FAULT FINDING
SECTION 500-036-500
JANUARY 1988

Strata S_e / VI_e

RELEASE 2

FAULT FINDING PROCEDURES

STRATA S_e/VI_e

FAULT FINDING

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ILLUSTRATION LIST

01 GENERAL

01.01 This section describes the maintenance procedures used for the diagnosis of faults in this electronic key telephone system. Faults are classified and then cleared by replacing the apparatus and performing operational tests in the sequences prescribed by the fault clearing flowcharts in Paragraph **05**.

02 FAULT CLASSIFICATION

02.01 A Fault Classification Flowchart is provided to ensure that fault clearing is pursued in a logical sequence (Chart No. 1).

02.02 An assumption is made in the flowcharts that the fault was discovered and reported by an EKT user. All faults, therefore, are classified according to the way they would appear at the EKT.

02.03 Faults and associated flowcharts in Table A are organized into the following categories:

TABLE A — FLOWCHARTS

Flowchart	Title
1	Fault Classification
2	Power Faults
3	Station Faults
4	HKSU Faults
5	CO Line Faults
6	MOH Faults
7	Page/BGM Faults
8	Door Phone Faults
9	SMDR Faults
10	OPX Faults
11	OPL Faults
12	Remote Maintenance Faults

03 FAULT CLEARING PROCEDURES

03.01 Before attempting to clear any fault, ensure that it is in the system and not caused by associated external equipment, such as wiring, MOH source, etc.

IMPORTANT!

Many system features are assigned, enabled or disabled using software entries as described in Programming Procedures. ***Further, with the exception of*** **Programs 5XX ~ 9XX, *programming changes are not effective until the new data has been secured in working memory (see Paragraph*** **02.06** ***of*** Programming Procedures). ***It is important to verify that the system programming is correct and functional before troubleshooting the hardware.***

03.02 In new systems, or when the SCCU/VCCU PCB has been changed, the initialization procedure must be performed before testing. The system data stored on the original SCCU/VCCU will be protected from loss by the backup battery on that PCB. Therefore, the initialization sequence *should not* be performed if the original PCB is reinstalled.

03.03 Faults in the system are cleared by replacing PCBs, EKTs or the power supply, as instructed in the flowcharts.

03.04 Five symbols are used in the flowcharts, which are identified in Figure 1.

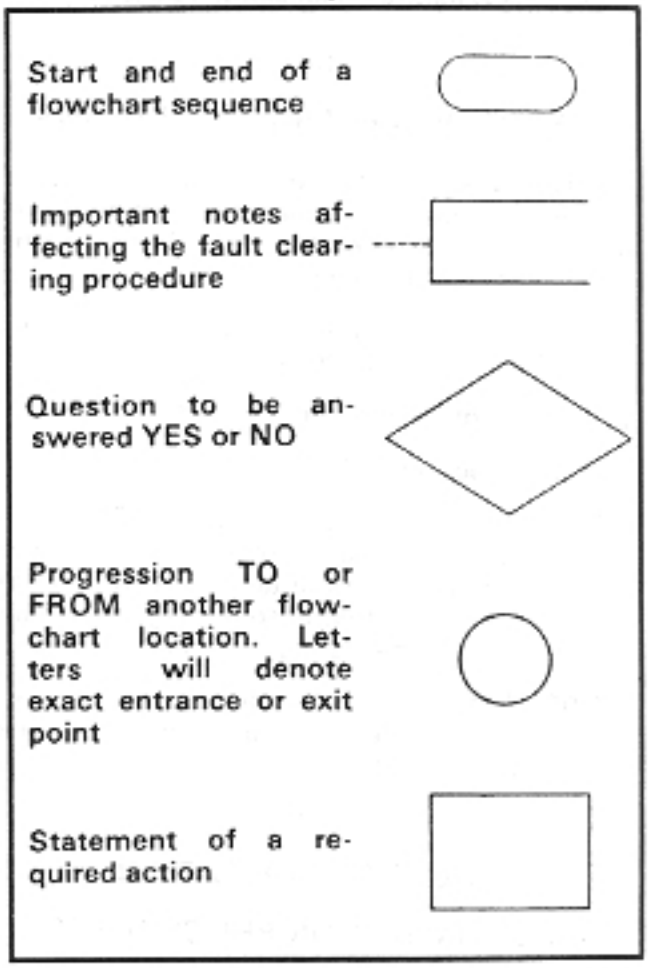


FIGURE 1—FLOWCHART SYMBOLS

03.05 The flowcharts are sequentially arranged to permit rapid fault localization within the system. *All fault clearing must begin with the Fault Classification Flowchart, which is arranged in the correct fault locating sequence.*

03.06 The following precautions must be observed when handling PCBs.

DO NOT:

- Drop a PCB.
- Stack one PCB on top of another.
- Handle a PCB without discharging any static electricity from your person by touching the grounded HKSU.
- Touch PCB contacts with your fingers.

IMPORTANT!
If the fault is not cleared by substituting a PCB, the original PCB must be reinstalled in the HKSU before trying another PCB.

04

DEFECTIVE APPARATUS RETURNS

04.01 When a defective system apparatus is shipped for repair, the apparatus must be packed in a suitable container (the original box is highly recommended), as follows:

a) Anti-static container for the SSTU, SCOU, VCOU and SMOU PCBs.

b) Paper container for the VCCU PCB.

c) Plastic bags for EKTs, HKSU, etc.

04.02 NEVER WRITE ON THE APPARATUS ITSELF! Describe the nature of the defect on an information tag. Attach the tag to the front of the unit with string (not wire) so the tag can remain attached during the testing and repair process.

04.03 If different and/or additional faults are created in the system by substituting a PCB, tag and return the substitute PCB as a defective unit.

05

FAULT IDENTIFICATION and ELIMINATION PROCEDURES

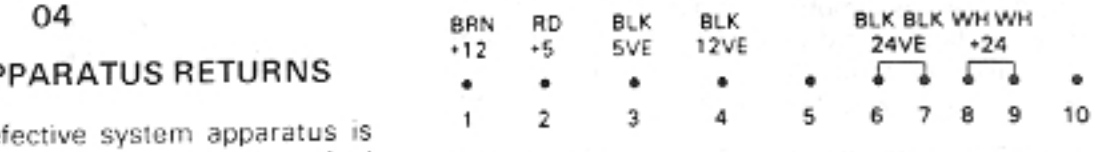
05.01 The SCCU/VCCU PCB may contain a "soft" fault due to static electricity. If it is found defective during the fault finding procedures, attempt to clear a soft fault prior to returning the SCCU/VCCU PCB for repair. The correct procedure for this is to reinstall the SCCU/VCCU, perform the initialization procedure, and then reprogram the system as necessary to test for the fault. If the fault returns after these procedures are performed, tag the defective SCCU/VCCU PCB and return it for repair.

06 POWER SUPPLY

06.01 If a power supply fault is suspected, the power supply should be removed from the HKSU **after** unplugging the power cable. Using a voltmeter, check the power supply output voltages at the power supply cable connector per the diagram below:

STRATA VI_e — HPSU 7120 (P1 connector):

STRATA S_e — HPSU 6120 (P7 connector):



06.02 Voltages should fall within the following ranges:

Nominal	Range
+24	+23.0 ~ 29.0
+12	+10.8 ~ 13.2
+ 5	+4.75 ~ 5.25

06.03 If voltage checks indicate a power supply fault, replace the HPSU with a correctly operating unit. Refer to the *Installation* section of this manual for HPSU installation procedures.

07

STATION CABLE CONTINUITY CHECK

07.01 Voltmeter Test

07.02 The continuity of the cable run between the HKSU and the EKT is checked with a voltmeter as follows:

NOTE:
Perform the following at the locations indicated:
1. *Modular block: Check all station cables.*
2. *MDF: Check cable from HKSU to MDF.*

1) Disconnect the EKT.

2) Using a DC voltmeter, measure between the wires of the two pairs to verify the readings shown in Table B.

3) An improper reading indicates an open, crossed or shorted wire.

4) For the MDF-to-EKT cable, a more precise check is made using an ohmmeter.

TABLE B

STATION CABLE CONTINUITY CHECK USING VOLTMETER

FROM			TO			VOLTAGE*
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	24
1	R	Red	2	T	Black	24
1	T	Green	2	R	Yellow	24
1	R	Red	2	R	Yellow	24
1	T	Green	1	R	Red	0
2	T	Red	2	R	Yellow	0
3	T	White	3	R	Blue	0
3	T	White	1	R	Red	0
3	R	Blue	1	R	Red	0
3	T	White	1	T	Green	0
3	R	Blue	1	T	Green	0
3	T	White	2	T	Black	0
3	R	Blue	2	T	Black	0
3	T	White	2	R	Yellow	0
3	R	Blue	2	R	Yellow	0

**Nominal voltage—within the power supply limits of +23.2 — 28.2 VDC while under AC power.*

07.10 Ohmmeter Test

07.11 The continuity of the cable run between the HKSU and the EKT is checked with an ohmmeter as follows:

1) Disconnect the EKT.

2) At the MDF, remove the bridging clips.

3) Using an ohmmeter, measure the resistance between all combinations of the four wires at the modular block. All measurements should exceed 1 M ohm.

4) At the MDF, place shorting jumper wires between the T and R of pair #1 (green-red), the T and R of pair #2 (black-yellow), and the T and R of pair #3 (blue-white).

5) At the modular block, measure the resistance between all wire combinations. The proper readings are shown in Table C.

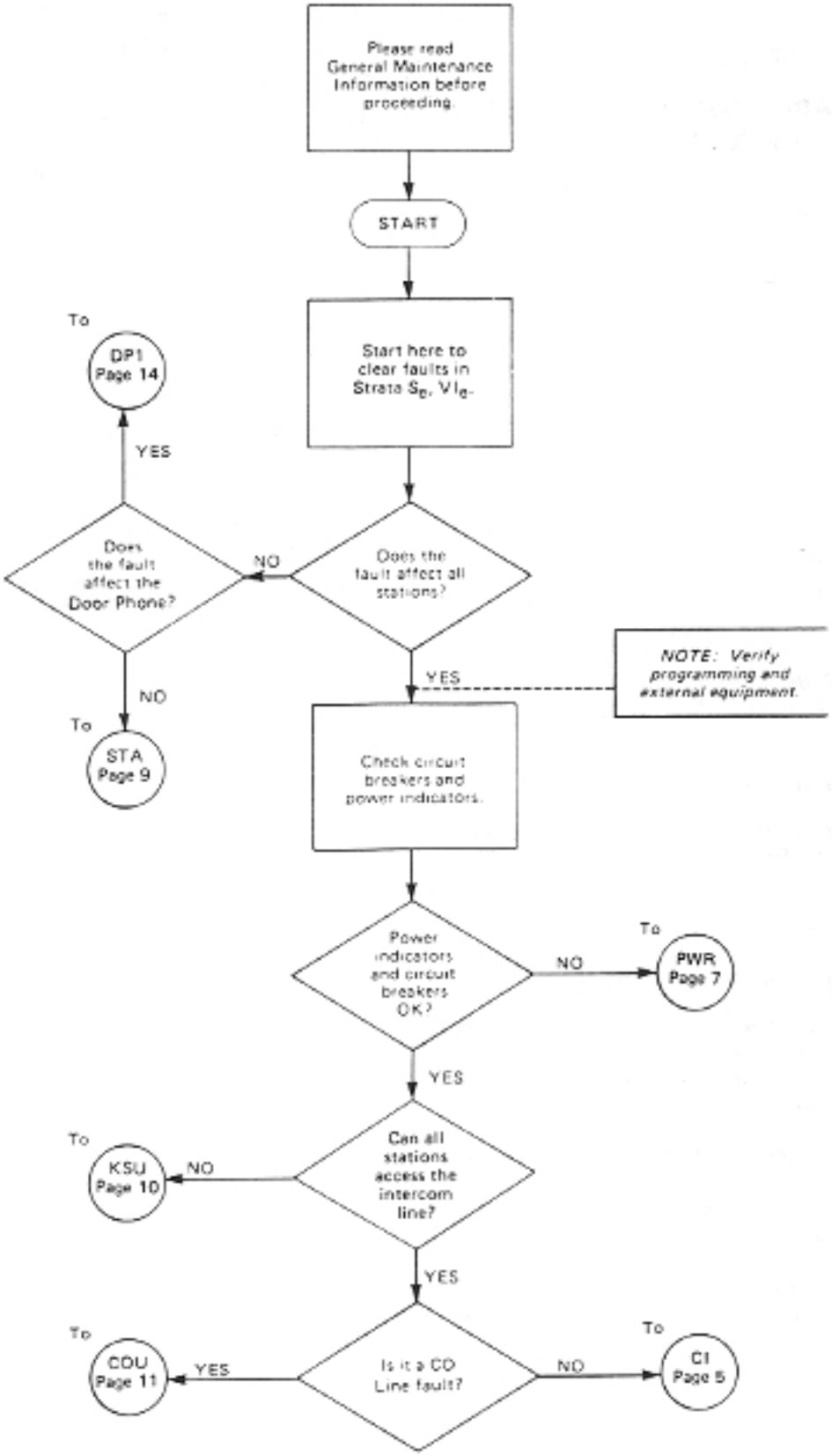
TABLE C

STATION CABLE CONTINUITY CHECK USING OHMMETER

FROM			TO			RESISTANCE
Pair	Wire	Color	Pair	Wire	Color	
1	T	Green	2	T	Black	1M ohm
1	R	Red	2	T	Black	1M ohm
1	T	Green	2	R	Yellow	1M ohm
1	R	Red	2	R	Yellow	1M ohm
1	T	Green	1	R	Red	55M ohms*
2	T	Black	2	R	Yellow	55M ohms*
3	T	White	3	R	Blue	55 ohms*
3	T	White	1	R	Red	1M ohm
3	R	Blue	1	R	Red	1M ohm
3	T	White	1	T	Green	1M ohm
3	R	Blue	1	T	Green	1M ohm
3	T	White	2	T	Black	1M ohm
3	R	Blue	2	T	Black	1M ohm
3	T	White	2	R	Yellow	1M ohm

**NOTE:*
The green-red and black-yellow measurements should be within 10% of each other.

CHART NO. 1
FAULT CLASSIFICATION



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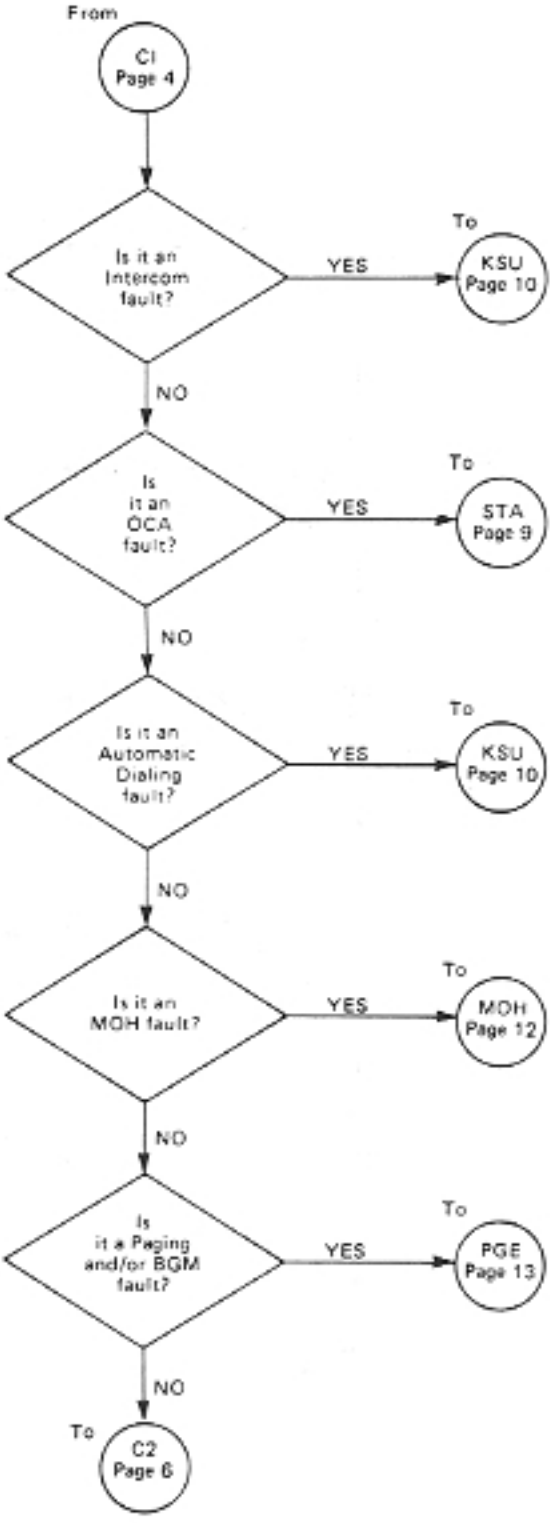

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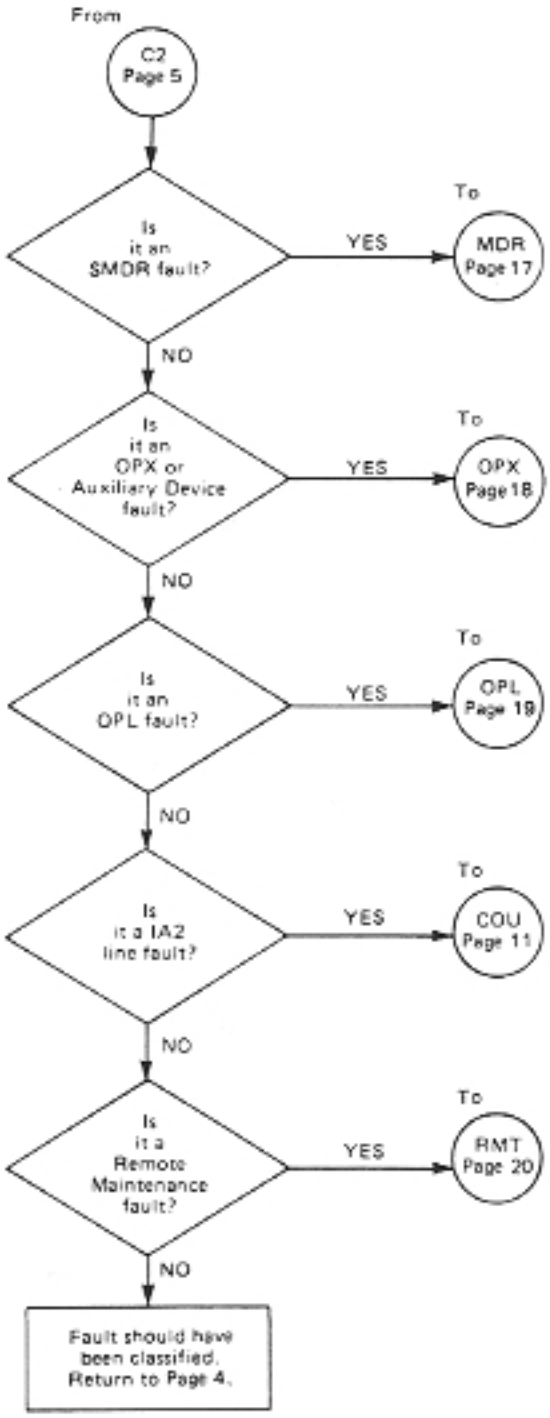


CHART NO. 2
POWER FAULTS

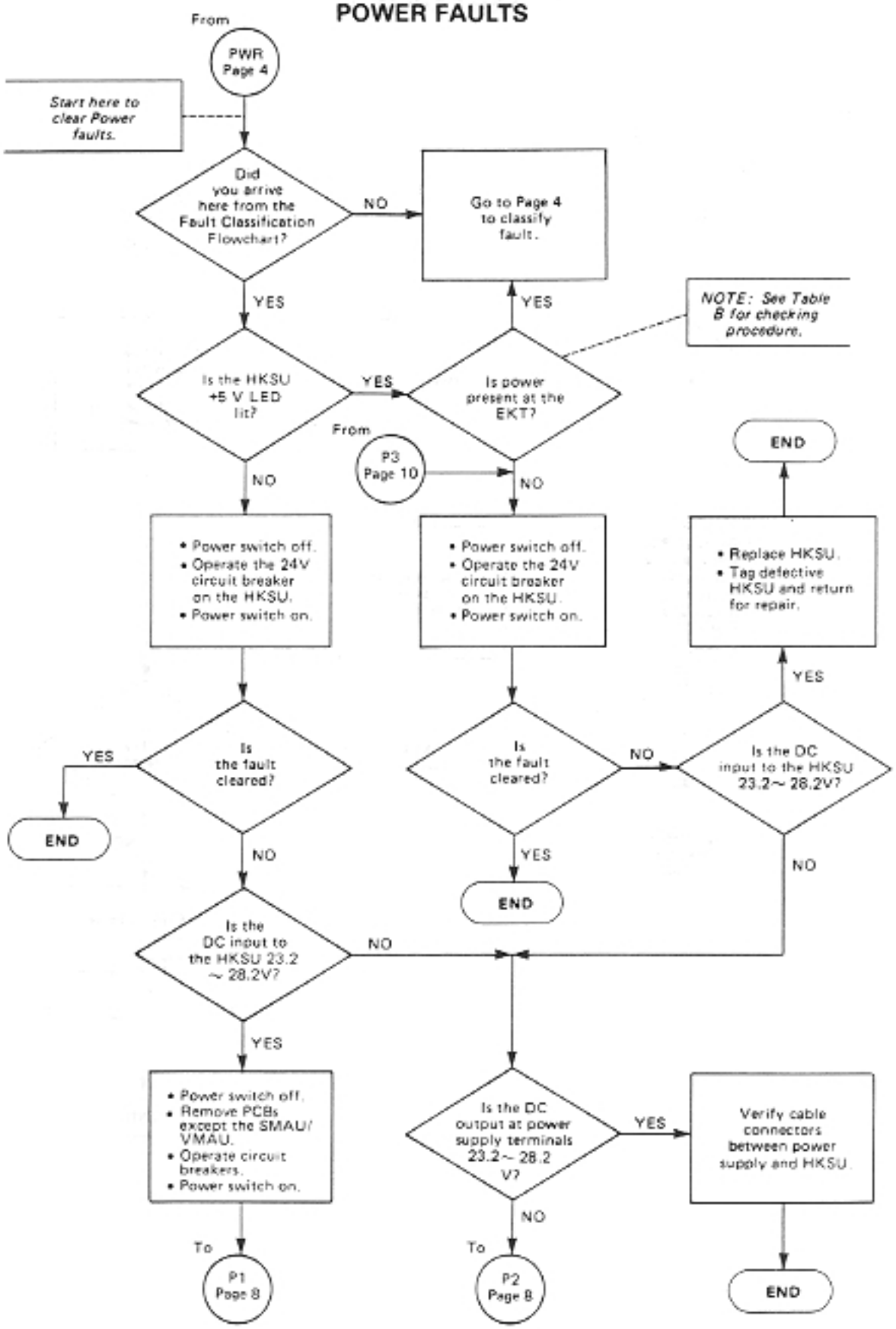


CHART NO. 2
POWER FAULTS (cont.)

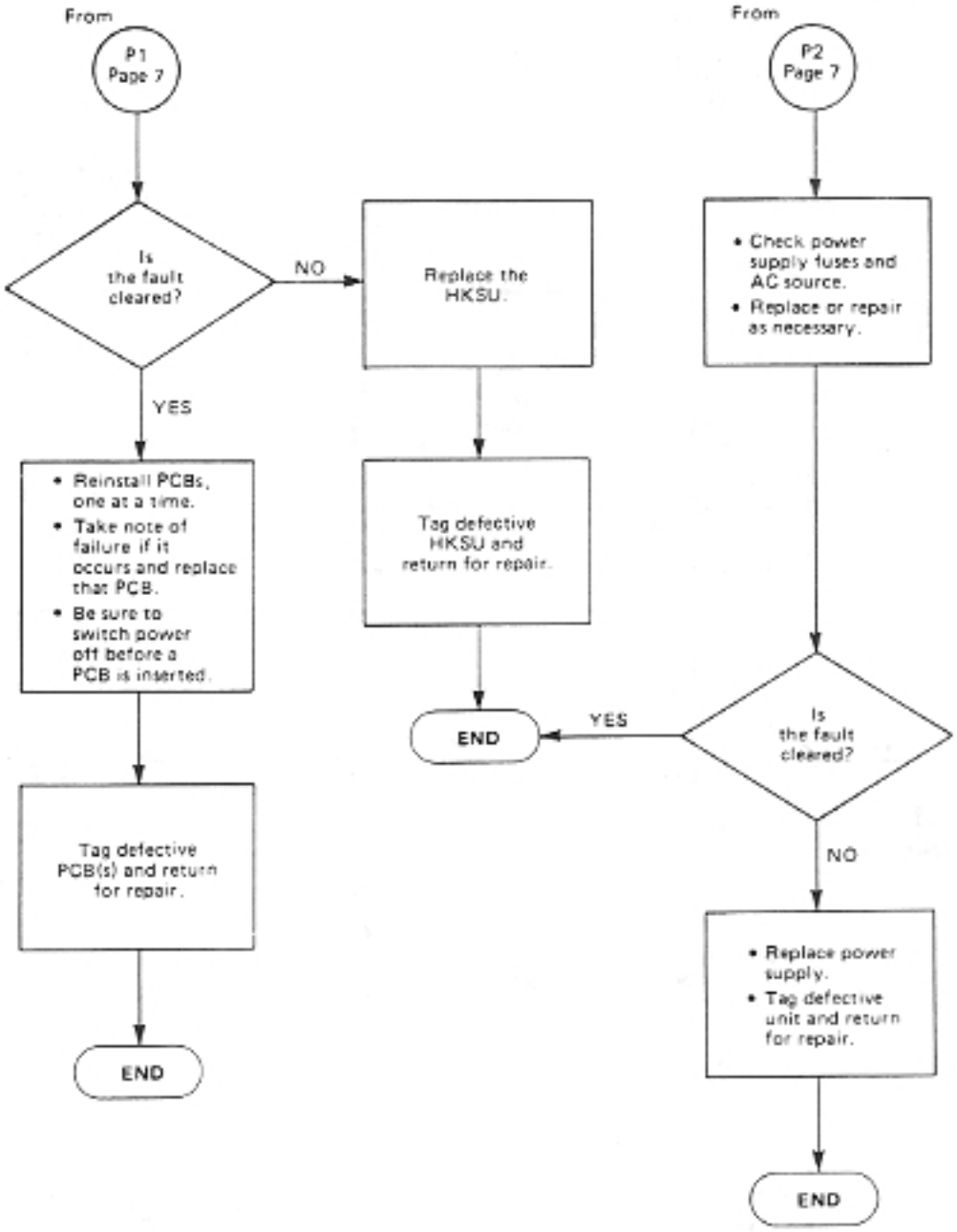


CHART NO. 3
STATION FAULTS

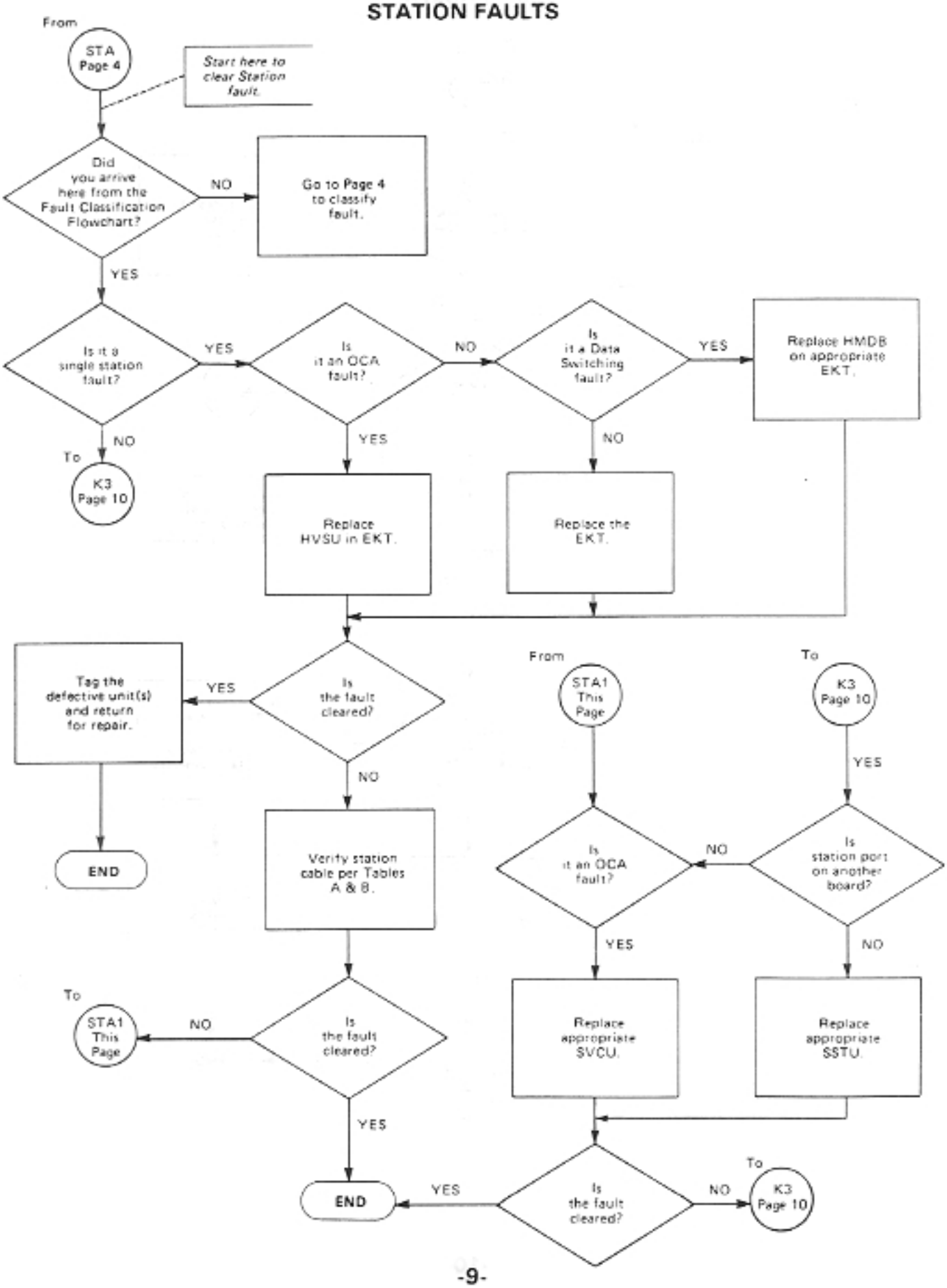


CHART NO. 4
HKSU FAULTS

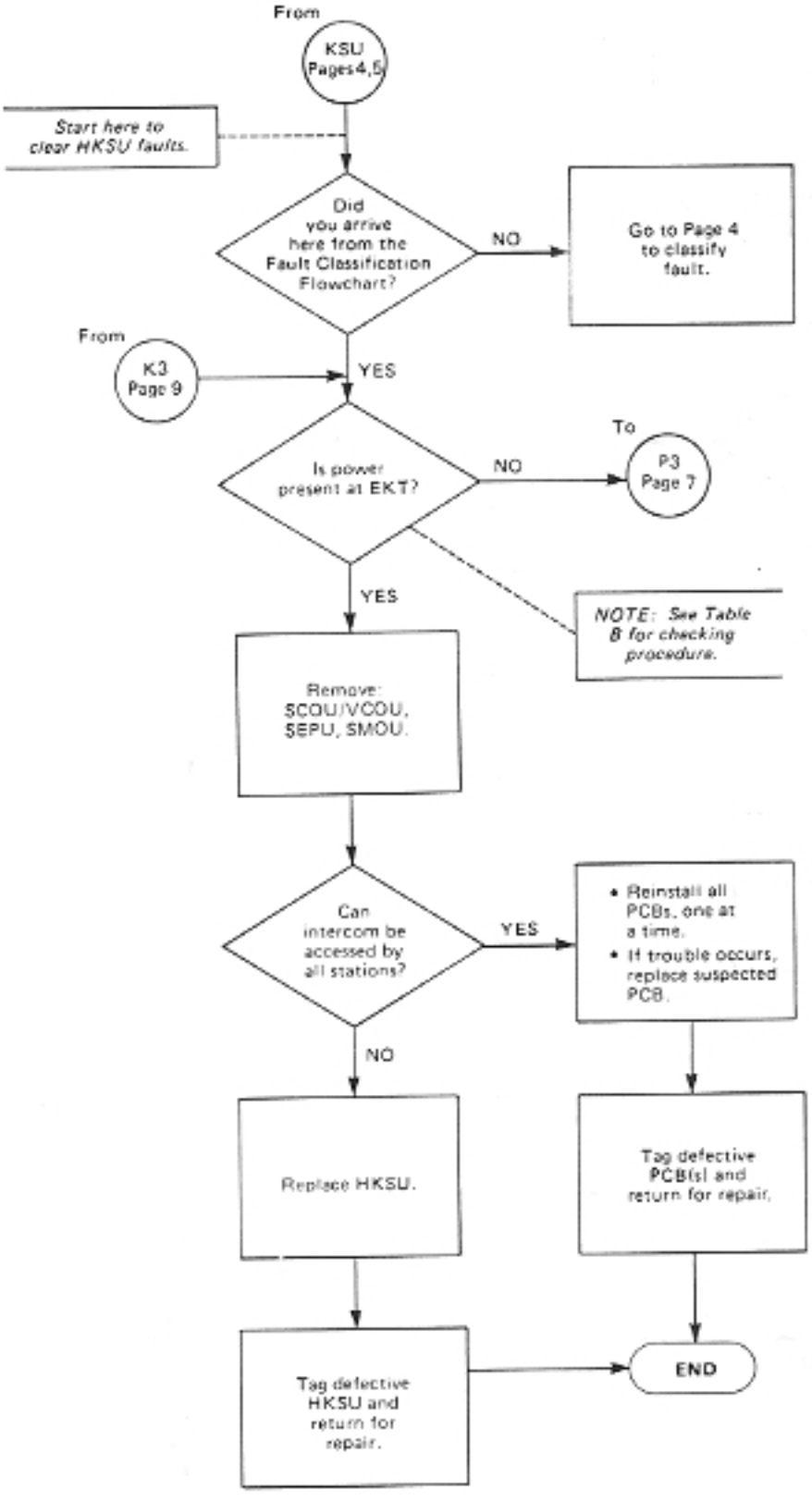


CHART NO. 5
CO LINE FAULTS

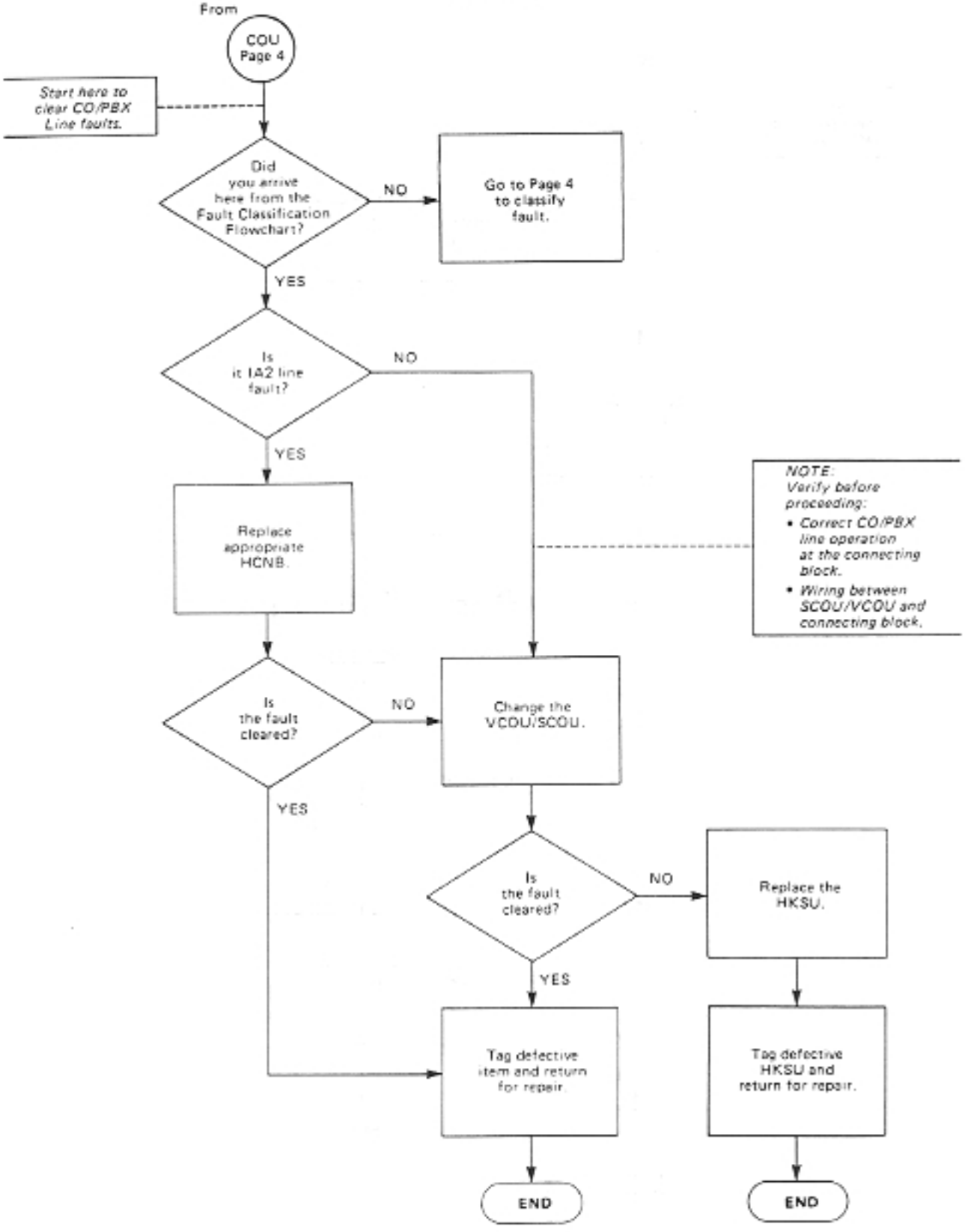
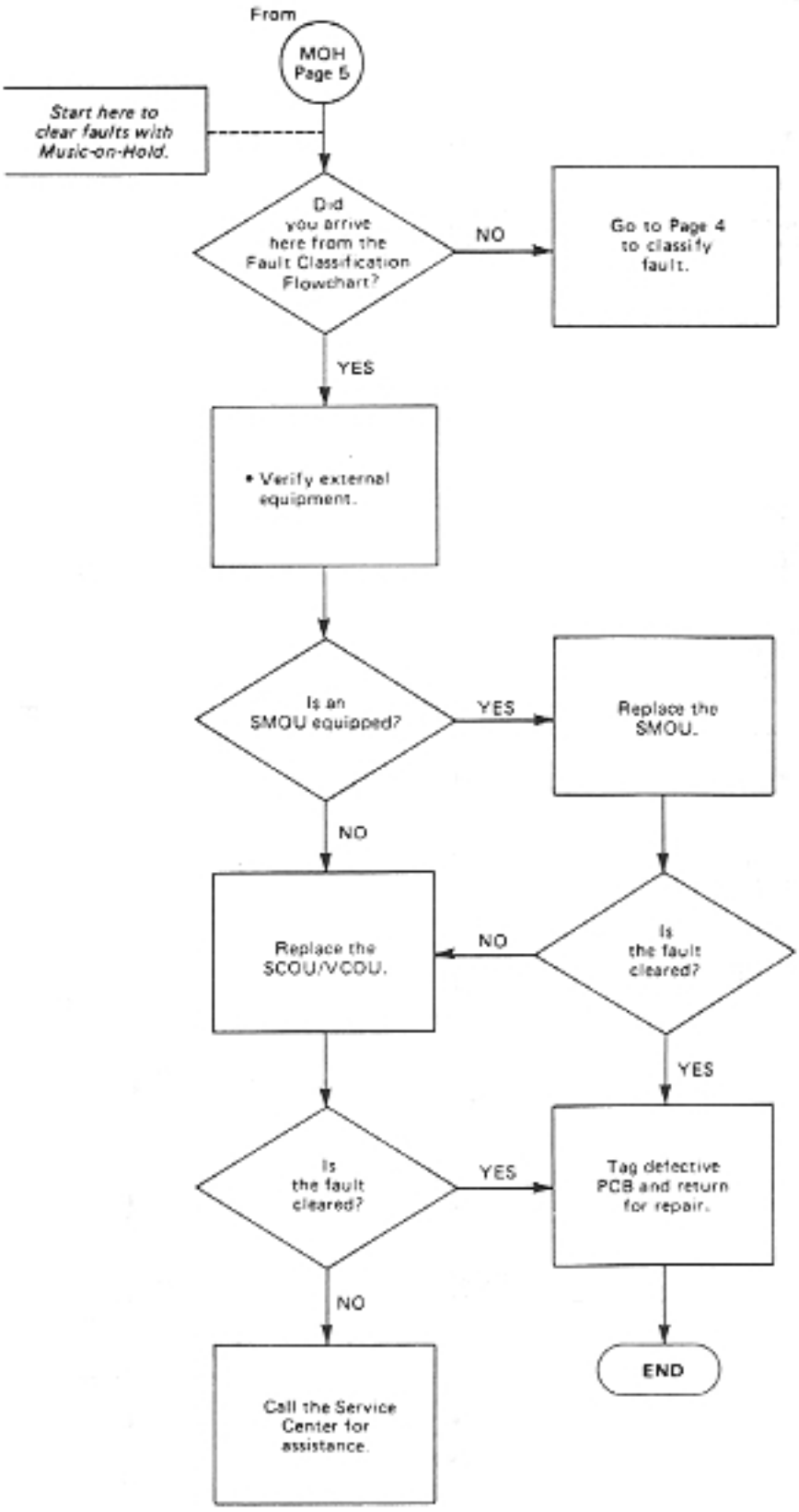


CHART NO. 6
MOH FAULTS



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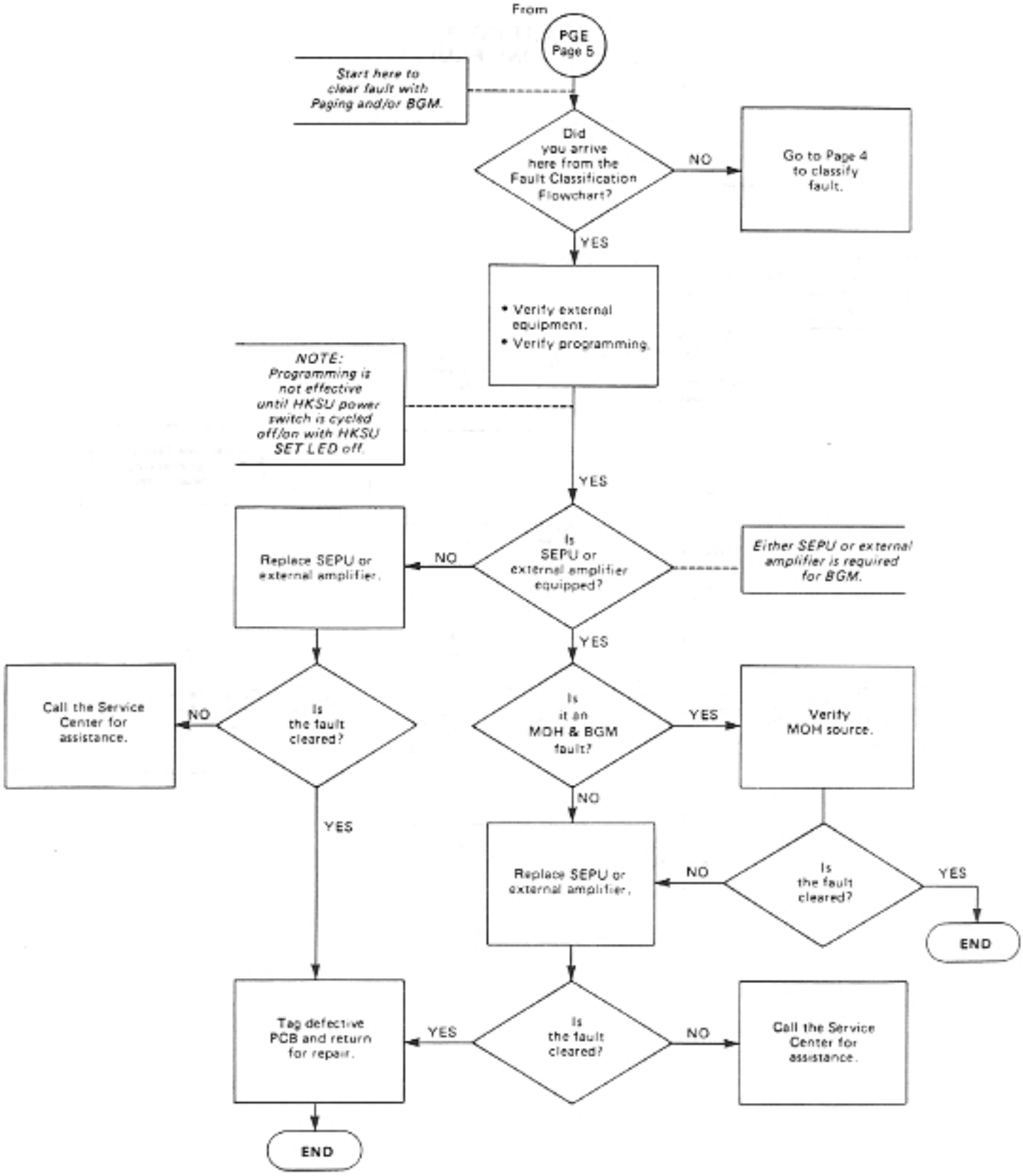
PAGE/BGM FAULTS



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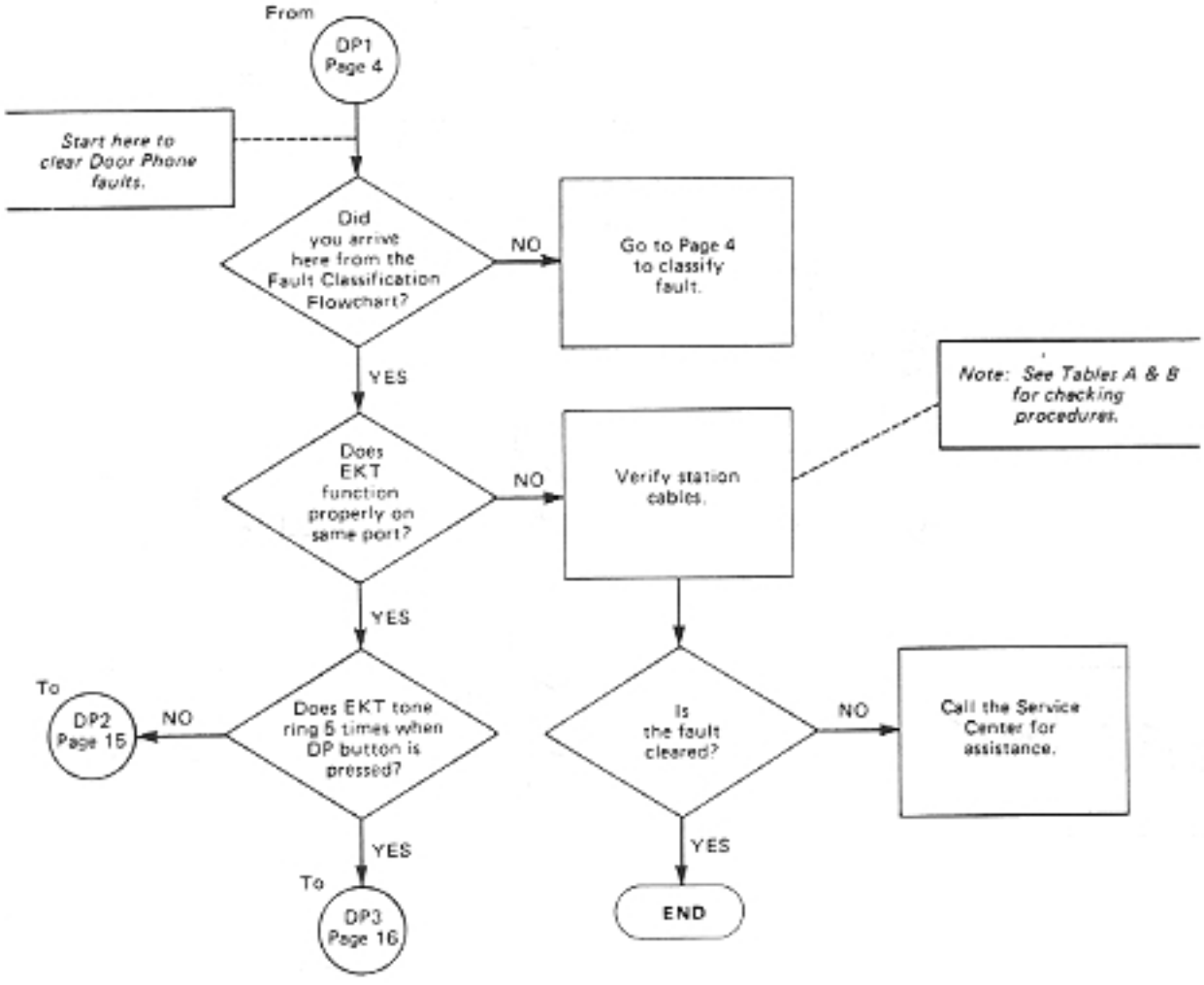
DOOR PHONE FAULTS



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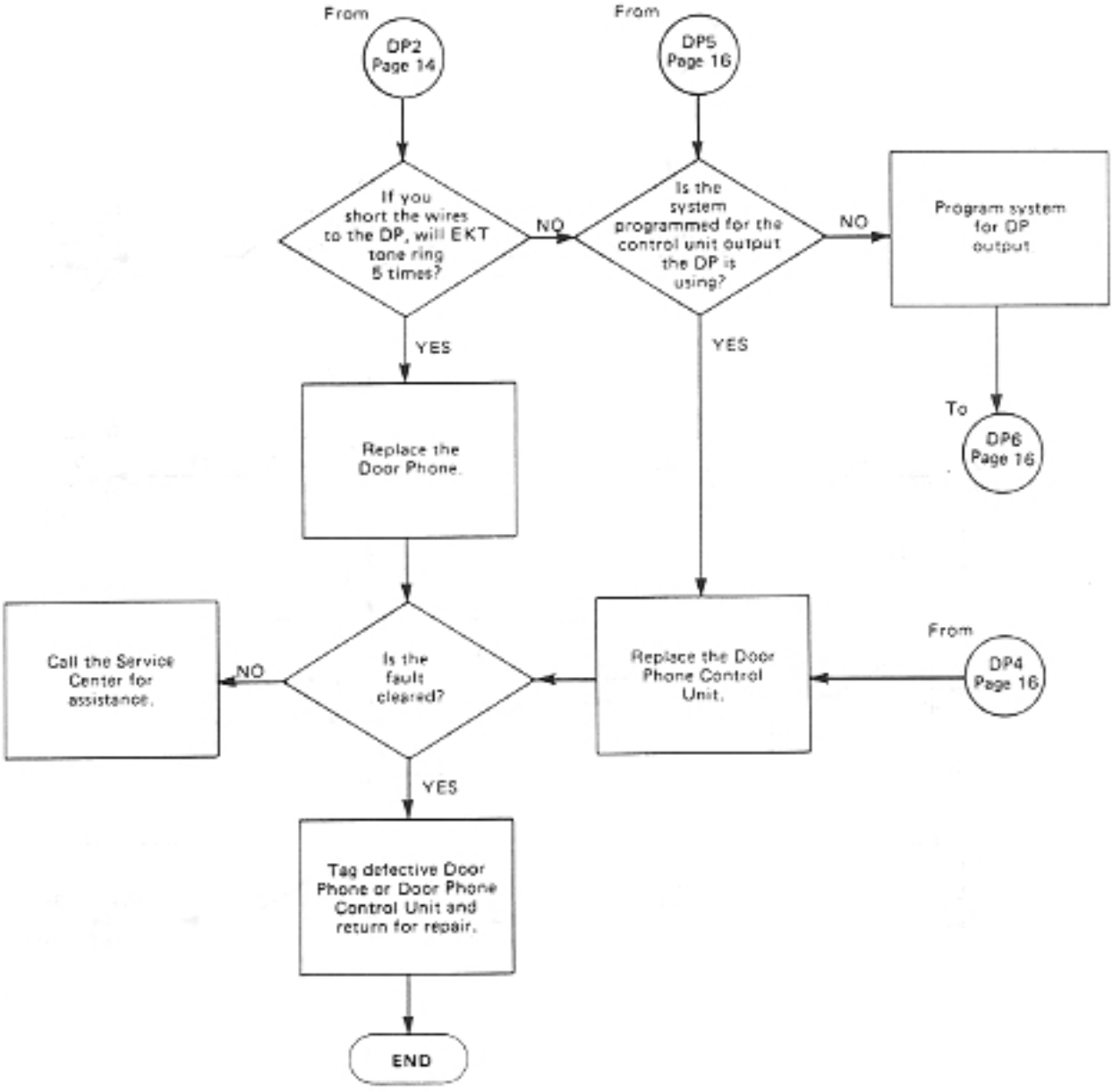

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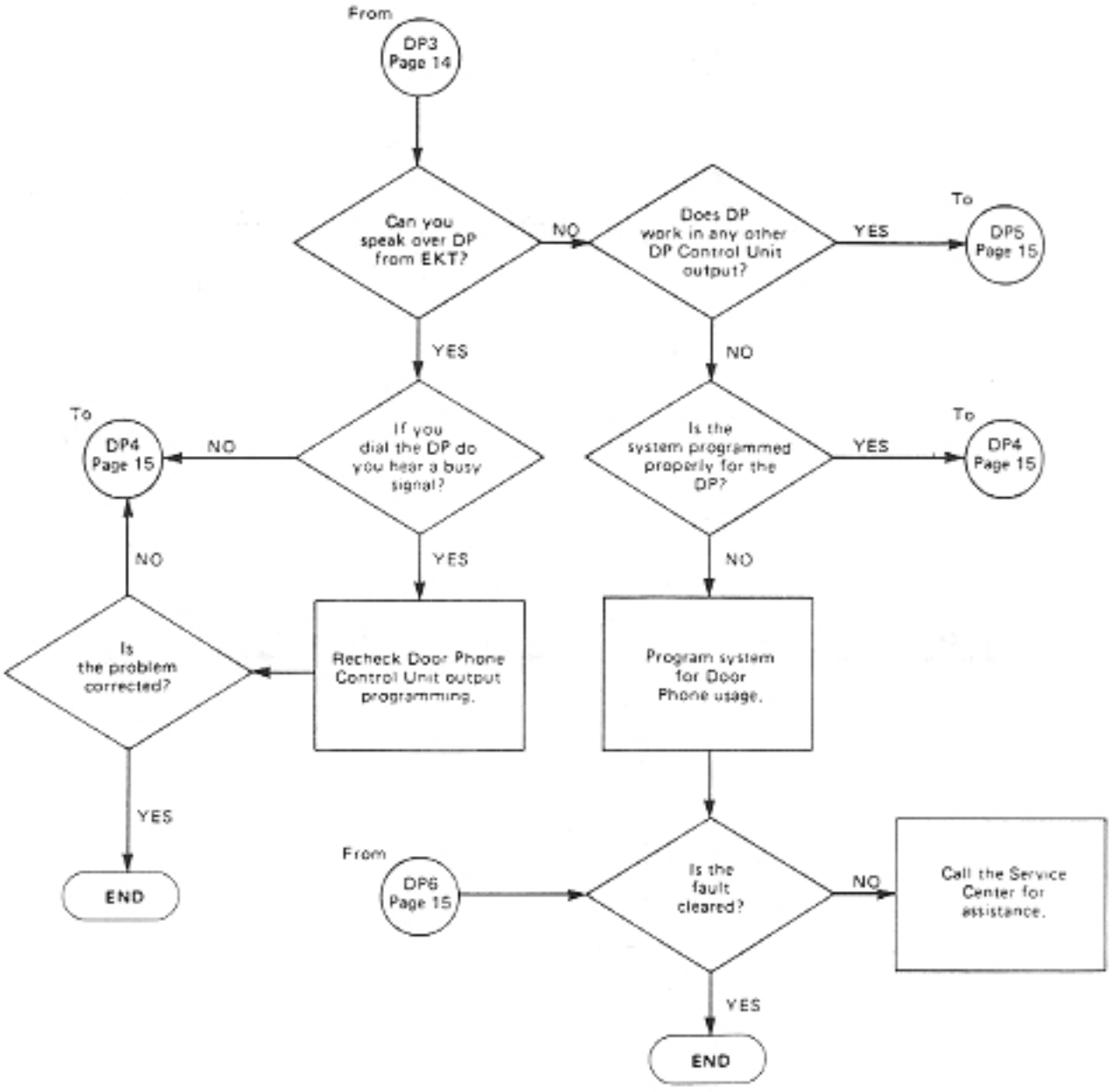

CHART NO. 9
SMDR FAULTS

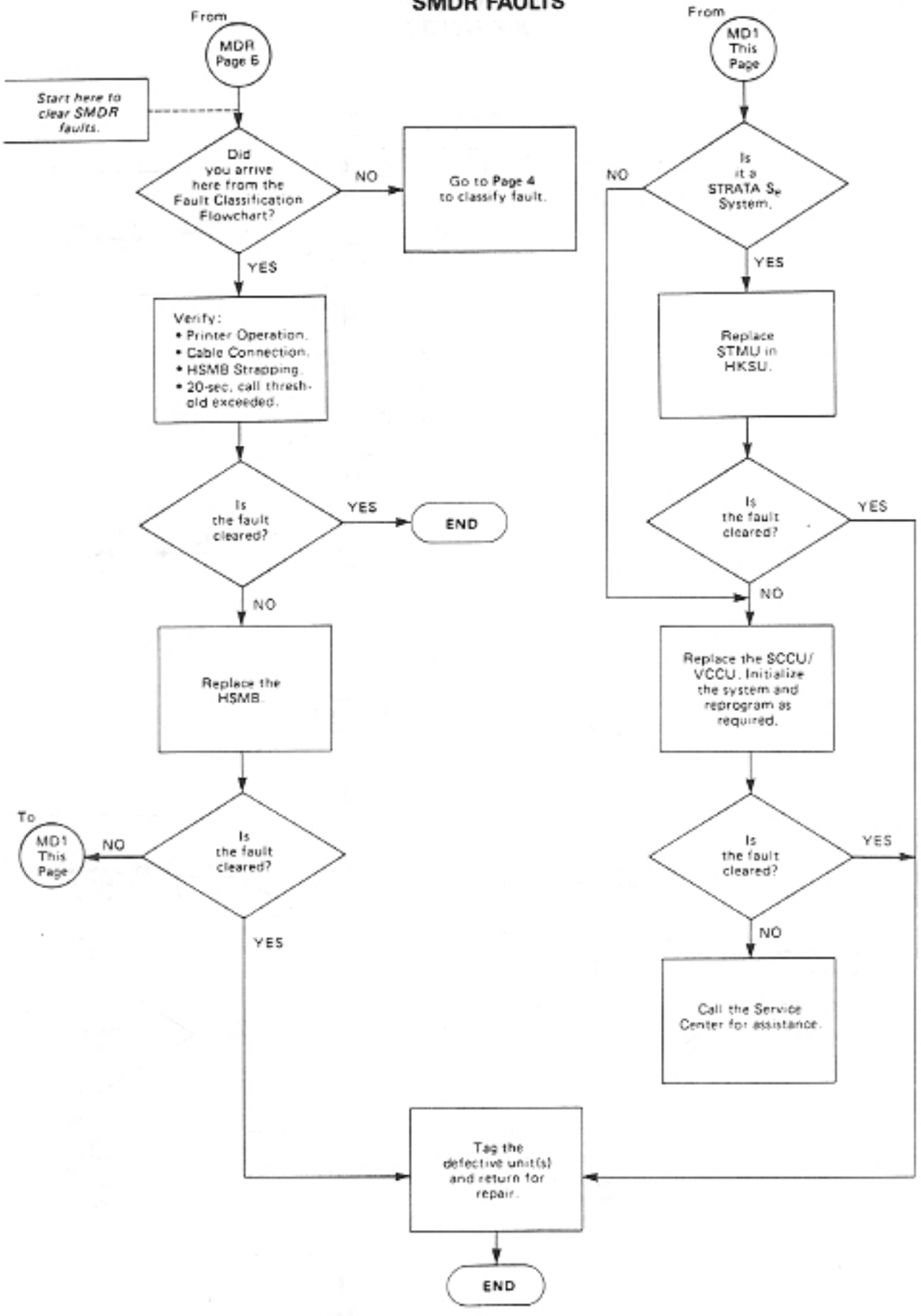

CHART NO. 10
OPX FAULTS

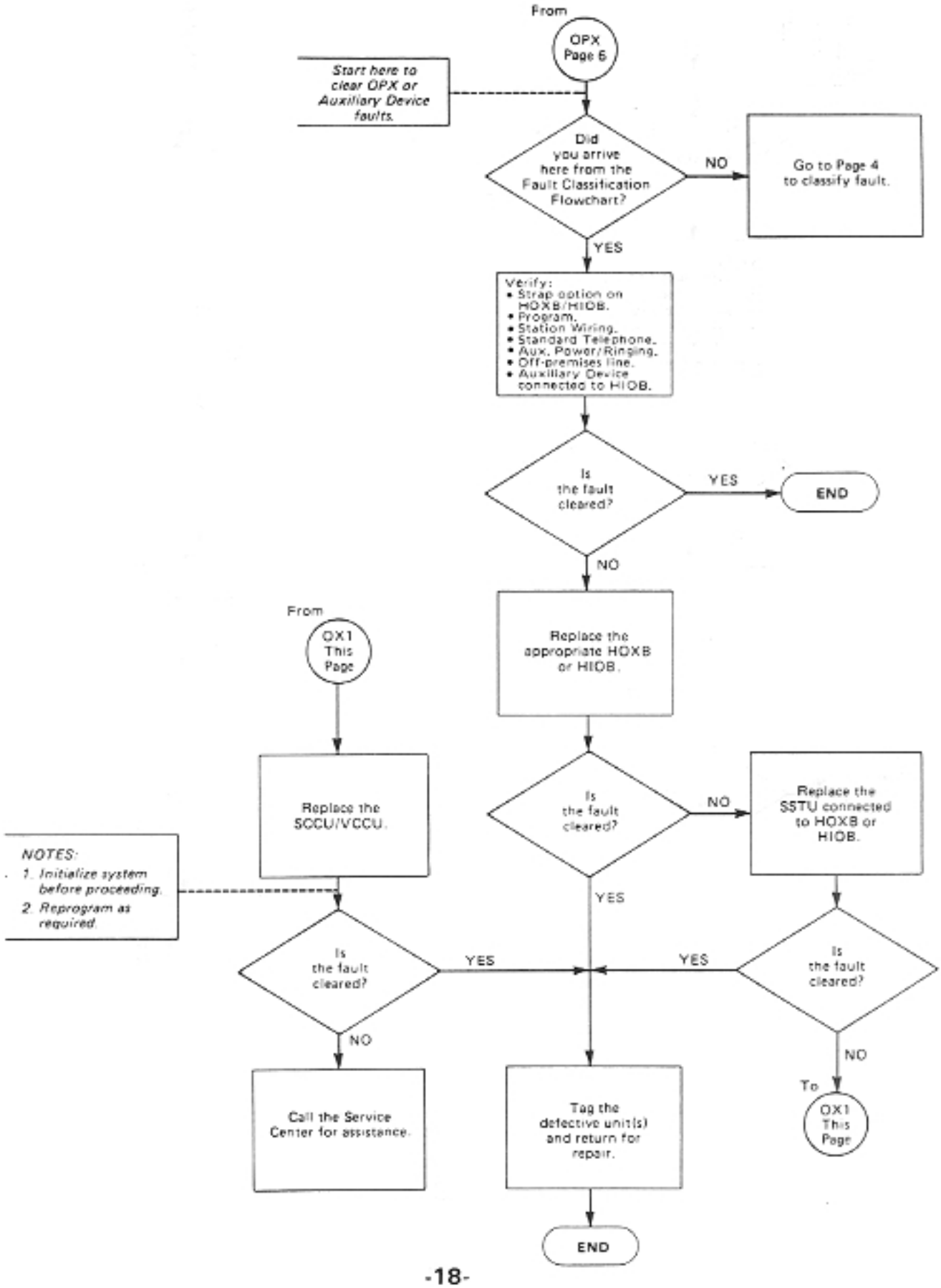

CHART NO. 11
OPL FAULTS

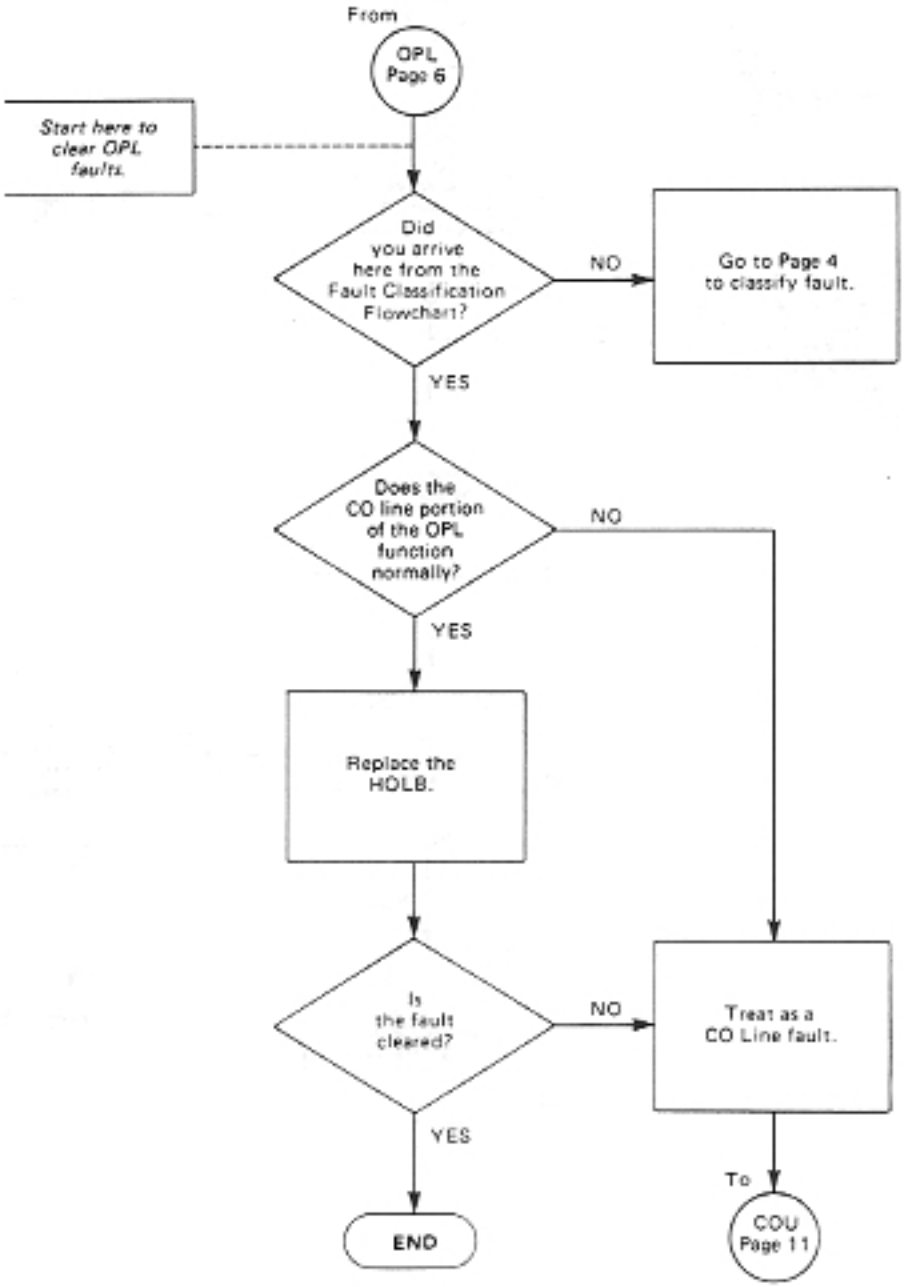

CHART NO. 12
REMOTE MAINTENANCE FAULTS