29MB DISK CONSOLE SERVICE MANUAL
600P84228
REVISION A

NOVEMBER 1984
# 29MB Disk Console Service Manual

## Table of Contents

**List of Illustrations** ........................................... v

### CHAPTER 1 GENERAL DATA

1.1 How to Use This Manual .......................... 1-2
1.2 Model Configurations ............................ 1-2
1.3 Call Management ................................. 1-2
1.4 Change Tag Index ................................. 1-2

### CHAPTER 2 INSTALLATION/REMOVAL

Refer to 8000 Series Reference Manual

### CHAPTER 3 REPAIR DATA

3.1 Console Top Cover .............................. 3-2
3.2 Console Fan .................................. 3-2
3.3 29MB Disk Drive ............................... 3-3
3.3.1 Actuator Lock .............................. 3-10
3.3.2 Spindle Lock ............................... 3-12
3.4 29MB Drive Belt ............................... 3-13
3.5 29MB Drive Motor ............................. 3-13
3.6 Actuator PWA .................................. 3-15
3.7 VFO PWA ..................................... 3-15
3.8 Control PWA .................................. 3-15
3.9 Read/Write PWA ............................... 3-16
3.10 Damper Assembly .............................. 3-17

### CHAPTER 4 PARTS IDENTIFICATION

PL 4.1 29MB Console Mechanical Parts .......... 4-2
PL 4.2 Disk Drive Assembly ....................... 4-4
PL 4.3 29MB Console Harnesses ................. 4-6

### CHAPTER 5 DISPLAY QUALITY

Refer to appropriate service manual

### CHAPTER 6 TROUBLESHOOTING

6.01 Introduction .................................. 6-2
6.02 Level 2 Check Charts ....................... 6-3
6.02.1 29MB Disk Faults ......................... 6-3
6.02.2 Disk MP Fault Code ....................... 6-8
6.02.1 Disk Not Ready ........................... 6-9
6.02.2 No Motor Drive ........................... 6-10
### TABLE OF CONTENTS
(Continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.02.3</td>
<td>No Drive Select</td>
<td>6-10</td>
</tr>
<tr>
<td>6.02.4</td>
<td>Mechanical Isolation</td>
<td>6-11</td>
</tr>
<tr>
<td>6.02.5</td>
<td>Logic Not Ready</td>
<td>6-11</td>
</tr>
<tr>
<td>6.03</td>
<td>Logic Fault</td>
<td>6-12</td>
</tr>
<tr>
<td>6.03.1</td>
<td>Control Fault</td>
<td>6-12</td>
</tr>
<tr>
<td>6.04</td>
<td>Track Seek Incomplete</td>
<td>6-13</td>
</tr>
<tr>
<td>6.05</td>
<td>Restore Errors</td>
<td>6-14</td>
</tr>
<tr>
<td>6.06</td>
<td>Seek Errors</td>
<td>6-14</td>
</tr>
<tr>
<td>6.07</td>
<td>Write Errors</td>
<td>6-16</td>
</tr>
<tr>
<td>6.08</td>
<td>Cooling Fan</td>
<td>6-16</td>
</tr>
<tr>
<td>6.09</td>
<td>Rigid Disk Drive Loading</td>
<td>6-16</td>
</tr>
<tr>
<td></td>
<td>Block Schematic Diagrams</td>
<td></td>
</tr>
<tr>
<td>Chain 1.1</td>
<td>29MB Disk Console Power Distribution</td>
<td>6-19</td>
</tr>
</tbody>
</table>

### CHAPTER 8 PRINCIPLES OF OPERATION
Refer to 8000 Series Reference Manual

### CHAPTER 7 PLUG/JACK LIST

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Introduction</td>
<td>7-2</td>
</tr>
<tr>
<td>7.2</td>
<td>Harness Identification</td>
<td>7-2</td>
</tr>
<tr>
<td>7.3</td>
<td>Plug/Jack Locations</td>
<td>7-2</td>
</tr>
<tr>
<td>7.4</td>
<td>Wiring Data</td>
<td>7-2</td>
</tr>
<tr>
<td>7.5</td>
<td>Connector Identification</td>
<td>7-2</td>
</tr>
</tbody>
</table>
## LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>Jumper Locations for 29MB Control PWA</td>
<td>3-4</td>
</tr>
<tr>
<td>3-2</td>
<td>Jumper Locations for 29MB Control PWA</td>
<td>3-4</td>
</tr>
<tr>
<td>3-3</td>
<td>Jumper Locations for 29MB Control PWA</td>
<td>3-5</td>
</tr>
<tr>
<td>3-4</td>
<td>Jumper Locations for 29MB Actuator PWA</td>
<td>3-5</td>
</tr>
<tr>
<td>3-5</td>
<td>Jumper Locations for 29MB VFO PWA</td>
<td>3-6</td>
</tr>
<tr>
<td>3-6</td>
<td>Sample of Shugart and Xerox Error Maps</td>
<td>3-7</td>
</tr>
<tr>
<td>3-7</td>
<td>Rigid Disk Drive or Processor Software Preparation Flow Chart</td>
<td>3-8</td>
</tr>
<tr>
<td>3-8</td>
<td>Actuator Lock Installation</td>
<td>3-11</td>
</tr>
<tr>
<td>3-9</td>
<td>29MB Disk Drive Assembly</td>
<td>3-12</td>
</tr>
<tr>
<td>3-10</td>
<td>Read/Write PWA</td>
<td>3-17</td>
</tr>
<tr>
<td>4-1</td>
<td>29MB Console Mechanical Parts</td>
<td>4-3</td>
</tr>
<tr>
<td>4-2</td>
<td>Disk Drive Assembly</td>
<td>4-5</td>
</tr>
<tr>
<td>4-3</td>
<td>29MB Console Harnesses</td>
<td>4-7</td>
</tr>
<tr>
<td>6-1</td>
<td>Control PWA (Version A)</td>
<td>6-4</td>
</tr>
<tr>
<td>6-2</td>
<td>Control PWA (Version B)</td>
<td>6-5</td>
</tr>
<tr>
<td>6-3</td>
<td>Actuator PWA</td>
<td>6-6</td>
</tr>
<tr>
<td>6-4</td>
<td>Test Connector</td>
<td>6-17</td>
</tr>
<tr>
<td>6-5</td>
<td>29MB Disk Console Power Distribution</td>
<td>6-19</td>
</tr>
<tr>
<td>7-1</td>
<td>29MB Disk Console Plug/Jack Locations</td>
<td>7-3</td>
</tr>
<tr>
<td>7-2</td>
<td>29MB Power Cable W20</td>
<td>7-3</td>
</tr>
<tr>
<td>7-3</td>
<td>29MB Signal Cable W21</td>
<td>7-4</td>
</tr>
<tr>
<td>7-4</td>
<td>Connector Type B</td>
<td>7-5</td>
</tr>
<tr>
<td>7-5</td>
<td>Connector Type D</td>
<td>7-5</td>
</tr>
<tr>
<td>7-6</td>
<td>Connector Type H</td>
<td>7-5</td>
</tr>
<tr>
<td>7-7</td>
<td>Connector Type R</td>
<td>7-6</td>
</tr>
<tr>
<td>7-8</td>
<td>Connector Type S</td>
<td>7-6</td>
</tr>
</tbody>
</table>
CHAPTER 1  GENERAL DATA

29MB DISK CONSOLE SERVICE MANUAL
1.1 HOW TO USE THIS MANUAL

This service manual provides information necessary for maintenance of the 29MB Disk Console.

The 8000 Series Reference Manual provides the complete instructions for use of 8000 Series service manuals.

1.2 MODEL CONFIGURATIONS

Various models of 8000 Series products are available. The 8000 Series Reference Manual provides product codes, model configurations, and catalog number information, as well as related explanations.

1.3 CALL MANAGEMENT

The Call Management procedures are to be performed during every service call. The complete Call Management procedures are provided in the 8000 Series Reference Manual.

1.4 CHANGE TAG INDEX

Refer to the 8000 Series Reference Manual for instructions about use of matrix tags and Tag Letter Classification definitions.

The 29MB Disk Console has one matrix tag. The matrix tag is located on the bottom frame on the left side of the console. Any important modification of the disk drive, or related cables and connectors, must be indicated on the 29MB Disk Console matrix tag.
<table>
<thead>
<tr>
<th>Tag No.</th>
<th>Description</th>
<th>Serial No. Cut-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 N</td>
<td>Tag 1 moves slide-lock hardware from 29MB Signal Cable to Processor connector panel to prevent improper connection at Processor. Related part is the 29MB Signal Cable 152581277.</td>
<td>T25-Initial</td>
</tr>
<tr>
<td>2</td>
<td>CANCELLED</td>
<td></td>
</tr>
<tr>
<td>3 R</td>
<td>Tag 3 changes the molded connector hood on 29MB Signal Cable to eliminate interference between cable connector and rear cover. Related part is the 29MB Signal Cable 1525825031.</td>
<td>T25-131-</td>
</tr>
<tr>
<td>225 R</td>
<td>Tag 225 changes the molded connector hood on 29MB Signal Cable to eliminate interference between cable connector and rear cover. Related part is the 29MB Signal Cable 1525825031.</td>
<td>T25-131-</td>
</tr>
</tbody>
</table>
CHAPTER 2  INSTALLATION/REMOVAL

29MB DISK CONSOLE SERVICE MANUAL

REFER TO 8000 SERIES REFERENCE MANUAL
CHAPTER 3 REPAIR DATA

29MB DISK CONSOLE SERVICE MANUAL
3. REPAIR DATA
CONSOLE TOP COVER  CONSOLE FAN

3.1 CONSOLE TOP COVER
REF PL 4.1

REMOVAL
1. SWITCH OFF SYSTEM POWER.
2. REMOVE BOTH CONSOLE SIDE COVERS.
3. REMOVE CONSOLE TOP COVER.
   a. Remove the six speed nuts securing the Top Cover to frame.
   b. Remove Top Cover.

REPLACEMENT
1. REPLACE CONSOLE TOP COVER.
   a. Perform removal procedure in reverse order.

3.2 CONSOLE FAN
REF PL 4.1

REMOVAL
1. SWITCH OFF SYSTEM POWER.
2. REMOVE CONSOLE REAR COVER.
3. REMOVE THE CONSOLE FAN
   a. Remove screws securing the Fan Cover to frame.
   b. Remove the Fan Cover.
   c. Disconnect harness connector from the Fan.
   d. Remove the Fan from console.

REPLACEMENT

CAUTION
The Fan must be installed with arrow pointing to rear of console for the correct air flow.

1. REPLACE THE CONSOLE FAN.
   a. Perform removal procedure in reverse order.
REMOVAL

NOTE: RX only. References in the following procedures to a call for assistance or report of conditions, should be made to the RX Technical Specialist.

CAUTION
Drive replacement deletes customer files. This requires restoration of files by customer. BEFORE replacing drive, contact RES or NSC; then notify customer's System Administrator or Network Coordinator. Customer MUST be notified BEFORE replacing rigid drive. It is possible that Systems Analyst will know work around procedure, and drive will not require replacing. If customer will not agree to drive replacement, contact Systems Analyst for further instructions. NEVER REPLACE DISK DRIVE WITHOUT FIRST NOTIFYING CUSTOMER AND SYSTEMS ANALYST.

1. ENSURE THAT THE CORRECT DISK DRIVE REPLACEMENT PROCEDURE IS FOLLOWED
   a. Ensure that RES or NSC is informed.
   b. Customer has approved and understands that disk drive is to be replaced
   c. Systems Analyst has been informed.

2. SWITCH OFF SYSTEM POWER.

3. REMOVE BOTH SIDE COVERS.
4. INSTALL ACTUATOR LOCK (REPLACEMENT 3.3.1).
5. INSTALL SPINDLE LOCK (REPLACEMENT 3.3.2).
6. REMOVE 29MB DISK DRIVE
   a. Disconnect power harness connector from J4 on Disk Drive Motor.
   b. Disconnect power harness connector from J3 on Actuator PWA.
   c. Disconnect signal harness connector from J1 on the Control PWA.
   d. Remove the four bolts securing the Disk Drive to frame.
   e. Carefully pull Disk Drive from console.
   f. Remove brackets from Disk Drive.

REPLACEMENT (FIGURES 3-1 TO 3-5, INCLUSIVE)

CAUTION
Jumpers on new Disk Drive must be configured to match old Disk Drive jumper location BEFORE installation. Several Control PWAs are now in use. Ensure that the correct figure is referred to when verifying the jumper locations.

1. INSTALL JUMPERS ON DISK DRIVE PWAs.
   a. Refer to Figures 3-1 to 3-5, inclusive, and install jumpers as shown.
   b. Remove any jumpers not shown in figures.
   c. Add any jumpers necessary, as shown in figures.
3. REPAIR DATA
FIGURES 3-1, 3-2

Figure 3-1 Jumper Locations for 29MB Control PWA (Version A)

Figure 3-2 Jumper Locations for 29MB Control PWA (Version B)
Figure 3-3 Jumper Locations for 29MB Control PWA
(Version C)

Figure 3-4 Jumper Locations for 29MB Actuator PWA
3. REPAIR DATA

29MB DISK DRIVE  FIGURE 3-5

2. REPLACE 29MB DISK DRIVE.
   a. Replace brackets onto new Disk Drive.
   b. Carefully install Disk Drive inside console.
   c. Replace the four bolts securing the Disk Drive to frame.
   d. Remove spindle lock screw through the access hole in Drive Belt Cover.
   e. Connect power harness connector to J4 on Disk Drive Motor.
   f. Connect power harness connector to J3 on Actuator PWA.
   g. Connect signal harness connector to J1 on the Control PWA.

3. REMOVE ACTUATOR LOCK (3.3.1).

NOTE: The 29MB Disk Drives have bad page error maps from the OEM supplier (the Original Equipment Manufacturer of the drive) and Xerox. Refer to Figure 3-6 for a sample of the error map. Refer to Figure 3-7 for a flow chart on preparing the drive for software.

4. CHECK THE AVAILABILITY OF XEROX ERROR MAP.
   a. Remove map from the right side of drive.
   b. Locate date on the Xerox error map. If dated 11-30-82 or before, or the map does not exist, proceed to step 12.

NOTE 1: GR JUMPER PRESENT ONLY ON LATER VERSIONS OF VFO PWA.

Figure 3-5 Jumper Locations for 29MB VFO PWA
5. **RUN ALAG AND VERIFY A SUCCESSFUL COMPLETION.**
   a. If ALAG completes successfully, proceed to step 6.
   b. If ALAG fails while PV Scavenger is running, proceed to step 6.
   c. If ALAG does not complete and an MP Code other than 1799 is displayed, see MP Code List.
   d. If physical volume needs forward conversion
      Warnings is displayed on the screen, proceed to step 13.

**CAUTION**
The following steps contain instructions that will destroy customer files. **DO NOT** logon with Analyst privileges, or perform these steps, unless service manual procedures instruct you to do so. Performing these exercises on Disk Drives containing any customer files will DESTROY ALL CUSTOMER INFORMATION.

6. **LOGON WITH ANALYST PRIVILEGES.**
   a. Refer to 8000 NS Diagnostics Handbook for detailed instructions.

7. **RUN DISK EXERCISER FOR 10 PASSES TO DETERMINE THE CONDITION OF THE HARDWARE.**
   a. Refer to the 8000 NS Diagnostics Handbook on how to run Disk Exerciser.
   b. If an error is detected other than a Header CRC, Label CRC, or Data CRC, perform Level 1 Checkout in the 8000 Processor Service Manual.
3. REPAIR DATA

FIGURE 3-7

- Run Disk Exerciser (10 passes)
- Run Destructive Scan (2 passes)

START

Bad Pages Are Detected With Destructive Scan

NO

Date on Xerox Error Map
Is 11-30-82 or Before

YES

ALAG Indicates
Physical Volume Needs Converting

NO

Manually Enter Bad Pages From OEM Map and From Media Scan

YES

Record and Save to Enter Later

Format Disk Drive, Restoring Old Bad Page Table

YES

Bad Pages On Xerox Map and ones From Destructive Scan Are In Bad Page Table

Run ALAG

NO

END

Run New Disk Checkout (10 passes)

Bad Pages Are Detected With Media Scan

Run ALAG

Record and Save to Enter Later

8010-047(2)
c. If no error is detected, or the error is a Header CRC, Label CRC, or Data CRC, continue with step 8.

8 RUN DESTRUCTIVE SCAN FOR 2 PASSES, WITH 2 RETRIES.
   a. Refer to 8000 NS Diagnostics Handbook for detailed instructions.
   b. If bad pages are detected while Destructive Scan is running, record and save to use later.

CAUTION
When performing the next step, RESTORE the Bad Page Table.

9 FORMAT DISK DRIVE, RESTORING OLD BAD PAGE TABLE.
   a. Refer to 8000 NS Diagnostics Handbook for detailed instructions.

10 VERIFY BAD PAGE TABLE CONTAINS ALL PAGES ON XEROX ERROR MAP AND PAGES RECORDED DURING DESTRUCTIVE SCAN
   a. Compare Bad Page Table on the display to Xerox error map, and pages recorded during Destructive Scan.
   b. If all pages are in the Bad Page Table, proceed to step 16

11. MANUALLY ENTER BAD PAGES NOT IN BAD PAGE TABLE, THEN PROCEED TO STEP 16.
   a. Refer to 8000 NS Diagnostics Handbook for detailed instructions.
   b. After entering bad pages, proceed to Step 16.

12. RUN ALAG AND VERIFY A SUCCESSFUL COMPLETION.
   a. If ALAG completes successfully, proceed to step 13.

b. If ALAG fails while PV Scavenger is running, continue with step 13.

c. If ALAG does not complete and an MP Code other than 1799 is displayed, see MP Code List.

d. If physical volume needs forward conversion Warnings is displayed on the screen, proceed to step 13.

CAUTION
The following steps contain instructions that will destroy customer files. DO NOT logon with Analyst privileges, or perform these steps, unless service manual procedures instruct you to do so. Performing these exercises on Disk Drives containing any customer files will DESTROY ALL CUSTOMER INFORMATION.

NOTE: If you cannot logon (system locked up), perform an Alternate Boot 0002, and press the BREAK or STOP key when Fault Analysis begins.

13. LOGON ON WITH ANALYST PRIVILEGES.
   a. Refer to 8000 NS Diagnostics Handbook for detailed instructions.

14. RUN NEW DISK CHECKOUT FOR 10 PASSES TO DETERMINE THE CONDITION OF THE HARDWARE.
   a. Refer to the 8000 NS Diagnostics Handbook for detailed instructions.
b. If an error is detected other than a Header CRC, Label CRC, or Data CRC while Destructive Exerciser is running, perform Level 1 Checkout in the 8000 Processor Service Manual.

c. If no error is detected while Destructive Exerciser is running, or the error is a Header CRC, Label CRC, or Data CRC, continue with next step.

d. When Do you wish to reconstruct the bad page table at this time (Y/N): Y is displayed, press return.

e. When Do you wish to perform a media scan (Y/N): is displayed, type y and press return.

f. When Pass count (1-1000): 10 is displayed, type 2 and press return.

g. When Retry Count (0-20): 2 is displayed, press return.

h. If bad pages are detected while media scan is running, record and save to use later.

i. If Do you wish to test the bad pages (Y/N): is displayed, type n and press return.

j. When Do you wish to manually enter bad pages (Y/N): is displayed, type y and press return.

k. If Xerox error map was dated 11-30-82 or before, proceed to step 15.

l. Select Page Format and enter bad pages from Xerox error map and bad pages detected during media scan.

m. Proceed to step 16.

15 MANUALLY ENTER BAD PAGES FROM OEM MAP AND MEDIA SCAN.

a. Refer to the 8000 NS Diagnostics Handbook for detailed instructions.

16. RUN ALAG AND VERIFY A SUCCESSFUL COMPLETION.

17. RETURN ERROR MAPS TO PLASTIC POUCH.

18. REPLACE COVERS.

19. INFORM SYSTEM ADMINISTRATOR TO PARTITION DISK, INSTALL SYSTEM SOFTWARE, AND RESTORE FILES.

3.3.1 ACTUATOR LOCK

REF PL 4.2

REMOVAL

NOTE: Some 29MB Disk Drives are not equipped with Actuator Locks. Do not perform procedure if drive is without Actuator Lock feature. (See PL 4.2 for Actuator Lock part number.)

1. SWITCH OFF SYSTEM POWER.

2. REMOVE LEFT SIDE COVER.

3. REMOVE ACTUATOR LOCK (FIGURE 3-8).

   a. Disconnect power harness connector from J3 on the Actuator PWA.

   b. Switch ON system power.

   CAUTION

Do not move Damper Assembly until disk speed has been reached (approximately five seconds after AC power is applied). Movement of heads without disk rotation may cause disk or head damage.

   c. Wait for disk to reach proper speed.
d. Remove Actuator Lock from motor and damper assembly by pulling it down.
e. Place lock on shelf above Disk Drive.
f. Switch OFF system power.
g. Connect power harness connector to J3 on Actuator PWA.
4. REPLACE LEFT SIDE COVER.

REPLACEMENT (Figure 3-8)

NOTE: Some 29MB Disk Drives are not equipped with Actuator Locks. Do not perform procedure if drive is without Actuator Lock feature. (See PL 4.2 for Actuator Lock part number.)

1. SWITCH OFF SYSTEM POWER
2. REMOVE BOTH SIDE COVERS.
3. INSTALL ACTUATOR LOCK (FIGURE 3-8).
   a. Disconnect power harness connector from J3 on Actuator PWA.
   b. Switch ON system power.
   
   CAUTION
   Do not move Damper Assembly until disk speed has been reached (approximately five seconds after AC power is applied). Movement of heads without disk rotation may cause disk or head damage.

   c. Wait for disk to reach proper speed.
   d. Remove damper cover.

Figure 3-8 Actuator Lock Installation
3. REPAIR DATA
ACTUATOR LOCK  SPINDLE LOCK  FIGURE 3-9

3.3.2 SPINDLE LOCK
REF PL 4.2

REMOVAL (FIGURE 3-9)

1. REMOVE LEFT SIDE COVER.
2. REMOVE SPINDLE LOCK.
   a. Remove spindle lock screw through the access hole in drive Belt Cover.
   b. Place lock in storage hole, indicated by the label at bottom of frame.
3. REPLACE LEFT SIDE COVER.

- e. Rotate damper clockwise, and observe that actuator arm moves on disk.
- f. Wait for arm to stop.
- g. Install Actuator Lock between damper and star.
- h. Rotate damper clockwise until lock snaps into position on damper collar.
- i. Replace damper cover.
- j. Switch OFF system power.
- k. Connect power harness connector to J3 on Actuator PWA.

4. REPLACE BOTH SIDE COVERS.

3-12

Figure 3-9 29MB Disk Drive Assembly
REPLACEMENT

CAUTION
DO NOT switch ON system power when spindle is locked.

1. SWITCH OFF SYSTEM POWER.
2. REMOVE LEFT SIDE COVER.
3. REMOVE DRIVE BELT COVER.

CAUTION
DO NOT rotate spindle in a counterclockwise direction. Disk and heads may be damaged.

4. INSTALL SPINDLE LOCK.
   a. Rotate spindle slowly in a clockwise direction only until hole in pulley aligns with hole in casting.
   b. Remove spindle lock screw from storage hole.
   c. Insert spindle lock screw and tighten.
5. REPLACE DRIVE BELT COVER
6. REPLACE LEFT SIDE COVER.

3.4 29MB DRIVE BELT
     REF PL 4.2

REMOVAL
1. SWITCH OFF SYSTEM POWER
2. REMOVE LEFT SIDE COVER.
3. REMOVE DRIVE BELT COVER.

3.5 29MB DRIVE MOTOR
     REF PL 4.2

REMOVAL (FIGURE 3.9)
1. SWITCH OFF SYSTEM POWER.
2. REMOVE BOTH SIDE COVERS.
3. INSTALL ACTUATOR LOCK
4. DISCONNECT POWER HARNESS CONNECTOR FROM J4 ON DRIVE MOTOR
5. REMOVE DRIVE BELT (3.4).

NOTE: Do not replace Drive Belt Cover.

6. INSTALL SPINDLE LOCK (REPLACEMENT 3.3.2).
3. REPAIR DATA
29MB DRIVE MOTOR

7. REMOVE CAPACITOR FROM BRACKET.
   a. Place small screwdriver under top edge of capacitor bracket.
   b. To remove capacitor, carefully apply pressure with screwdriver, and pull on body of capacitor.

8. REMOVE DRIVE MOTOR.
   a. Remove Drive Motor connector J4 from bracket.
   b. Remove the two screws securing the motor relay to casting.

   NOTE: Ensure that the insulating washers on both sides of motor mounts are glued to casting or motor.
   c. Support the motor while removing the four mounting screws.
   d. Remove Drive Motor assembly from casting.

9. REMOVE PULLEY.
   a. Loosen the two set screws on Drive Motor pulley.
   b. Remove pulley from motor shaft.
   c. Keep pulley for use with new Drive Motor.

REPLACEMENT
1. REPLACE PULLEY
   a. Align one set screw with flat side of motor shaft, and install pulley onto shaft.
   b. Place 0.035 inch (0.88) shim between outer edges of pulley and motor.
   c. Move pulley against shim, and tighten set screws.
   d. Remove shim.

   NOTE: Ensure that the insulating washers are on both sides of motor mounts, and that motor does not touch casting.

2. REPLACE DRIVE MOTOR.
   a. Ensure that there are insulating washers glued to motor mounts or motor.
   b. Support the motor while threading the capacitor, relay, and power connector J4 through hole in casting.
   c. Install the four screws and four insulating washers, but do not tighten.

   CAUTION
   Do not apply too much torque to screws, or the insulating washers will split.
   d. Attach ohm meter leads to casting and motor.
   e. Tighten the four screws and observe meter to ensure that motor does not touch casting.
   f. Remove meter leads from motor and casting.
   g. Position relay and replace the two screws securing it to the casting.
   h. Install capacitor into bracket.
   i. Install Drive Motor connector J4 into bracket.

3. REMOVE SPINDLE LOCK SCREW AND PLACE IN STORAGE.

4. REPLACE DRIVE BELT (3.4).

5. CONNECT POWER HARNESS CONNECTOR TO DRIVE MOTOR CONNECTOR J4.

6. REMOVE ACTUATOR LOCK (3.3.1).
29MB DISK CONSOLE
600P84228

7. RUN ALAG.
8. REPLACE BOTH SIDE COVERS.

### 3.6 ACTUATOR PWA
REF PL 4.2

**REMOVAL (FIGURE 3-9)**
1. SWITCH OFF SYSTEM POWER.
2. REMOVE LEFT SIDE COVER.
3. REMOVE DRIVE BELT COVER.

**CAUTION**
Do not cause any disk movement by moving the drive belt.

4. REMOVE ACTUATOR PWA
   a. Remove J8 connector from Actuator PWA.
   b. Remove power harness connector from Actuator PWA J3.
   c. Remove the four screws securing PWA to casting.
   d. Move PWA slightly to left and disconnect P9 and P10 from PWA.
   e. Remove Actuator PWA.

**REPLACEMENT (FIGURE 3-4)**
1. INSTALL JUMPER ON ACTUATOR PWA.
   a. Refer to Figure 3-4 and install jumper as shown.
2. REPLACE ACTUATOR PWA.
   a. Perform removal procedure in reverse order.
3. SWITCH ON SYSTEM POWER.
4. RUN ALAG.

### 3.7 VFO PWA
REF PL 4.2

**REMOVAL (FIGURE 3-9)**
1. SWITCH OFF SYSTEM POWER.
2. REMOVE LEFT SIDE COVER.
3. REMOVE VFO PWA
   a. Release clips securing corners of PWA, and remove from mounting studs.
   b. Disconnect P2 and P3 connectors from VFO PWA.

**REPLACEMENT (FIGURE 3-5)**
1. INSTALL JUMPERS ON VFO PWA.
   a. Refer to Figure 3-5 and install jumpers as shown.
2. REPLACE VFO PWA
   a. Perform removal procedure in reverse order.
3. SWITCH ON SYSTEM POWER.
4. RUN ALAG.

### 3.8 CONTROL PWA
REF PL 4.2

**REMOVAL (FIGURE 3-9)**
1. REMOVE VFO PWA (3.7).
2. REMOVE CONTROL PWA.
   a. Remove signal harness connector from J1 on Control PWA.
   b. Disconnect harness from J7 on Control PWA.

RUN ALAG.
3. REPAIR DATA
CONTROL PWA  READ/WRITE PWA

REPLACEMENT (FIGURES 3-1, 3-2, 3-3)

CAUTION
Jumpers on new Control PWA must be configured to match old Control PWA jumper locations BEFORE installation. Several Control PWAs are now in use. Ensure that the correct figure is referred to when verifying the jumper locations.

a. Refer to Figures 3-1, 3-2, and 3-3 and install jumpers as shown.
b. Remove any jumpers not shown in figures.
c. Add any jumpers necessary, as shown in figures.

2 REPLACE CONTROL PWA
a. Perform removal procedure in reverse order.
3 SWITCH ON SYSTEM POWER
4 RUN ALAG.

3.9 READ/WRITE PWA
REF PL 4.2

REMOVAL (FIGURE 3-9)
1 REMOVE CONTROL PWA (3.8).
2 REMOVE DAMPER ASSEMBLY COVER.
3 REMOVE READ/WRITE PWA.

4.2 READ/WRITE PWA

a. Remove the two screws on left side of Read/Write PWA.
b. Remove the six screws from center of Read/Write PWA.

CAUTION
Do not pull head cables through seal. This will reduce slack inside the Disk Drive and prevent arms from moving properly.

c. Carefully pull Read/Write PWA away from casting enough to reach behind PWA and disconnect cables.
d. Disconnect cables from component side of Read/Write PWA.

7. If rubber gasket adheres to Read/Write PWA, remove and replace around hole in casting.

REPLACEMENT (FIGURE 3-10)

NOTE: Cables are sequentially marked. P20 is at bottom, and P28 is at top.

1. REPLACE READ/WRITE PWA.
a. Ensure that rubber gasket is properly attached around hole in casting.
b. Carefully connect head cables on new PWA (Figure 3-10)
c. Push PWA against casting, ensuring that the wires are not caught between PWA and casting.
e. Replace the eight screws securing the Read/Write PWA to casting.
2. REPLACE CONTROL PWA (3.8)  
3. REPLACE VFO PWA (3.7).  
4. SWITCH ON SYSTEM POWER  
5. RUN ALAG.  
6. REPLACE LEFT SIDE COVER.  

3.10 DAMPER ASSEMBLY  
REF PL 4.2  

REMOVAL  
1. SWITCH OFF SYSTEM POWER.  
2. REMOVE BOTH SIDE COVERS.  
3. REMOVE DAMPER ASSEMBLY.  
a. Disconnect power harness connector J3 from Actuator PWA.  
b. Switch ON system power.  

CAUTION  
DO NOT move Damper Assembly until disk speed has been reached (approximately five seconds after AC power is applied). Movement of the heads without disk rotation may cause disk or head damage.  
c. Remove damper cover  
d. Rotate damper counterclockwise until actuator arm is located against the outer stop.  
e. Loosen set screw securing the damper and collar to actuator motor shaft.  
f. Remove damper assembly from shaft.
REPAIR DATA
DAMPER ASSEMBLY

CAUTION
AC power must be applied while installing Damper Assembly.

1. REPLACE DAMPER ASSEMBLY.
   a. Ensure that harness connector J3 is disconnected.
   b. Switch ON system power.
   c. Install Damper Assembly onto actuator motor shaft.

NOTE: Ensure that damper and collar are NOT in contact with actuator motor housing.

   d. Tighten set screw securing the damper to actuator motor shaft.
   e. Replace damper cover.
   f. Switch OFF system power.
   g. Connect power harness connector to J3 on Actuator PWA.

2. SWITCH ON SYSTEM POWER
3. RUN AILAG.
4. REPLACE BOTH SIDE COVERS

3-18
CHAPTER 4  PARTS IDENTIFICATION

29MB DISK CONSOLE SERVICE MANUAL

USO/XC ONLY
### 4. PARTS IDENTIFICATION

**USO/XC ONLY**

#### PL 4.1 29MB CONSOLE MECHANICAL PARTS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2PB1938</td>
<td>Cover, Top</td>
</tr>
<tr>
<td>2</td>
<td>NSC: 2PB2011</td>
<td>Plate, Fan Cover</td>
</tr>
<tr>
<td>3</td>
<td>127P1275</td>
<td>Fan, Console</td>
</tr>
<tr>
<td>4</td>
<td>2581969</td>
<td>Cover, Rear (includes item 13)</td>
</tr>
<tr>
<td>5</td>
<td>NSC: 30P83957</td>
<td>Bracket, Drive Mounting</td>
</tr>
<tr>
<td>6</td>
<td>2581967</td>
<td>Cover, Side (includes item 13)</td>
</tr>
<tr>
<td>7</td>
<td>26PB0475</td>
<td>Stud, Castor Locking</td>
</tr>
<tr>
<td>8</td>
<td>17PB0207</td>
<td>Castor, Rear</td>
</tr>
<tr>
<td>9</td>
<td>3P1454</td>
<td>Clip, Quarter Turn Receptacle</td>
</tr>
<tr>
<td>10</td>
<td>17PB0199</td>
<td>Castor, Front</td>
</tr>
<tr>
<td>11</td>
<td>2581968</td>
<td>Cover, Front (includes 12, 13)</td>
</tr>
<tr>
<td>12</td>
<td>NSC: 91P81325</td>
<td>Label, Logo</td>
</tr>
<tr>
<td>13</td>
<td>6015920</td>
<td>Kit, Quarter Turn Hardware</td>
</tr>
<tr>
<td>14</td>
<td>- -</td>
<td>Stud, Quarter Turn (P/O item 13)</td>
</tr>
<tr>
<td>15</td>
<td>- -</td>
<td>Spring, Ejector (P/O item 13)</td>
</tr>
<tr>
<td>16</td>
<td>- -</td>
<td>Washer, Nylon (P/O item 13)</td>
</tr>
<tr>
<td>17</td>
<td>- -</td>
<td>Retainer, Split Ring (P/O item 13)</td>
</tr>
<tr>
<td>18</td>
<td>NSC: 2PB2021</td>
<td>Bezel, Front Ring</td>
</tr>
<tr>
<td>19</td>
<td>NSC: 2PB0410</td>
<td>Nut, Speed</td>
</tr>
</tbody>
</table>

**NSC:** Call the Network Support Center to obtain parts.

- - - - Removal and Replacement 3.1, 3.2
4. PARTS IDENTIFICATION
29MB CONSOLE MECHANICAL PARTS

Figure 4-1 29MB Console Mechanical Parts
### 4. PARTS IDENTIFICATION

#### DISK DRIVE ASSEMBLY

**USO/XC ONLY**

**29MB DISK CONSOLE**

**600P84228**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>99P80929</td>
<td>Motor, 60Hz Drive</td>
</tr>
<tr>
<td>2</td>
<td>82P80897</td>
<td>Drive Assembly, 29MB Disk</td>
</tr>
<tr>
<td>3</td>
<td>99P80921</td>
<td>PWA, Actuator</td>
</tr>
<tr>
<td>4</td>
<td>99P81093</td>
<td>Harness, C-A</td>
</tr>
<tr>
<td>5</td>
<td>99P87543</td>
<td>Lock, Actuator (Note 1)</td>
</tr>
<tr>
<td>6</td>
<td>99P81095</td>
<td>Damper Assembly</td>
</tr>
<tr>
<td>7</td>
<td>99P87509</td>
<td>PWA, Read/Write</td>
</tr>
<tr>
<td>8</td>
<td>99P87511</td>
<td>PWA, VFO</td>
</tr>
<tr>
<td>9</td>
<td>99P81094</td>
<td>Harness, C-V</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Terminator (RX only)</td>
</tr>
<tr>
<td>11</td>
<td>99P87510</td>
<td>PWA, Control</td>
</tr>
<tr>
<td>12</td>
<td>NSC: 99P80924</td>
<td>Cover, Belt</td>
</tr>
<tr>
<td>13</td>
<td>99P80925</td>
<td>Belt, 60Hz Drive</td>
</tr>
<tr>
<td>14</td>
<td>NSC: 99P80927</td>
<td>Pulley, Belt</td>
</tr>
<tr>
<td>15</td>
<td>99P81226</td>
<td>Kit, Belt Retainer</td>
</tr>
</tbody>
</table>

| A    | 201W21802 | Hex Nut (1/4-20) |
| B    | 256W11402 | Lockwasher (1/4) |
| C    | 256W10902 | Lockwasher (No. 8) |
| D    | 113W23002 | Screw (8-32 x 5/8) |
| E    | 112W39610 | Screw (8-32 x 3/8) |
| F    | 113W22402 | Screw (8-32 x 1/4) |
| G    | 113W17208 | Spindle Lock Screw (4-40 x 3/4) |
| H    | 259W10502 | Spindle Lock Lockwasher (No. 4) |
| J    | 113W16602 | Screw (4-40 x 3/8) |

**NSC:** Call the Network Support Center to obtain parts.

**NOTE 1:** Actuator lock may not be provided on all disk drives.

- Removal and Replacement 3.1 to 3.10, inclusive.
Figure 4-2  Disk Drive Assembly
### 4. PARTS IDENTIFICATION

#### 29MB CONSOLE HARNESS

**USO/XC ONLY**

#### 29MB DISK CONSOLE

600P8422B

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>152525031</td>
<td>Cable W21, 29MB Signal (TAGS 3, 225)</td>
<td>A</td>
<td>112W36710</td>
</tr>
<tr>
<td></td>
<td>152525030</td>
<td>Cable W21, 19MB Signal (alt.)</td>
<td>B</td>
<td>258W10902</td>
</tr>
<tr>
<td>2</td>
<td>NSC: 19P20514</td>
<td>Clamp, Cable</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>NSC: 19P20515</td>
<td>Clamp, Cable</td>
<td>D</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>Block, Cable Tie (P/O item 1)</td>
<td>NSC:</td>
<td>Call the Network Support Center to obtain parts.</td>
</tr>
<tr>
<td>5</td>
<td>152525440</td>
<td>Cable W20, 29MB Power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>Cover, Rear Cable (RX only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>Clamp, Cable (RX only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 5  PRINT/DISPLAY QUALITY

29MB DISK CONSOLE SERVICE MANUAL

REFER TO APPROPRIATE SERVICE MANUAL
CHAPTER 6 TROUBLESHOOTING

29MB DISK CONSOLE SERVICE MANUAL
INTRODUCTION

Service Strategy

The steps required for isolation of faults in the 8000 Network System, are provided in the sequence below. These steps are described in detail in the 8000 Processor Service Manual. Instructions for using diagnostics are provided in the 8000 Network Systems Diagnostics Handbook.

1. Perform Level 01 Troubleshooting, using the Level 01 Troubleshooting Flowchart.
2. Perform the Level 1 Checkout procedure.
3. Perform any Level 2 Check Chart procedures indicated by Level 1 Checkout.
4. **USO only.** If necessary, ask for assistance from the Region Engineering Specialist (RES) or the Network Support Center (NSC).
5. **RX only.** If necessary, ask for assistance from the Technical Specialist.

Information obtained during fault isolation (in the 8000 Processor Service Manual) may refer you to this manual or other manuals.

Use the appropriate amount of time (determined by the local Branch Manager) to troubleshoot a problem. Then, if a correction cannot be made, ask for assistance.
6. TROUBLESHOOTING

CHECK CHART 6.01

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.01</td>
<td>29MB DISK FAULTS</td>
<td>Control PWA J6 (Figure 6-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Lower the VFO PWA. The following voltages, at the Control PWA, are within tolerance:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. 5.2V</td>
<td>Pin J</td>
<td>Step 1b</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td>b. -5.2V</td>
<td>Pin E</td>
<td>Step 1c</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAUTION</td>
<td>When checking the 24V at Pin 22, switch OFF power, and connect E-Z hook meter lead to Pin 22 lead on the Control PWA (Figure 6-1). Switch ON power.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. 24V</td>
<td>Pin 22</td>
<td>Step 1d</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td>d. 12V</td>
<td>Pin B</td>
<td>Check Chart 6.02</td>
<td>Step 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| VOLTAGE TOLERANCES |
|-------------------|------------------|------------------|
| Voltage           | Xerox 600T860    | Digital Meter    |
| 5.2V              | 4.8 to 5.6       | 5.02 to 5.38     |
| -5.2V             | -4.8 to -5.6     | -5.02 to -5.38   |
| -12V              | -11.0 to -13.0   | -11.4 to -12.6   |
| 12V               | 11.0 to 13.0     | 11.4 to 12.6     |
| 24V               | 22.0 to 26.0     | 22.8 to 25.2     |
6. TROUBLESHOOTING

Figure 6-1 Control PWA (Version A)
TERMINATOR CHIP INSTALLED

SHORTING PLUG

Figure 6-2 Control PWA (Version B)
2. Disconnect C-A (ribbon) Harness connector J8 from Actuator PWA. All of the following voltages are within tolerance:

a. 5.2V
b. 5.2V
c. 5.2V
d. 5.2V
e. -5.2V
f. 24V
g. 24V
h. 12V

3. All of the following voltages are within tolerance:

a. 5.2V
b. -5.2V
c. 24V

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Disconnect C-A (ribbon) Harness connector J8 from Actuator PWA. All of the following voltages are within tolerance:</td>
<td>Actuator PWA J8 (Figure 6-3)</td>
<td>Replace C-A Harness.</td>
<td>If problem still exists, replace Control PWA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>All of the following voltages are within tolerance:</td>
<td>Actuator PWA J3 (Figure 6-3)</td>
<td>Replace Actuator PWA</td>
<td>Replace 29MB Power Cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pin 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLTAGE TOLERANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
</tr>
<tr>
<td>5.2V</td>
</tr>
<tr>
<td>-5.2V</td>
</tr>
<tr>
<td>-12V</td>
</tr>
<tr>
<td>12V</td>
</tr>
<tr>
<td>24V</td>
</tr>
</tbody>
</table>
## 6. TROUBLESHOOTING

### CHECK CHARTS 6.02

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.02</td>
<td>DISK MP FAULT CODE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CAUTION

Performing the following steps with P43 connected to the HSIO PWA will write over, and therefore destroy, customer files.

**NOTE:** When P43 is disconnected from the HSIO PWA, the system cannot determine if there is a 29MB, 42MB, or 10MB Disk Drive installed. Since the 10MB Data Wrap Around test does not require the Disk Drive to be connected this is the test you should select.

1. Disconnect P43 only from HSIO PWA. Run ALAG. Upon the completion of Test 0316, press STOP key on 8010 Workstation or BREAK key on Server Terminal. When the MP reaches 0399, type a d. When MP reaches 0799, type an s then 31, then press return. Test ran successfully (MP = 0799).

2. Connect P43 to HSIO PWA. Locate the original MP Code from the list below, and access the specified Check Chart.
   - a. 1611 to 1618, inclusive
   - b. 1631 to 1636, inclusive
   - c. 1641 to 1643, inclusive
   - d. 1671 or 1672
   - e. 1713
   - f. 1741, 1742, or 1791
   - g. None of the above

Replace HSIO PWA
## 6. TROUBLESHOOTING

**CHECK CHART 6.02.1**

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.02.1</strong> DISK NOT READY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Drive Motor is running.</td>
<td>Visual</td>
<td>Step 2</td>
<td></td>
<td>Check Chart 6.02.2</td>
</tr>
<tr>
<td>2</td>
<td>Disk is spinning.</td>
<td>Visual</td>
<td>Step 3</td>
<td></td>
<td>Check Chart 6.02.4</td>
</tr>
<tr>
<td><strong>NOTE:</strong> Use Logic Probe 600T1580 for all measurements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Verify that DS jumper is in the correct location at DS1, then logon using xerox and cicos for name and password. Enter the Isolation Tools. Select Drive Select - Dynamic - Frequency: 1000. Logic Probe indicates pulses.</td>
<td>Control PWA DS Jumper (Figure 6-1 or 6-2)</td>
<td>Step 4</td>
<td></td>
<td>Check Chart 6.02.3</td>
</tr>
<tr>
<td><strong>NOTE:</strong> Test selected in Step 3 should still be running while performing Step 4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Measure the Control PWA jumper RY. Probe indicates pulses.</td>
<td>Control PWA RY Jumper (Figure 6-1 or 6-2)</td>
<td>Step 5</td>
<td></td>
<td>Check Chart 6.02.5</td>
</tr>
<tr>
<td>5</td>
<td>Measure HSIO PWA. Probe indicates pulses</td>
<td>HSIO PWA J43-22</td>
<td>Replace HSIO PWA</td>
<td>Step 6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Disconnect P1 from Processor Connector Panel J2 and J1 from the Control PWA. 29MB Signal Cable has continuity.</td>
<td>29MB Signal Cable J1-F to P1-12</td>
<td>Step 7</td>
<td>Replace 29MB Signal Cable</td>
<td></td>
</tr>
</tbody>
</table>
6. TROUBLESHOOTING
CHECK CHARTS 6.02.1, 6.02.2, 6.02.3

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Disconnect J43 from HSIO PWA. 29MB Interface Harness has continuity.</td>
<td>29MB Interface Harness J2-12 to J43-22</td>
<td>Replace in order: Control PWA HSIO PWA</td>
<td>Replace 29MB Interface Harness</td>
</tr>
</tbody>
</table>

6.02.2 NO MOTOR DRIVE

1. Voltage at Drive Motor is as follows: USO. 103 to 127 VAC RX. 193 to 264 VAC

6.02.3 NO DRIVE SELECT

1. Press STOP on 8010 Workstation or BREAK on Server Terminal. Select Drive Select - Dynamic - Frequency 1000. Measure HSIO PWA with Logic Probe 600T1580. Probe indicates pulses.

2. Disconnect P1 from Processor Connector Panel J2 and J1 from the Control PWA. 29MB Signal Cable J1-J to P1-16 has continuity.

3. Disconnect J43 from HSIO PWA. 29MB Interface Harness has continuity.

29MB DISK CONSOLE
600P84228

6-10
### 6.02.4 MECHANICAL ISOLATION

1. Verify that Spindle Lock Screw and Actuator Lock are removed.  
   - **Test Point**: Visual  
   - **Correct**: Step 2  
   - **Indication**: Remove Lock Screw and Actuator Lock (Procedures 3.3.1 and 3.3.2)

2. Verify that pulley is correctly installed.  
   - **Test Point**: Visual  
   - **Correct**: Step 3  
   - **Indication**: Tighten or replace pulley

3. Verify that Drive Belt is correctly installed.  
   - **Test Point**: Visual  
   - **Correct**: Replace in order:  
     - Control PWA  
     - HSIO PWA  
   - **Indication**: Install Drive Belt

### 6.02.5 LOGIC NOT READY

**NOTE**: Lower the VFO PWA to access the Control PWA. Place two sheets of paper under VFO PWA to prevent an electrical short from PWA to disk console frame.

1. Measure the Control PWA with Logic Probe 600T1580. Probe shows a high indication.  
   - **Test Point**: Control PWA TP 8 (Figure 6-1 or 6-2)  
   - **Correct**: Replace in order:  
     - R/W PWA  
     - Control PWA  
   - **Indication**: Replace Control PWA  
   - **Incorrect**: If problem still exists, call for assistance.
### 6. TROUBLESHOOTING

**CHECK CHARTS 6.03, 60.3.1**

---

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.03</strong></td>
<td><strong>LOGIC FAULT</strong></td>
<td><strong>6.03</strong></td>
<td><strong>LOGIC FAULT</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Measure the Control PWA with Logic Probe 600T1580. Probe shows a high indication.</td>
<td>Control PWA TP 21 (Figure 6-1 or 6-2)</td>
<td>Check Chart 6.03.1</td>
<td>Replace in order: R/W PWA Control PWA If problem still exists, call for assistance.</td>
</tr>
<tr>
<td><strong>6.03.1</strong></td>
<td><strong>CONTROL FAULT</strong></td>
<td><strong>6.03.1</strong></td>
<td><strong>CONTROL FAULT</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Run Fault Analysis. After an MP Code is displayed, Logic Probe 600T1580 shows a low indication.</td>
<td>Control PWA TP 22 (Figure 6-1 or 6-2)</td>
<td>Step 2</td>
<td>Replace in order: R/W PWA Control PWA If problem still exists, call for assistance.</td>
</tr>
<tr>
<td>2</td>
<td>Measure the Control PWA with Logic Probe, 600T1580. Probe shows a high indication.</td>
<td>Control PWA TP 12 (Figure 6-1 or 6-2)</td>
<td>Step 3</td>
<td>Check Chart 6.02.1</td>
</tr>
<tr>
<td>3</td>
<td>Measure the Control PWA with Logic Probe, 600T1580. Probe shows a low indication.</td>
<td>Control PWA TP 13 (Figure 6-1 or 6-2)</td>
<td>Step 4</td>
<td>Replace in order: R/W PWA Control PWA If problem still exists, call for assistance.</td>
</tr>
</tbody>
</table>

---
**29MB DISK CONSOLE**

**600P84228**

**6. TROUBLESHOOTING**

**CHECK CHARTS 6.03.1, 6.04**

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT INDICATION</th>
<th>INCORRECT INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Measure the Control PWA with Logic Probe 600T1580. Probe shows a low indication.</td>
<td>Control PWA J1-30 (Figure 6-1 or 6-2)</td>
<td>Replace HSIO PWA</td>
<td>Step 5</td>
</tr>
<tr>
<td>5.</td>
<td>Disconnect P1 from Processor Connector Panel J2 and J1 from the Control PWA. 29MB Signal Cable has continuity.</td>
<td>29MB Signal Cable P1-34 to J1-U</td>
<td>Step 6</td>
<td>Replace 29MB Signal Cable</td>
</tr>
<tr>
<td>6.</td>
<td>Disconnect J43 from HSIO PWA. 29MB Interface Harness has continuity.</td>
<td>29MB Interface Harness J2-34 to J43-44</td>
<td>Replace Control PWA</td>
<td>Check 29MB Interface Harness connector for loose pins; replace bad harness</td>
</tr>
</tbody>
</table>

**6.04 TRACK SEEK INCOMPLETE**

1. Enter the Isolation Tools. Select Step Pulses - Frequency 1000 - Inward. Measure SC Jumper on the Control PWA with Logic Probe 600T1580. Probe shows pulsing indication. | Control PWA SC Jumper (Figure 6-1 or 6-2) | Step 2 | Replace in order: Actuator PWA C-A Harness Control PWA HSIO PWA |

**NOTE:** Test selected in Step 1 should still be running while performing Step 2.

2. Measure C Jumper on the Control PWA with Logic Probe 600T1580. Probe shows pulsing indication. | Control PWA C Jumper (Figure 6-1 or 6-2) | Step 3 | Replace Actuator PWA |
### 6. TROUBLESHOOTING

#### CHECK CHARTS 6.04, 6.05

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>29MB DISK CONSOLE 600P84228</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSIO PWA J10-1 (Figure 6-3)</td>
<td>Step 2</td>
<td>Replace in order: Control PWA, Actuator PWA, HSIO PWA</td>
<td>Replace Actuator PWA. If problem still exists, call for assistance.</td>
</tr>
<tr>
<td>Actuator PWA TP3 (Figure 6-3)</td>
<td>Replace Actuator PWA. If problem still exists, call for assistance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSIO PWA J43-8</td>
<td>Replace HSIO PWA</td>
<td>Replace 29MB Signal Cable</td>
<td></td>
</tr>
</tbody>
</table>

#### NOTE:
Test selected in Step 1 should still be running while performing Step 3.

3. Measure HSIO PWA with Logic Probe 600T1580. Probe shows pulsing indication

### 6.05 RESTORE ERRORS

1. Enter the Isolation Tools Select Step Pulses - Frequency 1000 - Outward. When test stops, Logic Probe 600T1580 shows a high indication (heads at track 00).

2. Measure Actuator PWA with Logic Probe 600T1580. Probe shows a high indication.
### 6. TROUBLESHOOTING

### CHECK CHART 6.06

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.06</td>
<td>SEEK ERRORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Enter the Isolation Tools. Select Step Pulses - Frequency 1000 - Inward. Measure Actuator PWA with Logic Probe 600T1580. Probe shows a high indication, pulsing low.

   - Actuator PWA TP5 (Figure 6-3)
   - Step 2
   - Step 4

2. Verify that heads are moving. (Repeat Step 1, selecting Outward, if necessary.)

   - Visual
   - Step 3
   - Replace Actuator PWA. If problem still exists, call for assistance.

3. Original MP code was 1713.

   - Visual
   - Replace in order: Control PWA, Actuator PWA, HSIO PWA, C-A Harness, 29MB Signal Cable, Damper Assembly. If problem still exists, call for assistance.

4. Measure the Control PWA with Logic Probe 600T1580. Probe shows pulsing indication.

   - Control PWA J1-26 (Figure 6-1 or 6-2)
   - Replace in order: Control PWA, C-A Harness, Actuator PWA
   - Step 5
### 6. TROUBLESHOOTING

**CHECK CHARTS 6.06, 6.07, 6.08, 6.09**

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Measure HSIO PWA with Logic Probe 600T1580. Probe shows pulsing indication.</td>
<td>HSIO PWA J43-36 (Harness connected)</td>
<td>Replace 29MB Signal Cable</td>
<td>Replace in order: HSIO PWA 29MB Signal Cable</td>
<td></td>
</tr>
<tr>
<td>6.07</td>
<td>WRITE ERRORS</td>
<td>Control PWA TP17 (Figure 6-1 or 6-2)</td>
<td>Replace in order: RW PWA VFO PWA HSIO PWA</td>
<td>Replace in order: Control PWA HSIO PWA 29MB Signal Cable</td>
<td></td>
</tr>
<tr>
<td>6.08</td>
<td>COOLING FAN</td>
<td>Fan Connector P2-1 to 2</td>
<td>Replace Fan</td>
<td>Replace 29MB Power Cable</td>
<td></td>
</tr>
<tr>
<td>6.09</td>
<td>RIGID DISC DRIVE LOADING</td>
<td>Test Connector to RTN Step 2</td>
<td></td>
<td>Replace 29MB Power Cable</td>
<td></td>
</tr>
</tbody>
</table>

6-16
### Step Procedure

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
<th>INCORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Connect J3 to Actuator PWA. Disconnect J8 from Actuator PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Step 3</td>
<td>Replace Actuator PWA</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Connect J8 to Actuator PWA. Disconnect J7 from the Control PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Step 4</td>
<td>Replace C-A Harness</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6-4 Test Connector**

![Test Connector Diagram]

- 5.2V
- -5.2V
- 24V
- -12V
- 12V

**8010-009**
## 6. TROUBLESHOOTING

### CHECK CHART 6.09

<table>
<thead>
<tr>
<th>STEP</th>
<th>PROCEDURE</th>
<th>TEST POINT</th>
<th>CORRECT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Connect J7 to the Control PWA. Disconnect right hand C-V (ribbon) Harness from bottom of the Control PWA and J6 from the Control PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Step 5</td>
<td>Replace Control PWA</td>
</tr>
<tr>
<td>5.</td>
<td>Connect C-V (ribbon) Harness to the Control PWA. Disconnect J2 from VFO PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Step 6</td>
<td>Replace C-V Harness</td>
</tr>
<tr>
<td>6.</td>
<td>Connect J2 to VFO PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Step 7</td>
<td>Replace VFO PWA</td>
</tr>
<tr>
<td>7.</td>
<td>Connect J6 to the Control PWA. Voltage in question is within tolerance.</td>
<td>Test Connector to RTN</td>
<td>Return to Level 1</td>
<td>Replace R/W PWA</td>
</tr>
</tbody>
</table>

### VOLTAGE TOLERANCES

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Xerox 6001060</th>
<th>Digital Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2V</td>
<td>4.8 to 5.6</td>
<td>5.02 to 5.38</td>
</tr>
<tr>
<td>-5.2V</td>
<td>-4.8 to -5.6</td>
<td>-5.02 to -5.38</td>
</tr>
<tr>
<td>1.2V</td>
<td>-11.0 to -13.0</td>
<td>-11.4 to -12.6</td>
</tr>
<tr>
<td>12V</td>
<td>11.0 to 13.0</td>
<td>11.4 to 12.6</td>
</tr>
<tr>
<td>24V</td>
<td>22.0 to 26.0</td>
<td>22.8 to 25.2</td>
</tr>
</tbody>
</table>
CHAPTER 7  PLUG/JACK LIST

29MB DISK CONSOLE SERVICE MANUAL
Harnesses for the 29MB Disk Console are each identified with an alphanumeric code (W00). These harness codes are defined in Section 7.2. The codes are used on plug/jack location diagrams.

In Section 7.3, a plug/jack location diagram (Figure 7-1) is provided to show actual locations of plugs and jacks. Each plug/jack is identified by harness code and plug/jack name.

Section 7.4 provides illustrations of the wiring data for each harness. The wiring data illustrations (Figures 7-2 and 7-3) use letter codes, within a hexagonal symbol, which identify related connector diagrams.

Pin location diagrams for various types of connectors are provided in Section 7.5. The diagrams (Figures 7-4 to 7-8, inclusive) show pin side view of the connectors.

HARNESS IDENTIFICATION

W20  29MB Power Cable
W21  29MB Signal Cable

7.3 PLUG/JACK LOCATIONS

Refer to Figure 7-1 for illustration of plug/jack locations and identification.

7.4 WIRING DATA

Refer to Figures 7-2 and 7-3 for illustrations of the wiring data for each harness.

7.5 CONNECTOR IDENTIFICATION

Refer to Figures 7-4 to 7-8, inclusive, for pin location diagrams for various types of connectors used on harnesses. The diagrams show pin side view of connectors.
Figure 7-1 29MB Disk Console Plug/Jack Locations

Figure 7-2 29MB Power Cable - W20
Figure 7-3 29MB Signal Cable - W21
Figure 7-4 Connector Type B

Figure 7-5 Connector Type D

Figure 7-6 Connector Type H
7. PLUG/JACK LIST
CONNECTOR IDENTIFICATION TYPES R, S

Figure 7-7 Connector Type R

Figure 7-8 Connector Type S
CHAPTER 8  PRINCIPLES OF OPERATION

29MB DISK CONSOLE SERVICE MANUAL

REFER TO 8000 SERIES REFERENCE MANUAL
Use this Comment Sheet to assist in identification of errors or needed improvements in this manual. For specific errors, include specific page number in the report.

Name                                      | Job Title | Employee No.
-------------------------------------------|-----------|--------------

Mailing Address

<table>
<thead>
<tr>
<th>Page/Fig.No.</th>
<th>Description of Error or Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Detach Comment Sheet, and mail the card to the printed address on the reverse side.

To receive an answer, mark this area. Include name, and mailing address above.
BUSINESS REPLY MAIL
FIRST CLASS Permit No. 229 El Segundo, California

POSTAGE WILL BE PAID BY ADDRESSEE

XEROX CORPORATION
OS Service Education
701 S. Aviation Blvd.
MSN107
El Segundo, California 90245

Attn: Manager, OS Service Education