

VOLUME A06 MACHINE 4381- -0011647 MODEL M02 SYSTEM 0000JYP MODE SCHED SHIP 00/00/00

LOGIC TYPE -0- SYSTEMS DIAGRAMS

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Maintenance Information

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SAFETY INDEX TERMS/ABBREVIATIONS INTRODUCTION START PU REPAIR CHNL REPAIR MSS REPAIR END OF REPAIR	PWR REPAIR (HWS AND MBC)	PWR REPAIR (PROC) PR 1001 THRU PR 13 XX	PWR REPAIR (PROC) PR 1401 THRU PR 18 XX	PWR REPAIR (PROC) PR 1901 THRU PR 5001	SERVICE AIDS	LOCATIONS TOOLS REMOVAL/REPLACEMENT PREVENTIVE MAINTENANCE DIAGNOSTICS LOGS SYSTEM TEST INSTALLATION SAFETY INSP	CONSOLE FUNCTIONS MESSAGES
VOL A01	VOL A02	VOL A03	VOL A04	VOL A05	VOL A06	VOL A07	VOL A08



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Processor Maintenance Information

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Service Aids

AID 005

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Introduction

The purpose of this section is to keep common information together. This section of the manual contains procedures:

- Referenced from the "Processor Installation"
- Configuring the state of the system
- Referenced from the "Repair Procedures"
- Enabling remote site communications
- Referenced during an EC installation.

3279 Display Console Aids

3279 Display Console Adjustment

The Console Color Convergence and Console Test Pattern screens are used for the color adjustment and checkout on a 3279 Display Console. The Console Color Convergence screen is used to align the color. Use this procedure when:

- Color console is set up
- Console is moved to another area
- Color definition is in question
- The battery is replaced (customer purchased item).

This procedure aligns the color settings (red, green, and blue) to produce a pure compound color (white). If convergence is wrong, either traces of each color show at the edges of the white character or two separate patterns appear.

The Console Test Pattern screen provides a visual check for the colors, intensity, fields, and characters.

Convergence Procedure

To perform the color convergence adjustment:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFA next to COMMAND:.
3. Press ENTER. The convergence procedure appears.
4. Press ENTER. The adjustment pattern screen appears.

Note: Pattern positions are displayed in the order indicated by the number in parenthesis.

Console Color Convergence Screen

```

CONSOLE COLOR CONVERGENCE ADJUSTMENT UTILITY

THIS UTILITY IS USED TO CONVERGE RED, GREEN, AND BLUE
DISPLAYS INTO CORRECT ALIGNMENT. PATTERNS ARE SHOWN
TWICE AT 13 POSITIONS ON THE SCREEN, IN RED/GREEN AND
THEN RED/BLUE. THE 4 CURSOR KEYS ARE USED TO MOVE THE
2 COLOR PATTERNS TOGETHER INTO 1 COLOR, THE RED/GREEN
MERGES INTO YELLOW AND RED/BLUE MERGES INTO PINK.

ENTER INITIALIZES UTILITY (MUST BE PRESSED 1ST)

CURSOR UP, DOWN, LEFT, OR RIGHT MOVES THE PATTERN

SPACE BAR SELECTS NEXT POSITION OR COLOR

R KEY CHANGES PATTERN COLOR (RED/GREEN(-)RED/BLUE)

MODE SEL KEY EXITS UTILITY
    
```

Console Color Convergence Adjustment Pattern

Convergence can be adjusted by using the keyboard to align a pattern. By using two colors (red/green or red/blue), a pattern (-|-|-) appears at a location on the screen. Any misconvergence can be easily seen. In a correctly converged screen, the two colors combine to show one pattern in the color obtained by mixing the two primary colors (red/green combine into yellow; red/blue combine into pink). A misconverged screen shows traces of the primary colors at the edge of the pattern, or if the convergence is bad, two separate patterns. The pattern is displayed at 13 positions on the screen to allow all areas to be converged. At each of the 13 positions, the pattern is first displayed in red/green and then in red/blue.

Use the cursor positioning keys to move the green (or blue) pattern towards the red until they coincide and a yellow (or pink) pattern is displayed. These keys are typematic and can be held down until the pattern is in the correct position.

The R key is used to reverse the color setting of the displayed pattern (red/green to or from red/blue). This enables both patterns to be checked and adjusted at one position.

Use the SPACE BAR to advance to the next adjustment position in the convergence procedure. The initial pattern at each position is displayed with the red/green colors. Pressing the SPACE BAR at this time changes the pattern to red/blue (the same as the R key). Pressing the SPACE BAR when the red/blue pattern is displayed advances the procedure to the next adjustment position and displays the pattern in red/green. After the last position has been adjusted, pressing the SPACE BAR displays the pattern in white at all positions. If the SPACE BAR is pressed again, the procedure restarts at position one.

Pressing the ENTER key at any time restarts the adjustment procedure. If INHIBITED or any other symbol appears in the operator information area, press the RESET key, and retry the action.

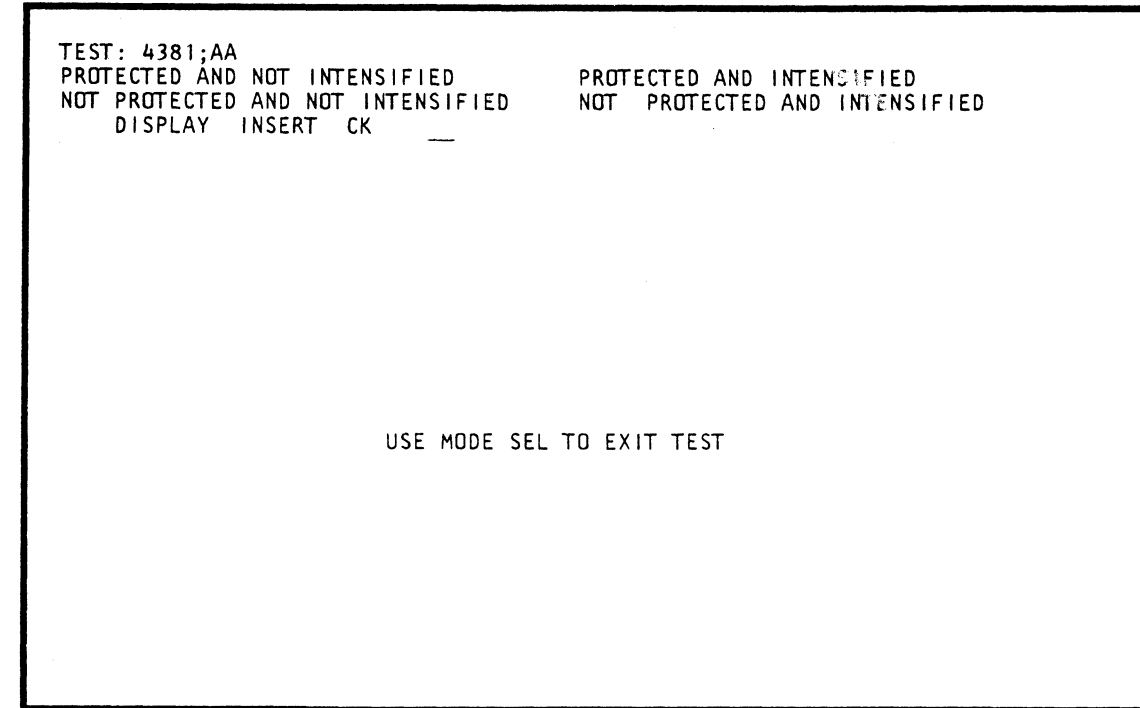
To return to the General Selection (Q) screen, press the MODE SEL key. However, because of interaction of some of the convergence positions, check all positions after the procedure is started. Adjusting each position is not necessary; advancing through each pattern position with the SPACE BAR performs the necessary action.

Console Test Pattern Procedure

To select the Console Test Pattern:

1. Press MODE SEL. The General Selection (Q) screen appears.
 2. Key QFP next to COMMAND:.
 3. Press ENTER. The Console Test Pattern screen appears.
 4. Visually check all fields for correct characteristics.
 5. Move cursor under the CK field.
 6. Press INSERT. INSERT MODE displays in the operator information area.
 7. Press keys A, B, and C. DISPLAY INSERT abck displays on line 4. INHIBITED appears in the operator information area.
 8. Press RESET.
- Note:** Any character key may be entered on lines 5 through 17 to check proper operation.
9. Press MODE SEL. The General Selection (Q) screen appears.

Console Test Pattern Screen



Line Identification

Line 1

Test: 4381;AA: Identifies the controller to which a display console is attached. AA is a port number (00 through 03).

Line 2

Protected and Not Intensified: No data can be entered. The field is not intensified (blue on a 3279-2C, normal green on a 3278-2A).

Protected and Intensified: No data can be entered. The field is intensified (white on a 3279-2C, high intensity on a 3278-2A).

Line 3

Not Protected and not Intensified: Data can be entered. The field is not intensified (green on a 3279-2C, normal green on a 3278-2A).

Not Protected and Intensified: Data can be entered. The field is intensified (red on a 3279-2C, high intensity on a 3278-2A).

Line 4

Display Insert CK: Display and Insert fields are protected fields. CK is an unprotected field.

Note: If the blanking circuit fails, a nondisplayable field (NON) appears ahead of the DISPLAY field.

Lines 5 to 17: Lines 5 to 17 are used to check all keyboard characters for proper operation. These lines are unprotected and not intensified.

Console Test Pattern Characteristics

	field 1	field 2
line 1	TEST: 4381;AA	
line 2	PROTECTED AND NOT INTENSIFIED	PROTECTED AND INTENSIFIED
line 3	NOT PROTECTED AND NOT INTENSIFIED	NOT PROTECTED AND INTENSIFIED
line 4	DISPLAY INSERT	CK —

line	field	3278-2A	3279-2C 4 Color	3279-2C Monochrome
1	1	g	b	g
1	2			
2	1	g	b	g
2	2	bg	w	w
3	1	g	g	g
3	2	bg	r	w
4	1	g	b	b
4	2	g	g	g

g - green
 bg - bright green
 b - blue
 r - red
 w - white

Configuration Aids

System Configuration-Customer

The System Configuration-Customer screen is used to alter system configuration selections to which the customer has access. Changes are made by entering the required data. Only those fields preceded by a colon (:) can be altered.

The customer is responsible for system configuration and supplying assignment information. System programmers or system analysts configure the system for best operation.

Configuration Procedure

To make a change to the System Configuration-Customer screen:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFO next to COMMAND:.
3. Press ENTER. The System Configuration-Customer screen appears.
4. Change the sections as required.

The following sections can be altered:

I/O Power-On Time-Out

Move the cursor to I/O POWER-ON TIME-OUT:.
Key in the number of minutes (in decimal) that the power code waits for the channel I/O devices to power up. If I/O stepping is not complete in the specified time, the machine posts a reference code. Press the ENTER key.

IML at Power-On

Move the cursor to IML AT POWER-ON:.
Key in a Y for an automatic PU IML (Processing Unit Initial Microcode Load) at power-on, or a N to specify no PU IML at power-on. Press the ENTER key.

IML and IPL at Power-On

Move the cursor to IML AND IPL AT POWER-ON:.
Key in a Y for an automatic IML and IPL at power-on, or a N to specify no IPL and IPL at power-on. Press the ENTER key.

System Configuration-Customer Screen

```

*SYSTEM CONFIGURATION*
DISKETTE *DRIVE1* *DRIVE2*
IDENTIFIER  FUNC1  FUNC2

I/O POWER-ON TIME-OUT: 02 MINS      COPY KEY -CONSOLE PRT: Y  PORT: P3
IML AT POWER-ON: N                  -DISKETTE : N
IML AND IPL AT POWER-ON: N          -CHANNEL PRT: N  ADDR: 0000

REMOTE TOD ENABLED: N                BYTE MODE-CHNL 5:  N

CONSOLE MODE -PRT/KYBD: N            CONSOLE PORTS  P0  P1  P2  P3
              -DISPLAY  Y              INSTALLED:      Y  Y  Y  N
              I/O CONFIGURATION        OPERATIONAL     Y  Y  Y  N
              Q GENERAL SELECTION      HARDCOPY:       N  N  N
              Z RETURN TO PRG SYS      DEVICE NUMBER   00F2 DISC 00F4 00F5
              COMMAND: QFO              CONNECTED:      Y  N  Y  Y
                                         ==>
    
```

Note: The example screen shown is for S/370XA mode. In S/370 mode, the DEVICE NUMBER field is displayed as ADDRESS S/370:.

Remote TOD Enabled

Note: The Remote TOD code is stored on the FUNC1 diskette. If the code is changed, you must update the diskette by performing an SP IML. If the other fields on this screen are to be updated, postpone the SP IML until they are complete.

1. Move the cursor to REMOTE TOD ENABLED:.
2. Key in a Y to enable Remote TOD or a N if you do not want it enabled.
3. Press ENTER. IML REQUIRED (SP&PU) message is displayed.
4. Press Power On/IML on the operator control panel. An SP IML is performed.

Console Mode

Move the cursor to CONSOLE MODE. Determine if the system is to operate in Printer/Keyboard or Display mode. Key a Y next to PRT/KYBD: if the system is to operate in Printer/Keyboard mode. Key an N next to PRT/KYBD: if the system is to operate in Display mode. Press the ENTER key.

Copy Key

The COPY key copies a display screen to either:

- A console printer
- The system diskette (CE mode only)
- A channel-attached printer.

The COPY key can be configured to operate in only one of these modes at a time. If the COPY key is set to operate (Y) in one mode of operation, the other two modes must be set not to operate (N).

Console Prt: Move the cursor to -CONSOLE PRT:.
Key in a Y if a console printer is to be the COPY key device, or an N if it is not to be the COPY key device. If you have entered a Y after -CONSOLE PRT:;, move the cursor to PORT:;, and key in the port number of the console printer.

Diskette: Move the cursor to -DISKETTE:.
Key in a Y if the COPY key is to be used to copy to the system diskette, or an N if the COPY key is not to be used to copy to the diskette.

Channel Prt: Move the cursor to -CHANNEL PRT:.
Key in a Y if a channel-attached printer is to be the COPY key device, or an N if it is not to be the COPY key device. If you have entered a Y after -CHANNEL PRT:;, move the cursor to the location on the screen displaying ADDR:;, and key in the address of the printer.

Note: The channel-attached printer selection is valid only when the system has been IMLed and not IPLed.

Verify that the COPY KEY fields are entered correctly. Press the ENTER key.

Byte Mode-Chnl 5

Move the cursor to BYTE MODE-CHNL 5:. Key in a Y if the channel is to be used as a byte multiplexer channel, or an N if it is to be used as a block multiplexer channel. Press the ENTER key.

Note: Always check the UCW Directory (QFOI) screen to verify the assignment.

Block

Console Ports

A successful port assignment requires that the device be physically attached, a console address be assigned, and that the port be assigned as a hard-copy device or not. After determining whether the system is to operate in Printer/Keyboard or Display mode, refer to the applicable notes.

Printer/Keyboard Mode

Notes:

- This mode is valid for S/370 operation; it is not available in S/370XA mode.
- Maximum of two addresses can be assigned. Each address can have a display console and console printer assigned.
- A minimum of one display console must be assigned. A hard-copy device cannot be assigned by itself.
- The hard-copy device and display console must have the same address.
- Sixteen addresses (00F0-00FF) are reserved and cannot be assigned as a console address.

Display Mode

Notes:

- Maximum of four ports can be assigned. Each port (device) must have its own address.
- Devices cannot share the same address.
- You must have one display console assigned. The other ports can be either display consoles or hard-copy devices.
- Sixteen addresses (00F0-00FF) are reserved and cannot be assigned as console addresses.

Installed: Move the cursor to INSTALLED:. Key in a Y under the appropriate port designation (P0-P3) for a device installed on that port, or an N if no device is installed on that port.

Hardcopy: Move the cursor to HARDCOPY:. Key in a Y under the appropriate port designation (P1-P3) if the device installed on that port is a hard-copy device, or an N if the device installed on that port is not a hard-copy device.

Console Address: The console address assignment is mode sensitive (S/370 or S/370XA); refer to the applicable assignment:

S/370 Mode

Address S/370: Move the cursor to ADDRESS S/370:. Key in the correct address for that attached device. A device may be assigned DISC (disconnected). A device that is disconnected has no address and is not available to the customer programming system.

S/370XA Mode

Device Number Informational field only. This field represents the address assigned by the Input/Output Control Data Set (IOCDs).

Connected: Move the cursor to CONNECTED:. Key in a Y under the appropriate port designation (P0-P3) to enable its operation or a N to disconnect the device. A device that is disconnected has no address and is not available to the customer programming system.

Verify that the INSTALLED, HARDCOPY, and CONSOLE ADDRESS fields are entered correctly. Press the ENTER key.

Return to General Selection (Q)

To return to the General Selection (Q) screen from the System Configuration-Customer screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen from the System Configuration-Customer screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Seq FC005	PN 0446061 Pg 2 of 2	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02217 10 JAN 84		
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System Configuration-Service

The System Configuration-Service screen is used to alter the configuration record stored on the FUNC1 diskette. The configuration record represents the machine configuration. If the screen is altered, update the diskette by performing an SP IML.

A hard-copy document is shipped with each machine. This document contains a copy of the configuration for the machine you are installing. Use the information on this copy to configure the screen. If the document is lost, refer to Volume C01, "Machine History," for any required information that you may need.

Changes are made by entering the required data. Only those fields preceded by a colon (:) can be altered.

Configuration Procedure

To make a change to the System Configuration-Service screen:

1. Set the CE Mode switch to CE Mode.
2. Press MODE SEL. The General Selection (Q) screen appears.
3. Key QFS next to COMMAND:.
4. Press ENTER. The System Configuration-Service screen appears.
5. Change the sections as required, and then perform a SP IML. See "Diskette Update."

The following sections can be altered:

System Configuration-Service Screen

```

*SYSTEM CONFIGURATION-SERVICE*
SYSTEM TYPE 4381-1
SERIAL NO.: 000000
DISKETTE ID 1954285
          EC 856093
          REA 0000000
MAIN STORE SIZE : 16 MEG
CONTROL STORE SIZE: 112 KB
ROCF           : N
RSF FEATURE CODE : NONE
CHANNEL TO CHANNEL: Y
NUMBER OF CHANNELS: 06
CHANNELS NOT OPERATIONAL ARE HIGHLIGHTED
CHANNEL NO. 0 1 2 3 4 5
POWER GROUP: 15
50/60 HZ: 60
REMOTE TOD INSTALLED: N
L LOCK SERIAL NUMBER
A PU CONFIGURATION
Q GENERAL SELECTION
Z RETURN TO PROG SYS
COMMAND: QFS
    
```

Serial No.

Note: The serial number update is a one-time event. Once entered, this field becomes unalterable. It is important that the entered serial number be verified.

1. Move the cursor to SERIAL NO.: and key in the six-digit machine serial number.
2. Key QFSL next to COMMAND:.
3. Press ENTER. QFSLOCKSERNUM appears next to COMMAND:.. The message PRESS ENTER TO LOCK is displayed in the message area.
4. Press ENTER. The machine serial number is now unalterable.

Power Group

Determine what Power Group Code is associated with the processor. The chart indicates which Power Group Code matches the machine configuration.

Move the cursor to POWER GROUP:., and key in the correct code. Press the ENTER key.

Power Group Codes

Feature Description	Power Group Code
2nd Source Storage Group 4 Meg	11
2nd Source Storage Group 8 Meg	11
2nd Source Storage Group 16 Meg	13
1st Source Storage Group	15

50/60 HZ

Move the cursor to 50/60 HZ:., and key in the two-digit number representing the frequency of the power source. Press the ENTER key.

Remote TOD Installed

Move the cursor to REMOTE TOD INSTALLED:.. Key in a Y if the Remote TOD feature is installed or an N if the feature is not installed. Press the ENTER key.

Main Store Size

1111 *
2200

Move the cursor to MAIN STORE SIZE:., and key in the two-digit number representing the size of main storage. Press the ENTER key.

Control Store Size

Move the cursor to CONTROL STORE SIZE:., and key in the three-digit number representing the size of control storage. Press the ENTER key.

ROCF

Move the cursor to ROCF:.. Key in a Y if the customer has ROCF installed or an N if ROCF is not installed. Press the ENTER key.

Note: The following feature codes support ROCF:

U.S.A. and Canada

- 9511
- 9514

World Trade

- 2833
- 2836
- 2837
- 2838

The following feature codes require a customer-supplied External Modem with Auto-Answer.

- 2833
- 2838
- 9511

RSF Feature Code

Determine what RSF feature is associated with the processor. The chart indicates which RSF Feature Code matches the installed RSF feature.

Move the cursor to RSF FEATURE CODE:, and key in the appropriate code. Press the ENTER key.

RSF Feature Codes

Feature Description	RSF Feature Code
B/M 4143543 RSF Feature	2833
B/M 4143542 RSF Feature	2836
B/M 4143540 RSF Feature	2837
B/M 4143543 RSF Feature	2838
B/M 8645621 RSF Feature	2839
B/M 4143541 RSF Feature	2944
B/M 1806887 RSF Feature	9510
B/M 4143544 RSF Feature	9511
B/M 1806885 RSF Feature	9514
B/M 8645066 No RSF Feat.	N

Channel to Channel

Move the cursor to CHANNEL TO CHANNEL:. Key in a Y to configure the Channel-to-Channel feature, or a N if the feature is not to be configured. Press the ENTER key.

Number of Channels

Move the cursor to NUMBER OF CHANNELS:, and key in 06 or 12 to represent the installed number of channels. Press the ENTER key.

Note: If a channel is not operational, its channel number is intensified. A check occurred on this channel and could not be reset. Go to Volume A01, "START Repair Procedure."

Diskette Update

To update the diskette, press Power On/IML on the operator control panel. An SP IML is performed.

Return to General Selection (Q)

To return to the General Selection (Q) screen from the System Configuration-Service screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen from the System Configuration-Service screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

I/O Configuration (S/370)

A channel directs the flow of information between main storage and various I/O devices under the control of a channel facility functioning independently of the processor program. This permits the processor program to resume processing after initiating an I/O operation.

The channel facility required to sustain a single I/O operation is called a *subchannel*. A subchannel requires internal storage, called a *Unit Control Word (UCW)*, for recording the addresses, count, and any status and control information.

Each device attached to the processor has a device address and an associated UCW. This information is entered into a channel directory (one for each channel) which is stored in auxiliary storage. Each channel directory has 256 entries. Each device entered into the directory has an address specified by a channel designation (c) and a two-character unit designation (xx).

A channel directory entry contains:

- An indication whether or not a UCW is assigned to the associated device address (UNA = unassigned).
- An indication whether the UCW is shared or unshared (SHR = shared).
- An indication whether the device associated with this entry can operate in selector (SEL), byte multiplexer (BYT), block multiplexer (BLK), Start I/O Fast Release with queuing (SIOF), or data streaming (DST) mode.

Directory information can be displayed by the Display UCW Directory (QFOIC) screen.

Each channel has a local storage area for processing a UCW. When an operation requires using the information in a UCW, that UCW is read from auxiliary storage into local storage. The operation specified by the subchannel is then performed, and the UCW is updated and returned to auxiliary storage. The UCW carries a running record of the operation for the I/O device assigned. The UCW assignment procedure is critical to the efficient operation of the processor. Change information to the UCW Directory is provided by personnel responsible for system configuration. System programmers or system analysts configure the input/output devices and control units for optimum operation. Poor device assignments can affect processor performance. Reserve addresses for I/O equipment expected; early address definition provides easier installation and testing when these devices are installed.

UCW Assignment Screens (S/370)

The following screens are used for the UCW assignment:

- **Change UCW Directory (QFOIU)** is used to modify the UCW directory by adding or deleting UCW entries, or to modify the type of UCW entry in the directory.
- **Display UCW Directory (QFOIC)** is used to verify changes made while using the UCW assignment procedure. Device addresses are displayed as assigned (for example: 301-305).

Note: Both of these functions change/display the UCWs on the diskette holding the directories, not the UCWs in auxiliary storage. This requires a processor IML (QLM).

Seq FC025	PN 0446063 Pg 1 of 4	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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Device Assignment (S/370)

The Device Assignment procedure is used for assigning I/O equipment that has not already been assigned. If the characteristics of an assigned device must be changed, use the "Device Assignment Change (S/370)" procedure.

Notes:

- Assignment information is provided by personnel responsible for system configuration. System programmers or system analysts configure the input/output devices and control units for optimum operation.
- Before making a device assignment, refer to the "I/O Assignment Table (S/370)" for correct device information.
- The paging keys are not applicable for this function.

To perform a device assignment:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFOIU next to COMMAND:.
3. Press ENTER. The Change UCW Directory screen appears.
4. Key the following next to QFOIU on the COMMAND line:
 - a. A = You are adding a device(s).
 - b. CXX = Device address or beginning device address range.

Change UCW Directory Screen

```

*I/O CONFIGURATION*                *CHANGE UCW DIRECTORY*
*370*                                FORMAT: F CXX -CYY CHAR.CODES
*UCW DIRECTORIES*                   F = A OR R (A FOR ADD, R FOR REMOVE)
U CHANGE UCW                         CXX = STARTING DEVICE ADDRESS
C DISPLAY UCW                         -CYY = ENDING DEVICE ADDRESS (OPTIONAL)

*370XA*                               CHANNEL: 0-BYTE    1-BLOCK  2-BLOCK
T CHANGE DATA SET SELECTION         3-BLOCK  4-BLOCK  5-BLOCK
DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM         CHAR.CODES (OPTIONAL, ANY ORDER)
N SUBCHAN IMG BY DEVICE NUM          S SHARED UCW
L SUBCHAN IMG LISTING                L SELECTOR MODE      -BLOCK ONLY
D IOCP PARAMETERS                   D DATA STREAMING MODE -BLOCK ONLY
S START IOCP PROG                    C SIOF QUEUING CTL UNIT -BLOCK ONLY

Q GENERAL SELECTION                   ONE ENTRY MUST COVER ALL ADDRS FOR ANY CTL UNIT
Z RETURN TO PROG SYS                 PU-IML REQUIRED AFTER CHANGES -USE LOAD SCREEN

COMMAND: QFOIU                        ==>
    
```

Notes:

- Sixteen addresses (OFO through OFF) are reserved for internal functions.
- With six channels installed, the addresses can range from 000-5FF and with twelve channels installed, the addresses range from 000-BFF.
- If two ranges of addresses are adjacent, they must be assigned at different times (a different entry); otherwise, the same control unit reference number is assigned to both ranges or devices.

- c. -CYY = Ending device address range. (If you are adding one device, this step is not required.)
- d. CHAR.CODES = Characteristic of the device(s) being assigned (optional/device dependent).

Notes:

- Any characteristic(s) required after the address replaces the default characteristic.
- The following characteristic codes can be assigned to the address(s):

CHAR.CODES Meaning

- S Shared UCW
- L Selector device on block multiplexer channel
- D Data streaming mode
- C Start I/O Fast Release with queuing

5. Press ENTER. The message SELECTION COMPLETE is displayed. Directory is updated and device(s) are assigned.

Notes:

- An invalid channel configuration entry displays INV in the characteristics field.
- If additional device(s) are to be assigned at this time repeat steps 4 and 5 before continuing.
- The routine only changes the diskette holding the directories, not the UCWs in auxiliary storage. This requires a processor IML (QLM).

6. Key QLM next to COMMAND:.
7. Press ENTER. A processor IML is performed and auxiliary storage is updated.
8. Update the backup diskette. For updating a diskette, see "Module Transfer."
9. Verify changes made by using the section "UCW Verification."
10. Verify I/O is operational. For more information, see Volume A07, System Test, "System Test/4381." If system is being installed, eliminate this step.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND.
2. Press ENTER. The Prog Sys (Z) screen appears.

Device Assignment Change (S/370)

The Device Assignment Change procedure is used for changing the characteristics of device(s) already assigned or to remove device(s).

Notes:

- Assignment information is provided by personnel responsible for system configuration. System programmers or system analysts configure the input/output devices and control units for optimum operation.
- Before changing a device assignment, refer to the "I/O Assignment Table (S/370)" for correct device information.
- The paging keys are not applicable for this function.

To change a device assignment:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFOIU next to COMMAND:.
3. Press ENTER. Change UCW Directory screen appears.
4. Key the following next to QFOIU on the COMMAND line.
 - a. R = You are removing a device.
 - b. CXX = Device address or beginning device address range.
 - c. -CYY = Ending device address range. (If you are removing one device, this step is not required.)
5. Press ENTER. The message SELECTION COMPLETE is displayed. Device(s) are removed (unassigned). If you are removing the device(s), go to step 8.

Change UCW Directory Screen

```

*I/O CONFIGURATION*
*370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

*370XA*
T CHANGE DATA SET SELECTION
  DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PROG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOIU

*CHANGE UCW DIRECTORY*
FORMAT: F CXX -CYY CHAR.CODES
F = A OR R (A FOR ADD, R FOR REMOVE)
CXX = STARTING DEVICE ADDRESS
-CYY = ENDING DEVICE ADDRESS (OPTIONAL)

CHANNEL: 0-BYTE 1-BLOCK 2-BLOCK
          3-BLOCK 4-BLOCK 5-BLOCK ←

CHAR.CODES (OPTIONAL, ANY ORDER)
S SHARED UCW
L SELECTOR MODE -BLOCK ONLY
D DATA STREAMING MODE -BLOCK ONLY
C SIOF QUEUING CTL UNIT -BLOCK ONLY

ONE ENTRY MUST COVER ALL ADDRS FOR ANY CTL UNIT
PU-IML REQUIRED AFTER CHANGES -USE LOAD SCREEN
==>
    
```

- a. A = You are adding a device(s).
 - b. CXX = Device address or beginning device address range.
- Notes:**
- Sixteen addresses (0F0 through 0FF) are reserved for internal functions.
 - With six channels installed, the addresses can range from 000-5FF and with twelve channels installed, the addresses range from 000-BFF.
 - If two ranges of shared UCW devices or unshared devices are adjacent, they must be assigned at different times (a different entry); otherwise, the same reference number is assigned to both ranges or devices.

- c. -CYY = Ending device address range. (If you are adding one device, this step is not required.)
- d. CHAR.CODES = Characteristic of the device(s) being assigned (optional/device dependent).

Notes:

- Any characteristic(s) required after the address replaces the default characteristic.
- The following characteristic codes can be assigned to the address(s):

CHAR.CODES Meaning

S	Shared UCW
L	Selector device on block multiplexer channel
D	Data streaming mode
C	Start I/O Fast Release with queuing

7. Press ENTER. The message SELECTION COMPLETE is displayed. Directory is updated and device(s) are assigned.

Notes:

- An invalid channel configuration entry displays INV in the characteristics field.
 - The routine only changes the diskette holding the directories, not the UCWs in auxiliary storage. This requires a processor IML (QLM).
8. Key QLM next to COMMAND:.
 9. Press ENTER. A processor IML is performed and auxiliary storage is updated.
 10. Update the backup diskette. For updating a diskette, see "Module Transfer."
 11. Verify changes made by using the section "UCW Verification."

12. Verify I/O is operational. For more information, see Volume A07, System Test, "System Test/4381." If system is being installed, eliminate this step.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND.
2. Press ENTER. The Prog Sys (Z) screen appears.

UCW Verification (S/370)

The Display UCW Directory (QFOIC) screen is used to display the present device assignment or to verify any changes made to the directory. This screen displays the UCWs as currently stored on the diskette. The Display UCW Directory (QFOIC) screen displays device addresses as assigned (for example: 301-305).

Display UCW Directory (S/370)

To select the Display UCW Directory screen:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFOIC and a three-digit device address (000-BFF) next to COMMAND:.

Note: The default address is zero.

3. Press ENTER. The Display UCW Directory screen appears.

Notes:

- The message MORE, PRESS ENTER is displayed if there is more data than can be displayed on one page.
- This screen cannot be altered.

UCW Directory Screen

```

*1/O CONFIGURATION*
      *370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

      *370XA*
T CHANGE DATA SET SELECTION
  DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PROG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOIC

      *DISPLAY UCW DIRECTORY*
CXX-CYY      CHARACTERISTICS
000          BYT,SHR
301-305     BYT,SHR
306-30F     BYT,SHR
310-31F     SEL,DST,SIOFQ

      PU-IML REQUIRED AFTER CHANGES -USE LOAD SCREEN
      ==>
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND.
2. Press ENTER. The Prog Sys (Z) screen appears.

I/O Assignment Table (S/370)

This table illustrates the most commonly used assignments. For additional information, refer to the applicable system library document.

Characteristic Code (CHAR. Codes) Entries

Char. Code Description

- Invalid selection; do not use.
- C** Control unit queueable with start I/O fast release. (See note 8.)
- D** Control unit operating in data streaming mode.
- L** Device requires a block multiplexer channel to operate in selector mode.
- NE** No Entry—defaults to an unshared channel.
- S** Device requires a shared UCW.

Notes:

1. Preferred attachment is a byte multiplexer channel.
2. Preferred attachment is a block multiplexer channel.
3. The number of 1419 devices per byte multiplexer channel is limited; consult your system engineer.
4. When CHAR. Code D or NE is selected, ensure that the control unit is properly set up to operate in correct mode. Follow necessary control unit guidelines and/or procedures.
5. Control units with 3350, 3370, 3375, 3380, or 3420 Model 8 are channel data rate sensitive.
 - 3370 and 3375 have a data rate of two megabytes and must be attached to the appropriate channel.
 - 3380 has a data rate of three megabytes and must be attached to the appropriate channel.
 - 3420 Model 8 can cause overrun errors on a channel that has a data rate of less than two megabytes. Use an appropriate channel.

6. Assign only one address and one unshared UCW for 3274 control units that have a model number ending in A. All other models require one shared UCW and an address range dependent on the number of attached devices (for example, a 3274 Model 1D with eight devices: 220-227 S). Assign only one UCW for each 3272 or 3274 control unit.
7. 7170—Device Attachment Control Unit (DACU) attaches OEM UNIBUS and RS232C devices to IBM systems. This unit has five addresses, with the address range beginning with 0 or 8.
8. Use the following guidelines when the SIOF Queuing CTL Unit (C) Characteristic Code is selected:
 - In general, any block multiplex unshared control unit/device can have SIOFQ assigned to it.
 - The complete address range for a control unit must be specified if SIOFQ is assigned. For example, if a control unit is assigned 32 addresses starting at address 03A0, the assignment entry must contain addresses 03A0 through 03BF.
 - A control unit that has different devices with different address ranges for each device must have one SIOFQ entry covering the complete range. For example, a 3830 control unit has 3350s and 3330s assigned with different ranges (240-243 and 250-257, respectively) and must be reassigned to show one entry (for example, 240-257).
 - SIOFQ not allowed on a byte channel.
 - SIOFQ not allowed for shared UCW entries.
 - For optimum performance, this option should be specified when indicated.

	Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
Auxiliary Processor			
<i>Control Unit</i>			
3838 - With Feature No. 4850	---	D	4
3838 - Without Feature No. 4850	---	NE	

	Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
Channel-to-Channel Adapter			
<i>Control Unit</i>			
CTCA (Integrated)	---	NE	2
3088	---	NE or D	2, 4

	Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
Communication/Data Acquisition/Process Control			
<i>Control Unit</i>			
2701	NE	---	
3704	NE	---	
3705	CA1	---	
3705	CA2 and CA3	NE	2 Block
3705	CA4	NE	1 Byte
3725	NE	NE	
4993	---	S	
4994	---	S	
7170	---	NE	7

Data Security Device	Character Code	Character Code	Notes
	----- Byte Channel	----- Block Channel	
<i>Control Unit</i>			
3848	---	NE or D	4

Direct Access Storage Units			Character Code	Character Code	Notes
<i>Control Unit</i>	<i>Controller</i>	<i>Device</i>	----- Byte Channel	----- Block Channel	
2835		2305	---	NE	
3830	3333	3330	---	NE or C	5, 8
	3340-A2	3340, 3344	---	NE or C	5, 8
	3350-A2	3350	---	NE or C	5, 8
3880	With Speed Matching Buffer				
	3375-A1, D1	3375	---	NE,D,C	4, 5, 8
	3380-A4, AA4	3380	---	NE,D,C	4, 5, 8
3880	Without Speed Matching Buffer				
	3333	3330	---	NE,D,C	4, 5, 8
	3340-A2	3340, 3344	---	NE,D,C	4, 5, 8
	3350-A2	3350	---	NE,D,C	4, 5, 8
	3370-A1	3370	---	NE,D,C	4, 5, 8
	3375-A1, D1	3375	---	NE,D,C	4, 5, 8
	3380-A4, AA4	3380	---	D,C	4, 8

Note: Char. Code D is recommended for use on a 3880 without a speed matching buffer.

Diskette I/O	Character Code	Character Code	Notes
	----- Byte Channel	----- Block Channel	
<i>Control Unit</i>			
3540	NE	NE	

Display and Console Printers		Character Code	Character Code	Notes
<i>Control Unit</i>	<i>Device</i>	----- Byte Channel	----- Block Channel	
3258	3251, 3255	---	S	
3272	3277, 3284, 3286, 3287, 3288	S	S	2,6
3274	Models 1B, 1D, 21B, 21D, 31D	S	S	2,6
	3179, 3268, 3276, 3277, 3278, 3279, 3284, 3286, 3287, 3288, 3289, 3290	---	---	
3274	Models 1A, 21A, 31A	NE	NE	2,6
	3179, 3268, 3276, 3277, 3278, 3279, 3284, 3286, 3287, 3288, 3289, 3290	---	---	
3791	3277, 3284, 3286, 3287, 3288, 3793	NE	NE	
5088	5085	---	NE,D	2,4

Magnetic Character and Optical Reader			
	Character Code	Character Code	Notes
<i>Control Unit</i>	----- Byte Channel	----- Block Channel	
1255	NE	L	1
1287	NE	NE	1
1288	NE	NE	1
1419	NE	NE	1,3
3881	NE	NE	
3886	NE	NE	
3890	NE	NE	1
3895	NE	NE	

Magnetic Tape I/O		Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
<i>Control Unit</i>	<i>Device</i>			
3411	3410	---	LS	
3430	3430	---	LS	
3480	---	---	NE,D	2,4
3803	3420	---	LS	

Mass Storage System		Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
<i>Control Unit</i>				
3850/51		NE	NE	

Punched Card I/O and Printers		Character Code ----- Byte Channel	Character Code ----- Block Channel	Notes
<i>Control Unit</i>	<i>Device</i>			
1442		NE	NE	1
1443		NE	NE	1
2501, 2520		NE	NE	1
2821	1403, 2540	NE	NE	1
3203		NE	NE	2
3262 (Model 5)		NE	NE	1
3811	3211	NE	NE	2
3505, 3525		NE	NE	2
3800		NE	NE	2
4245		NE	NE	2
4248		NE	NE	2

**Channel Configuration/Data Rates
(S/370)**

Channel	Channel Type	Maximum Data Rate
0	Byte Multiplexer	(See below)
1	Block Multiplexer	3 Megabytes/Second
2	Block Multiplexer	3 Megabytes/Second
3	Block Multiplexer	3 Megabytes/Second
4	Block Multiplexer	3 Megabytes/Second
5	Block Multiplexer (or Byte Multiplexer)	2 Megabytes/Second (See below)
6	Block Multiplexer	2 Megabytes/Second
7	Block Multiplexer	2 Megabytes/Second
8	Block Multiplexer	1 Megabyte/Second
9	Block Multiplexer	1 Megabyte/Second
A	Block Multiplexer	1 Megabyte/Second
B	Block Multiplexer	1 Megabyte/Second

Byte Multiplex Channels 0 and 5 (Byte Mode Operation)

Data rates are with no other channel activity; with channel activity, see *IBM 4381 Processor Channel Characteristics*.

Byte-Mode Type	Maximum Data Rate
Single-Byte Transfer	32 Kilobytes/Second
Two-Byte Transfer	64 Kilobytes/Second
Four-Byte Transfer	128 Kilobytes/Second

Byte Multiplex Channels 0 and 5 (Burst Mode Operation)

For buffered devices only. Unbuffered burst mode devices are not supported.

Operation	Average Data Rate
Input (Read)	2 Megabytes/Second
Output (Write)	$\frac{DR}{1 + DR}$ (for DR equal to or less than 2 Mb)

DR = Data rate of device in Megabytes/Second

Note: Data rates assume small interface and control unit generated delays.

Assignment Examples

COMMAND: QFOIUA _____

- CXX** Device CXX assigned as unshared UCW.
- CXX-CYY** Devices CXX through CYY assigned as unshared UCW.
- CXX-CYY S** Devices CXX through CYY assigned as shared UCW.
- CXX-CYY L** Devices CXX through CYY assigned to selector mode.
- CXX-CYY SL** Devices CXX through CYY assigned as shared UCW to selector mode.
- CXX-CYY C** Devices CXX through CYY assigned to operate with Start I/O Fast Release with queuing.
- CXX-CYY D** Devices CXX through CYY assigned to data streaming mode.

Notes:

- Use a R in place of A to remove (unassign) the device(s).
- CXX and CYY are in the form of channel designation (c) and a two-character unit designation (uu).

S/370XA Installation

This procedure is to be performed at installation time if the customer has elected to operate the system in S/370XA mode.

The processor is shipped with a "starter" configuration on the FUNC2 diskette. This "starter" configuration allows the service representative to:

- Perform a S/370XA IML.
- Test channel and device operations in this mode by using System Test/4381XA.

To install S/370XA:

1. Install FUNC1 diskette into diskette drive 1.
2. Install FUNC2 diskette into diskette drive 2.
3. Press MODE SEL. The General Selection (Q) screen appears.
4. Key QLI next to COMMAND:. Press ENTER. The IML Parameters (QLI) screen appears.
5. Key W2D1 next to QLI on the COMMAND line.
6. Press ENTER.
7. Key M next to QLI on the COMMAND line.
8. Press ENTER. A S/370XA IML, using the "starter" configuration, is performed.
9. You are now able to run System Test/4381XA in S/370XA mode. Go to Volume A07, "System Test," and run System Test/4381XA.

Note: Ensure that only the path that you are to run System Test/4381XA on is enabled; all other paths must be disabled to that tape drive. After you have run System Test/4381XA, return to Volume A07, Processor Installation, "Completing the Installation."

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I/O Configuration (S/370XA)

Notes:

- During the installation:
 - The service representative uses a "starter" configuration (shipped with the processor in Data Set 1) to test channel and device operations. Use the "S/370XA Installation" procedure to do this.
 - The service representative tests the system with the "starter" configuration by using System Test/4381XA.
- The customer:
 - Is responsible for their own input file containing IOCP macro instructions (prepared and checked by the customer) to configure the processor.
 - Is responsible for system configuration and to supply assignment information. System programmers or system analysts configure the input/output devices and control units for best operation.

In S/370XA mode, the processor operates in accordance with System/370 Extended Architecture. Two main characteristics of S/370XA mode are 31-bit addressing and the use of a channel subsystem to direct the flow of information between I/O devices and the processor. When operating in S/370XA mode, an Input/Output Configuration Data Set (IOCDS) replaces the Unit Control Words (UCWs) used in S/370 mode. To operate the processor in this mode, the I/O devices must be assigned differently than when in S/370 mode. In order to assign devices to operate in S/370XA mode, the Input/Output Configuration Program (IOCP) must be used.

A control unit can be attached to a maximum of four channel paths. Each channel path can contain up to 256 control units. An I/O device (subchannel) can be attached to a maximum of four control units, and have a maximum of four channel paths defined. Each channel path can contain up to 256 subchannels. Each subchannel requires 128 bytes of storage with an additional 64 bytes of storage required for each control unit. Subchannel information is entered into a channel directory (one for each channel). Each channel directory entry consists of four bytes: two bytes for path management, and two bytes containing the subchannel (I/O) information.

For additional information see IOCP Users Guide Order No. GC24-3964.

Input/Output Configuration Program

The Input/Output Configuration Program is run in S/370 mode. The required input to the program is a card deck or card deck image on tape and is called an input file. The input file contains all the I/O information necessary for the program to assign the devices. These devices can be assigned in a multiple-path configuration for the most efficient operation in S/370XA mode.

The Input/Output Configuration Program defines I/O configuration data required to control the I/O devices. Running the program generates:

- Status/Error Messages
- Configuration Reports
- Input/Output Configuration Data Set (IOCDS).

Messages generated when running the Input/Output Configuration Program inform the user of printer conditions, the status of the program, and any error conditions that may indicate a user action. For more information, see "IOCP Messages."

The configuration report (if a printer is assigned) shows the configuration data contained in the Input/Output Configuration Data Set in storage. For more information, see "S/370XA Configuration Report."

The Input/Output Configuration Program processes customer-supplied definitions of channel paths, control units, and I/O devices. If no major errors were found, the Input/Output Configuration Data Set can be written to the diskette.

Two Input/Output Configuration Data Sets can be stored on the FUNC2 diskette as Data Set 0 and Data Set 1. These data sets are used when the processor is running in S/370XA mode. Having two data sets allows you to define and test a new configuration without affecting an existing configuration.

The Input/Output Configuration Data Set can be read or written from both Data Set 0 or Data Set 1.

Input File

To run the Input/Output Configuration Program, an input file is required. The input file contains all the I/O information necessary for the program to assign the devices. When the program processes this information, it also produces reports that allow you to check the configuration.

The customer may choose not to define existing devices and their paths, or to define devices and paths that do not exist. However all devices and paths that are defined and do exist must be defined correctly or unpredictable results can occur.

The following information is contained in the input file:

Instruction	Description
ID	Allows you to specify the information you want included in the headings of the I/O Configuration reports. This instruction is optional.
CHPID	Instruction that specifies the channel paths.
CNTLUNIT	Instruction that specifies the control units attached to the channel paths.
IODEVICE	Instruction that specifies the I/O devices assigned to control units.

For additional information see IOCP Users Guide Order No. GC24-3964.

IOCP Screens

The following screens (in the order of their use) are used for the IOCP assignment:

- **IOCP Parameters (QFOID) screen** is used to configure the input and output device to be used when running the program.
- **Start IOCP Program (QFOIS) screen** is used to run the program and to monitor its progress.
- **Update XA Directory (QFOISY) screen** is used to write the I/O Configuration Data Set (IOCDS) to the diskette.

The following screens are used to display the I/O Configuration Data Sets stored on the FUNC2 diskette.

- **Change Data Set Selection (QFOIT) (not a screen)** is used to select the data set that you want to display.
- **Subchannel Image by Subchannel Number (QFOII) screen** is used to display the subchannel configuration by using the subchannel number.
- **Subchannel Image by Device Number (QFOIN) screen** is used to display the subchannel configuration by using the device number.

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IOCP Device Assignment

This screen is used to configure the input and output device used when running the Input/Output Configuration Program. An input device (card reader or tape unit) is required to read the input file, which contains the system generation information. The output device (optional) is a printer used to provide hard-copy information about the build process and for printing a record of the configuration.

The Target System (M) selection allows you to select what Model Group that the Input/Output Configuration Data Set will run on. For example, it is possible to run on a 4381 Model Group 2 the IOCP operation that is to be used on a 4381 Model Group 1.

The device(s) you specify must have been defined in the I/O configuration (S/370) processed on the previous PU IML and must be available to the processor when running the Input/Output Configuration Program.

The screen is initially displayed with default values. If appropriate, skip this procedure and go to the "IOCP Generation" procedure.

IOCP Parameters Screen

```

* I/O CONFIGURATION*
*370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW
*370XA*
T CHANGE DATA SET SELECTION
  DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PROG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOID

*PARAMETERS FOR I/O CONFIG PROG*
*OUTPUT LISTING DEVICE*
P PRINTER ADDR      000E
Y PRINTER TYPE      1403
A PRINTER TRAIN     PCAN
W PAGE WIDTH(72/100) 0100
L PAGE LENGTH(40-160) 0050
  (8 LINES PER INCH)

*INPUT DECK DEVICE*
R CARD READER ADDR  0014
T TAPE ADDR         _____

*TARGET SYSTEM*
M MODEL GROUP #    4381-02

==>
    
```

Device Assignment

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Ensure that the system is in S/370 mode, if not:
 - a. Key QLIW1 next to COMMAND:.
 - b. Press ENTER. The processor is placed in S/370 mode.
 - c. Key QLM next to COMMAND:.
 - d. Press ENTER. A S/370 processor IML is performed, and the Program Load (QL) screen appears.
3. Key QFOID next to COMMAND:.
4. Press ENTER. IOCP Parameters screen appears.
5. Change the sections as required. To change the input or output device assignments, refer to the following procedures:

Output Device

1. Key the following next to QFOID on the COMMAND line:

- a. P0 = You want to change the printer address.
- b. CXX = Device address.

Notes:

- If an output printer is not available, key P next to COMMAND:, and press ENTER. A printed copy of the system configuration is not generated during the configuration procedure.
- Sixteen addresses (0F0 through 0FF) are reserved for internal functions.
- With six channels installed, the addresses range from 000-5FF and with twelve channels installed, the addresses range from 000-BFF.

2. Press ENTER. Printer address is changed.

3. Key the following next to QFOID on the COMMAND line:

- a. Y = You want to change the printer type.
- b. XXXX = Printer type (where XXXX can be 1403, 3203, or 3211).

4. Press ENTER. Printer type is changed.

5. Key the following next to QFOID on the COMMAND line:

- a. A = You want to change the printer character set (printer train).

Note: If the correct Universal Character Set (UCS) is already loaded, skip to step 7.

- b. XXXX = Printer character set installed on the printer. The following printer character sets are supported:

Printer	Printer Character Set
1403	A,AN,GN,H,HN,J,PCA,PCAN,PCH,PCHN,PN,QN,QNC,RN,SN,TN,XN,YN
3203	A,AN,GN,H,HN,J,PCA,PCAN,PCH,PCHN,PN,QN,QNC,RN,SN,TN,XN,YN
3211	A11,G11,H11,P11,T11

6. Press ENTER. Printer character set is changed. A printer universal character set (UCS) buffer load takes place.

7. Key the following next to QFOID on the COMMAND line:

- a. W = You want to change the page width of the printout.
- b. XXXX = Page width (where XXXX can be 0072 or 0100).

8. Press ENTER. The page width is changed.

9. Key the following next to QFOID on the COMMAND line:

- a. L = You want to change the page length of the printout.
- b. XXXX = Page length (where XXXX = can be from 40 to 160).

10. Press ENTER. The page length is changed.

11. Perform "Input Device" procedure.

Input Device

1. Key the following next to QFOID on the COMMAND line:

- a. X = R0 if you are using a card reader or T0 if you are using a tape drive.
- b. CXX = Device address.

Notes:

- Sixteen addresses (0F0 through 0FF) are reserved for internal functions.
- With six channels installed, the addresses range from 000-5FF, and with twelve channels installed, the addresses range from 000-BFF.

2. Press ENTER. Input device is changed.

3. Go to "Target System" procedure.

Target System

1. Key the following next to QFOID on the COMMAND line:

- a. M = You want to change the Target System.
- b. XX = Model type (where XX can be 01 or 02).

2. Press ENTER. Target System is changed.

3. Go to "IOCP Generation" procedure.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

- 1. Key Q next to COMMAND:.
- 2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

- 1. Key Z next to COMMAND:.
- 2. Press ENTER. The Prog Sys (Z) screen appears.

Update XA Directory

Note: The "Start IOCP Program" procedure must be performed before you do this procedure.

This procedure allows you to write your Input/Output Configuration Data Set that you just generated to the diskette. Two Input/Output Configuration Data Sets can be stored on the FUNC2 diskette.

If a configuration is already present on the selected data set, performing this procedure will write over it. Ensure that you have made the proper selection and that the configuration you are about to write over will not be needed in the future.

Directory Update

To update the XA Directory:

1. Key the following next to QFOISY on the COMMAND line:
 - a. D = You are selecting an Input/Output Configuration Data Set.
 - b. n = The Data Set that you want to write to (where n = 0 or 1).

Warning: Performing this operation alters information on the diskette, and a loss of customer data can result.

2. Press ENTER. The Input/Output Configuration Data Set is written to the diskette. The message DATA SET n SAVED is displayed.
3. Update the backup diskette. For updating a diskette, see "Module Transfer."

Update XA Directory Screen

```

*1/O CONFIGURATION*
  *370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

  *370XA*
T CHANGE DATA SET SELECTION
  DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PROG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOISY

*UPDATE XA DIRECTORY
*****
*
*          DO CONFIG 0
*
*          D1 CONFIG 1
*
*  SELECT CONFIGURATION THAT
*  IS TO BE REPLACED ON DISKETTE
*****

WARNING : SELECTED CONFIGURATION ON
          DISKETTE WILL BE ERASED

          CURRENT DATA SET IS HIGHLIGHTED

          ==> SELECT D0/D1
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

S/370XA Mode

Running in S/370XA mode

To operate the system in S/370XA mode:

1. Enter QLI next to COMMAND:.
2. Press ENTER. The IML Parameters (QLI) screen appears.
3. Key the following next to QLI on the COMMAND line:
 - a. D = You are selecting an Input/Output Configuration Data Set.
 - b. n = The Input/Output Configuration Data Set that you want the system to run with (n=0 or 1).
 - c. W2 = You are selecting S/370XA mode (this is the only valid option).
 - d. M = You want to perform an IML.
4. Press ENTER. A S/370XA IML, using the Input/Output Configuration Data Set you selected, is performed.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

When operating in S/370XA mode, this selection is not available.

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Data Set Selection

This screen is used to select the data set you are to display when using the Subchannel Image (QFOI and QFOIN) screens. This is a nondisplayable function, and requires only the correct input on the COMMAND line.

Data Set Selection Procedure

1. Key T next to QFOI on the COMMAND line:
2. Press ENTER. The message DATA SET n SELECTED is displayed (where n = 0 or 1).

Note: Specifying the command again returns (toggles) you to the previous selection.

Data Set Selection Screen

```

*1/O CONFIGURATION*

  *370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

  *370XA*
T CHANGE DATA SET SELECTION
  DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PRG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOI                      ==>

```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

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Subchannel Verification

Use the Subchannel Image by Subchannel Number (QFOI) screen to display the subchannel images generated by running the IOCP program. This screen displays the subchannel image by the entry of the subchannel number.

Display Subchannel Image by Subchannel Number

To select the Subchannel Image by Subchannel Number screen from the I/O Configuration (QFOI) screen:

1. Key QFOI and a one to four-digit hex number next to COMMAND:. The hex number is the subchannel number assigned by the IOCP program.

Note: The default subchannel is 0001.

2. Press ENTER. The Subchannel Image by Subchannel Number screen is displayed. The subchannel on the COMMAND line is incremented by one. This allows you to display the images in numbered sequence.

Subchannel Identification Screen

```

*I/O CONFIGURATION*
*370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

*370XA*
T CHANGE DATA SET SELECTION
DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PROG

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFOI1223F

*SUBCHANNEL ID 223F*
CHPIDX   CHPIDX   CHPIDX   CHPIDX
  XX      XX      XX      XX
CTL UNITX CTL UNITX CTL UNITX CTL UNITX
  XXXX    XXXX    XXXX    XXXX

PIM       DEV ADDR  DEV NUMBER
  XX      XX      XXXX

DEV MODE  CHARACTERISTIC DATA SET
  XX      CCC,CCC   X

TIMER     CTL UNIT TYPE
  X       X
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Label Identification

CHPIDx (Channel Path Identifier): X identifies the channel path (0-3) being used. The XX field (00-0B) identifies the physical channel for the device.

CTL UNITx (Control Unit): X identifies the control unit path (0-7) being used. The XXXX field (0000-00FF) identifies the sequential number of the control unit (resulting from the SYSGEN specification).

PIM (Path Installed Mask): Mask identifies the installed channel path. A maximum combination of four paths is allowed. Only the first four bits are valid.

DEV ADDR (Device Address): The device address (00-FF) on the physical channel interface.

DEV NUMBER (Device Number): The device number (0000-FFFF) assigned by the IOCP program.

DEV MODE (Device Mode): This supplies information about the device. The bit meanings are:

- Bit 0 = 0
- Bit 1 = 0 Selector Mode
- Bit 0 = 0
- Bit 1 = 1 Byte Multiplexer mode
- Bit 0 = 1
- Bit 1 = 0 Block Multiplexer mode
- Bit 0 = 1
- Bit 1 = 1 Invalid
- Bit 2 = 1 Natively attached device
- Bit 3 = 1 Data Streaming mode
- Bit 4 = 1 Reserved
- Bit 5 = 1 Dynamic Path Device
- Bit 6 = 1 Timer installed
- Bit 7 = 1 Valid device number bit (always 1)

CHARACTERISTIC: Characteristic of the device:

- BLK** Block multiplexer mode
- BYT** Byte multiplexer mode
- DST** Data streaming mode
- INV** Invalid characteristic
- NAT** Natively attached device
- SEL** Selector mode

DATA SET: Indicates the Data Set (0 or 1) displayed on the screen.

TIMER: Indicates that the timer is installed (Y) or not installed (N).

CTL UNIT TYPE (Control Unit Type): Indicates the control unit type:

- 1 Selector Unshared — Single request only.
- 2 Shared — Multiple requests only.
- 3 Unused.

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Device Verification

Use the Subchannel Image by Device Number (QFOIN) screen to display the subchannel images generated by running the IOCP program. This screen displays the subchannel image by the entry of the device number.

Display Subchannel Image by Device Number

To select the Subchannel Image by Device Number screen from the I/O Configuration (QFOI) screen:

1. Key QFOIN and a one to four-digit hex number next to COMMAND:. The hex number is the device number assigned by the IOCP program.

Note: The default address is 0001.

2. Press ENTER. The Subchannel Image by Device Number screen is displayed. The address on the COMMAND line is incremented by one. This allows you to display the images in numbered sequence.

Device Identification Screen

```

*I/O CONFIGURATION*
*370*
*UCW DIRECTORIES*
U CHANGE UCW
C DISPLAY UCW

*370XA*
T CHANGE DATA SET SELECTION
DISPLAYING DATA SET 0
I SUBCHAN IMG BY SUBCHAN NUM
N SUBCHAN IMG BY DEVICE NUM
L SUBCHAN IMG LISTING
D IOCP PARAMETERS
S START IOCP PRG

Q GENERAL SELECTION
Z RETURN TO PRG SYS

COMMAND: QFOIN000E

*SUBCHANNEL ID XXXX*
CHPIDX  CHPIDX  CHPIDX  CHPIDX
XX      XX      XX      XX

CTL UNITX CTL UNITX CTL UNITX CTL UNITX
XXXX     XXXX     XXXX     XXXX

PIM      DEV ADDR  DEV NUMBER
XX      XX      000E

DEV MODE  CHARACTERISTIC  DATA SET
XX      CCC,CCC      X

TIMER     CTL UNIT TYPE
X        X

==>
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Label Identification

CHPIDx (Channel Path Identifier): X identifies the channel path (0-3) being used. The XX field (00-0B) identifies the physical channel for the device.

CTL UNITx (Control Unit): X identifies the control unit path (0-7) being used. The XXXX field (0000-00FF) identifies the sequential number of the control unit (resulting from the SYSGEN specification).

PIM (Path Installed Mask): Mask identifies the installed channel path. A maximum combination of four paths is allowed. Only the first four bits are valid.

DEV ADDR (Device Address): The device address (00-FF) on the physical channel interface.

DEV NUMBER (Device Number): The device number (0000-FFFF) assigned by the IOCP program.

DEV MODE (Device Mode): This supplies information about the device. The bit meanings are:

- Bit 0 = 0
- Bit 1 = 0 Selector Mode
- Bit 0 = 0
- Bit 1 = 1 Byte Multiplexer mode
- Bit 0 = 1
- Bit 1 = 0 Block Multiplexer mode
- Bit 0 = 1
- Bit 1 = 1 Invalid
- Bit 2 = 1 Natively attached device
- Bit 3 = 1 Data Streaming mode
- Bit 4 = 1 Reserved
- Bit 5 = 1 Dynamic Path Device
- Bit 6 = 1 Timer installed
- Bit 7 = 1 Valid device number bit (always 1)

CHARACTERISTIC: Characteristic of the device:

- BLK** Block multiplexer mode
- BYT** Byte multiplexer mode
- DST** Data streaming mode
- INV** Invalid characteristic
- NAT** Natively attached device
- SEL** Selector mode

DATA SET: Indicates the Data Set (0 or 1) displayed on the screen.

TIMER: Indicates that the timer is installed (Y) or not installed (N).

CTL UNIT TYPE (Control Unit Type): Indicates the control unit type:

- 1 Selector Unshared — Single request only.
- 2 Shared — Multiple requests only.
- 3 Unused.

IOCP Message Section

Messages contained in this section apply to the Input/Output Configuration Program (IOCP). For information on common messages, see Volume A08, Console Functions and Messages, "Appendix A. Messages." The Input/Output Configuration Program displays three types of messages: status, error, and informational.

Message Types

Status Messages are displayed, in a one-line message area, toward the top of the Start IOCP Program (QFOIS) screen. These messages indicate input deck reading problems, Input/Output Configuration Data Set, or Report generation problems.

Error Messages are displayed, in a eight-line message area, on the Start IOCP Program (QFOIS) screen. These messages indicate a user action to continue, a condition to be corrected, or termination of the operation.

Informational Messages are displayed on line 19 and to the right of the arrow on line 20. These messages provide status information about the assigned reader and printer.

Message Format

Each message is identified with a three-digit number and a suffix letter. The format is:

nnn cccc Message

where:

- nnn Three-digit message number associated with each message.
- x Message type:
 - r response required
 - i informational
 - w warning
 - e error
 - s severe error
 - t terminal.
- cccc Number of the card responsible for causing the message. This field is present for syntax type error messages.

The messages are organized by their key number. Each message is followed by its type (informational, status, or error), and a description that explains the cause of the message. Recovery information is given on how to correct that error condition, if applicable, or information which may be of help in the understanding of the message.

Messages

001E CLEAR RESET REQUIRED

Description: An attempt was made to run IOCP while the system was IPLed.

Recovery: Ensure that the system is set to S/370 mode, perform an IML, and retry the function. For information, see Volume A08, Console Functions and Messages, "(QL)Program Load Screens."

002E DISKETTE 2 NOT READY

Description: FUNC2 diskette is not installed in diskette drive 2 or not ready.

Recovery: Ensure that the FUNC2 diskette is properly installed in diskette drive 2, and retry the function.

003E INVALID PAGE LENGTH

Description: Page length parameter not between the line values 40-160.

Recovery: Use the IOCP Parameters (QFOID) screen to enter correct page length.

004E INVALID CHANNEL ADDR

Description: The channel address of the input or output device assigned for the IOCP program is not valid.

Recovery: Use the IOCP Parameters (QFOID) screen to enter the correct channel address.

005E INVALID DEVICE NUMBR

Description: The device number of the input or output device assigned for the IOCP program is reserved or not valid.

Recovery: Use the IOCP Parameters (QFOID) screen to enter the correct device number.

006E INVALID HEX CHARACTR

Description: IOCP checks for valid hexadecimal I/O device assignments and found an invalid entry.

Recovery: Enter the correct hex character on the IOCP Parameters (QFOID) screen, and retry the function.

007E INVALID INPUT

Description: An invalid character or more than the allowed number of characters was entered.

Recovery: Enter the correct information, and retry the function.

008E INVALID PRINTER TYPE

Description: An invalid or unsupported printer type specified.

Recovery: Select a valid printer type, and retry the function.

009E INVALID PRINTER TRAIN

Description: An invalid or unsupported printer train specified.

Recovery: Select a valid printer train, and retry the function.

010E INVALID FIRST DIGIT

Description: Input data does not contain a valid channel ID in the address.

Recovery: Enter an address with valid first digit.

011E S370 IML REQUIRED

Description: A S/370 IML is required. To run the IOCP program, the processor must be in S/370 mode.

Recovery: Perform an S/370 IML, and retry the function. For information, see Volume A08, Console Functions and Messages, "(QL) Program Load Screens."

012E INVALID PAGE WIDTH

Description: Page width selection invalid. Valid page widths are 72 or 100.

Recovery: Use the IOCP Parameters (QFOID) screen to enter valid page width.

013E PU IS NOT INSTR STOP

Description: Processor not in instruction stop state.

Recovery: Place processor in instruction stop mode, and retry the procedure.

014E INPUT EQUALS OUTPUT

Description: Selected input device address same as output device.

Recovery: Use the IOCP Parameters (QFOID) screen to enter correct device address.

015E NOT NORMAL OPER RATE

Description: Processor not in normal operation rate.

Recovery: Place processor in normal mode, and retry the procedure.

018E INVALID MODEL NUMBER

Description: The model group number you entered on the IOCP Parameters (QFOID) screen is not valid.

Recovery: Key in valid model group number.

019E NOT ON TARGET SYSTEM

Description: The target model group number selected on the IOCP Parameters (QFOID) screen does not equal the model group number of the system on which IOCP is running.

Recovery: To save the generated data set, the target model group number must be the same as the system running IOCP.

020I DATA SET n SAVED

Description: The Input/Output Configuration Data Set written and saved on the FUNC2 diskette.

Recovery: Informational message; no action required.

021T IOCP FAILURE

Description: Four minutes have elapsed with no response between the program and support processor.

Recovery: If all the I/O is operational, an internal IOCP failure has occurred. Restart the program.

022I IOCP PROGRAM STARTED

Description: IOCP program has started and running.

Recovery: Informational message; no action required.

023I LOADING IOCP PROGRAM

Description: Support processor is loading the Input File into the system.

Recovery: Informational message; no action required.

030I DATA SET NOT SAVED

Description: Displayed when data set not saved.

Recovery: Informational message; no action required.

031R SAVE DATA SET (Y/N)

Description: Prompting message to save or cancel the data set just generated.

Recovery: To save, enter 'Y'; enter 'N' not to save.

032R ENTER KEY - SCROLL/PAGE UP - 1 PAGE

Description: Message area on the Start IOCP PROG (QFOIS) screen is full.

Recovery: Press PAGE UP key to display next page of error messages. Press ENTER to scroll.

050T TERMINAL ERROR (S) DETECTED

Description: Program has determined that a device or control unit has invalid status or is in an unrecoverable error state.

Recovery: This is an unrecoverable error; the program is halted. Message is preceded by another message that describes the error state. Correct error and restart program.

051I ... ATTENTION BIT ON

Description: An invalid ATTENTION request has been detected from a device, and the program is halted.

Recovery: Information defining the device with the invalid ATTENTION request is displayed on the console. From this information, determine the device in error, and correct the condition. Restart the program.

052I ... STATUS MODIFIER BIT ON

Description: An invalid STATUS MODIFIER condition has been detected from a device and the program is halted.

Recovery: Information defining the device with the invalid STATUS MODIFIER condition is displayed on the console. From this information, determine the device error, and correct the condition. Restart the program.

053T PROG. ERR.: CONFLICTING I/O STATUS.

Description: A device or control unit configured for the program has changed status during processing and the program is terminated.

Recovery: This is an unrecoverable error; the program is halted. Restart the procedure.

054T DEVICE SENSING WAS UNSUCCESSFUL.

Description: The processor has received a UNIT CHECK from an assigned device, and repeated attempts to SENSE the device have been unsuccessful. The program is terminated.

Recovery: This is an unrecoverable error; the program is halted. Restart the procedure.

055I ... SENSE NORMAL, IOCP CONTINUES.

Description: An assigned device requires manual intervention to correct a recoverable condition.

Recovery: Information defining the device requiring intervention is displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

058T DEVICE PROBLEM IS NOT RECOVERABLE.

Description: The program has received a UNIT CHECK from a device, and determined that the malfunction is unrecoverable.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

Seq FC065	PN 0446066 Pg 2 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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059I ... PROGRAM CONTROL CHECK

Description: A channel assigned to the program contains a PROGRAM CONTROL CHECK condition in the channel status field.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If error persists, invoke your support structure.

060I ... INCORRECT LENGTH

Description: A channel or device assigned to the program contains an INCORRECT LENGTH condition in the channel status field.

Recovery: Channel status is checked, and recovery information is displayed. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

061I ... PROGRAM CHECK

Description: A channel or device assigned to the program contains a PROGRAM CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

062I ... PROTECTION CHECK

Description: A channel or device assigned to the program contains a PROTECTION CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

063I ... CHANNEL DATA CHECK

Description: A channel assigned to the program contains a CHANNEL DATA CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

064I ... CHANNEL CONTROL CHECK

Description: A channel assigned to the program contains a CHANNEL CONTROL CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

065I ... INTERFACE CONTROL CHECK

Description: A channel assigned to the program contains an INTERFACE CONTROL CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

066I ... CHAINING CHECK

Description: A channel assigned to the program contains a CHAINING CHECK condition in the channel status field.

Recovery: Channel status is checked. This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

091T IOCP PROGRAM CHECK.

Description: A PROGRAM CHECK has occurred during the execution of the program.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

092T UNRECOVERABLE MACH CHECK
IOCP ENDED

Description: An unrecoverable machine check condition has occurred during the execution of the program.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

093T USER REQUESTED PROGRAM
TERMINATION

Description: The console INTR (interrupt) key has been pressed. The program operation is terminated.

Recovery: The program is halted; this is a user's request to terminate.

100T IOCP UNABLE TO CONTINUE

Description: Terminal error has occurred; all processing has ended before completion.

Recovery: This is an unrecoverable error; the program is halted.

101I DEVICE nnnn CHANNEL STATUS =

Description: Interrupting device contains channel status bits on. Immediately following the display of the message, a description of the channel status bits is displayed.

Recovery: This is an unrecoverable error; the program is halted. Recovery procedures may be determined from displayed information. If the error persists, invoke your support structure.

Seq FC075	PN 0446067 Pg 1 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84			
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102I DEVICE nnnn INVALID STATUS =

Description: Device address (nnnn) has interrupted with invalid unit status. Immediately following the display of the message, the status of the device is displayed.

Recovery: This is an unrecoverable error; the program is halted. Recovery procedures can be determined from displayed information.

103I DEVICE nnnn UNIT CHECK.

Description: A unit check has occurred at device address (nnnn). Depending on of the problem, the program may be halted or may require intervention to continue.

Recovery: Recovery procedures can be determined from displayed information.

104T DEVICE nnnn IS NOT OPERATIONAL.

Description: Program has detected a device at address (nnnn) that is not operational.

Recovery: This is an unrecoverable error; the program is halted. Restart the procedure.

105I DEVICE nnnn SENSE DATA =

Description: A UNIT CHECK has occurred at device address (nnnnn). Immediately following the display of the message, the sense data of the device is displayed.

Recovery: Depending on of the problem, the program may be halted or may require intervention to continue.

106I DEVICE nnnn INTERVENTION REQUIRED.

Description: A UNIT CHECK has occurred at device address nnnn, and the returned sense data indicates that intervention is required.

Recovery: Information defining the device requiring intervention is displayed on the console. Attend to the device problem, and the program restarts, or press the INTR (interrupt) key to terminate the program.

107I DEVICE nnnn EQUIPMENT CHECK.

Description: A UNIT CHECK has occurred at device address nnnn and has returned sense data information. The returned status indicates that intervention is required to remove the EQUIPMENT CHECK.

Recovery: Information defining the device requiring intervention is displayed on the console. Attend to the device problem, and the program restarts, or press the INTR (interrupt) key to terminate the program.

108I DEVICE nnnn READIED.

Description: Program has received an interrupt, by the START key, from a device that required intervention.

Recovery: The condition requiring intervention has been corrected; the program continues.

110I nnnnnnnn nnnnnnnn nnnnnnnn

Description: Returned sense data (24 hexadecimal digits) of a device that has had a UNIT CHECK resulting from a I/O SENSE command.

Recovery: Additional information on this problem is displayed on the console. Appropriate recovery procedures are to be taken from the device address and sense information displayed. Depending on the problem, the program may be halted or may require intervention to continue.

111T DEVICE nnnn UNRECOVERABLE DATA CHK.

Description: The error recovery procedure for retrying a read to the tape unit after a data check has failed.

Recovery: This is an unrecoverable error; the program is halted. Clean the tape, and restart the procedure. If the error persists, a new Input File should be made.

150T INVALID 1403 PRINT TRAIN.

Description: An invalid or unsupported 1403 printer train specified.

Recovery: This is an unrecoverable error; the program is halted. Select a valid printer train, and restart the procedure.

151T INVALID 3203 PRINT TRAIN.

Description: An invalid or unsupported 3203 printer train specified.

Recovery: This is an unrecoverable error; the program is halted. Select a valid printer train, and restart the procedure.

152T INVALID 3211 PRINT TRAIN.

Description: An invalid or unsupported 3211 printer train specified.

Recovery: This is an unrecoverable error; the program is halted. Select a valid printer train, and restart the procedure.

153T INVALID PRINTER TYPE.

Description: An invalid or unsupported printer type specified.

Recovery: This is an unrecoverable error; the program is halted. Select a valid printer type, and restart the procedure.

200S ERROR READING INPUT

Description: IOCP has encountered an error while reading the source input record data set.

Recovery: The IOCP operation is terminated. Refer to message number 3011. Using message number 3011, check the source input data set for invalid input. Restart the IOCP operation by reloading the source input record data set in the IOCP assigned reader device.

300E cccc INVALID VERB: xxxxxxxx

Description: An unrecognizable macro, xxxxxxxx, was found in the input data set at record number cccc. This often happens when new, previously unknown SYSGEN macros and control statements are encountered in the input.

Recovery: Review the input record data set for incorrect macro specifications and, if necessary, correct and resubmit the input for processing.

300T ERROR READING INPUT

Description: An error occurred reading the Input File; the program is halted.

Recovery: Reload the Input File, and restart the procedure. For additional information, refer to message Number 3011.

301I nnnn RECORDS READ

Description: Displays the number of records read before the error occurred. This helps you determine the record in error by supplying a count of the valid records read from the Input File.

Recovery: Informational message used with other displayed information.

Seq FC075	PN 0446067 Pg 2 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84			
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**305E cccc IODEVICE INVALID PARM
 mmmmmmmmm**

Description: A parameter (mmmmmmmm) that is not known to the IODEVICE macro was found on an IODEVICE card. cccc is the number of the record that had the bad IODEVICE parameter.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

**314E ccccNO PARMS FOUND ON DEVICE
 VERB**

Description: An IODEVICE macro card was processed, but no parameters were specified. cccc is the record number where IOCP detected the error.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

315I PROCESSING STARTED

Description: Reading of the Input File complete. A syntax check and path validation started.

Recovery: Informational message; processing continues.

**355T SCAN CURSOR EXCEEDED CARD
 END**

Description: Cursor used for scanning input records exceeded the end of a single record.

Recovery: The program is halted. Invoke your support structure.

405E cccc xxxxxx BAD PARM yyyyyy

Description: Program detected an invalid parameter (yyyyyy) that has been specified for verb xxxxxx. If the parameter is an error, the program assumes an appropriate default value. If the parameter specified is invalid, the program ignores the statement that specified the parameter and any records associated with it. The program continues with the next record that contains a valid verb.

Recovery: Correct the parameter term in the Input File, and, if necessary, restart the procedure.

**406W cccc PATH NOT SUPPORTED,
 IGNORED**

Description: A PATH= parameter was specified. PATH= parameter is not supported and is ignored by the program.

Recovery: Warning message; no action required. Processing continues.

**407E cccc DEV # mmmm PREVIOUSLY
 DEFINED**

Description: IODEVICE has same device number as previous IODEVICE. cccc is the number of the IODEVICE card; mmmm is the device number.

Recovery: Correct the duplicate numbers in the Input File, and restart the procedure.

408E cccc CNTLUNIT DUAL RANGES yyyyyyyy

Description: The CNTLUNIT macro definition contains overlapping device number ranges on the yyyyyyyy parameter on input record cccc.

Recovery: Correct the address ranges in the Input File, and restart the procedure.

409E cccc xxxxxx CH 5 MODE MIX yyyy

Description: The program detected a mixture of byte and block mode specification on channel 5 for input record number cccc of the xxxxx macro statement for the yyyy parameter.

Recovery: Correct the mode specification and resubmit the deck for processing.

415E cccc xxxxxx MISSING PARM yyyyyy

Description: The program detected that the source input did not supply the parameter (yyyyyy) for verb (xxxxxx) and has supplied a default value for the missing parameter.

Recovery: Ensure that a proper value has been selected or correct the Input File. Restart the procedure.

**419E NATIVE DEV ADDR nnnn IS
 RESERVED**

Description: A native device with a unit address other than F2, F3, F4, F5, or FF was defined. Device addresses F0, F1, and F7 through FE are reserved on channel 0. Device address nnnn is ignored.

Recovery: Correct the device address in the Input File, and restart the procedure.

420W cccc xxxxxx yyyyyy MISSING PAREN

Description: Parentheses missing from yyyyyy parameter.

Recovery: Warning message; no action required. Processing continues.

**421W cccc IODEVICE "TIMEOUT=N"
 IGNORED**

Description: IODEVICE verb contains a "no timeout" statement. "No timeout" is not supported and is ignored by the program.

Recovery: Warning message; no action required. Processing continues.

**422E cccc ADDRESS + CNT EXCEEDS
 X'FF'**

Description: IODEVICE verb contains a first address plus number of devices count which exceeds X'FF.' Any devices with a unit address greater than X'FF' are not supported.

Recovery: Correct the IODEVICE verb statement so that the count does not exceed X'FF', and retry.

**423E cccc UNITADD SUPERSEDED BY
 DEVNUMBR**

Description: An IODEVICE macro (card number cccc) has a UNITADD parameter and a DEVNUMBR parameter. These parameters are mutually exclusive, and the UNITADD parameter is ignored. Processing continues using the DEVNUMBR parameter.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

**424E cccc DUPLICATE DEVICE PARM
 mmmmmmmmm**

Description: An IODEVICE macro (card number cccc) was processed and contained more than one occurrence of the same parameter specification (mmmmmmmm). The first valid specification of the parameter, if any, is used.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

Seq FC085	PN 0446068 Pg 1 of 6	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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425E cccc DUPLICATE CU # nnn

Description: An IODEVICE macro card (number cccc) was processed, and found to specify the same control unit (nnn) more than once in the CUNUMBR argument. The second, or later occurrences of this control unit are ignored.

Recovery: Review the input record data set for valid argument specification and, resubmit for processing.

426W cccc DEV NUMBER WRAPPED to '0000'X

Description: An IODEVICE macro (card number cccc) was processed which caused the device number to be incremented past 'FFFF'.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

427E cccc TOO MANY CHARACTERS FOR A CU

Description: An IODEVICE macro (card number cccc) was processed and the CUNUMBR section was found to contain a series of four or more characters where a control unit specification should have been. Scanning of the CUNUMBR argument is halted, and only those control units that were specified before this error are retained. Processing of the remaining parameters on this card continues.

Recovery: Review the input record data set for valid parameter specifications, and resubmit for processing.

430I cccc CNTLUNIT 2ND xxxxxxxx IGNORED

Description: CNTLUNIT card contains more than one xxxxxxxx parameter. First valid entry is accepted; all others are ignored.

Recovery: Informational message; no action required.

431I cccc CNTLUNIT XTRA TEXT W/xxxxxxx

Description: CNTLUNIT card contains additional data beyond valid entry field. Data within the valid field is used, all other data is ignored.

Recovery: Informational message; no action required.

432E cccc CNTLUNIT PREVIOUSLY SPECIFIED

Description: Control unit has already been specified. The first valid record is accepted; all others are ignored.

Recovery: Correct the Input File, and restart the procedure.

433E cccc CNTLUNIT CARDS EXCEED 256

Description: The number of control units assigned exceeds 256. Any control units over the count of 256 are ignored.

Recovery: Ensure the correct number of control units have been assigned, and restart the procedure.

434E cccc UNITADD + CNT EXCEEDS X'FF'

Description: IODEVICE verb contains a first address plus number of devices count which exceeds X'FF'. Any devices with a unit address greater than X'FF' are not supported.

Recovery: Correct the IODEVICE verb statement so that the count does not exceed X'FF', and retry.

443E cccc NMBR OF IODEVICES EXCEEDS 2048

Description: More than 2048 devices were specified by the input deck. Only 2048 devices are allowed.

Recovery: Processing continues with IOCP using only the first 2048 device definitions. Review the input record data set for the correct number of device assignments, and resubmit for processing.

480S UNABLE TO BUILD DATA SET

Description: The program cannot complete the Input/Output Configuration Data Set (IOCDs) because of errors encountered during data set generation.

Recovery: The program is halted. Correct all possible errors in the Input File, and restart the procedure.

499I NO ERRORS DETECTED

Description: No errors detected during the syntax check and path validation.

Recovery: Informational message; no action required.

500I NO ERRORS, DATA SET CAN BE SAVED

Description: No errors occurred. IOCDs can be saved.

Recovery: Informational message; no action required.

500R GOOD COMPLETION, SAVE DATA SET?

Description: IOCP detected no errors during input processing.

Recovery: You can now transfer the IOCDs from the support processor to the diskette. IOCP waits for your action.

501I ERRORS FOUND, DATA SET CAN BE SAVED

Description: The program has completed all processing but detected errors during the operation. This is a prompting message to save the data set or purge it.

Recovery: By analyzing the results of the program the user can determine whether to accept or reject the data set. To accept the result, enter 'Y' for accept or 'N' to reject, and then press ENTER. Accepting the data set overlays the existing data set on the FUNC2 diskette. The user must enter either 'Y' or 'N' to continue processing.

501R ERRORS DETECTED, SAVE DATA SET?

Description: IOCP detected errors during processing, but continues to store the IOCDs in support processor storage.

Recovery: IOCP will ask you if you want to save the data set. Examine the error messages and available configuration reports to make sure that the data set in the support processor storage is valid.

502S EMPTY DATA SET, CANNOT BE SAVED

Description: Severe errors occurred during processing of input. No valid control units or I/O devices specified or data set empty or null.

Recovery: This is a unrecoverable error; the program is halted. Correct the Input File, and restart the procedure.

504T DATA SET CANNOT BE SAVED

Description: A severe error has occurred during path validation, and as a result, the data set cannot be saved.

Recovery: Review the input data set to determine the cause of the severe errors. Then correct and submit the input data set.

Seq FC085	PN 0446068 Pg 2 of 6	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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550E 'cccc' ZERO LENGTH ARGUMENT

Description: Parameter specified with an "=" sign argument, but no argument was found. Program continues without an argument for this parameter. cccc is the record number where the error occurred.

Recovery: Informational message; no action required.

551W cccc WARNING: PARM HAS NO ARGUMENT

Description: Parameter has no argument specified. Program continues without an argument for this parameter. cccc is the record number where the error occurred.

Recovery: Informational message; no action required.

552E cccc UNCLOSED QUOTE OR PAREN

Description: Opening quote or parenthesis not closed before a logical end of record. cccc is the record number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

553E cccc TOO MANY RIGHT PARENTHESES

Description: Too many closing parentheses specified. cccc is the record number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

554E cccc UNCLOSED LEFT PARENTHESIS

Description: Argument ended before all opening parentheses were closed. cccc is the record number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

555E cccc UNEXPECTED END OF SOURCE

Description: No continue record found following a continuation statement. cccc is the record number where the error occurred.

Recovery: Informational message; no action required.

556E cccc PARAMETER HAS ZERO LENGTH

Description: Parameter length equals zero. This can occur if successive commas are detected. cccc is the record number where the error occurred.

Recovery: Informational message; no action required.

557W cccc PARM TRUNCATED TO 8 CHARS

Description: Parameter contained more than eight characters. The first eight characters are used. cccc is the record number where the error occurred.

Recovery: Informational message; no action required.

558W cccc DANGLING COMMA FOUND

Description: Last character in parameter list is a comma. This may indicate a missing parameter. cccc is the record number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

559E cccc TOO MANY CONTINUATION CARDS

Description: More than ten continuation cards were found. cccc is the record number of the statement. Processing continues with the next record number.

Recovery: Correct the Input File, and restart the procedure.

560E cccc ARGUMENT LENGTH OVER 80 CHARS

Description: Record number cccc contains an argument which exceeds 80 characters.

Recovery: Correct the Input File, and restart the procedure.

561W cccc ONLY FIRST TEN PARMS SCANNED

Description: Record number cccc has a statement containing more than ten parameters. Processing continues with the next record number.

Recovery: Correct the Input File, and restart the procedure.

562E cccc INVALID CONTINUATION CARD

Description: Record number cccc contains an invalid continuation card. Continuation statements must extend to column 71 or end with a comma. Processing continues with the next record number.

Recovery: Correct the Input File, and restart the procedure.

602E CHIPD nn IS MULTIPLY DEFINED

Description: Channel Path ID number nn is already specified. The first record defining the number is used; all others are ignored.

Recovery: Correct the Input File, and restart the procedure.

603E CU "nnn": BAD PROTOCL FOR BYTE CHAN

Description: A byte CHPID was found on a control unit that was not of type PROTOCL=S. nnn is the control unit number.

Recovery: Correct the Input File, and restart the procedure.

604E CHPID nn IS NOT ALONE ON CU "mmm"

Description: Channel nn, where nn = 00 or 05, is operating in byte mode and more than one Channel Path ID has been assigned to the control unit (mmm). One Channel Path ID is allowed for a control unit operating in byte mode. The control unit is ignored.

Recovery: Correct the Input File, and restart the procedure.

605E BLOCK/BYTE MISMATCH ON CU "nnn"

Description: Not all Channel Path IDs assigned to the control unit are operating in the same mode (byte or block). The control unit (nnn) is ignored.

Recovery: Correct the Input File, and restart the procedure.

606T DEV nn ALREADY HAS 256 CUS:CU "mmm"

Description: More than 256 devices are assigned to control unit mmm. nn is the I/O device over the allowable assignment.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

607W WARNING: CHIPD nn IS UNREFERENCED

Description: A Channel Path ID was defined but not referenced by a control unit. nn is the unreferenced Channel Path ID. The Channel Path ID is ignored by the program.

Recovery: Informational message; no action required.

Seq FC085	PN 0446068 Pg 3 of 6	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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**608T PROTOCOL 'nnnn' IS BAD FOR CU
 #mmmm**

Description: The protocol field on a control unit entry was found to be invalid. mmmm is the number of the entry in the control unit, and 'nnnn' is the hexadecimal value of the protocol field.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

609T NO CHPIDS FOUND ON CU #nnnn

Description: A control unit entry does not specify any Channel Path IDs. nnnn is the number of the control unit entry.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**610E UNKNOWN CHPID nn ON CU
 "mmm"**

Description: A control unit entry contains an unknown Channel Path ID. mmm is the control unit containing the unknown (nn) entry. The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**611T CU OF "nnnnnn"X IS BAD FOR CU
 #mmmm**

Description: An entry in the control unit pool has an invalid control unit number entry.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**612T VPM OF "nn"X IS BAD FOR CU
 #mmmm**

Description: The VPM field (nn) contains an invalid entry for the control unit pool entry (mmmm).

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**613T BAD CHPID REF "nnnn"X ON CU
 #mmmm**

Description: The Channel Path ID (nnnn) is invalid for the specified control unit pool entry (mmmm).

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**614T BAD CHPID REF nnnn ON CU
 #mmmm-ss**

Description: An entry in the control unit pool contains an invalid entry referencing beyond the end of the Channel Path ID table. nnnn is the value of the Channel Path ID field. mmmm is the control unit pool entry, and ss is the Channel Path ID field with the bad reference.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**615T BAD VAL OF "nnnn"X FOR CHPID
 #mmmm**

Description: A Channel Path ID entry did not correspond with its entry in the Channel Path ID table during validation. nnnn is the bad Channel Path ID. mmmm is the number of the Channel Path ID in the table.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**616T LOGICAL ENTRY MISSING FOR CU
 #mmmm**

Description: No entry found in the CU2CUTBL table for control unit pool entry mmmm.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**617T BAD VAL "nnnn"X IN
 UL:CU=mmmm #sss**

Description: Bad value in unit list. nnnn is the bad unit in the list. mmmm is the number of the control unit pool entry, and sss is the entry number in the unit list.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**618T BAD TABLE LEN. OF nnnn FOR
 CU=mmmm**

Description: Unit list table length invalid. nnnn is the number of the control unit pool entry.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

619T USP IN ERROR ON CU #nnnn

Description: Unit string pointer of control unit pool entry (nnnn) is not initialized.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**620T BAD REF TO CU=nnnn FROM SUBC
 #mmmm**

Description: A reference from an entry (mmmm) in the device pool was made to a control unit (nnnn) that is out of range.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**621E DEVICE nnnn SPECIFIES CU
 "mmm," BUT C.U. DOES NOT
 SPECIFY DEVICE**

Description: Control unit mmm does not specify device nnnn in its list of units and has been referenced from the device pool entry list. The control unit is ignored by the program.

Recovery: Correct the Input File, and restart the procedure.

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**622E MORE THAN 4 CHPIDS ON nnnn:CU
"mmm"**

Description: Control unit mmm has specified more than four Channel Path IDs for device nnnn. The program uses the first four Channel Path IDs; all others are ignored.

Recovery: Correct the Input File, and restart the procedure.

**623T BAD UNIT "nnnn"X ON SUBCTBL
#mmmm**

Description: The unit-address field (nnnn) is invalid for device pool entry mmmmm.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**624E PROTOCOL MISMATCH FOR
DEVICE nnnn**

Description: Control unit nnnn does not have the same protocol assignment as the other control units in the device pool. The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**625E UNITADD 'NN' ON CU 'mmm' NOT
DEFINED**

Description: Control unit mmm has referenced an unknown device (nn). This may be because of a missing IODEVICE card or a syntax error on it. nnn is the control unit number. The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**627T CU SEQ "nn"X IS BAD ON SUBC
#mmmm**

Description: The device pool contains an invalid sequence of control unit entries. nn is the invalid sequence, and mmm is the device pool entry.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**628E CU "nnn" SPECIFIES UNITADD mm,
BUT UNITADD DOES NOT SPECIFY
CU.**

Description: Control unit nnn references device mm, but the device does not reference the control unit. The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**629E CU TYPE MISMATCH ON DEVICE
mmmm**

Description: I/O device entry mmmmm references control units that are not of the same type (byte or block). The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**630E MULTIPLE REFERENCES TO
UNITAD nn: FROM CHANNEL mm ;
CHPID ss ON CONTROL UNIT ttt ON
DEVICE rrrr**

Description: Channel Path ID ss already specified. This could have occurred on a previous IODEVICE entry or with a different control unit with the same IODEVICE entry.

- nn Unit address
- mm Corresponding channel
- ss Channel Path ID
- ttt Control unit CHPID found on
- rrrr Device number.

The invalid entry is ignored.

Recovery: Correct the Input File, and restart the procedure.

**631T DEV "nnnnnnnn"X IS BAD:SUBC
#mmmm**

Description: Device number field of a device pool entry contains invalid characters. nnnnnnnn is the invalid field, and mmmmm is the device pool entry.

Recovery: This is an unrecoverable error; the program is halted. Review any information displayed on the console. From this information, determine the error and correct the condition. Restart the procedure. If the error persists, invoke your support structure.

**632E UNKNOWN CU "nnn" ON DEVICE
mmmm**

Description: Device entry mmmmm specified a control unit that was not defined. This may be because of a missing control unit card or a syntax error on it.

Recovery: Correct the Input File, and restart the procedure.

**633W WARNING: CU "nnn" IS
UNREFERENCED**

Description: Control unit nnn is not referenced by any devices.

Recovery: Informational message; no action required.

**634W WARNING: DEVICE #00FF NOT
DEFINED**

Description: Device at unit address of X'FF' not defined.

Recovery: Informational message; no action required.

**635W WARNING: NO CONSOLES ARE
DEFINED**

Description: A console not defined. At least one console must be assigned as a native console device.

Recovery: Informational message; no action required.

**636E CHPID nn IS NOT ALONE ON DEV
#mmmm**

Description: A CHPID representing channel 0 (or 5 if assigned) is specified as the second or later CHPID in a IODEVICE entry. The CHPID is ignored (it should be alone on a entry). nn is the CHPID, and mmmmm is the record number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

**637E IGNORING CHPID nn ON DEVICE
#mmmm**

Description: A CHPID representing byte channel 0 (or 5 if assigned) is specified as the first CHPID in a IODEVICE entry. This should be the only one assigned; all others are ignored. nn is the CHPID being ignored, and mmmmm is the device number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

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638E BLOCK/BYTE MISMATCH ON DEV #mmmm

Description: CHPID on a device entry should be block or byte. CHPIDs must match the first CHPID type. mmmm is the device number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

639E WRONG CU TYPE FOR NATIVE DEV nnnn

Description: Device defined on control unit was not type 2. The device is deleted. nnnn is the device number where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

640E CU 'nnn' IS RESERVED, DEV mmmm

Description: A nonnative device assigned to control nnn. The control unit has been previously assigned for native devices. Device mmmm is ignored, and nnn is the control unit where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

641E NATIVE DEV nnnn NOT ON CU'mmm'

Description: Native device nnnn has been assigned to a control unit other than the control unit designated for native devices. mmm is the control unit assigned for native devices.

Recovery: Correct the Input File, and restart the procedure.

642E CU 'nnn' ALREADY USED, NATIVE DEV mmmm

Description: The control unit has been previously assigned for nonnative devices. Device mmmm is ignored, and nnn is the control unit where the error occurred.

Recovery: Correct the Input File, and restart the procedure.

643S DEV #00FF NOT DEFINED WITH CONSOLES

Description: Console device 00FF is not defined to the Input/Output Configuration Program.

Recovery: This is an unrecoverable error; the program is halted. Assign the console device at address 00FF to the program, and restart the procedure.

700T MEMORY OVERFLOW!

Description: More memory was needed than was allocated for logical control unit group processing.

Recovery: An internal IOCP failure has occurred; IOCP has terminated. For more information, invoke your support structure.

701T LCU nnnn HAS OVER 256 DEVICES; DEV mmmm

Description: More than 256 devices were assigned to logical control unit group nnnn. Device number mmmm was the 257th device that was attempted to be added to the group.

Recovery: An internal IOCP failure has occurred; IOCP has terminated. For more information, invoke your support structure.

702T OVER 2048 LCU'S DETECTED

Description: More than 2048 logical control unit groups were generated.

Recovery: An internal IOCP failure has occurred; IOCP has terminated. For more information, invoke your support structure.

800I CHPID SUMMARY REPORT STARTED

Description: Channel Path Identifier report starts printing.

Recovery: Informational message; no action required.

801I DEVICE I/O CONFIG. REPORT STARTED

Description: Input/Output Configuration report starts printing.

Recovery: Informational message; no action required.

802I CHPID CONFIGURATION REPORT STARTED

Description: Channel Path ID Configuration report starts printing.

Recovery: Informational message; no action required.

803I IOCDS IMAGE REPORT STARTED

Description: IOCDS image report starts printing.

Recovery: Informational message; no action required.

804T PRINTER IS NOT OPERATIONAL

Description: The assigned printer is not operational; the operation is stopped.

Recovery: The cause must be found and corrected, then the operation can be restarted.

810I INPUT IMAGE REPORT STARTED

Description: Input image report starts printing.

Recovery: Informational message; no action required.

811I LOGICAL CONTROL UNIT REPORT STARTED

Description: The logical control unit report is printing on the IOCP assigned printer.

Recovery: Informational message; no action required.

900I PAGE NUMBER nnnn IS NOW PRINTING

Description: Indicates the finished printed pages (nnnn) of the configuration report on a running basis in increments of five pages.

Recovery: Informational message; no action required.

999I UNKNOWN MSG # "nnn"

Description: An invalid message number nnn has not been passed to the IOCP message handler.

Recovery: An internal IOCP failure occurred; IOCP has terminated. For more information, invoke your support structure.

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S/370XA Terms

CCW: Channel Command Word.

channel path: A connection between a processor and control unit along which signals and data can be sent to perform I/O requests. Equivalent to channel.

channel set: A collection of channels that can be addressed by the processor.

channel subsystem: The collection of channels, channel paths, control units, and I/O devices that attach to the processor.

CRW: Channel Report Word.

CSCH: Clear Subchannel (instruction).

CSW: Channel Status Word.

CUB: Control Unit Busy.

CUE: Control Unit End.

data streaming: The I/O interface protocol that operates at the rate governed by the control unit.

device address: Three hexadecimal digits that uniquely identify an I/O device in S/370 mode.

device number: Four hexadecimal digits that uniquely identify an I/O device in S/370XA mode.

HSCH: Halt Subchannel (instruction).

I/O Configuration: The collection of channel paths, control units, and I/O devices that attaches to the processor.

IOCDs: Input/Output Configuration Data Set. The data set, located on the FUNC2 diskette, that contains the I/O configuration (S/370XA) definition.

IOCP: Input/Output Configuration Program. Program that creates the I/O configuration definition (IOCDs) based on user-defined input.

IPL: Initial Program Load.

IRB: Interrupt Response Block.

ISC: Interrupt Subclass.

logical control unit: A logical representation of a control unit that does not share devices, or two to four control units that do share devices.

MB: Measurement Block.

MSCH: Modify Subchannel (instruction).

ORB: Operation Request Block.

PMCW: Path Management Control Word.

RCHP: Reset Channel Path (instruction).

RSCH: Resume Subchannel (instruction).

SAL: Set Address Limit (instruction).

SCHIB: Subchannel Information Block.

SCHM: Set Channel Monitor (instruction).

SCSW: Subchannel Status Word.

SID: Subchannel Identification Word.

SSCH: Start Subchannel (instruction).

STCRW: Store Channel Report Word (instruction).

STSCH: Store Subchannel (instruction).

SYSGEN: Operating System generation procedure.

TPI: Test Pending Interruption (instruction).

TSCH: Test Subchannel (instruction).

unit address: The last two digits of a device address or a device number.

370XA: System 370/Extended Architecture.

S/370XA Configuration Report

This section describes the configuration reports that are generated when the Input/Output Configuration Program is run. The reports are used for checking the I/O configuration of the Input/Output Configuration Data Set (IOCDS) and for providing a hard copy record of all I/O devices, channel path identifiers, and control units being used by the system.

Running the Input/Output Configuration Program produces four reports in the following order:

- CHPID Summary Report
- Device I/O Configuration Report
- CHPID Configuration Report
- Image Table Report (CE Mode only)

Device subchannel image
Control unit image.

CHPID Summary Report

This report lists the channel paths defined in the Input/Output Configuration Data Set (IOCDS). For each channel path, the report shows the corresponding channel set, channel number, and mode of operation. The Channel Path Identifiers are listed in ascending order.

Label Identification

Channel CHPID: The Channel Path Identifier field lists the valid CHPID numbers specified in the Input File.

Channel Set: Always set to zero.

Channel Number: The channel number is any of the installed available channels from 0 to 5 in a standard channel installation, and from 0 to B if the optional channels are installed.

Mode: The mode of operation is the type of configuration specified for the specific channel. Channel 0 is always byte mode; the other channels are always block mode except channel 5 which may be either.

Sample CHPID Summary Report

```

IOCP VERSION 1                LEVEL 0                CHPID SUMMARY REPORT
                             PAGE NUMBER 1
ID1=HERE IS A SAMPLE OF THE
ID2=CHPID SUMMARYREPORT

      CHANNEL      CHANNEL      CHANNEL
      CHPID        SET          NUMBER
      *****      *****      *****
      00           0            0
      10           0            A
      11           0            B
      12           0            4
      13           0            3
      14           0            6
      15           0            2
      MODE
      ****
      BYTE
      BLOCK
      BLOCK
      BLOCK
      BLOCK
      BLOCK
      BLOCK
      BLOCK

***** END OF CHPID SUMMARY REPORT *****

```

Device I/O Configuration Report

This report lists the device numbers defined in the Input/Output Configuration Data Set (IOCDs). For each device number, the report shows the corresponding unit address, subchannel number, logical control unit number, control unit type, device type, model, timeout, protocol, and channel path identifier.

Label Identification

Device Number: This is the user-specified number contained on the IODEVICE macro definition statement. A series of device numbers will print if more than one was specified in the number field of the ADDRESS parameter of the IODEVICE statement.

Unit Address: This is the real address where the device is located. Note that all unit addresses on a specific channel must be unique.

Subchannel Number: The subchannel number is the position of the I/O device entry in the device subchannel image table data set used to configure the processor in S/370XA mode. If the subchannel number is 001, then it is the first device entry in the data set.

Logical Control Unit Number: The logical control unit number is the number specified by the user on the IODEVICE macro definition statement following the keyword parameter CUNUMBR=. There is a one-to-one correspondence between the logical control units and the channel path identifiers. Note that columns 4, 5, 6, and 7 of the report (the logical control unit number group) and columns 13, 14, 15, and 16 (channel path ID number group) are directly related.

Control Unit Type: This is the control unit type specified. Type 1 control units support only a single channel program at a time. Type 2 control units support multiple channel programs concurrently.

Device Type: This is the device type.

Model: This is the model number of the specified device.

Timeout: Timeout is always YES.

Protocol: There are two methods of operation, or protocol, under which a control unit may function. The first of these, used for slower devices, is Direct Control Interlock (DCI). DCI requires that the control unit respond to a channel command and wait for a response from the channel before proceeding with data transfer. Under this type of protocol are Byte, Block, and Selector modes.

Data Streaming protocol (DST) does not require a response from the the channel. When a signal is received from the channel, the control unit begins data transfer immediately without waiting for additional response commands. Control units that have been configured for data streaming mode are noted in the DEV MODE and CHARACTERISTIC fields on the Subchannel (QFOII) and Device (QFOIN) identification screens.

Channel Path ID: A channel path identifier (CHPID) is used to refer to the physical path between the channel subsystem and one or more control units. There are four channel paths available per device on the processor.

CHPID Configuration Report

This report, like the CHPID Summary report, lists the channel paths defined in the Input/Output Configuration Data Set (IOCDs). In addition, this report shows the control units and the I/O devices assigned to each channel path, interface protocol, and control unit type and mode.

Label Identification

CHPID: Channel Path Identifier field. A CHPID is used to refer to the physical path between the channel subsystem and one or more control units. There are four channel paths available per device on the processor.

Channel Set And Channel Number: The channel set is always 0. The channel number is any of the installed available channels, from 0 to 5, in a standard channel installation and from 0 to B if the optional channels are installed.

Mode: The mode of operation is the type of configuration specified for the channel. Channel 0 is always byte mode; the other channels are always block mode except channel 5 which may be either.

Logical Control Unit Number and Logical Control Unit Type-Model: These are the control unit numbers supplied by the user in the CNTLUNIT macro definition.

Control Unit Type: This is the control unit type specified. Type 1 control units support only a single channel program at a time. Type 2 control units support multiple channel programs concurrently.

Physical Control Unit Number: This number is the entry position in the control unit image table data set where information about the specific control unit is kept. If the physical control unit number is 01, then it is the first entry in the control unit image table. Note that the physical and logical control unit numbers should not be confused and do not have to be the same number. The physical is the entry number in the table and the logical is the one supplied by the user.

Protocol: There are two methods of operation, or protocol, under which a control unit may function. The first of these, used for slower devices, is Direct Control Interlock (DCI). DCI requires that the control unit respond to a channel command and wait for a response from the channel before proceeding with data transfer. Under this type of protocol are Byte, Block, and Selector modes.

Data Streaming protocol (DST) does not require a response from the the channel. When a signal is received from the channel, the control unit begins data transfer immediately without waiting for additional response commands. Control units that have been configured for data streaming mode are noted in the DEV MODE and CHARACTERISTIC fields on the Subchannel (QFOII) and Device (QFOIN) identification screens.

Unit Address: This is the real address where the device is located. Note that all unit addresses on a specific channel must be unique.

Device Type and Model: This is the device type and model.

Sample I/O Configuration Report

```
IOCP VERSION 1          LEVEL 0          DEVICE I/O CONFIGURATION REPORT
                        PAGE NUMBER      1
ID1=HERE IS AN EXAMPLE
ID2=OF THE NARROW REPORT

  UNIT SUB  LOG CONTROL  CU DEV.  TIME
DEV# ADDR CH#  UNIT NUMBER  TYPE TYPE MODEL OUT  PROT  CH PATH ID
**** ****  ***  -----
0641 41   001  3FF          2  1288   YES DCI   00
0642 42   002  3FE 3FE      1  1288   YES DCI  10 13
0643 43   003  3FD 3FD 3FD  2  1288   YES DCI  11 12 15

***** END OF DEVICE I/O CONFIGURATION REPORT *****
```

Sample CHPID Configuration Report

```
IOCP VERSION 1          LEVEL 0          CHPID CONFIGURATION REPORT
                        PAGE NUMBER      1
ID1=HERE IS AN EXAMPLE OF THE NARROW
ID2=FORM OF THIS REPORT

  CHPID CHANNEL  CNTRL-UNIT  CU  CU  UNIT  DEVICE
      SET NUM  MODE  NUM MODEL  TYPE NMBR ADDR TYPE-MODEL
***** *-----*  ****  *****  ****  ****  *****  ****  *****
00     0  0  BYTE  3FF  1288  2    01  DCI    41  1288
10     0  A  BLOCK 3FE  1288  1    02  DCI    42  1288
11     0  B  BLOCK 3FD  1288  2    03  DCI    43  1288
12     0  4  BLOCK 3FD  1288  2    03  DCI    43  1288
13     0  3  BLOCK 3FE  1288  1    02  DCI    42  1288
15     0  2  BLOCK 3FD  1288  2    03  DCI    43  1288

***** END OF CHPID CONFIGURATION REPORT *****
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Image Table Report

The image table report consists of two different reports: the device subchannel report and control unit image report. These reports provide a means of validating the device subchannel image and control unit image that are generated when the Input/Output Configuration Program is run.

The subchannel image report shows the subchannel number (in hexadecimal and decimal), the channels and their corresponding control units, a path install mask to indicate which channels are valid, the real device address, the logical device number, and device mode.

The control image report shows the physical control unit number (in hexadecimal and decimal), the channels associated with the control unit, the status of the control unit, and a valid path mask to indicate valid channels.

Sample Subchannel Image Report

LIST OF ALL DATA CONTAINED IN THE SUBCHANNEL IMAGE TABLE
PAGE NUMBER 1

SUBC HEX#	SUBC DEC#	CH 1	CH 2	CH 3	CH 4	CU 1	CU 2	CU 3	CU 4	PIM	DEV ADDR	DEV NUMB	MODE
****	****	----	----	----	----	----	----	----	----	***	****	****	****
0001	0001	00	00	00	00	0001	0000	0000	0000	80	04	0004	41
0002	0002	00	00	00	00	0001	0000	0000	0000	80	0C	000C	41
0003	0003	00	00	00	00	0001	0000	0000	0000	80	0D	000D	41
0004	0004	00	00	00	00	0001	0000	0000	0000	80	0E	000E	41
0005	0005	00	00	00	00	0002	0000	0000	0000	80	1A	001A	41

Sample Control Unit Image Report

LIST OF ALL DATA CONTAINED IN THE CONTROL UNIT IMAGE TABLE
PAGE NUMBER 1

CTLU HEX#	CTLU DEC#	CH 1	CH 2	CH 3	CH 4	STATUS	VPM
****	****	----	----	----	----	*****	***
0001	0001	00	00	00	00	80	80
0002	0002	00	00	00	00	80	80
0003	0003	00	00	00	00	80	80
0004	0004	00	00	00	00	80	80

**Customer Data and Security Control
(Problem Analysis)**

The Customer Data and Security Control option provides the customer with a means of controlling transmission of main storage data. This option also allows the customer to change the program type/level, his telephone number and/or extension, and the local service telephone number.

Information on this screen is filled in by the service representative at the time of installation and normally requires no updating. If you are doing an installation, perform the "Send Service Information" procedure first. Then return to this procedure, and verify that the updated information is correct, and complete any additional steps that may be required.

Customer Data and Security Control Screen

```

*PROBLEM ANALYSIS*                               MSG2E
      CUSTOMER NAME: _____
      CUSTOMER ADDRESS: _____
      PROGRAM TYPE/LEVEL: _____
      TELEPHONE NO.: _____ EXT _____
      TO CALL LOCAL SERVICE: _____

      CUSTOMER DATA TRANSMISSION SECURITY CONTROL
      (PASSWORD ASSIGNED BY CUSTOMER)
      ALLOW MAIN STORAGE DUMPS (1=YES OR 2=NO)? -
      ENTER CURRENT PASSWORD: _____
      CHANGE PASSWORD (1=YES OR 2=NO)? -
      ENTER NEW PASSWORD: _____

      ACTION:
      Q GEN SELECTION
      Z RTN TO PGM SYS
      COMMAND: QP6
    
```

Password Change Procedure

Note: It is the responsibility of the customer to change and maintain his own password. Once it is lost, it cannot be recovered, and a new diskette must be ordered.

To change the password from the Customer Data and Security Control screen:

1. Move the cursor to CHANGE PASSWORD (1=YES OR 2=NO)?, and key in a 1.
2. Key in the current password into the ENTER CURRENT PASSWORD field.

Notes:

- The password is entered into a nondisplayable field.
 - The initial password when shipped is PASSWORD (uppercase).
3. Key in the new password into the ENTER NEW PASSWORD field.

Note: A minimum of one and a maximum of eight characters are required for the password.

4. Press ENTER. The message PASSWORD CHANGED, RECORD NEW PASSWORD is displayed. The new password is displayed until the MODE SEL key is pressed.

Note: The message INCORRECT CURRENT PASSWORD, PLEASE REENTER appears if the current password was entered incorrectly.

5. Press the MODE SEL key to return to the General Selection (Q) screen.

Update Procedure

Notes:

- Any changes made to this screen must be approved by the customer.
- To change the password, see "Password Change Procedure."

To update the Customer Data and Security Control screen:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QP6 next to COMMAND:.
3. Press ENTER. The Customer Data and Security Control screen appears.

4. With this screen displayed, the program type/level, the customer telephone number, the local service telephone number, and the decision to allow main storage dumps can be changed by keying over the existing data. When the ENTER key is pressed, the changes are effective, and the DATA SAVED message is displayed.

Note: The password is required to change main storage dumps.

5. Press the MODE SEL key to return to the General Selection (Q) screen.

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Diskette Aids

Module Transfer

The Module Transfer function is used to move machine-sensitive data from one diskette to another. The selected data is transferred from the diskette in diskette drive 1 (FROM) to the diskette in diskette drive 2 (TO). Use this function when installing an EC or to transfer machine-sensitive data that is required on another diskette. Patches cannot be transferred with the Module Transfer function.

Module Transfer Procedure

Note: If you mistakenly press the COPY key during a Module Transfer, restart the procedure. To perform a Module Transfer:

1. Set the CE Mode switch to CE Mode.
2. Press MODE SEL. The General Selection (Q) screen appears.
3. Key QFM next to COMMAND:.
4. Press ENTER. The Module Transfer screen appears.
5. Key in X next to the modules you want transferred.

Note: The screen displays (default) Xs selected for all FUNC1 modules.

6. Key in a blank or (underscore) next to the modules you do **not** want transferred.

Note: Do not select FUNC1 and FUNC2 modules for transfer at the same time; each diskette requires its own pass.

7. Press ENTER. The status area displays an S next to the modules that you have selected. The message ENTER STARTD TO TRANSFER SELECTED MODULES is displayed.

Note: INVP appears if an error occurs; retry by pressing ENTER.

Module Transfer Screen

```

*MODULE TRANSFER SCREEN*
STATUS  MACHINE SENSITIVE DATA      DISK
X CONFIG.LOGS (PWR,PU,SP) . . . (FUNC1)
X UCWS. . . . . (FUNC1)
X SAVED SCREENS . . . . . (FUNC1)
X REF CODES . . . . . (FUNC1)
X RECONFIGURATION DATA. . . . (FUNC1)
X PROBLEM ANALYSIS. . . . . (FUNC1)
_ IOCD5 . . . . . (FUNC2)

ERR MODS:

STATUS INFO: S=SELECT R=READ W=WRITE T=TRANSFER DONE INVPT=INVALID INPUT
             DSZ=SIZE DIFFERENT DLA=LOAD ADDRESS DIFFERENT D41=NOT FOUND
             D81 READ (CRC) ERROR DID=WRONG DISK IN DISK DRIVE

Q GENERAL SELECTION      ENTER STARTD TO TRANSFER SELECTED MODULES
Z RETURN TO PROG SYS
COMMAND: QFM                      ==> FUNC1 MODULES SELECTED
    
```

8. Key STARTD next to QFM on the COMMAND line.
9. Press ENTER. The message INSERT FROM DISKETTE INTO DRIVE1, TO DISKETTE INTO DRIVE2 is displayed.
10. Install the diskette to be copied from into diskette drive 1. Install the diskette to be copied to into diskette drive 2.
11. Press ENTER. The module(s) are transferred. Modules with errors are not transferred.
12. At the end of the transfer the messages, TRANSFER COMPLETE and IML REQUIRED (SP & PU) are displayed. Press ENTER.
13. The message SELECT MODULES TO BE TRANSFERRED is displayed. At this time, you have the following options:
 - If additional diskettes are to be updated:
 - a. Install the original diskettes into their drives.
 - b. Return to step 5 of this procedure.
 - If you have completed transferring modules from one diskette to another, install the updated diskettes into their drives and continue with step 15.
14. Press Power On/IML on the operator control panel. An SP IML is performed.
15. Display the UCW Directory (QFOIC) screen and the Configuration (QFO and QFS) screens to verify any changes.

Status Area Codes

Note: The status shows the last error encountered.

Code Meaning

- | | |
|----|---|
| ID | Wrong diskette in drive |
| LA | Module load addresses different |
| SZ | Module sizes different |
| 01 | Zero length |
| 0F | Diskette not ready |
| 21 | Past end-of-file |
| 31 | Address length, memory protect error |
| 41 | Module ID not found |
| 4F | Write protect error |
| 81 | Read error |
| 82 | Adapter machine check |
| 83 | UC machine check |
| 8F | Cylinder index and master index different |
| 9F | No current seek issued |

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Diskette Copy

The diskette to diskette copy function is used to copy information from one diskette to another. This procedure can be used to build backup diskettes.

Copy Procedure

1. Install FUNC1 diskette into diskette drive 1.
2. Install FUNC2 diskette into diskette drive 2.
3. Set CE mode switch to CE Mode.
4. Press MODE SEL. The General Selection (Q) screen appears.
5. Key QFG next to COMMAND:.
6. Press ENTER. Diskette To Diskette Copy screen appears.

Note: To build a new diskette for another processor, specify that processor's serial number and other changes needed.
7. Key QFGS next to COMMAND:.
8. Press ENTER. The message INSERT FROM DISKETTE INTO DRIVE1, TO INTO DRIVE2 is displayed.
9. Install the diskette to be copied into diskette drive 2.
10. Press ENTER. The message DISKETTE COPY STARTED - SUCCESSFUL BUILD WILL TAKE APPROXIMATELY 5 MIN. is displayed.

Diskette Copy Screen

```

                                *DISKETTE TO DISKETTE COPY*

M  MACHINE SERIAL NUMBER <000000>

L  DISKETTE LABEL <Y>
K  LINK DATE <0000000000>
G  GID <T0000000>
H  DATE <00/00/00>
I  ISEQ <01>

S  START COPY
Q  GENERAL SELECTION
Z  RETURN TO PROG SYS

COMMAND: QFG                      ==>
    
```

Diskette Label Screen

```

                                *DISKETTE TO DISKETTE COPY*

M  MACHINE SERIAL NUMBER <100123>

L  DISKETTE LABEL <Y>
K  LINK DATE <0123456789>
G  GID <T1234567>
H  DATE <07/22/82>
I  ISEQ <01>

S  START COPY
Q  GENERAL SELECTION
Z  RETURN TO PROG SYS

COMMAND: QFGS                      ==>

*****
*                               53FD *
* 4381-002      SER NO. 0123456 *
* FUNCT  LOAD VOL      001FU1 *
* LINK DATE 0123456789  ISEQ 01 *
*
* PN -      0001234567      *
* EC -      xxxxxxxxxx      *
* REA -      *
* GID - T1234567      *
* F.O. NO.      0001234567 *
* DATE 07/20/82 WID-A1 SEQ- 1 *
*****
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

EC Diskette Update

Use this procedure to update the functional diskettes and their backups when installing an EC. The **FROM** diskette will be the original diskette and the **TO** is the diskette to be updated.

Note: Copying screens are required when doing this procedure. Ensure that the COPY key is configured for printing. For additional information, see Volume A08, Console Functions and Messages, "Using the Copy Key."

Copy Procedure

1. Ensure that the original FUNC1 is in diskette drive 1 and the original FUNC2 in diskette drive 2.
2. Set the CE Mode switch to CE Mode.
3. Press I/O Power Hold on the service panel.
4. Press Power Off on the service panel. Wait a minute for the system to cycle off.
5. Press Power On on the service panel.
6. Press MODE SEL. The General Selection (Q) screen appears.
7. Key QFO next to COMMAND:.
8. Press ENTER. The System Configuration screen appears.
9. Press the COPY key to make copy of screen (save for later use).
10. Key QFS next to COMMAND:.
11. Press ENTER. System Configuration-Service screen appears.
12. Press the COPY key to make copy of screen (save for later use).
13. Key QFOIC next to COMMAND:.
14. Press ENTER. Display UCW Directory screen appears.
15. Press the COPY key to make copy of screen (save for later use).

Note: If the message MORE PRESS ENTER is displayed, press ENTER to display the additional UCWs. Then press the copy key to copy each screen.

16. Key QFM next to COMMAND:.
17. Press ENTER. The Module Transfer screen appears.
18. Key in X next to the modules you want transferred.

Note: The screen displays (default) Xs selected for all FUNC1 modules.
19. Key in a blank or (underscore) next to the modules you do **not** want transferred.

Note: Do not select FUNC1 and FUNC2 modules for transfer at the same time; each diskette requires its own pass.
20. Press ENTER. The message ENTER **STARTD TO TRANSFER SELECTED MODULES** is displayed.

Note: **INVP** appears if an error occurs; retry by pressing ENTER.
21. Key **STARTD** next to QFM on the COMMAND line.
22. Press ENTER. The message **INSERT FROM DISKETTE INTO DRIVE1, TO DISKETTE INTO DRIVE2** is displayed.
23. Install the TO diskette into diskette drive 2.
24. Press ENTER. The module(s) are transferred.
25. At the end of the transfer the messages, **TRANSFER COMPLETE** and **IML REQUIRED (SP & PU)** are displayed. Press ENTER.

26. The message **SELECT MODULES TO BE TRANSFERRED** is displayed. At this time, you have the following options:
 - If additional diskettes are to be updated, install the original diskettes into their drives and return to step 18.
 - If you have completed transferring modules from one diskette to another, go to step 27.
 - If any IML blocks are to be transferred, go to "IML Block Transfer" procedure.
27. Ensure original FUNC1 and FUNC2 diskettes are installed.
28. Press Power Off on the service panel. Wait a minute for system to cycle off.
29. Install the updated diskettes.
30. Press Power On on the service panel.
31. Set the I/O Power Hold on service panel to Normal.
32. Set CE mode switch to Normal.
33. Display the Configuration (QFO, QFS, and QFOIC) screens, then use the screens you copied to verify any changes.

Note: The EC and or the REA number can change on the QFS screen, however, the other data on the QFO, QFS, and QFOIC screens stay the same, unless there is a hardware change to reflect the microcode update.

IML Block Transfer

This procedure enables you to transfer IML blocks.

1. Obtain the record(s) that contain the names of the IML blocks to be transferred. These may be found on the QBT and QBM screens.
2. Key QBT next to COMMAND:.
3. Press ENTER. The Block transfer screen appears. Make note of the names.
4. Ensure original FUNC1 is in diskette drive 1 and the original FUNC2 is in diskette drive 2.
5. Press MODE SEL. The General Selection (Q) screen appears.
6. Key QBK and block name to be transferred next to COMMAND:.. Press the ENTER key twice.
7. Install the new EC FUNC1 into Diskette drive 1.
8. Repeat steps 4 and 5 for any additional IML blocks you need to copy to the EC FUNC1 diskette.
9. If any IML blocks need to be activated during the IML process, key QBM next to COMMAND and press ENTER.

Note: If no IML blocks need to be activated, continue with next step.
10. Press Power On/IML on the operator control panel. An SP IML is performed.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

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Damaged Diskette Recovery

Note: Use this procedure to retrieve as much data as possible from a diskette that has been damaged. This procedure can be used for a damaged functional or diagnostic diskette.

Recovery Procedure

1. Install damaged diskette into diskette drive 1.
2. Set the CE Mode switch to CE Mode.
3. Press MODE SEL. The General Selection (Q) screen appears.
4. Key QFM next to COMMAND:.
5. Press ENTER. The Module Transfer screen appears.
6. Key in X next to the modules you want transferred.

Note: The screen displays (default) Xs selected for all FUNC1 Modules.
7. Key in a blank or _ next to the modules you do not want transferred.

Note: Do not select FUNC1 and FUNC2 modules for transfer at the same time; each diskette requires its own pass.
8. Press ENTER. The status area displays an S next to the modules that you have selected.

9. If there are no errors, continue with next step. If there are errors:
 - a. List the modules that failed.
 - b. Install the backup diskette of the damaged one into diskette drive 1.
 - c. Press MODE SEL. The module transfer options are reset.
 - d. Key QFM next to COMMAND:.
 - e. Press ENTER. The Module Transfer screen appears.
 - f. Select the modules that failed on damaged diskette.
10. Press ENTER.
11. Key STARTD next to QFM on the COMMAND line.
12. Press ENTER. The message ENTER STARTD TO TRANSFER SELECTED MODULES is displayed.
13. Key STARTD next to QFM on the COMMAND line.
14. Press ENTER. The message INSERT FROM DISKETTE INTO DRIVE1, TO DISKETTE INTO DRIVE 2 is displayed.

Note: The FROM diskette will be the new diskette.
15. Press ENTER. The modules are transferred.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Language Configuration

The Language Support screen is used to:

- Configure the character set/keyboard layout.
- Configure the Problem Analysis screens to display in the user's language.

Configuration Procedure

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFL next to COMMAND:.
3. Press ENTER. The Language Support screen appears.
4. Change the following sections as required.

Current Console Language Code

1. Move the cursor to CURRENT CONSOLE KEYBOARD LANGUAGE CODE:, and key in one of the following values:

- 01 Belgian
- 02 Danish
- 03 Italian
- 04 Spanish
- 05 Swedish
- 06 Austrian/German
- 07 French/Azerty
- 08 French/Qwerty
- 09 International
- 10 Spanish-Speaking
- 11 Brazilian/Portuguese
- 12 EBCDIC/World Trade
- 13 English/United Kingdom
- 14 Japanese/English
- 15 Japanese/Katakana
- 16 Finnish
- 17 Norwegian
- 18 Portuguese
- 19 U.S. English

Language Support Screen

```

*LANGUAGE SUPPORT*

CURRENT CONSOLE KEYBOARD LANGUAGE CODE : 19 ==> U.S. ENGLISH
01 BELGIAN 06 AUSTRIAN/GERMAN 11 BRAZILIAN/PORTUGUESE 16 FINNISH
02 DANISH 07 FRENCH/AZERTY 12 EBCDIC/WORLD TRADE 17 NORWEGIAN
03 ITALIAN 08 FRENCH/QWERTY 13 ENGLISH/UNITED KINGDOM 18 PORTUGUESE
04 SPANISH 09 INTERNATIONAL 14 JAPANESE/ENGLISH 19 U.S. ENGLISH
05 SWEDISH 10 SPANISH-SPEAKING 15 JAPANESE/KATAKANA

CURRENT PROBLEM ANALYSIS LANGUAGE :07 ==> ENGLISH
01 ITALIAN 03 AUSTRIAN/GERMAN 05 BRAZILIAN/PORTUGUESE 07 ENGLISH
02 SPANISH 04 FRENCH 06 JAPANESE/KATAKANA

ALTERNATE PROBLEM ANALYSIS LANGUAGE ON FUNC1 DISKETTE
Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFL ==>
```

2. Press ENTER. The message ENTER QFLT TO START TRANSFER is displayed.
3. Enter QFLT next to COMMAND:.
4. Press ENTER. Message INSERT DIAG1 IN DISKETTE DRIVE 2 is displayed.
5. Install the DIAG1 diskette into diskette drive 2.
6. Enter QFLSTARTD next to COMMAND:.
7. Press ENTER. The transfer process begins; on completion, the message TRANSFER COMPLETE is displayed.
8. Install the FUNC2 diskette into diskette drive 2.
9. Press Power On/IML on the operator control panel. An SP IML is performed, and the FUNC1 diskette is updated with the console code you selected.

Current Problem Analysis Language

1. Move the cursor to CURRENT PROBLEM ANALYSIS LANGUAGE:, and key in one of the following values:

- 01 Italian
- 02 Spanish
- 03 Austrian/German
- 04 French
- 05 Brazilian/Portuguese
- 06 Japanese/Katakana
- 07 English

Note: All keyboards/languages are not compatible with all Problem Analysis Languages; the following are:

- Italian, Austrian/German, French, and English.
- Spanish and Spanish speaking.
- Brazilian/Portuguese.
- Japanese/Katakana.

2. Press ENTER. The message ENTER QFLT TO START TRANSFER is displayed.
3. Enter QFLT next to COMMAND:.
4. Press ENTER. Message INSERT DIAG1 IN DISKETTE DRIVE 2 is displayed.
5. Install the DIAG1 diskette into diskette drive 2.
6. Enter QFLSTARTD next to COMMAND:.
7. Press ENTER. The transfer process begins; on completion, the message TRANSFER COMPLETE is displayed.
8. Install the FUNC2 diskette into diskette drive 2.
9. Press Power On/IML on the operator control panel. An SP IML is performed, and the FUNC1 diskette is updated with the language you selected.

Note: If you do not want to save the selected language on the FUNC1 diskette, do not perform an SP IML. This "temporarily" selected language can still be used while the processor is powered up. Powering off the machine and performing a subsequent IML defaults to the previously configured language code.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

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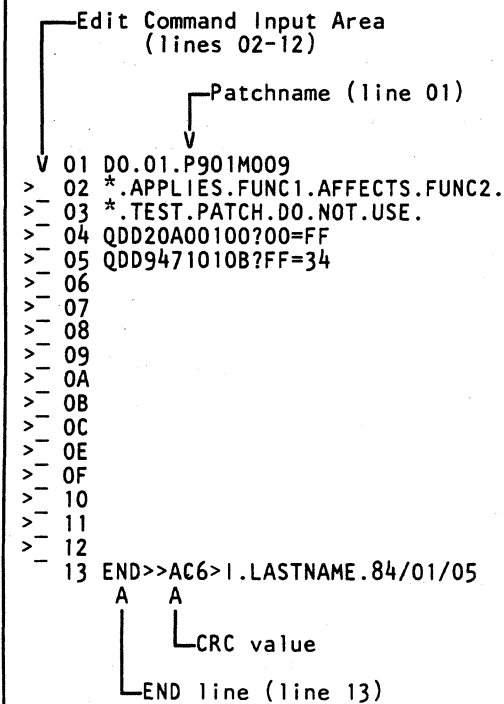
Automatic Patch Installation

If Send Service Information (Problem Analysis) is invoked by the customer or the service representative, patches can automatically be received from the support structure.

To verify if any patches were received:

1. Set CE Mode switch to CE Mode.
2. Install FUNC1 diskette into diskette drive 1.
3. Install the the FUNC2 diskette into diskette drive 2.
4. Press MODE SEL. The General Selection (Q) screen appears.
5. Key QBTP next to COMMAND:.
6. Press ENTER. The Patch List screen appears.
7. Check the list for any new patches that may have been received. The patch names start with P and are flagged with the word INACTIVE.
8. If you wish to activate a patch, see "Patch Activation."

Sample Patch



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Diskette Copy Patch Installation

To copy a patch from one diskette to another:

1. Set the CE Mode switch to CE Mode.
2. Install the FUNC1 diskette that contains the patch to be transferred into diskette drive 1.
3. Press MODE SEL. The General Selection (Q) screen appears.
4. Key QBTP next to COMMAND:.
5. Press ENTER. The Patch List screen appears.
6. Locate the patch you are to copy.
7. Key QBF`patchname` next to COMMAND:.
patchname is the name of the patch you are to copy.
8. Press ENTER. The Patch Screen appears.
9. Look at line 02 of the displayed patch.
10. Line 02 indicates where the patch is *applied* and what diskette the patch *affects*.

Note: If the patch is inactive, move the cursor to the EDIT COMMAND INPUT AREA and key an N at any line to exit the Patch Screen. (See "Sample Patch.")

11. Press ENTER. The Patch List Screen appears.
12. Key QBK`patchname` next to COMMAND:.
13. Press ENTER. The message PUT IN FROM DISK-ENTER is displayed.
14. Press ENTER. The message PUT IN TO DISK-ENTER is displayed.
15. Install the BACKUP FUNC1 diskette into diskette drive 1. Install the BACKUP FUNC2 diskette into diskette drive 2.

Note: Ensure that there is a diskette in diskette drive 2 even if it is not used during the procedure.

16. Press ENTER. The patch is written on the diskette, verified, and activated. The code on the diskette in diskette drive 2 may be altered by the patch.
17. The Patch List (QBTP) screen appears. Verify that the patch name is on the list.
18. Install the PRIMARY FUNC1 diskette into diskette drive 1, and install the PRIMARY FUNC2 diskette into diskette drive 2.
19. If additional patches are to be copied, return to step 3.
20. Set the CE Mode switch to Normal.
21. The patch changes have now been installed on the diskette only. To load the change into the processor, perform "Patch Initialization."
22. Return the system to the customer.

Patch Activation

To activate the new patches received:

1. Key QBA~~patchname~~ next to COMMAND:.
~~patchname~~ is the patch you are to activate.
2. Press ENTER. The patch appears and is now active.

Notes:

- Line 02 indicates where the patch is **applied** and which diskette the patch **affects**.
- If an error occurs, the diskette to be patched is not mounted.
- Make a note of the patchname, and install the required diskette into diskette drive 2.
- If an error condition is not corrected, invoke your support structure.

3. Repeat steps 1 and 2 to activate any additional patches.

Note: The patch changes have now been installed on the diskette only. To load the change into the processor, perform "Patch Initialization."

Patch Initialization

1. Set the CE Mode switch to Normal.
2. Press Power Off on the operator control panel (OCP).
3. Wait a minute for the processor to cycle off.
4. Press Power On/IML on the operator control panel. The Program Load (QL) screen appears.
5. Check the status line of the Program Load screen to verify that the processor IMLed.
6. Return the system back to the customer so that an IPL can be performed.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

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Remote Support Facility (RSF) Aids

Remote Support Facility

The RSF provides a means of remote communications for the customer, service representative, and the support system. The RSF includes:

- Send Service Information (Problem Analysis)—customer and service representative option.
- Remote Operator Console Facility—customer and service representative option.
- Data Bank Initialization—service representative under the direction of the support structure.
- Remote Console Initialization—service representative under the direction of the support structure.
- Remote Console Communications—service representative under the direction of the support structure.

All these areas rely on the same communication link (RSF port) and are only run on an individual basis.

Send Service Information is an option that is invoked when directed by Problem Analysis. The customer or the service representative can transmit log and system data to the support structure. This data helps determine the problem. For additional information, see Volume A08, Console Functions and Messages, "(QP) Problem Analysis Screens."

The Remote Operator Console Facility (ROCF) uses the Remote Support Facility to link a remote 4381 Processor to a host console through a standard communications network. When a remote 4381 system is properly equipped with an auto-answer modem, personnel at a host site can dial up and take control of the remote 4381. The host console performs most of the processor functions, except power-on.

Data Bank Initialization allows the service representative to invoke the support system for additional information.

Remote Console Initialization uses the Remote Support Facility to link the 4381 Processor to a remote console through a standard communication network.

Remote Console Communications is used as a communications facility between the service representative and the support system. Two methods of communications are available: terminal and voice.

Remote Support Facility Keys

Two keys on the operator console keyboard are reserved for this facility:

- *Communications Request (COMM REQ) key*—Pressing this key while holding the ALT key initiates voice or terminal communication between the service representative and support system. Initiating a communications request can be done either by the service representative or by the support system.
- *Line Disconnect (LINE DISC) key*—Pressing this key while holding the ALT key disconnects the data link. This can also be used to end the RSF operation. Use this key if an RSF operation fails to initialize and the support processor appears to be in a loop.

Communications Equipment

The processor requires different RSF card and cabling features, which are dependent on the customer's needs. These features require different coupling techniques to work properly. For information concerning feature coupling techniques (configurations), see *IBM 4300 Processors Installation Manual—Physical Planning*, Order No. GA24-4017.

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Send Service Information (Problem Analysis)

With the Send Service Information option, you can transmit data by way of data link to your support structure.

Use this procedure at installation time to **open an incident** with your support structure. The option can then be used at a later date when remote assistance is required to diagnose a problem.

Two screens are involved with this option. The first screen displayed is the Service Request IBM Data screen. Information on this screen is filled in by the service representative at the time of installation and normally requires no updating. Information on this screen is also used to update the Customer Data and Security Control (QP6) screen.

The second screen displayed is the Service Request and Send Service Information screen. Once completed, this screen allows the data link to your support structure.

Update Procedure

Notes:

- The initial Routing Codes when shipped are for the U.S.A. Routing Codes must be left-justified and have a total of 12 characters (fill unused positions with blanks).
- If Routing Codes are changed, the telephone numbers associated with these Routing Codes must also be changed.
- To obtain any required screen information, invoke your support structure.
- If data transfer fails, review the Service Transmission History (QP9) screen for possible causes.

To update the Send Service Information screens:

1. Set CE Mode switch to CE Mode.
2. Press MODE SEL. The General Selection (Q) appears.
3. Key QP4 next to COMMAND:.
4. Press ENTER. The Service Request IBM Data screen appears.
5. Verify that all fields on the screen are entered correctly. Make any necessary corrections.

Service Request IBM Data Screen

```

                                *PROBLEM ANALYSIS*                               MSG32
IBM INSTALLATION DATA:
  REGION   BRANCH OFFICE>   COUNTRY>
  CUSTOMER NAME:>
  STREET .CITY .STATE:>
RSF: LINE SPEED (1=600, 2=1200 BPS) :>
  DATA BLOCK SIZE (1=256B, 2=2KB):>
  LINE PLATE INSTALLED (Y OR N) :> (WORLD TRADE ONLY)

TO CALL LOCAL SERVICE:>

PRIMARY SYSTEM:                BACKUP SYSTEM:
  PHONE NUMBER:>1-800-525-0342   PHONE NUMBER:>1-800-237-8942
  ROUTING CODE:>RAL/R370/R     ROUTING CODE:>SF2/R370/R
ACTION:>FILL IN SPACES, THEN PRESS ENTER KEY.
Q GEN SELECTION
Z RTN TO PGM SYS
COMMAND: QP4                      ==>
    
```

Service Request and Send Service Information Screen

```

                                *PROBLEM ANALYSIS*                               MSG2B
                                4381-010015 TO CALL LOCAL SERVICE: (nnnnnnnnnnnnnn)
                                YOUR NAME:>
                                TELEPHONE NUMBER:> EXT
                                PROGRAM TYPE/LEVEL:
                                SYSTEM STATUS (1=NOT WORKING, 2=WORKING):>
                                IBM SUPPORT SYSTEM (1=PRIMARY, 2=BACKUP):>
                                PROBLEM DESCRIPTION:>

                                SEND I/O DEVICE TRACE (1=YES,2=NO) ?
                                SEND INSTRUCTION TRACE (1=YES,2=NO) ?
                                SEND MAIN STORE DUMP (01-64 KB)? KB START ADDRESS
                                PASSWORD FOR DUMP:
                                SEND MODULE ID: SEND SP DUMP (1=YES,2=NO):
                                ACTION:>FILL IN THE SPACES, THEN PRESS ENTER KEY
Q GEN SELECTION
Z RTN TO PGM SYS
COMMAND:QP4                      ==>
    
```

6. Press ENTER. The screen is updated if any corrections were made. The Service Request and Send Service Information screen appears.
7. Complete fields only as directed by your support structure. If a main store dump is to be performed, have the customer enter the password. The password must be entered the same way it was stored, either uppercase or lowercase.

Warning: Sending I/O trace, Instruction trace, or Main Storage dump causes the processor to be stopped for a period of time. While data is being sent, the online network may time-out as a result of the processor being stopped. Perform these functions only when requested by the support structure.

Notes:

- A password is not required for a main store dump if the system has not been IPLed.
- The START ADDRESS must be a right-justified, four-byte address.

8. Press ENTER. Action steps 1, 2, and 3 are displayed on the screen.
9. Follow Action steps 1 and 2 on the screen. If you have entered valid data, the message **INITIALIZING RSF-LINK** is displayed. Blank or invalid fields result in the error message **INVALID OR INCOMPLETE INPUT, PLEASE REENTER**. Enter correct data, and press ENTER.
10. Data transfer begins. The current configuration, patch status, any selected traces or dumps, and all logs with valid data about the machine are transmitted. Messages indicating the progress of transmission appear on line 23. When the **DATA SENT OK, xxxxxxxx** message is displayed, the console returns to the General Selection (Q) screen or to the PROG SYS (Z) screen if the system was IPLed. Return data set to TALK mode, hang up, and record xxxxxxxx number.

Note: To cancel transmission, hold ALT key down and press LINE DISC key. The General Selection (Q) screen appears.

11. Patches may have automatically been received by your support structure. To verify if any patches have been received perform "Automatic Patch Installation."

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Remote Operator Console Facility (ROCF)

The Remote Operator Console Facility screen provides selections which assist system operation in a Distributed Data Processing environment. When the system is operated in this mode, personnel at a host site have the ability to control the processor through the Remote Support Facility (RSF) port.

The Remote Operator Console Facility screen is selectable only when the ROCF auto-answer modem is configured on the System Configuration-Service (QFS) screen.

ROCF Configuration Procedure

To make a change to the Remote Operator Console Facility screen:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QFB next to COMMAND:.
3. Press ENTER. The Remote Operator Console Facility screen appears.
4. The following sections apply to the areas which can be altered. Change the sections as required.

Remote Operator Console Facility Screen

```

*CNFG/REMOTE*      *REMOTE OPERATOR CONSOLE FACILITY*      *STATUS AREA*

M  ROCF MODE - SWITCH      ROCF MODE DISABLED
T  PROTECTION-SWITCH      PASSWORDS NOT REQUIRED
C  CHANGE PASSWORD

S  LINE SPEED-SWITCH      LINE SPEED 1200BPS
R  RESET SECURITY COUNT    SEC COUNT 0

N  SYSTEM NODE ID        SYS NODE ID IBM/nnn
P  CONSOLE PORT          CONSOLE PORT P1

D  SYSTEM POWER DOWN     SYS POWER ON

Q  GENERAL SELECTION
Z  RETURN TO PROG SYS

COMMAND: QFB                ==>
    
```

M ROCF Mode-Switch

The Remote Operator Console Facility is alternately enabled and disabled each time the M option is entered on the COMMAND line and the ENTER key is pressed. The current status is highlighted in the status area on the right side of the screen.

Notes:

- If the protection switch is set to PASSWORDS NOT REQUIRED, the entry is cleared after pressing ENTER. The message REENTER SELECTION is displayed. Reenter the M option, and press ENTER again.
- M is invalid if keyed in from the remote console. Key in MODE to perform the M option from the remote console.

T Protection-Switch

Passwords are alternately Required or Not Required each time the T option is selected. Entering T on the COMMAND line and pressing ENTER prompts you to enter the correct password. Entering the correct password and pressing the ENTER key completes the selection. The current status is highlighted in the status area on the right side of the screen.

Notes:

- When passwords are required, all selections require entering the current password before any changes take effect.
- The passwords are entered into a nondisplayable field.

C Change Password

Note: It is responsibility of the customer to change and maintain his own password; once lost it cannot be recovered, and a new diskette must be ordered.

To change the password for the Remote Operator Console Facility:

1. Key C next to COMMAND:.
2. Press ENTER. The message ENTER NEW PASSWORD is displayed.
3. Key in new password.
4. Press ENTER. The message REPEAT NEW PASSWORD is displayed.
5. Key in new password again.
6. Press ENTER. The message ENTER OLD PASSWORD is displayed.
7. Key in old password.
8. Press ENTER. The message ENTER DATE MM/DD/YY is displayed.
9. Key in the date.
10. Press ENTER. The message PASSWORD CHANGED is displayed.

Notes:

- The passwords are entered into a nondisplayable field.
- A minimum of four and a maximum of eight characters are required for the password.
- If the entered date is not a valid date, the user is allowed one attempt to correct the date.
- The initial password when shipped is PASSWORD.
- The initial date when shipped is MM/DD/YY.

S Line Speed-Switch

The Line Speed switch is alternately changed between 600 bps and 1200 bps each time the S option is keyed in on the COMMAND line and the ENTER key is pressed. The current line speed is highlighted in the status area on the right side of the screen.

Note: If the protection switch is set to PASSWORDS NOT REQUIRED, the entry is cleared after pressing ENTER. The message REENTER SELECTION is displayed. Reenter the S option, and press ENTER again.

R Reset Security Count

The security counter is reset each time the R option is entered on the COMMAND line and the ENTER key is pressed. The current count is displayed in the status area on the right side of the screen.

N System Node ID

The node identification is changed each time the N option followed by the new node ID is entered on the COMMAND line and the ENTER key is pressed. The current node ID is highlighted in the status area on the right side of the screen.

Notes:

- Keying in N on the COMMAND line and pressing ENTER prompts you for a Node ID.
- The Node ID can consist of eight characters maximum.

P Console Port

The console port on which the Remote Operator Console Facility is initialized, is assigned with the P option. Entering Pn (where n = 0, 1, 2, or 3) next to COMMAND assigns that port (device) for the facility. The status area on the right side of the screen indicates which console is to be linked to the host system when the Remote Operator Console Facility is activated.

Notes:

- If no port is assigned when selecting the P option, you are prompted with the choice of valid consoles to enter.
- The console assignment is valid only when that device has been installed to the system through the System Configuration-Customer (QFO) screen.
- If the assigned device is not ready when the Remote Operator Console link is activated, an alternate port (console) is selected.

D System Power Down

Entering D on the COMMAND line and pressing ENTER powers down the Remote system.

Notes:

- If the protection switch is set to PASSWORDS NOT REQUIRED, the entry is cleared after pressing ENTER. The message REENTER SELECTION is displayed. Reenter the D option, and press ENTER again.
- D is invalid if keyed in from the remote console. Key in DOWN to perform the D option from the remote console.

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Data Bank Initialization

Data Bank Initialization allows the processor console to operate in Remote Data Bank (RDB) mode. If the maintenance package does not successfully resolve a problem, the service representative can invoke the support system (if available) for additional diagnostic information.

To perform a Data Bank Initialization:

1. Set CE Mode switch to CE Mode.
2. Press MODE SEL. The General Selection (Q) screen appears.
3. Press the STOP key. INSTR STOP message is displayed.
4. Key QOM next to COMMAND:.
5. Press ENTER. Processor is in Microword Step state. CLOCK STEP message is displayed.
6. Key QFD next to COMMAND:.
7. Press ENTER. The Data Bank Initialization screen appears.
8. Invoke your support structure.
9. Upon completion of Data Bank mode, invoke your support structure for disconnect procedures.
10. Key in QON next to COMMAND:.
11. Press ENTER.
12. Press the START key; INSTR STOP message is displayed. (To start processing again, press the START key one more time.)

Data Bank Initialization Screen

```

*CNFG/REMOTE*           *DATA BANK INITIALIZATION*
MACHINE TYPE.....: 4381
MACHINE SERIAL NO: 123456

LOW SPEED (600 BPS) WANTED (Y/N): N

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFD           ==>
    
```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

Remote Console Initialization

Remote Console Initialization uses the Remote Support Facility to link the processor to a remote console through a standard communications network. Once initialized, Remote Console Support (RCS) is provided by way of a 3275 Display Station or by the support system.

To perform a Remote Console Initialization:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key in QFR next to COMMAND:.
3. Press ENTER. The Remote Console Initialization screen appears.
4. Invoke your support structure.
5. Upon completion of Remote Console Initialization mode, invoke your support structure for disconnect procedures.

Remote Console Initialization Screen

```

*CNFG/REMOTE*          *REMOTE CONSOLE INITIALIZATION*
MACHINE TYPE.....: 4381          CE NAME.....: JOHN DOE
MACHINE SERIAL NO: 123456        CUSTOMER NAME : ABC CORP
BRANCH OFFICE....: xxxxx        CUSTOMER PHONE: 1-234-567-8901

REMOTE CONSOLE VIA 3275.....(Y/N): N
VOICE/DATA VIA COMM REQ KEY (Y/N): N
LOW SPEED (600 BPS) WANTED..(Y/N): N

Q GENERAL SELECTION
Z RETURN TO PROG SYS

COMMAND: QFR                      ==>

```

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

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Remote Console Communications

Remote Console Communications is used as a communications facility between the support system and the service representative. Two methods of Remote Console Communications are available:

- Terminal Communications—A message is entered at one console, and the system passes the information to the other console.
- Voice Communications—Remote Console Support is temporarily suspended while the service representative and the support system use the DATA-PHONE to talk.

Remote Console Communications Procedure

Remote Console Communications is only valid when Remote Console Support is active. (See "Remote Console Initialization.") The service representative does not invoke this procedure. The support system initializes and controls the communication process.

Remote Console Communications Screen

CNFG/REMOTE	*REMOTE CONSOLE COMMUNICATION (QFC)*	
MESSAGE AREA		
E ERASE MESSAGE AREA	ON SITE	REMOTE
COMMAND: QFC		Q GENERAL SELECTION Z RETURN TO PROG SYS ==>

Return to General Selection (Q)

To return to the General Selection (Q) screen:

1. Key Q next to COMMAND:.
2. Press ENTER. The General Selection (Q) screen appears.

Return to Prog Sys (Z)

To return to the Prog Sys (Z) screen:

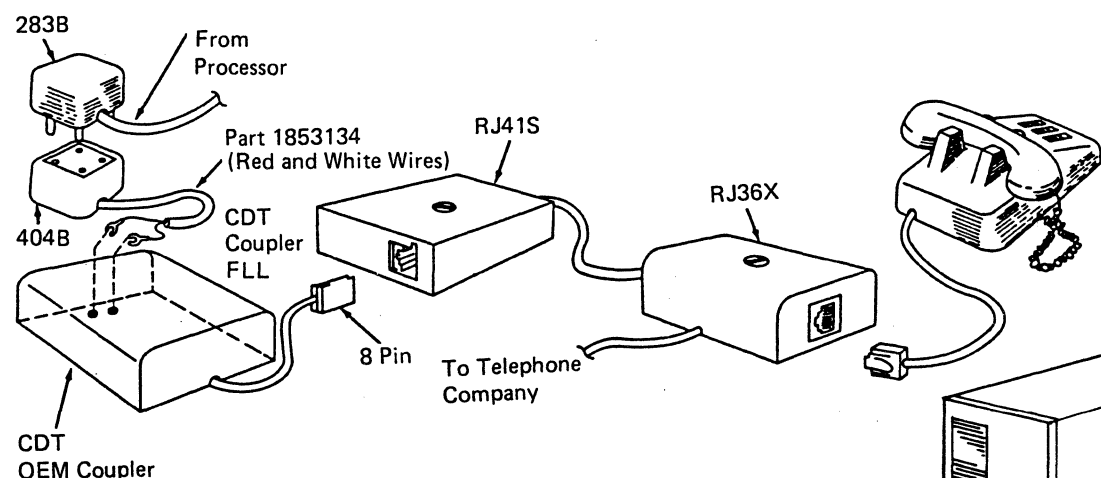
1. Key Z next to COMMAND:.
2. Press ENTER. The Prog Sys (Z) screen appears.

RSF Cards, Diagrams, and Wiring Configurations

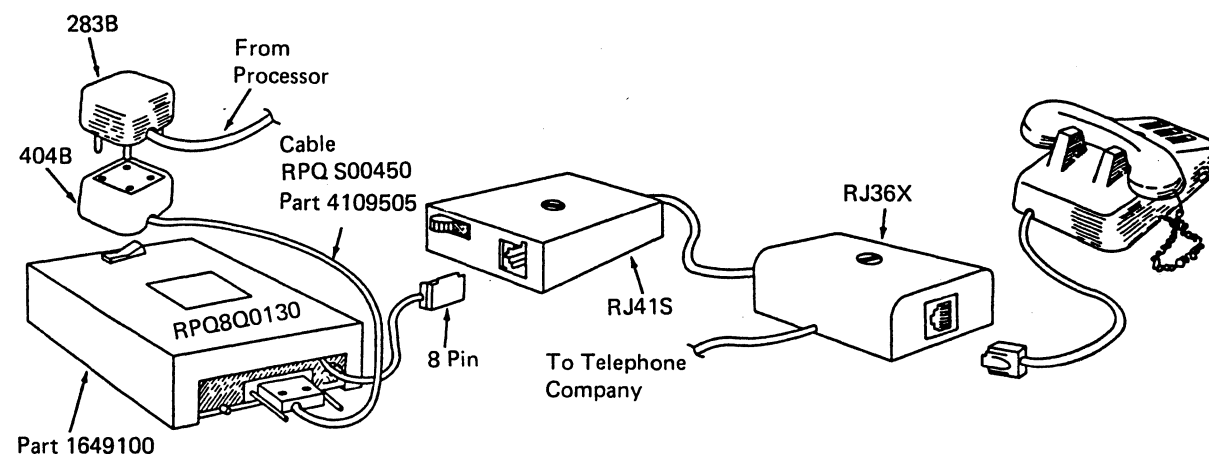
RSF Diagram Feature Code 9510 (External Cable Part 8482931)

The following are possible combinations for this Feature Code. Use this page to determine which RSF configuration the customer has installed.

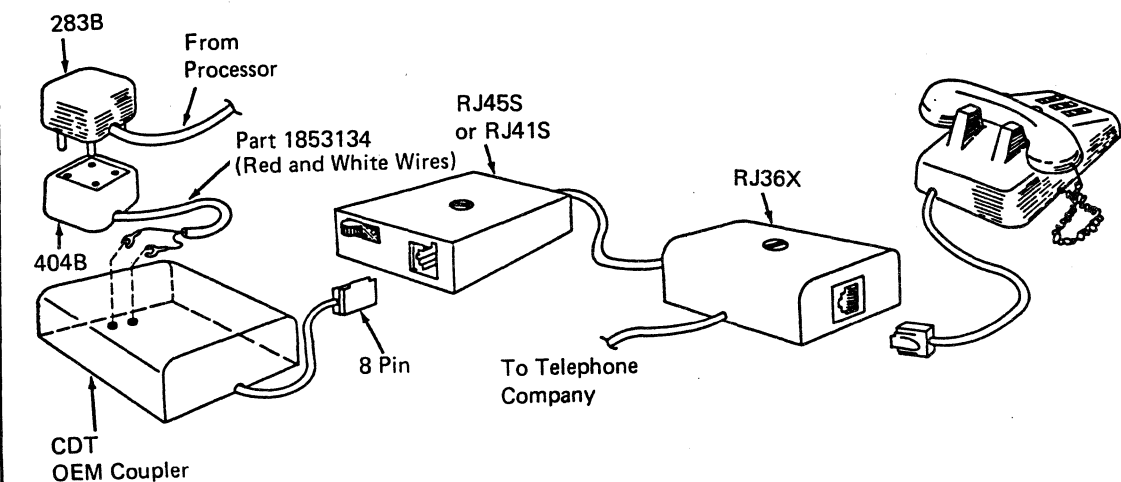
Fixed Lost Loop OEM Coupler



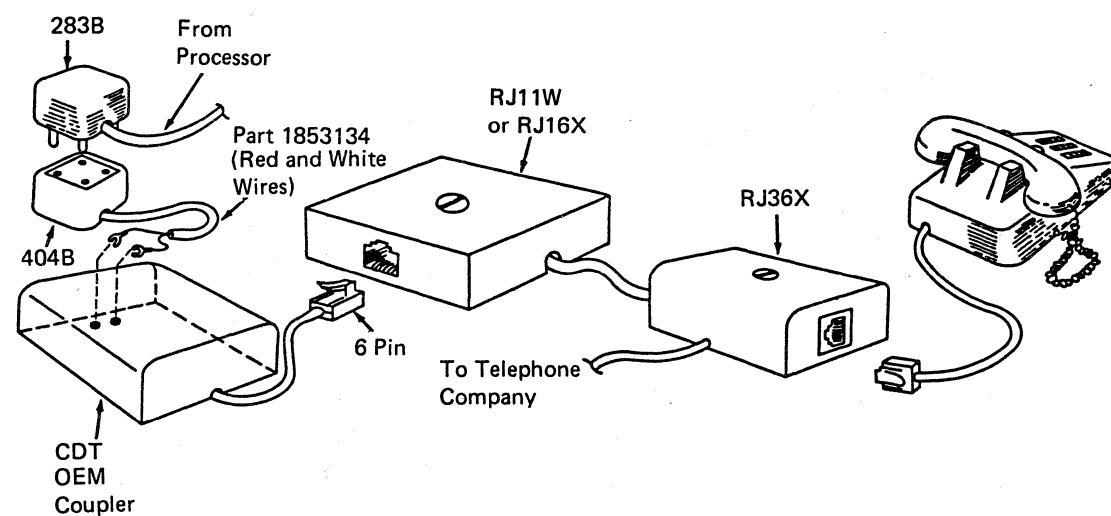
Fixed Lost Loop IBM Coupler



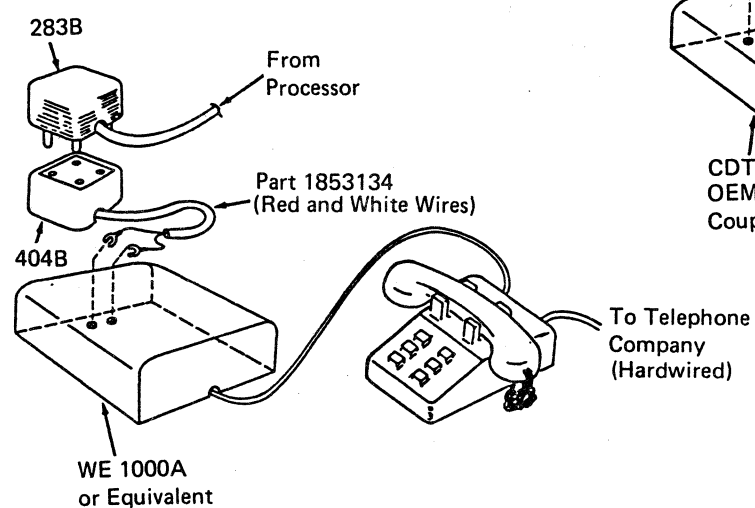
Programmable OEM Coupler



Permissive OEM Coupler



Common Carrier

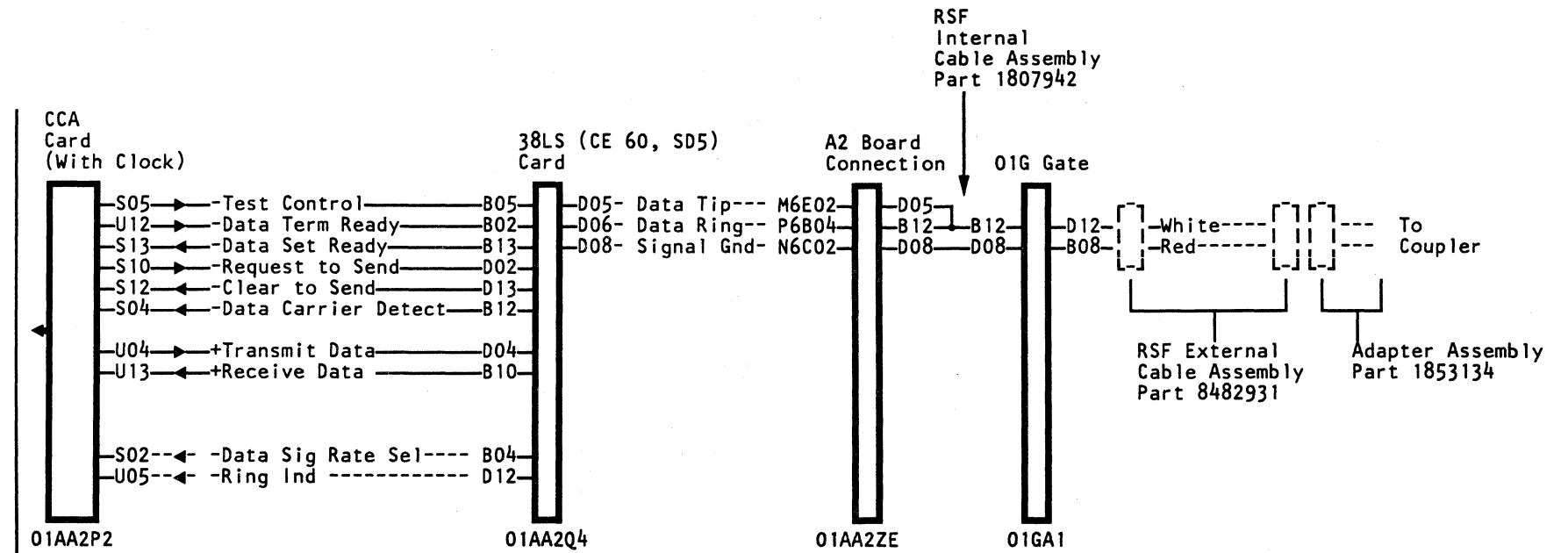


Seq FG005	PN 0446084 Pg 1 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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38LS/(U.S.A. and Canada) Configuration (External Cable Part 8482931)

Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 9510 (B/M 1806887).



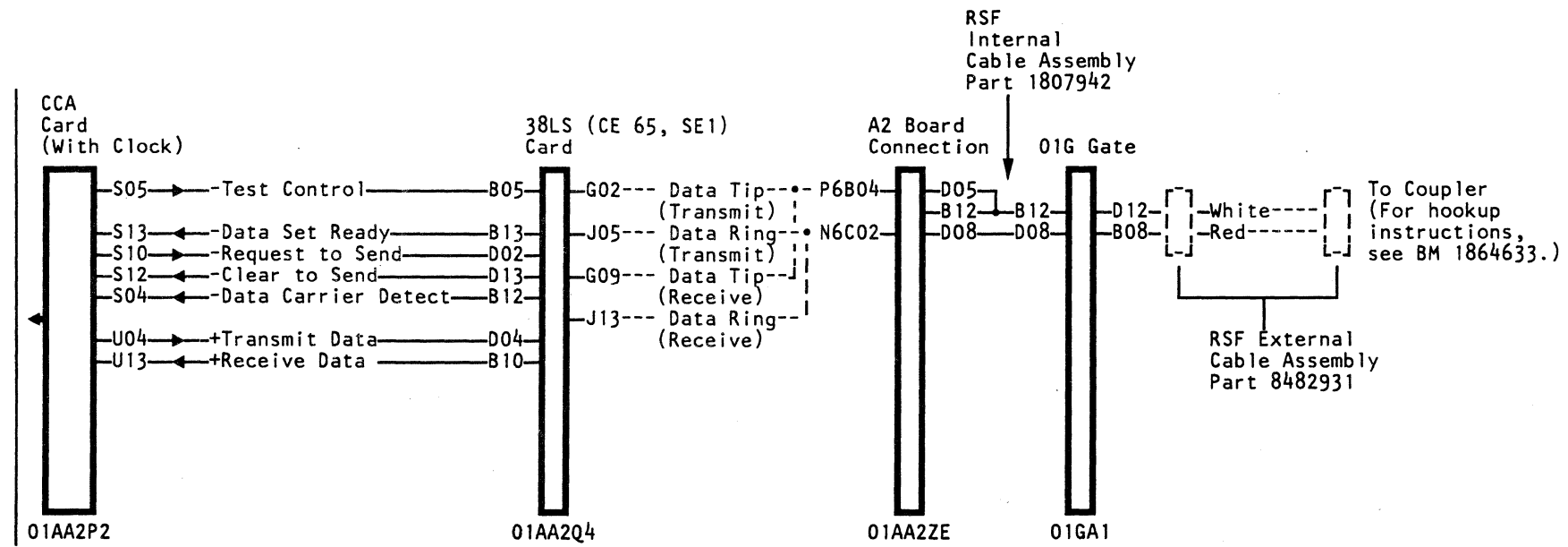
Line Type	Meaning
————	Lines checked by "D0" option
-----	Lines not checked by "D0" option

Seq FG005	PN 0446084 Pg 2 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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38LS/(Japan) Configuration (External Cable Part 8482931)

Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 2944 (B/M 4143541).



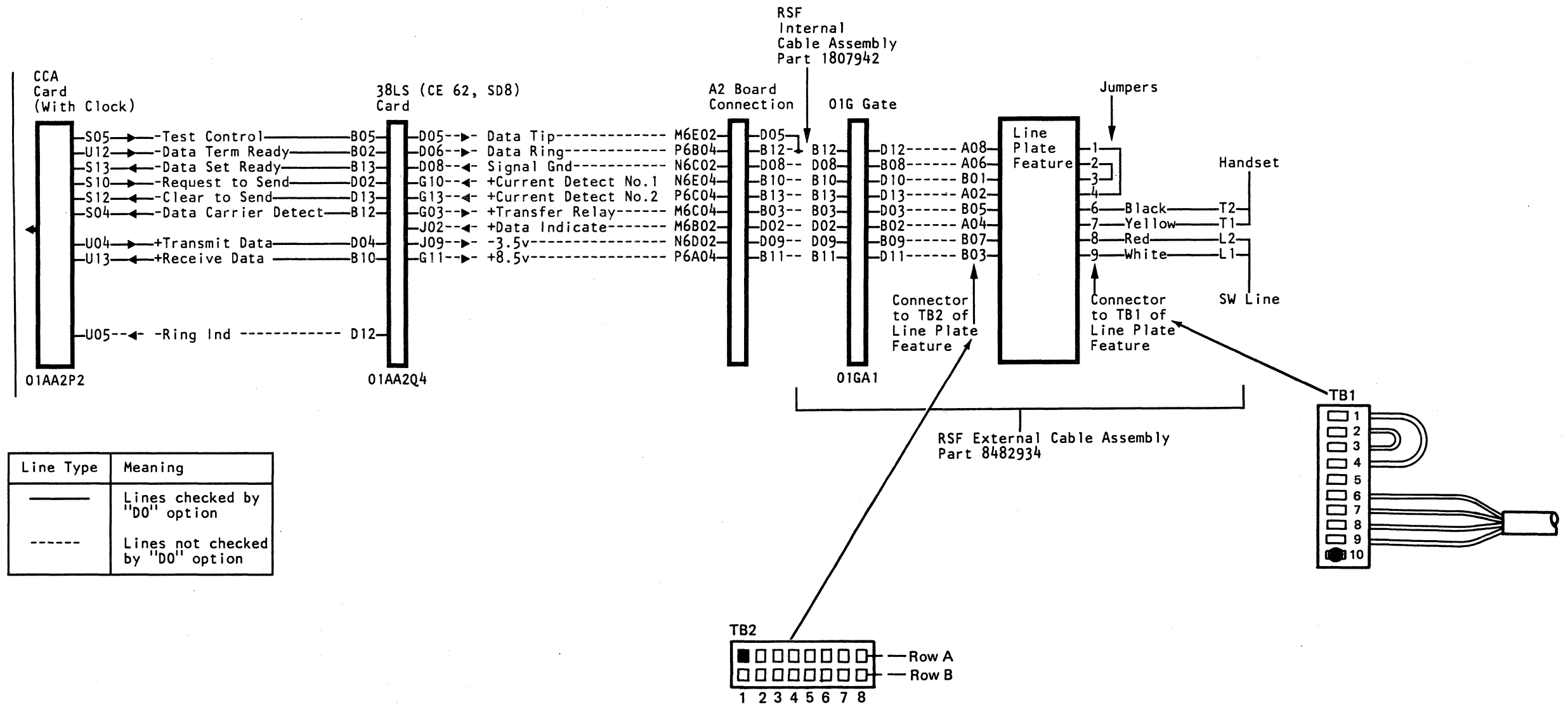
Line Type	Meaning
————	Lines checked by "D0" option
-----	Lines not checked by "D0" option

Seq FG015	PN 0446085 Pg 1 of 1	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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Line Plate Configuration (World Trade) (External Cable Part 8482934)

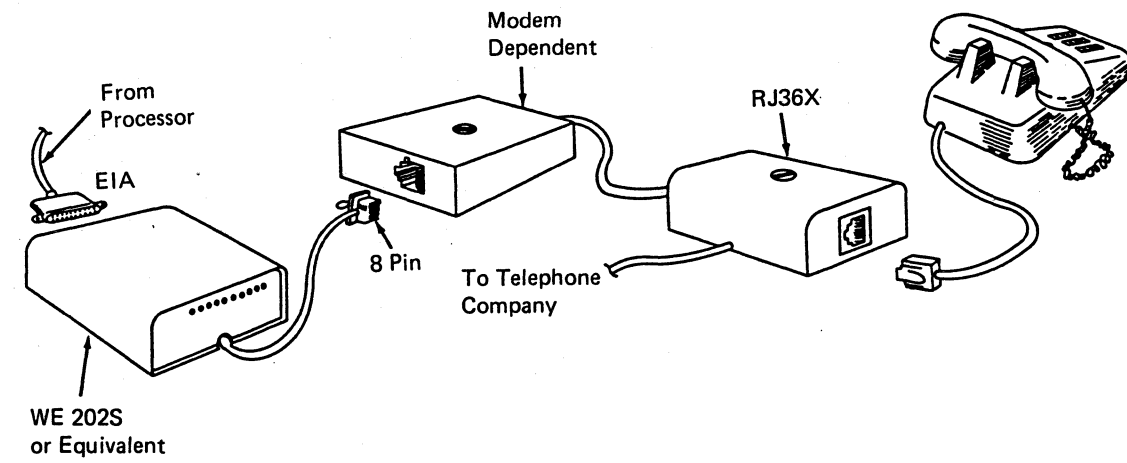
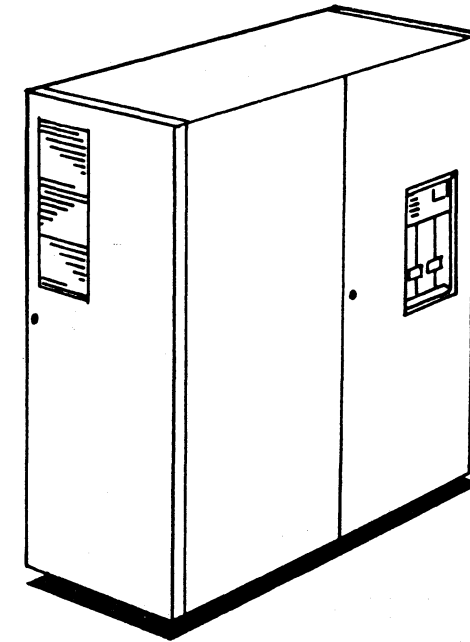
Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 2836 (B/M 4143542) or 2837 (B/M 4143540).



Seq FG025	PN 0446086 Pg 1 of 1	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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RSF Diagram Feature Code 9511 (External Cable Part 8482930)

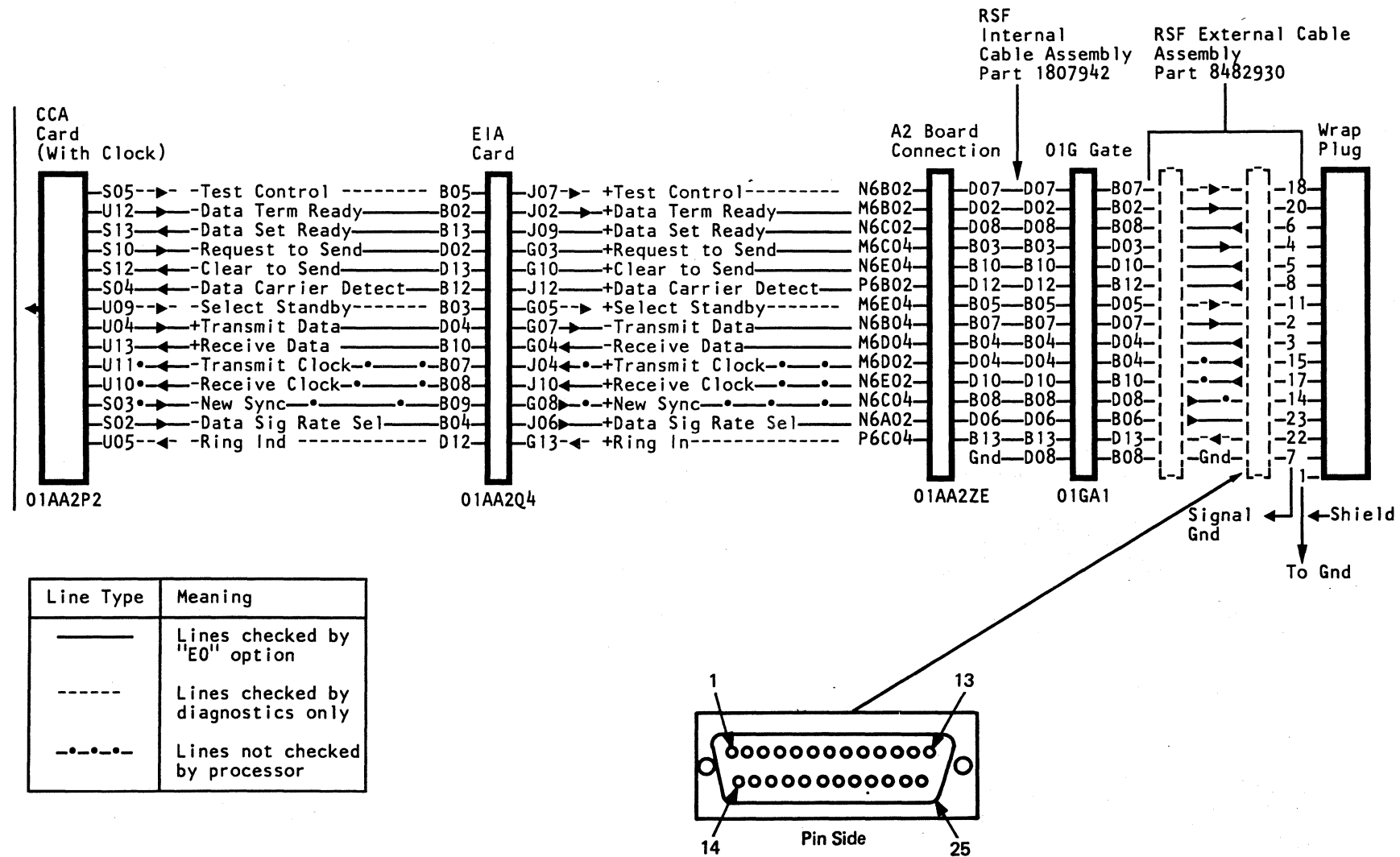


Seq FG035	PN 0446087 Pg 1 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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EIA Adapter Configuration (External Cable Part 8482930)

Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 2833 (B/M 4143543), 2838 (B/M 4143543), or 9511 (B/M 4143544).

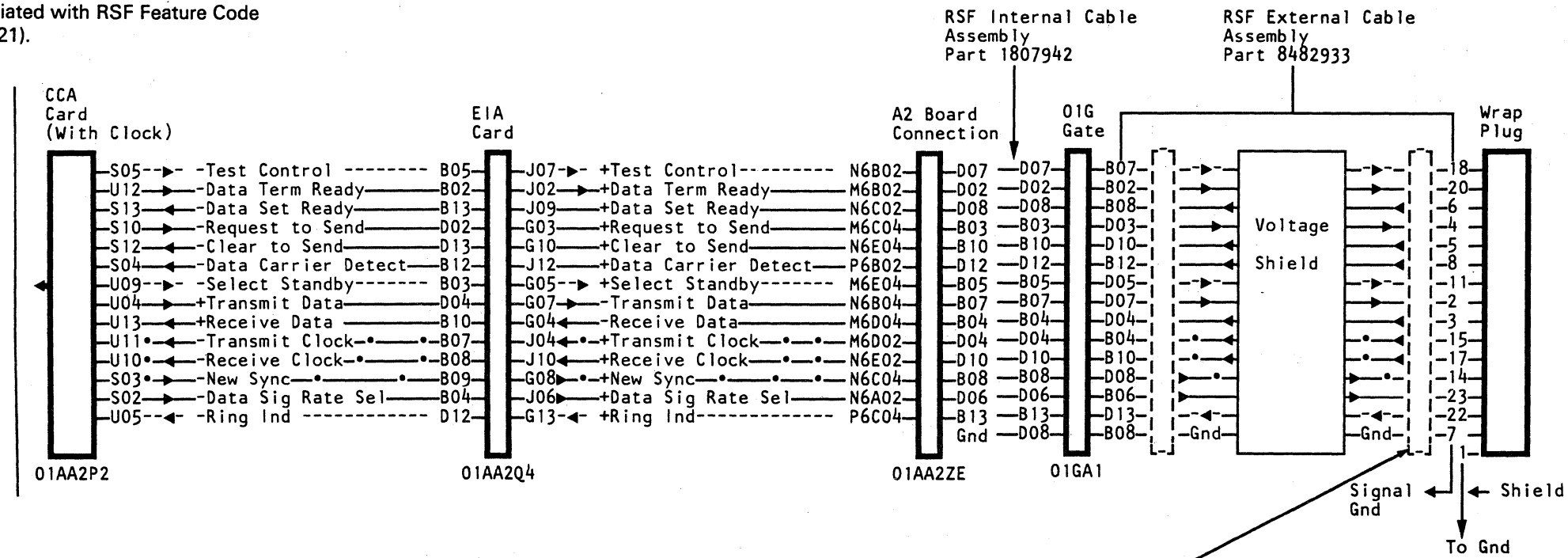


Seq FG035	PN 0446087 Pg 2 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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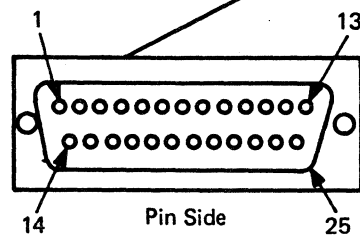
EIA Adapter Configuration (United Kingdom) (External Cable Part 8482933)

Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 2839 (B/M 8645621).



Line Type	Meaning
—	Lines checked by "EO" option
----	Lines checked by diagnostics only
-.-.-.-	Lines not checked by processor



RSF Option Verification Procedure for Feature Code 9514

Common Carrier Facility

This procedure verifies correct option connections in the Common Carrier facilities for Feature Code 9514.

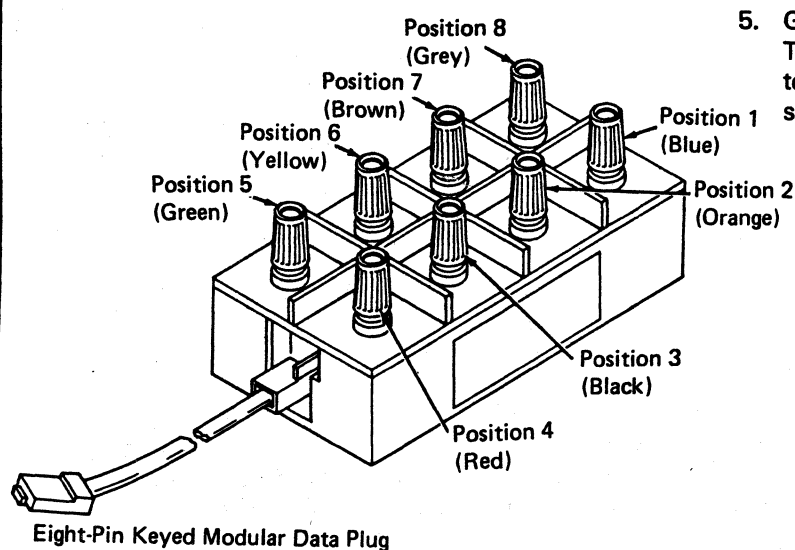
1. Disconnect the 4381 Processor RSF cable (part 401441) from the RJ41S or RJ45S data jack.
2. Connect the Modular Jack Test Adapter (part 6339647) into the RJ41S or RJ45S data jack.

Note: DO NOT connect the 4381 Processor RSF cable to the modular jack test adapter.

3. Set the switch to PROG on the RJ41S data jack. If an RJ45S is installed, the switch is omitted. Go to the next step.
4. Use the Option Verification Charts on this page to check voltage and continuity. Six checks are made using a CE meter.

Note: All six checks MUST BE CORRECT for proper operation Feature Code 9514. If any of the six checks are incorrect, make a note of the option(s) and notify the customer.

Modular Jack Test Adapter (Part 6339647)



Special Exclusion Key Telephone Set

This procedure verifies correct operation of the Special Exclusion Key Telephone Set (part 4494964).

1. Disconnect the 4381 Processor RSF cable (part 401441) from the REG. DATA EQUIP. position of the telephone set.
2. Connect the Modular Jack Test Adapter (part 6339647) into the REG.DATA EQUIP. position of the telephone set.

Note: DO NOT connect the 4381 Processor RSF cable to the modular jack test adapter.

3. Use Option Verification Chart 1 to check voltage and continuity. Six checks are made using a CE meter.

Note: All six checks MUST BE CORRECT for proper operation of the telephone set.

4. If any of the six checks are incorrect, order a NEW telephone set.

Note: The unpacking, assembly, and connection of the IBM supplied telephone is **TOTALLY** the responsibility of the customer and is **NOT** performed by the service representative.

5. Give the NEW telephone set to the customer. The customer MUST disconnect the OLD telephone set and connect the NEW telephone set.

Option Verification Chart 1

Use this chart for Exclusion Key Telephone Sets with options A1 and D8 to verify they are connected properly.

Note: The A1 option provides talk/dial capability when the handset is OFF-HOOK and data capability when the exclusion key is pulled UP.

Telephone	Modular Jack Test Adapter Test Points	Checks	Option Being Verified
Phone ON-HOOK	Red (4) and Green (5)	0 Vdc	A1
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Down	Red (4) and Green (5)	0 Vdc	A1
	Black (3) and Yellow (6)	Short	D8
Phone OFF-HOOK Exclusion Key Up	Red (4) and Green (5)	50 Vdc	A1
	Black (3) and Yellow (6)	Open	D8

Option Verification Chart 2

Use this chart for Exclusion Key Telephone Sets with options A2 and D8 to verify they are connected properly.

Note: The A2 option provides talk/dial capability when the exclusion key is pulled UP and data capability when the phone is either ON-HOOK or OFF-HOOK with the exclusion key DOWN.

Telephone	Modular Jack Test Adapter Test Points	Checks	Option Being Verified
Phone ON-HOOK	Red (4) and Green (5)	50 Vdc	A2
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Down	Red (4) and Green (5)	50 Vdc	A2
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Up	Red (4) and Green (5)	0 Vdc	A2
	Black (3) and Yellow (6)	Short	D8

RSF Option Verification Procedure for Feature Code 9514

Common Carrier Facility

This procedure verifies correct option connections in the Common Carrier facilities for Feature Code 9514.

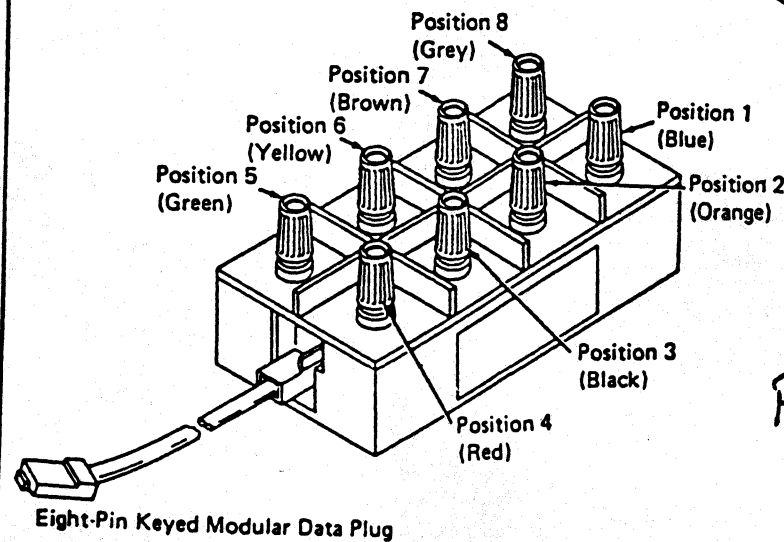
1. Disconnect the 4381 Processor RSF cable (part 401441) from the RJ41S or RJ45S data jack.
2. Connect the Modular Jack Test Adapter (part 6339647) into the RJ41S or RJ45S data jack.

Note: DO NOT connect the 4381 Processor RSF cable to the modular jack test adapter.

3. Set the switch to PROG on the RJ41S data jack. If an RJ45S is installed, the switch is omitted. Go to the next step.
4. Use the Option Verification Charts on this page to check voltage and continuity. Six checks are made using a CE meter.

Note: All six checks MUST BE CORRECT for proper operation Feature Code 9514. If any of the six checks are incorrect, make a note of the option(s) and notify the customer.

Modular Jack Test Adapter (Part 6339647)



Special Exclusion Key Telephone Set

This procedure verifies correct operation of the Special Exclusion Key Telephone Set (part 4494964).

1. Disconnect the 4381 Processor RSF cable (part 401441) from the REG. DATA EQUIP. position of the telephone set.
2. Connect the Modular Jack Test Adapter (part 6339647) into the REG. DATA EQUIP. position of the telephone set.

Note: DO NOT connect the 4381 Processor RSF cable to the modular jack test adapter.

3. Use Option Verification Chart 1 to check voltage and continuity. Six checks are made using a CE meter.

Note: All six checks MUST BE CORRECT for proper operation of the telephone set.

4. If any of the six checks are incorrect, notify the customer. The customer must follow the repair/replacement procedure shipped with the telephone.

Note: The unpacking, assembly, connection, and maintenance of the IBM supplied telephone is TOTALLY the responsibility of the customer and is NOT performed by the service representative.

4. If any of the six checks are incorrect, notify the customer. The customer must follow the repair/replacement procedure shipped with the telephone.

REA 01-57539

PUECA02221

Option Verification Chart 1

Use this chart for Exclusion Key Telephone Sets with options A1 and D8 to verify they are connected properly.

Note: The A1 option provides talk/dial capability when the handset is OFF-HOOK and data capability when the exclusion key is pulled UP.

Telephone	Modular Jack Test Adapter Test Points	Checks	Option Being Verified
Phone ON-HOOK	Red (4) and Green (5)	0 Vdc	A1
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Down	Red (4) and Green (5)	0 Vdc	A1
	Black (3) and Yellow (6)	Short	D8
Phone OFF-HOOK Exclusion Key Up	Red (4) and Green (5)	50 Vdc	A1
	Black (3) and Yellow (6)	Open	D8

Option Verification Chart 2

Use this chart for Exclusion Key Telephone Sets with options A2 and D8 to verify they are connected properly.

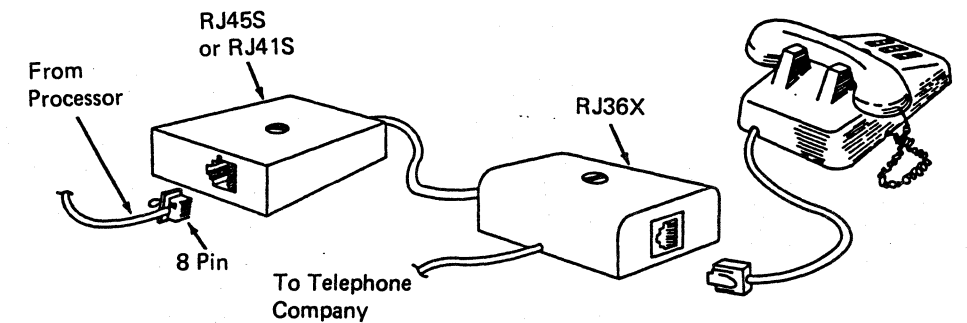
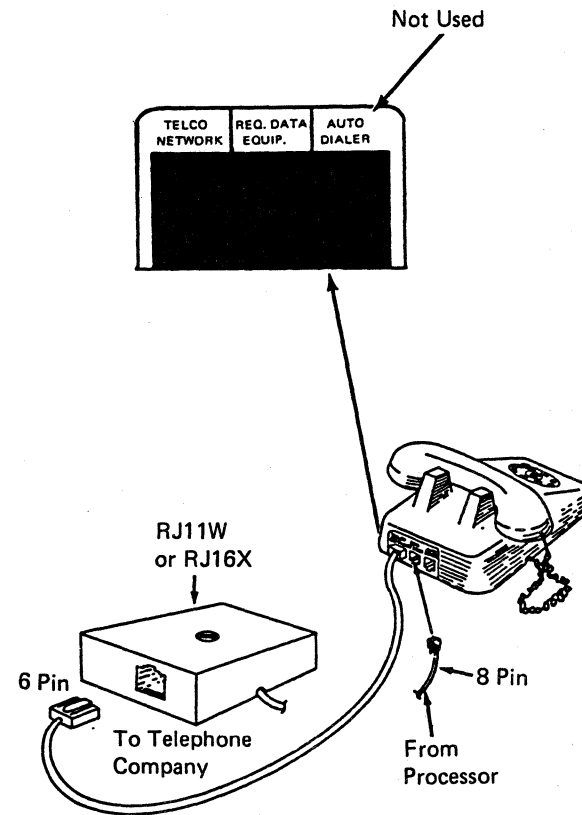
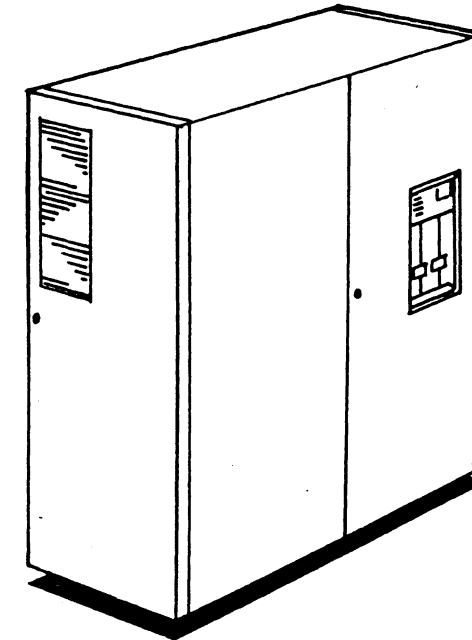
Note: The A2 option provides talk/dial capability when the exclusion key is pulled UP and data capability when the phone is either ON-HOOK or OFF-HOOK with the exclusion key DOWN.

Telephone	Modular Jack Test Adapter Test Points	Checks	Option Being Verified
Phone ON-HOOK	Red (4) and Green (5)	50 Vdc	A2
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Down	Red (4) and Green (5)	50 Vdc	A2
	Black (3) and Yellow (6)	Open	D8
Phone OFF-HOOK Exclusion Key Up	Red (4) and Green (5)	0 Vdc	A2
	Black (3) and Yellow (6)	Short	D8

RSF Diagram Feature Code 9514 (External Cable Part 401441)

These diagrams are possible combinations that you can find for this Feature Code. Use this page to determine which RSF configuration the customer has installed.

Note: If the RJ41S/RJ45S and RJ36X are installed, telephone (part 4494964) CAN be installed in this configuration. Install the eight-pin RSF cable from the processor into the REG.DATA EQUIP. position of the telephone set. Install the six-pin RSF cable into the telephone position TELCO NETWORK and then install the other end into the RJ36X. If the customer has provided the RJ11W/RJ16X, install the telephone set (part 4494964) as shown.

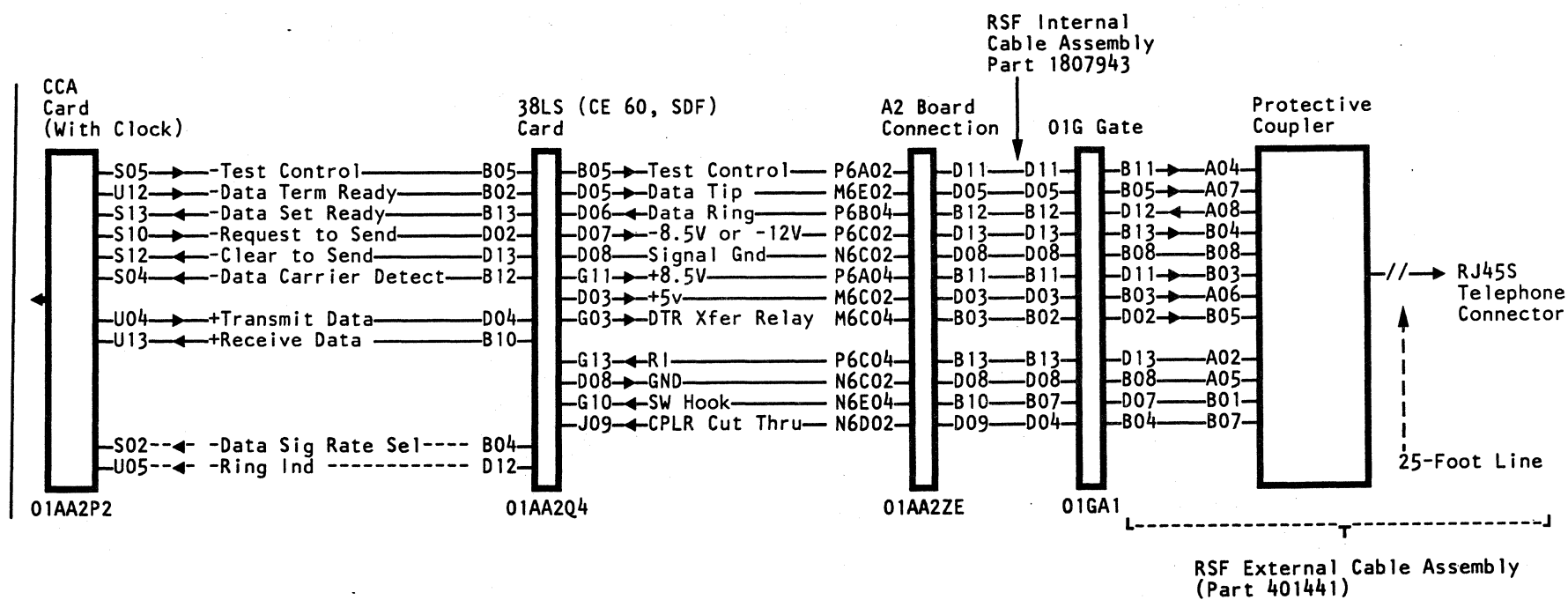


Seq FG055	PN 0446089 Pg 1 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84		
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Protective Coupler Configuration (U.S.A.) (External Cable Part 401441)

Notes:

- This drawing represents functional signal lines only. Additional lines contained in this cable are unused.
- This cable is associated with RSF Feature Code 9514 (B/M 1806885).



Line Type	Meaning
————	Lines checked by "DO" option
-----	Lines not checked by "DO" option

Reconfiguration Aids

Reconfiguration

Warning: Use these procedures under the direction of your support structure.

If a machine check occurs, the retry component analyzes the check to determine if it is in one of the reconfigurable arrays or logic components. If it is, the support processor reconfigures the hardware; that is, the support processor:

- Automatically stops using the defective hardware and instead uses spare hardware.
- Moves, if possible, any data present in the defective hardware to the spare hardware.
- Ensures that later IMLs and system resets recognize that reconfiguration has occurred.

The reconfiguration function can be used to:

- Determine if any hardware reconfiguration has occurred.
- Manually reset (restore to normal) the following hardware:
 - Control Storage Array
 - Cache Data Array
 - Cache Swap Buffer Array
 - Channel Data Buffer Array
 - Main Storage (Memory)
 - Key Array
 - Multiply Function.
- Save the reconfiguration values entered by you.

Reconfiguration Screen

```

*PROCESSING UNIT CONFIGURATION*

*CONFIGURABLE ITEMS*  *NORMAL*  *ERROR LOCATIONS*
(Y/N)
CONTROL STORAGE ARRAY  N          BYTES      : 0/4  1/5  2/6  3/7
                        N          ADDRESSES  : 01000 02000 03000 04000
                        N          BYTES      : 8/C  9/D  A/E  B/F
                        N          ADDRESSES  : 15000 16000 17000 17800
CACHE DATA ARRAY     N          BYTES      : 0 1 2 3 4 5 6 7
CACHE SWAP BUFFER ARRAY N          EVEN BYTES : 0/1 2/3 4/5 6/7
                        N          ODD BYTES  : 8/9 A/B C/D E/F
CHNL DATA BUFFER ARRAY N          CHANNELS   : 4 9
MEMORY (4K BLOCKS BAD) N          ADDRESSES  : 00003000 00007000 00008000 (MORE)
KEY ARRAY              N
MULTIPLY FUNCTION     N          *WARNING: CHECK CONTROL IN HARDSTOP.*
                        N          *CONFIGURATION HAS BEEN CHANGED.DATA*
R      RESET VALUES (DEFAULT)  *INTEGRITY NOT MAINTAINED. CONTINUED*
D      OPERATIONAL VALUES (OS TO SAVE) *OPERATION UNPREDICTABLE. TO RESUME *
                        N          *NORMAL OPERATION ENTER: QKN & QNOR.*

COMMAND: QFSAO                      ==>
    
```

Reconfiguration Procedures

- Set the CE Mode switch to CE Mode.
 - **For QFSA selection**, key QFSA next to COMMAND, and press the ENTER key (defaults to QFSAR).

Do this to determine if any reconfiguration occurred.
 - **For QFSAR selection**, key QFSAR next to COMMAND, and press the ENTER key.

Do this to reset (restore to normal) Memory and the Key Array, or reset and reconfigure the Multiply function.
 - **For QFSAO selection**, key QOM next to COMMAND, and press the ENTER key. This stops the PU clock. When SELECTION COMPLETE message appears, press the ENTER key.

Do this to reset (restore to normal) or manually reconfigure the Control Storage array, Cache Data array, Cache Swap Buffer array, and the Channel Data Buffer array.
 - **For QFSAOS selection**, key QOM next to COMMAND, and press the ENTER key. This stops the PU clock. When SELECTION COMPLETE message appears, press the ENTER key.

Now respond to the prompting messages to save the values you entered.
 - **To exit from the QFSA screen**, press the MODE SEL key, or change the selection parameters on the COMMAND line.

Manually Reconfiguring the Arrays

The procedure to reconfigure an array is similar for all of them. (The reconfiguration values you enter are different. For information, refer to "Label Identification.")

To reconfigure one of the arrays:

- Use the QFSAO selection to display the QFSA screen.
- Move the cursor to the Y/N field, and change the Y to an N.
- Move the cursor to the ERROR LOCATIONS field, and key in the reconfiguration data.
- Press the ENTER key.
- Verify that you entered the reconfiguration data correctly by displaying the:
 - QVAC screen - Control Storage array
 - QVAD screen - Channel Data Buffer array
 - QVAG screen - Cache Data array
 - QVAS screen - Cache Swap buffer array

If you entered the data correctly, intensified Vs appear above the data columns that are using spare hardware (except for the QVAD screen) together with message RECONFIGURATION ACTIVE.
- Use the QFSAOS selection to save the reconfiguration values.
- Continue normal operation by doing the following:
 - QLM for Control Storage array
 - QCLEAR for Cache Data array and Cache Swap Buffer array
 - QNORMAL for Channel Data Buffer array.

Restoring the Arrays to Normal

The procedure to restore arrays to normal is similar for each of the four arrays. To restore the arrays:

1. Use the QFSAO selection to display the QFSA screen.
2. To restore all of an array to normal, move the cursor to the Y/N field, and change the N to a Y.

To restore part of an array to normal, move the cursor to the ERROR LOCATIONS field, and key asterisks in those positions you want to restore.

3. Press the ENTER key.
4. Continue normal operation by doing the following:
 - QLM for Control Storage array
 - QCLEAR for Cache Data array and Cache Swap Buffer array
 - QNORMAL for Channel Data Buffer array.

Restoring Logic Components to Normal

To restore logic components (Memory, Key Array, Multiply Function) to normal:

1. Use the QFSAR selection to display the QFSA screen.
2. Move the cursor to the Y/N field, and change the N to a Y.

Note: You have the option of changing a Y to an N for the Multiply function but not for Memory or the Key Array.

3. Press the ENTER key.

Now respond to the prompting messages to save the values you entered.

Label Identification

Control Storage Array: This array has a 2K (X'800') area reserved for reconfiguration. Reconfiguration is on a two-byte basis (0/4, 1/5, 2/6, etc.). For example, if byte 6 at address 31F6 fails, all addresses between 3000 and 37FF are reconfigured to use bytes 2 and 6 in the reserved area. If additional addresses fail (must not be caused by the same byte pair), they also are reconfigured to use the reserved area.

The entries must be five digits on 2K boundaries (X'800'). Each entry indicates the control storage address that has been reconfigured for a specific byte pair (it is possible to have all entries the same). Asterisks in a field indicate that reconfiguration has not occurred.

Cache Data Array: The cache data array and the area reserved for reconfiguration are exactly the same size. Therefore, when any byte (0 to 7) in the cache array fails, all bytes with that number are reconfigured to use the reserved area. (That is, if byte 1 fails, all byte 1s are reconfigured.) It is possible to have all of the cache data array (bytes 0 to 7) using the reserved area.

The entries are either a single digit (0 to 7) or an asterisk (*). The digits must be in increasing order. A digit identifies the failing byte number; an asterisk indicates that reconfiguration has not occurred.

Cache Swap Buffer Array: The cache swap buffer array and the area reserved for reconfiguration are exactly the same size.

If a failure occurs in the cache swap buffer, reconfiguration occurs on a two-byte basis (0/1, 2/3, etc.). For example, if byte 1 fails, all buffer bytes 0 and 1 are reconfigured to use bytes 0 and 1 in the reserved area. If additional bytes fail (must not be the same byte pair), they are also reconfigured to use the reserved area.

The entries are either 0/1, 2/3, etc. for the even field or 8/9, A/B, etc. for the odd field. The hexadecimal entry identifies the failing byte number; an asterisk indicates that reconfiguration has not occurred.

Channel Data Buffer Array: This array has two buffers reserved for use if part of the main array fails. Reconfiguration is by buffer size (64 bytes) for each channel (the valid channel ID number range is 0 through B). For example, if a byte in the buffer for channel 2 fails, the buffer is reconfigured to use one of the reserved buffers. A maximum of two channel data buffers can be reconfigured.

The entries (up to two) are a single digit between the values of 0 and the maximum number of channels installed. The hexadecimal entry identifies the failing channel; an asterisk indicates that reconfiguration has not occurred.

Memory (4K Blocks Bad): Reconfiguration for main storage is different from the other hardware reconfigurations. Instead of using a reserved area after a storage error occurs, the system stops using the 4K block of storage that contains the error. For example, if address 0007E4A2 is bad, future storage operations bypass the 4K block from 0007E000 to 0007EFFF. Up to 4096 4K blocks (16 meg) of storage can be bypassed (the first 4K block of storage, 00000000 to 00000FFF, cannot be bypassed because this area is necessary for system operation).

The entries display (on 4K boundaries) all the main storage addresses that have failed and are no longer being used by the system. The addresses are in no specific order. MORE indicates that four or more 4K blocks have failed (use the paging key to see all the addresses). Asterisks in a field indicate that reconfiguration has not occurred.

Key Array: When a key array failure is detected by the system, the retry component reconfigures two associated keys as bad. Both the key array and storage facilities are mutually independent. For example, you may have a 4K storage page reconfigured as bad and have no entry for the associated keys. You may also have the key reconfigured but not the memory.

If the Y/N field is N, reconfiguration of the key stack has occurred for two or more keys whose entry is associated with a 4K page of main storage. Two keys exist for each 4K page.

Multiply Function: If the Multiply function fails (and the control storage array is not reconfigured), the microcode starts to use the microcode multiply routines. (This change slows the system operation.) The multiply routines reside in control storage; therefore, any reconfiguration of control storage prevents the use of these routines.

If the Y/N field is N, the microcode routines are being used for multiply operations; if the Y/N field is Y, the hardware is being used for multiply operations.

Normal: Displays either as Y (associated error location is normal) or N (associated error location has been reconfigured).

Error Locations: An asterisk (*) in a field indicates that normal hardware is being used (no reconfiguration has taken place). A hexadecimal value indicates that reconfiguration has occurred.

Seq FH005	PN 0446090 Pg 2 of 2	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02217 10 JAN 84		
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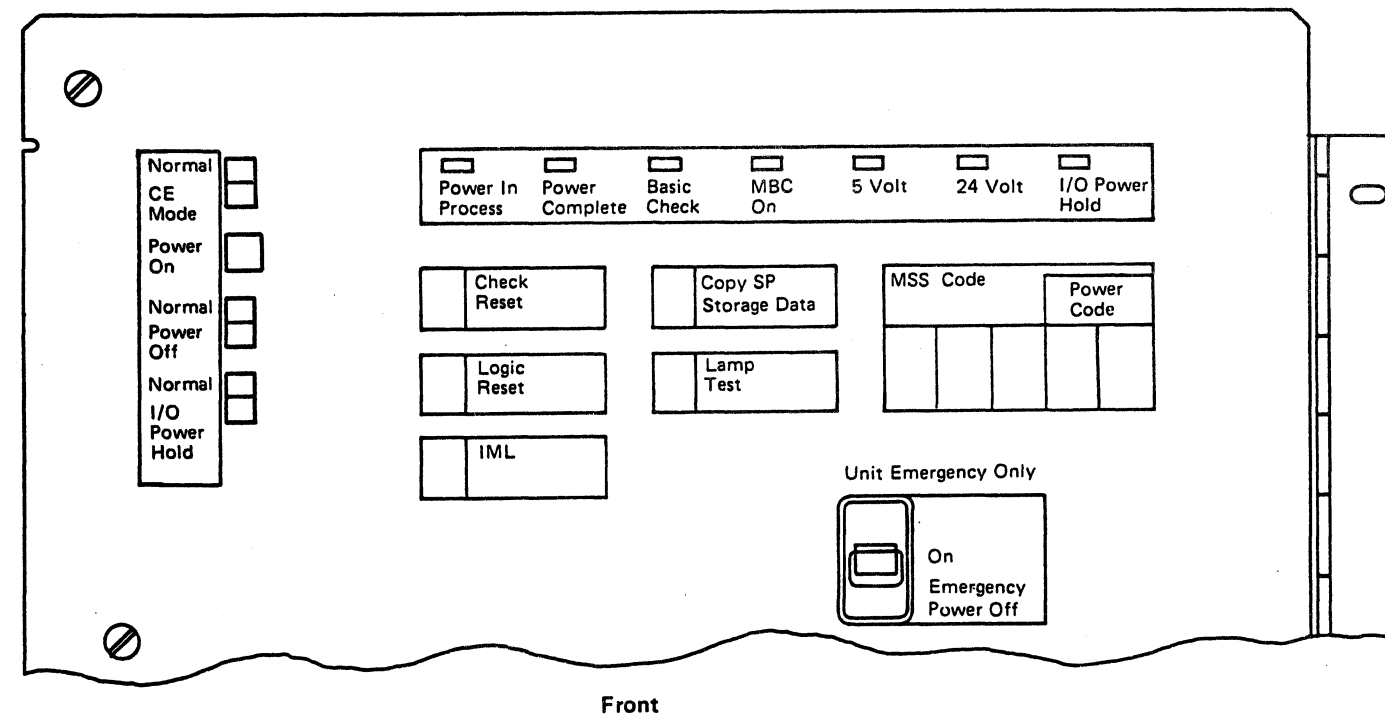
MSS Aids

4381 Processor Service Panel

The service panel contains:

- Switches/Pushbuttons
 - CE Mode
 - Power On
 - Power Off
 - I/O Power Hold
 - Check Reset
 - Copy SP Storage Data
 - Logic Reset
 - Lamp Test
 - IML
- Indicators
 - Power In Process
 - Power Complete
 - Basic Check
 - MBC On
 - 5 Volt
 - 24 Volt
 - I/O Power Hold

- Service Panel Display
 - MSS Code Display
 - Power Code Display
- Diskette drives
 - Diskette Drive 1
 - Diskette Drive 2
- Unit Emergency switch



Switches/Pushbuttons

Normal/CE Mode

With the Normal/CE Mode switch in CE Mode:

- Additional information and selections are displayed on some of the screens.
- The processing unit and channel error log displays can be cleared.
- The Basic Check indicator is on.
- Power On/IML on the operator control panel cannot power up the processor (it can IML the processor).
- When Power On is pressed on the service panel, the power sequence stops at the Power Up/Down (QWW) screen.

Power On

If the Normal/Power Off switch is set to Normal, pressing this button powers up the processor. If the Normal/CE Mode switch is set to Normal, the MSS, processing unit, and attached I/O are powered up. If the Normal/CE Mode switch is set to CE Mode, the power sequence stops after the MSS is powered up, and the Power Up/Down (QW) screen displays.

Normal/Power Off

If the Normal/Power Off switch is set to Power Off, a sequential power down of the processor and attached I/O devices will occur when powering off. The switch must be returned to the Normal position to power up the processor.

Normal/I/O Power Hold

Setting the Normal/I/O Power Hold switch to the I/O Power Hold position allows you to power down the processor without powering down the attached I/O devices. The I/O Power Hold indicator is on while in this position. If the switch is set to Normal, the attached I/O devices are powered down when powering off the processor.

Check Reset

Pressing this button causes a reset of the MBC card (location 01A-A1V2). Use Check Reset to clear a two-digit Power code before trying to power on again.

Copy SP Storage Data

Pressing this button loads 128K of SP storage to the FUNC2 diskette. Problem Analysis can then transmit the information stored on FUNC2 to the support system for analysis.

Logic Reset

This button restores operation of the support processor without reloading any microcode.

Pressing this button causes a hardware reset of the support processor and all adapters except the PCA. A reference code of EC330014 is logged on the QESD and QERD screens.

Lamp Test

Pressing this button on the service panel causes these indicators to light:

- Power In Process
- Power Complete
- Basic Check
- MBC On
- I/O Power Hold

Pressing this button on the Operator Control Panel (OCP) causes these indicators to light:

- Power In Process
- Power Complete
- Basic Check
- MBC On
- I/O Power Hold
- System Wait
- Chan-Chan Disabled

IML

Pressing this button when the machine is powered up performs an SP IML.

Seq Fi005	PN 0446096 Pg 1 of 2	EC A02214 15 SEP 83	EC A02219 29 FEB 84		
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Indicators

Power In Process

Indicates that a power-on or power-off sequence is in progress. The Power In Process indicator remains on if the power sequence in the processor or an attached I/O device fails.

Power Complete

Indicates that the processor and I/O power sequence completed without error. This indicator remains on until powering off or a power error occurs.

Basic Check

Indicates one of the following:

- An error was detected by the MBC during power up (a two-digit Power code is displayed).
- An error was detected in the DCA or system console while functional microcode was running (a five-digit MSS code is displayed).
- The Normal/CE Mode switch is in the CE Mode position.

MBC On

Indicates that the MBC card has +5 and +24 volts applied. The indicator is on whenever the processor has primary (ac) voltage applied and CB1 is on.

5 Volt

Indicates that +5 volts from PS101 is applied to the 01A-A1 board, the support processor, and the MBC card. The indicator is on whenever the processor has primary (ac) voltage applied and CB1 is on.

24 Volt

Indicates that +24 volts from PS101 is applied to the 01A-A1 board, the support processor, and the MBC card. The indicator is on whenever the processor has primary (ac) voltage applied and CB1 is on.

I/O Power Hold

Indicates that the I/O Power Hold switch is in I/O Power Hold position.

Service Panel Display

This five-digit panel displays the MSS and Power codes. If a power error is detected by the MBC, a two-digit Power code is displayed in the last two display positions. If there is no power error, digits are displayed in all five of the display positions. The five-digit code is either the address of the current support processor instruction, or if an MSS error was detected, a functional microcode or diagnostic error code.

Diskette Drives

Two diskette drives are used to load support processor and processing unit control storage at IML time, store configuration data, store log information, and load support processor and processing unit diagnostics.

Unit Emergency Switch

Moving the Unit Emergency switch to Power Off removes the 24 volt control voltage and causes the processor and all attached I/O devices to drop power. The switch is then latched in the Power Off position until you reset it.

Seq F1005	PN 0446096 Pg 2 of 2	EC A02214 15 SEP 83	EC A02219 29 FEB 84			
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Service Panel Checkout

This procedure allows for a visual checkout of the service panel display and is normally carried out when referenced from a Repair Procedure or the Installation instructions. If referenced from the either of these, begin with step 5 of this procedure.

Service Panel Checkout Procedure

1. Set the Power Off switch to Power Off.
2. Install DIAG1 diskette into diskette drive 1.
3. Set the Power Off switch to Normal.
4. Press Power On. The processor is powered up, and the MSS Diagnostic Option screen is displayed.
5. Select Option 90 on the screen.
6. Optional Service Panel Diagnostics option begins. Message displayed indicates the option is running, and prompts you to this procedure.
7. When 80000 is displayed on the service panel, initiate and verify the following numerical display sequence. Press Logic Reset to start the test.

Note: The numbers are displayed at two to four second intervals.

80000
81111
82222
83333
84444
85555
86666
87777
88888
99999
AAAAA
BBBBB
CCCCC
DDDDD
EEEEE
FFFFF
F0123
F4567
F89AB
FCDEF

8. At the completion of this sequence, the MSS Diagnostic Option screen appears. Return to the procedure that initially referenced you to this one. If the numerical sequence did not run as displayed or failed to complete, go to Volume A02, Power Repair, "Hex Display" on PR 381.

Seq FI015	PN 0446097 Pg 1 of 1	EC A02214 15 SEP 83				
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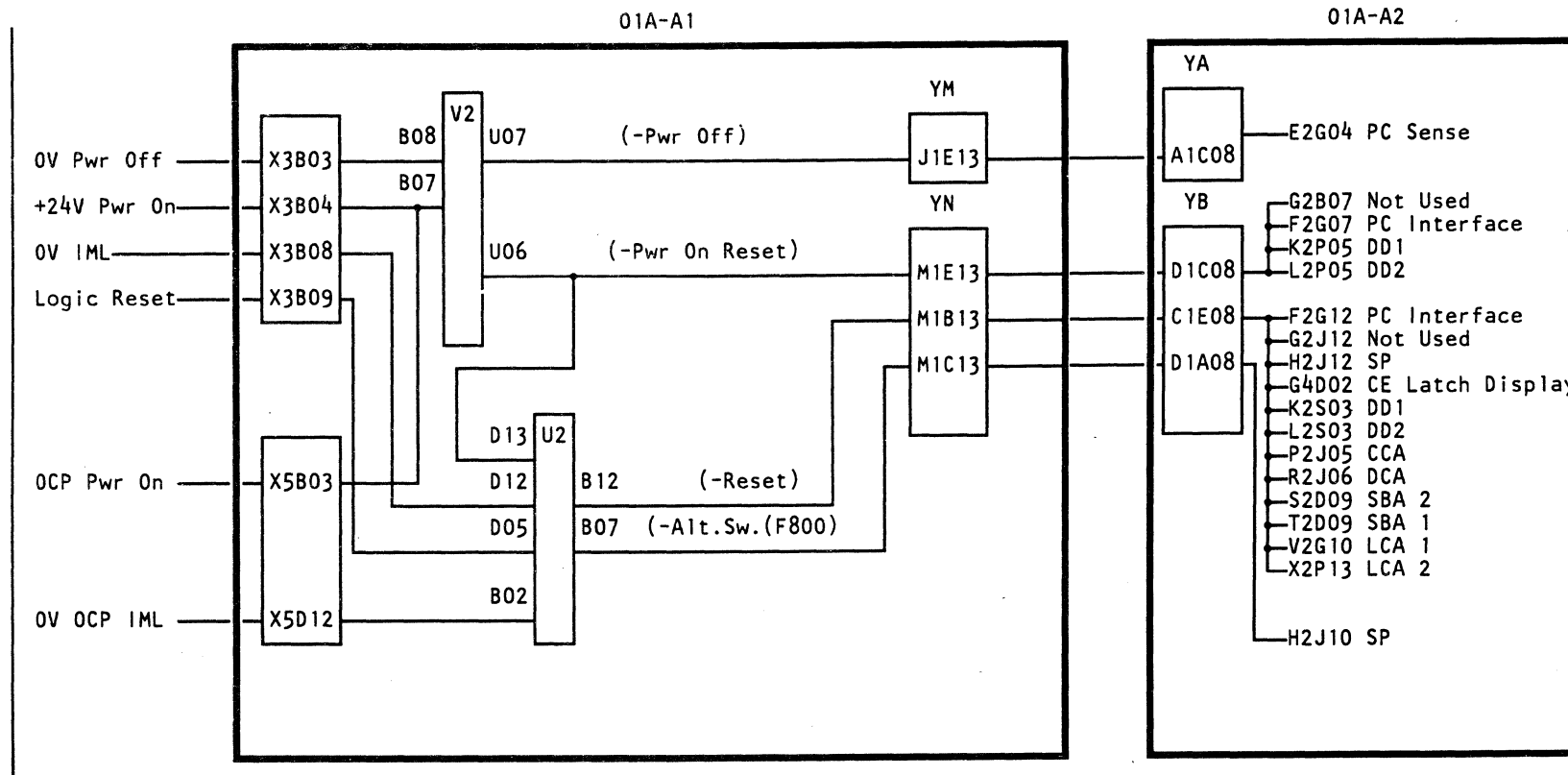
Logic Reset

The logic reset card (01A-A1U2) supplies logic reset to the following:

- Power Control Adapter (PCA)
- Diskette Drive Adapter 1 (DDA 1)
- Diskette Drive Adapter 2 (DDA 2)
- Support Bus Adapter (SBA)
- Local Channel Adapter 1 (LCA 1)
- Local Channel Adapter 2 (LCA 2)
- Common Communications Adapter (CCA)
- Device Cluster Adapter (DCA)
- Support Processor Storage.

To invoke a logic reset, press IML or Logic Reset on the service panel or Power On/IML on the operator control panel.

Logic Reset

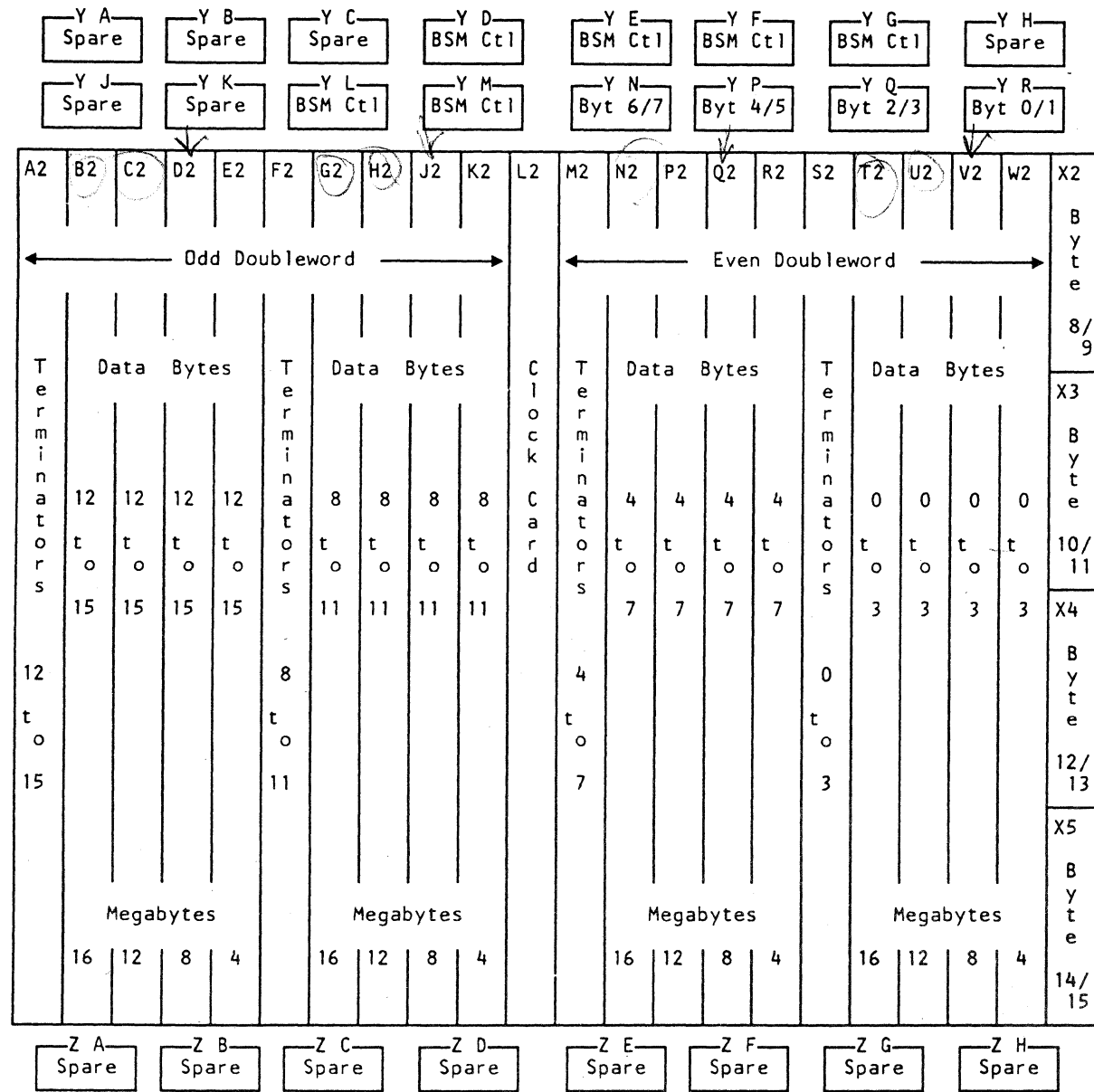


Storage Aids

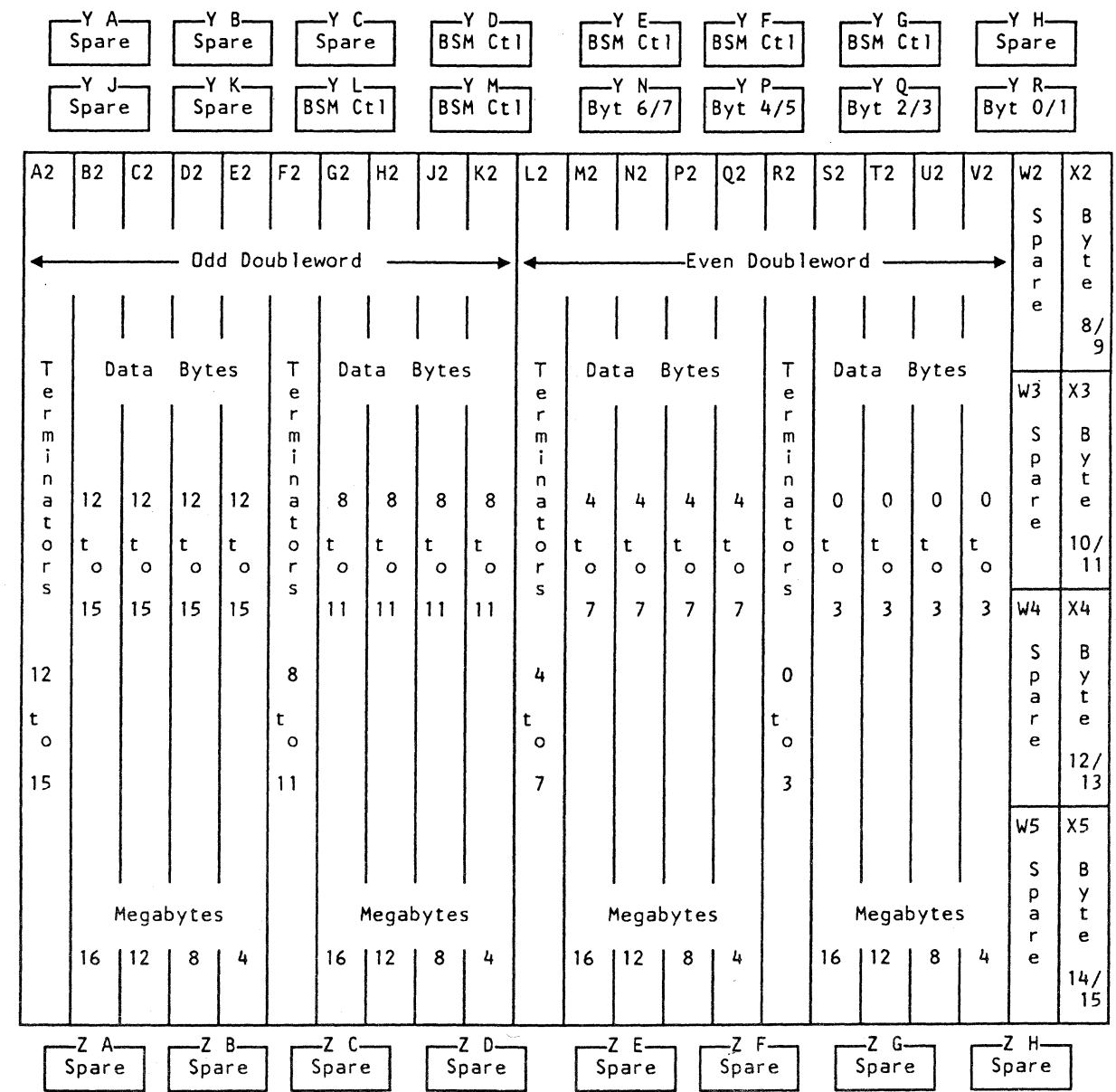
Storage Scope Points

Use these storage scope points when directed by your support structure.

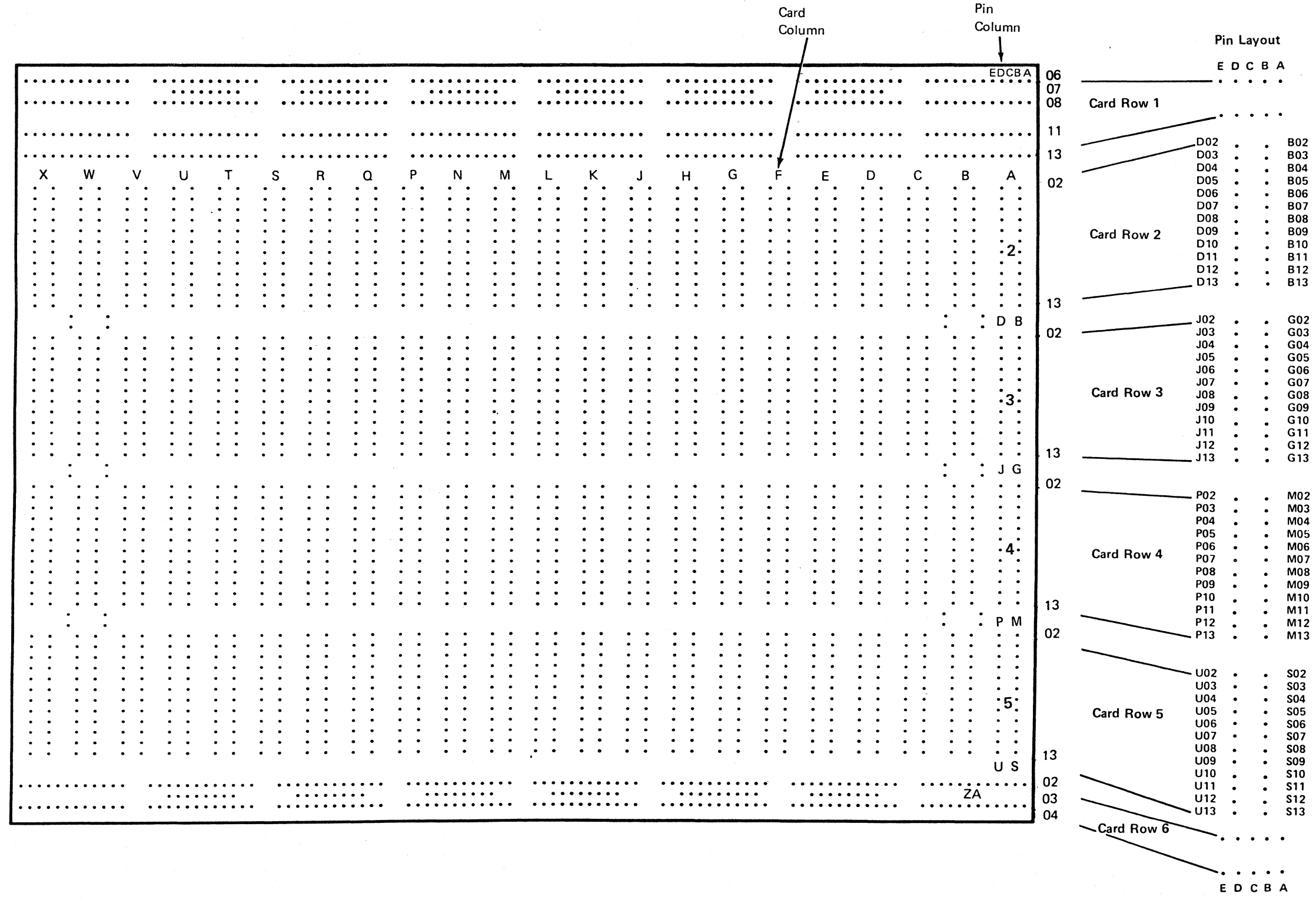
Board 01A-A4
Card and Cable Locations
Source 1



Board 01A-A4
Card and Cable Locations
Source 2



Board 01A-A4 Pin Locations



Seq FJ005	PN 0446100 Pg 2 of 3	EC A02214 15 SEP 83	EC A02215 01 NOV 83			
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Storage Scope Points (Source 1)

DATA BITS								
Byte	EVEN DOUBLEWORD							
	0	1	2	3	4	5	6	7
Bit 0	X1D13	W1C13	U1E13	S1D13	S1A13	Q1E13	P1B13	N1A13
Bit 1	X1E13	W1C11	V1A13	T1D11	S1B13	Q1E11	P1C13	N1A11
Bit 2	X1C11	W1B13	U1D11	T1C13	R1E11	Q1D13	P1A11	M1E13
Bit 3	X1B13	W1B11	U1C13	T1C11	R1D13	Q1D11	N1E13	M1E11
Bit 4	X1B11	W1A13	U1C13	T1B13	R1D11	Q1C13	N1E13	M1D13
Bit 5	X1A13	V1E11	U1B13	T1A11	R1C13	Q1B11	N1D13	M1C11
Bit 6	X1A11	V1D11	U1B11	T1E11	R1C11	Q1A11	N1D11	M1B11
Bit 7	W1E13	V1D13	U1A13	T1E13	R1B13	Q1A13	N1C13	M1B13
Bit CK	X1E11	W1D11	V1A11	S1E11	S1B11	R1A11	P1C11	N1B11

Byte	ODD DOUBLEWORD							
	8	9	10	11	12	13	14	15
Bit 0	J1C11	X2B06	X3B12	X3B06	F1D11	X4B06	X5B12	X5B06
Bit 1	X2B13	X2D06	X3B13	X3D06	X4B13	X4D06	X5B13	X5D06
Bit 2	X2D11	X2B05	X3D11	X3B05	X4D11	X4B05	X5D11	X5B05
Bit 3	X2B10	X2D05	X3B10	X3D05	X4B10	X4D05	X5B10	X5D05
Bit 4	X2D10	X2B04	X3D10	X3B04	X4D10	X4B04	X5D10	X5B04
Bit 5	X2B09	X2D03	X3B09	X3D03	X4B09	X4D03	X5B09	X5D03
Bit 6	X2D09	X2D02	X3D09	X3D02	X4D09	X4D02	X5D09	X5D02
Bit 7	X2B08	X2B02	X3B08	X3B02	X4B08	X4B02	X5B08	X5B02
Bit CK	X2D13	X2D07	X3D13	X3D07	X4D13	X4D07	X5D13	X5D07

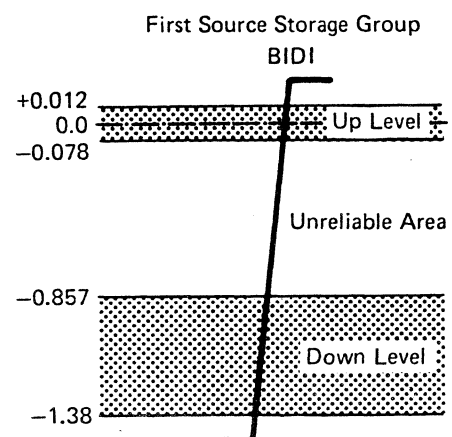
Note: Scope points without card locations have the same pin assignments on all cards.

Source 1

Byte	0	1	2	3
4	5	6	7	
8	9	10	11	
12	13	14	15	

Bit 0	D05	B06	G11	S09
Bit 1	D06	B07	P11	U10
Bit 2	D04	J11	M12	P09
Bit 3	B04	G12	P05	M10
Bit 4	D07	J10	M03	S13
Bit 5	B05	M06	M07	U11
Bit 6	B03	P06	P07	S07
Bit 7	P03	M08	P10	U09
Bit CK	B02	M04	M05	M11

Address	Bit	Even	Odd	Source 1
10	T1A06	G1D11	D11	
11	S1E08	G1C11	G08	
12	V1A06	U1D06	G07	
13	V1A08	U1C06	B12	
14	U1B08	H1E11	G05	
15	U1A08	H1E13	B11	
16	T1E06	H1C11	D10	
17	T1D06	H1B11	D09	
18	T1C08	H1A13	B09	
19	T1B08	G1E13	B13	
20	G1B13	L1D11	G02	
21	G1A13	L1D13	G03	
22	F1E11	L1B11	J06	
23	F1D13	L1A11	J02	
24	J1D11	K1E13	D13	
25	J1C13	K1D13	(not used)	



Storage Scope Points (Source 2)

DATA BITS								
Byte	EVEN DOUBLEWORD							
	0	1	2	3	4	5	6	7
Bit 0	X1D13	W1C13	U1E13	S1D13	S1A13	Q1E13	P1B13	N1A13
Bit 1	X1E13	W1C11	V1A13	T1D11	S1B13	Q1E11	P1C13	N1A11
Bit 2	X1C11	W1B13	U1D11	T1C13	R1E11	Q1D13	P1A11	M1E13
Bit 3	X1B13	W1B11	U1C13	T1C11	R1D13	Q1D11	N1E13	M1E11
Bit 4	X1B11	W1A13	U1C13	T1B13	R1D11	Q1C13	N1E13	M1D13
Bit 5	X1A13	V1E11	U1B13	T1A11	R1C13	Q1B11	N1D13	M1C11
Bit 6	X1A11	V1D11	U1B11	T1E11	R1C11	Q1A11	N1D11	M1B11
Bit 7	W1E13	V1D13	U1A13	T1E13	R1B13	Q1A13	N1C13	M1B13
Bit CK	X1E11	W1D11	V1A11	S1E11	S1B11	R1A11	P1C11	N1B11

Byte	ODD DOUBLEWORD							
	8	9	10	11	12	13	14	15
Bit 0	J1C11	X2B06	X3B12	X3B06	F1D11	X4B06	X5B12	X5B06
Bit 1	X2B13	X2D06	X3B13	X3D06	X4B13	X4D06	X5B13	X5D06
Bit 2	X2D11	X2B05	X3D11	X3B05	X4D11	X4B05	X5D11	X5B05
Bit 3	X2B10	X2D05	X3B10	X3D05	X4B10	X4D05	X5B10	X5D05
Bit 4	X2D10	X2B04	X3D10	X3B04	X4D10	X4B04	X5D10	X5B04
Bit 5	X2B09	X2D03	X3B09	X3D03	X4B09	X4D03	X5B09	X5D03
Bit 6	X2D09	X2D02	X3D09	X3D02	X4D09	X4D02	X5D09	X5D02
Bit 7	X2B08	X2B02	X3B08	X3B02	X4B08	X4B02	X5B08	X5B02
Bit CK	X2D13	X2D07	X3D13	X3D07	X4D13	X4D07	X5D13	X5D07

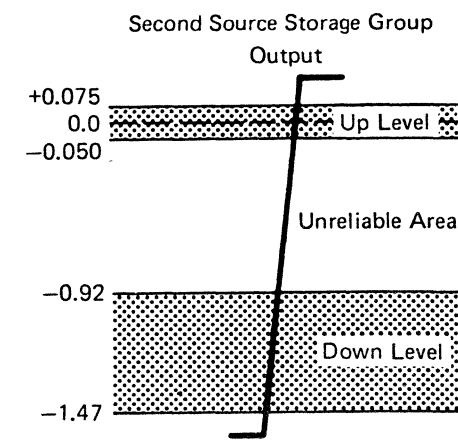
Note: Scope points without card locations have the same pin assignments on all cards.

Source 2

Byte	0	1	2	3
4	5	6	7	
8	9	10	11	
12	13	14	15	

Bit 0	B02	J04	P06	U07
Bit 1	D10	J04	P10	U04
Bit 2	B08	G02	P11	S12
Bit 3	D04	J02	S03	S13
Bit 4	B04	G05	S04	U05
Bit 5	B10	J06	P09	S05
Bit 6	D11	J09	M10	U10
Bit 7	D13	G09	U02	S11
Bit CK	D02	B05	P05	S02

Address	Bit	Even	Odd	Source 2
10	T1A06	G1D11	M05	
11	S1E08	G1C11	J07	
12	V1A06	U1D06	M03	
13	V1A08	U1C06	G06	
14	U1B08	H1E11	B09	
15	U1A08	H1E13	D09	
16	T1E06	H1C11	S09	
17	T1D06	H1B11	U09	
18	T1C08	H1A13	M13	
19	T1B08	G1E13	G13	
20	G1B13	L1D11	B12	
21	G1A13	L1D13	B07	
22	F1E11	L1B11	S10	
23	F1D13	L1A11	S07	
24	J1D11	K1E13	P13	
25	J1C13	K1D13	J10	



Channel Aids

Channel Failure Isolation

Use this procedure when the Cable Wrap test indicates an error inside the processing unit.

Isolation Procedure

1. Set the CE Mode switch to CE Mode.
2. Install FUNC1 diskette into diskette drive 1.
3. Install DIAG1 diskette into diskette drive 2.
4. Press MODE SEL. The General Selection (Q) screen appears.
5. Key QG next to COMMAND:.
6. Press ENTER. The PU Diagnostic Selection screen appears.
7. Key C next to COMMAND:.
8. Press ENTER. The Special Channel Tests screen appears.
9. Key O2 next to COMMAND:.
10. Press ENTER. Detailed instructions and available options are displayed to aid you in running the tests.
11. Install bus (part 8483772) and tag (part 848773) wrap tools.

12. Select Wrap test Option D (Loop Test/No Error Reports).
13. Refer to the displayed screen, and determine which bit(s) is failing.

Use the point-to-point drawing on the following page to scope the failing line for a signal swing of 0.0 to +3.5 volts. If you are not able to isolate the failure, invoke your support structure.

Be aware that the signal starts at the interface adapter card (IFA), travels across the board net, out its related Yx connector (card side), through its attached cable to the gate, and then through the wrap tool.

The signal then returns from the gate, through a cable to the board and through its related Zx connector (card side), and across the board net to the IFA card input pin.

Notes:

- The IFA card pins shown are the same for each channel. To locate the IFA card for the channel being tested, use the following:

Channel	IFA Card
0	01A-A3K2
1	01A-A3E2
2	01A-A3F2
3	01A-A3G2
4	01A-A3H2
5	01A-A3J2
6	01A-A3P2
7	01A-A3Q2
8	01A-A3R2
9	01A-A3S2
A	01A-A3T2
B	01A-A3U2

- Select a vertical column of pins under the channel number of the channel being tested.
- Gate 01E connector pins are the same for each channel. For more information, see Volume A07, Locations, "Gate 01E."

Bus Wrap Terminator (Part 8483772) Wiring

Bus Bit	Bus Out	Bus In
P	B03	G03
0(80)	D04	J04
1(40)	B05	G05
2(20)	D06	J06
3(10)	B08	G08
4(08)	D09	J09
5(04)	B10	G10
6(02)	D11	J11
7(01)	B12	G12
MARK	D13	J13

Tag Wrap Terminator (Part 8483773) Wiring

Tag Bit (hex)	Tag Out	Pin	Tag In	Pin
0(80)	SUPR	B12	REQ	J06
1(40)	OP	J13	OP	B03
2(20)	HOLD	G12	DISC	J11

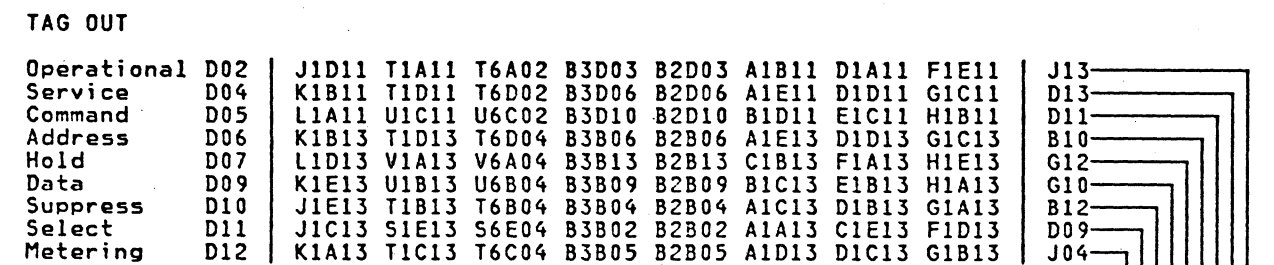
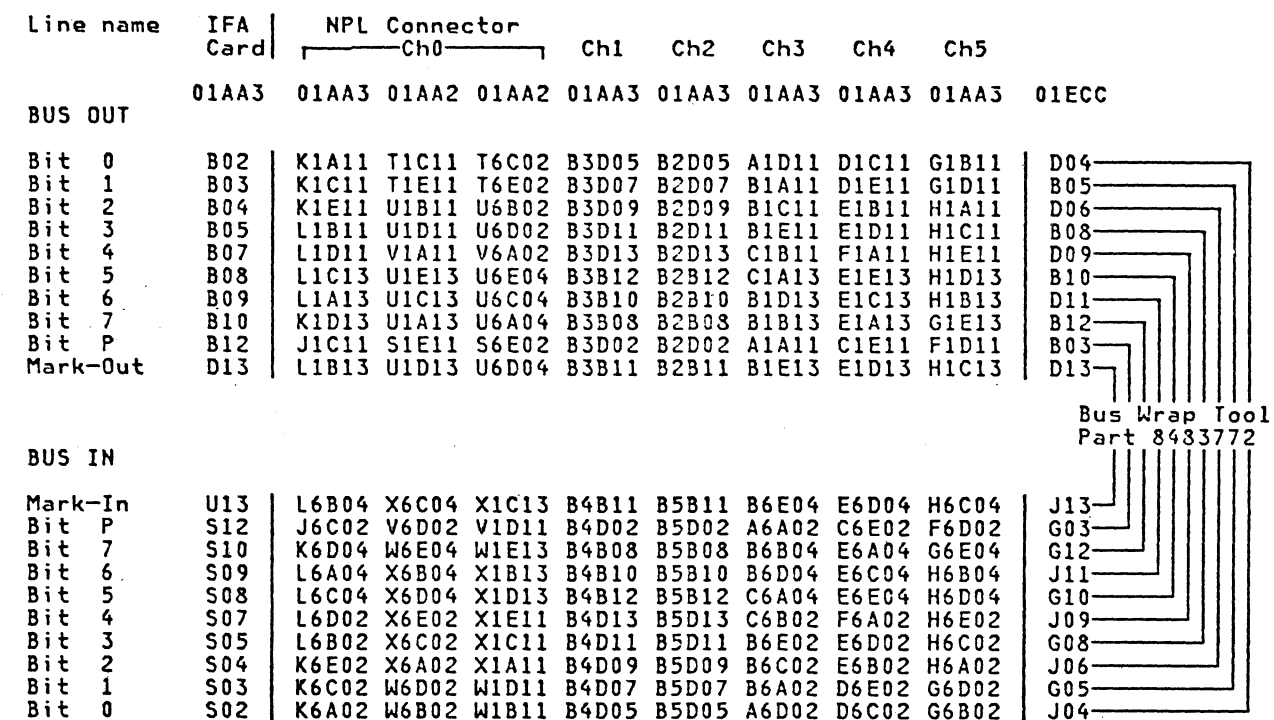
Tag Bit (hex)	Tag Out	Pin	Tag In	Pin
3(10)	ADR	B10	ADR	B05
4(08)	SEL	D09	SEL	B08
5(04)	CMD	D11	STAT	D04
6(02)	DATA	G10	DATA	G08
7(01)	SRV	D13	SRV	D06
	MTR	J04	MTR	G05

Seq FK005	PN 0446101 Pg 1 of 1	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02220 06 JUN 84		
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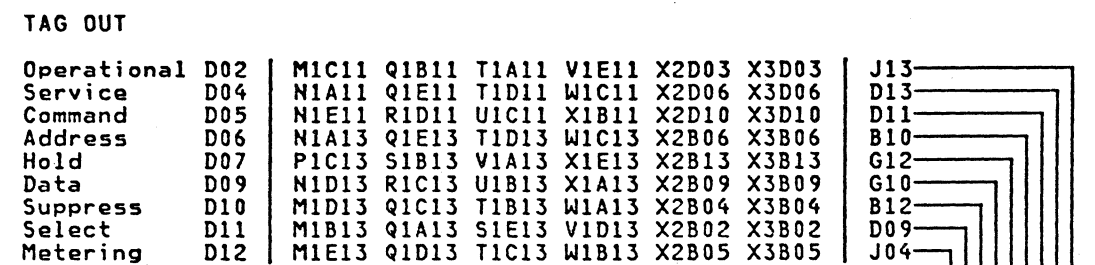
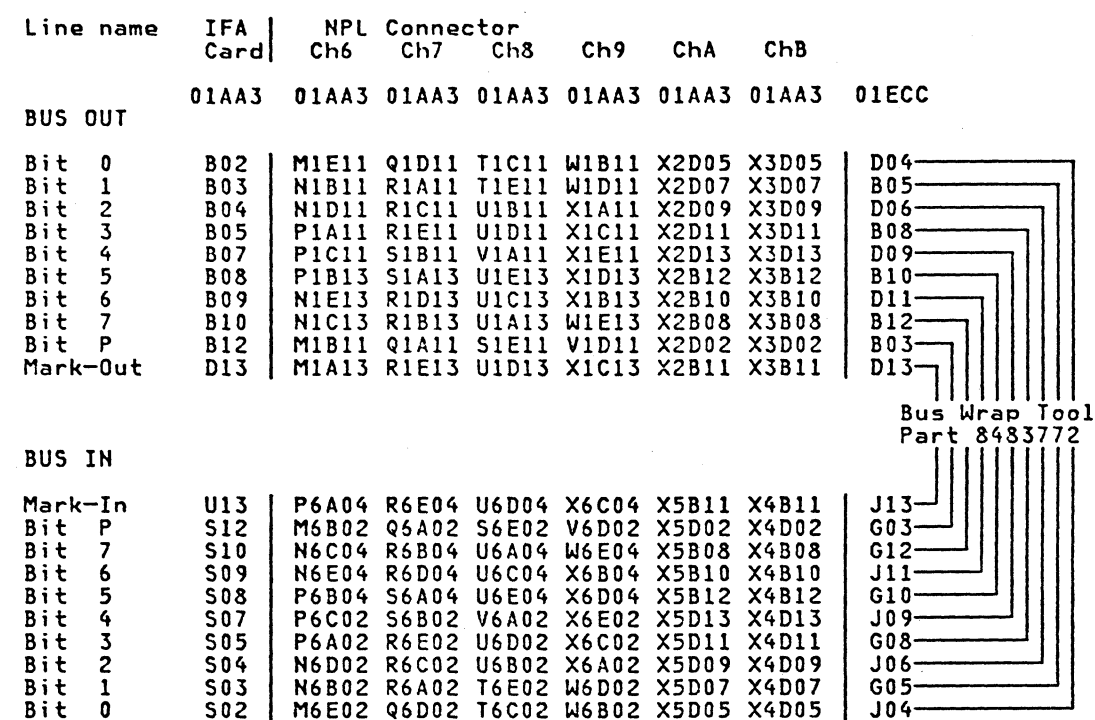
Bus and Tag Lines -- 01A-A3/01A-A2/01E-CC Pins

Bus and Tag Pins—Channels 0-5

Note: Channel 0 driver/receiver card for the Local Channel Adapter (LCA) is located on 01A-A2X2.



Bus and Tag Pins—Channels 6-B



Seq FK015	PN 0446102 Pg 1 of 1	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84
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Channel Interface/Holly Monitor Procedure

Warning: Use this procedure under the direction of your support structure.

Notes:

- Use the L-Action on the Address Compare (QAA) screen to activate the channel sync pulse.
- The sync pulse is available at 01A-A3N2G02 (Holly Box Out Line).
- A jumper from 01A-A3N2G02 to a Special-In tag line is used to make the sync pulse available at the 370 I/O interface.

1. Press STOP on the operator control panel (OCP). INSTR STOP is displayed on the screen.
2. Connect the monitor to the required channel.
3. Choose the Special Tag Line (SP IN), located on board 01A-A3, associated with the channel you are to monitor.

Channel	Location
0	A3B02
1	A3B04
2	A3B05
3	A3B06
4	A3B08
5	A3B09
6	A3D03
7	A3D05
8	A3D06
9	A3D07
A	A3D09
B	A3D02

4. To activate the Special Tag Line, jumper the Holly Box Out Line 01A-A3N2G02 to the point you chose from the chart. This point is used as your SYNC.

Note: The Holly Box Out Line is an actual line name on board 01A-A3, which is used for both monitors.

5. Key QAA next to COMMAND:.
6. Press ENTER. The Address Compare (QAA) screen appears.
7. Go to Volume A08, Console Functions and Messages, "(QAA) Address Compare." Select the action L (Channel Sync), then select the parameters for your particular compare/trace. This freezes the Channel Interface/Holly Monitor at the match condition you selected.

TIO Single Cycle Mode (S/370 Mode)

Use this procedure to single cycle TIO (Test I/O).

Note The Symbol '___' indicates a channel number.

1. Set machine to microstep.
Key in QOM, and press ENTER.
2. Set CH___CMDR reg to 20.
Key in QVH___29=20, and press ENTER.
3. Clear CCA array.
Key in QVH___07=0000000000000000, and press ENTER.
4. Clear CHCCAR1.
Key in QVH___09=00000000, and press ENTER.
5. Clear CHCCAR2.
Key in QVH___11=00000000, and press ENTER.
6. Set CH___CMDRD (Cmd Ready Lt) on.
Key in QVH___32=1, and press ENTER.
7. Set CH___SYNCO to device address.
Key in QVH___12=UU, and press ENTER, where UU = device address.
8. Start Single Cycle.
 - a. Press the START key, and then the press ENTER key.
 - b. Monitor the TAG and BUS lines.
 - c. After pressing the START and ENTER keys several times, the TAG and BUS lines will change.
 - d. After STATUS IN, further pressing of the START and ENTER keys will be useless. To restart, go back to beginning of this procedure.

TIO/SIO Loop Procedure (S/370 Mode)

The following program can be used to loop I/O for scoping. This program can be entered as a block and saved on the diskette. For additional information on the block procedure, see Volume A08, Console Functions and Messages, "(QB) Block/Patch Screens." The block screen contains all the commands necessary to edit and run the block.

Block Program - TIO/SIO Loop (S/370 Mode)

```

01 DO.01.TIO-SIO Loop (370 mode)
02 QOI
03 KEY.START.01
04 QDM000=0004000000000400
05 QDM048=00000500
06 QDM070=0002000000FCCECE
07 QDM078=0004000000000400
08 QDM400=9D000CUU47700410
09 QDM408=9C000CUU47F00410
0A QDM410=9104004047800400
0B QDM418=8000007582000070
0C QDM500=0400060020000018
0D QDP0=0004000000000400
0E QON
0F NOP.PUSH.START.KEY.TO.START
10 NOP.CUU.AT.402.AND.40A
11 NOP.CCW.AT.500
12 END.XXXX.I.YOURNAME.DATE
    
```

Before loading the block, do a system reset-clear.

This block stores the necessary information in main storage to loop a specified I/O device as specified by the CUU (device address) at locations 402 and 40A. These locations can be changed to specify any device desired.

Location 400 contains the TIO instruction for device 'CUU.' The next instruction is a Branch that will test the condition code of the TIO and will branch to location 410 if the condition code is 1, 2 or 3. If the condition code is 0, a branch to location 408 occurs.

Location 408 contains the SIO instruction for device 'CUU'. The next instruction will branch to location 400.

Location 410 does a Test Under Mask for the logout pending bit and falls through to location 418 if the bit is on.

Location 418 (Set System Mask) sets the system mask to allow interrupts and stores a CSW. Bits 0-7 of the current PSW are overlaid with the system MASK bits at location 418. System mask bits X'FC' allow I/O interrupts for every channel at location 75.

After executing the SSM instruction if an interrupt occurs, the I/O new PSW is loaded into location 400. If no interrupts occur, a Branch is taken to location 41C. Location 41C will load the current PSW with the contents of location 70 and a wait state occurs. To restart, do a system reset-normal and then restart.

Location 70 is the machine check new PSW, has the wait bit set to 1, and does not allow interrupts.

Location 78 is the I/O new PSW.

The CCW is located at location 500 and has a Sense command. The sense data will be stored at location 600.

Lines 0F through 11 are NOP comment lines to describe the block run procedures.

Seq FK035	PN 0446104 Pg 1 of 1	EC A02214 15 SEP 83				
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Loop Procedures (S/370XA)

Two loop procedures are available for testing channels in S/370XA mode. They reside on the functional diskette as Block programs; they are:

- ENSSCH—used to enable all subchannels.
- BSSCH1 and BSSCH2—used to issue a sense command to a device.

Use these procedures under the direction of your support structure.

Enable All Subchannels

This program will load General Purpose Register 1 (GPR1) with subchannel number 000, enable the subchannels with the Interruption Subclass Code 0 (ISC), step the subchannel number by 1, and continue through the loop until all subchannels have been enabled. A wait state code of EACC3 will be displayed after all the installed subchannels have been enabled.

Note Do not issue a System Reset after the loop is executed as this will disable all the subchannels.

Enable All Subchannels Procedure

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key QBAENSSCH next to COMMAND:.
3. Press ENTER. This loads the block.
4. Key QRESTART next to COMMAND:.
5. Press ENTER. This starts the execution of the block. EACC3 will be displayed in the PSW after all installed subchannels have been enabled.

Block Program - Enable All Subchannels

```

01 DO>01 ENSSCH
02 QDM00000000=0108000000000800
03 QDM00000058=010F000000DEAD58
04 QDM00000060=010F000000DEAD60
05 QDM00000068=010F000000DEAD68
06 QDM00000070=010F000000DEAD70
07 QDM00000078=010F000000DEAD78
08 QDM00000800=58100850
09 QDM00000804=B2340700
0A QDM00000808=47100840
0B QDM0000080C=92800705
0C QDM00000810=B2320700
0D QDM00000814=47700814
0E QDM00000818=41101001
0F QDM0000081C=47F00804
10 QDM00000840=82000848
11 QDM00000848=010E000000EACC3
12 QDM00000850=00010000
13 END>36EA
    
```

Basic Start Subchannel

This program allows you to invoke a channel program for a particular I/O device. The program consists of a single Channel Control Word (CCW) specifying a Sense command and setting the Operation Request Block (ORB). The ORB is set up with a Logical Path Mask (LPM) of X'FF' and a channel program address of X'890'. The subchannel number associated with the I/O device is specified at location X'852'. The paths selected by the channel subsystem can be altered by changing the LPM in the ORB at location X'886'. The Interruption Request Block (IRB) is stored at location X'8C0' because of the Test Subchannel (TSCH) instruction being executed.

The following wait states can occur:

- CC3 - Subchannel specified at location X'854' does not exist.
- 1CC3 - Probable ORB error, LPM, or subchannel not enabled.
- DEAD68 - Program Check at location X'28'. This location stores the updated storage address and interruption code. Verify the program for any entry errors.

Basic Start Subchannel Procedure

1. Press MODE SEL. The General Selection (Q) appears.
2. Key QBABSSCH1 next to COMMAND:
3. Press ENTER. The block loads into main storage.
4. When END appears on the status line, press MODE SEL.
5. Update the subchannel by keying in QMD852=xxxx. xxxx is the subchannel ID (SCHID) number of the device you want to issue a sense command to.
6. Press ENTER. The SCHID is stored in main storage location X'852'.
7. Key QRESTART next to COMMAND:.
8. Press ENTER. This starts the program.

The program is designed to execute a sense command with a type 0 CCW at location X'890'. If you want to change the program, do the following:

1. Press MODE SEL. The General Selection (Q) screen appears.
2. Key in QDM890=xxxx next to COMMAND:.. xxxx is your new CCW or CCW string.
3. Press ENTER.
4. Key QRESTART next to COMMAND:.
5. Press ENTER. This starts the program.

Block Program - Basic Start Subchannel

```

01 DO>01 BSSCH1
02 QDM00000000=0108000000000800
03 QDM00000058=010F000000DEAD58
04 QDM00000060=010F000000DEAD60
05 QDM00000068=010F000000DEAD68
06 QDM00000070=010F000000DEAD70
07 QDM00000078=010F000000DEAD78
08 QDM00000800=58100850
09 QDM00000804=B2340700
0A QDM00000808=47100860
0B QDM0000080C=92800705
0C QDM00000810=B2320700
0D QDM00000814=47700810
0E QDM00000818=B2330880
0F QDM0000081C=47600824
10 QDM00000820=47100870
11 QDM00000824=B23508C0
12 XFER.BSSCH2
13 END>FCEA>
    
```

```

01 DO>01 BSSCH2
02 QDM00000824=B23508C0
03 QDM00000828=47800818
04 QDM00000850=00010000
05 QDM00000860=82000868
06 QDM00000868=010F00000000CC3
07 QDM00000870=82000878
08 QDM00000878=010F000000001CC3
09 QDM00000880=00000000
0A QDM00000884=0000FF00
0B QDM00000888=00000890
0C QDM00000890=0400100020000020
0D *MUST HAVE BLOCK BSSCH1 INVOKED*
0E
0F
10
11
12
13END>CCEA>
    
```


**Channel Interface Adapter (IFA) Card
Scope Points**

Use these IFA card scope points when directed by your support structure. An IFA card is associated with each channel, each with the same pin and line points. To isolate errors while scoping, use the "Channel Isolation Procedure" or the "SIO/TIO Loop Procedure." If the SIO/TIO Loop Procedure is used, verify the operating mode, S/370 or S370/XA, and then use the appropriate loop procedure.

Channel	IFA Card
0	01A-A3K2
1	01A-A3E2
2	01A-A3F2
3	01A-A3G2
4	01A-A3H2
5	01A-A3J2
6	01A-A3P2
7	01A-A3Q2
8	01A-A3R2
9	01A-A3S2
A	01A-A3T2
B	01A-A3U2

IFA Card Scope Points

LINE NAME		PIN	PIN	LINE NAME	
+OPERATION-OUT (OP)	*NPL TAG*	D02	B02	+BUS-OUT BIT 0	*NPL*
+5 VOLTS		D03	B03	+BUS-OUT BIT 1	*NPL*
+SERVICE-OUT (SR)	*NPL TAG*	D04	B04	+BUS-OUT BIT 2	*NPL*
+COMMAND-OUT (CM)	*NPL TAG*	D05	B05	+BUS-OUT BIT 3	*NPL*
+ADDRESS-OUT (AD)	*NPL TAG*	D06	B06	-4.25 VOLTS	
+HOLD-OUT (HL)	*NPL TAG*	D07	B07	+BUS-OUT BIT 4	*NPL*
GROUND		D08	B08	+BUS-OUT BIT 5	*NPL*
+DATA-OUT (DA)	*NPL TAG*	D09	B09	+BUS-OUT BIT 6	*NPL*
+SUPPRESS-OUT (SU)	*NPL TAG*	D10	B10	+BUS-OUT BIT 7	
NPL					
+SELECT-OUT (SE)	*NPL TAG*	D11	B11	+6 VOLTS	
+METER-OUT (MT)	*NPL TAG*	D12	B12	+BUS-OUT BIT P	*NPL*
+MARK-OUT (M)	*NPL TAG*	D13	B13	-1.5 VOLTS	
-MARK/LOCKOUT/END (MK)	*IBD*	J02	G02	-BUS BIT 0	*BIDI*
+5 VOLTS		J03	G03	-BUS BIT 1	*BIDI*
-XFER SIG EVEN (XE)	*IBD*	J04	G04	-BUS BIT 2	*BIDI*
-XFER SIG ODD (XO)	*IBD*	J05	G05	-BUS BIT 3	*BIDI*
-PARITY GOOD (PG)	*IBD*	J06	G06	+TIEUP	
-METERING-IN (MT)	*IBD*	J07	G07	-BUS BIT 4	*BIDI*
GROUND		J08	G08	-BUS BIT 5	*BIDI*
-CONTROL IN 1 (From Scan Card)		J09	G09	-BUS BIT 6	*BIDI*
-CONTROL IN 2 (From Scan Card)		J10	G10	-BUS BIT 7	*BIDI*
-CONTROL IN 3 (From Scan Card)		J11	G11	+6 VOLTS	
-CONTROL IN 4 (From Scan Card)		J12	G12	-BUS BIT P	*BIDI*
-DATA MODE (DM)	*IBD*	J13	G13	-1.5 VOLTS	
-POWER SEQUENCE INHIBIT		P02	M02	-ADAPTOR CLOCK/STOP (AS)	*IBD*
+5 VOLTS		P03	M03	-XFER OK EVEN (XE)	*IBD*
-ODD GATE (OG)	*BI-DI*	P04	M04	-XFER OK ODD (XO)	*IBD*
-TAG SENSE	*From Scan Card*	P05	M05	-SCAN MODE CHAN	*IBD*
-DATA SENSE	*From Scan Card*	P06	M06	-RESPOND STOP SEQ (RS)	*IBD*
-STAT SENSE	*From Scan Card*	P07	M07	-SUPPRESS DATA ODD (SO)	*IBD*
GROUND		P08	M08	-HALT ADAPTER (HA)	*IBD*
		P09	M09	-INPUT MODE (IN)	*IBD*
+CONTROL IN 0	*From Scan Card*	P10	M10	+CHNL METER OUT	
-CHAN X BYTE COUNT		P11	M11	+6 VOLTS	
+CHAN X INPUT		P12	M12	-COM REG BIT 2	*IBD*
-BUSMODE/SUPPRESS EVEN		P13	M13	-1.5 VOLTS	
+METER-IN (MT)	*NPL TAG*	U02	S02	+BUS-IN BIT 0	*NPL*
+5 VOLTS		U03	S03	+BUS-IN BIT 1	*NPL*
+STATUS-IN (ST)	*NPL TAG*	U04	S04	+BUS-IN BIT 2	*NPL*
+SELECT-IN (SE)	*NPL TAG*	U05	S05	+BUS-IN BIT 3	*NPL*
+OPERATION-IN (OP)	*NPL TAG*	U06	S06	-4.25 VOLTS	
+SERVICE-IN (SR)	*NPL TAG*	U07	S07	+BUS-IN BIT 4	*NPL*
GROUND		U08	S08	+BUS-IN BIT 5	*NPL*
+ADDRESS-IN (AD)	*NPL TAG*	U09	S09	+BUS-IN BIT 6	*NPL*
+REQUEST-IN (RE)	*NPL TAG*	U10	S10	+BUS-IN BIT 7	*NPL*
+DISCONNECT-IN (DI)	*NPL TAG*	U11	S11	+6 VOLTS	
+DATA-IN (DA)	*NPL TAG*	U12	S12	+BUS-IN BIT P	*NPL*
+MARK-IN	*NPL TAG*	U13	S13	-1.5 VOLTS	

Limited Channel Logout (LCL) Bit Definitions

Limited Channel Logout (LCL) is at hex address B0-B3. To display the LCL; key in QDMB0, and press ENTER.

Bit	Definition
0	When a channel or interface control check occurs, the channel posts an LCL and sets this bit to a zero (0). Bit 0 = (0) = LCL stored in bytes (B0-B3) Bit 0 = (1) = LCL not stored (reset state)
1-3	Identity of the storage control unit (SCU) through which storage references were directed when an error was detected. When only one path exists between the channel and storage, the storage control unit has the identity of the processing unit.
4-7	Detect fields; identify the type of unit that detected the error. At least one bit is present in this field, and multiple bits may be set when more than one unit detects the error. Bit 4 = CPU Bit 5 = Channel Bit 6 = Main Storage Control Bit 7 = Main Storage.
8-12	Source field indicates the most likely source of error. Normally only one bit is present in this field. When interunit communication cannot be resolved to a single unit, such as when the interface between units is at fault, multiple bits may be set in this field. If detect and source fields indicate different units, the interface between them can also be considered as suspect. Bit 8 = CPU Bit 9 = Channel Bit 10 = Main Storage Control Bit 11 = Main Storage Bit 12 = Control Unit.
13	Reserved—Stored zero.
14	Reserved—Stored zero.
15	Reserved—Stored zero.

Bit	Definition
16-23	Field validity flags indicate the validity of the information stored in the designated fields. When the contents stored is correct, the validity bit is one. When the contents stored is unpredictable, the validity bit is zero. Validity bits for nonstored fields are meaningless. The fields designated are: Bit 16 = Reserved—Stored zero. Bit 17 = Reserved—Stored zero. Bit 18 = Reserved—Stored zero. Bit 19 = Sequence Code Bit 20 = Unit Status Bit 21 = Command Address and Key Bit 22 = Channel Address Bit 23 = Device Address.
24-25	Type of termination that has occurred is indicated by these two bits. This encoded field has meaning only when a channel control check or interface control check is indicated in the CSW. When neither of these two checks is indicated, no termination has been forced by the channel. 00 = Interface Disconnect 01 = Stop, stack, or normal termination 10 = Selective reset 11 = System reset.
26	Stored as zero.
27	Interface inoperative. When the recovery extension facility is installed, this bit is set to one when the channel detects an I/O interface malfunction, which persists after selective reset is signaled on the interface. When the recovery extension is not installed, bit 27 is zero.
28	I/O error-alert bit when set to one indicates that the limited channel logout resulted from the signaling of I/O error alert on the I/O interface by the indicated unit. This signal indicates that the control unit has detected a malfunction that prevents it from communicating properly with the channel. The channel in response performs a malfunction reset and sets the interface control check.

Bit	Definition
29-31	<p>Sequence count identifies the I/O sequence in progress at the time of error. It is meaningless if stored during the execution of HALT I/O or HALT DEVICE. For all cases, the channel program address, if validity stored and if nonzero, is the address of the current CCW + 8. The sequence code assignments are:</p> <p>000 A channel-detected error occurred during the execution of a TEST I/O or CLEAR I/O instruction.</p> <p>001 Command-out with a nonzero command byte on bus-out has been sent by the channel, but device status has not yet been analyzed by the channel. This code is set with a command-out response to address-in during initial selection.</p> <p>010 The command has been accepted by the device, but no data has been transferred. This code is set by a service-out or command-out response to status-in during an initial selection sequence, if the status is either channel end alone, channel end and device end, or channel end, device end, and status modifier, or all zeros.</p> <p>011 At least one byte of data has been transferred over the interface. This code is set with a service-out response to service-in and, when appropriate, may be used when the channel is in an idle or polling state.</p> <p>100 The command in the current CCW has either not yet been sent to the device or else was sent but not accepted by the device. This code is set when one of the following conditions occurs:</p> <ol style="list-style-type: none"> 1. When the command address is updated during command chaining or a START I/O. 2. When service-out or command-out is raised in response to status-in during initial selection sequence with the status on bus-in including attention, control unit end, unit exception, busy, status modifier (without channel end and device end), or device end (without channel end). 3. When a short, control-unit-busy sequence is signaled. 4. When command retry is signaled. 5. When the channel issues a TEST I/O command rather than the command in the current CCW. <p>101 The command has been accepted but data transfer is unpredictable. This code applies from the time a device comes on the interface until the time it is determined that a new sequence code applies. It may be used when a channel goes into the polling or idle state and it is impossible to determine that code 2 or 3 applies. It may also be used at other times when a channel cannot distinguish between code 2 or 3.</p> <p>110 Reserved.</p> <p>111 Reserved.</p>

Catalog Numbers (S/370)

Catalog Numbers are used by microcode to catalog errors. Sequence Count Numbers are used by the channel hardware to track channel operations.

After the microcode has decoded an I/O instruction and gains control of the channel, the microcode monitors the channel hardware. The Sequence Count Number is then fetched from the Channel Control Array (CCA) and is interrogated by the Multiple Decision Maker (MDM) to determine channel operation. If an error occurs, the microcode sets the error condition and Catalog Number associated with the error. The error is then logged to the diskette file. To display an IFCC error, invoke the Channel Interface Logout (QEID) screen. Then use the displayed Catalog Number and Sequence Count Number, along with the following tables, to further investigate the error.

Note The tables that follow consist of Interface Control Checks (IFCC), Channel Control Checks (CCC), and Channel Data Checks (CDC). For more information, invoke your support structure.

The Catalog Numbers are grouped into ten categories:

Range	Category
00-1F	Interface Sequence
20-3F	Microcode Timeouts
40-5F	Interface Malfunctions
60-6F	Microcode Detected Hardware Malfunctions
70-7F	Program Check Errors
80-9F	Instruction Processing Errors (architecture)
90-9F	Instruction Processing Errors (configuration dependent)
A0-BF	Interrupt Processing
C0-DF	Special Sequences
E0-FF	Support Processor

Interface Sequence

CAT NUM	SQ	Description
00		Reserved for reset state of catalog number.
02		Select-In received during initial selection sequence for an I/O instruction.
03	08	(IFCC) A Bus-In parity check was detected at Address-In time of initial selection.
04	08	(IFCC) The address sent did not agree with the address received at initial selection time.
06	0C	(IFCC) Disconnect-In was received during initial selection.
07		(IFCC) During SIO (initial selection sequence) illegal status was detected.
08	07	(IFCC) Disconnect-In was received during command chaining.
08	5C	(IFCC) Disconnect-In was received after the operation completed (Select-Out was dropped).
08	11	(IFCC) Disconnect-In was received during data transfer.
08	91	(IFCC) Disconnect-In was received during data transfer. One of the following occurred: Protection check Wrong length record (without SILI)
0A	68	(IFCC) A response of either Select-In or Address-In and Operational-In was not received when the channel sent Select-Out after receiving Request-In.
0C	5C	(IFCC) An interface line (other than Request-In) was active after the operation was complete (Select-Out was dropped).
0E	6C	(IFCC) During a Request-In sequence, an interface line remained active after Select-In was received.
10	11	(IFCC) One of the following occurred during data transfer: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.

Microcode Timeouts

CAT NUM	SQ	Description
20		(CCC) A time-out occurred while trying to gain control of the block multiplexer channel.
22		(CCC) A time-out occurred while waiting for initial selection status.
24		(CCC) A time-out occurred while trying to gain control of the byte multiplexer channel. (Entry added to channel busy queue.)
26		(CCC) A time-out occurred while waiting for initial selection status for an internal test I/O.
27		(CCC) Spin decode not blocked after control of channel obtained.
28		A SIOF was issued, and control of channel was not obtained. An entry has been added to the channel busy queue.
2A		Not all inbound tags were dropped after clear channel system reset.

Interface Malfunctions

CAT NUM	SQ	Description
40	06	(IFCC) Select-In was received during command chaining initial selection.
42	1C	(IFCC) One of the following occurred during Status-In time of initial selection: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.
42	9C	(IFCC) One of the following was detected at Status-In time of initial selection: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.
44	06	(IFCC) During initial selection, a time-out occurred while waiting for Operational-In and Address-In, Select-In, or Status-In.
44	07	(IFCC) During command chaining, a time-out occurred while waiting for the interface to clear.
44	0C	(IFCC) During initial selection, a time-out occurred while waiting for Status-In and Operational-In.
44	36	(IFCC) After Request-In from a control unit, a time-out occurred while waiting for Status-In and Operational-In.
46		A check occurred during command chaining which caused chaining to end.
48	21	(IFCC) One of the following occurred during ending status: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.
4A	37	(IFCC) After a Request-In sequence, a Bus-In parity check was detected at Status-In time.

CAT NUM	SQ	Description
4C		A request was received for a device which does not have a valid directory element.
4E	00	A request was received for a shared UCW already in use by another device.
4F		(CCC) Device did not drop off properly after a selective reset was issued. (This is a Hot-I/O problem).
50		A request was received for a device which does not control the UCW. This is an error for nonshared UCWs.

Microcode Detected Hardware Malfunctions

CAT NUM	SQ	Description
60		(CCC) The channel detected an invalid command or an invalid command/sequence count combination.
6A	36	(IFCC) After a Request-In sequence, Disconnect-In was received.
6E		The function field was zero during entry to the Asynchronous Command Completion trap.
6F	78	(IFCC) A parity check occurred during the address test (Address-In compare).

Instruction Processor Errors (architecture)

CAT NUM	SQ	Description
80		The CCW specified by the CAW is not on a double word boundary.
82		Bits 4-7 of the CAW key are not zero.
84		Data-End occurred with one of the following errors: Program check Protection check Wrong length record
86		A check condition from previous processing was detected when a Request-In occurred.

Instruction Processing Errors (configuration dependent)

CAT NUM	SQ	Description
90		Bad status was received during an IPL.
94		Channel specified by I/O instruction is not installed on the system.
96		The directory element for the addressed device does not have the VALID bit on. Possible reasons are: 1. The device has not yet been validated. 2. The addressed device is natively attached.
98		An IPL was issued to a support processor device.
9C		Test Channel—channel specified is not installed on system.
9F		Store Channel ID—channel specified is not installed on system.

Interrupt Processing

CAT NUM	SQ	Description
A1		Channel (n) interrupt because of logout pending.
A4		Channel (n) interrupt required an Internal Test I/O.
A5		Program Controlled Interrupt (PCI) not reported; wait for requeue.
A6		An asynchronous status interrupt occurred for a support processor device.

Special Sequences

CAT NUM	SQ	Description
C0		A partial UCW fetch to the processor unit direct local storage was required to determine the subchannel state.
C2	16	(IFCC) During initial selection for command chaining, a control unit busy was received.
C3		During initial selection sequence a control unit busy was received.
C4		A device on the byte multiplexer channel requested a data transfer when it was not expected. (The first such request is not an error condition.)
C6	36	(IFCC) A second request for data was received on the byte multiplexer channel when it was not expected (error condition).
C8	36	(IFCC) An unexpected data request was received (block multiplexer).
CA		Status-In without device end received while in the load loop (standard Request-In, Operational-In sequence). A command chain or a retry sequence is indicated.
CC		Ending status received without device end. A command chain or a command retry sequence is indicated.
CE		Nonzero status was received at initial selection time, and did not contain device end.
D0		A halt operation was requested.
D2		An interface disconnect has been preformed.
D6		(CCC) A Channel Control Check occurred because of a machine check.

Support Processor

AID 675

CAT NUM	SQ	Description
E0		A halt operation was attempted while a SIO was queued. The halt operation is queued.
E2		A SIO/TIO was issued to an Maintenance Support Subsystem (MSS) device while an immediate command was being completed. The SIO/TIO has been queued for reissue.
E4		One of the following invalid support processor command procedures has caused the channel to be unloaded: <ol style="list-style-type: none"> 1. A Signal Processor command (SIGP) was in process while another was trying to start. 2. An invalid TIO (CMD 00) is about to be transferred to the support processor. The TIO (CMD 00) is canceled.
E6		An interface disconnect has occurred for a queued halt operation for an Maintenance Support Subsystem (MSS) device.
E8	06	(IFCC) Select-In was received during initial selection for a support processor device (address not found).

AID 675

Catalog Numbers (S/370XA)

Catalog Numbers are used by microcode to catalog errors. Sequence Count Numbers are used by the channel hardware to track channel operations.

After the microcode has decoded an I/O instruction and gains control of the channel, the microcode monitors the channel hardware. The Sequence Count Number is then fetched from the Channel Control Array (CCA) and is interrogated by the Multiple Decision Maker (MDM) to determine channel operation. If an error occurs, the microcode sets the error condition and Catalog Number associated with the error. The error is then logged to the diskette file. To display an IFCC error, invoke the Channel Interface Logout (QEID) screen. Then use the displayed Catalog Number and Sequence Count Number, along with the following tables, to further investigate the error.

Note The tables that follow consist of Interface Control Checks (IFCC), Channel Control Checks (CCC), and Channel Data Checks (CDC).

For more information, invoke your support structure.

The Catalog Numbers are grouped into ten categories:

Range	Category
00-1F	Interface Sequence
20-3F	Microcode Timeouts
40-5F	Interface Malfunctions
60-6F	Microcode Detected Hardware Malfunctions
70-7F	Program Check Errors
80-9F	Instruction Processing Errors (architecture)
90-9F	Instruction Processing Errors (configuration dependent)
A0-BF	Interrupt Processing
C0-DF	Special Sequences
E0-FF	Support Processor

Interface Sequence (S/370XA)

CAT NUM	SQ	Description
00		Reserved for reset state of catalog number.
01		Select-In was received on all valid paths to a device (deferred CC=3).
02		Select-In was received during initial selection sequence for an I/O instruction (SSCH, CSCH, HSCH, or RSCH).
03	08	(IFCC) A Bus-In parity check was detected at Address-In time of initial selection.
04	08	(IFCC) The address sent did not agree with the address received at initial selection time.
06	0C	(IFCC) Disconnect-In was received during initial selection.
07		(IFCC) During start subchannel (initial selection sequence) illegal status was detected.
08	07	(IFCC) Disconnect-In was received during command chaining.
08	5C	(IFCC) Disconnect-In was received after the operation completed (Select-Out was dropped).
08	11	(IFCC) Disconnect-In was received during data transfer.
08	91	(IFCC) Disconnect-In was received during data transfer. One of the following occurred. Protection check Wrong length record (without SILI)
0A	68	(IFCC) A response of either Select-In or Address-In and Operational-In was not received when the channel sent Select-Out after receiving Request-In.
0C	5C	(IFCC) An interface line (other than Request-In) was active after the operation was complete (Select-Out was dropped).
0E	6C	(IFCC) During a Request-In sequence, an interface line remained active after Select-In was received.
10	11	(IFCC) One of the following occurred during data transfer: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.

Microcode Timeouts (S/370XA)

CAT NUM	SQ	Description
20		(CCC) A time-out occurred while trying to gain control of the block multiplexer channel. Entry added to that channel busy queue.
24		(CCC) A time-out occurred while trying to gain control of the byte multiplexer channel. (Entry added to channel busy queue.)
26		(CCC) A time-out occurred while trying to gain control of the channel do drop Suppress-Out. Unload with Suppress-Out bit was reset.

Interface Malfunctions (S/370XA)

CAT NUM	SQ	Description
40	06	(IFCC) Select-In was received during command chaining initial selection.
42	9C	(IFCC) One of the following was detected at Status-In time of initial selection: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.
44	06	(IFCC) During initial selection, a time-out occurred while waiting for Operational-In and Address-In, Select-In, or Status-In.
44	07	(IFCC) During command chaining, a time-out occurred while waiting for the interface to clear.
44	0C	(IFCC) During initial selection, a time-out occurred while waiting for Status-In and Operational-In.
44	36	(IFCC) After Request-In from a control unit, a time-out occurred while waiting for Status-In and Operational-In.
46		A check occurred during command chaining which caused chaining to end (Interface Disconnect).
48	21	(IFCC) One of the following occurred during ending status: Bus-In parity check Channel program check Protection check Wrong length record (without SILI) Chaining check.
4A	37	(IFCC) After Request-In from a control unit, a Bus-In parity check was detected at Status-In time.
4C		A request was received for a device which does not have a valid directory element. (Use dummy subchannel for this channel.)
4F		(CCC) Device did not drop off properly after a selective reset was issued. (This is a Hot-I/O problem.)
50		A request was received for a device which was on another channel.

Microcode Detected Hardware Malfunctions (S/370XA)

CAT NUM	SQ	Description
60		(CCC) The channel detected an invalid command or an invalid command/sequence count combination.
6A	36	(IFCC) After Request-In from a control unit, Disconnect-In was received.
6F	78	(IFCC) A parity check occurred during the address test (Address-In compare).

Program Check Errors (S/370XA)

CAT NUM	SQ	Description
70		CCW address is not on a double word boundary.
71		The CCW address is greater than 16 Meg (format 0).
72		Invalid CCW was detected by hardware.
73		Indirect Data Addressing Word (IDAW) address not on word boundary.
74		Invalid Indirect Data Addressing Word (IDAW) specified was not equal to zero for byte 0, bit 0.
75		Invalid CCW. The suspend-control flag is off, but the suspend bit is on.

Instruction Processing Errors (architecture) (S/370XA)

CAT NUM	SQ	Description
84		Data-End occurred with one of the following errors: Program check Protection check Wrong length record.

Instruction Processing Errors (configuration dependent) (S/370XA)

CAT NUM	SQ	Description
86		A check condition from previous processing was detected when a load occurred.
90		Bad status was received during an IPL.
94		Channel specified by I/O instructions (SSCH, RSCH, CSCH, HSCH, and RCHP) is either not installed on the system or not available.

Special Sequence (S/370XA)

CAT NUM	SQ	Description
C0		Because of no available paths, a fetch to set status pending was invoked.
C2	16	(IFCC) During initial selection for command chaining, a control unit busy was received.
C3		During initial selection sequence a control unit busy was received.
C4		A device on the byte multiplexer channel requested a data transfer when it was not expected. (The first such request is not an error condition.)
C6	36	(IFCC) A second request for data was received on the byte multiplexer channel when it was not expected (error condition).
C8	36	(IFCC) An unexpected data request was received (block multiplexer).
CA		Status-In without device end received while in the load loop (standard Request-In, Operational-In sequence). A command chain or a retry sequence is indicated.
CC		Ending status received without device end. A command chain or a command retry sequence is indicated.
CE		Nonzero status was received at initial selection time, and did not contain device end.
D0		During initial selection a halt operation was requested by the Halt Subchannel Instruction (HSCH).
D2		An interface disconnect has been preformed.
D3		A selective reset has been preformed.
D6		(CCC) A Channel Control Check occurred because of a machine check.

Board Aids

Clock Waveforms

This procedure allows for a visual check of the processor clock waveforms and is used under the direction of your support structure.

Required Equipment

The following equipment is required to perform this procedure:

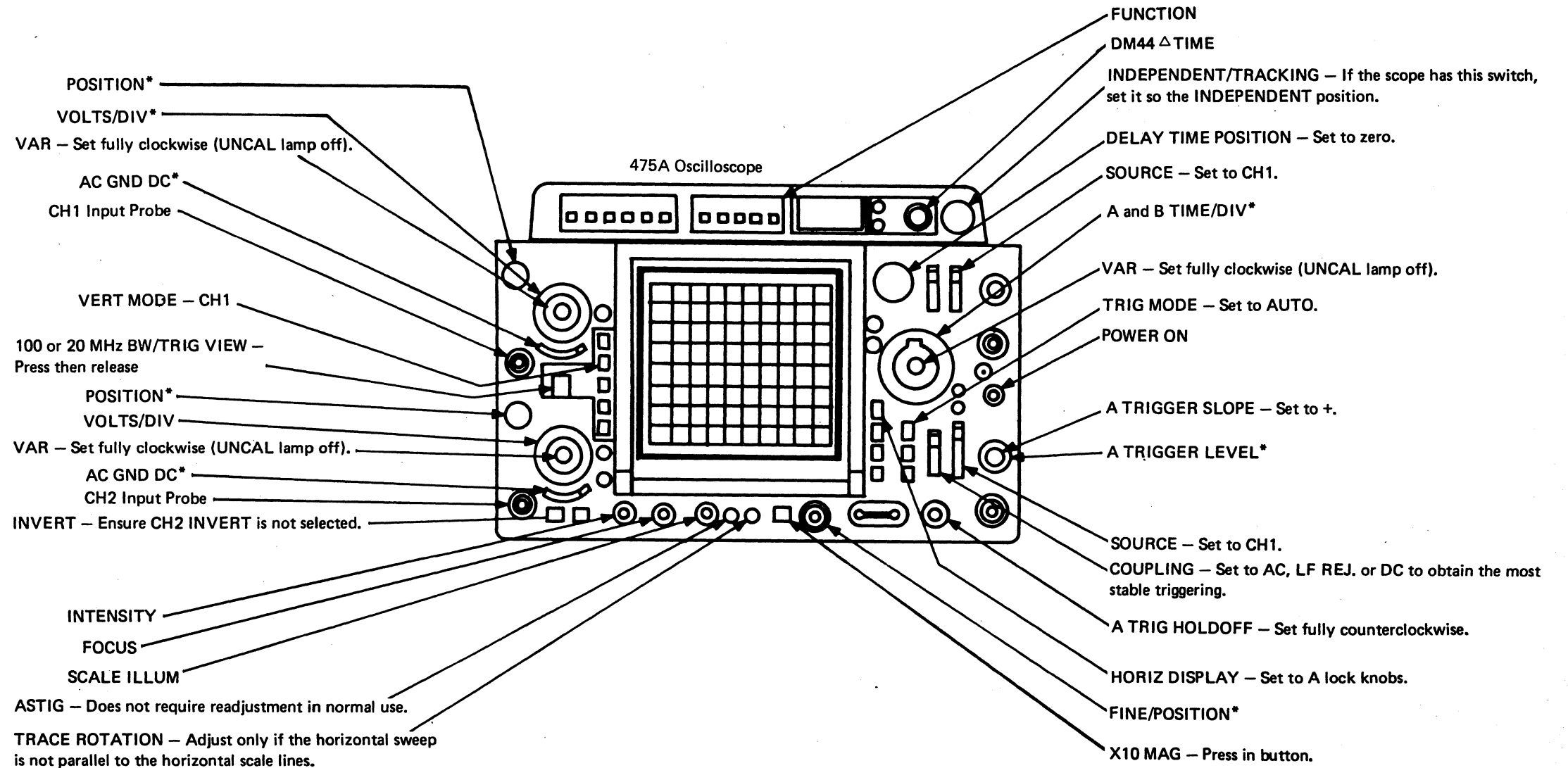
- Tektronix* Model 475A oscilloscope with DM44 option (part 1650782).
- Two Tektronix P6106 probes (part 1650776) of equal length and attenuation.
- Two probe tips (part 453915).
- Two probe tip adapters (part 1310714).
- or
- Tektronix* Model 2465 oscilloscope (part 6428882).
- Two Tektronix P6131 probes (part 7838679) of equal length and attenuation.
- Two probe tips (part 453915).
- Two probe tip adapters (part 7838680).

Before You Begin

Before you begin, ensure that:

- The processor has been IMLed and the clocks are running.
- The scope is grounded.
- The scope and leads are calibrated.
- The scope is set up as shown on this page. Controls marked with an asterisk (*) are used in the following procedures.

* Trademark of Tektronix inc.



*Indicates a control to be adjusted during the clock adjustment procedure.

Seq FM005	PN 0446112 Pg 1 of 2	EC A02214 15 SEP 83	EC A02220 06 JUN 84			
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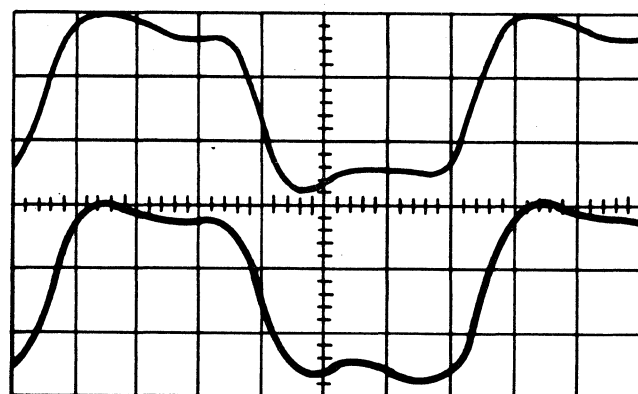
Voltage Levels

1. Set VOLT/DIV scale on CH.1 to 1 volt.
2. Set VERT MODE to CH.1.
3. Set TIME/DIV setting to 5 ns (set control knob to .05 us, and press X10 MAG button).
4. Using the CH.1 probe, verify that the correct voltage levels are present at these locations:

Probe Points	Voltage Levels
A3L2-B03	-1.0 Vdc
A3L2-B05	-2.0 Vdc
A3L2-D05	-1.0 Vdc
A3L2-D06	-2.0 Vdc
A3L2-D07	-1.0 Vdc

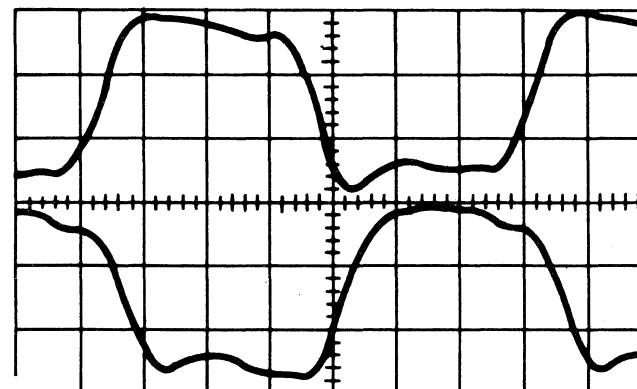
Clock Waveforms

1. Set VOLT/DIV scale on CH.1 and CH.2 to .5 volt.
2. Set VERT MODE to ALT.
3. Set TIME/DIV setting to 5 ns (set control knob to .05 us, and press X10 MAG button).
4. Attach CH.1 probe to A3L2-B02, and adjust A TRIGGER LEVEL to obtain a stable sweep.
5. Attach CH.2 probe to A3L2-D11, and adjust the POSITION control so that the waveforms look like the following figure:



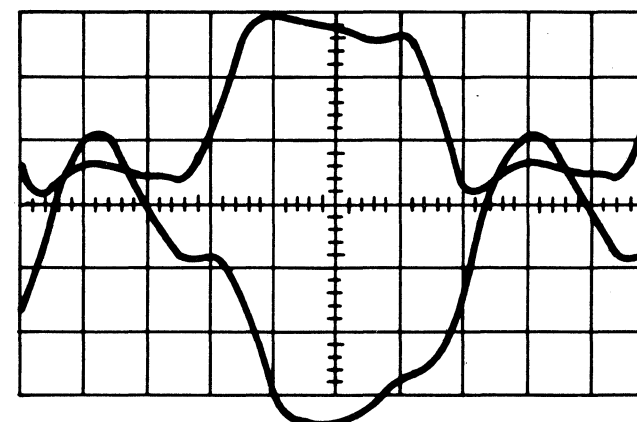
6. Attach CH.2 probe to A3L2-D12, and adjust the POSITION control so that the waveforms look like the above figure.

7. Attach CH.2 probe to A3L2-B04, and adjust the POSITION control so that the waveforms look like the following figure:

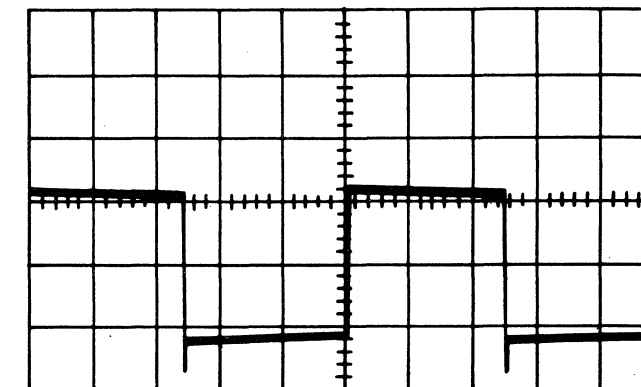


8. Attach CH.2 probe to A3L2-B11, and adjust the POSITION control so that the waveforms look like the above figure.
9. Attach CH.2 probe to A3L2-D10, and adjust the POSITION control so that the waveforms look like the above figure.

Note: For Second Source Storage, use the following figure:



10. Remove CH.2 probe.
11. Set TIME/DIV setting to .2 us.
12. Attach CH.1 probe to A3L2-B07, and adjust the POSITION control so that the waveform looks like the following figure:



Board Signal Levels

01A-A1 Board

Board	UP Level	DOWN Level	Probe Point	Figure
01A-A1	+1.7 to +6.0	+0.7 to -0.015	C2U02	A
	+3.16 to +5.10	+0.15 to 0.0	C2P02	B
	+2.5 to +5.5	+0.8 to 0.0	M1B13	C

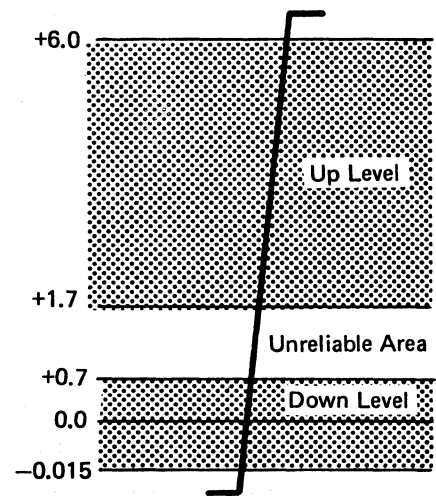


Figure A

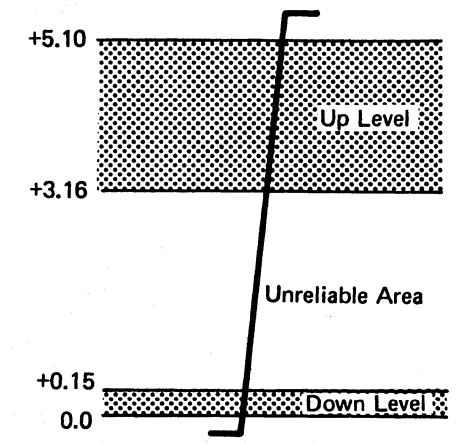


Figure B

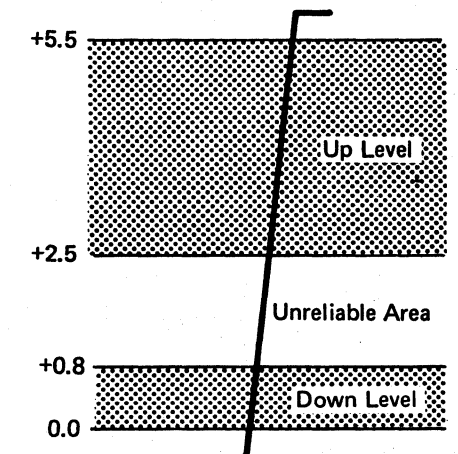


Figure C

Board	UP Level	DOWN Level	Probe Point	Figure
01A-A2	+2.4 to +5.5	+0.6 to 0.0	U2D02	A
	-0.08 to +0.02	-0.8 to -1.2	U2G02	B
	-0.08 to +0.02	-0.93 to -1.2	U2D11	C
	+2.0 to +5.5	+0.9 to 0.0	U2B10	D
	+3.16 to +5.10	+0.15 to 0.0	X2U02	E
	+2.5 to +5.5	+0.8 to 0.0	C1E08	F

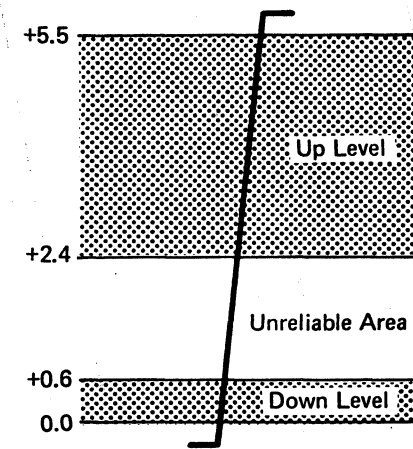


Figure A

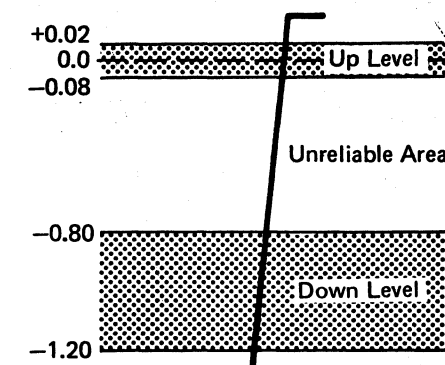


Figure B

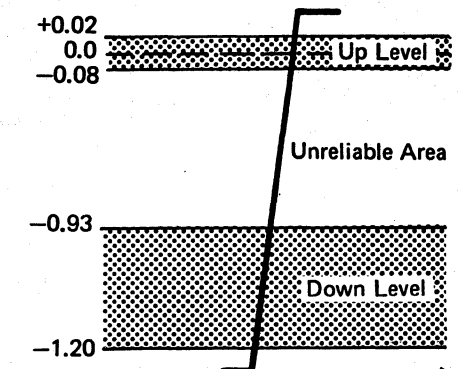


Figure C

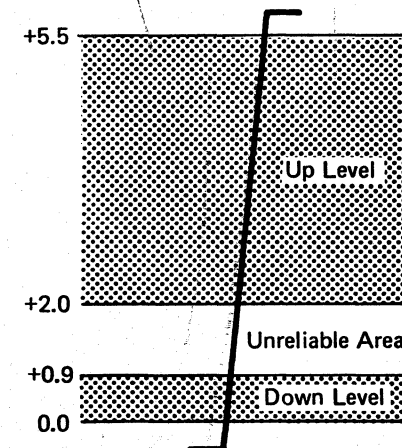


Figure D

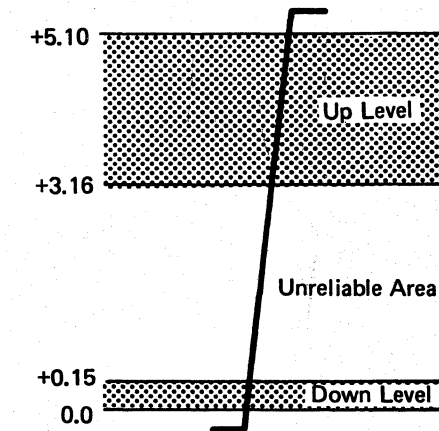


Figure E

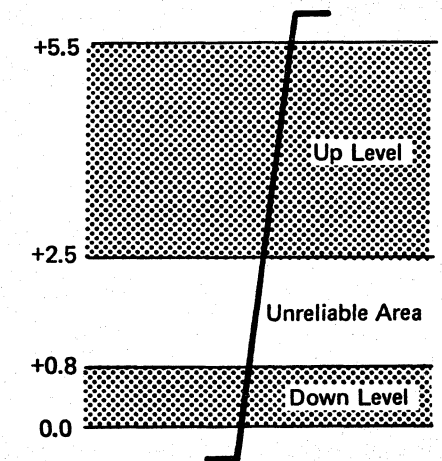


Figure F

Board	UP Level	DOWN Level	Probe Point	Figure
01A-A3	+2.4 to +5.5	+0.6 to 0.0	E4D05	A
	-1.24 to -0.90	-1.88 to -2.32	L2B04	B
	-0.08 to +0.08	-0.9 to -1.4	E3B02	C
	+1.7 to +5.5	+0.7 to 0.0	E5B02	D
	+3.16 to +5.10	+0.15 to 0.0	E2B02	E

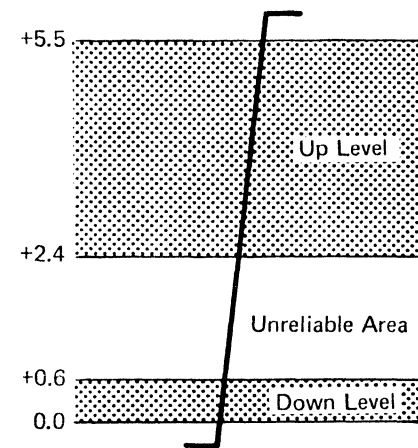


Figure A

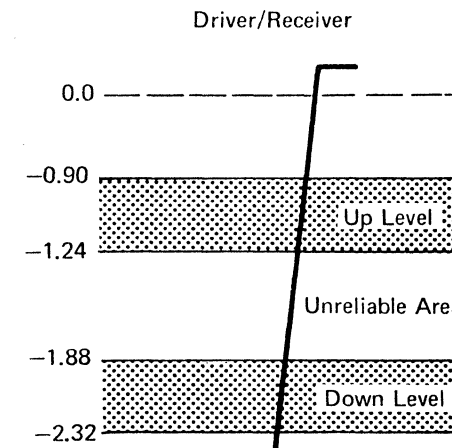


Figure B

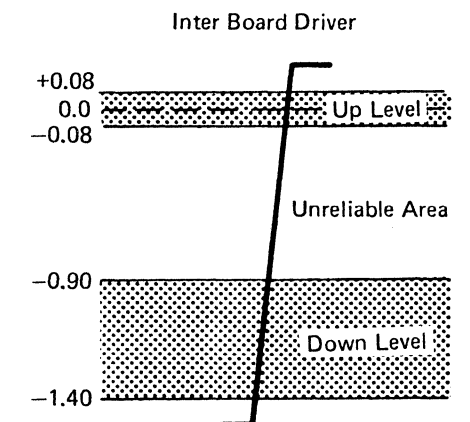


Figure C

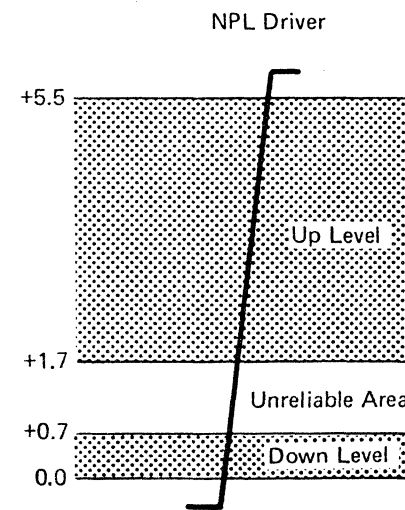


Figure D

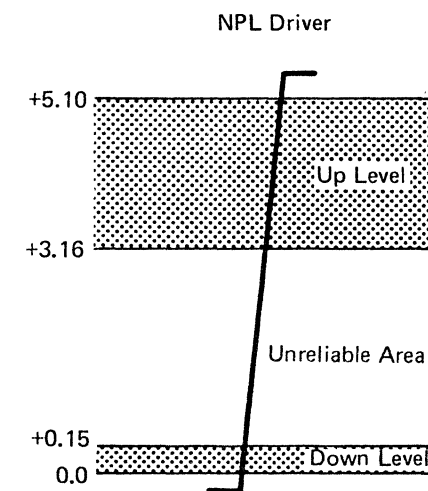


Figure E

01A-A4 Board (First Source Storage)

Board	UP Level	DOWN Level	Probe Point	Figure
01A-A4	-0.078 to +0.012	-1.38 to -0.857	X1E11	A
	-0.082 to +0.012	-1.449 to -0.964	S1A08	B
	-0.57 to -1.17	-2.3 to -1.83	L2S09	C

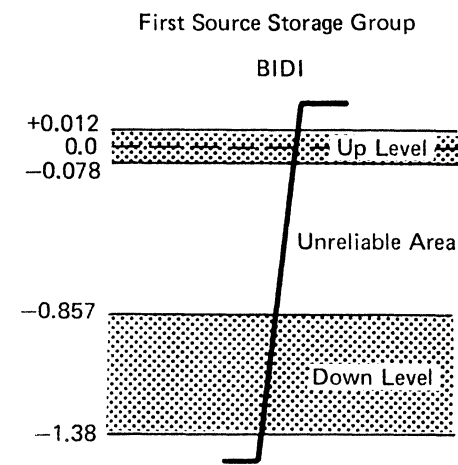


Figure A

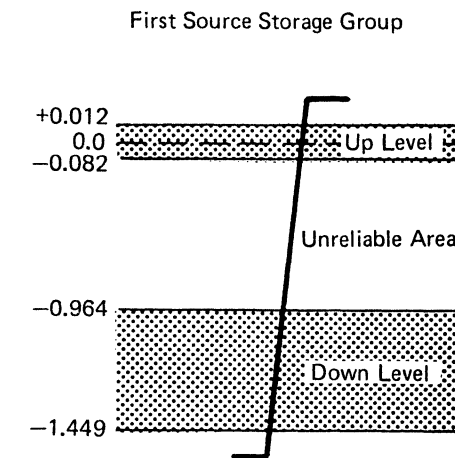


Figure B

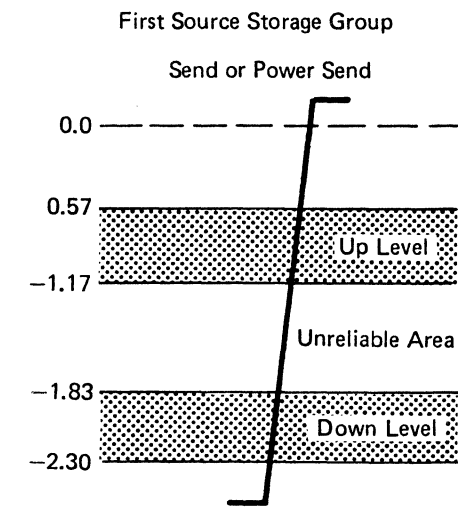


Figure C

01A-A4 Board (Second Source Storage)

Board	UP Level	DOWN Level	Probe Point	Figure
01A-A4	-0.050 to +0.075	-1.470 to -0.920	U1C08	D

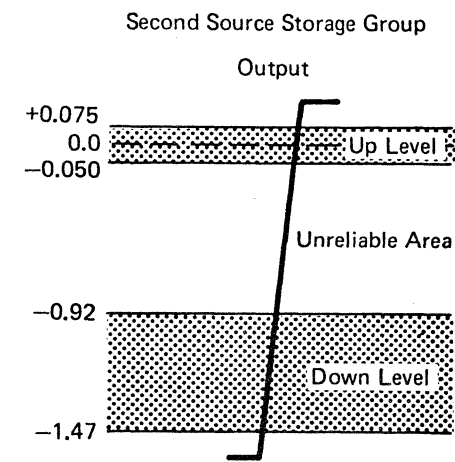


Figure D

Seq FM045	PN 0446116 Pg 1 of 1	EC A02214 15 SEP 83				
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01A-B2 Board

Board	UP Level	DOWN Level	Probe Point	Figure
01A-B2	-0.604 to -1.16	-1.677 to -2.198	HEB202	A
	+0.027 to -0.100	-1.016 to -1.35	VED711	B

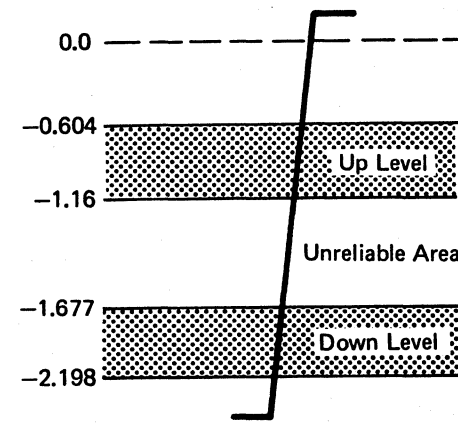


Figure A

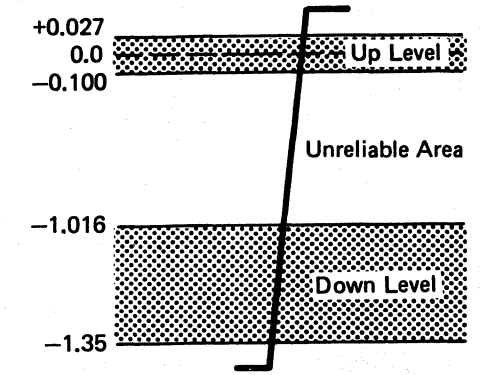
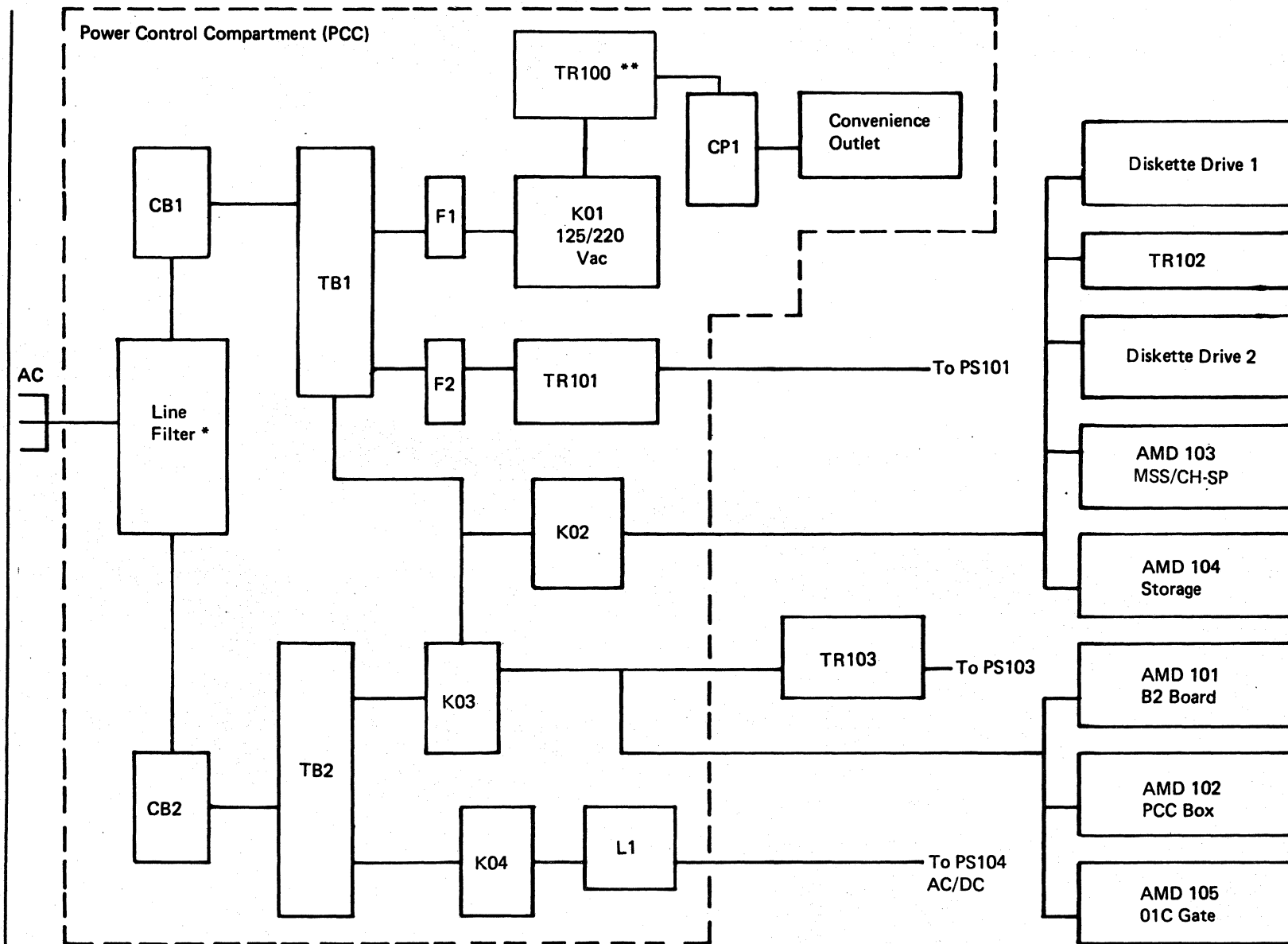


Figure B

Power Aids

AC Distribution

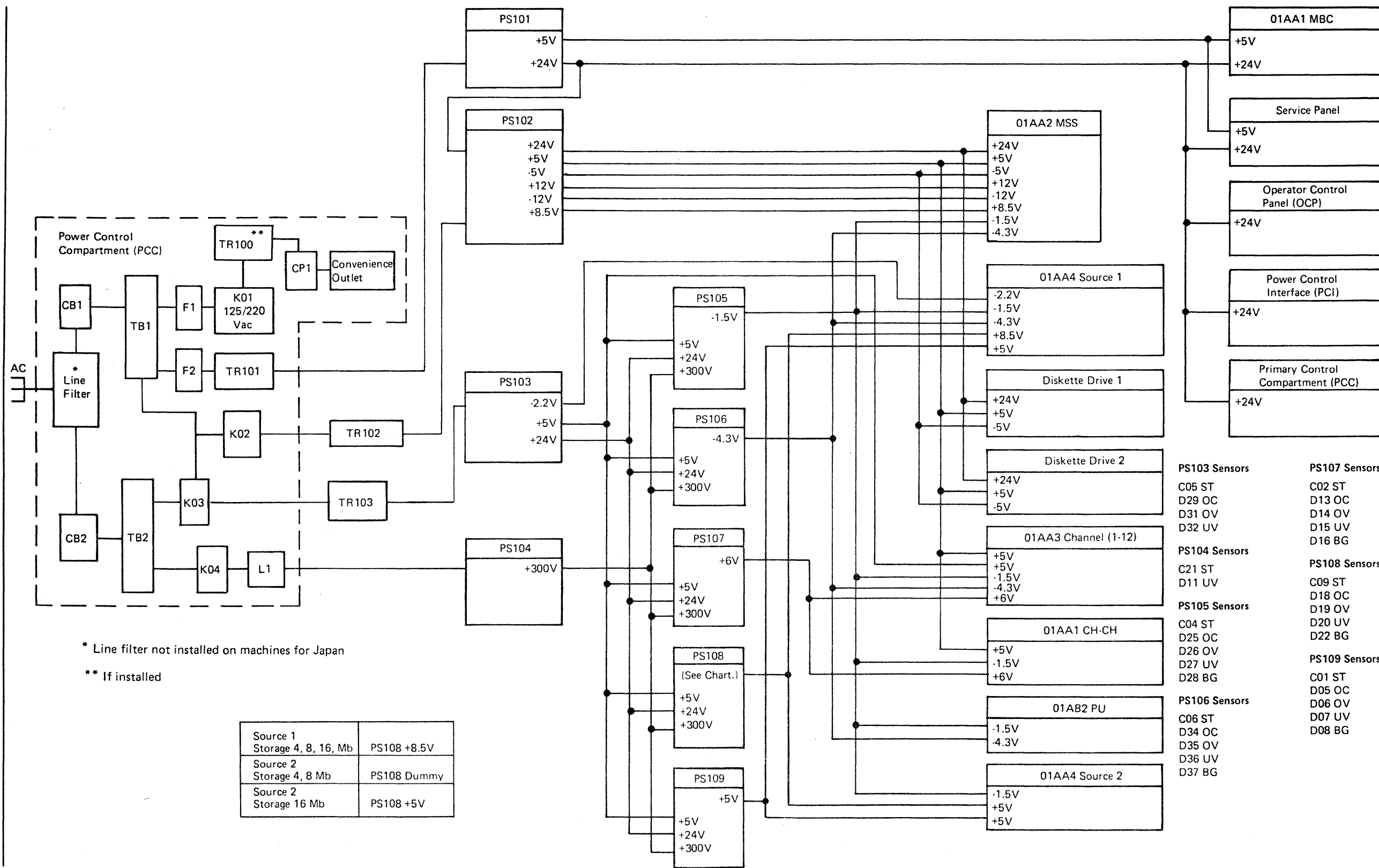


* Line filter not installed on machines for Japan

** If installed

Seq FN005	PN 0446119 Pg 1 of 1	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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DC Distribution



* Line filter not installed on machines for Japan

** If installed

- PS103 Sensors
C05 ST
D29 OC
D31 OV
D32 UV
- PS104 Sensors
C21 ST
D11 UV
- PS105 Sensors
C04 ST
D25 OC
D26 OV
D27 UV
D28 BG
- PS106 Sensors
C06 ST
D34 OC
D35 OV
D36 UV
D37 BG
- PS107 Sensors
C02 ST
D13 OC
D14 OV
D15 UV
D16 BG
- PS108 Sensors
C09 ST
D18 OC
D19 OV
D20 UV
D22 BG
- PS109 Sensors
C01 ST
D05 OC
D06 OV
D07 UV
D08 BG

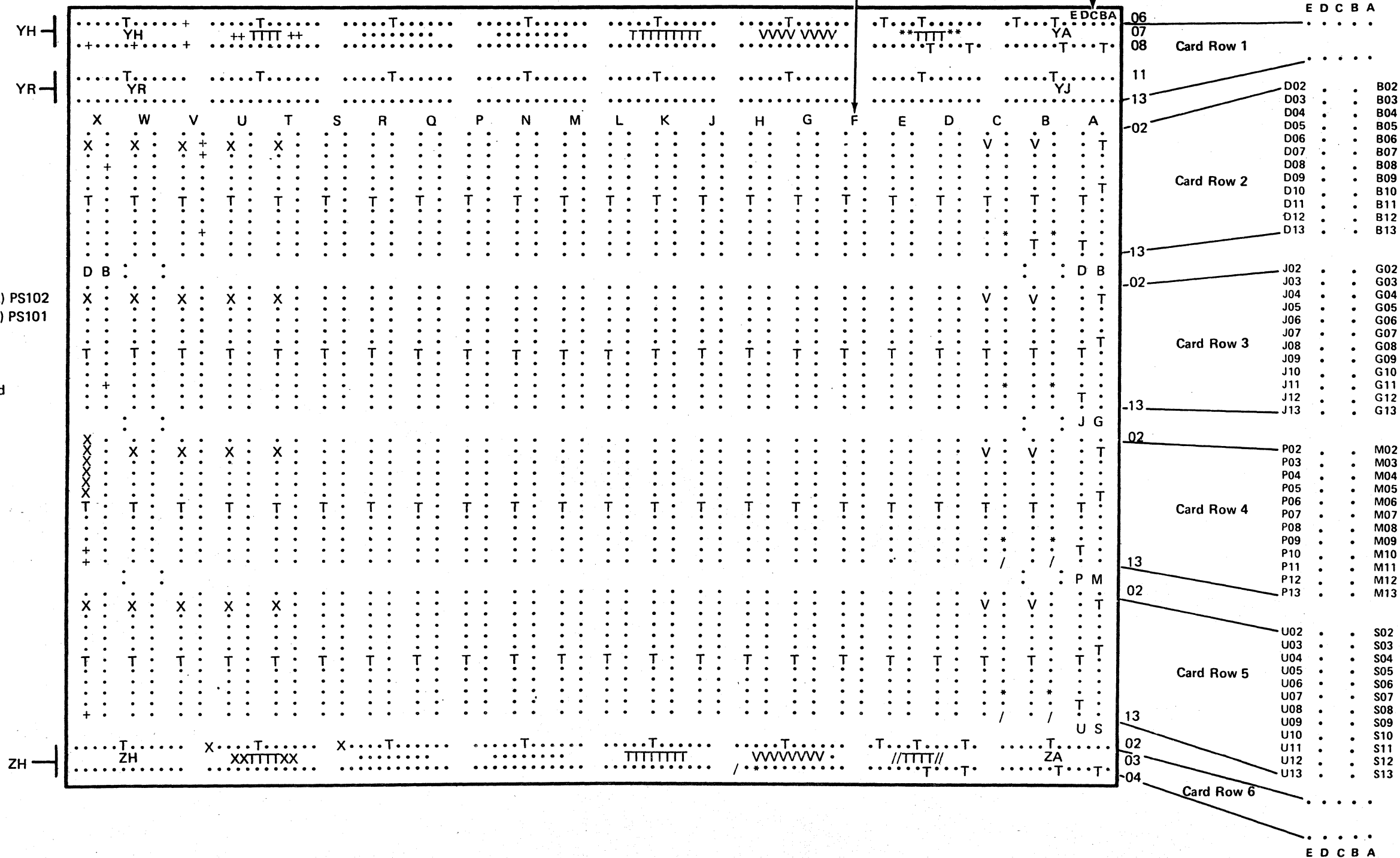
Seq FN015	PN 0446120 Pg 1 of 1	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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Board 01A-A1 Voltage Pins

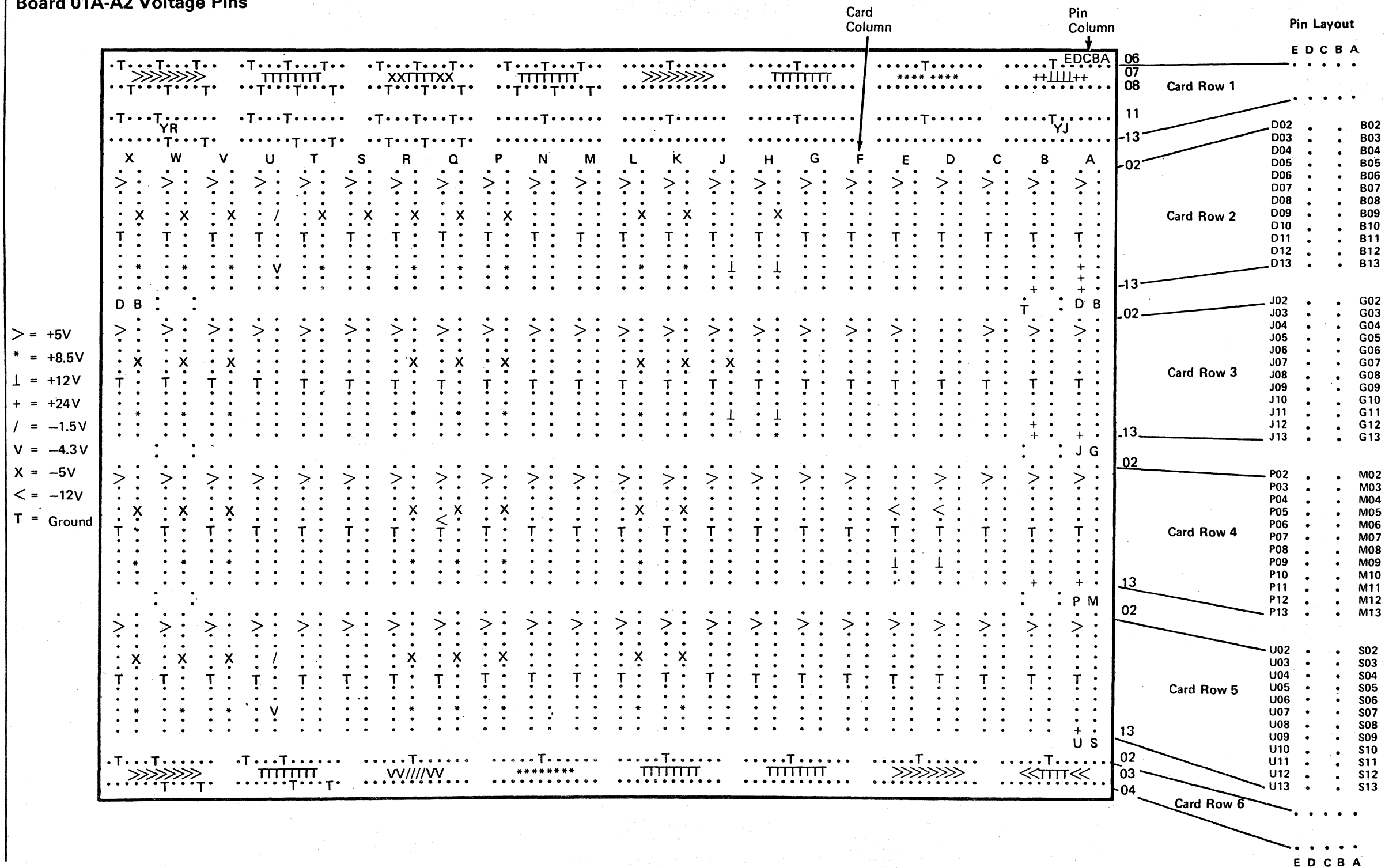
Card Column

Pin Column

Pin Layout



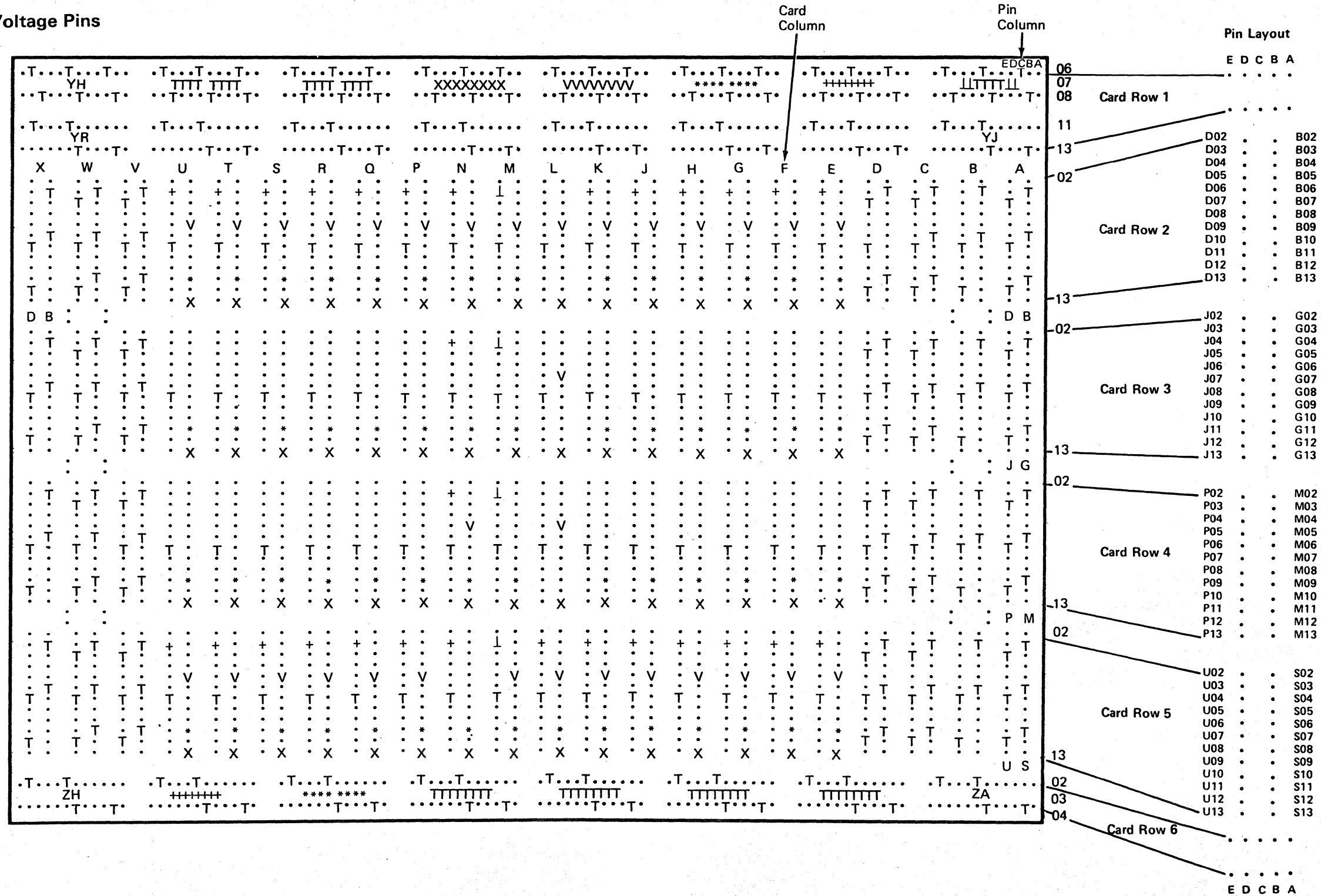
Board 01A-A2 Voltage Pins



Seq FN035	PN 0446122 Pg 1 of 1	EC A02214 15 SEP 83	EC A02215 01 NOV 83			
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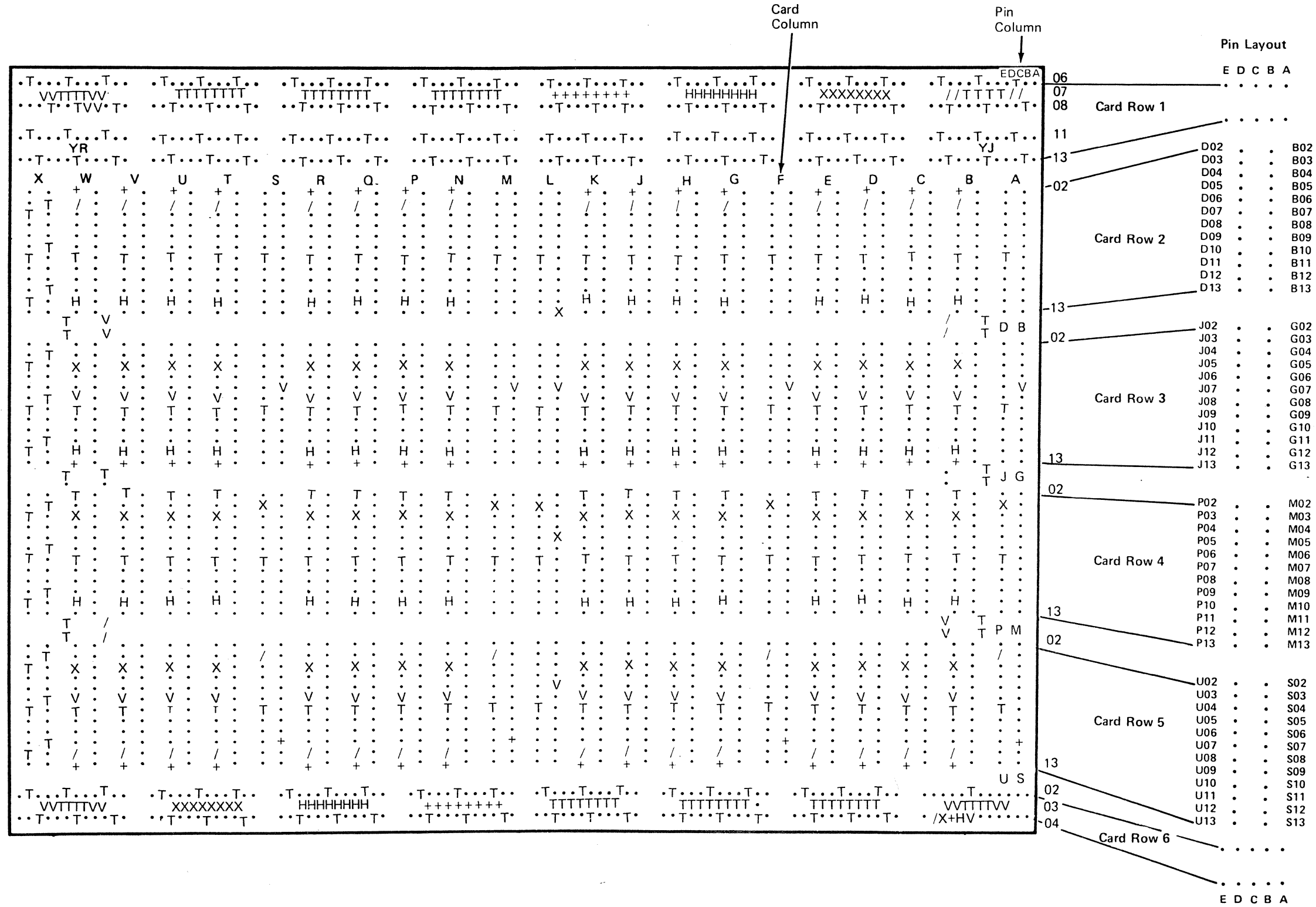
Board 01A-A3 Voltage Pins

+ = +5V PS103
 l = +5V(A) PS102
 * = +6V
 X = -1.5V
 V = -4.3V
 T = Ground



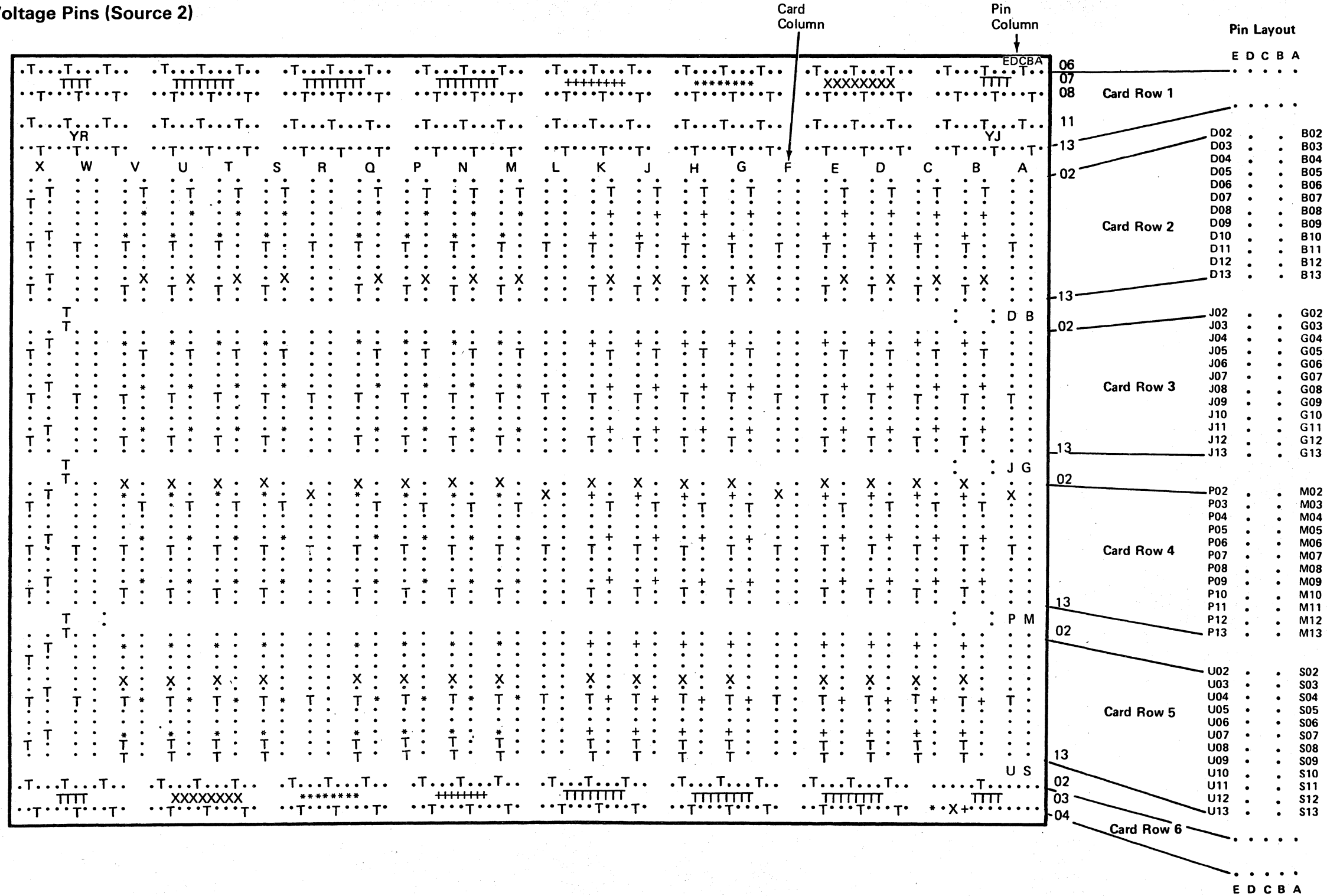
Board 01A-A4 Voltage Pins (Source 1)

H = +8.5V PS108
 Source 1
 + = +5V PS109
 X = -1.5V
 / = -2.2V
 Source 1
 V = -4.3V
 T = Ground



Board 01A-A4 Voltage Pins (Source 2)

+ = +5V PS109
 * = +5V(A) PS108
 X = -1.5V
 T = Ground



Analog Sensors

Address Bit	Sensor	Description	Power Supply	01A-A2 Paddle Card	01A-A2 Card Pin	Normal Voltage Levels
8580	A01	+24 Vdc bias	PS103	A3B08	E2B07	+1.29 to +1.71 Vdc
8540	A02	+5 Vdc bias	PS103	A3B09	E2B10	+1.29 to +1.71 Vdc
8520	A03	Spare	-----	-----	E2B02	---
8510	A04	Spare	-----	-----	E2B03	---
8508	A05	Spare	-----	-----	E2D02	---
8504	A06	Spare	-----	-----	E2B04	---
8502	A07	+5V Board 01A-A3	PS102	A5D12	E2B06	+1.29 to +1.71 Vdc
8501	A08	+5V Board 01A-A4 (Source 2)	PS108	A5D06	E2B05	+1.43 to +1.57 Vdc
8780	A09	+5V Board 01A-A4	PS109	A5B02	E2B08	+1.43 to +1.57 Vdc
8740	A10	+5V Board 01A-A3	PS103	A5B03	E2B11	+1.29 to +1.71 Vdc
8720	A11	Spare	-----	-----	E2D11	---
8710	A12	+6V Board 01A-A3	PS107	A5B05	E2D12	+1.43 to +1.57 Vdc
8708	A13	Spare	-----	-----	E2B09	---
8704	A14	+8.5V Board 01A-A4 (Source 1)	PS108	A5B10	E2D07	+1.43 to +1.57 Vdc
8702	A15	+5V Board 01A-A1 (CTCA)	PS102	B5B02	E2D06	+1.29 to +1.71 Vdc
8701	A16	+6V Board 01A-A1 (CTCA)	PS107	B5B05	E2D05	+1.37 to +1.63 Vdc
9580	A17	-1.5V Board 01A-A1 (CTCA)	PS105	B5B04	E2U06	-1.44 to -1.59 Vdc
9540	A18	-2.2V Board 01A-A4 (Source 1)	PS103	A5B11	E2U09	-1.37 to -1.63 Vdc
9520	A19	Spare	-----	-----	E2U11	---
9510	A20	Spare	-----	-----	E2S09	---
9508	A21	-5V V-Ref 01A-A2	PS102	A5B13	E2S08	-1.13 to -1.87 Vdc
9504	A22	Spare	-----	-----	E2S07	---
9502	A23	Spare	-----	-----	E2U10	---
9501	A24	Spare	-----	-----	E2S10	---
9780	A25	Spare	-----	-----	E2P12	---
9740	A26	-1.5V Board 01A-B2	PS105	B2B07	E2S04	-1.44 to -1.56 Vdc
9720	A27	Spare	-----	-----	E2S05	---
9710	A28	Spare	-----	-----	E2U05	---
9708	A29 *	-1.5V Board 01A-A2	PS105	B2B03	E2U07	-1.44 to -1.58 Vdc
9704	A30 *	-1.5V Board 01A-A4	PS105	A5B04	E2S03	-1.44 to -1.58 Vdc
9702	A31 *	-1.5V Board 01A-A3	PS105	A5D05	E2P13	-1.44 to -1.58 Vdc
9701	A32 *	Spare	-----	-----	E2M13	---

Address Bit	Sensor	Description	Power Supply	01A-A2 Paddle Card	01A-A2 Card Pin	Normal Voltage Levels
A580	A33	Spare	-----	-----	D2B07	---
A540	A34	Spare	-----	-----	D2B10	---
A520	A35	Spare	-----	-----	D2B02	---
A510	A36	Spare	-----	-----	D2B03	---
A508	A37	Spare	-----	-----	D2D02	---
A504	A38	Temperature Inlet	-----	A5D10	D2B04	+0.36 to +1.11 Vdc
A502	A39	Spare	-----	-----	D2B06	---
A501	A40	Spare	-----	-----	D2B05	---
A780	A41	CE Mode Switch	-----	C1B06	D2B08	---
A740	A42	CP Auxiliary Point	PS103	A3B11	D2B11	+2.5 to +5.5 Vdc
A720	A43	I/O Power Complete	-----	C1A06	D2D11	+2.5 to +5.5 Vdc
A710	A44	K3 Auxiliary Point (AMD/Bias)	-----	B1E06	D2D12	+2.5 to +5.5 Vdc
A708	A45	K4 Auxiliary Point (300V Bulk)	-----	B1D06	D2B09	+2.5 to +5.5 Vdc
A704	A46	I/O Power Hold	-----	B1C06	D2D07	---
A702	A47	Spare	-----	-----	D2D06	---
A701	A48	CP Auxiliary Point	PS102	B5D10	D2D05	+2.5 to +5.5 Vdc
B580	A49	Spare	-----	-----	D2U06	---
B540	A50	Spare	-----	-----	D2U09	---
B520	A51	Spare	-----	-----	D2U11	---
B510	A52	Spare	-----	-----	D2S09	---
B508	A53	Spare	-----	-----	D2S08	---
B504	A54	-5V V-Ref 01A-A2	PS102	A5B13	D2S07	-1.13 to -1.87 Vdc
B502	A55	Spare	-----	-----	D2U10	---
B501	A56	Spare	-----	-----	D2S10	---
B780	A57	Spare	-----	-----	D2P12	---
B740	A58	-4.3V Board 01A-B2	PS106	B2B02	D2S04	-1.44 to -1.56 Vdc
B720	A59	Spare	-----	-----	D2S05	---
B710	A60	Spare	-----	-----	D2U05	---
B708	A61 *	-4.3V Board 01A-A2	PS106	B2B06	D2U07	-1.43 to -1.57 Vdc
B704	A62 *	-4.3V Board 01A-A3	PS106	A5B06	D2S03	-1.43 to -1.57 Vdc
B702	A63 *	Spare	-----	-----	D2P13	---
B701	A64 *	-4.3V Board 01A-A4 (Source 1)	PS106	A5B07	D2M13	-1.43 to -1.57 Vdc

* Analog Interruptable

Digital Sensors

Address Bit	Sensor	Description	01A-A2 Paddle Card Note 1	Input Pin Note 1	Output Pin Note 2	01A-A2 Board Pin Note 2
8180	D01	Not Usable	-----	-----	-----	-----
8140	D02	IPU Interrupt	T1D06	U2G08	U2J07	E2J06
8120	D03	Spare	-----	-----	-----	E2G08
8110	D04	Spare	-----	-----	E3D03	E2G06
8108	D05 *	+5V CL (PS109)	A4B03	C2G04	C2J04	E2J04
8104	D06 *	+5V OV (PS109)	A4B04	C2G05	C2J05	E2G03
8102	D07 *	+5V UV (PS109)	A4B05	C2G06	C2J06	E2J02
8101	D08 *	+5V BG (PS109)	A4B06	C2G07	C2J07	E2G05
8380	D09	01A-B2 Board Interlock	A2D06	E1E08	F1A08	E2G02
8340	D10	Not Usable	-----	-----	-----	-----
8320	D11 *	300 Vac/Vdc UV (PS104)	A2D02	C2B13	C2D13	E2J05
8310	D12	Power Off Switch	A1C08	-----	-----	E2G04
8308	D13 *	+6V CL (PS107)	A4B09	C2G09	C2J09	E2D13
8304	D14 *	+6V OV (PS107)	A4B10	C2G10	C2J10	E2G07
8302	D15 *	+6V UV (PS107)	A4B11	C2G11	C2J11	E2J09
8301	D16 *	+6V BG (PS107)	A4B12	C2G12	C2J12	E2D09
9180	D17	Analog Interrupt	-----	-----	-----	-----
9140	D18 ***	+5V/+8.5V CL (PS108)	A4D05	C2M04	C2P04	E2P04
9120	D19 ***	+5V/+8.5V OV (PS108)	A4D06	C2M05	C2P05	E2P05
9110	D20 ***	+5V/+8.5V UV (PS108)	A4D07	C2M06	C2P06	E2M03
9108	D21	Not Usable	-----	-----	-----	-----
9104	D22 ***	+5/+8.5V BG (PS108)	A4D09	C2M07	C2P07	E2M04
9102	D23 *	Spare	E6B04	C2G02	C2J02	E2M05
9101	D24 *	Spare	E6C04	C2G13	C2J13	E2M07
9380	D25 *	-1.5V CL (PS105)	A2B03	C2B04	C2D04	E2P07
9340	D26 *	-1.5V OV (PS105)	A2B04	C2B05	C2D05	E2M08
9320	D27 *	-1.5V UV (PS105)	A2B05	C2B06	C2D06	E2P09
9310	D28 *	-1.5V BG (PS105)	A2B06	C2B07	C2D07	E2M09
9308	D29	-2.2V CL (PS103)	A3B03	-----	-----	E2M10
9304	D30	Not Usable	-----	-----	-----	-----
9302	D31	-2.2V OV (PS103)	A3B04	-----	-----	E2P10
9301	D32	-2.2V UV (PS103)	A3B05	-----	-----	E2M11
A180	D33	Not Usable	-----	-----	-----	-----
A140	D34 *	-4.3V CL (PS106)	A2B09	C2B09	C2D09	D2J06
A120	D35 *	-4.3V OV (PS106)	A2B10	C2B10	C2D10	D2G08
A110	D36 *	-4.3V UV (PS106)	A2B11	C2B11	C2D11	D2G06

Address Bit	Sensor	Description	01A-A2 Paddle Card Note 1	Input Pin Note 1	Output Pin Note 2	01A-A2 Board Pin Note 2
A108	D37 *	-4.3V BG (PS106)	A2B12	C2B12	C2D12	D2J04
A104	D38	Spare Serial Number	F4D03	F4B02	F4D07 F4D07	D2G03 D2G03
A102	D39	Spare Serial Number	F4D03	F4B03	F4D09 F4D09	D2J02 D2J02
A101	D40	Spare Serial Number	F4D03	F4B04	F4D10 F4D10	D2G05 D2G05
A380	D41	Spare Serial Number	F4D03	F4B05	F4D11 F4D11	D2G02 D2G02
A340	D42	Not Usable	-----	-----	-----	-----
A320	D43 *	Spare	E6D04	C2S02	C2U02	D2J05
A310	D44 *	Spare	E6E04	C2S13	C2U13	D2G04
A308	D45 *	Spare	B3B03	C2S04	C2U04	D2D13
A304	D46 *	Spare	B3B04	C2S05	C2U05	D2G07
A302	D47 *	Spare	B3B05	C2S06	C2U06	D2J09
A301	D48 *	Spare	B3B06	C2S07	C2U07	D2D09
B180	D49	Analog Interrupt	-----	-----	-----	-----
B140	D50 *	Spare	B3B12	C2S12	C2U12	D2P04
B120	D51 *	Spare	B2B09	C2S09	C2U09	D2P05
B110	D52 *	Spare	B3B10	C2S10	C2U10	D2M03
B108	D53	Not Usable	-----	-----	-----	-----
B104	D54	Spare Serial Number	B3D02 E1E06	F1A06 F4B07	F4D12 ----- F4D12	D2M04 ----- D2M04
B102	D55	Spare Serial Number	F4D03 F4D03	F4B08 F4B08	F4D13 F4D13	D2M05 D2M05
B101	D56	Spare Serial Number	F4D03 F4D03	F4B09 F4B09	F4J09 F4J09	D2M07 D2M07
B380	D57	AFS 101 01A-B2 Serial Number	A5D02	F4B10	F4J07 F4J07	D2P07 D2P07
B340	D58	AFS 102 Serial Number	A2D04 A5D09	F4D02	F4J06 ----- F4J06	D2M08 ----- D2M08
B320	D59	AFS 105 (gate 01C) Serial Number	A4D12 A5D07	F4D04	F4J05 ----- F4J05	D2P09 ----- D2P09
B310	D60	Spare Serial Number	B4D02 B2D09	F4D05	F4J04 ----- F4J04	D2M09 ----- D2M09

See next page for meaning of asterisks.

Seq FN075	PN 0446126 Pg 1 of 2	EC A02214 15 SEP 83	EC A02217 10 JAN 84	EC A02219 29 FEB 84		
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Address Bit	Sensor	Description	01A-A2 Paddle Card Note 1	Input Pin Note 1	Output Pin Note 2	01A-A2 Board Pin Note 2
B308	D61	Spare Spare Serial Number	B3D04 B2B12 -----	F4D06 ----- -----	F4J02 ----- F4J02	D2M10 ----- D2M10
B304	D62	Not Usable	-----	-----	-----	-----
B302	D63 *	Spare	B3B11	C2S11	C2U11	D2P10
B301	D64	PCC box Interlock	A1B08	B3D07	-----	D2M11

- * Sense line goes through the optoisolator card.
- ** Not used for 4 meg or 8 meg Source 2 storage.

Digital Sense Point Voltage Levels

Notes:

1. Non-Optoisolator Input Pin and 01A-A2 Paddle Card

On (active) +0.0 to +0.8 Vdc Off (inactive) +2.5 to +5.5 Vdc
 On is the failure level Off is the expected level

Optoisolator Input Pin and Paddle Card

On (active) +0.0 to +0.8 Vdc Off (inactive) +1.2 to +1.6 Vdc
 On is the failure level Off is the expected level

2. Output Pin and 01A-A2 Board Pin

On (active) +0.0 to +0.8 Vdc Off (inactive) +2.5 to +5.5 Vdc
 On is the failure level Off is the expected level

Control Line Sensors

Address Bit	Sensor	Description	Power Supply	01A-A2 Paddle Card	01A-A2 Card Pin
4080	C01	+5V Start	PS109	A4B02	E2B13
4040	C02	+6V Start	PS107	A4B08	E2B12
4020	C03	+8.5V Start Source 1	PS108	A4D04	E2J07
4010	C04	-1.5V Start	PS105	A2B02	E2G09
4008	C05	-2.2V Start	PS103	A3B02	E2J11
4004	C06	-4.3V Start	PS106	A2B08	E2G11
4002	C07	Spare	-----	-----	E2G12
4001	C08	Spare	-----	-----	E2J12
4280	C09	+5V Start Source 2	PS108	A4D02	E2D04
4240	C10	Enable IPU Interrupt	-----	U2U11	E2D10
4220	C11	Spare	-----	-----	E2J10
4210	C12	Enable Dump Switch	-----	G4G06	E2G10
4208	C13	Spare	-----	-----	E2G13
4204	C14	Spare	-----	-----	E2J13
4202	C15	Spare	-----	-----	E2P02
4201	C16	LCA PCA Reset	-----	G4D12	E2M02
5080	C17	Basic Check Light	-----	A1E06	D2B13
5040	C18	I/O Start	-----	A1D06	D2B12
5020	C19	PCA Ready	-----	A1C06	D2J07
5010	C20	Pick K03 (AMD/Bias)	-----	A1A06	D2G09
5008	C21	Pick K04 (300V Bulk)	-----	C1B08	D2J11
5004	C22	Power Complete Light	-----	C1A08	D2G11
5002	C23	Power Incomplete Light	-----	B1D08	D2G12
5001	C24	Power Off to MBC	-----	B1C08	D2J12
5280	C25	Read Serial Number	-----	F4B13	D2D04
5240	C26	Set/Reset 30 Second Timer	-----	B1B08	D2D10
5220	C27	Power Seq Inhibit (Chan)	-----	A5D04	D2J10
5210	C28	Spare	-----	-----	D2G10
5208	C29	Spare	-----	-----	D2G13
5204	C30	Spare	-----	-----	D2J13
5202	C31	Pick K1 (CTCA)	-----	B5D02	D2P02
5201	C32	Pick K2 (CTCA)	-----	B5D04	D2M02
3008	C33	Spare	-----	-----	F2J09
3004	C34	Spare	-----	-----	F2G03
3002	C35	Spare	-----	-----	F2J11
3001	C36	Spare	-----	-----	F2G11

Control Line Sense Point Voltage Levels

Notes:

1. Input Pin and 01A-A2 Paddle Card

On (active) +0.0/+0.8 Vdc Off (inactive) +2.5/+5.5 Vdc
 On is the failure level Off is the expected level

2. Output Pin and 01A-A2 Board Pin

On (active) +0.0/+0.8 Vdc Off (inactive) +2.5/+5.5 Vdc
 On is the failure level Off is the expected level

Power On Action String

Normal Mode

Sequence 00

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Reset Basic Check	C17	D2B13	+2.5/+5.5 Vdc	YA274
Power Complete off	C22	D2G11	+2.5/+5.5 Vdc	YA274
PCA Ready on	C19	D2J07	+0.0/+0.8 Vdc	YA274
Power Incomplete Light on	C23	D2G12	+0.0/+0.8 Vdc	YA274
Turn Relay K03 off	C20	D2G09	+2.5/+5.5 Vdc	YA184

Wait Twelve Seconds Maximum

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test AFS 101 no air flow	D57	D2P07	+0.0/+0.8 Vdc	YA311
Test AFS 102 no air flow	D58	D2M08	+0.0/+0.8 Vdc	YA304
Test AFS 105 no air flow	D59	D2P09	+0.0/+0.8 Vdc	YA304
Test for K03 not picked	A44	D2D12	+0.0/+0.8 Vdc	YA204

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
CTCA Installed				
PS102 CP2	A48	D2D05	+2.5/+5.5 Vdc	YA201
+5 Vdc	A15	E2D06	+1.29/+1.71 Vdc	YA201

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
PS103 CP2, CP3, and CP4	A42	D2B11	+2.5/+5.5 Vdc	YA211
Temperature Inlet	A38	D2B04	+0.36/+1.11 Vdc	YA311

Wait Eleven Seconds Maximum

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
+5 Vdc PS109 CL	D05	E2J04	+0.0/+0.8 Vdc	YA244
+5 Vdc PS109 OV	D06	E2G03	+0.0/+0.8 Vdc	YA244
+5 Vdc PS109 Bias	D08	E2G05	+0.0/+0.8 Vdc	YA244
+6 Vdc PS107 CL	D13	E2D13	+0.0/+0.8 Vdc	YA234
+6 Vdc PS107 OV	D14	E2G07	+0.0/+0.8 Vdc	YA234
+6 Vdc PS107 Bias	D16	E2D09	+0.0/+0.8 Vdc	YA234
-1.5 Vdc PS105 CL	D25	E2P07	+0.0/+0.8 Vdc	YA231
-1.5 Vdc PS105 OV	D26	E2M08	+0.0/+0.8 Vdc	YA231
-1.5 Vdc PS105 Bias	D28	E2M09	+0.0/+0.8 Vdc	YA231
-2.2 Vdc PS103 CL	D29	E2M10	+0.0/+0.8 Vdc	YA211
-2.2 Vdc PS103 OV	D31	E2P10	+0.0/+0.8 Vdc	YA211
-4.3 Vdc PS106 CL	D34	D2J06	+0.0/+0.8 Vdc	YA231
-4.3 Vdc PS106 OV	D35	D2G08	+0.0/+0.8 Vdc	YA231
-4.3 Vdc PS106 Bias	D37	D2J04	+0.0/+0.8 Vdc	YA231

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Power Groups 13 and 15				
+5/+8.5 Vdc PS105 CL	D18	E2P04	+0.0/+0.8 Vdc	YA241
+5/+8.5 Vdc PS105 OV	D19	E2P05	+0.0/+0.8 Vdc	YA241
+5/+8.5 Vdc PS105 Bias	D22	E2M04	+0.0/+0.8 Vdc	YA241

Sequence 01

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Pick K03 Blowers/Bias	C20	D2G09	+0.0/+0.8 Vdc	YA184
Test for K03 picked	A44	D2D12	+2.5/+5.5 Vdc	YA204

Wait Twelve Seconds Maximum

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test AFS 101 for air flow	D57	D2P07	+2.5/+5.5 Vdc	YA311
Test AFS 102 for air flow	D58	D2M08	+2.5/+5.5 Vdc	YA304
Test AFS 105 for air flow	D59	D2P09	+2.5/+5.5 Vdc	YA304
Test PS103 +24 Vdc Bias	A01	E2B07	+1.29/+1.71	YA211
Test PS103 +5 Vdc Bias	A02	E2B10	+1.29/+1.71	YA211
+5 Vdc PS103	A10	E2B11	+1.29/+1.71	YA211

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
+5 Vdc PS109 CL	D05	E2J04	+2.5/+5.5 Vdc	YA244
+5 Vdc PS109 OV	D06	E2G03	+2.5/+5.5 Vdc	YA244
+5 Vdc PS109 Bias	D08	E2G05	+2.5/+5.5 Vdc	YA244
+6 Vdc PS107 CL	D13	E2D13	+2.5/+5.5 Vdc	YA234
+6 Vdc PS107 OV	D14	E2G07	+2.5/+5.5 Vdc	YA234
+6 Vdc PS107 Bias	D16	E2D09	+2.5/+5.5 Vdc	YA234
-1.5 Vdc PS105 CL	D25	E2P07	+2.5/+5.5 Vdc	YA241
-1.5 Vdc PS105 OV	D26	E2M08	+2.5/+5.5 Vdc	YA241
-1.5 Vdc PS105 Bias	D28	E2M09	+2.5/+5.5 Vdc	YA241
-2.2 Vdc PS103 CL	D29	E2M10	+2.5/+5.5 Vdc	YA211
-2.2 Vdc PS103 OV	D31	E2P10	+2.5/+5.5 Vdc	YA211
-4.3 Vdc PS106 CL	D34	D2J06	+2.5/+5.5 Vdc	YA231
-4.3 Vdc PS106 OV	D35	D2G08	+2.5/+5.5 Vdc	YA231
-4.3 Vdc PS106 Bias	D37	D2J04	+2.5/+5.5 Vdc	YA231

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Power Groups 13 and 15				
+5/+8.5 Vdc PS108 CL	D18	E2P04	+2.5/+5.5 Vdc	YA241
+5/+8.5 Vdc PS108 OV	D19	E2P05	+2.5/+5.5 Vdc	YA241
+5/+8.5 Vdc PS108 BIAS	D22	E2M04	+2.5/+5.5 Vdc	YA241

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
+5 Vdc PS109 UV	D07	E2J02	+0.0/+0.8 Vdc	YA244
300 Vac/Vdc PS104 UV	D11	E2J05	+0.0/+0.8 Vdc	YA221
+6 Vdc PS107 UV	D15	E2J09	+0.0/+0.8 Vdc	YA234
-1.5 Vdc PS105 UV	D27	E2P09	+0.0/+0.8 Vdc	YA231
-2.2 Vdc PS103 UV	D32	E2M11	+0.0/+0.8 Vdc	YA211
-4.3 Vdc PS106 UV	D36	D2G06	+0.0/+0.8 Vdc	YA231

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Power Groups 13 and 15				
+5/+8.5 Vdc PS108 UV	D20	E2M03	+0.0/+0.8 Vdc	YA231

Sequence 02

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Pick K04 300 volts	C21	D2J11	+0.0/+0.8 Vdc	YA184
Test for K04 picked	A45	D2B09	+2.5/+5.5 Vdc	YA214
Test for 300 Vac/Vdc UV on	D11	E2J05	+0.0/+0.8 Vdc	YA221

Wait Two Seconds Maximum

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test for 300 Vac/Vdc UV on	D11	E2J05	+2.5/+5.5 Vdc	YA221
Test for PCC door closed	D64	D2M11	+2.5/+5.5 Vdc	YA311
01A-B2 plenum door closed	D09	E2G02	+2.5/+5.5 Vdc	YA231

Five Second Delay

Sequence 03

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS103 -2.2 Vdc	C05	E2J11	+0.0/+0.8 Vdc	YA211
Wait one second maximum				
Test for -2.2 Vdc UV off	D32	E2M11	+2.5/+5.5 Vdc	YA211

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Power Group 15				
-2.2 Vdc	A18	E2U09	-1.37/-1.63 Vdc	YA211

Sequence 04

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS105 -1.5 Vdc	C04	E2G09	+0/+0.8 Vdc	YA231
Turn on PS106 -4.3 Vdc	C06	E2G11	+0/+0.8 Vdc	YA231

Wait Two Seconds Maximum

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
CTCA Installed				
-1.5 Vdc	A26	E2S04	-1.44/-1.56 Vdc	YA231
-1.5 Vdc	A29	E2U07	-1.44/-1.56 Vdc	YA231
-1.5 Vdc	A30	E2S03	-1.44/-1.56 Vdc	YA231
-1.5 Vdc	A31	E2P13	-1.44/-1.56 Vdc	YA231
-1.5 Vdc	A17	E2U06	-1.43/-1.57 Vdc	YA231
-1.5 Vdc UV	D27	E2P09	+2.5/+5.5 Vdc	YA231
-4.3 Vdc	A58	D2S04	-1.44/-1.56 Vdc	YA231
-4.3 Vdc	A61	D2U07	-1.43/-1.57 Vdc	YA231
-4.3 Vdc	A62	D2S03	-1.43/-1.57 Vdc	YA231
-4.3 Vdc UV	D36	D2G06	+2.5/+5.5 Vdc	YA231

Action CTCA Not Installed	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
-1.5 Vdc	A26	E2S04	-1.44/-1.56 Vdc	YA231
-1.5 Vdc	A29	E2U07	-1.44/-1.56 Vdc	YA321
-1.5 Vdc	A30	E2S03	-1.44/-1.56 Vdc	YA321
-1.5 Vdc	A31	E2P13	-1.44/-1.56 Vdc	YA231
-1.5 Vdc UV	D27	E2P09	+2.5/+5.5 Vdc	YA231
-4.3 Vdc	A58	D2S04	-1.44/-1.56 Vdc	YA231
-4.3 Vdc	A61	D2U07	-1.43/-1.57 Vdc	YA231
-4.3 Vdc	A62	D2S03	-1.43/-1.57 Vdc	YA231
-4.3 Vdc UV	D36	D2G06	+2.5/+5.5 Vdc	YA231

Action Power Group 15	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test for -4.3 Vdc	A64	D2M13	-1.43/-1.57 Vdc	YA231

Sequence 05

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS109 +5 Vdc	C01	E2B13	+0.0/+0.8 Vdc	YA244

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test for +5 Vdc	A09	E2B08	+1.43/+1.57 Vdc	YA244
Test for +5 Vdc UV	D07	E2J02	+2.5/+5.5 Vdc	YA244

Action Power Group 11	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test For +5 Vdc	A08	E2B05	+1.43/+1.57 Vdc	YA241

Sequence 06 For Power Groups 13 and 15

Action Power Group 13	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS108 +5 Vdc	C09	E2D04	+0.0/+0.8 Vdc	YA241

Action Power Group 15	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS108 +8.5 Vdc	C03	E2J07	+0.0/+0.8 Vdc	YA241

Action Power Group 13	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test for +5 Vdc	A08	E2B05	+1.43/+1.57 Vdc	YA241
Test for +5/+8.5 Vdc UV	D20	E2M03	+2.5/+5.5 Vdc	YA241

Action Power Group 15	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Test for +8.5 Vdc	A14	E2D07	+1.43/+1.57 Vdc	YA241
Test for +5/+8.5 Vdc UV	D20	E2M03	+2.5/+5.5 Vdc	YA241

Sequence 06 For Power Group 11

Or

Sequence 07 For Power Group 13 and 15

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on PS107 +6 Vdc	C02	E2B12	+0.0/+0.8 Vdc	YA234

Wait One Second

Action CTCA Installed	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
+6 Vdc PS107	A12	E2D12	+1.43/+1.57 Vdc	YA234
+6 Vdc PS107	A16	E2D05	+1.37/+1.63 Vdc	YA234
+6 Vdc PS107 UV	D15	E2J09	+2.5/+5.5 Vdc	YA234

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
CTCA Not Installed				
Test for +6 Vdc	A12	E2D12	-1.43/-1.57 Vdc	YA234
Test for +6 Vdc	D15	E2J09	+2.5/+5.5 Vdc	YA234

Sequence 07 Power Group 11

Or

Sequence 08 Power Groups 13 and 15

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on I/O	C18	D2B12	+0.0/+0.8 Vdc	YA274
I/O Power Complete	A43	D2D11	+2.5/+5.5 Vdc	YA274

Sequence 08 Power Group 11

Or

Sequence 09 Power Groups 13 and 15

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn on Power Complete	C22	D2G11	+0.0/+0.8 Vdc	YA274

Action	Sensor Number	01A-A2 Pin	Voltage Level Expected	Logic Ref
Turn off Power Incomplete	C23	D2G12	+0.0/+0.8 Vdc	YA274

Power On Action String

CE Mode

Step	Sequential Events	Cause or Result	Comments
1	Customer circuit breaker on.	Supply ac to the PCC box.	
2	PCC CB1 and CB2 on.	CB1 feeds ac to PCC K01, K02, K03, and TR101. CB2 feeds K03 and K04.	
3	PS101 CP2 on. Unit Emergency switch on.	Complete the pick circuit for PS101, relays K1 and K2.	
4	Pick PS101 relays K1 and K2.	Supply +5 Vdc (CP1) and +24 Vdc (CP2) to board 01A-A1 and service panel from PS101.	
5	Pick PCC K01.	Supplies ac through K01, TR100, and CP1 to convenience outlet.	
6	Hardwire sequence complete.	Indicators on at the service panel: +5 Volt, +24 Volt, and MBC On.	
7	MBC card +5V bias voltage above +4.3V.	MBC card UV sensor turns off and MBC card completes a MBC reset.	
8	Turn on the Power In Process indicator.	Turns on the Power In Process indicator on the OCP and the service panel.	
9	Turn on power-on reset and reset lines to the MSS.	Reset lines are active to the MSS.	
10	Monitor sensors on MBC card for faults.	Enter 'Fault State' if unexpected inputs are found. (Two-digit Power Code is displayed.)	
11	Allow up to 30 seconds for AFS 103 and AFS 104 to heat to a fault state.	When the sensors heat up, enable the power-on input. If the sensors fail to heat up in 30 seconds, the system enters a fault state. This checks that the AFSs are working.	
12	Enable Power On.	Allows the activation of a power on condition.	
13	Turn off Power In Process indicator.	Turn off Power In Process indicator (on the OCP and the service panel).	
14	Wait for the power on input. (Power On key on service panel.)	The +5 Volt, +24 Volt, and MBC On indicators are on at the service panel. Hex display=00000	
15	Press Power On.	Set power-on input to MBC card.	
16	Disable power-on input.	MBC disables the line.	
17	Turn on Power In Process.	Turns on the Power In Process indicators at the OCP and service panel.	

Step	Sequential Events	Cause or Result	Comments
18	Turn on PS102.	Pick PS101 K3, PCC K02, ac to AMD 103, AMD 104, and trim files. Supply +24, +5, and -5 to trim files. Supply +24, +5, -5, +12, -12, and +8.5 to board 01A-A2.	
19	Check voltages.	MBC 01A-A1V2 D04 -5.0V MBC 01A-A1V2 D05 +5.0V MBC 01A-A1V2 D06 +8.5V MBC 01A-A1V2 D02 -12.0V MBC 01A-A1V2 B13 +12.0V MBC 01A-A1V2 D13 +24.0V	
20	6.65 second wait.	Check AFS 103 and AFS 104 to ensure AMDs are operating.	
21	Turn off -Reset lines to the MSS.	MSS voltages are correct at MBC card.	Power-on reset
22	Pick PS101 K4.	+24V to PCC K03, K04, and K05.	
23	Hex display.	Current storage access lines for MSS are displayed.	
24	Wait 30 seconds.	Runs ROS diagnostics. Tests the DCA, then loads the power microcode.	
25	Basic microcode control.	Turns on PC Ready, disables error interrupts, and allows display-screen messages.	
26	Partial Power Up/Down screen displayed.	Refer to system console for power on instructions.	Continue monitoring sensors.
27	AFS test.	Turn PCC K03 off. Tests that PCC K03 is not picked, and AFS 101, 102, and 105 are off. Check PS103 for a tripped CP2.	
28	Test PS103 CP.	Check for a tripped CP2, 3, and 4. Test inlet temperature.	
29	Check that the CL, OV, and bias detectors work.	Check PCC sense for all lines active (should be down levels).	PS103, PS105 PS106, PS107 PS108, PS109
30	Turn on PS103. (5V, 24V bias)	Pick PCC K03, ac to AMD 101, AMD 102, AMD 105, and PS103.	Diagnostic Stop A
31	Test that K03 picked.	Check the K03 auxiliary point.	
32	Check AFS.	Test sensors for AMD 101, 102, and 105.	
33	Test that PS103 bias is on.	Check the +5V and +24V at the PC sense card.	
34	Verify +5V at board 01A-A3.	Check the +5V at the PC sense card.	

Step	Sequential Events	Cause or Result	Comments
35	Check that the CL, OV, and bias detectors work.	Check for no CL, no OV, no bias failure, and UV on.	PS105 PS106 PS107 PS108 PS109 PS103 (-2.2V)
36	Turn on PS104.	Pick PCC K04, ac to PS104. (300V bulk dc)	Diagnostic Stop B
37	Test that K04 picked.	Check the K04 auxiliary point.	
38	Test PS104 (300V).	Check the bulk-on relay inside PS104.	
39	Test interlocks.	Check that the doors for the PCC box and the B2 board are closed.	
40	Turn on PS103 (-2.2V).	Start line to PS103 from the MSS.	Diagnostic Stop C
41	Test the -2.2V from PS103.	Check UV and voltage sense from board 01A-A4 (source 1 storage).	
42	Turn on PS105 (-1.5V) and PS106 (-4.3V).	Start line to PS105 and PS106 from the MSS.	Diagnostic Stop D
43	Test PS105 (-1.5V).	Check UV and voltage sense lines from 01A-A2, A3, A4, B2, and (A1 CTCA) boards.	
44	Test PS106 (-4.3V).	Check UV and voltage sense lines from 01A-A2, A3, B2, and (A4 source 1 storage) boards.	
45	Turn on PS109 (+5V).	Start line to PS109 from the MSS.	Diagnostic Stop F
46	Test PS109 (+5V).	Check UV and the voltage sense line to PS109 from the 01A-A4 board.	
47	Turn on PS108 (+5V/+8.5V).	Start line to PS108 from the MSS. (PS108 voltages are storage size dependent.)	Diagnostic Stop G source 1: storage = +8.5V source 2: storage = +5V
48	Test PS108 (+5V/+8.5V).	Check UV and the voltage sense line to PS108 from the 01A-A4 board.	
49	Turn on PS107 (+6V).	Start line to PS107 from the MSS.	Diagnostic Stop H
50	Test PS107 (+6V).	Check UV and voltage sense line from boards 01A-A3 and (01A-A1 CTCA).	
51	Turn on I/O.	Start I/O power-on sequence.	Diagnostic Stop I
52	I/O Complete.	All I/O is powered on or I/O Hold is on.	
53	Turn on Power Complete to the MBC.	The OCP and service panel indicators are on.	
54	Turns off Power In Process to MBC.	Turns off the OCP and service panel Power In Process indicators.	
55	Power Complete.	The following indicators are on at the service panel. MBC On, Power Complete, +24 Volt, and +5 Volt. Hex Display=Dynamic 06888.	

Cable Diagrams

Cables and Connectors

Reference Number	Part Number	From Connector	To Connector
1	8645448 (Pin Side) CTCA	01A-A1YB	PS107 J/P06
2	1807964 (Card side)	01A-A2B2	01A-A2YC
3	1807967 (Card Side)	01A-A1YM	01A-A2YA
4	1807966 (Card Side)	01A-A1YN	01A-A2YB
5	8645329 (Pin Side)	01A-A1YG 01A-A1ZG	PS101 J/P01 PS101 J/P01
6	1807958 (Card Side)	01A-A1YH	AFS 103 J/P01 AFS 104 J/P02 PS102 J/P07 J/P13 Service Panel
7	1808000 (Card Side)	01A-A1X2	PCC BOX J/P03
8	1807953 (Card Side)	01A-A1X3 01A-A1X3 01A-A1X4 01A-A2ZC	Service Panel
9	1807957 (Card Side)	01A-A1X5	OCP 01F J/P01
10	1807959 (Card Side)	01A-A1YG	PS101 J/P03 J/P06
11	1807965 (Card Side)	01A-A1ZF	01A-A2YJ
13	1807968 (Card Side)	01A-A1ZC	01A-A2B5
14	8645447 (Pin Side) CTCA	01A-A1ZB	01A-B2TB1
15	8645321 (Pin Side)	01A-A1ZC 01A-A1ZD	PS102 J/P04 PS102 J/P04
16	8645347 (Pin Side)	01A-A2YD 01A-A2YE	PS102 J/P05 J/P06 PS102 J/P05 J/P06
17	8645346 (Pin Side)	01A-A2ZF	01A-B2TB1
18	8645354 (Card Side)	01A-A2YF	01A-B2VS6
19	8645348 (Pin Side)	01A-A2ZG 01A-A2ZH	PS102 J/P08 J/P09 PS102 J/P08 J/P09
21	8645326 (Pin Side)	01A-A2YA 01A-A2YC 01A-A2YF 01A-A2ZA 01A-A2ZD 01A-A2ZE	PS102 J/P14 PS102 J/P14 PS102 J/P14 PS102 J/P15 PS102 J/P15 PS102 J/P15
22 See note.	1807942 1807943 (38LSPC)	01A-A2ZE 01A-A2ZE	01G-CCA1 01G-CCA1

Reference Number	Part Number	From Connector	To Connector
24	1807963 (Card Side)	01A-A2A5	01A-A3YH 01A-A4ZA AFS 101 J/P01 AMD 102 Air Inlet
25	1807960 (Card Side)	01A-A2A4	AFS 105 J/P01 PS107 J/P01 PS108 J/P01 PS109 J/P01
26	1807962 (Card Side)	01A-A2A3	PS103
27	1807961 (Card Side)	01A-A2A2	AFS 102 J/P01 PS104 J/P03 PS105 J/P02 PS106 J/P02
28	8645349 (Pin Side)	01A-A3YA	PS103 J/P03
40	8645382 (Pin Side)	01A-A4YH 01A-A4ZH	01A-B2TB1 01A-B2TB1
41	1802708 1802709 1802710 1802711 1802712 1802713 1807980 1807981 1807982 1807983 1807984 1807989 1807991 1807995 8645394	01A-A3YC YG 01A-A3ZB ZF 01A-A4YD YF 01A-A4ZC ZE 01A-A4ZB ZF 01A-A4YC YG 01A-A3YE 01A-A4ZG 01A-A4YB 01A-A3ZD 01A-A3ZE 01A-A4ZD 01A-A4YE 01A-A3YD 01A-A3YB YF	PS107 J/P04 PS107 J/P05 PS109 J/P06 PS109 J/P05 PS108 J/P05 PS108 J/P06 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 01A-B2TB1 PS103 J/P09
47	8645314 (Pin Side)	01A-A4YA	PS103 J/P03
48	401452 (Pin Side)	01A-A4ZA	01A-B2TB1

Note: Reference number **22** is the RSF feature.

Seq F0015	PN 0446130 Pg 1 of 1	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02217 10 JAN 84	EC A02220 06 JUN 84	
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Cable Connectors Point to Point

Reference Number **1** AID 985

Part Number	Signal Name	From Connector	To Connector
8645448 Pin Side CTCA	+6V	01A-A1YB D1B07	PS107 J/P06-A
	+6V	01A-A1YB D1C07	PS107 J/P06-A
	+6V	01A-A1YB E1C07	PS107 J/P06-A
	+6V	01A-A1YB E1D07	PS107 J/P06-A
	+6V Return	01A-A1YB D1D07	PS107 J/P06-B
	+6V Return	01A-A1YB D1E07	PS107 J/P06-B
	+6V Return	01A-A1YB E1A07	PS107 J/P06-B
	+6V Return	01A-A1YB E1B07	PS107 J/P06-B

Reference Number **2** AID 985

Part Number	Signal Name	From Connector	To Connector
1807964 Card Side	+24V Spare	01A-A2B2D13	
	-1.5V Sense 01A-B2	01A-A2B2B07	01A-A2YC G1A06
	-4.3V Sense 01A-B2	01A-A2B2B02	01A-A2YC G1C06
	-1.5V Sense 01A-A2	01A-A2B2B03	01A-A2YC H1C08
	-4.3V Sense 01A-A2	01A-A2B2B06	01A-A2YC H1D08
	Common	01A-A2B2D08	01A-A2YC G1B06
	Common	01A-A2B2D08	01A-A2YC G1D06
	Common	01A-A2B2D08	01A-A2YC G1E06
	Common	01A-A2B2D08	01A-A2YC G1E06
	Common	01A-A2B2D08	01A-A2YC G1E06

Reference Number **3** AID 985

Part Number	Signal Name	From Connector	To Connector
1807967 Card Side	-Pick PCC K03	01A-A1YM J1C11	01A-A2YA A1A06
	-Pick PCC K04	01A-A1YM L1D13	01A-A2YA C1B08
	+I/O Hold	01A-A1YM K1E11	01A-A2YA B1C06
	-Pwr Off to MSS	01A-A1YM J1E13	01A-A2YA A1C08
	+K03 Normal Sense	01A-A1YM L1B11	01A-A2YA B1E06
	+K04 Normal Sense	01A-A1YM L1A11	01A-A2YA B1D06
	-CE Mode (MBC Out)	01A-A1YM L1D11	01A-A2YA C1B06
	-Basic Check Indicator	01A-A1YM K1B11	01A-A2YA A1E06
	-PCA Ready	01A-A1YM J1E11	01A-A2YA A1C06
	-Pwr Incomplete Indicator	01A-A1YM L1A13	01A-A2YA B1D08
	-Pwr Complete Indicator	01A-A1YM L1C13	01A-A2YA C1A08
	-Pwr Off to MBC	01A-A1YM K1E13	01A-A2YA B1C08
	-Set/Reset 30 Sec Timer	01A-A1YM K1D13	01A-A2YA B1B08
	-I/O Start	01A-A1YM K1A11	01A-A2YA A1D06
	+I/O Complete	01A-A1YM L1C11	01A-A2YA C1A06
	+PCC Intik Sw Normal Sense	01A-A1YM J1D13	01A-A2YA A1B08
	Common	01A-A1YM K1D11	01A-A2YA B1B06
	Common	01A-A1YM K1D11	01A-A2YA B1B06
	Common	01A-A1YM K1D11	01A-A2YA B1B06

Reference Number **4** AID 985

Part Number	Signal Name	From Connector	To Connector
1807966 Card Side	Spare Signal	01A-A1YN N1A11	01A-A2YB D1D06
	Spare Signal	01A-A1YN M1E11	01A-A2YB D1C06
	Spare Signal	01A-A1YN N1B11	01A-A2YB D1E06
	Spare Signal	01A-A1YN M1D11	01A-A2YB D1B06
	Spare Signal	01A-A1YN M1B11	01A-A2YB C1E06
	Spare Signal	01A-A1YN P1C11	01A-A2YB F1A06
	Spare Signal	01A-A1YN P1B11	01A-A2YB E1E06
	+24V from Micro Sw	01A-A1YN P1B13	01A-A2YB E1E08
	+01A-B2 Micro Sw Normal Sig	01A-A1YN P1C13	01A-A2YB F1A08
	-Reset	01A-A1YN M1B13	01A-A2YB C1E08
	-Alternate Sw (800)	01A-A1YN M1C13	01A-A2YB D1A08
	-Lamp Test	01A-A1YN M1D13	01A-A2YB D1B08
	-Pwr On Reset	01A-A1YN M1E13	01A-A2YB D1C08
	+CE Key to SBA	01A-A1YN N1B13	01A-A2YB D1E08
		01A-A1YN N1E13	01A-A2YB E1C08
		01A-A1YN N1E11	01A-A2YB E1C06
		01A-A1YN N1C11	01A-A2YB E1A08
	Common	01A-A1YN Common	01A-A2YB Common
	Common	01A-A1YN Common	01A-A2YB Common
	Common	01A-A1YN Common	01A-A2YB Common
		01A-A1YN Common	01A-A2YB Common

Reference Number **5** AID 985

Part Number	Signal Name	From Connector	To Connector
8645329 Pin Side	+24V	01A-A1YG T1B07	PS101 J/P01-1
	+24V	01A-A1YG U1D07	PS101 J/P01-4
	+24V Return	01A-A1YG T1D07	PS101 J/P01-2
	+24V Return	01A-A1YG U1B07	PS101 J/P01-3
	+5V	01A-A1ZG T6B03	PS101 J/P01-8
	+5V	01A-A1ZG T6C03	PS101 J/P01-8
	+5V	01A-A1ZG U6C03	PS101 J/P01-9
	+5V	01A-A1ZG U6D03	PS101 J/P01-9
	+5V Return	01A-A1ZG U6A03	PS101 J/P01-6
	+5V Return	01A-A1ZG U6B03	PS101 J/P01-6
	+5V Return	01A-A1ZG T6D03	PS101 J/P01-5
	+5V Return	01A-A1ZG T6E03	PS101 J/P01-5

Reference Number **6** AID 985

Part Number	Signal Name	From Connector	To Connector
1807958 Card Side	+24V from PS101	01A-A1YH V1D08	AFS 103 J/P01-1
	+24V Return	01A-A1YH W1E06	AFS 103 J/P01-3
	+24V from PS101	01A-A1YH W1D08	AFS 104 J/P01-1
	+24V Return	01A-A1YH W1E08	AFS 104 J/P01-3
	+24V from PS101	01A-A1YH V1D06	PS102 J/P13-1
	+24V from PS101	01A-A1YH X1D08	PS102 J/P07-3
	+PS102 CP Sense	01A-A1YH W1B06	PS102 J/P13-2
	+CP2 Sense	01A-A1YH X1E08	PS102 J/P07-1
	+AFS 104 Sense	01A-A1YH X1A08	AFS 104 J/P01-2
	+AFS 103 Sense	01A-A1YH W1A08	AFS 103 J/P01-2
	+CE Key to SBA	01A-A1YH X1E06	Serv Pnl CE SW3
	+CE Key Return	01A-A1YH W1E06	Serv Pnl CE SW2

Reference Number **7** AID 985

Part Number	Signal Name	From Connector	To Connector
1808000 Card Side	+24V from PS101	01A-A1X2B05	PCC J/P03-5
	+24V from Intlk Sw	01A-A1X2B06	PCC J/P03-6
	+K03 Sense	01A-A1X2B02	PCC J/P03-4
	+K03 Sense	01A-A1X2B03	PCC J/P03-2

Reference Number **8** AID 985

Part Number	Signal Name	From Connector	To Connector
1807953 Card Side	-MBC On Ind	01A-A1X3D06	Service Panel A1D06
	-Pwr Incomplete Ind	01A-A1X3D02	Service Panel A1D02
	-Basic Check Ind	01A-A1X3D04	Service Panel A1D04
	+24V from PS101	01A-A1X3D05	Service Panel A1D05
	-PS101 Gnd to I/O Hold Sw	01A-A1X3B11	Service Panel A1B11
	-I/O Hold Sw Gnd to K5	01A-A1X3B13	Service Panel A1B13
	+Lamp Test (OCP)	01A-A1X3B12	Service Panel A1B12
	-CE Intlk Off	01A-A1X3D13	Service Panel A1D13
	-Pwr Off Sw/Com	01A-A1X3B05	Service Panel A1B05
	+I/O Hold Sw	01A-A1X3B02	Service Panel A1B02
	-Re-IML from (Service Panel)	01A-A1X3B10	Service Panel A1B10
	-Logic Reset (800)	01A-A1X3B08	Service Panel A1B08
	+Lamp Test MBC	01A-A1X3B09	Service Panel A1B09
	-Lamp Test I/O	01A-A1X3D09	Service Panel A1D09
	-CE Mode	01A-A1X3B10	Service Panel A1D10
	-Pwr Off (Service Panel)	01A-A1X3B07	Service Panel A1B07
	+Check Reset (Service Panel)	01A-A1X3B03	Service Panel A1B03
	+Pwr On (OCP/Service Panel)	01A-A1X3D07	Service Panel A1D07
	Common	01A-A1X3B04	Service Panel A1B04
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X3D08	Service Panel A1D08
	Common	01A-A1X4D08	Service Panel A2D08
	Common	01A-A1X4D08	Service Panel A2D08
	Common	01A-A1X4D08	Service Panel A2D08
	Common	01A-A2XC G6A03	Service Panel B2D08
	Common	01A-A2XC G6A03	Service Panel B2D08
	Common	01A-A2XC G6A03	Service Panel B2D08
	Common	01A-A2XC G6A03	Service Panel B2D08
	Common	01A-A2XC G6A03	Service Panel B2D08
Common	01A-A2XC G6A03	Service Panel B2D08	

Reference Number **9** AID 985

Part Number	Signal Name	From Connector	To Connector
1807957 Card Side	+24V	01A-A1X5D13	OCP 01F J1-15
	Gnd	01A-A1X5D08	OCP 01F J1-6
	-Pwr In Process (OCP)	01A-A1X5B09	OCP 01F J1-7
	-Pwr Complete (OCP)	01A-A1X5B10	OCP 01F J1-5
	-Basic Check (OCP)	01A-A1X5B13	OCP 01F J1-4
	+Pwr on (OCP/Service Panel)	01A-A1X5B03	OCP 01F J1-2
	+Check Reset	01A-A1X5D11	OCP 01F J1-9
	+Lamp Test (OCP)	01A-A1X5D09	OCP 01F J1-10
	-CE Intlk Off	01A-A1X5B02	OCP 01F J1-3
	-Pwr Off Sw/Com	01A-A1X5D10	OCP 01F J1-1
	-Lamp Test SBA	01A-A1X5D07	OCP 01F J1-11
	-IML	01A-A1X5D12	OCP 01F J1-8
	-CTCA Disable Ind	01A-A1X5B08	OCP 01F J1-22
	-Gnd	01A-A1X5D04	OCP 01F J1-21
	-CTCA Disable	01A-A1X5D06	OCP 01F J1-24
	+CTCA Disable	01A-A1X5D05	OCP 01F J1-23
	-System Ind	01A-A1X5B11	OCP 01F J1-14
	-Wait Ind	01A-A1X5B12	OCP 01F J1-13
	Gnd	01A-A1X5 Common	Cable Gnd Tab
	Gnd	01A-A1X5 Common	Cable Gnd Tab
Gnd	01A-A1X5 Common	Cable Gnd Tab	

Reference Number **10** AID 985

Part Number	Signal Name	From Connector	To Connector
1807959 Card Side	+I/O Cmplt	01A-A1YG U1C06	PS101 J/P03-6
	-I/O Start	01A-A1YG U1B06	PS101 J/P03-9
	-PS101 Gnd to I/O Hold Sw	01A-A1YG V1A06	PS101 J/P03-2
	-I/O Hold Sw Gnd to K5	01A-A1YG U1E06	PS101 J/P03-3
	-Pick PS101 K3	01A-A1YG S1E08	PS101 J/P03-11
	-Pick PS101 K4	01A-A1YG T1A08	PS101 J/P03-12
	-Pick PCC K03	01A-A1YG U1D08	PS101 J/P03-10
	-Pick PCC K04	01A-A1YG U1E08	PS101 J/P03-7
		01A-A1YG U1C08	PS101 J/P03-4
		Unit Emergency Switch 3	PS101 J/P06-1
		Unit Emergency Switch 2	PS101 J/P06-2

Reference Number **11** AID 985

Part Number	Signal Name	From Connector	To Connector
1807965 Card Side	+5V Sense	01A-A1ZF Q6A04	01A-A2YJ A1A13
	-5V Sense	01A-A1ZF Q6B04	01A-A2YJ A1B13
	+8.5V Sense	01A-A1ZF Q6C04	01A-A2YJ A1C13
	+12V Sense	01A-A1ZF Q6D04	01A-A2YJ A1D13
	-12V Sense	01A-A1ZF R6A04	01A-A2YJ B1A13
	+24V Sense	01A-A1ZF S6A04	01A-A2YJ C1A13
	Common	01A-A1ZF R6B02	01A-A2YJ B1B11
	Common	01A-A1ZF R6B02	01A-A2YJ B1B11
	Common	01A-A1ZF R6B02	01A-A2YJ B1B11
	Common	01A-A1ZF R6B02	01A-A2YJ B1B11
	+5V	01A-A1ZF S6B02	01A-A2YJ C1B11

Reference Number **13** AID 985

Part Number	Signal Name	From Connector	To Connector
1807968 Card Side	+CP2 Norm Sense	01A-A1ZC F6D04	01A-A2B5D10
	+5V Norm Sense	01A-A1ZC F6E02	01A-A2B5B02
	-1.5V Norm Sense	01A-A1ZC H6E04	01A-A2B5B04
	-Pick K1	01A-A1ZC F6D02	01A-A2B5D02
	-Pick K2	01A-A1ZC G6A02	01A-A2B5D04
	+6V Norm Sense	01A-A1ZC H6C04	01A-A2B5B05
	Common	01A-A1ZC G6E02	01A-A2B5D08
	Common	01A-A1ZC G6E02	01A-A2B5D08
	Common	01A-A1ZC G6E02	01A-A2B5D08

Reference Number **14** AID 985

Part Number	Signal Name	From Connector	To Connector
8645447 Pin Side CTCA	-1.5V	01A-A1ZB D6B03	01A-B2TB1 A15
	-1.5V	01A-A1ZB E6D03	01A-B2TB1 A15
	Common	01A-A1ZB D6E03	01A-B2TB1 B18
	Common	01A-A1ZB E6A03	01A-B2TB1 B18

Reference Number **15** AID 985

Part Number	Signal Name	From Connector	To Connector
8645321 Pin Side CTCA	+5V (CP2)	01A-A1ZC G6A03	PS102 J/P04-A
	+5V (CP2)	01A-A1ZC G6C03	PS102 J/P04-A
	+5V (CP2)	01A-A1ZC G6E03	PS102 J/P04-A
	+5V (CP2)	01A-A1ZC H6B03	PS102 J/P04-A
	+5V Return	01A-A1ZD J6E03	PS102 J/P04-B
	+5V Return	01A-A1ZD K6B03	PS102 J/P04-B
	+5V Return	01A-A1ZD K6D03	PS102 J/P04-B
	+5V Return	01A-A1ZD L6A03	PS102 J/P04-B

Reference Number 16 AID 985

Part Number	Signal Name	From Connector	To Connector
8645347 Pin Side	+5V (CP1)	01A-A2YD J1E07	PS102 J/P05-A
	+5V (CP1)	01A-A2YD K1A07	PS102 J/P06-A
	+5V (CP1)	01A-A2YD K1B07	PS102 J/P05-A
	+5V (CP1)	01A-A2YD K1C07	PS102 J/P06-A
	+5V (CP1)	01A-A2YD K1D07	PS102 J/P05-A
	+5V (CP1)	01A-A2YD K1E07	PS102 J/P06-A
	+5V (CP1)	01A-A2YD L1A07	PS102 J/P05-A
	+5V (CP1)	01A-A2YD L1B07	PS102 J/P06-A
	+5V Return	01A-A2YE M1D07	PS102 J/P05-B
	+5V Return	01A-A2YE M1E07	PS102 J/P06-B
	+5V Return	01A-A2YE N1A07	PS102 J/P05-B
	+5V Return	01A-A2YE N1B07	PS102 J/P06-B
	+5V Return	01A-A2YE N1C07	PS102 J/P05-B
	+5V Return	01A-A2YE N1D07	PS102 J/P06-B
	+5V Return	01A-A2YE N1E07	PS102 J/P05-B
	+5V Return	01A-A2YE P1A07	PS102 J/P06-B

Reference Number 19 AID 985

Part Number	Signal Name	From Connector	To Connector
8645348 Pin Side	+5V Return	01A-A2ZG T6B03	PS102 J/P09-B
	+5V Return	01A-A2ZG T6C03	PS102 J/P08-B
	+5V Return	01A-A2ZG T6D03	PS102 J/P09-B
	+5V Return	01A-A2ZG T6E03	PS102 J/P08-B
	+5V Return	01A-A2ZG U6A03	PS102 J/P09-B
	+5V Return	01A-A2ZG U6B03	PS102 J/P08-B
	+5V Return	01A-A2ZG U6C03	PS102 J/P09-B
	+5V Return	01A-A2ZG U6D03	PS102 J/P08-B
	+5V (CP1)	01A-A2ZH W6A03	PS102 J/P09-A
	+5V (CP1)	01A-A2ZH W6B03	PS102 J/P08-A
	+5V (CP1)	01A-A2ZH W6C03	PS102 J/P09-A
	+5V (CP1)	01A-A2ZH W6D03	PS102 J/P08-A
	+5V (CP1)	01A-A2ZH W6E03	PS102 J/P09-A
	+5V (CP1)	01A-A2ZH X6A03	PS102 J/P08-A
	+5V (CP1)	01A-A2ZH X6B03	PS102 J/P09-A
	+5V (CP1)	01A-A2ZH X6C03	PS102 J/P08-A

Reference Number 17 AID 985

Part Number	Signal Name	From Connector	To Connector
8645346 Pin Side	-4.3V	01A-A2ZF Q6C03	01A-B2 TB1C04
	-1.5V	01A-A2ZF Q6E03	01A-B2 TB1A09
	-1.5V	01A-A2ZF R6A03	01A-B2 TB1A09
	Common	01A-A2ZC G6A03	01A-B2 TB1B05
	Common	01A-A2ZC G6D03	01A-B2 TB1B08
	Common	01A-A2ZC H6C03	01A-B2 TB1B08

Reference Number 21 AID 985

Part Number	Signal Name	From Connector	To Connector
8645326 Pin Side	+24V	01A-A2YA A1C07	PS102 J/P14-3
	+24V	01A-A2YA B1E07	PS102 J/P14-3
	+12V (CP7)	01A-A2YA A1E07	PS102 J/P14-1
	+12V (CP7)	01A-A2YA B1C07	PS102 J/P14-1
	+24V Return	01A-A2YC H1A07	PS102 J/P14-2
	+24V Return	01A-A2YC H1C07	PS102 J/P14-2
	+12V Return	01A-A2YC G1A07	PS102 J/P14-9
	+12V Return	01A-A2YC G1C07	PS102 J/P14-9
	-5V Return	01A-A2YF R1C07	PS102 J/P14-11
	-5V Return	01A-A2YF Q1E07	PS102 J/P14-11
	-5V (CP5)	01A-A2YF Q1C07	PS102 J/P14-10
	-5V (CP5)	01A-A2YF R1E07	PS102 J/P14-10
	-12V (CP6)	01A-A2ZA A6C03	PS102 J/P15-3
	-12V (CP6)	01A-A2ZA B6E03	PS102 J/P15-3
	-12V Return	01A-A2ZA A6E03	PS102 J/P15-1
	-12V Return	01A-A2ZA B6C03	PS102 J/P15-1
	+8.5V Return	01A-A2ZD J6E03	PS102 J/P15-7
	+8.5V Return	01A-A2ZD K6B03	PS102 J/P15-8
	+8.5V Return	01A-A2ZD K6D03	PS102 J/P15-9
	+8.5V (CP4)	01A-A2ZE M6D03	PS102 J/P15-10
	+8.5V (CP4)	01A-A2ZE N6A03	PS102 J/P15-11
	+8.5V (CP4)	01A-A2ZE N6C03	PS102 J/P15-12

Reference Number 18 AID 985

Part Number	Signal Name	From Connector	To Connector
8645354 Card Side	-1.5V Sense	01A-A2YF R1A06	01A-B2VS6 C01
	-1.5V Return	01A-A2YF Q1E08	01A-B2VS6 C02
	-4.3V Sense	01A-A2YF Q1D08	01A-B2VS6 C04
	-4.3V Return	01A-A2YF Q1D06	01A-B2VS6 C05

Reference Number 22 AID 985

Part Number	Signal Name	From Connector	To Connector
1807942 RSF	+8.5V RSF	01A-A2ZE P6A04	01G-CCA2 B11
	-12V RSF	01A-A2ZE P6C02	01G-CCA2 D13

Reference Number **24** AID 985

Part Number	Signal Name	From Connector	To Connector
1807963 Card Side	+5V Normal Sense	01A-A2A5D12	01A-A3YH X1B08
	Common	01A-A2A5D08	01A-A3YH W1E06
	+5V	01A-A2A5D03	01A-A2H5
	+24V from PS102	01A-A2A5D13	AFS 101 J/P01-1
	-2.2V Normal Sense	01A-A2A5B11	01A-A4ZA C6A04
	Common	01A-A2A5D08	01A-A4ZA B6B02
	+5V Normal Sense	01A-A2A5B03	01A-A3YH W1B08
	Pwr Seq Inhibit	01A-A2A5D04	01A-A3YH V1D06
	Common	01A-A2A5D08	01A-A3YH W1E06
	Common	01A-A2A5D08	01A-A3YH W1E06
	-1.5V Normal Sense 01A-A3	01A-A2A5D05	01A-A3YH W1E08
	-4.3V Normal Sense 01A-A3	01A-A2A5B06	01A-A3YH X1D08
	-1.5V Normal Sense 01A-A4	01A-A2A5B04	01A-A4ZA B6E04
	-4.3V Normal Sense 01A-A4	01A-A2A5B07	01A-A4ZA B6B04
	Common	01A-A2A5D08	01A-A3YH W1E06
	Common	01A-A2A5D08	01A-A3YH W1E06
	Common	01A-A2A5D08	01A-A4ZA B6B02
	Common	01A-A2A5D08	01A-A4ZA B6B02
	+6V Norm Sense	01A-A2A5B05	01A-A3YH V1D08
	Common	01A-A2A5D08	01A-A3YH W1E06
	Common	01A-A2A5B10	01A-A4ZA B6C04
	Common	01A-A2A5D08	01A-A4ZA B6B02
	Common	01A-A2A5B02	01A-A4ZA B6D04
	+5V Normal Sense	01A-A2A5D06	01A-A4ZA C6B04
	AIS 101	01A-A2A5D10	AMD 101 AIS
	AIS 101	01A-A2A5D11	AMD 101 AIS
	AFS 101	01A-A2A5D13	AFS 101 J/P01-1
	AFS 101	01A-A2A5D08	AFS 101 J/P01-3
	AFS 101	01A-A2A5D02	AFS 101 J/P01-2

Reference Number **25** AID 985

Part Number	Signal Name	From Connector	To Connector
1807960 Card Side	+5V to PS107, PS108, PS109	01A-A2A4D03	PS107 J/P01-2
	+24V to AFS 105	01A-A2A4D13	AFS 105 J/P01-1
	+AFS 105 Sense	01A-A2A4D12	AFS 105 J/P01-2
	+24V Return	01A-A2A4D08	AFS 105 J/P01-3
	-OC Sense	01A-A2A4B09	PS107 J/P01-5
	-OV Sense	01A-A2A4B10	PS107 J/P01-3
	-UV Sense	01A-A2A4B11	PS107 J/P01-4
	-BG Sense	01A-A2A4B12	PS107 J/P01-7
	Common	01A-A2A4B07	PS107 J/P01-6
	Common	01A-A2A4B07	PS107 J/P01-6
	Common	01A-A2A4D04	PS108 J/P01-9
	-Start (8.5V) Source 1	01A-A2A4D05	PS108 J/P01-5
	-OC Sense	01A-A2A4D06	PS108 J/P01-3
	-OV Sense	01A-A2A4D07	PS108 J/P01-4
	-UV Sense	01A-A2A4D09	PS108 J/P01-7
	-BG Sense	01A-A2A4B07	PS108 J/P01-6
	-Sense Return	01A-A2A4B07	PS108 J/P01-6
	-Start (5V) Source 2	01A-A2A4D02	PS108 J/P01-1

Reference Number **26** AID 985

Part Number	Signal Name	From Connector	To Connector
1807962 Card Side	+24V from PS102	01A-A2A3D13	PS103 J/P02-12
	-Start (2.2V)	01A-A2A3B02	PS103 J/P01-6
	-OC (-2.2C) Sense	01A-A2A3B03	PS103 J/P01-3
	-OV (-2.2V) Sense	01A-A2A3B04	PS103 J/P01-5
	-UV (-2.2V) Sense	01A-A2A3B05	PS103 J/P01-1
	+24V Normal Sense	01A-A2A3B08	PS103 J/P01-2
	+5V Normal Sense	01A-A2A3B09	PS103 J/P01-11
	+CP Normal Sense	01A-A2A3B11	PS103 J/P01-9
	Common	01A-A2A3D08	PS103 J/P01-3
	Common	01A-A2A3D08	PS103 J/P01-3
	Common	01A-A2A3D08	PS103 J/P02-6,1,4
	Common	01A-A2A3D08	PS103 J/P02-6,1,4

Reference Number 27 AID 985

Part Number	Signal Name	From Connector	To Connector
1807961 Card Side	-PS105 OC Sense	01A-A2A2B03	PS105 J/P02-10
	-PS105 OV Sense	01A-A2A2B04	PS105 J/P02-5
	-PS105 UN Sense	01A-A2A2B05	PS105 J/P02-4
	-PS105 BG Sense	01A-A2A2B06	PS105 J/P02-6
	-PS106 OC Sense	01A-A2A2B09	PS106 J/P02-10
	-PS106 OV Sense	01A-A2A2B10	PS106 J/P02-5
	-PS106 UV Sense	01A-A2A2B11	PS106 J/P02-4
	-PS106 BG Sense	01A-A2A2B12	PS106 J/P02-6
	-Sense Return	01A-A2A2B07	PS105 J/P02-7
	-Sense Return	01A-A2A2B07	PS105 J/P02-2
	-Sense Return	01A-A2A2B07	PS105 J/P02-11
	-Sense Return	01A-A2A2B07	PS105 J/P02-9
	-Sense Return	01A-A2A2B07	PS106 J/P02-7
	-Sense Return	01A-A2A2B07	PS106 J/P02-2
	-Sense Return	01A-A2A2B07	PS106 J/P02-11
	-Sense Return	01A-A2A2B07	PS106 J/P02-9
	+5V from PS102	01A-A2A2D03	PS106 J/P02-12
	-PS105 Start	01A-A2A2B02	PS105 J/P02-1
	-PS106 Start	01A-A2A2B08	PS106 J/P02-1
	+24V from PS102	01A-A2A2D13	AFS 102 J/P01-1
	+AFS 102 Sense	01A-A2A2D04	AFS 102 J/P01-2
	+24V Return	01A-A2A2D08	AFS 102 J/P01-3
	Common	01A-A2A2D02	PS102 J/P03-1
	+24V Spare	01A-A2A2D08	PS102 J/P03-3
	+24V 01A-B2 Micro Sw	01A-A2A2D11	01AB2 Plenum Sw
	+24V to AFS 102	01A-A2A2D12	AFS 102 J/P01-1
	+24V from Micro Sw	01A-A2A2D06	01AB2 Plenum Sw

Reference Number 28 AID 985

Part Number	Signal Name	From Connector	To Connector
8645349 Pin Side	+5V (CP2)	01A-A3YA A1C07	PS102 J/P03-A
	+5V (CP2)	01A-A3YA A1D07	PS102 J/P03-A
	+5V (CP2)	01A-A3YA B1D07	PS102 J/P03-A
	+5V (CP2)	01A-A3YA B1E07	PS102 J/P03-A
	+5V Return	01A-A3YA B1B07	PS102 J/P03-B
	+5V Return	01A-A3YA B1C07	PS102 J/P03-B
	+5V Return	01A-A3YA A1E07	PS102 J/P03-B
	+5V Return	01A-A3YA B1A07	PS102 J/P03-B

Reference Number 40 AID 985

Part Number	Signal Name	From Connector	To Connector
8645382 Pin Side	-4.3V	01A-A4YH W1A07	01A-B2TB1 C01
	-4.3V	01A-A4YH W1B07	01A-B2TB1 C01
	Common	01A-A4YH W1C07	01A-B2TB1 B13
	Common	01A-A4YH W1D07	01A-B2TB1 B13
	Common	01A-A4YH W1E07	01A-B2TB1 B13
	Common	01A-A4YH X1A07	01A-B2TB1 B14
	-4.3V	01A-A4YH X1B07	01A-B2TB1 C01
	-4.3V	01A-A4YH X1C07	01A-B2TB1 C02
	-4.3V	01A-A4ZH W6A03	01A-B2TB1 C02
	-4.3V	01A-A4ZH W6B03	01A-B2TB1 C02
	Common	01A-A4ZH W6C03	01A-B2TB1 B14
	Common	01A-A4ZH W6D03	01A-B2TB1 B14
	Common	01A-A4ZH W6E03	01A-B2TB1 B17
	Common	01A-A4ZH X6A03	01A-B2TB1 B17
	-4.3V	01A-A4ZH X6B03	01A-B2TB1 C03
	-4.3V	01A-A4ZH X6C03	01A-B2TB1 C03

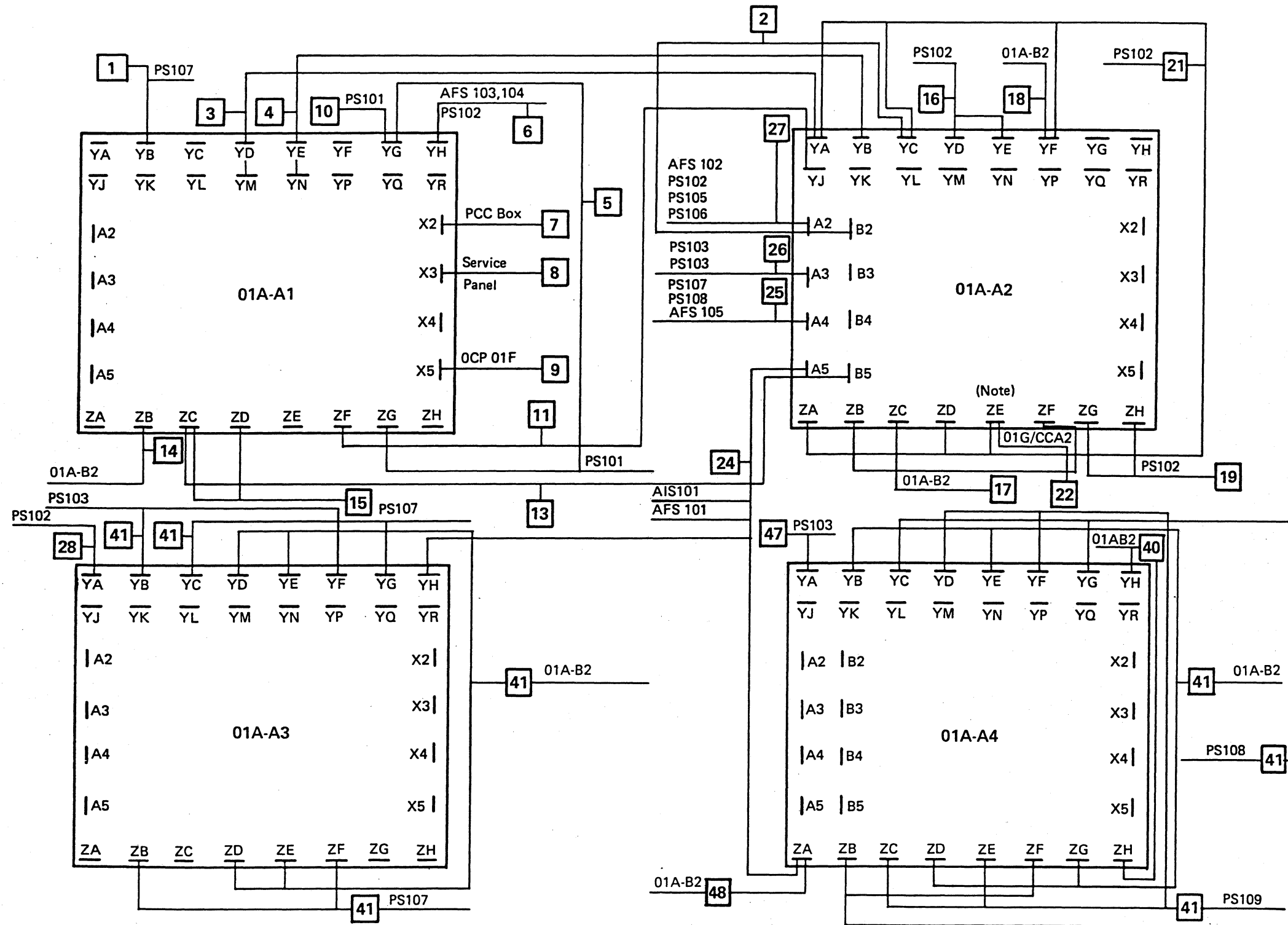
Reference Number 47 AID 985

Part Number	Signal Name	From Connector	To Connector
8645314 Pin Side	-2.2V	01A-A4YA A1A07	PS103 J/P03-1
	-2.2V	01A-A4YA B1C07	PS103 J/P03-2
	-2.2V Return	01A-A4YA B1A07	PS103 J/P03-5
	-2.2V Return	01A-A4YA A1C07	PS103 J/P03-6

Reference Number 48 AID 985

Part Number	Signal Name	From Connector	To Connector
401452 Pin Side	-4.3V	01A-A4ZA A6C03	01A-B2TB1 C01
	-4.3V	01A-A4ZA A6D03	01A-B2TB1 C02
	-4.3V Return	01A-A4ZA A6E03	01A-B2TB1 C05
	-4.3V Return	01A-A4ZA B6A03	01A-B2TB1 C06
	-4.3V Return	01A-A4ZA B6B03	01A-B2TB1 C07
	-4.3V Return	01A-A4ZA B6C03	01A-B2TB1 C08
	-4.3V	01A-A4ZA B6D03	01A-B2TB1 C03
	-4.3V	01A-A4ZA B6E03	01A-B2TB1 C04

Cable Reference Number Diagram



Note: 01G/CCA2 is the RSF Cable

Seq FO035	PN 0446132 Pg 1 of 1	EC A02214 15 SEP 83	EC A02220 06 JUN 84			
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FDS Cables

Reference Number **41** AID 985

Part Number	Signal Name	From Connector	To Connector
1802708	+6 Volts +6 Volts Return	PS107 J/P04-A PS107 J/P04-B	01A-A3YC 01A-A3YG
1802709	+6 Volts Return +6 Volts	PS107 J/P05-A PS107 J/P05-B	01A-A3ZB 01A-A3ZF
1802710	+5 Volts +5 Volts Return	PS109 J/P06-A PS109 J/P06-B	01A-A4YD 01A-A4YF
1802711	+5 Volts Return +5 Volts	PS109 J/P05-A PS109 J/P05-B	01A-A4ZC 01A-A4ZE
1802712	+8.5 Volts Return +8.5 Volts	PS108 J/P05-A PS108 J/P05-B	01A-A4ZB 01A-A4ZF
1802713	+8.5 Volts +8.5 Volts Return	PS108 J/P06-A PS108 J/P06-B	01A-A4YC 01A-A4YG
1807980	-1.5 Volts -1.5 Volts	01A-B2TB1 A15 01A-B2TB1 A16	01A-A3YE 01A-A3YE
1807981	-1.5 Volts -1.5 Volts	01A-B2TB1 A15 01A-B2TB1 A16	01A-A4ZG 01A-A4ZG
1807982	-1.5 Volts -1.5 Volts	01A-B2TB1 A19 01A-B2TB1 A20	01A-A4YB 01A-A4YB
1807983	Return Return	01A-B2TB1 B07 01A-B2TB1 B08	01A-A3ZD 01A-A3ZD
1807984	Return Return	01A-B2TB1 B07 01A-B2TB1 B08	01A-A3ZE 01A-A3ZE
1807989	Return Return	01A-B2TB1 B17 01A-B2TB1 B18	01A-A4ZD 01A-A4ZD
1807991	Return Return	01A-B2TB1 B13 01A-B2TB1 B14	01A-A4YE 01A-A4YE
1807995	-4.3 Volts -4.3 Volts	01A-B2TB1 C03 01A-B2TB1 C04	01A-A3YD 01A-A3YD
8645394	+5V (CP3) +5V Return	PS103 J/P09-A PS103 J/P09-B	01A-A3YB 01A-A3YF

Seq F0045	PN 0446133 Pg 1 of 1	EC A02214 15 SEP 83	EC A02215 01 NOV 83	EC A02219 29 FEB 84		
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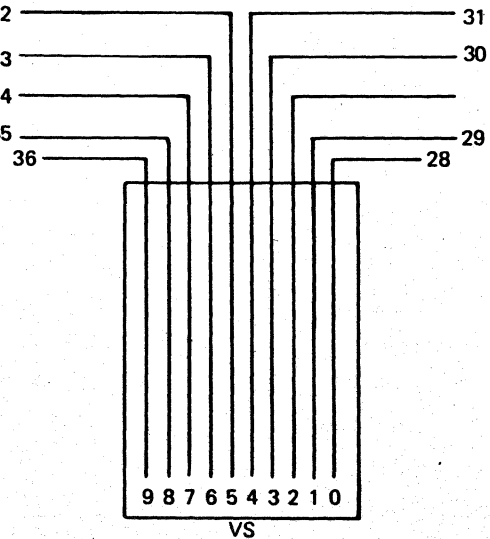
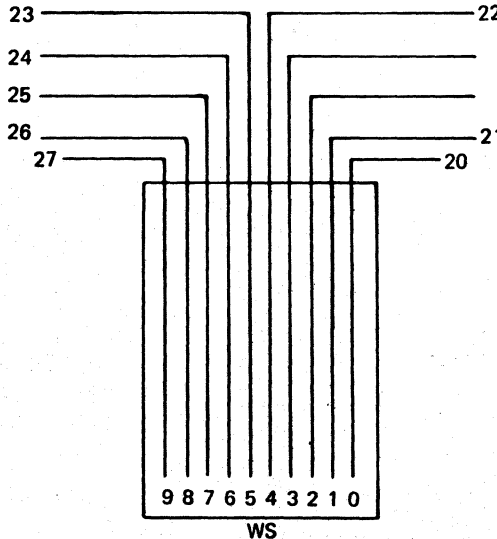
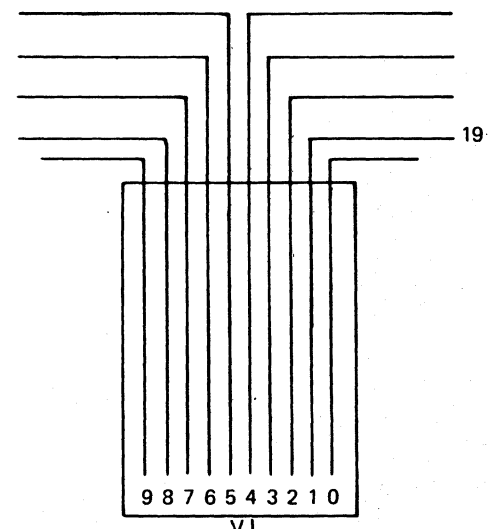
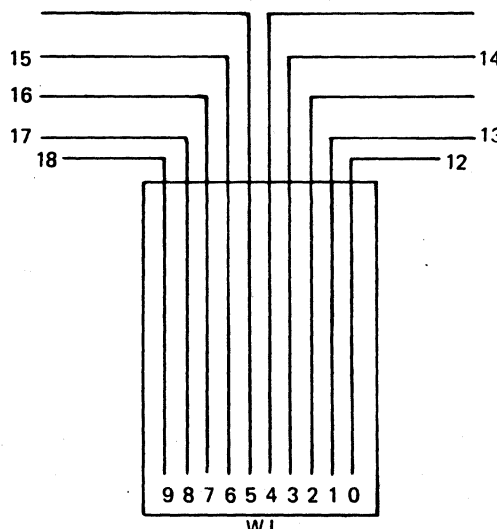
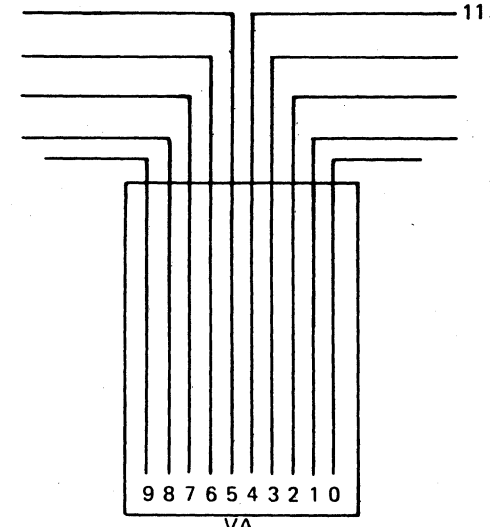
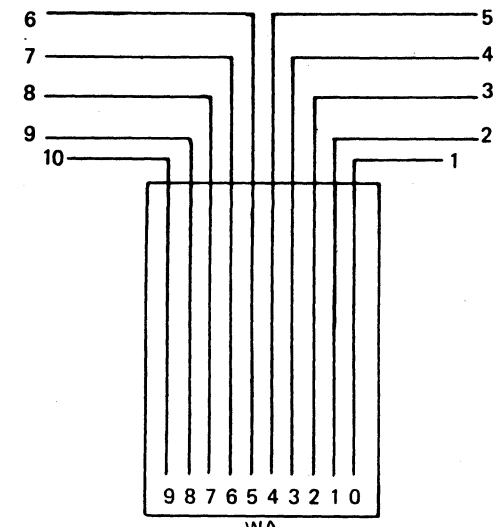
Board 01A-B2 Signal Cable Interconnections

Reference Number	From Connector	To Connector	Part Number
1	01A-B2WA0	01A-A4YR	8645353
2	01A-B2WA1	01A-A4YE	8645353
3	01A-B2WA2	01A-A4YG	8645353
4	01A-B2WA3	01A-A4YQ	8645353
5	01A-B2WA4	01A-A4YF	8645353
6	01A-B2WA5	01A-A4YL	8645353
7	01A-B2WA6	01A-A4YP	8645353
8	01A-B2WA7	01A-A4YD	8645353
9	01A-B2WA8	01A-A4YM	8645353
10	01A-B2WA9	01A-A4YN	8645353
11	01A-B2VA4	01A-A3YG	8645354
12	01A-B2WJ0	01A-A4X2	8645357
13	01A-B2WJ1	01A-A3YD	8645357
14	01A-B2WJ3	01A-A4X3	8645357
15	01A-B2WJ6	01A-A4X4	8645357
16	01A-B2WJ7	01A-A2YG	8645357
17	01A-B2WJ8	01A-A3W4	8645354
18	01A-B2WJ9	01A-A4X5	8645357
19	01A-B2VJ1	01A-A3A4	8645357
20	01A-B2WS0	01A-A3W2	8645354
21	01A-B2WS1	01A-A3V4	8645354
22	01A-B2WS4	01A-A3V3	8645354
23	01A-B2WS5	01A-A3V5	8645354
24	01A-B2WS6	01A-A3W5	8645354
26	01A-B2WS8	01A-A3W3	8645354
27	01A-B2WS9	01A-A3V2	8645354
28	01A-B2VS0	01A-A3C2	8645354
29	01A-B2VS1	01A-A3C3	8645354
30	01A-B2VS3	01A-A3D5	8645354
31	01A-B2VS4	01A-A3C5	8645354
32	01A-B2VS5	01A-A3D3	8645354
33	01A-B2VS6	01A-A2YF	8645354
34	01A-B2VS7	01A-A3D4	8645354
35	01A-B2VS8	01A-A3C4	8645354
36	01A-B2VS9	01A-A3D2	8645354

Note: For reference numbers **1** through **36**, see page AID 1015.

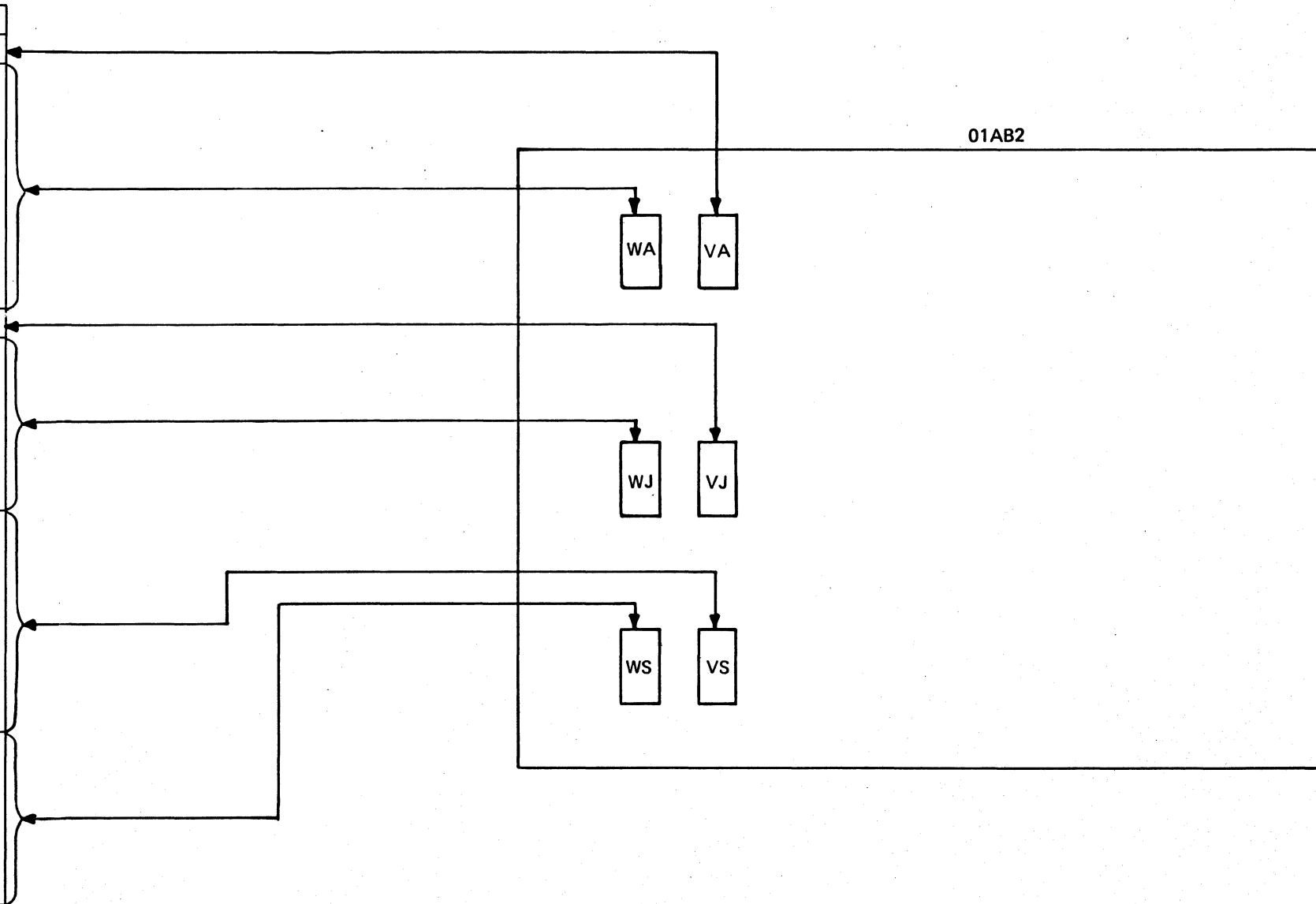
Board 01A-B2 Cable Reference Numbers

Reference Number	From Connector	To Connector	Part Number
1	01A-B2WA0	01A-A4YR	8645353
2	01A-B2WA1	01A-A4YE	8645353
3	01A-B2WA2	01A-A4WG	8645353
4	01A-B2WA3	01A-A4YQ	8645353
5	01A-B2WA4	01A-A4YF	8645353
6	01A-B2WA5	01A-A4YL	8645353
7	01A-B2WA6	01A-A4YP	8645353
8	01A-B2WA7	01A-A4YD	8645353
9	01A-B2WA8	01A-A4YM	8645353
10	01A-B2WA9	01A-A4YN	8645353
11	01A-B2VA4	01A-A3YG	8645354
12	01A-B2WJ0	01A-A4X2	8645357
13	01A-B2WJ1	01A-A3YD	8645357
14	01A-B2WJ3	01A-A4X3	8645357
15	01A-B2WJ6	01A-A4X4	8645357
16	01A-B2WJ7	01A-A2YG	8645357
17	01A-B2WJ8	01A-A3W4	8645354
18	01A-B2WJ9	01A-A4X5	8645357
19	01A-B2VJ1	01A-A3A4	8645357
20	01A-B2WS0	01A-A3WZ	8645354
21	01A-B2WS1	01A-A3V4	8645354
22	01A-B2WS4	01A-A3V3	8645354
23	01A-B2WS5	01A-A3V5	8645354
24	01A-B2WS6	01A-A3W5	8645354
26	01A-B2WS8	01A-A3W3	8645354
27	01A-B2WS9	01A-A3V2	8645354
28	01A-B2VS0	01A-A3C2	8645354
29	01A-B2VS1	01A-A3C3	8645354
30	01A-B2VS3	01A-A3D5	8645354
31	01A-B2VS4	01A-A3C5	8645354
32	01A-B2VS5	01A-A3D3	8645354
33	01A-B2VS6	01A-A2YF	8645354
34	01A-B2VS7	01A-A3D4	8645354
35	01A-B2VS8	01A-A3C4	8645354
36	01A-B2VS9	01A-A3D2	8645354



Board 01A-B2 Distribution

From Connector	To Connector	Part Number
01A-B2VA4	01A-A3YG	8645354
01A-B2WA0	01A-A4YR	8645353
01A-B2WA1	01A-A4YE	8645353
01A-B2WA2	01A-A4YG	8645353
01A-B2WA3	01A-A4YQ	8645353
01A-B2WA4	01A-A4YF	8645353
01A-B2WA5	01A-A4YL	8645353
01A-B2WA6	01A-A4YP	8645353
01A-B2WA7	01A-A4YD	8645353
01A-B2WA8	01A-A4YM	8645353
01A-B2WA9	01A-A4YN	8645353
01A-B2VJ1	01A-A3A4	8645357
01A-B2WJ0	01A-A4X2	8645357
01A-B2WJ1	01A-A3YD	8645357
01A-B2WJ3	01A-A4X3	8645357
01A-B2WJ6	01A-A4X4	8645357
01A-B2WJ7	01A-A2YG	8645357
01A-B2WJ8	01A-A3W4	8645356
01A-B2WJ9	01A-A4X5	8645357
01A-B2VS0	01A-A3C2	8645354
01A-B2VS1	01A-A3C3	8645354
01A-B2VS3	01A-A3D5	8645354
01A-B2VS4	01A-A3C5	8645354
01A-B2VS5	01A-A3D3	8645354
01A-B2VS6	01A-A2YF	8645354
01A-B2VS7	01A-A3D4	8645354
01A-B2VS8	01A-A3C4	8645354
01A-B2VS9	01A-A3D2	8645354
01A-B2WS0	01A-A3W2	8645354
01A-B2WS1	01A-A3V4	8645354
01A-B2WS4	01A-A3V3	8645354
01A-B2WS5	01A-A3V5	8645354
01A-B2WS6	01A-A3W5	8645354
01A-B2WS8	01A-A3W3	8645354
01A-B2WS9	01A-A3V2	8645354



Signal and Power Cable Replacement List

Signal Cables

From Connector	To Connector	Part Number
01A-A2YF	01A-B2VS6	8645354
01A-A2YG	01A-B2WJ7	8645357
01A-A2YQ	01A-A3YM	1807955
01A-A2YR	01A-A3ZD	1807949
01A-A2ZG	01E-CCA1	1807955
01A-A2ZG	01E-CCA2	1807955
01A-A2ZH	01E-CCA1	1807955
01A-A2ZH	01E-CCA2	1807955
01A-A3A4	01A-B2VJ1	8645357
01A-A3C2	01A-B2VS0	8645354
01A-A3C3	01A-B2VS1	8645354
01A-A3C4	01A-B2VS8	8645354
01A-A3C5	01A-B2VS4	8645354
01A-A3D2	01A-B2VS9	8645354
01A-A3D3	01A-B2VS5	8645354
01A-A3D4	01A-B2VS7	8645354
01A-A3D5	01A-B2VS3	8645354
01A-A3YC	01A-B2WS7	8645354
01A-A3YD	01A-B2WJ1	8645357
01A-A3YG	01A-B2VA4	8645354
01A-A3V2	01A-B2WS9	8645354
01A-A3V3	01A-B2WS4	8645354
01A-A3V4	01A-B2WS1	8645354
01A-A3V5	01A-B2WS5	8645354
01A-A3W2	01A-B2WS0	8645354
01A-A3W3	01A-B2WS8	8645354
01A-A3W4	01A-B2WJ8	8645354
01A-A3W5	01A-B2WS6	8645354

From Connector	To Connector	Part Number
01A-A3YJ	01E-CCA7	1807945
01A-A3YJ	01E-CCA8	1807945
01A-A3ZA	01E-CCA7	1807945
01A-A3ZA	01E-CCA8	1807945
01A-A3B2	01E-CCA6	1807944
01A-A3B2	01E-CCA5	1807944
01A-A3B3	01E-CCA4	1807944
01A-A3B3	01E-CCA3	1807944
01A-A3B4	01E-CCA4	1807944
01A-A3B4	01E-CCA3	1807944
01A-A3B5	01E-CCA6	1807944
01A-A3B5	01E-CCA5	1807944
01A-A3YK	01E-CCA9	1807945
01A-A3YK	01E-CCB1	1807945
01A-A3ZB	01E-CCA9	1807945
01A-A3ZB	01E-CCB1	1807945
01A-A3YL	01E-CCB2	1807945
01A-A3YL	01E-CCB3	1807945
01A-A3ZC	01E-CCB2	1807945
01A-A3ZC	01E-CCB3	1807945
01A-A3ZE	01E-CCB4	1807946
01A-A3ZE	01E-CCB5	1807946
01A-A3YN	01E-CCB4	1807946
01A-A3YN	01E-CCB5	1807946
01A-A3YP	01E-CCB6	1807946
01A-A3YP	01E-CCB7	1807946
01A-A3ZF	01E-CCB6	1807946
01A-A3ZF	01E-CCB7	1807946
01A-A3YQ	01E-CCB8	1807946
01A-A3YQ	01E-CCB9	1807946
01A-A3ZG	01E-CCB8	1807946
01A-A3ZG	01E-CCB9	1807946
01A-A3YR	01E-CCC1	1807947
01A-A3YR	01E-CCC2	1807947
01A-A3ZH	01E-CCC1	1807947
01A-A3ZH	01E-CCC2	1807947
01A-A3X2	01E-CCC4	1807947
01A-A3X2	01E-CCC3	1807947
01A-A3X3	01E-CCC6	1807947
01A-A3X3	01E-CCC5	1807947
01A-A3X4	01E-CCC5	1807947
01A-A3X4	01E-CCC6	1807947
01A-A3X5	01E-CCC4	1807947
01A-A3X5	01E-CCC3	1807947

From Connector	To Connector	Part Number
01A-A4YL	01A-B2WA5	8645353
01A-A4YD	01A-B2WA7	8645353
01A-A4YM	01A-B2WA8	8645353
01A-A4YE	01A-B2WA1	8645353
01A-A4YN	01A-B2WA9	8645353
01A-A4YF	01A-B2WA4	8645353
01A-A4YP	01A-B2WA6	8645353
01A-A4WG	01A-B2WA2	8645353
01A-A4YQ	01A-B2WA3	8645353
01A-A4YR	01A-B2WA0	8645353
01A-A4X2	01A-B2WJ0	8645357
01A-A4X3	01A-B2WJ3	8645357
01A-A4X4	01A-B2WJ6	8645357
01A-A4X5	01A-B2WJ9	8645357

Power Cables

From Connector	To Connector	Part Number
01A-A1X5	OCP 01F J/P01	1807957
01A-A1YB	PS107 J/P06	8645448 **
01A-A2A4	PS107 J/P01	1807960
01A-A2A4	AFS 105 J/P01	1807960
01A-A2A4	PS108 J/P01	1807960
01A-A4YH	PS103 J/P03	8645314
01A-A4YA	01AB2 TB1	8645382
01A-A4ZA	01AB2 TB1	8645382 *
01A-A2B5	01A-A1ZC	1807968
01A-A2YB	01A-A1YN	1807966
01A-A2A5	01A-A3YH	1807963
01A-A2A5	AFS 101 J/P01	1807963
01A-A2A5	01A-A4ZA	1807963
01A-A2A5	AMD 102	1807963
01A-A2YF	01AB2 VS6	8645354
01A-A2YD	PS102 J/P05	8645347
01A-A2YD	PS102 J/P06	8645347
01A-A2YE	PS102 J/P05	8645347
01A-A2YE	PS102 J/P06	8645347
01A-A2ZG	PS102 J/P08	8645348
01A-A2ZG	PS102 J/P09	8645348
01A-A2ZH	PS102 J/P08	8645348
01A-A2ZH	PS102 J/P09	8645348
01A-A2YA	PS102 J/P14	8645326 *
01A-A2YC	PS102 J/P14	8645326 *
01A-A2YF	PS102 J/P14	8645326 *
01A-A2ZA	PS102 J/P15	8645326 *
01A-A2ZD	PS102 J/P15	8645326 *
01A-A2ZE	PS102 J/P15	8645326 *
01A-A2YA	01A-A1YM	8645380
01A-A1YH	AFS 103 J/P01	1807958 *
01A-A1YH	AFS 104 J/P01	1807958 *
01A-A1YH	PS102 J/P13	1807958 *
01A-A1YH	PS102 J/P07	1807958 *
01A-A1YH	Service Panel CE Sw3, Sw2	1807958 *
01A-A1YG	PS101 J/P01	8645329
01A-A1ZG	PS101 J/P01	8645329
01A-A1YG	PS101 J/P03	1807959
01A-A1ZF	01A-A2YJ	1807965

From Connector	To Connector	Part Number
01A-A2A2	PS105 J/P02	1807961
01A-A2A2	PS106 J/P02	1807961
01A-A2A2	AFS 102 J/P01	1807961
01A-A2A2	PS102 J/P03	1807961
01A-A2A3	PS103 J/P02	1807962
01A-A2A3	PS103 J/P01	1807962
01A-A2B2	01A-A2YC	1807964
01A-A1YM	01A-A2YA	1807967
01A-A1X3	Service Panel A1	1807953
01A-A1YN	01A-A2YB	1807966
01A-A1ZC	PS102 J/P04	8645321 **
01A-A1ZC	01A-A2B5	1807968
01A-A1X2	PCC J/P03	1808000
01A-A1ZB	01A-B2 TB1	8645447 **
01A-A3YA	PS102 J/P04	8645349
01A-A2ZF	01A-B2 TB1	8645346
01A-A2ZC	01A-B2 TB1	8645346

* Pin side connector

** CTCA

External Interrupts

External Interrupt	From 01G 01A-A2YE Note 1	Convert In 01A-A2U2 Note 1	Convert Out 01A-A2U2 Note 2	To 01A-B2 01A-A2YF Note 2
0	N1D08	U2B05	-----	-----
1	N1D06	U2B07	-----	-----
2	P1C06	U2D04	U2B04	S1B06
3	P1B08	U2D07	U2D02	S1A08
4	P1C08	U2B03	U2D09	S1B08
5	P1A06	U2D06	U2B09	R1E06
6	N1E08	U2B02	U2B08	R1D08
7	N1E06	U2D05	U2D13	R1D06

Notes:

1. Up level +3.16V to +5.10V; down level +0.15V to 0.0V.
2. Up level +2.4V to 5.5V; down level +0.6V to 0.0V.

SBA Input and Output Signals

Input Signals

SBA Input Signals	From 01A-B2 01A-A2YG Note 1	Convert In 01A-A2U2 Note 1	Convert Out 01A-A2U2 Note 2	SBA 1 01A-A2T2 Note 2	PCA 1 01A-A2E2 Note 2
-SBA Bit In Bus 0	U1B08	U2G02	U2D10	T2D02	-----
-SBA Bit In Bus 1	U1B06	U2G04	U2B13	T2G10	-----
-Any Machine Check	U1A08	U2J02	U2B12	T2U04	-----
-IPU/Chnl Meter Run	T1D08	U2G05	U2J05	T2S04	-----
-Wait Indicator	T1E06	U2G06	U2J11	T2S05	-----
-IPU Interrupt	T1D06	U2G08	U2J07	-----	E2J06

Notes:

1. Up level -0.08V to +0.02V; down level -0.80V to -1.20V.
2. Up level +2.40V to +5.50V; down level +0.60V to 0.0V.

Output Signals

SBA Output Signals	SBA1 01A-A2T2 Note 1	Convert In 01A-A2U2 Note 1	Convert Out 01A-A2U2 Note 2	TO 01A-B2 01A-A2YG Note 2
-SBA Bit Out Bus 0	T2B04	U2B10	U2D11	T1C08
-SBA Set Pulse Bus 0	T2B03	U2D12	U2G07	T1C06
-Addr/Data Bus 0	T2B02	U2G03	U2J04	T1B08
-A Clock (master) Bus 0	T2B12	U2J06	U2J10	T1A06
-B Clock (slave) Bus 0	T2J11	U2J09	U2G11	S1E06
-SBA Bit Out Bus 1	T2M02	U2G09	U2G10	V1A06
-SBA Set Pulse Bus 1	T2M05	U2G13	U2M06	U1E08
-Addr/Data Bus 1	T2P02	U2P05	U2G12	V1A08
-A Clock (master) Bus 1	T2M11	U2P04	U2M09	U1D06
-B Clock (slave) Bus 1	T2M08	U2M08	U2M10	U1C08
+Metering Out	T2S03	-----	-----	U1C06

Notes:

1. Up level +2.0V to +5.50V; down level +0.90V to 0.0V.
2. Up level -0.08V to +0.02V; down level -0.93V to -1.20V.

Channel Cable Replacement List

Channel	From Tailgate	To Connector	Part Number
0	01E-CCA1/A2	01A-A2ZH	1807955
	01E-CCA1/A2	01A-A2ZG	1807955
	01E-CCA1/A2	01A-A2YR	1807977
	01E-CCA1/A2	01A-A2YQ	1807955
	01E-CCA1/A2	01A-A3YM	1807955
	01E-CCA1/A2	01A-A3ZD	1807955
1	01E-CCA3/A4	01A-A3B4	1807944
	01E-CCA3/A4	01A-A3B5	1807944
2	01E-CCA5/A6	01A-A3B2	1807944
	01E-CCA5/A6	01A-A3B3	1807944
3	01E-CCA7/A8	01A-A3YJ	1807945
	01E-CCA7/A8	01A-A3ZA	1807945
4	01E-CCA9/B1	01A-A3YK	1807945
	01E-CCA9/B1	01A-A3ZB	1807945
5	01E-CCB2/B3	01A-A3YL	1807945
	01E-CCB2/B3	01A-A3ZC	1807945
6	01E-CCB4/B5	01A-A3YN	1807946
	01E-CCB4/B5	01A-A3ZE	1807946
7	01E-CCB6/B7	01A-A3YP	1807946
	01E-CCB6/B7	01A-A3ZF	1807946
8	01E-CCB8/B9	01A-A3YQ	1807946
	01E-CCB8/B9	01A-A3ZG	1807946
9	01E-CCC1/C2	01A-A3YR	1807947
	01E-CCC1/C2	01A-A3ZH	1807947
A	01E-CCC3/C4	01A-A3X2	1807947
	01E-CCC3/C4	01A-A3X5	1807947
B	01E-CCC5/C6	01A-A3X3	1807947
	01E-CCC5/C6	01A-A3X4	1807947

I/O Cables Channel 0

Bus-In Pin Locations

Signal Name +NPL Channel 0	I/O Connector Pin	Connector 01A-A2ZH	Card 01A-A2X2	Connector 01A-A2YR	Connector 01A-A3ZD	Card 01A-A3K2
Bus-In Bit P	01E-A1G03	V6D02	X2J06	V1D11	J6C02	K2S12
Bus-In Bit 0	01E-A1J04	W6B02	X2D13	W1B11	K6A02	K2S02
Bus-In Bit 1	01E-A1G05	W6D02	X2G02	W1D11	K6C02	K2S03
Bus-In Bit 2	01E-A1J06	X6A02	X2J02	X1A11	K6E02	K2S04
Bus-In Bit 3	01E-A1G08	X6C02	X2G03	X1C11	L6B02	K2S05
Bus-In Bit 4	01E-A1J09	X6E02	X2J04	X1E11	L6D02	K2S07
Bus-In Bit 5	01E-A1G10	X6D04	X2G04	X1D13	L6C04	K2S08
Bus-In Bit 6	01E-A1J11	X6B04	X2J05	X1B13	L6A04	K2S09
Bus-In Bit 7	01E-A1G12	W6E04	X2G05	W1E13	K6D04	K2S10
Mark-In	01E-A1J13	X6C04	X2D02	X1C13	L6B04	K2U13

Tag-In Pin Locations

Signal Name +NPL Channel 0	I/O Connector Pin	Connector 01A-A2ZH	Card 01A-A2X2	Connector 01A-A2YR	Connector 01A-A3ZD	Card 01A-A3K2
Address-In	01E-A2B05	W6C04	X2D06	W1C13	K6B04	K2U08
Data-In	01E-A2G08	X6A04	-----	X1A13	K6E04	K2U12
Disconnect-In	01E-A2J11	W6A04	X2B05	W1A13	J6E04	K2U11
Meter-In	01E-A2G05	W6B04	-----	W1B13	K6A04	K2U02
Op-In	01E-A2B03	V6E02	X2B10	V1E11	J6D02	K2U06
Request-In	01E-A2J06	X6E04	X2D12	X1E13	L6D04	K2U10
Select-In	01E-A2B08	V6D04	X2S02 to X2G09	V1D13	J6C04	K2U05
Service-In	01E-A2D06	W6C02	X2D09	W1C11	K6B02	K2U07
Status-In	01E-A2D04	X6B02	X2B07	X1B11	L6A02	K2S04
Special	01E-A2J09	W6A02	-----	W1A11	J6E02	-----

Bus-Out Pin Locations

Signal Name +NPL Channel 0	I/O Connector Pin	Connector 01A-A2ZG	Card 01A-A2X2	Connector 01A-A2YQ	Connector 01A-A3YM	Card 01A-A3K2
Bus-Out Bit P	01E-A1B03	S6E02	X2M12	S1E11	J1C11	K2B12
Bus-Out Bit 0	01E-A1D04	T6C02	X2S09	T1C11	K1A11	K2B02
Bus-Out Bit 1	01E-A1B05	T6E02	X2S10	T1E11	K1C11	K2B03
Bus-Out Bit 2	01E-A1D06	U6B02	X2U10	U1B11	K1E11	K2B04
Bus-Out Bit 3	01E-A1B08	U6D02	X2U02	U1D11	L1B11	K2B05
Bus-Out Bit 4	01E-A1D09	V6A02	X2S03	V1A11	L1D11	K2B07
Bus-Out Bit 5	01E-A1B10	U6E04	X2U04	U1E13	L1C13	K2B08
Bus-Out Bit 6	01E-A1D11	U6C04	X2S04	U1C13	L1A13	K2B09
Bus-Out Bit 7	01E-A1B12	U6A04	X2P12	U1A13	K1D13	K2B10
Mark-Out	01E-A1D13	U6D04	-----	U1D13	L1B13	K2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 0	I/O Connector Pin	Connector 01A-A2ZG	Card 01A-A2X2	Connector 01A-A2YQ	Connector 01A-A3YM	Card 01A-A3K2
Address-Out	01E-A2B10	T6D04	X2M07	T1D13	K1B13	K2D06
Command-Out	01E-A2D11	U6C02	X2G08	U1C11	L1A11	K2D05
Data-Out	01E-A2G10	U6B04	-----	U1B13	K1E13	K2D09
Hold-Out	01E-A2G12	V6A04	X2J10	V1A13	L1D13	K2D07
Meter-Out	01E-A2J04	T6C04	X2U09	T1C13	K1A13	K2D12
Op-Out	01E-A2J13	T6A02	X2J11	T1A11	J1D11	K2D02
Select-Out	01E-A2D09	S6E04	-----	S1E13	J1C13	K2D11
Service-Out	01E-A2D13	T6D02	X2J07	T1D11	K1B11	K2D04
Suppress-Out	01E-A2B12	T6B04	X2G10	T1B13	J1E13	K2D10

Note: Up level +3.16V to +5.1V; down level +0.15V to 0.0V.

I/O Cables Channel 1

Bus-In Pin Locations

Signal Name +NPL Channel 1	I/O Connector Pin	Connector 01A-A3B4	Card 01A-A3E2
Bus-In Bit P	01E-A3G03	B4D02	E2S12
Bus-In Bit 0	01E-A3J04	B4D05	E2S02
Bus-In Bit 1	01E-A3G05	B4D07	E2S03
Bus-In Bit 2	01E-A3J06	B4D09	E2S04
Bus-In Bit 3	01E-A3G08	B4D11	E3S05
Bus-In Bit 4	01E-A3J09	B4D13	E2S07
Bus-In Bit 5	01E-A3G10	B4B12	E2S08
Bus-In Bit 6	01E-A3J11	B4B10	E2S09
Bus-In Bit 7	01E-A3G12	B4B08	E2S10
Mark-In	01E-A3J13	B4B11	E2U13

Tag-In Pin Locations

Signal Name +NPL Channel 1	I/O Connector Pin	Connector 01A-A3B4	Card 01A-A3E2
Address-In	01E-A4B05	B4B06	E2U09
Data-In	01E-A4G08	B4B09	E2U12
Disconnect-In	01E-A4J11	B4B04	E2U11
Meter-In	01E-A4G05	B4B05	E2U02
Op-In	01E-A4B03	B4D03	E2U06
Request-In	01E-A4J06	B4B13	E2U10
Select-In	01E-A4B08	B4B02	E2U05
Service-In	01E-A4D06	B4D06	E2U07
Status-In	01E-A4D04	B4D10	E2U04
Special	01E-A4J09	B4D04	-----

Bus-Out Pin Locations

Signal Name +NPL Channel 1	I/O Connector Pin	Connector 01A-A3B3	Card 01A-A3E2
Bus-Out Bit P	01E-A3B03	B3D02	E2B12
Bus-Out Bit 0	01E-A3D04	B3D05	E2B02
Bus-Out Bit 1	01E-A3B05	B3D07	E2B03
Bus-Out Bit 2	01E-A3D06	B3D09	E2B04
Bus-Out Bit 3	01E-A3B08	B3D11	E2B05
Bus-Out Bit 4	01E-A3D09	B3D13	E2B07
Bus-Out Bit 5	01E-A3B10	B3B12	E2B08
Bus-Out Bit 6	01E-A3D11	B3B10	E2B09
Bus-Out Bit 7	01E-A3B12	B3B08	E2B10
Mark-Out	01E-A3D13	B3B11	E2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 1	I/O Connector Pin	Connector 01A-A3B3	Card 01A-A3E2
Address-Out	01E-A4B10	B3B06	E2D06
Meter Out	01E-A4J04	B3B05	E2D12
Command-Out	01E-A4D11	B3D10	E2D05
Data-Out	01E-A4G10	B3B09	E2D09
Hold-Out	01E-A4G12	B3B13	E2D07
Op-Out	01E-A4J13	B3D03	E2D02
Select-Out	01E-A4D09	B3B02	E2D11
Service-Out	01E-A4D13	B3D06	E2D04
Suppress-Out	01E-A4B12	B3B04	E2D10

I/O Cables Channel 2

Bus-In Pin Locations

Signal Name +NPL Channel 2	I/O Connector Pin	Connector 01A-A3B5	Card 01A-A3F2
Bus-In Bit P	01E-A5G03	B5D02	F2S12
Bus-In Bit 0	01E-A5J04	B5D05	F2S02
Bus-In Bit 1	01E-A5G05	B5D07	F2S03
Bus-In Bit 2	01E-A5J06	B5D09	F2S04
Bus-In Bit 3	01E-A5G08	B5D11	F3S05
Bus-In Bit 4	01E-A5J09	B5D13	F2S07
Bus-In Bit 5	01E-A5G10	B5B12	F2S08
Bus-In Bit 6	01E-A5J11	B5B10	F2S09
Bus-In Bit 7	01E-A5G12	B5B08	F2S10
Mark-In	01E-A5J13	B5B11	F2U13

Tag-In Pin Locations

Signal Name +NPL Channel 2	I/O Connector Pin	Connector 01A-A3B5	Card 01A-A3F2
Address-In	01E-A6B05	B5B06	F2U09
Data-In	01E-A6G08	B5B09	F2U12
Disconnect-In	01E-A6J11	B5B04	F2U11
Meter-In	01E-A6G05	B5B05	F2U02
Op-In	01E-A6B03	B5D03	F2U06
Request-In	01E-A6J06	B5B13	F2U10
Select-In	01E-A6B08	B5B02	F2U05
Service-In	01E-A6D06	B5D06	F2U07
Status-In	01E-A6D04	B5D10	F2U04
Special	01E-A6J09	B5D04	F2---

Bus-Out Pin Locations

Signal Name +NPL Channel 2	I/O Connector Pin	Connector 01A-A3B2	Card 01A-A3F2
Bus-Out Bit P	01E-A5B03	B2D02	F2B12
Bus-Out Bit 0	01E-A5D04	B2D05	F2B02
Bus-Out Bit 1	01E-A5B05	B2D07	F2B03
Bus-Out Bit 2	01E-A5D06	B2D09	F2B04
Bus-Out Bit 3	01E-A5B08	B2D11	F2B05
Bus-Out Bit 4	01E-A5D09	B2D13	F2B07
Bus-Out Bit 5	01E-A5B10	B2B12	F2B08
Bus-Out Bit 6	01E-A5D11	B2B10	F2B09
Bus-Out Bit 7	01E-A5B12	B2B08	F2B10
Mark-Out	01E-A5D13	B2B11	F2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 2	I/O Connector Pin	Connector 01A-A3B2	Card 01A-A3F2
Address-Out	01E-A6B10	B2B06	F2D06
Meter Out	01E-A6J04	B2B05	F2D12
Command-Out	01E-A6D11	B2D10	F2D05
Data-Out	01E-A6G10	B2B09	F2D09
Hold-Out	01E-A6G12	B2B13	F2D07
Op-Out	01E-A6J13	B2D03	F2D02
Select-Out	01E-A6D09	B2B02	F2D11
Service-Out	01E-A6D13	B2D06	F2D04
Suppress-Out	01E-A6B12	B2B04	F2D10

I/O Cables Channel 3

Bus-In Pin Locations

Signal Name +NPL Channel 3	I/O Connector Pin	Connector 01A-A3ZA	Card 01A-A3G2
Bus-In Bit P	01E-A7G03	A6A02	G2S12
Bus-In Bit 0	01E-A7J04	A6D02	G2S02
Bus-In Bit 1	01E-A7G05	B6A02	G2S03
Bus-In Bit 2	01E-A7J06	B6C02	G2S04
Bus-In Bit 3	01E-A7G08	B6E02	G2S05
Bus-In Bit 4	01E-A7J09	C6B02	G2S07
Bus-In Bit 5	01E-A7G10	C6A04	G2S08
Bus-In Bit 6	01E-A7J11	B6D04	G2S09
Bus-In Bit 7	01E-A7G12	B6B04	G2S10
Mark-In	01E-A7J13	B6E04	G2U13

Tag-In Pin Locations

Signal Name +NPL Channel 3	I/O Connector Pin	Connector 01A-A3ZA	Card 01A-A3G2
Address-In	01E-A8B05	A6E04	G2U09
Data-In	01E-A8G08	B6C04	G2U12
Disconnect-In	01E-A8J11	A6C04	G2U11
Meter-In	01E-A8G05	A6D04	G2U02
Op-In	01E-A8B03	A6B02	G2U06
Request-In	01E-A8J06	C6B04	G2U10
Select-In	01E-A8B08	A6A04	G2U05
Service-In	01E-A8D06	A6E02	G2U07
Status-In	01E-A8D04	B6D02	G2U04
Special	01E-A8J09	A6C02	G2---

Bus-Out Pin Locations

Signal Name +NPL Channel 3	I/O Connector Pin	Connector 01A-A3YJ	Card 01A-A3G2
Bus-Out Bit P	01E-A7B03	A1A11	G2B12
Bus-Out Bit 0	01E-A7D04	A1D11	G2B02
Bus-Out Bit 1	01E-A7B05	B1A11	G2B03
Bus-Out Bit 2	01E-A7D06	B1C11	G2B04
Bus-Out Bit 3	01E-A7B08	B1E11	G2B05
Bus-Out Bit 4	01E-A7D09	C1B11	G2B07
Bus-Out Bit 5	01E-A7B10	C1A13	G2B08
Bus-Out Bit 6	01E-A7D11	B1D13	G2B09
Bus-Out Bit 7	01E-A7B12	B1B13	G2B10
Mark-Out	01E-A7D13	B1E13	G2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 3	I/O Connector Pin	Connector 01A-A3YJ	Card 01A-A3G2
Address-Out	01E-A8B10	A1E13	G2D06
Meter Out	01E-A8J04	A1D13	G2D12
Command-Out	01E-A8D11	B1D11	G2D05
Data-Out	01E-A8G10	B1C13	G2D09
Hold-Out	01E-A8G12	C1B13	G2D07
Op-Out	01E-A8J13	A1B11	G2D02
Select-Out	01E-A8D09	A1A13	G2D11
Service-Out	01E-A8D13	A1E11	G2D04
Suppress-Out	01E-A8B12	A1C13	G2D10

I/O Cables Channel 4

Bus-In Pin Locations

Signal Name +NPL Channel 4	I/O Connector Pin	Connector 01A-A3ZB	Card 01A-A3H2
Bus-In Bit P	01E-A9G03	C6E02	H2S12
Bus-In Bit 0	01E-A9J04	D6C02	H2S02
Bus-In Bit 1	01E-A9G05	D6E02	H2S03
Bus-In Bit 2	01E-A9J06	E6B02	H2S04
Bus-In Bit 3	01E-A9G08	E6D02	H2S05
Bus-In Bit 4	01E-A9J09	F6A02	H2S07
Bus-In Bit 5	01E-A9G10	E6E04	H2S08
Bus-In Bit 6	01E-A9J11	E6C04	H2S09
Bus-In Bit 7	01E-A9G12	E6A04	H2S10
Mark-In	01E-A9J13	E6D04	H2U13

Tag-In Pin Locations

Signal Name +NPL Channel 4	I/O Connector Pin	Connector 01A-A3ZB	Card 01A-A3H2
Address-In	01E-B1B05	D6D04	H2U09
Data-In	01E-B1G08	E6B04	H2U12
Disconnect-In	01E-B1J11	D6B04	H2U11
Meter-In	01E-B1G05	D6C04	H2U02
Op-In	01E-B1B03	D6A02	H2U06
Request-In	01E-B1J06	F6A04	H2U10
Select-In	01E-B1B08	C6E04	H2U05
Service-In	01E-B1D06	D6E02	H2U07
Status-In	01E-B1D04	E6C02	H2U04
Special	01E-B1J09	D6B02	H2---

Bus-Out Pin Locations

Signal Name +NPL Channel 4	I/O Connector Pin	Connector 01A-A3YK	Card 01A-A3H2
Bus-Out Bit P	01E-A9B03	C1E11	H2B12
Bus-Out Bit 0	01E-A9D04	D1C11	H2B02
Bus-Out Bit 1	01E-A9B05	D1E11	H2B03
Bus-Out Bit 2	01E-A9D06	E1B11	H2B04
Bus-Out Bit 3	01E-A9B08	E1D11	H2B05
Bus-Out Bit 4	01E-A9D09	F1A11	H2B07
Bus-Out Bit 5	01E-A9B10	E1E13	H2B08
Bus-Out Bit 6	01E-A9D11	E1C13	H2B09
Bus-Out Bit 7	01E-A9B12	E1A13	H2B10
Mark-Out	01E-A9D13	E1D13	H2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 4	I/O Connector Pin	Connector 01A-A3YK	Card 01A-A3H2
Address-Out	01E-B1B10	D1D13	H2D06
Meter Out	01E-B1J04	D1C13	H2D12
Command-Out	01E-B1D11	E1C11	H2D05
Data-Out	01E-B1G10	E1B13	H2D09
Hold-Out	01E-B1G12	F1A13	H2D07
Op-Out	01E-B1J13	D1A11	H2D02
Select-Out	01E-B1D09	C1E13	H2D11
Service-Out	01E-B1D13	D1D11	H2D04
Suppress-Out	01E-B1B12	D1B13	H2D10

I/O Cables Channel 5

Bus-In Pin Locations

Signal Name +NPL Channel 5	I/O Connector Pin	Connector 01A-A3ZC	Card 01A-A3J2
Bus-In Bit P	01E-B2G03	F6D02	J2S12
Bus-In Bit 0	01E-B2J04	G6B02	J2S02
Bus-In Bit 1	01E-B2G05	G6D02	J2S03
Bus-In Bit 2	01E-B2J06	H6A02	J2S04
Bus-In Bit 3	01E-B2G08	H6C02	J2S05
Bus-In Bit 4	01E-B2J09	H6E02	J2S07
Bus-In Bit 5	01E-B2G10	H6D04	J2S08
Bus-In Bit 6	01E-B2J11	H6B04	J2S09
Bus-In Bit 7	01E-B2G12	G6E04	J2S10
Mark-In	01E-B2J13	H6C04	J2U13

Tag-In Pin Locations

Signal Name +NPL Channel 5	I/O Connector Pin	Connector 01A-A3ZC	Card 01A-A3J2
Address-In	01E-B3B05	G6C04	J2U09
Data-In	01E-B3G08	H6A04	J2U12
Disconnect-In	01E-B3J11	G6A04	J2U11
Meter-In	01E-B3G05	G6B04	J2U02
Op-In	01E-B3B03	F6E02	J2U06
Request-In	01E-B3J06	H6E04	J2U10
Select-In	01E-B3B08	F6D04	J2U05
Service-In	01E-B3D06	G6C02	J2U07
Status-In	01E-B3D04	H6B02	J2U04
Special	01E-B3J09	G6A02	J2---

Bus-Out Pin Locations

Signal Name +NPL Channel 5	I/O Connector Pin	Connector 01A-A3YL	Card 01A-A3J2
Bus-Out Bit P	01E-B2B03	F1D11	J2B12
Bus-Out Bit 0	01E-B2D04	G1B11	J2B02
Bus-Out Bit 1	01E-B2B05	G1D11	J2B03
Bus-Out Bit 2	01E-B2D06	H1A11	J2B04
Bus-Out Bit 3	01E-B2B08	H1C11	J2B05
Bus-Out Bit 4	01E-B2D09	H1E11	J2B07
Bus-Out Bit 5	01E-B2B10	H1D13	J2B08
Bus-Out Bit 6	01E-B2D11	H1B13	J2B09
Bus-Out Bit 7	01E-B2B12	G1E13	J2B10
Mark-Out	01E-B2D13	H1C13	J2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 5	I/O Connector Pin	Connector 01A-A3YL	Card 01A-A3J2
Address-Out	01E-B3B10	G1C13	J2D06
Meter Out	01E-B3J04	G1B13	J2D12
Command-Out	01E-B3D11	H1B11	J2D05
Data-Out	01E-B3G10	H1A13	J2D09
Hold-Out	01E-B3G12	H1E13	J2D07
Op-Out	01E-B3J13	F1E11	J2D02
Select-Out	01E-B3D09	F1D13	J2D11
Service-Out	01E-B3D13	G1C11	J2D04
Suppress-Out	01E-B3B12	G1A13	J2D10

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I/O Cables Channel 6

Bus-In Pin Locations

Signal Name +NPL Channel 6	I/O Connector Pin	Connector 01A-A3ZE	Card 01A-A3P2
Bus-In Bit P	01E-B4G03	M6B02	P2S12
Bus-In Bit 0	01E-B4J04	M6E02	P2S02
Bus-In Bit 1	01E-B4G05	N6B02	P2S03
Bus-In Bit 2	01E-B4J06	N6D02	P2S04
Bus-In Bit 3	01E-B4G08	P6A02	P2S05
Bus-In Bit 4	01E-B4J09	P6C02	P2S07
Bus-In Bit 5	01E-B4G10	P6B04	P2S08
Bus-In Bit 6	01E-B4J11	N6E04	P2S09
Bus-In Bit 7	01E-B4G12	N6C04	P2S10
Mark-In	01E-B4J13	P6A04	P2U13

Tag-In Pin Locations

Signal Name +NPL Channel 6	I/O Connector Pin	Connector 01A-A3ZE	Card 01A-A3P2
Address-In	01E-B5B05	N6A04	P2U09
Data-In	01E-B5G08	N6D04	P2U12
Disconnect-In	01E-B5J11	M6D04	P2U11
Meter-In	01E-B5G05	M6E04	P2U02
Op-In	01E-B5B03	M6C02	P2U06
Request-In	01E-B5J06	P6C04	P2U10
Select-In	01E-B5B08	M6B04	P2U05
Service-In	01E-B5D06	N6A02	P2U07
Status-In	01E-B5D04	N6E02	P2U04
Special	01E-B5J09	M6D02	P2---

Bus-Out Pin Locations

Signal Name +NPL Channel 6	I/O Connector Pin	Connector 01A-A3YN	Card 01A-A3P2
Bus-Out Bit P	01E-B4B03	M1B11	P2B12
Bus-Out Bit 0	01E-B4D04	M1E11	P2B02
Bus-Out Bit 1	01E-B4B05	N1B11	P2B03
Bus-Out Bit 2	01E-B4D06	N1D11	P2B04
Bus-Out Bit 3	01E-B4B08	P1A11	P2B05
Bus-Out Bit 4	01E-B4D09	P1C11	P2B07
Bus-Out Bit 5	01E-B4B10	P1B13	P2B08
Bus-Out Bit 6	01E-B4D11	N1E13	P2B09
Bus-Out Bit 7	01E-B4B12	N1C13	P2B10
Mark-Out	01E-B4D13	P1A13	P2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 6	I/O Connector Pin	Connector 01A-A3YN	Card 01A-A3P2
Address-Out	01E-B5B10	N1A13	P2D06
Meter Out	01E-B5J04	M1E13	P2D12
Command-Out	01E-B5D11	N1E11	P2D05
Data-Out	01E-B5G10	N1D13	P2D09
Hold-Out	01E-B5G12	P1C13	P2D07
Op-Out	01E-B5J13	M1C11	P2D02
Select-Out	01E-B5D09	M1B13	P2D11
Service-Out	01E-B5D13	N1A11	P2D04
Suppress-Out	01E-B5B12	M1D13	P2D10

I/O Cables Channel 7

Bus-In Pin Locations

Signal Name +NPL Channel 7	I/O Connector Pin	Connector 01A-A3ZF	Card 01A-A3Q2
Bus-In Bit P	01E-B6G03	Q6A02	Q2S12
Bus-In Bit 0	01E-B6J04	Q6D02	Q2S02
Bus-In Bit 1	01E-B6G05	R6A02	Q2S03
Bus-In Bit 2	01E-B6J06	R6C02	Q2S04
Bus-In Bit 3	01E-B6G08	R6E02	Q2S05
Bus-In Bit 4	01E-B6J09	S6B02	Q2S07
Bus-In Bit 5	01E-B6G10	S6A04	Q2S08
Bus-In Bit 6	01E-B6J11	R6D04	Q2S09
Bus-In Bit 7	01E-B6G12	R6B04	Q2S10
Mark-In	01E-B6J13	R6E04	Q2U13

Tag-In Pin Locations

Signal Name +NPL Channel 7	I/O Connector Pin	Connector 01A-A3ZF	Card 01A-A3Q2
Address-In	01E-B7B05	Q6E04	Q2U09
Data-In	01E-B7G08	R6C04	Q2U12
Disconnect-In	01E-B7J11	Q6C04	Q2U11
Meter-In	01E-B7G05	Q6D04	Q2U02
Op-In	01E-B7B03	Q6B02	Q2U06
Request-In	01E-B7J06	S6B04	Q2U10
Select-In	01E-B7B08	Q6A04	Q2U05
Service-In	01E-B7D06	Q6E02	Q2U07
Status-In	01E-B7D04	R6D02	Q2U04
Special	01E-B7J09	Q6C02	Q2---

Bus-Out Pin Locations

Signal Name +NPL Channel 7	I/O Connector Pin	Connector 01A-A3YP	Card 01A-A3Q2
Bus-Out Bit P	01E-B6B03	Q1A11	Q2B12
Bus-Out Bit 0	01E-B6D04	Q1D11	Q2B02
Bus-Out Bit 1	01E-B6B05	R1A11	Q2B03
Bus-Out Bit 2	01E-B6D06	R1C11	Q2B04
Bus-Out Bit 3	01E-B6B08	R1E11	Q2B05
Bus-Out Bit 4	01E-B6D09	S1B11	Q2B07
Bus-Out Bit 5	01E-B6B10	S1A13	Q2B08
Bus-Out Bit 6	01E-B6D11	R1D13	Q2B09
Bus-Out Bit 7	01E-B6B12	R1B13	Q2B10
Mark-Out	01E-B6D13	R1E13	Q2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 7	I/O Connector Pin	Connector 01A-A3YP	Card 01A-A3Q2
Address-Out	01E-B7B10	Q1E13	Q2D06
Meter Out	01E-B7J04	Q1D13	Q2D12
Command-Out	01E-B7D11	R1D11	Q2D05
Data-Out	01E-B7G10	R1C13	Q2D09
Hold-Out	01E-B7G12	S1B13	Q2D07
Op-Out	01E-B7J13	Q1B11	Q2D02
Select-Out	01E-B7D09	Q1A13	Q2D11
Service-Out	01E-B7D13	Q1E11	Q2D04
Suppress-Out	01E-B7B12	Q1C13	Q2D10

I/O Cables Channel 8

Bus-In Pin Locations

Signal Name +NPL Channel 8	I/O Connector Pin	Connector 01A-A3ZG	Card 01A-A3R2
Bus-In Bit P	01E-B8G03	S6E02	R2S12
Bus-In Bit 0	01E-B8J04	T6C02	R2S02
Bus-In Bit 1	01E-B8G05	T6E02	R2S03
Bus-In Bit 2	01E-B8J06	U6B02	R2S04
Bus-In Bit 3	01E-B8G08	U6D02	R2S05
Bus-In Bit 4	01E-B8J09	V6A02	R2S07
Bus-In Bit 5	01E-B8G10	U6E04	R2S08
Bus-In Bit 6	01E-B8J11	U6C04	R2S09
Bus-In Bit 7	01E-B8G12	U6A04	R2S10
Mark-In	01E-B8J13	U6D04	R2U13

Tag-In Pin Locations

Signal Name +NPL Channel 8	I/O Connector Pin	Connector 01A-A3ZG	Card 01A-A3R2
Address-In	01E-B9B05	T6D04	R2U09
Data-In	01E-B9G08	U6B04	R2U12
Disconnect-In	01E-B9J11	T6B04	R2U11
Meter-In	01E-B9G05	T6C04	R2U02
Op-In	01E-B9B03	T6A02	R2U06
Request-In	01E-B9J06	V6A04	R2U10
Select-In	01E-B9B08	S6E04	R2U05
Service-In	01E-B9D06	T6D02	R2U07
Status-In	01E-B9D04	U6C02	R2U04
Special	01E-B9J09	T6B02	R2---

Bus-Out Pin Locations

Signal Name +NPL Channel 8	I/O Connector Pin	Connector 01A-A3YQ	Card 01A-A3R2
Bus-Out Bit P	01E-B8B03	S1E11	R2B12
Bus-Out Bit 0	01E-B8D04	T1C11	R2B02
Bus-Out Bit 1	01E-B8B05	T1E11	R2B03
Bus-Out Bit 2	01E-B8D06	U1B11	R2B04
Bus-Out Bit 3	01E-B8B08	U1D11	R2B05
Bus-Out Bit 4	01E-B8D09	V1A11	R2B07
Bus-Out Bit 5	01E-B8B10	U1E13	R2B08
Bus-Out Bit 6	01E-B8D11	U1C13	R2B09
Bus-Out Bit 7	01E-B8B12	U1A13	R2B10
Mark-Out	01E-B8D13	U1D13	R2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 8	I/O Connector Pin	Connector 01A-A3YQ	Card 01A-A3R2
Address-Out	01E-B9B10	T1D13	R2D06
Meter Out	01E-B9J04	T1C13	R2D12
Command-Out	01E-B9D11	U1C11	R2D05
Data-Out	01E-B9G10	U1B13	R2D09
Hold-Out	01E-B9G12	V1A13	R2D07
Op-Out	01E-B9J13	T1A11	R2D02
Select-Out	01E-B9D09	S1E13	R2D11
Service-Out	01E-B9D13	T1D11	R2D04
Suppress-Out	01E-B9B12	T1B13	R2D10

I/O Cables Channel 9

Bus-In Pin Locations

Signal Name +NPL Channel 9	I/O Connector Pin	Connector 01A-A3ZH	Card 01A-A3S2
Bus-In Bit P	01E-C1G03	V6D02	S2S12
Bus-In Bit 0	01E-C1J04	W6B02	S2S02
Bus-In Bit 1	01E-C1G05	W6D02	S2S03
Bus-In Bit 2	01E-C1J06	X6A02	S2S04
Bus-In Bit 3	01E-C1G08	X6C02	S2S05
Bus-In Bit 4	01E-C1J09	X6E02	S2S07
Bus-In Bit 5	01E-C1G10	X6D04	S2S08
Bus-In Bit 6	01E-C1J11	X6B04	S2S09
Bus-In Bit 7	01E-C1G12	W6E04	S2S10
Mark-In	01E-C1J13	X6C04	S2U13

Tag-In Pin Locations

Signal Name +NPL Channel 9	I/O Connector Pin	Connector 01A-A3ZH	Card 01A-A3S2
Address-In	01E-C2B05	W6C04	S2U09
Data-In	01E-C2G08	X6A04	S2U12
Disconnect-In	01E-C2J11	W6A04	S2U11
Meter-In	01E-C2G05	W6B04	S2U02
Op-In	01E-C2B03	V6E02	S2U06
Request-In	01E-C2J06	X6E04	S2U10
Select-In	01E-C2B08	V6D04	S2U05
Service-In	01E-C2D06	W6C02	S2U07
Status-In	01E-C2D04	X6B02	S2U04
Special	01E-C2J09	W6A02	S2---

Bus-Out Pin Locations

Signal Name +NPL Channel 9	I/O Connector Pin	Connector 01A-A3YR	Card 01A-A3S2
Bus-Out Bit P	01E-C1B03	V1D11	S2B12
Bus-Out Bit 0	01E-C1D04	W1B11	S2B02
Bus-Out Bit 1	01E-C1B05	W1D11	S2B03
Bus-Out Bit 2	01E-C1D06	X1A11	S2B04
Bus-Out Bit 3	01E-C1B08	X1C11	S2B05
Bus-Out Bit 4	01E-C1D09	X1E11	S2B07
Bus-Out Bit 5	01E-C1B10	X1D13	S2B08
Bus-Out Bit 6	01E-C1D11	X1B13	S2B09
Bus-Out Bit 7	01E-C1B12	W1E13	S2B10
Mark-Out	01E-C1D13	X1C13	S2D13

Tag-Out Pin Locations

Signal Name +NPL Channel 9	I/O Connector Pin	Connector 01A-A3YR	Card 01A-A3S2
Address-Out	01E-C2B10	W1C13	S2D06
Meter Out	01E-C2J04	W1B13	S2D12
Command-Out	01E-C2D11	X1B11	S2D05
Data-Out	01E-C2G10	X1A13	S2D09
Hold-Out	01E-C2G12	X1E13	S2D07
Op-Out	01E-C2J13	V1E11	S2D02
Select-Out	01E-C2D09	V1D13	S2D11
Service-Out	01E-C2D13	W1C11	S2D04
Suppress-Out	01E-C2B12	W1A13	S2D10

I/O Cables Channel A

Bus-In Pin Locations

Signal Name +NPL Channel A	I/O Connector Pin	Connector 01A-A3X5	Card 01A-A3T2
Bus-In Bit P	01E-C3G03	X5D02	T2S12
Bus-In Bit 0	01E-C3J04	X5D05	T2S02
Bus-In Bit 1	01E-C3G05	X5D07	T2S03
Bus-In Bit 2	01E-C3J06	X5D09	T2S04
Bus-In Bit 3	01E-C3G08	X5D11	T2S05
Bus-In Bit 4	01E-C3J09	X5D13	T2S07
Bus-In Bit 5	01E-C3G10	X5B12	T2S08
Bus-In Bit 6	01E-C3J11	X5B10	T2S09
Bus-In Bit 7	01E-C3G12	X5B08	T2S10
Mark-In	01E-C3J13	X5B11	T2U13

Tag-In Pin Locations

Signal Name +NPL Channel A	I/O Connector Pin	Connector 01A-A3X5	Card 01A-A3T2
Address-In	01E-C4B05	X5B06	T2U09
Data-In	01E-C4G08	X5B09	T2U12
Disconnect-In	01E-C4J11	X5B04	T2U11
Meter-In	01E-C4G05	X5B05	T2U02
Op-In	01E-C4B03	X5D03	T2U06
Request-In	01E-C4J06	X5B13	T2U10
Select-In	01E-C4B08	X5B02	T2U05
Service-In	01E-C4D06	X5D06	T2U07
Status-In	01E-C4D04	X5D10	T2U04
Special	01E-C4J09	X5D04	T2---

Bus-Out Pin Locations

Signal Name +NPL Channel A	I/O Connector Pin	Connector 01A-A3YQ	Card 01A-A3T2
Bus-Out Bit P	01E-C3B03	X2D02	T2B12
Bus-Out Bit 0	01E-C3D04	X2D05	T2B02
Bus-Out Bit 1	01E-C3B05	X2D07	T2B03
Bus-Out Bit 2	01E-C3D06	X2D09	T2B04
Bus-Out Bit 3	01E-C3B08	X2D11	T2B05
Bus-Out Bit 4	01E-C3D09	X2D13	T2B07
Bus-Out Bit 5	01E-C3B10	X2B12	T2B08
Bus-Out Bit 6	01E-C3D11	X2B10	T2B09
Bus-Out Bit 7	01E-C3B12	X2B08	T2B10
Mark-Out	01E-C3D13	X2B11	T2D13

Tag-Out Pin Locations

Signal Name +NPL Channel A	I/O Connector Pin	Connector 01A-A3YQ	Card 01A-A3T2
Address-Out	01E-C4B10	X2B06	T2D06
Meter Out	01E-C4J04	X2B05	T2D12
Command-Out	01E-C4D11	X2D10	T2D05
Data-Out	01E-C4G10	X2B09	T2D09
Hold-Out	01E-C4G12	X2B13	T2D07
Op-Out	01E-C4J13	X2D03	T2D02
Select-Out	01E-C4D09	X2B02	T2D11
Service-Out	01E-C4D13	X2D06	T2D04
Suppress-Out	01E-C4B12	X2B04	T2D10

I/O Cables Channel B

Bus-In Pin Locations

Signal Name + NPL Channel B	I/O Connector Pin	Connector 01A-A3X4	Card 01A-A3U2
Bus-In Bit P	01E-C5G03	X4D02	U2S12
Bus-In Bit 0	01E-C5J04	X4D05	U2S02
Bus-In Bit 1	01E-C5G05	X4D07	U2S03
Bus-In Bit 2	01E-C5J06	X4D09	U2S04
Bus-In Bit 3	01E-C5G08	X4D11	U2S05
Bus-In Bit 4	01E-C5J09	X4D13	U2S07
Bus-In Bit 5	01E-C5G10	X4B12	U2S08
Bus-In Bit 6	01E-C5J11	X4B10	U2S09
Bus-In Bit 7	01E-C5G12	X4B08	U2S10
Mark-In	01E-C5J13	X4D02	U2U13

Tag-In Pin Locations

Signal Name + NPL Channel B	I/O Connector Pin	Connector 01A-A3X4	Card 01A-A3U2
Address-In	01E-C6B05	X4B06	U2U09
Data-In	01E-C6G08	X4B09	U2U12
Disconnect-In	01E-C6J11	X4B04	U2U11
Meter-In	01E-C6G05	X4B05	U2U02
Op-In	01E-C6B03	X4D03	U2U06
Request-In	01E-C6J06	X4B13	U2U10
Select-In	01E-C6B08	X4B02	U2U05
Service-In	01E-C6D06	X4D06	U2U07
Status-In	01E-C6D04	X4D10	U2U04
Special	01E-C6J09	X4D04	U2---

Bus-Out Pin Locations

Signal Name + NPL Channel B	I/O Connector Pin	Connector 01A-A3X3	Card 01A-A3U2
Bus-Out Bit P	01E-C5B03	X3D02	U2B12
Bus-Out Bit 0	01E-C5D04	X3D05	U2B02
Bus-Out Bit 1	01E-C5B05	X3D07	U2B03
Bus-Out Bit 2	01E-C5D06	X3D09	U2B04
Bus-Out Bit 3	01E-C5B08	X3D11	U2B05
Bus-Out Bit 4	01E-C5D09	X3D13	U2B07
Bus-Out Bit 5	01E-C5B10	X3B12	U2B08
Bus-Out Bit 6	01E-C5D11	X3B10	U2B09
Bus-Out Bit 7	01E-C5B12	X3B08	U2B10
Mark-Out	01E-C5D13	X3B11	U2D13

Tag-Out Pin Locations

Signal Name + NPL Channel B	I/O Connector Pin	Connector 01A-A3X3	Card 01A-A3U2
Address-Out	01E-C6B10	X3B06	U2D06
Meter Out	01E-C6J04	X3B05	U2D12
Command-Out	01E-C6D11	X3D10	U2D05
Data-Out	01E-C6G10	X3B09	U2D09
Hold-Out	01E-C6G12	X3B13	U2D07
Op-Out	01E-C6J13	X3D03	U2D02
Select-Out	01E-C6D09	X3B02	U2D11
Service-Out	01E-C6D13	X3D06	U2D04
Suppress-Out	01E-C6B12	X3B04	U2D10

Channel Control Lines

Channel 0

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS7 C6	D4B04
Bus mode/suppress data even	VS5 C5	D3D05
Data mode	VS7 C9	D4B02
Halt	VS3 C5	D5D05
Input mode	VS9 C6	D2B04
Odd gate (bidirectional)	VS5 C6	D3B04
Suppress data even	VS7 C5	D4D05
Transfer OK even	VS3 C7	D5D03
Transfer OK odd	VS5 C4	D3B05

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS7 B4	D4D11
Parity good	VS3 B5	D5B10
Transfer signal even/page duplex	VS5 B4	D3D11
Transfer signal odd/mark duplex	VS5 B5	D3B10

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS5 C3	D3D06
0	VS3 C6	D5B04
1	VS7 C4	D4B05
2	VS9 B9	D2B08
3	VS9 C2	D2B06
4	VS9 B8	D2D09
5	VS7 B8	D4D09
6	VS5 B8	D3D09
7	VS9 B3	D2B13

Channel 1

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS3 C4	D5B05
Bus mode/suppress data even	VS9 C4	D2B05
Data mode	VS9 C9	D2B02
Halt	VS9 C5	D2D05
Input mode	VS3 C1	D5D07
Odd gate (bidirectional)	VS3 C9	D5B02
Suppress data even	VS9 C3	D2D06
Transfer OK even	VS5 C2	D3B06
Transfer OK odd	VS7 C3	D4D06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS3 B3	D5B13
Parity good	VS5 B2	D3B12
Transfer signal even/page duplex	VS3 B4	D5D11
Transfer signal odd/mark duplex	VS5 B3	D3B13

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS3 B6	D5D10
0	VS5 B6	D3D10
1	VS3 B9	D5B08
2	VS7 B7	D4B09
3	VS9 B2	D2B12
4	VS9 B5	D2B10
5	VS7 B6	D4D10
6	VS7 B9	D4B08
7	VS5 B7	D3B09

Channel 2

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS9 B7	D2B09
Bus mode/suppress data even	VS3 C3	D5D06
Data mode	VS9 C7	D2D03
Halt	VS3 C2	D5B06
Input mode	VS5 C1	D3D07
Odd gate (bidirectional)	VS9 C8	D2D02
Suppress data even	VS3 B8	D5D09
Transfer OK even	VS7 C1	D4D07
Transfer OK odd	VS7 C2	D4B06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS5 B9	D3B08
Parity good	VS7 B2	D4B12
Transfer signal even/page duplex	VS7 B3	D4B13
Transfer signal odd/mark duplex	VS5 B1	D3D13

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS3 B1	D5D13
0	VS9 B1	D2D13
1	VS3 B2	D5B12
2	VS3 B7	D5B09
3	VS9 C2	D2D07
4	VS9 B6	D2D10
5	VS7 B5	D4B10
6	VS9 B4	D2D11
7	VS7 B1	D4D13

Note: Up level -0.08V to +0.08V; down level -0.90V to -1.40V.

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Channel 3

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS1 B4	C3D11
Bus mode/suppress data even	VS1 B8	C3D09
Data mode	VS4 C1	C5D07
Halt	VS1 C4	C3B05
Input mode	VS0 B7	C2B09
Odd gate (bidirectional)	VS8 B9	C4B08
Suppress data even	VS8 B2	C4B12
Transfer OK even	VS8 B7	C4B09
Transfer OK odd	VS1 C2	C3B06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS8 B6	C4D10
Parity good	VS8 B3	C4B13
Transfer signal even/page duplex	VS0 B5	C2B10
Transfer signal odd/mark duplex	VS8 B4	C4D11

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS0 B8	C2D09
0	VS0 B1	C2D13
1	VS0 B3	C2B13
2	VS0 C6	C2B04
3	VS8 C3	C4D06
4	VS0 C3	C2D06
5	VS4 C4	C5B05
6	VS4 C6	C5B04
7	VS8 C5	C4D05

Channel 4

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS0 C7	C2D03
Bus mode/suppress data even	VS8 C9	C4B02
Data mode	VS8 C2	C4B06
Halt	VS1 C8	C3D02
Input mode	VS1 C9	C3B02
Odd gate (bidirectional)	VS8 C1	C4D07
Suppress data even	VS1 C7	C3D03
Transfer OK even	VS0 C9	C2B02
Transfer OK odd	VS8 C8	C4D02

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS1 C5	C3D05
Parity good	VS1 B9	C3B08
Transfer signal even/page duplex	VS0 C5	C2D05
Transfer signal odd/mark duplex	VS0 C1	C2D07

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS1 B6	C3D10
0	VS0 B6	C2D10
1	VS4 B5	C5B10
2	VS1 C6	C3B04
3	VS0 C8	C2D02
4	VS8 C4	C4B05
5	VS0 C4	C2B05
6	VS0 C2	C2B06
7	VS1 C1	C2D07

Channel 5

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	VS4 B1	C5D13
Bus mode/suppress data even	VS1 B3	C3B13
Data mode	VS4 C3	C4D06
Halt	VS0 B2	C2B12
Input mode	VS1 B2	C3B12
Odd gate (bidirectional)	VS4 C2	C5B06
Suppress data even	VS4 B6	C5D10
Transfer OK even	VS8 B1	C4D13
Transfer OK odd	VS4 B2	C5B12

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	VS1 B5	C3B10
Parity good	VS1 B1	C3D13
Transfer signal even/page duplex	VS8 B5	C4B10
Transfer signal odd/mark duplex	VS4 B4	C5D11

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	VS4 B7	C5B09
0	VS0 B9	C2B08
1	VS4 B3	C5B13
2	VS4 C5	C5D05
3	VS4 C8	C5D02
4	VS8 C6	C4B04
5	VS4 C7	C5D03
6	VS8 C7	C4D03
7	VS1 C3	C3D06

Note: Up level -0.08V to +0.08V; down level -0.90V to -1.40V.

Channel 6

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WS9 C7	V2D03
Bus mode/suppress data even	WS1 C9	V4B02
Data mode	WS1 C2	V4B06
Halt	WS4 C8	V3D02
Input mode	WS4 C9	V3B02
Odd gate (bidirectional)	WS1 C1	V4D07
Suppress data even	WS4 C7	V3D03
Transfer OK even	WS9 C9	V2B02
Transfer OK odd	WS4 C2	V3B06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WS4 C5	V3D05
Parity good	WS4 B9	V3B08
Transfer signal even/page duplex	WS9 C5	V2D05
Transfer signal odd/mark duplex	WS9 C1	V2D07

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS4 B6	V3D10
0	WS9 B6	V2D10
1	WS5 B5	V5B10
2	WS4 C6	V3B04
3	WS9 C8	V2D02
4	WS1 C4	V4B05
5	WS9 C4	V2B05
6	WS9 C2	V2B06
7	WS4 C1	V3D07

Channel 7

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WS5 B1	V5D13
Bus mode/suppress data even	WS4 B3	V3B13
Data mode	WS5 C3	V5D06
Halt	WS9 B2	V2B12
Input mode	WS4 B2	V3B12
Odd gate (bidirectional)	WS5 C2	V5B06
Suppress data even	WS5 B6	V5D10
Transfer OK even	WS1 B4	V4D13
Transfer OK odd	WS5 B2	V5B12

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WS4 B5	V3B10
Parity good	WS4 B1	V3D13
Transfer signal even/page duplex	WS1 B5	V4B10
Transfer signal odd/mark duplex	WS5 B4	V5D11

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS5 B7	V5B09
0	WS9 B9	V2B08
1	WS5 B3	V5B13
2	WS5 C5	V5D05
3	WS5 C8	V5D02
4	WS1 C6	V4B04
5	WS5 C7	V5D03
6	WS1 C7	V4D03
7	WS4 C3	V3D06

Channel 8

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WS4 B4	V3D11
Bus mode/suppress data even	WS5 C1	V3D09
Data mode	WS4 C4	V5D07
Halt	WS9 B7	V3B05
Input mode	WS1 B9	V2B09
Odd gate (bidirectional)	WS1 B7	V4B08
Suppress data even	WS1 B2	V4B12
Transfer OK even	WS1 C8	V4B09
Transfer OK odd	WS4 B8	V4D02

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WS1 B6	V4D10
Parity good	WS1 B3	V4B13
Transfer signal even/page duplex	WS9 B5	V2B10
Transfer signal odd/mark duplex	WS1 B4	V4D11

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS9 B8	V2D09
0	WS9 B1	V2D13
1	WS9 B3	V2B13
2	WS9 C6	V2B04
3	WS1 C3	V4D06
4	WS9 C3	V2D06
5	WS5 C4	V5B05
6	WS5 C6	V5B04
7	WS1 C5	V4D05

Note: Up level -0.08V to +0.08V; down level -0.90V to -1.40V.

Channel 9

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WS6 C4	W5B05
Bus mode/suppress data even	WS0 C4	W2B05
Data mode	WS0 C9	W2B02
Halt	WS0 C5	W2D05
Input mode	WS6 C1	W5D07
Odd gate (bidirectional)	WS6 C9	W5B02
Suppress data even	WS0 C3	W2D06
Transfer OK even	WS8 C2	W3B06
Transfer OK odd	WJ8 C3	W4D06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WS6 B3	W5B13
Parity good	WS8 B2	W5B12
Transfer signal even/page duplex	WS8 B4	W5D11
Transfer signal odd/mark duplex	WS8 B3	W3B13

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS6 B6	W5D10
0	WS8 B6	W3D10
1	WS6 B9	W5B08
2	WS8 B7	W4B09
3	WS0 B2	W2B12
4	WS0 B5	W2B10
5	WS8 B6	W4D10
6	WS8 B9	W4B08
7	WS8 B7	W3B09

Channel A

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WS0 B7	W2B09
Bus mode/suppress data even	WS6 C3	W5D06
Data mode	WS0 C7	W2D03
Halt	WS6 C2	W5B06
Input mode	WS8 C1	W3D07
Odd gate (bidirectional)	WS0 C8	W2D02
Suppress data even	WS6 B8	W5D09
Xfer OK even	WJ8 C1	W4D07
Xfer OK odd	WJ8 C2	W4B06

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WS8 B9	W3B08
Parity good	WS8 B2	W4B12
Transfer signal even/page duplex	WS8 B3	W4B13
Transfer signal odd/mark duplex	WS8 B1	W3D13

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS6 B1	W5D13
0	WS0 B1	W2D13
1	WS6 B2	W5B12
2	WS6 B7	W5B09
3	WS0 C1	W2D07
4	WS0 B6	W2D10
5	WS8 B5	W4B10
6	WS0 B4	W2D11
7	WS8 B1	W4D13

Channel B

Out Lines

Line Name	01A-B2	01A-A3
Adapter clock/transfer stop	WJ8 C6	W4B04
Bus mode/suppress data even	WS8 C5	W3D05
Data mode	WJ8 C9	W4B02
Halt	WS6 C5	W5D05
Input mode	WS0 C6	W2B04
Odd gate (bidirectional)	WS8 C6	W3B04
Suppress data even	WJ8 C5	W4D05
Transfer OK even	WS6 C7	W5D03
Transfer OK odd	WS8 C4	W3B05

In Lines

Line Name	01A-B2	01A-A3
Mark in/transfer end	WJ8 B4	W4D11
Parity good	WS6 B5	W5B10
Transfer signal even/page duplex	WS8 B4	W3D11
Transfer signal odd/mark duplex	WS8 B5	W3B10

Bidirectional Bus 0

Bit	01A-B2	01A-A3
P	WS8 C3	W3D06
0	WS6 C6	W5B04
1	WJ8 C4	W4B05
2	WS0 B9	W2B08
3	WS0 C2	W2B06
4	WS0 B8	W2D09
5	WJ8 B8	W4D09
6	WS8 B8	W3D09
7	WS0 B3	W2B13

Note: Up level -0.08V to +0.08V; down level -0.90V to -1.40V

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