2200A-L1A DATA CONTROL UNIT
(NETWORK CONTROLLER)
TEST PROCEDURES
"DATAPHONE®" II SERVICE

CONTENTS PAGE

1. GENERAL 1

2. INSTALLATION TEST 1

3. MAINTENANCE 2

A. Booting Procedure 2

B. Power-Down Procedure 3

C. Power-Up Procedure 3

D. Fuse Replacement Procedure . . . 3

E. Tape Drive Unit Replacement Procedure 3

F. 66A2 Mounting Replacement Procedure 3

G. Power Supply Troubleshooting . . 4

H. Booting/Operational Problem . . . 4

I. Port Problem 4

4. REFERENCES 4

1. GENERAL

1.01 This section contains information concerning procedures to be used when testing the network controller (NC), also referred to as 2200A-L1A data control unit (DCU).

1.02 Whenever this section is reissued the reason for reissue will be contained in this paragraph.

1.03 The NC continuously monitors the operational condition of the data sets connected to the control channel.

1.04 It should be kept in mind that the DATAPHONE® II service provides central-site network control. DATAPHONE II service provides continuous system monitoring and a continuous indication of the status of all the data sets and quality of the transmission facilities. These features change the installation and maintenance testing philosophy from that of other data systems.

1.05 The DATAPHONE II service provides extensive diagnostics that can rapidly identify the nature of a failure. These features provide a means for specific troubleshooting should the need arise. The maintenance part contains flowcharts that are the recommended approach.

1.06 The technician will first attempt to correct NC problems by rebooting and/or changing the replaceable items, namely; the circuit packs, power supply, tape drive unit, and tape cartridge.

2. INSTALLATION TEST

2.01 The NC should be tested to determine if it is operating properly after installation.

2.02 Execute several nondisruptive tests or commands on local data sets in the control channel network. Some examples of tests or commands that may be used are: EIA status (eia), identity (id). Refer to Section 592-102-101 for description, operation, and result indication of these tests. Refer to Table A or Table B to determine whether a test command is disruptive or nondisruptive.

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

3. MAINTENANCE

3.01 No routine maintenance is required. When investigating a trouble report or installation problem refer to Fig. 1 as a troubleshooting guide and to Fig. 2 for power supply troubleshooting guide.

A. Booting Procedure

3.02 During trouble report or installation follow the procedure below for booting NC:

STEP	ACTION	VERIFICATION
1	Ensure the ON LINE/OFF LINE switch is in the OFF LINE position. Insert the system program 100B data cartridge into the KS-21447, L10 minirecorder.	
2	Place the ON LINE/OFF LINE switch to the ON LINE position. Depress and ***hold*** BOOT and momentarily depress and release RESET. Release BOOT.	TAPE STATUS red ***and*** green light-emitting diodes (LEDs) light. CONTROLLER STATUS red LED lights. TAPE STATUS changes to GREEN. TAPE IN MOTION and UNIT SELECT LEDs light. ON LINE LED lights. CONTROLLER STATUS GREEN LED lights. On the DATASPEED® 40/2 terminal screen first SYSTEM TEST and then LOADING and the software versions are displayed. As the system program is read from the 100B data cartridge into memory (and after a short delay) the following occurs: • The audible tone on the terminal is heard at intervals. • The curser beam on the terminal display moves across the screen in steps at the same interval as the audible tones. •The TAPE IN MOTION and UNIT SELECT LEDs flash in intervals as the files are read. •CONTROLLER STATUS and TAPE STATUS green LEDs light. The terminal displays ***accessing tape—WAIT 0*** then ***Network Controller ID*** and software version information.

3.03 During trouble report or installation problem to power up or power down the NC, follow the procedure below:

B. Power-Down Procedure

1. Turn the ON LINE/OFF LINE switch to OFF LINE position.
2. Wait for TAPE IN MOTION LED to go off.
3. Remove the system program 100B data cartridge from the KS-21447, L10 minirecorder.
4. Unplug NC power cord from 115 Vac source.

C. Power-Up Procedure

Caution: Ensure that 100B data cartridge is not inserted into the KS-21447, L10 minirecorder.

1. Plug NC power cord into a 115 Vac source.
2. Insert the system program 100B data cartridge into the KS-21447, L10 minirecorder.
3. Turn the ON LINE/OFF LINE switch to ON LINE position.
4. Execute boot procedure.

3.04 During trouble report or installation if fuse is blown, follow the procedure below:

D. Fuse Replacement Procedure

1. Execute power-down procedure.

Caution: When checking fuses and voltage test points, avoid probes touching adjacent contacts or shorting out test points.

2. Locate and replace blown fuse. (Use of a multimeter is recommended to check for a blown fuse.) Fuses F1, F2, F3, F4, F5, F6, F7, and F8 are located on the rear of the 291A power unit inside the fuse holders. Refer to Fig. 3 for location of the fuses.
3. Execute power-up procedure.

3.05 Refer to Table C for the code, rating, and circuit protected by the fuses F1 through F8.

E. Tape Drive Unit Replacement Procedure

3.06 During trouble report or installation if tape drive unit needs replacement follow the procedure below:

Note: Tape drive unit circuit packs (Fig. 4) should not be replaced or exchanged.

1. Follow power-down procedure.
2. Remove plugs P5 and P6 (Fig. 3) from rear of tape drive unit.
3. Remove tape drive unit retaining screws (Fig. 3).
4. Slide out tape drive unit.
5. Remove tape drive unit mounting brackets.
6. Mount the new tape drive unit on the mounting bracket.
7. Slide tape drive unit into the NC.
8. Replace tape drive unit retaining screws.
9. Connect P5 and P6 connectors at the rear of the tape drive unit.
10. Follow power-up procedure.

F. 66A2 Mounting Replacement Procedure

3.07 During trouble report or installation if 66A2 mounting needs replacement follow the procedure below:

1. Follow power-down procedure.
2. Remove NC circuit packs (Fig. 3).
3. Remove 291A power unit.
4. Remove tape drive unit.
5. Remove 66A2 mounting.
6. Replace 66A2 mounting.

Caution: Ensure NC circuit packs are firmly seated on the sockets.

7. Install tape drive unit, 291A power unit and NC circuit packs.

8. Follow power-up procedure.

G. Power Supply Troubleshooting

3.08 When a power problem is suspected refer to Fig. 2 for the troubleshooting sequence. Figure 3 shows the location of the fuse holder and connectors and Fig. 4 shows the location the voltage terminal strip on the NC necessary for power supply troubleshooting.

H. Booting/Operational Problem

3.09 When a booting or operational problem is encountered and the local terminal displays an error code, refer to the figures below showing that particular error code:

Note: Ensure that all connectors are correctly installed and properly seated.

Fig 5—Display Reads ***Accessing Tape WAIT 06, 10, 20, 50, 51, 53, 55, 56, 57, 63, Boot Error 06, 0A, 14, 32, 33, 35, 37, 38, 39, 3F, PRODATA or CRC ERROR***

Fig 6—Display Reads ***Accessing Tape WAIT 21, Boot Error 15***

Fig 7—Display Reads ***Accessing Tape WAIT 03, 07, 13, 14, 18, 24, 26, 58, 67, Boot Error 03, 07, 0D, 0E, 12, 18, 1A, 3A, 43***

Fig 8—Display Reads ***Accessing Tape WAIT 16, 22, 59 60, Boot Error 10, 16, 3B, 3C***

Fig 9—Display Reads ***Accessing Tape WAIT 65, 66, Boot Error 41, 42***

Fig 10—Display Reads ***Accessing Tape WAIT 19, 25, 64, Boot Error 13, 19, 21, 40***

Fig 11—Display Reads ***WU5 RAM ERROR, WU5 ROM ERROR*** or ***SYSTEM ERROR***

Fig 12—Display Reads ***WU6 ACCESS DENIED, TAPE ACCESS DENIED,*** or ***TAPE ROM ERROR***

Fig 13—Display Reads ***WU6 SHARE MEMORY ERROR***

Fig 14—Display Reads ***WU6 TAPE CONTROLLER ERROR***

Fig 15—Display Reads ***TRAP XXXX***

Fig 16—Display Reads ***SYSTEM TEST....SYSTEM TEST***

I. Port Problem

3.10 When a fault symptom has been isolated to a particular port on the NC, refer to the following flowcharts as an aid in correcting the problem:

Fig. 17—Control Channel Out (CCO) Port Problem

Fig. 18—Local Terminal (LT) Port Problem

Fig. 19—Printer (PTR) Port Problem

Fig. 20—Remote Terminal (RT) Port Problem

Fig. 21—Telephone Company (TELCO) Port Problem

Fig. 22—Network (NET) Port Problem

Fig. 23—One-Number Dialer (OND) Problem

4. REFERENCES

4.01 Additional information concerning the NC is contained in the following Bell System Practices:

SECTION	TITLE
501-165-101	Station Dial—43A
501-165-110	Station Dial—53A
574-500-500	43 Basic KSR Teleprinter—Testing
582-200-502	Teletypewriter Compatible DATASPEED® 40/2—Testing and Troubleshooting
592-031-500	Data Set 202T Transmitter-Receiver—Test Procedures
592-039-500	Data Set 212AR-L1A/2A—Test Procedures

SECTION	TITLE
592-040-120	Private Line Data Sets 2024, 2048, and 2096 — Description and Operation — Stand Alone-Multiple DATAPHONE® II Service
592-040-220	Private Line Data Sets 2024, 2048, and 2096—Installation and Connections—Stand Alone — Multiple DATAPHONE® II Service
592-040-221	Private Line Data Set 2096C—Installation and Connections — Stand Alone—Multiple DATAPHONE® II Service
592-040-520	Private Line Data Sets 2024, 2048, and 2096 — Test Procedures—Stand Alone — Multiple — DATAPHONE® II Service
592-101-500	2100A Data Control Unit (Diagnostic Console) — Test Procedures — DATAPHONE® II Service
592-102-101	2200A-L1A Data Control Unit (Network Controller)—Description and Operation—DATAPHONE® II Service
592-102-201	2200A-L1A Data Control Unit—(Network Controller) — Installation and Connections — DATAPHONE® II Service

TABLE A

NETWORK CONTROLLER'S DATA SET TEST AND COMMAND MENU

TEST/COMMAND NAME	SELECTION DISPLAY	DISRUPTIVE/ NONDISRUPTIVE
Display modem status	(dsms)	Nondisruptive
Display options	(dsop)	
Display poll list	(dspl)	
EIA status	(eia)	
Identity	(id)	
Receive signal level	(rsl)	
Receive signal quality	(rsq)	
Report terminal power	(rtp)	
Signal profile	(sp)	
Abort test	(abt)	Disruptive
Automatic network test	(auto)	
2096 Change mux	(chmx)	
Change options	(chop)	
Change poll list	(chpl)	
Circuit loss - inbound	(cli)	
Circuit loss - outbound	(clo)	
Disable/enable	(dsab)	
Digital test	(dt)	
End-to-end block error test	(ee)	
Loopback	(lpbk)	
Make busy	(mb)	
Modem test	(mt)	
Standby facility	(sf)	
Service line	(sl)	
Send tone	(st)	

TABLE B

NETWORK CONTROLLER'S OPERATING COMMAND MENU

COMMAND NAME	SELECTION DISPLAY	DISRUPTIVE/ NONDISRUPTIVE
Directory modem profile	(drmp)	Nondisruptive
Display date and time	(dsdt)	
Display fault log	(dsfl)	
Display modem profile	(dsmp)	
Display NC identity	(dsncid)	
Display NC options	(dsncop)	
Display NC poll list	(dsncpl)	
Display network faults	(dsnf)	
Display network status	(dsns)	
Display queue	(dsq)	
Restore display heading	(rdh)	
Auto trouble report control	(atr)	Disruptive
Auto trouble report file	(atrf)	
Backup modem profile	(bump)	
Change date and time	(chdt)	
Change modem profile	(chmp)	
Change NC identity	(chncid)	
Change NC options	(chncop)	
Change NC poll list	(chncpl)	
Clear fault log	(clfl)	
Clear network faults	(clnf)	
Fault reporting/filtering	(fr)	
NC operating mode	(ncom)	
Password commands	(pw)	

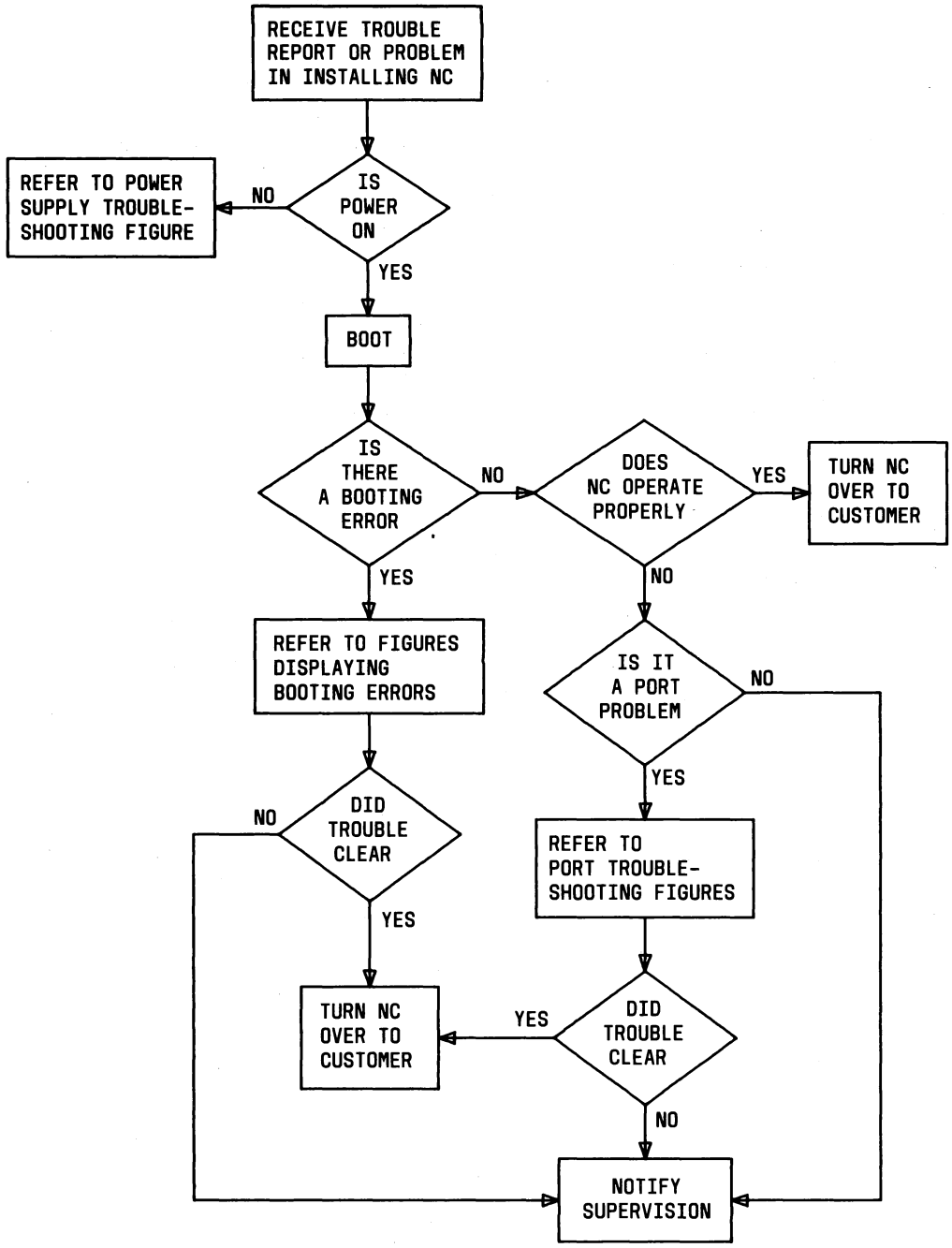

Fig. 1—Troubleshooting Guide

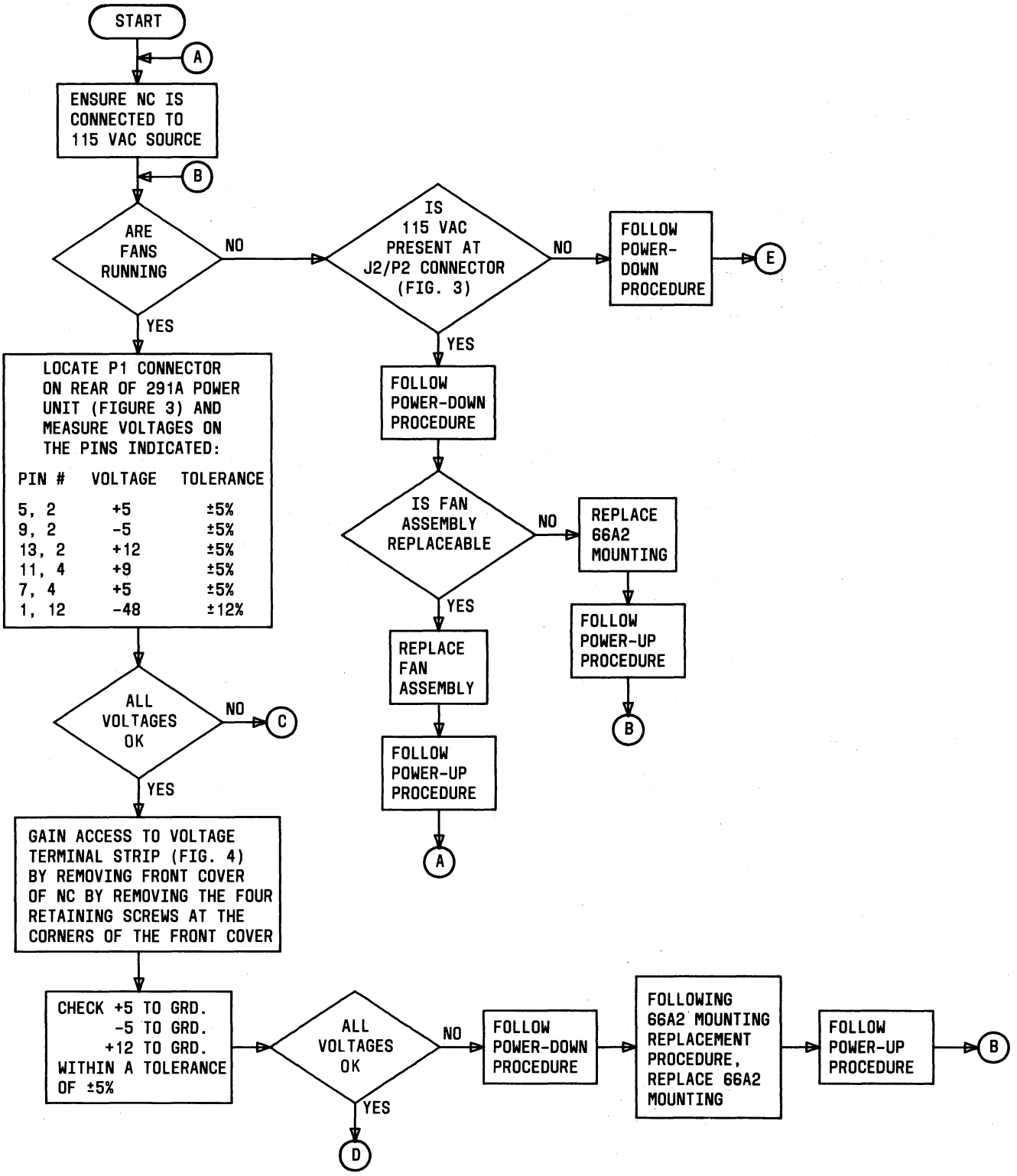

Fig. 2—Power Supply Troubleshooting (Sheet 1 of 2)

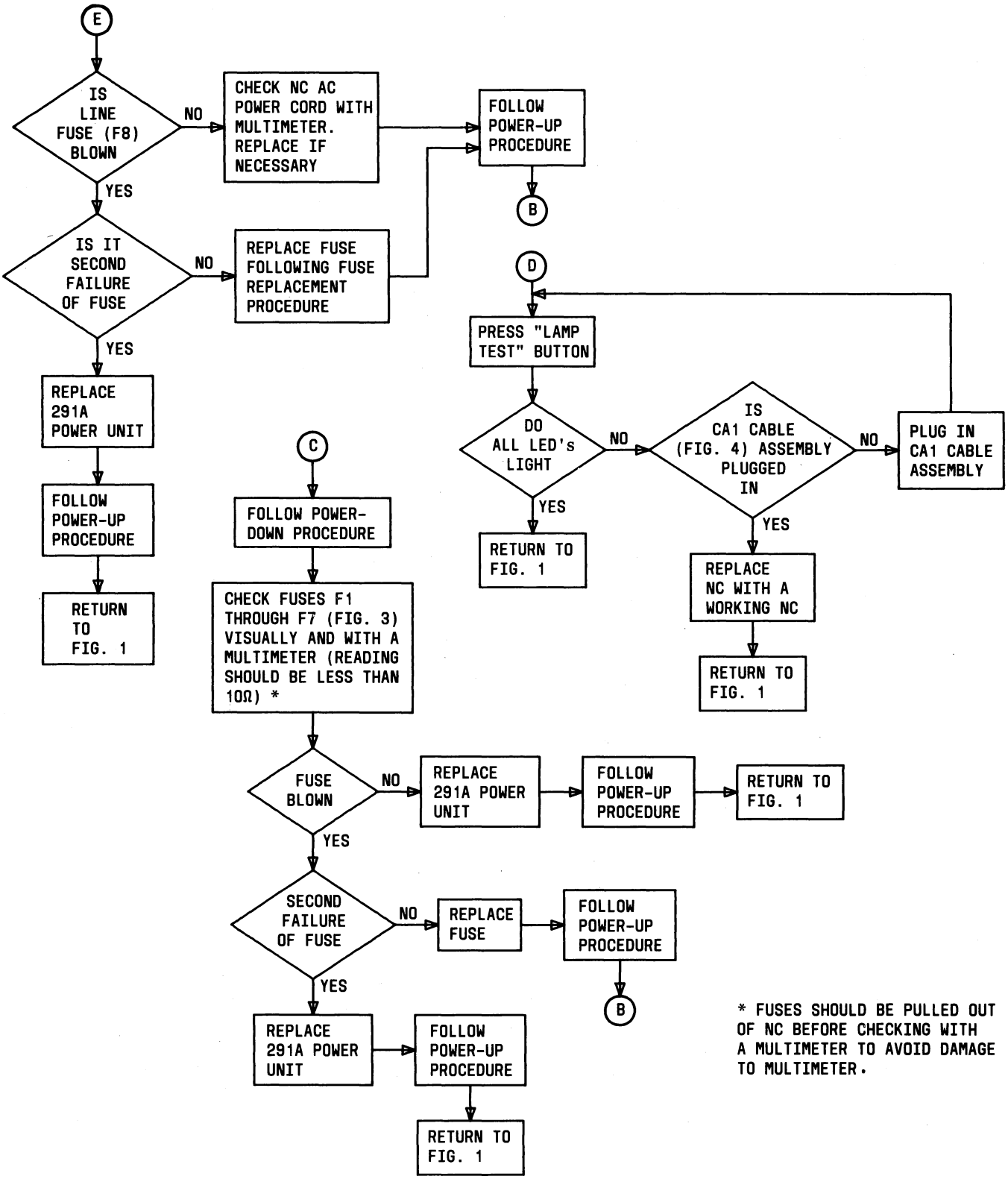

Fig. 2—Power Supply Troubleshooting (Sheet 2 of 2)

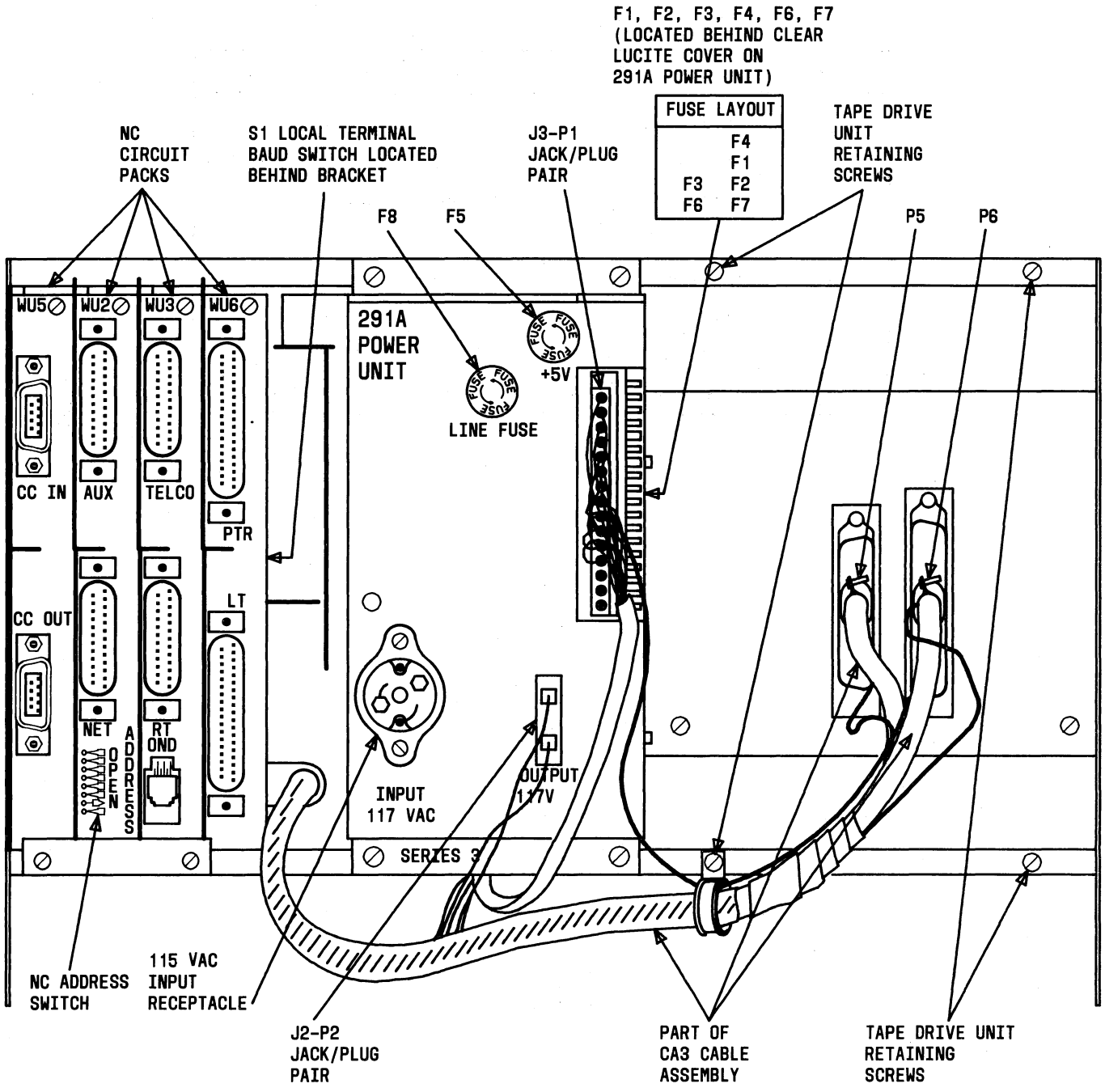

Fig. 3—NC Rear View Showing Fuses, Jack/Plugs, and NC Address Switch

TABLE C

FUSE DESCRIPTION

Designation	Code	Rating	Protected Circuit
F1	WECO 24F	5 amp	-48 Vdc Output
F2	WECO 24C	2 amp	Input to +5 Vdc
F3	WECO 24E	0.5 amp	Input to +12 Vdc
F4	WECO 24E	0.5 amp	Input to -5 Vdc
F5	Bussman 3AG, 8A	8 amp	+5 Vdc Output
F6	WECO 24E	0.5 amp	Input to +9 Vdc
F7	WECO 24G	1.3 amp	+12 Vdc Output
F8	Bussman 3AG, 4A	4 amp	115 Vac Input

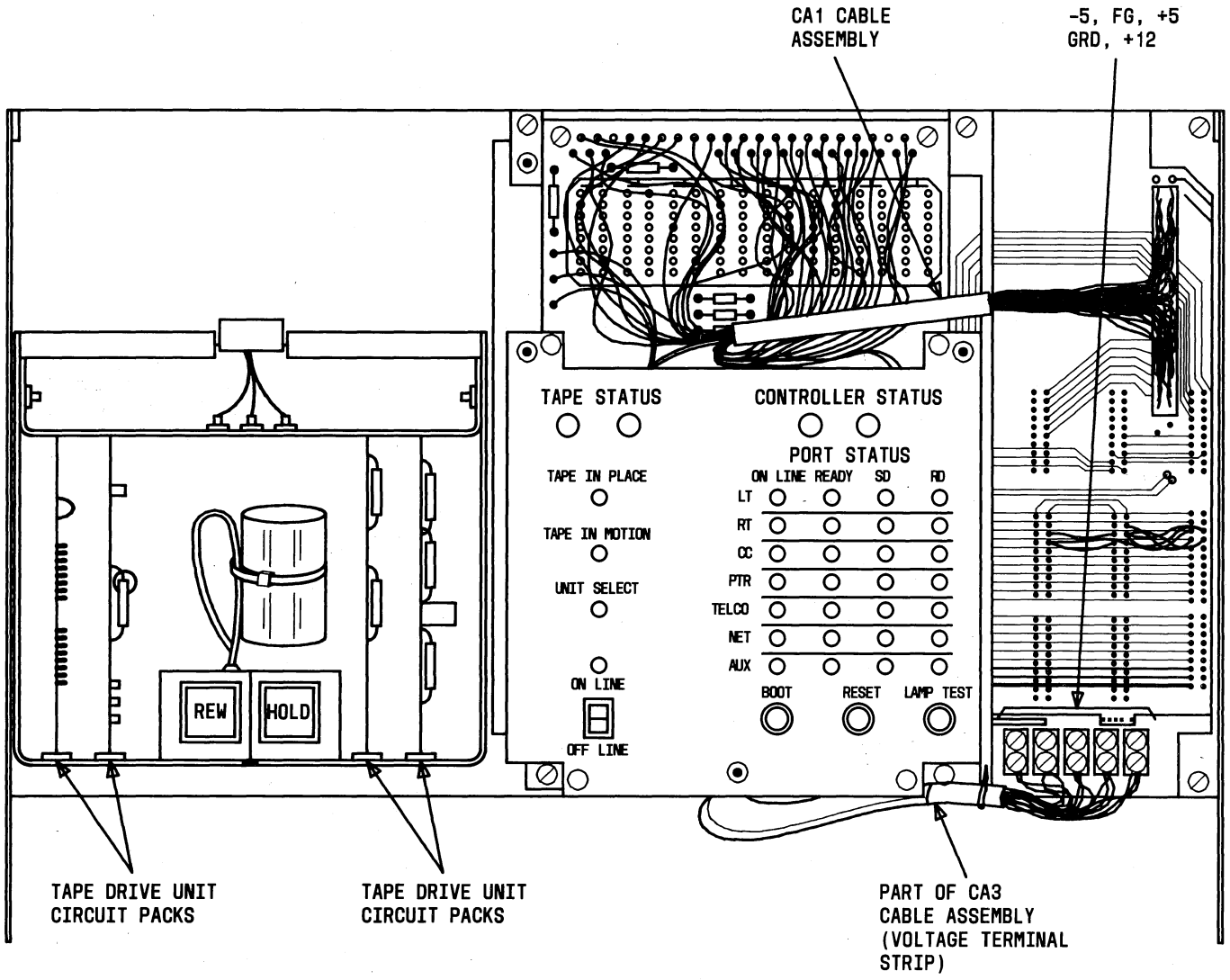

Fig. 4—NC Front View (Cover Removed) Showing CA1 and CA3 (Voltage Terminal Strip) Cable Assembly

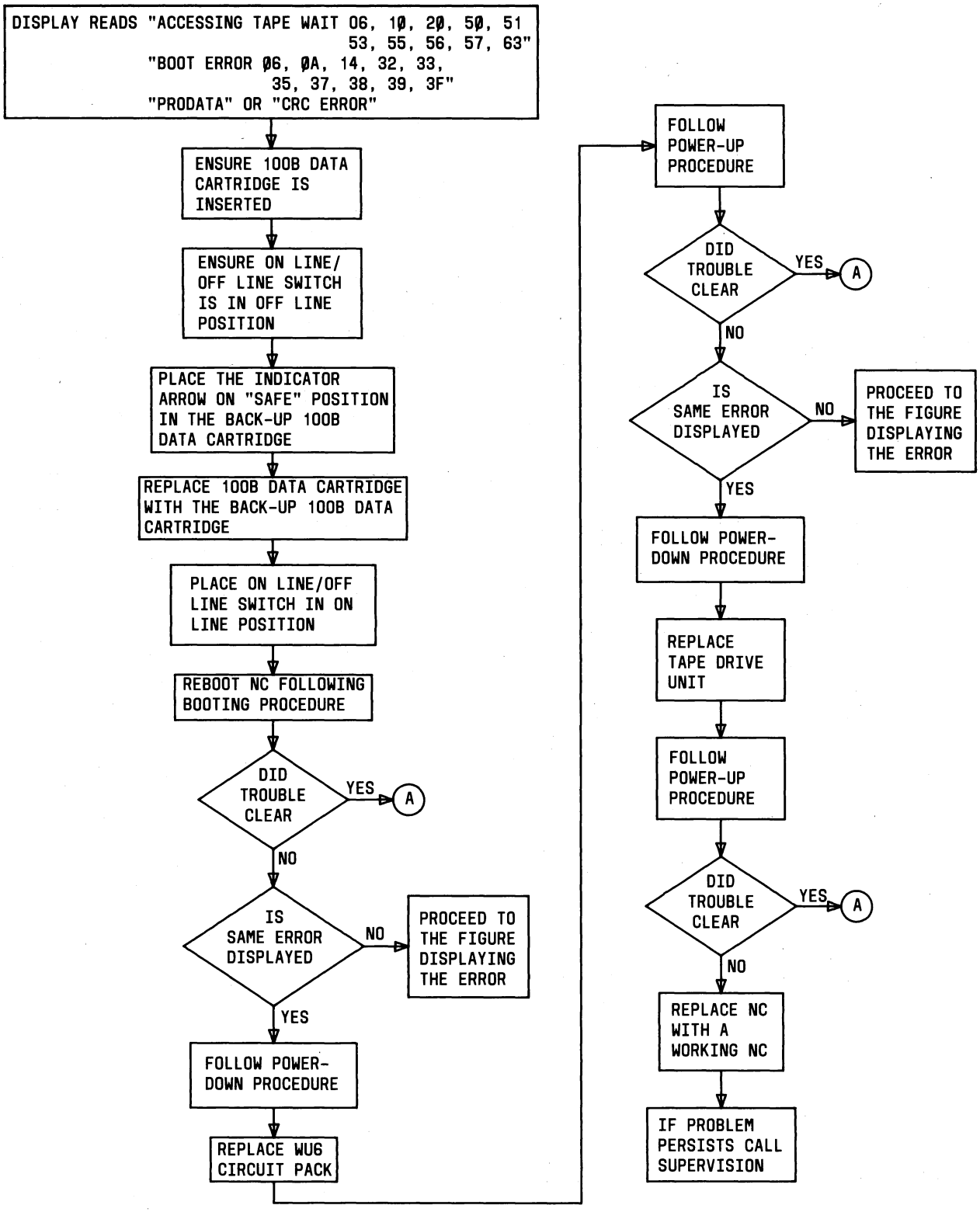

Fig. 5—Display Reads Accessing Tape WAIT 06, 10, 20, 50, 51, 53, 55, 56, 57, 63, Boot Error 06, 0A, 14, 32, 33, 35, 37, 38, 39, 3F, PRODATA or CRC ERROR (Sheet 1 of 2)

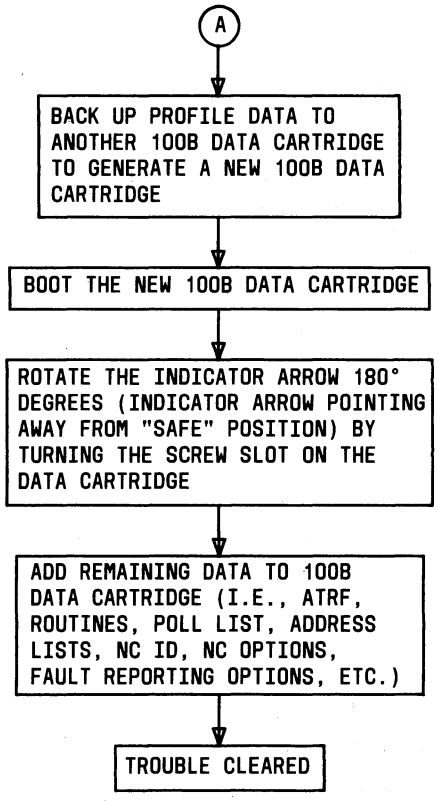

Fig. 5 — Display Reads Accessing Tape WAIT 06, 10, 20, 50, 51, 53, 55, 56, 57, 63, Boot Error 06, 0A, 14, 32, 33, 35, 37, 38, 39, 3F, PRODATA or CRC ERROR (Sheet 2 of 2)

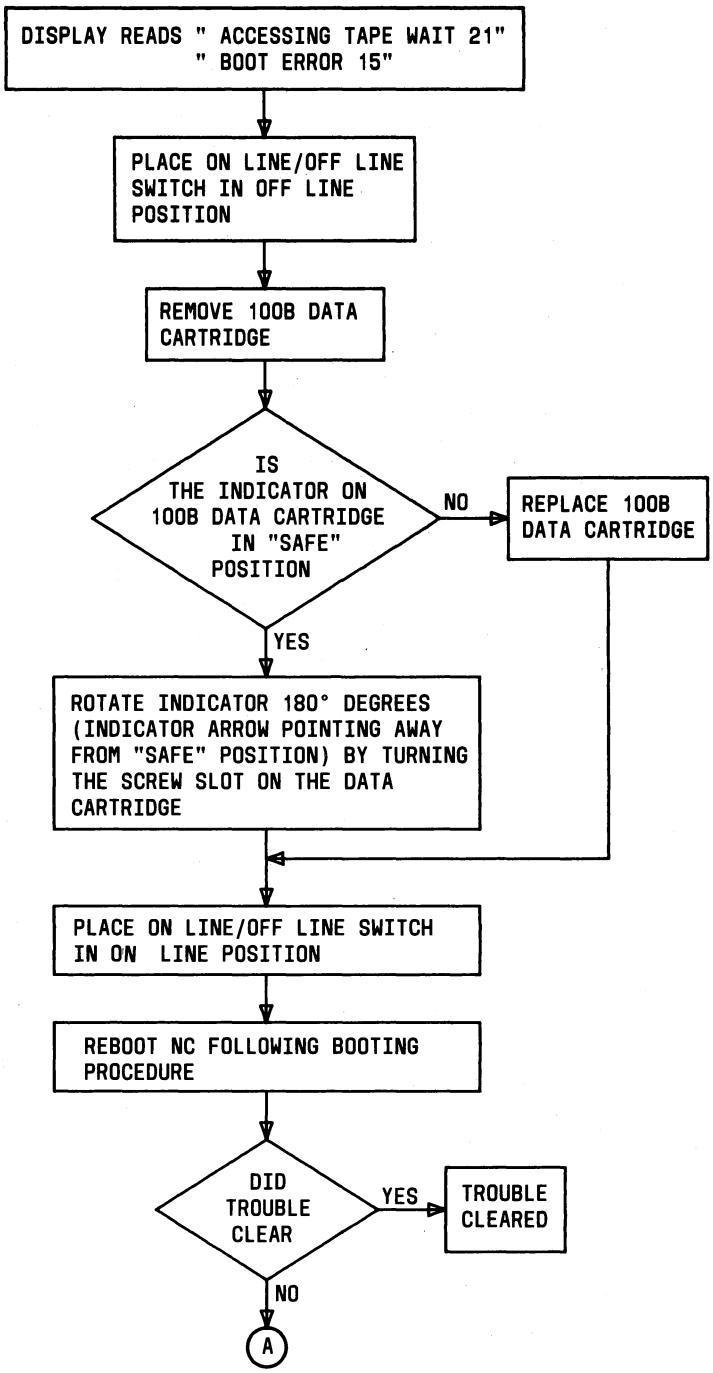

Fig. 6 — Display Reads Accessing Tape WAIT 21, Boot Error 15 (Sheet 1 of 2)

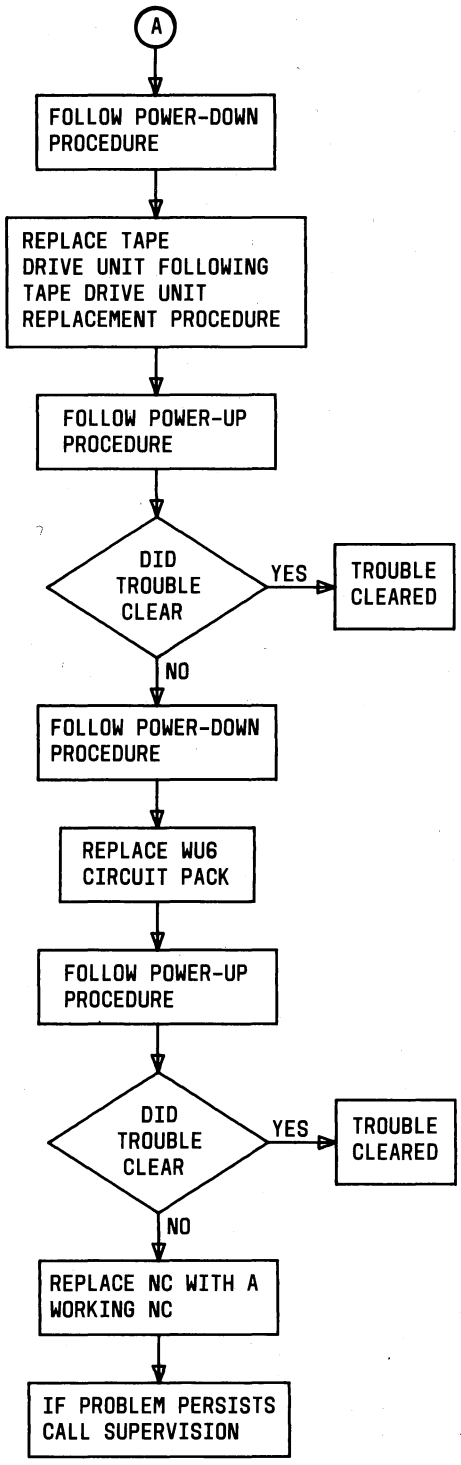

Fig. 6—Display Reads Accessing Tape WAIT 21, Boot Error 15 (Sheet 2 of 2)

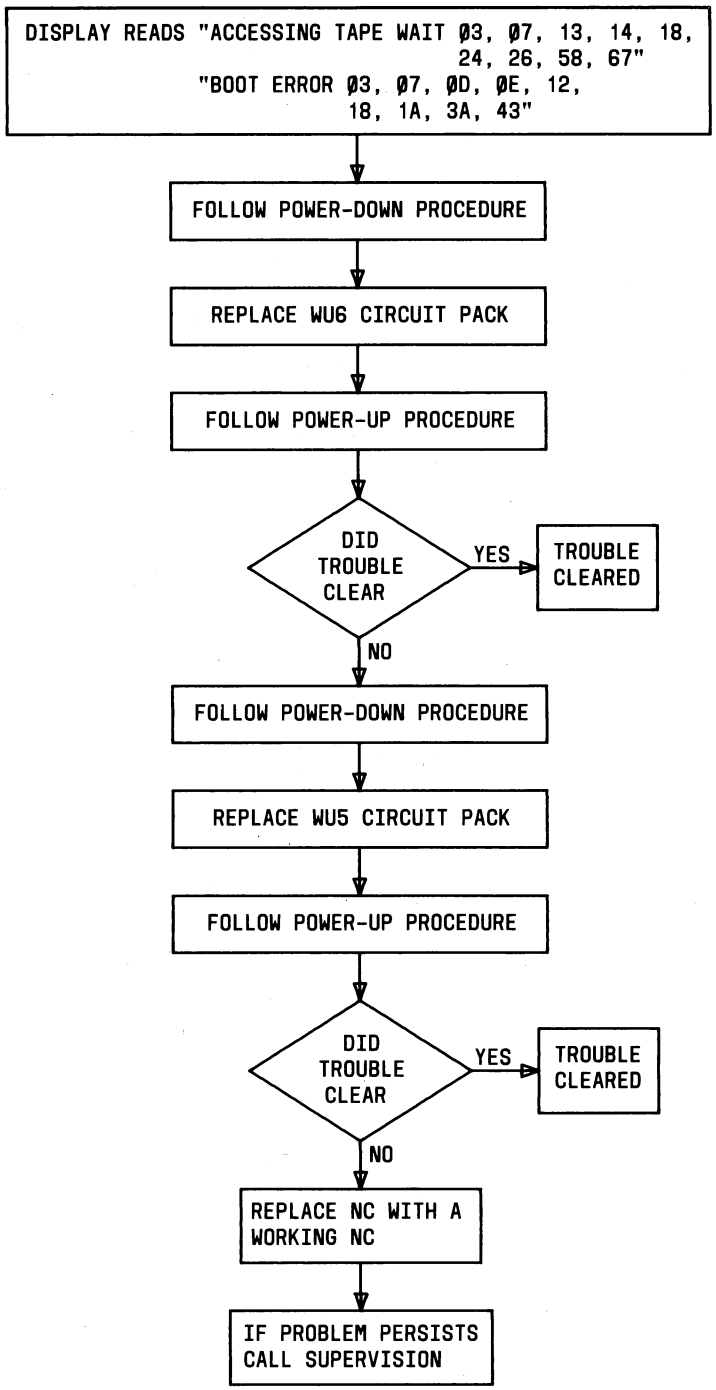

Fig. 7—Display Reads Accessing Tape WAIT 03, 07, 13, 14, 18, 24, 26, 58, 67, Boot Error 03, 07, 0D, 0E, 12, 18, 1A, 3A, 43

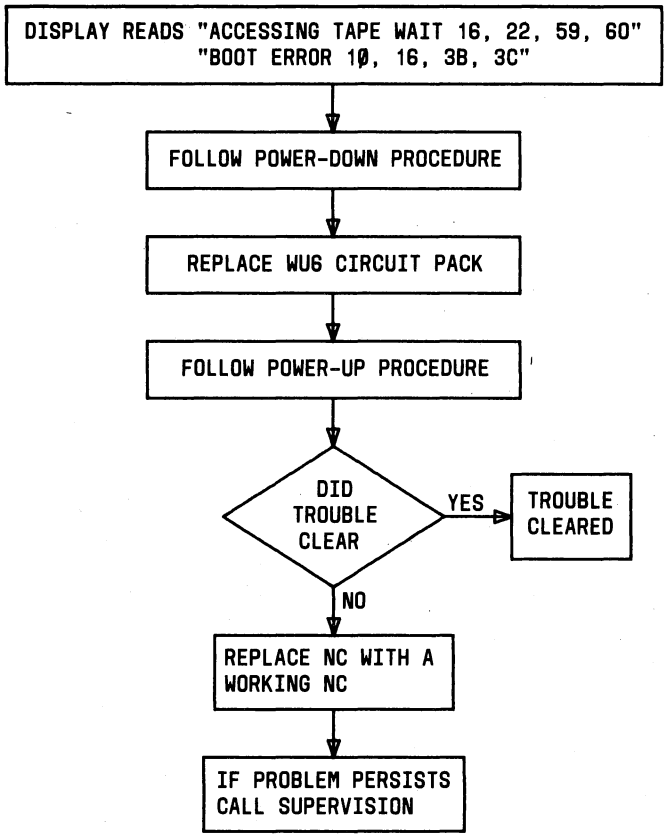

Fig. 8—Display Reads Accessing Tape WAIT 16, 22, 59, 60, Boot Error 10, 16, 3B, 3C

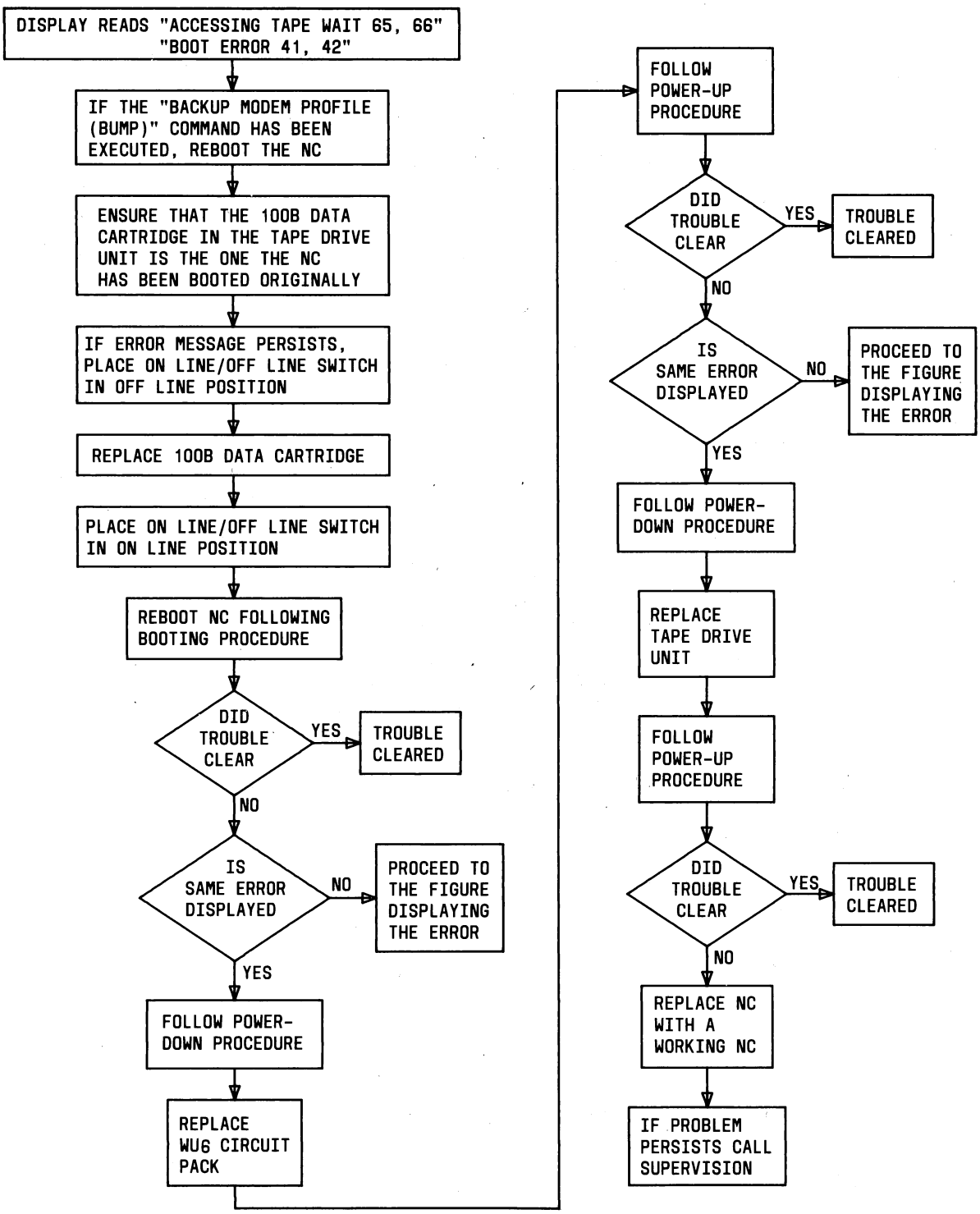

Fig. 9—Display Reads Accessing Tape WAIT 65, 66, Boot Error 41, 42

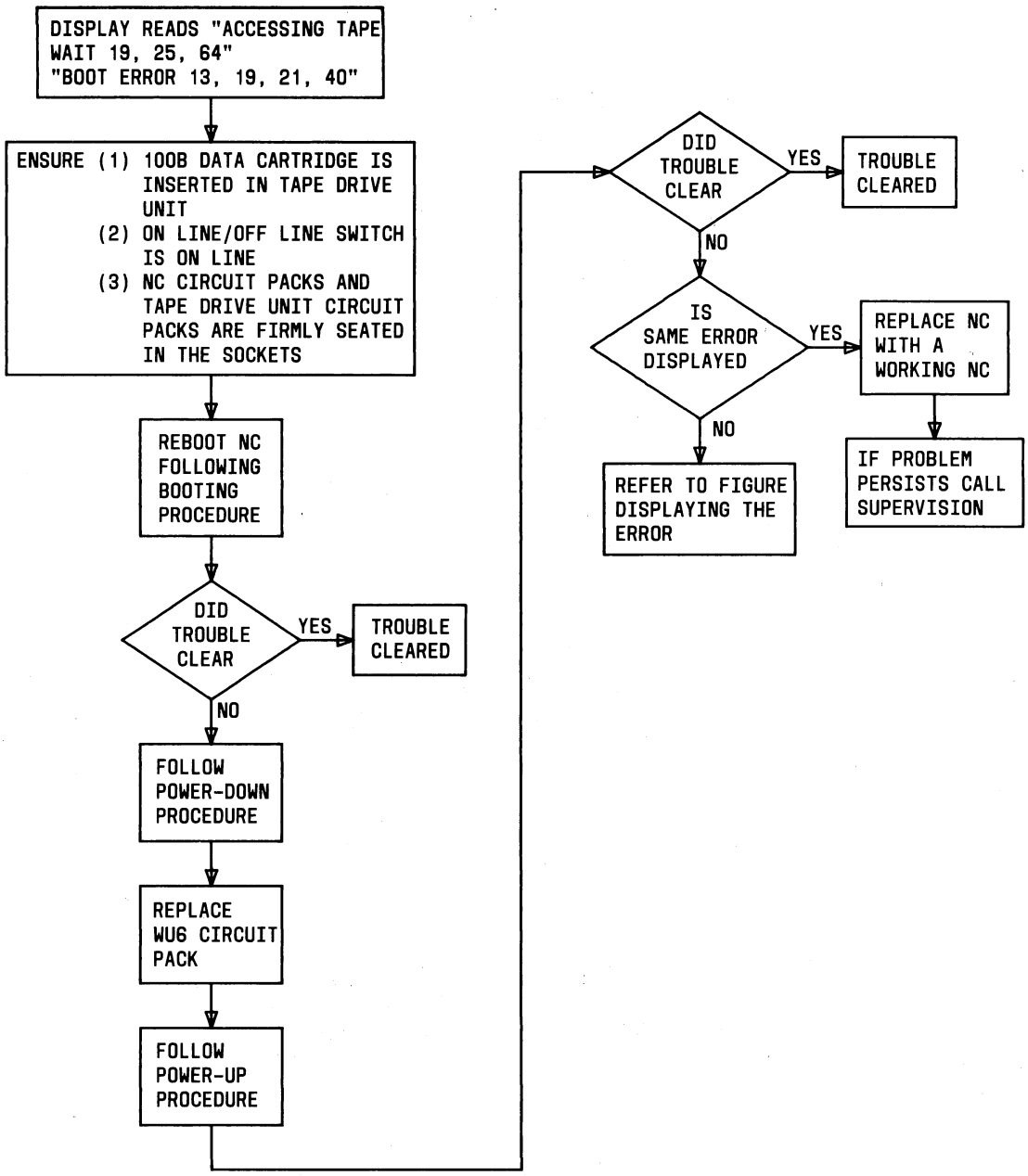

Fig. 10—Display Reads Accessing Tape WAIT 19, 25, 64, Boot Error 13, 19, 21, 40

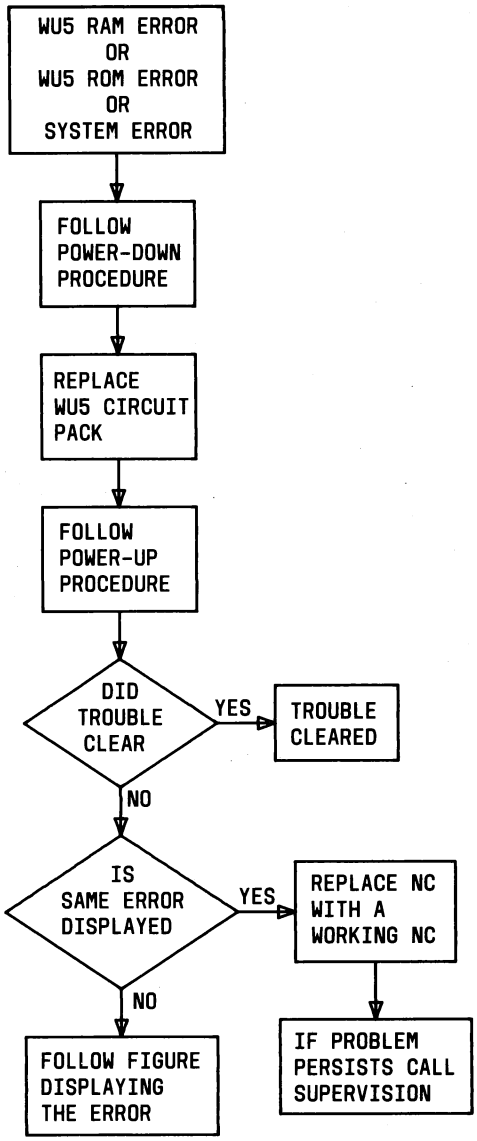

Fig. 11 — Display Reads WU5 RAM ERROR, WU5 ROM ERROR, or SYSTEM ERROR

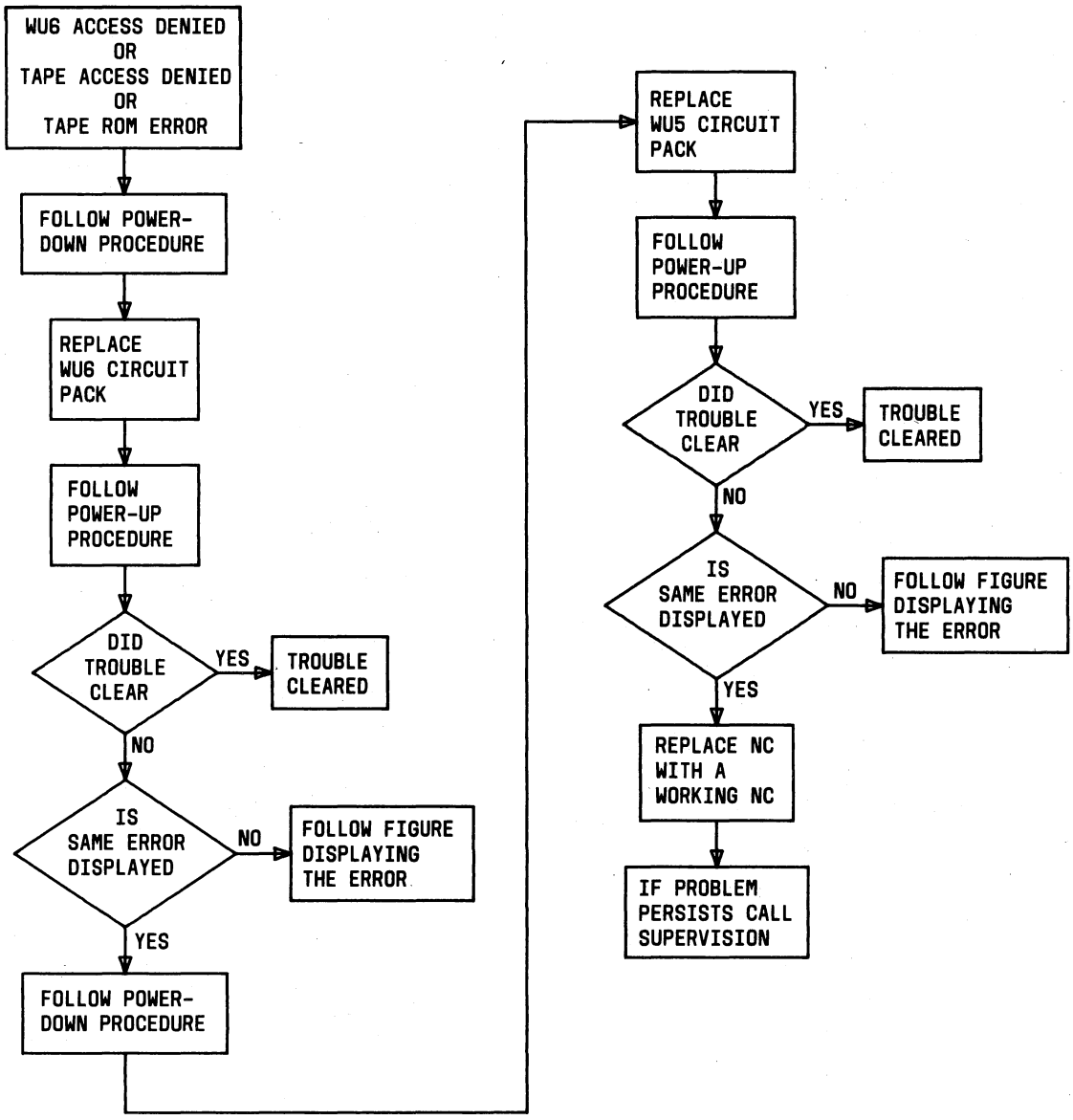

Fig. 12—Display Reads WU6 ACCESS DENIED, TAPE ACCESS DENIED, or TAPE ROM ERROR

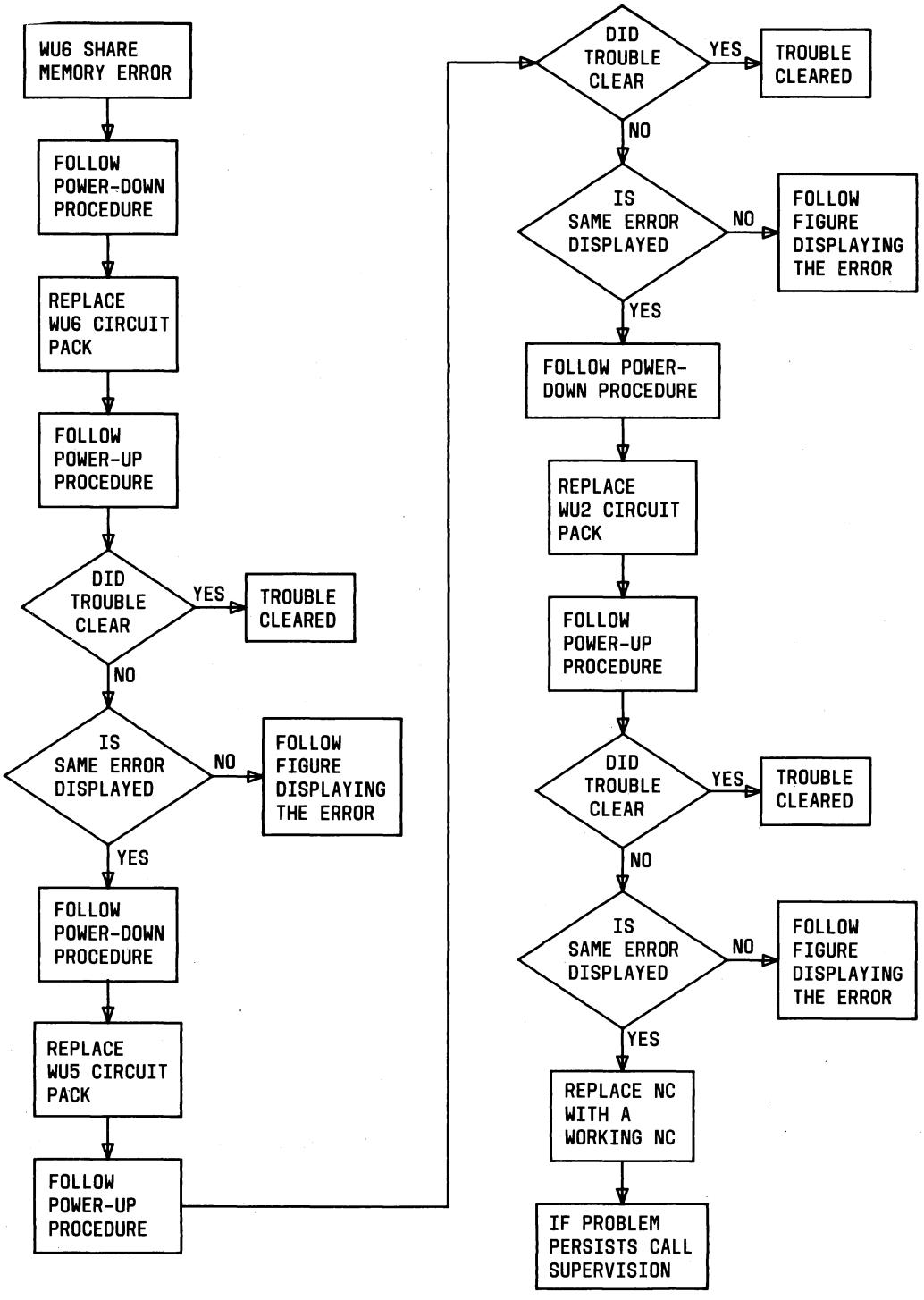

Fig. 13—Display Reads WU6 SHARE MEMORY ERROR

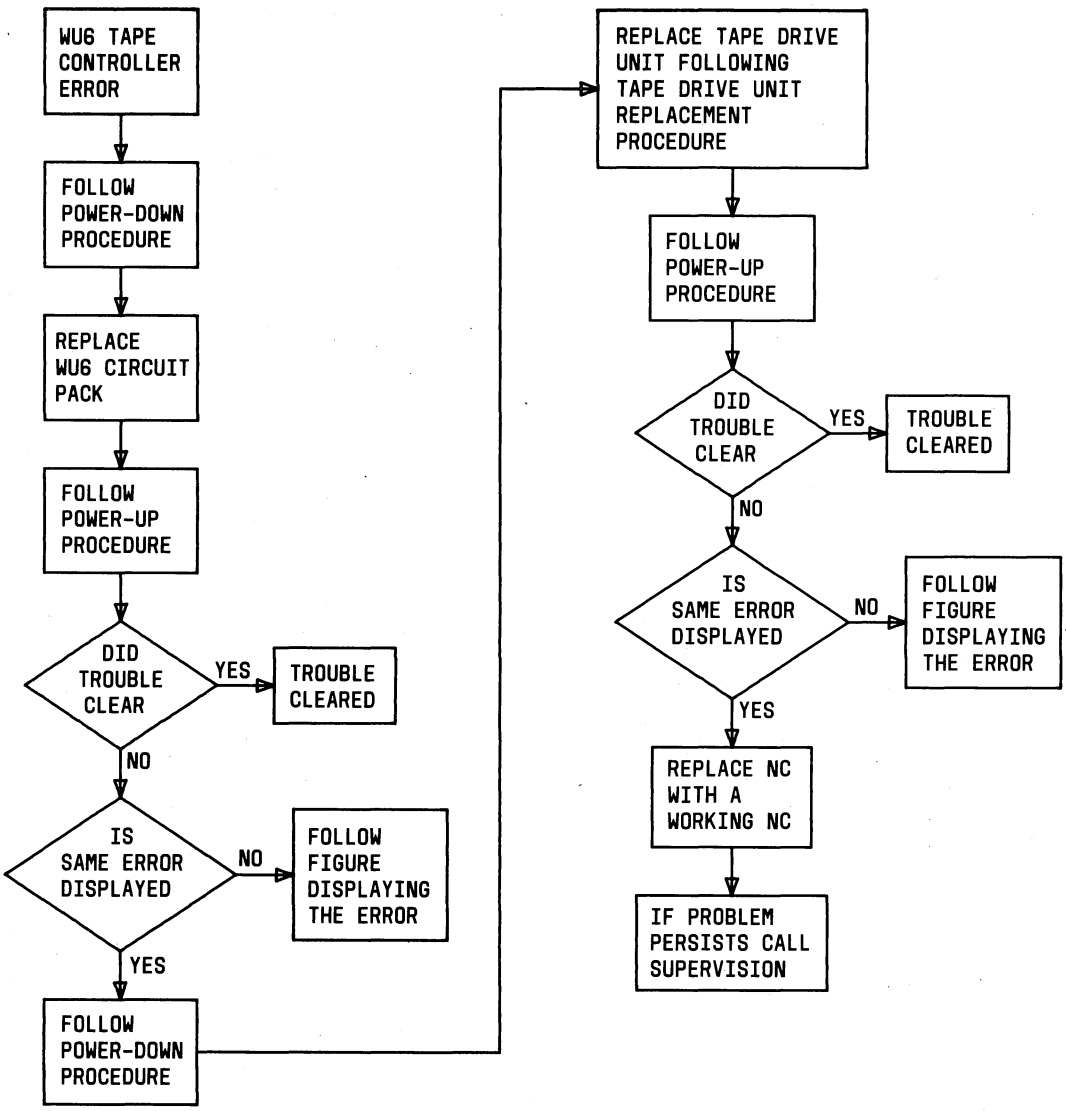

Fig. 14—Display Reads WU6 TAPE CONTROLLER ERROR

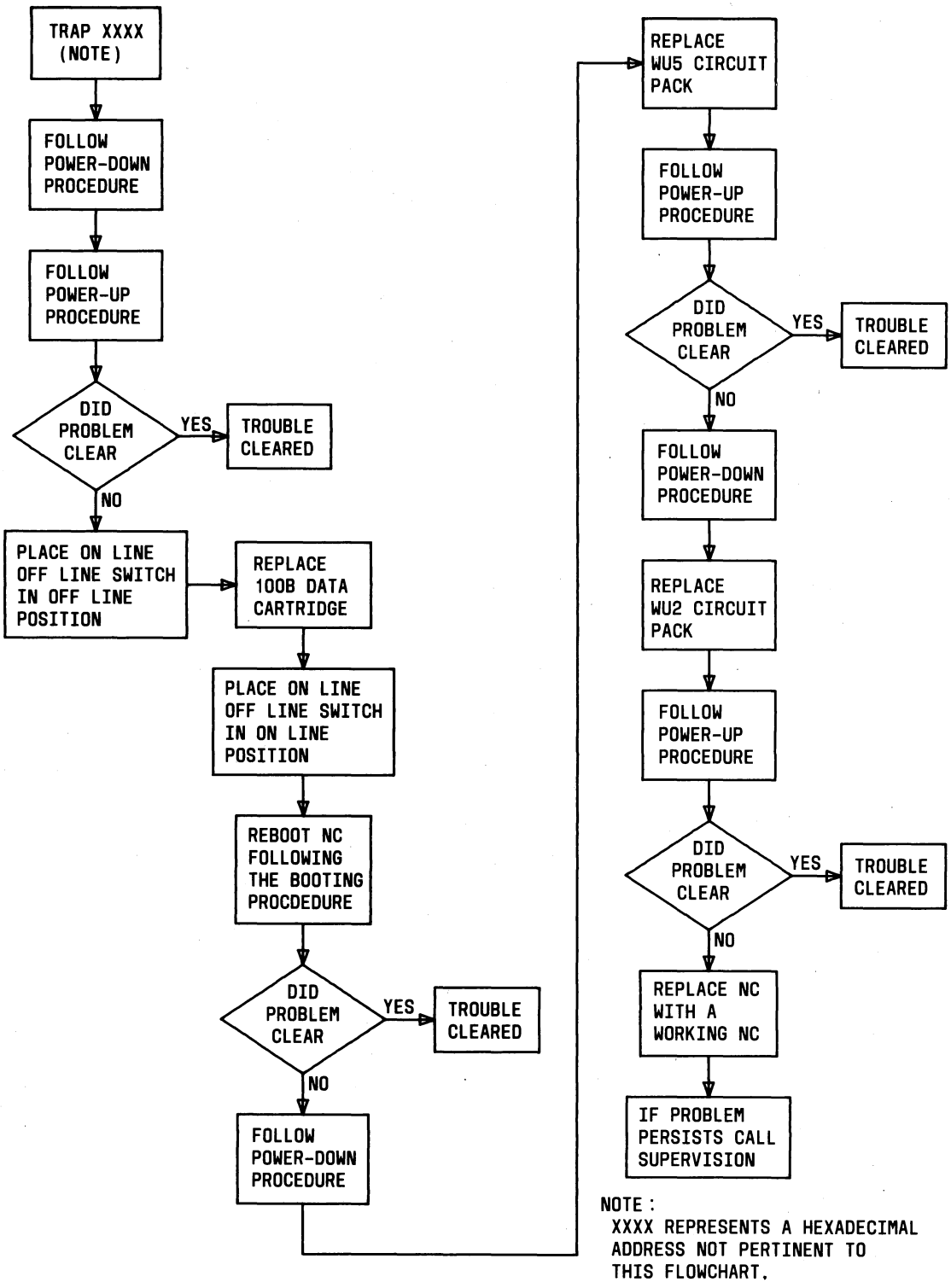

Fig. 15—Display Reads TRAP XXXX

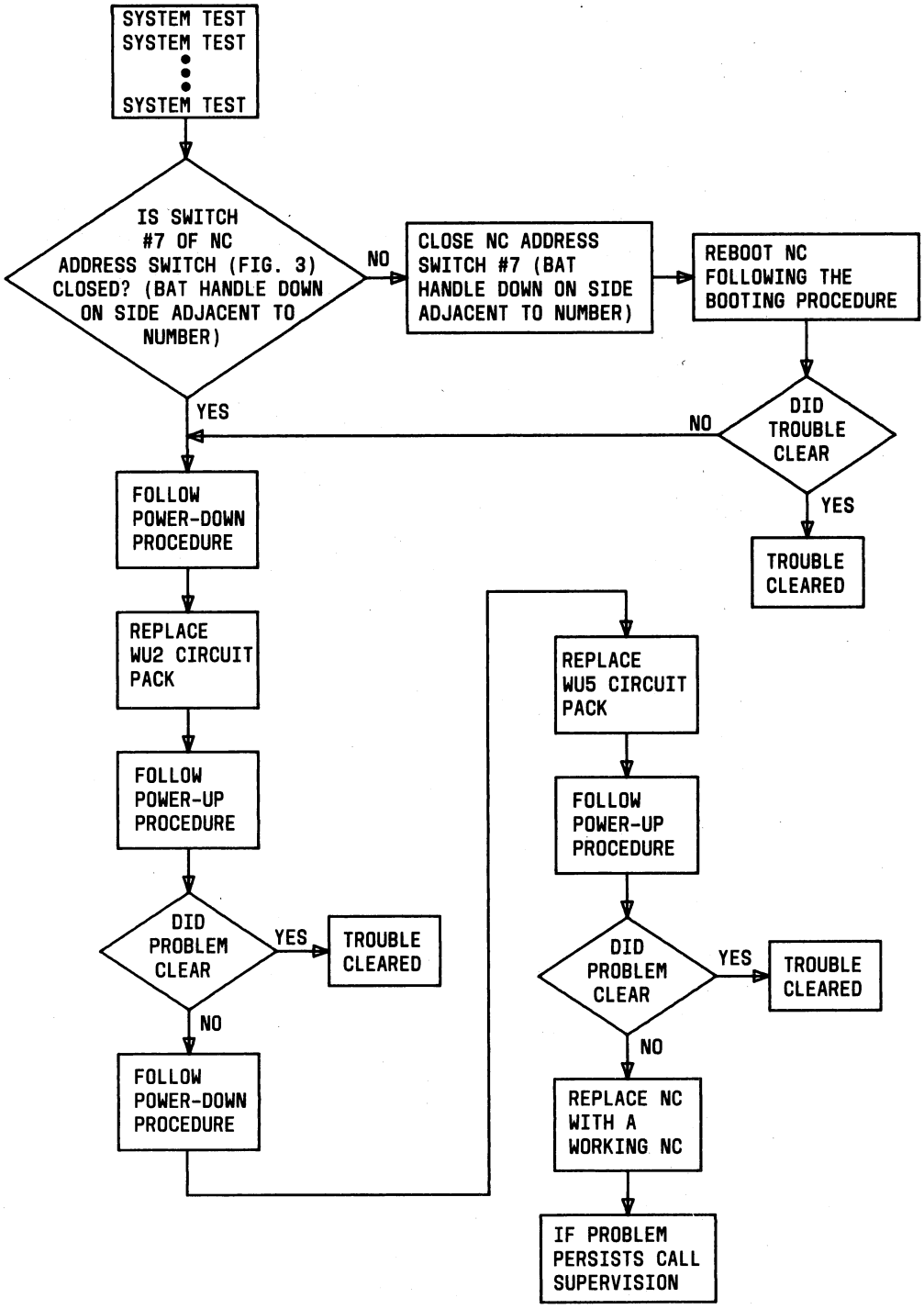

Fig. 16—Display Reads SYSTEM TEST....SYSTEM TEST

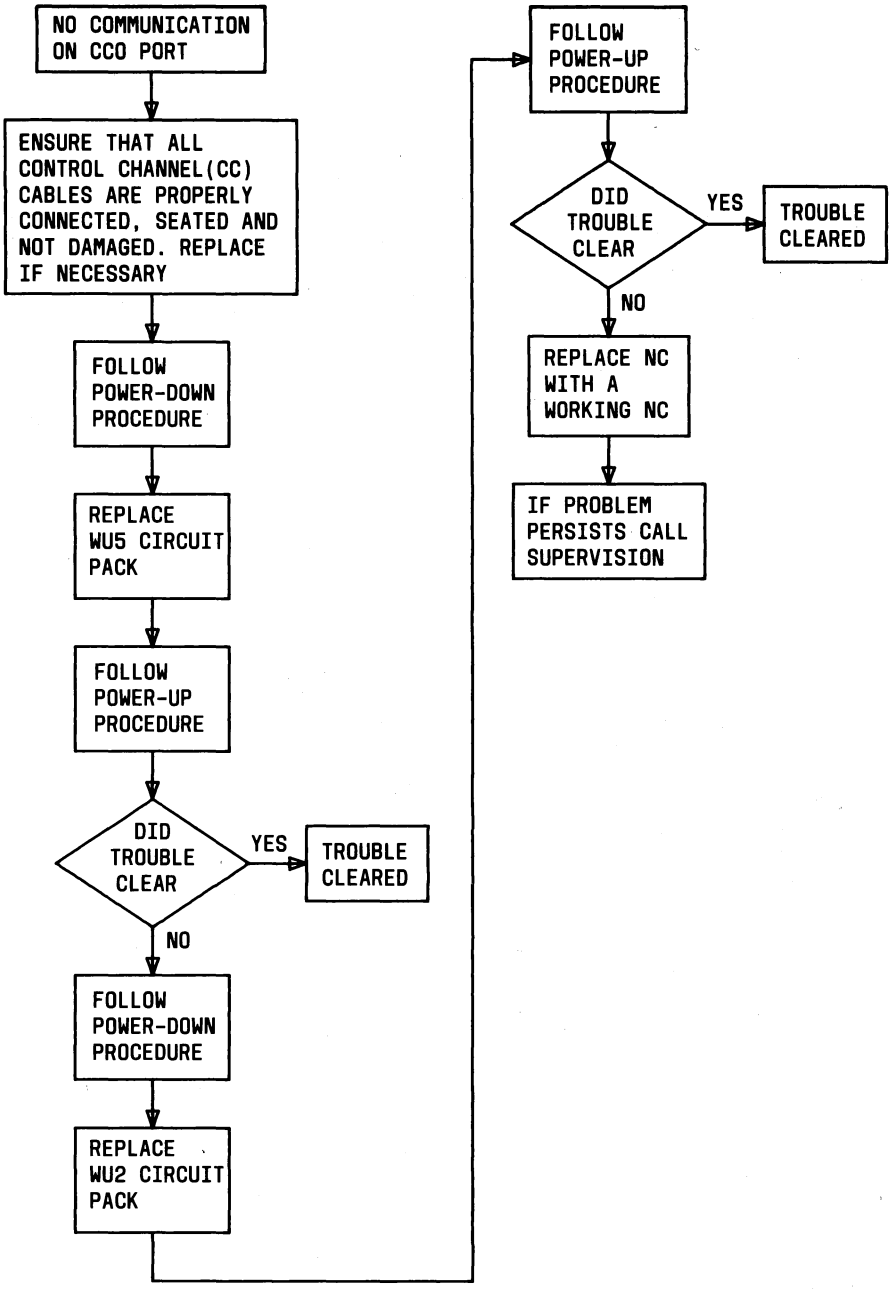

Fig. 17—Control Channel Out (CCO) Port Problem

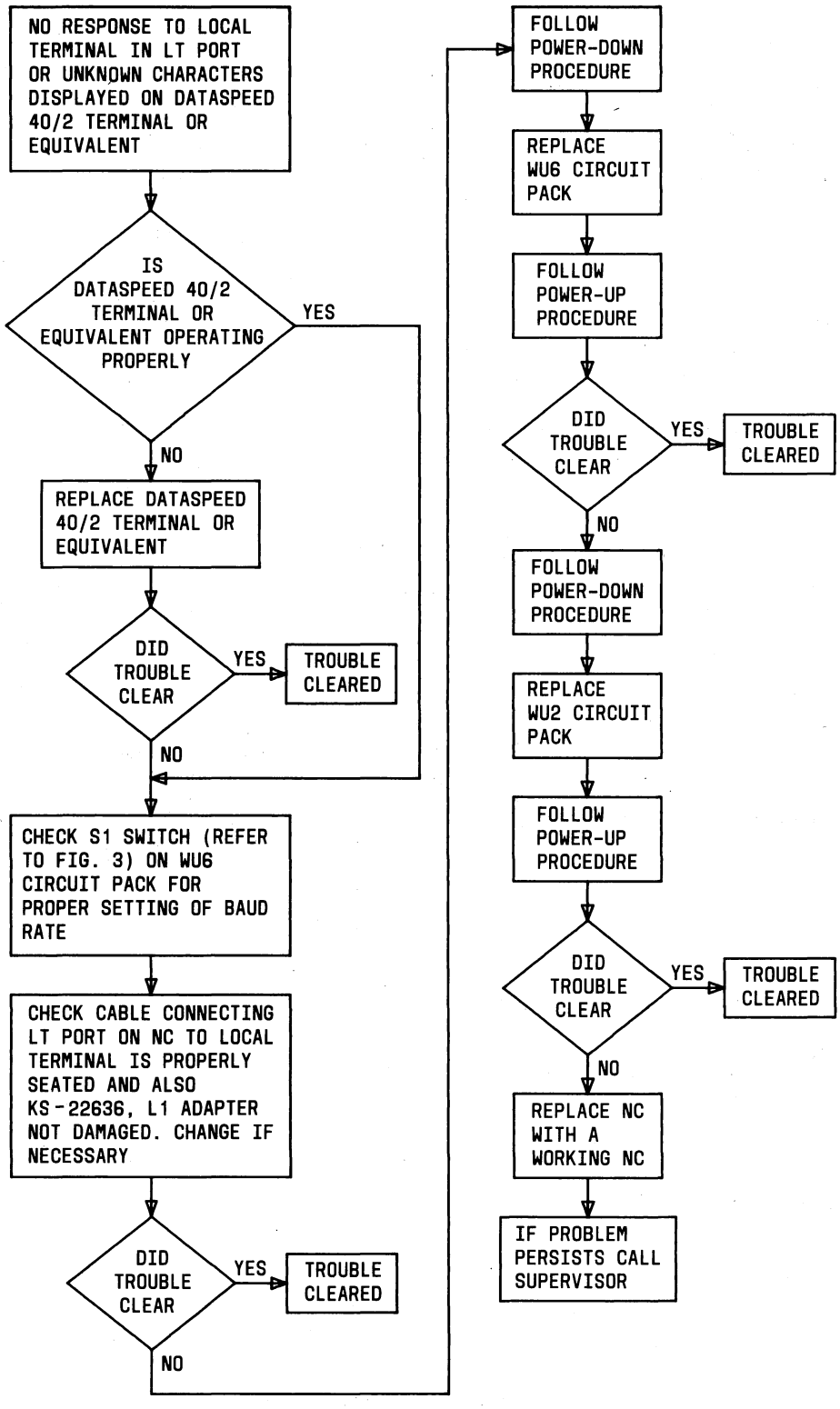

Fig. 18—Local Terminal (LT) Port Problem

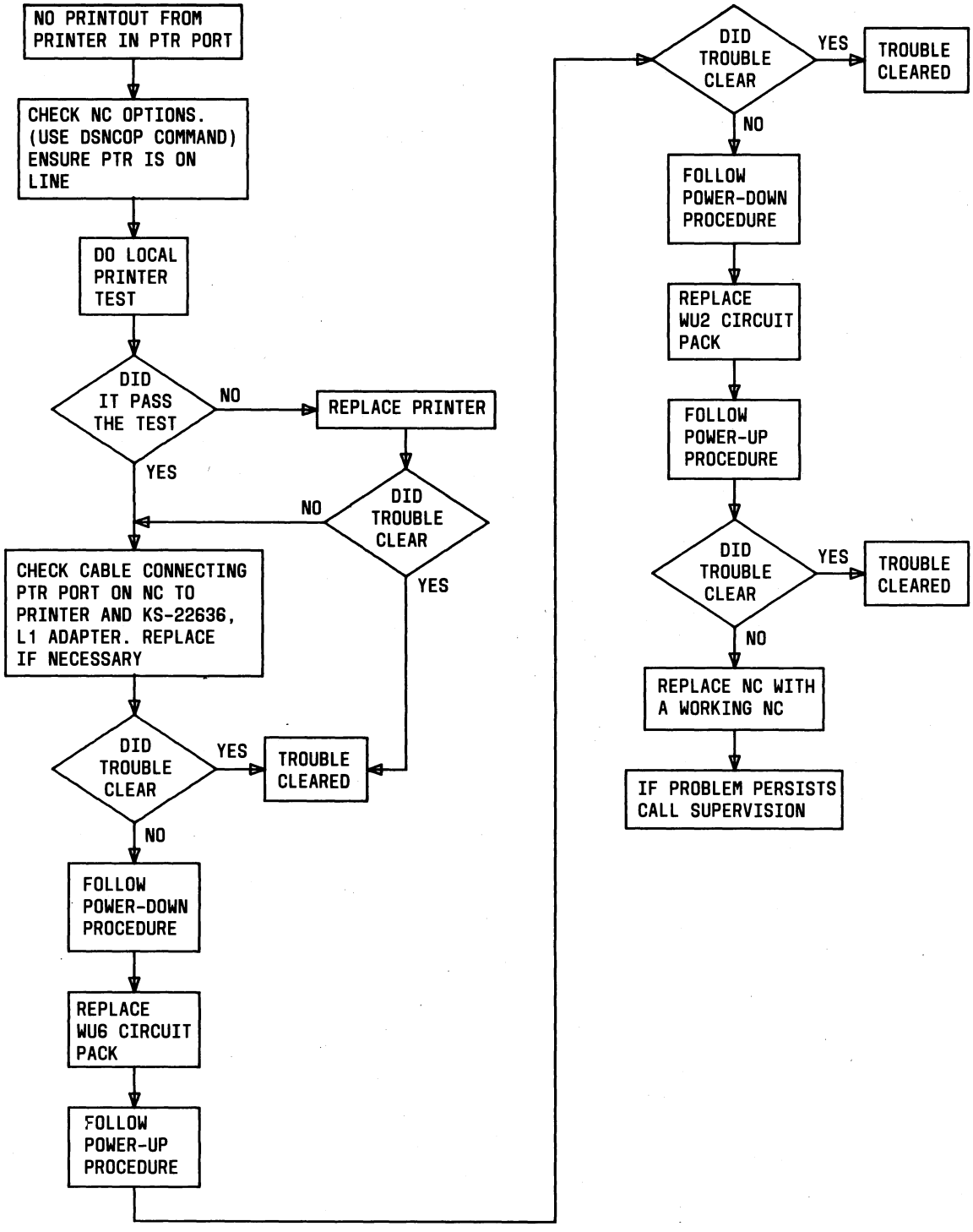

Fig. 19—Printer (PTR) Port Problem

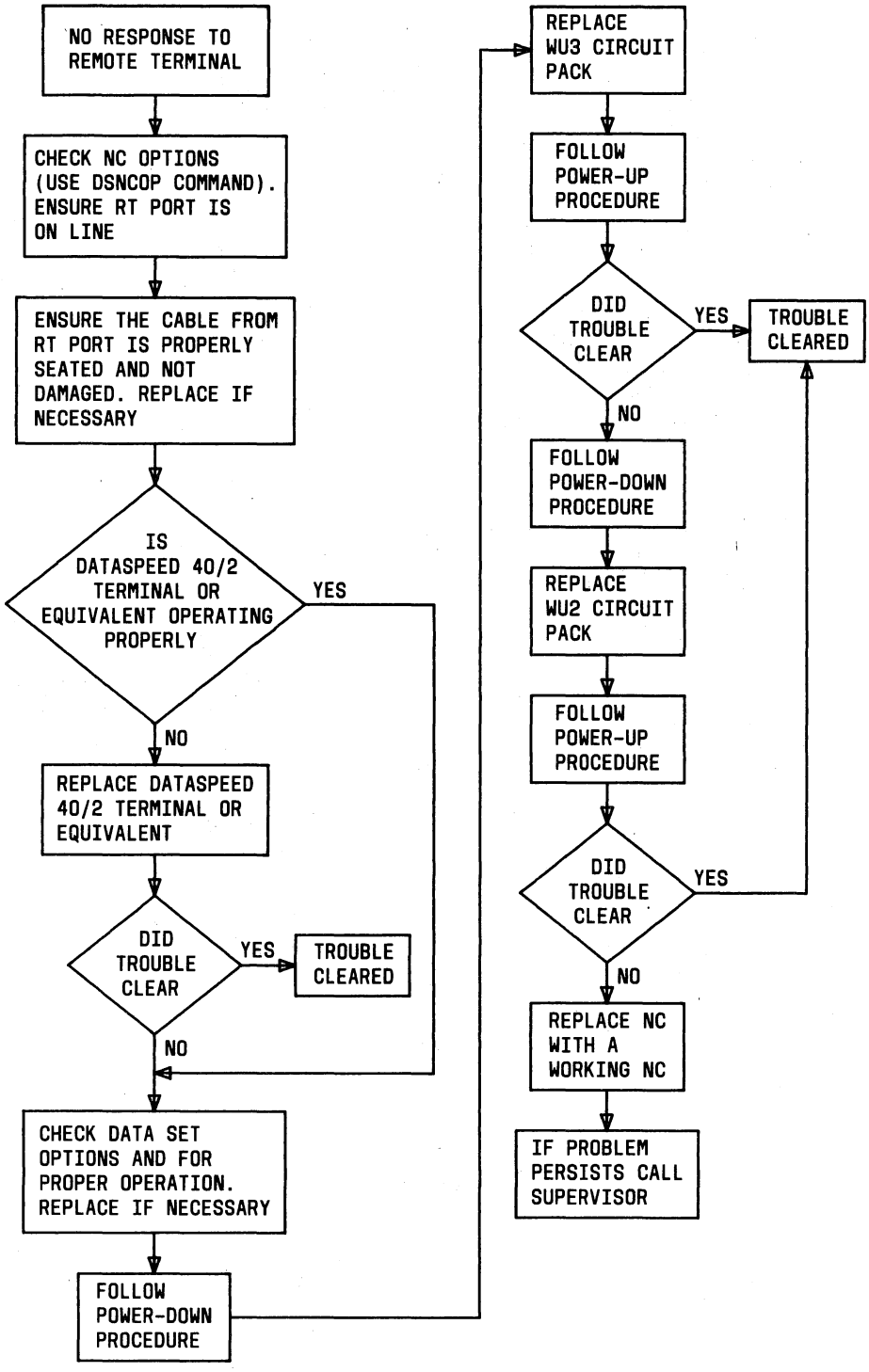

Fig. 20—Remote Terminal (RT) Port Problem

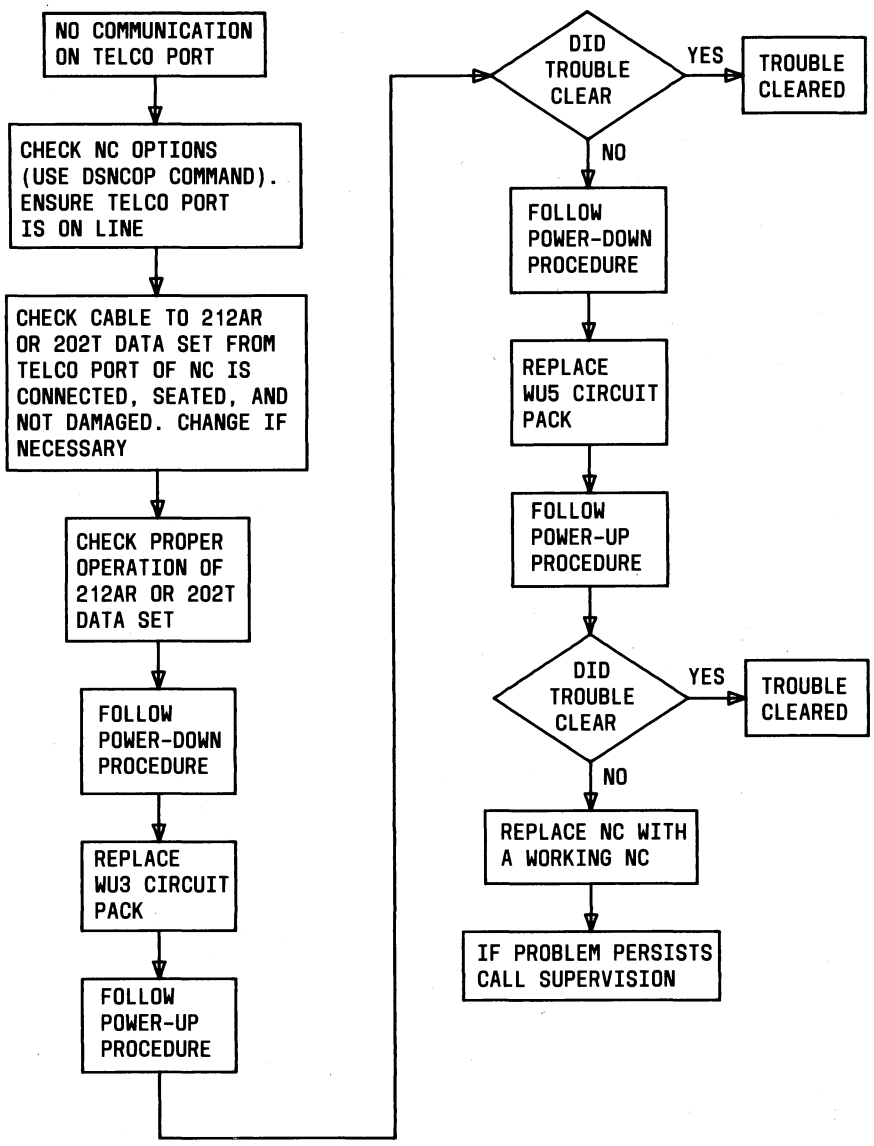

Fig. 21—Telephone Company (TELCO) Port Problem

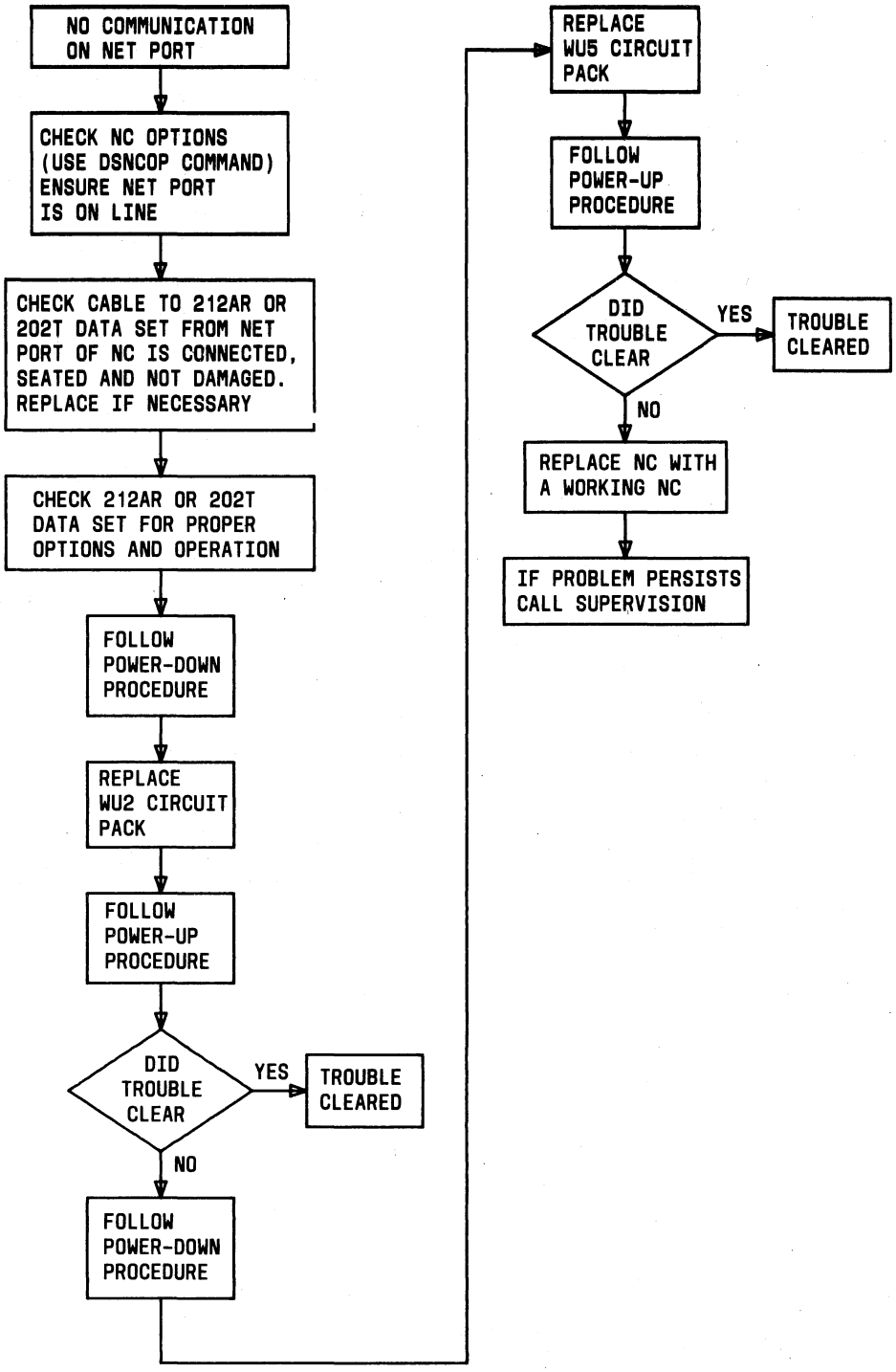

Fig. 22—Network (NET) Port Problem

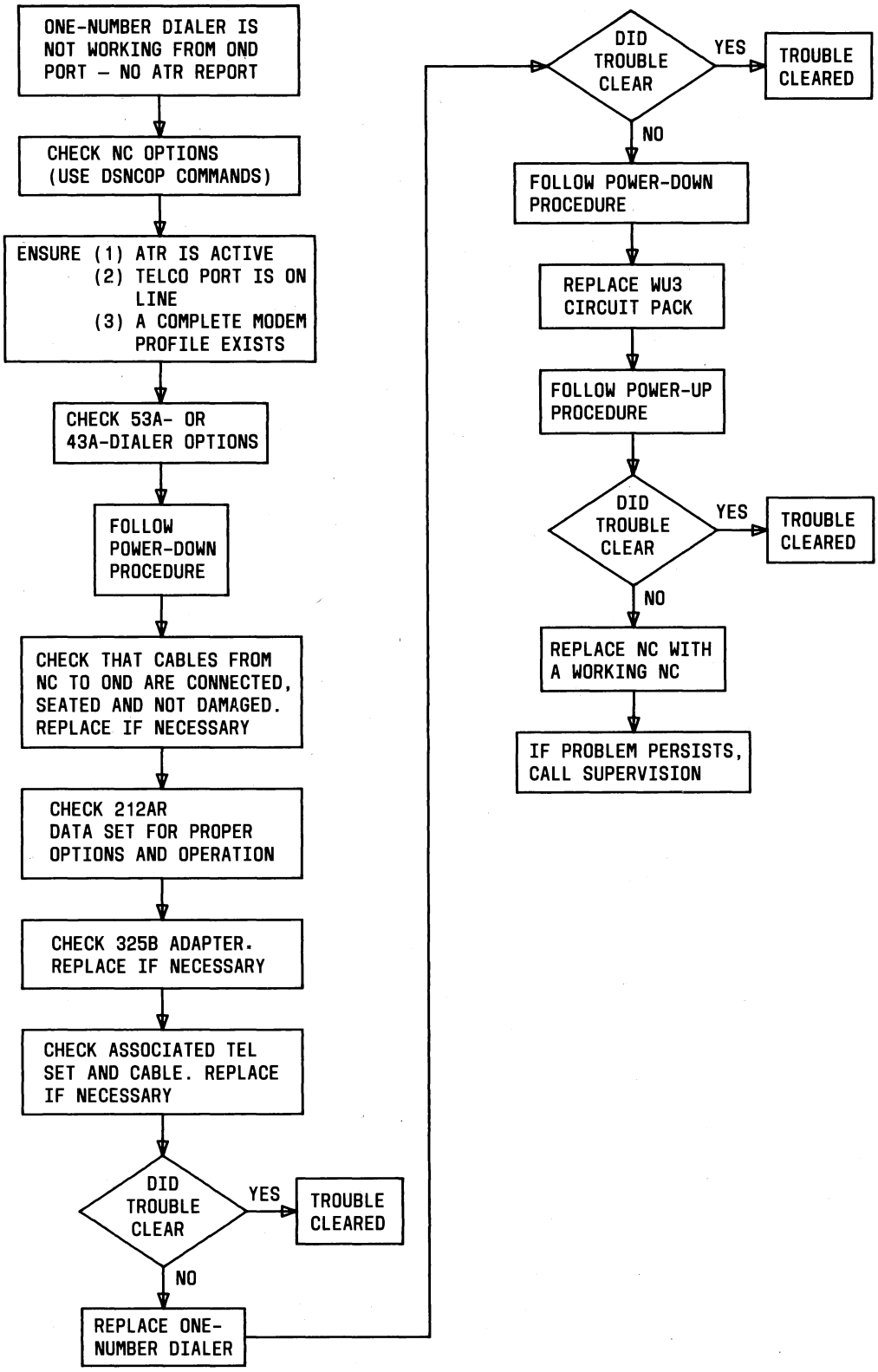

Fig. 23—One-Number Dialer (OND) Problem