards to the open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears.

STEP 2 - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU</td>
<td>PRESS: ENTER</td>
<td></td>
</tr>
</tbody>
</table>

After normal completion the Utility Manager Operations menu automatically appears.

STEP 3 - Perform the following key sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF</td>
<td>Insert the floppy diskette from which to copy/save into the diskette drive and presss ENTER</td>
<td></td>
</tr>
</tbody>
</table>

The OIU now saves (copies) the data from the floppy diskette to the Winchester fixed rigid-disk in a file named FLOPPY.

NOTE: This utility can save (copy) data from only one floppy diskette at a time. To save data from more than one floppy and to restore such data to other diskettes, perform all desired restore floppy diskette utility operations before saving data from the next diskette.

STEP 4 - To restore data just saved to another diskette, proceed to Step 2 of the Restore (Copy to) Floppy Diskette utility. To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/Normal Mode position and reset the OIU.
**Restore (Copy to) Floppy Diskette Utility**

To perform this utility, follow the steps below.

**STEP 1** - Set the DPSA-3 switches on all IOXM boards to the open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears.

**NOTE:** This utility requires an initialized floppy diskette. If the floppy diskette on which to copy the data is not initialized, proceed to Step 2 of the INITIALIZE FLOPPY DISKETTE utility before proceeding with the current utility.

**STEP 2** — Perform the following keying sequence.

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU</td>
<td>PRESS: ENTER</td>
<td></td>
</tr>
</tbody>
</table>

After normal completion the Utility Manager Operations menu automatically appears.

**STEP 3** - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUME NAME = SYS0</td>
<td>XF</td>
<td>Insert SYS1 Floppy PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = LDBCFG</td>
<td>SYS1</td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

The OIU now copies the file and lists it on the CRT.

**STEP 4** - To make diskette copies, repeat Steps 2 and 3 as many times as necessary. Remember to use an initialized diskette each time. To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/NORMAL Mode position and reset the OIU.

---

**Load Blank Configuration Utility**

To perform this utility, follow the steps below.

**STEP 1** - Set the DPSA-3 switches on all IOXM boards to the open/Utility Mode position and reset the OIU. The File Utility Operations Menu automatically appears.

**STEP 2** - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU</td>
<td>PRESS: ENTER</td>
<td></td>
</tr>
</tbody>
</table>

After normal completion the Utility Manager Operations menu automatically appears.

**STEP 3** - Perform the following keying sequence:

<table>
<thead>
<tr>
<th>Display</th>
<th>Enter</th>
<th>Actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLUME NAME = SYS0</td>
<td>XF</td>
<td>Insert SYS1 Floppy PRESS: ENTER</td>
</tr>
<tr>
<td>File Name = LDBCFG</td>
<td>SYS1</td>
<td>PRESS: ENTER</td>
</tr>
</tbody>
</table>

The OIU now copies the file and lists it on the CRT.

**STEP 4** - To perform other file utilities, reset the OIU and proceed to Step 2 of the desired utility. Else, set the DPSA-3 switches on all IOXM boards to the closed/NORMAL Mode position and reset the OIU.
Console Array Assembly Installation

The Console Array is a custom assembly and can have one or more of the following components:

- NUCC01 Utility Console Cabinet
- NCWS01 Console Work Station
- NCPS01 Console Printer Surface
- NPIE01 15° Wedge Console
- NOCS01 Operator’s Chair.

The Console Array can either be a separate assembly or can integrate one or more NOIU02 Operator Interface Units (OIU).

Assembling the Console Array

Assemble the Console Array at your installation site according to details shown in Figure 7.5. The following figures show details for the individual components of the Console Array:

The NUCC01 has identical dimensions to the NOIU02 enclosure (Figure 7.6). This cabinet can mount auxiliary equipment. For example, the front panel of the NUCC01 can mount NETWORK 90 Digital Control/Indicator/Logic Stations, and/or Pulverizer Control Stations. The NUCC01 has front and rear lockable doors. The NUCC01 has provisions for rear, bottom, and top entry of cables identical to the NOIU02.

The NCWS01 dimensions are 28 in. high x 28 in. wide x 46 in. deep (see Figure 7.7). This work station can also mount ancillary equipment. Its counter surface can have table top equipment such as the NOIU01 CRT/Keyboard Console. The NCWS01 has front and rear lockable doors. The NCWS01 has provisions for rear and bottom entry of cables identical to the NOIU02.

The NCPS01 is identical to the NCWS01 except it has a slot for printer paper and clamps for printer cables at the rear of its counter top (Figure 7.7). The NCPS01 is intended for table top printers such as the NPT02.

The NPIE01 is a 15° wedge section used to provide a curve to a Console Array Assembly (See Figure 7.8). The NPIE01 can also mount ancillary equipment. A NETWORK 90 Digital Control Station (or Indicator or Logic Station) or wall-mounted telephone can be mounted on the NPIE01 front panel. The NPIE01 has front and rear lift-off panels.

The NOCS01 is an operator chair with an adjustable seat. The seat has a height adjustable from about 17 to 20 inches (see Figure 7.9).

<table>
<thead>
<tr>
<th>Figure</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.3</td>
<td>NOIU02 Operator Interface Unit</td>
</tr>
<tr>
<td>7.6</td>
<td>NUCC01 Utility Console Cabinet</td>
</tr>
<tr>
<td>7.7</td>
<td>NCWS01 Console Work Station and NCPS01 Console Printer Surface</td>
</tr>
<tr>
<td>7.8</td>
<td>NPIE01 15° Wedge Console</td>
</tr>
<tr>
<td>7.9</td>
<td>NOCS01 Operator’s Chair</td>
</tr>
</tbody>
</table>

CAUTION

Figures 7.3 through 7.9 detail only the MINIMUM recommended clearances for each component. Local building, electrical, and/or fire safety codes may require additional clearances.

ATTENTION

Les figures 7.3 a 7.9 n’illustrent que l’espace MINIMUM requis entre chaque element. Les codes du batiment, de l’electricite, et/ou de prevention des incendies peuvent dicter des espaces plus importants.

NOTE: NPIE01 15° Wedge consoles are not designated to be the END units of any Console Array Assembly. Assemble single or multiple NPIE01 components BETWEEN other full width units (NOIU02, NUCC01, NCWS01, or NCPS01).

Place each unit in the desired location, level it, align it with adjacent units, and bolt it to the floor (optional) according to the respective installation figure. Secure each unit to adjacent units using the supplied rear joining brackets and console clamps (see Details A and B of Figure 7.5).

If installing the units without mounting them to the floor, install the supplied stabilizers. The stabilizers prevent the Operator Interface Unit(s) or Console Array from tipping over when placing a heavy weight (such as a printer or the NOIU01 CRT/Keyboard Console) near the front of one or more of the console surfaces.
If desired, add one trim plate at each end of the Console Array. Use two .190 x .500 in. slotted, pan head, thread-forming screws (Type AB) per trim plate. Align the bottom edge of the trim plate flush with the floor before tightening the retaining screws.
Section IV
Maintenance

This section explains periodic maintenance requirements, diagnostic tests, and replacement part procedures. Supplier service manuals list similar procedures for the printer and other Bailey components obtained from your suppliers. The information in Sections II and III of this manual may also be helpful for replacing parts. Review the section on Installation and Start-up for specific adjustments associated with certain replaceable parts before returning your system to normal operation. Table 4.1 lists a reference for Preventive Maintenance procedures.

NOTE: Only qualified personnel should perform repair and adjustment.

Troubleshooting

Table 4.2 is a Fault Correction Guide listing probable causes and corrective actions for commonly seen malfunctions. Executing diagnostics (stored in the ROM on each MFPM) aids OIU Troubleshooting. Table 4.3 lists all diagnostic tests. Initiate tests by setting dipswitch #5 of each MFPM to open and then resetting. Run specific tests and sequences based on dipswitch settings of DPSA 5-8 on each IOXM. Binary coded LEDs on the MFPM indicate the tests performed. The bottom four LEDs serve this purpose. (The bottom LED is the least significant bit.) Test failure stops the sequence leaving the corresponding LEDs illuminated. Tables 4.4 and 4.5 provide details for the auto test sequences.

**TABLE 4.1 — Preventive Maintenance**

<table>
<thead>
<tr>
<th>UNIT(S)</th>
<th>MONTHLY</th>
<th>QUARTERLY</th>
<th>ANNUALLY</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floppy Diskette Drive</td>
<td></td>
<td></td>
<td>Clean, inspect, and check</td>
<td>Refer to SA 800/801, M2896, FD1155 Diskette Storage Drive Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alignment</td>
<td>Manual, as applicable</td>
</tr>
<tr>
<td>Line Printer</td>
<td>Inspection and</td>
<td>Lubrication</td>
<td>Adjustment</td>
<td>Refer to the printer service manual.</td>
</tr>
<tr>
<td>Keyboard electronics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjust (NOIU01 only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOIU01 Driver Cabinet and</td>
<td>Clean Filter</td>
<td></td>
<td></td>
<td>Rinse with water, blow dry, and reinstall</td>
</tr>
<tr>
<td>NOIU02 Blower Assembly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOIU01 Driver Cabinet and</td>
<td></td>
<td></td>
<td>Adjust Power Supply</td>
<td>See Section III “NOIU01 CRT/Keyboard Console Setup”</td>
</tr>
<tr>
<td>NOIU02 Power Supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power and Grounding Connections</td>
<td></td>
<td></td>
<td>Clean and Tighten</td>
<td>Verify that connections are corrosion-free and tight. Clean &amp; tighten as</td>
</tr>
<tr>
<td>FAULT</td>
<td>PROBABLE CAUSE</td>
<td>CORRECTIVE ACTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On OIU power up Area #1 fails to appear</td>
<td>No power to disk drives and Disk Controller. OIU shows only the CRT reset message</td>
<td>Check fuses and ON/OFF switch. Check for correct supply levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incorrect switch settings on MFPM, IOXM, or LSM02 boards</td>
<td>Check all MFP/IOX switch settings. See Section III — Module Setups. Check NCIU02 Setup.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIM not inserted</td>
<td>Insert LIM and Reset.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipping lock not moved from Winchester (ON MODELS WITH SHUGART DRIVES ONLY)</td>
<td>Power down, remove lock and power up again.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Card Cage power supply problem</td>
<td>Check power supply adjustments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect and/or non-secured disk-related cable connections/ jumpers</td>
<td>Refer to jumper drawing Figure 7.11.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component failure</td>
<td>Proceed to off-line testing. Run utility mode disk pair diagnostics to isolate hardware fault.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Time&quot; does not appear</td>
<td>LSM02 or related cabling</td>
<td>Replace defective part.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Utility Mode &quot;file utility operations&quot; appears and OIU responds to key strokes but does not complete disk operations</td>
<td>Disk Drive power problems</td>
<td>Check disk controller power supply fuses, and voltage levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faulty component: Check: Hard Disk, Disk Controller Board, Disk MFP/IOX Pair, Related cables</td>
<td>Proceed to off-line testing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOIU01 does not print screen</td>
<td>OIU possibly has noise problem caused by fans</td>
<td>Remove unused cable from top of CRT CPU Card. Roll it up and store it in bottom of CRT enclosure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAULT</td>
<td>PROBABLE CAUSE</td>
<td>CORRECTIVE ACTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genicom 3400/3410 Printer does not function correctly.</td>
<td>Incorrect printer configuration</td>
<td>See printer setup instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On print screen command, paper feeds without printing</td>
<td>Switch DPSA-6 on LP/ CRT IOXM board is not set open</td>
<td>Set Switch #6 open and reset the OIU.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No response to print command</td>
<td>Line printer disabled by OIU peripheral parameters</td>
<td>Go to OIU Configuration Menu. Select (I) and enter (Yes) for Line Printer available. Press ENTER.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend hard copy does not have unique dot patterns for each trend color</td>
<td>Switch DPSA-7 on LP/ CRT IOXM board remembered as open</td>
<td>Set switch #7 closed even if it is already closed. Try reset. The switch may have been open on last reset.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The message “DISK VOLUME FULL” appears on CRT while trying to initialize SYS0</td>
<td>Bad Winchester</td>
<td>Replace Winchester.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All on-board tests fail</td>
<td>AC voltage riding on the DC power supply outputs</td>
<td>Replace power supply.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 4.3 — Auto Test Sequences (OIU Utilities and Diagnostics)

<table>
<thead>
<tr>
<th>IOXM BD DPSA Setting</th>
<th>SEQUENCE NO.</th>
<th>SEQUENCE FUNCTION</th>
<th>SEQUENCE APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MSD) 5 6 7 (LSD) 8</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 0 0 0</td>
<td>00</td>
<td>MFPM Test</td>
<td>Any MFPM</td>
</tr>
<tr>
<td>0 0 0 0 1</td>
<td>01</td>
<td>Maximum Test</td>
<td>Complete System (4)</td>
</tr>
<tr>
<td>0 0 1 0 0</td>
<td>02</td>
<td>System Test</td>
<td>System Less Peripherals (4)</td>
</tr>
<tr>
<td>0 0 1 0 1</td>
<td>03</td>
<td>MFPM/OXM Pair</td>
<td>Any MFPM/OXM Pair</td>
</tr>
<tr>
<td>0 1 0 0 0</td>
<td>04</td>
<td>PIM Test</td>
<td>Main MFPM/OXM Pair Only (4,8,10)</td>
</tr>
<tr>
<td>0 1 0 0 1</td>
<td>05</td>
<td>Watchdog Test</td>
<td>Main MFPM/OXM Pair Only</td>
</tr>
<tr>
<td>0 1 1 0 0</td>
<td>06</td>
<td>Close Relays</td>
<td>Any MFPM/OXM Pair Only (7)</td>
</tr>
<tr>
<td>0 1 1 1 0</td>
<td>07</td>
<td>CRT Test</td>
<td>LP/CRT MFPM/OXM Pair Only</td>
</tr>
<tr>
<td>1 0 0 0 0</td>
<td>08</td>
<td>Printer Test</td>
<td>LP/CRT MFPM/OXM Pair Only</td>
</tr>
<tr>
<td>1 0 0 0 1</td>
<td>09</td>
<td>CIU Test</td>
<td>DBP MFPM/OXM Pair Only (11)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. 1 = OPEN = OFF; 0 = Closed = ON.
2. Unused dipswitch combinations (11-15) access sequence 00.
3. If no IOXM present, the MFPM sees the switches as sequence 00.
4. System tests (sequences 01 & 02) require all three pairs with correct address. Sequence 01 requires a Winchester Disk and the CRT.
5. Sequence 09 runs only on the Main MFPM/OXM pair in a standard system, but also runs on any pair if enabling the watchdog timer by DPSA-2 (See Table 3.4).
6. Sequence 09 opens and closes the relays once only. To repeat the test, reset the MFPM.
7. A floppy must already be in the diskette drive.
8. Set FE (Hex) on PIM to run for test sequences 01,02,04. FE = all switches set OPEN, except the bottom one which is set CLOSED.
9. See Tables 4.6 and 4.7 for explanation of all tests run in each sequence.
10. PIM test is for 500/1400-tag OIU only.
11. Only on 5000 tag unit (NMFP02)
**TABLE 4.4 — Auto Test Sequences (OIU Utilities and Diagnostics) for Disk Pair Only**

<table>
<thead>
<tr>
<th>IOXM BD DPSA Setting</th>
<th>SEQUENCE NO.</th>
<th>SEQUENCE FUNCTION</th>
<th>SEQUENCE APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MSD) 5 6 7 (LSD) 8</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 X (2) X (2)</td>
<td>01</td>
<td>Maximum Test</td>
<td>Disk MFPM/OXN Pair</td>
</tr>
<tr>
<td>0 0 X (2) X (2)</td>
<td>02</td>
<td>System Test</td>
<td>Disk MFPM/OXN Pair</td>
</tr>
<tr>
<td>1 0 X (2) X (2)</td>
<td>08D</td>
<td>Winchester Test</td>
<td>Disk MFPM/OXN Pair</td>
</tr>
<tr>
<td>1 1 X (2) X (2)</td>
<td>09D</td>
<td>Floppy Test</td>
<td>Disk MFPM/OXN Pair</td>
</tr>
</tbody>
</table>

**NOTES:**

1. 1 = OPEN = OFF, 0 = CLOSED = ON
2. X = Do NOT change switch settings while running test. These switch settings (Table 4.5 below) designate the Winchester Disk - Disk Controller combinations. Changing the switch settings causes the test to fail.

**TABLE 4.5 — Winchester Disk/Controller Combination IOXM Switch Settings (Test Sequences)**

<table>
<thead>
<tr>
<th>IOXM BD DPSA SETTING</th>
<th>DISK/CONTROLLER COMBINATION</th>
<th>Dish/Controller Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MSD) 5 6 7 (LSD) 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0</td>
<td>DTC-1403</td>
<td></td>
</tr>
<tr>
<td>1 0</td>
<td>OMIT/ST225</td>
<td>ST225 Combination = 20 MB Disk</td>
</tr>
<tr>
<td>0 (*1) 1 (*0)</td>
<td>OMIT/ST212</td>
<td>ST212 Combination = 10 MB Disk</td>
</tr>
<tr>
<td>1 1</td>
<td>OMIT/ST213</td>
<td>ST213 Combination = 10 MB Disk</td>
</tr>
</tbody>
</table>

**NOTES:**

1. The 20 MB Disk is for the 5000 tag OIU.
   * OPERATIONAL (NON-DIAGNOSTIC) SETTINGS

1 = OPEN = OFF, 0 = CLOSED = ON
### TABLE 4.6 — Details of Auto Test Sequences

<table>
<thead>
<tr>
<th>Seq.</th>
<th>Board</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>ALL</td>
<td>LC MT LR MU</td>
</tr>
<tr>
<td>01</td>
<td>MAIN</td>
<td>LC(4) MT LR MU IU CK SSIGNL..IW</td>
</tr>
<tr>
<td></td>
<td>DISK</td>
<td>LC(4) MT LR MU IU SWAIT..SR IT CK WT SWAIT LOOP</td>
</tr>
<tr>
<td></td>
<td>CRT</td>
<td>LC(4) MT LR MU IU SWAIT..SR IT CK CT SWAIT LOOP</td>
</tr>
<tr>
<td>02</td>
<td>MAIN</td>
<td>LC(4) MT LR MU IU IT CK SSIGNL..IW</td>
</tr>
<tr>
<td></td>
<td>DISK</td>
<td>LC(4) MT LR MU IU SWAIT..SR IT CK SWAIT LOOP</td>
</tr>
<tr>
<td></td>
<td>CRT</td>
<td>LC(4) MT LR MU IU SWAIT..SR IT CU SWAIT LOOP</td>
</tr>
<tr>
<td>03</td>
<td>ALL</td>
<td>LC MT LR MU IT CK</td>
</tr>
<tr>
<td>04</td>
<td>ALL</td>
<td>LC PI (SEE NOTE 6)</td>
</tr>
<tr>
<td>05</td>
<td>ALL</td>
<td>LC IW</td>
</tr>
<tr>
<td>06</td>
<td>ALL</td>
<td>LC RR</td>
</tr>
<tr>
<td>07</td>
<td>ALL</td>
<td>LC CT</td>
</tr>
<tr>
<td>08</td>
<td>ALL</td>
<td>LC LP</td>
</tr>
<tr>
<td>09</td>
<td>ALL</td>
<td>LC CI</td>
</tr>
</tbody>
</table>

**NOTES:**

1. In sequences 01 & 03 the LED test repeats four times.

2. SSIGNL = wait and synchronize state for Main IOXM pair.

3. SWAIT = wait and synchronize state for Disk and LP/CRT MFPM/IOXM pairs.

4. IW on Main MFPM/IOXM pair causes system reset thus restarting test sequences 01 and 02.

5. Test sequence 06 does not repeat.

6. PIM is used for 500/1400 tag OIU only.
### TABLE 4.7 — LED Codes for Auto Tests

<table>
<thead>
<tr>
<th>Table 4.6 Test Code</th>
<th>LED Code (See NOTE 1)</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC</td>
<td>Binary Count (0 - F)</td>
<td>LED UP COUNT</td>
</tr>
<tr>
<td>MT</td>
<td>1</td>
<td>MAP TRST</td>
</tr>
<tr>
<td>LR</td>
<td>2</td>
<td>LOCAL RAM</td>
</tr>
<tr>
<td>MU</td>
<td>3</td>
<td>MFPM UART</td>
</tr>
<tr>
<td>IU</td>
<td>4</td>
<td>IOXM UART</td>
</tr>
<tr>
<td>IT</td>
<td>5</td>
<td>INTERRUPTS</td>
</tr>
<tr>
<td>CK</td>
<td>6</td>
<td>1 - SHOT CLOCK</td>
</tr>
<tr>
<td>PI</td>
<td>7</td>
<td>PIM INTERFACE (SEE NOTE 4)</td>
</tr>
<tr>
<td>SR</td>
<td>8</td>
<td>SELECTED RAM</td>
</tr>
<tr>
<td>WT</td>
<td>9</td>
<td>WINCHESTER</td>
</tr>
<tr>
<td>CT</td>
<td>A</td>
<td>CRT</td>
</tr>
<tr>
<td>IW</td>
<td>B</td>
<td>INT WATCH DOG</td>
</tr>
<tr>
<td>FT</td>
<td>C</td>
<td>FLOPPY</td>
</tr>
<tr>
<td>LP</td>
<td>D</td>
<td>PRINTER</td>
</tr>
<tr>
<td>RR</td>
<td>E</td>
<td>CLOSE RELAYS</td>
</tr>
<tr>
<td>CI</td>
<td>F</td>
<td>SEE NOTE 3</td>
</tr>
<tr>
<td>SSIGNL, SWAIT</td>
<td>F, E</td>
<td>SEE NOTE 2</td>
</tr>
<tr>
<td>LOOP</td>
<td>D</td>
<td>SEE NOTE 2</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Displays momentarily during test but displays continuously upon test failure. The bottom LED = LSB (Least Significant Bit).

2. In sequence 01 and 02 each board has two WAIT states. In each case the first WAIT displays code F and the second displays code E. While the Main board does the watch dog test (IW) the other boards loop to display code D. In sequence 01 and 02 no tests use these codes.

3. LED code only appears during CIU test run. The SSIGNL indicator only appears on tests in sequences 01 and 02. The CIU test sequence is 09.

4. PIM is used with 500/1400 tag OIU only.
Part Replacement Procedures

NOIU01/03 Driver Cabinet Disk Drive Assembly Replacement (SA-1000, SA-800/801)

To remove the assembly, refer to Figure 7.26 follow the steps below:

Follow Steps 1-6 of “NOIU01/03 Winchester Drive Retrofit Kit Using Universal 5.25 Inch DC Drive Assembly”

To install the assembly, refer to Figure 7.26 follow the steps below.

STEP 1 — Perform the ‘removal’ steps of the NOIU01/03 Disk Drive Assembly in reverse order. Replace all cut cable ties.

STEP 2 — If replacing the Winchester Drive of the Disk Drive Assembly, perform the "Initializing Disk/Loading System Software Utility" procedure (Section III, “File Utilities”).

NOTE: After answering "Y" to bad track data, press "ENTER". If disk has not been formatted, reset and repeat procedure a second time at this point.

NOIU01/03 Driver Cabinet Controller Board Replacement (DTC 1403, OMTI 5200, or DTC 520 D)

To remove the controller board, refer to Figure 7.16 and follow the steps below.

STEP 1 — Disconnect power to the NOIU01/03 Driver Cabinet.

STEP 2 — Remove attaching screws and top of the NOIU01/03 Driver Cabinet.

STEP 3 — Remove attaching screws and top cover of the Disk Drive Enclosure, setting it aside.

STEP 4 — Remove cable connections at controller board (See Figures 4.1, 4.2 — 1403 D/E).

STEP 5 — Loosen controller board attaching screws. Lift out the controller board carefully and keep the washers underneath from dropping into the mechanism.

To install the controller board, refer to Figure 7.16 and follow the steps below.

STEP 1 — Set up Controller Board dipswitch 2H for 1403 D, (Figure 4.1) or 1J for 1403 E, (Figure 4.2) using procedure in controller board section of Table 4.8.

NOTE: For OMTI 5200 or DTC 520D controller board, set jumpers according to Figure 7.11.

FIGURE 4.1 — Disk Controller Board Setup Components (DTC 1403D)

STEP 2 — Perform the steps of the NOIU01/03 Driver Cabinet controller board removal procedure in reverse order.

STEP 3 — Perform the Disk Drive Enclosure installation procedure.
NOIU02 Disk Controller Board Replacement (DTC 1403, OMTI 520D, DTC 520D)

To remove the controller board follow the steps below:

STEP 1 — Disconnect power to the NOIU02.

STEP 2 — Open (or remove) the rear door.

STEP 3 — Remove all power and ribbon cable connectors to the Controller Board.

STEP 4 — Plastic snap locks or machine nuts hold the 1403 Controller Board in place. Release the locks by squeezing them with fingers or needle-nose pliers or remove the nuts and lift the Controller Board free of the locks. Remove 4 screws for other controllers. Remove the Controller Board through the rear of the NOIU02.

To install the controller board, refer to Figure 7.16 and follow the steps below.

STEP 1 — Set up Controller Board dipswitch 2H for DTC 1403D (Figure 4.1), or 1J for DTC 1403E (Figure 4.2) using the procedure in the Controller Board section of Table 4.8.

Note: For setup of other controller boards, refer to Figure 7.11.

STEP 2 — Perform the steps of the NOIU02 Controller Board removal procedure in reverse order.
\textbf{TABLE 4.8 — Jumper/Switch Settings for Initial Installation of Floppy, Winchester, and Controller Boards***}

<table>
<thead>
<tr>
<th>Floppy Board (Figure 4.4) “SA 801” only</th>
<th>Winchester Board (Figure 4.3) “SA 1000” only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jumper Name</strong></td>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>A</td>
<td>Install</td>
</tr>
<tr>
<td>B</td>
<td>Install</td>
</tr>
<tr>
<td>C</td>
<td>Remove</td>
</tr>
<tr>
<td>D</td>
<td>Remove</td>
</tr>
<tr>
<td>DC</td>
<td>Remove —5/—15</td>
</tr>
<tr>
<td>DS</td>
<td>Install Ready</td>
</tr>
<tr>
<td>DS1</td>
<td>Install</td>
</tr>
<tr>
<td>DS2</td>
<td>Remove</td>
</tr>
<tr>
<td>DS3</td>
<td>Remove</td>
</tr>
<tr>
<td>DS4</td>
<td>Remove</td>
</tr>
<tr>
<td>HL</td>
<td>Remove</td>
</tr>
<tr>
<td>T1</td>
<td>Remove</td>
</tr>
<tr>
<td>T2</td>
<td>Remove*</td>
</tr>
<tr>
<td>T3</td>
<td>Remove*</td>
</tr>
<tr>
<td>T4</td>
<td>Remove*</td>
</tr>
<tr>
<td>T5</td>
<td>Remove*</td>
</tr>
<tr>
<td>T6</td>
<td>Remove*</td>
</tr>
<tr>
<td>X</td>
<td>Install</td>
</tr>
<tr>
<td>Y</td>
<td>Remove</td>
</tr>
<tr>
<td>Z</td>
<td>Install</td>
</tr>
<tr>
<td>800</td>
<td>Install</td>
</tr>
<tr>
<td>801</td>
<td>Remove</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>JUMPERS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1403D</td>
</tr>
<tr>
<td>5K</td>
</tr>
<tr>
<td>W1</td>
</tr>
<tr>
<td>W2</td>
</tr>
<tr>
<td>W3</td>
</tr>
<tr>
<td>10E</td>
</tr>
</tbody>
</table>

*Install when SA801 is bussed with OMT5200/DTC520D controller
**1403 D/E only
***Settings for other controller and drive boards are on “Jumper Drawing, Figure 7.11.

NOIU01/03 Driver Unit Winchester Fixed Rigid-Disk Drive Assembly Replacement (SA1000)

To remove the Winchester fixed rigid-disk, refer to Figure 7.16 and follow the steps below.

**STEP 1 —** Perform the steps of the NOIU01/03 Drive Unit Controller Board removal procedure. Disconnect the interconnecting ribbon cable at the Winchester board. Disconnect the Winchester drive’s power.

**STEP 2 —** Remove the screws attaching the Winchester Assembly to the Disk Drive Enclosure (two at the side and four at the bottom). Remove the Winchester Assembly with Winchester board attached from the Disk Drive Enclosure.
To install the Winchester fixed rigid-disk, refer to Figure 7.16 and follow the steps below.

**STEP 1** — Referring to the Winchester board section of Table 4.8 and Figure 4.3, perform the Winchester Assembly circuit board setup (only required for new or different Winchester Assembly). For Winchester Drives other than SA — 1000, refer to Figure 7.11.

**STEP 2** — Perform the steps of the NOIU01/03 Driver Cabinet Winchester Drive Assembly removal procedure in reverse order.

**STEP 3** — Perform the “Initializing Disk/Loading System Software Utility” procedure (Section III, “File Utilities”) if installing a different Winchester drive assembly.

**Note:** After answering “Y” to bad track data, press “ENTER.” If disk has not been formatted, reset and repeat procedure a second time at this point.

**NOIU02 Winchester Drive (SA1000)**

To remove the NOIU02 Winchester fixed rigid-disk, follow the steps below.

**STEP 1** — Perform the removal steps for the NOIU02 Disk Controller Board.

**STEP 2** — Disconnect plugs to the disk power supply.

**STEP 3** — Loosen the left-most screw (viewed from the rear) but leave in place. Remove the remaining four screws retaining the disk power supply. Swing
the power supply to the left and out of
the way to access the Winchester Drive.
Cut and remove cable ties securing AC
and DC wires.

Note: Where controller board is mounted beside drive,
tray subassembly slides between terminal and power
supply without removing either one.

STEP 4 — Remove all power and ribbon cable con-
nectors to the Winchester Drive.

STEP 5 — Remove the two screws at the bottom
which retain the Winchester Drive in
place, sliding the Winchester Drive out
the back of the NOIU02.

To install the NOIU02 Winchester fixed rigid-disk,
follow the steps below.

STEP 1 — Referring to the Winchester board sec-
tion of Table 4.8 and to Figure 4.3, per-
form the setup for the Winchester
Assembly circuit board (only required
for new or different Winchester
Assembly).

Note: For Winchester drives other than the SA-1000,
refer to Figure 7.11 to perform setup.

STEP 2 — Perform the steps of the NOIU02 Win-
chester Drive removal procedure in
reverse order.

STEP 3 — Replace any cut cable ties.

STEP 4 — Perform the “Initializing Disk/Loading
Software Utility” procedure (Section III,
“File Utilities”) if installing a different Win-
chester Drive Assembly.

Note: After answering “Y” to bad track data, press
“ENTER”. If disk has not been formatted, reset and
repeat procedure a second time.

NOIU01/03 Winchester Disk Drive Retrofit Using
Universal 5.25 Inch Assembly Kit (For ST
212/213/225, TM 252)

Disk Drive Assembly Removal
(Figures 4.4, 4.5, 4.6, 7.16)

STEP 1 — Disconnect power to the Cabinet.

STEP 2 — Disconnect ribbon cable from connector
at rear of Disk Drive Assembly (1).

STEP 3 — Disconnect line cord at Power Distribution
Module rear panel. Cut and remove any
cable ties securing the line cord.

STEP 4 — Remove the four screws from blank panel
below the front panel of the Disk Drive
Assembly.

STEP 5 — Remove screws attaching the Disk Drive
Assembly to Driver Unit rails and remove
the assembly from the Driver Unit (2).

STEP 6 — Remove attaching screws and top cover
of the disk drive enclosure, setting cover
aside.

STEP 7 — Place the subassembly on the fixed disk
controller side and remove 4 screws from
underside.

STEP 8 — Place on base and remove screws from
fixed disk side.

STEP 9 — Compare cable location photos (Figures
4.4, 4.5, 4.6) to the installation and mark
cables to facilitate reassembly. “Pin 1”
end of ribbon cables have a stripe and a
board notch.

STEP 10 — Unplug AC power, DC power, 20 conduc-
tor signal cable, 50 pin SCSI cable (to rear
enclosure apron). The 34 conductor
“ST506 control” cable is also reusable.

Step 11 — Remove additional screws bolting an
8-inch controller board, then remove
obsolete 8-inch drive and controller board.
FIGURE 4.4 — NOU01/03 Disk Drive Assembly (for Retrofit)

FIGURE 4.5 — NOIU01/03 Disk Drive Assembly (for Retrofit)
Modification

STEP 12 — Inspect the disk power supply's harness. If not 4-contact connector is present, the P/N 6637440-1 5.25 inch controller board adapter cable must be used as supplied (3). Join the adapter's 6-pin connector with the shortest 6-pin connector cable of the disk power supply assembly.

STEP 13 — If the enclosure back panel has 3 fuse holders, remove the lower one, clipping fuseholder leads (with diagonal cutters) at adjoining components (4). Otherwise, skip to Step 14.

STEP 14 — Locate and thread cable 6635923A2 (lugs first) through hole to outside of enclosure (5). Locate strain relief supplied (4), and install around cable at a point 13 inches from the 4-pin connector, and snap into enclosure from rear surface side.

STEP 15 — Remove 8 fan screws, position airflow arrow on casting so fan discharges air out rear of enclosure, then remount with finger and wireguards (6).

STEP 16 — Place the replacement drive/controller stack in the enclosure, set the enclosure on that edge, and retain it to the enclosure base using four 6-32 x .375 screws (7).

STEP 17 — If flexible drive is SA801, unbolt and add jumpers PN 1946984A1 in positions T2 through T6 (8).

STEP 18 — Set drive and controller jumpers per Figure 7.11.

STEP 19 — Attach the free end of cable marked 6635923A2 to the 4-pin connector on the drive at the bottom near the basepan (5).
STEP 20 — At a point 6 inches from the 4 pin connector, strip ½ inch insulation from either blue lead of cable 6635923A2. Fold the bare portion of the lead, insert it into the butt connector on cable 6637440A1, and crimp the connector. Or splice to the blue lead of the 4 pin connector if adapter is not used.

STEP 21 — Attach the adapter cable’s (P/N 6637440A1) 4-pin connector to the similar connector on the controller board “5200/520D” (P/N 1947415A2) stacked atop the drive (9).

STEP 22 — Make certain that the ribbon cable from the flexible disk drive is 6635924C50N42 (the A50N2 cable exhibits excessive voltage drop in “signal comm.” lead, and should be replaced) (11). Attach the cable’s free end to pin headers silkscreen “J7” on the controller board. The pin 1 (striped) edge of all ribbon cables on this board points toward the white 4-pin connector (9). Connector ends should line up with J2 connector.

STEP 23 — Connect the free end of 50-pin SCSI cable from enclosure rear to controller board pin header “J1” (12). Site-'em in; pin header connectors will insert when you’re off by one row of pins in any direction. (The electronically damaged subassembly varies with misorientation at power-up).

STEP 24 — Test/debug drive subassembly on floor behind cabinet before remounting. Loosen logic power supply lugs “NEG”, “POS,” upper left hand “—S,” and “+ S” terminals. You have the correct “—S” terminal if the adjacent-strapped “—” terminal is joined to the large “Neg” terminal. The connections are as follows:

<table>
<thead>
<tr>
<th>Lead Marking</th>
<th>Color</th>
<th>Lug Size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pos</td>
<td>Brown</td>
<td>Large No. 8</td>
<td>5 V dc</td>
</tr>
<tr>
<td>Neg</td>
<td>Blue</td>
<td>Large, No. 8</td>
<td>5 V return</td>
</tr>
<tr>
<td>—S</td>
<td>Blue</td>
<td>Small, No. 6</td>
<td>12 V return</td>
</tr>
<tr>
<td>+ S</td>
<td>Yellow</td>
<td>Small, No. 6</td>
<td>12 V dc</td>
</tr>
</tbody>
</table>

Temporarily slip lugs partly under terminal screws, tighten, and check for looseness.

STEP 25 — Temporarily attach white and black power lugs under appropriate terminals of the logic supply’s a-c power barrier strip.

STEP 26 — Attach the free SCSI cable from disk IOX board to enclosure rear connector (1).

STEP 27 — With enclosure’s rocker switch off, and empty “floppy” door closed, turn on cabinet power breaker and put ear next to hard disk to hear it run-up, then regulate (at 3600 rpm — don’t bump the box while spinning). This checks fixed drive except factory checked intercom.

STEP 28 — Watch flexible diskette drive light and head while rocking drive enclosure power switch on. Light on for one second should be accompanied by two “ticks” from head assembly. This checks disk supply, controller board, flexible diskette drive and all except SCSI cable.

If a 19:2 K baud data terminal having only pins 2, 3, and 7 wired 1:1 is cabled to the disk MFP board, drive diagnostics may be run. Diagnostics are operated by: Reset, T, return, WT or FT, return, using “disk” MFP RS-232 connector. Board piano dipswitches DPSA-7 and DPSA-8 and the two ROMs in MFP board(s) must be in agreement with the Disk/ROM/Dipswitch Table for new Disk System Variables supplied with software diskettes/ROMs.

Diagnostics require Main, Disk, and Color. Terminal MFP boards to have dipswitch 6 closed — autoload off. It may be wise to have OIU loaded and on-line with box still on floor, or enclosure installed with cabinet and enclosure tops removed. It’s not proven working until it is on the plant loop.

STEP 29 — Power down the system, remove Disk MFP board (cabled to Disk IOX which has the 50 pin SCSI ribbon cable leading to the controller board.)
STEP 30 — Presently, 1400 Tag firmware is available on 2764 ROM and 5000 Tag firmware on 27128. Note old jumper settings for back tracking, then remove wire wraps between E8 - E12. Add new jumpers per MFP version available, as illustrated in Table 3.3.

STEP 31 — With autoload off, run disk pair diagnostics as described in the manual except IOX board piano dip switches DPSA-7 and DPSA-8 set per Disk/ROM/Dipswitch Table as furnished with software Diskettes/ROMs. Fault indication is available with data terminal diagnostics.

STEP 32 — Disk activity signals successful ROM changeover and switch setup. Change over the remaining boards one-at-a-time with retries. Remember that a backplane master (MFP or PIM) removed from a 990/4 backplane requires a grant jumper installed to its left; that the slot 1 main MFP has jumper E19 installed to drive backplane bus clock and switch 4 closed not to sync to it. Control lines are terminated with resistor dip packs in Main MFP and IOX boards only.

STEP 33 — With all new ROMs installed on boards, load the system with software diskettes as described in the Hardware Manual — “Initializing Disk/Loading Software Utility” procedure (Section III, “File Utilities”).

Note: After answering “Y” to bad track data, press “ENTER”. If disk has not been formatted, reset and repeat procedure a second time.

STEP 34 — Bring up the system on line, record clock time if failure should occur, and assure that Area 1 appears. Observe LIM startup on LEDs.

Reassembly:

STEP 35 — Load configurations, etc., and fully install disk drive assembly, fastening all screws. (Follow steps 1 thru 6 of this procedure in reverse order). Remove spindle lock sticker.

NOIU02 Winchester Drive Retrofit Using Universal 5.25 Inch Disk Assembly Kit (DC Drive)

To remove the NOIU02 Winchester fixed rigid-disk, refer to Figures 4.7, 4.8 and 7.16 and follow the steps below.

STEP 1 — Make backup diskettes of OIU configuration.

STEP 2 — Disconnect power to NOIU02.

STEP 3 — Open or remove rear door.

STEP 4 — Disconnect plugs to the disk power supply, and controller 50-pin cable that leads to the disk IOX board.

STEP 5 — Loosen the left-most screw (viewed from the rear) but leave in place. Remove the remaining four screws retaining the disk power supply. Swing the power supply to left and out of the way to access the Winchester Drive (1). Cut and remove cable ties securing AC and DC wires. Note: Where 5 ¼ inch where controller is mounted beside drive, tray subassembly slides between terminal and supply without removing either one.

STEP 6 — Remove all power and ribbon cable connectors to the Winchester Drive.

STEP 7 — Remove the two or three screws at the bottom which retain the Winchester Drive in place, sliding the Winchester Drive out the back of the NOIU02 (2).

STEP 8 — If flexible drive is an SA801, unbolt two retaining screws, top and bottom. Unplug the three connectors (Squeeze two opposite tabs to release 9-pin connector). Remove drive.

Modification

STEP 9 — Locate silkscreened jumper labeled T2 through T6 on flexible drive. Install jumpers 1946984A1 in these locations.

STEP 10 — Set Winchester drive jumpers per Figure 7.11.
FIGURE 4.7 — NOIU02 5.25 Inch DC Winchester Disk Drive Installation

FIGURE 4.8 — NOIU02 5.25 Inch DC Winchester Disk Drive Installation
STEP 11 — Attach the free end of cable marked 6635923A2 to the 4-pin connector on the replacement drive at the bottom near the basepan (3).

STEP 12 — Inspect the disk power supply's harness. If no 4-contact connector is present, the P/N 6637440-1 5.25 inch controller board adapter cable must be used as supplied (3). Join the adapter's 6-pin connector with the shortest 6-pin connector cable of the disk power supply assembly.

STEP 13 — At a point 6 inches from the 4-pin connector, strip ½ inch insulation from either blue lead of cable 6635923A2. Fold the bare portion of the lead, and insert into the butt connector of cable 6637440A1, crimping the connection. Or splice to the blue lead of the 4-pin connector if adapter is not used.

STEP 14 — Attach the adapter cable's 4-pin connector to the similar connector on the replacement controller board "5200/520D" (P/N 1947415A2) stacked atop the drive.

STEP 15 — Make certain that the ribbon cable from the flexible disk drive is 6635924C50N42 (the A50N42 cable exhibits excessive voltage drop in "signal com." lead, and should be replaced) (5). Attach the cable free end (6635923A2) to pin headers silkscreened "J7" on the controller board. The pin 1 (striped) edge of all ribbon cables on this board points toward the white 4-pin connector. Connector ends should line up with J2 connector.

STEP 16 — Connect the free end of 50-pin SCSI cable from IOX board to controller board pin header "J1" (6). Site-'em in; pin header connectors will insert when you're off by one row of pins in any direction. (The electronically damaged subassembly varies with mis-orientation at power-up.

STEP 17 — Test/debug drive subassembly with drive assembly set on shelf; disk supply not bolted. Loosen logic power supply lugs "Neg," "Pos," upper left hand "—S" and "+ S" terminals. You have the correct "—S" terminal if the adjacent-Strapped "—" terminal is joined to the large "Neg" terminal. The connections are as follows:

<table>
<thead>
<tr>
<th>Lead Marking</th>
<th>Color</th>
<th>Lug Size</th>
<th>Function</th>
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<tbody>
<tr>
<td>Pos</td>
<td>Brown</td>
<td>Large, No. 8</td>
<td>5 V dc</td>
</tr>
<tr>
<td>Neg</td>
<td>Blue</td>
<td>Large, No. 8</td>
<td>5 V return</td>
</tr>
<tr>
<td>—S</td>
<td>Blue</td>
<td>Small, No. 6</td>
<td>12 V return</td>
</tr>
<tr>
<td>+ S</td>
<td>Yellow</td>
<td>Small, No. 6</td>
<td>12 V dc</td>
</tr>
</tbody>
</table>

Temporarily slip lugs partly under terminal screws, tighten, and check for looseness.

STEP 18 — Temporarily attach white and black power lugs under appropriate terminals of the logic supply's a-c power barrier strip.

STEP 19 — With empty "floppy" door closed, turn on cabinet power breaker and put ear next to hard disk to hear it run-up, then regulate (at 3600 rpm — don't bump the drive while spinning). This checks fixed drive except factory checked interconnections.

STEP 20 — Watch flexible diskette drive light and head while rocking drive enclosure power switch on. Light on for one second should be accompanied by two "ticks" from head assembly. This checks disk supply, controller board, flexible diskette drive and all except SCSI cable.

If a 19.2 K baud data terminal having only pins 2, 3, and 7 wired 1:1 is cabled to the disk MFP board, drive diagnostics may be run. Diagnostics are operated by pressing: Reset, T, return, WT or FT, return, using "disk" MFP RS-232 connector. IOX board piano dinswitches DPSA-7 and DPSA-8 and the two ROMs in MFP board(s) must be in agreement with the Disk/ROM/Dipswitch Table for new Disk System Variables, supplied with software diskettes/ROMs. Diagnostics
require Main, Disk, and Color Terminal MFP boards to have switch 6 closed — autoload off.

STEP 21 — Power down the system, remove Disk MFP board (cabled to Disk IOX which has the 50 pin SCSI ribbon cable leading to the controller board.)

STEP 22 — Presently, 1400 Tag firmware is available on 2764 (and 5000 Tag firmware on 27128). Note old jumper settings for back tracking, then remove wire wraps between E8-E12. Add new jumpers per version MFP available, as illustrated in Table 3.3.

STEP 23 — With autoload off, run disk pair diagnostics as described in the hardware manual except IOX board piano dip switches DPSA-7 and DPSA-8 set per Disk/ROM/Dipswitch Table as furnished with software Diskettes/ROMs. Fault indication is available with data terminal diagnostics, which are operated by: Reset T, return, WT or FT, return.

STEP 24 — Disk activity signals successful ROM changeover and switch setup. Change over the remaining boards one-at-a-time with retrys. Remember that a backplane master (MFP or PIM) removed from a 990/4 backplane requires a grant jumper installed to its left; that the slot 1 main MFP has jumper E19 installed to drive backplane bus clock and switch 4 closed not to sync to it. Control lines are terminated with resistor dip packs in Main MFP and IOX boards only.

STEP 25 — With all new ROMs installed on boards, load the system with software diskettes as described in the Hardware Manual — "Initializing Disk/Loading Software Utility" procedure (Section III, File Utilities).

Note: After answering “Y” to bad track data, press “ENTER”. If disk has not been formatted, reset and repeat procedure a second time.

STEP 26 — Bring up the system on line, record clock time if failure should occur, and assure that Area 1 appears. Observe LIM startup on LEDs.

Reassembly

STEP 27 — Perform the steps of the NOIU02 Winchester Drive removal procedure in reverse order.

If prior drive size was 5.25 inch, save disk tray and reuse to retain the new drive. In this case, remove the eight screws retaining the new drive stack to the two lower mounting brackets. Save screws and bolt new drive to existing (beige) disk tray through the four vibration isolators.

If, alternatively, the prior fixed drive was the 8-inch size, position black drive bracket with its slotted front to the right of the shelf, with fan discharging toward drive assembly (7). Align clearance holes in disk shelf with tapped holes at edge of black bracket, and retain the assembly with two of four 6-32 x .375 inch screws (2). Slip flat washers over the remaining two screws, and thread into black bracket at front-facing corners of the shelf hole cutout visible from underneath shelf (8).

STEP 28 — Load configurations. Remove spindle lock sticker.

STEP 29 — Replace any cut cable ties.

NOIU01/03 Driver Cabinet Diskette Drive Assembly Replacement

To remove the assembly, refer to Figure 7.16 and follow the steps below.

STEP 1 — Disconnect power to the cabinet.

STEP 2 — Disconnect ribbon cable from connector at rear of Disk Drive Assembly.

STEP 3 — Disconnect line cord at Power Distribution Module rear panel. Cut and remove any cable ties securing the line cord.
STEP 4 — Remove the four screws from blank panel below the front panel of the Disk Drive Assembly.

STEP 5 — Remove screws attaching the Disk Drive Assembly to Driver Unit rails and remove the assembly from the Driver Unit.

STEP 6 — Remove top cover screws and top cover of Disk Drive Enclosure and set aside.

STEP 7 — Stand enclosure on the flexible disk end. Remove four screws from baseplate. Unplug edge connector, and a-c power connector from drive's rear surface. Squeeze release tabs to remove 9-pin d-c power connector.

STEP 8 — Remove flexible diskette drive.

STEP 9 — If SA-801 drive is to be reinstalled, skip to step 10.

If retrofit diskette drive is to be installed, perform the following:

Unpack flexible diskette replacement drive, mounting tray P/N 6636269A1, and four 4MM metric screws, P/N 197813A1. Orient the tray vertically with longer bracket at the bottom. Position the drive vertically so that the notch in the rear edge connector is toward the top. Slide drive into center of bracket and position faceplate in line with front bracket surface. Fasten screws through two bracket clearance holes on the top surface into the drive. Flip over the drive and repeat with two remaining screws.

STEP 10 — For half-height drives (M2896 or FD 1165) install jumpers per Figure 7.11.

For SA-801 jumper per Figure 4.9 and Table 4.8.

STEP 11 — Reinstall the drive assembly, reversing the disassembly process.

NOIU02 Diskette Drive Assembly Replacement

STEP 1 — Disconnect power to the cabinet.

STEP 2 — Open the rear door and unscrew two 10-32 slotted screws at left and right upper corners. Hinge top cover upward at rear, then pull backward one inch and lift off.

STEP 3 — Locate and remove the slotted screw projecting above the top center of the exposed flexible diskette drive box.

STEP 4 — Locate and remove the slotted screw at the bottom rear center of the diskette drive box.

STEP 5 — Pull the old diskette drive out the front of the OIU.

STEP 6 — Refer to steps 8 through end of NOIU01/03 diskette drive replacement procedure.

OIU Main Logic Power Supply Replacement

**CAUTION**

Disconnect from electrical supply before attempting repair or replacement.

**ATTENTION**

Interrompe l'alimentation avant de proceder a la reparation ou au remplacement.

To remove the Logic Power Supply Assembly, follow the steps below.

STEP 1 — Disconnect power to the NOIU01/03 Driver Cabinet or NOIU02.

STEP 2 — Locate the Power Supply assembly at rear of the Power Rack Assembly of the NOIU01/03 Driver Unit or NOIU02 (see Figure 2.3 or 2.4 as appropriate). Disconnect cables on the adjacent Power Distribution Module.
STEP 21 — Power down the system, remove Disk MFP board (cabled to Disk IOX which has the 50 pin SCSI ribbon cable leading to the controller board.)

STEP 22 — Presently, 1400 Tag firmware is available on 2764 (and 5000 Tag firmware on 27128). Note old jumper settings for back tracking, then remove wire wraps between E8-E12. Add new jumpers per version MFP available, as illustrated in Table 3.3.

STEP 23 — With autoload off, run disk pair diagnostics as described in the hardware manual except IOX board piano dip switches DPSA-7 and DPSA-8 set per Disk/ROM/Dipswitch Table as furnished with software Diskettes/ROMs. Fault indication is available with data terminal diagnostics, which are operated by: Reset T, return, WT or FT, return.

STEP 24 — Disk activity signals successful ROM changeover and switch setup. Change over the remaining boards one-at-a-time with retries. Remember that a backplane master (MFP or PIM) removed from a 990/4 backplane requires a grant jumper installed to its left; that the slot 1 main MFP has jumper E19 installed to drive backplane bus clock and switch 4 closed not to sync to it. Control lines are terminated with resistor dip packs in Main MFP and IOX boards only.

STEP 25 — With all new ROMs installed on boards, load the system with software diskettes as described in the Hardware Manual — “Initializing Disk/Loading Software Utility” procedure (Section III, File Utilities).

STEP 26 — Bring up the system on line, record clock time if failure should occur, and assure that Area 1 appears. Observe LIM startup on LEDs.

Reassembly

STEP 27 — Perform the steps of the NOIU02 Winchester Drive removal procedure in reverse order.

If prior drive size was 5.25 inch, save disk tray and reuse to retain the new drive. In this case, remove the eight screws retaining the new drive stack to the two lower mounting brackets. Save screws and bolt new drive to existing (beige) disk tray through the four vibration isolators.

If, alternatively, the prior fixed drive was the 8-inch size, position black drive bracket with its slotted front to the right of the shelf, with fan discharging toward drive assembly (7). Align clearance holes in disk shelf with tapped holes at edge of black bracket, and retain the assembly with two of four 6-32 x .375 inch screws (2). Slip flat washers over the remaining two screws, and thread into black bracket at front-facing corners of the shelf hole cutout visible from underneath shelf (8).

STEP 28 — Load configurations. Remove spindle lock sticker.

STEP 29 — Replace any cut cable ties.

NOIU01/03 Driver Cabinet Diskette Drive Assembly Replacement

To remove the assembly, refer to Figure 7.16 and follow the steps below.

STEP 1 — Disconnect power to the cabinet.

STEP 2 — Disconnect ribbon cable from connector at rear of Disk Drive Assembly.

STEP 3 — Disconnect line cord at Power Distribution Module rear panel. Cut and remove any cable ties securing the line cord.

Note: After answering “Y” to bad track data, press “ENTER”. If disk has not been formatted, reset and repeat procedure a second time.
STEP 4 — Remove the four screws from blank panel below the front panel of the Disk Drive Assembly.

STEP 5 — Remove screws attaching the Disk Drive Assembly to Driver Unit rails and remove the assembly from the Driver Unit.

STEP 6 — Remove top cover screws and top cover of Disk Drive Enclosure and set aside.

STEP 7 — Stand enclosure on the flexible disk end. Remove four screws from baseplate. Unplug edge connector, and a-c power connector from drive’s rear surface. Squeeze release tabs to remove 9-pin d-c power connector.

STEP 8 — Remove flexible diskette drive.

STEP 9 — If SA-801 drive is to be reinstalled, skip to step 10.

If retrofit diskette drive is to be installed, perform the following:

Unpack flexible diskette replacement drive, mounting tray P/N 6636269A1, and four 4MM metric screws, P/N 197813A1. Orient the tray vertically with longer bracket at the bottom. Position the drive vertically so that the notch in the rear edge connector is toward the top. Slide drive into center of bracket and position faceplate in line with front bracket surface. Fasten screws through two bracket clearance holes on the top surface into the drive. Flip over the drive and repeat with two remaining screws.

STEP 10 — For half-height drives (M2896 or FD 1165) install jumpers per Figure 7.11.

For SA-801 jumper per Figure 4.9 and Table 4.8.

STEP 11 — Reinstall the drive assembly, reversing the disassembly process.

NOIU02 Diskette Drive Assembly Replacement

STEP 1 — Disconnect power to the cabinet.

STEP 2 — Open the rear door and unscrew two 10-32 slotted screws at left and right upper corners. Hinge top cover upward at rear, then pull backward one inch and lift off.

STEP 3 — Locate and remove the slotted screw projecting above the top center of the exposed flexible diskette drive box.

STEP 4 — Locate and remove the slotted screw at the bottom rear center of the diskette drive box.

STEP 5 — Pull the old diskette drive out the front of the OIU.

STEP 6 — Refer to steps 8 through end of NOIU01/03 diskette drive replacement procedure.

OIU Main Logic Power Supply Replacement

CAUTION

Disconnect from electrical supply before attempting repair or replacement.

ATTENTION

Interrompe l’alimentation avant de proceder à la reparation ou au remplacement.

To remove the Logic Power Supply Assembly, follow the steps below.

STEP 1 — Disconnect power to the NOIU01/03 Driver Cabinet or NOIU02.

STEP 2 — Locate the Power Supply assembly at rear of the Power Rack Assembly of the NOIU01/03 Driver Unit or NOIU02 (see Figure 2.3 or 2.4 as appropriate). Disconnect cables on the adjacent Power Distribution Module.
FIGURE 4.9 — SA-801 Floppy Board Setup Components

STEP 3 — Mark and disconnect the wires connecting the Power Supply Assembly (Figure 7.15).

STEP 4 — Remove the fasteners on the Power Supply Assembly. Remove unit from rear of the Driver Cabinet and place on a work table. Remove four screws attaching supply to bracket. The bracket is reused with the replacement supply.

To install the OIU Replacement Logic Supply (P/N 1947424A1), follow the steps below.

STEP 1 — Mount bracket to underside of supply with four screws.
STEP 2 — Position the Power Supply Assembly in the rear opening of the Driver Cabinet Power Rack Assembly. Reconnect power leads from the Power Distribution Module and connect the wiring between the Power Supply Assembly and driver cabinet components (see Figure 7.15).

STEP 3 — Fasten the power supply assembly into the power rack assembly.

STEP 4 — Perform the “Power Rack Assembly DC Power Supply Setup” adjustment procedures (Section III, “NOIU01/03 Driver Cabinet, NOIU02 Setup”).

NOIU01/03 Disk Drive Enclosure; Disk Power Supply Replacement

To remove the NOIU01/03 Disk Drive Enclosure, refer to Figure 7.16 and follow the steps below.

STEP 1 — Perform NOIU01/03 Driver Unit Disk Drive Assembly removal procedure and place assembly on a work bench. Remove four screws retaining power supply to assembly rear surface.

STEP 2 — Replace power supply assembly with 1947655A1. Reuse old harness.

STEP 3 — Set old and new supplies side by side and transfer wires to correspondingly labeled terminals on new supply. Use a 5 Amp slow-blow fuse for disk power supply.

STEP 4 — Mount supply onto enclosure, threading untapped power supply holes using 10-32 tap.

STEP 5 — Perform the adjustments in steps 7, 8, and 9 of the “Disk Drive Setup” procedure in Section III (NOIU01/03 Driver Unit and NOIU02 Setup) to adjust new disk power supply.

STEP 6 — Perform the steps of the NOIU01/03 Disk Drive Enclosure removal in reverse order. The replacement supply requires a 5 Amp slow-blow fuse be installed in the disk drive fuseholder. Relabel to indicate the new fuse size.

NOIU02 Disk Power Supply Assembly Replacement

To remove the NOIU02 Disk Power Supply, follow the steps below.

STEP 1 — Disconnect power to the NOIU02.

STEP 2 — Open (or remove) the rear door.

STEP 3 — Cut and remove cable ties retaining the AC and DC wires to/from the disk power supply; unplug cables.

STEP 4 — Remove the five screws from the bottom of the Disk Power Supply and remove the power supply by lifting it from its mounting shelf.

To install the NOIU02 Disk Power Supply P/N 663051-1, follow the steps below.

STEP 1 — Perform the steps of the NOIU02 Disk Power Supply removal in reverse order.

STEP 2 — Replace all cut cable ties.

STEP 3 — If one or both drives are AC type (i.e. SA800/801, SA-1000), attach corresponding connectors of cable 6637508-1 to each drive, and plug into Test receptacle of Power Distribution Module.

OIU Modules (LIM, BTM, LSM, MFP, IOXM)

When a replacement MFP is required for a 1400 Tag OIU, equivalent part NMFP02 assembly P/N 6634163-2 is currently in production for all OIU applications. For 1400 Tag OIU:

1. Obtain conversion ROM firmware from Bailey, referencing your existing software revision level (at bottom of menu screen), and firmware (ROM labeling at MFP board locations U26 and U28).

2. Set jumpers E1 thru E13 per Table 3.3 for new ROM type.

3. Set jumpers to position E19-E20 for 128K (NMFP01, 1400 Tag) applications.

To remove or install the OIU modules, refer to Figures 7.13 (NOIU01/03) or 7.15 (NOIU02) for module locations and connections of the respective module interface cables. Refer to the module setups and tests in Section III after installation.
NOIU01/03 Driver Cabinet Blower Assembly
To remove the Driver Cabinet Blower Assembly, follow the steps below.

STEP 1 - Disconnect power to the NOIU01 Driver Cabinet.

STEP 2 - Remove the four pan head Philips screws from the blower filter panel (Figure 2.3). Remove the blower filter panel.

STEP 3 - Remove the four Philips screws from the blower duct assembly above the filter panel. Remove the blower duct assembly.

STEP 4 - Remove the two screws holding the blower assembly to the cabinet (two on front panel and one at the side of each rear bracket). Cut and remove any cable ties securing the blower line cord. Disconnect the blower line cord from "BLO" of the Power Distribution Module and remove the Blower Assembly from the front of the cabinet.

To install the Blower Assembly, perform the steps of the above removal procedure in reverse order. Make installations where removals are indicated. Replace all cut cable ties.

NOIU02 Blower Unit
To remove the NOIU02 Blower Unit, follow the steps below.

STEP 1 - Disconnect power to the NOIU02.

STEP 2 - Open (or remove) the rear door.

STEP 3 - Cut and remove cable ties securing the blower unit power cord.

STEP 4 - Remove the two screws (at the bottom of the blower unit enclosure) which retain the blower unit in the NOIU02.

STEP 5 - Lift out the blower from the rear of the NOIU02.

To install the Blower Unit, follow the steps below.

STEP 1 - Perform the steps of the NOIU02 Blower Unit removal above in reverse order.

STEP 2 - Replace all cut cable ties.

OIU Keyboard
To remove the OIU Keyboard, follow the steps below.

STEP 1 - Disconnect power to the NOIU01/03 CRT/Keyboard Console or NOIU02.

STEP 2 - Slide the NETWORK 90 Logo plate from the face of the keyboard. (For NOIU03, see NOTE in step 3)

STEP 3 - Remove the two exposed screws holding the keyboard assembly to the keyboard housing, and remove the assembly.

NOTE: The NOIU03 has no logo plate. Remove the screws from the raised plate surrounding the keyboard. Lift the plate from the cabinet and lift out the keyboard assembly.

STEP 4 - Lift the keyboard assembly from the housing. Remove the connections at the CPU Board's P1-P5 connectors. Remove the keyswitch (S1 and S2) cable connectors.

To install the keyboard assembly, perform the removal steps above in reverse order.

OIU CPU Board

NOTE: Located at side of CRT console enclosures on NOIU01 units built prior to March 1980. After March 1980 became part of the OIU keyboard (see above).

STEP 1 - Perform the steps of the OIU Keyboard removal procedure.

STEP 2 - Disconnect the wires of the Keyboard assembly Key SW1 and Key SW2 units at the Decoder board's terminals (Figure 7.23).

STEP 3 - Detach the CPU board from the Keyboard assembly by removing the six connecting Philips head screws.

To install the OIU CPU Board, follow the steps below.

STEP 1 - Perform the OIU CPU Board removal steps above in reverse order.

STEP 2 - Perform the OIU Keyboard assembly removal steps above in reverse order.
OIU Switchboard Assembly
To remove the OIU Switchboard Assembly, follow the steps below.

STEP 1 - Perform the OIU Keyboard removal steps above.

STEP 2 - Detach the Switchboard assembly from the Keyboard assembly by removing the screws holding the Switchboard to the Keyboard assembly spacers and frame.

To install the Switchboard Assembly, follow the steps below.

STEP 1 - Perform the Switchboard Assembly removal steps above in reverse order.

STEP 2 - Perform the OIU Keyboard Assembly removal steps above in reverse order.

NOIU01/03 CRT/Keyboard Console Enclosure Upper Back Plate, Fan, and Shroud
To remove the Upper Back Plate, Fan, and Shroud, follow the steps below.

STEP 1 - Using a Philips screwdriver, remove the seven ¼-turn fasteners holding the upper back plate to the enclosure. Disconnect the fan power cord and lift off the upper back plate. If it is necessary to remove the fan, disconnect the fan by removing its attaching hardware.

STEP 2 - Remove the shroud by sliding it forward and lifting it from the enclosure base (Figure 7.22).

To install the Upper Back Plate, Fan, and Shroud, follow the steps below.

STEP 1 - Engage the Shroud pins with the slots of the enclosure base. Slide the shroud into place (Figure 7.22).

STEP 2 - If installing fan assembly, mount it on the upper back plate by installing it with its attaching hardware.

STEP 3 - Connect the fan cord. Attach the upper back plate to the rear of the enclosure by tightening the ¼-turn fasteners into place.

NOIU01/03 CRT/Keyboard Console + 12 V, −12 V dc Supply
To remove the Keyboard Console dc Supply Assembly, follow the steps below.

STEP 1 - Identify the assembly as the rear unit in the rear, left-hand portion of the assembled chassis (viewed from the rear). See Figure 7.22.

STEP 2 - Using a Philips screwdriver, remove the two screws holding the Power Supply assembly to the side panel mounting bracket.

STEP 3 - Lift up the supply assembly. Mark and unsolder the leads from the +5 V Power Supply Assembly and the enclosure wiring harness. Remove the ±12 V dc supply assembly.

To install the ±12 V dc Power Supply Assembly, follow the steps below.

STEP 1 - Referring to Figures 7.14 and 7.18, solder the wires connecting the replacement unit to the +5 V dc supply assembly and the wiring enclosure harness.

STEP 2 - Mount the ±12 V dc supply assembly on the assembled chassis side panel bracket by installing its two mounting screws. Verify power supply voltages are as specified in the “CRT/Keyboard Console Setup” of Section III.

NOIU01/03 CRT/Keyboard Console + 5 V dc Supply
To remove the +5 V dc Supply Assembly, follow the steps below.

STEP 1 - Identify this assembly as the far unit in the rear, left-hand portion of the assembled chassis (viewed from the rear). See Figure 7.18.

STEP 2 - Using a Philips screwdriver, remove the two screws holding the Power Supply to the side panel mounting bracket.

STEP 3 - Mark and unsolder the attached leads from the ±12 V dc Power Supply assembly and the enclosure wiring harness. Remove the +5 V dc supply assembly.
To install the +5 V dc Supply Assembly, follow the steps below.

STEP 1 - Referring to Figures 7.18 and 7.14, solder the wires connecting the replacement unit to the ±12 V dc supply assembly and the enclosure wiring harness.

STEP 2 - Mount the +5 V dc supply assembly on the assembled chassis side panel bracket by installing the two mounting screws.

STEP 3 - Perform the power supply adjustment in Step 2 of the "CRT/Keyboard Console Setup" procedure (see Section III).

FIGURE 4.10 - NOIU01/03 CRT/Keyboard Console Terminal Interface
NOIU01 Color Graphic Terminal
To remove the CRT, follow the steps below.

STEP 1 — Remove the CRT/Keyboard Console upper back plate and shroud (see procedure in this Section).

STEP 2 — Remove the screws attaching lower back plate to the enclosure and, leaving wire attached, move the back plate away from the terminal chassis.

STEP 3 — Unplug the power cord from the filter unit receptacle attached to the terminal chassis.

STEP 4 — Maneuver the CRT/Keyboard Console at the edge of a table and remove the four pan head screws at the bottom corners of the enclosure.

STEP 5 — Lift the terminal carefully from the enclosure and set it aside.

STEP 6 — Locate new line cord. If different connector from one at right rear of enclosure, replace as follows. Cut and strip conductors 3 ft. from rear-of-set connector. Install corresponding wires in place of old ones on terminal block TBI. (See Hardware Manual Console drawing, Figure 4.10)

STEP 7 — Install New Intecolor or Aydin Terminal.

a) ISC bolt brackets (reused) to underside of new Intecolor terminal using four 8-32 x ¼” flathead screws supplied

Aydin — bolt brackets to underside of new Aydin terminal using two 10-32 x 5/8” flathead screws for item #3 and use two 3/4” high spacers and two 10-32 x 1” flathead screws for Item #4.

b) ISC position Intecolor terminal in console with CRT against bezel lower edge, and adjust jam nuts on upper CRT mounting ears for CRT conformance to top of bezel.

Aydin — on the Aydin terminal loosen the 4 adjustment nuts on each side of the CRT bezel. Then tighten the top nuts to hold the CRT in position. Remove the terminal and tighten the remaining adjustment nuts.

c) Install four 8-32 x ¼” panhead screws through brackets slots into housing mounting bars.

d) On Intecolor models with black chassis, lower card cage by removing screws at right top corner. Swing open cage and loosen 2 screws joining the hinge to cage. Slide cage down and reassemble.

STEP 8 — Transfer fans from old to new upper rear cover. Secure lower cover to console.

STEP 9 — Attach RS232 cable connector from the keyboard CPU to Intecolor jack ‘J’ or to the special adapter plate in the J4 cutout position, on the lower rear panel, for the Aydin. The adapter plate is discarded with the Intecolor terminal.

STEP 10 — On the Aydin terminal, remove the brightness pot from the terminal and install it in the holes on the right side of the lower rear panel.

STEP 11 — Attach remaining cables, apply power, and follow set-up procedure in Intecolor user's manual for new terminal; or follow the Aydin documentation for terminal set-up and alignment.

STEP 12 — Install upper-cover half, slide-lock in position, then plug-in rear cover fans to labeled connector and tighten all rear cover ¼ turn fasteners.

STEP 13 — Confirm operation of all fans.

NOIU02 Color Graphic Terminal
To remove the NOIU02 CRT, follow the steps below.

STEP 1 — Disconnect power to the NOIU02.

STEP 2 — Open (or remove) the rear door.

STEP 3 — Remove the two screws at the side of the door that retain the top cover. Remove the top cover by lifting its rear edge and pushing it toward the front of the NOIU02.

STEP 4 — Remove the cable from the J1 connector.
STEP 5 — If supplied with a remote mounted convergence card, remove the cable to the card (delta gun CRTs only). Otherwise, skip this step.

STEP 6 — Remove the cable to the front panel mounted brightness control.

STEP 7 — Remove the power cord.

STEP 8 — Remove the two screws holding the CRT to the rails.

STEP 9 — Slide the terminal out the rear of the NOIU02.

STEP 10 — Remove 7 rubber feet from new terminal, retaining screws.

STEP 11 — Locate and fasten 'wedgie' P/N 6635785A2 (Left: Mount on side nearest line cord connector; wedgie tip toward screen). Use screws from step 10.

STEP 12 — Repeat the process for 'wedgie' P/N 6635785A1, mounting it to the right edge of the base pan.

STEP 13 — Examine the OIU02's terminal power cord to see if the connector will insert in the new terminal. If required, cut cable tie 5 and substitute the line cord shipped with the replacement terminal.

To install the NOIU02 terminal, perform the NOIU02 CRT removal steps above in reverse order. Ensure the CRT's protective, anti-glare screen is in place.

NOIU03 Color Terminal

STEP 1 — Hinge open rear door and unplug terminal power cord at right rear apron.

STEP 2 — Remove retaining screws, then RS232 connector at left rear apron.

STEP 3 — Remove screws visible at right and left edges.

STEP 4 — Withdraw terminal and place base-up on the floor.

STEP 5 — With replacement terminal similarly positioned, transfer the mounting strap to the replacement.

STEP 6 — Reverse the above process to reinstall the replacement color terminal.
## Section V — Specifications

### VOLTAGE/FREQUENCY

<table>
<thead>
<tr>
<th>Component</th>
<th>Voltage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOIU01/03 Driver Cabinet</td>
<td>105 - 125 V ac</td>
<td>47 - 63 Hz</td>
</tr>
<tr>
<td>NOIU01 CRT/Console</td>
<td>105 - 125 V ac</td>
<td>47 - 63 Hz</td>
</tr>
<tr>
<td>NOIU03 CRT/Console</td>
<td>105 - 125 V ac</td>
<td>47 - 63 Hz</td>
</tr>
<tr>
<td>NOIU02 Console Cabinet</td>
<td>105 - 125 V ac</td>
<td>47 - 63 Hz</td>
</tr>
<tr>
<td>NPRT01/02/03 Printer</td>
<td>105 - 125 V ac</td>
<td>47 - 63 Hz</td>
</tr>
</tbody>
</table>

**NOTE:**

1. Input power must be sine wave AC, ± 3% total harmonic distortion.

2. All system “Safety Grounds” must be at the same voltage level. If the safety grounds are at different voltage levels, groundloop current in the RS-232 lines can cause erratic system operation.

3. OIU Alarm Contact Ratings: 28 V dc, .25 A switching, 1 A continuous.

### CURRENT

<table>
<thead>
<tr>
<th>Components</th>
<th>Run Amps</th>
<th>Peak Value (Amps)</th>
<th>Inrush Current Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOIU01/03 Driver Cabinet</td>
<td>5.0</td>
<td>19.5</td>
<td>60.0</td>
</tr>
<tr>
<td>NOIU01 CRT/Console</td>
<td>2.8</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>NOIU03 CRT/Console</td>
<td>13.8</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>NOIU02 Console Cabinet</td>
<td>7.8</td>
<td>19.5</td>
<td>80.0</td>
</tr>
<tr>
<td>NPRT01/02/03 Printer</td>
<td>2.0</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>
### POWER/COOLING REQUIREMENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Watts</th>
<th>BTU/Hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOIU01/03 Driver Cabinet</td>
<td>570</td>
<td>1940</td>
</tr>
<tr>
<td>NOIU01 CRT/Console</td>
<td>276</td>
<td>940</td>
</tr>
<tr>
<td>NOIU03 CRT/Console</td>
<td>1325</td>
<td>940*</td>
</tr>
<tr>
<td>NOIU02 Console Cabinet</td>
<td>846</td>
<td>2890</td>
</tr>
<tr>
<td>NPRT01/02/03 Printer</td>
<td>204</td>
<td>700</td>
</tr>
</tbody>
</table>

*Does not include air conditioning.

### ENVIRONMENT

<table>
<thead>
<tr>
<th>Component</th>
<th>Operating Temperature % Relative Humidity (non-condensing)</th>
<th>Non-operating (transportation, storage and construction area) Temperature and % Relative Humidity (non-condensing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOIU01/03 Cabinet</td>
<td>50 - 104°F (10 - 40°C) 5 - 80% R.H.</td>
<td>—4 to 122°F (—20 to 50°C) 0 - 95% R.H.</td>
</tr>
<tr>
<td>NOIU01/03 CRT Console</td>
<td>50 - 104°F (10 - 40°C) 5 - 95% R.H.</td>
<td>—4 to 122°F (—20 to 50°C) 0 - 95% R.H.</td>
</tr>
<tr>
<td>NOIU02 Console Cabinet</td>
<td>50 - 104°F (10 - 40°C) 5 - 95% R.H.</td>
<td>—4 to 122°F (—20 to 50°C) 0 - 95% R.H.</td>
</tr>
<tr>
<td>NPRT01/02/03 Printer</td>
<td>50 - 104°F (10 - 40°C) 10 - 80% R.H.</td>
<td>—4 to 122°F (—20 to 50°C) 0 - 95% R.H.</td>
</tr>
</tbody>
</table>

**NOTE:** All OIU hardware must be stored and used in a non-corrosive environment.

### PHYSICAL DATA

<table>
<thead>
<tr>
<th>Component</th>
<th>Width</th>
<th>Depth</th>
<th>Height</th>
<th>Weight lbs (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOIU01/03 Cabinet</td>
<td>23.2</td>
<td>25.6</td>
<td>51.1 (1297)</td>
<td>400 (181.4)</td>
</tr>
<tr>
<td>NOIU01 CRT Console</td>
<td>26.4</td>
<td>36.7</td>
<td>18.6 (473)</td>
<td>152 (68.9)</td>
</tr>
<tr>
<td>NOIU03 CRT Console</td>
<td>22.0</td>
<td>30.0</td>
<td>70.0 (1778)</td>
<td>290 (131.4)</td>
</tr>
<tr>
<td>NOIU02 Integrated Console</td>
<td>28.1</td>
<td>28.0</td>
<td>52.5 (1334)</td>
<td>412 (186.9)</td>
</tr>
</tbody>
</table>
Section VI — Parts Ordering Information

OIU Replacement

When ordering an OIU as a replacement or add on to your system, your Bailey representative will need to know the revision of the software presently in your OIU. All OIU's should have the same software revision level to ensure consistent functionality with the rest of the system.

The current software revision level that the OIU is using is located at the bottom of the General Function Menu, obtained by depressing the menu key. Figure 6.1 shows this menu and indicates that the software revision level is N5 (1900063N5).

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Module Replacement

When ordering a Multi-Function Processor Module (NMFP01/02/03), Bus Transfer Module (NBTM01), Loop Storage Module (NLSM01/02), Loop Interface Module (NLIM01), or Processor Interface Module (NPIM01) as a replacement for your system, supply the revision level of the module firmware to your Bailey representative. The firmware consists of the integrated circuits which control and guide the module. These integrated circuits are Read Only Memory (ROM) chips which contain Bailey operation codes. Bailey changes the operation codes, adding functions and enhancements, improving module efficiency and system integrity.

The firmware revision level, designated by a letter and number(s), is printed on a white tab on the ROM chips. Obtain the module firmware revision from the ROM locations specified below:

NMFP01/02/03 — (Figure 3.10) ROM locations U26 and U28. (Both of these ROM designations should be noted on the order form.)

NBTM01 — (Figure 3.7) either ROM location XU14 or XU15.

NLIM01 — (Figure 3.6) ROM location XU4.

NPIM01 — (Figure 3.12) either ROM location XU11 or XU17.

NLSM01/02 — (Figure 6.2) either ROM location XU45 or XU57.

---

FIGURE 6.1 — General Function Menu
**Subscription Service**

Bailey Controls has released a Software Subscription Service for the OIU. This service allows customers to have all new enhancements that Bailey develops during the subscription period.

AOSOIU0101  1 year subscription  
AOSOIU0102  2 year subscription  
AOSOIU0103  3 year subscription

If any questions arise on the ordering procedure or the Software Subscription Service, please contact your Bailey representative. Aftermarket Development is also available to answer your technical questions at (216) 585-7206.
NOTES

1.) UNIT IS SUPPLIED WITH A 72.00 \( \frac{1829.0}{1829.0} \) A.C. POWER CORD WHICH PLUGS INTO A 125V., 15 AMP, 2 POLE 3 WIRE GROUNDING RECEPTACLE (NEMA 5-15R).

2.) J1 AND J2 CONNECTORS ARE CINCH TYPE DB-25-S OR EQUIVALENT.

3.) TOTAL WEIGHT IS APPROX. 152 LBS. (69 KG)

4.) CUSTOMER MAY FASTEN UNIT TO DESK TABLE PER TAPPED HOLES SHOWN IN SECTION B - B. BOLTS SHOULD NOT PROTRUDE INTO UNIT MORE THAN \( \frac{.38}{0.6} \) DUE TO INTERNAL INTERFERENCE. DO NOT REMOVE FEET.

5.) ALLOW \( \frac{30.00}{762.0} \) CLEARANCE BEHIND UNIT FOR CABLES, VENTILATION AND SERVICING & TOP ENCLOSURE AND/OR REAR PANEL REMOVAL.

6.) GROUNDING NOTE - ALL SYSTEM "SAFETY GROUNDS" SHOULD BE TIED TO THE SAME POINT. (ANY VOLTAGE DIFFERENCE ON THE SAFETY GROUNDS CAN CAUSE ERRATIC OPERATION).

7.) 120 VAC POWER SOURCE MUST BE CORRECTLY WIRED. INCORRECT WIRING CAN CAUSE SERIOUS EQUIPMENT DAMAGE.

DIMENSIONS

INCH
MILLIMETER
NOTES

1.) 6.00
   152.4 MINIMUM CLEARANCE REQUIRED
   WHEN INSTALLING CABLE IN TOP ENTRY.

2.) REMOVE SPINDLE LOCK FROM WINCHESTER
   DISK DRIVE BEFORE APPLYING POWER.

3.) SUMMARY OF SPECIFICATIONS:
   POWER REQUIREMENT: 105–125 VAC, 60 Hz ±.5 Hz
   LINE DISTORTION: NO MORE THAN 5% T.H.D.
   POWER CONSUMPTION: 570 W. (MAX)
   POWER FACTOR: .8 (WORST CASE)
   INRUSH CURRENT: 61 A. (PEAK) FOR 1 CYCLE DROPS TO
   19.5 A. PEAK FOR 3 SECONDS, THEN DROPS
   TO NORMAL POWER CONSUMPTION LEVEL.

ENVIRONMENT:
   OPERATING: +10 TO +38°C, 20–80% RELATIVE HUMIDITY
   STORAGE: -22 TO -47°C, 1–95% RELATIVE HUMIDITY
   ATMOSPHERE: NON-CONDENSING AND NON-CORROSIVE.
   HEAT DISSIPATION: 1938 BTU/HOUR MAX.

4.) GROUNDING NOTE: ALL SYSTEM "SAFETY GROUNDS"
   SHOULD BE TIED TO THE SAME POINT. (ANY VOLTAGE
   DIFFERENCE ON THE SAFETY GROUNDS CAN CAUSE
   ERRATIC SYSTEM OPERATION).

5.) 120 VAC POWER SOURCE MUST BE CORRECTLY WIRED.
   INCORRECT WIRING CAN CAUSE SERIOUS
   EQUIPMENT DAMAGE.

6.) FOR OTHER THAN 105–125 VAC, 60Hz ±.5 Hz OPERATION
   SEE BAILEY DWG D3053318.

REFERENCE D3053254, SHEET 1

FIGURE 7.1 — NOIU01/03 Driver Unit Installation
FIGURE 7.2 — NOIU01 CRT/Keyboard Console Installation
NOTES:

1.) UNIT IS SUPPLIED WITH A 7 FT. 2.1 METER A.C. POWER CORD AND 25 FT. 7.62 METER PRINTER CABLE.

2.) MINIMUM CLEARANCE FOR MAINTENANCE AND OPERATION.

3.) WEIGHT OF PRINTER 20LBS. (9.1 KG.) W/PEDESTAL 61LBS. (27.7 KG.)

4.) SUMMARY OF SPECIFICATIONS:
   POWER REQUIREMENT: 100-128VAC, 48/65 HZ
   POWER: 180 WATTS

ENVIRONMENT:
   OPERATING: +40 TO +104 °F (+4 TO +40 °C) TEMPERATURE
   5 TO 95% RELATIVE HUMIDITY
   NON-CONDENSING AND NON-CORROSIVE ATMOSPHERE
   STORAGE: -40 TO +160 °F (-40 TO +71 °C)
   5 TO 95% RELATIVE HUMIDITY
NOTES:
1.) REMOVE SPINDLE LOCK FROM WINCHESTER DISK DRIVE BEFORE APPLYING POWER.
2.) SYSTEM SAFETY GROUND CONNECTION.
3.) 120 VAC POWER SOURCE MUST BE WIRED CORRECTLY. INCORRECT WIRING CAN CAUSE SERIOUS EQUIPMENT DAMAGE.
4.) TOTAL WEIGHT IS APPROX. 412 LBS. (186.9 KG).
5.) TRIM PLATE IS REQUIRED ON EACH SIDE OF A FREE-STANDING CONSOLE, BUT ONLY END CONSOLES NEED TRIM PLATES (1 EACH) IN AN ARRAY.
6.) SUMMARY OF SPECIFICATIONS:
   POWER REQUIREMENT: 105-125 VAC, 50/60 HZ ± .5 HZ
   LINE DISTORTION: NO MORE THAN 5% T.H.D.
   POWER CONSUMPTION: 846 W. (MAX.)
   POWER FACTOR: .8 (WORST CASE)
   INRUSH CURRENT: 80A. (PEAK) FOR 1 CYCLE DROPS TO 19.5 A. PEAK FOR 3 SECONDS, THEN DROPS TO THE NORMAL POWER CONSUMPTION LEVEL.
   ENVIRONMENT:
   OPERATING: -10 TO +38° C, 20-80% RELATIVE HUMIDITY.
   STORAGE: -22 TO +47° C, 5-95% RELATIVE HUMIDITY.
   ATMOSPHERE: NON-CONDENSING AND NON-CORROSIVE.
   HEAT DISSIPATION: 2976 BTU/HOUR MAX.
7.) STABILIZERS (PROVIDED) MUST BE USED WHEN CONSOLES ARE NOT SECURED TO FLOOR.
8.) APPLICABLE CODES & STANDARDS MAY REQUIRE ADDITIONAL CLEARANCE.

REFERENCE D3053363, SHEET 1

FIGURE 7.3 — NOIU02 Operator Interface Unit Installation
SECTION A-A

ON/OFF SWITCH
CABLE CONNECTION
(SEE NOTE 1)

POWER CORD CONN.
(SEE NOTE 1)
(REAR)

PAPER BASE

PRINTER

24.00
609.6
(SEE NOTE 2)

19.35
466.1

6.30
160.0

PEDESTAL
(OMITTED ON NPRT02)

28.29
667.7

25.00
635.0

36.00
914.4
(SEE NOTE 2)

21.00
533.4

62
15.7

24.00
609.6
(SEE NOTE 2)

FIGURE 7.4 — Printer Installation
DETAIL A
TIE REAR OF CONSOLES TOGETHER WITH BRACKETS, BOLTS AND NUT PROVIDED. UNITS CAN BE DRAWN TOWARD EACH OTHER TO ELIMINATE GAPS WITH THIS HARDWARE.

DETAIL B
TIE CONSOLE COUNTERS TOGETHER WITH CLAMP AND BOLTS PROVIDED. TURN BOLTS BY HAND UNTIL SEATED IN GROOVES OF RECESSES BEFORE TIGHTENING WITH WRENCH.
RECOMMENDED CLEARANCE FROM WALL FOR SERVICING AND AISLEWAY (SEE NOTE 5)

130° MAX. DOOR OPENING
MIN. FOR COVER REMOVAL
1.50 MIN. 38.1

NOTES:

1) TOTAL WEIGHT IS APPROX. 214 LBS.
   (97 KG.)

2) TRIM PLATE IS REQUIRED ON EACH SIDE OF A FREE-STANDING CONSOLE. BUT ONLY END CONSOLES NEED TRIM PLATES (1 EACH) IN AN ARRAY.

3) STABILIZERS (PROVIDED) MUST BE USED WHEN CONSOLES ARE NOT SECURED TO FLOOR.

4) SYSTEM SAFETY GROUND CONNECTION.

5) APPLICABLE CODES & STANDARDS MAY REQUIRE ADDITIONAL CLEARANCE.
CLEARANCE
SERVICING
SEE NOTE 7)

28.12
714.2

48.12
1171.4

ENDED
ANCE TO
: AISLEWAY
SEATED OPERATOR
(SEE NOTE 6)

REAR JOINING BRACKETS
(SEE DETAIL A)

INTERUNIT CABLE RUN
(SEE NOTE 1)

TRIM PLATE
(SEE NOTE 2)

STABILIZER
(SEE NOTE 3)

COUNTER CLAMP
(SEE DETAIL B)

NOTES:

1.) CABLES MAY BE BROUGHT UP THROUGH FLOOR
UNDER ONE UNIT AND ROUTED TO THE OTHERS
IN AN ARRAY VIA 14.86 x .88 (377.4 x 22.3)
CABLE RUN.

2.) TRIM PLATES SHOULD BE INSTALLED ONLY
AT OUTER ENDS OF ARRAY.

3.) STABILIZERS (PROVIDED) MUST BE USED WHEN
CONSOLES ARE NOT SECURED TO FLOOR.

4.) FLOOR MOUNTING:
ALL FULL WIDTH UNITS MUST BE SECURED
TO FLOOR. WEDGES NEED ONLY BE TIED
TO ADJACENT FULL WIDTH UNITS PER
DETAILS A & B.

5.) THE WEDGE UNIT IS DESIGNED TO BE USED
ONLY BETWEEN FULL WIDTH UNITS.

6.) AUXILIARY KEYBOARD REQUIRES 7.00 (177.8)
BE ADDED TO FRONTAL CLEARANCES.

7.) APPLICABLE CODES & STANDARDS MAY
REQUIRE ADDITIONAL CLEARANCE.

REFERENCE D3053367

FIGURE 7.5 — Console Array Assembly
FIGURE 7.6 — NUCC01 Utility Console Cabinet Installation
NOTES:

1.) TOTAL WEIGHT IS APPROX. 95 LBS. (43.1 KG.)

2.) STABILIZERS (PROVIDED) MUST BE USED WHEN ADJACENT FULL WIDTH CONSOLES ARE NOT SECURED TO THE FLOOR.

3.) SINGLE OR MULTIPLE UNITS ARE DESIGNED TO BE USED ONLY BETWEEN FULL WIDTH UNITS. WEDGES MUST BE SUPPORTED BY ADJACENT UNITS VIA COUNTER CLAMPS & REAR JOINING BRACKETS. SEE ARRAY DWG. D3053367 FOR DETAILS.

4.) APPLICABLE CODES & STANDARDS MAY REQUIRE ADDITIONAL CLEARANCE.

DIMENSIONS

<table>
<thead>
<tr>
<th>INCH</th>
<th>MILLIMETER</th>
</tr>
</thead>
</table>

UNIT CABLE RUN: 22.3 x 14.86/377.4
NOTES:

1.) TOTAL WEIGHT IS APPROX. 110 LBS. (49.8KG.)

2.) TRIM PLATE IS REQUIRED ON EACH SIDE OF A FREE-STANDING CONSOLE. BUT ONLY END CONSOLES NEED TRIM PLATES (1 EACH) IN AN ARRAY.

3.) STABILIZERS (PROVIDED) MUST BE USED WHEN CONSOLES ARE NOT SECURED TO FLOOR.

4.) APPLICABLE CODES & STANDARDS MAY REQUIRE ADDITIONAL CLEARANCE.

FIGURE 7.7 — NCWS01 Console Work Station and NCPS01 Console Printer Surface Installation
FIGURE 7.8 — NPIE01 15° Wedge Console Installation
NOTES:

1. SHIPPING WEIGHT IS 47 LBS. (21.3 KG.) MAX.

2. FABRIC IS ACRYLIC (CLARET IN COLOR), ARM RESTS & BASE ARE PLASTISOL COVERED METAL (DARK BROWN FINISH).

3. CARE: UPHOLSTERY—VACUUM REGULARLY. IN CASE OF A SPILL, BLOT IMMEDIATELY THEN RINSE WITH WATER. VACUUM WHEN DRY. PLASTISOL COVERED PARTS—RINSE IN MILD DETERGENT, RINSE WITH WARM WATER AND DRY WITH A SOFT CLOTH.

4. UPHOLSTERY REPLACEMENT KIT
PT. NO. 199938-1

* HEIGHT CAN BE REDUCED A TOTAL OF (-) 3.25 (82.5)

REFERENCE C3053365

FIGURE 7.9 — NOCS01 Operator Chair
DC POWER CONNECTOR FOR MITSUBISHI OR NEC DC DISKETTE DRIVES. AC POWER CABLE NOT USED.

FIGURE 7.11 — Jumper Drawing
[AUTOTRANSFORMER SHOWN WILL POWER A STANDARD NETWORK 90 NOIUØ1 (1 DRIVER AND 1 CONSOLE) OR NOIUØ2 PLUS A PRINTER(NPRTRØ)].

THE AUTOTRANSFORMER IS FOR USE IN CERTAIN EUROPEAN COUNTRIES, WITH 240VAC REFERENCED TO NEUTRAL ONLY.
THIS AUTOTRANSFORMER MUST NOT BE USED WITH NORTH AMERICAN 240VAC (TWO 120VAC LINES EACH 180° OUT OF PHASE WITH THE OTHER AND BOTH REFERENCED TO NEUTRAL).

CONSULT SITE PREPARATION MANUAL P.I.-E93-900-5 FOR DETAILS OF POWER AND GROUND CONNECTION & REQUIREMENTS.

ALWAYS TEST WIRING BEFORE CONNECTING TO A NETWORK 90 NOIUØ. INCORRECT POWER WIRING CAN CAUSE SEVERE EQUIPMENT DAMAGE.

FIGURE 7.10 — Transformer Installation
1. NKLMO1004 CABLE: CONNECT FROM REAR OF NLIM02(P2) TO NTPL01(P1).
2. 6636342A1 CABLE: CONNECT FROM REAR OF NLSM02(P2) TO IOX (POS 5) IN CARD CAGE (FRONT).
3. ITEMS WITH ASTERISK (*) FOR 2ND PRINTER OPTION ONLY.
PCU WITH TERMINATION

SEE TYPICAL EQUIPMENT MOUNTING DRAWING, BCCO 03053596, FOR FURTHER DETAILS OF NETWORK 90 CABINET STRUCTURES.

ASSOCIATED NTPL01 WITH NEXT PROCEEDING PCU OR OPERATOR INTERFACE UNIT, NOIU, IN PLANT LOOP.

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<thead>
<tr>
<th>TERMINAL</th>
<th>SIGNAL DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB1-1</td>
<td>LOOP 1 IN (+) (RED TERMINAL OF CABLE WITH TUBING IDENTIFIER).</td>
</tr>
<tr>
<td>TB1-2</td>
<td>LOOP 1 IN (—) RED TERMINAL OF CABLE WITH NO IDENTIFIER.</td>
</tr>
<tr>
<td>TB1-3</td>
<td>LOOP 1 CABLE SHIELD (BLUE TERMINAL OF CABLE).</td>
</tr>
<tr>
<td>TB2-1</td>
<td>LOOP 2 IN (+) (RED TERMINAL OF CABLE WITH TUBING IDENTIFIER).</td>
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<td>TB2-3</td>
<td>LOOP 2 CABLE SHIELD (BLUE LUG OF CABLE).</td>
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THE NLIM01 — NBIM01, BUS INTERFACE MODULE, PAIR INTERFACES A PCU TO THE PLANT LOOP. THESE MODULES ARE CONNECTED BY 40 CONDUCTOR RIBBON CABLE ASSEMBLY WHICH IS SPECIFIED BY THE NBIM01 ASSEMBLY. THE MODULES ARE INSERTED IN ADJACENT SLOTS OF THE MODULE MOUNTING UNIT, NMMU. THE CONNECTING CABLE PASSES THROUGH A SLOT IN THE NBIM01 PRINTED CIRCUIT BOARD.

THE OPERATOR INTERFACE UNIT, NOIU, INTERFACES THE PLANT LOOP VIA THE NLIM01-NPIM01, PROCESSOR INTERFACE MODULE FOR THE 5000/1400 TAG UNIT. A NLIM02, NBTM01 (BUS TRANSFER MODULE), AND NLSM02 (LOOP STORAGE MODULE) ARE USED WITH THE 5000 TAG NOIU. THESE MODULES ARE MOUNTED IN SEPARATE MODULE MOUNTING UNITS WITHIN THE NOIU. THEY ARE CONNECTED BY A 40 CONDUCTOR RIBBON CABLE ASSEMBLY WHICH IS SPECIFIED BY THE NPIM01 AND IS KEYED SO PROPER ORIENTATION IS FOLLOWED.

FIGURE 7.12 — Plant Loop Communication Interface
### FIGURE 7.13 — NOIU01/03 Driver Unit Wiring Diagram and Cable Connection (continued)

#### TABLE 1

<table>
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<th>FROM</th>
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<th>WIRE</th>
<th>TERM (OTHER END)</th>
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<td>TB1-4</td>
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<td>YEL</td>
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<td>ITEM 6 (DIST PANEL)</td>
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<td>TB3-1</td>
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<td>ITEM 6 (DIST. MOD)</td>
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*Note: Diagram not shown in text.*
### TABLE 2

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<td>11</td>
<td>POS 11 P4 PTR</td>
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<td>8</td>
<td>POS 8 P4 DSK</td>
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91
FIGURE 7.14 — NOIU01 CRT/Keyboard Enclosure Wiring
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<th>POS</th>
<th>TO CONN</th>
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<td>P4</td>
<td>45</td>
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<td>P4</td>
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<td>DTC</td>
<td>OMT</td>
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<td>DTC</td>
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<td>IOXM</td>
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**TABLE 4**

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<th>NAME</th>
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**TABLE 2**

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FOR CALLOUT NAME, SEE TABLE 4, NEXT PG.

NOTES:

1. COIL EXCESS LENGTH AND CONNECT TERMINAL (RED LEAD) TO PIN 4 OF TB1 ON REAR OF ITEM 33.

2. ITEMS WITH ASTERISK (*) FOR 2nd PRINTER OPTION ONLY

FIGURE 7.15 — NOIU02 Wiring Diagram and Cable Connection
### TABLE 1

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM (ONE END)</th>
<th>WIRE</th>
<th>TERM (OTHER END)</th>
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<td>(+ V)</td>
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<tr>
<td>ITEM 15</td>
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<tr>
<td>(DRIVE DISK)</td>
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<td>POWER CONNECTOR</td>
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<td>(PWR SUPPLY)</td>
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<td>GRN</td>
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<td>3</td>
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<td>WHT</td>
<td></td>
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<tr>
<td>ITEM 33</td>
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<td>115</td>
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### TABLE 2

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<td>POS 8 P4 CONT</td>
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<td>POS 11 P3 CRT</td>
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<td>58</td>
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<td>POS 2 P5 PTR</td>
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<td>59</td>
<td>11</td>
<td>POS 11 P4 PTR</td>
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</table>
SEE DWG FIGURE 7.11 FOR SWITCH SETTINGS AND/OR JUMPER POSITIONS OF ITEMS 3 & 6.

CONNECT ITEM 7 to J2 OF ITEM 6,
CONNECT ITEM 8 to J4 OF ITEM 6,
PIN 1 TO PIN 1 RESPECTIVELY.

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<td>2</td>
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<tr>
<td>3</td>
<td></td>
<td>FIXED DISK DRIVE</td>
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<tr>
<td>4</td>
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<td>CONTROLLER BRKT</td>
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<tr>
<td>5</td>
<td></td>
<td>FIBER WASHER</td>
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<tr>
<td>6</td>
<td></td>
<td>DISK CONTROLLER</td>
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<tr>
<td>7</td>
<td></td>
<td>CONTROLLER CABLE</td>
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<tr>
<td>8</td>
<td></td>
<td>CONTROLLER CABLE</td>
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<tr>
<td>9</td>
<td></td>
<td>NYLON SCREW</td>
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<tr>
<td>10</td>
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<td>MTG CHASSIS</td>
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<tr>
<td>11</td>
<td>NIDAC09003</td>
<td>SEMS SCREW</td>
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<tr>
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<td>SEMS SCREW</td>
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<table>
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<td>1947418 A3</td>
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SECTION A-A

J1 CONNECTOR TO CONTROLLER BOARD (J1)

PIN 1

CONTROLLER DC POWER

FIXED DISK DC POWER

ITEM | PART NO. | NAME
--- | --- | ---
1 | | DISK DRIVE ENCLOSURE
2 | | DISKETTE DRIVE
3 | | DRIVE & CONTR ASSY
4 | | DRIVE POWER CABLE
5 | | DISK DRIVE CABLE
6 | | CONTROLLER CABLE
7 | | DISK MTG TRAY
8 | | FUSE (5 AMP, 125 V)
9 | .112-40x.375 | PAN HD CAD PL STL MACH SCR
10 | .112-40 | EXT LW STNLS STL HEX KEPS
11 | | FUSE LABEL
12 | | POWER SUPPLY ASSY
13 | | METRIC SCREW
14 | NBSAC13004 | SCREW

FIGURE 7.16 — NOIU01/03 Driver Unit Disk Drive Assembly
FIGURE 7.17 — Winchester Fixed Rigid-disk Drive Assembly
NOTES:

1. SOLDER 36 IN. WIRE EXTENSION TO THE POT SHOWN. WIRE COLOR ARE SAME AS EXISTING COLORS TO POT. USE HEAT SHRINKABLE TUBING, ITEM 14 OVER SPLICES. CUT ITEM 14 INTO 3 ONE INCH PIECES. REMOUNT POT I ORIGINAL HOLE.

2. MOUNT CRT ASSEMBLY (2 PLACES) IN ADJUSTMENT FIXTURE. ADJUST TUBE FACE 4 PLACES, TO SEAT AGAINST MATING SURFACE OF FIXTURE.

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<tr>
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<td>30 AWG W&amp;H lead wire</td>
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<td>14</td>
<td>3</td>
<td>Tubing, heat shrinkable</td>
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<td>13</td>
<td>36</td>
<td>22 AWG Blk leadwire</td>
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<td>12</td>
<td>36</td>
<td>22 AWG Yel leadwire</td>
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<td>11</td>
<td>36</td>
<td>22 AWG Red leadwire</td>
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<td></td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>.16432 × 375 Lg. Pan Hd</td>
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<td>5</td>
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<td>Wedge, CRT MTG (R.H.)</td>
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<td>2</td>
<td>1</td>
<td>Filter, CRT</td>
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<tr>
<td>1</td>
<td>1</td>
<td>Term, CRT Intecolor</td>
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FIGURE 7.18 — CRT Assembly
FIGURE 7.19 — OIU Power Supply Assembly (Outline, Wiring, and Voltage)
FIGURE 7.21 — Printer Termination Unit Interface
<table>
<thead>
<tr>
<th>ITEM</th>
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<th>PART NO.</th>
<th>NAME</th>
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<td>A</td>
<td>1945155A4</td>
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<td>B</td>
<td>1947508A1</td>
<td>NEON LAMP</td>
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<td>D</td>
<td>196949A8</td>
<td>CIRCUIT BREAKER</td>
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<td>D</td>
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<td>AC/DC POWER SUPPLY</td>
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<td>A</td>
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<td>6633686A3</td>
<td>COVER, TB</td>
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<td>NFBAC13008</td>
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</table>

**FIGURE 7.20 — Power Distribution Module (Outline and Wiring)**

99
ON UNITS BUILT PRIOR TO MARCH 1980, SUBSEQUENTLY BECAME PART OF KEYBOARD ASSEMBLY
A. Card Cage

J17-J32 located to left of J1-J16 respectively

B. TB1 (Mounted on Back of the Card Cage)

FIGURE 7.25 — 16-slot Card Cage Assembly
Component | Description
----------|-------------------
C1         | Cap, ceramic 0.01mF 1KV
CR1-CR3    | Lamp, solid state
J1-J16     | Edge connector
J17-J32    | Conn, PC, Jmpr
           | Conn, PC, Post
R1         | Res, film, 316Ω, ½ W, 1%
R2, R3     | Res, film, 1K, ½ W, 1%
U1, U3, U5, U7, U9, U11, U13 | Res, film, Sip 7, 560Ω
U2, U4, U6, U8, U10, U12, U14 | Res, film, Sip, 7.390Ω
TB1        | Term blk PC

FIGURE 7.24 — 16-slot Card Cage Schematic
POWER CABLE HARNESS SUPPLIED WITH ITEM 1 (SEE NOTE 3)

LOCATE APPROX. AS SHOWN

ASSEMBLE WITH 1/2 TWIST TO ALLOW PIN 1 OF LARGE CONNECTOR TO BE ASSEMBLED IN POSITION SHOWN

PIN 1

A.C. FOR WINCHESTER (AT BOTTOM OF DRIVE)

A.C. FOR FLOPPY

D.C. FOR FLOPPY

WINCHESTER, D.C. POWER (UNDER CONTROLLER)

CONTROLLER, D.C. POWER

Pin 1
NOTES:
1. HARDWARE IS SUPPLIED WITH ITEM 1 TO RETAIN ITEMS 2, 3, & 4 IN ITEM 1 AS SHOWN.

2. WINCHESTER "SPINDLE LOCK" MUST BE INSTALLED PRIOR TO SHIPMENT, AND MUST BE REMOVED BEFORE APPLYING POWER TO THE DISK DRIVE ASSEMBLY.

3. ALL AC POWER CONNECTORS ARE 3-PIN CONNECTORS. D.C. POWER IS ON THE 6-PIN CONNECTORS.

<table>
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<tr>
<td>10</td>
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<td>.112-40 Ext LW Strls Stl Hex Keps</td>
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<td>2</td>
<td>.112-40 × 375 Pan HD Cad Pl Stl Mach Scr</td>
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<td>3</td>
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<td>Disk controller</td>
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FIGURE 7.26 — NOIU01/03 Disk Drive Assembly (older version)