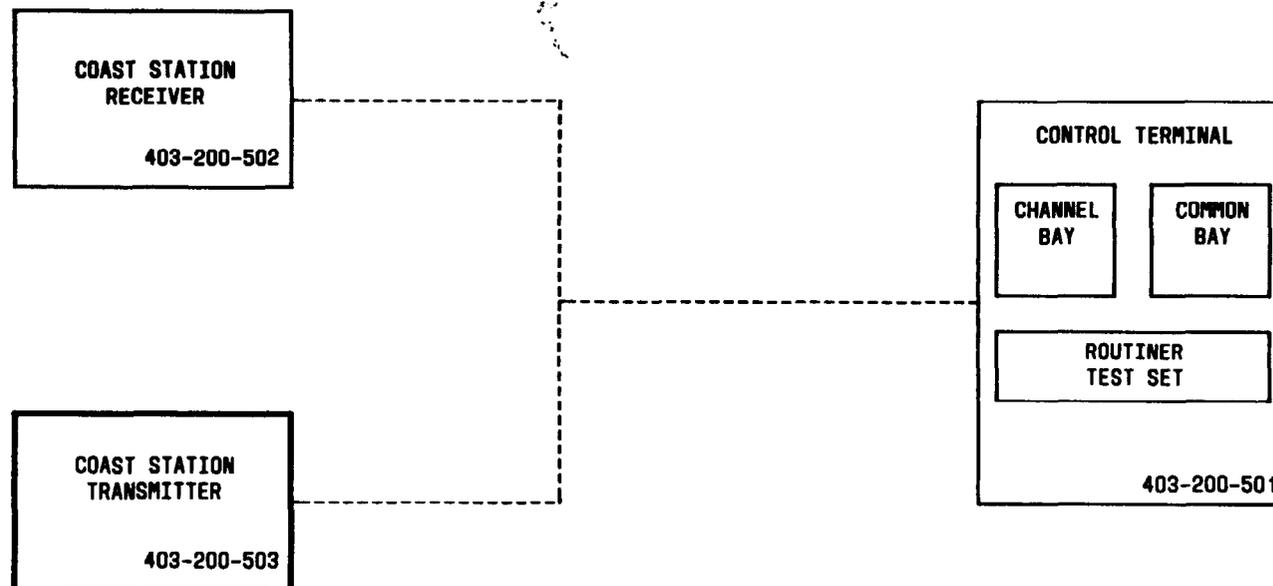


**MM COASTAL HARBOR RADIO
TOP DOCUMENTATION
THREE VOLUMES**



TPA 648582
BSP 403-200-503
DOC PLAN
40W X 26H

Task Oriented Practice
(TOP)

MM COASTAL HARBOR RADIO SYSTEM

COAST STATION TRANSMITTERS

NOTE

**Before using TOP for the first time, complete the
TOP-USER Plant Training Course—PTC No. 278.**

**A short version of PTC No. 278 is in the back of
this volume.**

NOTICE

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

Printed in U.S.A.

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
CHECKLIST		TAP-128		DLP-525							
RTL-001		TAP-129		DLP-526							
RTP-002		TAP-130		DLP-527							
ATL-030		TAP-131		DLP-528							
ATP-031		TAP-132		DLP-529							
COL-050		TAD-133		DLP-530							
TIL-095		TAD-134		DLP-531							
TAP-100		TAP-135		DLP-532							
TAD-101		TAD-136		DLP-533							
TAP-102		TAD-137		DLP-534							
TAP-103		DLP-500		DLP-535							
TAP-104		DLP-501		DLP-536							
TAP-105		DLP-502		DLP-537							
TAP-106		DLP-503		DLP-538							
TAP-107		DLP-504		DLP-539							
TAP-108		DLP-505		DLP-540							
TAP-109		DLP-506		DLP-541							
TAP-110		DLP-507		DLP-542							
TAP-111		DLP-508		DLP-543							
TAP-112		DLP-509		DLP-544							
TAP-113		DLP-510		IXL-890							
TAP-114		DLP-511									
TAP-115		DLP-512									
TAP-116		DLP-513									
TAP-117		DLP-514									
TAD-118		DLP-515									
TAP-119		DLP-516									
TAP-120		DLP-517									
TAD-121		DLP-518									
TAP-122		DLP-519									
TAP-123		DLP-520									
TAD-124		DLP-521									
TAP-125		DLP-522									
TAP-126		DLP-523									
TAP-127		DLP-524									

● REVISED OR ADDED ITEM

□ CANCELED ITEM

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CKL

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CHECKLIST

JOB NO.	ROUTINE TASK	CLASS	FREQ	PROCEDURE NUMBER
	CHECK TRANSMITTER METER INDICATIONS	MW	3M	DLP-500
	MEASURE TRANSMITTER FREQUENCY	MW	3M	DLP-501
	MEASURE TRANSMITTER CARRIER POWER OUTPUT	MW	3M	DLP-502
	TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION	MW	3M	DLP-503
	TEST MONITOR RECEIVER OUTPUT	MW	3M	DLP-504
	MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS	MW	3M	DLP-505
	MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE FREQUENCIES	MW	3M	DLP-506
	MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE	MW	3M	DLP-507
	MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL	MW	3M	DLP-508
	MEASURE CONTROL TERMINAL TO TRANSMITTER 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS	MW	3M	DLP-509
	MEASURE CONTROL TERMINAL TO TRANSMITTER 1000-HZ TONE LEVEL	MW	3M	DLP-510
	TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING	MW	3M	RTP-002
	TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS	MW	1M	DLP-511
	TEST TRANSMITTER SIGNALING OF VSWR ALARM	MW	1M	DLP-512
	TEST TRANSMITTER AUXILIARY SIGNALING BOARD	MW	1M	DLP-513
	TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL	MW	1M	DLP-514
	SELF-CHECK KS-21277 ROUTINER TEST SET FOR TRANSMITTER TEST	MW	6M	DLP-531

ROUTINE TASK LIST - COAST STATION TRANSMITTERS

ITEM	SUBTASKS	PROCEDURE NUMBER
1	TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS	DLP-515
2	TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS	DLP-516
TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING		Issue 2
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		RTP
		PAGE 1 of 1 002

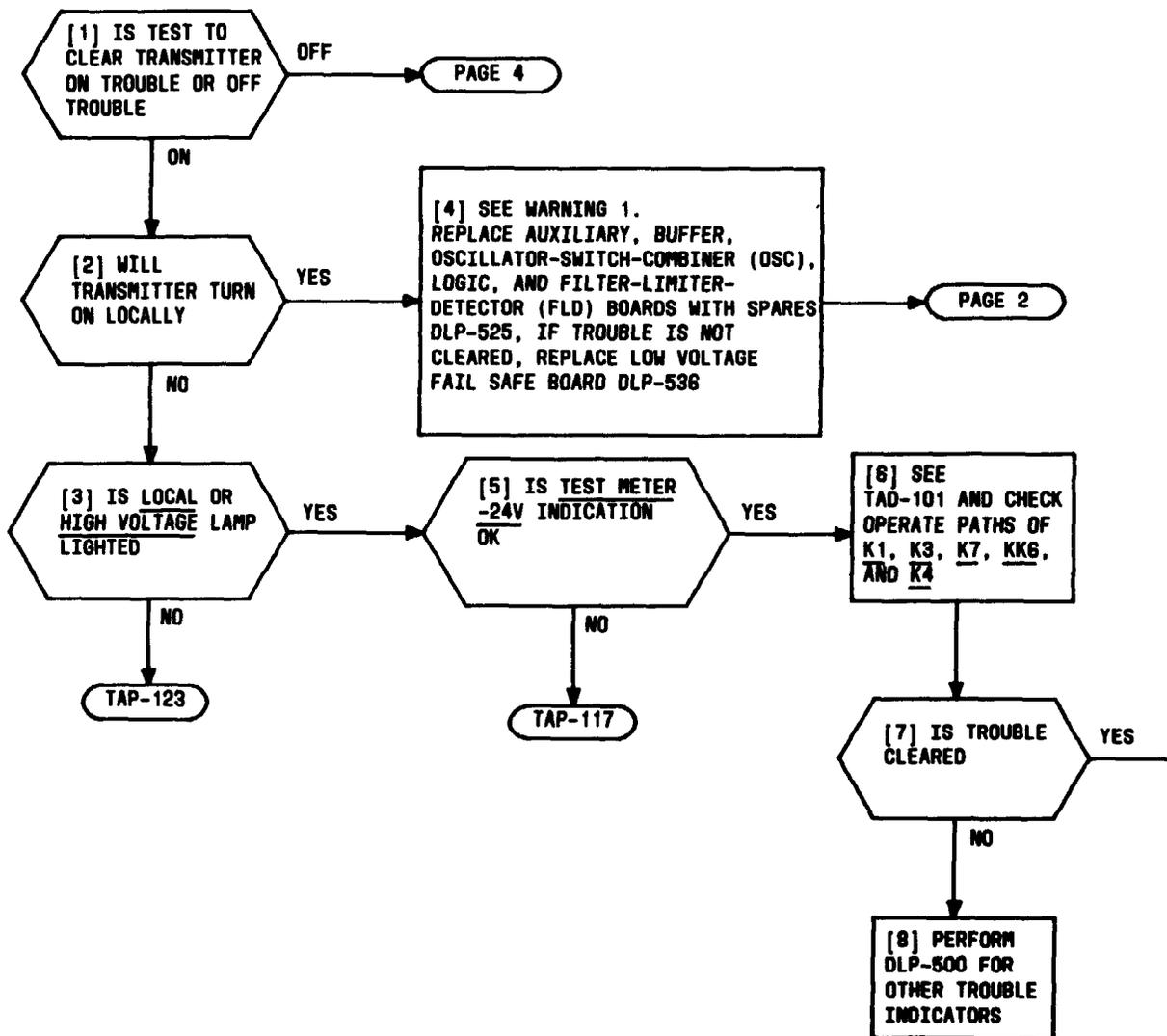
ACCEPTANCE TASK LIST	PROCEDURE NUMBER	
ACCEPT COAST STATION TRANSMITTERS	ATP-031	
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ACCEPTANCE TASK - COAST STATION TRANSMITTERS		

ITEM	SUBTASKS	PROCEDURE NUMBER						
1	CHECK TRANSMITTER METER INDICATIONS	DLP-500						
2	MEASURE TRANSMITTER FREQUENCY	DLP-501						
3	CHECK TRANSMITTER CARRIER BALANCE	DLP-534						
4	CHECK TRANSMITTER CARRIER LEVEL	DLP-535						
5	MEASURE TRANSMITTER CARRIER POWER OUTPUT	DLP-502						
6	TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION	DLP-503						
7	TEST MONITOR RECEIVER OUTPUT	DLP-504						
8	MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS	DLP-505						
9	MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE FREQUENCIES	DLP-506						
10	MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE	DLP-507						
11	MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL	DLP-508						
12	TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS	DLP-515						
13	TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS	DLP-516						
14	TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS	DLP-511						
15	TEST TRANSMITTER SIGNALING OF VSWR ALARM	DLP-512						
16	TEST TRANSMITTER AUXILIARY SIGNALING BOARD	DLP-513						
17	TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL	DLP-514						
ACCEPT COAST STATION TRANSMITTERS		<table border="1"> <tr> <td data-bbox="1642 1036 1814 1279">Issue 2</td> <td data-bbox="1814 1036 1976 1279">FEB 1979</td> </tr> <tr> <td data-bbox="1642 1279 1814 1347">403-200-503</td> <td data-bbox="1814 1279 1976 1347">ATP</td> </tr> <tr> <td data-bbox="1642 1347 1814 1396">PAGE 1 of 1</td> <td data-bbox="1814 1347 1976 1396">031</td> </tr> </table>	Issue 2	FEB 1979	403-200-503	ATP	PAGE 1 of 1	031
			Issue 2	FEB 1979				
			403-200-503	ATP				
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ACCEPTANCE TASK LIST	PROCEDURE NUMBER
NONE REQUIRED	
CIRCUIT ORDER LIST - COAST STATION TRASMITTERS	Issue 2 FEB 1979
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TROUBLE INDICATED	MAY ALSO BE REPORTED AS	PROCEDURE NUMBER
MAINTENANCE PHILOSOPHY		TAD-136
AUTOMATIC DEVICES		
TRANSMITTER ALARM LAMP		TAP-114
VSWR/TUBE ALARM LAMP		TAP-115
TRANSMITTER FUSE LAMP		TAP-132
TROUBLE REPORTS		
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT		TAP-132

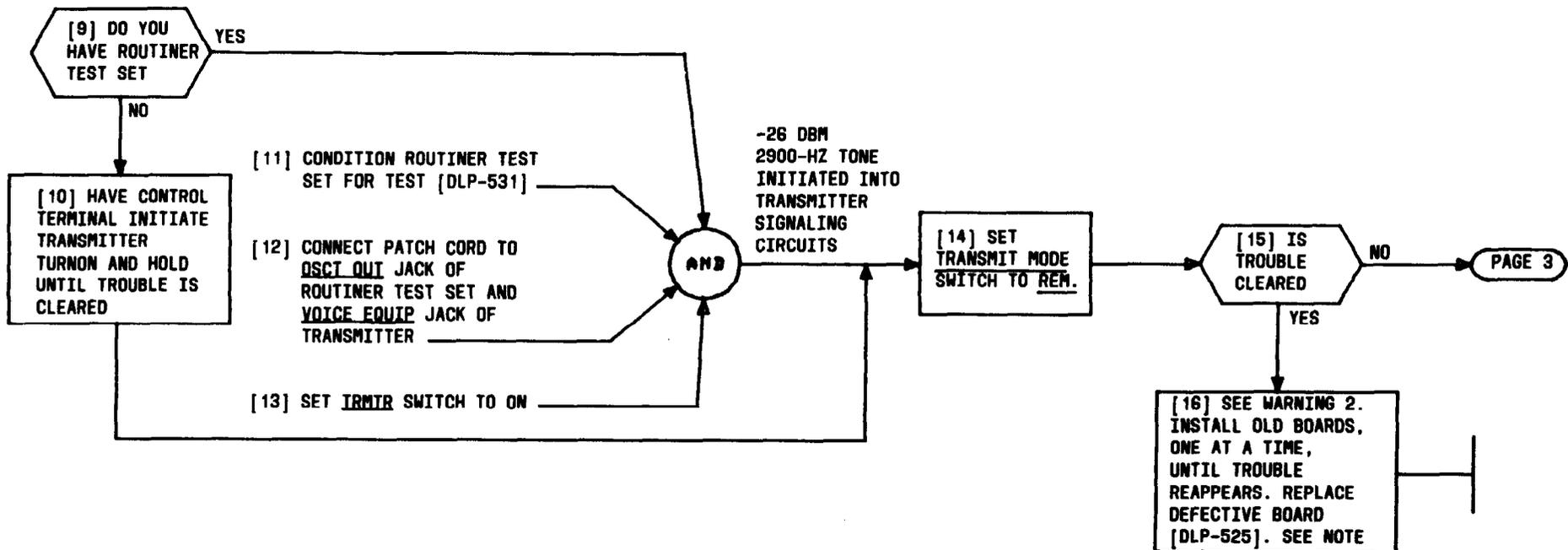
TROUBLE INDICATOR LIST - COAST STATION TRANSMITTERS



WARNING 1
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR TRANSMITTER ON AND/OR OFF TROUBLE

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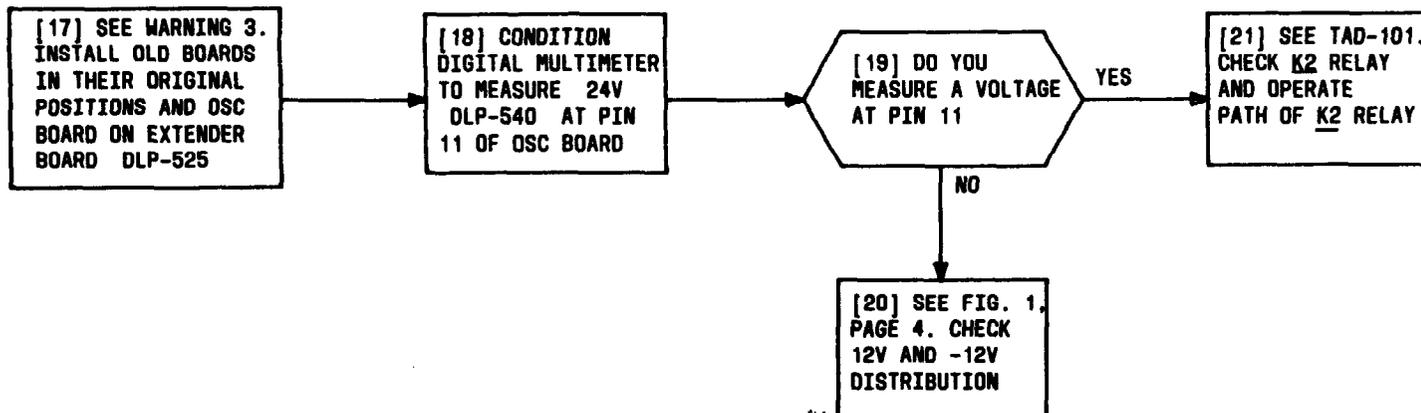


NOTE
IF AUXILIARY OR OSC
BOARDS ARE REPLACED,
ENSURE THEY ARE PROPERLY
ADJUSTED. AUXILIARY -
DLP-539, OSC - DLP-505
AND DLP-506

WARNING 2
MAIN POWER SWITCH IS SET
TO OFF [DLP-525] TO PREVENT
DAMAGE TO CIRCUIT BOARDS.
ALSO, TO PREVENT DAMAGE BY
STATIC ELECTRICITY, DO NOT
TOUCH ANY BARE SURFACE SUCH
AS CONTACT POINTS

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CLEAR TRANSMITTER ON AND/OR OFF TROUBLE

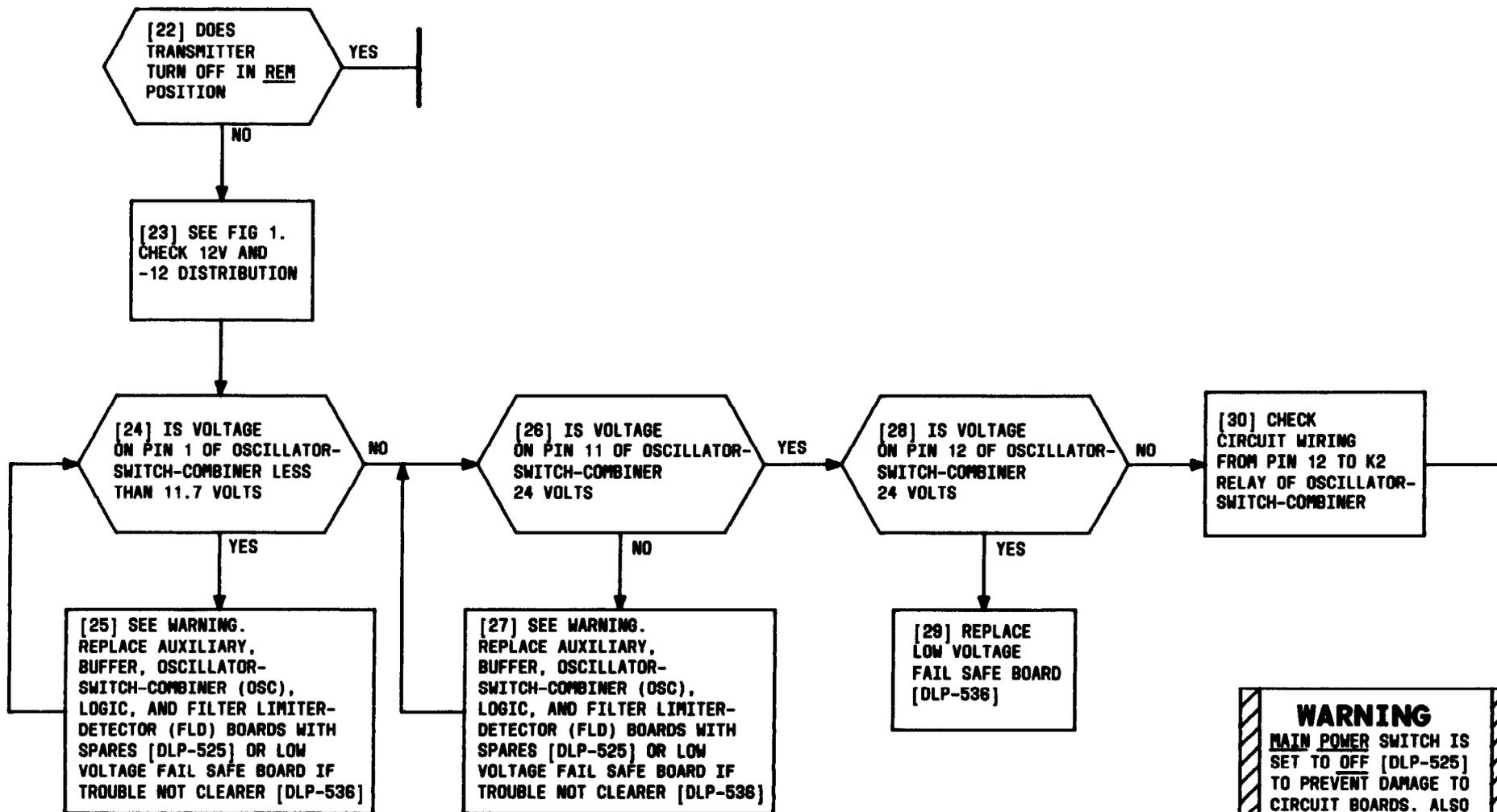


WARNING 3

MAIN POWER SWITCH IS SET TO QEE [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR TRANSMITTER ON AND/OR OFF TROUBLE



WARNING
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR TRANSMITTER ON AND/OR OFF TROUBLE

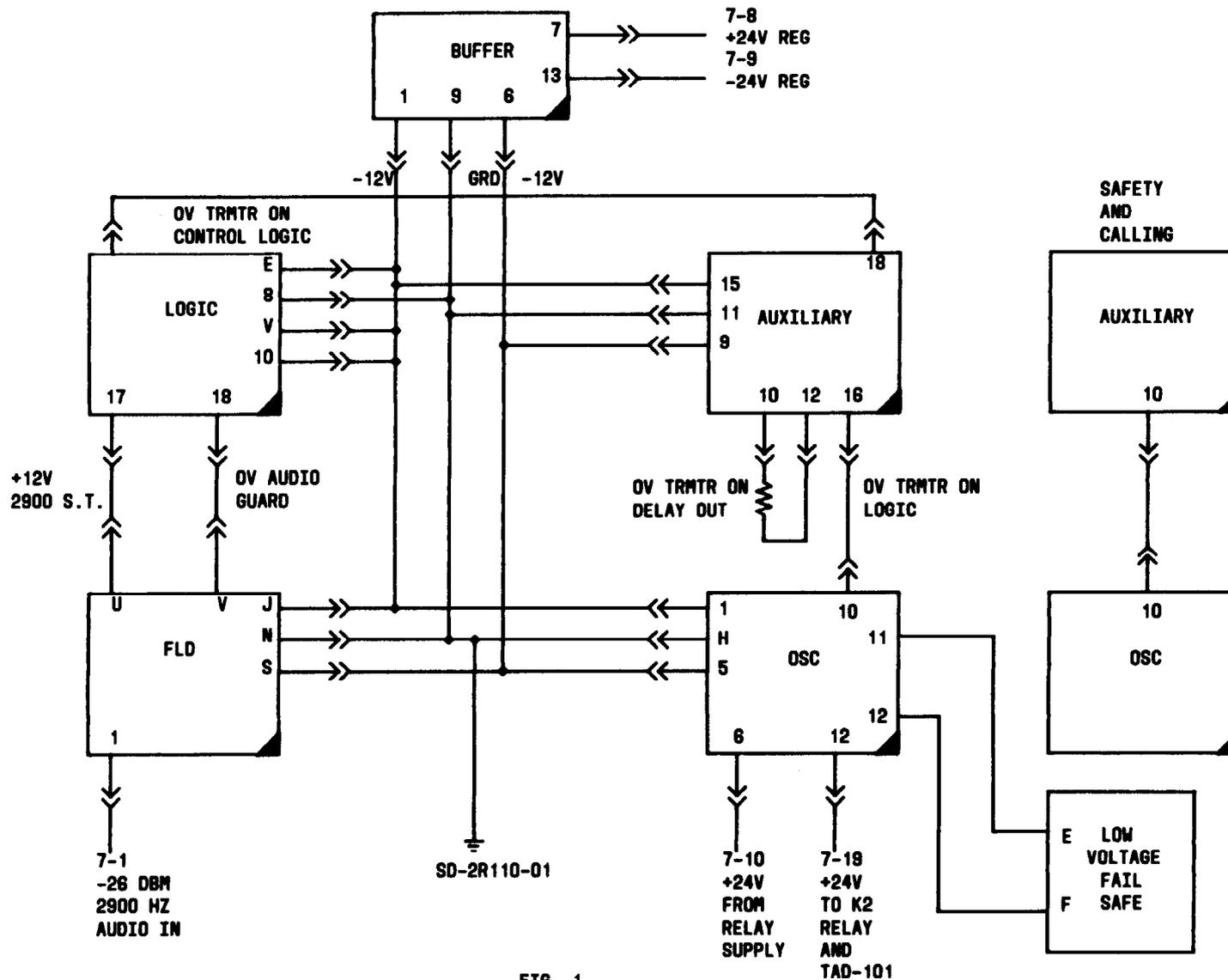
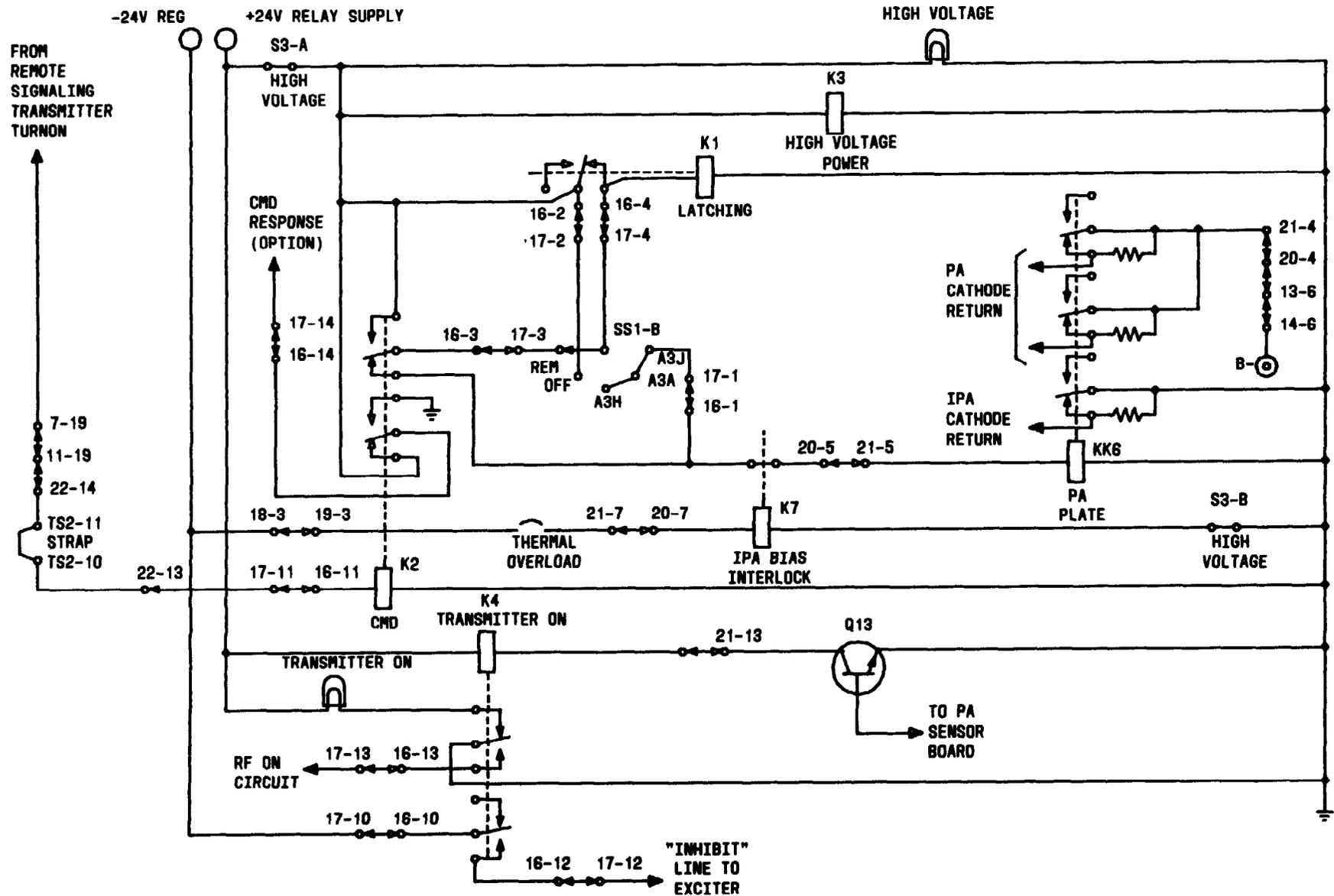


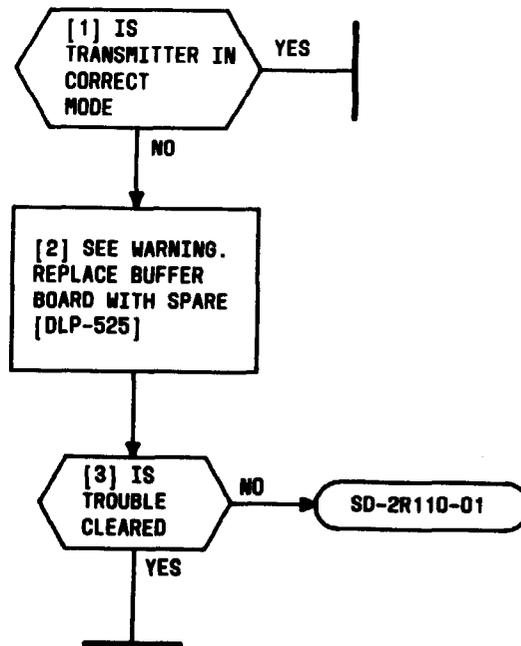
FIG. 1

CLEAR TRANSMITTER ON AND/OR OFF TROUBLE

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TRANSMITTER TORNON SCHEMATIC DIAGRAM



CLEAR MODE COMMAND TROUBLE

WARNING
MAIN POWER SWITCH IS SET TO OFF (DLP-525) TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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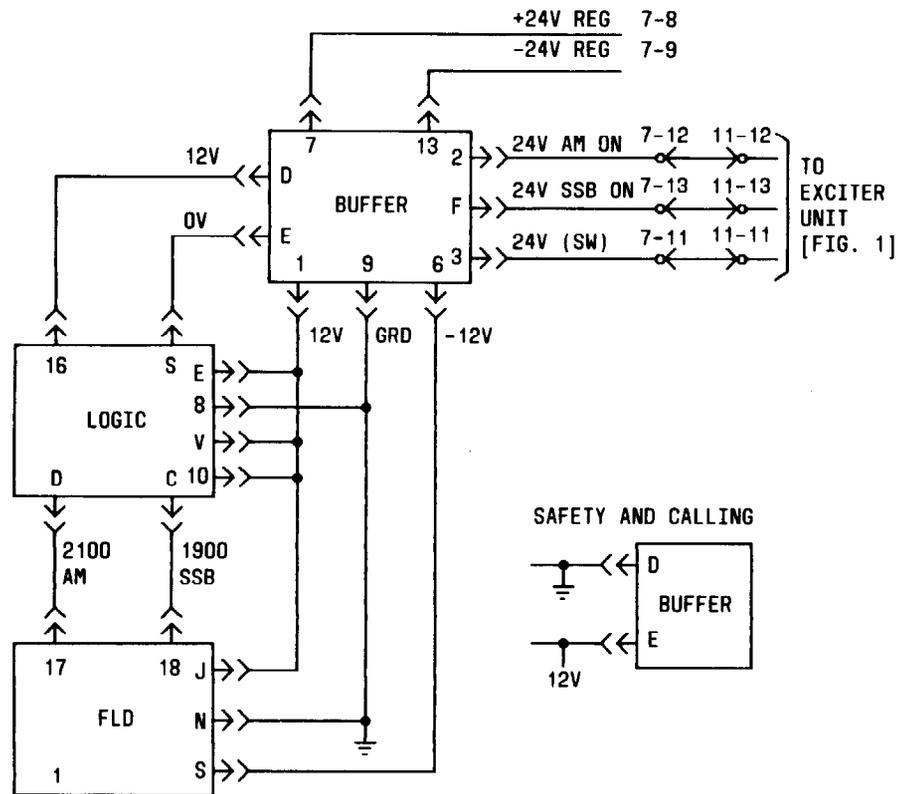
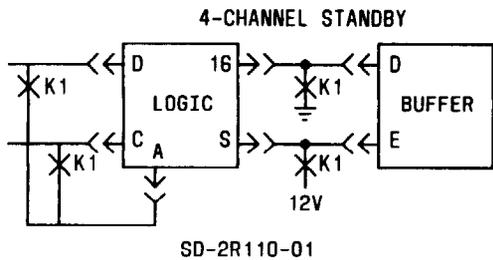


FIG. 1

7-1
-16 DBM
2100-HZ AM
1900-HZ SSB
SIGNALING
SEQUENCE SHOWN
IN FIG. 2



SD-2R110-01

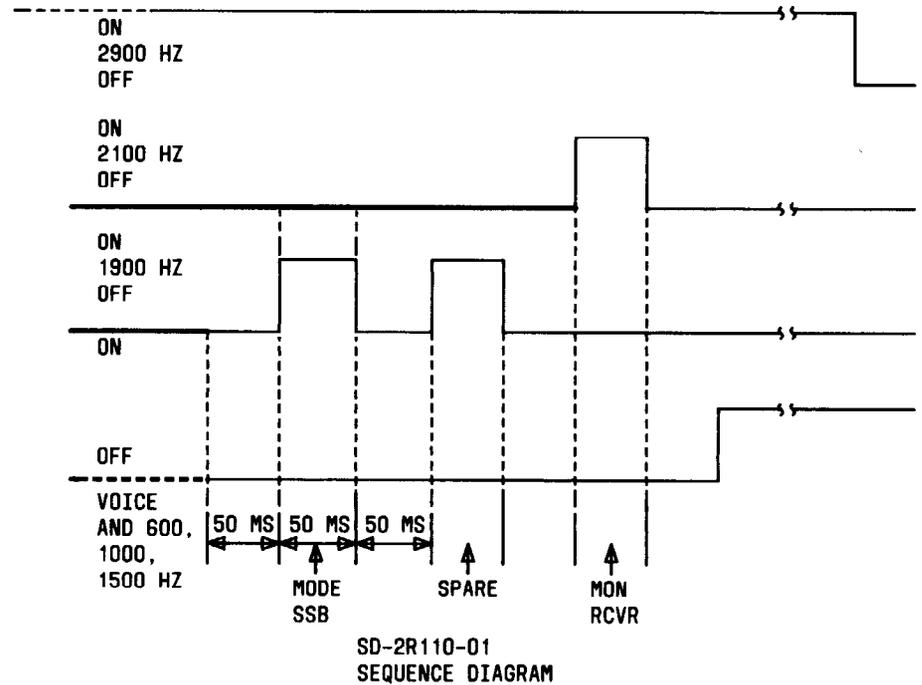


FIG. 2

CLEAR MODE COMMAND TROUBLE

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[1] SEE WARNING.
REPLACE BUFFER,
OSCILLATOR-SWITCH-
COMBINER (OSC), LOGIC,
AND FILTER-LIMITER-
DETECTOR (FLD) BOARDS
WITH SPARES [DLP-525]

[2] HAVE CONTROL
TERMINAL INITIATE
A SPARE ON AND/OR
SPARE OFF SIGNALING
SEQUENCE

[3] IS
TROUBLE
CLEARED

YES

[5] SEE WARNING.
INSTALL OLD BOARDS,
ONE AT A TIME, UNTIL
TROUBLE REAPPEARS.
REPLACE DEFECTIVE
BOARD [DLP-525 AND
NOTE]

NO

[4] SEE WARNING.
INSTALL OLD BOARDS
WITH OSC BOARD
ON EXTENDER
BOARD [DLP-525]

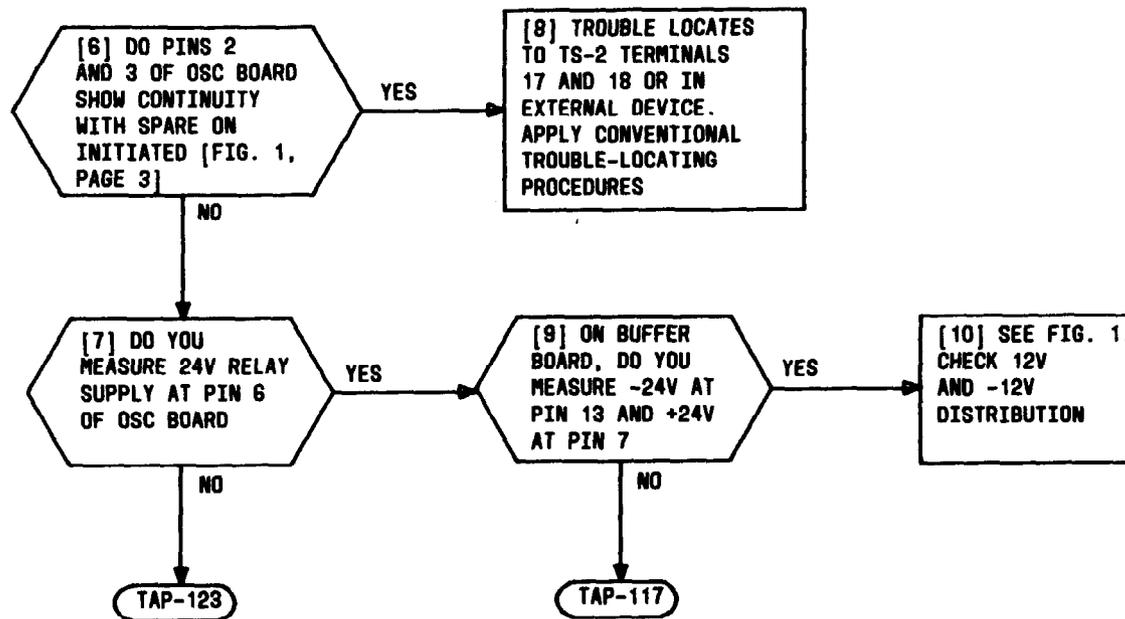
PAGE 2

WARNING
MAIN POWER SWITCH IS SET
TO OFF [DLP-525] TO PREVENT
DAMAGE TO CIRCUIT BOARDS.
ALSO, TO PREVENT DAMAGE
BY STATIC ELECTRICITY, DO
NOT TOUCH ANY BARE SURFACE
SUCH AS CONTACT POINTS

NOTE
IF NEW OSC BOARD
IS INSTALLED, ENSURE
THE BOARD IS PROPERLY
ADJUSTED. PERFORM
DLP-505 AND DLP-506

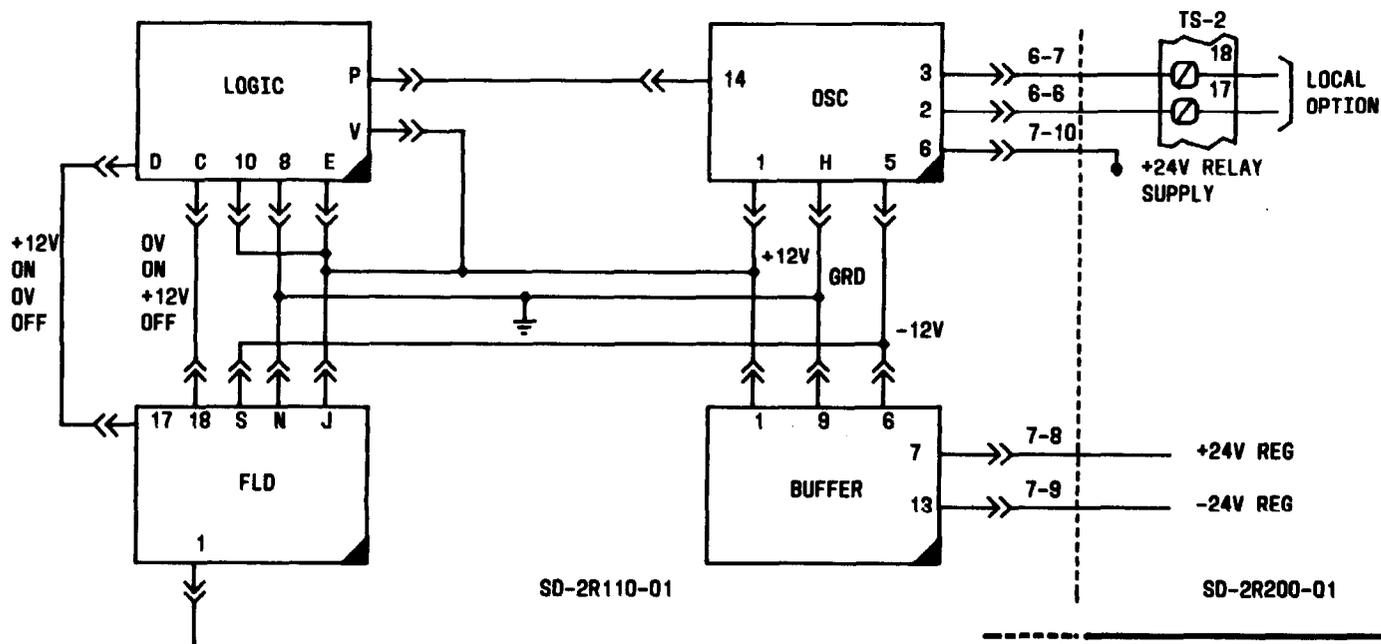
CLEAR SPARE ON/OFF COMMAND TROUBLE

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CLEAR SPARE ON/OFF COMMAND TROUBLE

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7-1
-16 DBM
2100-HZ SPARE ON
1900-HZ SPARE OFF
SIGNALING SEQUENCE
AS SHOWN IN FIG. 2

FIG. 1

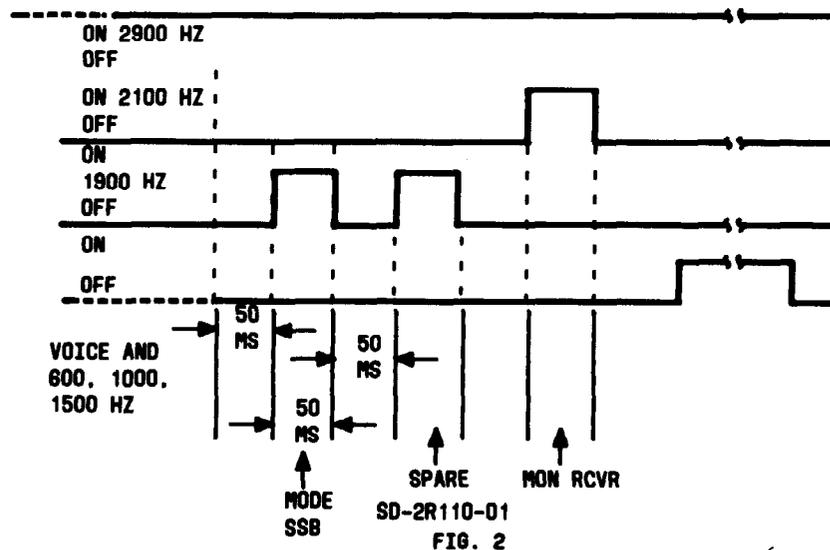
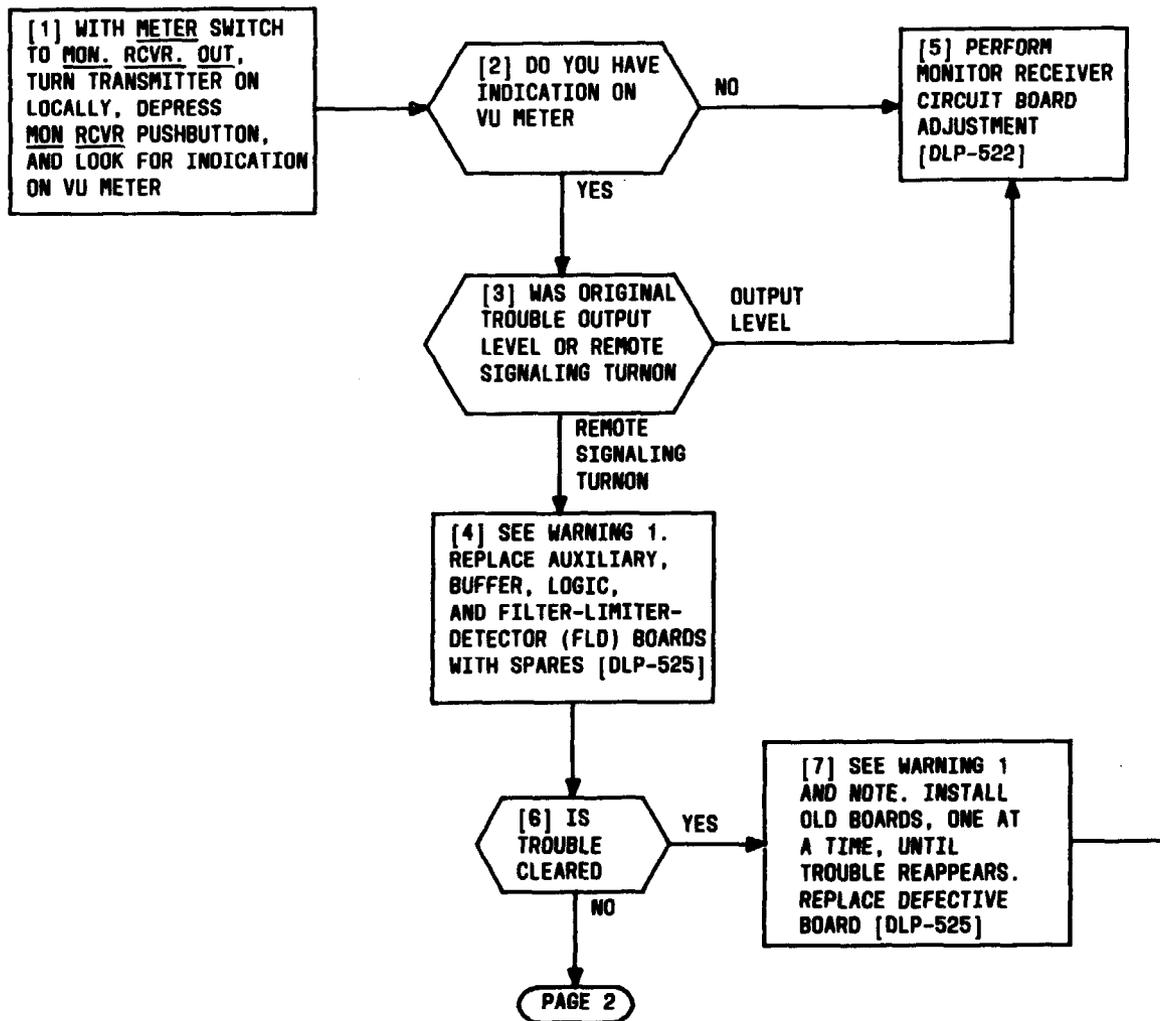


FIG. 2

CLEAR SPARE ON/OFF COMMAND TROUBLE

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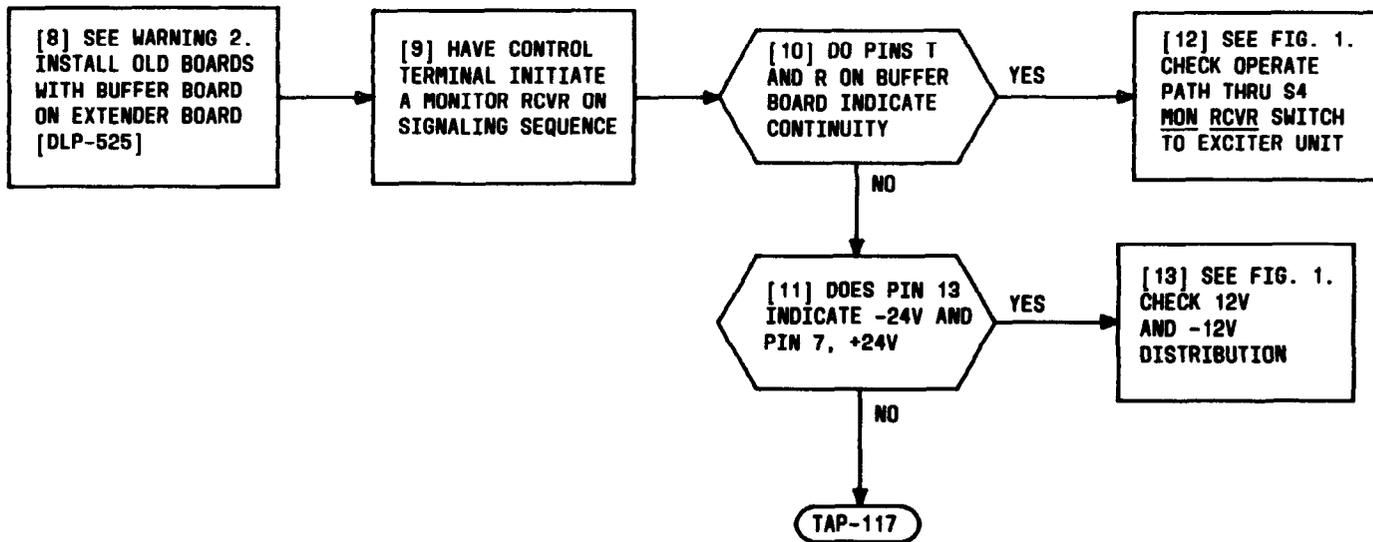


NOTE
 IF NEW AUXILIARY BOARD IS INSTALLED, ENSURE PROPER ADJUSTMENT. PERFORM DLP-539

WARNING 1
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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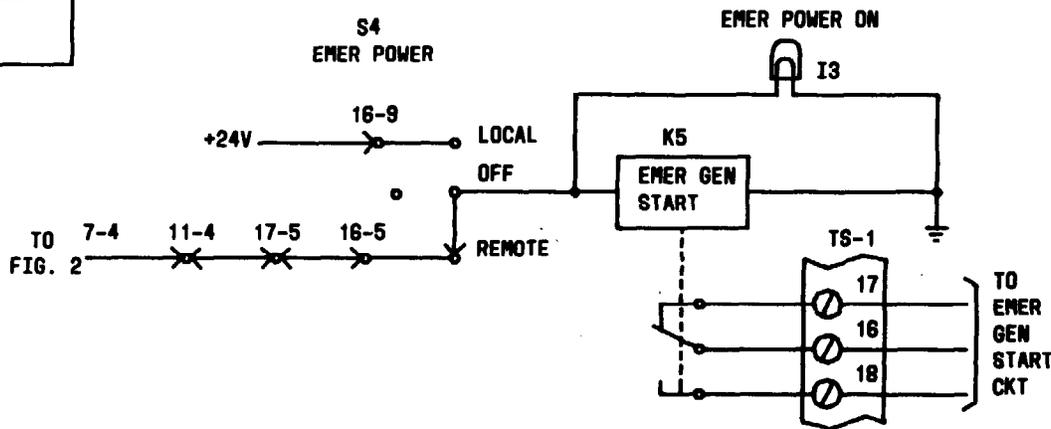
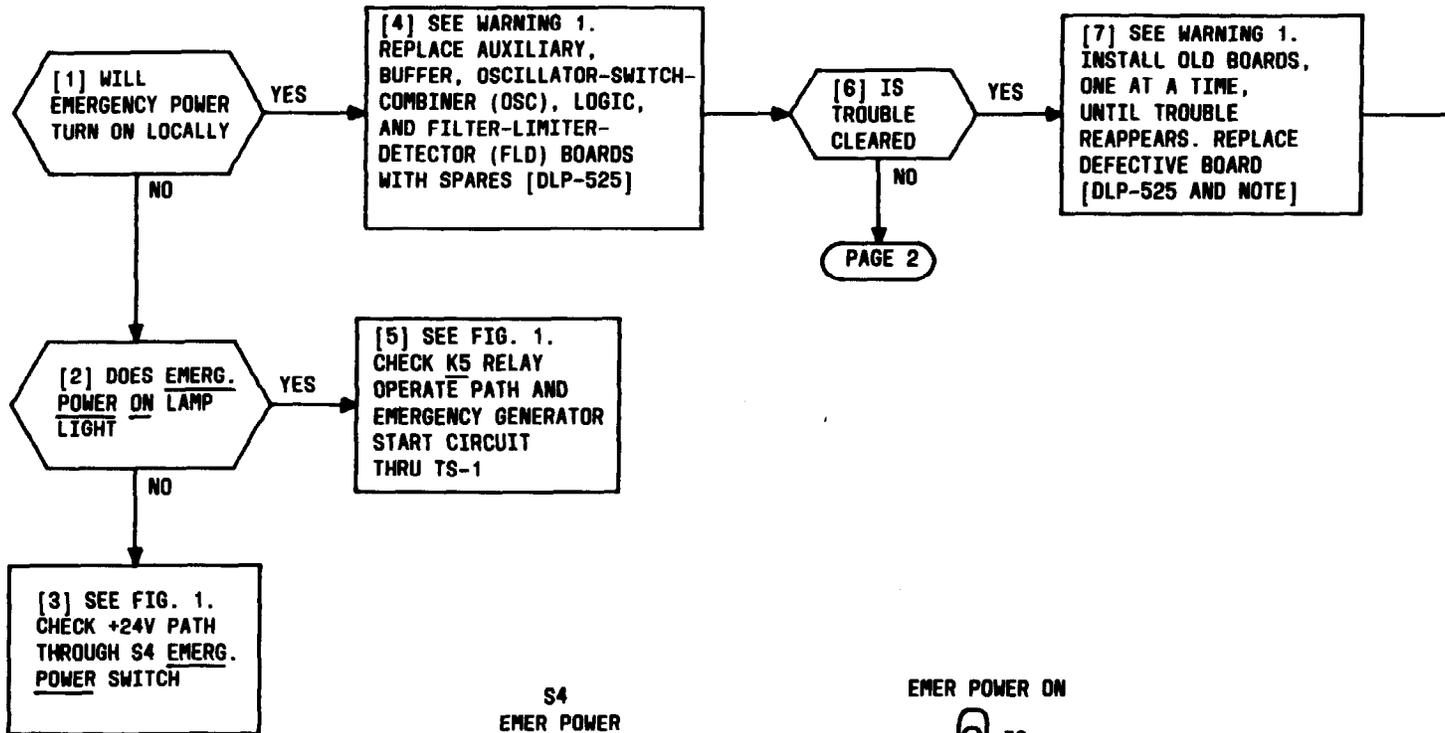
CLEAR MONITOR RECIVER ON/OFF COMMAND TROUBLE



WARNING 2
 MAIN POWER SWITCH IS SET
 TO OFF [DLP-525] TO PREVENT
 DAMAGE TO CIRCUIT BOARDS.
 ALSO, TO PREVENT DAMAGE
 BY STATIC ELECTRICITY, DO
 NOT TOUCH ANY BARE SURFACE
 SUCH AS CONTACT POINTS

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CLEAR MONITOR RECEIVER ON/OFF COMMAND TROUBLE



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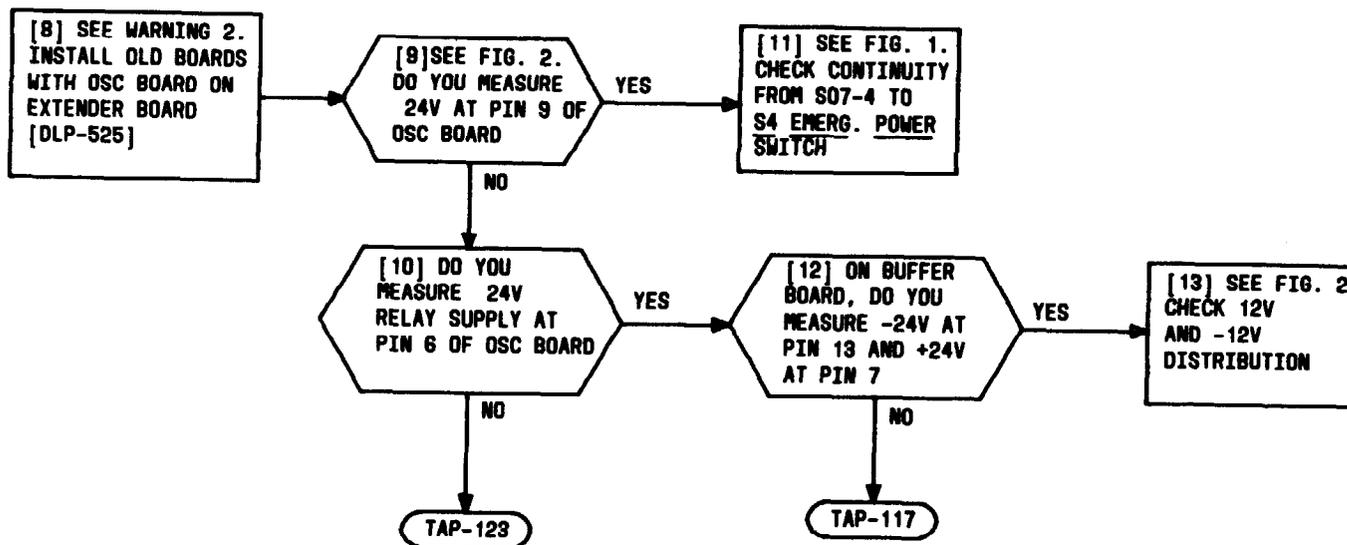
FIG. 1

NOTE
 IF AUXILIARY OR OSC BOARDS ARE REPLACED, ENSURE THEY ARE PROPERLY ADJUSTED.
 AUXILIARY - DLP-539; OSC - DLP-505 AND DLP-506

WARNING 1
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR EMERGENCY POWER ON COMMAND TROUBLE

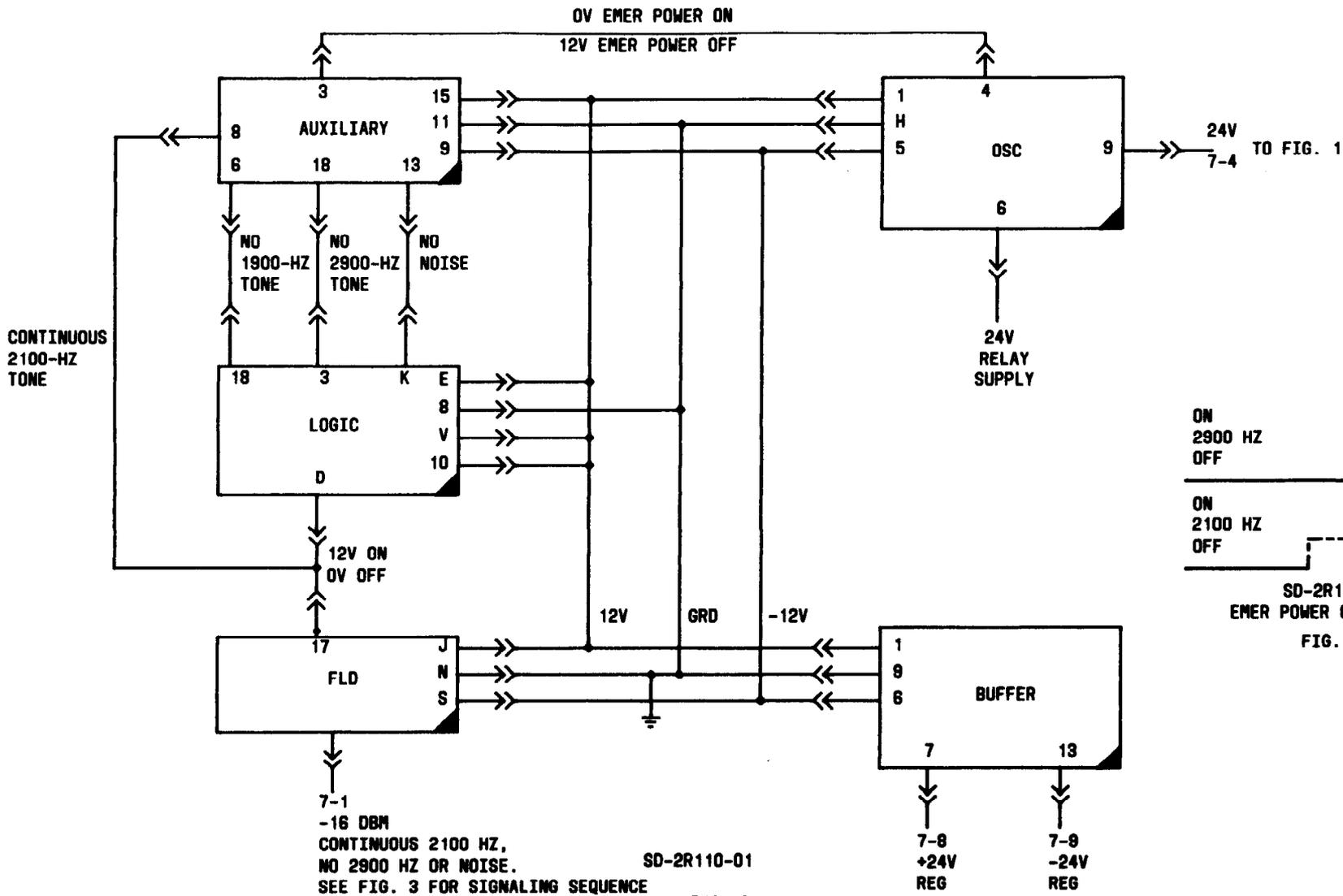


WARNING 2

MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

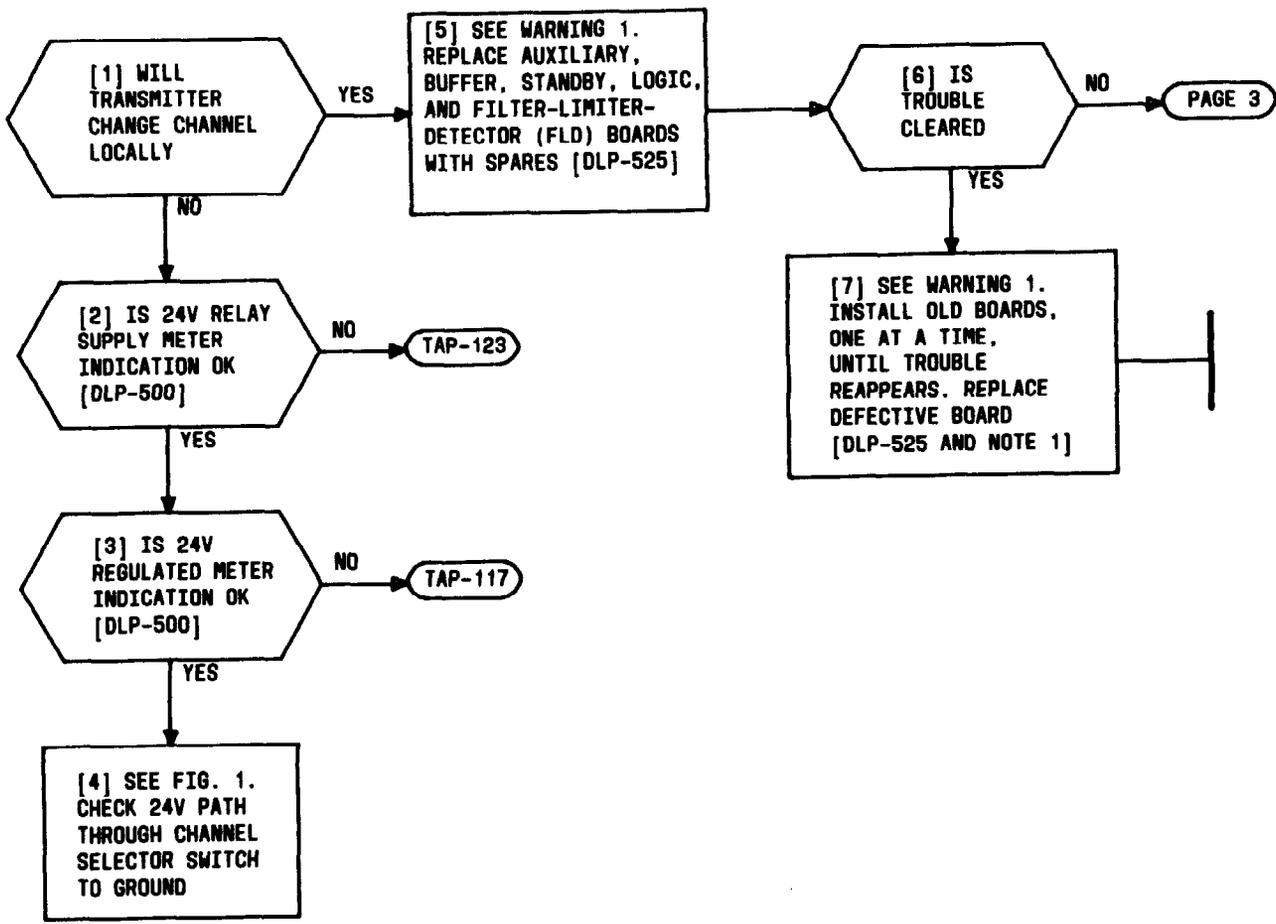
CLEAR EMERGENCY POWER ON COMMAND TROUBLE

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CLEAR EMERGENCY POWER ON COMMAND TROUBLE

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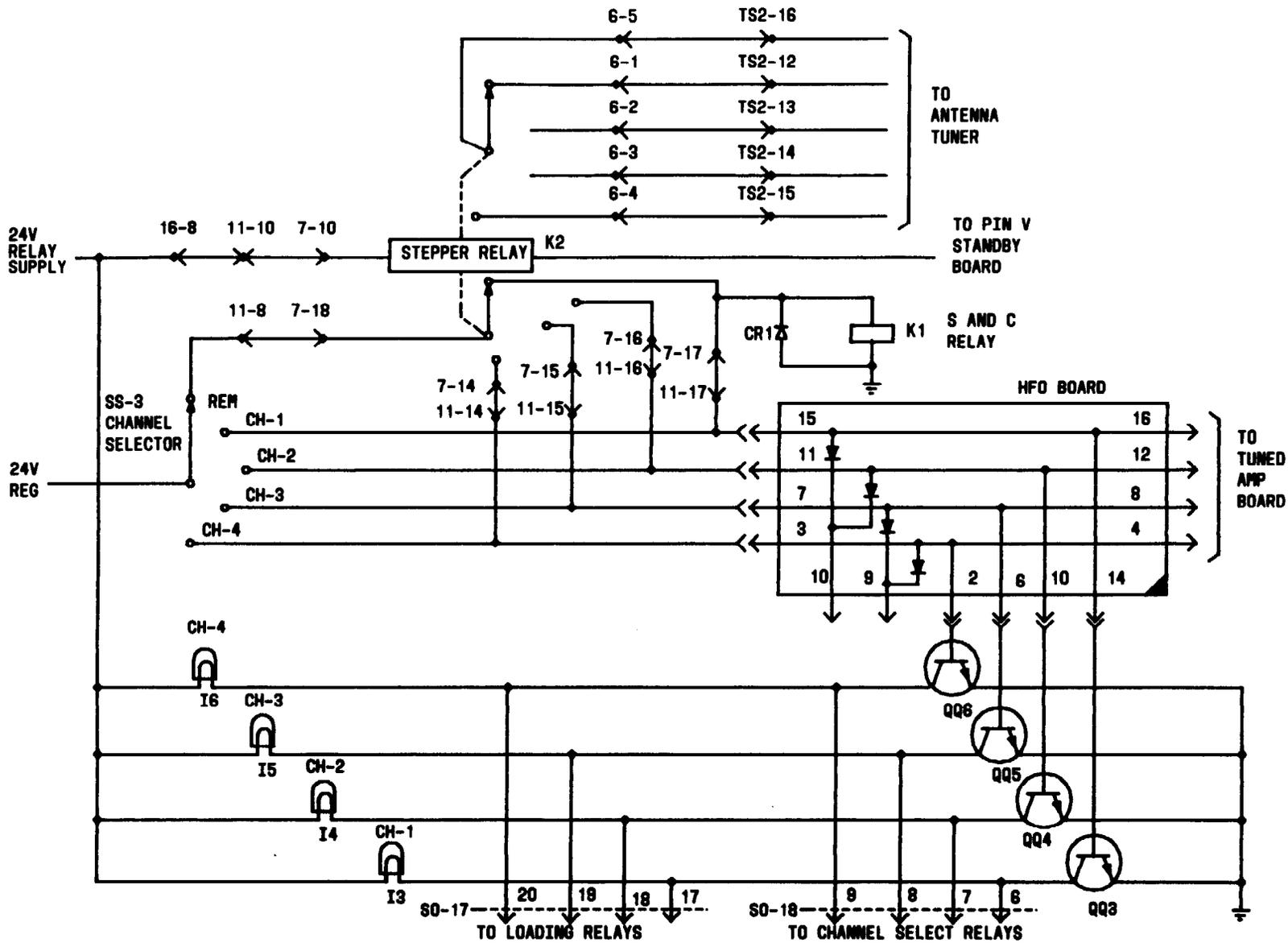


NOTE 1
IF AUXILIARY BOARD IS REPLACED, PERFORM DLP-539

WARNING 1
MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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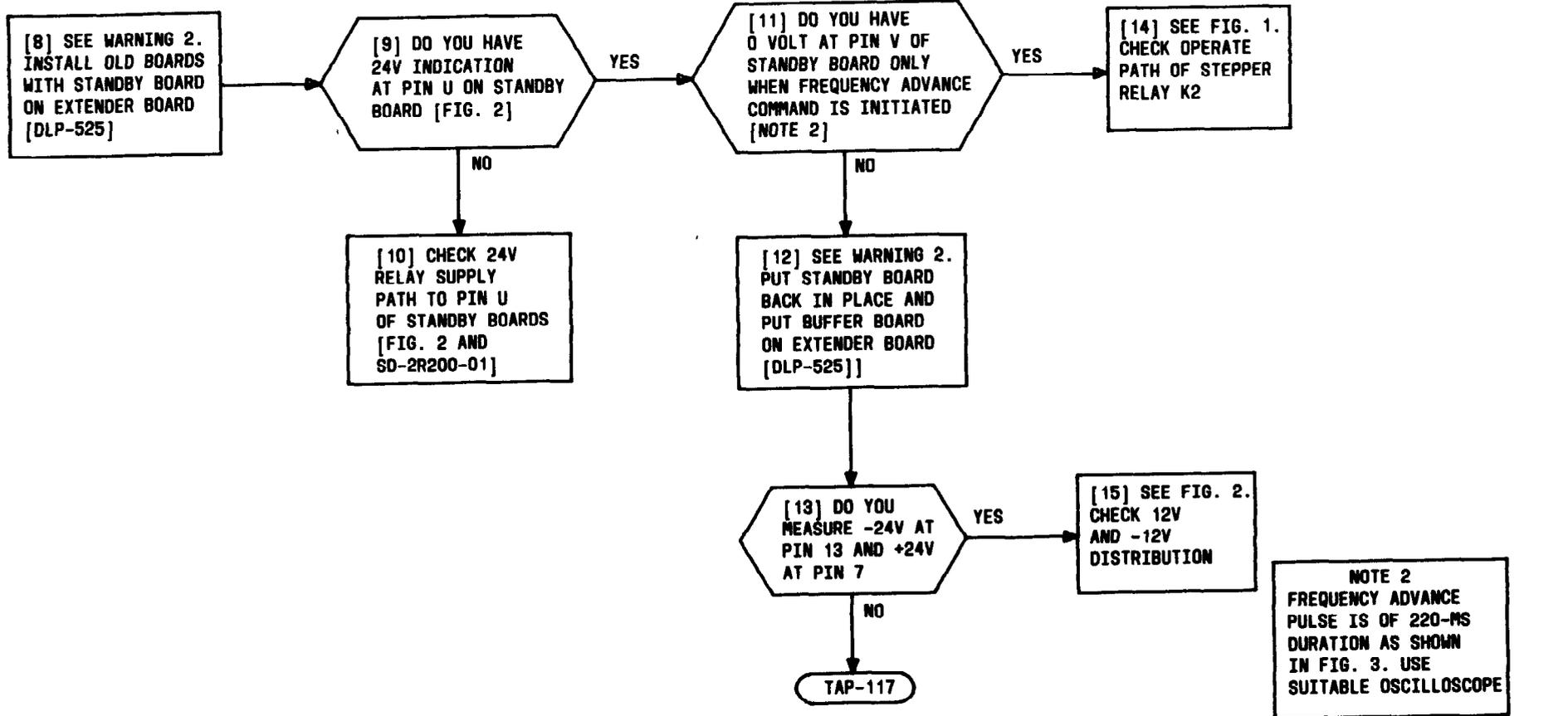
CLEAR FREQUENCY ADVANCE COMMAND TROUBLE



SD-2R200-01
FIG. 1

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE

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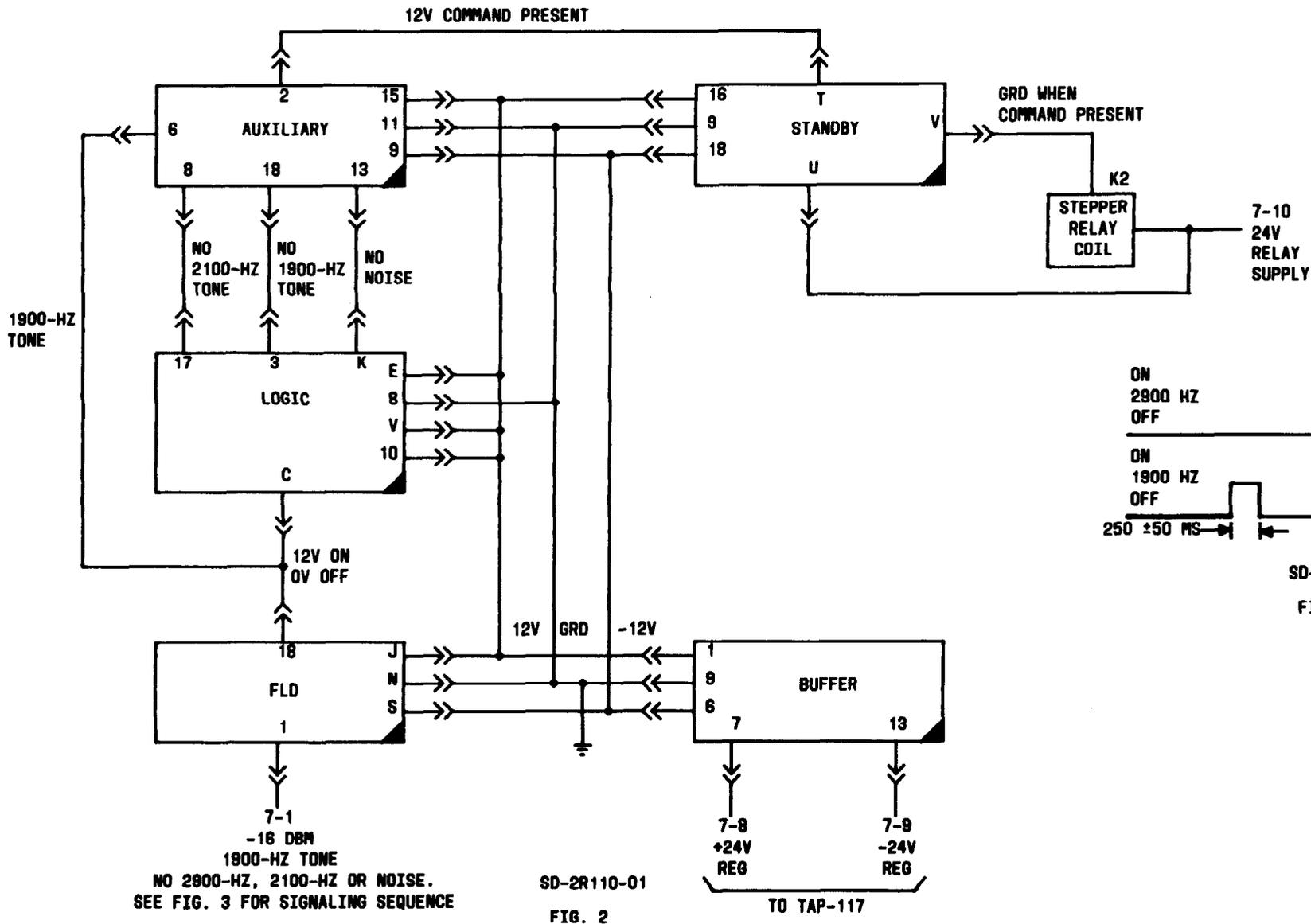


NOTE 2
FREQUENCY ADVANCE
PULSE IS OF 220-MS
DURATION AS SHOWN
IN FIG. 3. USE
SUITABLE OSCILLOSCOPE

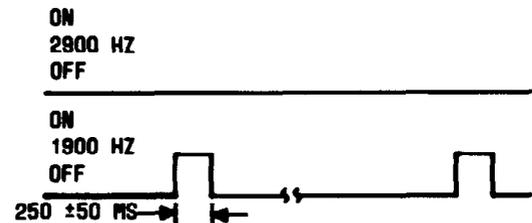
WARNING 2
MAIN POWER SWITCH IS SET TO
OFF [DLP-525] TO PREVENT DAMAGE
TO CIRCUIT BOARDS. ALSO, TO
PREVENT DAMAGE BY STATIC
ELECTRICITY, DO NOT TOUCH ANY
BARE SURFACE SUCH AS CONTACT
POINTS

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CLEAR FREQUENCY ADVANCE COMMAND TROUBLE



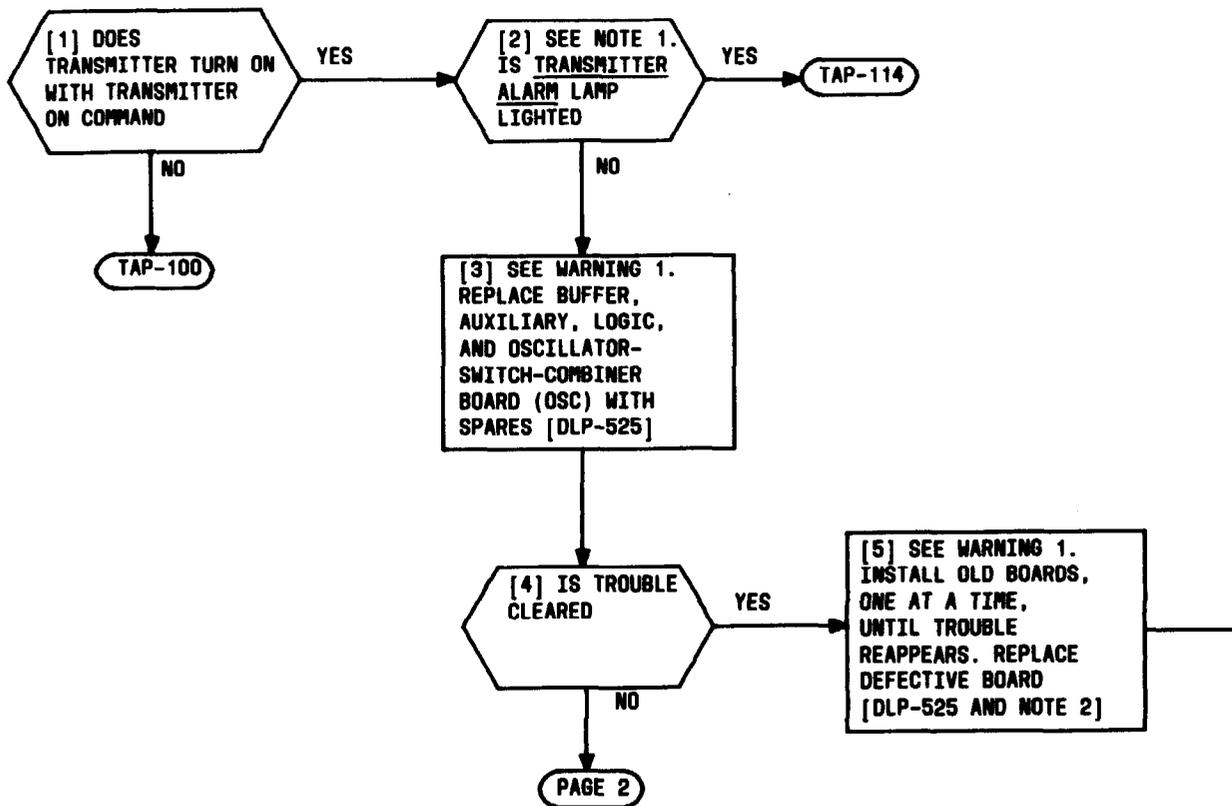
SD-2R110-01
FIG. 2



SD-2R110-01
FIG. 3

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE

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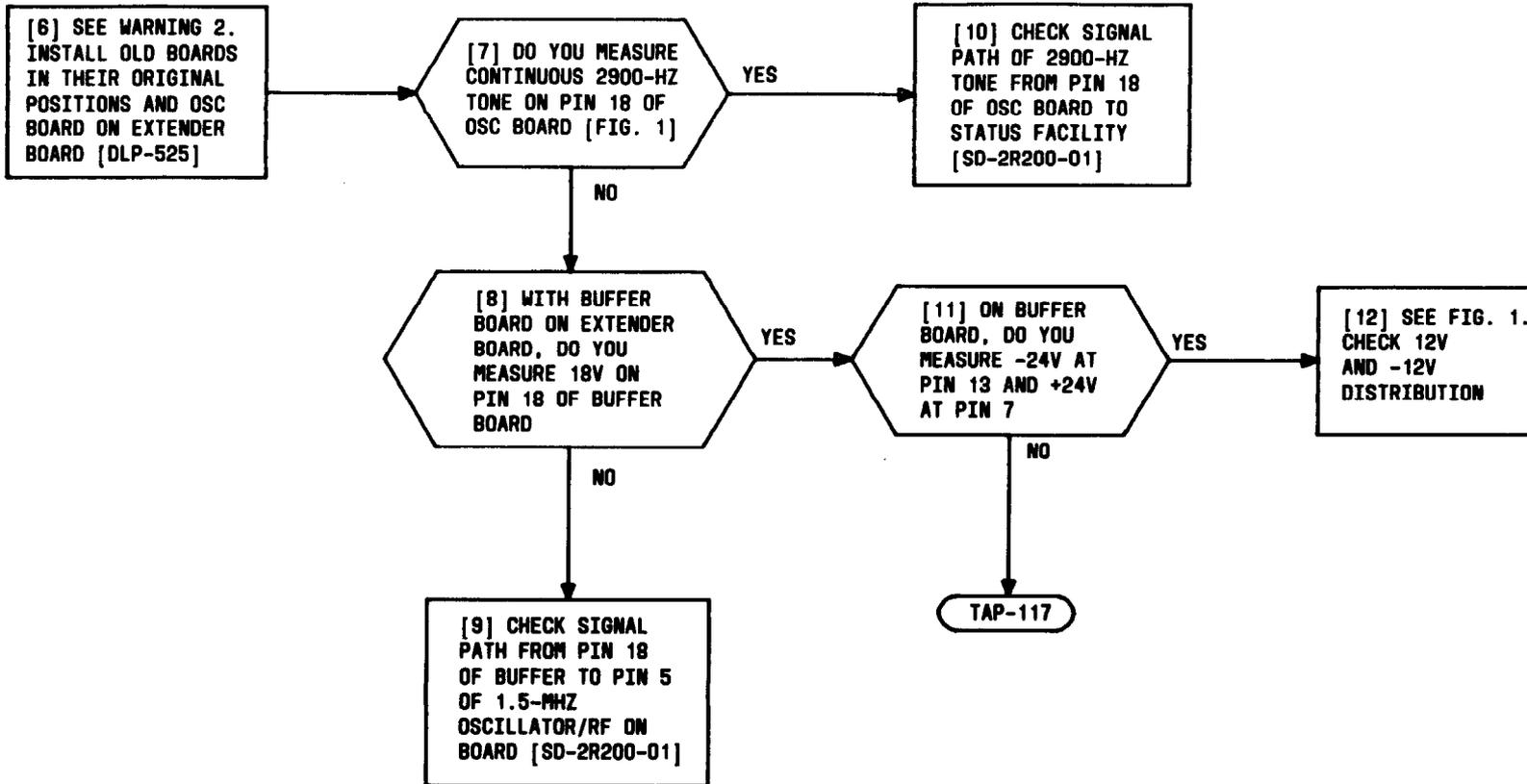
- NOTES**
1. ENSURE TRANSMITTER ALARM LAMP IS NOT BURNED OUT
 2. IF AUXILIARY BOARD IS REPLACED, PERFORM DLP-539. IF OSC BOARD IS REPLACED, PERFORM DLP-505 AND DLP-506

WARNING 1

MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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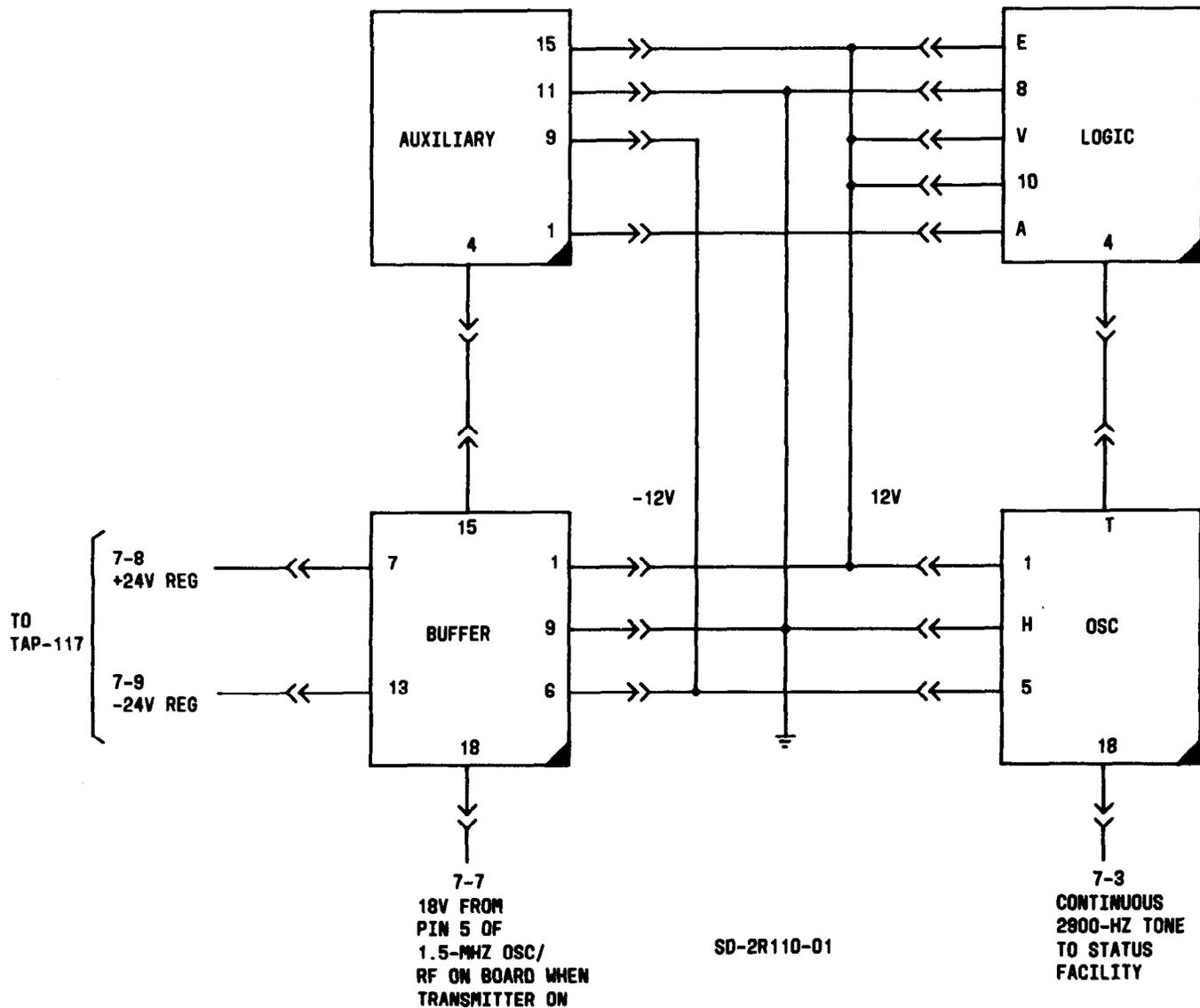
CLEAR RF ON STATUS TROUBLE



WARNING 2
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR RF ON STATUS TROUBLE

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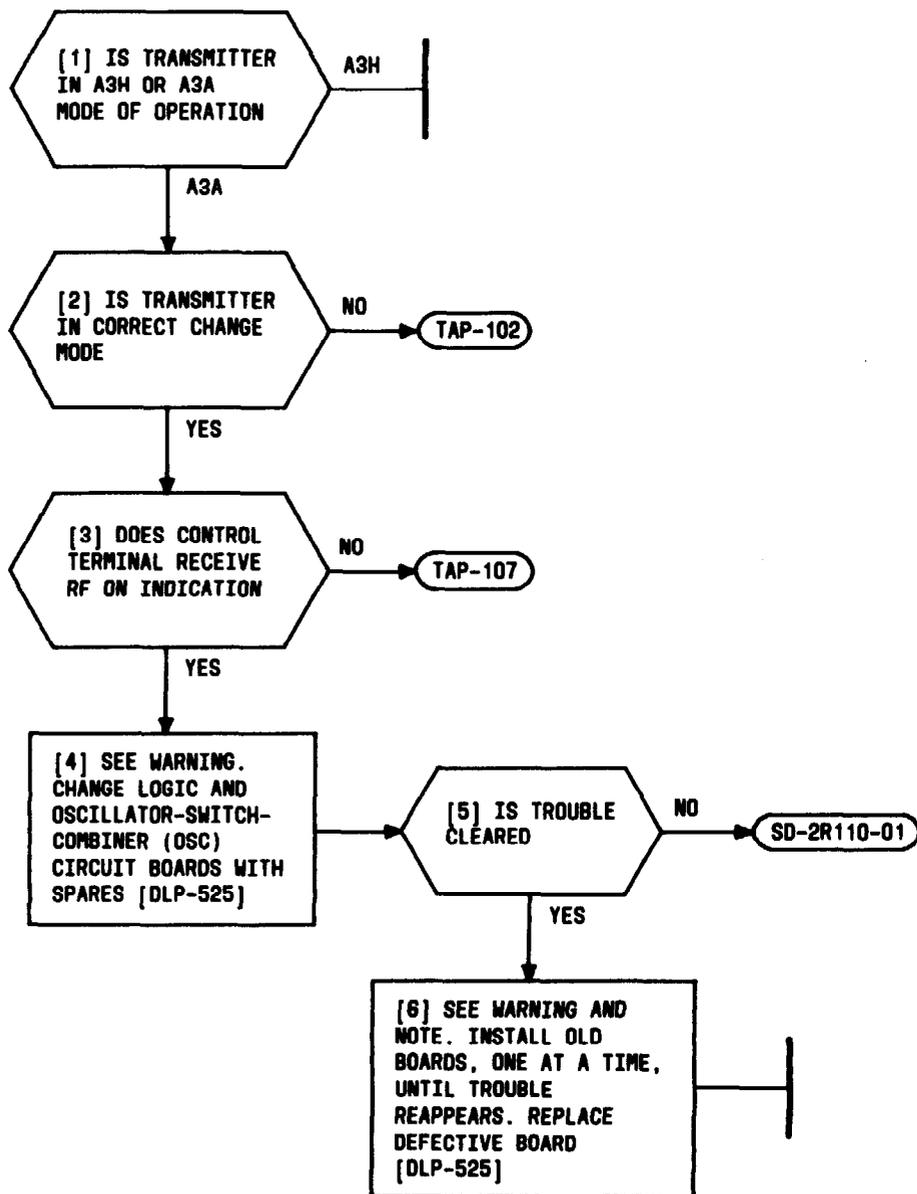


SD-2R110-01

FIG. 1

CLEAR RF ON STATUS TROUBLE

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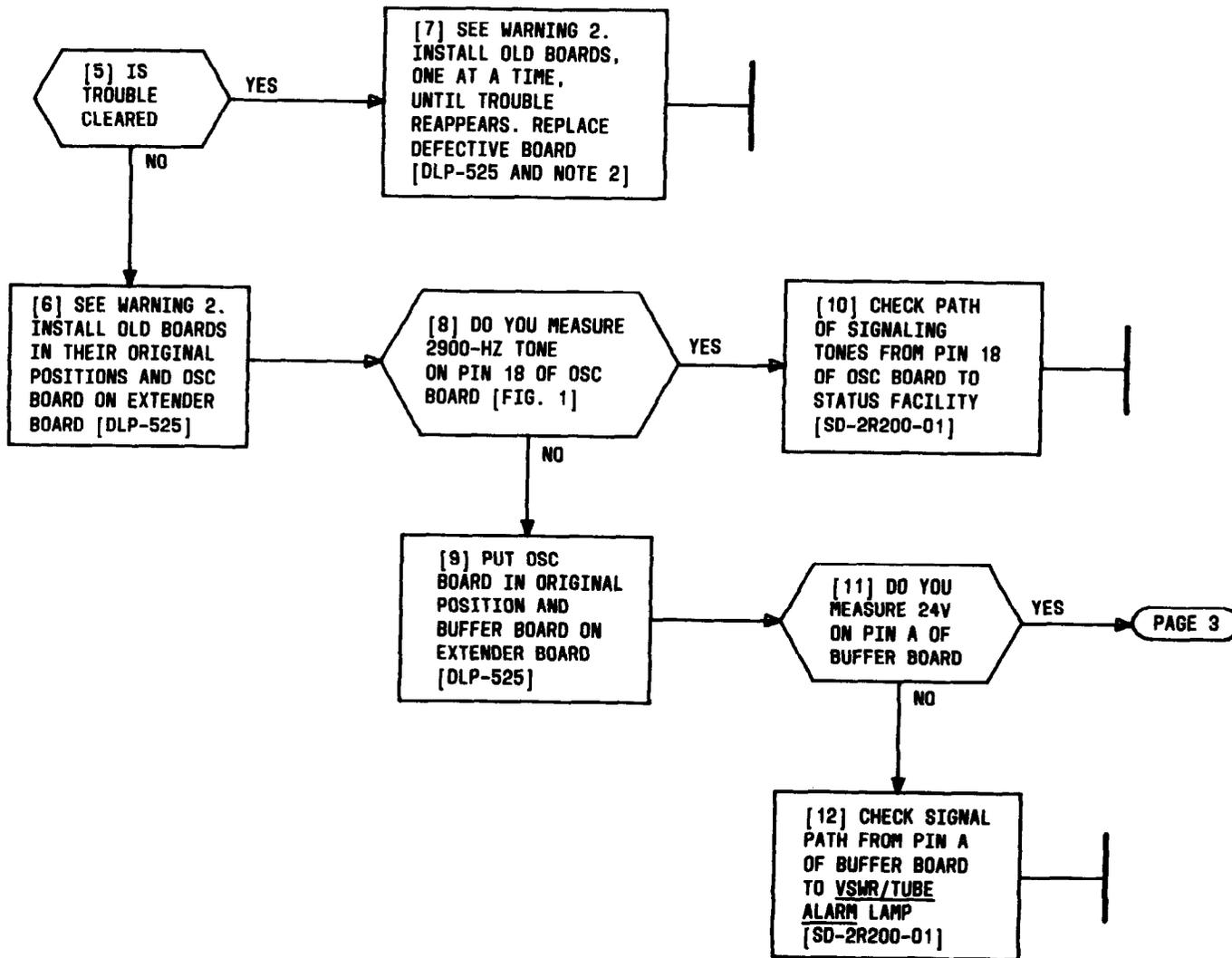


NOTE
IF OSC BOARD IS
REPLACED, PERFORM
DLP-505 AND
DLP-506

WARNING
MAIN POWER SWITCH IS SET TO OFF
[DLP-525] TO PREVENT DAMAGE TO
CIRCUIT BOARDS. ALSO, TO PREVENT
DAMAGE BY STATIC ELECTRICITY, DO
NOT TOUCH ANY BARE SURFACE SUCH
AS CONTACT POINTS

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CLEAR MODE STATUS TROUBLE



NOTE 2
IF AUXILIARY OR OSC BOARDS ARE REPLACED, ENSURE THEY ARE PROPERLY ADJUSTED.
AUXILIARY - DLP-539; OSC - DLP-505 AND DLP-506

WARNING 2
MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR VSWR STATUS TROUBLE

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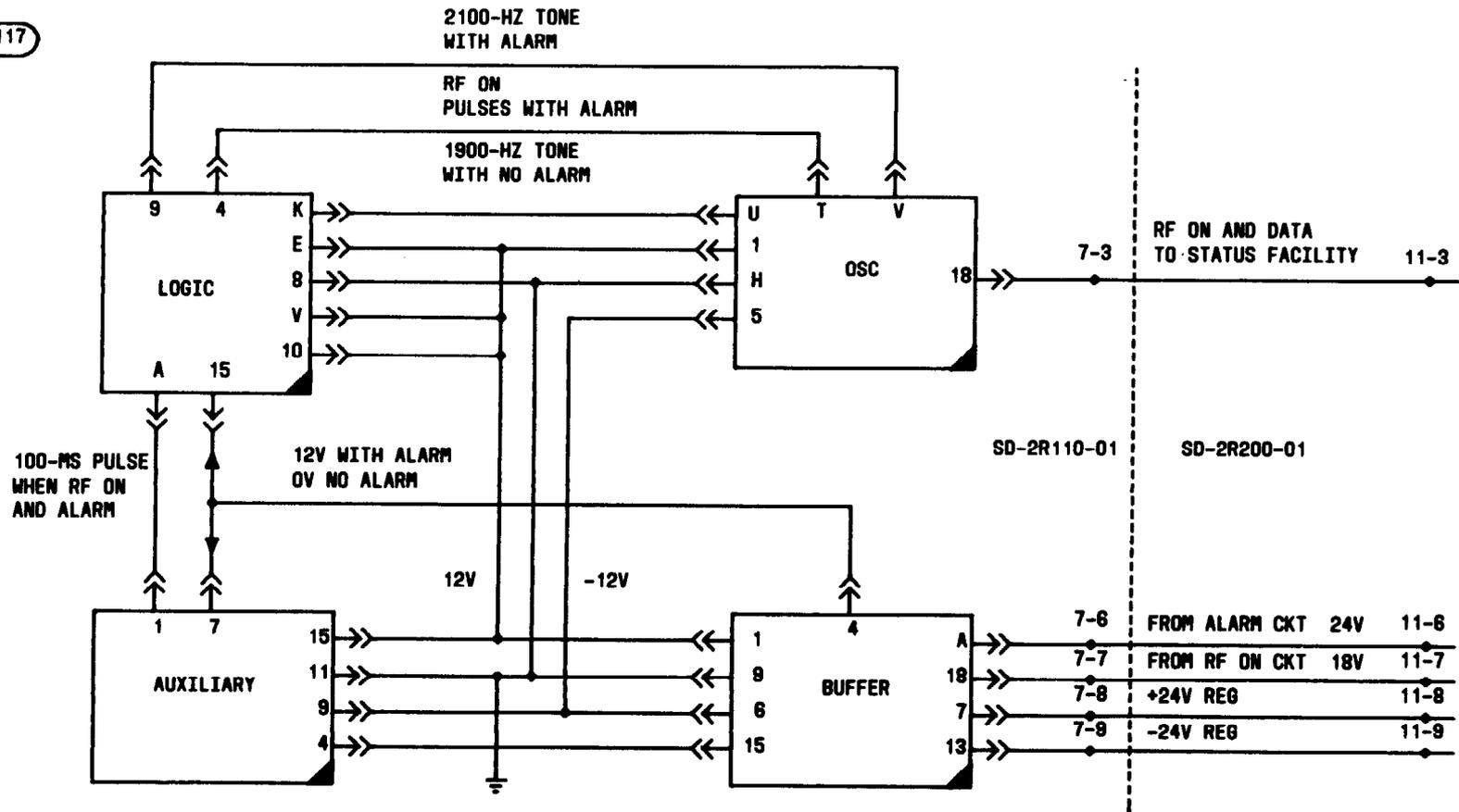
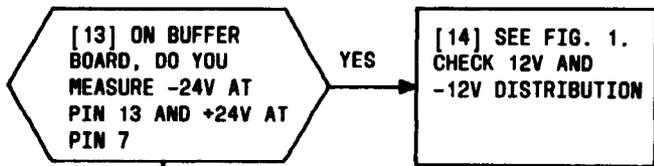
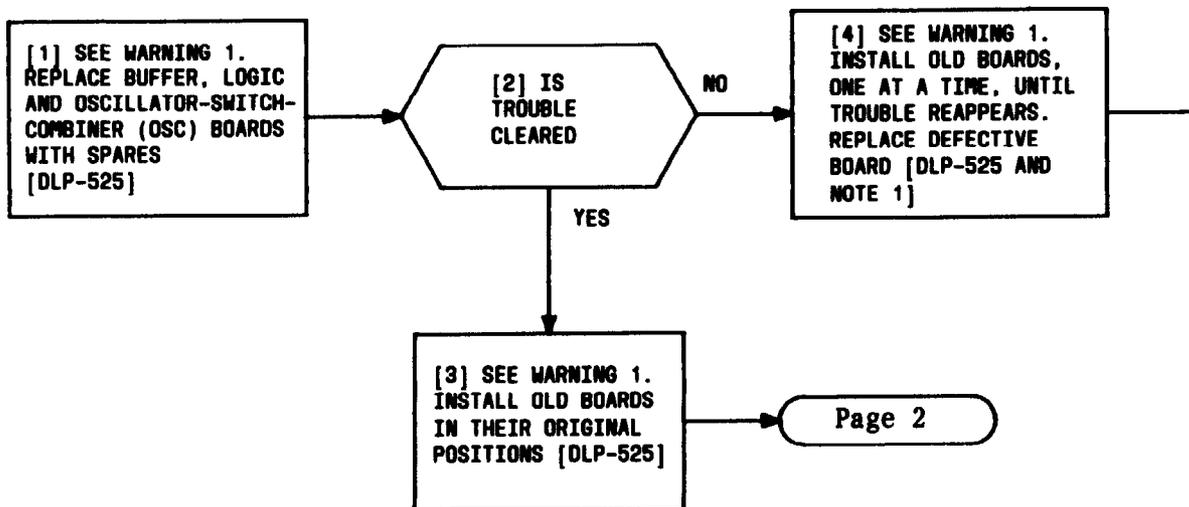


FIG. 1

CLEAR VSWR STATUS TROUBLE

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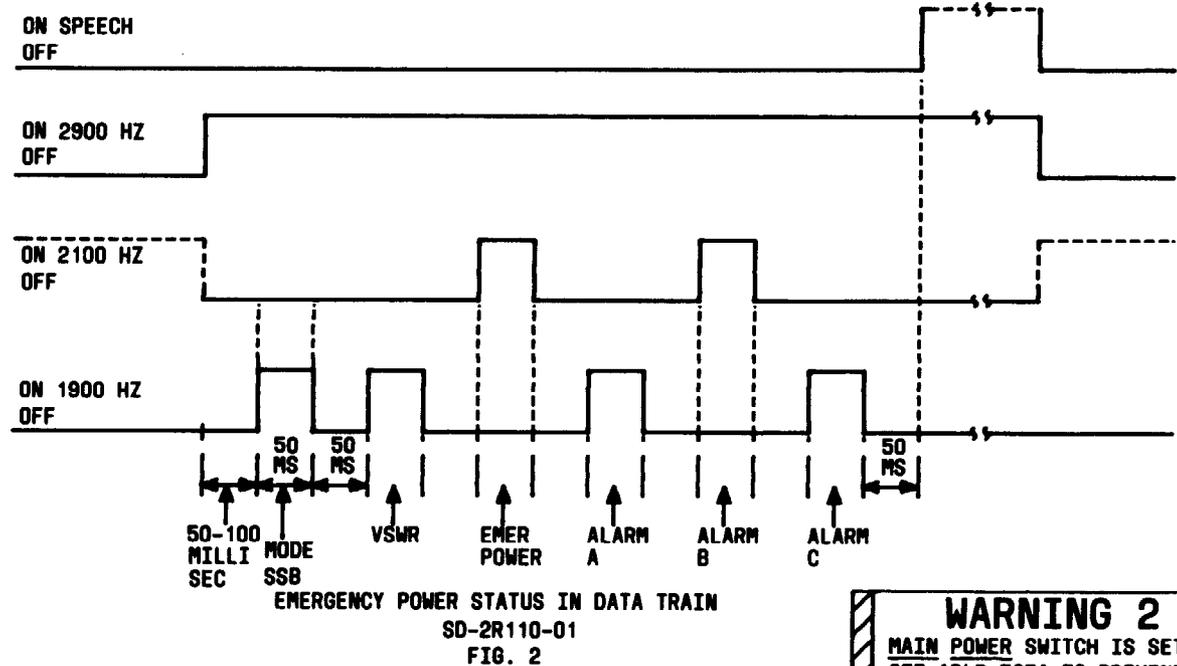
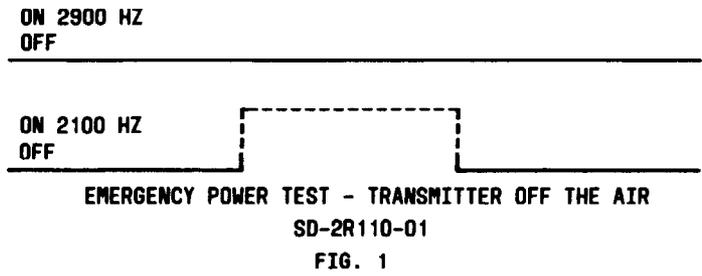
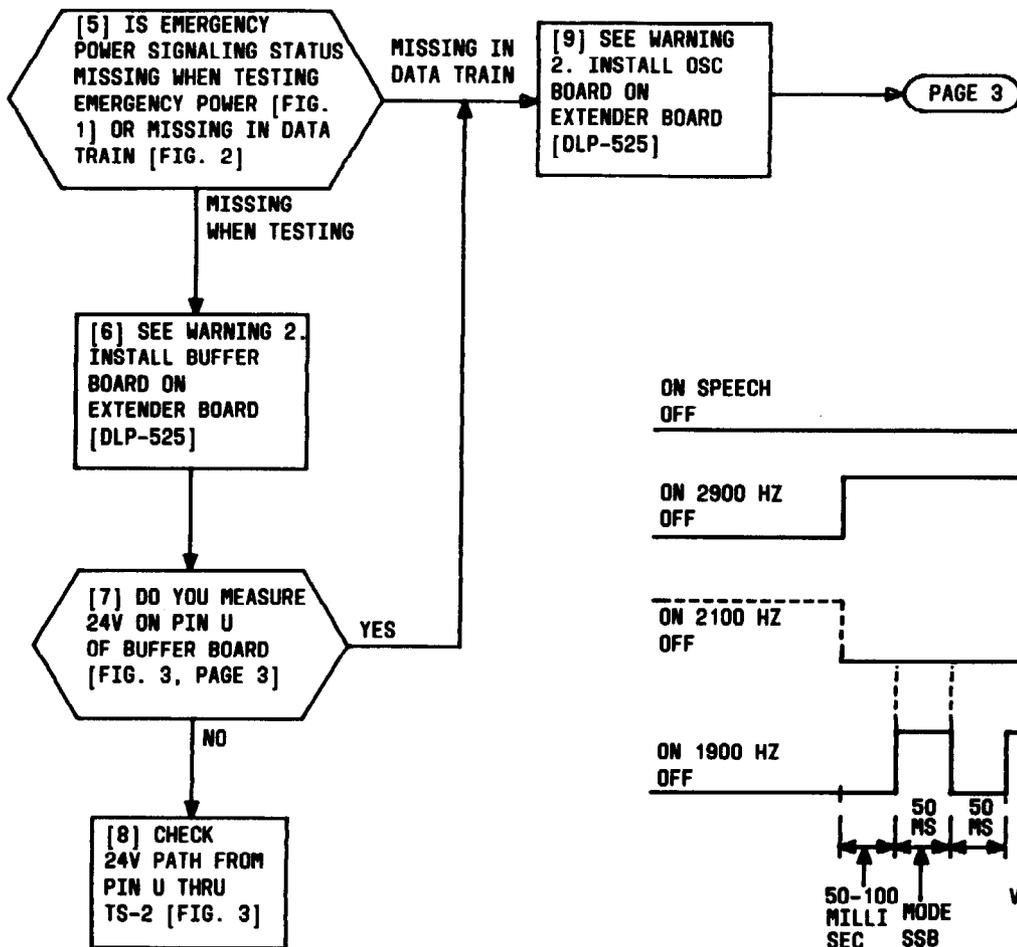


NOTE 1
IF OSC BOARD IS REPLACED,
PERFORM DLP-505 AND
DLP-506

WARNING 1
MAIN POWER SWITCH IS
SET TO OFF [DLP-525]
TO PREVENT DAMAGE TO
CIRCUIT BOARDS. ALSO,
TO PREVENT DAMAGE BY
STATIC ELECTRICITY,
DO NOT TOUCH ANY BARE
SURFACE SUCH AS
CONTACT POINTS

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CLEAR EMERGENCY POWER ON STATUS TROUBLE



WARNING 2
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR EMERGENCY POWER ON STATUS TROUBLE

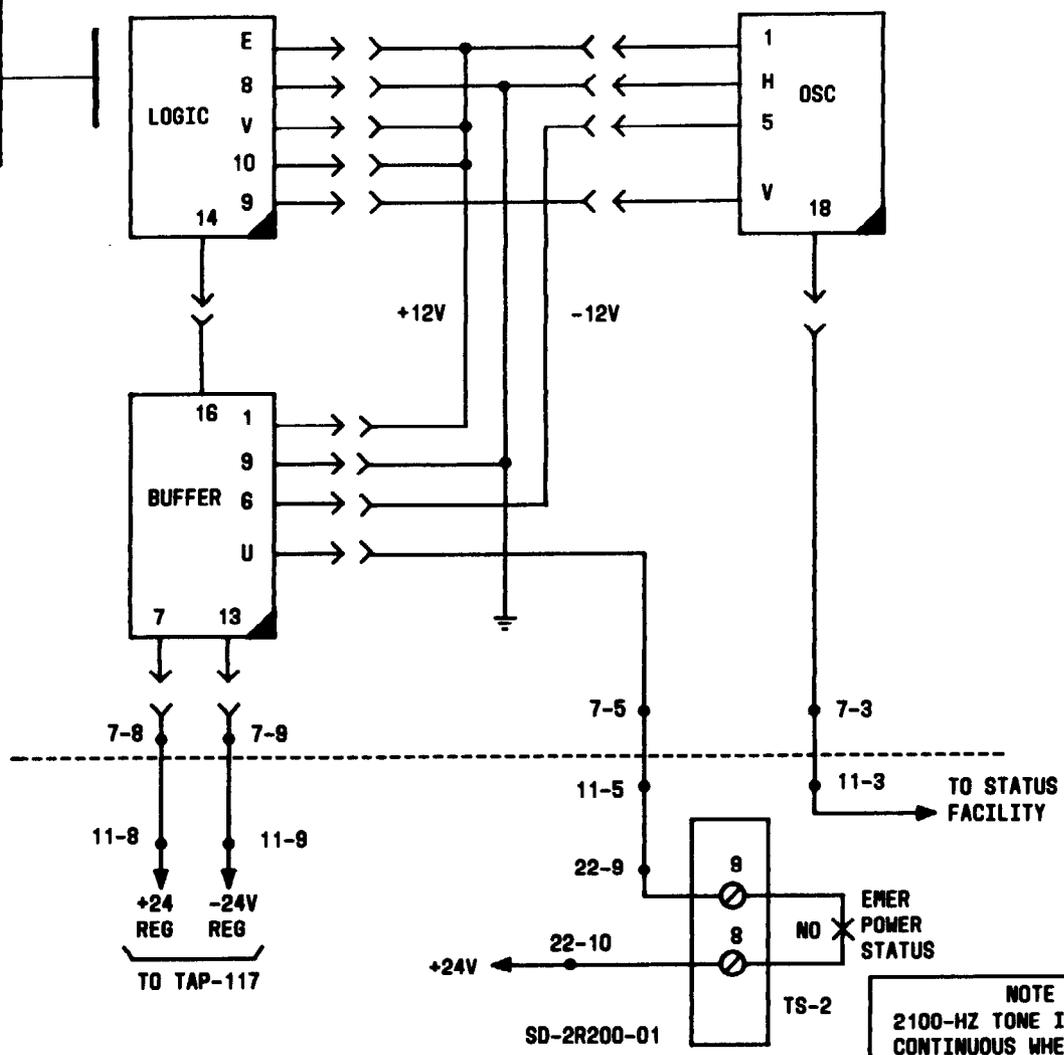
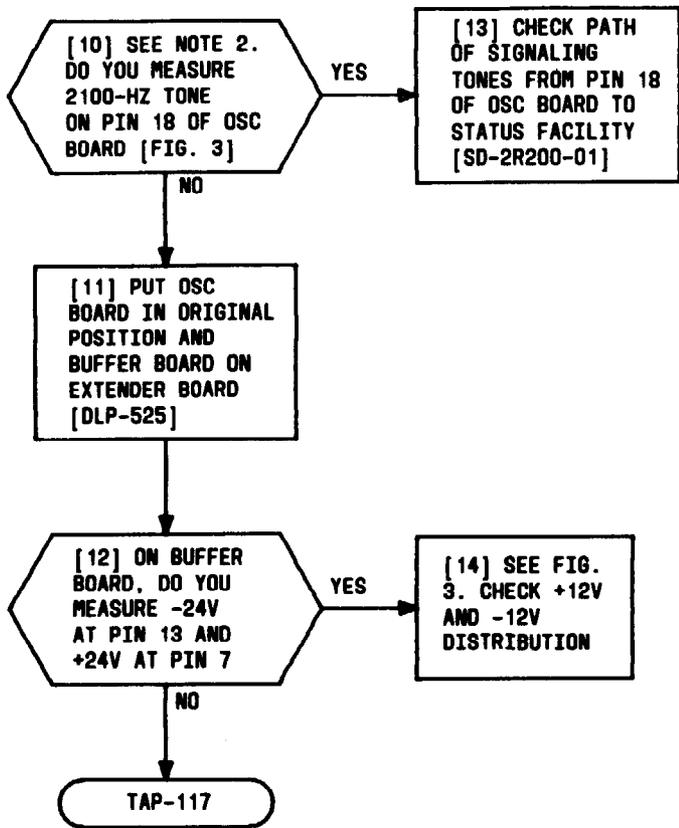
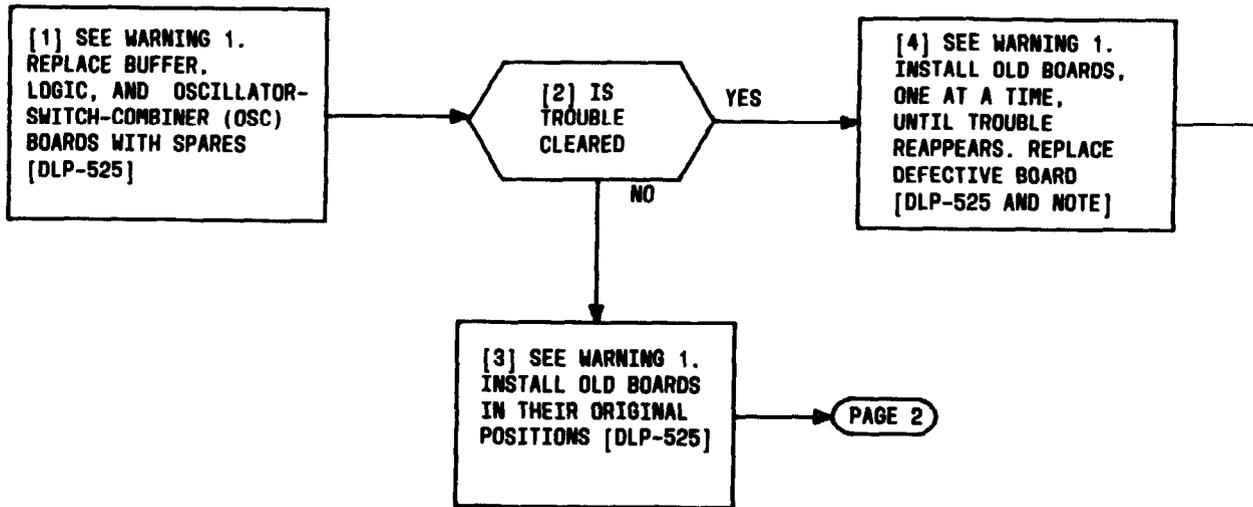


FIG. 3

NOTE 2
 2100-HZ TONE IS
 CONTINUOUS WHEN TESTING
 [FIG. 1]
 2100-HZ TONE IS THIRD
 PULSE WHEN CHECKING DATA
 TRAIN [FIG. 2]

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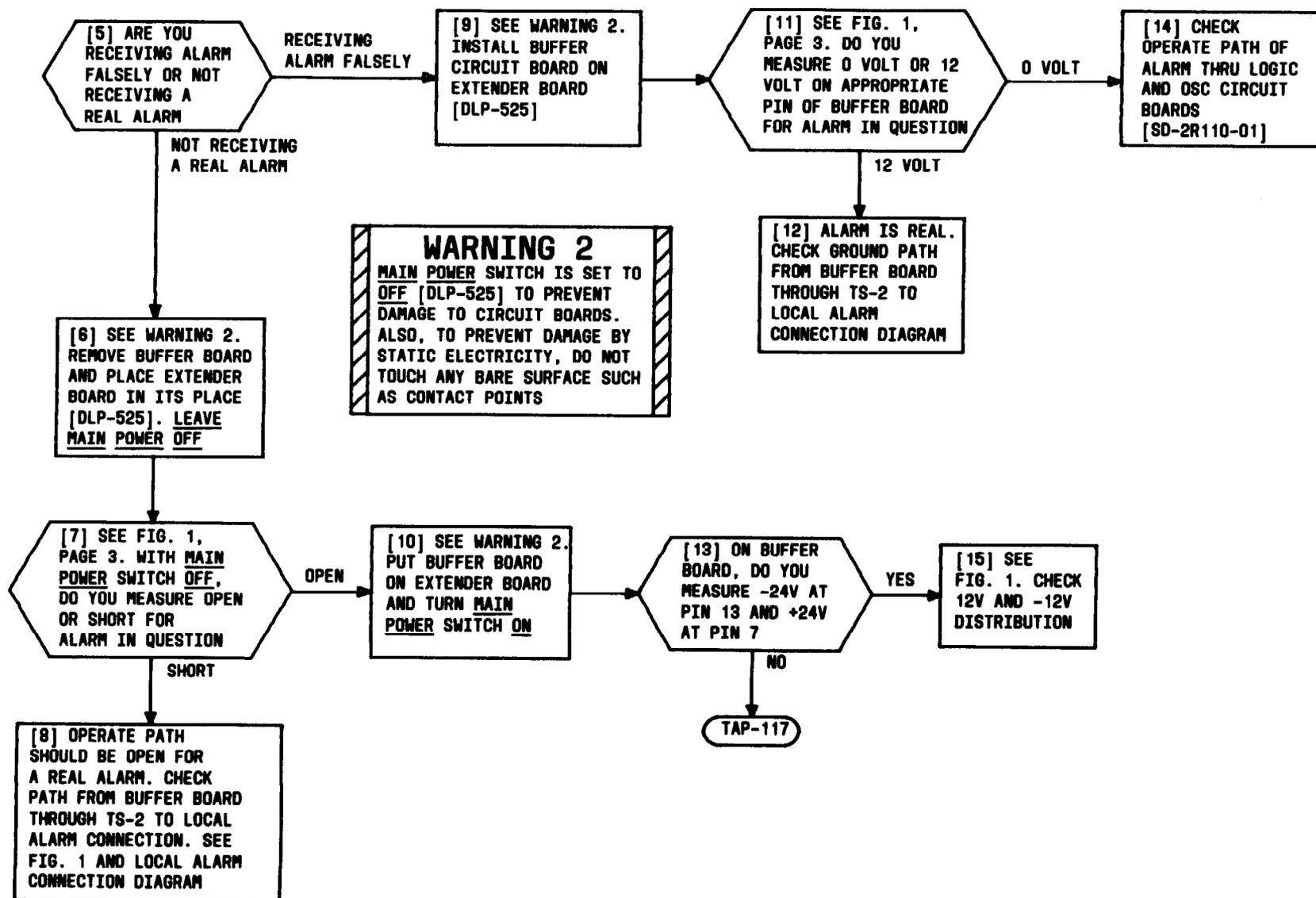


NOTE
IF OSC BOARD IS
REPLACED, PERFORM
DLP-505 AND
DLP-506

WARNING 1
MAIN POWER SWITCH IS SET TO OFF
[DLP-525] TO PREVENT DAMAGE TO
CIRCUIT BOARDS. ALSO, TO PREVENT
DAMAGE BY STATIC ELECTRICITY, DO
NOT TOUCH ANY BARE SURFACE SUCH
AS CONTACT POINTS

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CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE



CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE

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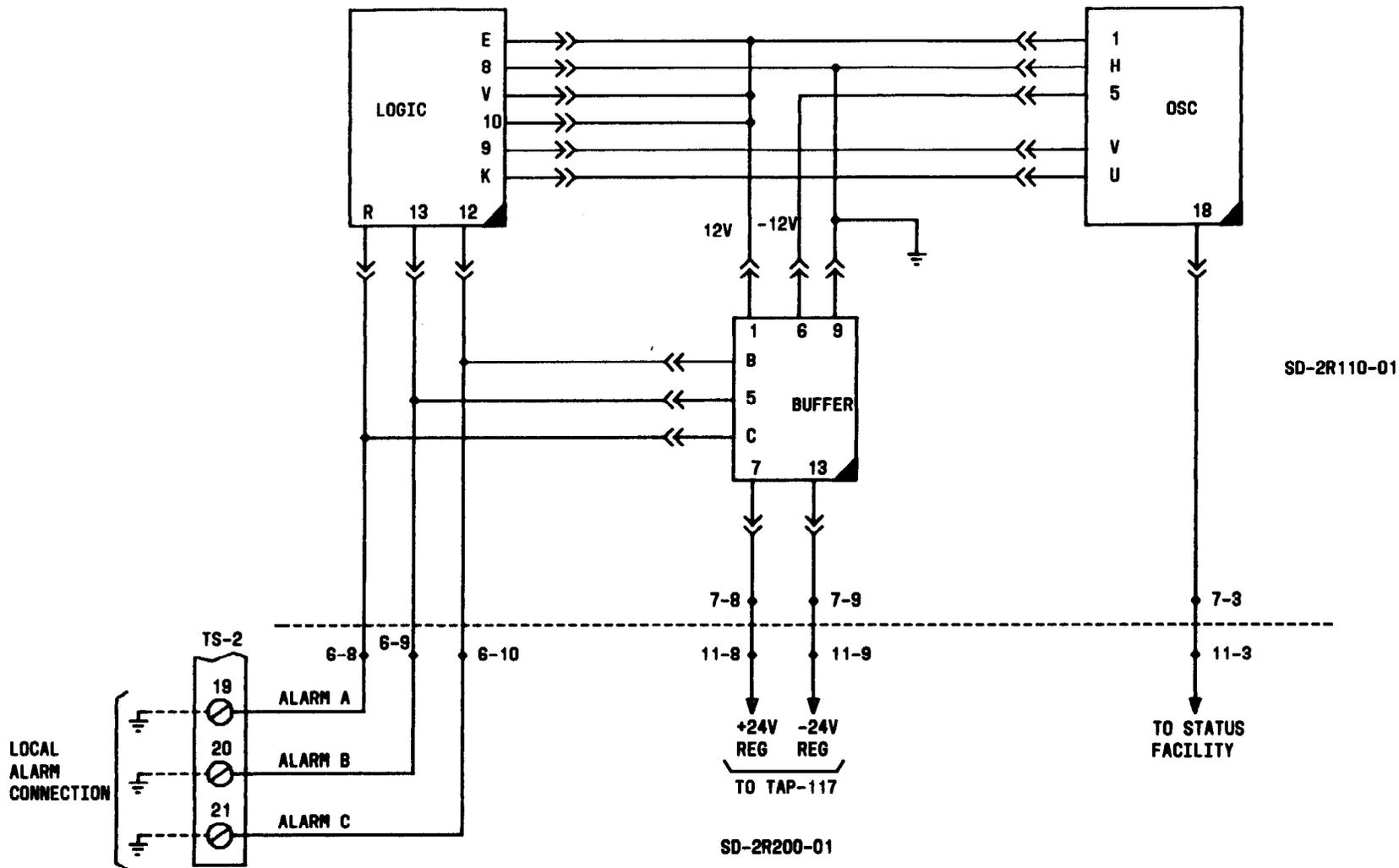
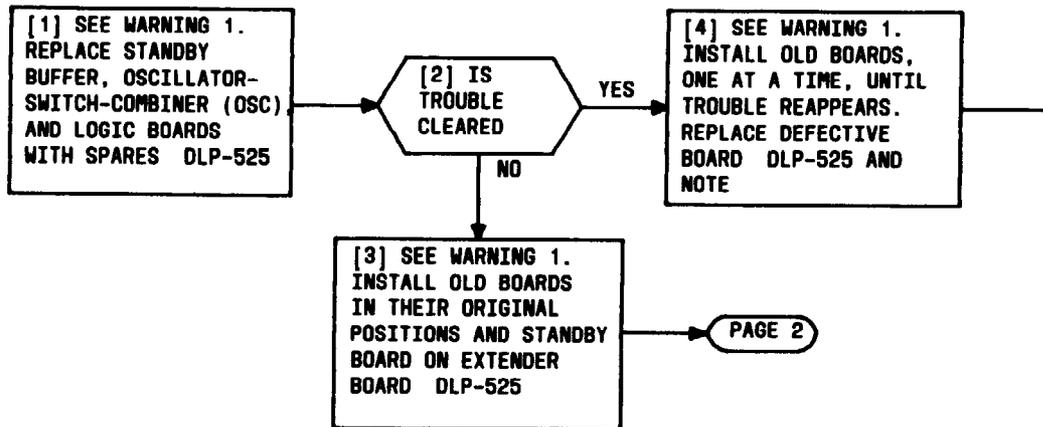


FIG. 1

CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE

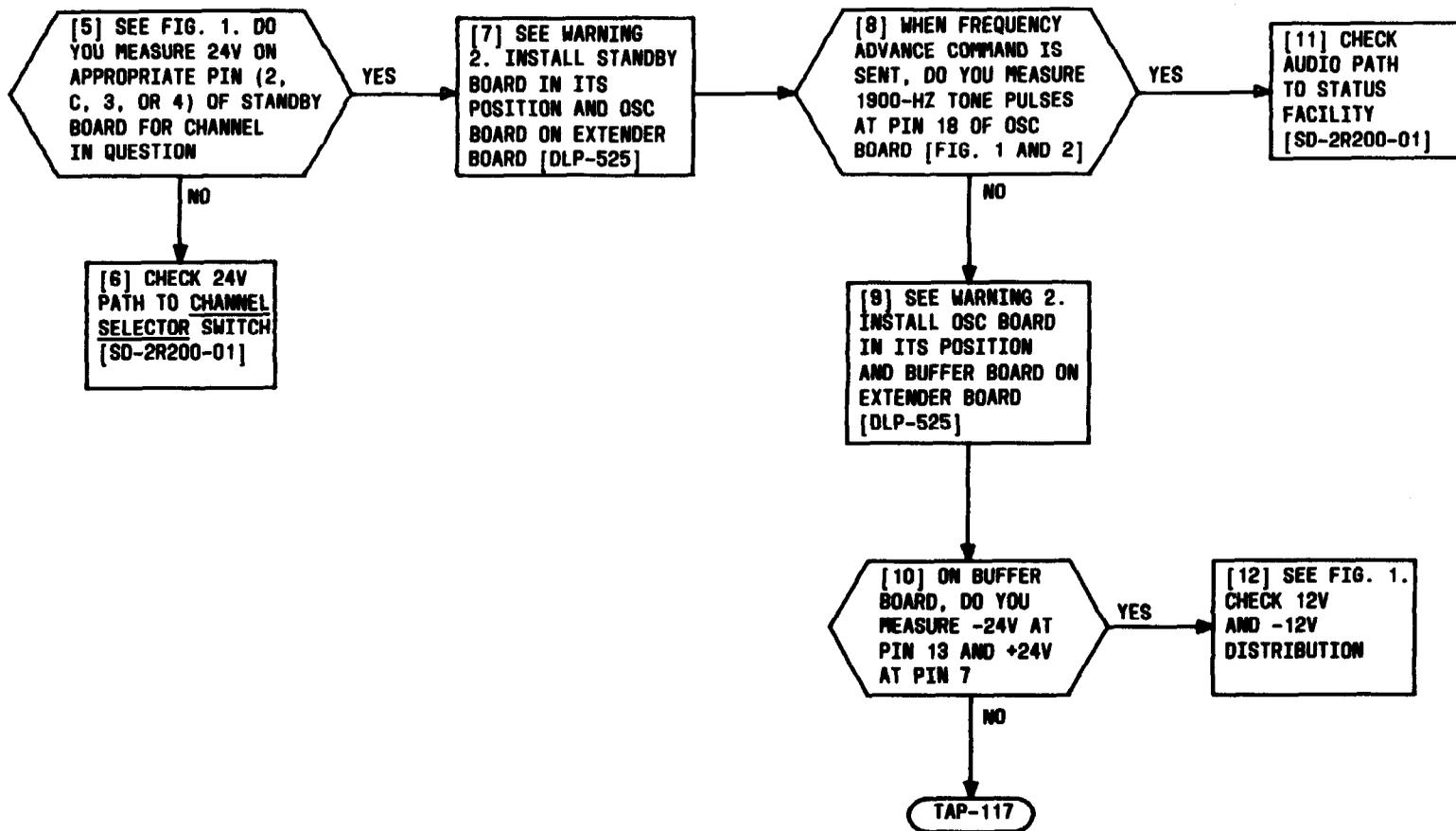
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NOTE
IF OSC BOARD IS
REPLACED, PERFORM
DLP-505 AND DLP-506

WARNING 1
MAIN POWER SWITCH IS SET TO
OFF [DLP-525] TO PREVENT
DAMAGE TO CIRCUIT BOARDS.
ALSO, TO PREVENT DAMAGE BY
STATIC ELECTRICITY, DO NOT
TOUCH ANY BARE SURFACE SUCH
AS CONTACT POINTS

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WARNING 2
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR FREQUENCY ADVANCE STATUS TROUBLE

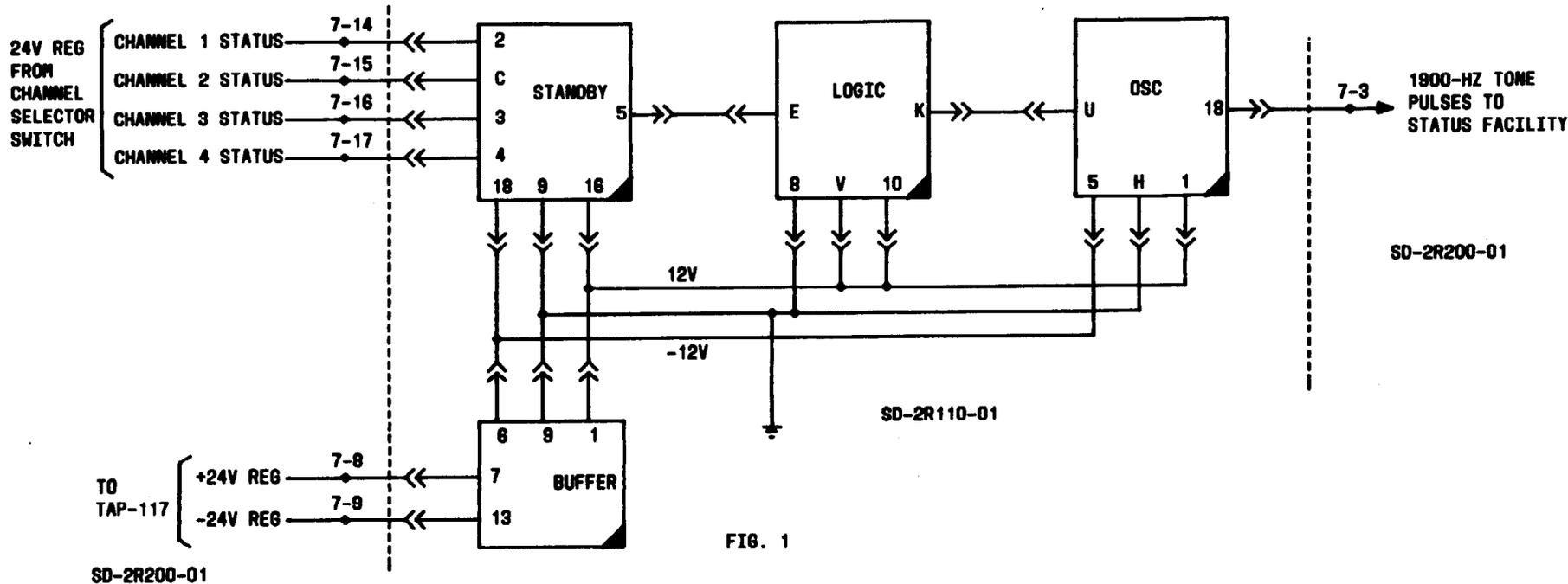


FIG. 1

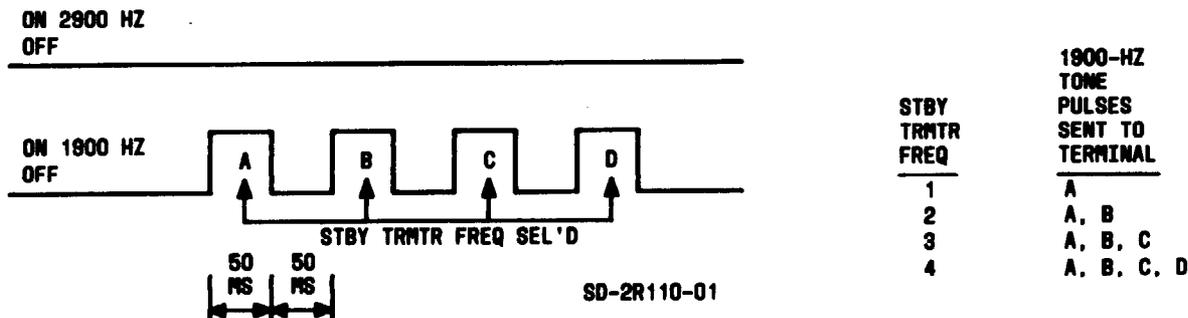
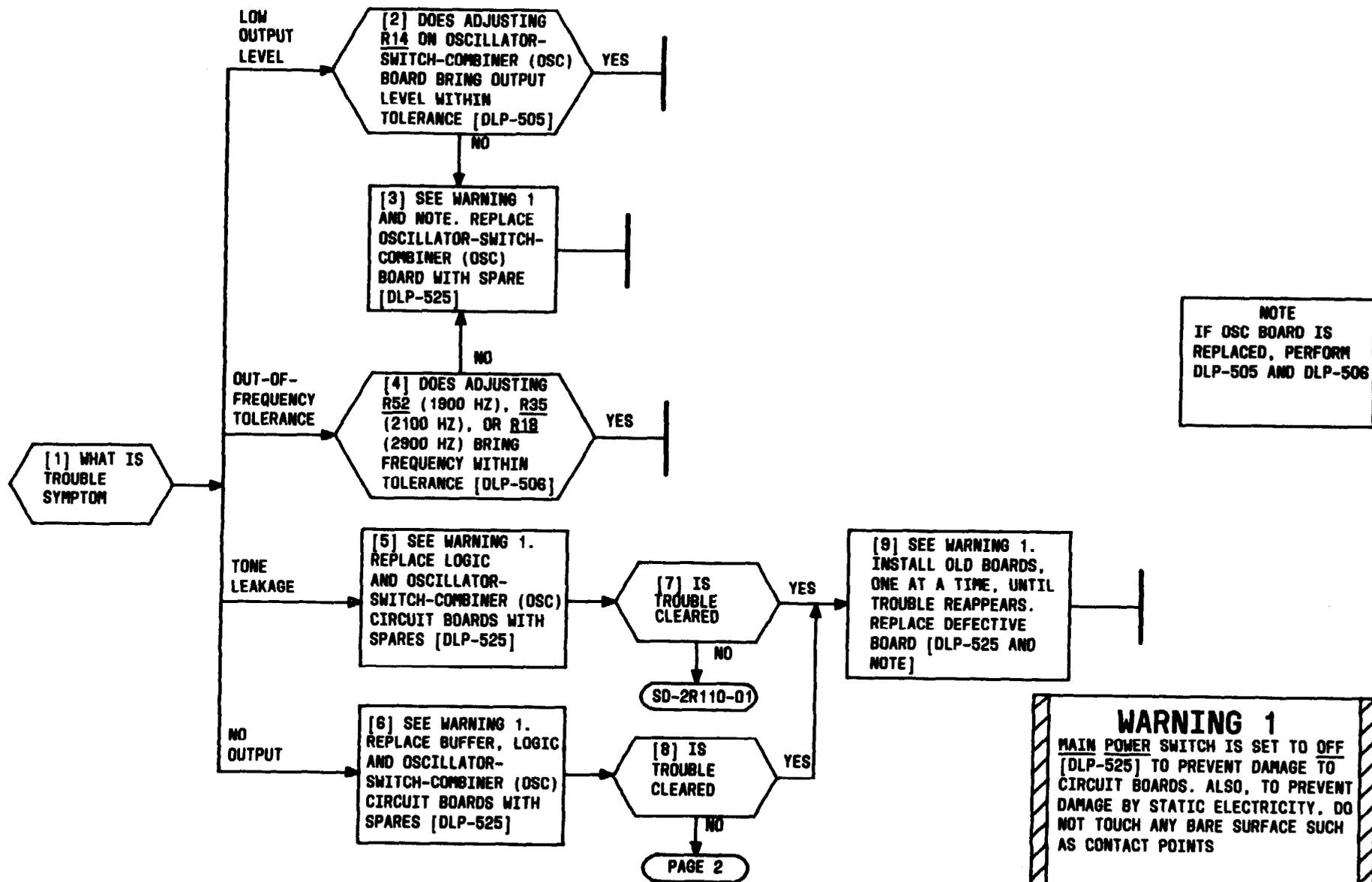


FIG. 2

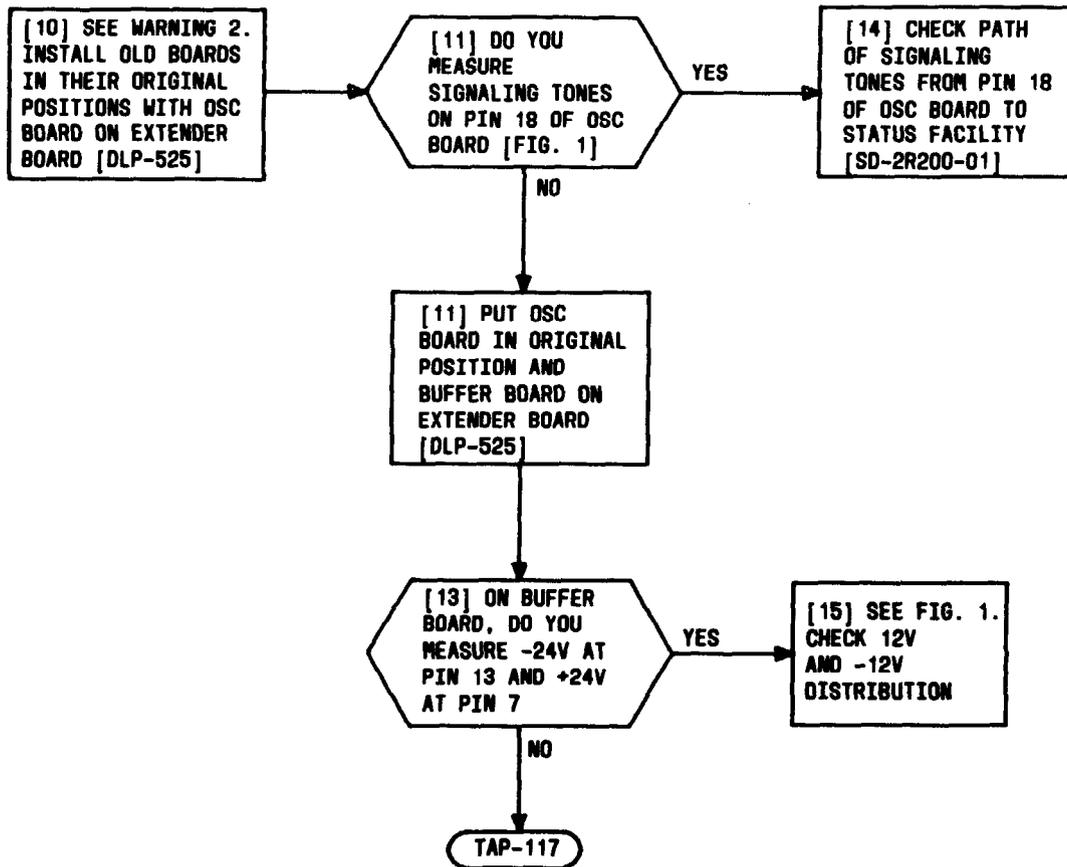


NOTE
IF OSC BOARD IS
REPLACED, PERFORM
DLP-505 AND DLP-506

WARNING 1
MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR SIGNALING TONE TROUBLE



WARNING 2
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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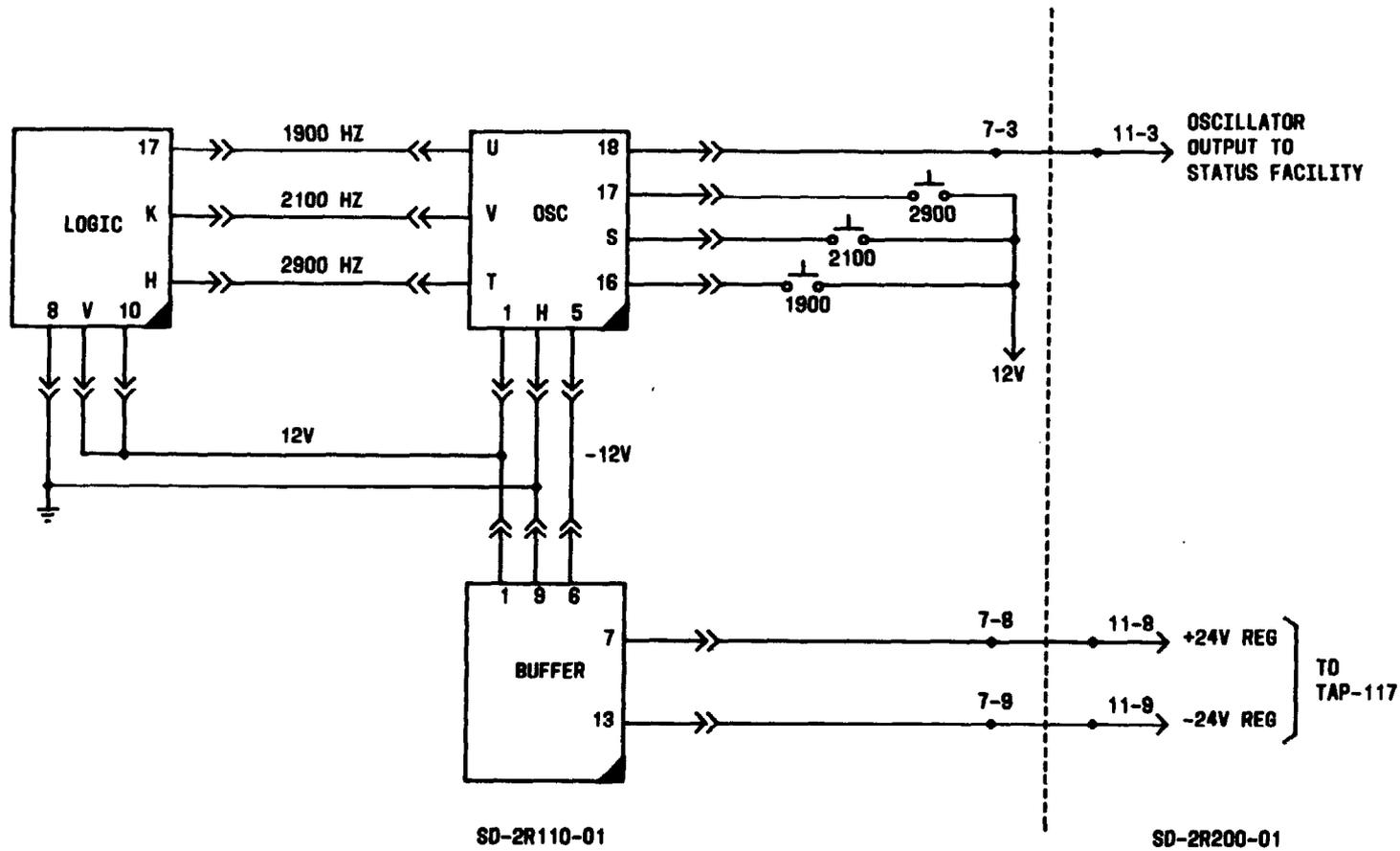
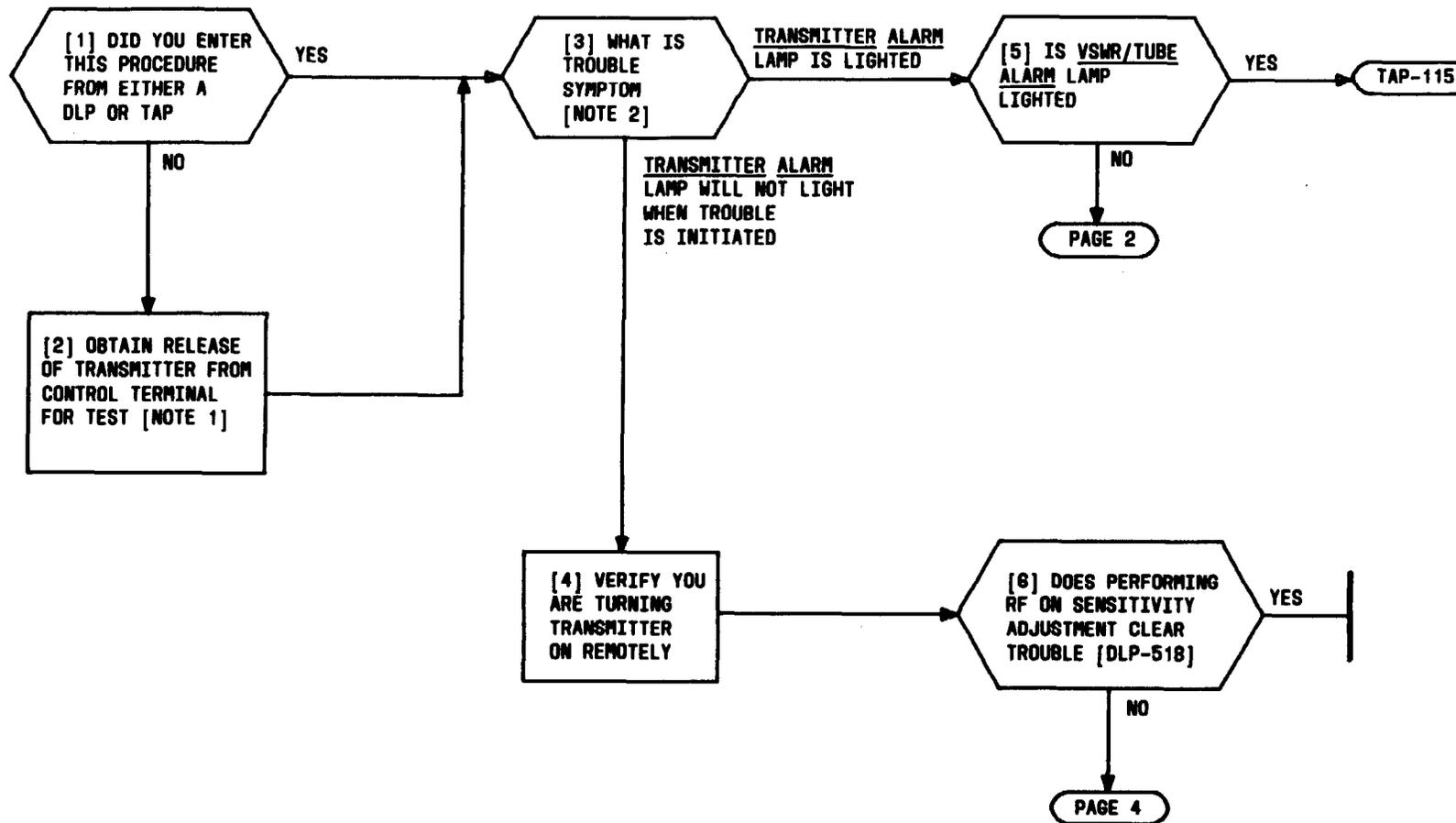


FIG. 1

CLEAR SIGNALING TONE TROUBLE

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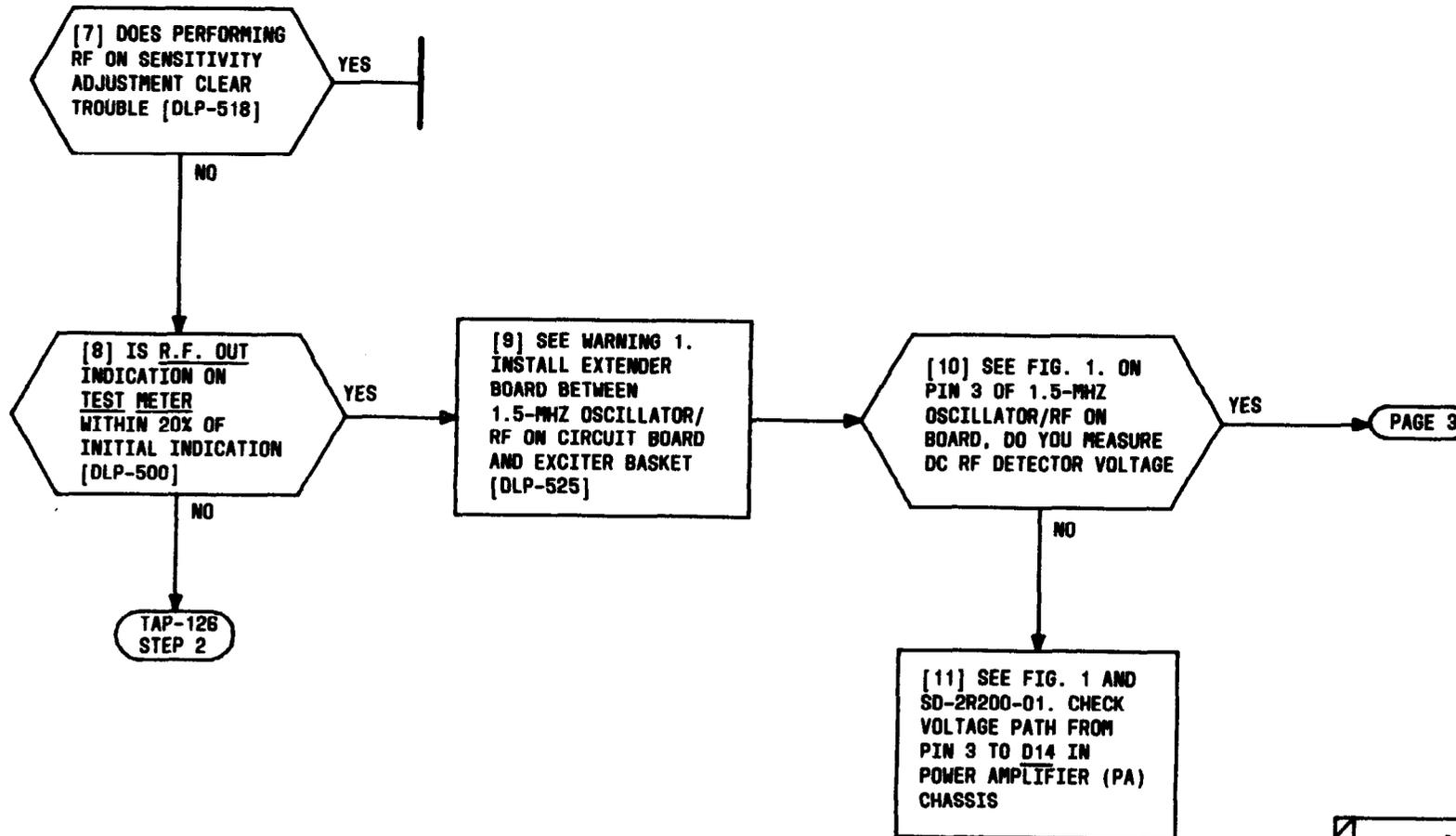


NOTES

1. RETURN TRANSMITTER TO SERVICE WHEN TESTING IS COMPLETED
2. ENSURE TRANSMITTER LAMPS ARE NOT BURNED OUT

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CLEAR TRANSMITTER ALARM TROUBLE

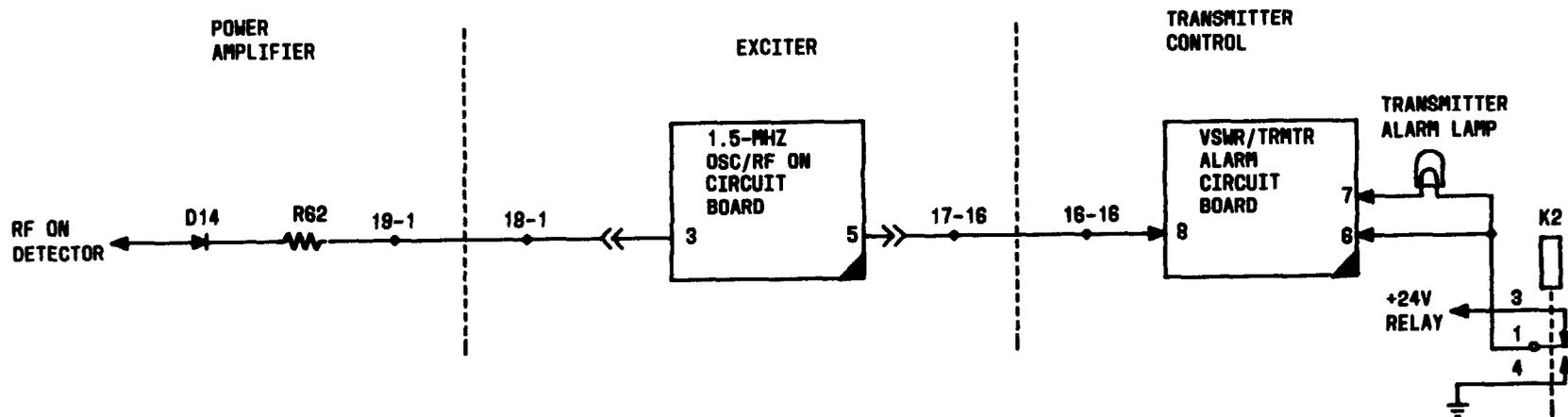
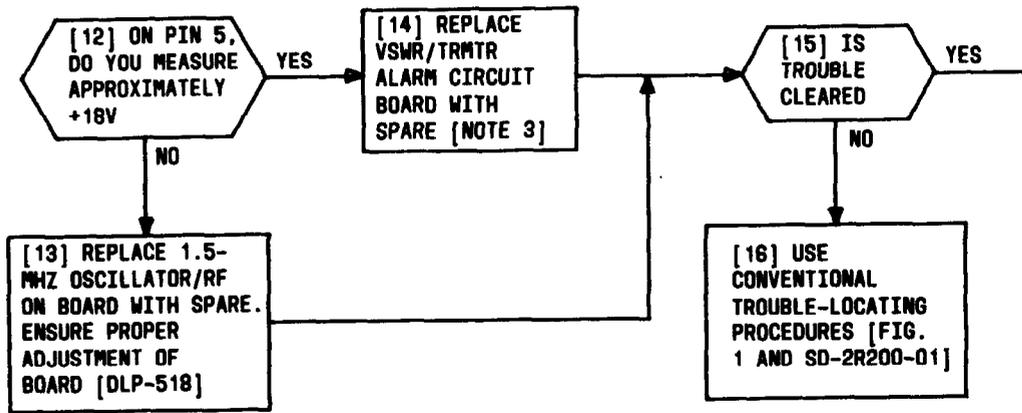


WARNING 1

MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR TRANSMITTER ALARM TROUBLE

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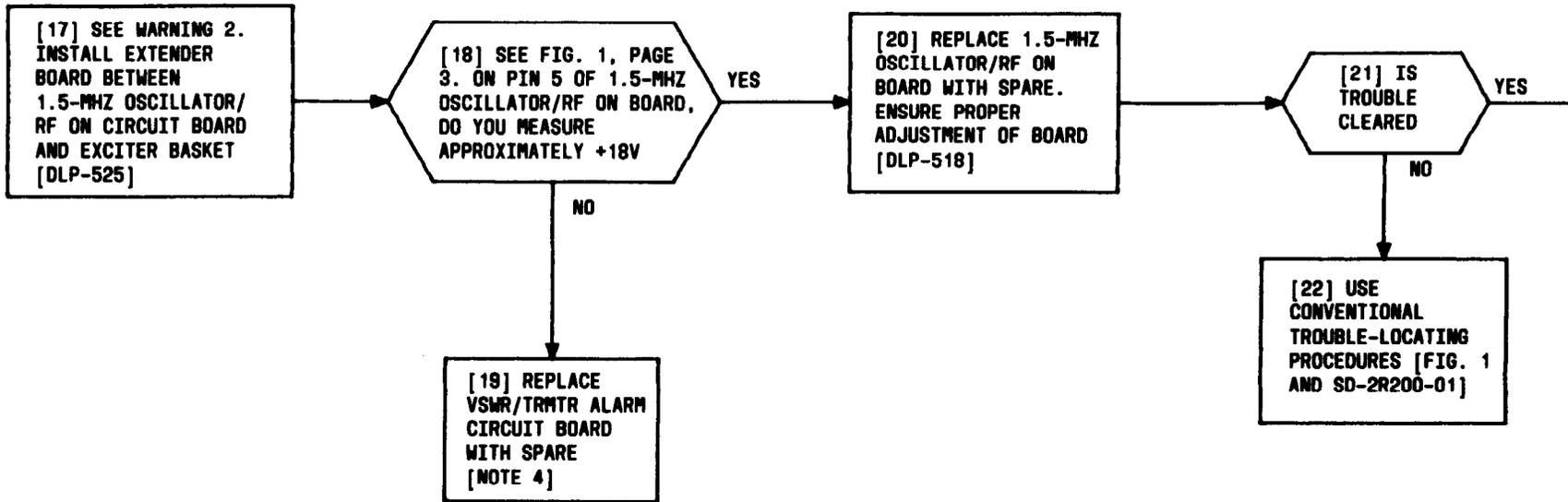


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FIG. 1

NOTE 3
 VSWR/TRMTR
 CIRCUIT BOARD
 IS LOCATED ON
 TRANSMITTER
 CONTROL CHASSIS

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NOTE 4
 VSWR/TRMTR ALARM
 CIRCUIT BOARD IS
 LOCATED ON TRANSMITTER
 CONTROL CHASSIS

WARNING 2
 MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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CLEAR TRANSMITTER ALARM TROUBLE

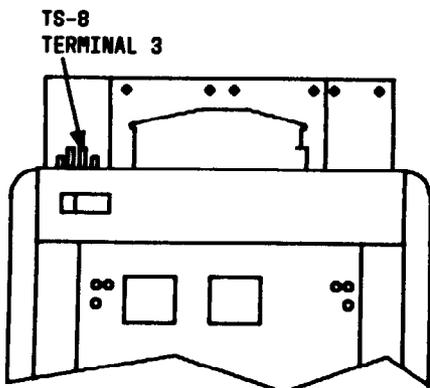
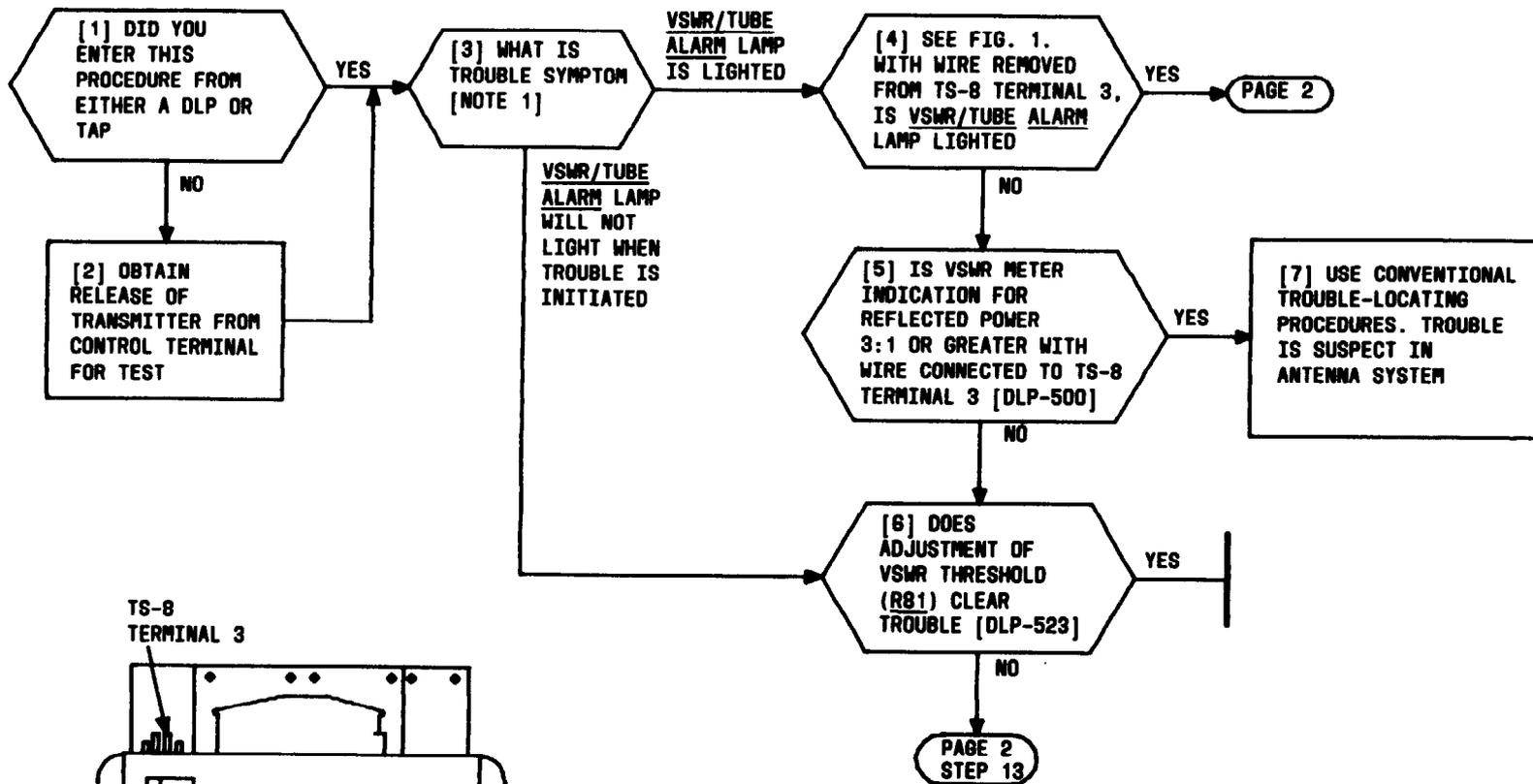
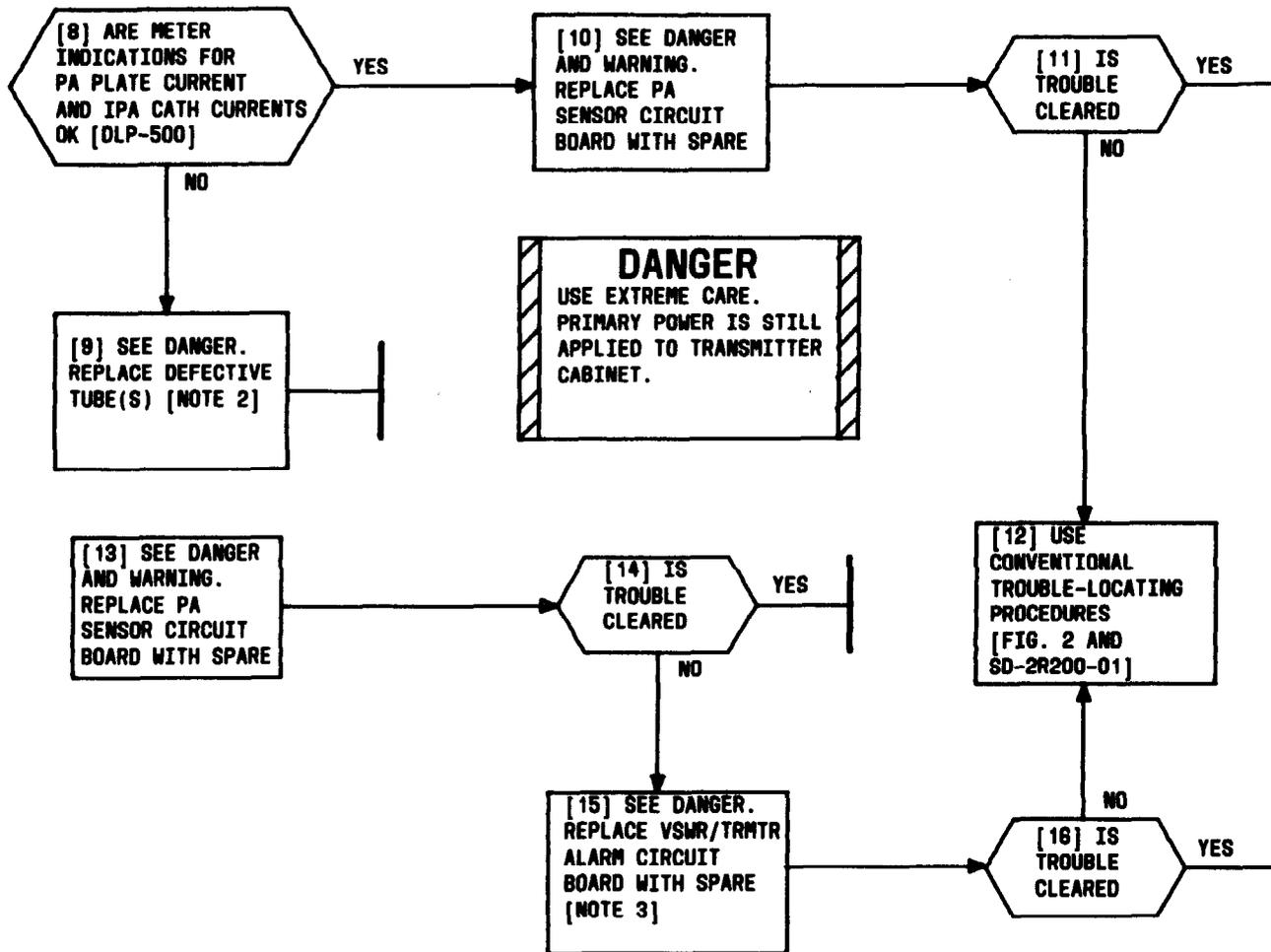


FIG. 1

NOTE 1
ENSURE VSWR/TUBE
ALARM LAMP IS
NOT BURNED OUT

CLEAR VSWR/TUBE ALARM TROUBLE

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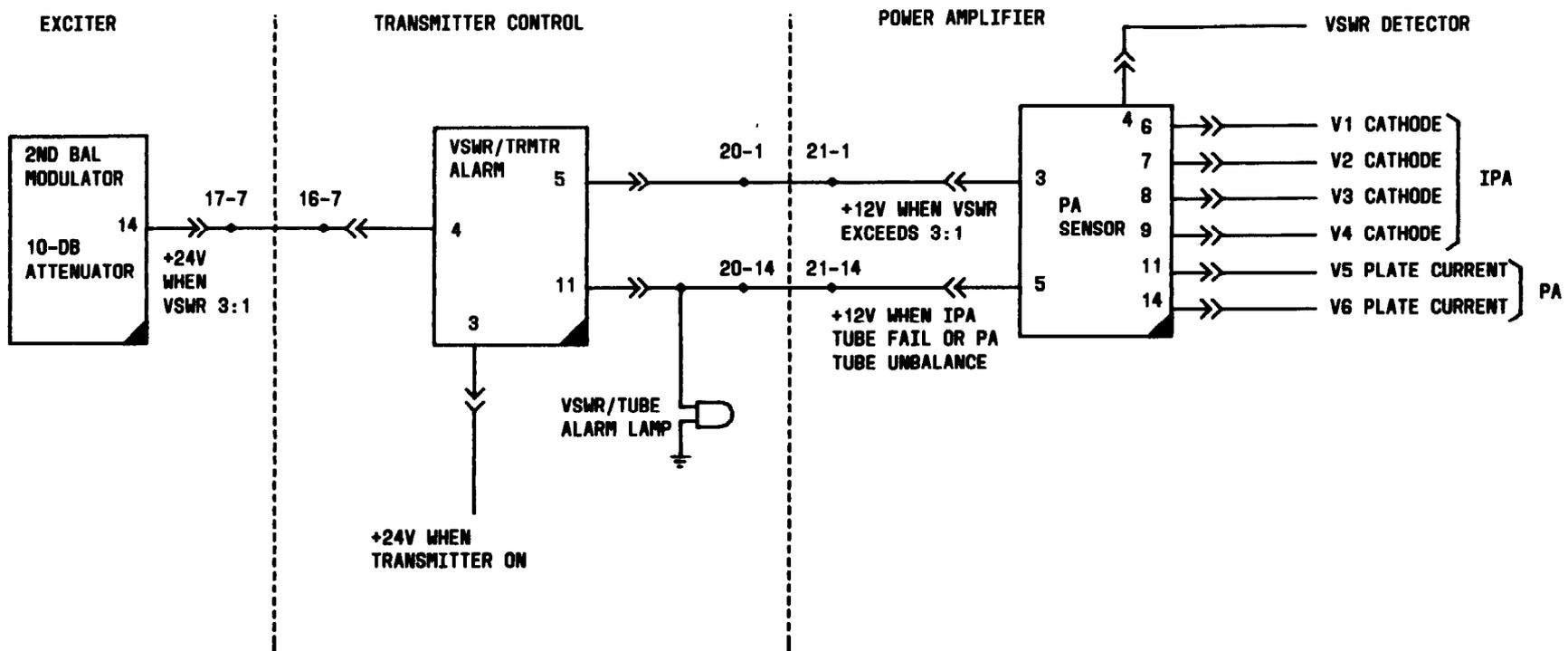
DANGER
USE EXTREME CARE.
PRIMARY POWER IS STILL
APPLIED TO TRANSMITTER
CABINET.

- NOTES**
- IT IS RECOMMENDED TO REPLACE ALL TUBES TO ENSURE PROPER BALANCE
 - VSWR/TRMTR ALARM CIRCUIT BOARD IS LOCATED ON TRANSMITTER CONTROL CHASSIS

WARNING
ENSURE SMALL FIBER KEY IS NOT DAMAGED WHILE REMOVING OR INSTALLING CIRCUIT BOARD

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CLEAR VSWR/TUBE ALARM TROUBLE



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FIG. 2

CLEAR VSWR/TUBE ALARM TROUBLE

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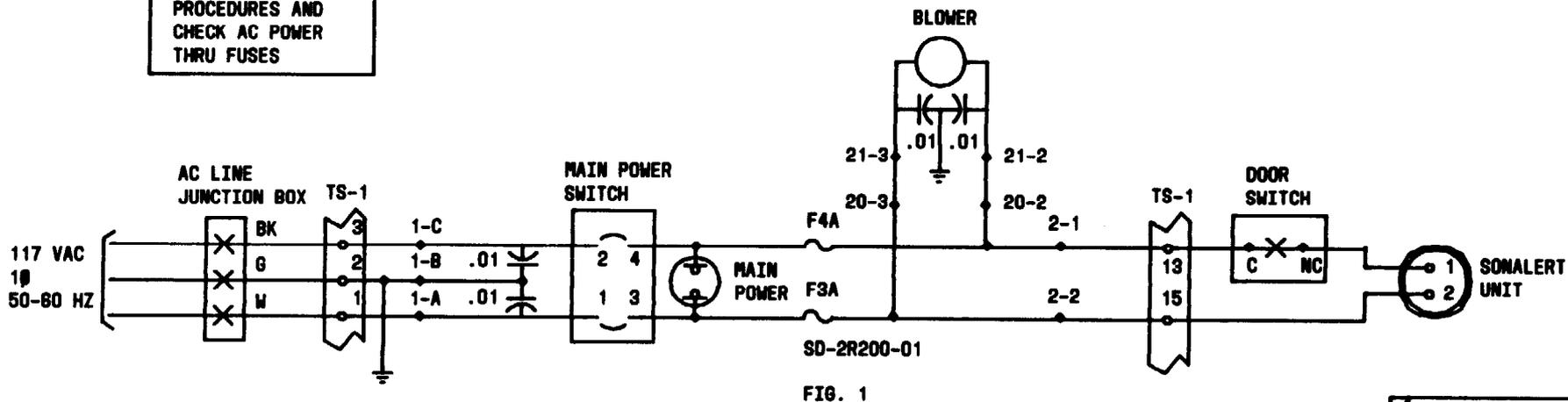
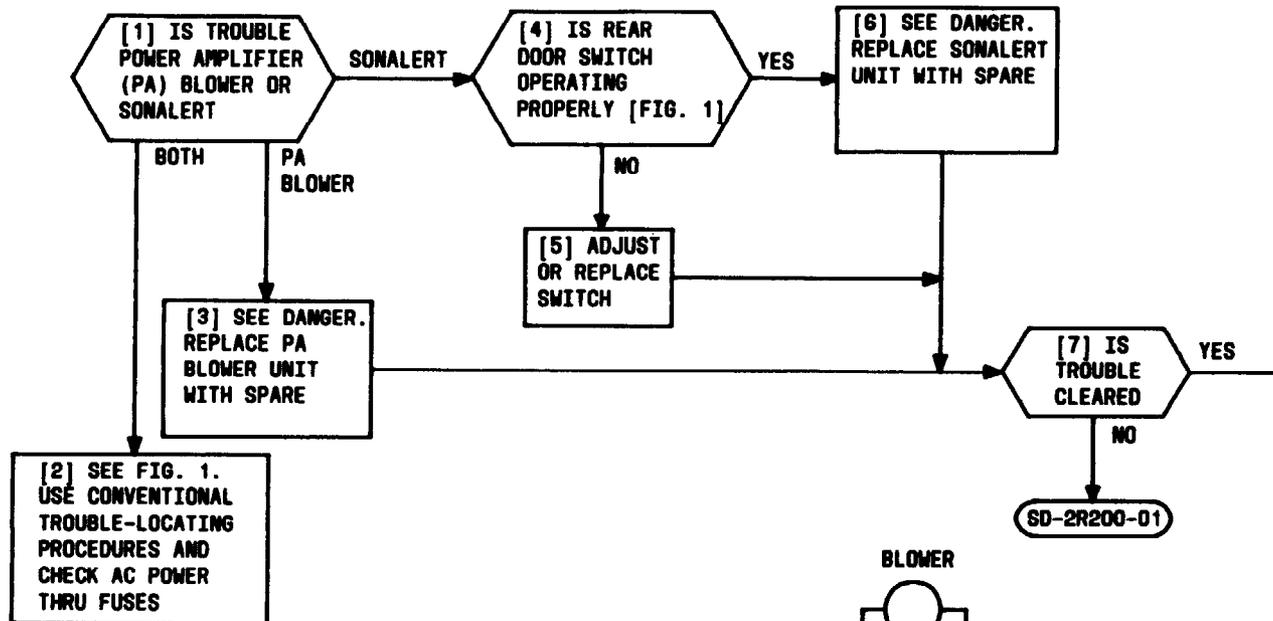
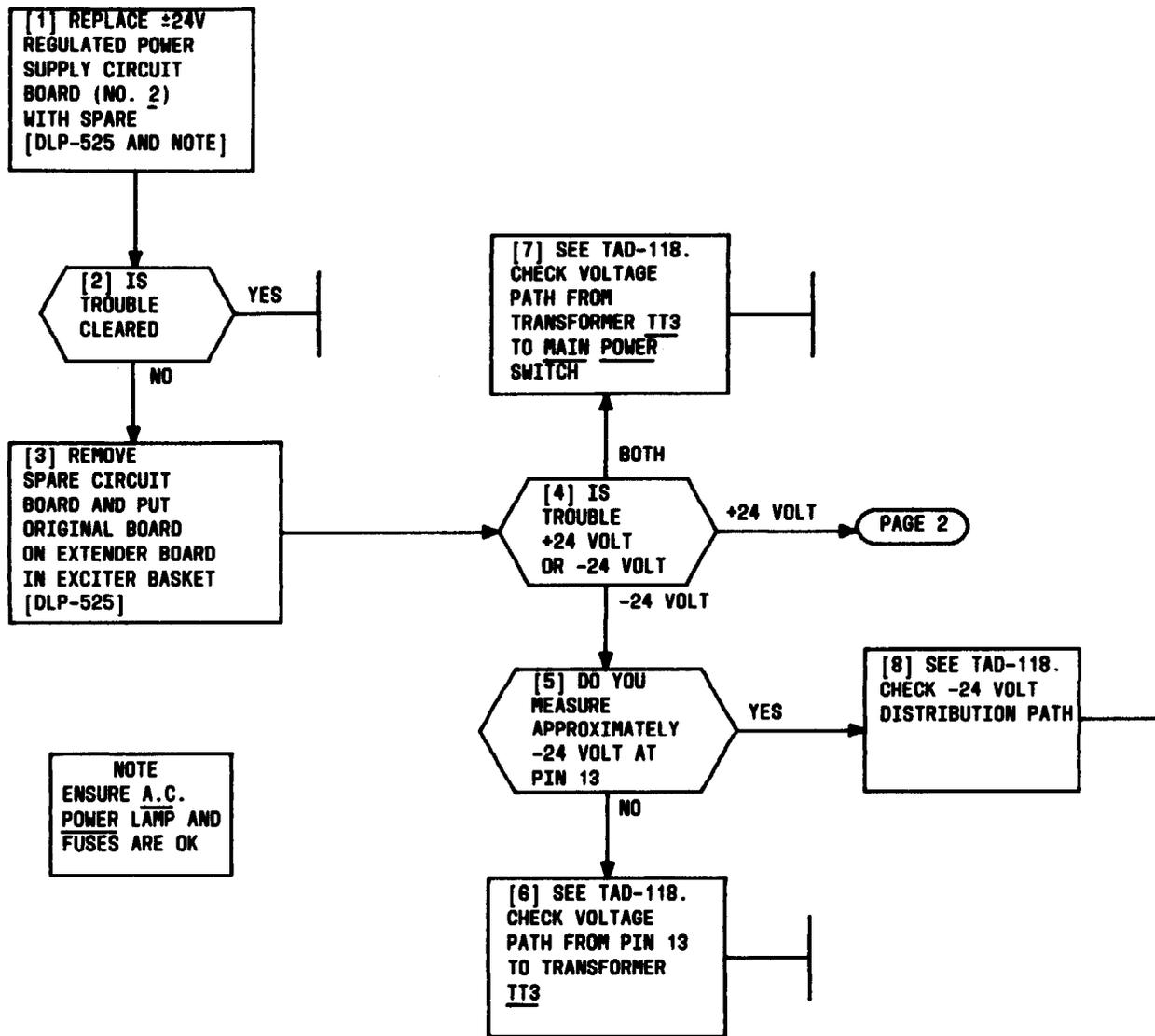


FIG. 1

DANGER
 REMOVE PRIMARY
 POWER FROM
 TRANSMITTER CABINET

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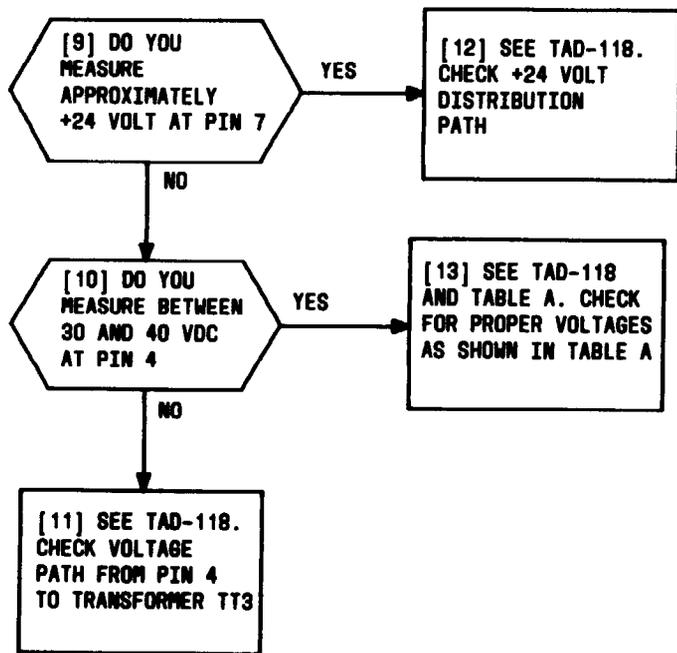
CLEAR POWER AMPLIFIER (PA) BLOWER/SONALERT TROUBLE



NOTE
ENSURE A.C.
POWER LAMP AND
FUSES ARE OK

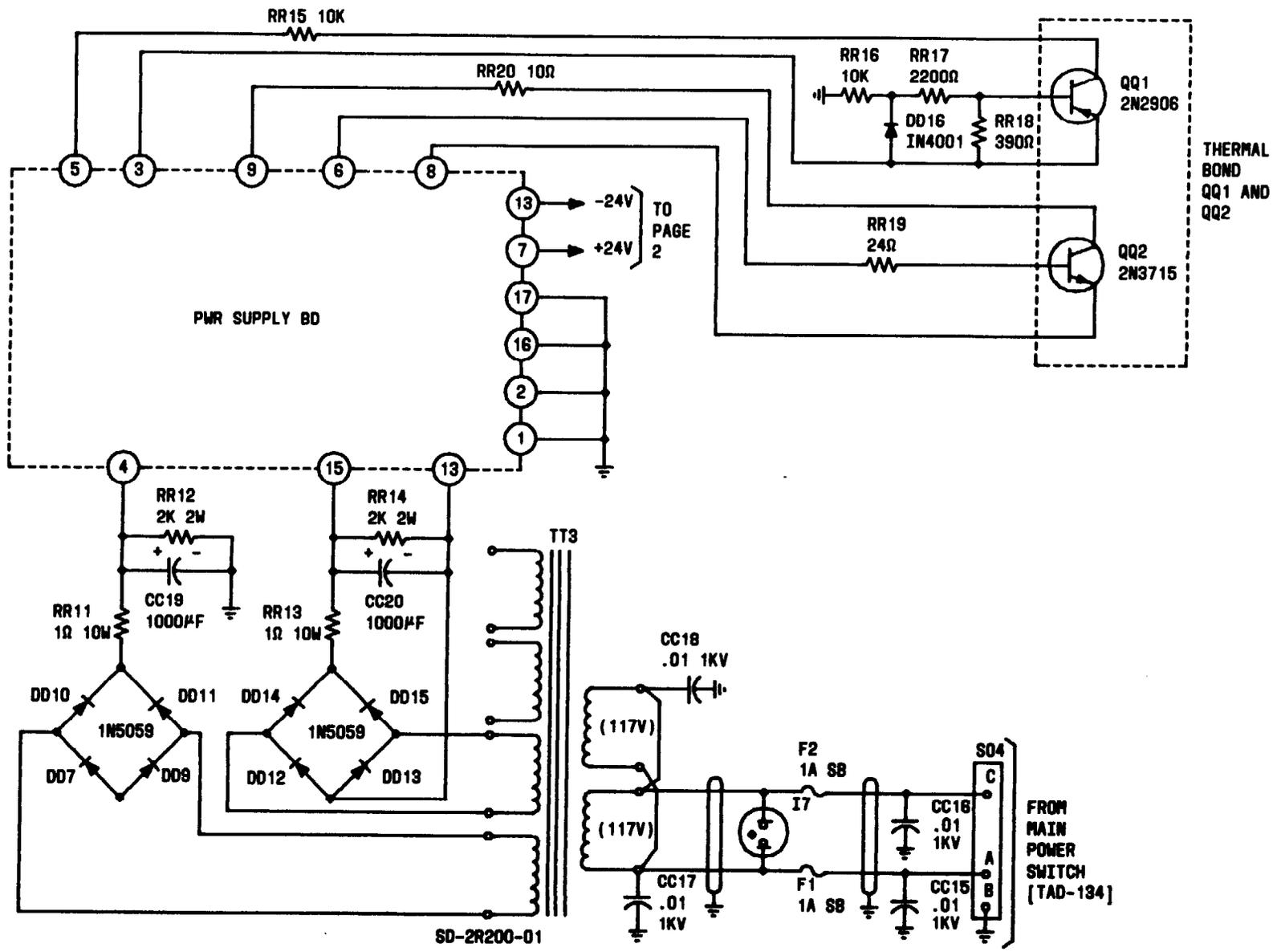
CLEAR +24 VOLT, -24 VOLT REGULATED POWER SUPPLY TROUBLE

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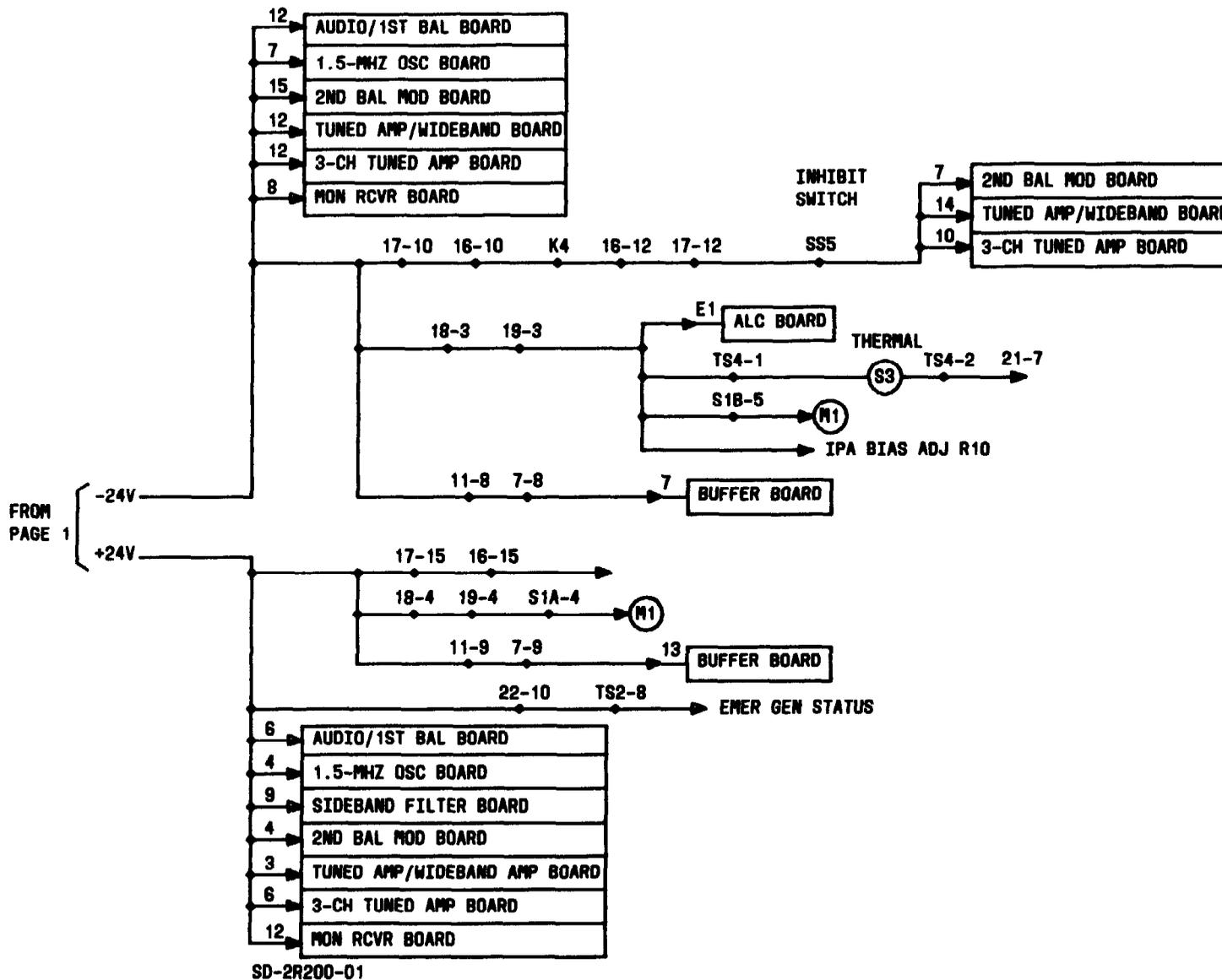
CLEAR +24 VOLT, -24 VOLT REGULATED POWER SUPPLY TROUBLE

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+24 VOLT, -24 VOLT REGULATED POWER SUPPLY DISTRIBUTION

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+24 VOLT, -24 VOLT REGULATED POWER SUPPLY DISTRIBUTION

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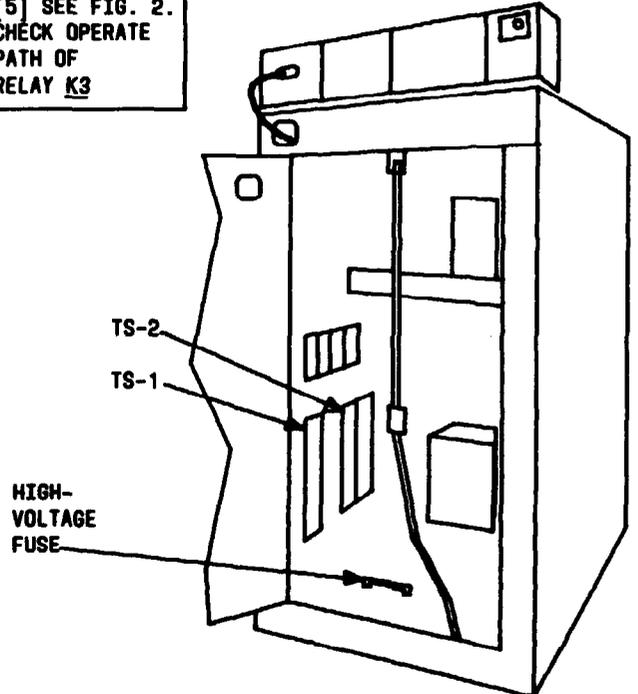
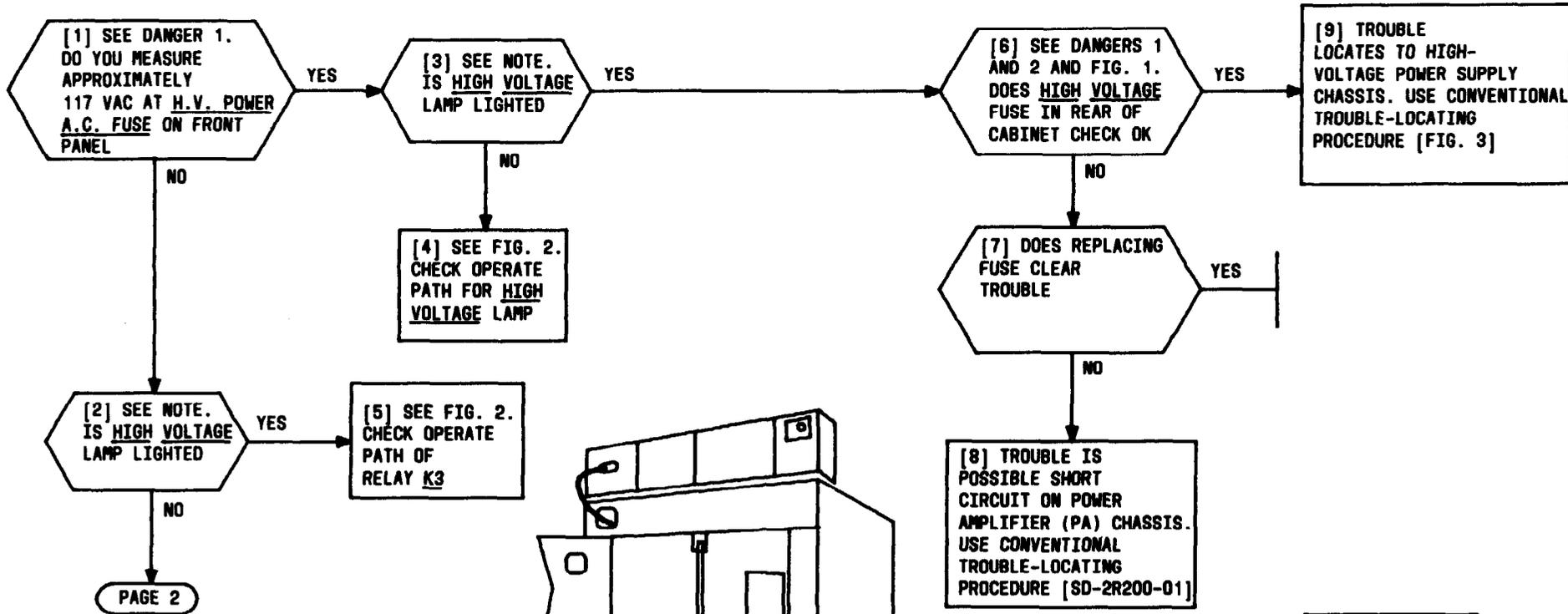


FIG. 1

NOTE
ENSURE HIGH
VOLTAGE LAMP IS
NOT BURNED OUT

DANGERS

1. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1.
2. IF POSSIBLE REMOVE PRIMARY POWER FROM TRANSMITTER WHILE CHECKING HIGH-VOLTAGE FUSE

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CLEAR HIGH-VOLTAGE POWER SUPPLY TROUBLE.

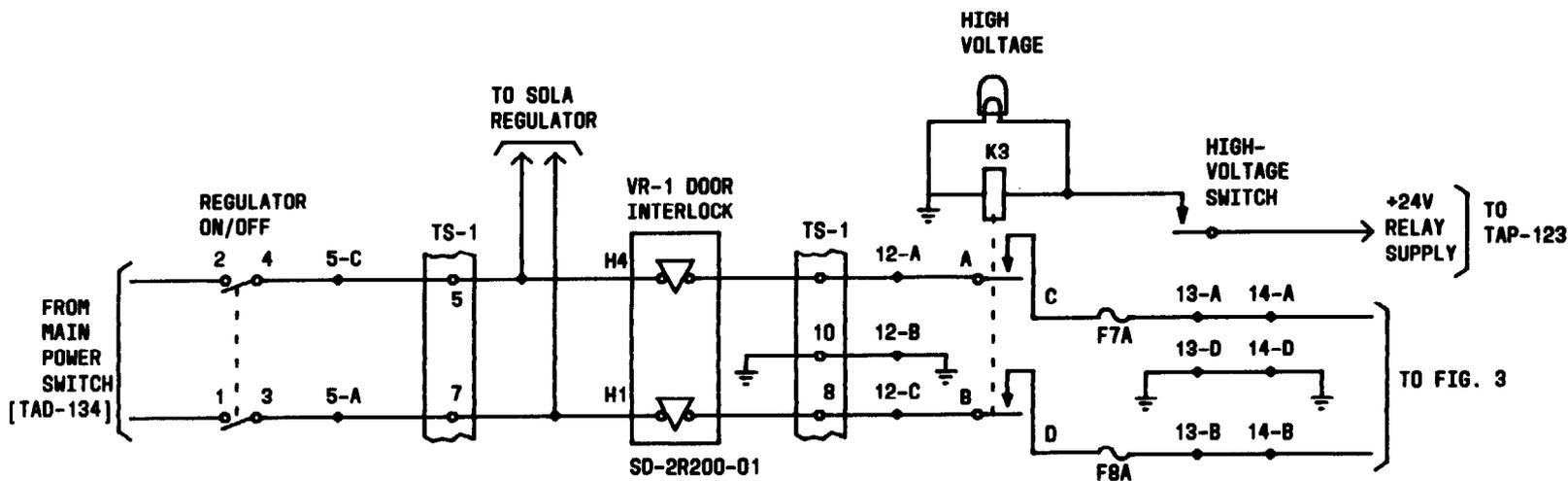
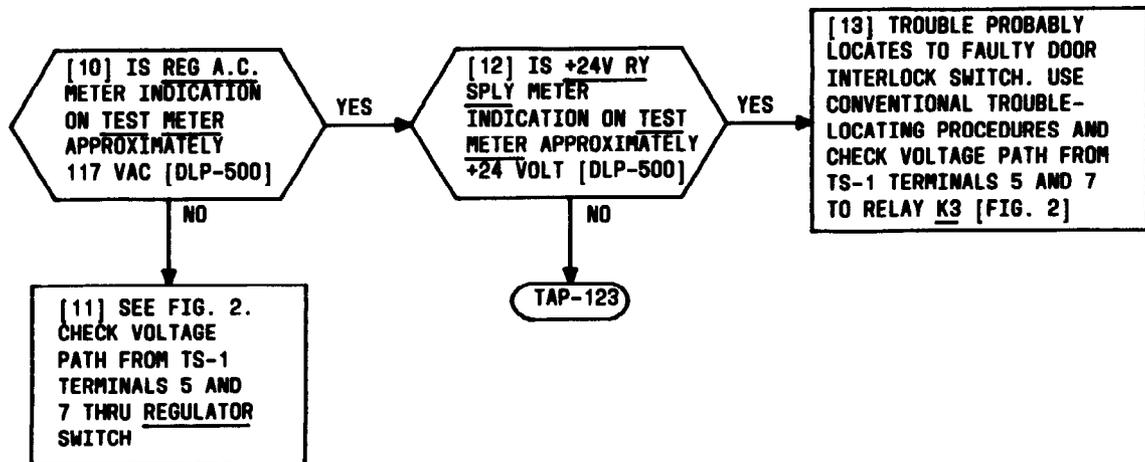


FIG. 2

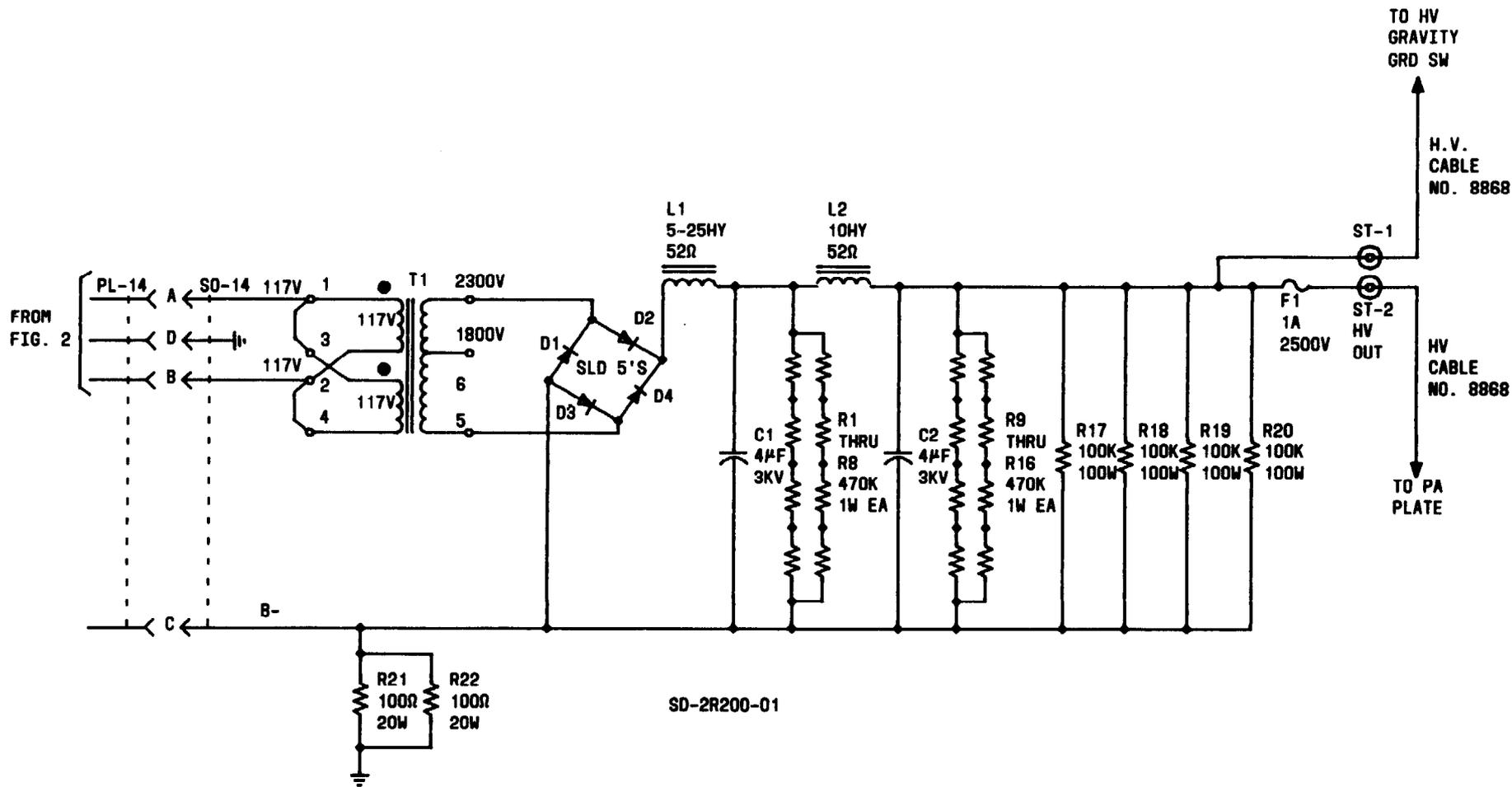
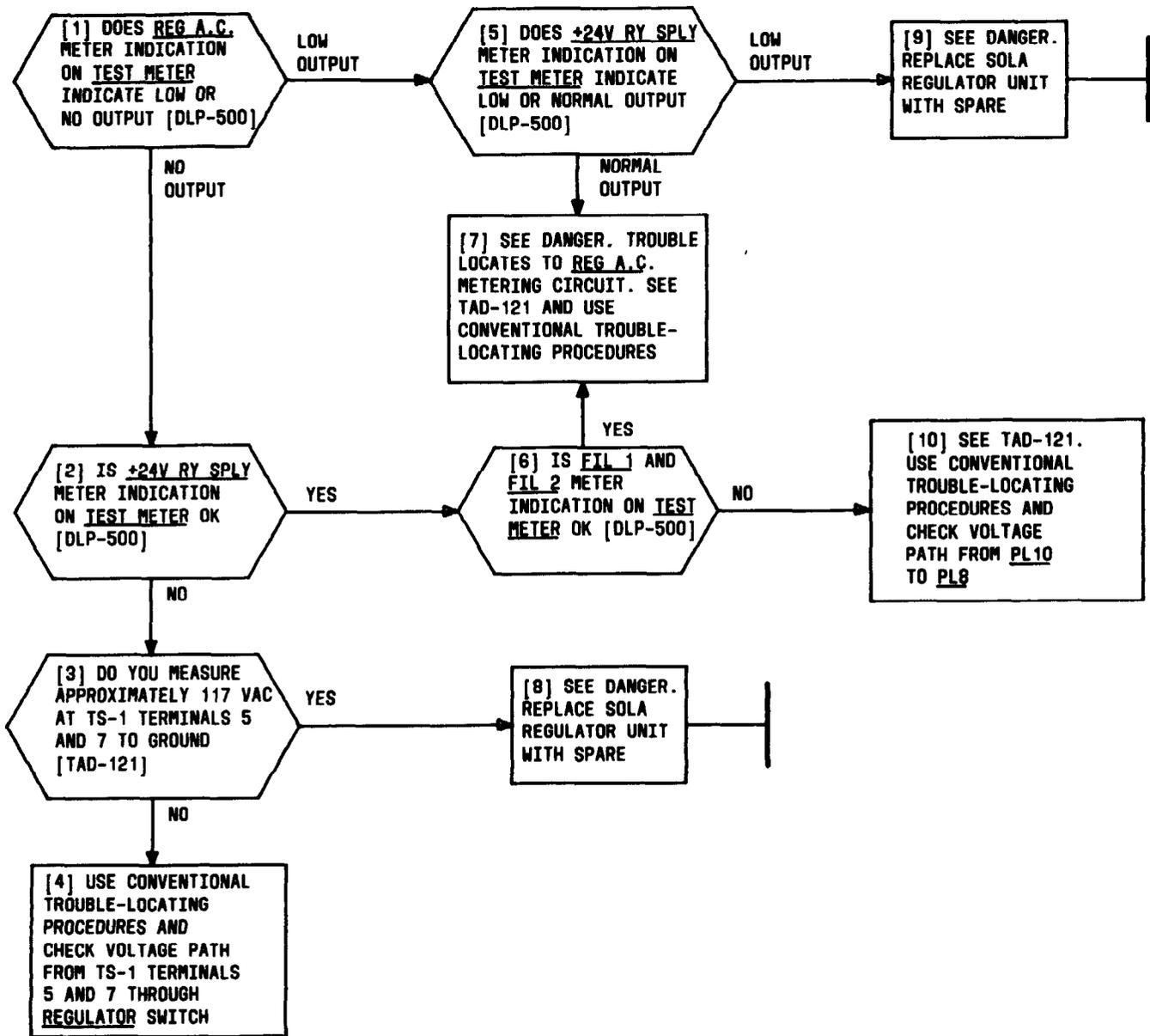


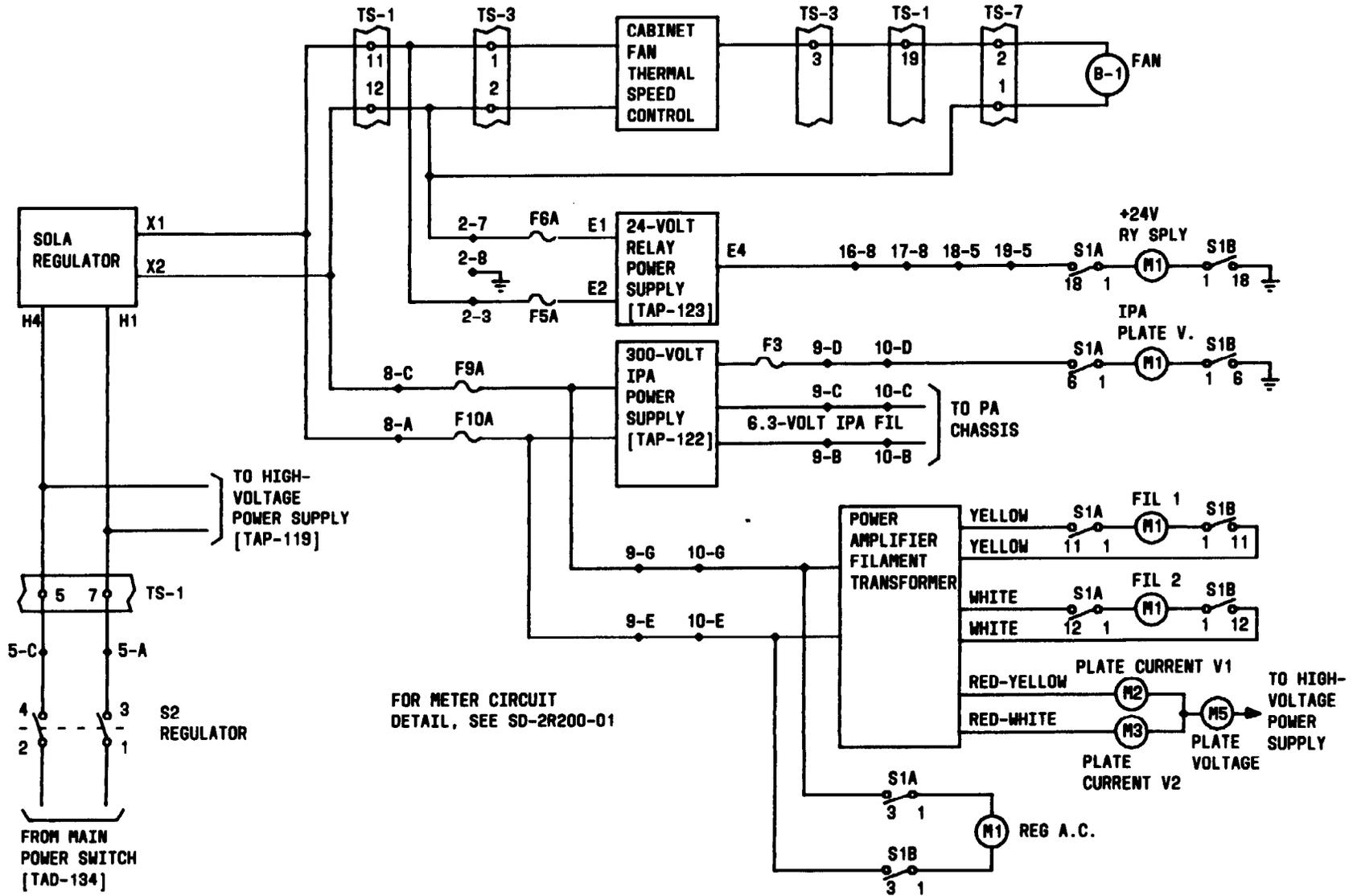
FIG. 3



DANGER
 PRIMARY POWER SHOULD
 BE REMOVED FROM
 TRANSMITTER CABINET
 WHEN POSSIBLE

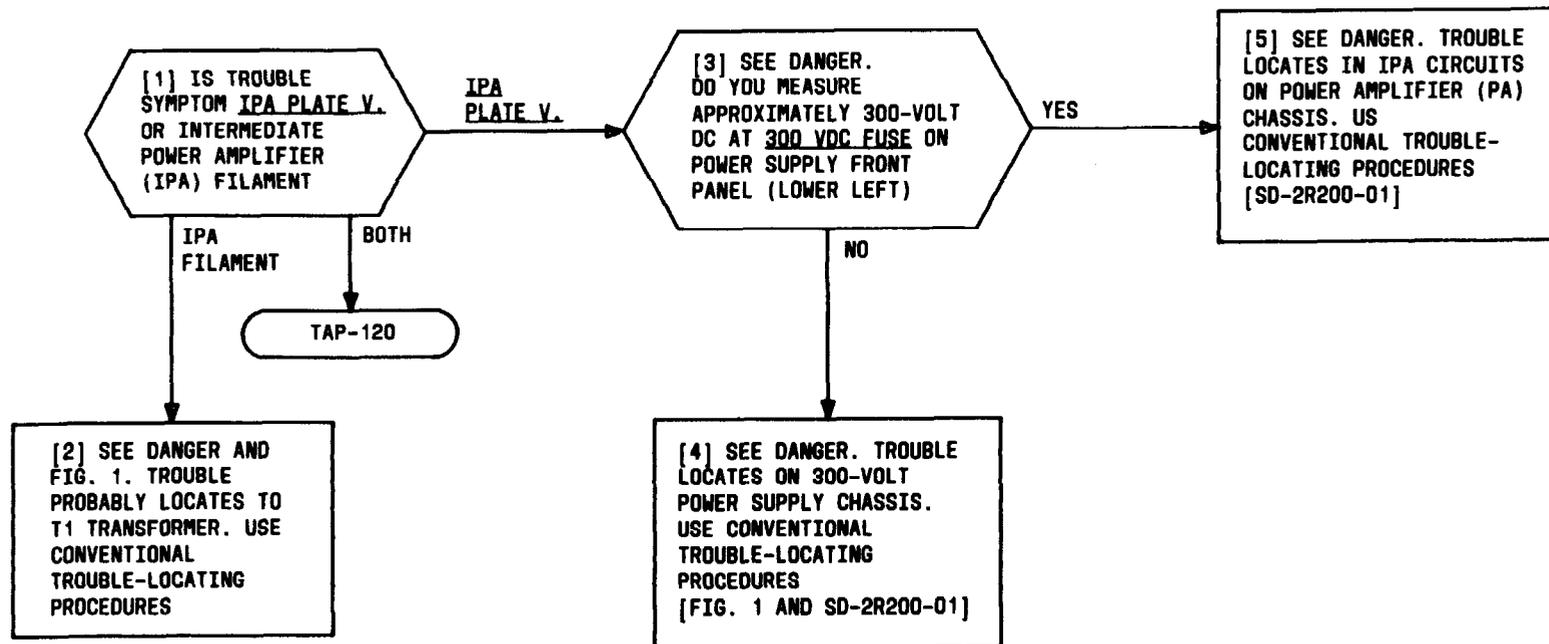
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CLEAR 117-VOLT AC REGULATED POWER SUPPLY TROUBLE



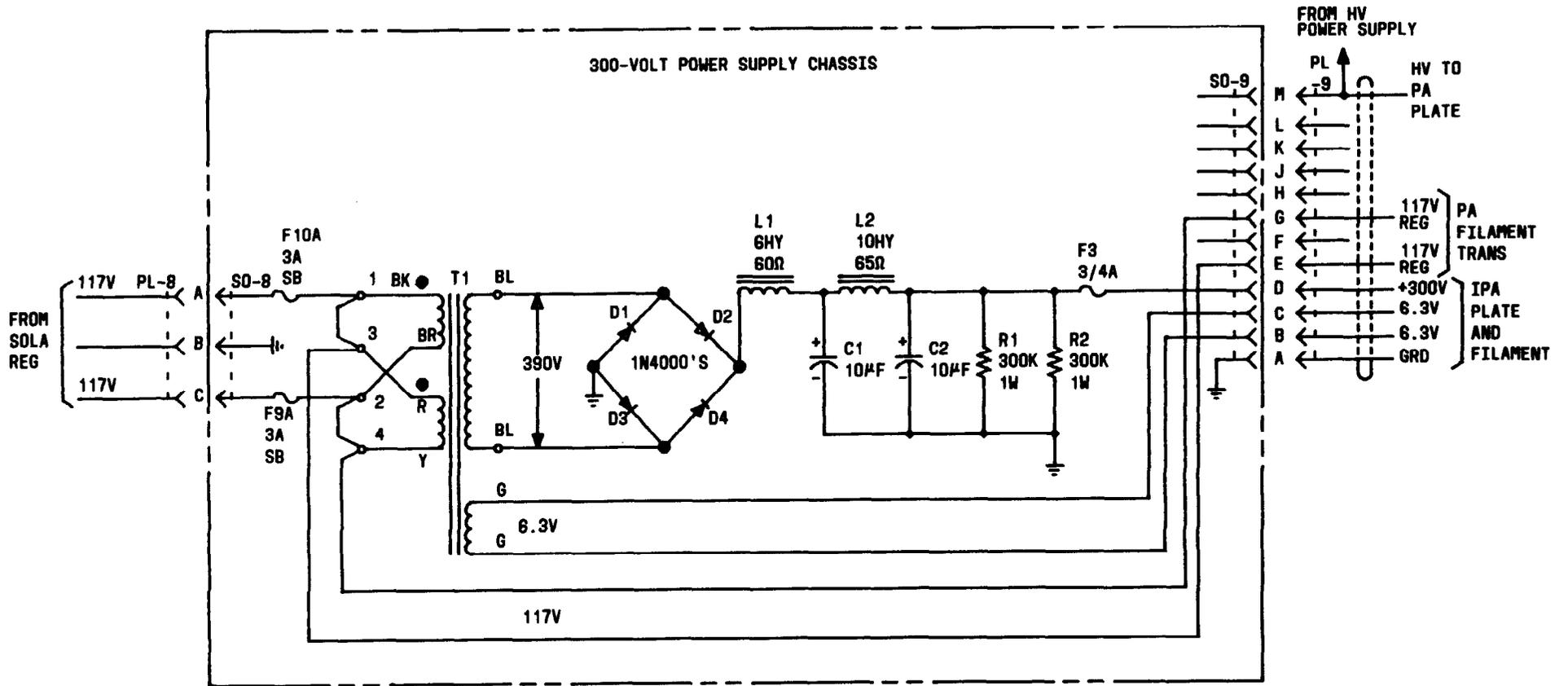
117-VOLT AC REGULATED DISTRIBUTION

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**CLEAR 300-VOLT INTERMEDIATE POWER AMPLIFIER (IPA)
POWER SUPPLY TROUBLE**

DANGER	
USE EXTREME CARE. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET	
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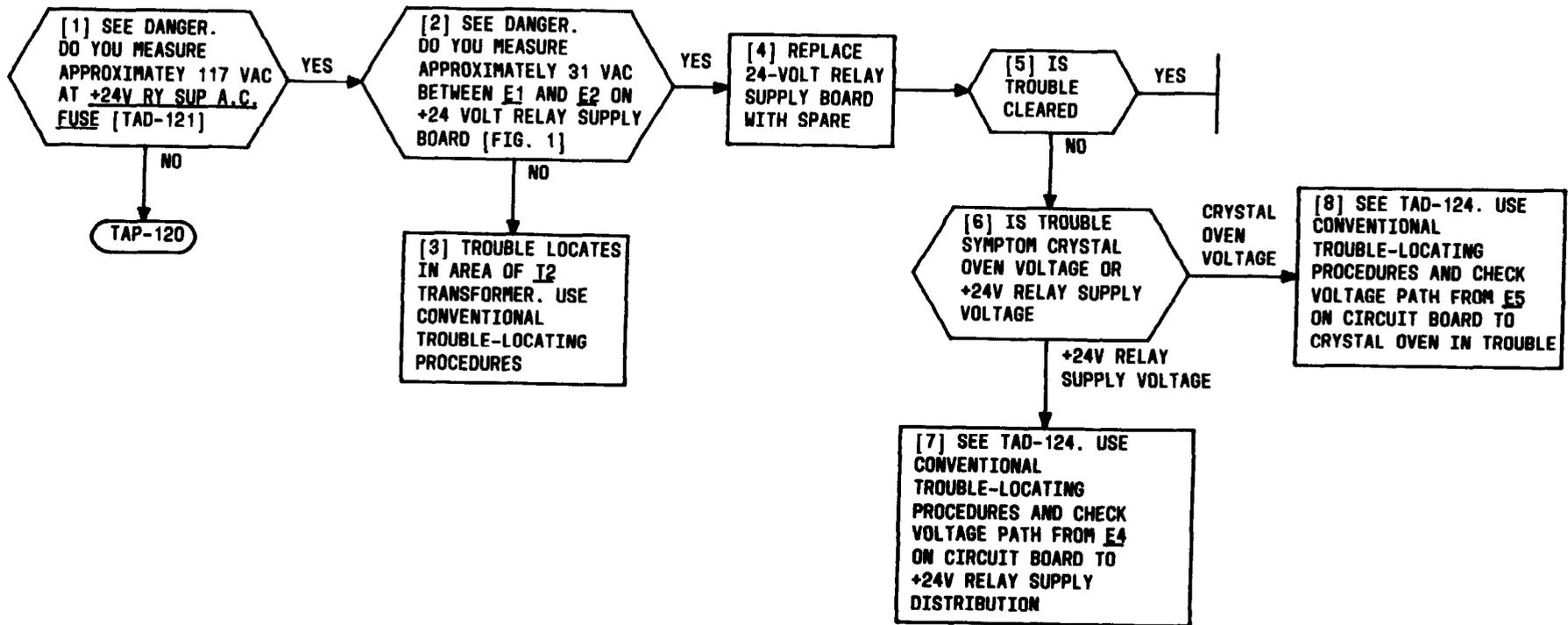


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FIG. 1

**CLEAR 300-VOLT INTERMEDIATE POWER AMPLIFIER (IPA)
POWER SUPPLY TROUBLE**

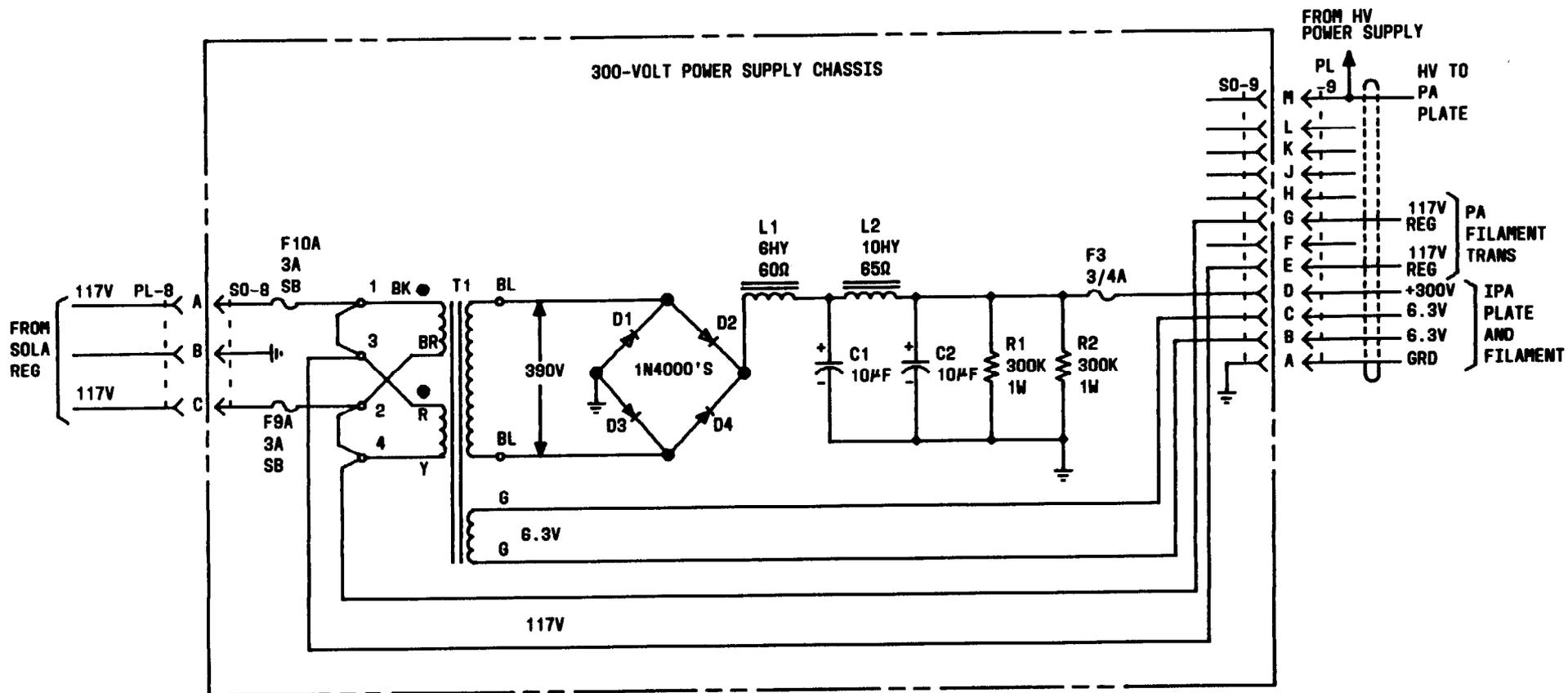
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DANGER
USE EXTREME CARE.
PRIMARY POWER IS STILL
APPLIED TO TRANSMITTER
CABINET

CLEAR +24 VOLT RELAY POWER SUPPLY TROUBLE

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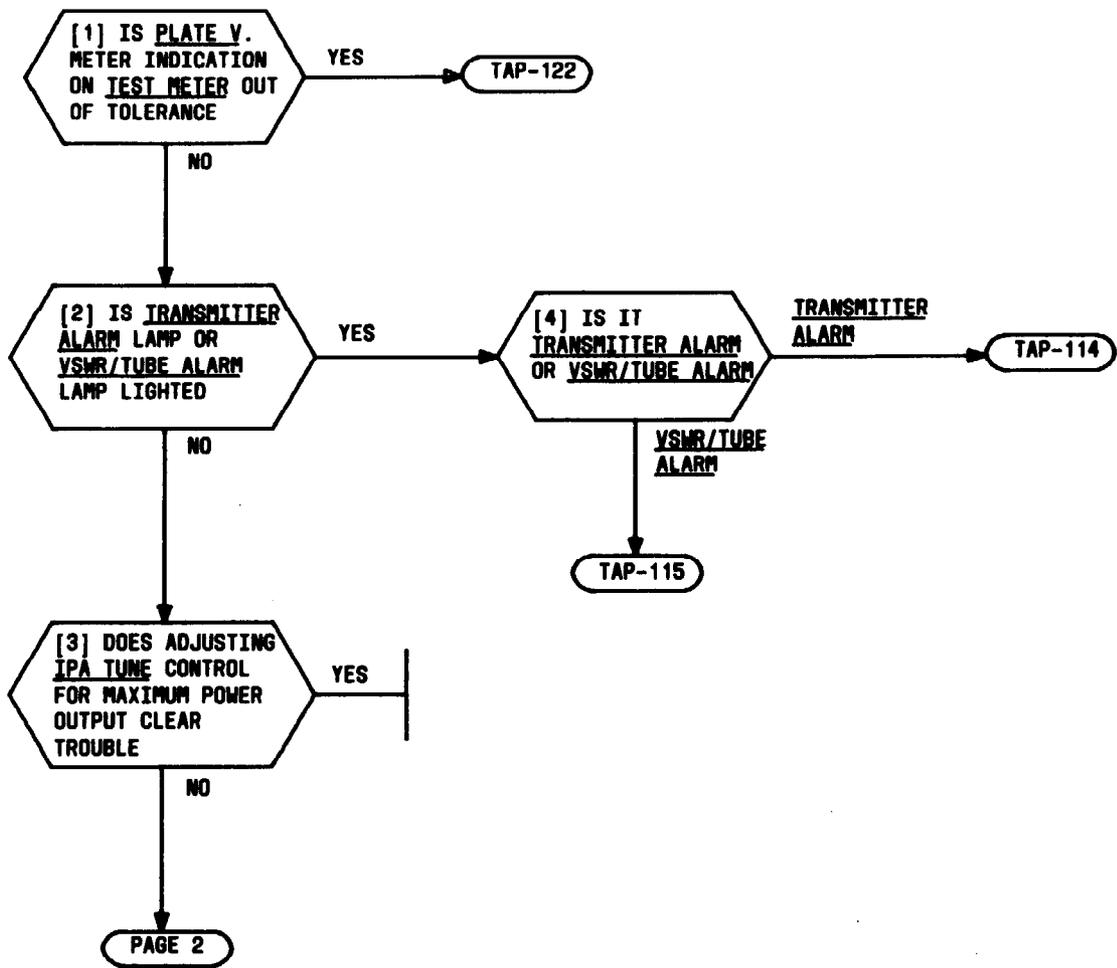


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FIG. 1

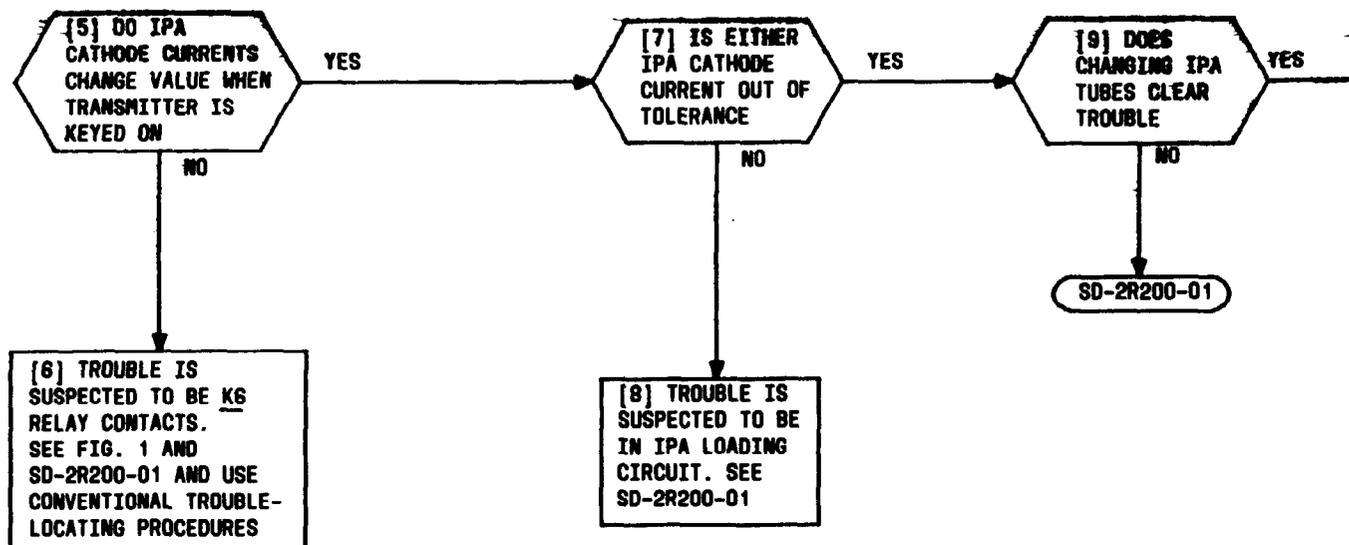
**CLEAR 300-VOLT INTERMEDIATE POWER AMPLIFIER (IPA)
POWER SUPPLY TROUBLE**

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CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE

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CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE

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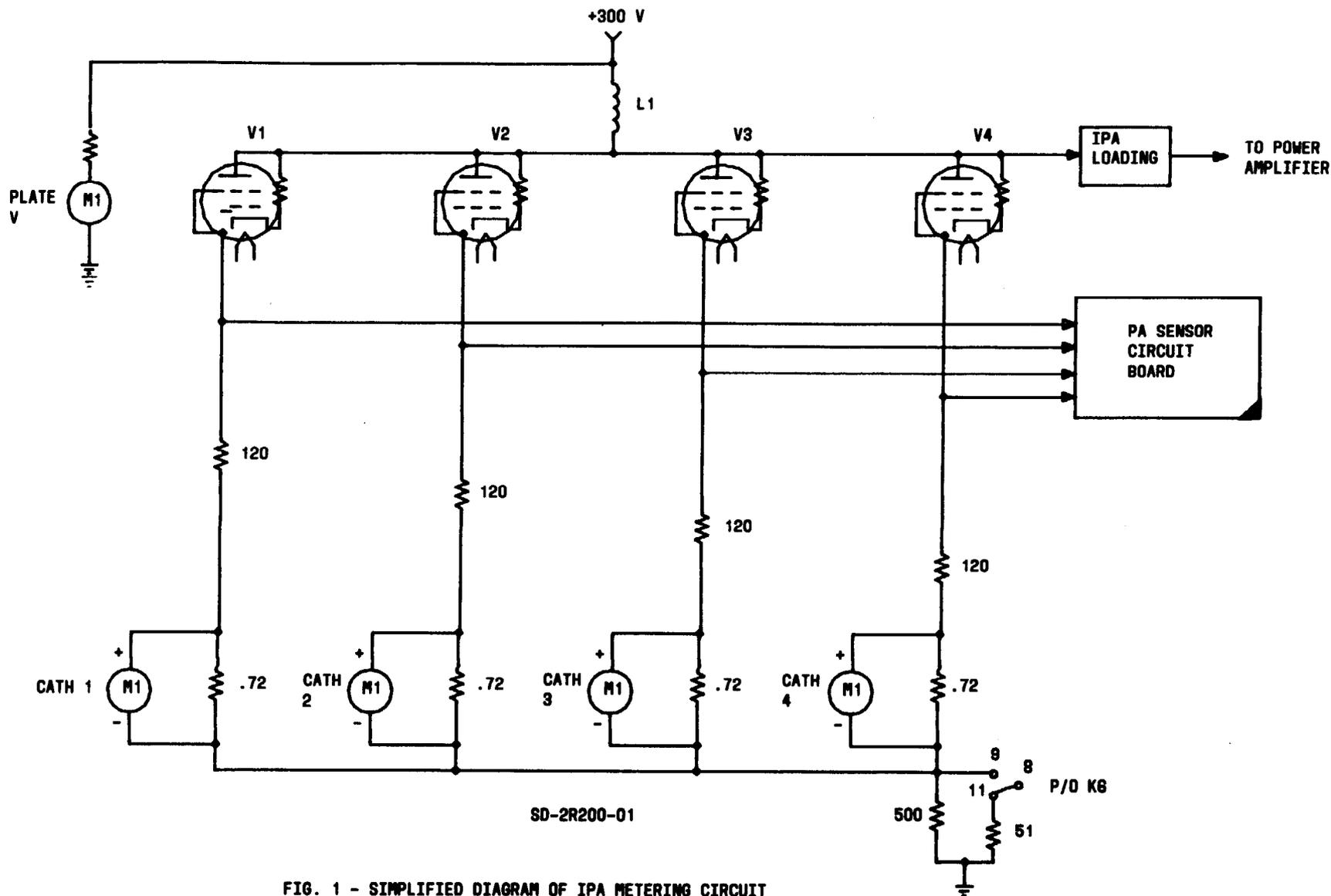
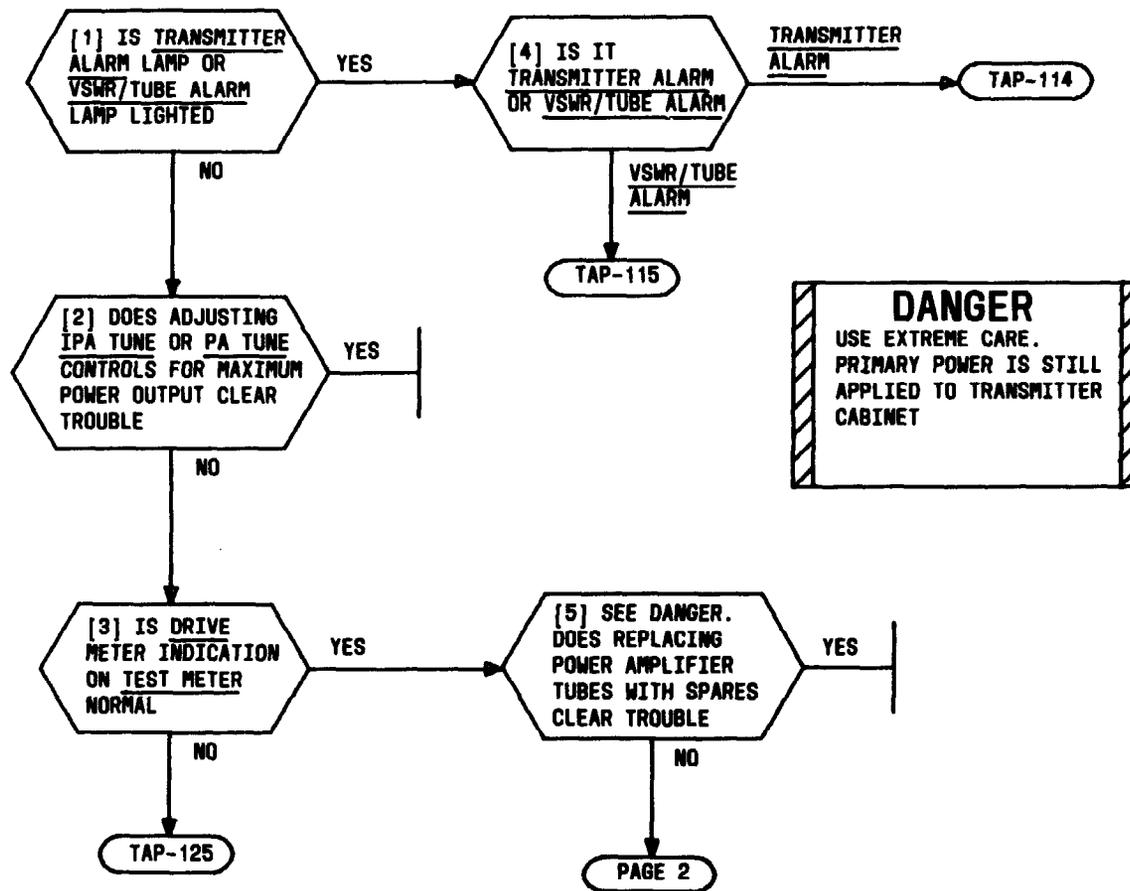


FIG. 1 - SIMPLIFIED DIAGRAM OF IPA METERING CIRCUIT

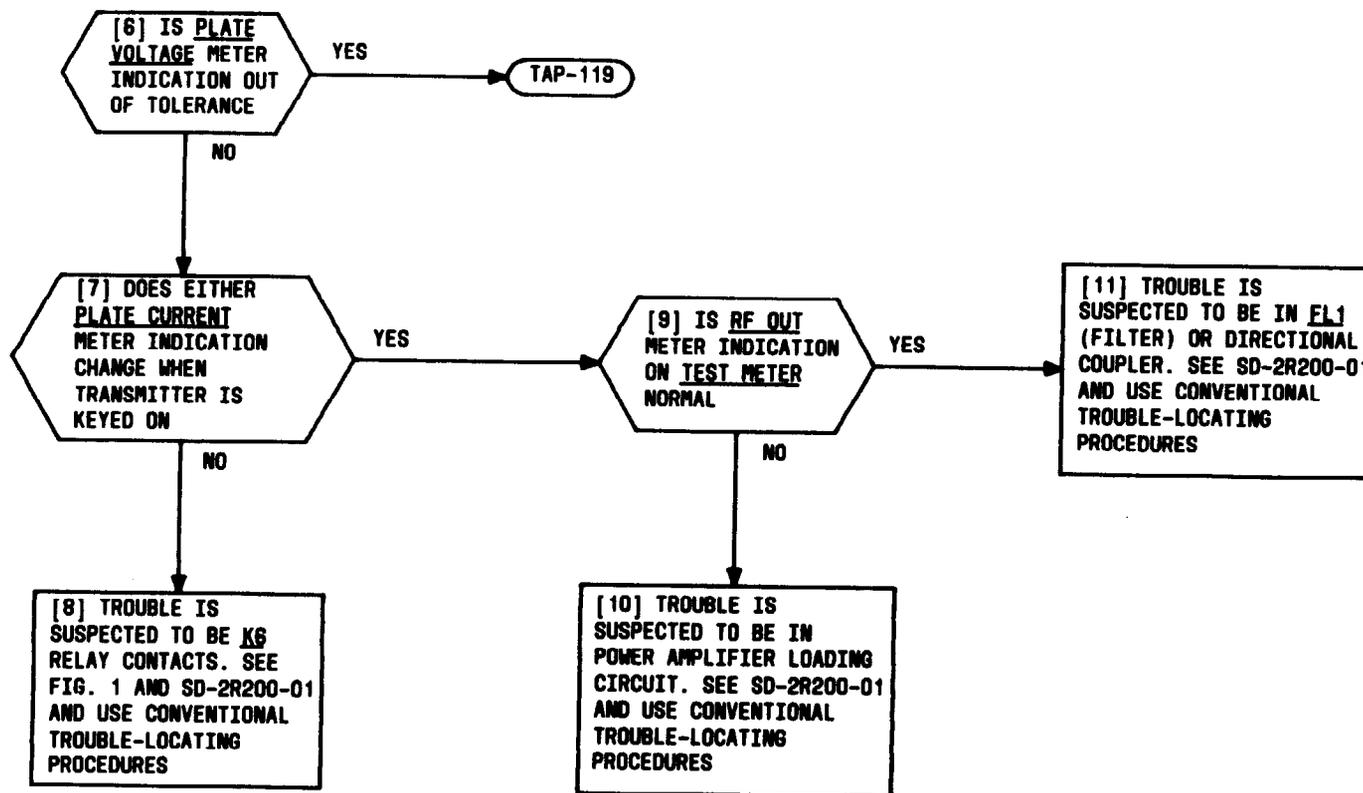
CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE

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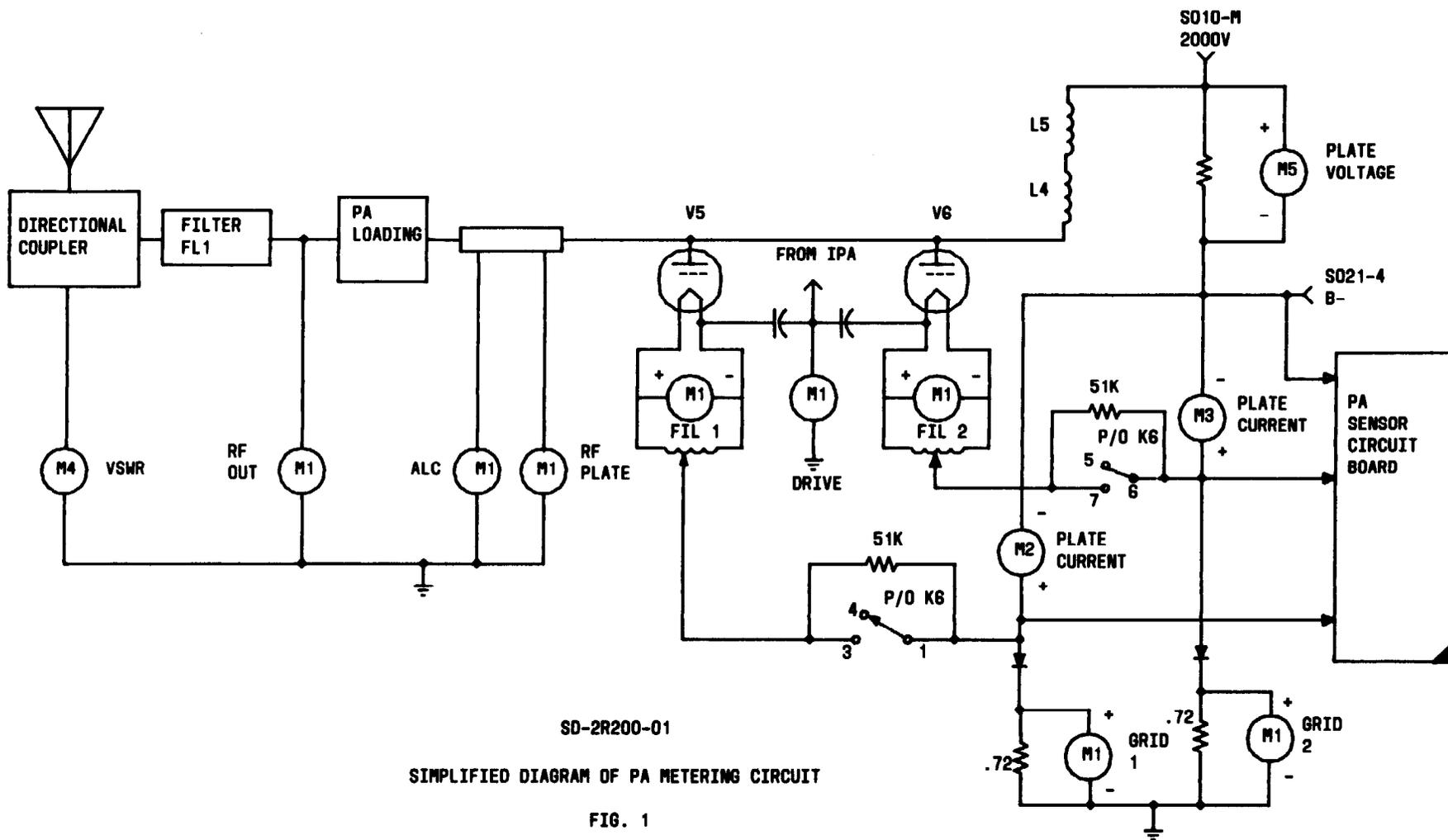
CLEAR POWER AMPLIFIER METER INDICATION TROUBLE

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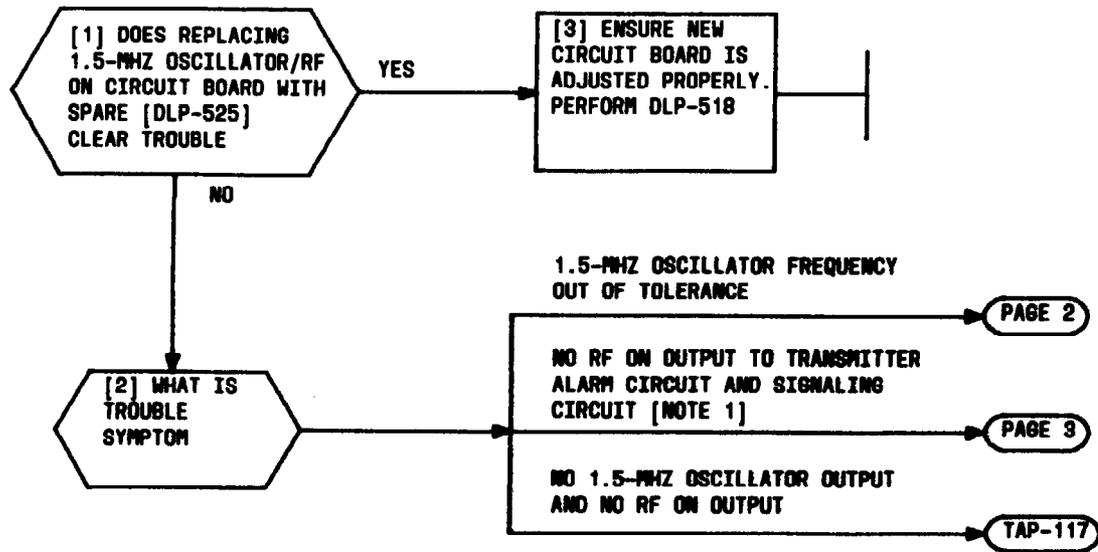
CLEAR POWER AMPLIFIER METER INDICATION TROUBLE

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 SIMPLIFIED DIAGRAM OF PA METERING CIRCUIT
 FIG. 1

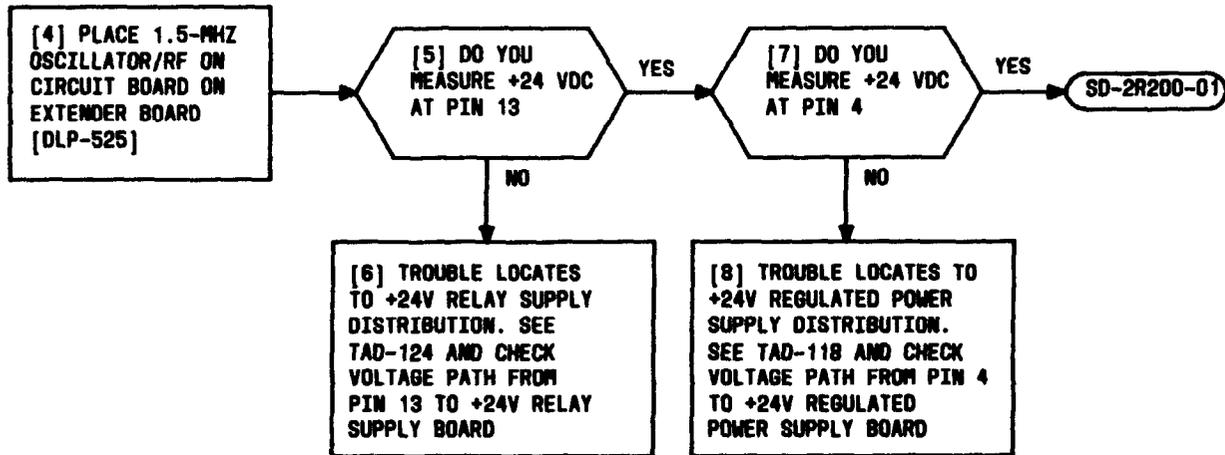
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NOTE 1
WHEN TRANSMITTER IS
TURNED ON REMOTELY
AND RF ON OUTPUT IS
MISSING, THE
TRANSMITTER ALARM
LAMP WILL LIGHT

CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE

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CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE

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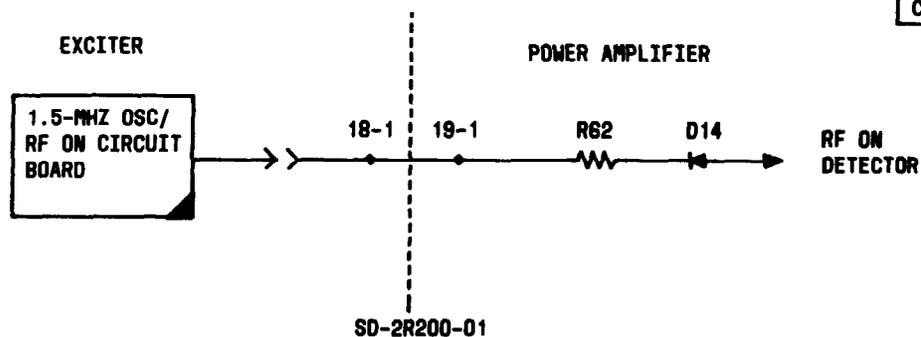
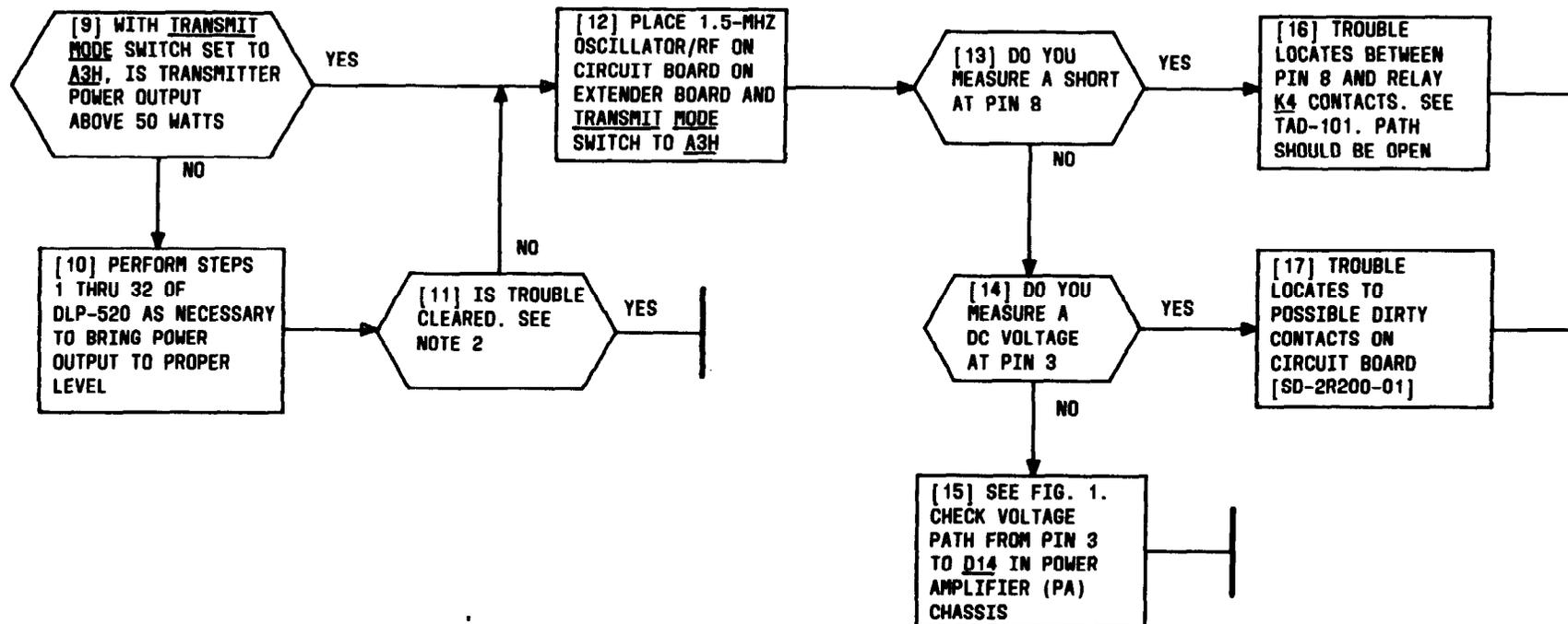
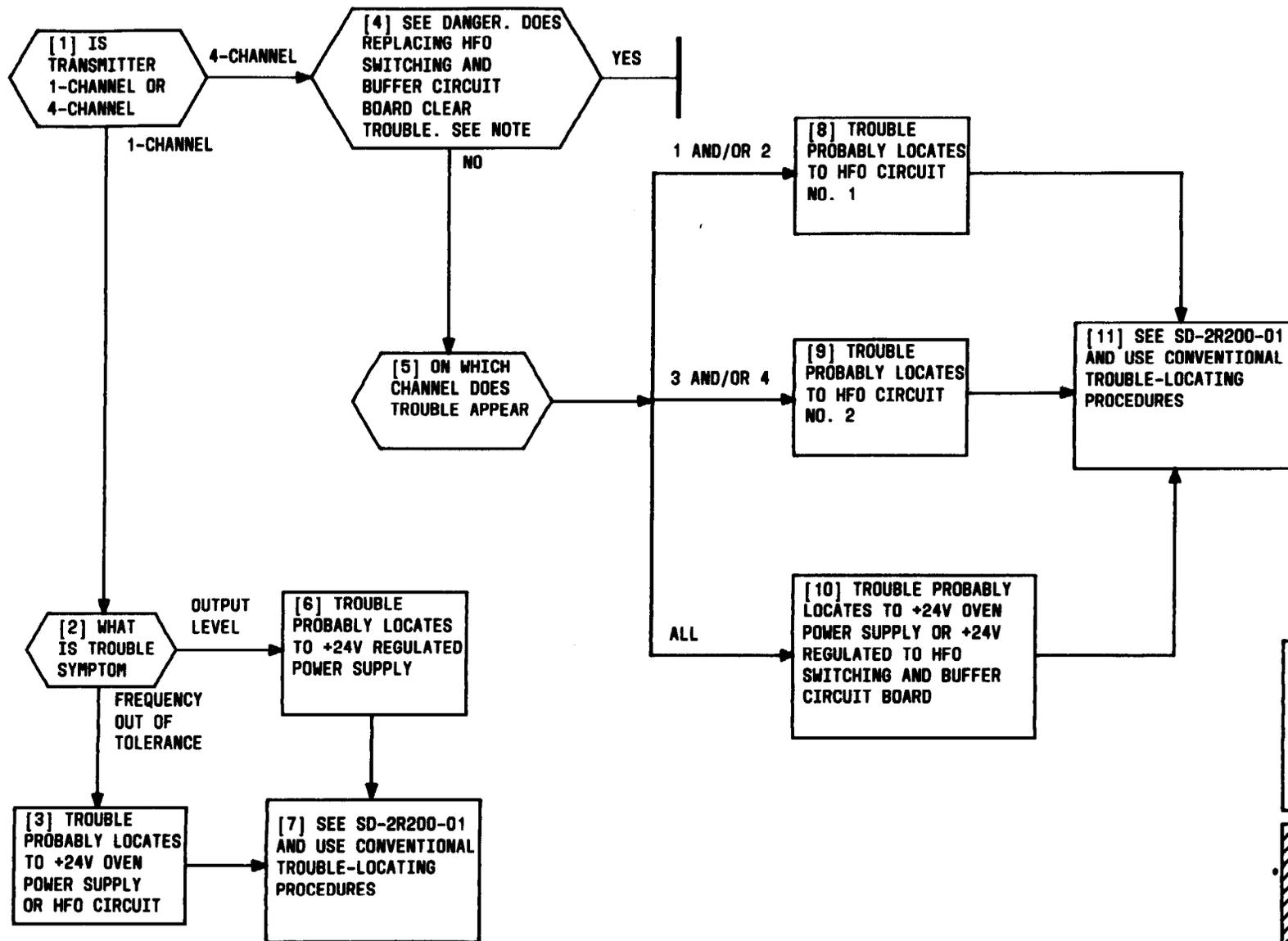


FIG. 1

NOTE 2
IF TROUBLE IS
CLEARED, PERFORM
STEPS 33 AND 34
OF DLP-520

CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE

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NOTE
HFO SWITCHING AND BUFFER
CIRCUIT BOARD IS LOCATED
INSIDE ON TOP OF EXCITER
CHASSIS AND IS NOT
PLUG-IN TYPE

DANGER
USE EXTREME CARE.
PRIMARY POWER IS
STILL APPLIED TO
TRANSMITTER CABINET

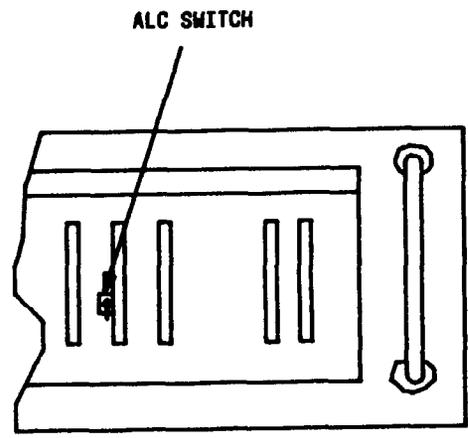
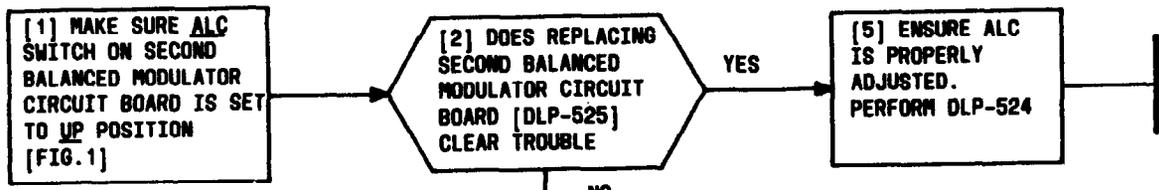


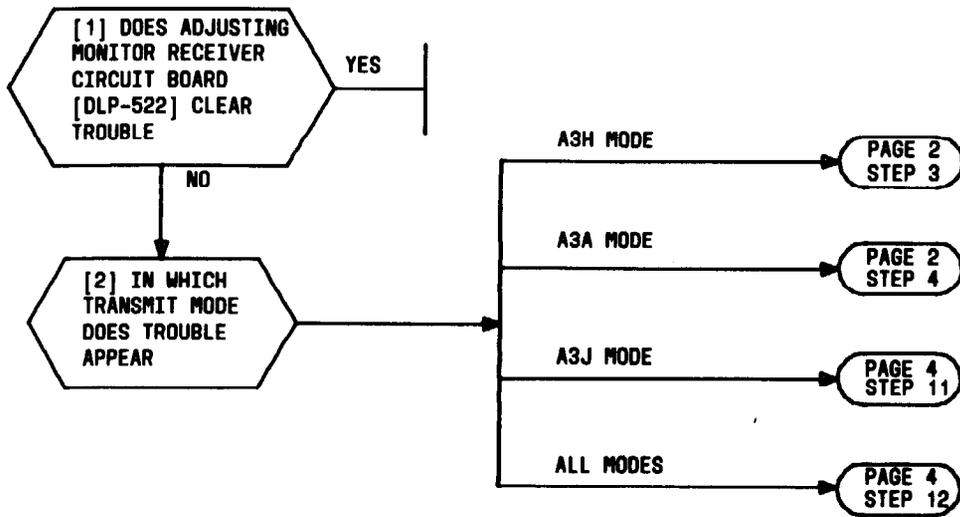
FIG.1



[4] TROUBLE PROBABLY LOCATES TO ALC CIRCUIT BOARD ON POWER AMPLIFIER (PA) CHASSIS. SEE SD-2R200-01 AND USE CONVENTIONAL TROUBLE-LOCATING PROCEDURE

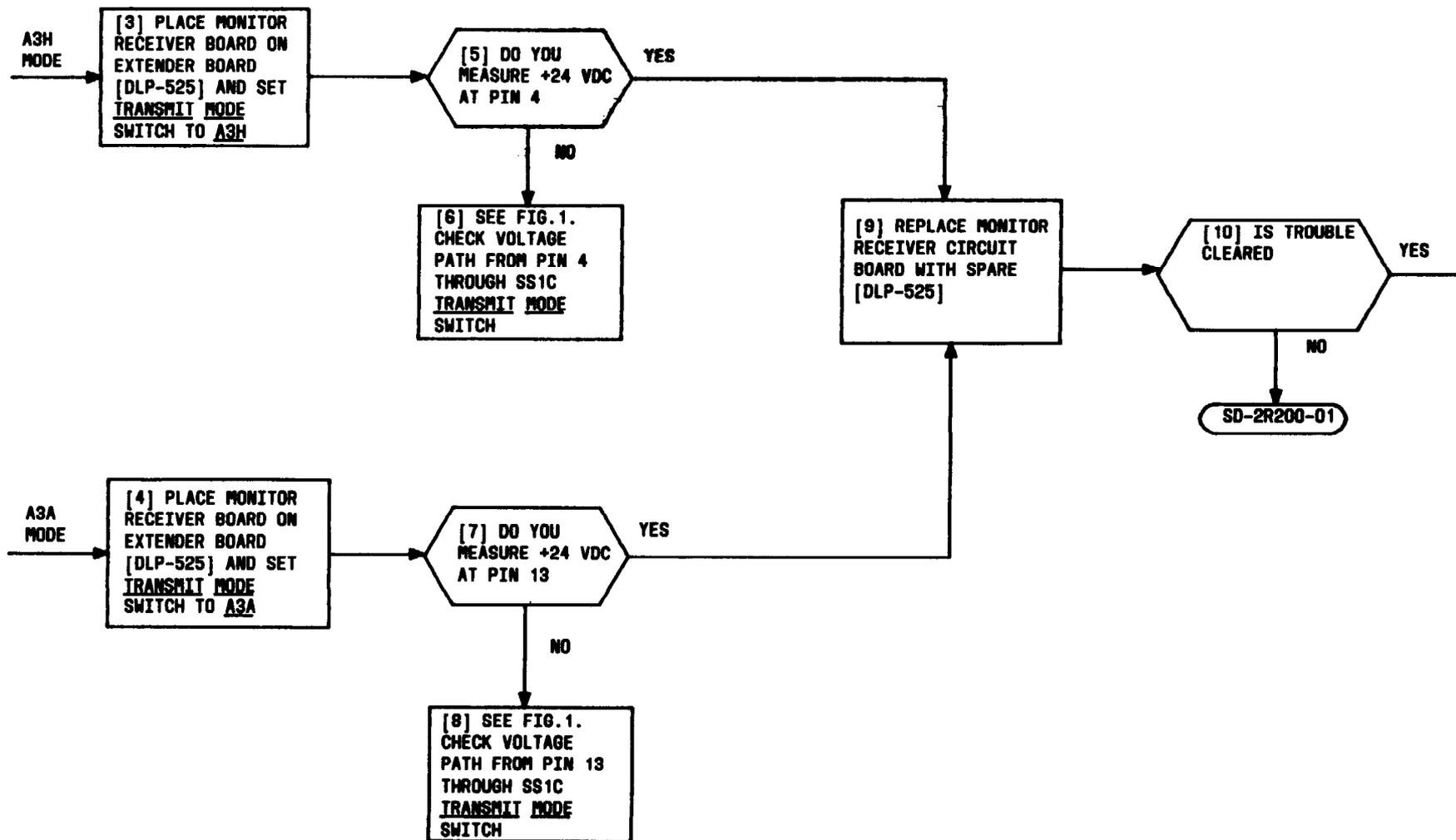
CLEAR AUTOMATIC LEVEL CONTROL (ALC) TROUBLE

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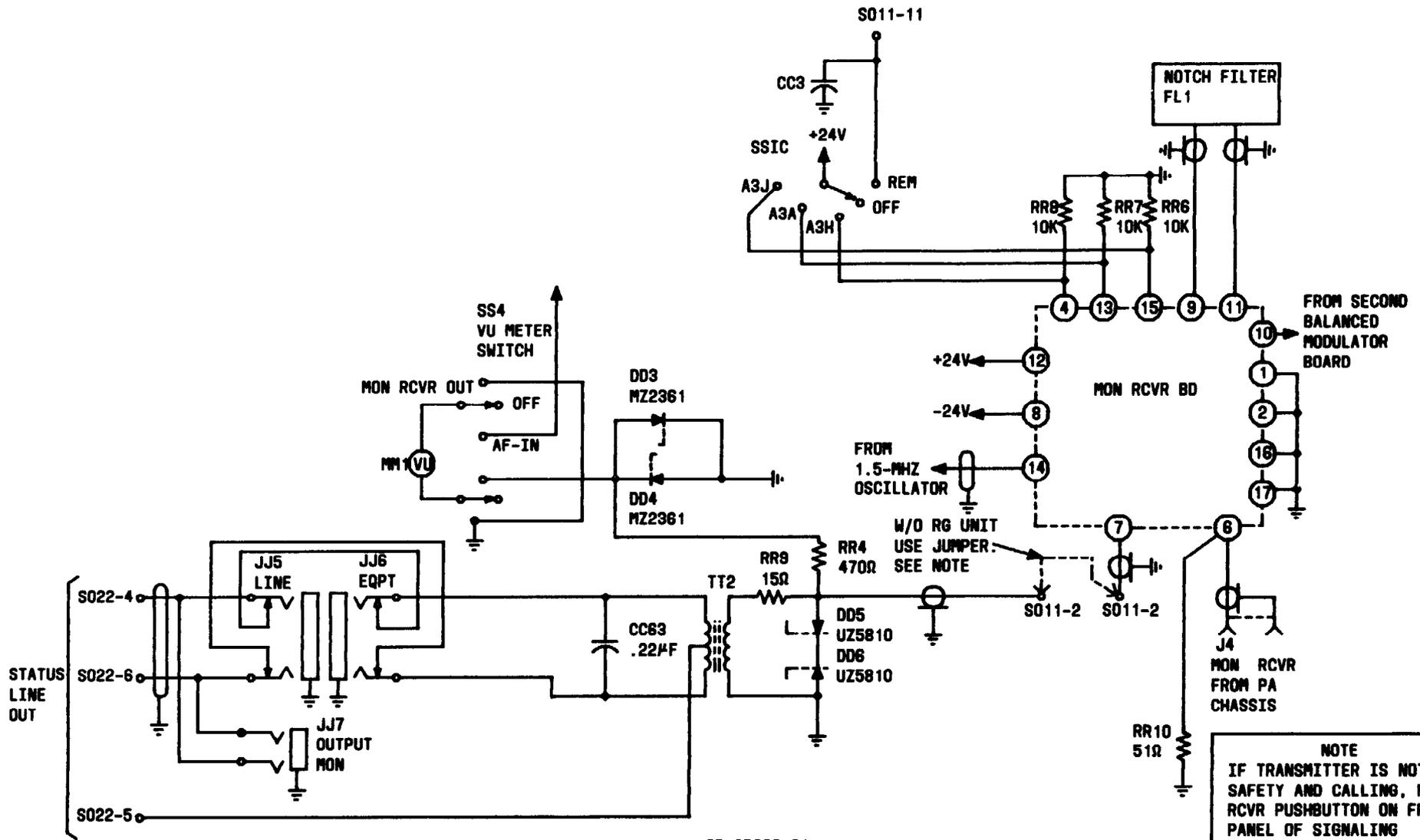
CLEAR MONITOR RECEIVER OUTPUT TROUBLE

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CLEAR MONITOR RECEIVER OUTPUT TROUBLE

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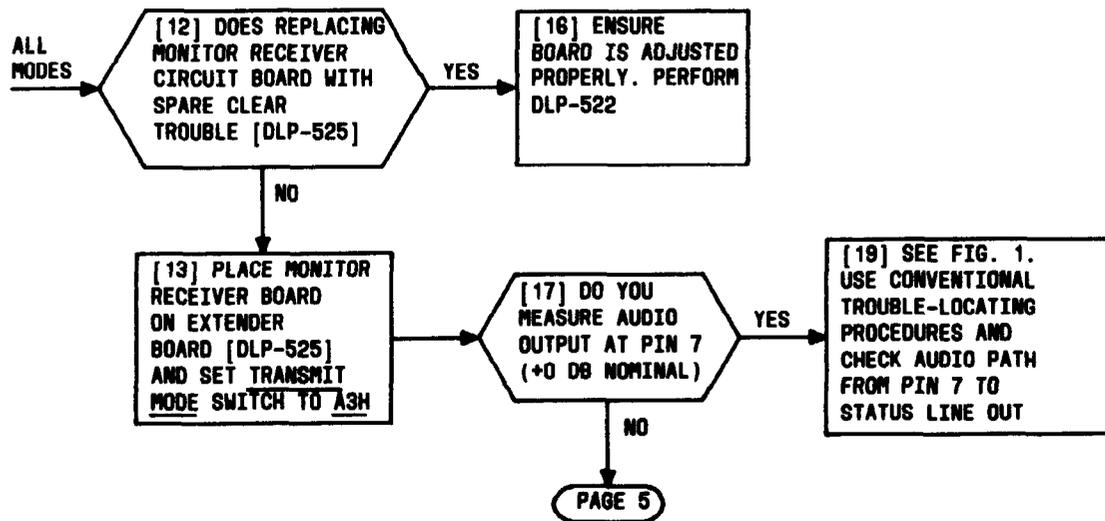
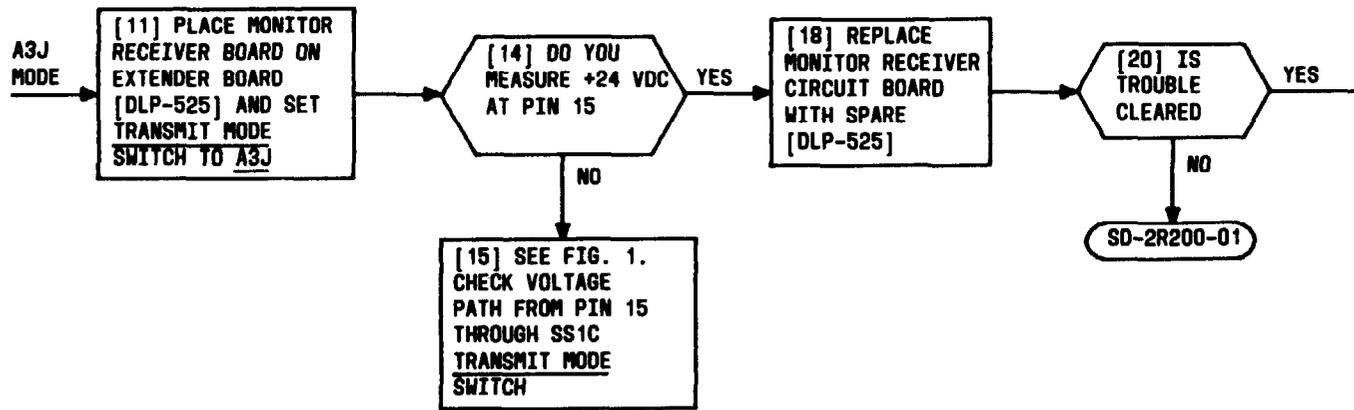


SD-2R200-01
FIG. 1

NOTE
IF TRANSMITTER IS NOT
SAFETY AND CALLING, MON
RCVR PUSHBUTTON ON FRONT
PANEL OF SIGNALING
CHASSIS MUST BE
DEPRESSED TO PASS AUDIO
TO STATUS LINE OUT

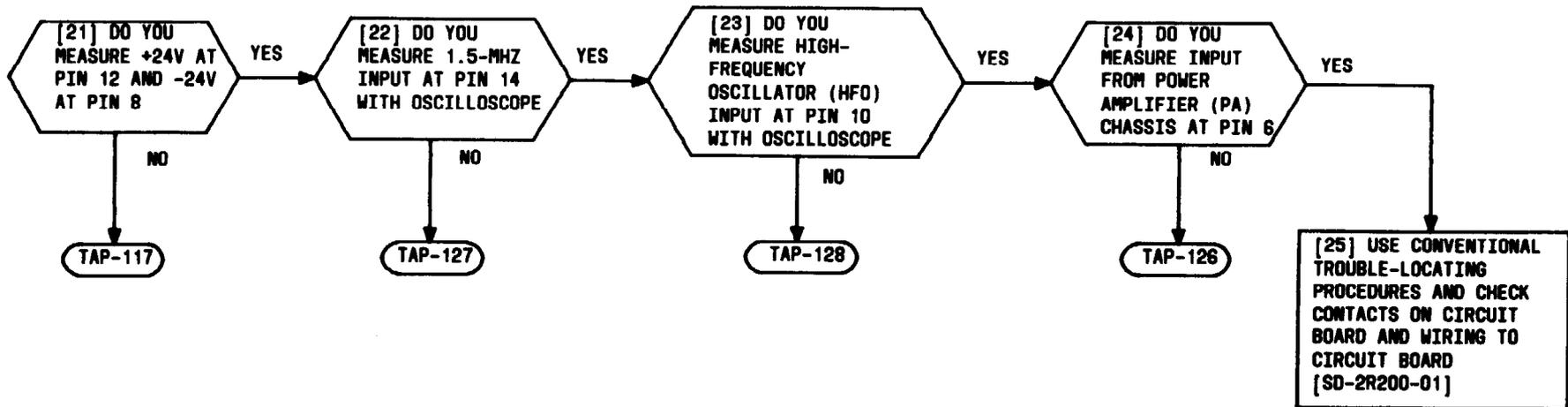
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CLEAR MONITOR RECEIVER OUTPUT TROUBLE



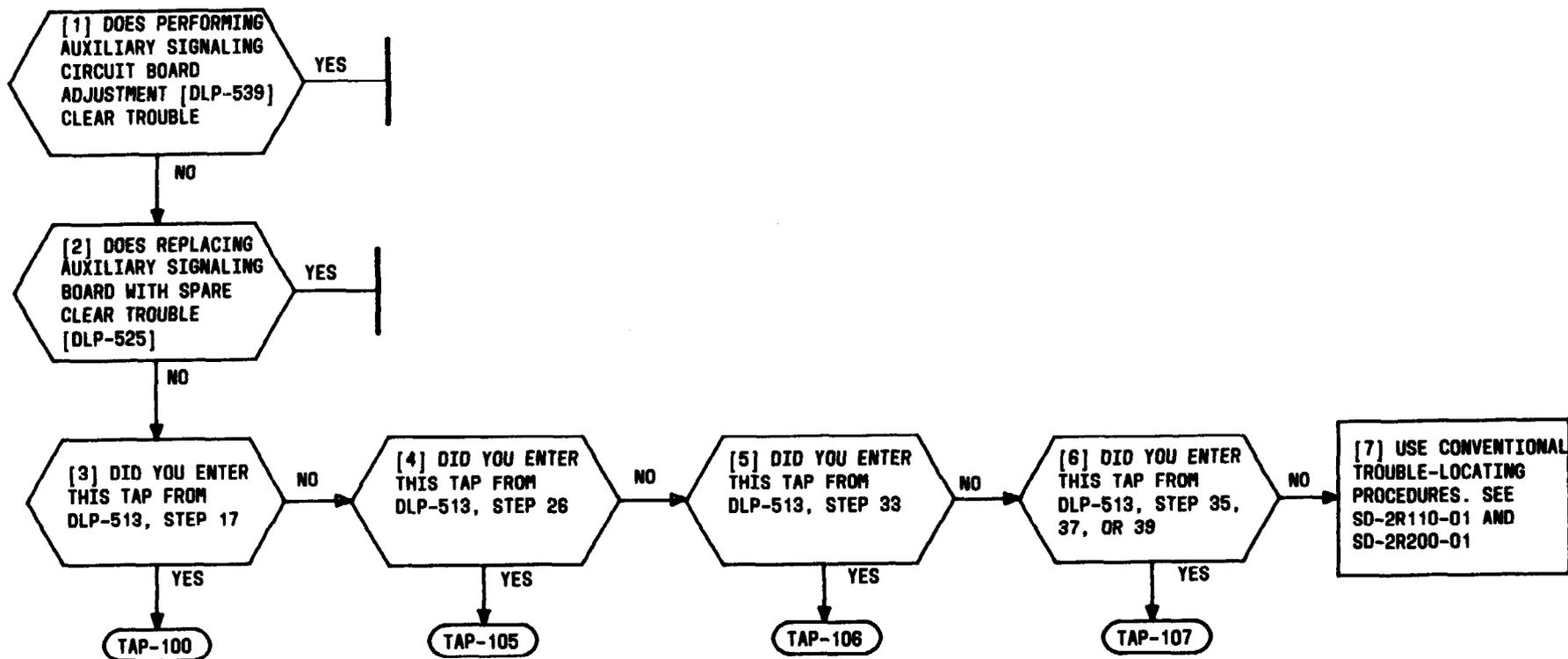
CLEAR MONITOR RECEIVER OUTPUT TROUBLE

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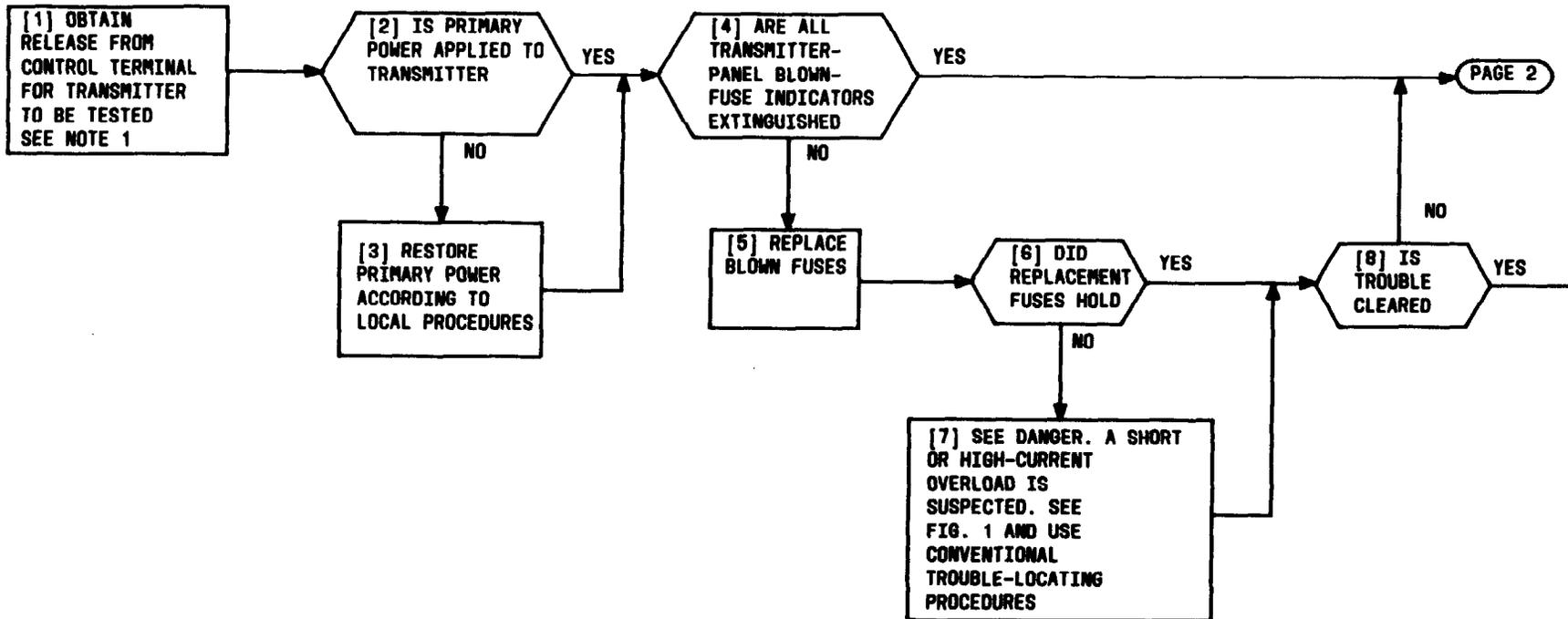
CLEAR MONITOR RECEIVER OUTPUT TROUBLE

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CLEAR AUXILIARY SIGNALING CIRCUIT TROUBLE

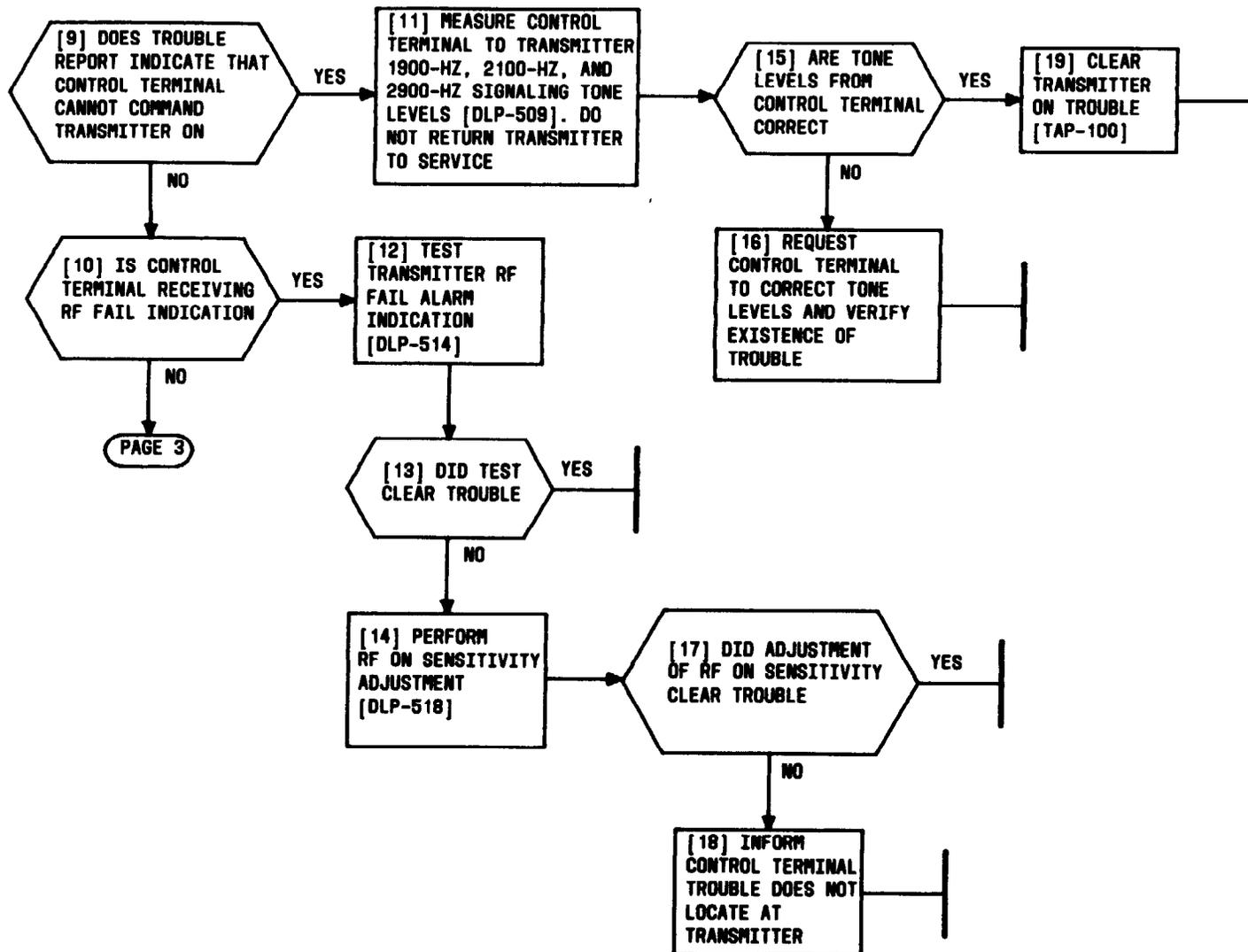
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NOTE 1
 RETURN TRANSMITTER TO SERVICE WHEN TROUBLE IS CLEARED AND MAKE ENTRIES IN FCC TECHNICAL LOG AS REQUIRED

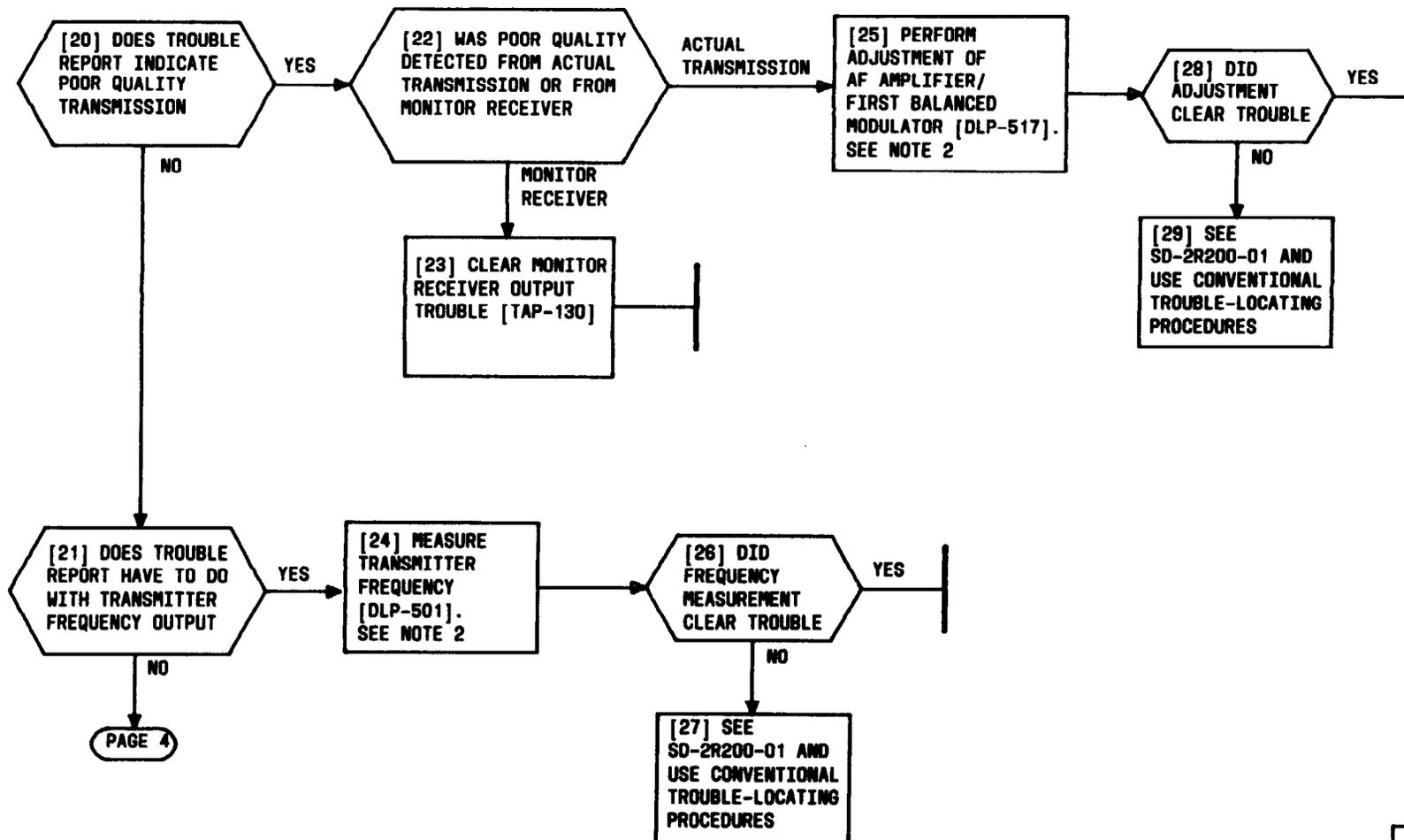
DANGER
 USE EXTREME CARE. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET

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LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT

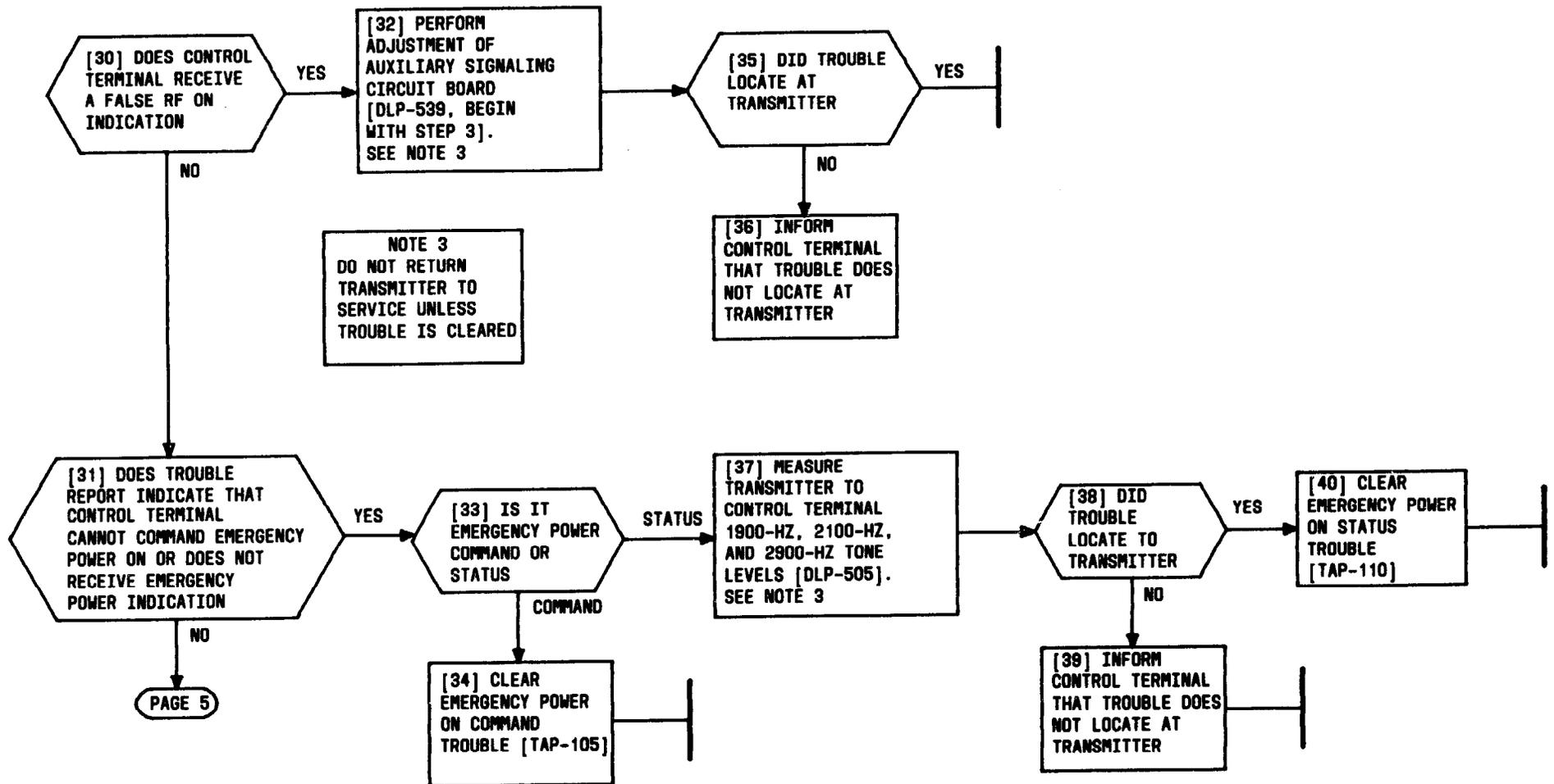
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NOTE 2
DO NOT RETURN TRANSMITTER TO SERVICE UNLESS TROUBLE IS CLEARED

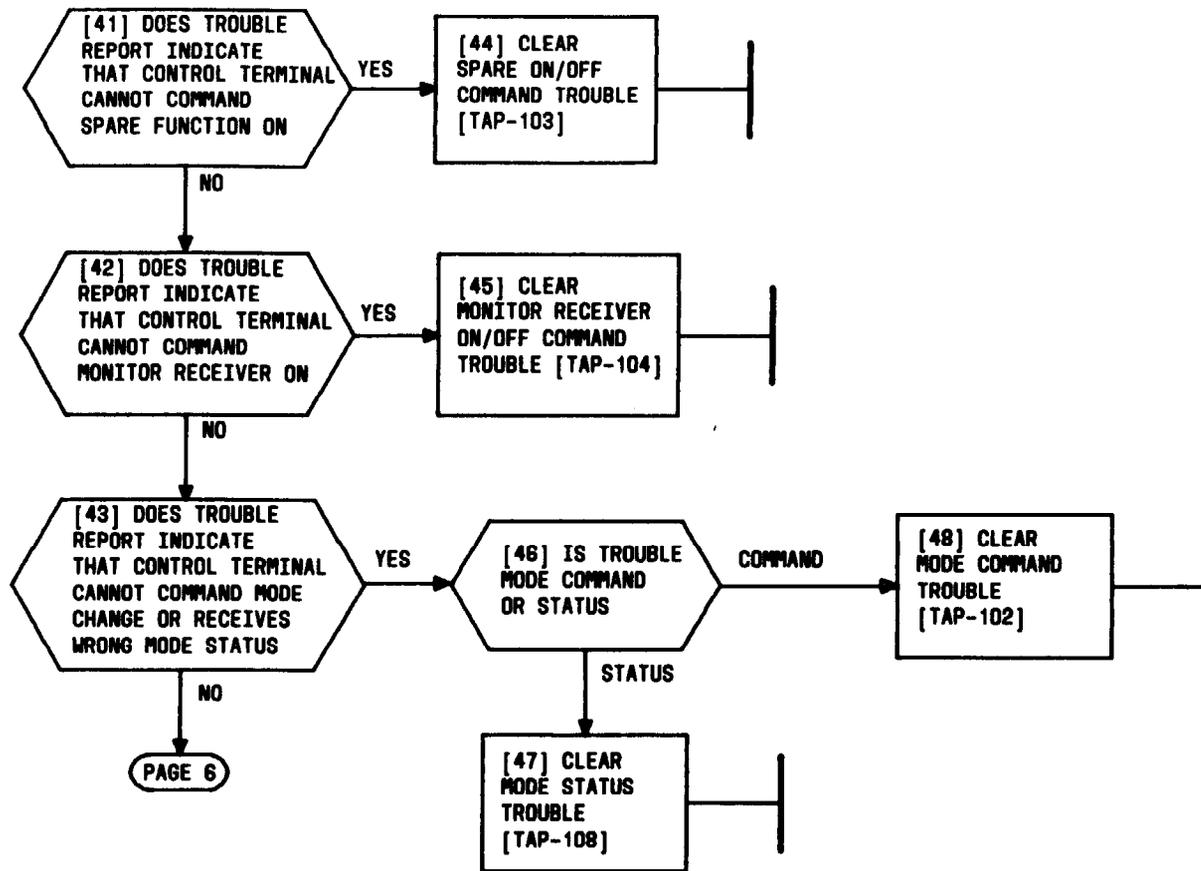
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LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



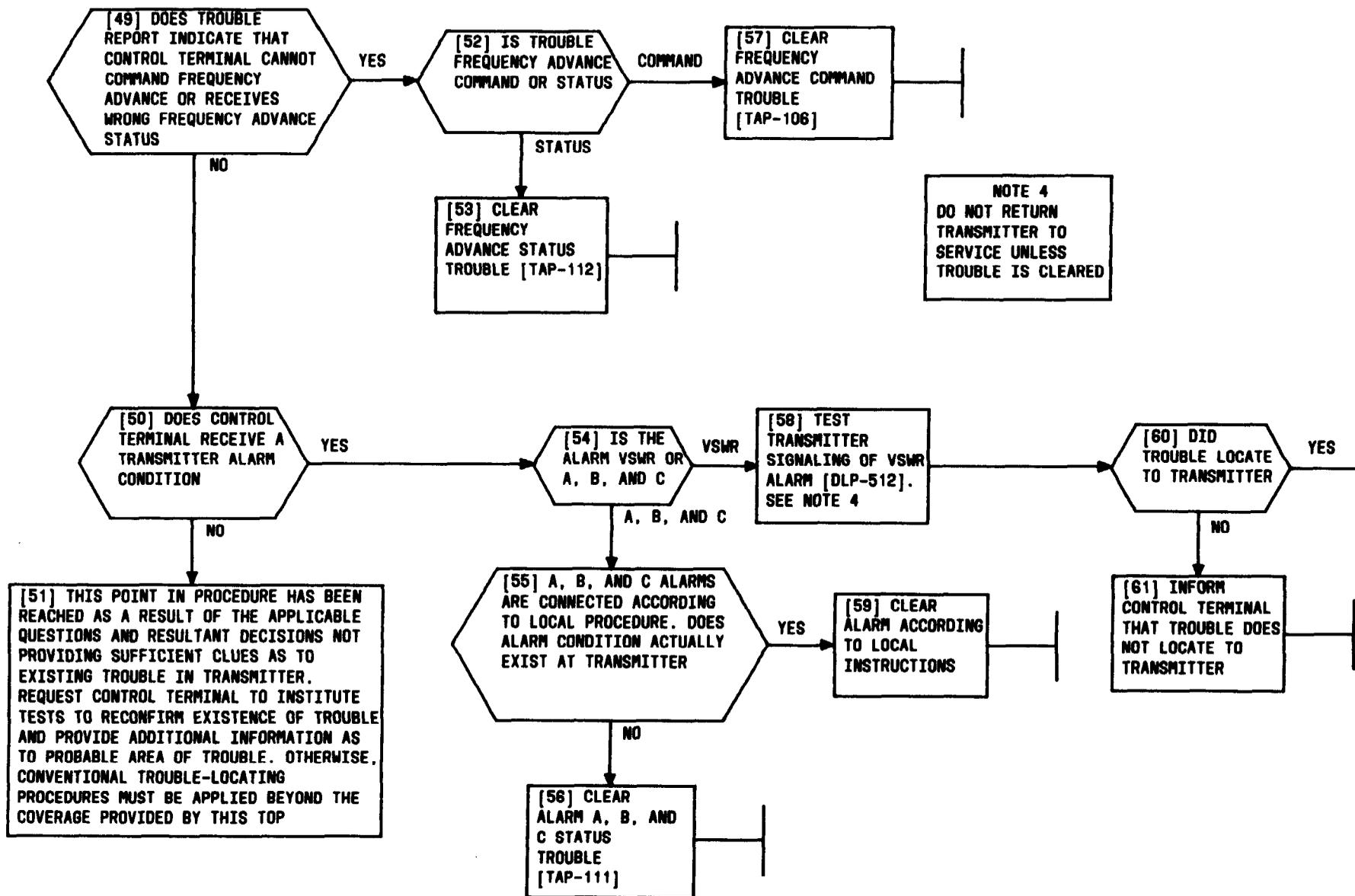
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT

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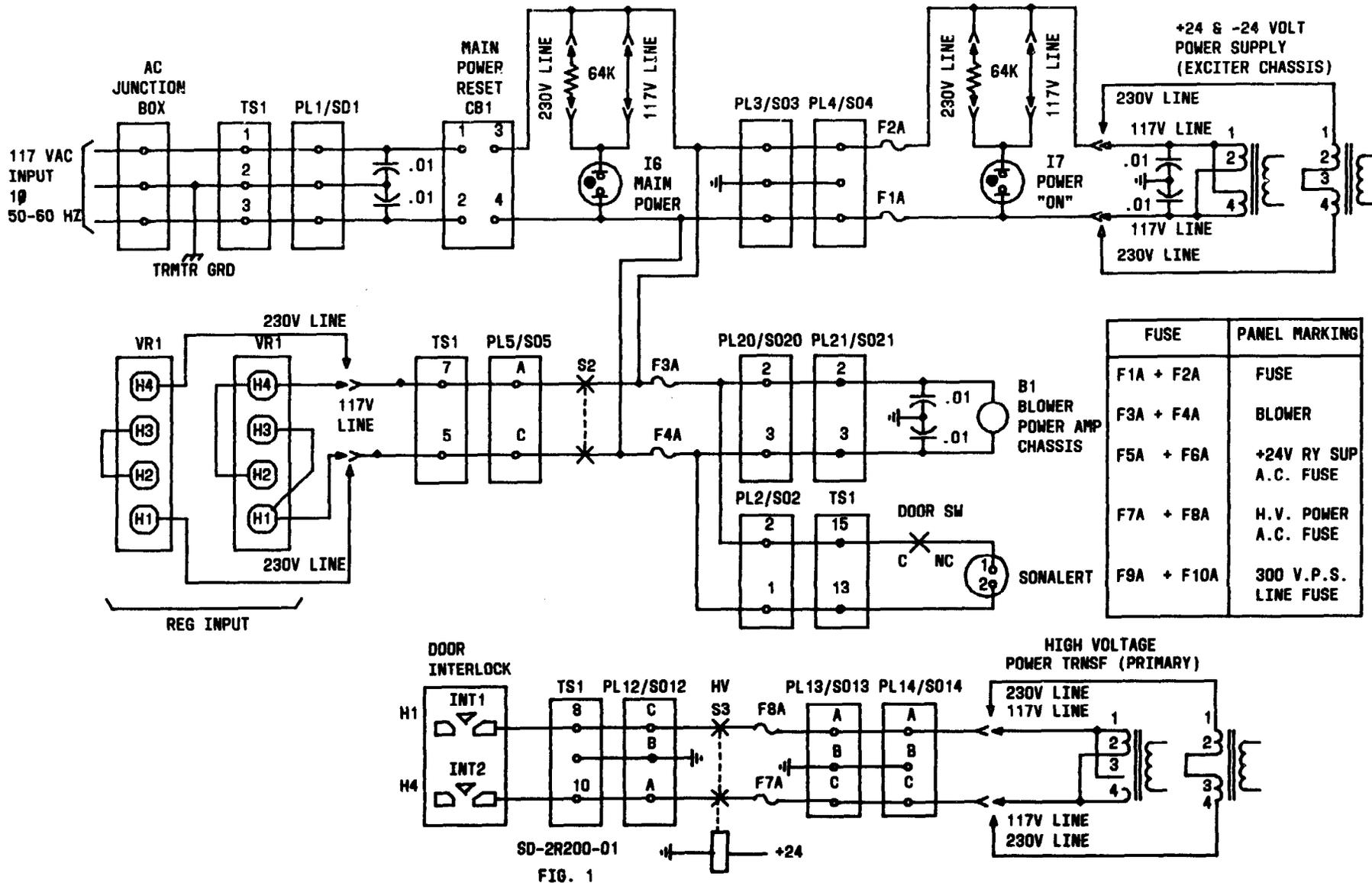
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT

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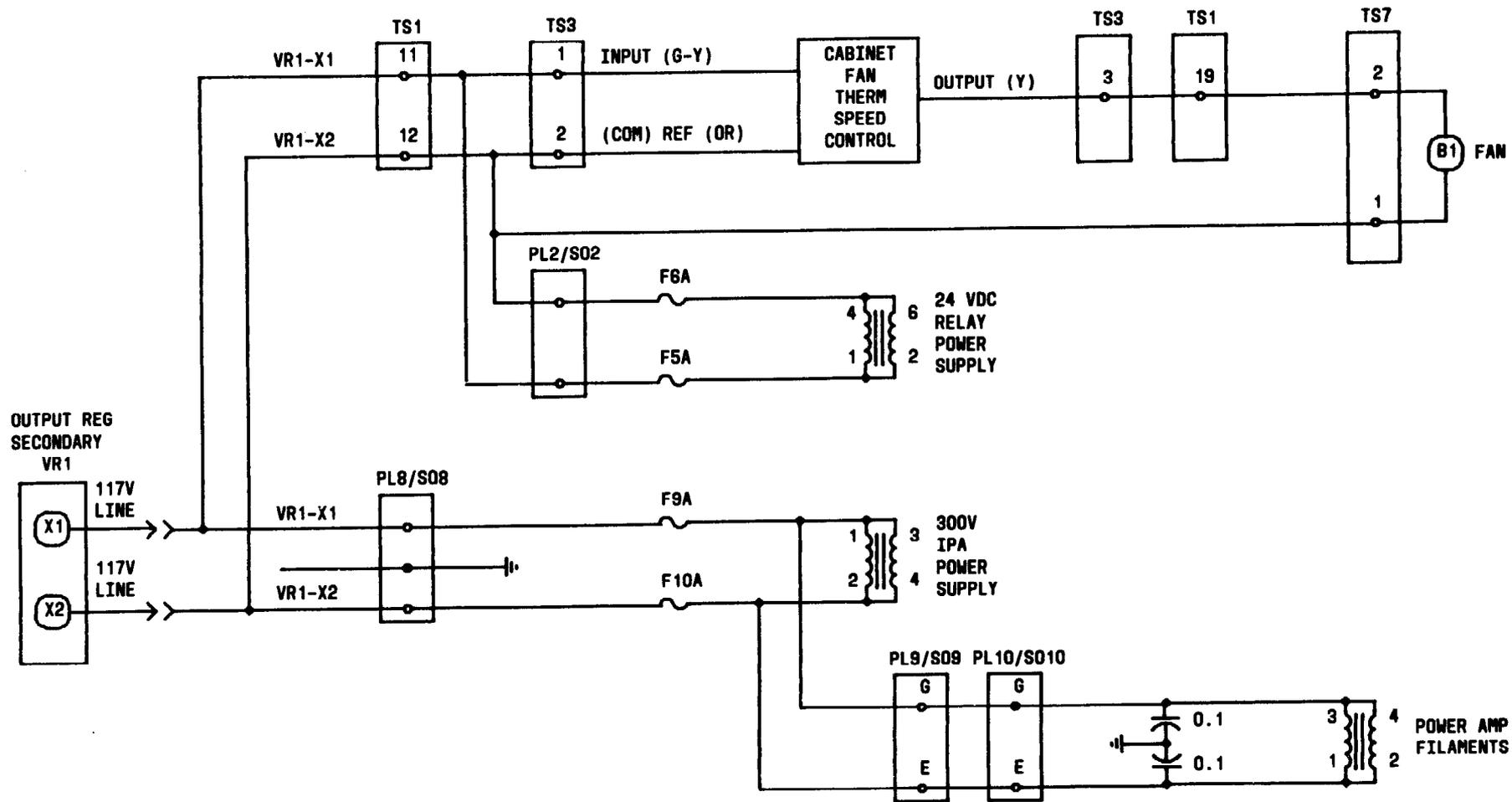


LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT

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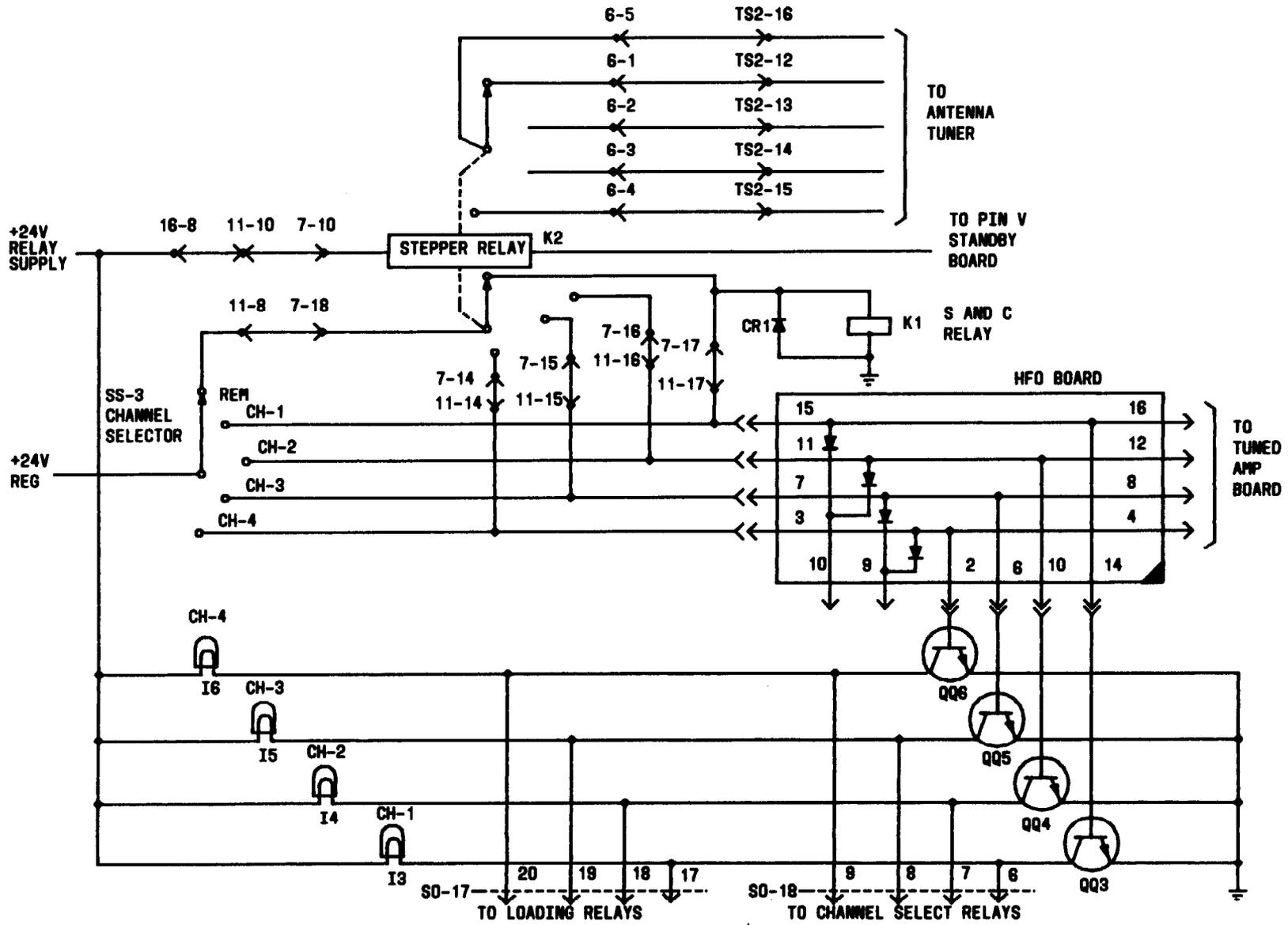
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



SD-2R200-01
FIG. 1 (CONT)

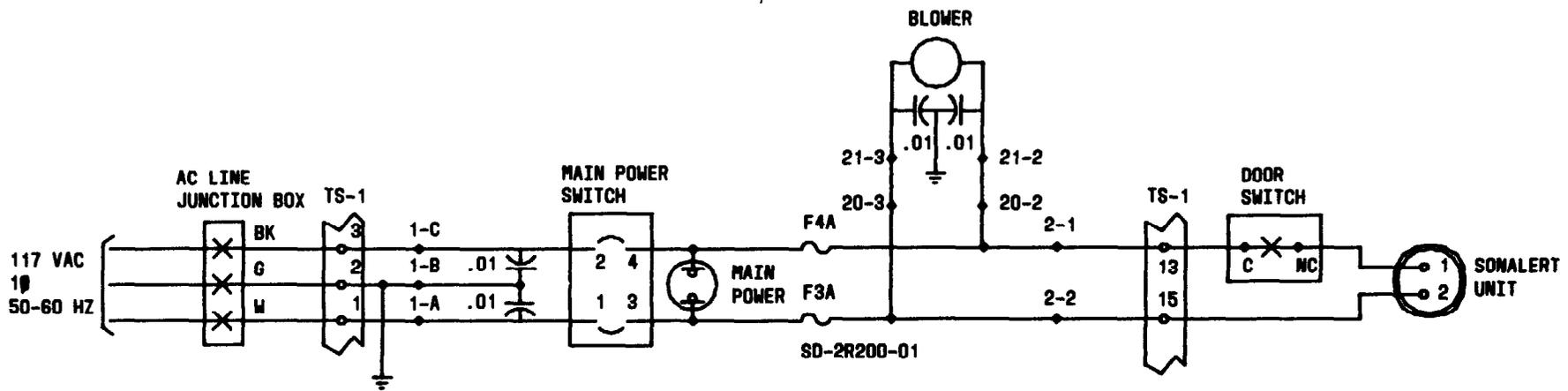
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LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



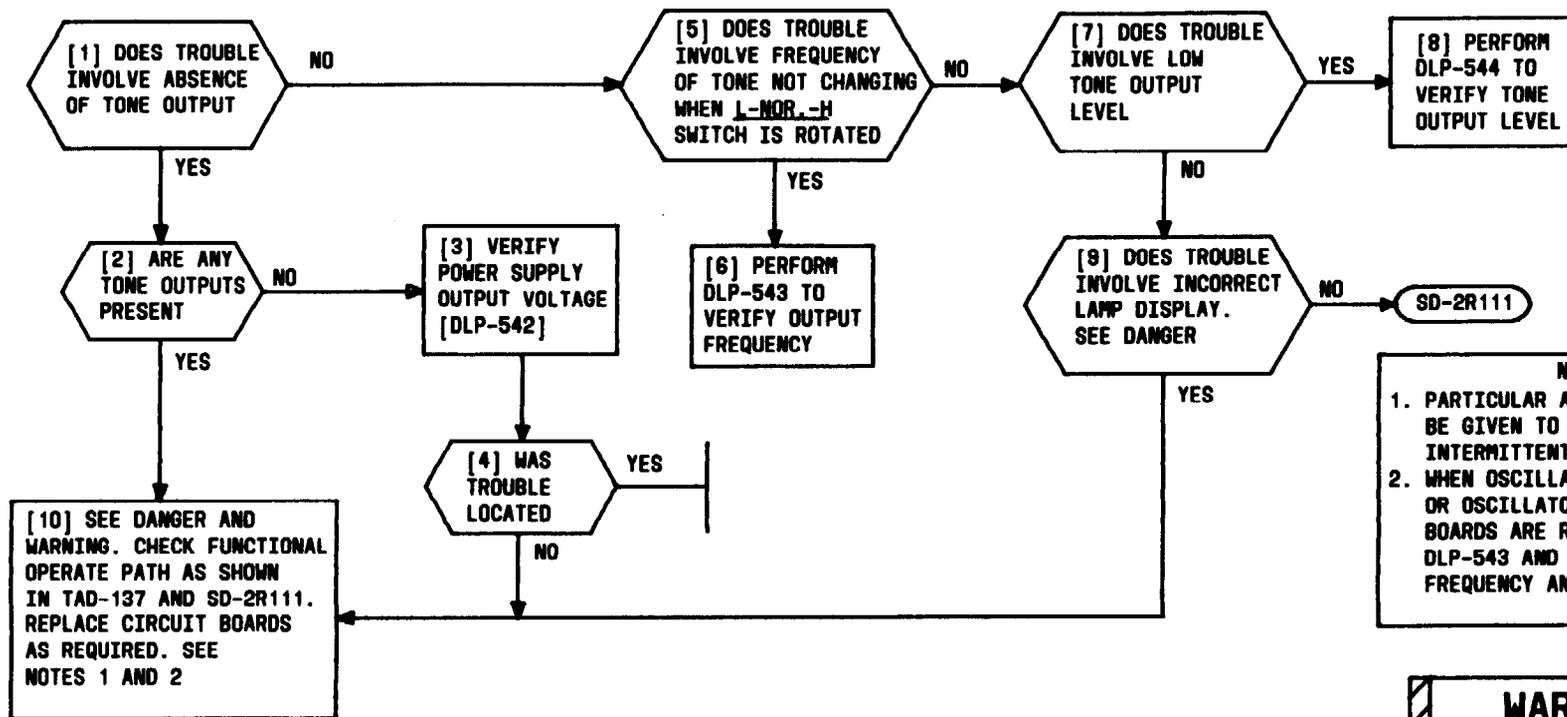
SIMPLIFIED DIAGRAM OF CHANNEL LAMP CIRCUIT

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SIMPLIFIED DIAGRAM OF MAIN POWER CIRCUIT

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- NOTES**
- PARTICULAR ATTENTION SHOULD BE GIVEN TO FAULTY AND INTERMITTENT SWITCH CONTACTS
 - WHEN OSCILLATOR POTENTIOMETER OR OSCILLATOR-SWITCH-COMBINER BOARDS ARE REPLACED, PERFORM DLP-543 AND -544 TO VERIFY FREQUENCY AND LEVEL OUTPUTS

WARNING
 WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT

DANGER
 120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE

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PREVENTIVE AND CORRECTIVE MAINTENANCE

COASTAL HARBOR RADIO MAINTENANCE PHILOSOPHY IS BASED UPON (A) PREVENTIVE MAINTENANCE AS REPRESENTED BY THE ROUTINE TASKS LISTED ON THE ROUTINE TASK LIST (RTL) AND (B) CORRECTIVE MAINTENANCE AS REPRESENTED BY THE TROUBLE ANALYSIS PROCEDURES (TAP) REFERENCED FROM ROUTINE TASKS AND THE TROUBLE INDICATOR LIST (TIL). THE MAINTENANCE COVERAGE, AS CONTAINED IN THE THREE TOP VOLUMES, IS STRUCTURED AND DESIGNED TO VERIFY OVERALL SYSTEM PERFORMANCE AND TO ISOLATE AND IDENTIFY TROUBLES IN THE CONTROL TERMINAL, SWITCHBOARD, SWITCHBOARD INTERFACE, RADIO RECEIVER, RADIO TRANSMITTER, AND TRANSMISSION FACILITY. A GENERAL DESCRIPTION OF THE STRUCTURE AND PHILOSOPHY OF USE FOR COASTAL HARBOR PREVENTIVE AND CORRECTIVE MAINTENANCE IS GIVEN BELOW

PREVENTIVE MAINTENANCE: AS SHOWN IN FIG. 1, ROUTINE TASKS MAKE UP A PREVENTIVE MAINTENANCE PROGRAM DESIGNED TO VERIFY THE FUNCTIONAL CONDITION OF MAJOR CIRCUIT OPERATIONS NECESSARY TO PROPER PERFORMANCE OF SYSTEM DESIGN CAPABILITIES. CORRECT PERFORMANCE OF THE ROUTINE TASKS ON A REGULARLY SCHEDULED INTERVAL PROVIDES A HIGH DEGREE OF CONFIDENCE IN SYSTEM READINESS AND OPERATION. THE CONTROL TERMINAL IS THE CENTER OF MAINTENANCE ACTIVITY. CONTROL TERMINAL ROUTINE TASKS (VOLUME 1) ARE DESIGNED

TO (A) TEST CONTROL TERMINAL FUNCTIONS ONLY, (B) TEST TERMINAL-TO-RECEIVER FUNCTIONS, AND (C) TEST TERMINAL-TO-TRANSMITTER FUNCTIONS. ROUTINE TASKS ON THE RECEIVER (VOLUME 2) AND TRANSMITTER (VOLUME 3) ARE STRUCTURED TO (A) TEST RECEIVER/TRANSMITTER FUNCTIONS AT THE RECEIVER/TRANSMITTER SITE WITH AND WITHOUT ASSISTANCE FROM THE CONTROL TERMINAL AND (B) TEST RECEIVER/TRANSMITTER-TO-CONTROL TERMINAL FUNCTIONS WITH ASSISTANCE AT CONTROL TERMINAL. MANY OF THE ROUTINE TASKS IN EACH OF THE THREE VOLUMES USE THE ROUTINER TEST SET TO VERIFY FUNCTIONAL OPERATIONS. PROCEDURES ARE GIVEN FOR USING THE ROUTINER AT CONTROL TERMINAL OR RECEIVER/TRANSMITTER SITE.

ALL ROUTINE TASKS PERFORMED AT THE CONTROL TERMINAL ARE DESIGNED FOR THE PUBLIC CORRESPONDENCE CHANNELS UNLESS SPECIFICALLY REFERRED TO WITHIN THE ROUTINE TITLE AS SAFETY AND CALLING. ROUTINE TASKS PERFORMED ON THE RECEIVERS AND TRANSMITTERS ASSOCIATED WITH THE SAFETY AND CALLING CHANNEL MUST BE COORDINATED IN ACCORDANCE WITH LOCAL OPERATING PROCEDURES. THE PERFORMANCE OF ALL ROUTINE TASKS FOR COASTAL HARBOR RADIO IS

COASTAL HARBOR RADIO MAINTENANCE PHILOSOPHY

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BASED ON THE FOLLOWING:

1. PERMISSION HAS BEEN OBTAINED TO USE CHANNEL AND RUN TEST IN ACCORDANCE WITH LOCAL OPERATING PROCEDURES
2. NO ALARM CONDITIONS EXIST
3. ALL SYSTEM OPERATING CONTROLS ARE IN THEIR NORMAL POSITIONS

CORRECTIVE MAINTENANCE: WHEN A TROUBLE

REPORT IS RECEIVED OR AN ALARM IS ACTIVATED, CORRECTIVE MAINTENANCE PROCEDURES (VOLUME 1) PROVIDE DIRECTION TO DETERMINE WHETHER THE TROUBLE IS VALID AND IF SO, WHETHER THE TROUBLE LOCATES IN CONTROL TERMINAL, RECEIVER, OR TRANSMITTER. TROUBLE ANALYSIS PROCEDURES (TAP) KEYED TO TROUBLE REPORTS AND ALARM INDICATIONS, AS REFERENCED FROM THE TROUBLE INDICATOR LIST (TIL), CONTAIN CORRECTIVE MAINTENANCE PROCEDURES [FIG. 2] TO VERIFY AND LOCATE TROUBLES AND CORRECT FAULTS. CORRECTIVE MAINTENANCE FOR FAULTS WHICH ARE IDENTIFIED DURING ROUTINE TASKS AT THE CONTROL TERMINAL, RECEIVER, OR TRANSMITTER IS PROVIDED EITHER ON THE ROUTINE TASK OR ON THE APPROPRIATE TAP.

IN GENERAL, TROUBLES WILL FIRST BE IDENTIFIED BY CONTROL TERMINAL PERSONNEL FROM ALARM INDICATIONS OR TROUBLE REPORTS. THE FIRST CORRECTIVE MAINTENANCE THEREFORE WILL BE PERFORMED AT THE CONTROL

TERMINAL TO ISOLATE AND CORRECT THE TROUBLE OR, IF REQUIRED, REFERENCE RECEIVER AND TRANSMITTER PERSONNEL INTO THE SUSPECTED FAULT AREA FOR USING CORRECTIVE MAINTENANCE PROCEDURES WITHIN THE RECEIVER OR TRANSMITTER VOLUME. ALL TROUBLE ANALYSIS PROCEDURES ARE BASED ON THE FOLLOWING:

1. PERMISSION HAS BEEN OBTAINED TO USE CHANNEL AND RUN TEST IN ACCORDANCE WITH LOCAL OPERATING PROCEDURES
2. ONLY ONE TROUBLE EXISTS AT A TIME
3. ALL SYSTEM OPERATING CONTROLS ARE IN THEIR NORMAL POSITIONS

TROUBLE ANALYSIS PROCEDURES ARE DESIGNED TO GUIDE THE USER BY THE MOST DIRECT MEANS AVAILABLE TO LOCATING AND CORRECTING FAULTS. TROUBLE CLEARING IS APPROACHED IN THE FOLLOWING MANNER:

- FIRST: BY OBSERVING AVAILABLE CIRCUIT INDICATORS SUCH AS LEADS, METERS, AND ALARM LAMPS
- SECOND: BY ESTABLISHING OR SIMULATING OPERATING CONDITIONS NECESSARY FOR CIRCUIT OBSERVATION AND MEASUREMENT
- THIRD: BY USING CONVENTIONAL TROUBLE-CLEARING PROCEDURES SUCH AS CHECKING THE DC OPERATE PATH FOR CIRCUIT FUNCTIONS AND WIRING

ADMONISHMENT BLOCKS

COASTAL HARBOR TOP PROCEDURES CONTAIN, AS REQUIRED, THREE TYPES OF ADMONISHMENT BLOCKS, OR FLAGS, TO CALL ATTENTION TO PERSONAL DANGER (DANGER BLOCKS), POSSIBLE SERVICE INTERRUPTION (CAUTION BLOCKS), AND POSSIBLE EQUIPMENT DAMAGE (WARNING BLOCKS). THE USER IS REMINDED TO READ THE ADMONISHMENT BY HAVING ATTENTION CALLED TO THE ADMONISHMENT AT THE BEGINNING OF A STEP WHICH INVOLVES ANY OF THE ABOVE ADMONISHMENT CONDITIONS AS SHOWN IN THE EXAMPLES BELOW:

[48] SEE WARNING 6. REPLACE CIRCUIT BOARDS 121 AND 120, ONE AT A TIME, TO ISOLATE TROUBLE [TAD-120]

[1] SEE WARNING 1. LOCATE CIRCUIT BOARD OF INTEREST. SEE NOTE 1

AN EXAMPLE OF EACH TYPE OF ADMONISHMENT BLOCK FOUND IN THIS VOLUME IS PROVIDED BELOW FOR REVIEW

PERSONAL DANGER

DANGERS

1. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1
2. IF POSSIBLE REMOVE PRIMARY POWER FROM TRANSMITTER WHILE CHECKING HIGH-VOLTAGE FUSE

PERSONAL DANGER

DANGER REMOVE PRIMARY POWER FROM TRANSMITTER CABINET	DANGER 120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE
--	--

DANGER
USE EXTREME CARE. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET

POSSIBLE EQUIPMENT DAMAGE

WARNING
MAKE SURE ARROW PRINTED ON FACE OF ELEMENT IS POINTING TO SIDE OF IN-LINE WATTMETER CONNECTED TO TRANSMITTER FILTER OUTPUT

WARNING
ENSURE SMALL FIBER KEY IS NOT DAMAGED WHILE REMOVING OR INSTALLING CIRCUIT BOARD

WARNING
USE STORAGE FUNCTION WHEN POSSIBLE TO PREVENT DAMAGE TO CRT

WARNING
WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT

POSSIBLE EQUIPMENT DAMAGE

WARNINGS

1. WHEN MAKING RESISTANCE MEASUREMENTS, MAKE SURE THAT POWER IS NOT APPLIED TO CIRCUIT BEING MEASURED AS DAMAGE TO METER WILL RESULT
2. WHEN MAKING EITHER CURRENT OR VOLTAGE MEASUREMENTS, SET FUNCTION SWITCH TO PROPER RANGE BEFORE MAKING CONTACT WITH TEST PROBES TO CIRCUIT BEING MEASURED. IF THERE IS ANY DOUBT AS TO APPROXIMATE VALUE OF VOLTAGE OR CURRENT TO BE MEASURED, SET FUNCTION SWITCH TO HIGHEST VALUE FOR INITIAL TEST AND THEN DECREASE STEP-BY-STEP UNTIL PROPER RANGE IS REACHED

WARNINGS

1. WHEN REMOVING CIRCUIT BOARDS, MAKE SURE THAT EDGES OF BOARD ARE AIMED SO THEY COME THROUGH THE SWITCH ON THE SIDE OF BOARD CARRIER
2. SOME OF THE CIRCUIT BOARDS COULD BE DAMAGED BY STATIC DISCHARGE IF HANDLED IMPROPERLY. CARE SHOULD BE TAKEN NOT TO TOUCH ANY BARE SURFACE SUCH AS THE CONTACT POINTS. IF A CIRCUIT BOARD IS TO BE STORED, IT SHOULD BE PLACED IN A CONDUCTIVE MEDIUM SUCH AS ALUMINUM FOIL.

WARNING

WHEN MAKING RESISTANCE MEASUREMENTS, MAKE SURE THAT POWER IS NOT APPLIED TO THE CIRCUIT BEING MEASURED, AS DAMAGE TO THE METER WILL RESULT

WARNING

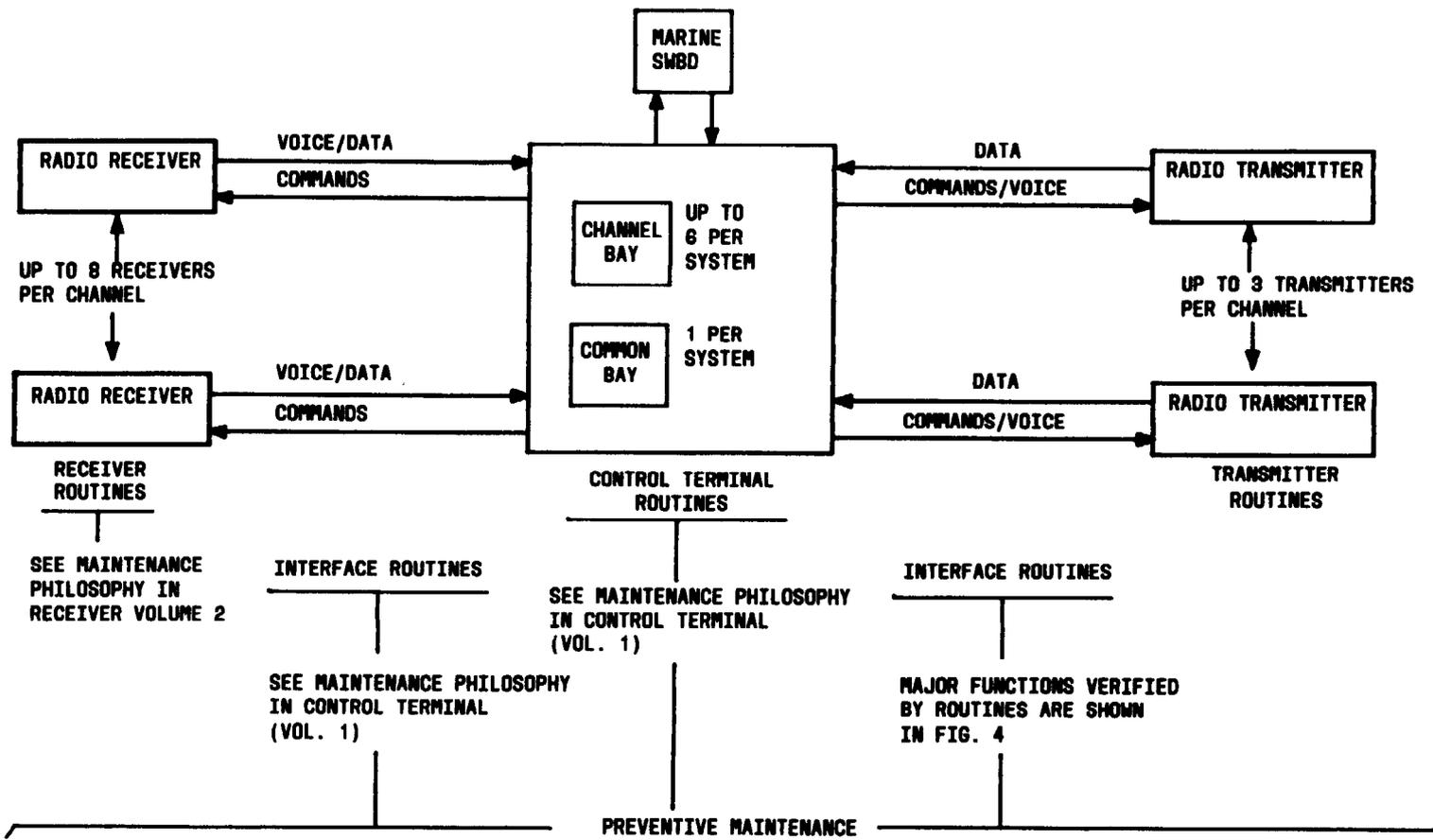
50H ELEMENT COULD BE CHANGED IF TRANSMIT MODE IS SET TO A3H

WARNING

WHEN REMOVING OR INSTALLING CIRCUIT BOARDS. FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT

WARNING

MAIN POWER SWITCH IS SET TO DEE [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

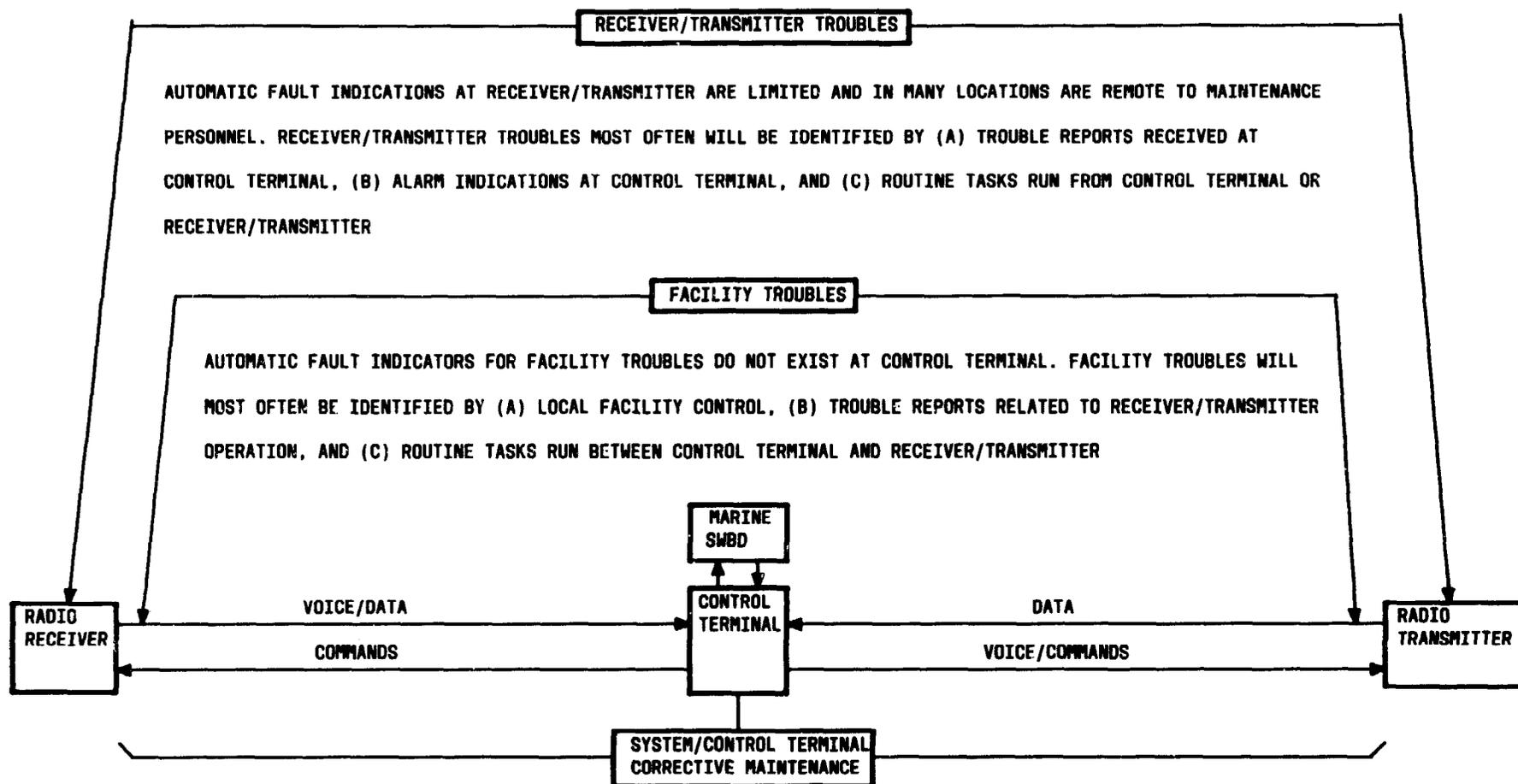


ROUTINE TASKS ARE STRUCTURED TO BE PERFORMED PERIODICALLY ON A CHANNEL BASIS AND ARE DESIGNED TO (A) VERIFY CIRCUIT OPERATIONS UNIQUE TO THE CONTROL TERMINAL WITHOUT ASSISTANCE FROM RECEIVER OR TRANSMITTER PERSONNEL, (B) VERIFY CIRCUIT OPERATIONS WITHIN THE CONTROL TERMINAL ASSOCIATED WITH CIRCUIT OPERATIONS WITHIN THE RECEIVER WITH AND WITHOUT ASSISTANCE FROM RECEIVER PERSONNEL, AND (C) VERIFY CIRCUIT OPERATIONS WITHIN THE CONTROL TERMINAL ASSOCIATED WITH CIRCUIT OPERATIONS WITHIN THE TRANSMITTER WITH AND WITHOUT ASSISTANCE FROM TRANSMITTER PERSONNEL

FIG. 1 - Preventive Maintenance

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COASTAL HARBOR RADIO MAINTENANCE PHILOSOPHY



CORRECTIVE MAINTENANCE IS ACCOMPLISHED THROUGH TROUBLE ANALYSIS PROCEDURES WHICH MAKE USE OF MANUAL AND ROUTINER TEST SET PROCEDURES TO ISOLATE TROUBLES TO CONTROL TERMINAL, RADIO RECEIVER, OR TRANSMITTER AND LOCATE FAULTS DOWN TO THE REPLACEABLE CARD LEVEL

FIG. 2 - CORRECTIVE MAINTENANCE

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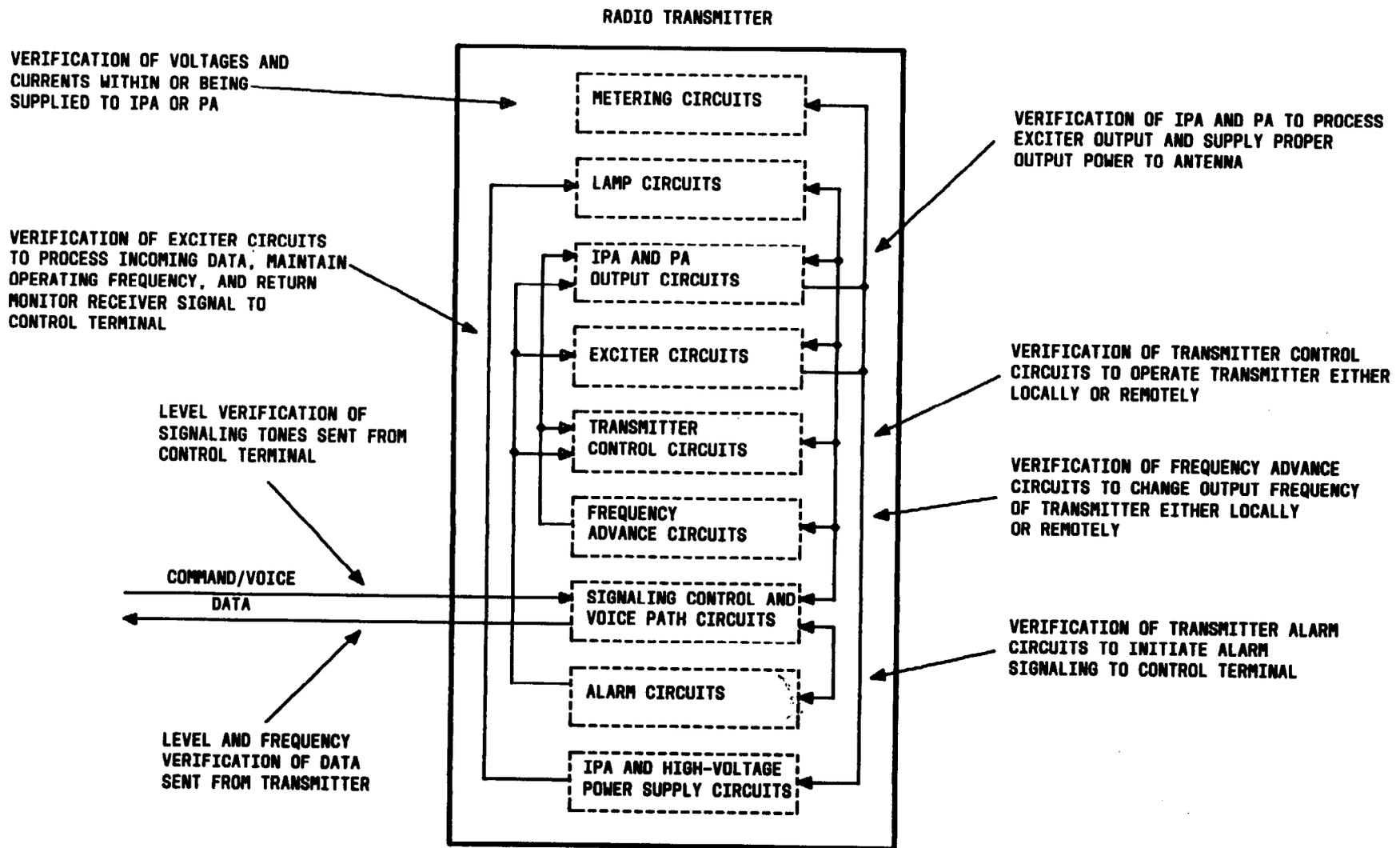


FIG. 3

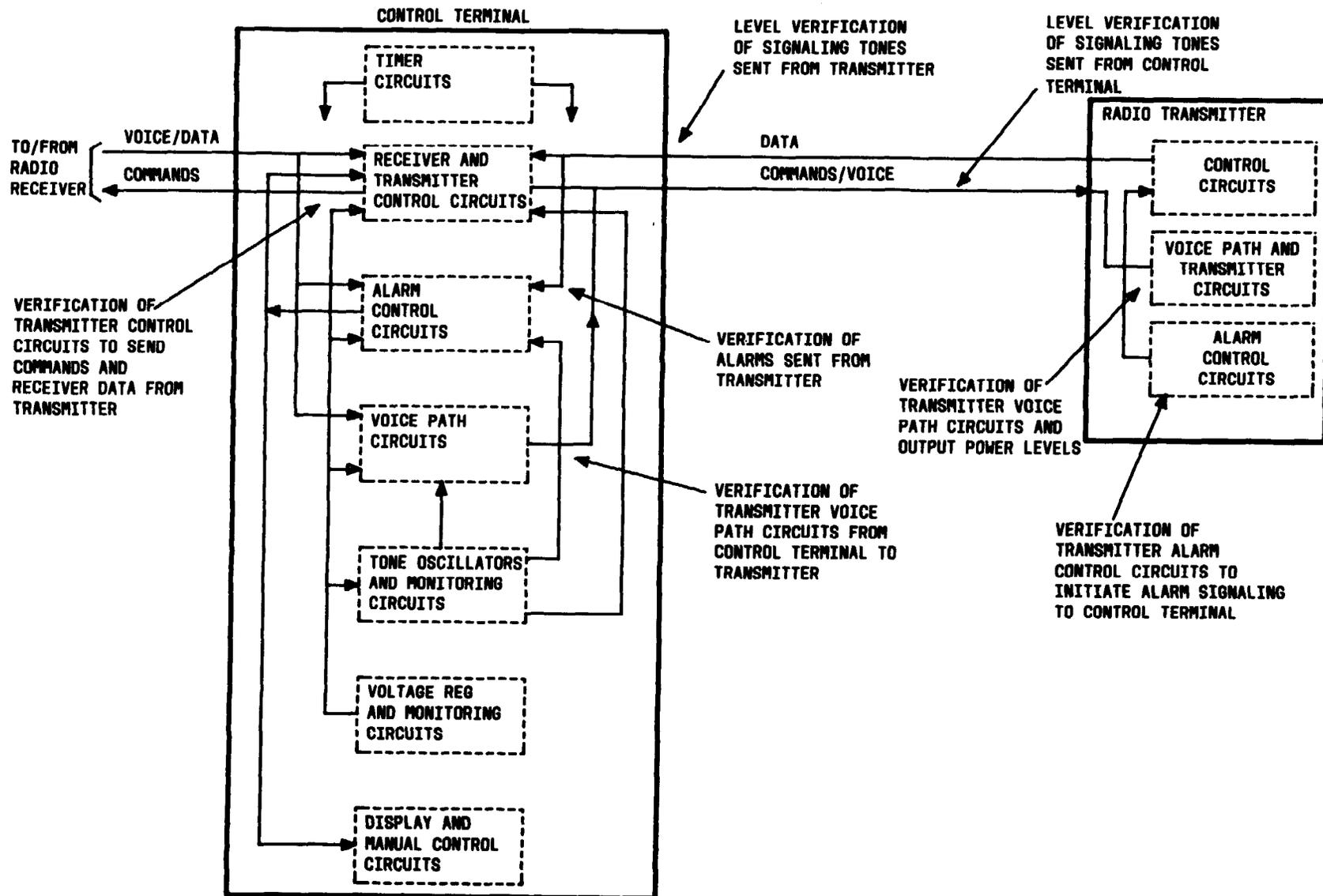


FIG. 4 - MAJOR FUNCTIONS VERIFIED BY CONTROL TERMINAL TO/FROM TRANSMITTER INTERFACE ROUTINES

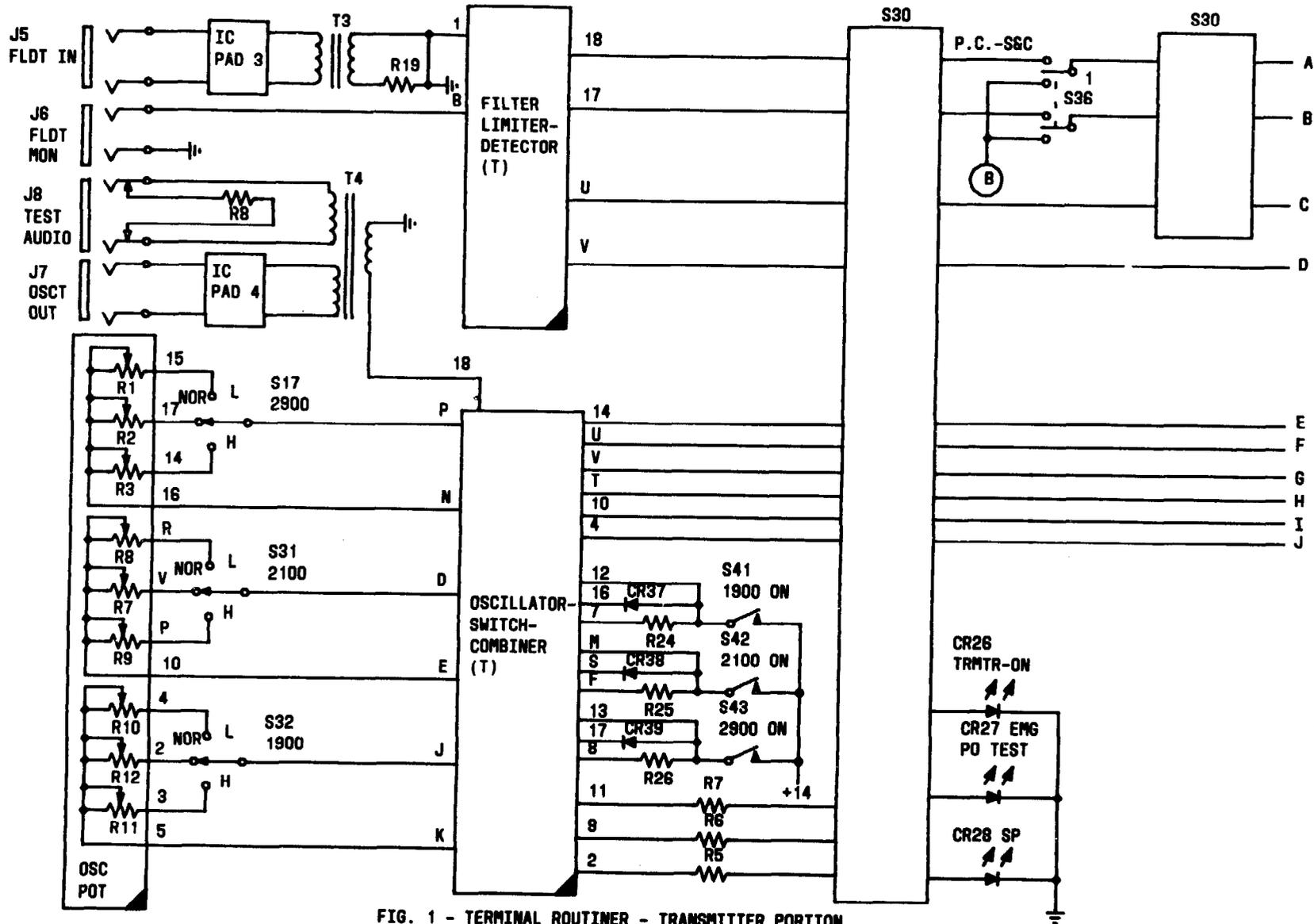


FIG. 1 - TERMINAL ROUTER - TRANSMITTER PORTION
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ROUTINER TEST SET CIRCUITS

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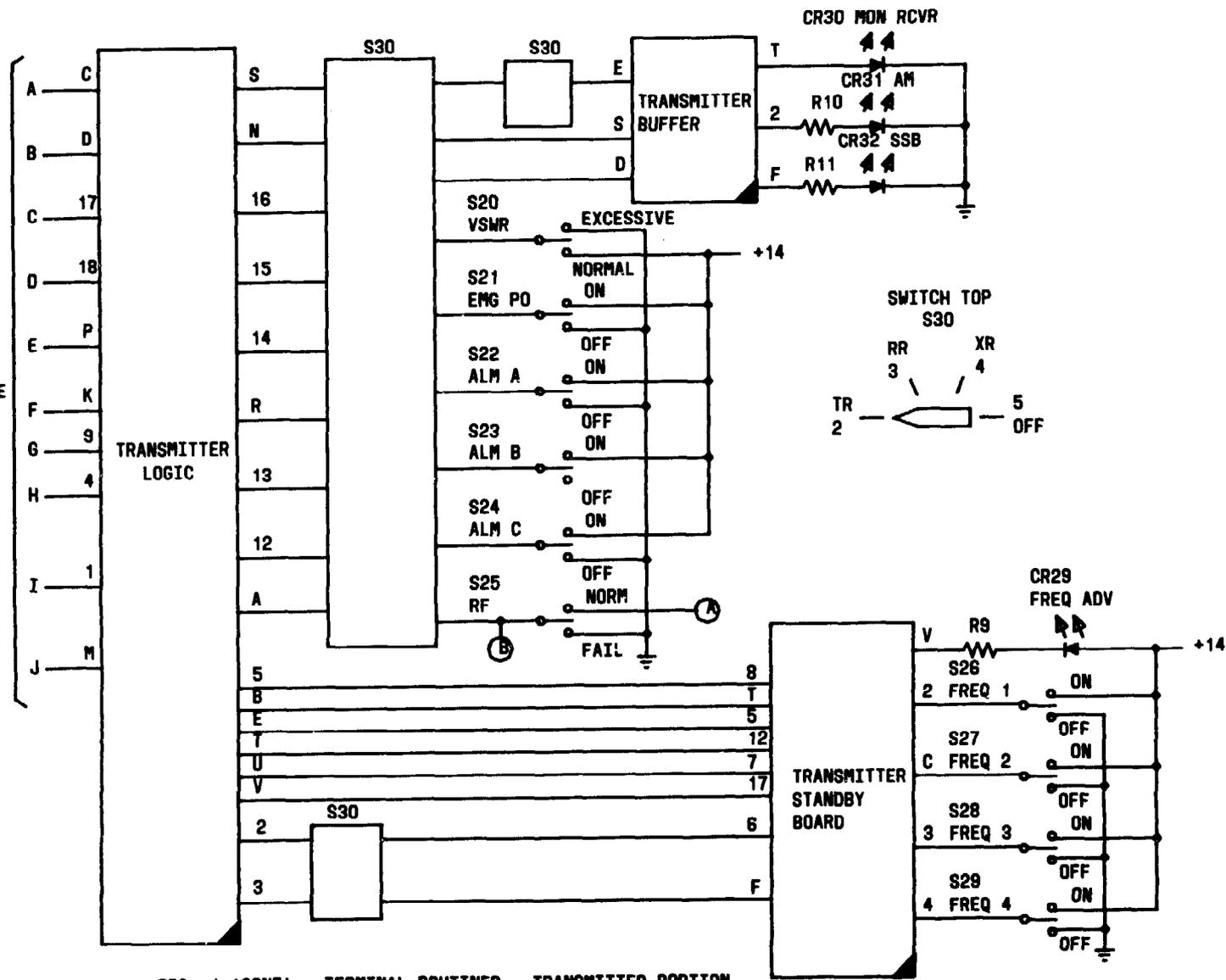
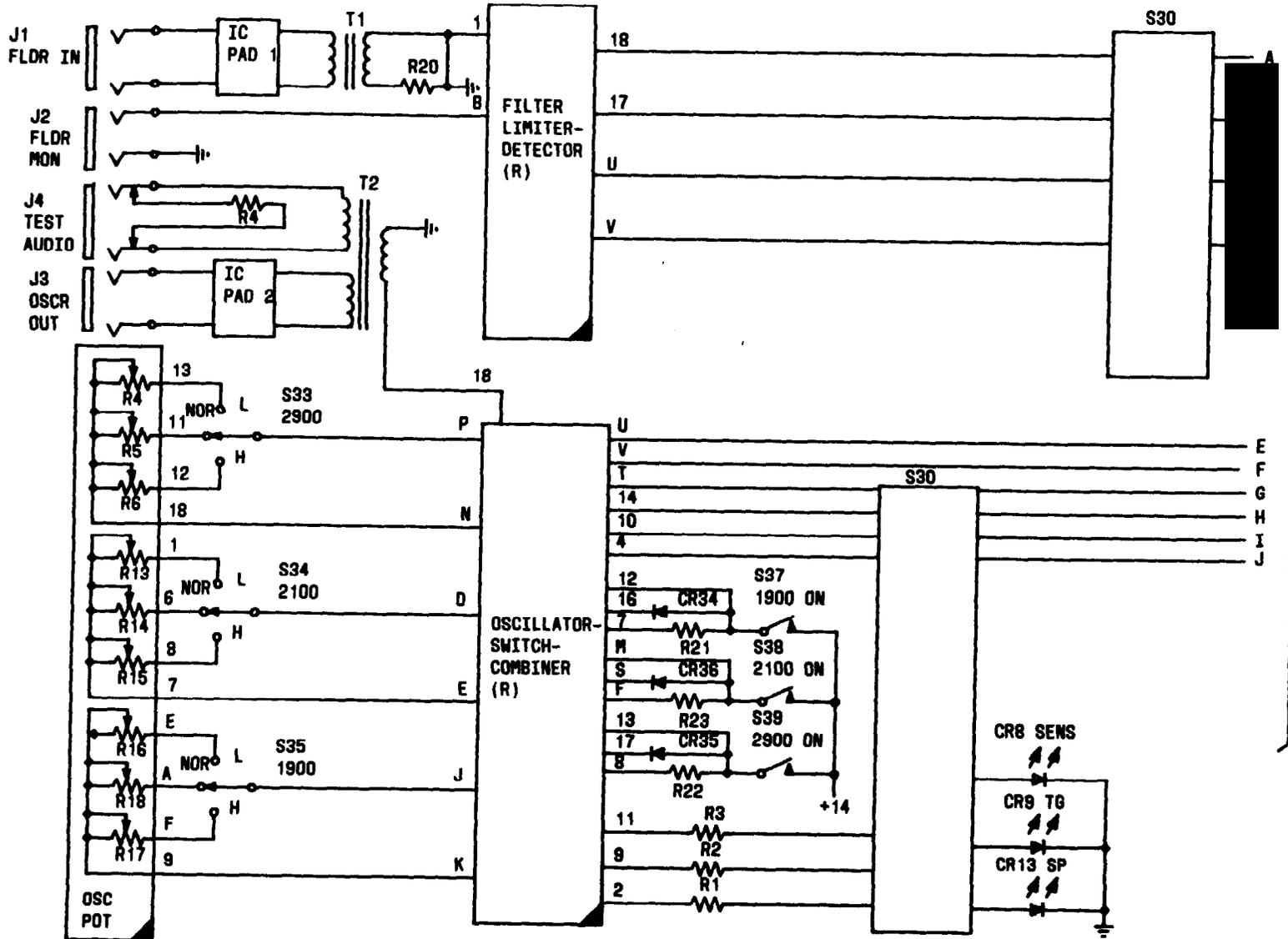


FIG. 1 (CONT) - TERMINAL ROUTER - TRANSMITTER PORTION
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FIG. 2 - Terminal Routiner - Receiver Portion
SD-2R111

ROUTINER TEST SET CIRCUITS

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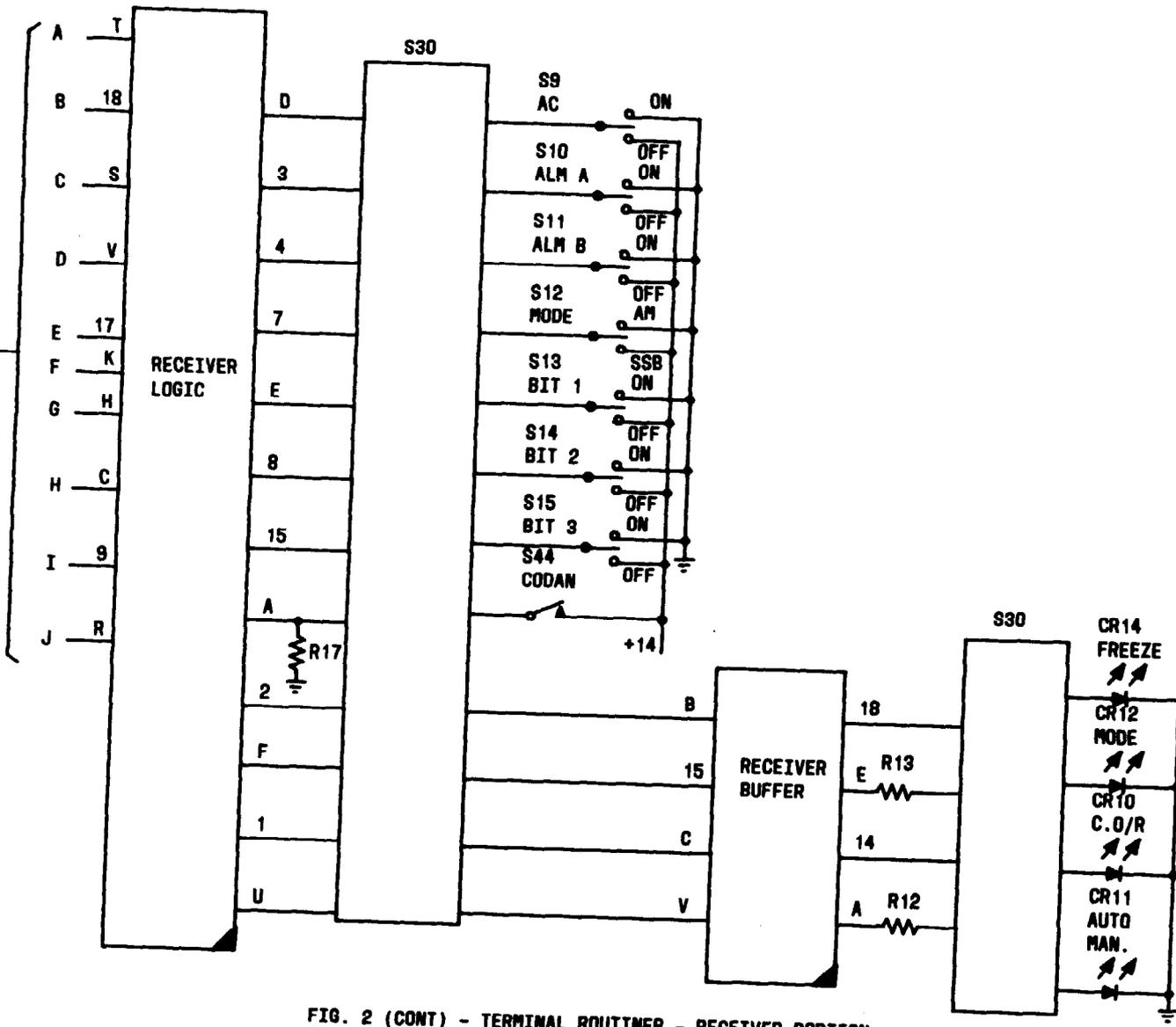
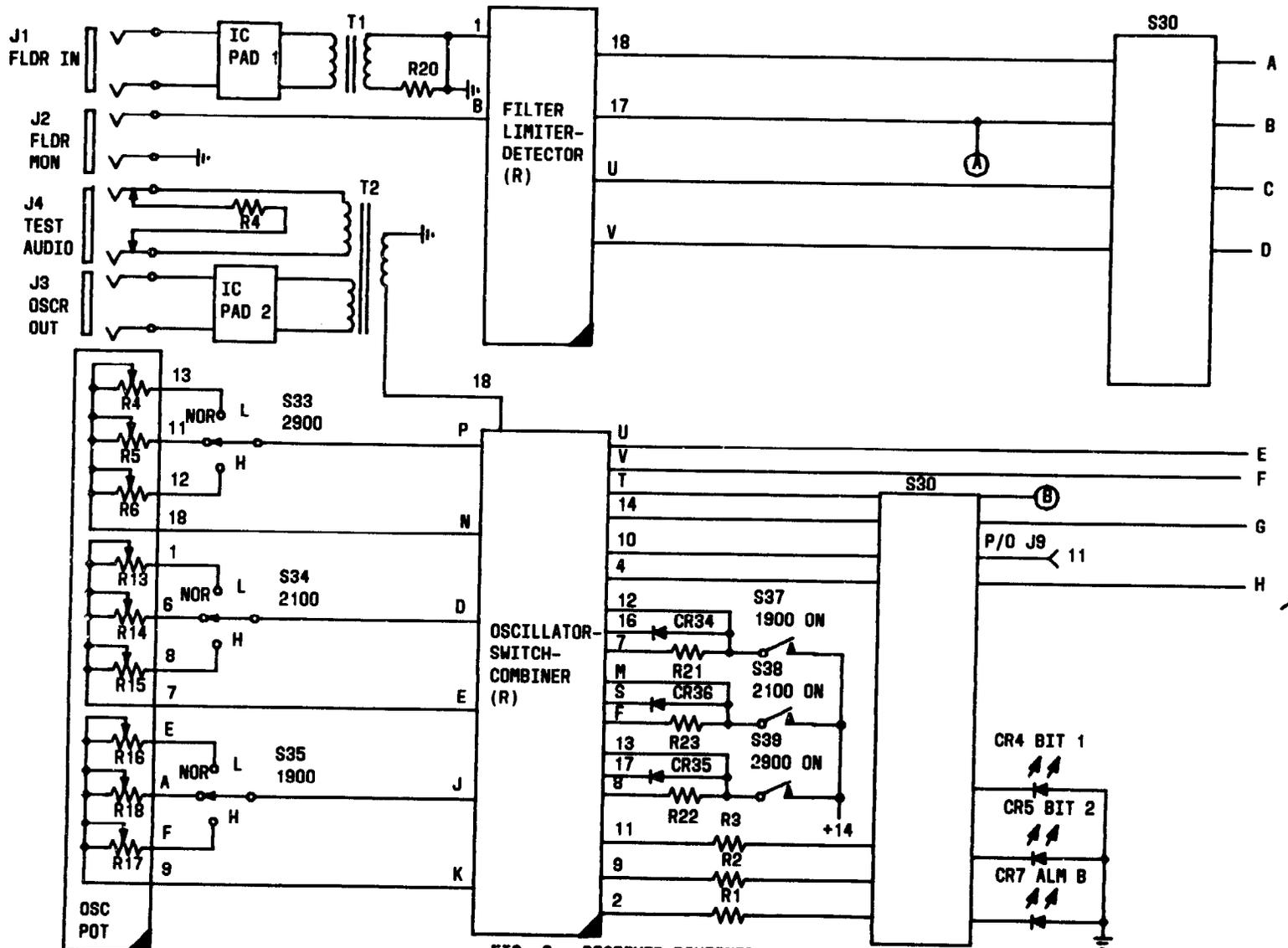


FIG. 2 (CONT) - TERMINAL ROUTINER - RECEIVER PORTION
SD-2R111



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FIG. 3 - RECEIVER ROUTINER
SD-2R111

ROUTINER TEST SET CIRCUITS

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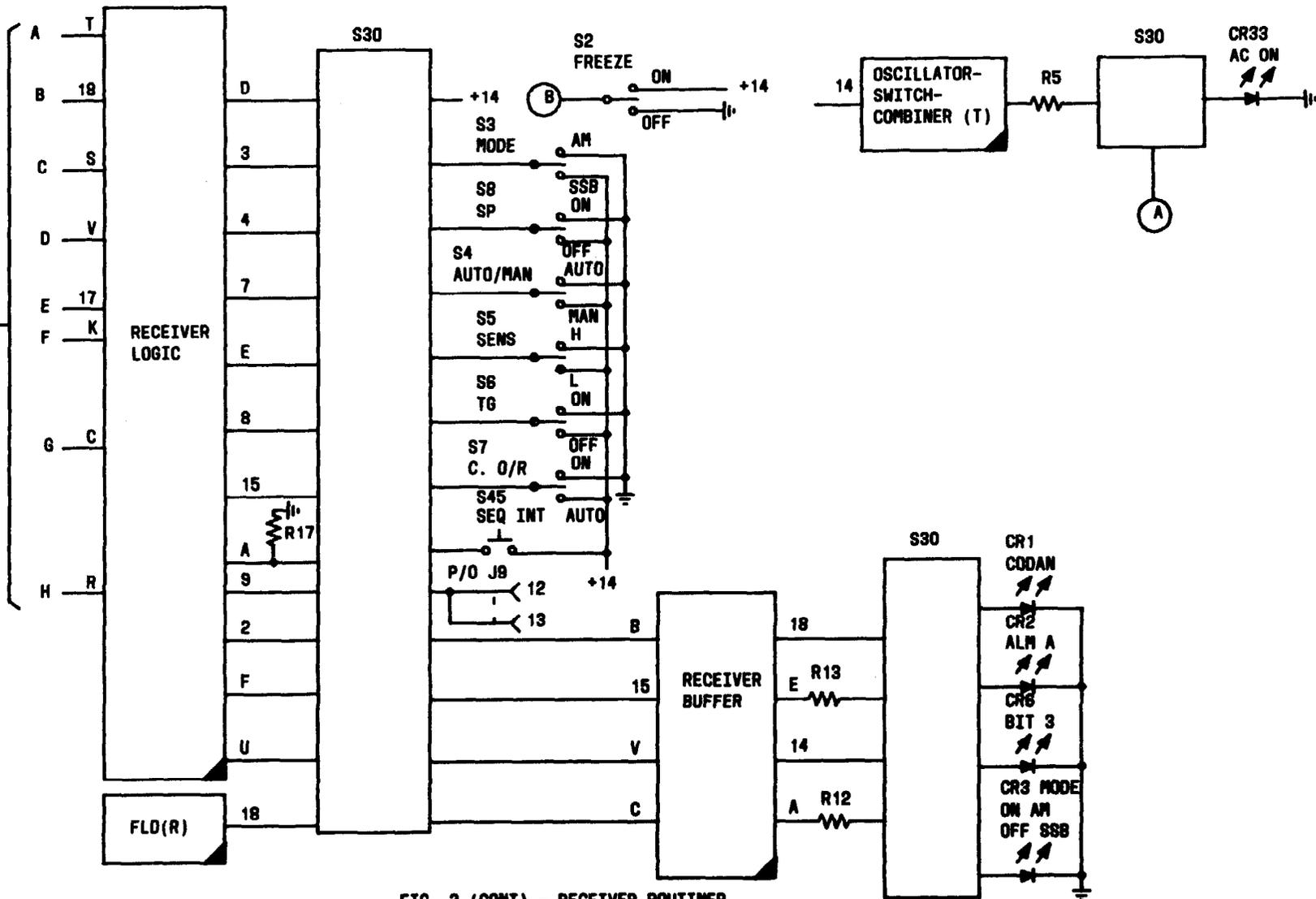
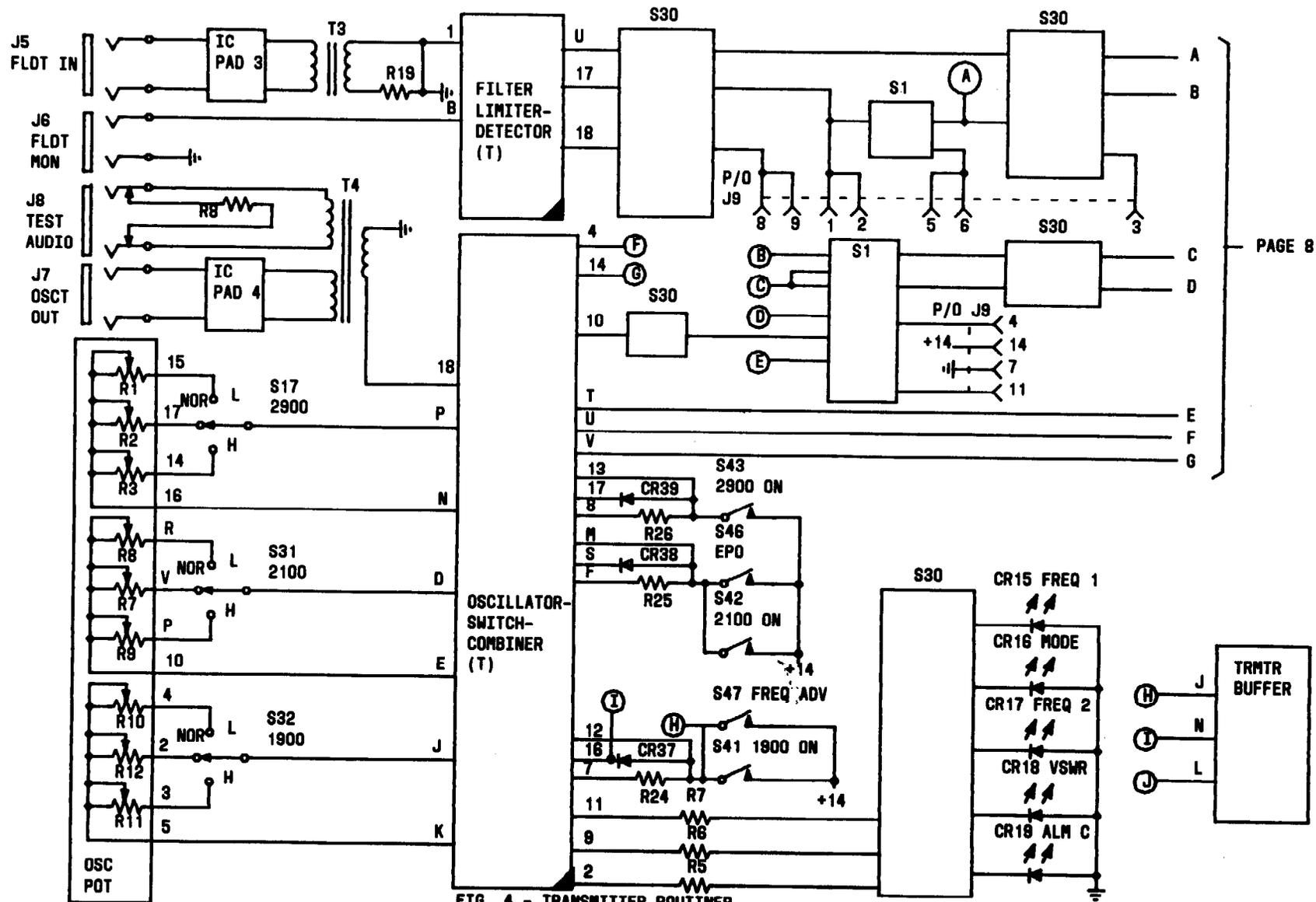


FIG. 3 (CONT) - RECEIVER ROUTINER
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FIG. 4 - TRANSMITTER ROUTINER SD-2R111

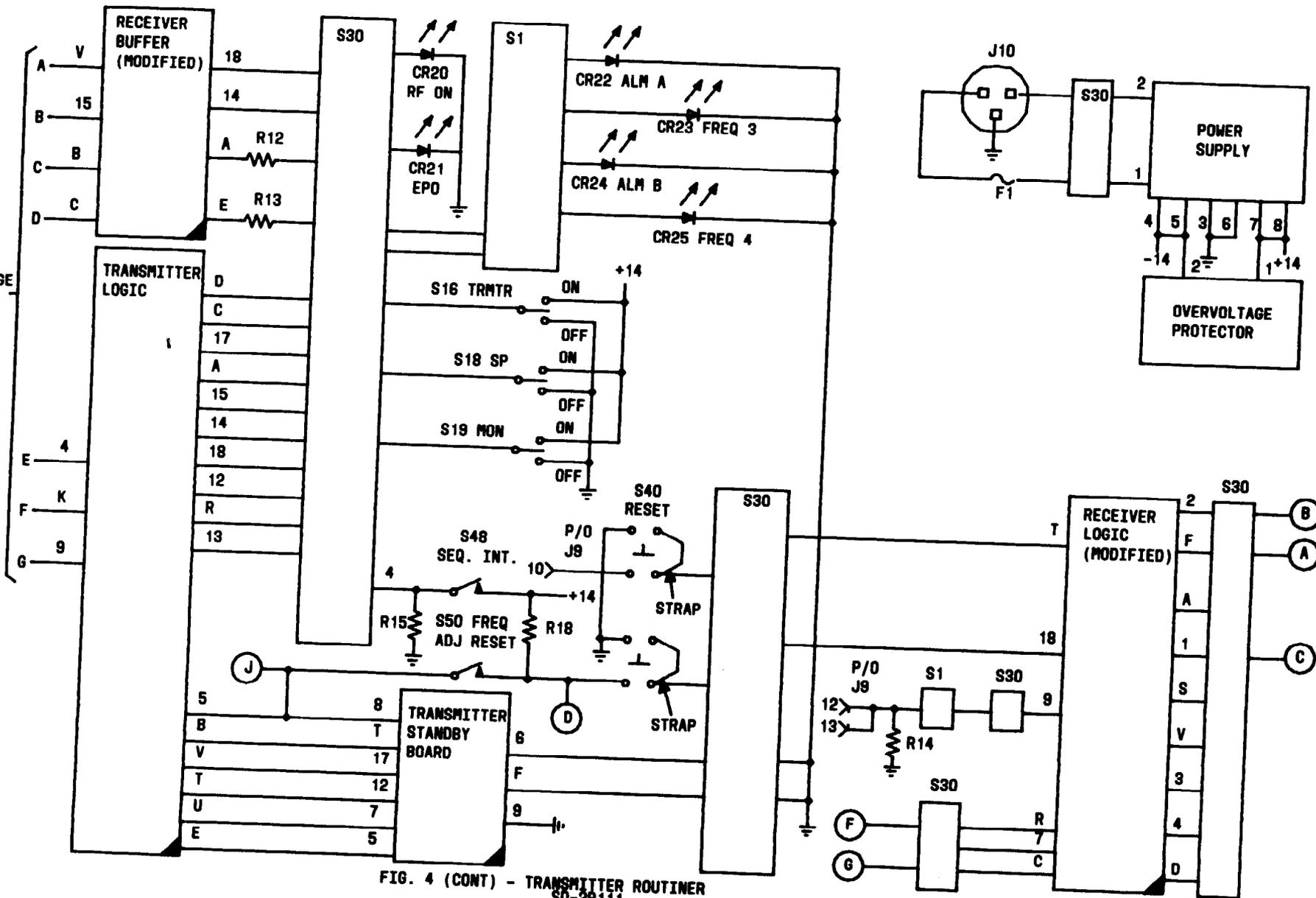


FIG. 4 (CONT) - TRANSMITTER ROUTINER
SD-2R111

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SUMMARY
 TRANSMITTER TO BE TESTED IS REMOVED FROM SERVICE. IN-LINE WATTMETER AND RF COAXIAL RESISTOR ARE CONNECTED TO TRANSMITTER OUTPUT. IN A3H (SAFETY AND CALLING) AND/OR A3A (PUBLIC CORRESPONDENCE) TRANSMIT MODE, METER INDICATIONS ARE TAKEN AND

COMPARED WITH PREVIOUS METER INDICATIONS. IF METER INDICATIONS TAKEN ARE NOT AT LEAST 80% OR ARE MORE THAN 120% OF INITIAL METER INDICATIONS, CORRECTIVE ACTION MUST BE PERFORMED. FOR AN ACCEPTANCE TEST, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION.

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED

[2] SET TRANSMIT MODE SWITCH TO OFF AND GET TEST EQUIPMENT AS SHOWN IN TABLE A. SEE NOTE 1

[3] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[4] CONNECT IN-LINE WATTMETER TO TRANSMITTER FILTER OUTPUT [FIG. 2]

[5] CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER [FIG. 2]

[6] SEE NOTE 2. INSTALL FOUR 369A PLUGS INTO STATUS LINE, STATUS EQUIP, VOICE LINE, AND VOICE EQUIP JACKS

[7] INSERT 250H ELEMENT FOR A3H MODE OR 50H ELEMENT FOR A3A MODE INTO IN-LINE WATTMETER [FIG. 2]

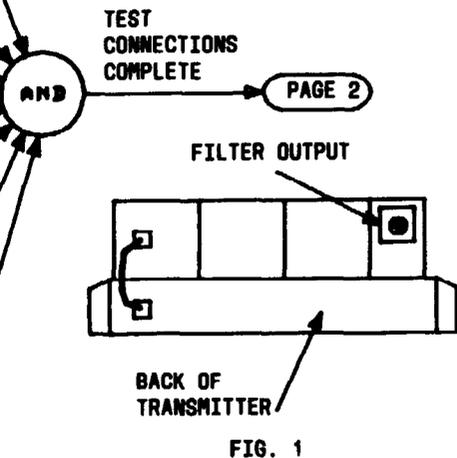
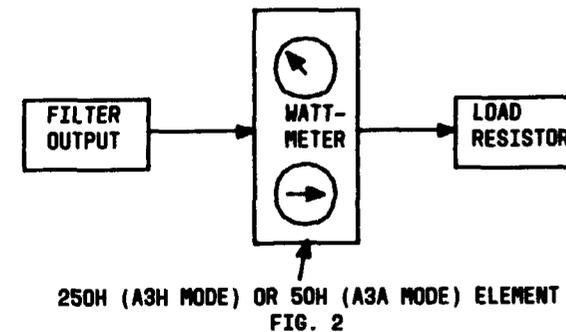


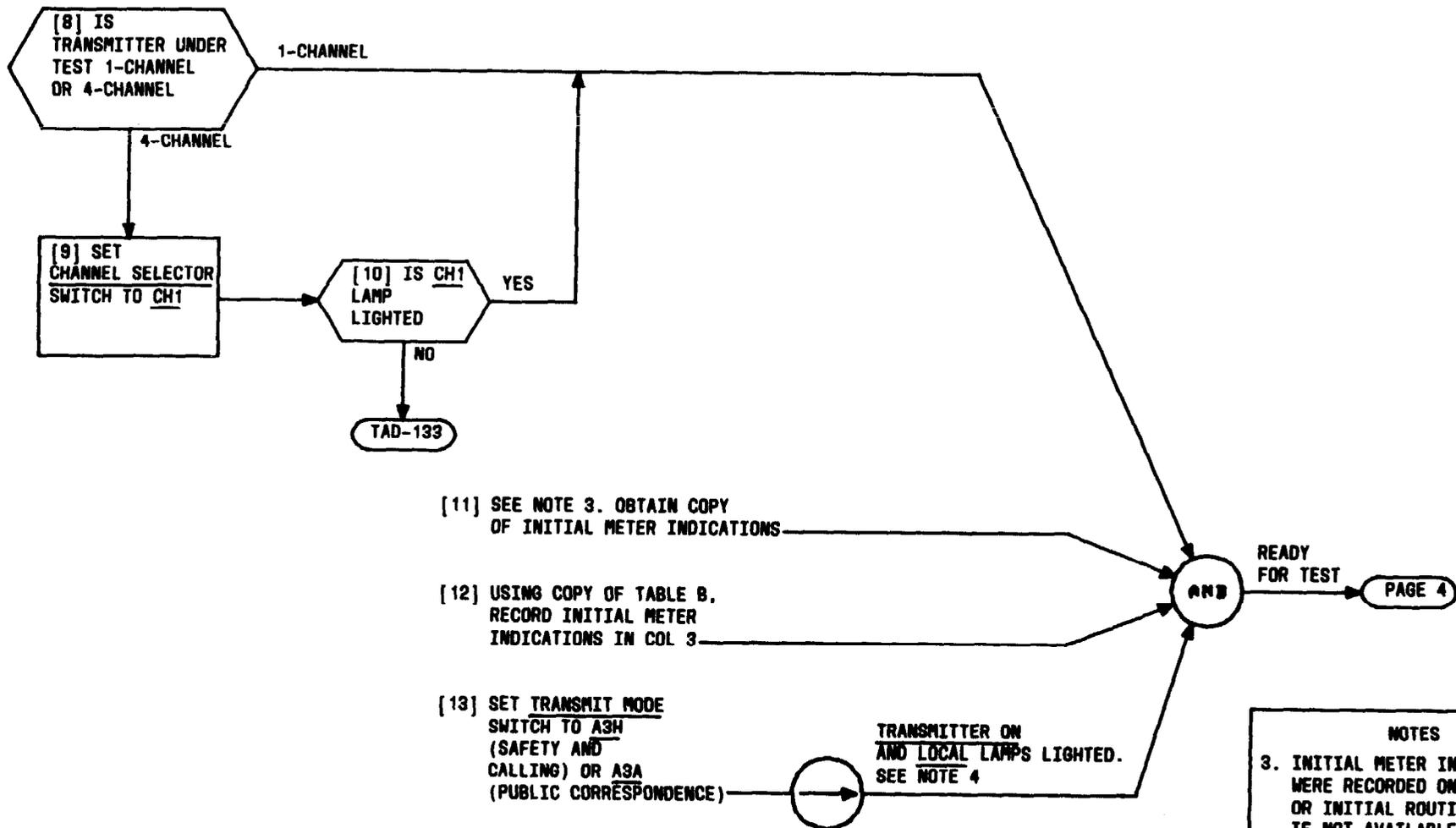
TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
IN-LINE WATTMETER	BIRD MODEL 43 WITH 250H AND 50H ELEMENTS
4 STANDARD TERMINATIONS	369A



NOTES

1. FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION
2. JACKS ARE TERMINATED TO PREVENT TRANSMITTER BEING MODULATED FROM CONTROL TERMINAL FROM CAUSING UNWANTED METER INDICATIONS

CHECK TRANSMITTER METER INDICATIONS



NOTES

3. INITIAL METER INDICATIONS WERE RECORDED ON ACCEPTANCE OR INITIAL ROUTINE TEST. IF NOT AVAILABLE, OBTAIN COPY OF MANUFACTURE FINAL TEST RESULTS

4. SEE TAD-101 FOR TRANSMITTER ON LAMP TROUBLE AND TAD-124 FOR LOCAL LAMP TROUBLE

CHECK TRANSMITTER METER INDICATIONS

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TABLE B					
FUNCTION		METER FULL SCALE	INITIAL INDICATIONS	PRESENT INDICATIONS	COLUMN 4 DIVIDED BY COLUMN 3
1		2	3	4	5
PLATE VOLTAGE METER		3000V			
PLATE CURRENT V-1 METER		500MA			
PLATE CURRENT V-2 METER		500MA			
IN-LINE WATTMETER	FWD	50W OR 250W			
	REFL	50W			
TEST METER	ALC	5V			
	REG A.C.	250V			
	+24V	50V			
	-24V	50V			
	PLATE V	500V			
	CATH 1	250MA			
	CATH 2	250MA			
	CATH 3	250MA			
	CATH 4	250MA			
	FIL 1	5V			
	FIL 2	5V			
	DRIVE	250V			
	GRID 1	250MA			
	GRID 2	250MA			
	R.F. PLATE	2500V			
R.F. OUT	500V				
+24 RY SPLY	50V				

CHECK TRANSMITTER METER INDICATIONS

[14] OBSERVE PLATE VOLTAGE
METER INDICATION

[15] RECORD PLATE VOLTAGE
METER INDICATION IN
TABLE B, COL 4

[16] SEE NOTE 5. OBSERVE
PLATE CURRENT V-1
METER INDICATION

[17] RECORD PLATE CURRENT V-1
METER INDICATION
IN TABLE B, COL 4

[18] SEE NOTE 5. OBSERVE
PLATE CURRENT V-2
METER INDICATION

[19] RECORD PLATE CURRENT V-2
METER INDICATION IN
TABLE B, COL 4

[20] OBSERVE IN-LINE WATTMETER
FWD INDICATION

[21] RECORD IN-LINE WATTMETER
FWD INDICATION IN TABLE B, COL 4

PLATE
VOLTAGE
RECORDED

AND

PLATE
CURRENT V-1
RECORDED

AND

PLATE
CURRENT V-2
RECORDED

AND

IN-LINE
WATTMETER
FWD RECORDED

AND

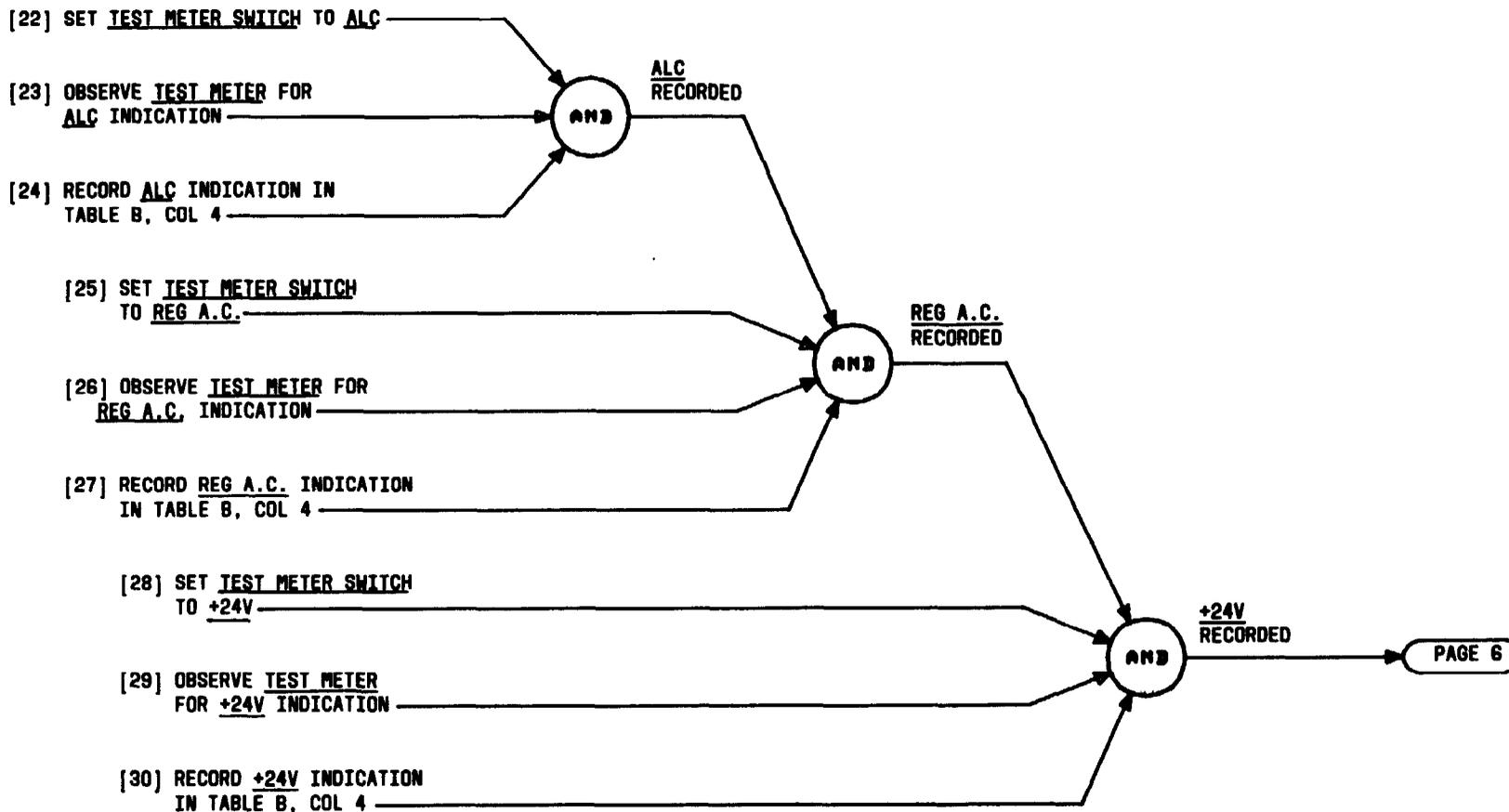
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NOTE 5

PLATE CURRENT V-1
IS METER ON LEFT.
PLATE CURRENT V-2
IS METER ON RIGHT

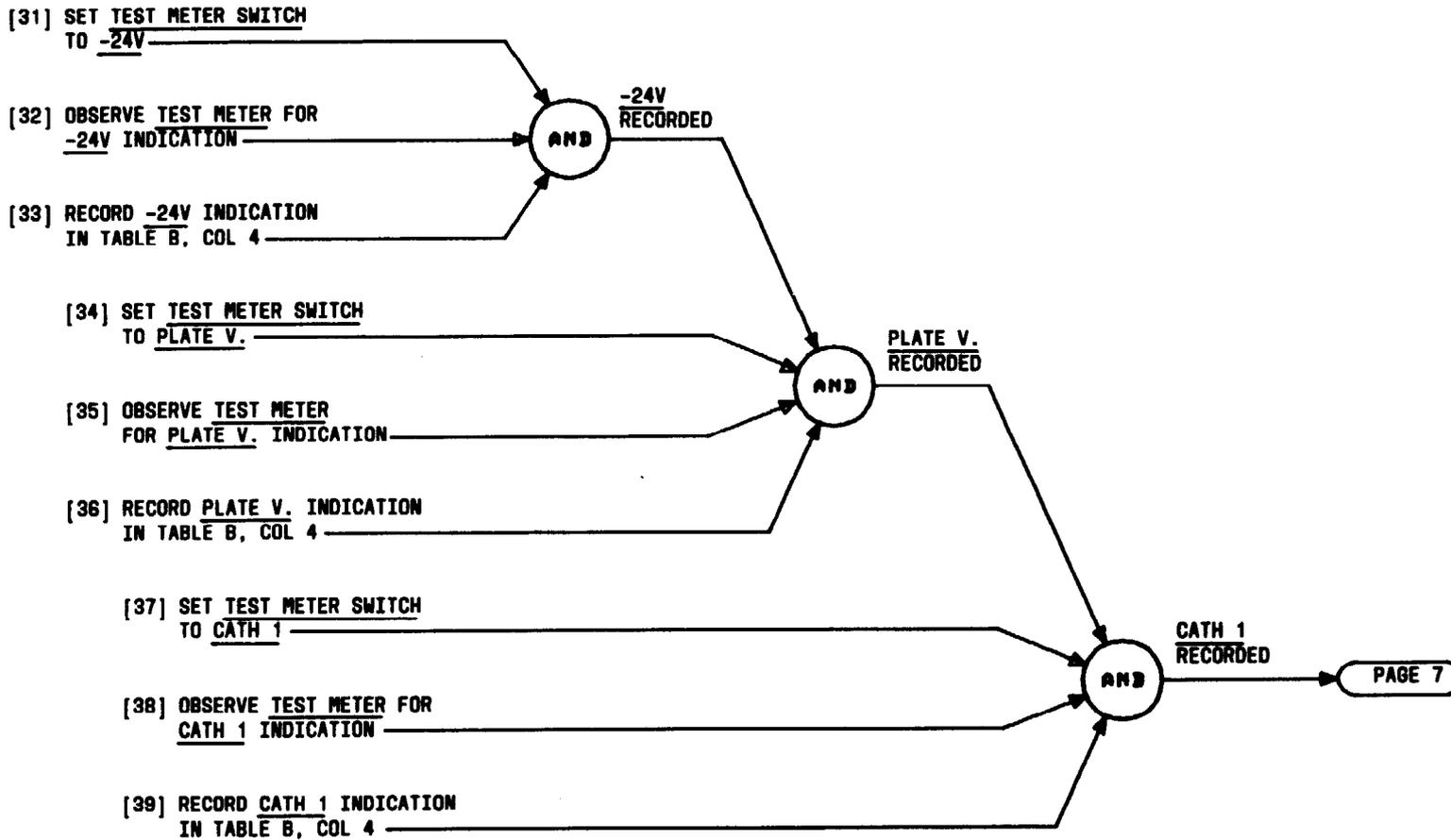
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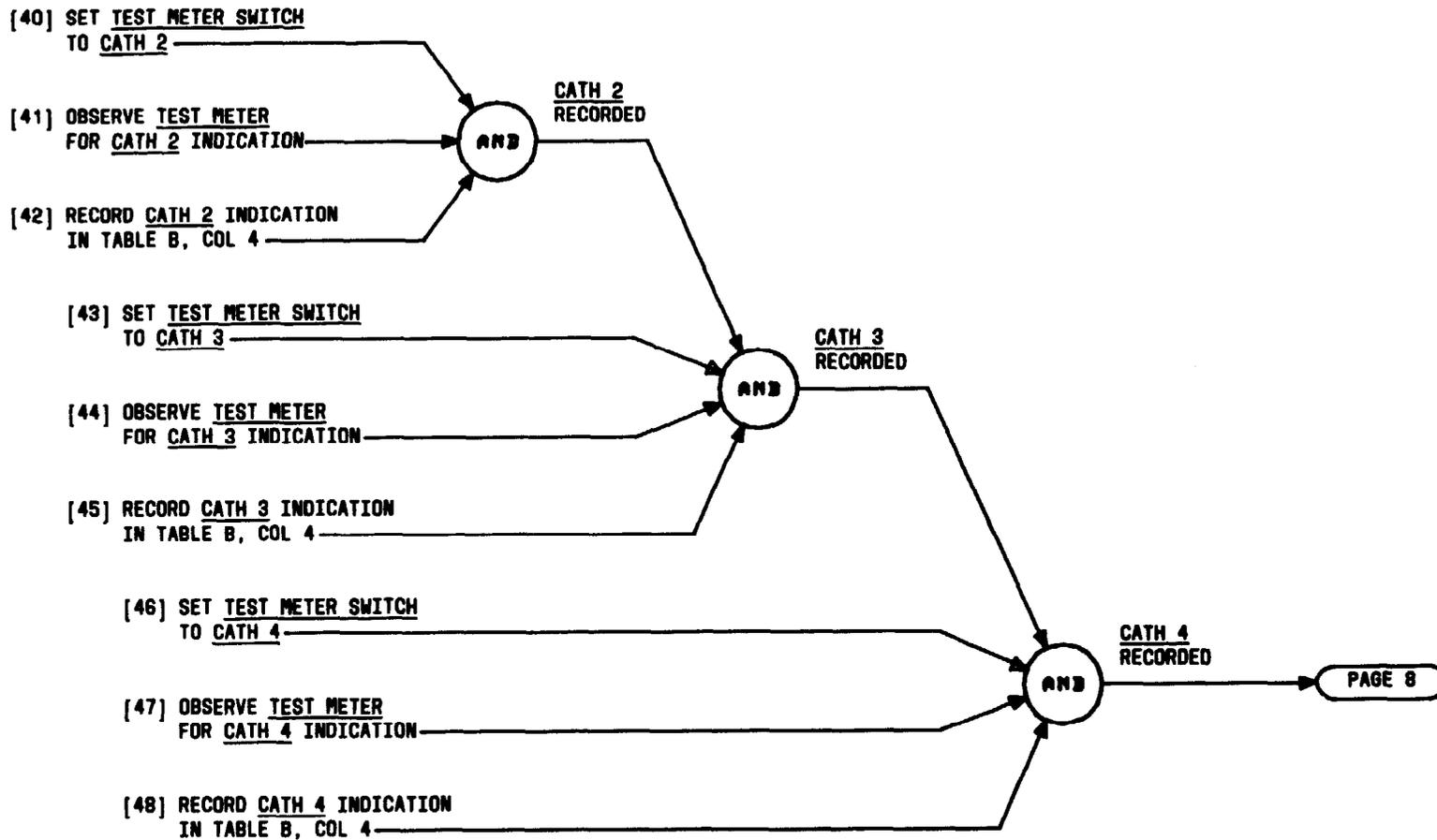
CHECK TRANSMITTER METER INDICATIONS

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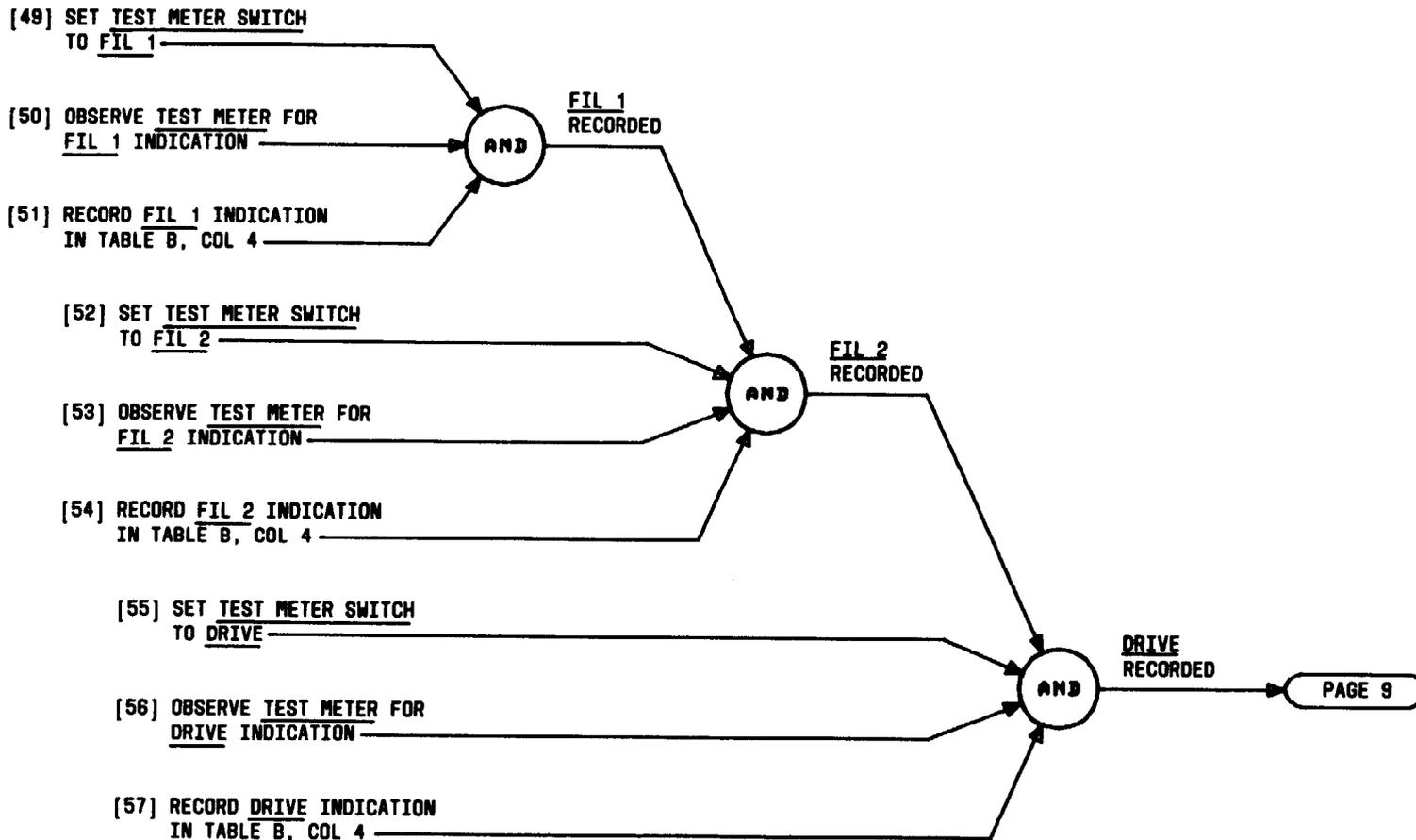
CHECK TRANSMITTER METER INDICATIONS

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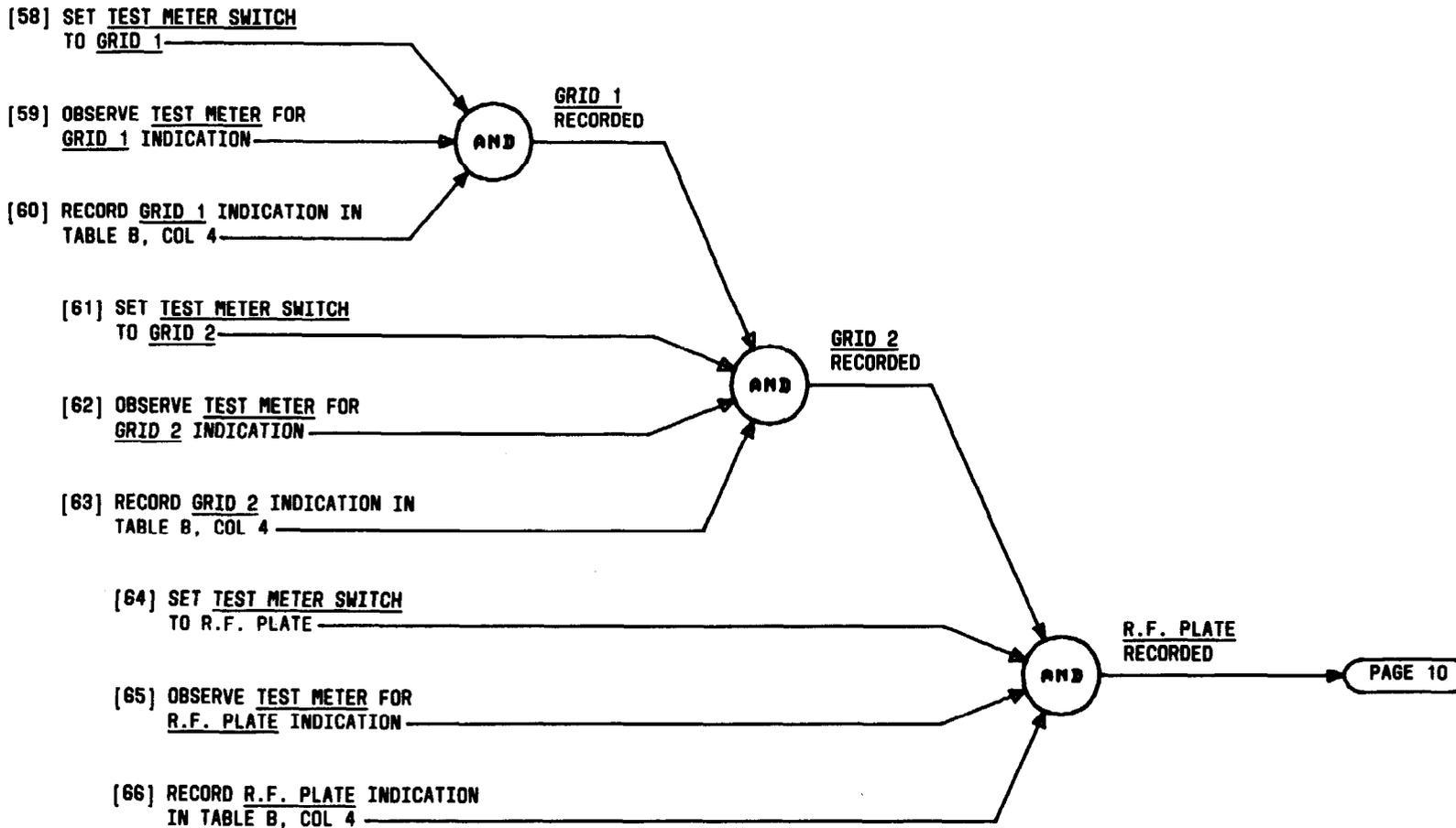
CHECK TRANSMITTER METER INDICATIONS

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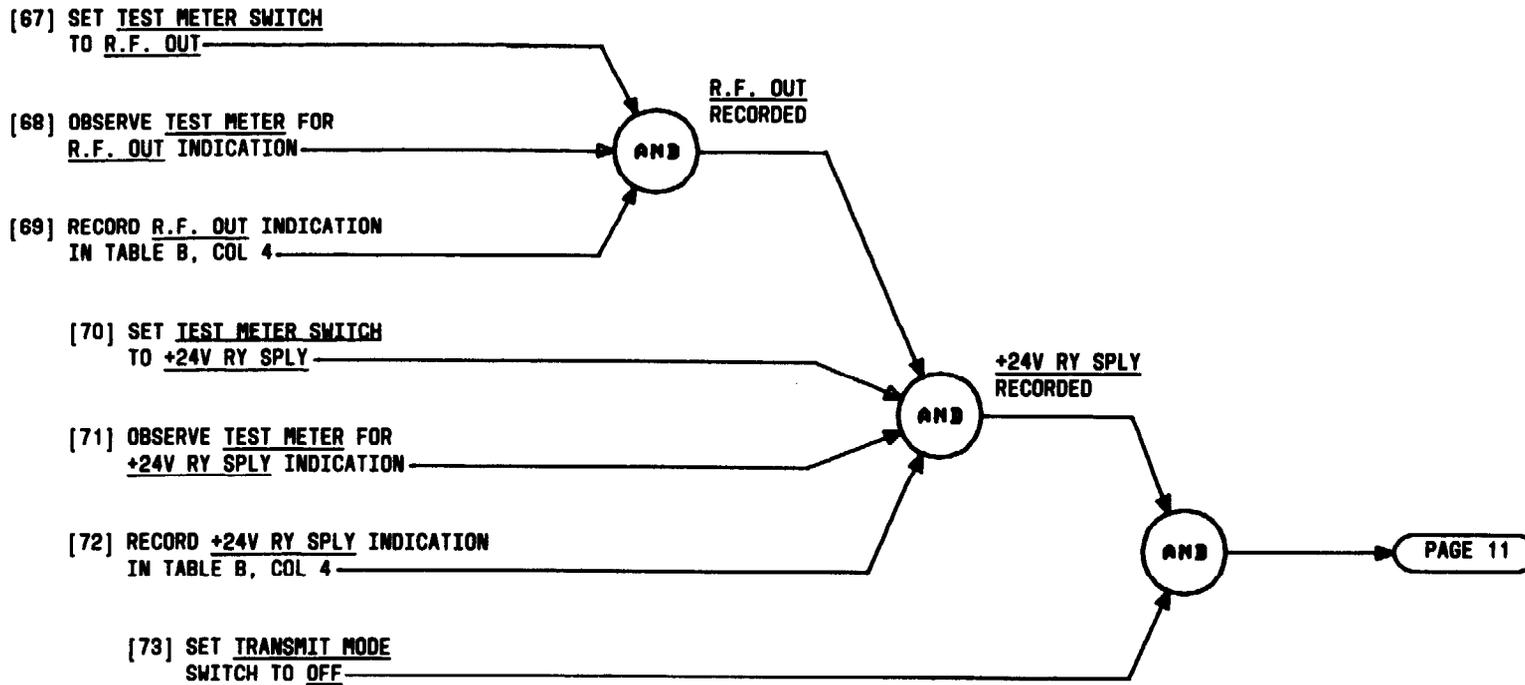
CHECK TRANSMITTER METER INDICATIONS

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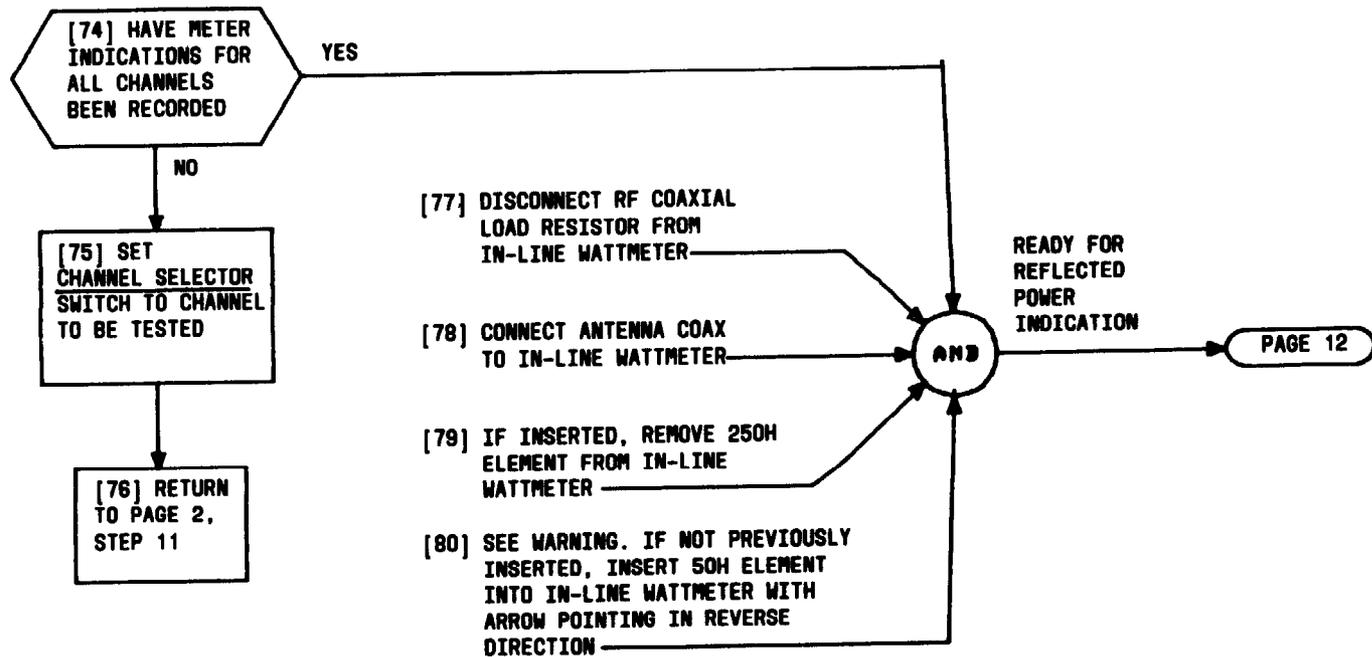
CHECK TRANSMITTER METER INDICATIONS

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CHECK TRANSMITTER METER TRANSMISSIONS

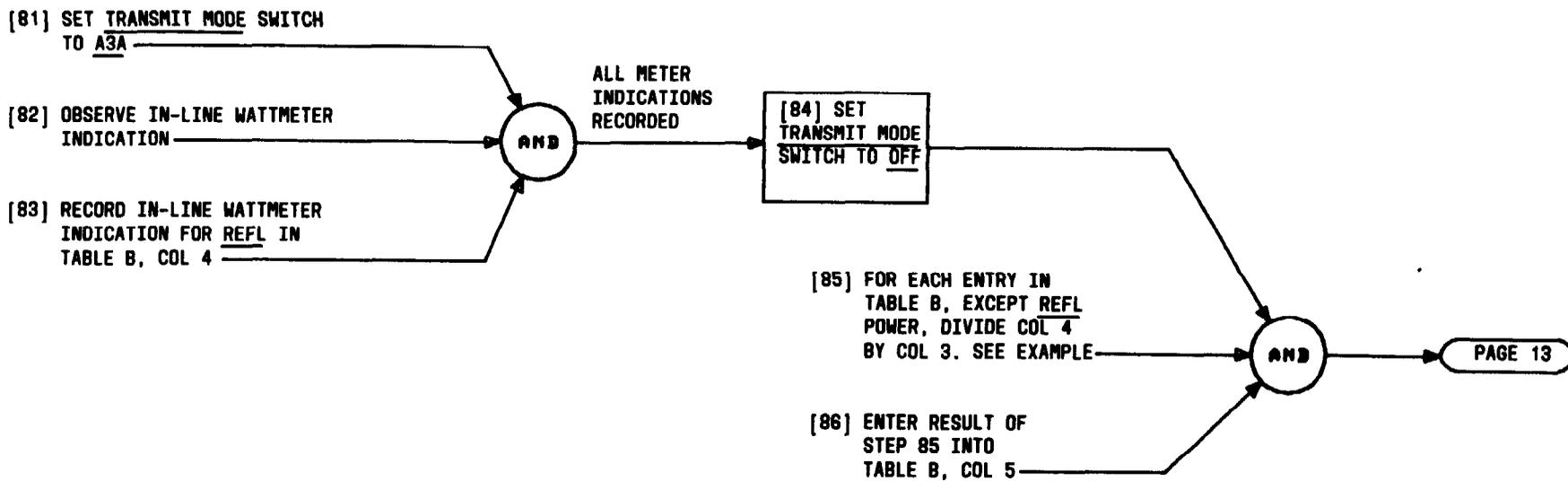
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CHECK TRANSMITTER METER INDICATIONS

WARNING
 MAKE SURE ARROW PRINTED ON FACE OF ELEMENT IS POINTING TO SIDE OF IN-LINE WATTMETER CONNECTED TO TRANSMITTER FILTER OUTPUT

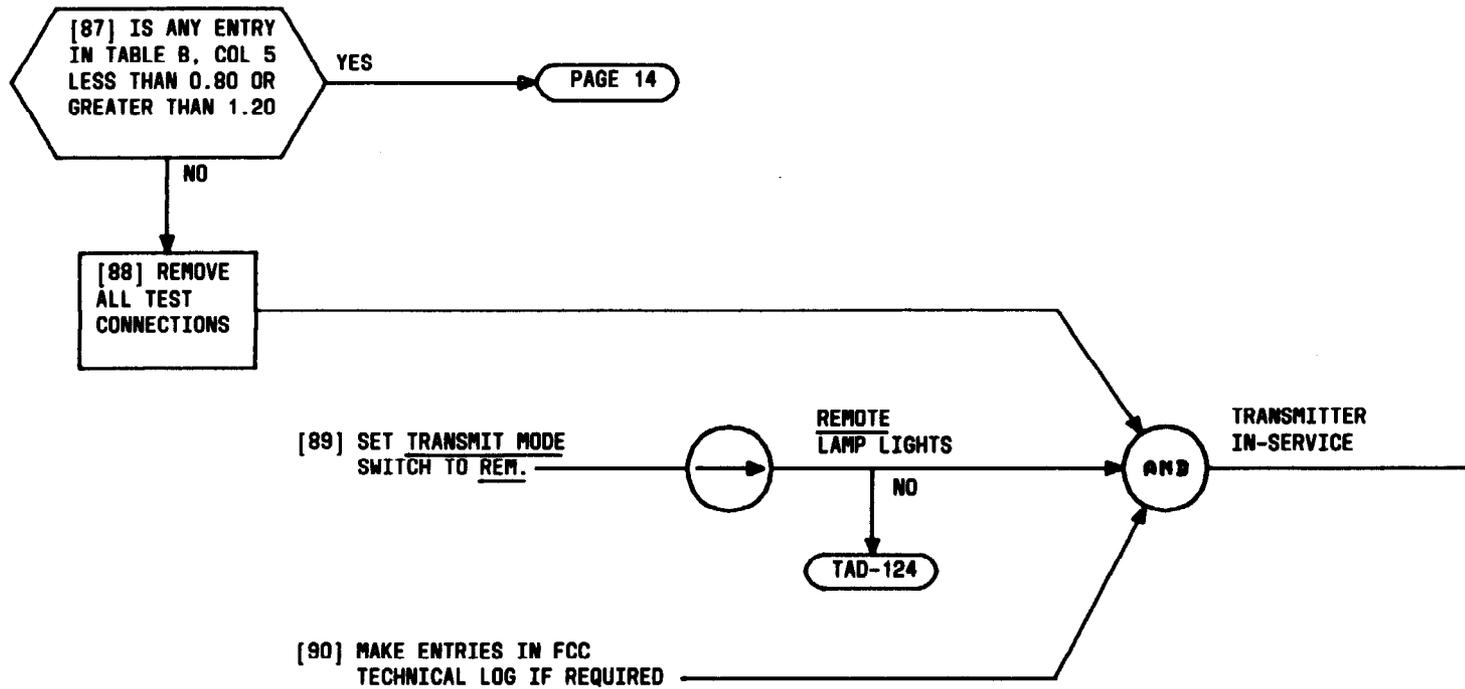
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EXAMPLE	
PLATE VOLTAGE COLUMN 4 =	2030
DIVIDE BY	_____
PLATE VOLTAGE COLUMN 3 =	2070
RESULT	0.98
ENTER INTO COLUMN 5	

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CHECK TRANSMITTER METER INDICATIONS



CHECK TRANSMITTER METER INDICATIONS

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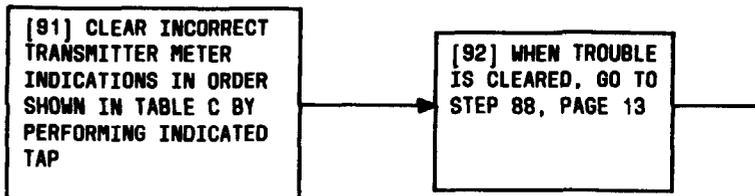


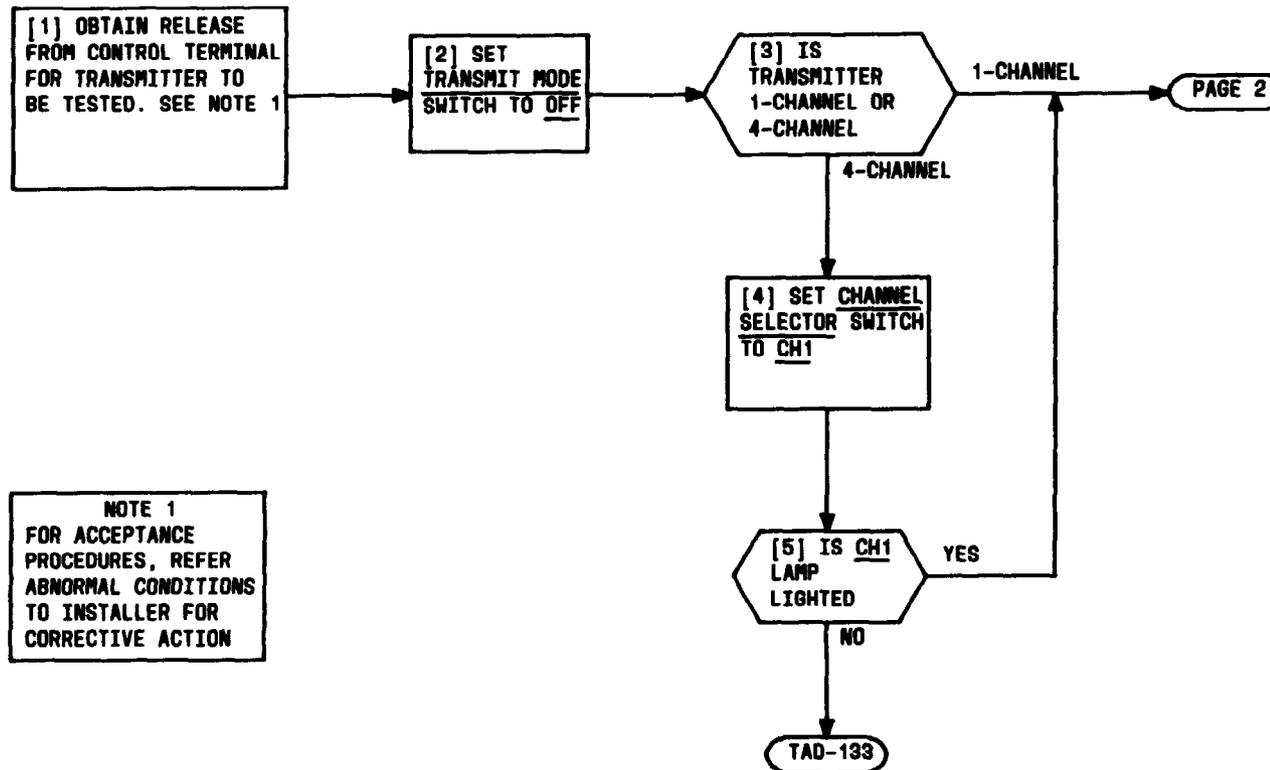
TABLE C	
INCORRECT METER INDICATIONS	CORRECTIVE ACTION TAP
1. REG A.C.	TAP-120
2. -24V AND +24V	TAP-117
3. +24V RY SPLY	TAP-123
4. PLATE V	TAP-125
5. CATH 1, 2, 3, AND 4	TAP-125
6. DRIVE	TAP-126
7. FIL 1 AND 2	TAP-126
8. GRID 1 AND 2	TAP-126
9. PLATE CURRENT 1 AND 2	TAP-126
10. PLATE VOLTAGE	TAP-126
11. ALC	TAP-128
12. RF PLATE	TAP-126
13. RF OUT	TAP-126
14. WATTMETER FWD	TAP-126
15. WATTMETER REFL	TAP-126

CHECK TRANSMITTER METER INDICATIONS

SUMMARY

AFTER TRANSMITTER HAS BEEN ALLOWED TO WARM UP FOR APPROXIMATELY 20 MINUTES, 1.5-MHZ OSCILLATOR IS CHECKED WITH FREQUENCY MONITOR CONNECTED TO 1.5-MHZ MON JACK OF TRANSMITTER. ADJUSTMENT MAY BE MADE BY ADJUSTING R21 ON THE 1.5-MHZ OSCILLATOR/RF ON BOARD (NO. 9). THE CHANNEL FREQUENCY IS CHECKED WITH FREQUENCY MONITOR CONNECTED TO R.F. MON JACK OF TRANSMITTER.

ADJUSTMENT MAY BE MADE BY ADJUSTING FREQ ADJ POTENTIOMETER ON FRONT PANEL OF EXCITER CHASSIS. FOR KS-20820 TRANSMITTER, EACH CHANNEL IS CHECKED AND MAY BE ADJUSTED BY ADJUSTING THE APPROPRIATE FREQ ADJ POTENTIOMETER. IF AN ACCEPTANCE TEST IS BEING PERFORMED, NO ADJUSTMENTS ARE MADE, SUPERVISOR IS NOTIFIED OF RESULTS, AND TEST TERMINATED



NOTE 1
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION

MEASURE TRANSMITTER FREQUENCY

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[6] GET TEST EQUIPMENT AS SHOWN IN TABLE A

[7] CONDITION HP 5245L FREQUENCY COUNTER FOR MEASUREMENT [DLP-527]

[8] CONNECT FREQUENCY COUNTER INPUT TO TRANSMITTER 1.5 MHZ MON JACK

[9] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[10] CONNECT RF COAXIAL LOAD RESISTOR TO TRANSMITTER FILTER OUTPUT [FIG. 2]

[11] SET TRANSMIT MODE SWITCH TO A3H

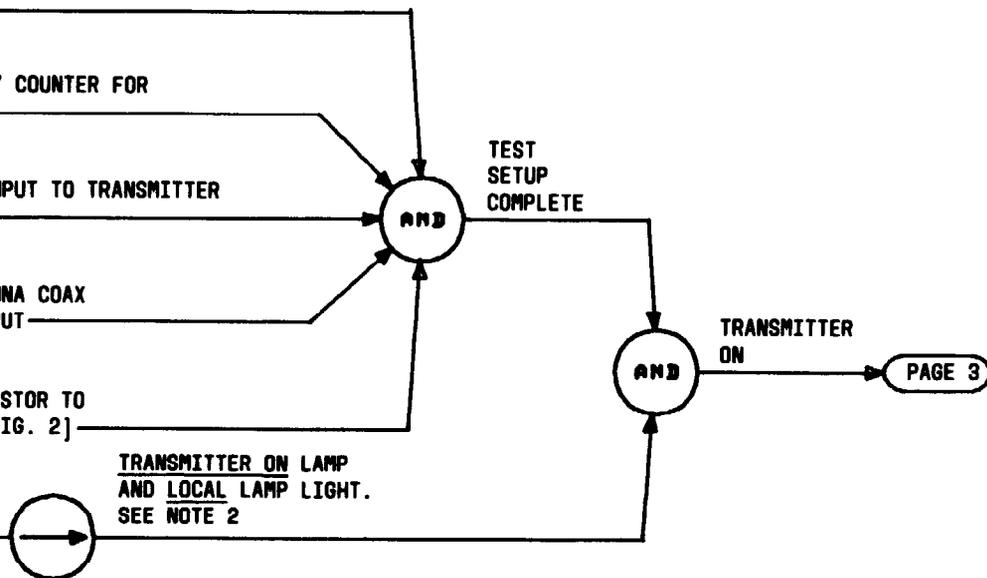


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
FREQUENCY COUNTER	HEWLETT-PACKARD MODEL 5245L WITH AMPLIFIER
TOOL KIT	

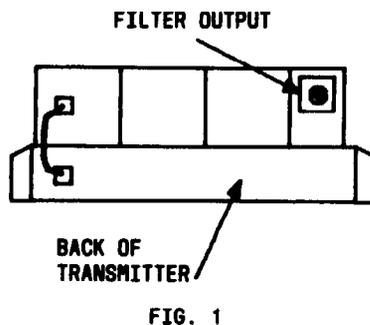


FIG. 1

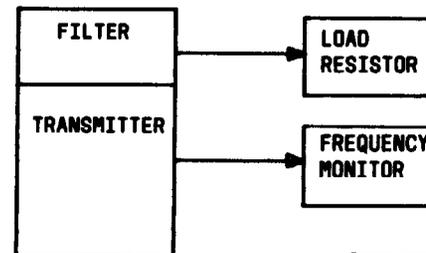


FIG. 2

NOTE 2
 FOR TRANSMITTER ON LAMP TROUBLE, USE TAD-101.
 FOR LOCAL LAMP TROUBLE, USE TAD-124

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MEASURE TRANSMITTER FREQUENCY

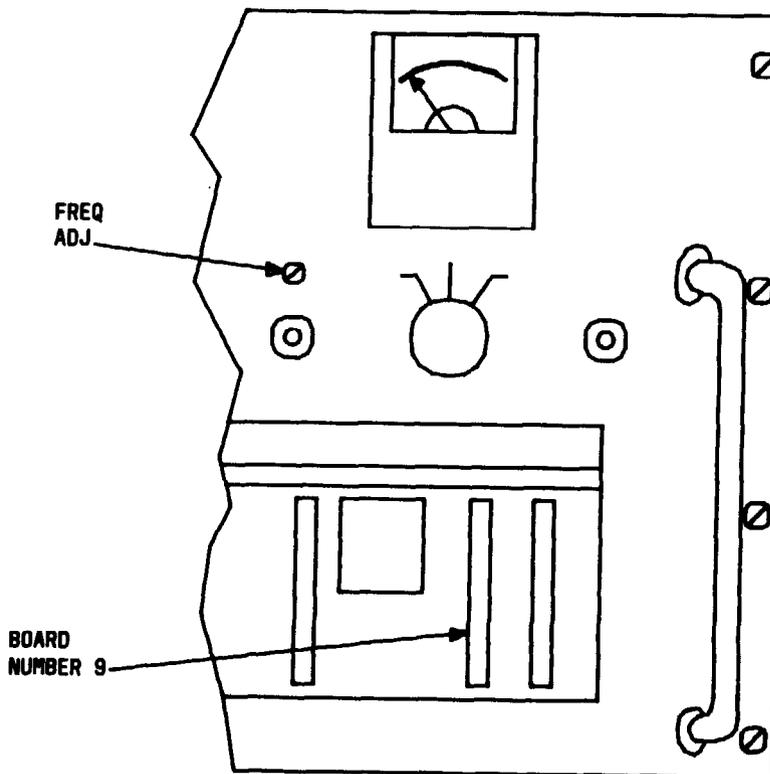
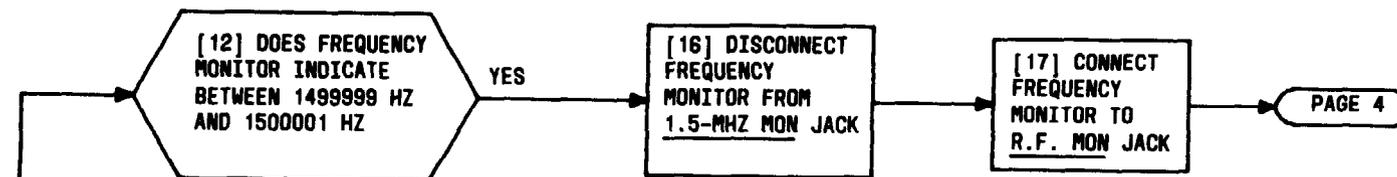


FIG. 3

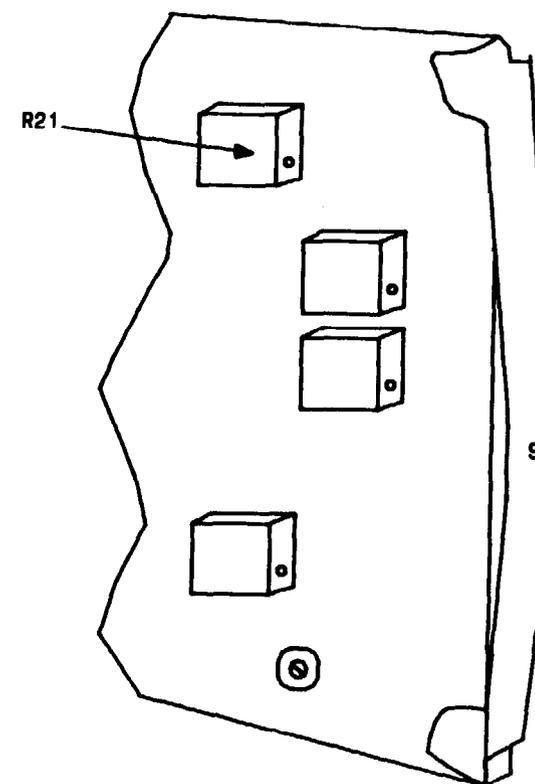


FIG. 4

MEASURE TRANSMITTER FREQUENCY

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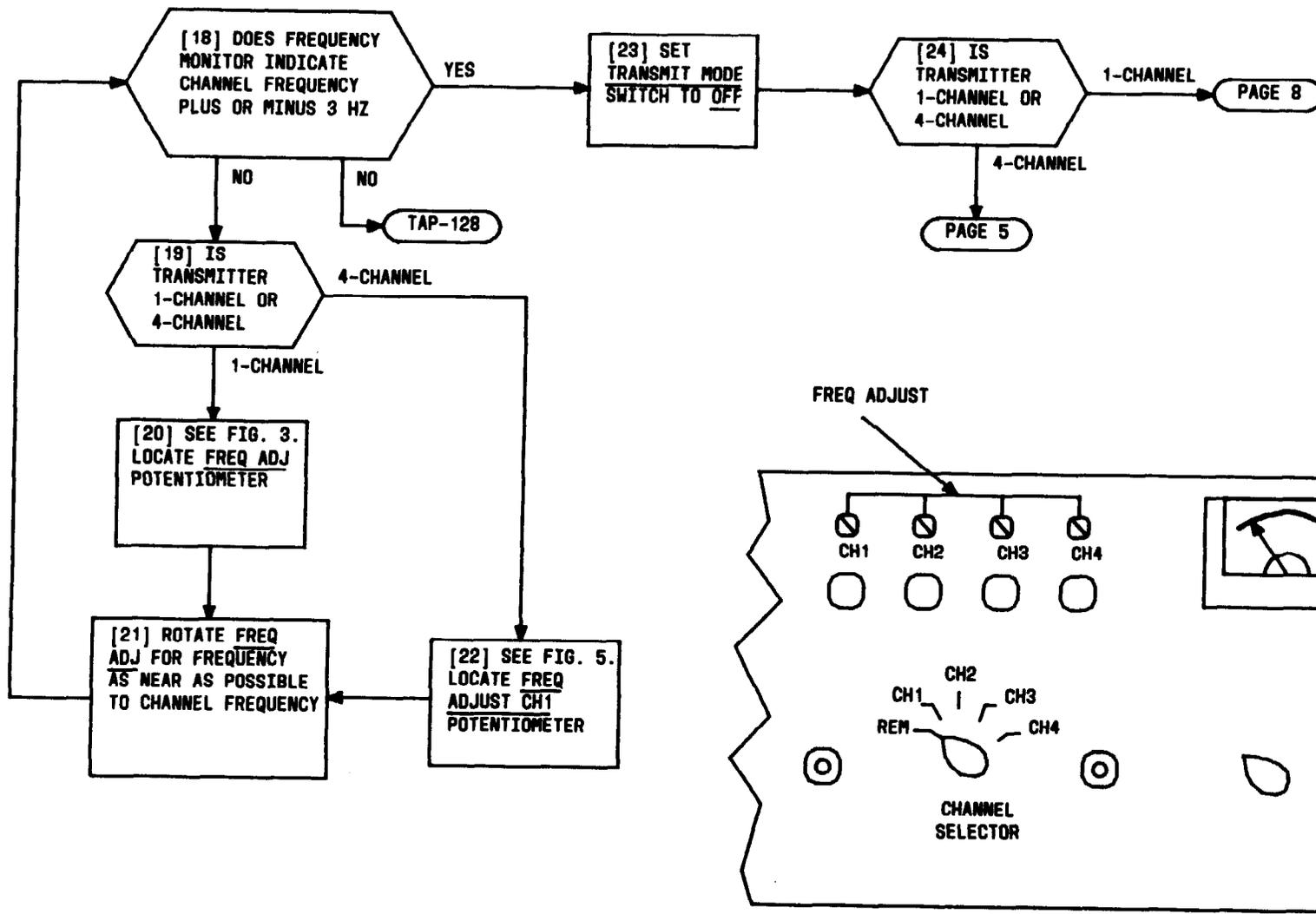
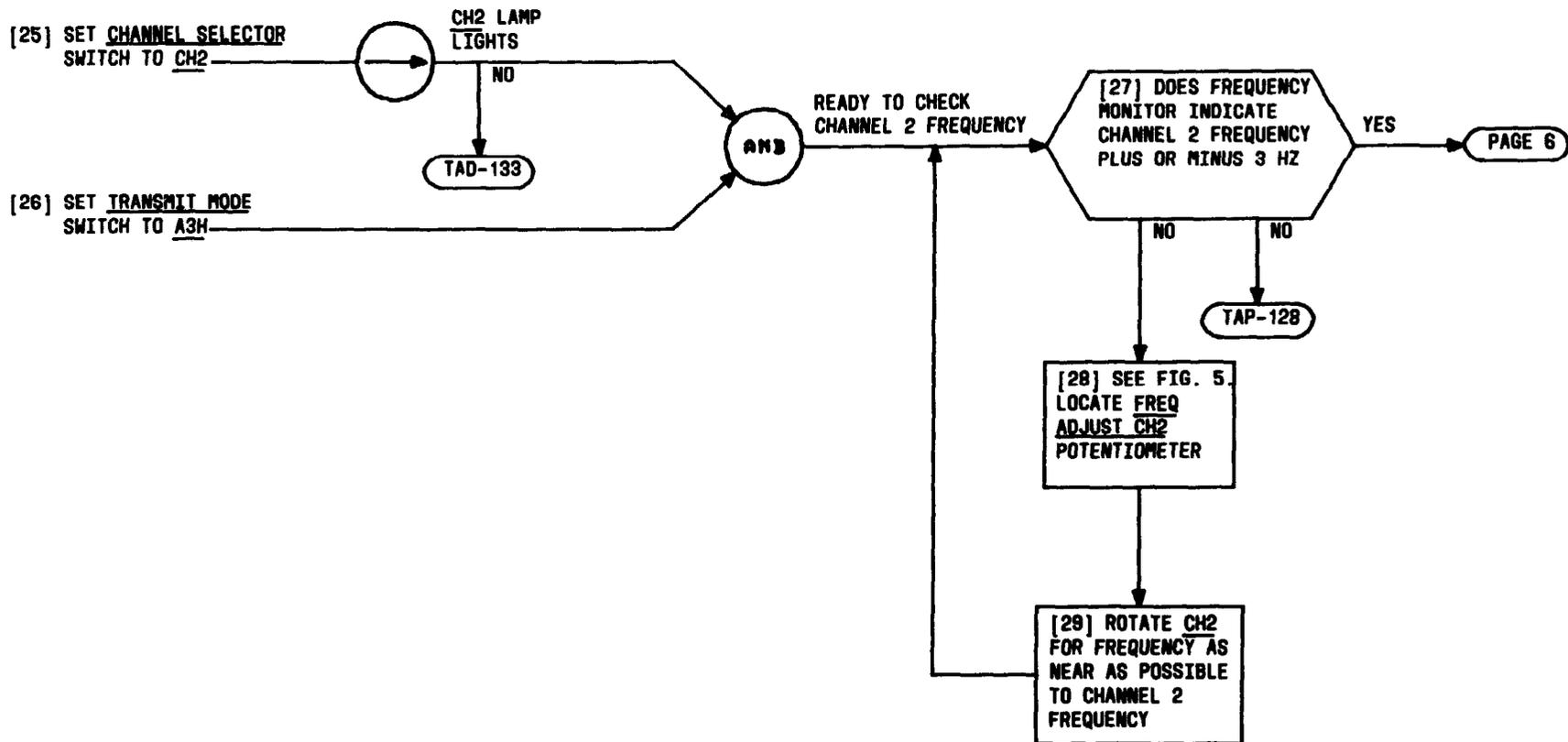


FIG. 5

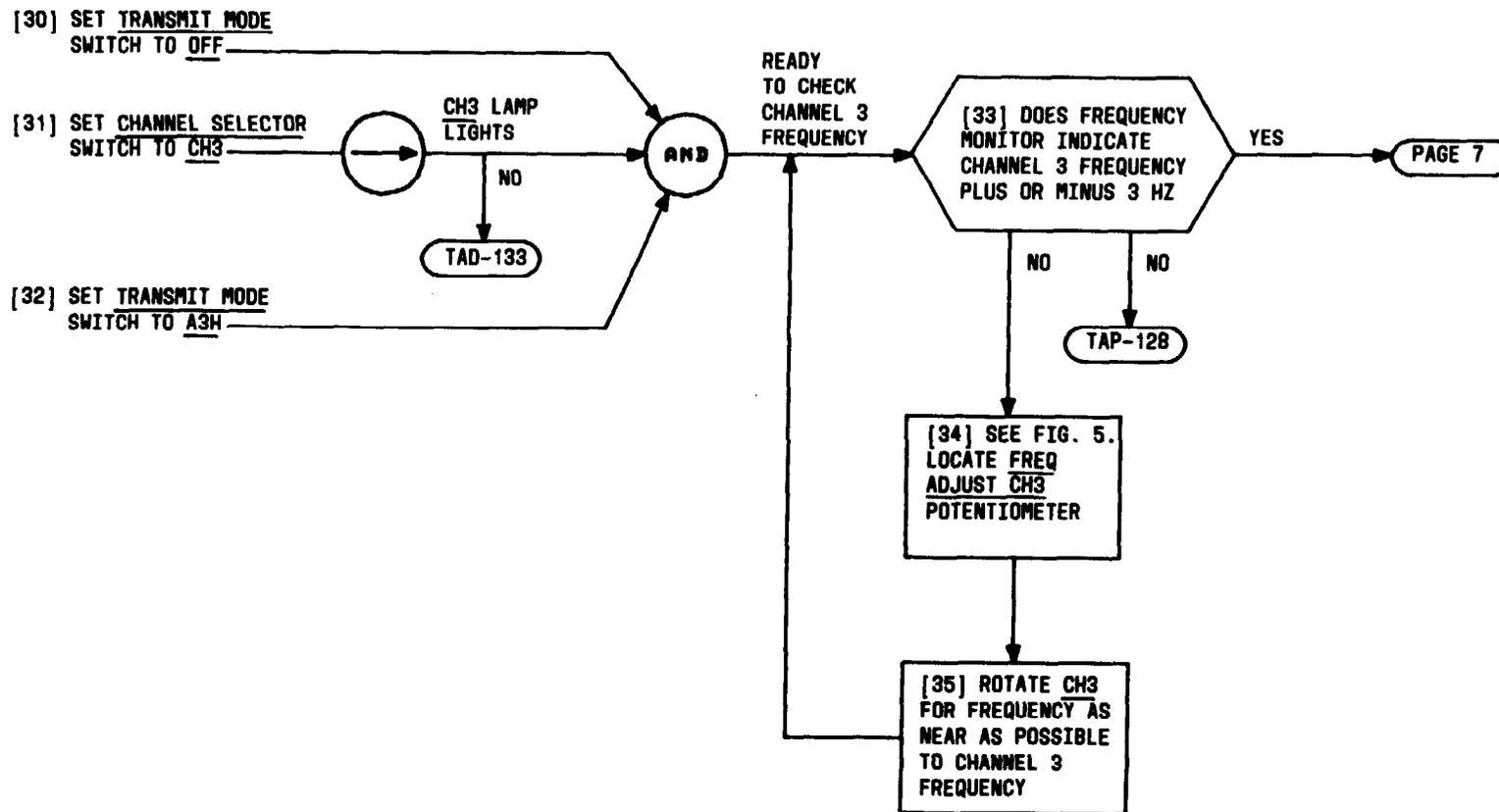
MEASURE TRANSMITTER FREQUENCY

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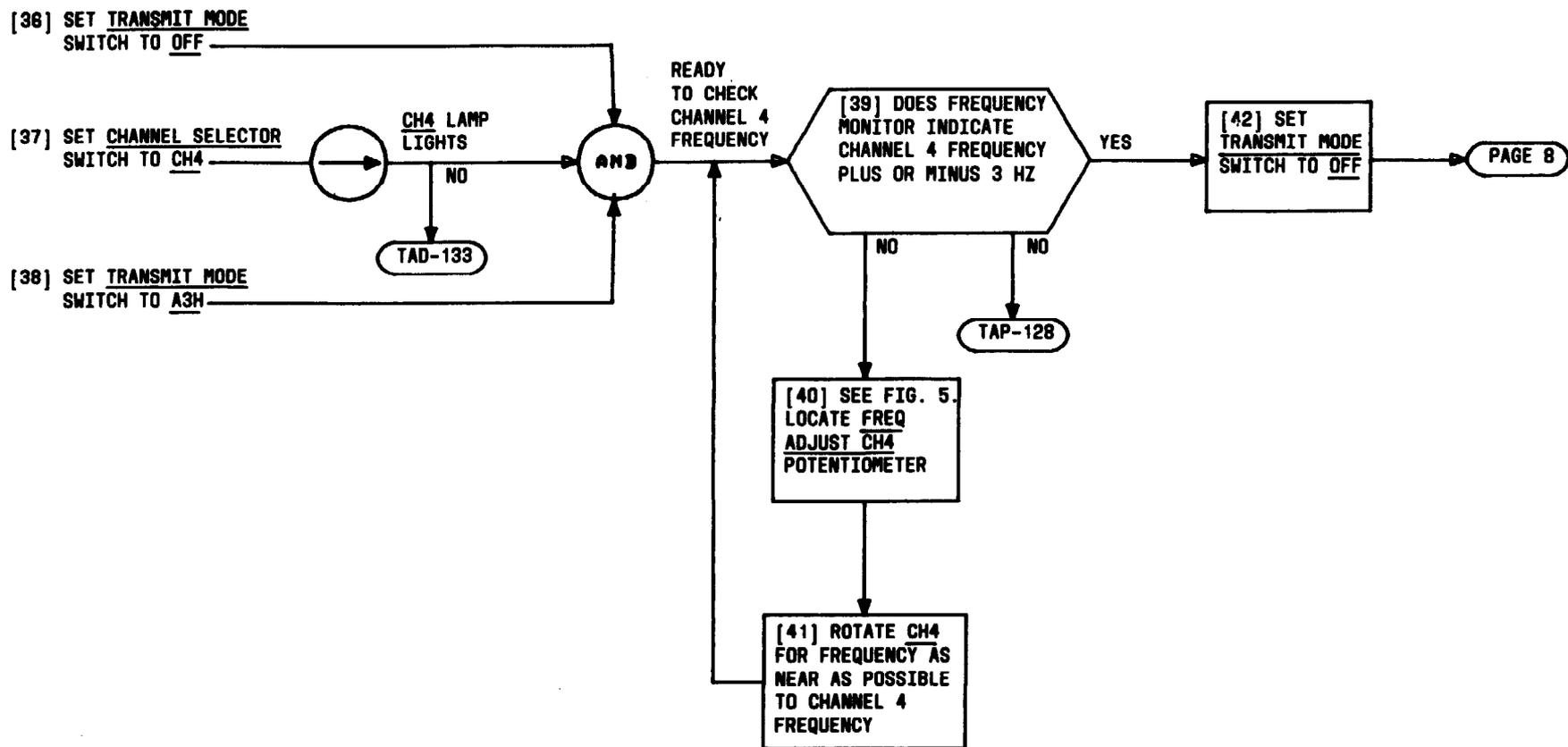
MEASURE TRANSMITTER FREQUENCY

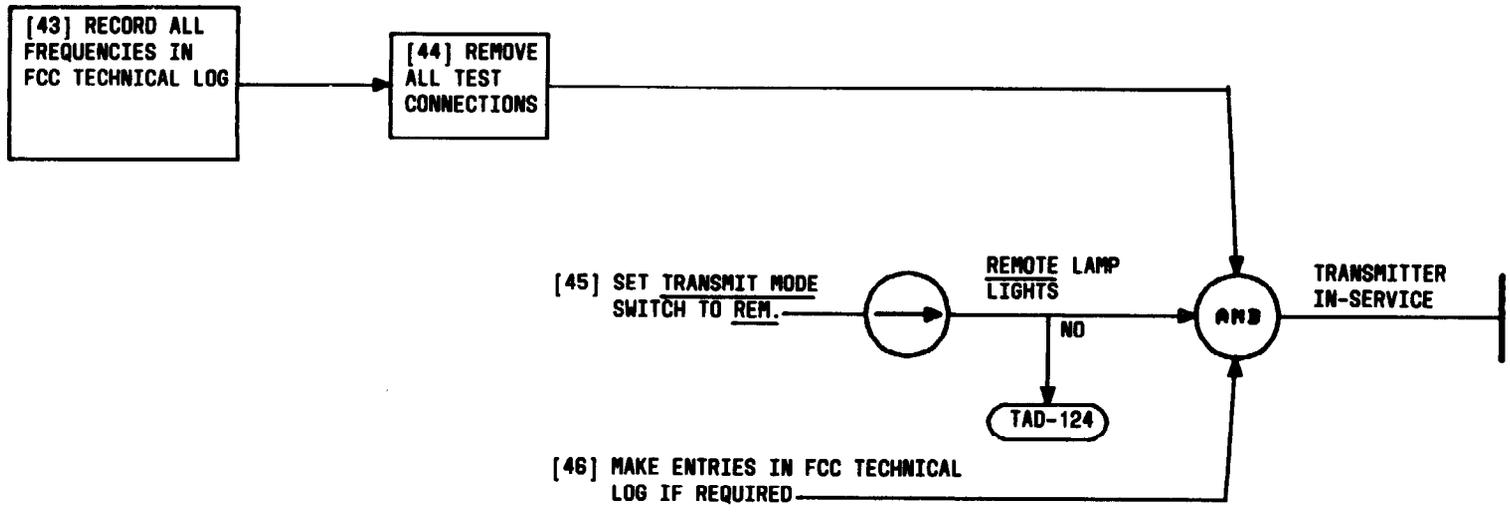
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MEASURE TRANSMITTER FREQUENCY

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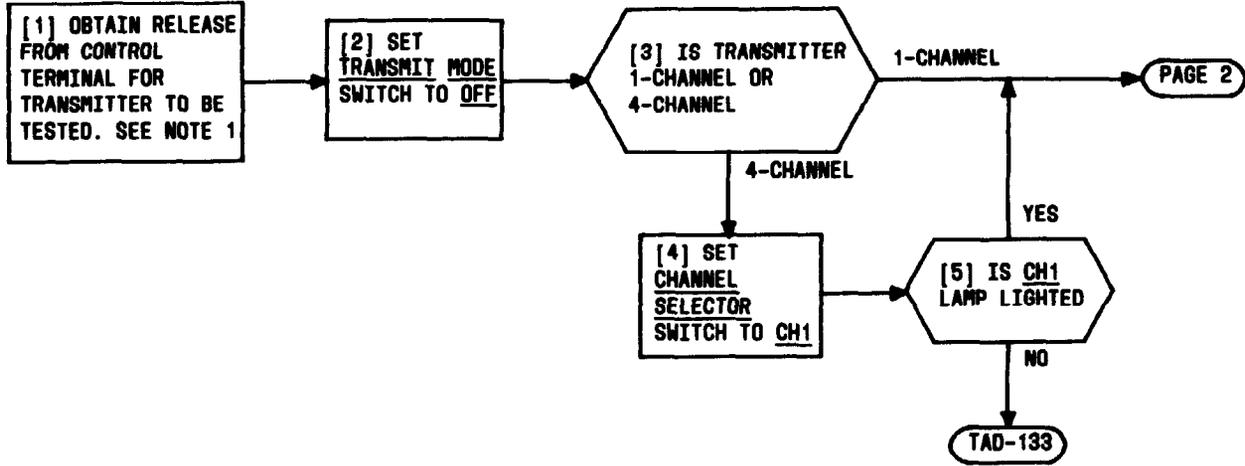


MEASURE TRANSMITTER FREQUENCY

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SUMMARY

USING IN-LINE WATTMETER. MEASURE TRANSMITTER POWER OUTPUT IN A3H (SAFETY AND CALLING) AND/OR A3A (PUBLIC CORRESPONDENCE) MODE OF OPERATION. THE REQUIREMENT FOR A3H IS BETWEEN 75 AND 120 WATTS. THE REQUIREMENT FOR A3A IS BETWEEN 7.5 AND 12 WATTS



NOTE 1		
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION		
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MEASURE TRANSMITTER CARRIER POWER OUTPUT

[6] GET TEST EQUIPMENT AS SHOWN IN TABLE A

[7] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[8] CONNECT IN-LINE WATTMETER TO TRANSMITTER FILTER OUTPUT [FIG. 2]

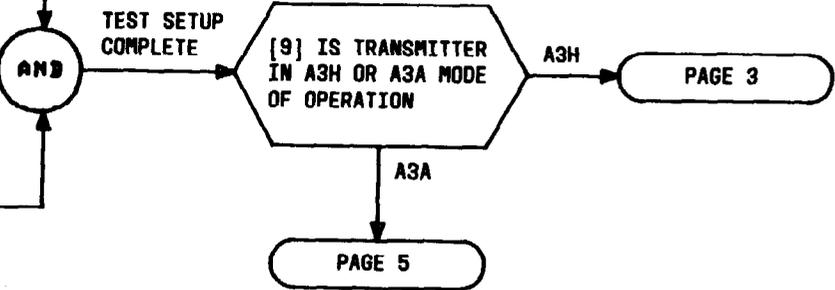
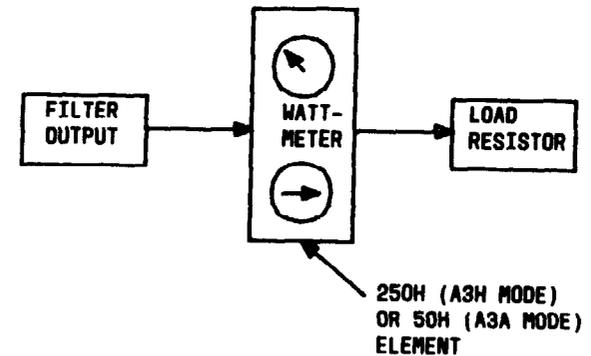
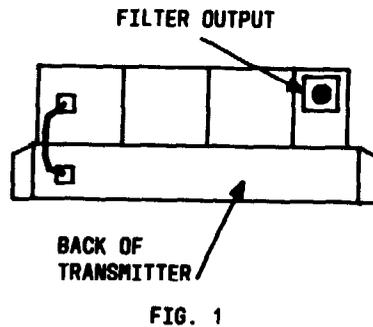


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
IN-LINE WATTMETER	BIRD MODEL 43 WITH 250H AND 50H ELEMENTS



MEASURE TRANSMITTER CARRIER POWER OUTPUT

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[10] INSERT 250H ELEMENT INTO IN-LINE WATTMETER WITH ARROW PRINTED ON ELEMENT FACING RIGHT [FIG. 2]

[11] CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER [FIG. 2]

[12] SET TRANSMIT MODE SWITCH TO A3H

SEE NOTE 2.
TRANSMITTER ON AND
LOCAL LAMP LIGHTED



TRANSMITTER ON

PAGE 4

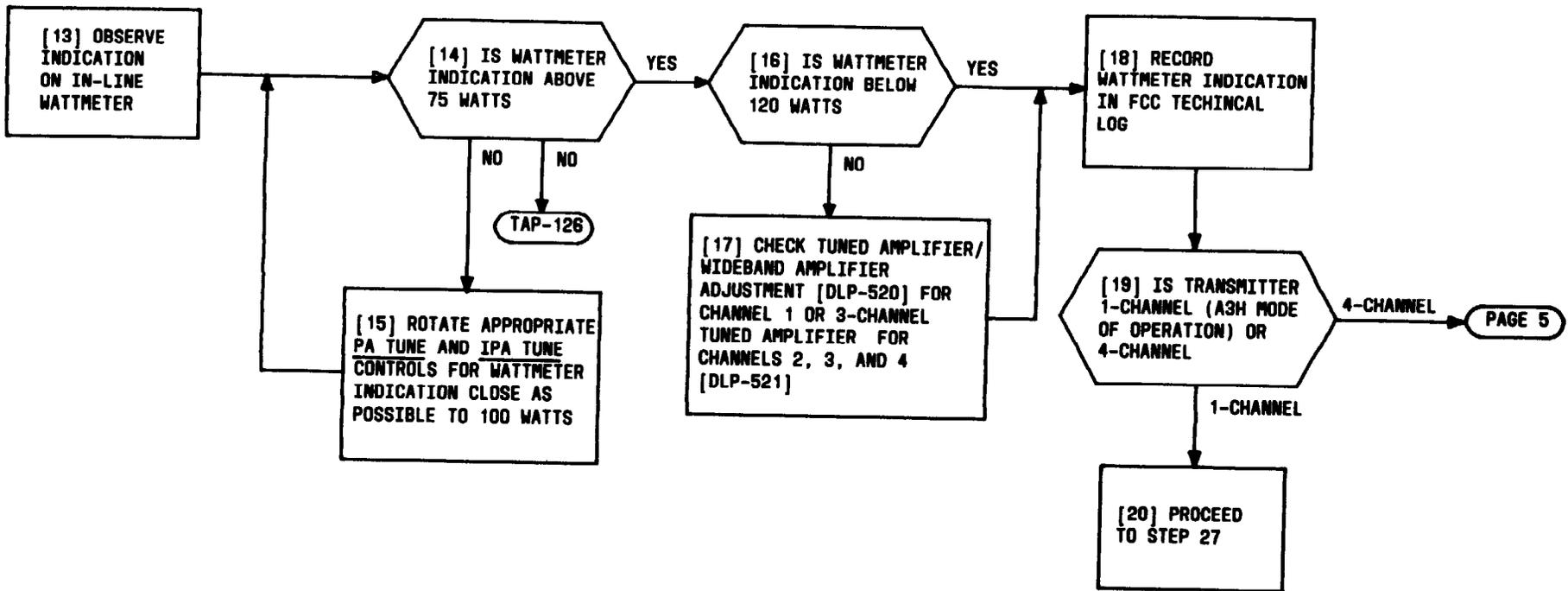
NOTE 2

FOR TRANSMITTER ON
LAMP, USE TAD-101
FOR LOCAL LAMP, USE
TAD-124

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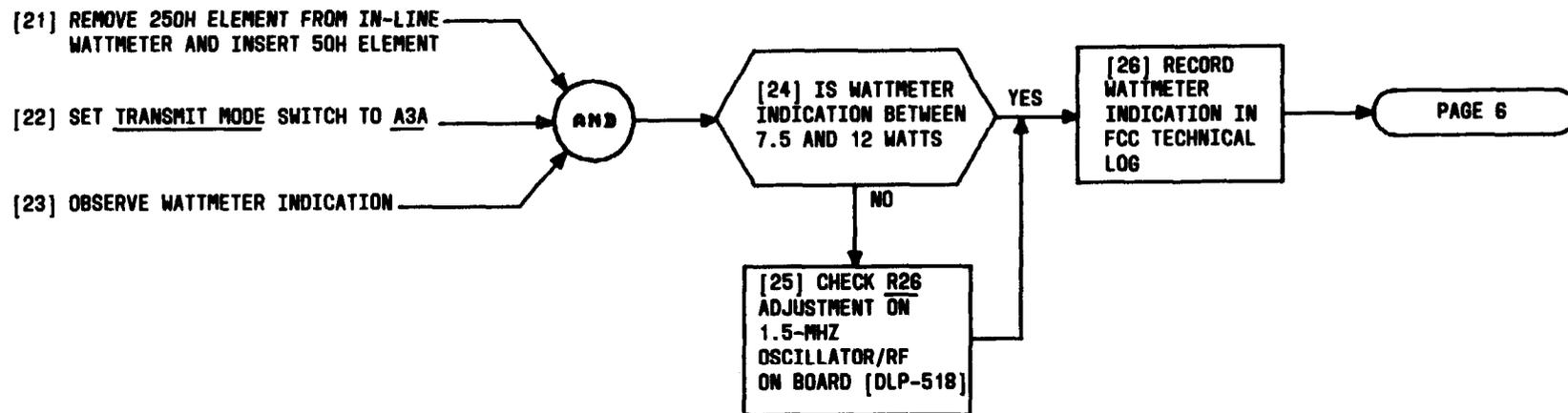
403-200-503 | DLP

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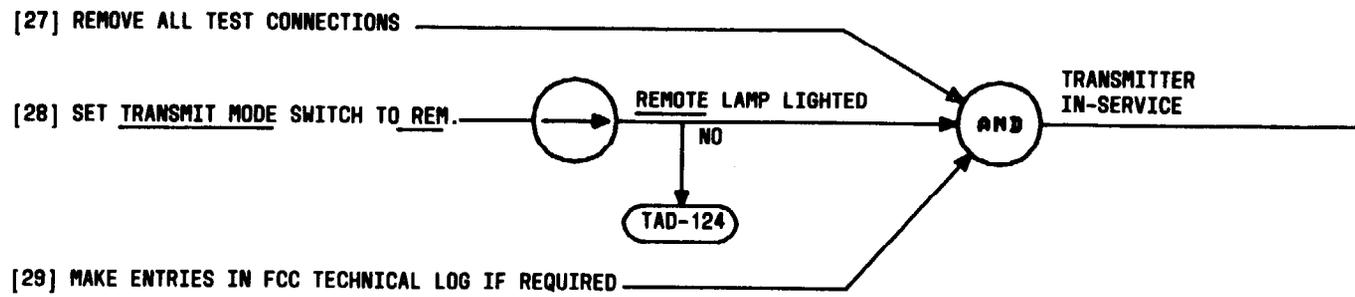
MEASURE TRANSMITTER CARRIER POWER OUTPUT

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MEASURE TRANSMITTER CARRIER POWER OUTPUT

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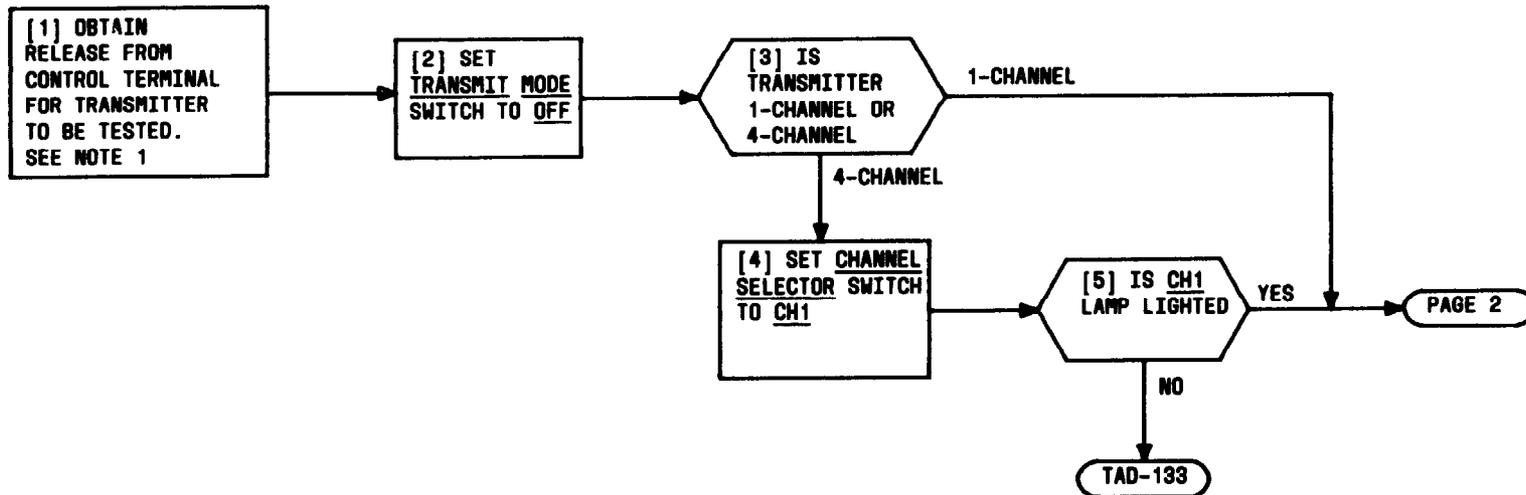


MEASURE TRANSMITTER CARRIER POWER OUTPUT

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SUMMARY

OPERATION OF AUTOMATIC LEVEL CONTROL (ALC) IS CHECKED WHILE MONITORING THE IN-LINE WATTMETER. POWER OUTPUT SHOULD BE 144 WATTS. ANY CORRECTIVE ACTION NECESSARY IS PERFORMED IN DLP-524



NOTE 1
 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

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[6] GET TEST EQUIPMENT AS SHOWN IN TABLE A

[7] INSERT ONE 369A TERMINATION INTO VOICE LINE JACK AND ONE 369A TERMINATION INTO STATUS LINE JACK [FIG. 1]

[8] USE THREE 200Ω RESISTORS AND SUITABLE CONNECTORS AND MAKE MIXING PAD AS SHOWN IN FIG. 2

[9] CONNECT MIXING PAD TO TRANSFORMER AS SHOWN IN FIG. 3

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TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 200Ω RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600Ω 1:1 RATIO
TRANSMISSION MEASURING SET (TMS)	WECO J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600Ω 1/2 WATT RESISTOR
THRULINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	

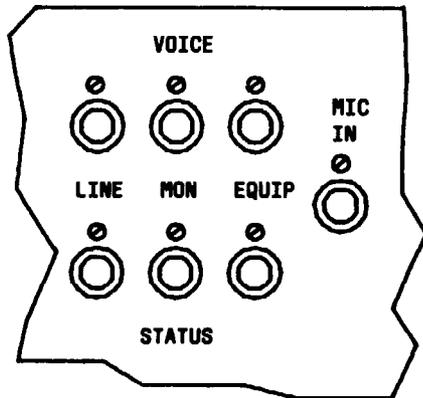


FIG. 1

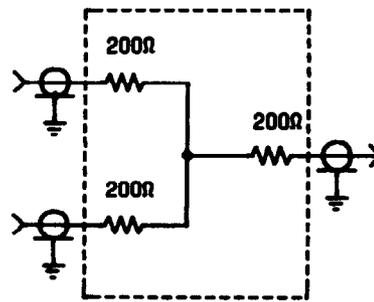


FIG. 2

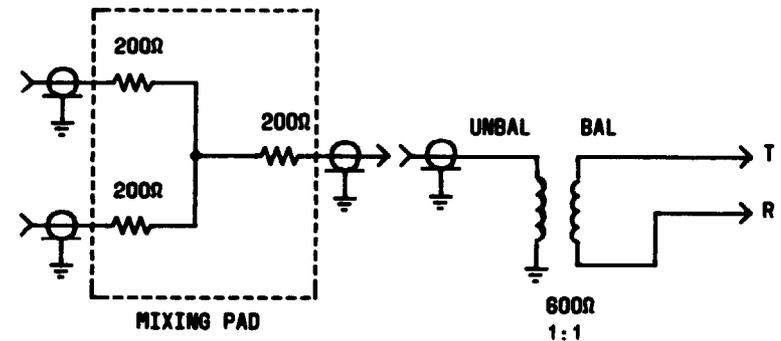


FIG. 3

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

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[10] CONDITION 21A TMS TO MEASURE DB [DLP-526]

[11] SEE FIG. 4. CONNECT DET IN 600Ω INPUT OF TMS TO OUTPUT OF TRANSFORMER

[12] SEE FIG. 4. CONDITION AUDIO OSCILLATOR FOR 700-HZ [DLP-528] AND CONNECT TO MIXING PAD

[13] SEE FIG. 4. CONNECT 600Ω RESISTOR TO MIXING PAD

[14] OBSERVE TMS AND INCREASE POWER OUTPUT OF AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB

[15] DISCONNECT 600Ω RESISTOR FROM MIXING PAD

700-HZ
OUTPUT
SET AT
-22 DB

PAGE 4

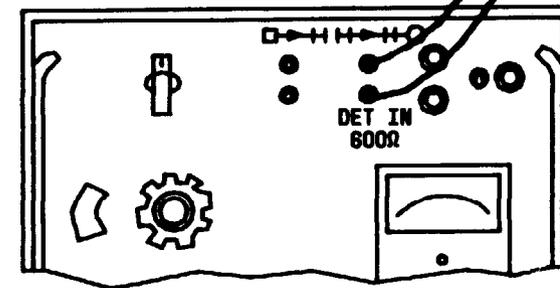
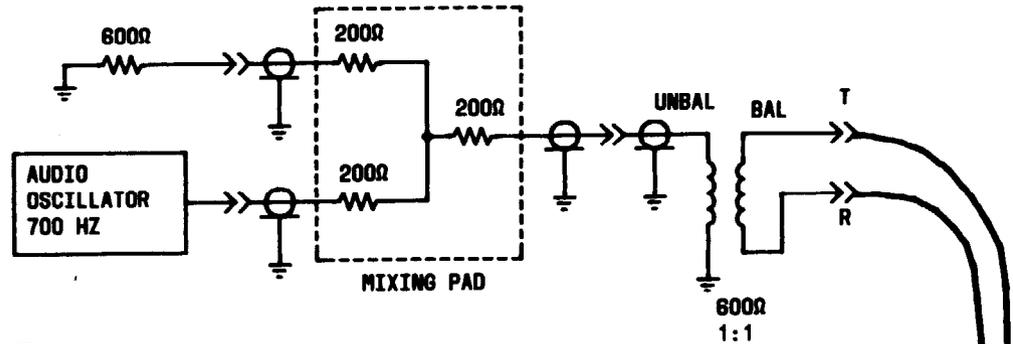


FIG. 4

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

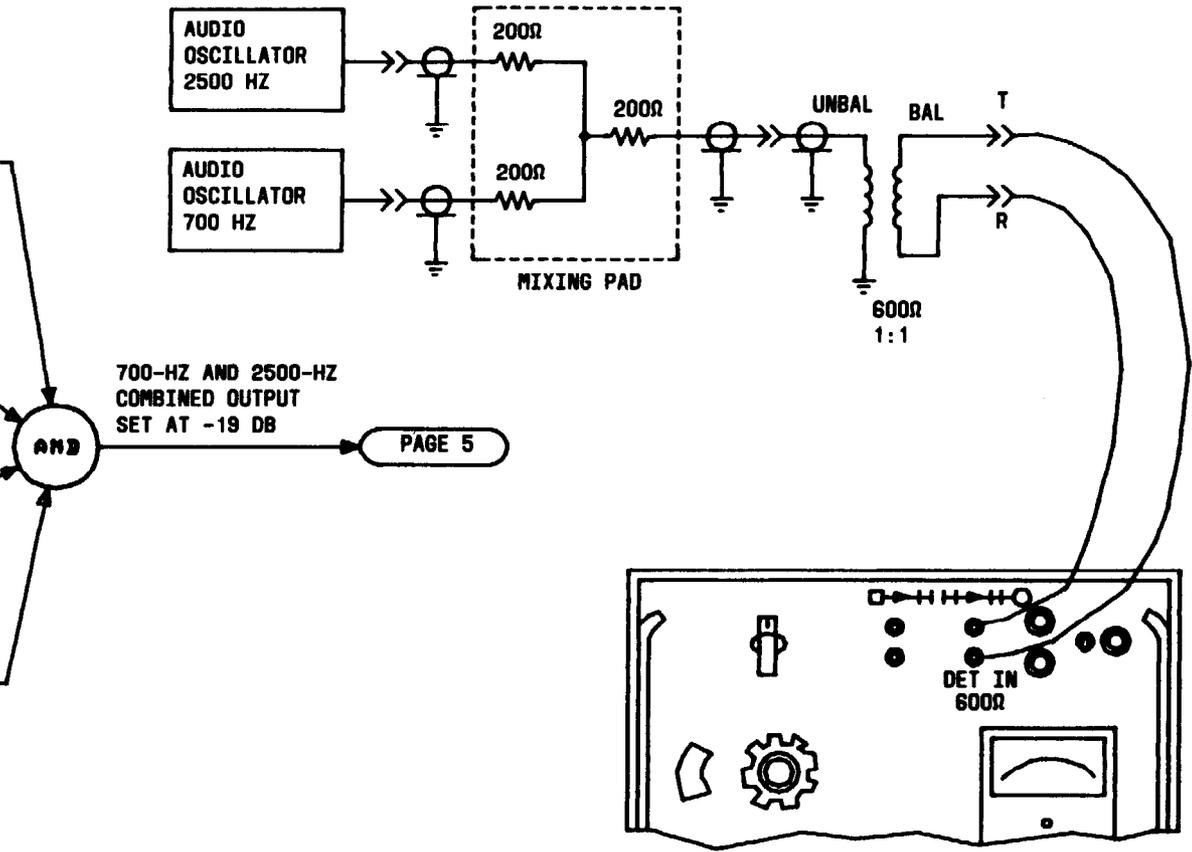
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[16] SEE FIG. 5. CONDITION OTHER AUDIO OSCILLATOR FOR 2500-HZ OUTPUT AND CONNECT TO MIXING PAD [DLP-528]

[17] DISCONNECT 700-HZ AUDIO OSCILLATOR FROM MIXING PAD AND CONNECT 600Ω RESISTOR TO MIXING PAD

[18] OBSERVE TMS AND INCREASE POWER OUTPUT OF 2500-HZ AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB

[19] DISCONNECT 600Ω RESISTOR AND CONNECT 700-HZ AUDIO OSCILLATOR [FIG. 5]



700-HZ AND 2500-HZ COMBINED OUTPUT SET AT -19 DB

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FIG. 5

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

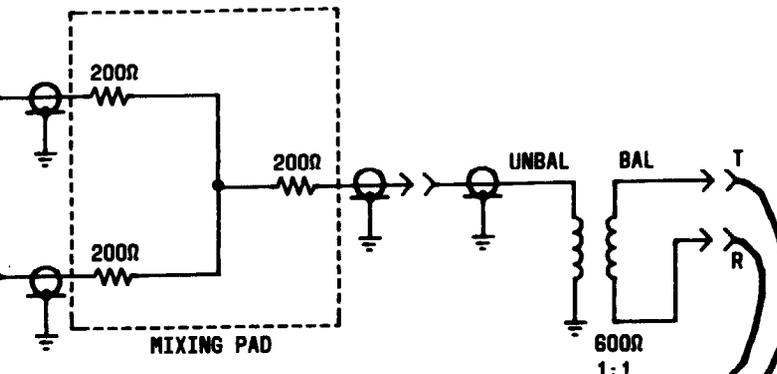
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[20] SEE FIG. 6. DISCONNECT TMS FROM TRANSFORMER AND CONNECT TRANSFORMER TO VOICE EQUIP JACK

[21] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[22] SEE FIG. 8. CONNECT THRU-LINE WATTMETER TO FILTER OUTPUT AND INSERT 250H ELEMENT INTO WATTMETER WITH ARROW PRINTED ON ELEMENT FACING RIGHT

[23] SEE FIG. 8. CONNECT RF COAXIAL LOAD RESISTOR TO THRU-LINE WATTMETER



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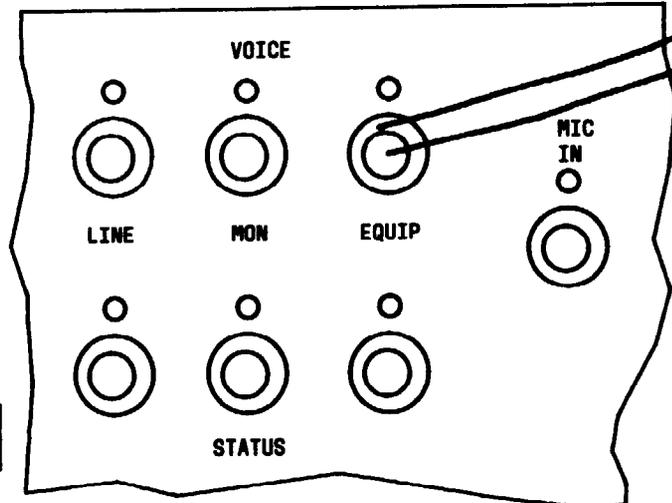


FIG. 6

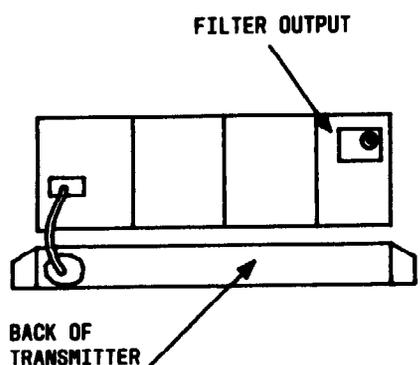


FIG. 7

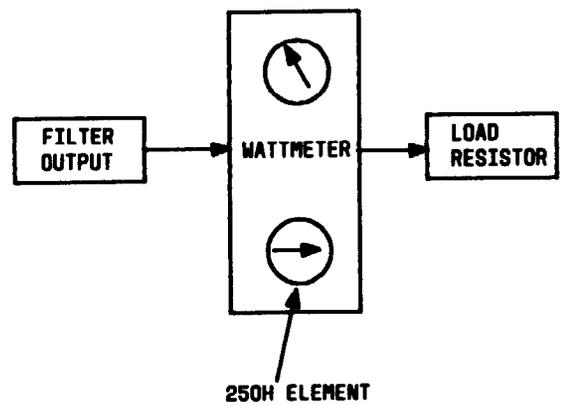
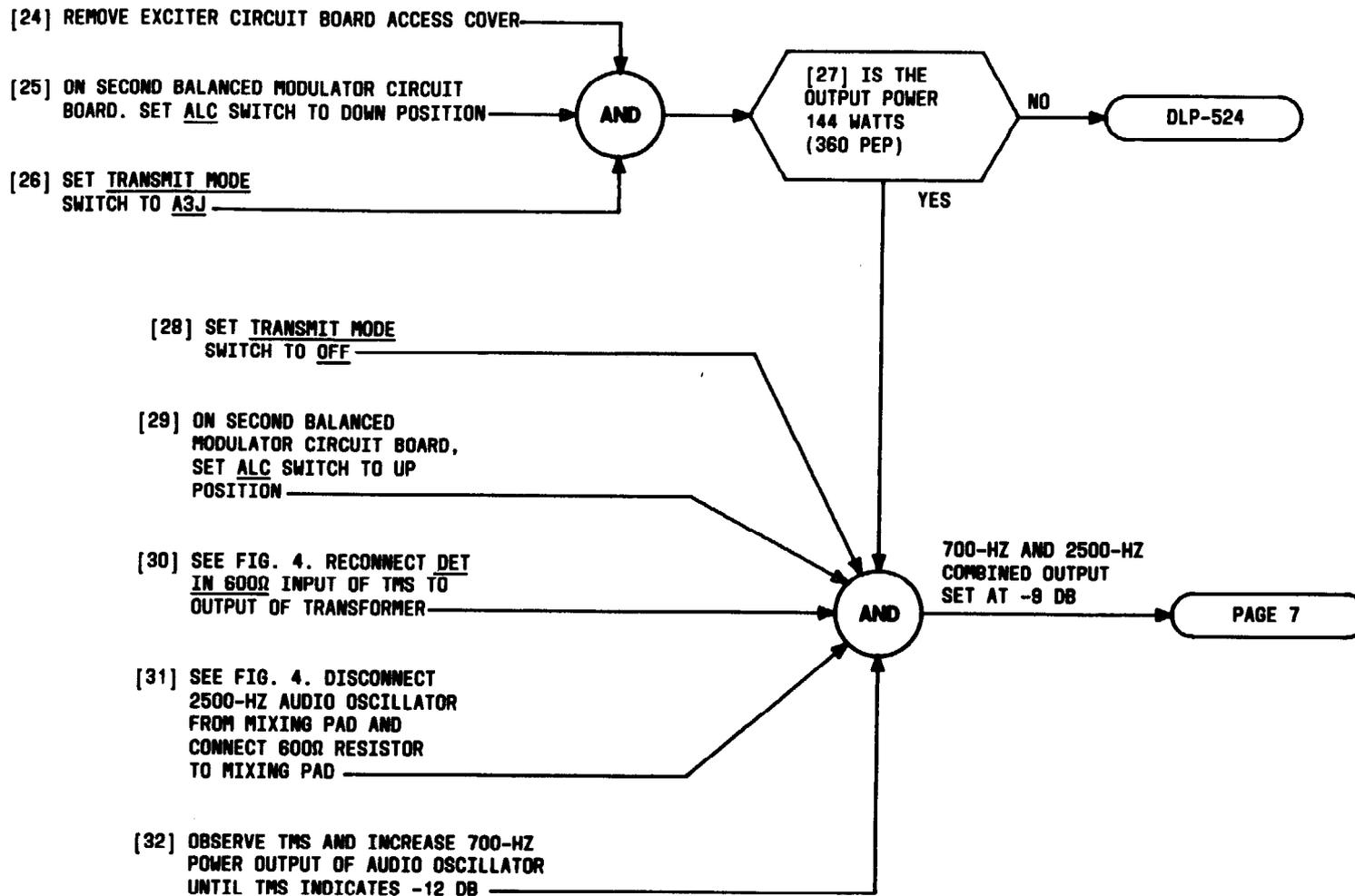


FIG. 8

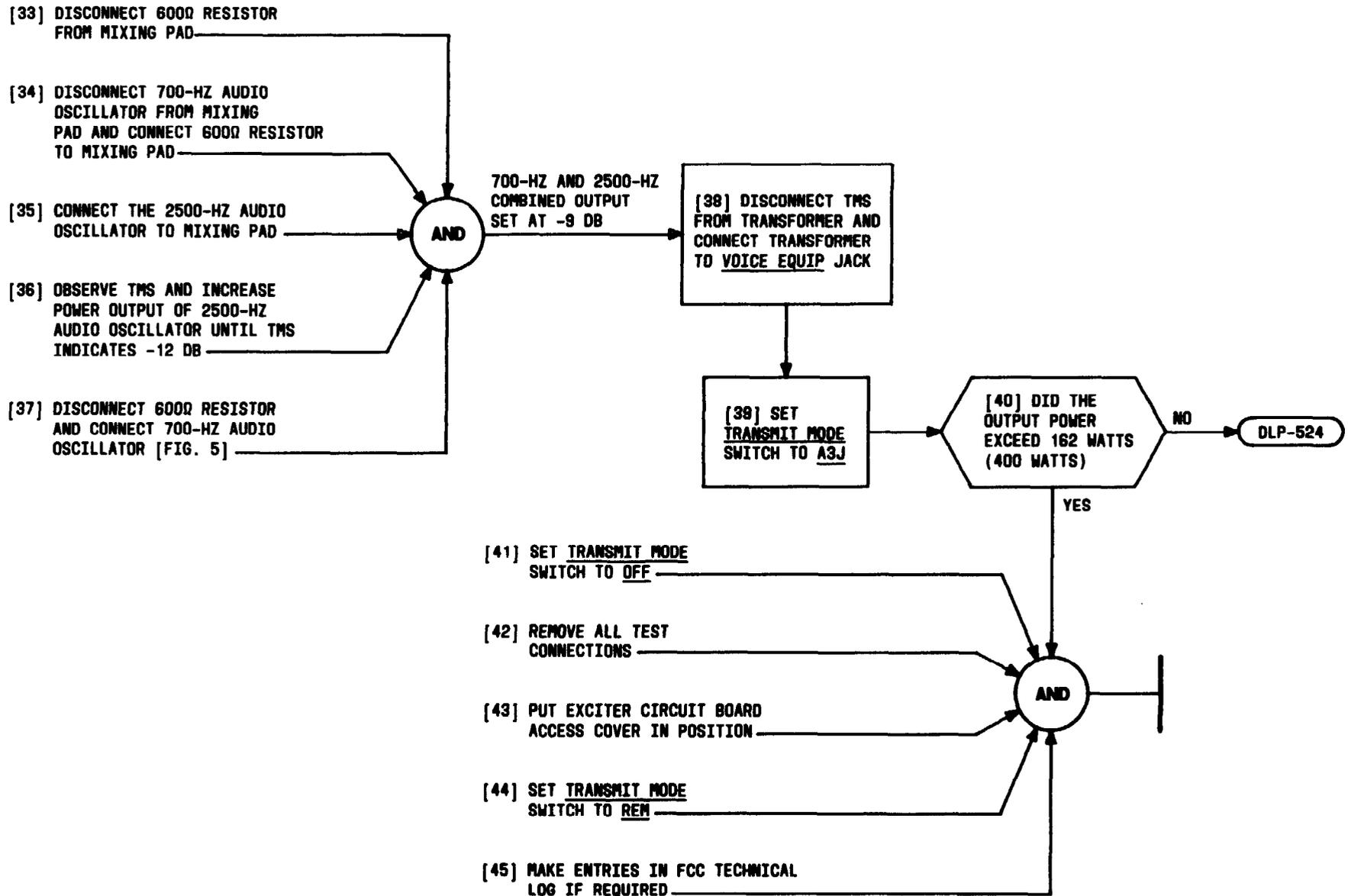
TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

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TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

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TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

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[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1

[2] SET TRANSMIT MODE SWITCH TO OFF

[3] GET TEST EQUIPMENT AS SHOWN IN TABLE A

[4] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM FILTER OUTPUT

[5] CONNECT RF COAXIAL LOAD RESISTOR TO FILTER OUTPUT

[6] SEE FIG. 2. CONDITION AUDIO OSCILLATOR FOR 1000-HZ TONE AT -16 DBM AND CONNECT TO VOICE EQUIP JACK

[7] SEE FIG. 3. INSERT TMS INTO STATUS EQUIP. JACK

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
AUDIO OSCILLATOR	HP MODEL 200CD
TRANSMISSION MEASURING SET	WECO J94021A

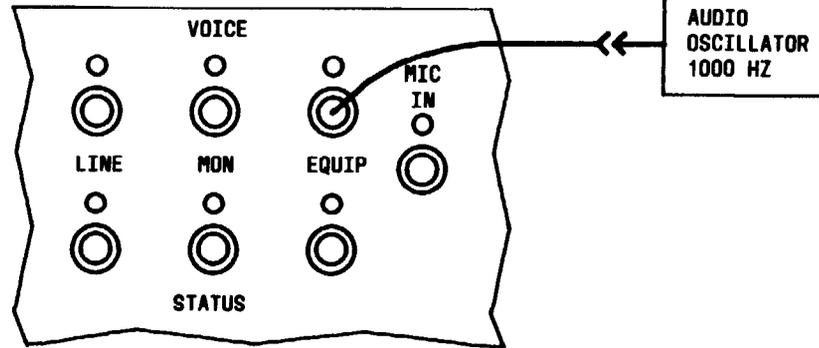
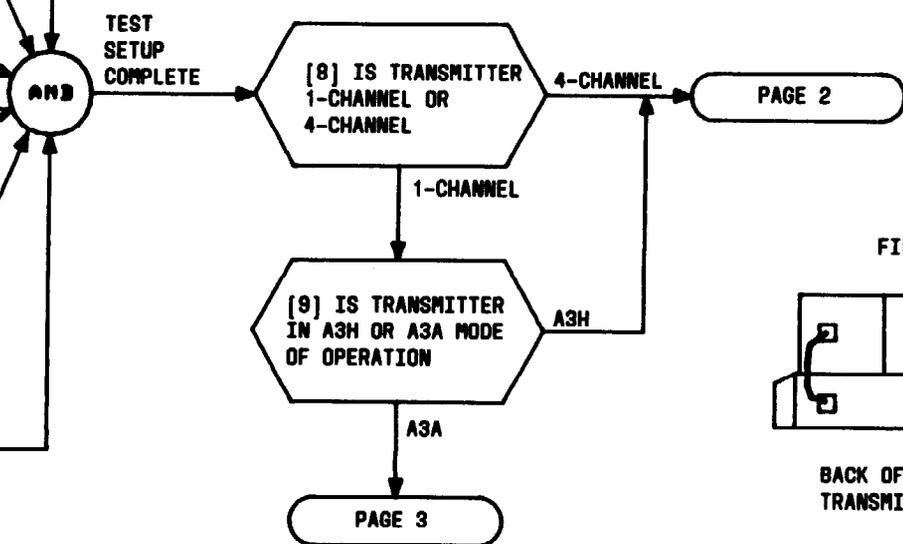


FIG. 2



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PAGE 3

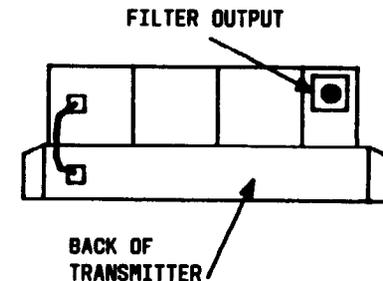
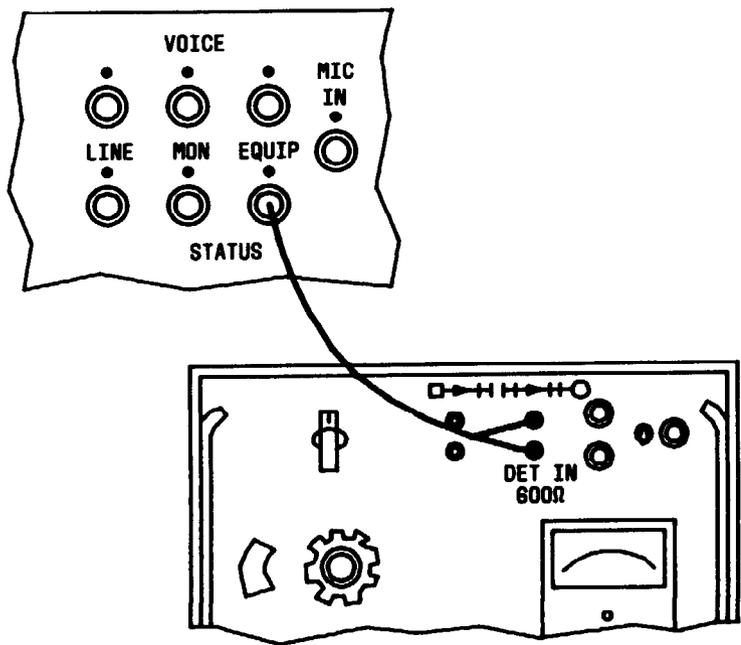
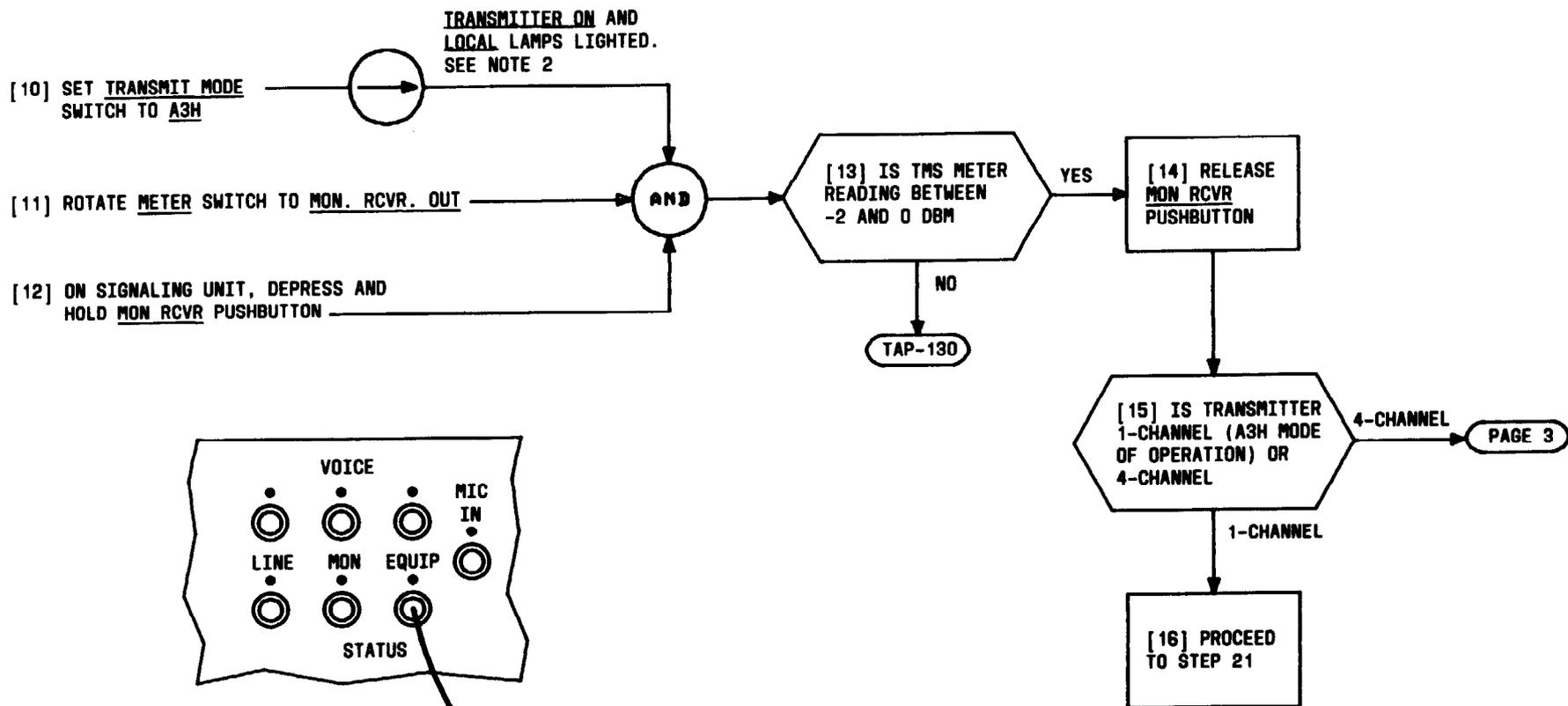


FIG. 1

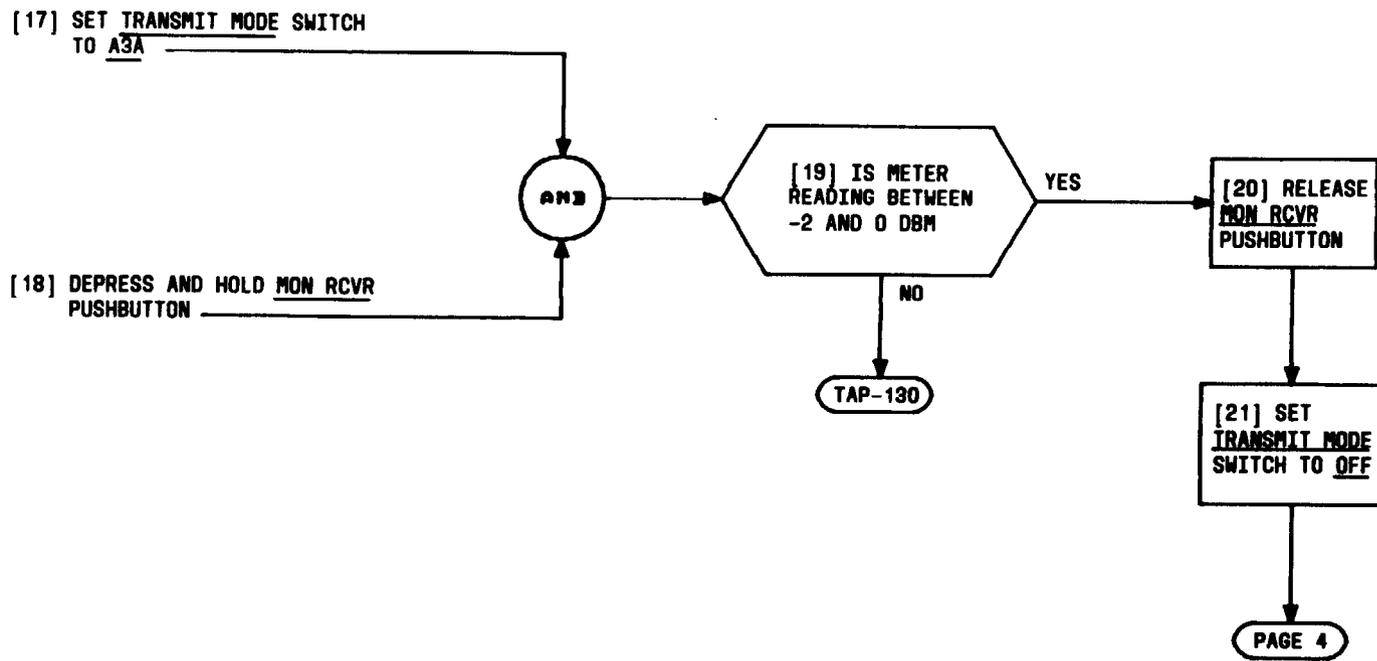
NOTE 1 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION	
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TEST MONITOR RECEIVER OUTPUT



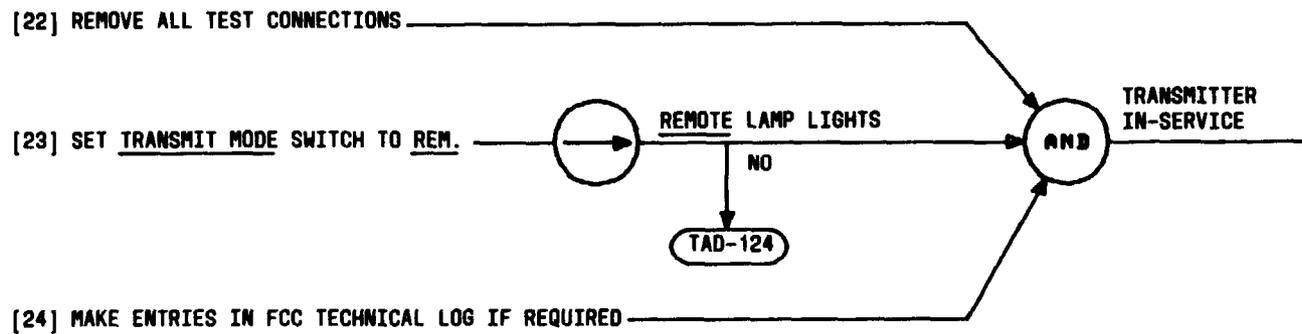
TEST MONITOR RECEIVER OUTPUT

NOTE 2 FOR TRANSMITTER ON LAMP TROUBLE, USE TAD-101. FOR LOCAL LAMP TROUBLE, USE TAD-124		
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TEST MONITOR RECEIVER OUTPUT

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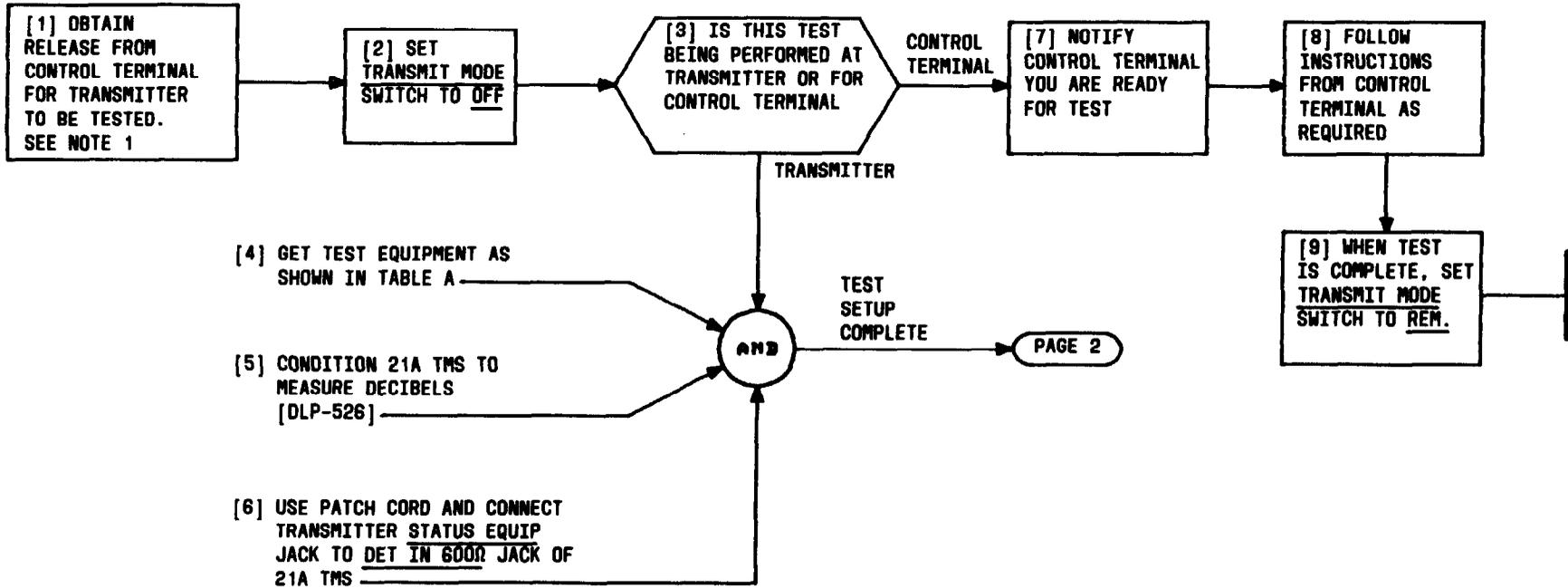


TEST MONITOR RECEIVER OUTPUT

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SUMMARY
 USING 21A TRANSMISSION MEASURING SET (TMS), MEASURE 1900-HZ AND 2100-HZ SIGNALING TONE LEVELS BETWEEN -4 AND -2 DBM. THE 2900-HZ SIGNALING TONE LEVEL IS MEASURED BETWEEN -8 AND -12 DBM

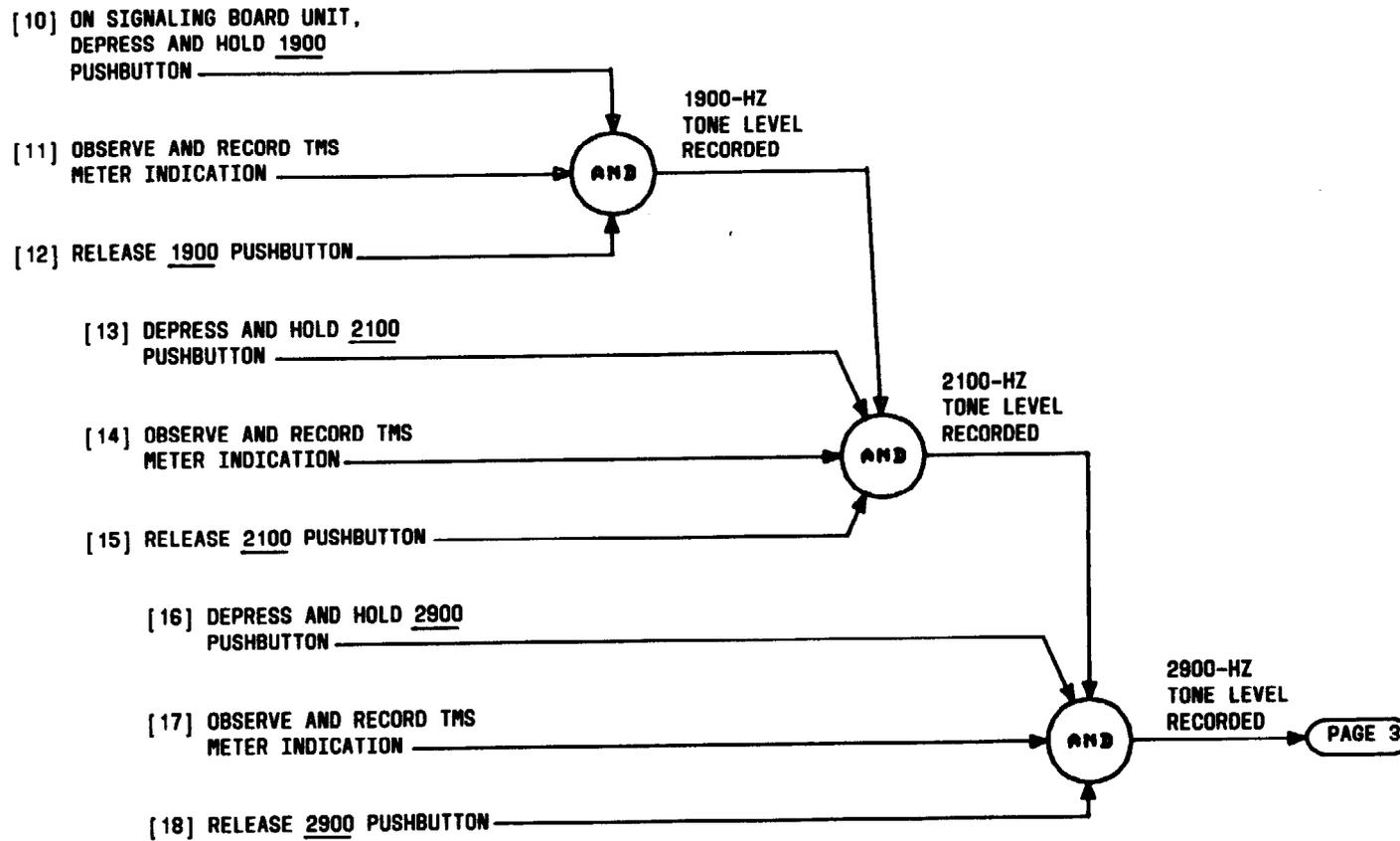
TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TRANSMISSION MEASURING SET	WECO J94021A
PATCH CORD	3P17B



MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

NOTE 1
 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION

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**MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ,
2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS**

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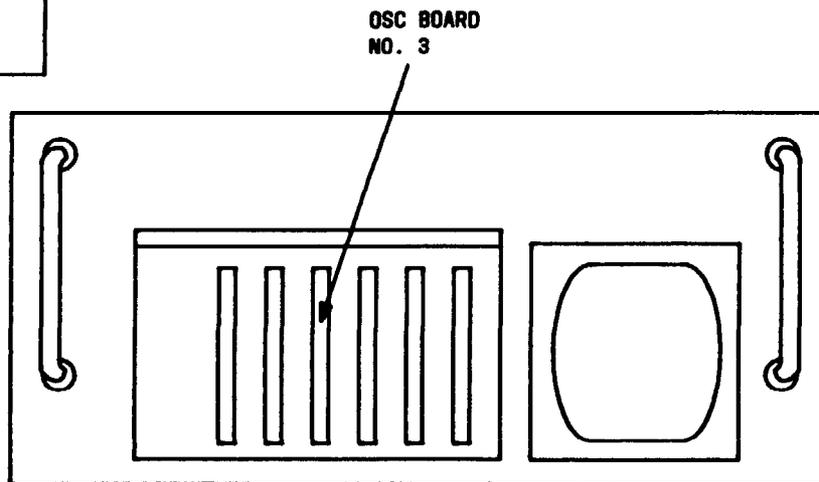
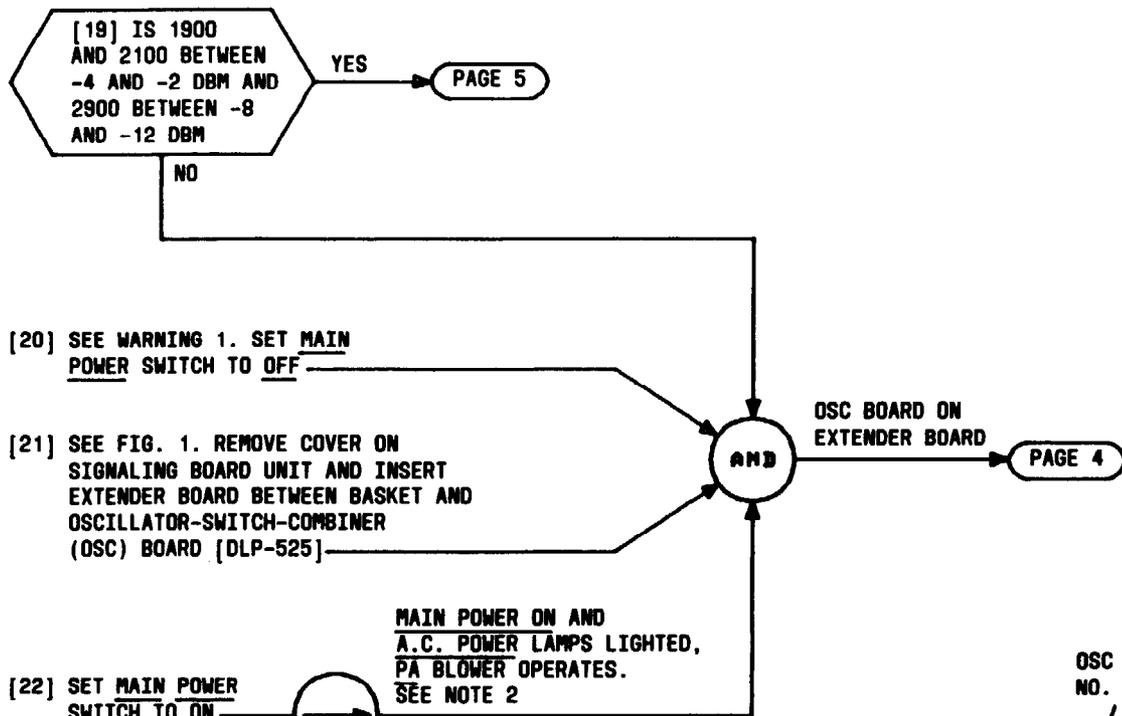


FIG. 1

MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

NOTE 2	
FOR MAIN POWER ON LAMP, USE TAD-134.	
FOR AC POWER LAMP, USE TAD-118.	
FOR PA BLOWER, USE TAP-116	
WARNING 1	
POWER IS TURNED OFF TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS	
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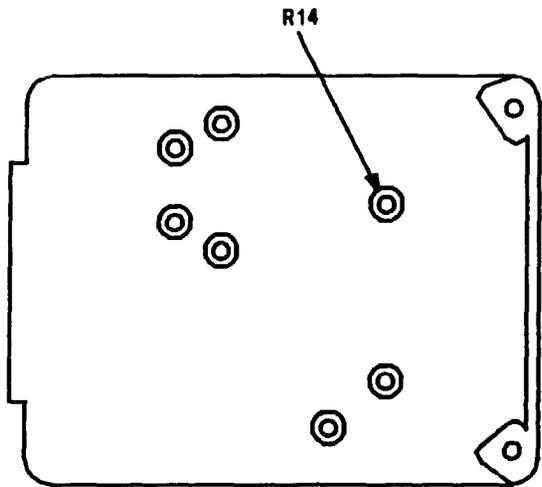
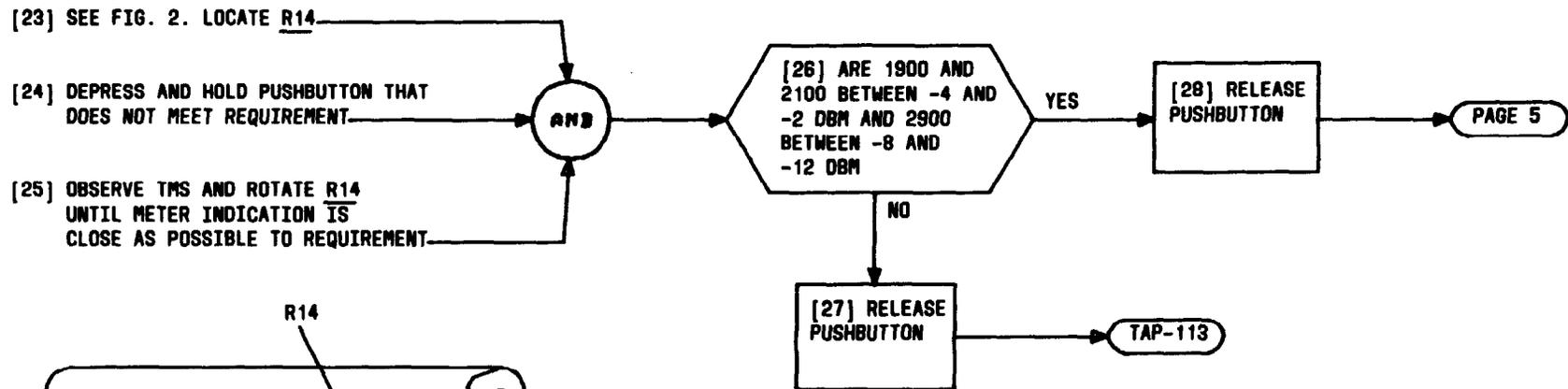
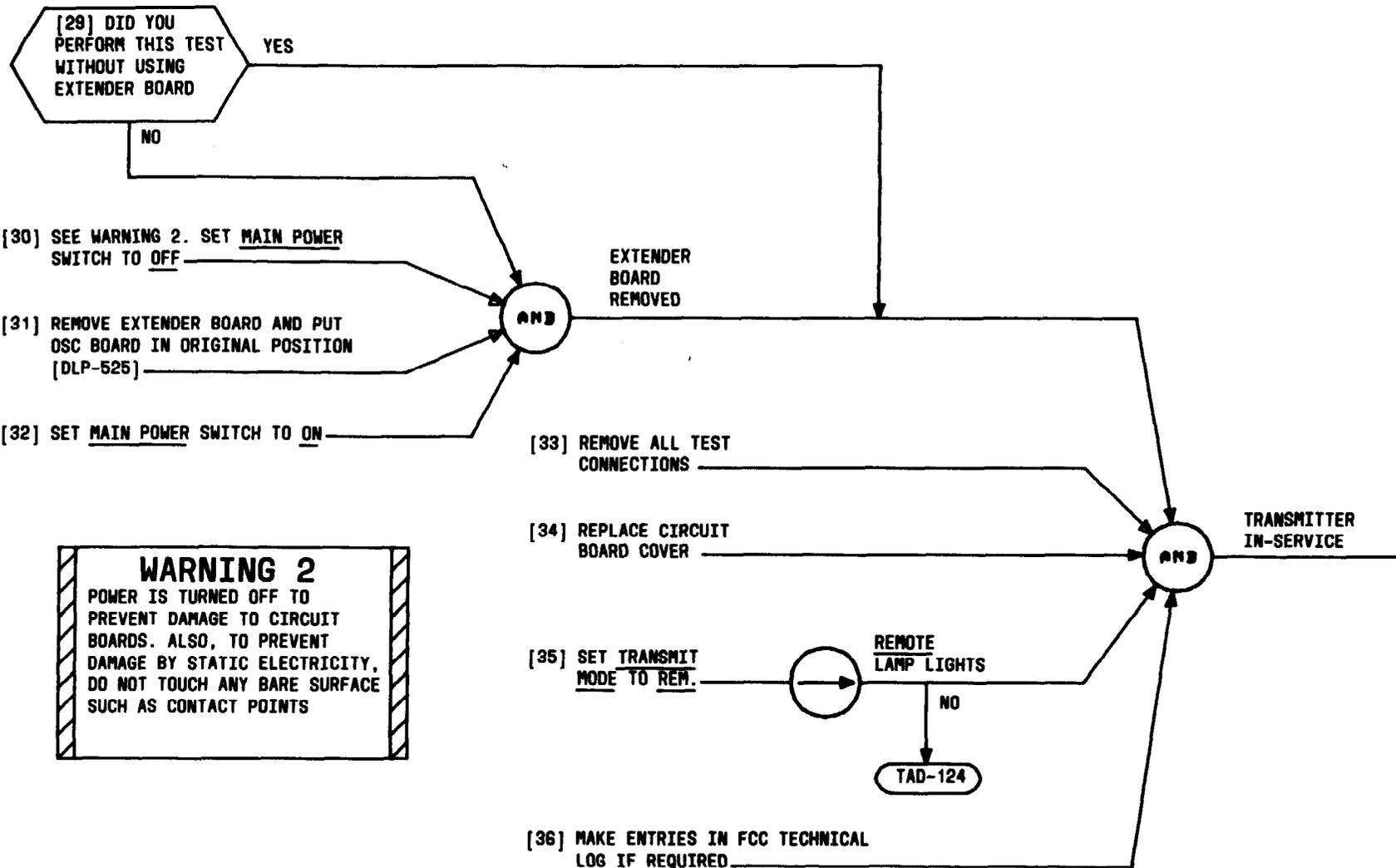


FIG. 2

MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

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WARNING 2
 POWER IS TURNED OFF TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

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SUMMARY
 USING FREQUENCY MONITOR, MEASURE 1900-HZ TONE BETWEEN 1906 AND 1894 HZ, 2100-HZ TONE BETWEEN 2106 AND 2094 HZ, AND 2900-HZ TONE BETWEEN 2909 AND 2891 HZ

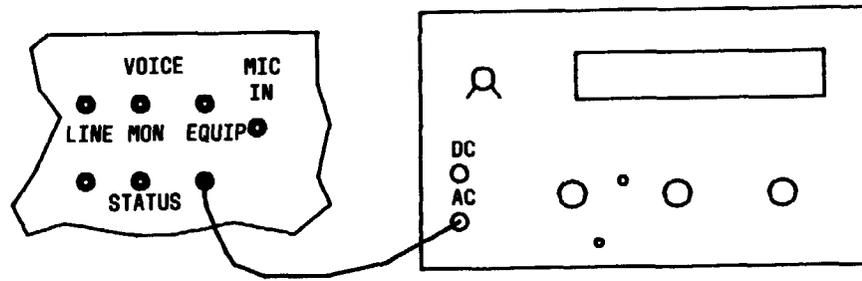


FIG. 1

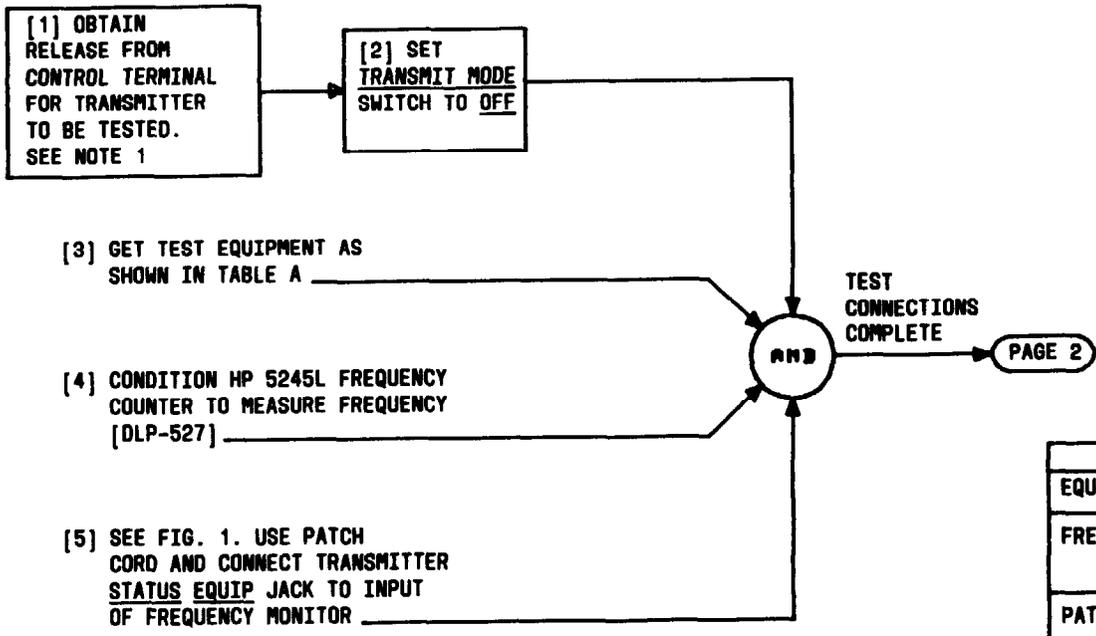


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
FREQUENCY MONITOR	HEWLETT-PACKARD MODEL 5245L
PATCH CORD	BNC TO 310 TYPE

NOTE 1
 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE FREQUENCIES

[6] ON SIGNALING BOARD UNIT, DEPRESS AND HOLD 1900 PUSHBUTTON

[7] OBSERVE INDICATION ON FREQUENCY MONITOR

[8] RELEASE 1900 PUSHBUTTON

[11] ON SIGNALING BOARD UNIT, DEPRESS AND HOLD 2100 PUSHBUTTON

[12] OBSERVE INDICATION ON FREQUENCY MONITOR

[13] RELEASE 2100 PUSHBUTTON

1900 HZ MEASURED

[9] WAS INDICATION ON FREQUENCY MONITOR BETWEEN 1906 AND 1894 HZ

YES

NO

TAP-113

[10] PUT OSCILLATOR-SWITCH-COMBINER (OSC) ON EXTENDER BOARD [DLP-525] AND ADJUST R52 CLOSE AS POSSIBLE TO 1900 HZ [FIG. 2]

R18

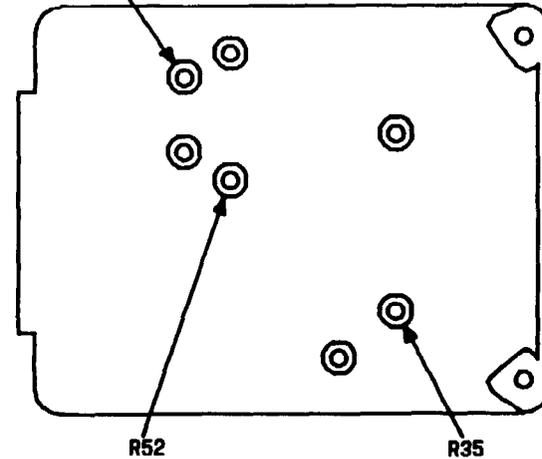


FIG. 2

2100 HZ MEASURED

[14] WAS INDICATION ON FREQUENCY MONITOR BETWEEN 2106 AND 2094 HZ

YES

NO

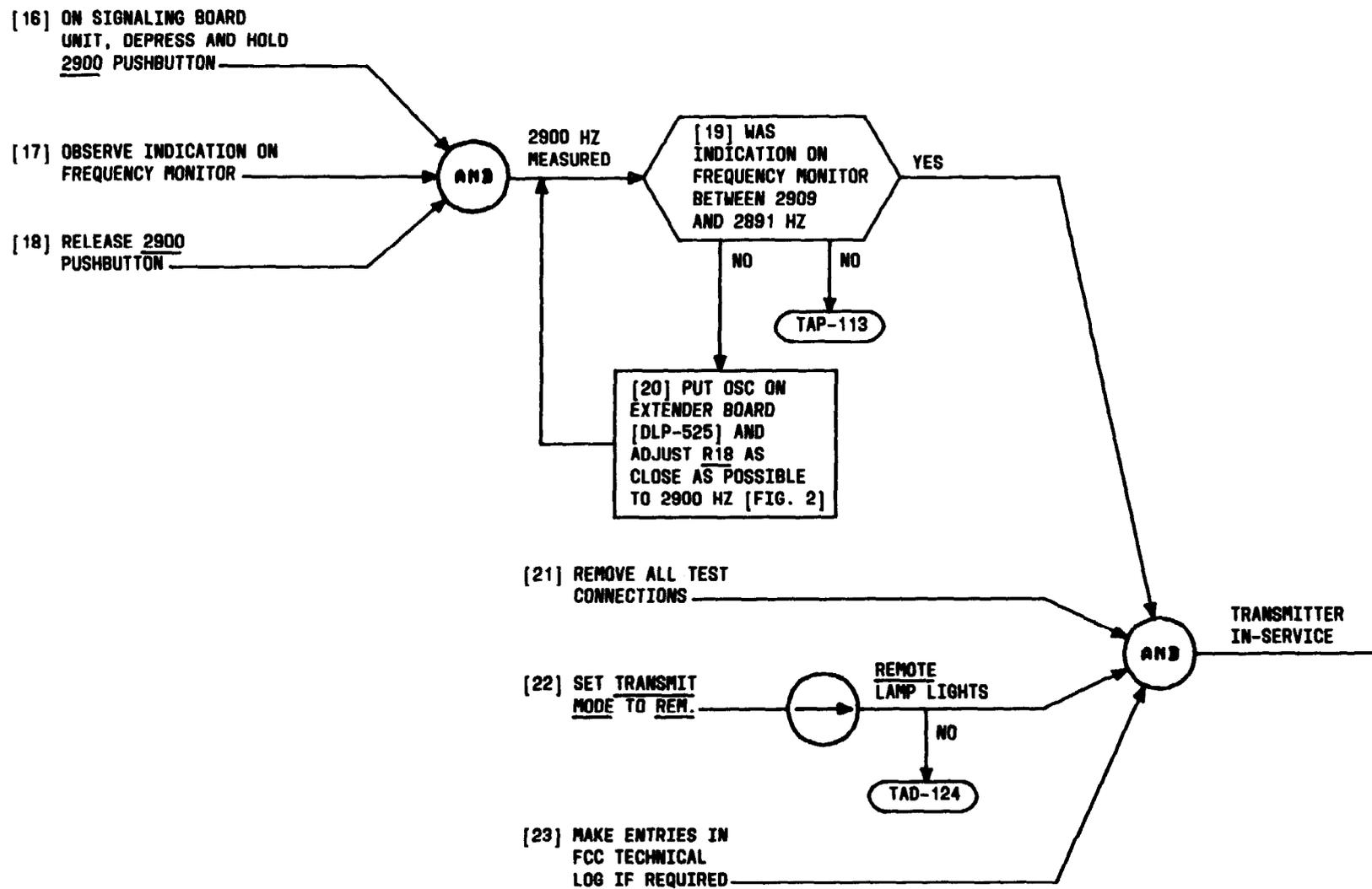
TAP-113

[15] PUT OSC ON EXTENDER BOARD [DLP-525] AND ADJUST R35 CLOSE AS POSSIBLE TO 2100 HZ [FIG. 2]

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MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE FREQUENCIES

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**MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ,
2100-HZ, AND 2900-HZ SIGNALING TONE FREQUENCIES**

SUMMARY
 USING 3C NOISE MEASURING SET, MEASURE SIGNALING TONE LEAKAGE TO BE LESS THAN 37 DBRN

- [1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1
- [2] SET TRANSMIT MODE SWITCH TO OFF
- [3] GET 3C NOISE MEASURING SET
- [4] CONDITION 3C NOISE MEASURING SET WITH C MESSAGE NETWORK FOR MEASUREMENT [DLP-532]
- [5] SEE FIG. 1. CONNECT NOISE MEASURING SET TO STATUS EQUIP JACK OF TRANSMITTER

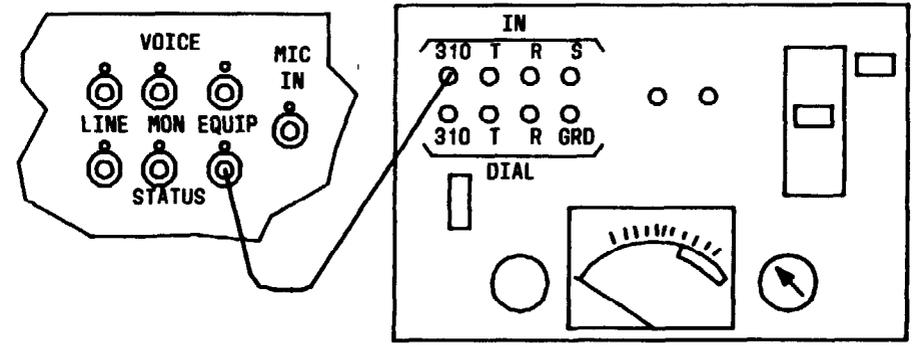
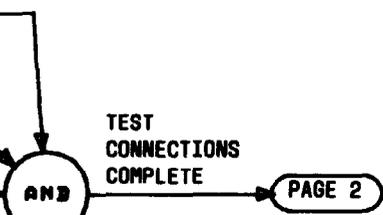


FIG. 1

NOTE 1	
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION	
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MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE

ON NOISE MEASURING SET:

[6] ROTATE DIAL ON RIGHT TO 30

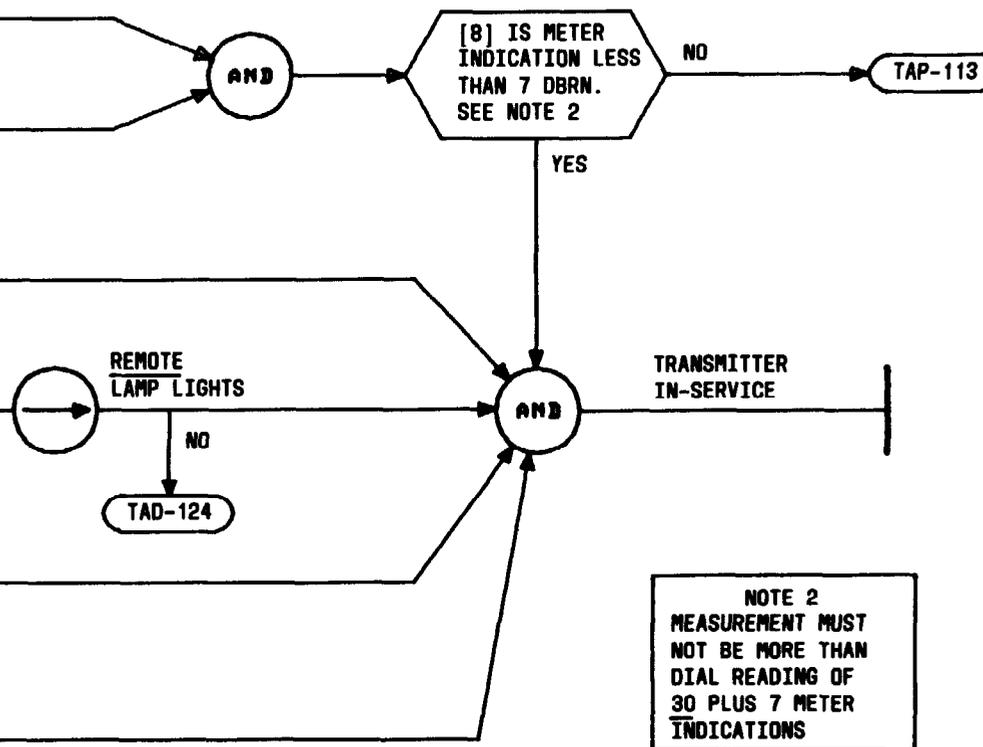
[7] OBSERVE METER INDICATION

[9] REMOVE ALL TEST CONNECTIONS

[10] SET TRANSMIT MODE TO REM.

[11] VERIFY REMOTE OPERATION WITH CONTROL TERMINAL

[12] MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED



NOTE 2
MEASUREMENT MUST NOT BE MORE THAN DIAL READING OF 30 PLUS 7 METER INDICATIONS

MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE

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SUMMARY

THIS TEST IS COORDINATED BY PERSONNEL AT CONTROL TERMINAL. WHEN NOTIFIED, CONDITION TRANSMISSION MEASURING SET (TMS) FOR A 600-OHM OUTPUT OF 1000 HZ AT A LEVEL OF 0.0 DBM AND CONNECT OUTPUT OF TMS TO STATUS LINE JACK OF TRANSMITTER

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TRANSMISSION MEASURING SET	WECO J94021A
PATCH CORD	3P17B

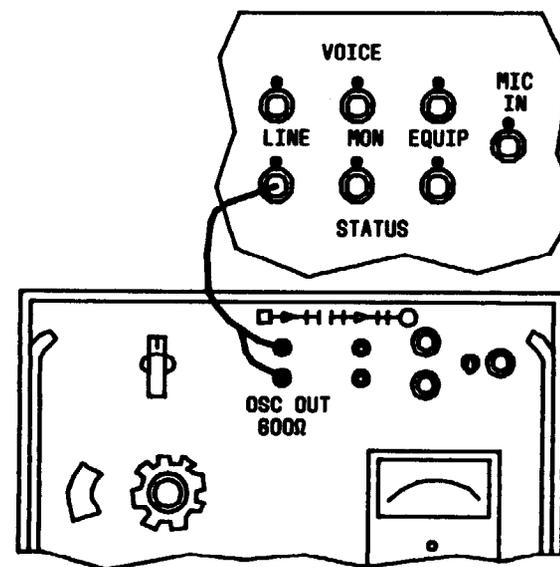
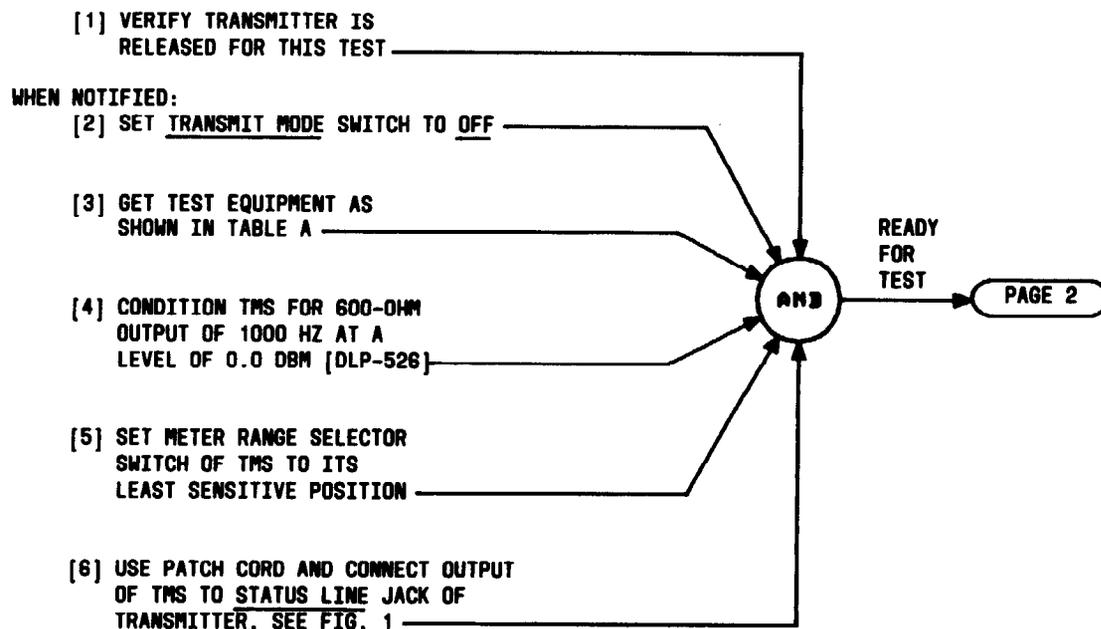


FIG. 1

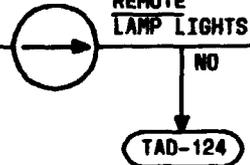
MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL

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[7] NOTIFY PERSONNEL AT CONTROL TERMINAL
TRANSMITTER IS READY FOR TEST

WHEN NOTIFIED THAT TEST IS COMPLETE:
[8] REMOVE ALL TEST CONNECTIONS

[9] SET TRANSMIT MODE SWITCH TO REM.



[10] MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED

AND

TRANSMITTER
IN-SERVICE

MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL

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SUMMARY

THIS TEST IS COORDINATED BY PERSONNEL AT CONTROL TERMINAL. WHEN NOTIFIED, CONNECT DET IN 600Ω INPUT OF TRANSMISSION MEASURING SET (TMS) TO VOICE LINE JACK OF TRANSMITTER. MEASURE 1900-HZ AND 2100-HZ TONE FOR -10.0 TO -24.0 DBM AND 2900-HZ TONE FOR -19.0 TO -37.0 DBM

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TRANSMISSION MEASURING SET	WECO J94021A
PATCH CORD	3P17B

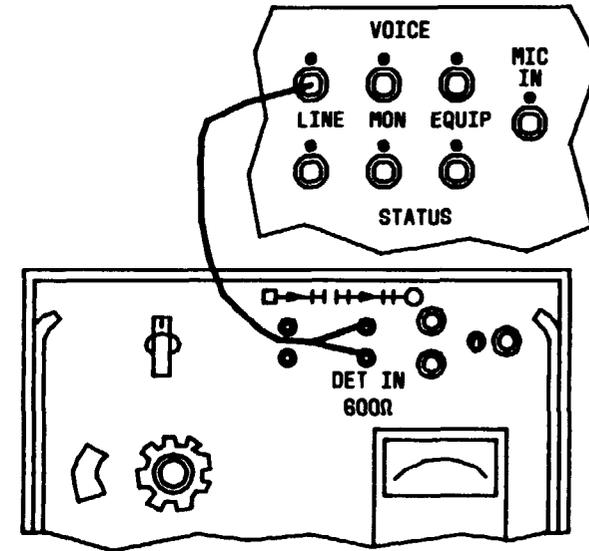
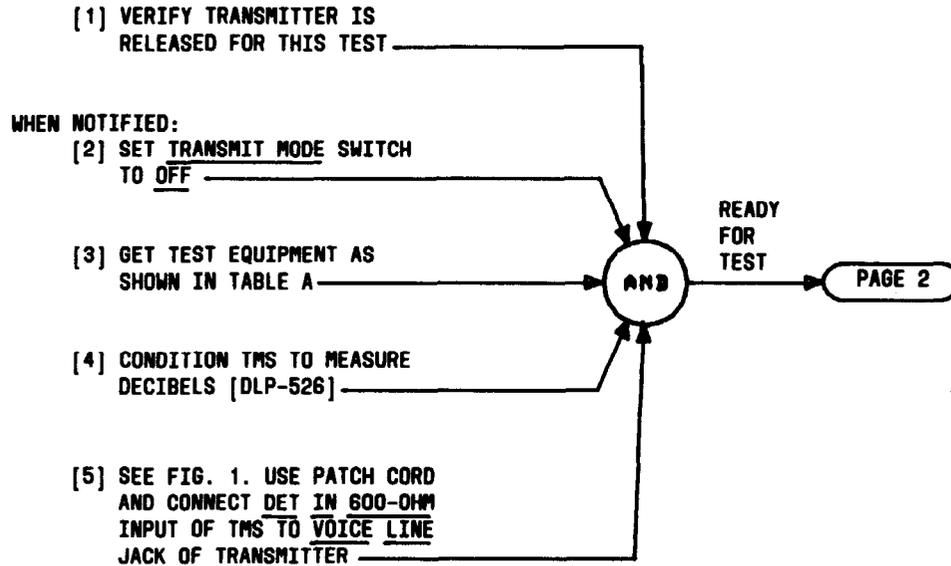
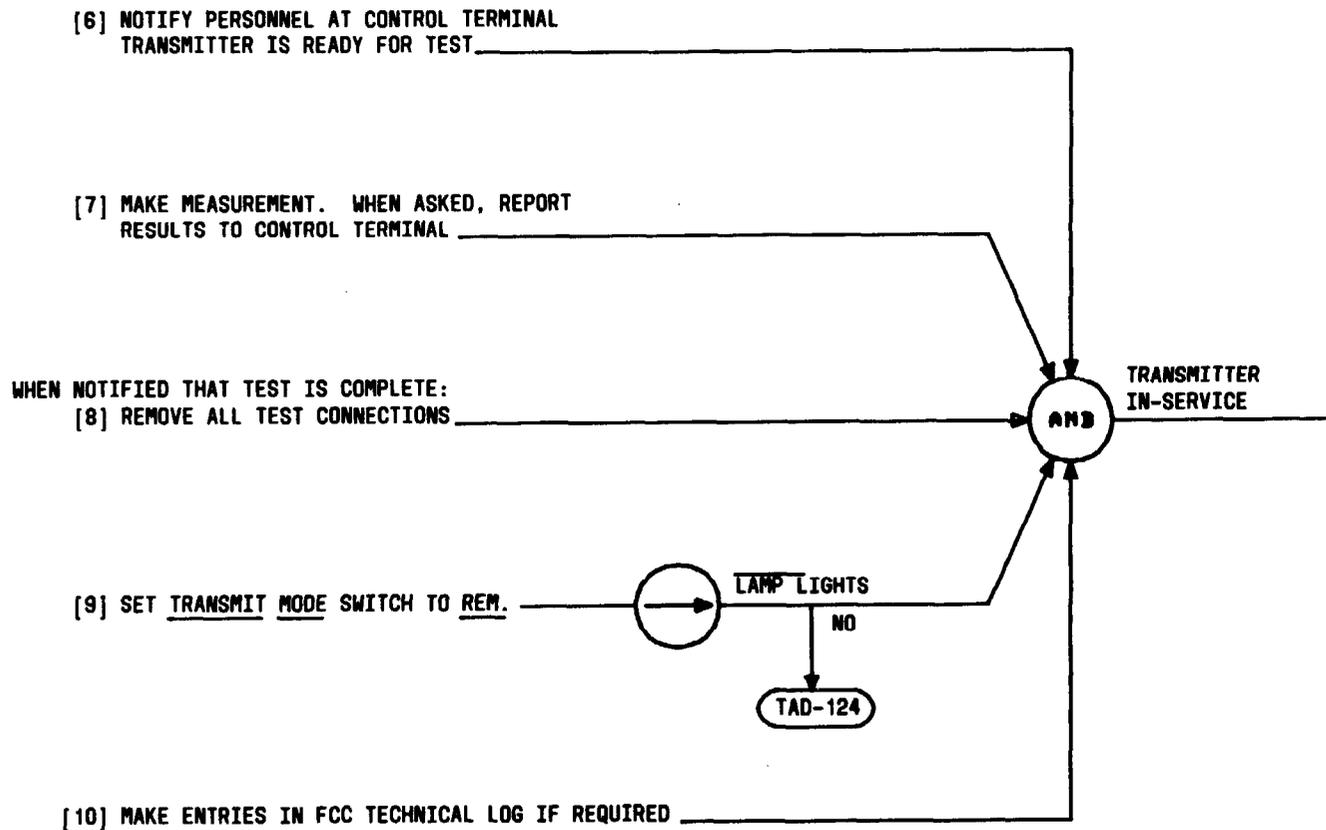


FIG. 1

MEASURE CONTROL TERMINAL TO TRANSMITTER 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

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**MEASURE CONTROL TERMINAL TO TRANSMITTER 1900-HZ,
2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS**

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SUMMARY

THIS TEST IS COORDINATED BY PERSONNEL AT CONTROL TERMINAL. WHEN NOTIFIED, CONNECT DET IN 600Ω INPUT OF TRANSMISSION MEASURING SET (TMS) TO VOICE LINE JACK OF TRANSMITTER. MEASURE 1000-HZ TONE FOR -13 TO -19 DBM

- [1] VERIFY TRANSMITTER IS RELEASED FOR THIS TEST

WHEN NOTIFIED:

- [2] SET TRANSMIT MODE SWITCH TO OFF

- [3] GET TEST EQUIPMENT AS SHOWN IN TABLE A

- [4] CONDITION TMS TO MEASURE DECIBELS [DLP-526]

- [5] SEE FIG. 1. USE PATCH CORD AND CONNECT DET IN 600-Ω INPUT OF TMS TO VOICE LINE JACK OF TRANSMITTER



TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TRANSMISSION MEASURING SET	WECO J94021A
PATCH CORD	3P17B

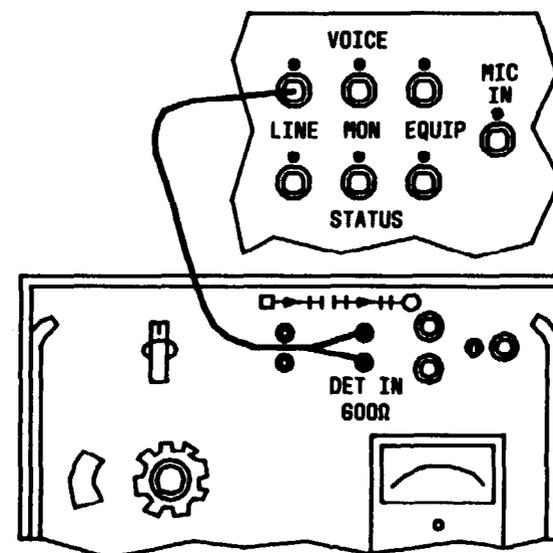
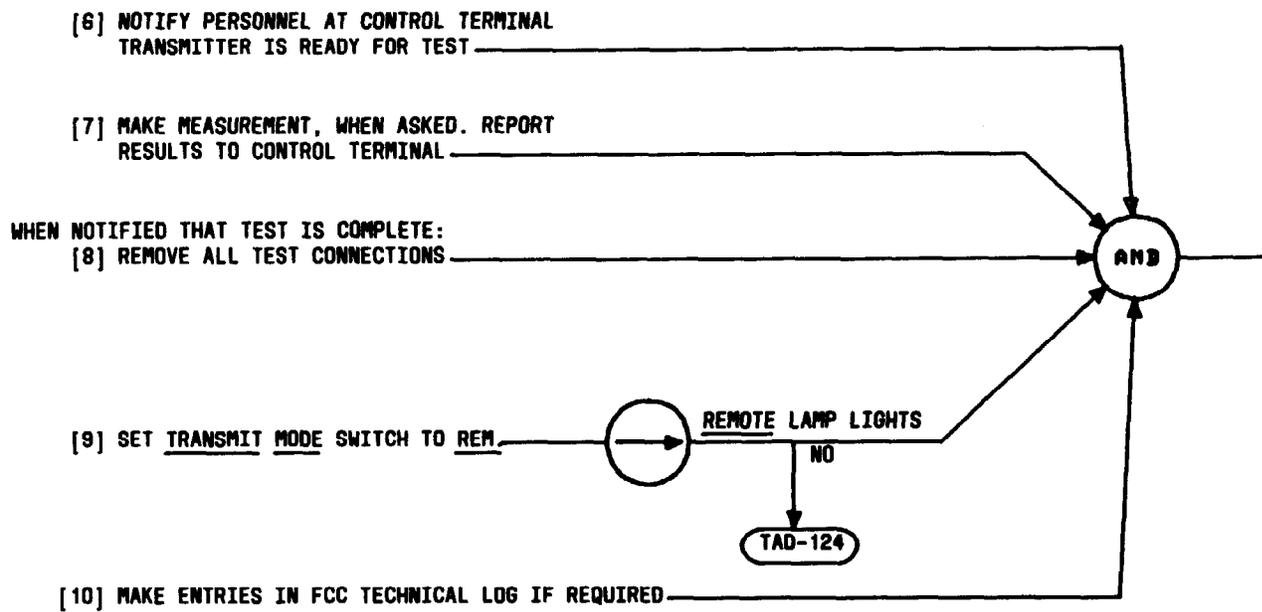


FIG. 1

MEASURE CONTROL TERMINAL TO TRANSMITTER 1000-HZ TONE LEVEL

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MEASURE CONTROL TERMINAL TO TRANSMITTER 1000-HZ TONE LEVEL

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SUMMARY

TURN TRANSMITTER PRIMARY POWER OFF. REMOVE TRANSMITTER LOGIC CIRCUIT BOARD TO DETERMINE WHICH ALARMS ARE WIRED MAJOR OR MINOR. CONNECT RF COAXIAL LOAD RESISTOR, WATTMETER, AND ROUTINER TEST SET (RTS) TO TRANSMITTER. FOR LOCAL TEST, INSERT 369A

TERMINATIONS. UNGROUND MAJOR ALARMS AT TS2 TERMINALS. USE RTS TO DETERMINE MAJOR ALARMS ARE WORKING PROPERLY. UNGROUND MINOR ALARMS AT TS2 TERMINALS. USE RTS TO DETERMINE MAJOR ALARMS ARE WORKING PROPERLY. THIS TEST MAY BE PERFORMED WITH RTS LOCATED AT CONTROL TERMINAL

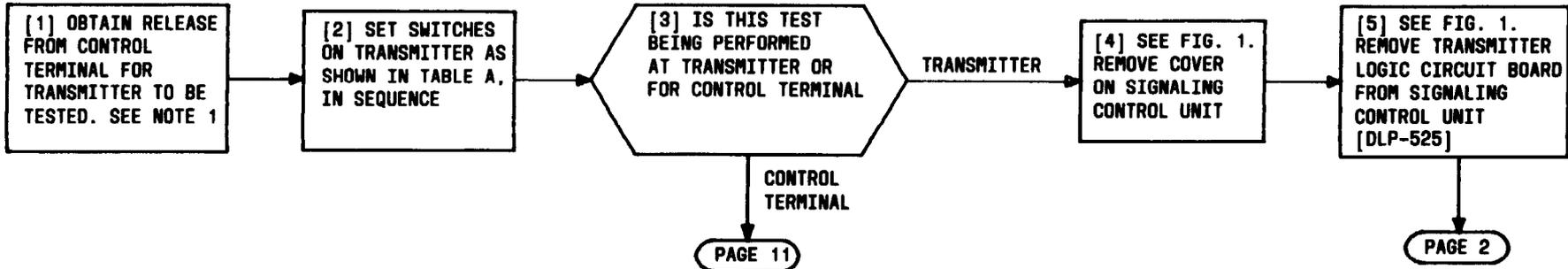


TABLE A		
SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

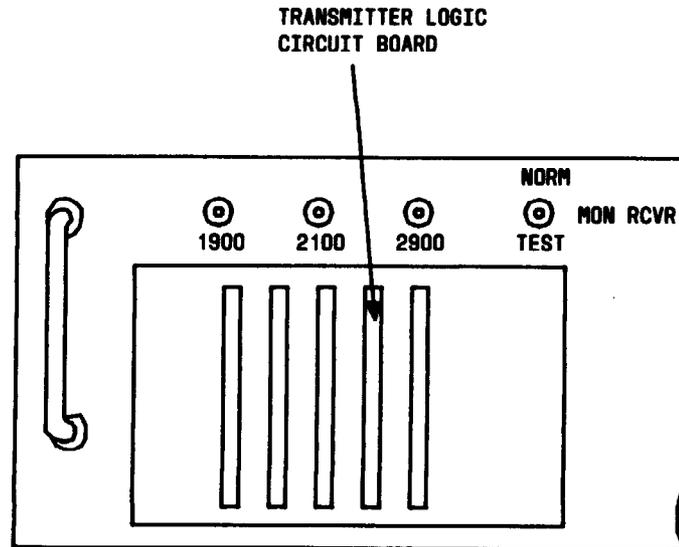
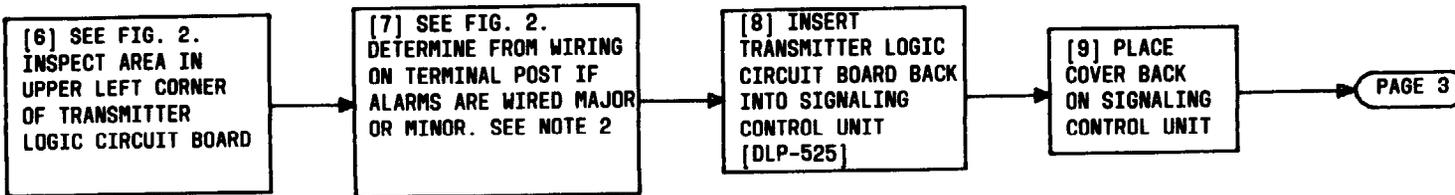


FIG. 1

NOTE 1
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

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NOTE 2
THIS INFORMATION
WILL BE USED IN
STEPS 21 AND 30

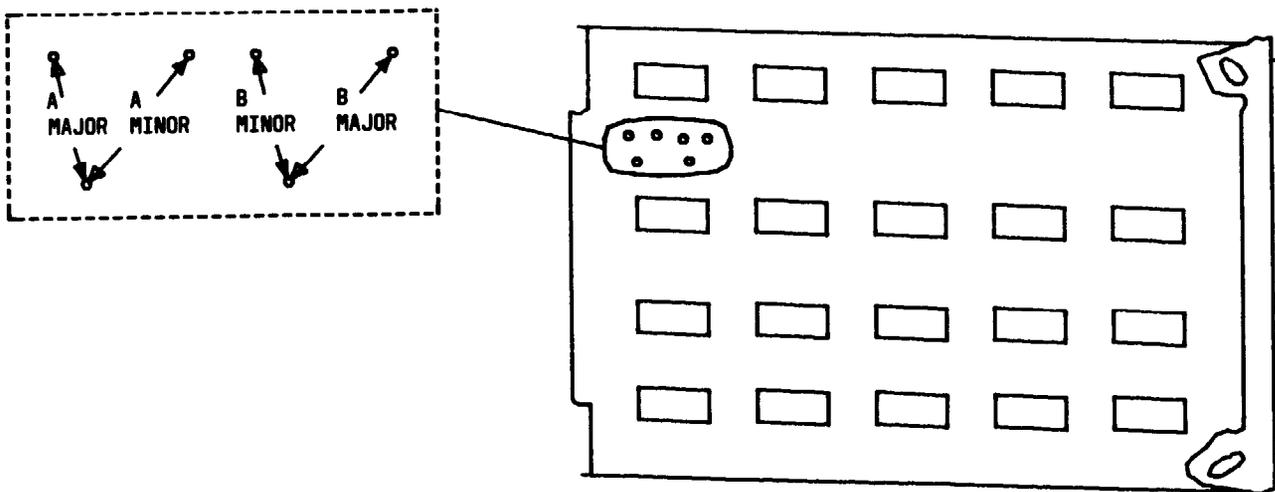


FIG. 2

TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

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[10] GET TEST EQUIPMENT SHOWN IN TABLE B

[11] SEE FIG. 3. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[12] CONNECT RF COAXIAL LOAD RESISTOR TO TRANSMITTER FILTER OUTPUT

[13] ON TRANSMITTER, INSERT 369A TERMINATIONS INTO VOICE LINE AND STATUS LINE JACKS

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TABLE B	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201 50 OHM
ROUTINER TEST SET	KS-21277
2 89BN RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 LINE TERMINATIONS	369A

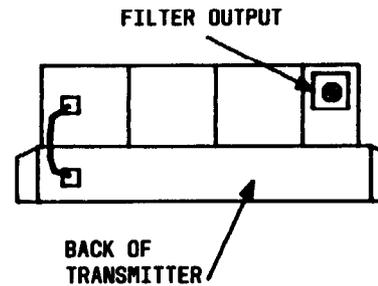


FIG. 3

[14] CONDITION ROUTINER TEST SET (RTS)
FOR TEST [DLP-531]. SEE NOTE 3

[15] SEE FIG. 4. CONNECT ONE END OF P2B PATCH CORD
INTO FLDT IN JACK OF RTS AND OTHER END INTO
STATUS EQUIP JACK OF TRANSMITTER.

[16] SEE FIG. 4. CONNECT ONE END OF P2B PATCH CORD
INTO OSCT OUT JACK OF RTS AND OTHER END INTO
VOICE EQUIP JACK OF TRANSMITTER.

TEST
CONNECTIONS
COMPLETED

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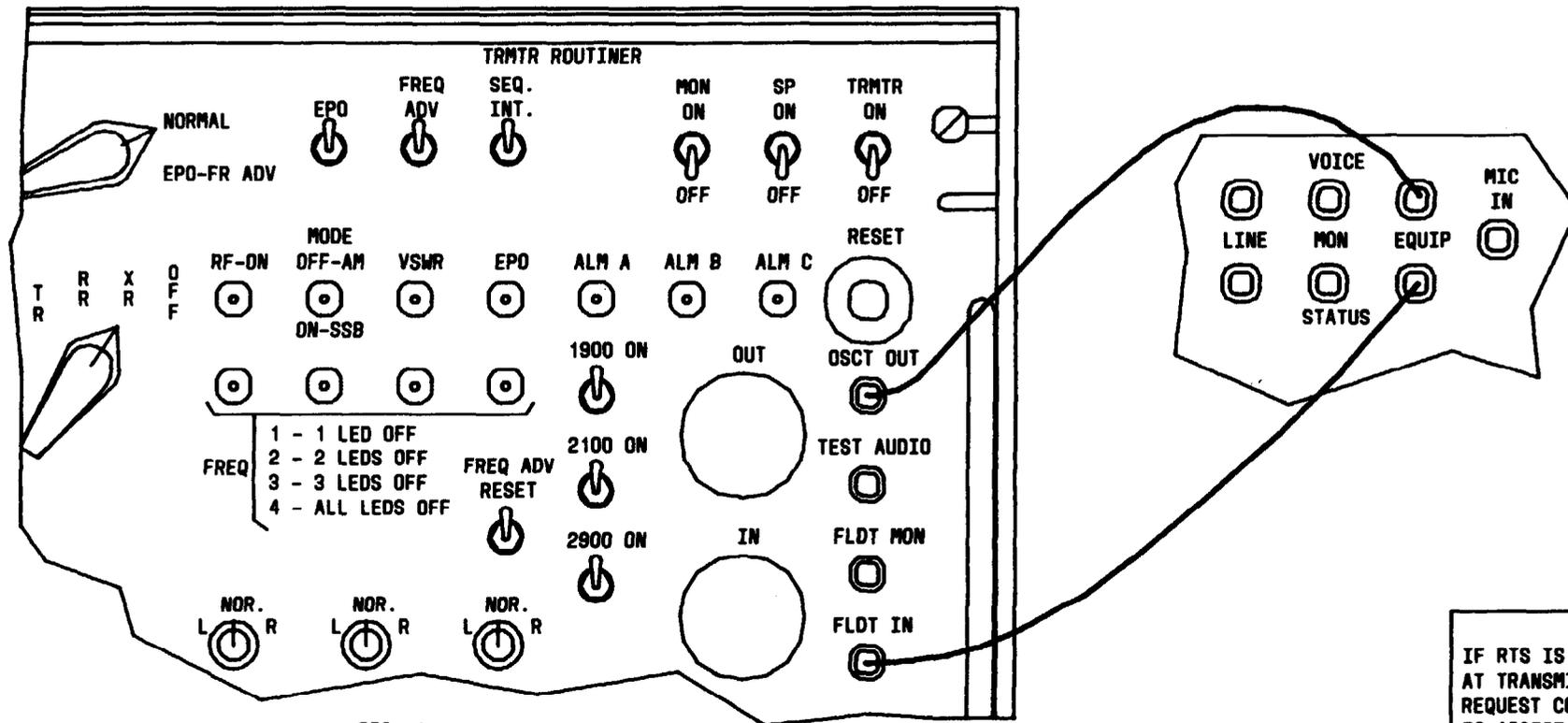


FIG. 4

NOTE 3
IF RTS IS NOT AVAILABLE
AT TRANSMITTER LOCATION,
REQUEST CONTROL TERMINAL
TO ASSIST TRANSMITTER
TEST USING RTS AT CONTROL
TERMINAL

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TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

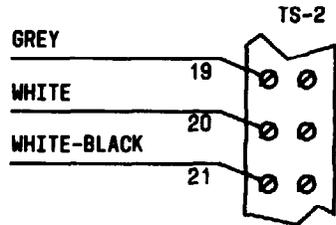
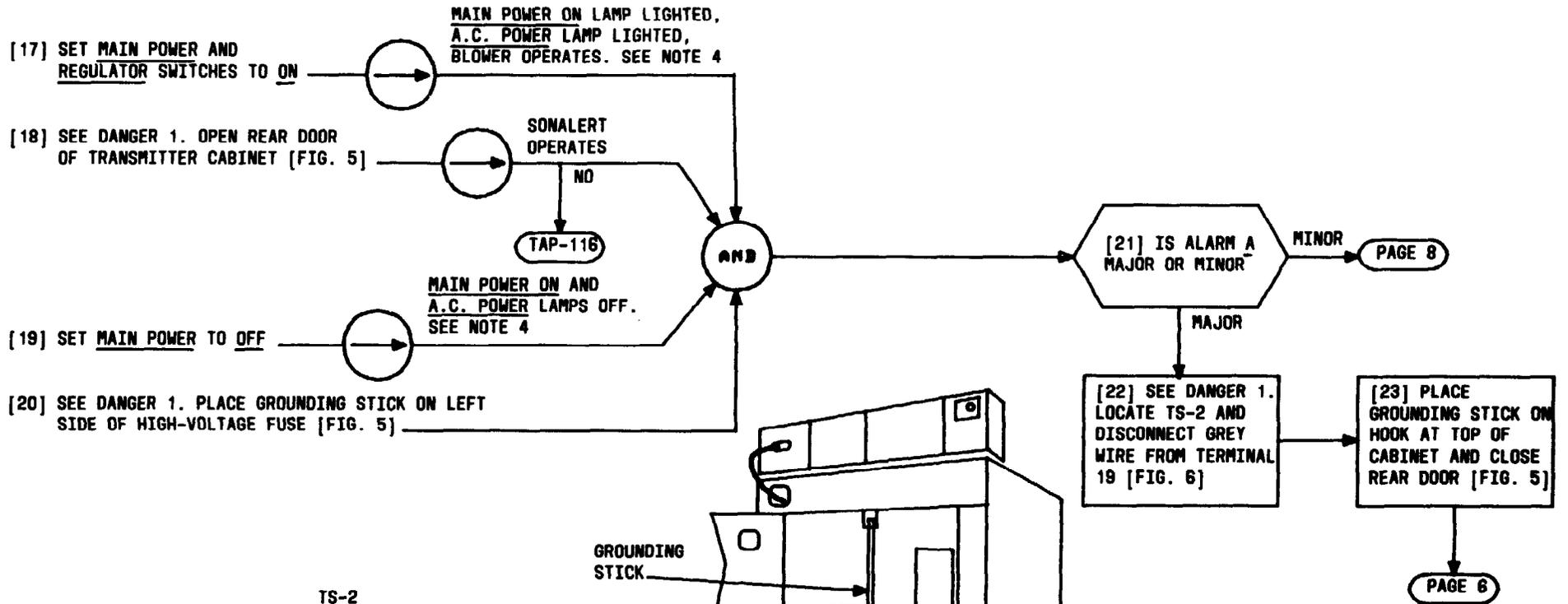


FIG. 6

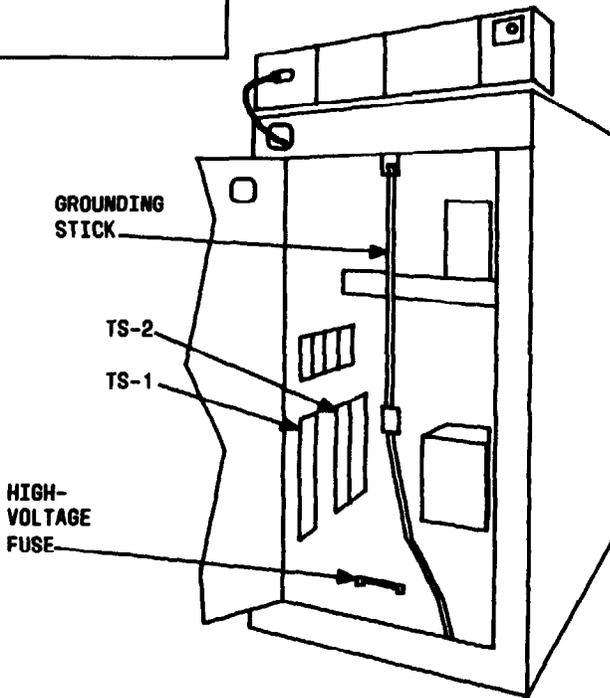


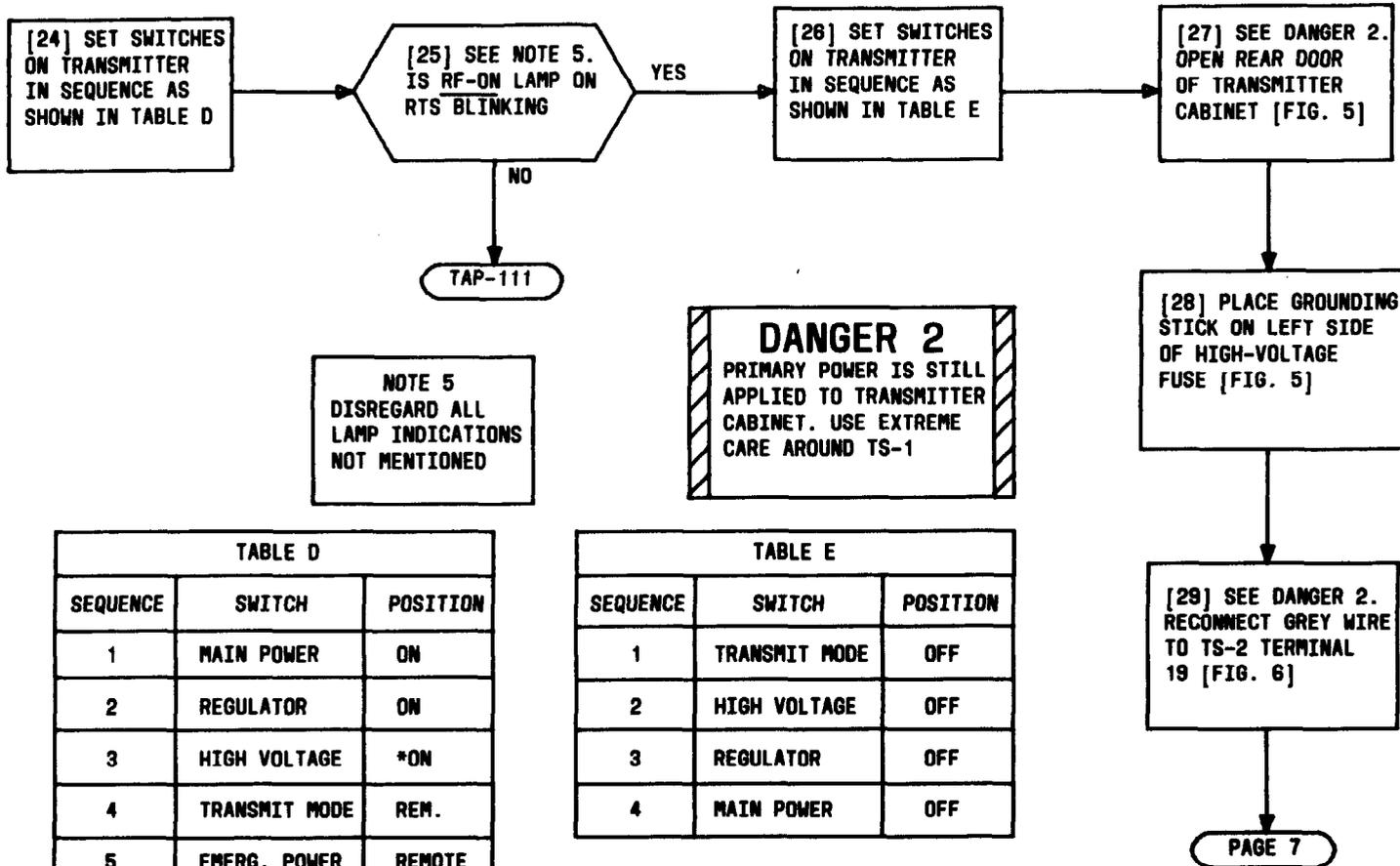
FIG. 5

NOTE 4
 MAIN POWER ON LAMP
 TROUBLE CORRECTED BY
 TAD-134. A.C. POWER LAMP
 TROUBLE CORRECTED BY
 TAD-118. BLOWER TROUBLE
 CORRECTED BY TAP-116

DANGER 1
 PRIMARY POWER IS
 STILL APPLIED TO
 TRANSMITTER CABINET.
 USE EXTREME CARE
 AROUND TS-1

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TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B AND C ALARMS



NOTE 5
DISREGARD ALL LAMP INDICATIONS NOT MENTIONED

DANGER 2
PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1

SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE

SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

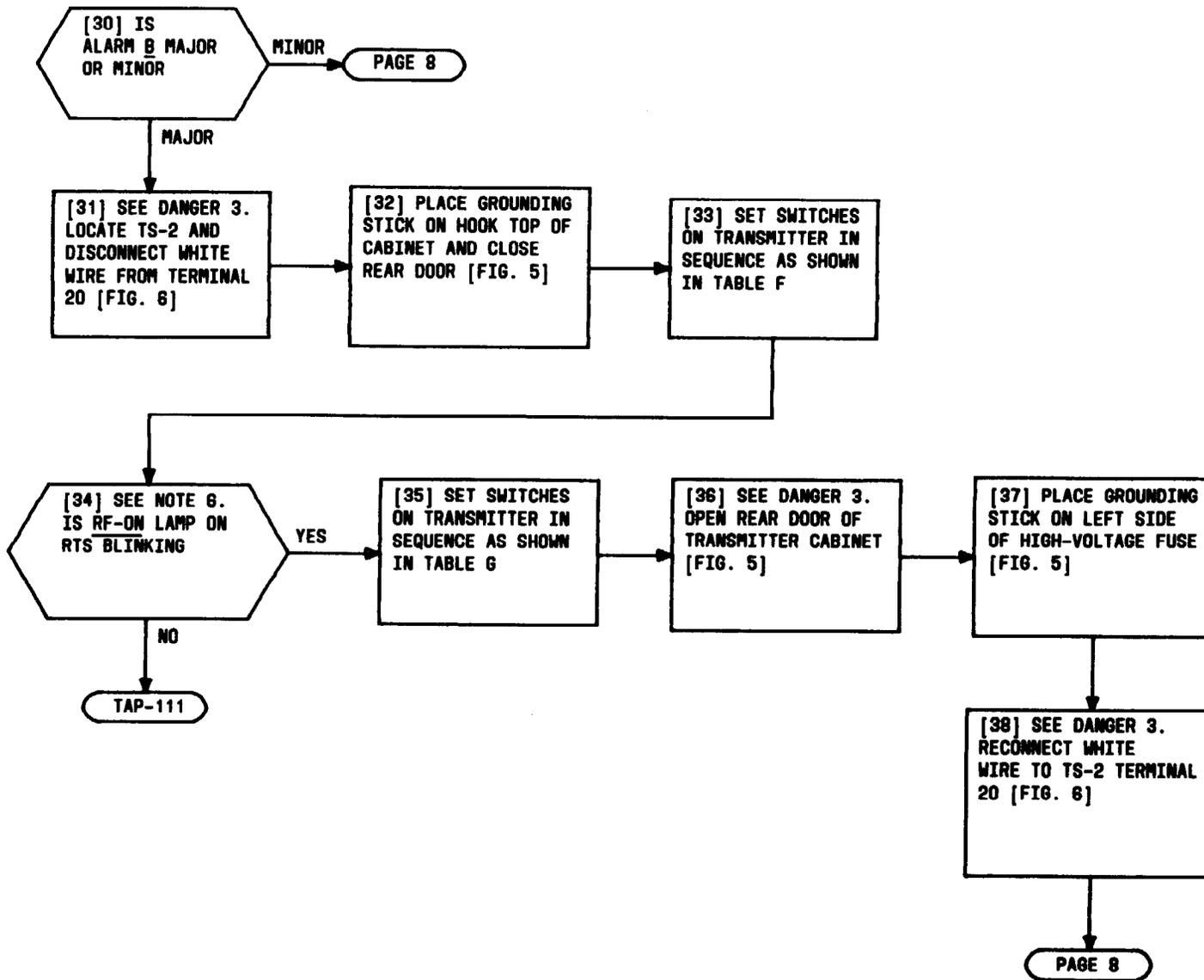


TABLE F		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	ON
4	TRANSMIT MODE	REM.

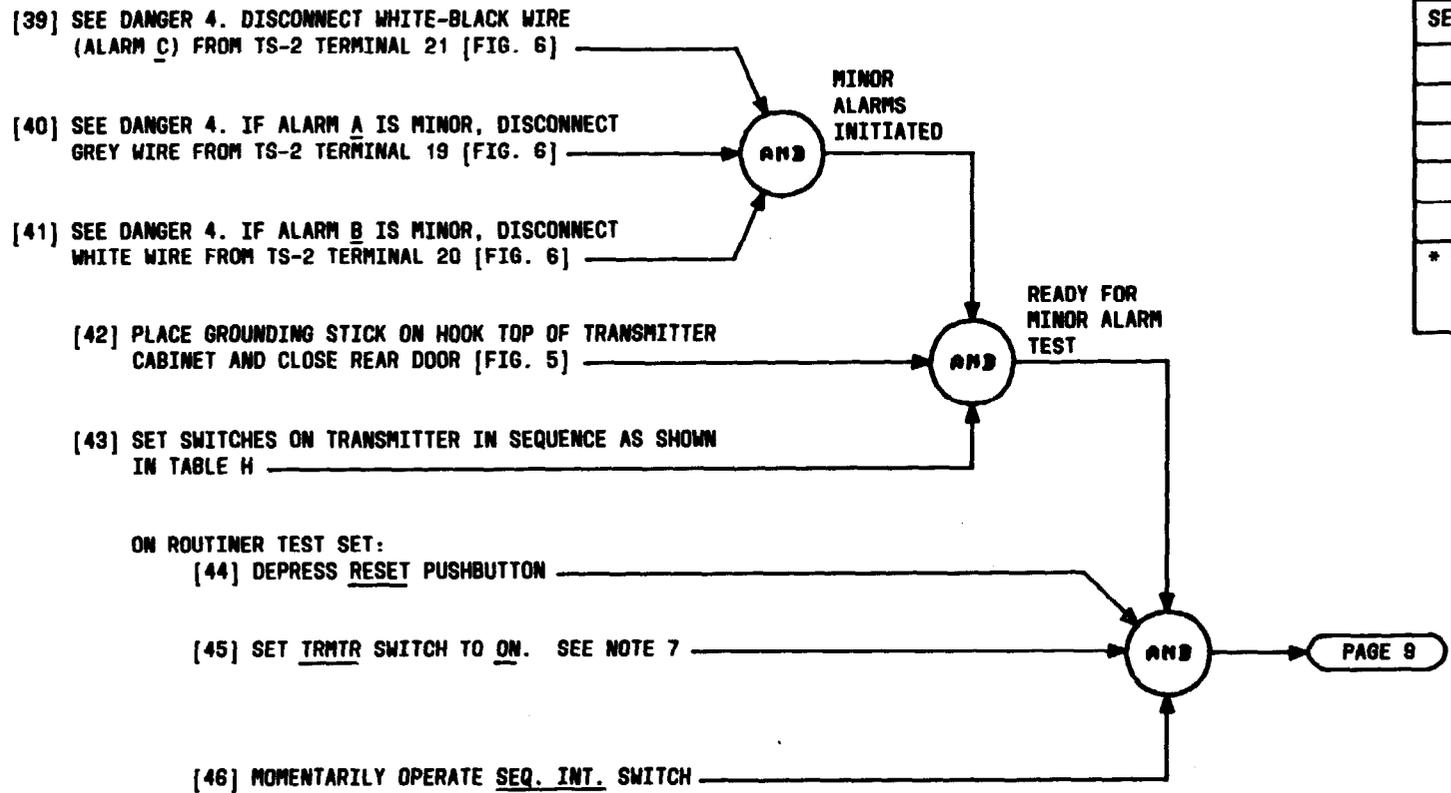
TABLE G		
SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

NOTE 6
DISREGARD ALL LAMP INDICATIONS NOT MENTIONED

DANGER 3
PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1

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TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS



SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE

NOTE 7
DISREGARD ALL LAMP INDICATIONS NOT MENTIONED

DANGER 4
PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1

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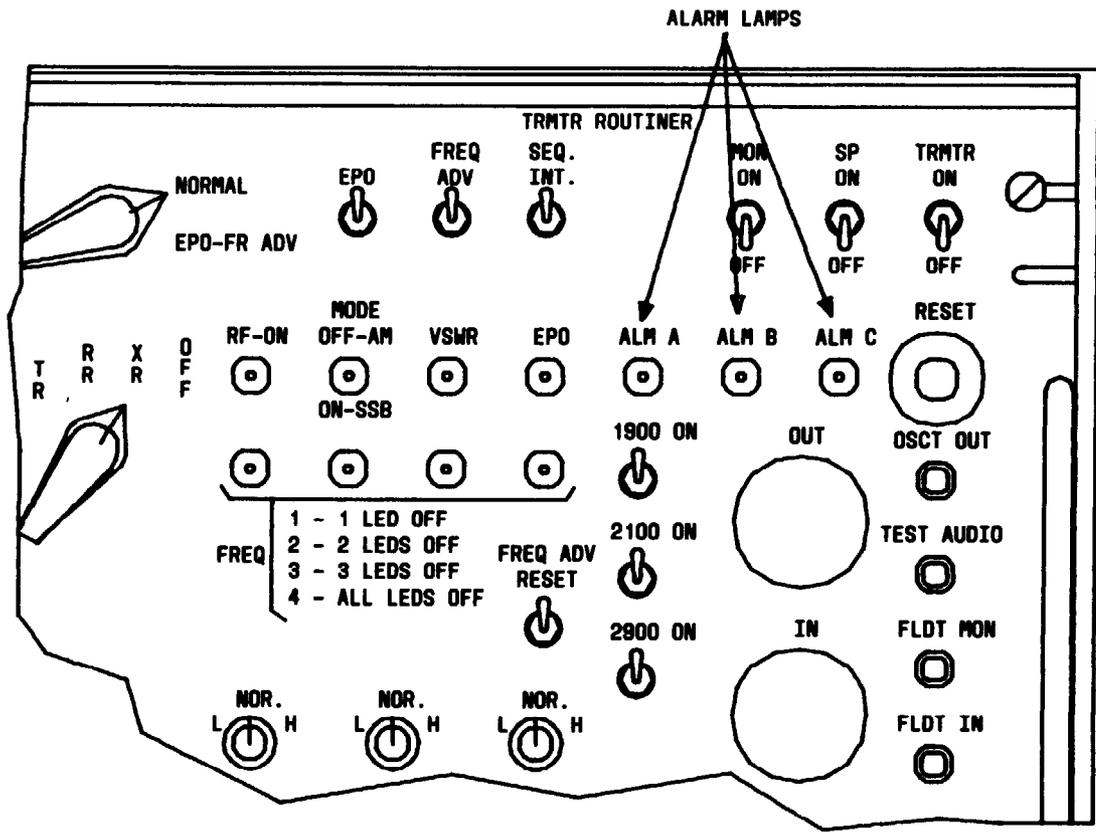
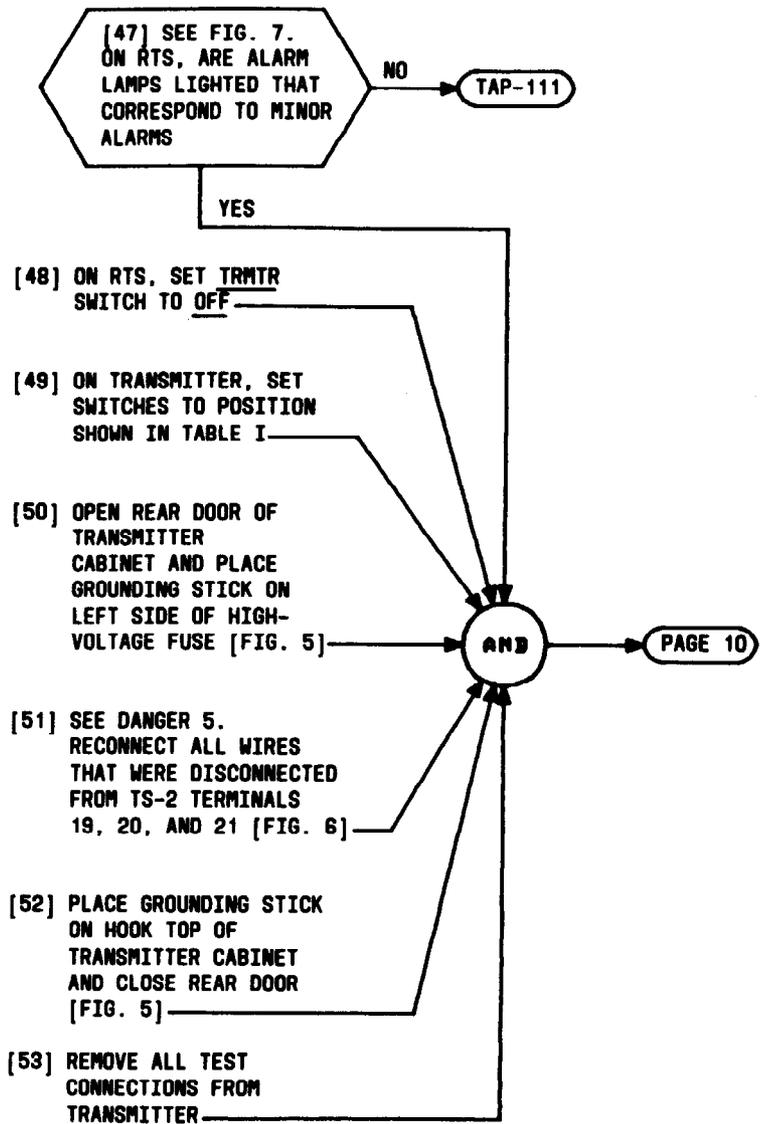


FIG. 7

TABLE I

SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

DANGER 5
 PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1

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TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

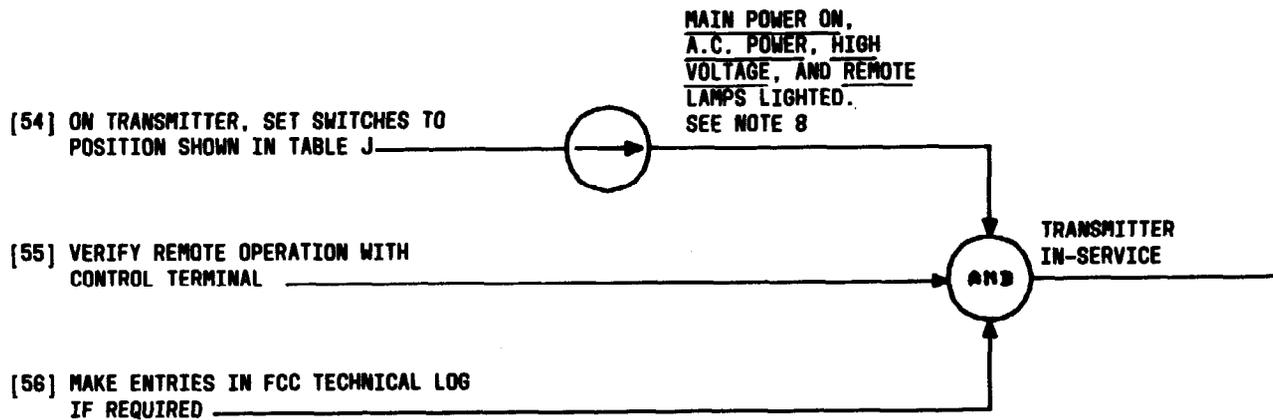


TABLE J		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* WAIT UNTIL VSMR/TUBE ALARM LAMP IS EXTINGUISHED BEFORE TURNING ON HIGH VOLTAGE

NOTE 8

MAIN POWER ON LAMP TROUBLE
CORRECTED BY TAD-134.

A.C. POWER LAMP TROUBLE
CORRECTED BY TAD-118.

HIGH VOLTAGE LAMP TROUBLE
CORRECTED BY TAP-119.

REMOTE LAMP TROUBLE
CORRECTED BY TAD-124

[57] NOTIFY CONTROL TERMINAL YOU ARE
STANDING BY FOR TEST

WHEN ASKED TO INITIATE ALARMS A, B, AND C:

[58] SEE DANGER 6. OPEN REAR DOOR OF
TRANSMITTER CABINET AND PLACE
GROUNDING STICK ON LEFT SIDE
OF HIGH-VOLTAGE FUSE [FIG. 8]

[59] SEE DANGER 6. LOCATE TS-2
AND DISCONNECT WIRES FROM TERMINALS
19, 20, AND 21 [FIG. 9]

[60] PLACE GROUNDING STICK ON HOOK
TOP OF CABINET AND CLOSE REAR
DOOR OF TRANSMITTER [FIG. 8]

AMB

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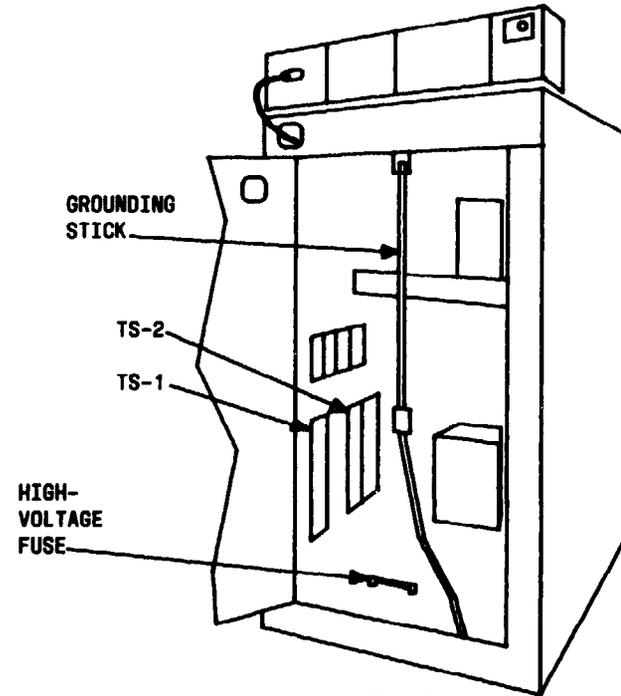


FIG. 8

DANGER 6
PRIMARY POWER IS STILL
APPLIED TO TRANSMITTER
CABINET. USE EXTREME
CARE AROUND TS-1

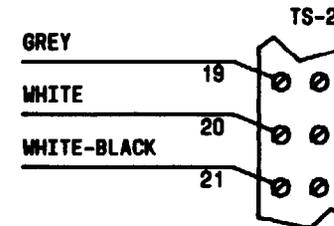
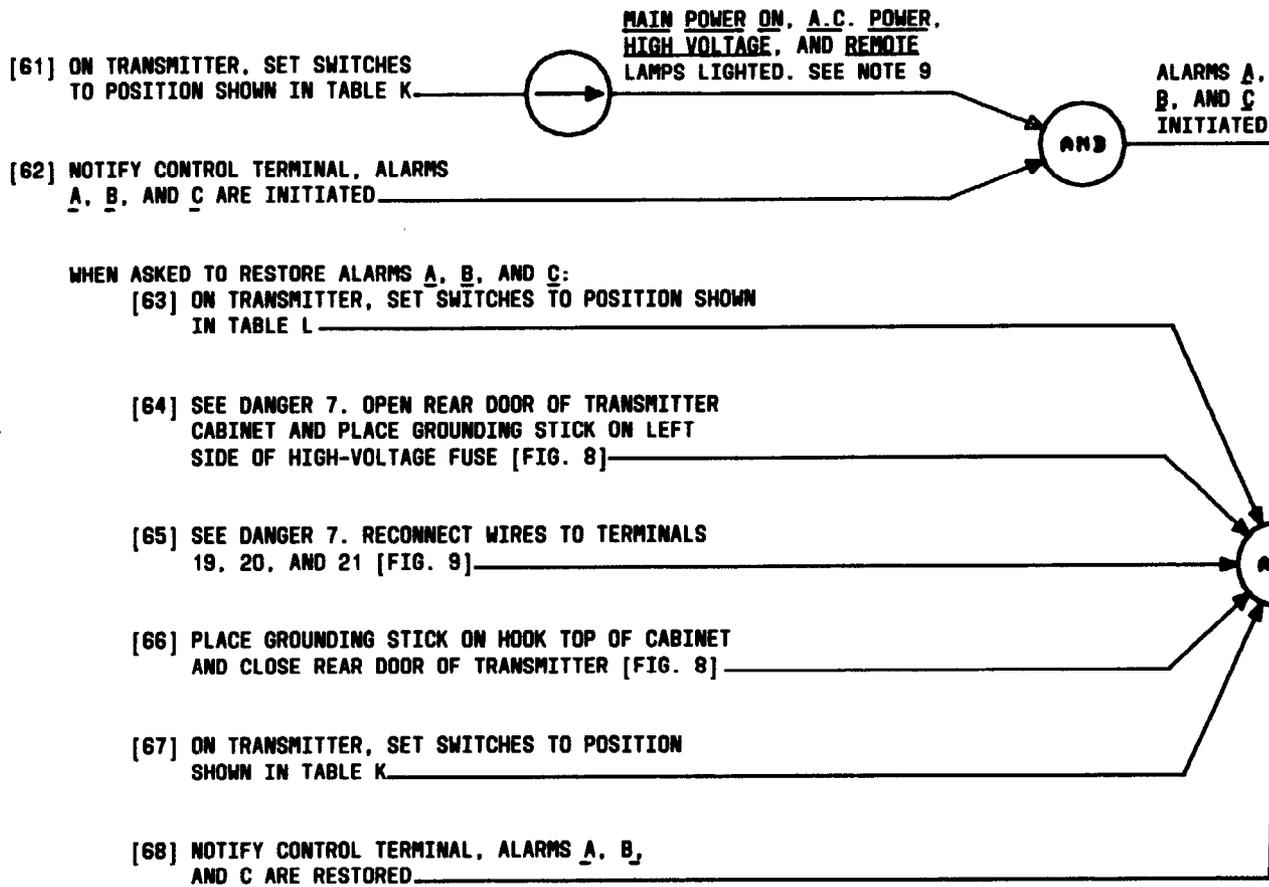


FIG. 9

TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

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DANGER 7
 PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1

NOTE 9
 MAIN POWER ON LAMP TROUBLE CORRECTED BY TAD-134. A.C. POWER LAMP TROUBLE CORRECTED BY TAD-118. HIGH VOLTAGE LAMP TROUBLE CORRECTED BY TAP-119. REMOTE LAMP TROUBLE CORRECTED BY TAD-124

[69] WHEN NOTIFIED THAT TEST IS COMPLETED, MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED

SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE

TEST TRANSMITTER SIGNALING OF MAJOR AND MINOR A, B, AND C ALARMS

SUMMARY
 USE ROUTINER TEST SET (RTS) AND OBSERVE A VSWR ALARM INDICATION WHEN ANTENNA COAX IS DISCONNECTED FROM TRANSMITTER FILTER OUTPUT. AN ALTERNATE METHOD IS TO ASSIST PERSONNEL AT CONTROL TERMINAL INSTEAD OF USING RTS

NOTES
 1. FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION
 2. IF RTS IS NOT AVAILABLE AT TRANSMITTER LOCATION, REQUEST CONTROL TERMINAL TO ASSIST TRANSMITTER TEST USING RTS AT CONTROL TERMINAL

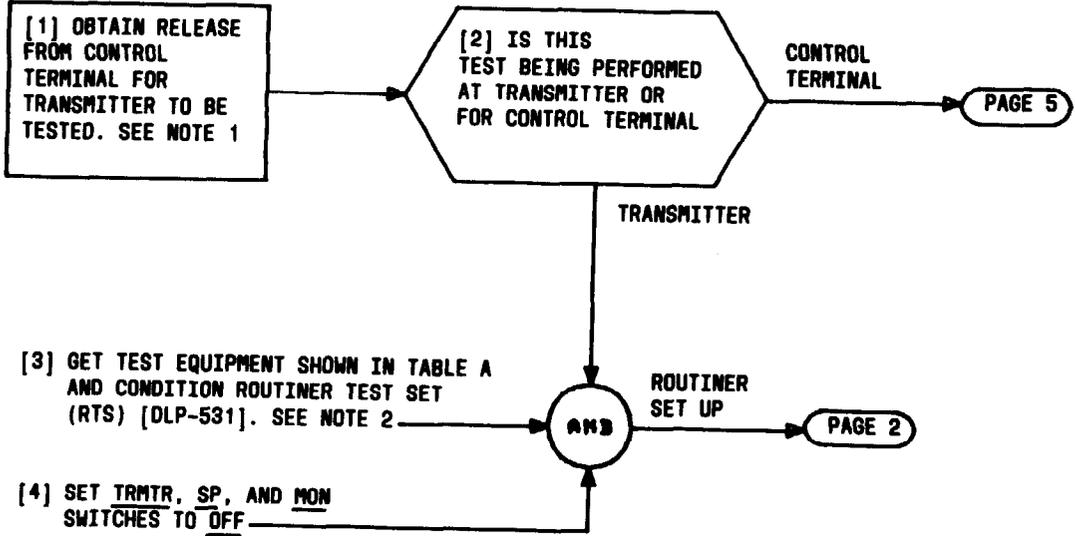


TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
ROUTINER TEST SET	KS-21277
2 898N RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 STANDARD TERMINATIONS	389A

TEST TRANSMITTER SIGNALING OF VSWR ALARM

[5] SEE FIG. 1. ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO OSCT OUT JACK

[6] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD INTO VOICE EQUIP JACK

[7] ON RTS, CONNECT ONE END OF ANOTHER P2B PATCH CORD INTO FLDT IN JACK

[8] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD INTO STATUS EQUIP JACK

[9] ON TRANSMITTER, INSERT TWO 369A PLUGS INTO VOICE LINE AND STATUS LINE JACKS

TEST
CONNECTIONS
COMPLETE

ON ROUTINER:

[10] SET TRMTR SWITCH
TO ON [NOTE 3]

[11] DEPRESS
SEQ. INT.

[12] SET TRMTR SWITCH
TO OFF

TRANSMITTER
CONDITIONED
FOR PROPER
MODE

PAGE 3

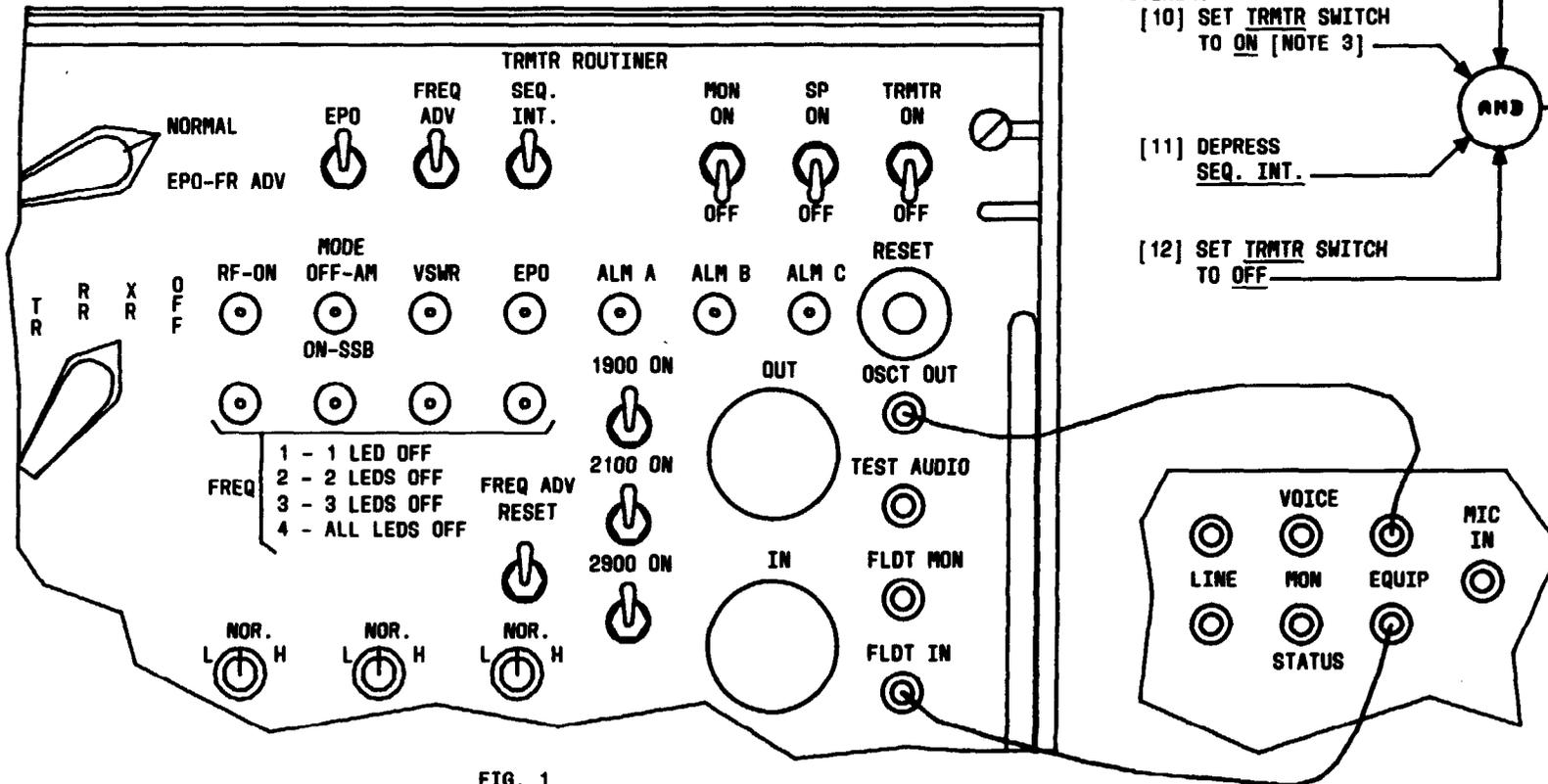


FIG. 1

NOTE 3
DISREGARD ALL
LAMP INDICATIONS
NOT MENTIONED

TEST TRANSMITTER SIGNALING OF VSWR ALARM

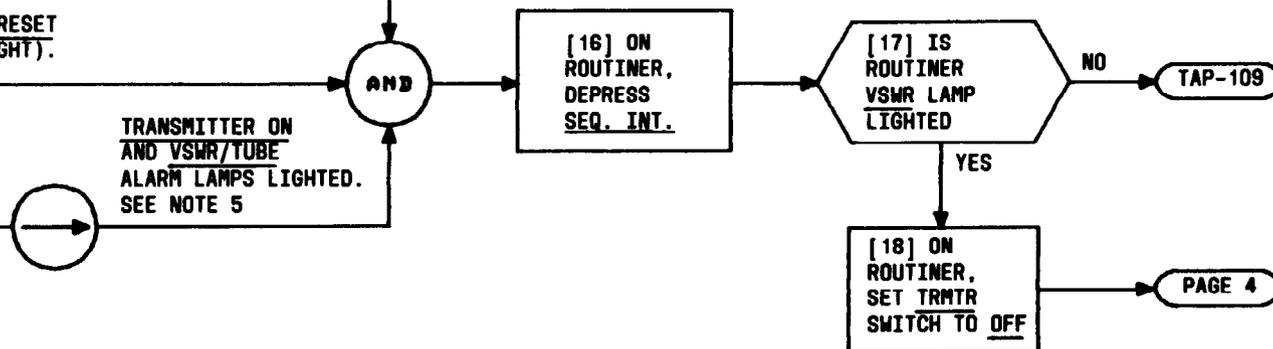
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[13] SEE FIG. 2. DISCONNECT COAX FROM TRANSMITTER FILTER OUTPUT

ON ROUTINER:

[14] MOMENTARILY DEPRESS RESET PUSHBUTTON (UPPER RIGHT). SEE NOTE 4

[15] SET TRMTR SWITCH TO ON



TRANSMITTER ON AND VSWR/TUBE ALARM LAMPS LIGHTED. SEE NOTE 5

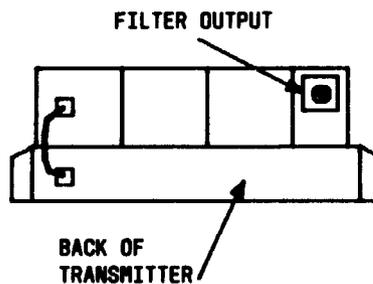
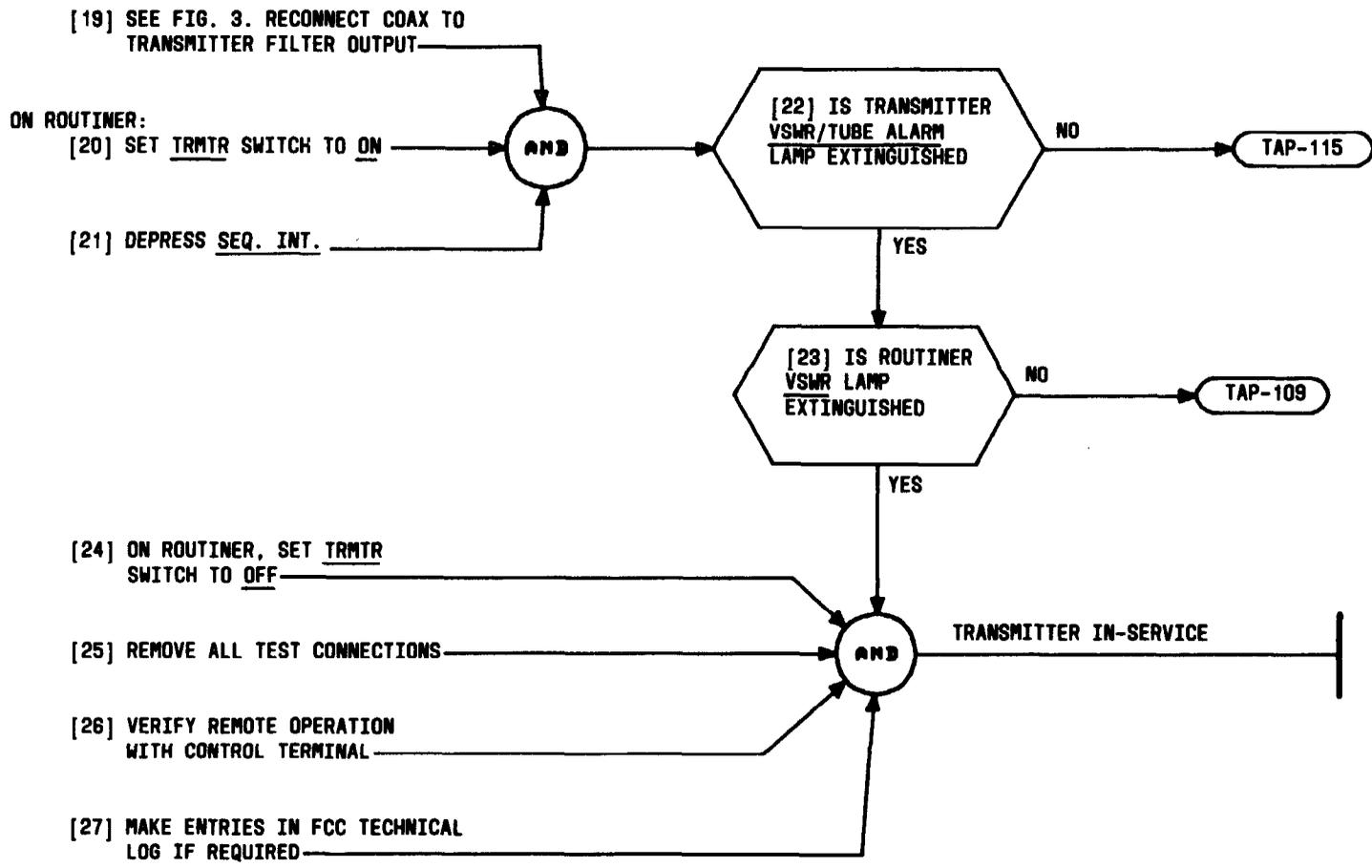


FIG. 2

NOTES	
4. DISREGARD ALL LAMP INDICATIONS NOT MENTIONED	
5. FOR TRANSMITTER ON LAMP, USE TAD-101. FOR VSWR/TUBE LAMP, USE TAP-115	
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TEST TRANSMITTER SIGNALING OF VSWR ALARM

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WHEN NOTIFIED:

[28] SEE FIG. 3. DISCONNECT
ANTENNA COAX FROM
TRANSMITTER FILTER OUTPUT

[29] NOTIFY CONTROL TERMINAL
WHEN ANTENNA IS DISCONNECTED

WHEN NOTIFIED:

[30] RECONNECT ANTENNA COAX TO
TRANSMITTER FILTER OUTPUT

[31] VERIFY REMOTE OPERATION WITH
CONTROL TERMINAL

[32] MAKE ENTRIES IN FCC TECHNICAL
LOG IF REQUIRED

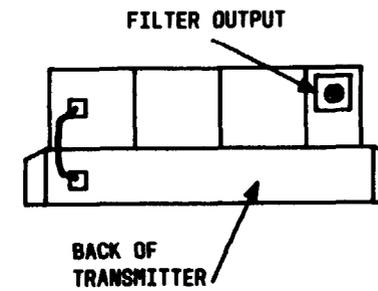
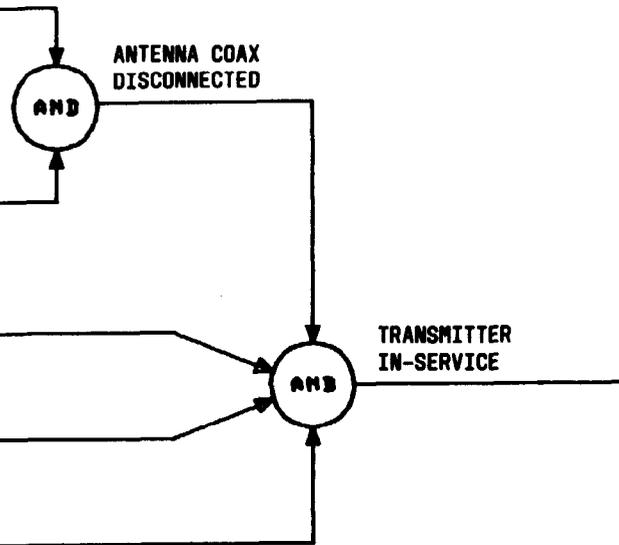


FIG. 3

TEST TRANSMITTER SIGNALING OF VSWR ALARM

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<p style="text-align: center;">SUMMARY</p> <p>USE A 3C NOISE MEASURING SET (NMS) AND SET AN OUTPUT LEVEL OF THE TAPE RECORDER AND TEST TAPE FOR 70 DBRN. CONNECT THE OUTPUT OF TAPE RECORDER TO VOICE EQUIP JACK OF THE TRANSMITTER TO SET FAIL-SAFE FEATURE OF AUXILIARY SIGNALING BOARD. WITH ROUTINER TEST SET (RTS), TEST FAIL-SAFE FEATURE USING EPO AND FREQ ADV SIGNALING. RESET FAIL-SAFE FEATURE WITH TRMTR ON</p>	<p>COMMAND FROM ROUTINER TEST SET AND CHECK THAT FAIL-SAFE IS RESET BY OBSERVING RF ON LAMP LIGHTED ON ROUTINER WITHOUT DELAY. INSERT TWO 369A PLUGS INTO VOICE LINE AND EQUIP LINE JACKS TO PREVENT UNWANTED NOISE</p>
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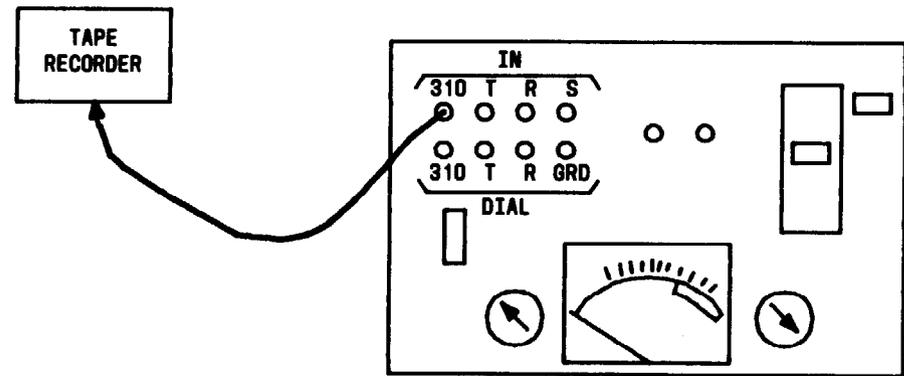
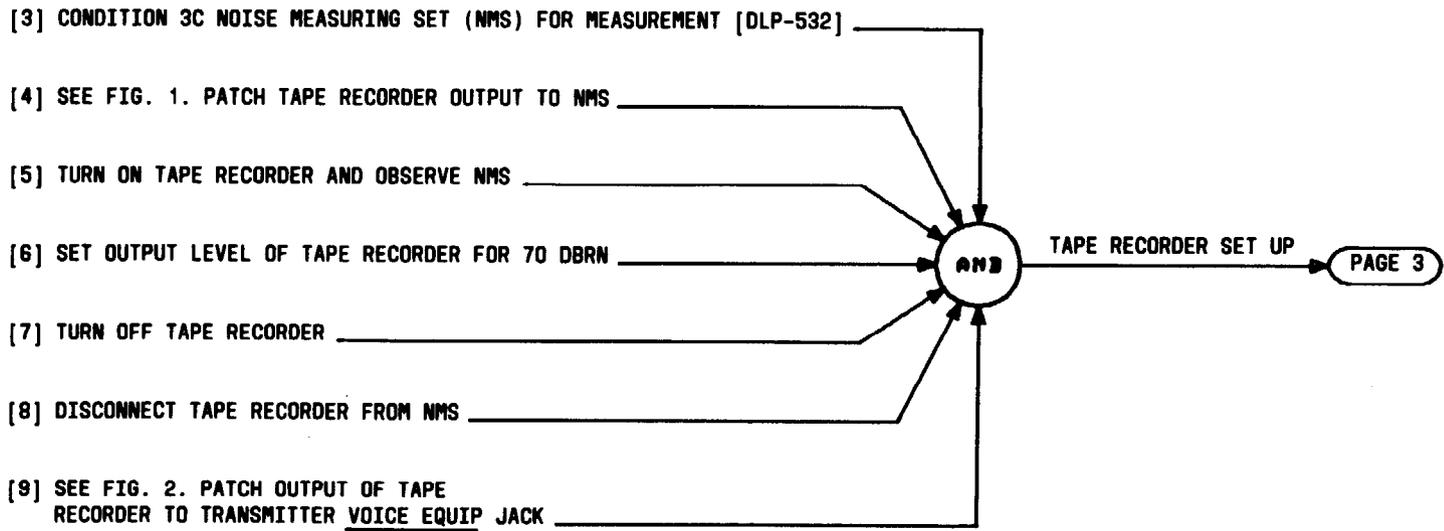
[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1

[2] GET TEST EQUIPMENT SHOWN IN TABLE A

PAGE 2

NOTE 1
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TAPE RECORDER	SONY TC-110A
TEST TAPE	EC3 TDK ELECT. CO
2 LINE TERMINATIONS	369A
ROUTINER TEST SET	KS-21277
2 PATCH CORDS	P2B
NOISE MEASURING SET	J94003C
2 898N RESISTORS	WITH KS-21277
1 PATCH CORD	TAPE RECORDER TO NOISE MEASURING SET



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[10] SEE FIG. 2. CONDITION ROUTINER TEST SET (RTS) FOR TRANSMITTER TEST [DLP-531]. SEE NOTE 2

[11] ON TRANSMITTER, INSERT ONE 369A TERMINATION INTO VOICE LINE JACK AND ONE 369A TERMINATION INTO STATUS LINE JACK

[12] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO FLDT IN JACK. SEE FIG. 2.

[13] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD INTO STATUS EQUIP JACK

[14] ENSURE TRANSMIT MODE SWITCH IS SET TO REM

[15] SEE NOTE 3. OBSERVE RF ON LAMP ON RTS AND TURN ON TAPE RECORDER

[16] TURN OFF TAPE RECORDER AFTER 2 SECONDS

NOTES
 2. IF RTS IS NOT AVAILABLE AT TRANSMITTER LOCATION, REQUEST CONTROL TERMINAL TO ASSIST TRANSMITTER TEST USING RTS AT CONTROL TERMINAL
 3. WHEN TAPE RECORDER IS TURNED ON, RF ON LAMP ON RTS WILL LIGHT APPROXIMATELY 750 MILLISECONDS. DISREGARD LAMP INDICATIONS NOT MENTIONED

TEST CONNECTIONS COMPLETED

AND

[17] DID RF ON LAMP ON RTS LIGHT APPROXIMATELY 750 MILLISECONDS AND THEN EXTINGUISH

YES

PAGE 4

NO

TAP-131

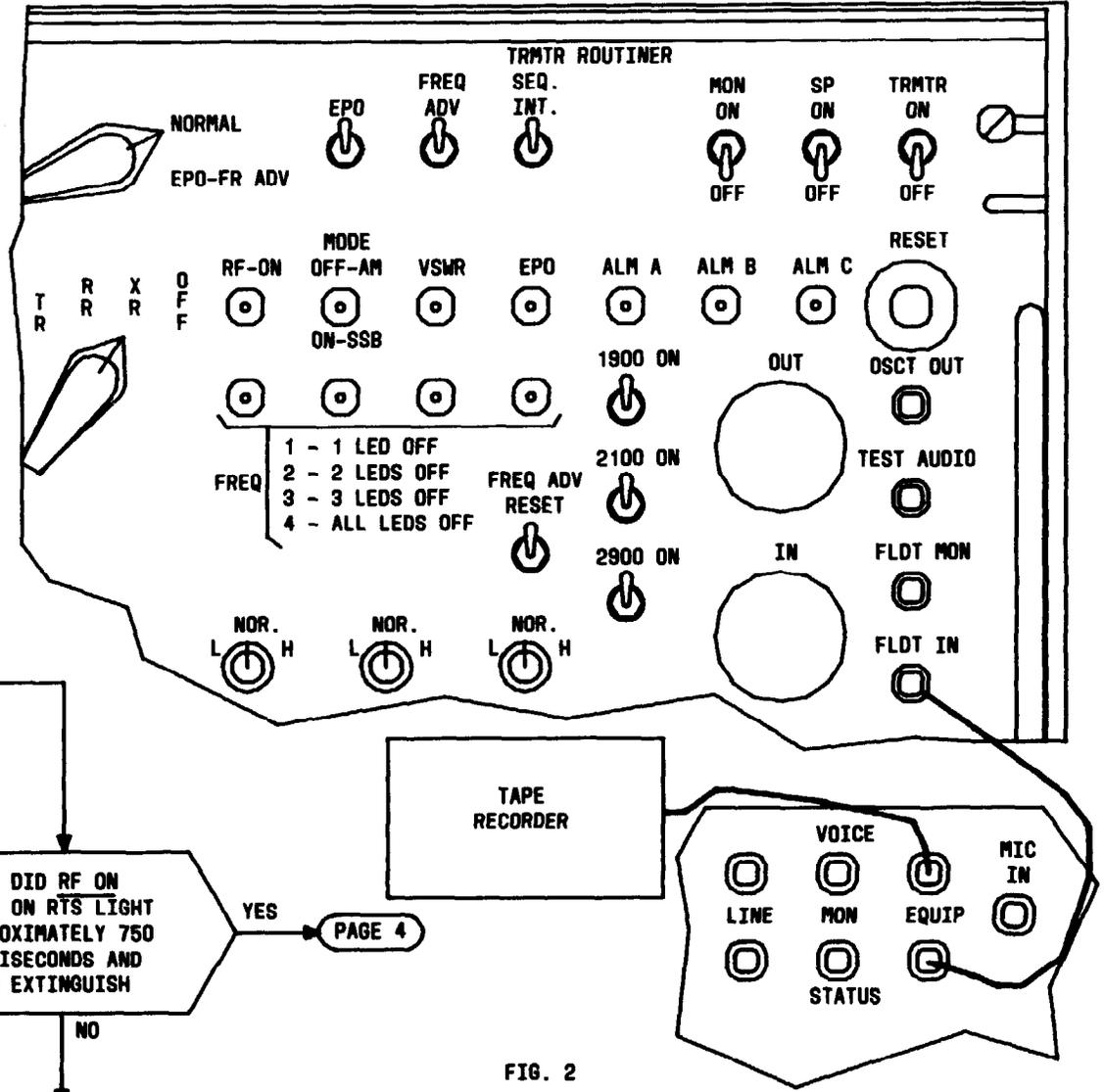


FIG. 2

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

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[18] DISCONNECT TAPE RECORDER FROM TRANSMITTER VOICE EQUIP JACK

[19] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO OSCT OUT JACK. SEE FIG. 3

[20] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD INTO VOICE EQUIP JACK

[21] ON TRANSMITTER, ENSURE EMERG. POWER SWITCH IS SET TO REMOTE

[22] ON RTS, SET EPO-FR ADV, NORMAL SWITCH TO EPO-FR ADV

[23] ON RTS, OPERATE AND HOLD EPO SWITCH

[24] ON TRANSMITTER, OBSERVE EMERG. POWER ON LAMP

[25] RELEASE EPO SWITCH AFTER 3 SECONDS

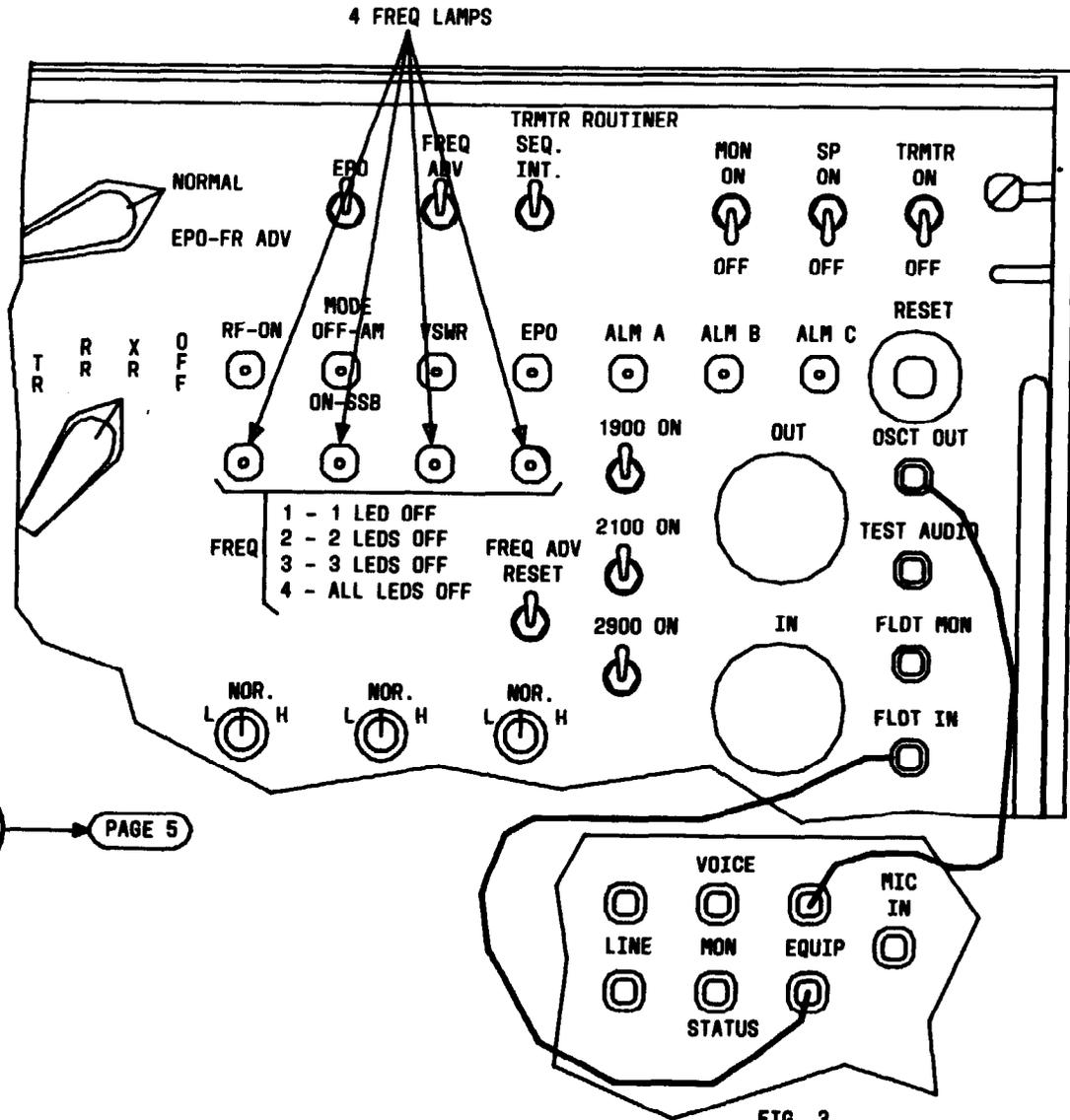
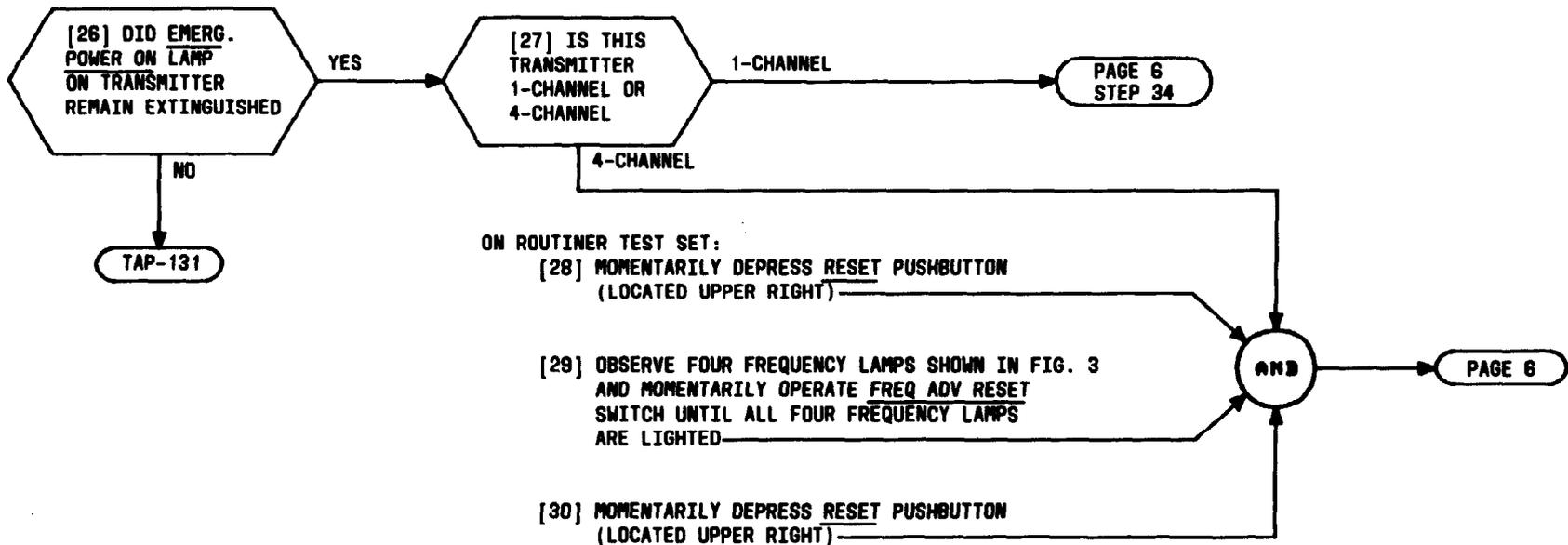


FIG. 3

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

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TEST TRANSMITTER AUXILIARY SIGNALING BOARD

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[31] ON TRANSMITTER, OBSERVE
FOUR CHANNEL LAMPS SHOWN
IN FIG. 4. SEE NOTE 4

[32] ON RTS, MOMENTARILY OPERATE
FREQ ADV SWITCH

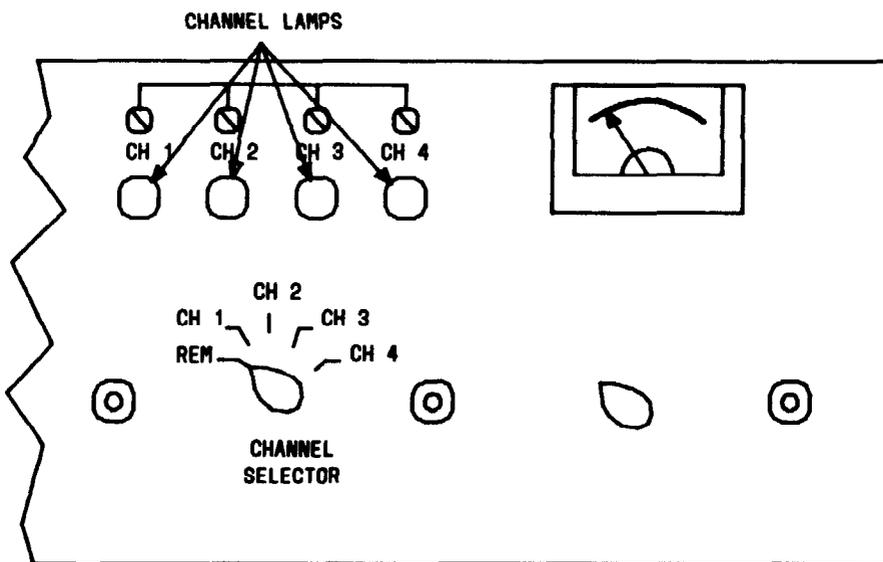
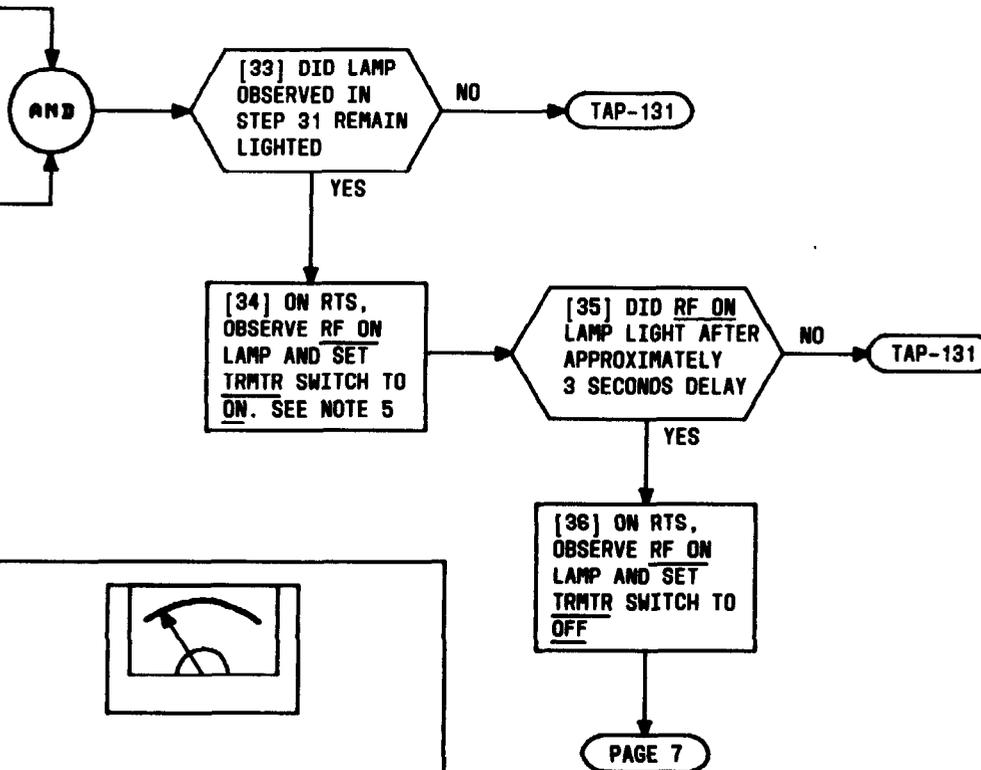
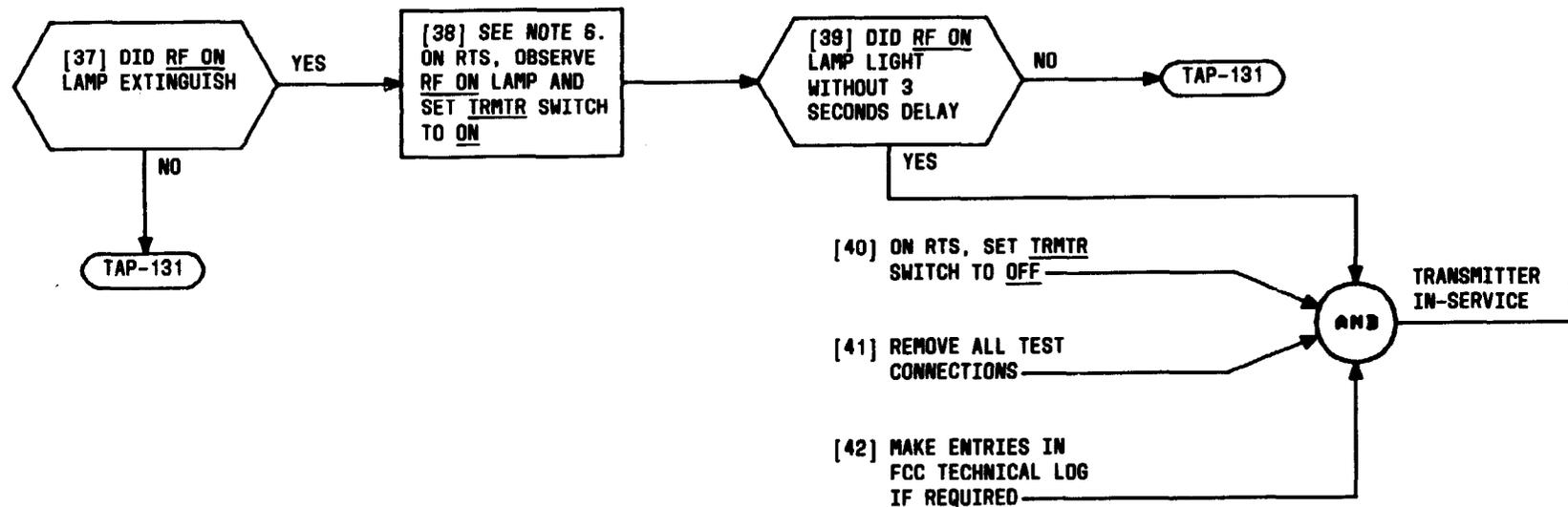


FIG. 4

NOTES	
4. ONLY ONE CHANNEL LAMP ON TRANSMITTER IS LIGHTED AND SHOULD REMAIN LIGHTED WHEN PERFORMING STEP 32. DISREGARD ALL LAMP INDICATIONS NOT MENTIONED	
5. RF ON LAMP SHOULD BE LIGHTED AFTER APPROXIMATELY 3 SECONDS DELAY	
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TEST TRANSMITTER AUXILIARY SIGNALING BOARD



NOTE 6 RF ON LAMP SHOULD BE LIGHTED WITHOUT 3 SECONDS DELAY	
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TEST TRANSMITTER AUXILIARY SIGNALING BOARD

SUMMARY

THIS TEST IS COORDINATED BY PERSONNEL AT CONTROL TERMINAL. WHEN NOTIFIED, CONNECT IN-LINE WATTMETER AND RF COAXIAL LOAD RESISTOR. RECORD IN-LINE WATTMETER INDICATION FOR A3H (SAFETY AND CALLING) AND/OR A3A (PUBLIC CORRESPONDENCE) MODE OF OPERATION. ROTATE R1 ON WIDEBAND AMPLIFIER CIRCUIT BOARD FOR AN

INDICATION OF 45 WATTS FOR A3H MODE AND/OR 4 WATTS FOR A3A MODE. WHEN NOTIFIED TO VERIFY RF ON INDICATION, ROTATE R1 FOR AN INDICATION OF 60 WATTS FOR A3H AND/OR 6 WATTS FOR A3A MODE. WHEN NOTIFIED THAT TEST IS COMPLETED, ROTATE R1 FOR ORIGINAL INDICATION ON WATTMETER. REMOVE ALL TEST CONNECTIONS AND VERIFY REMOTE OPERATION WITH CONTROL TERMINAL

[1] VERIFY TRANSMITTER IS RELEASED FOR THIS TEST

[2] SET TRANSMIT MODE SWITCH TO OFF

[3] GET TEST EQUIPMENT SHOWN IN TABLE A

[4] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM FILTER OUTPUT

[5] CONNECT IN-LINE WATTMETER TO FILTER OUTPUT AND INSERT 250H ELEMENT FOR A3H MODE OR 50H ELEMENT FOR A3A MODE INTO WATTMETER (FIG. 2)

[6] SEE FIG. 2. CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER

[7] REPORT TO CONTROL TERMINAL, YOU ARE STANDING BY FOR TEST

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
IN-LINE WATTMETER	BIRD MODEL 43 WITH 250H AND 50H ELEMENTS
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201

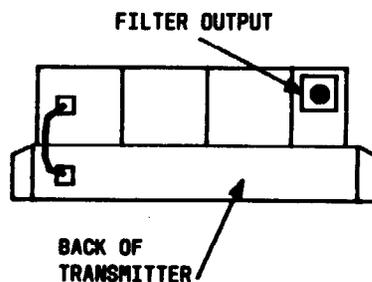
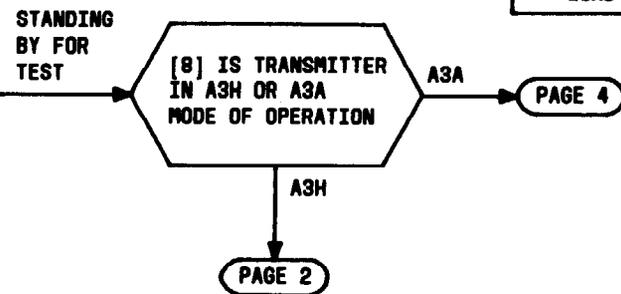


FIG. 1

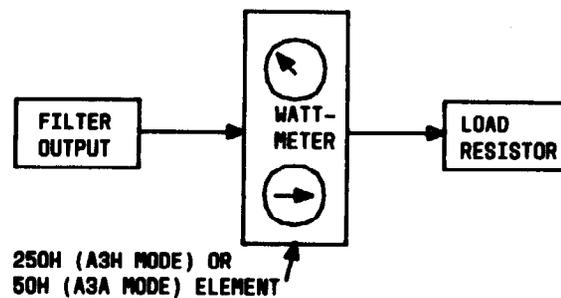
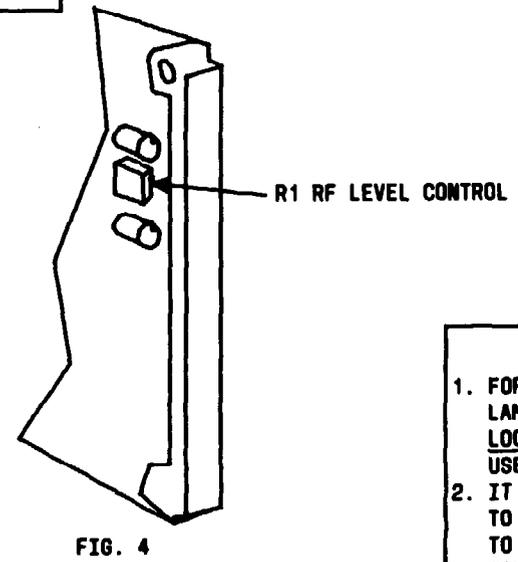
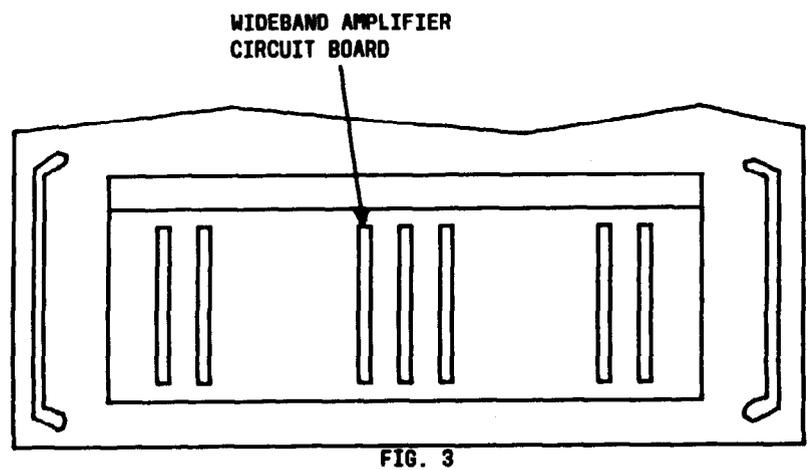
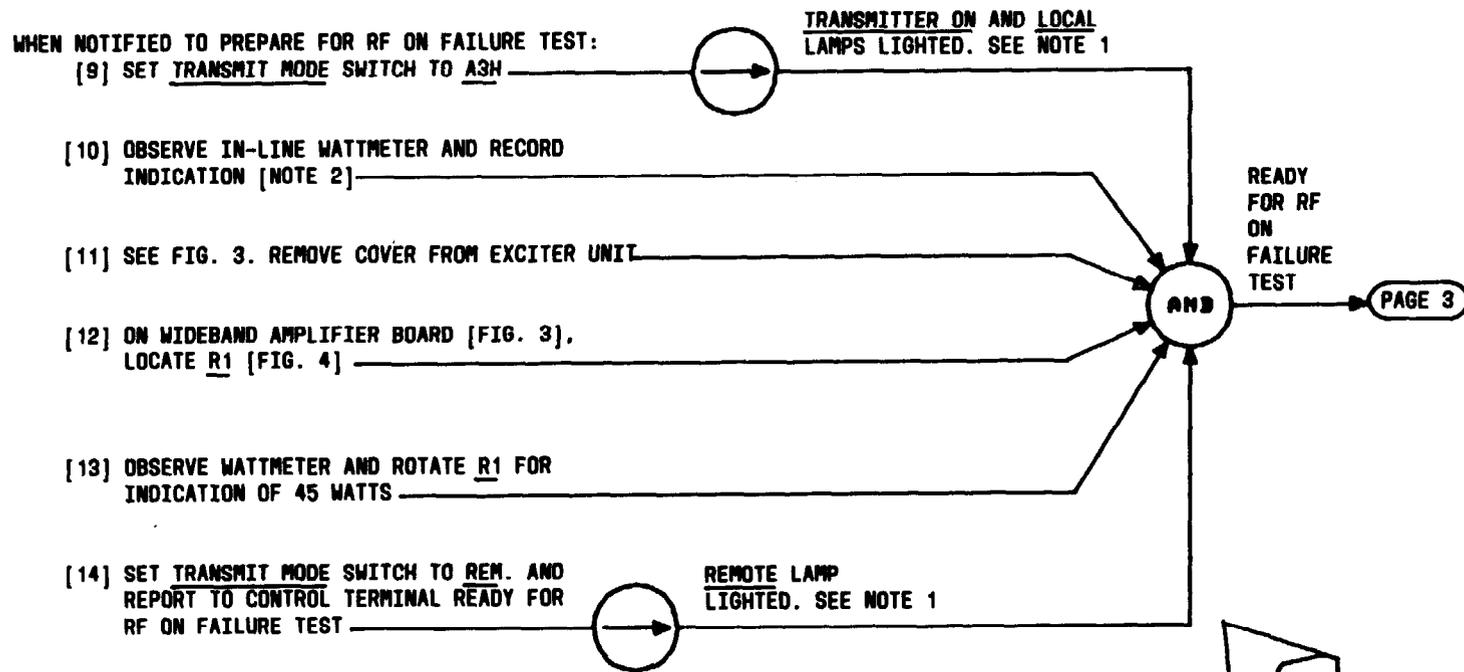


FIG. 2

TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

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NOTES

- FOR TRANSMITTER ON LAMP, USE TAD-101. LOCAL AND REMOTE LAMPS USE TAD-124.
- IT WILL BE NECESSARY TO READJUST TRANSMITTER TO THIS VALUE AT COMPLETION OF TEST

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TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

WHEN NOTIFIED TO VERIFY RF ON INDICATION:

[15] SET TRANSMIT MODE SWITCH TO A3H

[16] OBSERVE WATTMETER AND ROTATE R1
[FIG. 4] FOR 60 WATTS

[17] SET TRANSMIT MODE SWITCH TO REM.
AND REPORT TO CONTROL TERMINAL
READY TO VERIFY RF ON INDICATION

READY TO
VERIFY
RF ON
INDICATION

AND

WHEN NOTIFIED TEST IS COMPLETED:

[18] SET TRANSMIT MODE SWITCH TO A3H

TRANSMITTER ALARM
LAMP OFF

NO

TAP-114

[19] OBSERVE WATTMETER AND ROTATE R1 FOR
INDICATION RECORDED IN STEP 9

[20] SET TRANSMIT MODE SWITCH TO OFF

[21] REMOVE ALL TEST CONNECTIONS AND PLACE
COVER ON EXCITER UNIT [FIG. 3]

[22] SET TRANSMIT MODE SWITCH TO REM. AND VERIFY
REMOTE OPERATION WITH CONTROL TERMINAL

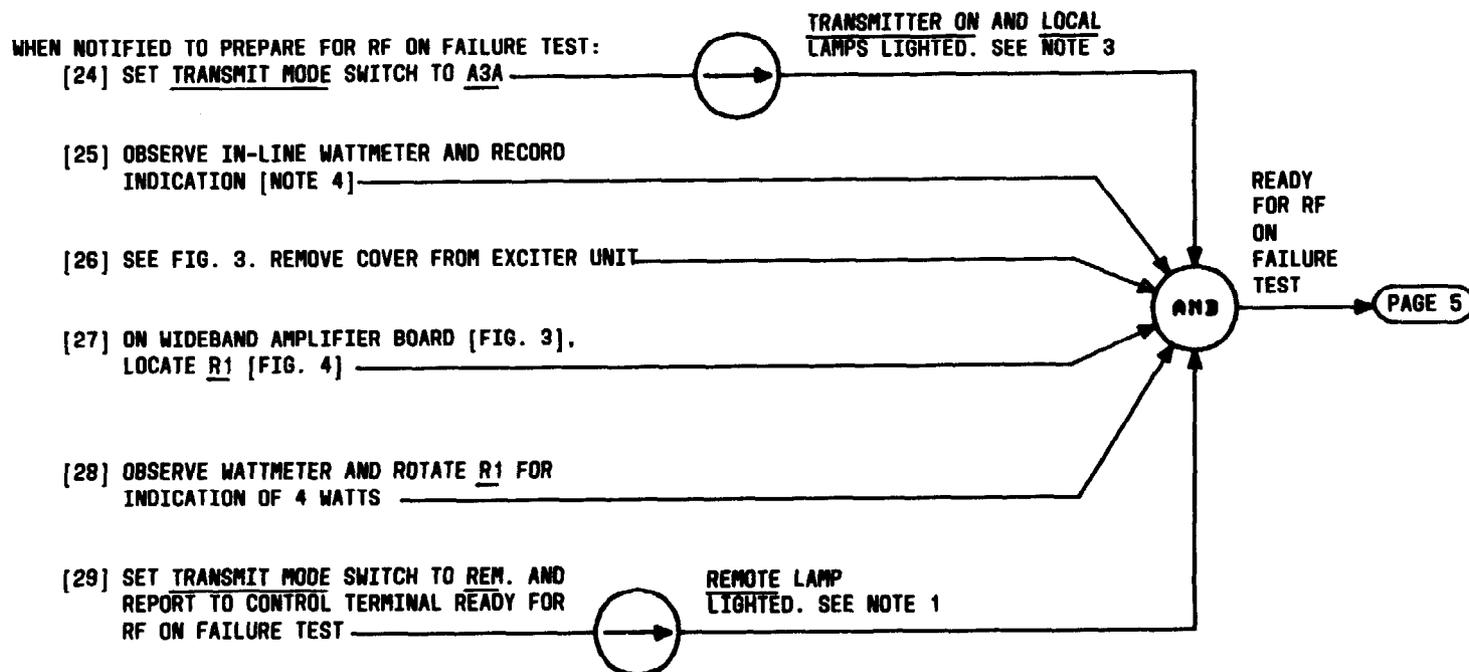
[23] MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED

TRANSMITTER
IN-SERVICE

AND

TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

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**TEST TRANSMITTER RF FAIL ALARM INDICATION
FROM CONTROL TERMINAL**

NOTES		
3. FOR <u>TRANSMITTER ON LAMPS</u> , USE TAD-101. FOR <u>LOCAL AND REMOTE LAMPS</u> USE TAD-124.		
4. IT WILL BE NECESSARY TO READJUST TRANSMITTER TO THIS VALUE AT COMPLETION OF TEST		
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WHEN NOTIFIED TO VERIFY RF ON INDICATION:

[30] SET TRANSMIT MODE SWITCH TO A3A

[31] OBSERVE WATTMETER AND ROTATE R1
[FIG. 4] FOR 6 WATTS

[32] SET TRANSMIT MODE SWITCH TO REM.
AND REPORT TO CONTROL TERMINAL
READY TO VERIFY RF ON INDICATION

READY TO
VERIFY
RF ON
INDICATION

AND

WHEN NOTIFIED TEST IS COMPLETED:

[33] SET TRANSMIT MODE SWITCH TO A3A

TRANSMITTER ALARM
LAMP OFF

NO

TAP-114

[34] OBSERVE WATTMETER AND ROTATE R1 FOR
INDICATION RECORDED IN STEP 25

[35] SET TRANSMIT MODE SWITCH TO OFF

[36] REMOVE ALL TEST CONNECTIONS AND PLACE
COVER ON EXCITER UNIT [FIG. 3]

[37] SET TRANSMIT MODE SWITCH TO REM. AND VERIFY
REMOTE OPERATION WITH CONTROL TERMINAL

[38] MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED

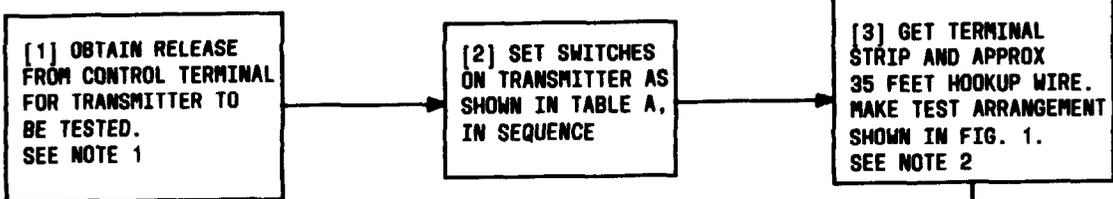
TRANSMITTER
IN-SERVICE

AND

TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

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<p style="text-align: center;">SUMMARY</p> <p>TURN TRANSMITTER PRIMARY POWER OFF. MAKE TEST ARRANGEMENT OF TERMINAL STRIP AND HOOK UP WIRE TO GAIN ACCESS TO TERMINALS 16, 17, AND 18 OF TS-1, AND 8, 9, 17, AND 18 OF TS-2. CONNECT WATTMETER, RF COAXIAL LOAD RESISTOR, ROUTINER TEST SET (RTS), AND HEADSET TO TRANSMITTER. TURN POWER ON AND CHECK TRANSMITTER ON, SPARE ON, MONITOR RECEIVER ON, SPARE OFF; MONITOR</p>	<p>RECEIVER OFF, AND TRANSMITTER OFF FUNCTIONS USING RTS, WATTMETER, HEADSET AND VOLT-OHM-MILLIAMMETER (VOM). FOR SAFETY AND CALLING TRANSMITTER, CHECK ONLY TRANSMITTER ON AND TRANSMITTER OFF FUNCTIONS. CHECK ALL TRANSMITTERS FOR EMERGENCY POWER ON AND EMERGENCY POWER OFF FUNCTIONS USING RTS AND OHMMETER</p>
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TABLE A		
SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF

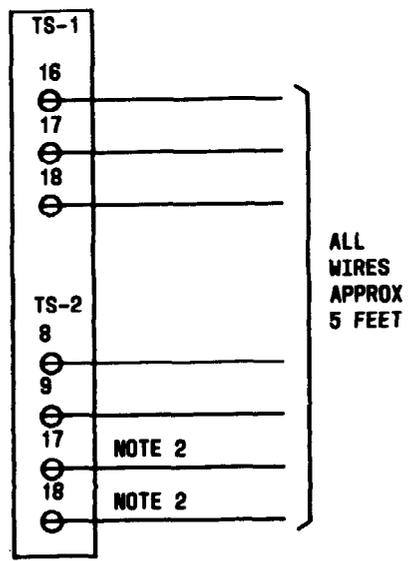


FIG. 1

NOTES	
1. FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION	
2. TS-2 TERMINALS 17 AND 18 ARE NOT USED FOR SAFETY AND CALLING TRANSMITTER TEST	
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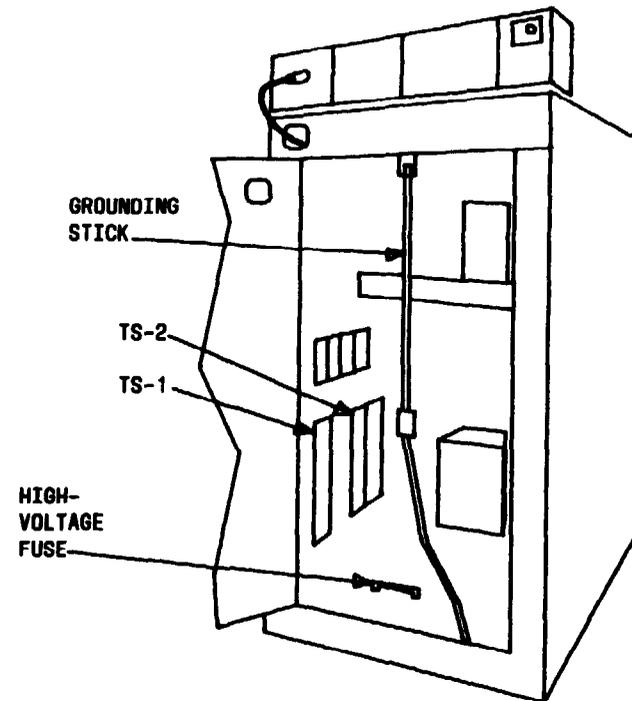
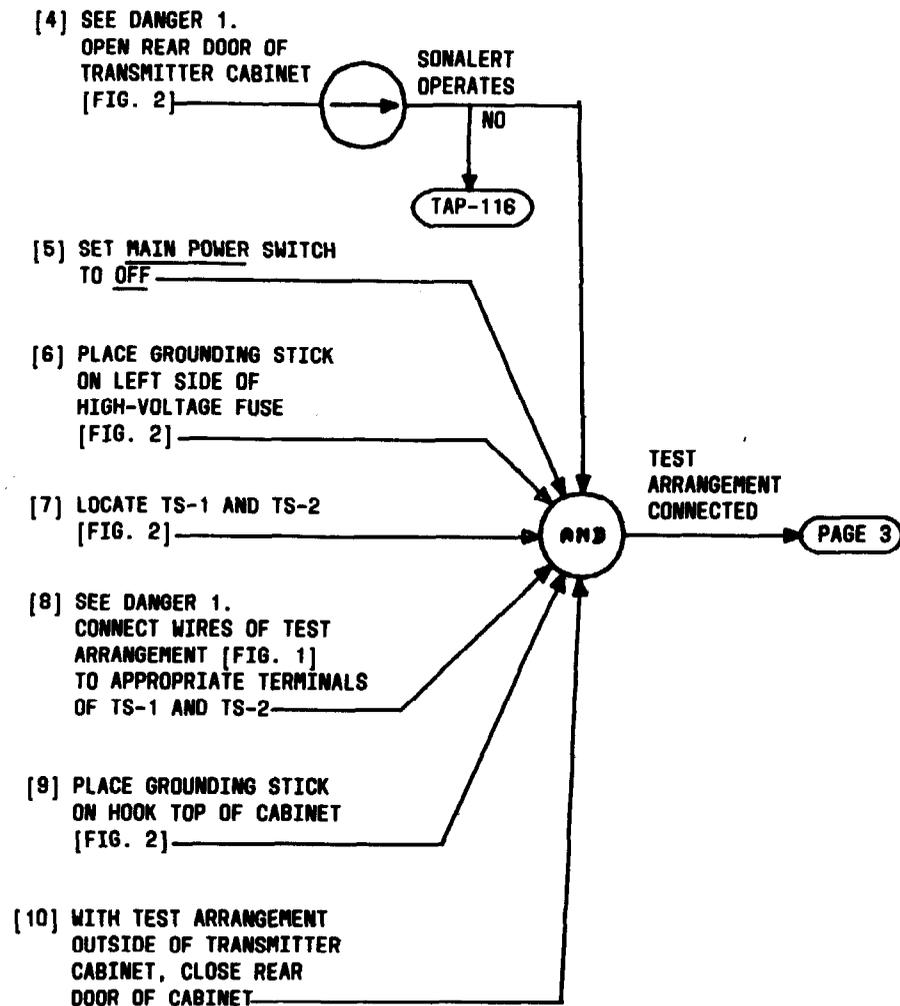


FIG. 2

DANGER 1
PRIMARY POWER IS STILL
APPLIED TO TRANSMITTER
CABINET. USE EXTREME
CARE AROUND TS-1. IF
POSSIBLE REMOVE PRIMARY
POWER FROM TRANSMITTER

**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
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[11] SEE FIG. 3. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[12] GET RF COAXIAL LOAD RESISTOR AND IN-LINE WATTMETER WITH ELEMENT AS SHOWN IN TABLE B

[13] CONNECT IN-LINE WATTMETER TO FILTER OUTPUT [FIG. 3 AND 4]

[14] INSERT 250H ELEMENT FOR A3H MODE OR 50H ELEMENT FOR A3A MODE INTO WATTMETER WITH PRINTED ARROW FACING TO RIGHT [FIG. 4]

[15] CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER [FIG. 4]

RF COAXIAL
LOAD RESISTOR
AND IN-LINE
WATTMETER
CONNECTED

PAGE 4

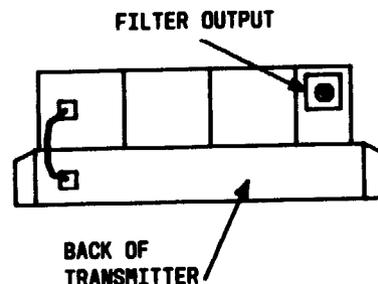


FIG. 3

TABLE B	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TERMINAL STRIP	MINIMUM OF 7 TERMINALS
HOOKUP WIRE	INSULATED, APPROX 35 FEET
IN-LINE WATTMETER	BIRD MODEL 43 WITH 250H AND 50H ELEMENTS
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201, 50 OHM
ROUTINER TEST SET	KS-21277
2 898N RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 LINE TERMINATIONS	389A
HEADSET OR EQUIVALENT	509 HEAD RECEIVER/ 2M4A CORD
VOLT-OHM-METER	KS-14510A

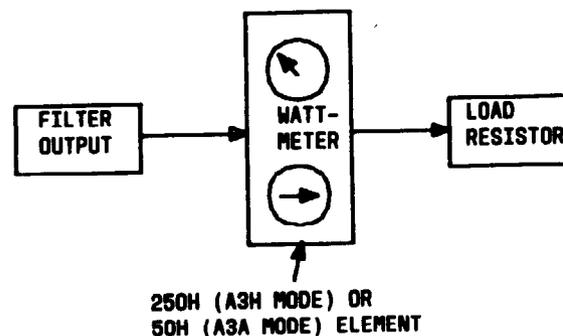


FIG. 4

**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY
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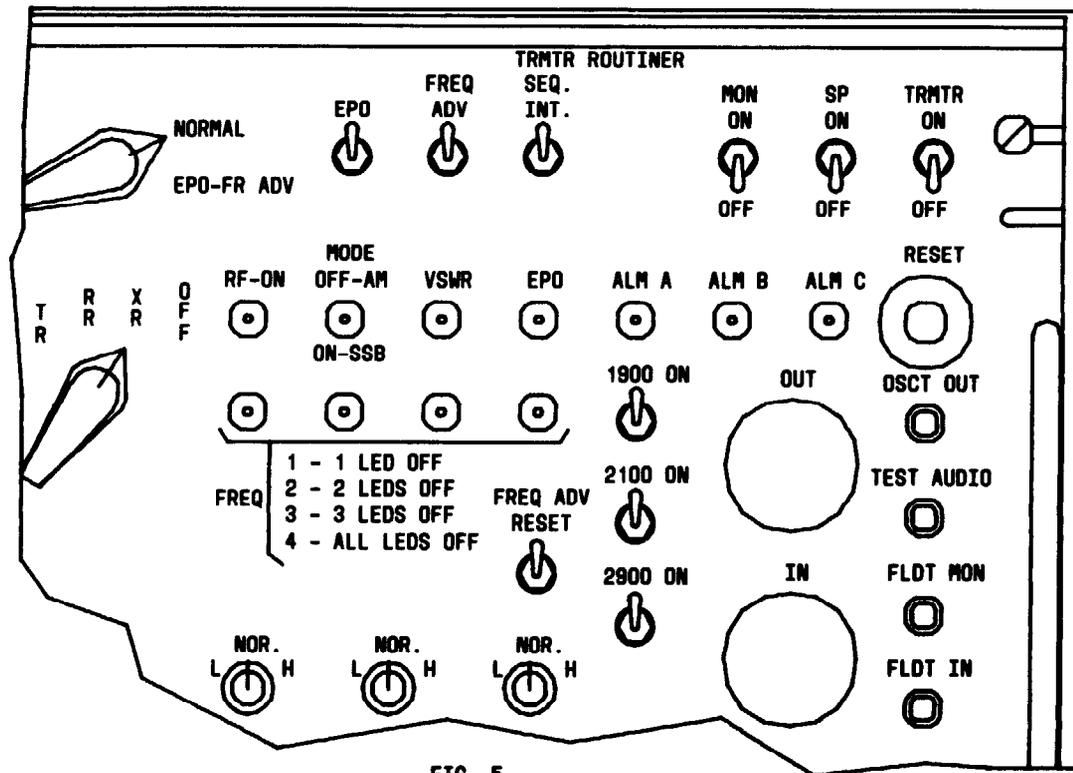
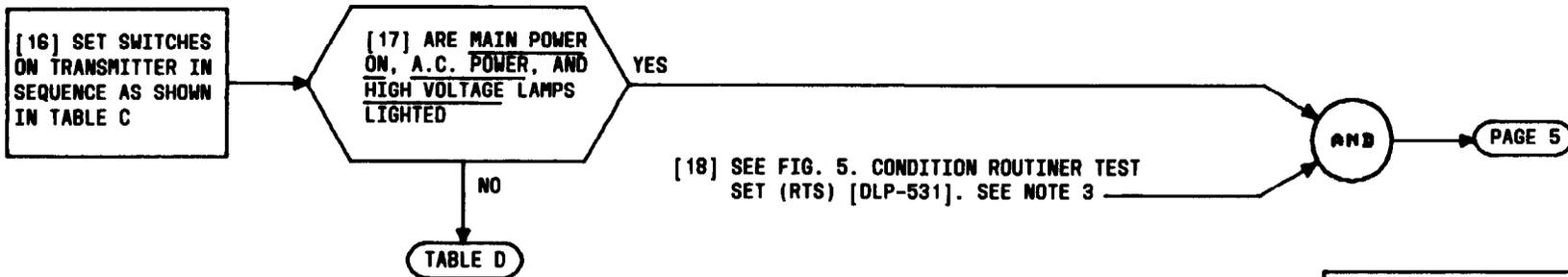


FIG. 5

TABLE C		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE

TABLE D	
LAMP TROUBLE	USE
MAIN POWER ON	TAD-134
A.C. POWER	TAD-118
HIGH VOLTAGE	TAP-119

NOTE 3

IF RTS IS NOT AVAILABLE AT TRANSMITTER LOCATION, REQUEST CONTROL TERMINAL TO ASSIST TRANSMITTER TEST USING RTS AT CONTROL TERMINAL

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TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS

[19] SEE TABLE B. INSTALL TWO 369A PLUGS INTO VOICE LINE AND STATUS LINE JACKS ON TRANSMITTER.

[20] SEE FIG. 6. CONNECT HEADSET TO FLDT MON JACK ON RTS.

[21] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO FLDT IN JACK [FIG. 6]

[22] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD TO STATUS EQUIP JACK [FIG. 6]

[23] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO OSCT OUT JACK [FIG. 6]

[24] ON TRANSMITTER, CONNECT OTHER END OF P2B PATCH CORD TO VOICE EQUIP JACK [FIG. 6]

TEST CONNECTIONS COMPLETED



[25] IS THIS TRANSMITTER SAFETY AND CALLING

YES

PAGE 6

NO

[26] IS THIS A STANDBY TRANSMITTER OPERATING AS SAFETY AND CALLING

YES

PAGE 6

NO

PAGE 8

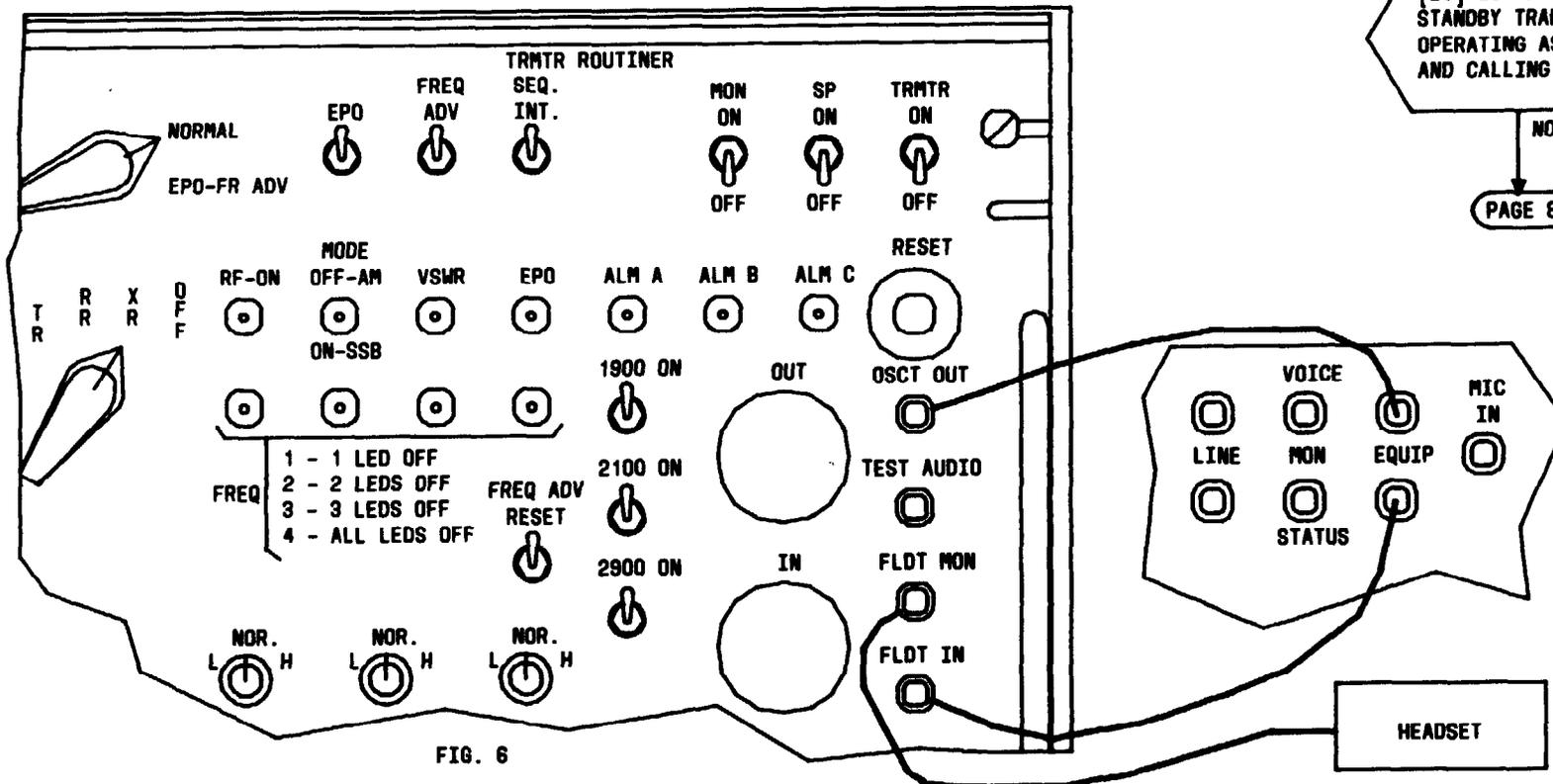
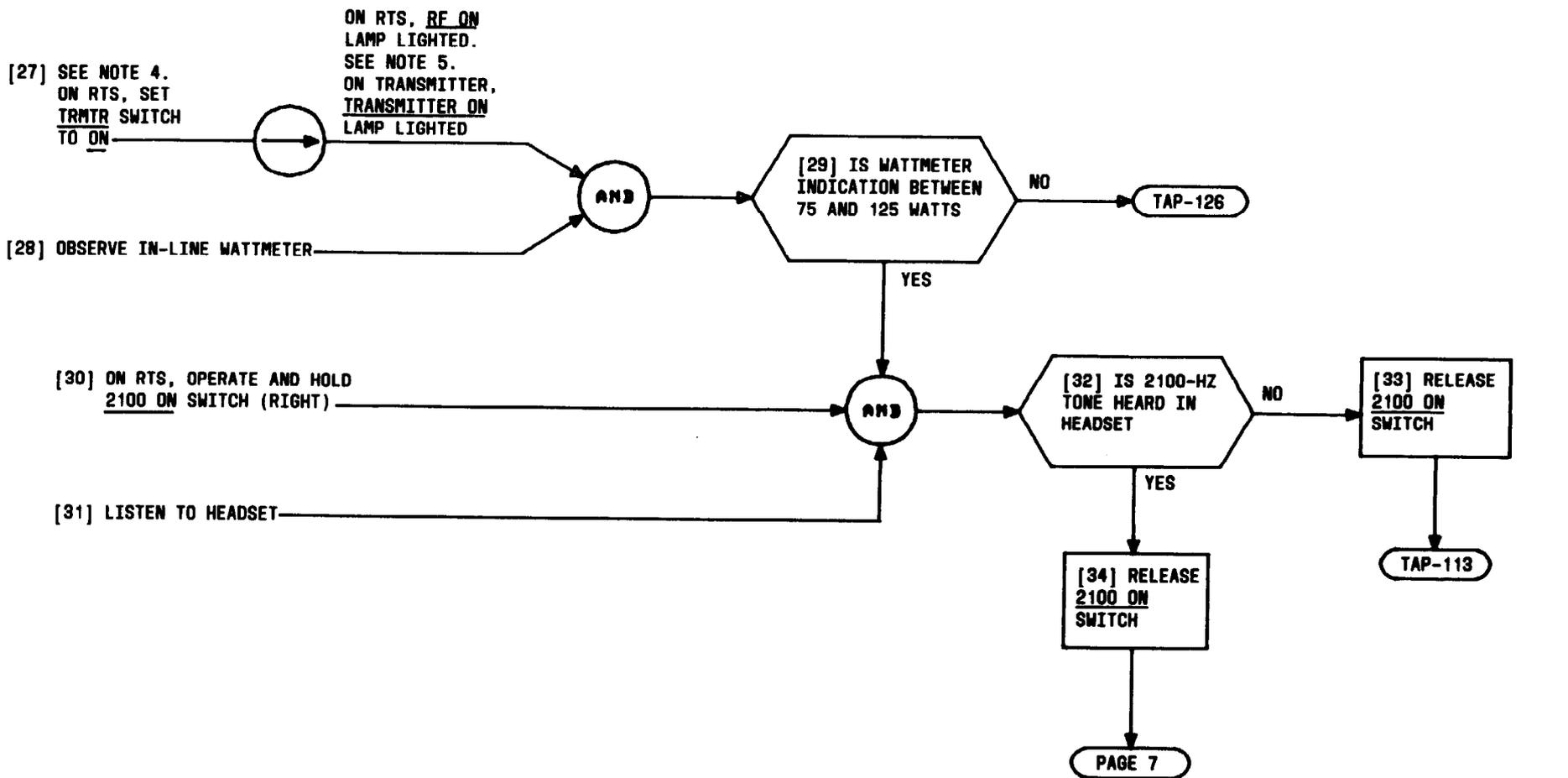


FIG. 6

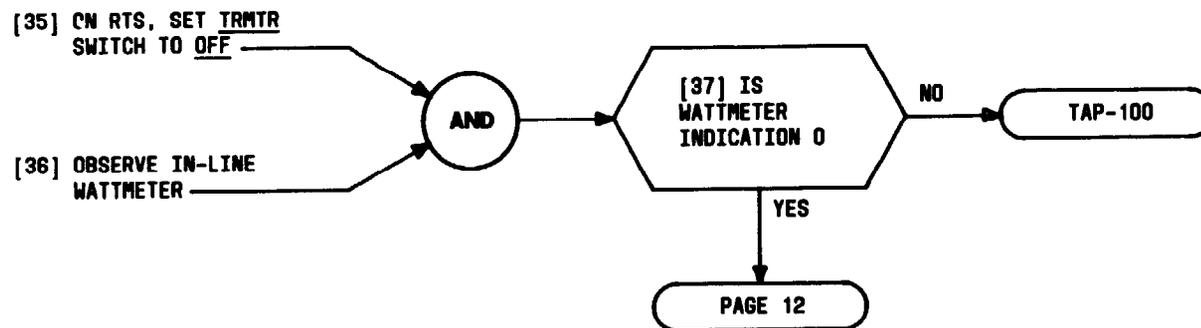
TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS

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**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
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POWER COMMANDS**

NOTES	
4. DISREGARD ALL LAMP INDICATIONS NOT MENTIONED	
5. FOR RF ON LAMP, USE TAP-107. FOR TRANSMITTER ON LAMP, USE TAP-100	
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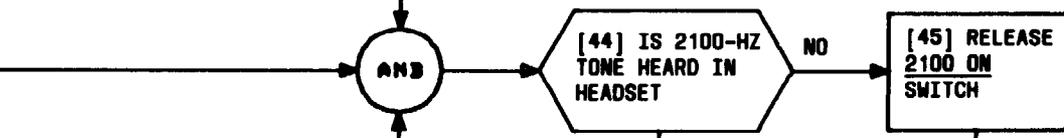
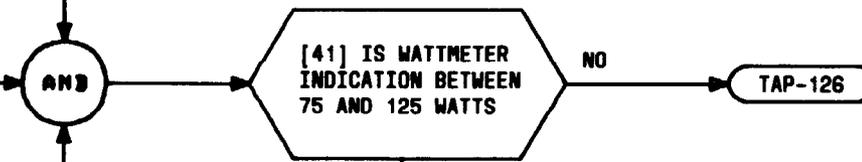
[38] SEE NOTE 6.
ON RTS, SET
TRMTR SWITCH
TO ON

[39] ON RTS, SET SP AND MON
SWITCHES TO ON AND MOMENTARILY
OPERATE SEQ INH SWITCH

[40] OBSERVE IN-LINE WATTMETER

[42] ON RTS, OPERATE AND HOLD
2100 ON SWITCH (RIGHT)

[43] LISTEN TO HEADSET



**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
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POWER COMMANDS**

NOTE 6 DISREGARD ALL LAMP INDICATIONS NOT MENTIONED		
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[47] GET VOM SHOWN IN TABLE B.
CONDITION FOR MEASUREMENT
[DLP-530]

[48] SEE FIG. 7. CONNECT ONE
LEAD OF VOM TO TS-2 TERMINAL
17 AND OTHER LEAD TO TS-2
TERMINAL 18 OF TEST ARRANGEMENT

[49] OBSERVE VOM INDICATION

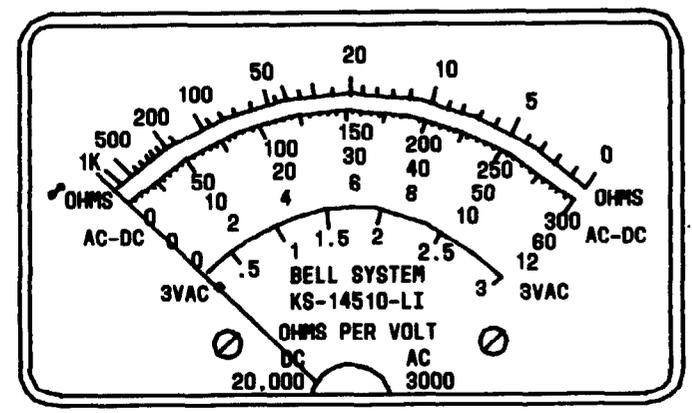
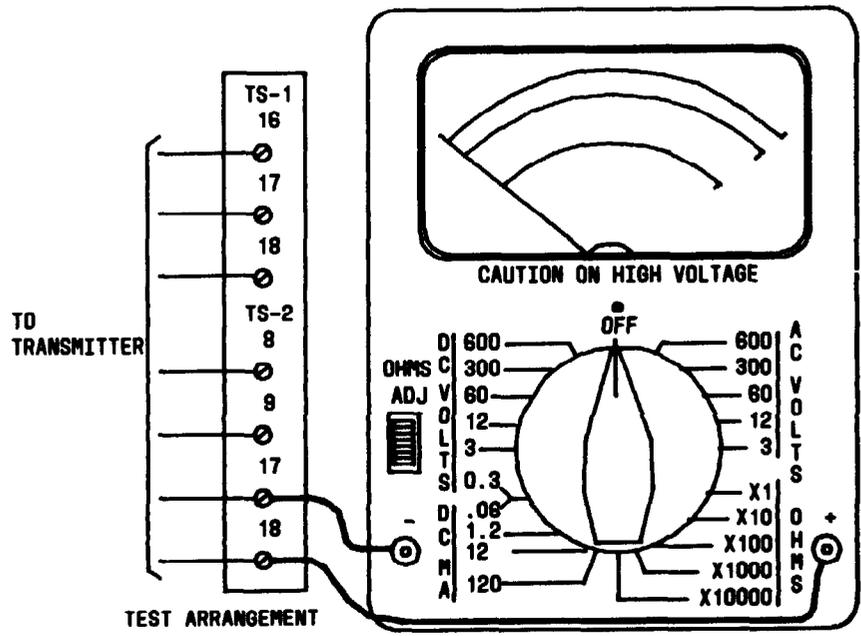
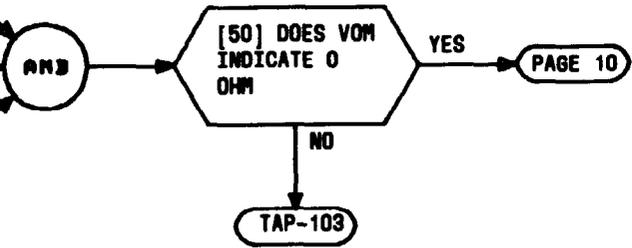
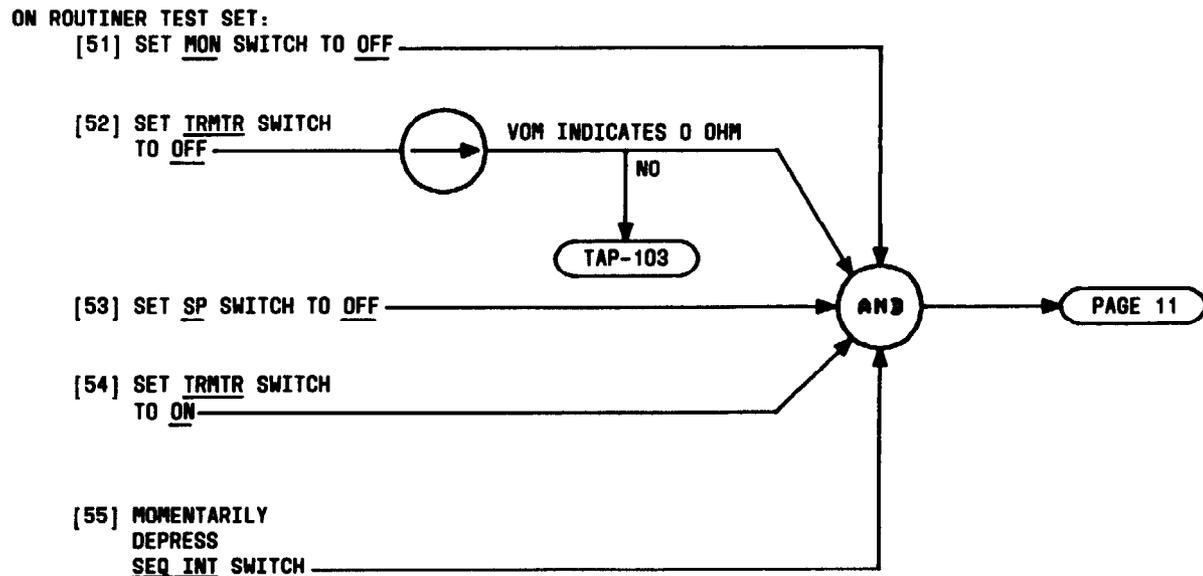


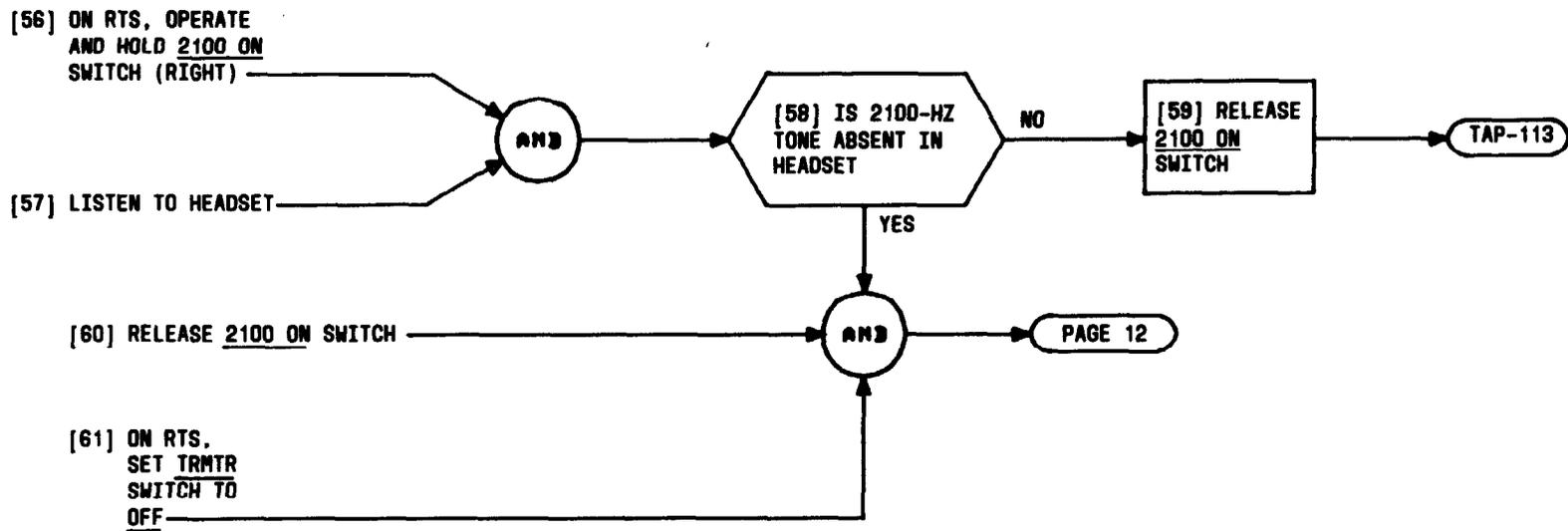
FIG. 7

**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY
POWER COMMANDS**



**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
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**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
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[62] SEE FIG. 8. CONDITION VOM FOR MEASUREMENT [DLP-530]. CONNECT ONE LEAD OF VOM TO TS-1 TERMINAL 16 AND OTHER LEAD TO TS-1 TERMINAL 17 OF TEST ARRANGEMENT

[63] ON RTS, SET EPO-FR ADV, NORMAL SWITCH TO EPO-FR ADV

[64] ON RTS, OPERATE AND HOLD EPO SWITCH

ON TRANSMITTER. EMERG. POWER ON LAMP LIGHTED. EMERGENCY POWER SOURCE ACTIVATED. SEE NOTE 7

[65] DOES VOM INDICATE 0 OHM

PAGE 13

[66] RELEASE EPO SWITCH

TAP-105

TAP-124

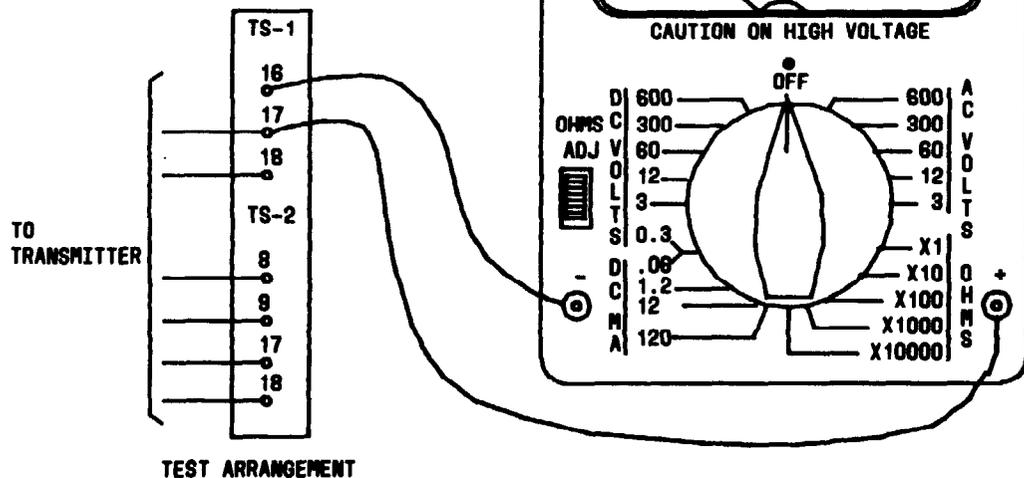


FIG. 8

TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS

NOTE 7
SEE LOCAL INSTRUCTIONS FOR EMERGENCY POWER CONNECTION

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[67] DISCONNECT VOM LEAD FROM TS-1 TERMINAL 17 AND CONNECT LEAD TO TS-1 TERMINAL 18

VOM NEEDLE ALL WAY TO LEFT. SEE NOTE 8

NO

TAP-105

[68] ON RTS, RELEASE EPO SWITCH

ON TRANSMITTER, EMERG. POWER ON LAMP EXTINGUISHED. VOM INDICATES 0 OHM. EMERGENCY POWER SOURCE NOT ACTIVATED. SEE NOTE 9

NO

TAP-105

[69] DISCONNECT VOM LEAD FROM TS-1 TERMINAL 18 AND CONNECT LEAD TO TS-1 TERMINAL 17

VOM NEEDLE ALL WAY TO LEFT

NO

TAP-105

[70] DISCONNECT BOTH VOM LEADS FROM TEST ARRANGEMENT

AND

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NOTE 8
ON RTS, EPO SWITCH SHOULD STILL BE OPERATED

NOTE 9
SEE LOCAL INSTRUCTIONS FOR EMERGENCY POWER CONNECTION

**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY
POWER COMMANDS**

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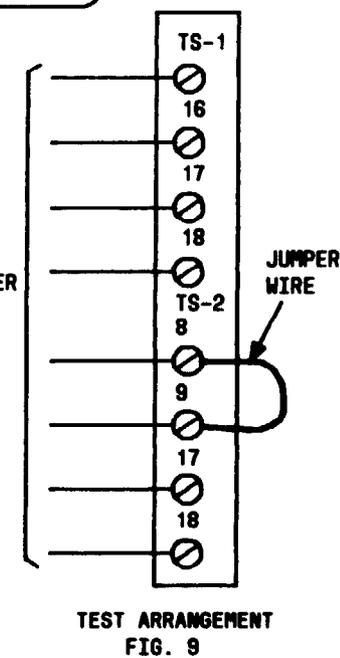
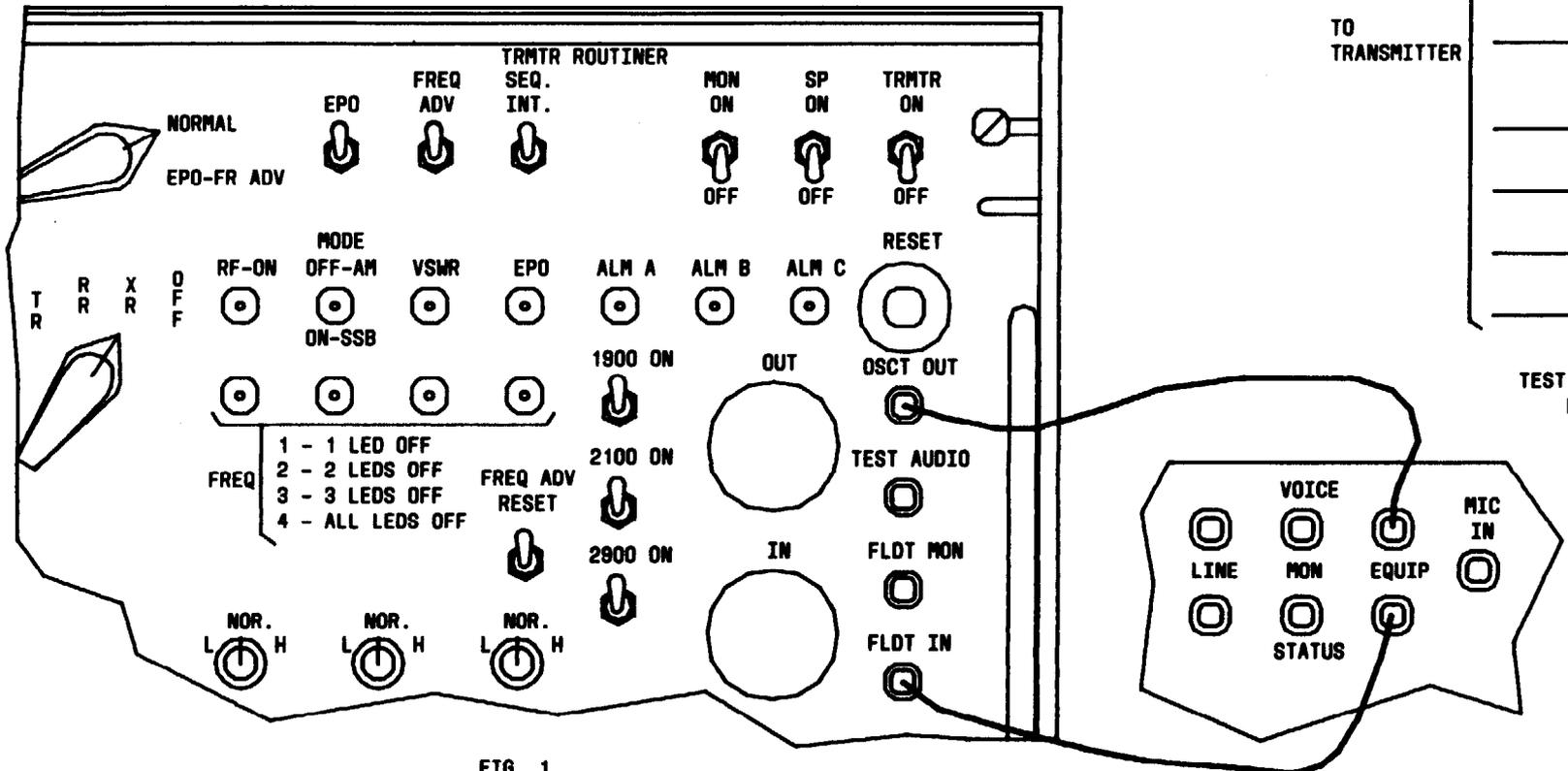
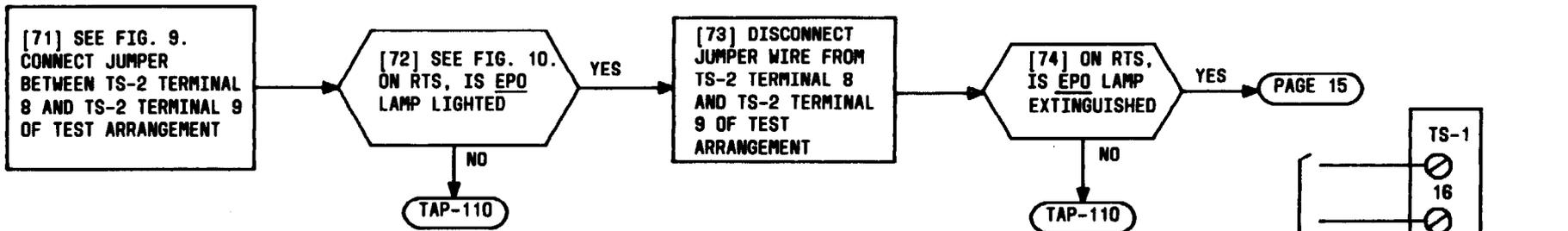


FIG. 1

**TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY
POWER COMMANDS**

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[75] THIS TEST IS COMPLETED. SET SWITCHES ON TRANSMITTER AS SHOWN IN TABLE D.

[76] OPEN REAR DOOR OF TRANSMITTER CABINET [FIG. 11]

[77] PLACE GROUNDING STICK ON LEFT SIDE OF HIGH-VOLTAGE FUSE [FIG. 11]

[78] SEE DANGER 2. DISCONNECT WIRES OF TEST ARRANGEMENT FROM TS-1 AND TS-2 [FIG. 11]

[79] PLACE GROUNDING STICK ON HOOK, TOP OF TRANSMITTER CABINET [FIG. 11]

[80] CLOSE REAR DOOR OF TRANSMITTER CABINET [FIG. 11]



TABLE D		
SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

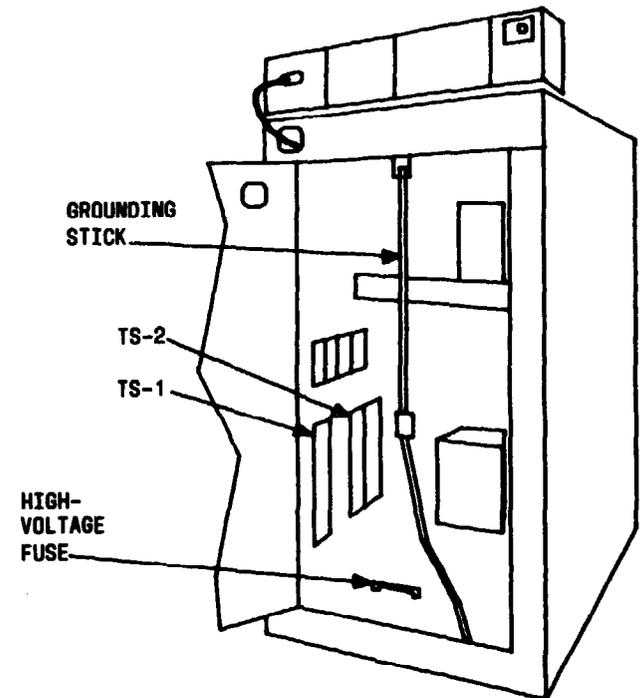


FIG. 11

DANGER 2
 PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET. USE EXTREME CARE AROUND TS-1. IF POSSIBLE REMOVE PRIMARY POWER FROM TRANSMITTER

TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS

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[81] REMOVE ALL TEST CONNECTIONS FROM TRANSMITTER

[82] SET SWITCHES ON TRANSMITTER AS SHOWN IN TABLE E

[83] MAKE ENTRIES IN FCC TECHNICAL LOG IF REQUIRED

MAIN POWER ON,
A.C. POWER, HIGH
VOLTAGE, AND
REMOTE LAMPS LIGHTED.
SEE NOTE 10

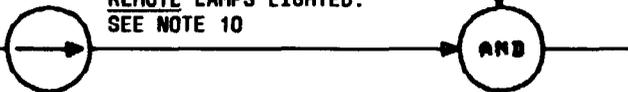


TABLE E		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE
* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE		

NOTE 10
FOR MAIN POWER ON, USE TAD-134.
FOR A.C. POWER, USE TAD-118.
FOR HIGH VOLTAGE, USE TAP-119.
FOR REMOTE, USE TAD-124

TEST TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING,
TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY
POWER COMMANDS

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SUMMARY
 USE ROUTINER TEST SET (RTS) AND SIGNAL STANDBY TRANSMITTER TO ADVANCE FREQUENCY UNTIL ALL FOUR CHANNELS HAVE BEEN SELECTED. SET TRANSMITTER TO DESIRED CHANNEL AND RETURN TO SERVICE

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1

[2] SET SWITCHES ON TRANSMITTER TO POSITION SHOWN IN TABLE A

[3] IS THIS TEST BEING PERFORMED AT TRANSMITTER OR FOR CONTROL TERMINAL

[4] NOTIFY CONTROL TERMINAL READY FOR TEST

[5] REPORT CONDITION OF TRANSMITTER TO CONTROL TERMINAL AS REQUIRED

[6] MAKE ENTRY IN FCC TECHNICAL LOG IF REQUIRED

NOTE 1
 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TABLE A	
SWITCH	POSITION
MAIN POWER	ON
REGULATOR	ON
HIGH VOLTAGE	*ON
TRANSMIT MODE	REM.
EMERG. POWER	REMOTE
CHANNEL SELECTOR	REM.
* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE	

PAGE 2

TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

SUMMARY
 USE ROUTINER TEST SET (RTS) AND SIGNAL STANDBY TRANSMITTER TO ADVANCE FREQUENCY UNTIL ALL FOUR CHANNELS HAVE BEEN SELECTED. SET TRANSMITTER TO DESIRED CHANNEL AND RETURN TO SERVICE

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1

[2] SET SWITCHES ON TRANSMITTER TO POSITION SHOWN IN TABLE A

[3] IS THIS TEST BEING PERFORMED AT TRANSMITTER OR FOR CONTROL TERMINAL

[4] NOTIFY CONTROL TERMINAL READY FOR TEST

[5] REPORT CONDITION OF TRANSMITTER TO CONTROL TERMINAL AS REQUIRED

[6] MAKE ENTRY IN FCC TECHNICAL LOG IF REQUIRED

NOTE 1
 FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TABLE A	
SWITCH	POSITION
MAIN POWER	ON
REGULATOR	ON
HIGH VOLTAGE	*ON
TRANSMIT MODE	REM.
EMERG. POWER	REMOTE
CHANNEL SELECTOR	REM.
* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE	

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CONTROL TERMINAL

TRANSMITTER

TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

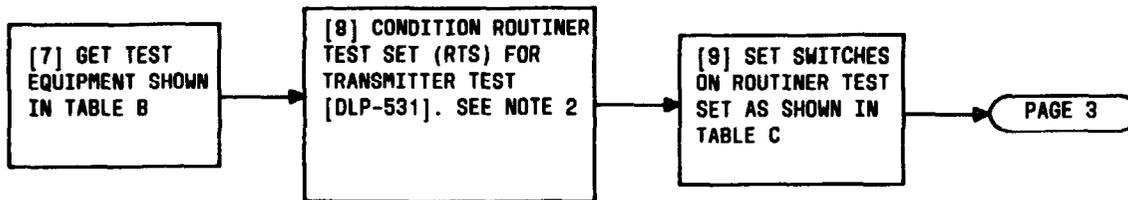


TABLE B	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
ROUTINER TEST SET	KS-21277
2 898N RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 LINE TERMINATIONS	369A

TABLE C	
SWITCH	POSITION
EPO-FR ADV, NORMAL	EPO-FR ADV
FUNCTION*	XR
MON	OFF
SP	OFF
TRMTR	OFF
L NOR. H (3)	NOR.
* FUNCTION SWITCH IS NOT MARKED FUNCTION. IT IS LOCATED TOP CENTER OF FRONT PANEL	

NOTE 2
 IF RTS IS NOT AVAILABLE AT TRANSMITTER LOCATION, REQUEST CONTROL TERMINAL TO ASSIST TRANSMITTER TEST USING RTS AT CONTROL TERMINAL

TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

[10] SEE TABLE B. INSTALL TWO 369A PLUGS INTO VOICE LINE AND STATUS LINE JACKS ON TRANSMITTER

[11] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO FLDT IN JACK [FIG. 1]

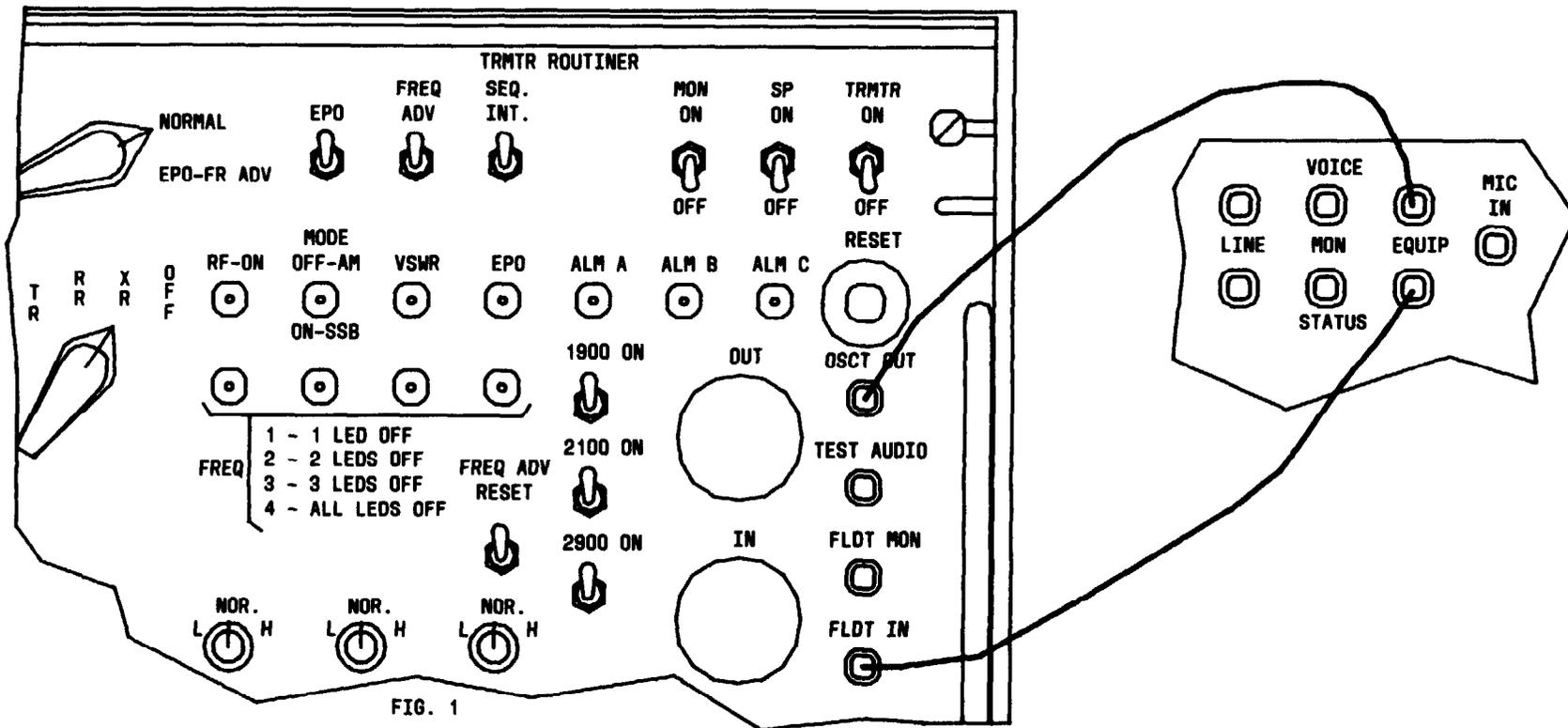
[12] ON TRANSMITTER, CONNECT OTHER END OF PATCH CORD INTO STATUS EQUIP JACK [FIG. 1]

[13] ON RTS, CONNECT ONE END OF P2B PATCH CORD INTO OSCT OUT JACK [FIG. 1]

[14] ON TRANSMITTER, CONNECT OTHER END OF PATCH CORD INTO VOICE EQUIP JACK [FIG. 1]

TEST
CONNECTIONS
COMPLETED

PAGE 4



TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

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[15] SEE NOTE 3. ON RTS, MOMENTARILY OPERATE
FREQ ADV RESET SWITCH UNTIL ALL FOUR
FREQUENCY LAMPS ON THE RTS ARE LIGHTED
[FIG. 1]

[16] ON RTS, MOMENTARILY DEPRESS RESET
PUSHBUTTON (LOCATED UPPER RIGHT)

[17] ON TRANSMITTER, OBSERVE CHANNEL
LAMPS [FIG. 2]

[18] ON RTS, MOMENTARILY OPERATE
FREQ ADV SWITCH

NOTE 3
DISREGARD ALL
LAMP INDICATIONS
NOT MENTIONED

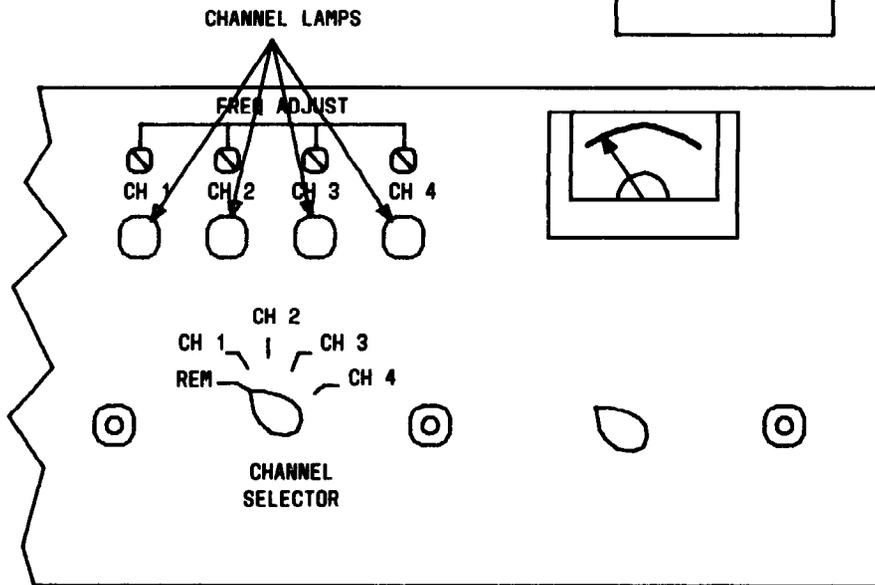


FIG. 2

**TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL
SIGNALING FREQUENCY ADVANCE COMMANDS**

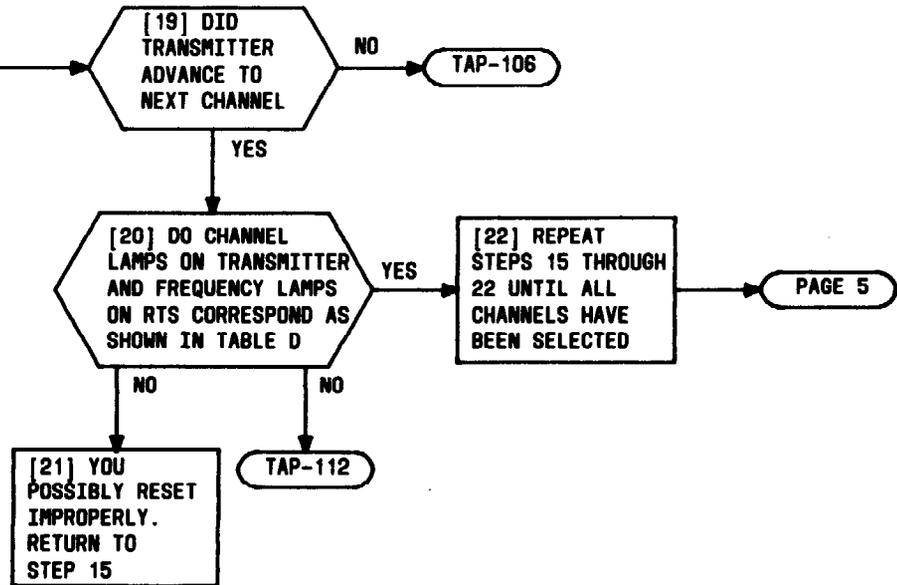
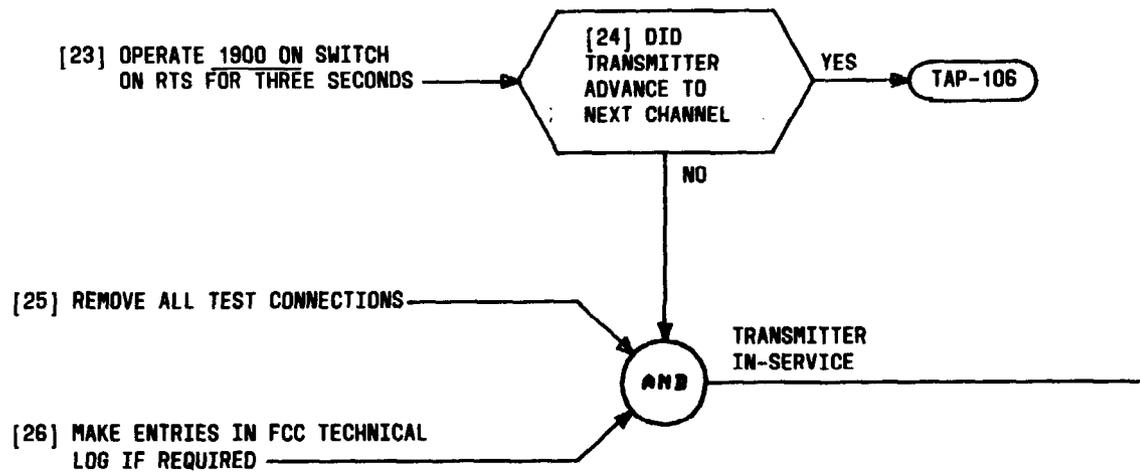


TABLE D	
ON TRANSMITTER	ON RTS
CH 1 LAMP LIGHTED	ONE FREQ LAMP EXTINGUISHED
CH 2 LAMP LIGHTED	TWO FREQ LAMPS EXTINGUISHED
CH 3 LAMP LIGHTED	THREE FREQ LAMPS EXTINGUISHED
CH 4 LAMP LIGHTED	FOUR FREQ LAMPS EXTINGUISHED



**TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL
SIGNALING FREQUENCY ADVANCE COMMANDS**

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SUMMARY

TERMINATE STATUS LINE AND VOICE LINE JACKS IN 600Ω. WITH HIGH VOLTAGE OFF. TERMINATE EXCITER OUTPUT WITH 50Ω 2-WATT RESISTOR. SET INHIBIT SWITCH TO TEST. CONNECT SPECTRUM ANALYZER TO RF MON JACK AND ADJUST R34 AND R60 FOR MINIMUM CARRIER AT OPERATING FREQUENCY. CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK WITH

OUTPUT AT 1000 HZ AND -19 DBM. CONNECT OSCILLOSCOPE TO RF MON JACK AND ADJUST C16 FOR MAXIMUM INDICATION. CONNECT OSCILLOSCOPE TO PIN 13 OF SECOND BALANCED MODULATOR BOARD AND ADJUST AF INPUT LEVEL FOR 90 MV (PEAK-TO-PEAK). TO ENSURE PROPER ALIGNMENT OF EXCITER, PERFORM DLP-519, THEN DLP-520. IF TRANSMITTER IS 4-CHANNEL, ALSO PERFORM DLP-521

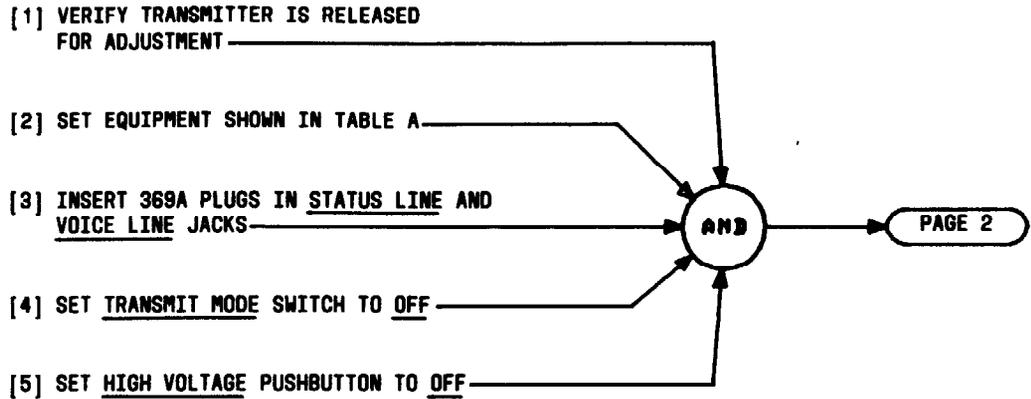
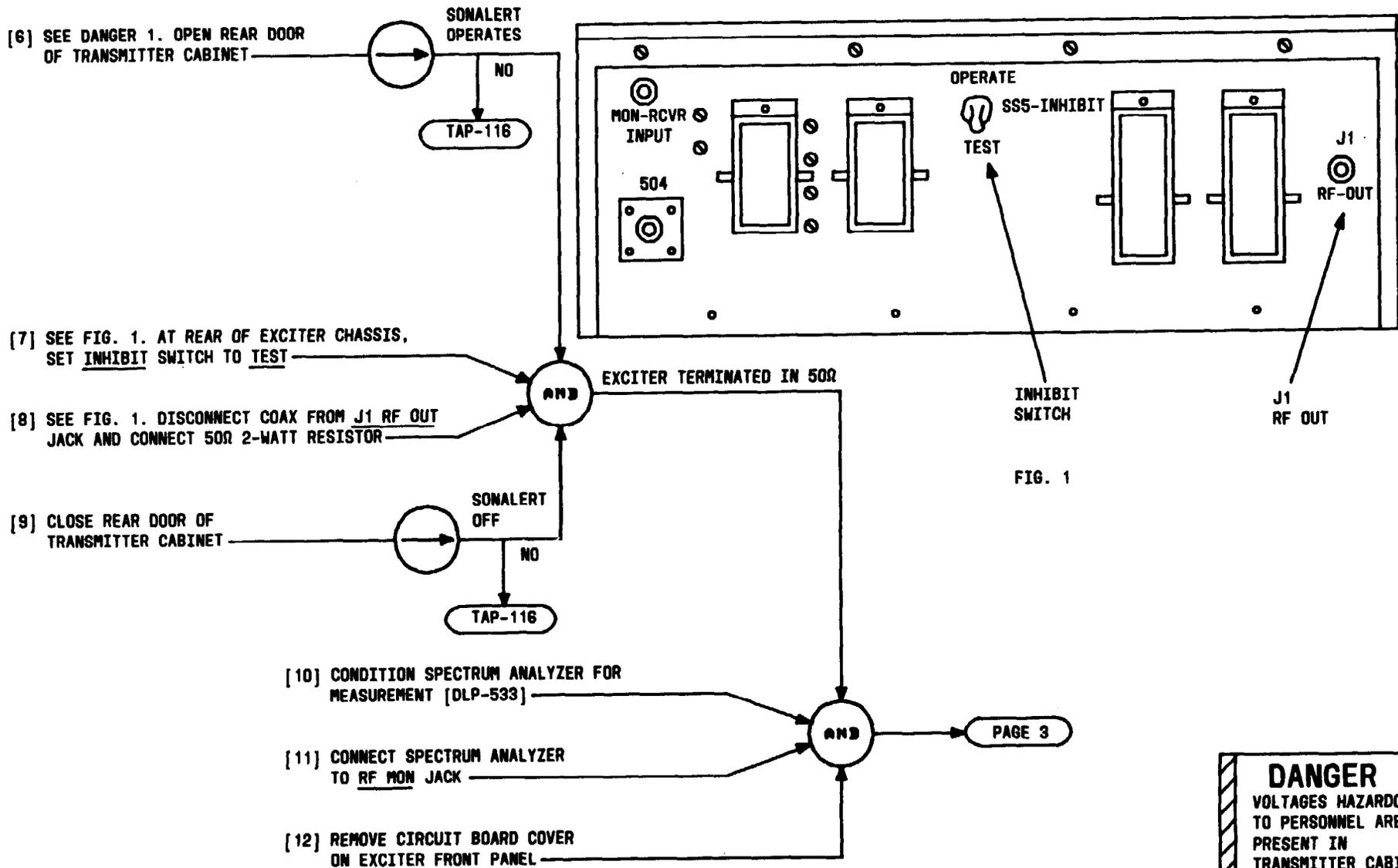


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
DUMMY LOAD	50 OHMS, 2 WATT WITH A BNC MALE CONNECTOR
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
OSCILLOSCOPE	TEKTRONIX MODEL 564B
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF
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ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

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ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

DANGER 1
 VOLTAGES HAZARDOUS
 TO PERSONNEL ARE
 PRESENT IN
 TRANSMITTER CABINET

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[13] SEE FIG. 2. ON AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD (NO. 10), LOCATE R34 AND R60 POTENTIOMETERS

[14] SET TRANSMIT MODE SWITCH TO A3J

[15] OBSERVE SPECTRUM ANALYZER AND ALTERNATELY ADJUST R34 AND R60 FOR MINIMUM CARRIER AT OPERATING FREQUENCY. SEE NOTE

[16] CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528]

[17] CONDITION AC VTVM FOR MEASUREMENT [DLP-537]

[18] USE VTVM AND SET AUDIO OSCILLATOR FOR 1000 HZ AND OUTPUT LEVEL OF -19 DBM

[19] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

R34 AND R60 ADJUSTED

AND

AND

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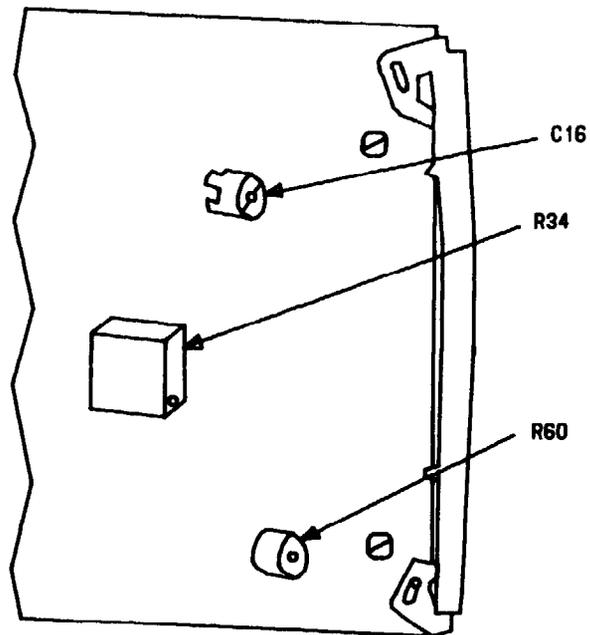


FIG. 2

NOTE
IT MAY BE DIFFICULT TO DETECT THE MINIMUM. IF SO, SET BOTH R34 AND R60 TO MIDRANGE

ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

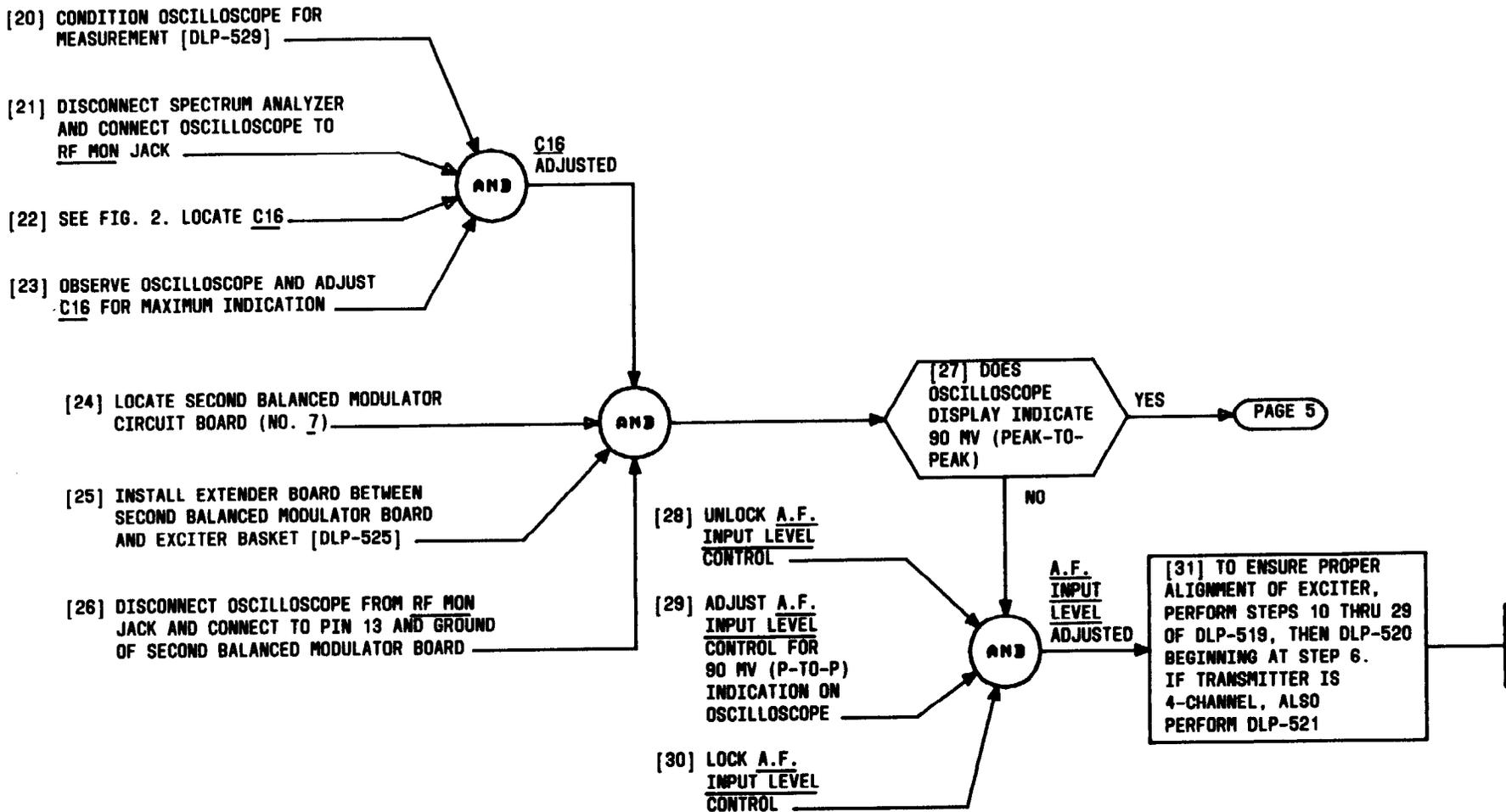
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ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

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SUMMARY

FOR 1.5-MHZ FREQUENCY ADJUSTMENT, PERFORM DLP-501, STEPS 1 THROUGH 16. FOR CARRIER REINSERTION, CONNECT OSCILLOSCOPE TO PIN 9 OF SECOND BALANCED MODULATOR BOARD AND ADJUST R23 FOR 1.5V PEAK-TO-PEAK. SET AUDIO OSCILLATOR FOR 1000 HZ AT -19 DBM AT VOICE EQUIP JACK. CONNECT OSCILLOSCOPE TO PIN 13 AND ADJUST AF INPUT LEVEL FOR 90 MV (PP). SET AUDIO OSCILLATOR FOR -16

DBM. WITH SPECTRUM ANALYZER AT RF MON JACK, ADJUST R57 ON SECOND BALANCED MODULATOR BOARD FOR EQUAL AMPLITUDE OF CARRIER AND SIDEBAND. WITH A3H REFERENCE, ADJUST R26 IN A3A 10 DB BELOW REFERENCE. FOR RF ON SENSITIVITY, WITH VTVM CONNECTED TO PIN 5 OF 1.5-MHZ OSCILLATOR/RF ON BOARD, ADJUST R1 FOR 10-WATTS ON PUBLIC CORRESPONDENCE TRANSMITTERS OR ADJUST R1 FOR 100-WATTS ON SAFETY AND CALLING TRANSMITTER.

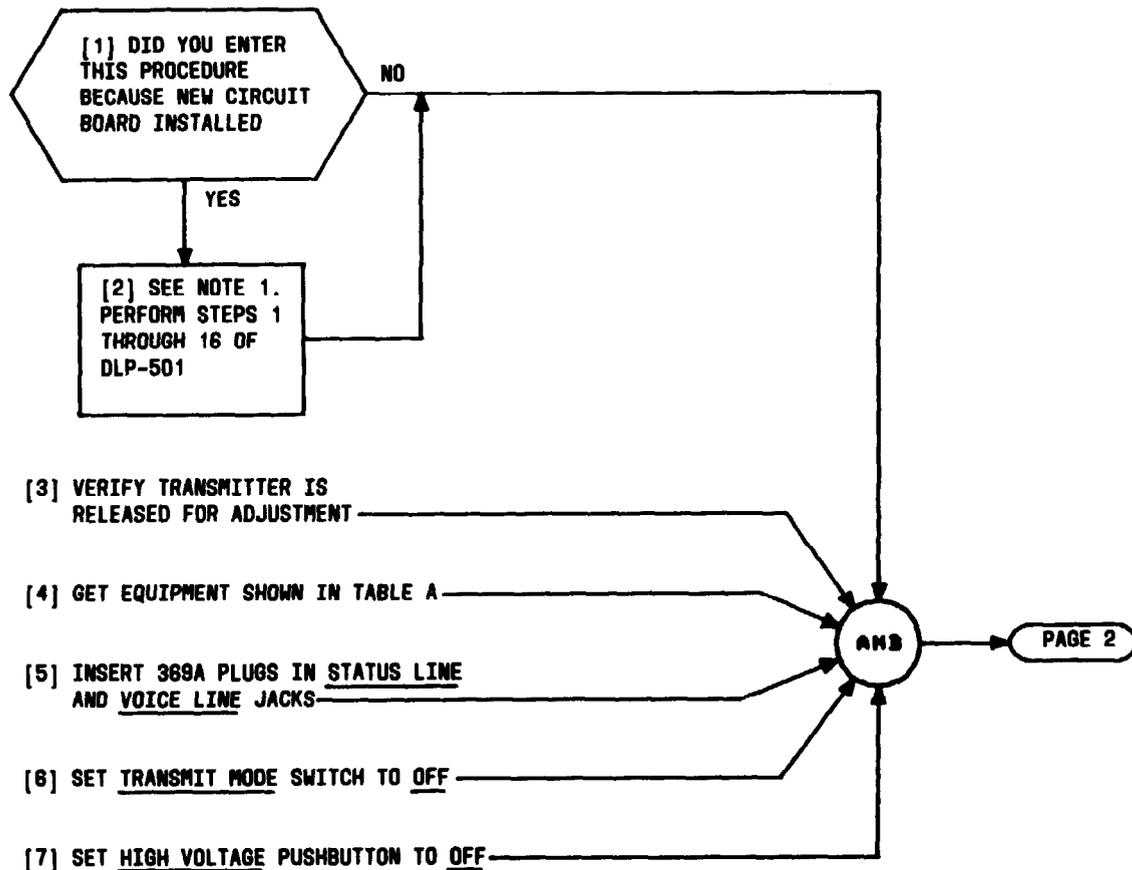


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRU LINE	BIRD MODEL 43 WITH 250H ELEMENT AND 50H ELEMENT
TOOL KIT	
OSCILLOSCOPE	TEKTRONIX MODEL 564B
AC VTVM *	HP MODEL 400D
AUDIO OSCILLATOR *	HP MODEL 200CD
SPECTRUM ANALYZER *	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF
* CXR REIN ADJUSTMENT ONLY	

NOTE 1
THERE ARE THREE CIRCUITS ON THIS BOARD. WHEN NEW BOARD IS INSTALLED, ALL THREE CIRCUITS SHOULD BE CHECKED AND ADJUSTED IF NECESSARY

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ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

[8] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[9] SEE FIG. 1. CONNECT IN-LINE WATTMETER TO TRANSMITTER FILTER OUTPUT

[10] SEE FIG. 1. CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER

[11] REMOVE CIRCUIT BOARD COVER ON EXCITER FRONT PANEL

[14] INSTALL EXTENDER BOARD BETWEEN SECOND BALANCED MODULATOR BOARD (NO. 7) AND EXCITER BASKET [DLP-525]

[15] CONDITION OSCILLOSCOPE FOR MEASUREMENT [DLP-529]

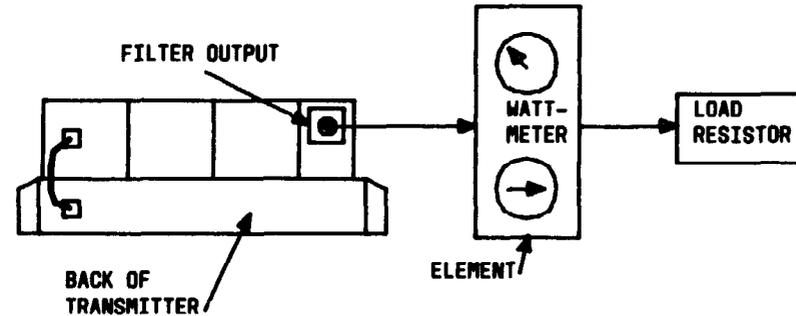
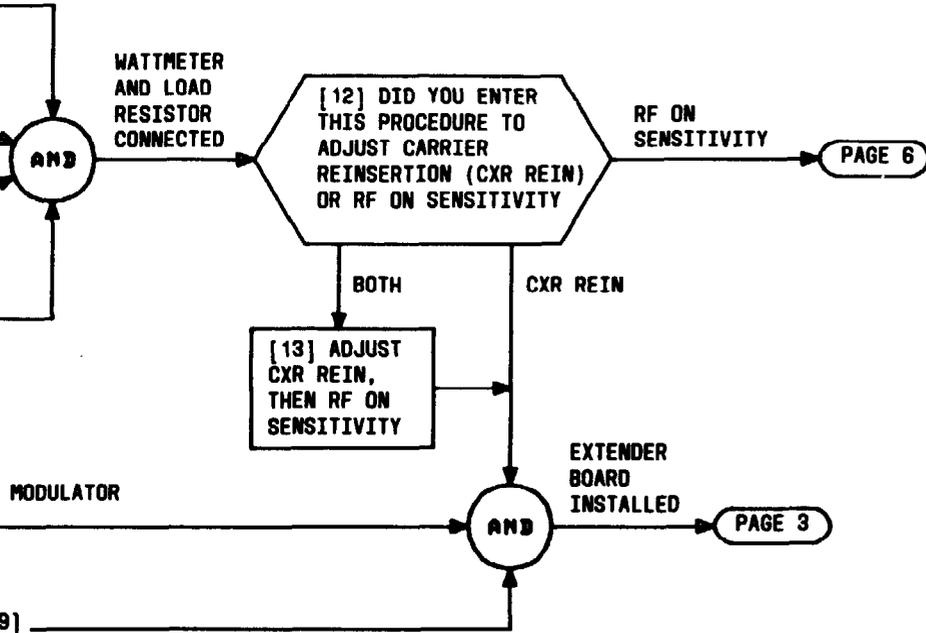


FIG. 1

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

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- [16] CONNECT OSCILLOSCOPE BETWEEN PIN 9 OF SECOND BALANCED MODULATOR BOARD AND GROUND
- [17] SET TRANSMIT MODE SWITCH TO A3H AND HIGH VOLTAGE PUSHBUTTON TO ON
- [18] SEE FIG. 2. LOCATE R23 ON 1.5-MHZ OSCILLATOR/RF ON BOARD
- [19] OBSERVE OSCILLOSCOPE AND ADJUST R23 FOR 1.5V PEAK-TO-PEAK OR POTENTIOMETER STOP (WHICHEVER IS FIRST)

R23 A3H CARRIER REINSERTION LEVEL ADJUSTED

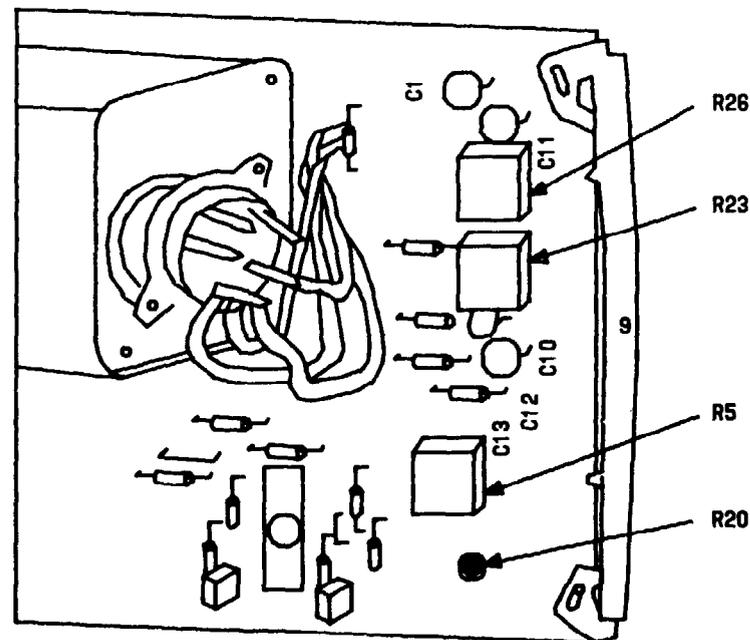


FIG. 2

- [20] CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528]
- [21] CONDITION AC VTVM FOR MEASUREMENT [DLP-537]
- [22] USE VTVM AND SET AUDIO OSCILLATOR FOR 1000 HZ AND OUTPUT LEVEL OF -19 DBM
- [23] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

AUDIO OSCILLATOR CONNECTED

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ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

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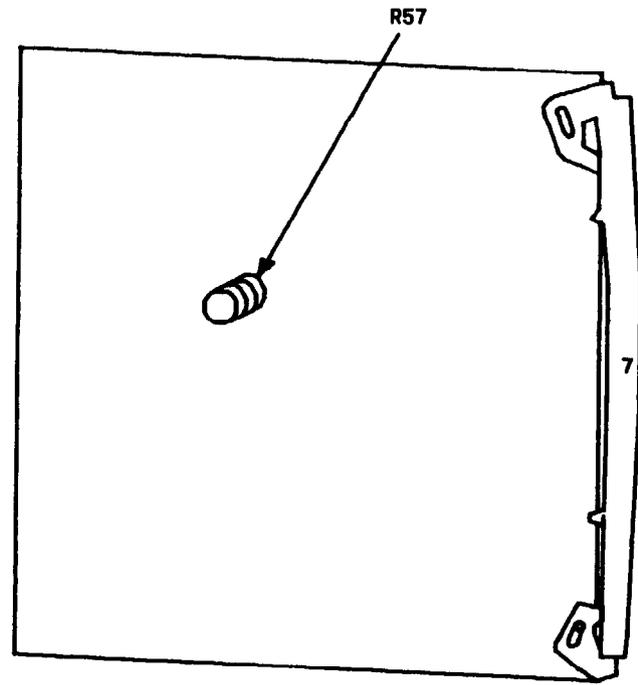
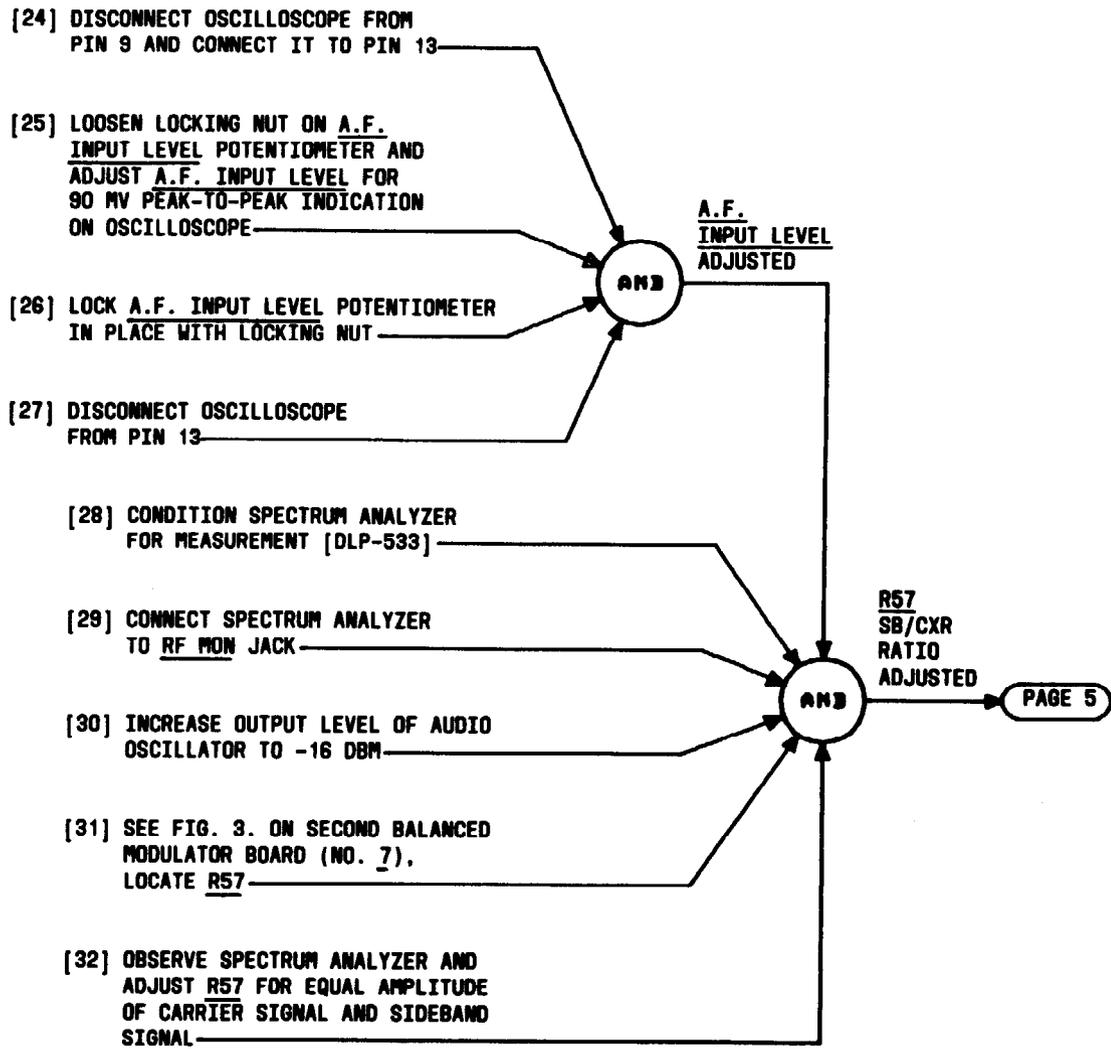


FIG. 3

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

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[33] DISCONNECT AUDIO OSCILLATOR FROM VOICE EQUIP JACK

[34] REMOVE EXTENDER BOARD AND INSTALL SECOND BALANCED MODULATOR BOARD IN ITS POSITION [DLP-525]

[35] ON SPECTRUM ANALYZER, ESTABLISH A DB REFERENCE OF A3H MODE

[36] SET TRANSMIT MODE SWITCH TO A3A

[37] SEE FIG. 2. LOCATE R26 ON 1.5-MHZ OSCILLATOR/RF ON BOARD

[38] OBSERVE SPECTRUM ANALYZER AND ADJUST R26 FOR CARRIER LEVEL OF 10 DB BELOW A3H REFERENCE ESTABLISHED IN STEP 35. SEE EXAMPLE AND NOTE 2

AUDIO OSCILLATOR AND EXTENDER BOARD REMOVED

AND

R26 A3A CARRIER REINSERTION LEVEL ADJUSTED

[39] DO YOU INTEND TO MAKE RF ON SENSITIVITY ADJUSTMENT

YES

PAGE 6

NO

[40] SET TRANSMIT MODE SWITCH TO REM

PAGE 9, STEP 72

EXAMPLE
A3H NO TONE - 10 DB
A3A NO TONE - 20 DB

NOTE 2
IT MAY BE NECESSARY TO SWITCH BETWEEN A3H AND A3A MODES TO ESTABLISH THE REFERENCE

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ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

[41] INSTALL EXTENDER BOARD BETWEEN
1.5-MHZ OSCILLATOR/RF ON BOARD
AND EXCITER BASKET [DLP-525]

[42] SET HIGH VOLTAGE PUSHBUTTON TO ON

[43] CONDITION VTVM FOR
MEASUREMENT [DLP-537]

[44] CONNECT VTVM TO PIN 5 OF
1.5-MHZ OSCILLATOR/RF ON BOARD

AND

[45] IS SYSTEM
PUBLIC
CORRESPONDENCE
OR SAFETY AND
CALLING

SSC

PAGE 8

PC

[46] SET TRANSMIT MODE SWITCH TO A3A

[47] SEE WARNING. INSTALL 50H ELEMENT
INTO IN-LINE WATTMETER

[48] SEE FIG. 4. LOCATE R1 ON TUNED
AMPLIFIER/WIDEBAND AMPLIFIER BOARD

[49] OBSERVE IN-LINE WATTMETER AND ADJUST
R1 FOR 5-WATT INDICATION

[50] SET TRANSMIT MODE SWITCH TO REM.

[51] ADJUST R20 FULLY CW

AND

PAGE 7

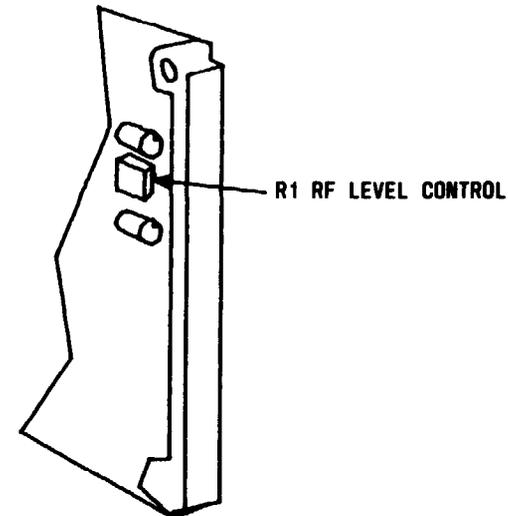


FIG. 4

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

WARNING

50H ELEMENT COULD
BE DAMAGED IF
TRANSMIT MODE IS
SET TO A3H

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[52] USE VTVM AND SET AUDIO OSCILLATOR
FOR 2900-HZ OUTPUT LEVEL OF
-26 DBM

[53] CONNECT AUDIO OSCILLATOR TO
VOICE EQUIP JACK

TRANSMITTER ON
LAMP LIGHTS

[54] OBSERVE VTVM AND ADJUST R20 SLOWLY
CCW UNTIL VOLTAGE INDICATION DROPS
TO ZERO

TRANSMITTER ALARM
LAMP LIGHT WITHIN
2 SECONDS

[55] OBSERVE IN-LINE WATTMETER AND ADJUST
R1 FOR 10-WATT INDICATION

[56] REMOVE 2900-HZ TONE MOMENTARILY FROM
VOICE EQUIP JACK AND THEN REAPPLY
TONE

TRANSMITTER ALARM
LAMP GOES OUT

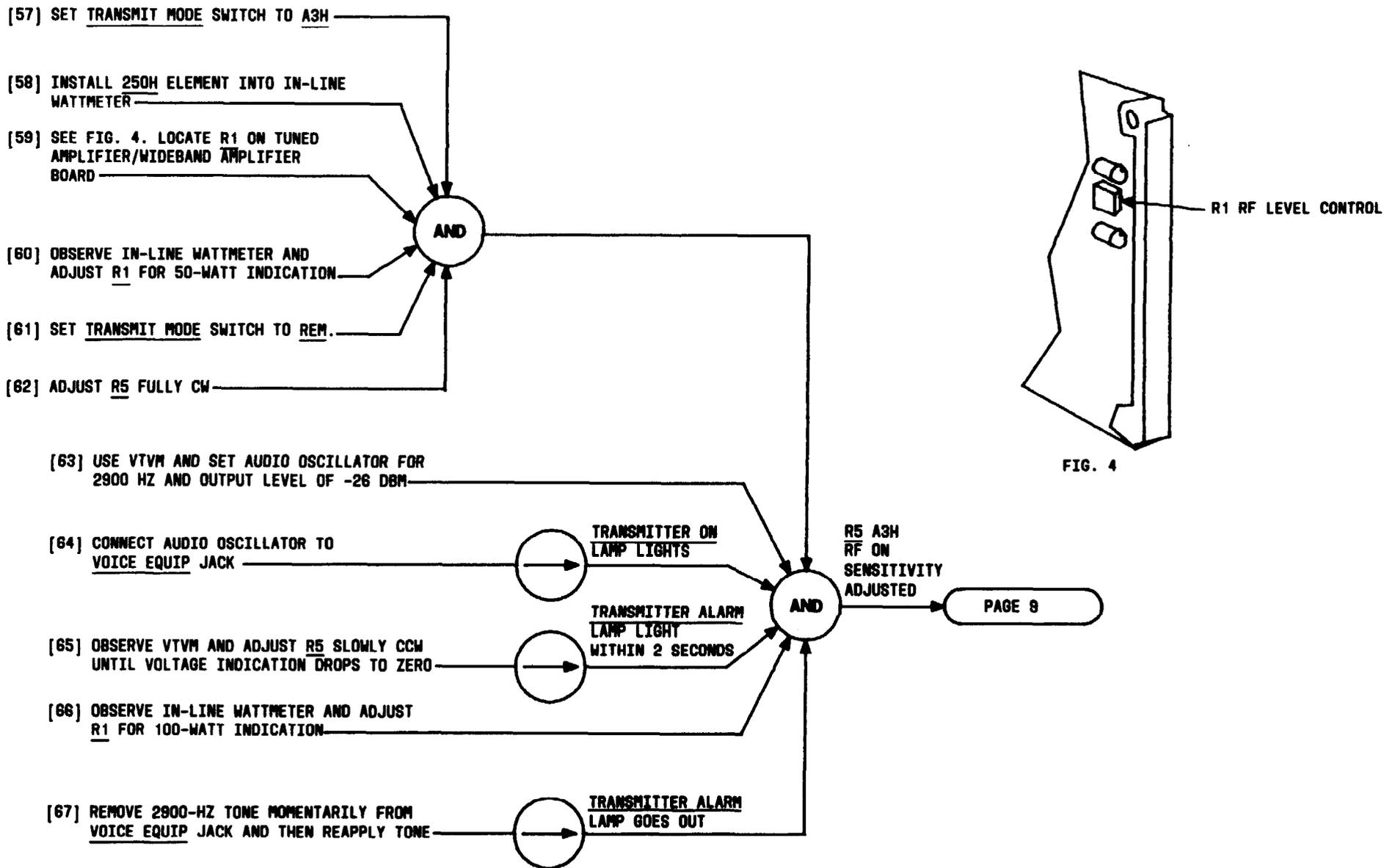
AND

R20 A3A RF ON
SENSITIVITY
ADJUSTED

PAGE 9

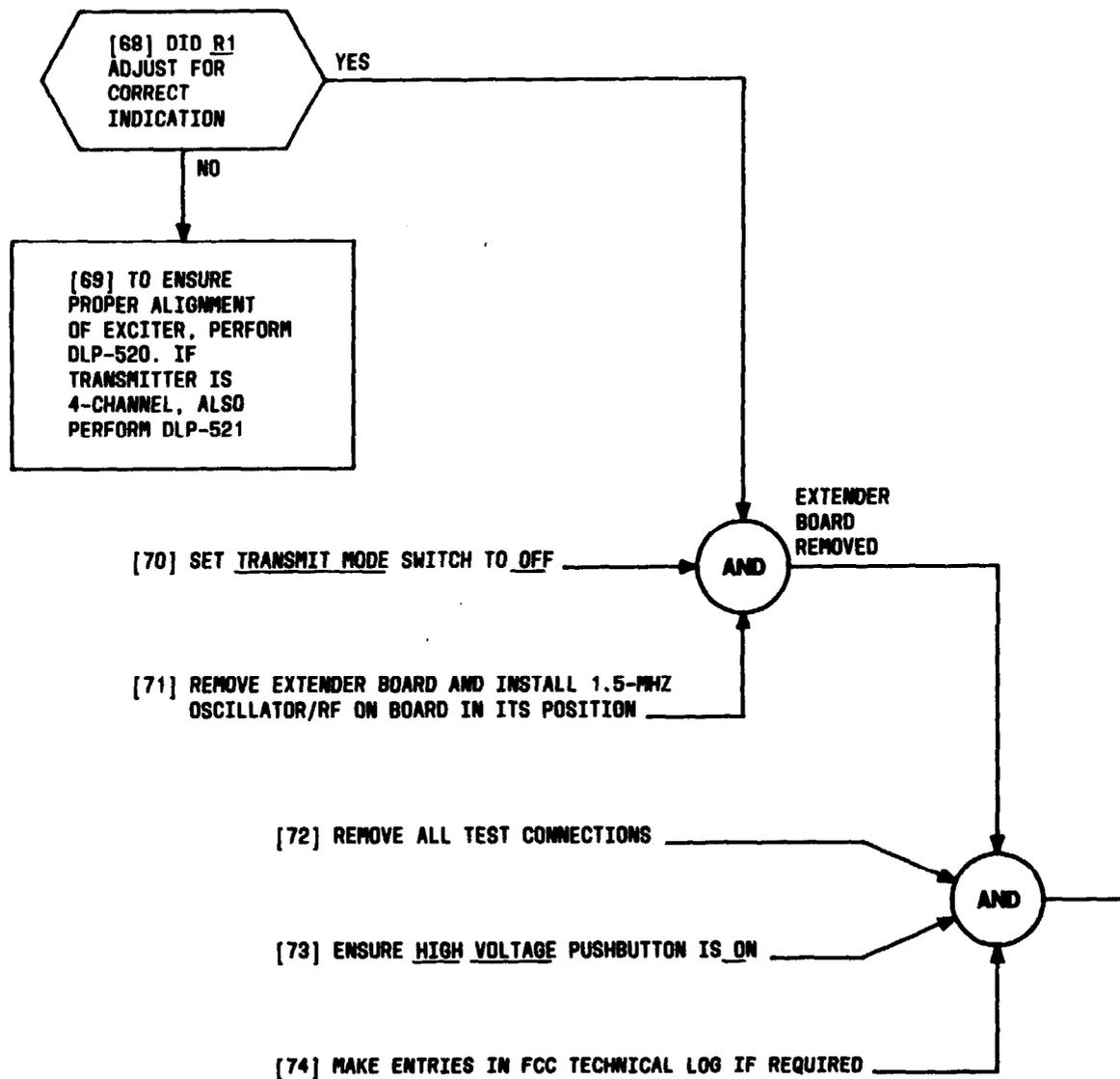
ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

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ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

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ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

SUMMARY

TERMINATE EXCITER OUTPUT IN 50Ω. CONNECT SPECTRUM ANALYZER TO RF MON JACK AND ADJUST R25 FOR MINIMUM HFO INDICATION. ADJUST C12 AND C32 FOR MAXIMUM CARRIER AMPLITUDE. CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK WITH 1000 HZ AND OUTPUT LEVEL OF -16 DBM. ADJUST R57 FOR EQUAL AMPLITUDE OF CARRIER SIGNAL AND SIDEBAND SIGNAL

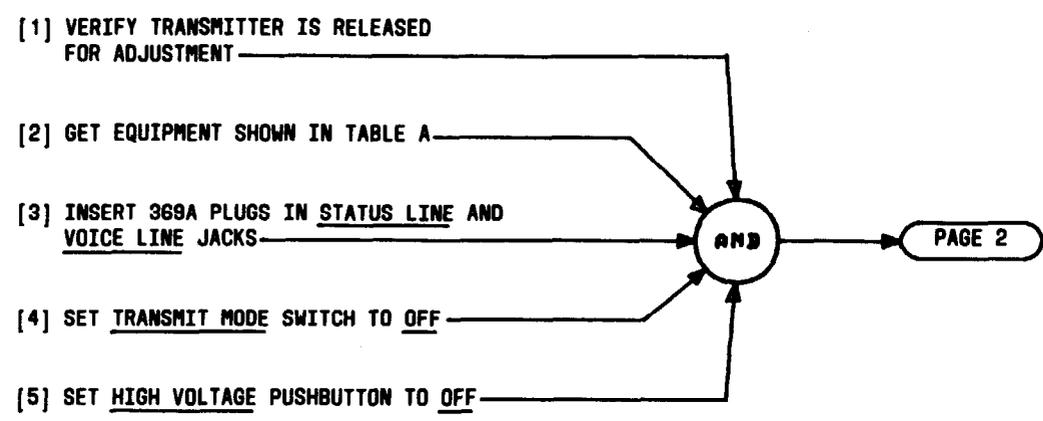
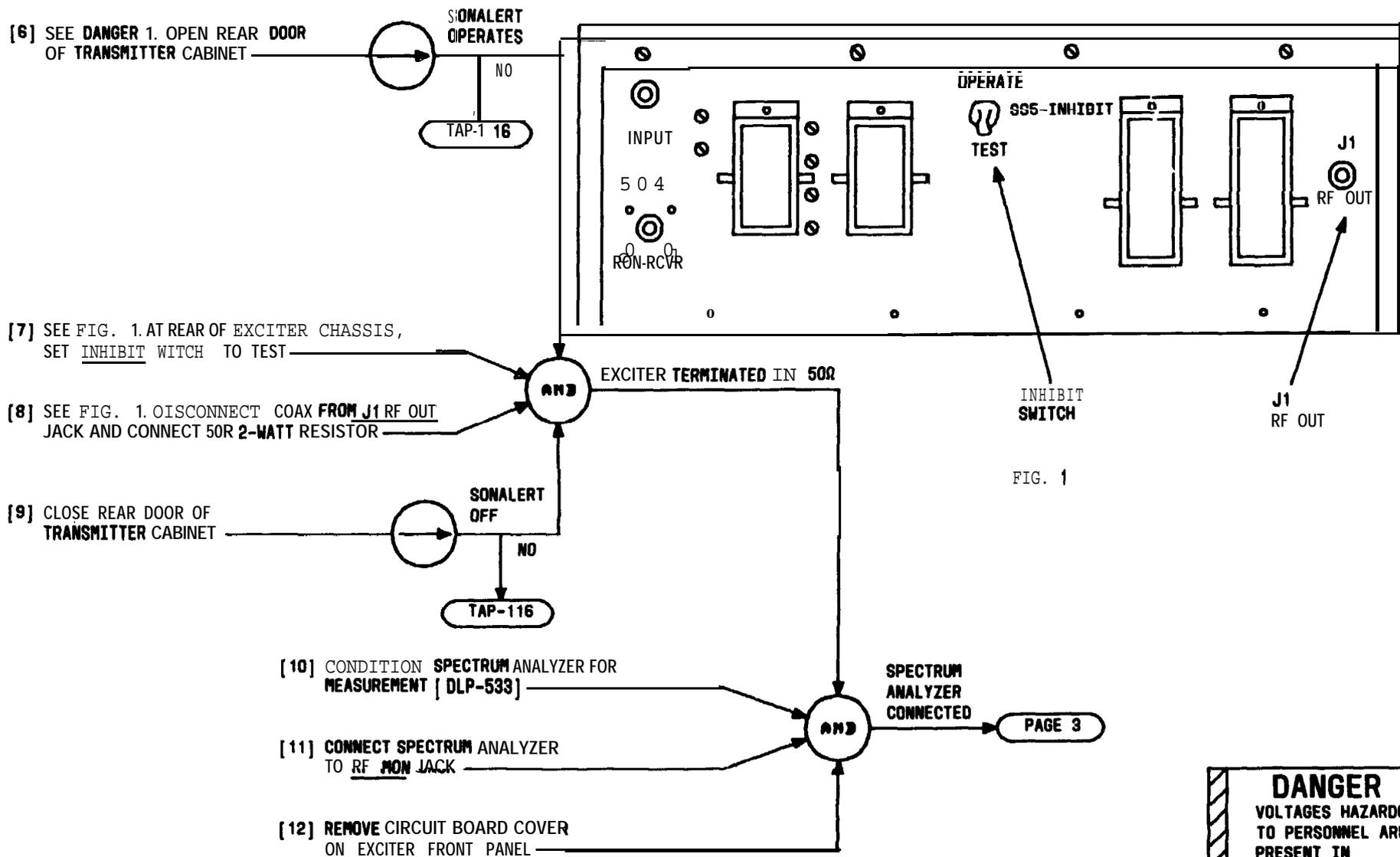


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
DUMMY LOAD	50 OHMS, 2 WATTS WITH BNC MALE CONNECTOR
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF
2 TERMINATIONS, STANDARD	369A

ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD



DANGER 1	
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET	
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[13] INSTALL EXTENDER BOARD BETWEEN SECOND BALANCED ROULATOR BOARD AND EXCITER BASKET [DLP-525]

[14] SET TRANSMIT MODE SWITCH TO A3H

[15] SEE FIG. 2. LOCATE C12, C32, AND R25 ON SECOND BALANCED NOOULATOR BOARD

[16] OBSERVE SPECTRUM ANALYZER AND ADJUST C12 AND C32 FOR MAXIMUM CARRIER AMPLITUDE

[17] OBSERVE SPECTRUM ANALYZER AND ADJUST R25 FOR MINIMUM HFO SIGNAL AMPLITUDE. SEE NOTE

EXTENDER BOARD,
INSTALLED AND
R25 ADJUSTED FOR
MINIMUM HFO

PAGE 4

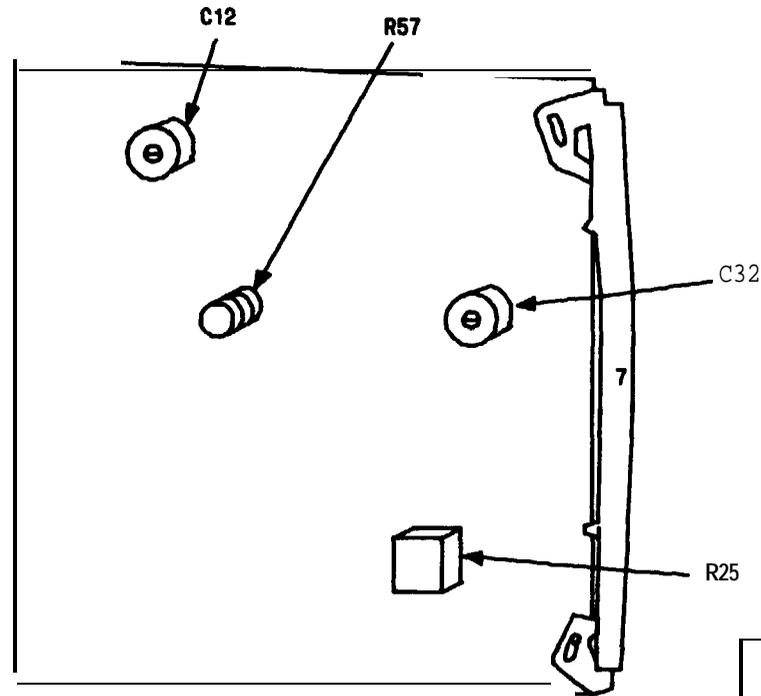


FIG. 2

NOTE	
HFO SIGNAL WILL APPEAR 1.5 MHZ TO RIGHT OF CARRIER SIGNAL AND MAY NOT BE PRESENT	
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ADJUST **SECOND** BALANCED MODULATOR **CIRCUIT** BOARD

[13] INSTALL EXTENDER BOARD BETWEEN SECOND BALANCED MODULATOR BOARD AND EXCITER BASKET [DLP-525]

[14] SET TRANSMIT MODE SWITCH TO A3H

[15] SEE FIG. 2. LOCATE C12, C32, AND R25 ON SECOND BALANCED MODULATOR BOARD

[16] OBSERVE SPECTRUM ANALYZER AND ADJUST C12 AND C32 FOR MAXIMUM CARRIER AMPLITUDE

[17] OBSERVE SPECTRUM ANALYZER AND ADJUST R25 FOR MINIMUM HFO SIGNAL AMPLITUDE. SEE NOTE

EXTENDER BOARD
INSTALLED AND
R25 ADJUSTED FOR
MINIMUM HFO

PAGE 4

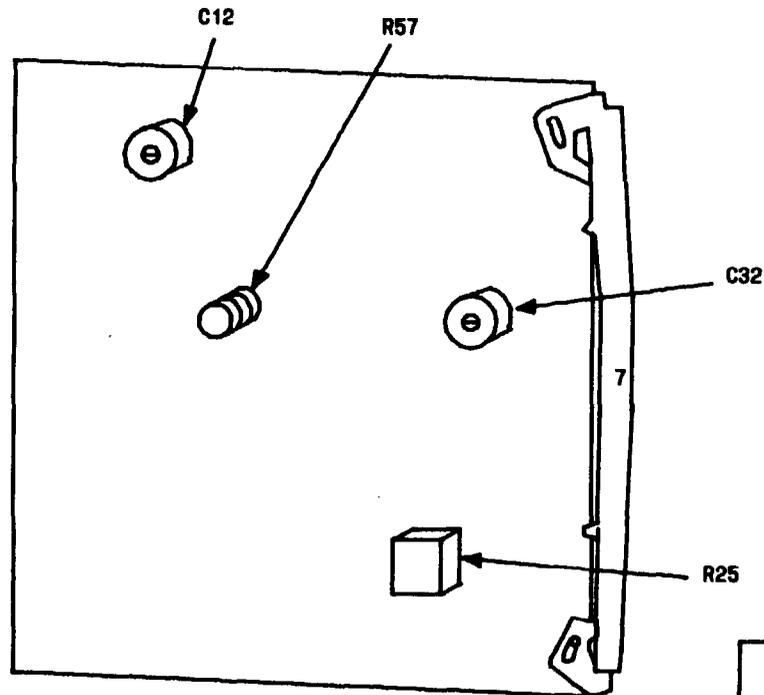


FIG. 2

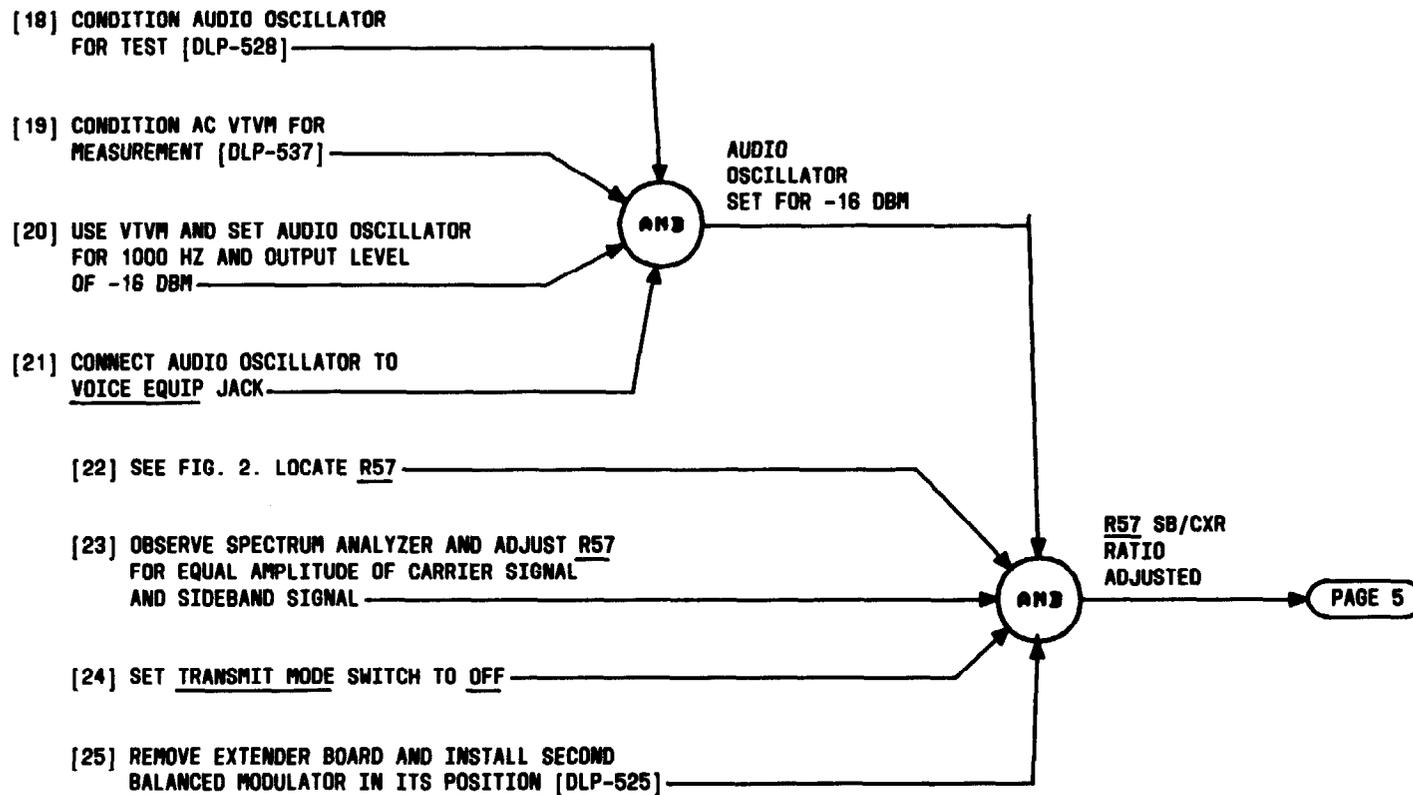
NOTE
HFO SIGNAL WILL APPEAR
1.5 MHZ TO RIGHT OF
CARRIER SIGNAL AND MAY
NOT BE PRESENT

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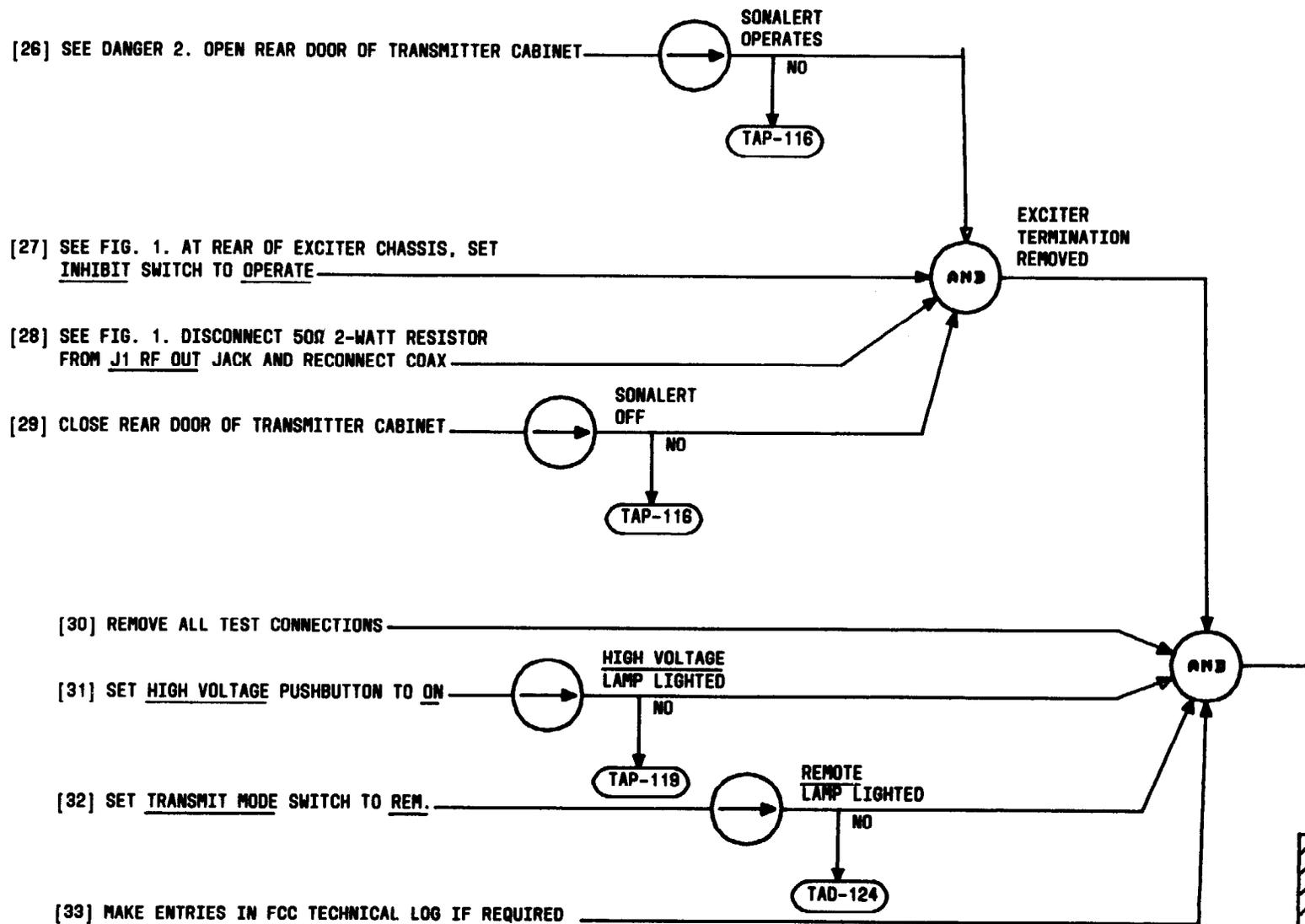
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ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD



ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD

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DANGER 2	
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET	
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ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD

SUMMARY

CONNECT WATTMETER AND LOAD RESISTOR TO FILTER OUTPUT AND SPECTRUM ANALYZER TO RF MON JACK. ADJUST C26 AND C28 ON CIRCUIT BOARD NO. 6 (TUNED/WIDEBAND AMPLIFIER) FOR MAXIMUM CARRIER AMPLITUDE. CONNECT AUDIO

OSCILLATOR TO VOICE EQUIP JACK WITH 1000 HZ AND OUTPUT LEVEL OF -16 DBM. ADJUST IPA TUNE AND PLATE TUNE FOR MAXIMUM INDICATION ON WATTMETER. ADJUST R1 RF LEVEL CONTROL FOR 162.5 WATTS (400 WATTS PEP).

- [1] VERIFY TRANSMITTER IS RELEASED FOR ADJUSTMENT _____
- [2] GET EQUIPMENT SHOWN IN TABLE A _____
- [3] INSERT 369A PLUGS INTO STATUS LINE AND VOICE LINE JACKS _____
- [4] SET TRANSMIT MODE SWITCH TO OFF _____
- [5] SET HIGH VOLTAGE PUSHBUTTON TO OFF _____



1-CHANNEL

PAGE 2

4-CHANNEL

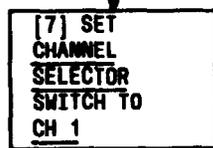


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRULINE	BIRD MODEL 43 WITH 250H ELEMENT
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 4000
AUDIO OSCILLATOR	HP MODEL 200C0
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

[8] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[9] SEE FIG. 1. CONNECT IN-LINE WATTMETER TO TRANSMITTER FILTER OUTPUT

[10] INSERT 250H ELEMENT INTO IN-LINE WATTMETER

[11] SEE FIG. 1. CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER

[12] CONDITION SPECTRUM ANALYZER FOR MEASUREMENT [DLP-533]

[13] CONNECT SPECTRUM ANALYZER TO RF MON JACK

[14] REMOVE CIRCUIT BOARD COVER ON EXCITER FRONT PANEL

[15] SET HIGH VOLTAGE PUSHBUTTON TO ON

[16] SET TRANSMIT MODE SWITCH TO A3J

WATTMETER AND LOAD RESISTOR CONNECTED

SPECTRUM ANALYZER CONNECTED

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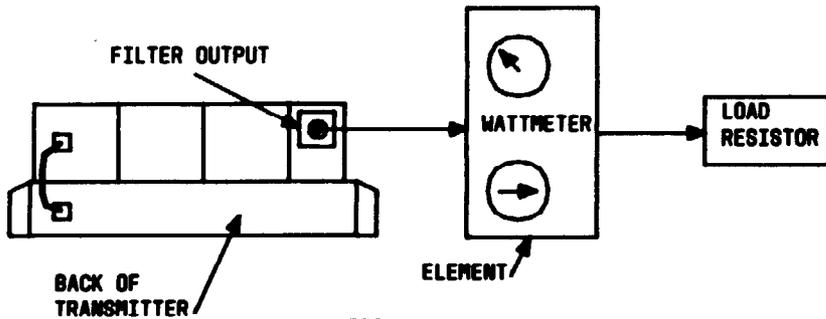


FIG. 1

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

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[17] SEE FIG. 2. LOCATE
C26 AND C28 ON TUNED/
WIDEBAND AMPLIFIER

[18] OBSERVE SPECTRUM ANALYZER AND
ADJUST C26 AND C28 FOR MAXIMUM
CARRIER AMPLITUDE

[19] CONDITION AUDIO OSCILLATOR
FOR TEST [DLP-528]

[20] CONDITION AC VTVM FOR
MEASUREMENT [DLP-537]

[21] USE VTVM AND SET AUDIO
OSCILLATOR FOR 1000 HZ
AND OUTPUT LEVEL OF
-16 DBM

[22] CONNECT AUDIO OSCILLATOR
TO VOICE EQUIP JACK

[23] SET TRANSMIT MODE SWITCH
TO A3H

C26 AND C28
ADJUSTED

ANS

AUDIO
OSCILLATOR
CONNECTED AND
SET FOR -16 DBM

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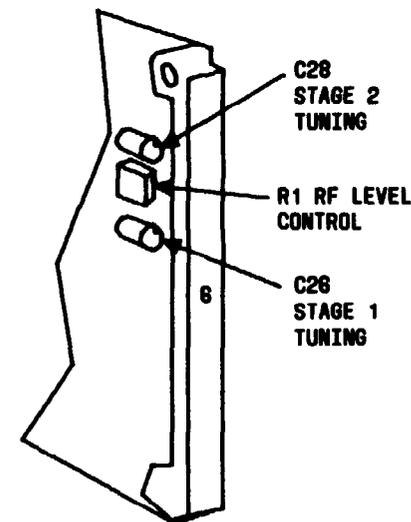


FIG. 2

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

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[24] SEE FIG. 2. OBSERVE WATTMETER AND ADJUST R1 CLOSE TO BUT NOT MORE THAN 162.5 WATTS (400 WATTS PEP)

[25] SEE FIG. 3. OBSERVE WATTMETER AND ADJUST IPA TUNE AND PLATE TUNE CONTROLS FOR MAXIMUM

[26] SEE NOTE. OBSERVE WATTMETER AND ADJUST R1 FOR 162.5 WATTS

NOTE
IT MAY BE NECESSARY TO REPEAT STEPS 24 THROUGH 26 SEVERAL TIMES TO GET THE EXPECTED INDICATION

[27] SET TRANSMIT MODE SWITCH TO OFF

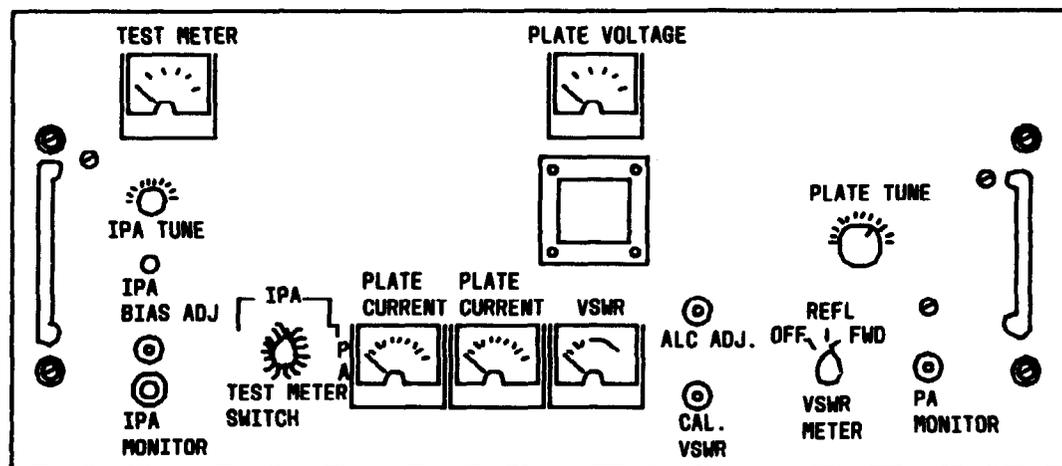
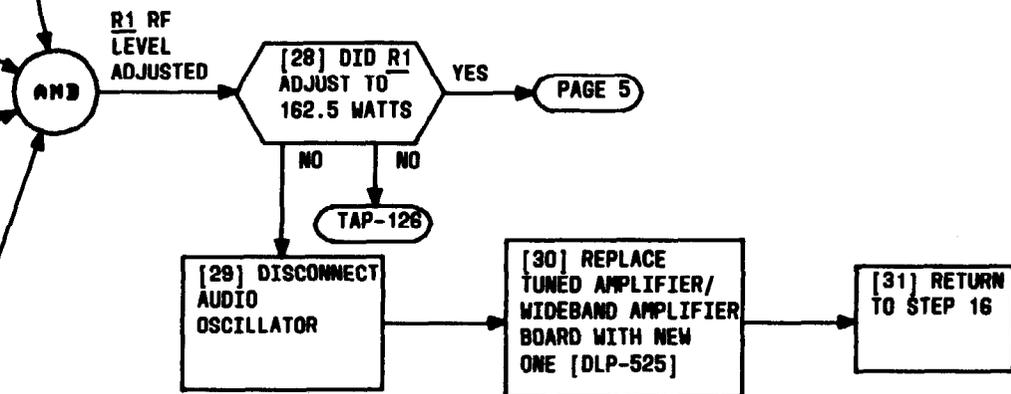
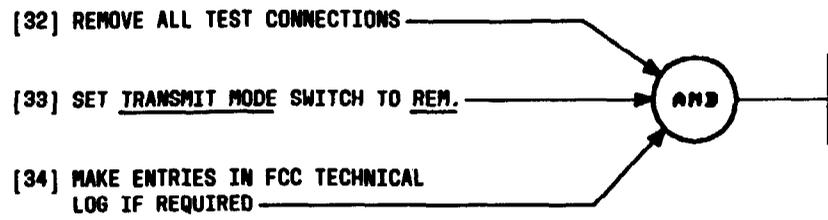


FIG. 3

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

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**ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER
CIRCUIT BOARD**

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SUMMARY
 CONNECT WATTMETER AND LOAD RESISTOR TO FILTER OUTPUT AND SPECTRUM ANALYZER TO RF MON JACK. CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK WITH 1000 HZ AND OUTPUT LEVEL OF -16 DBM. FOR CHANNEL 2, ADJUST C45 AND C44 FOR MAXIMUM CARRIER AMPLITUDE. ADJUST IPA TUNE AND PLATE TUNE FOR MAXIMUM

INDICATION ON WATTMETER. ADJUST R54 FOR 162.5 WATTS. FOR CHANNEL 3, ADJUST C43 AND C42 FOR MAXIMUM CARRIER AMPLITUDE. ADJUST IPA TUNE AND PLATE TUNE FOR MAXIMUM. ADJUST R53 FOR 162.5 WATTS. FOR CHANNEL 4, ADJUST C41 AND C40 FOR MAXIMUM. ADJUST IPA TUNE AND PLATE TUNE FOR MAXIMUM. ADJUST R52 FOR 162.5 WATTS

[1] VERIFY TRANSMITTER IS RELEASED FOR ADJUSTMENT _____

[2] GET EQUIPMENT SHOWN IN TABLE A _____

[3] INSERT 369A PLUGS INTO STATUS LINE AND VOICE LINE JACKS _____

[4] SET TRANSMIT MODE SWITCH TO OFF _____

[5] SET HIGH VOLTAGE PUSHBUTTON TO OFF _____

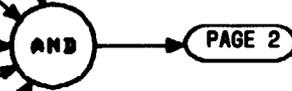


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRULINE	BIRD MODEL 43 WITH 250H ELEMENT
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

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[6] SEE FIG. 1. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[7] SEE FIG. 1. CONNECT IN-LINE WATTMETER TO TRANSMITTER FILTER OUTPUT

[8] INSERT 250H ELEMENT INTO IN-LINE WATTMETER

[9] SEE FIG. 1. CONNECT RF COAXIAL LOAD RESISTOR TO IN-LINE WATTMETER

WATTMETER AND LOAD RESISTOR CONNECTED

[10] CONDITION SPECTRUM ANALYZER FOR MEASUREMENT [DLP-533]

SPECTRUM ANALYZER CONNECTED

[11] CONNECT SPECTRUM ANALYZER TO RF MON JACK

PAGE 3

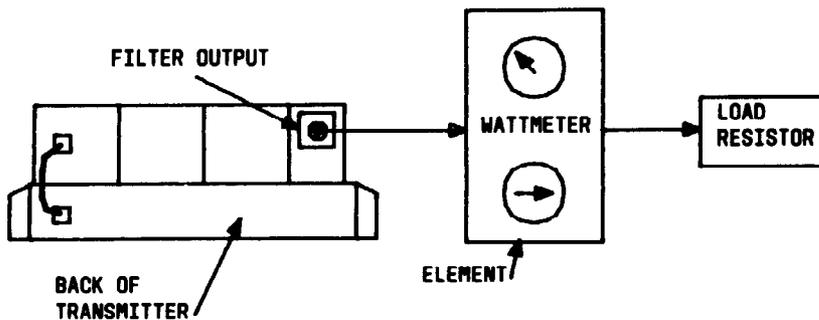
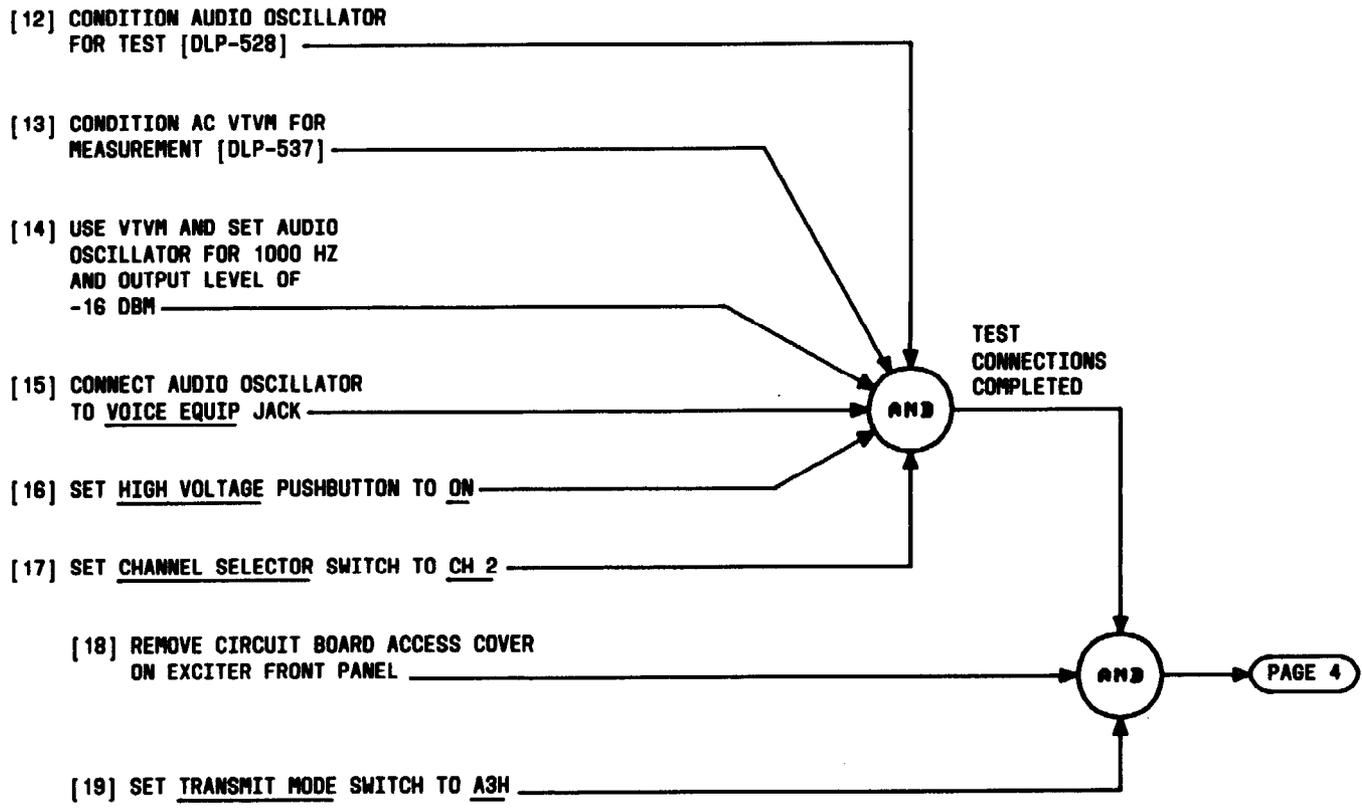


FIG. 1

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

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ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

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[20] SEE FIG. 2. LOCATE
C45, C44, AND R54

[21] OBSERVE SPECTRUM ANALYZER
AND ADJUST C45 AND C44 FOR
MAXIMUM CARRIER AMPLITUDE

[22] SEE FIG. 2. OBSERVE WATTMETER
AND ADJUST R54 CLOSE TO
BUT NOT MORE THAN 162.5 WATTS
(400 WATTS PEP)

[23] SEE FIG. 3. OBSERVE
WATTMETER AND ADJUST
IPA TUNE AND PLATE
TUNE CONTROLS FOR
MAXIMUM

[24] SEE NOTE 1. OBSERVE
WATTMETER AND ADJUST
R54 FOR 162.5 WATTS

[25] SET TRANSMIT MODE
SWITCH TO OFF

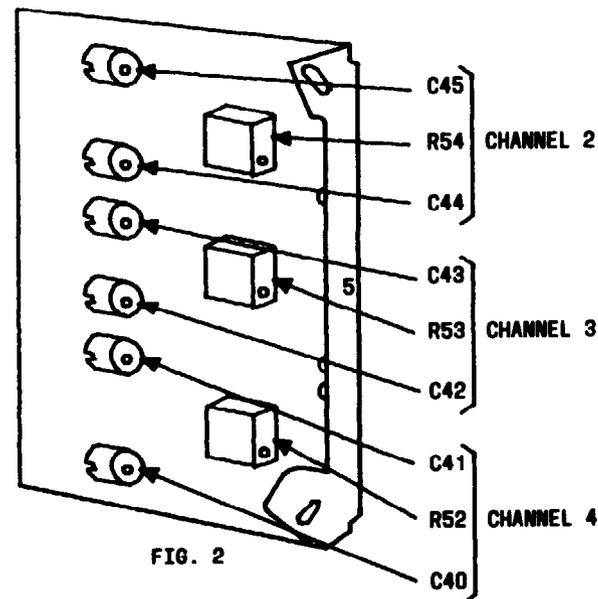
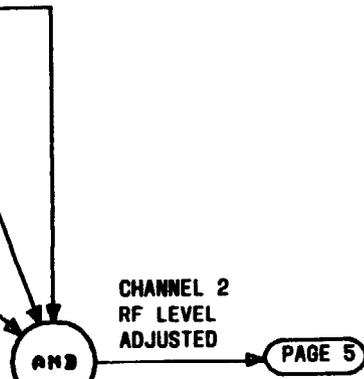


FIG. 2

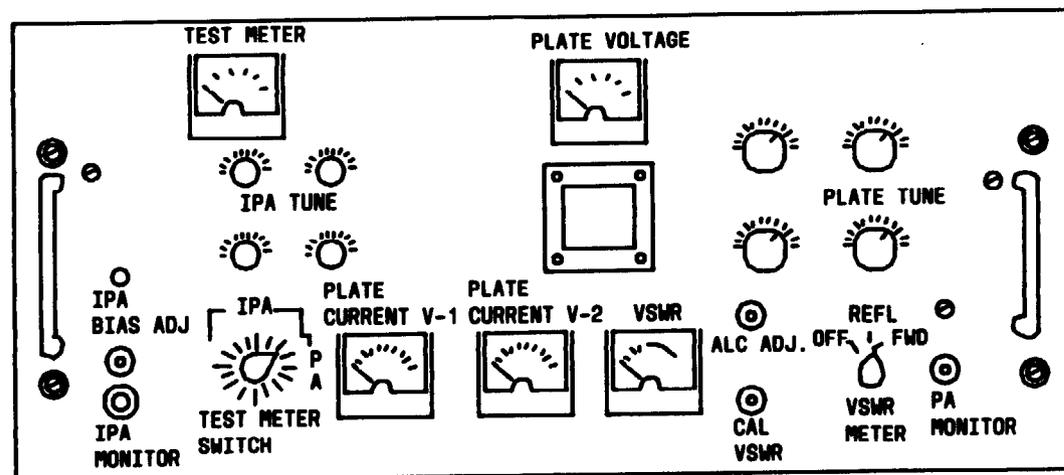
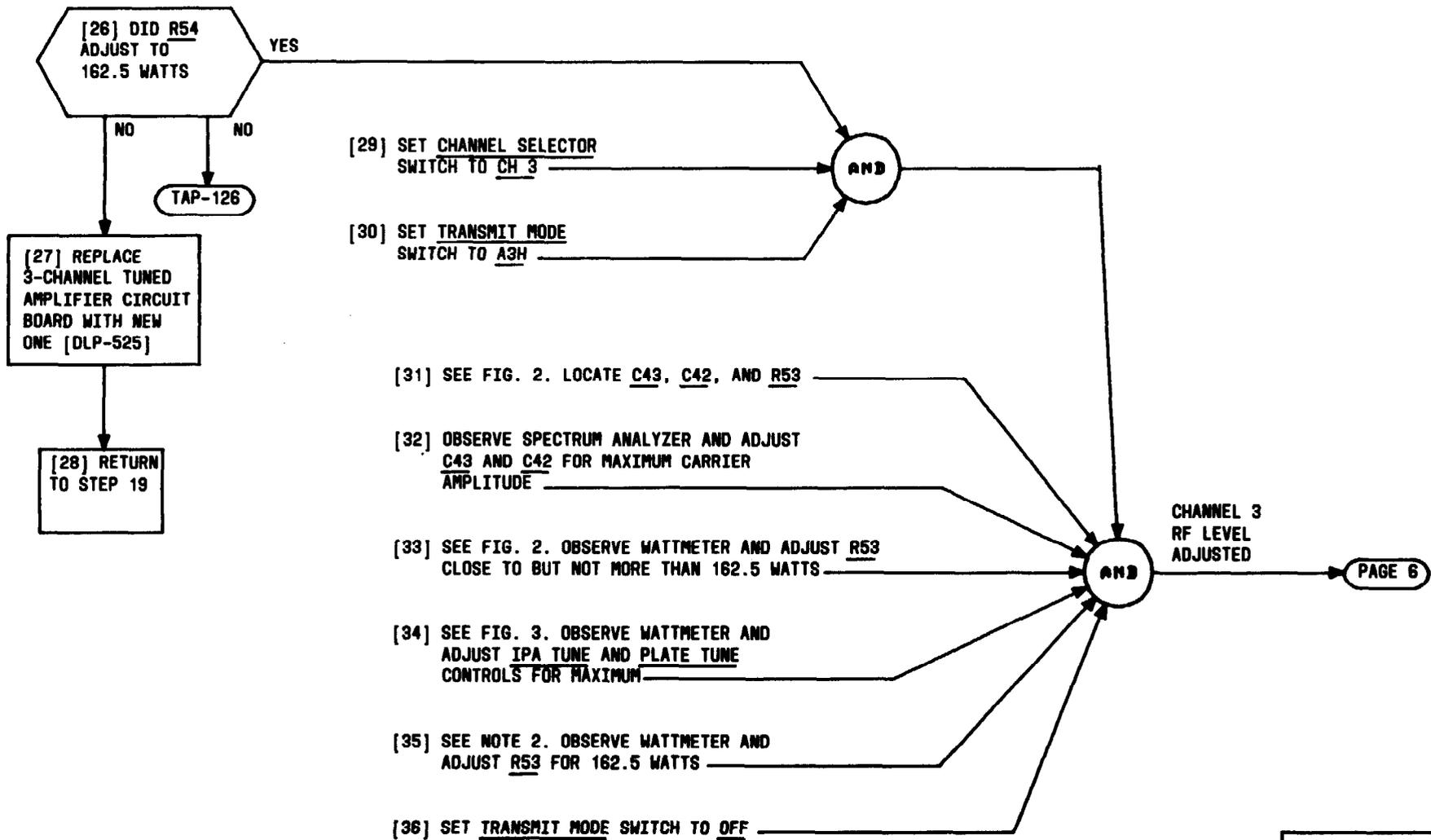


FIG. 3

NOTE 1
IT MAY BE NECESSARY
TO REPEAT STEPS 23
AND 24 SEVERAL TIMES
TO GET EXPECTED
INDICATION

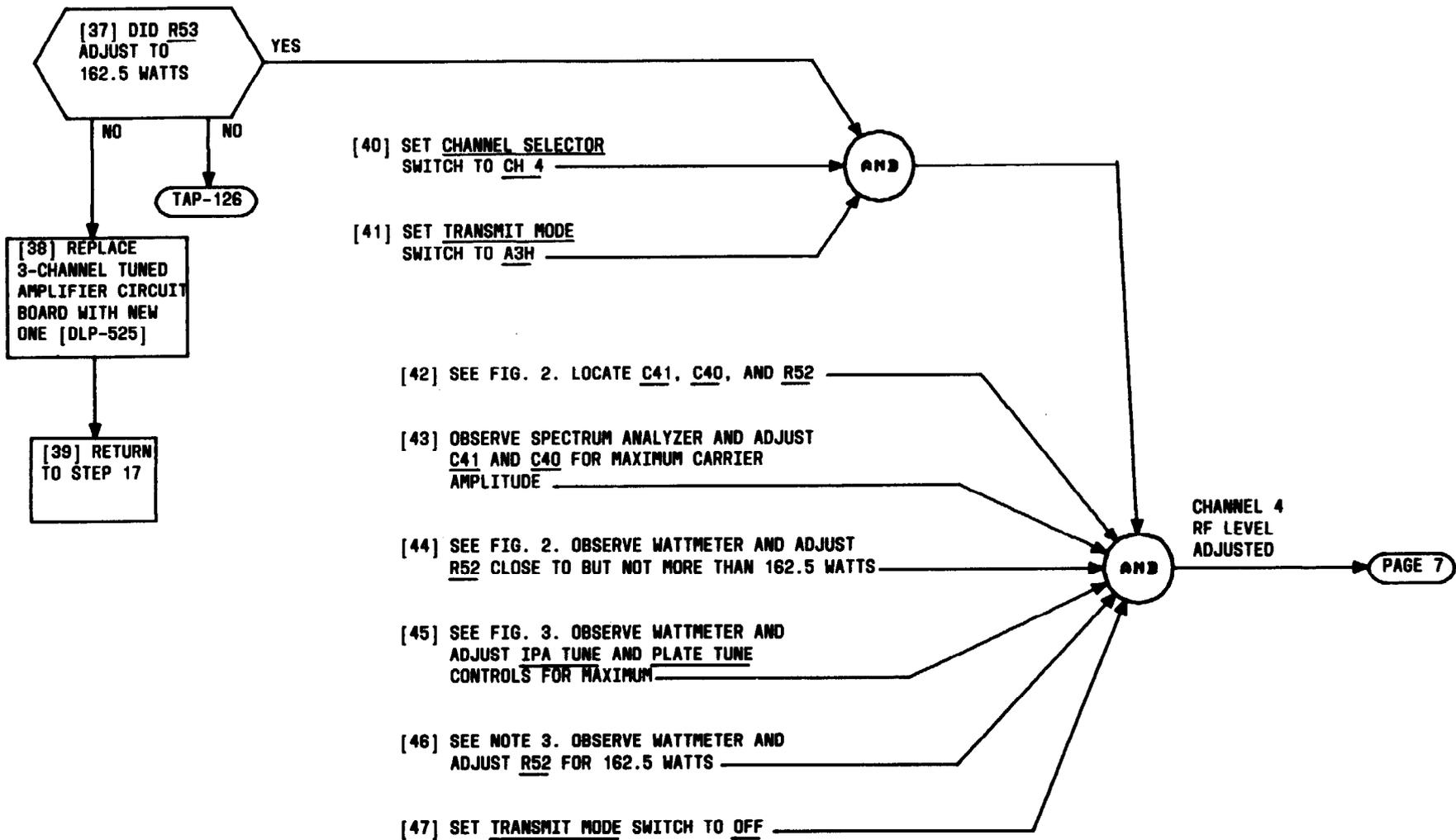
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ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



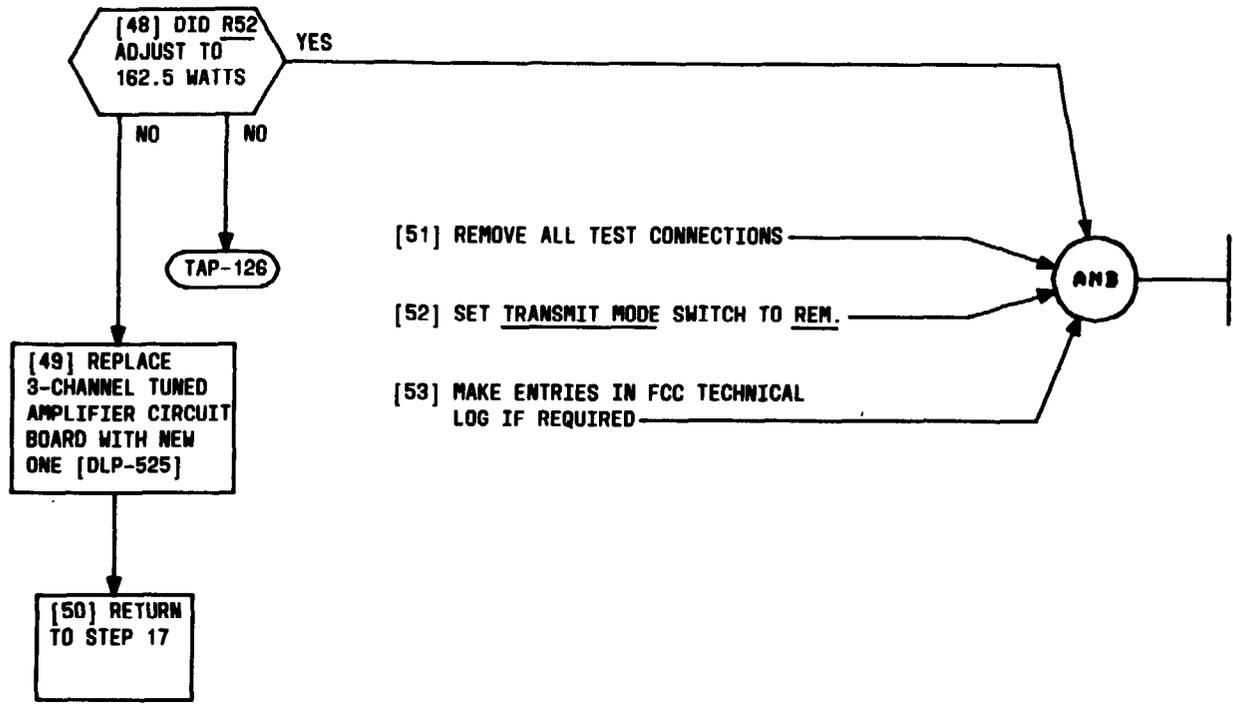
NOTE 2	
IT MAY BE NECESSARY TO REPEAT STEPS 34 AND 35 SEVERAL TIMES TO GET EXPECTED INDICATION	
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ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



NOTE 3		
IT MAY BE NECESSARY TO REPEAT STEPS 45 AND 46 SEVERAL TIMES TO GET EXPECTED INDICATION		
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ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

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SUMMARY

GET EQUIPMENT SHOWN IN TABLE A AND MAKE TEST CONNECTIONS USING [FIG. 1]. CONDITION TMS AND CONNECT TO STATUS EQUIP JACK. TRANSMIT IN A3H MODE AND ADJUST C7 AND C32 FOR MAXIMUM INDICATION ON TMS. ADJUST R45 BETWEEN 0 AND -2 DB. TRANSMIT IN A3A MODE AND CHECK FOR INDICATION ON TMS BETWEEN 0 AND -2 DB.

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED

[2] GET EQUIPMENT SHOWN IN TABLE A

[3] SET SWITCHES ON TRANSMITTER AS SHOWN IN TABLE B



TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	389A
AUDIO MIXING PAD	3 200Ω RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600Ω 1:1 RATIO
TRANSMISSION MEASURING SET	WECO J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600Ω 1/2 WATT RESISTOR
THRULINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	

TABLE B

SWITCH	POSITION
TRANSMIT MODE	OFF
HIGH VOLTAGE	OFF
REGULATOR	OFF
MAIN POWER	OFF

[4] CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528]
AND MAKE CONNECTIONS AS SHOWN IN [FIG. 1]

[5] PLACE MONITOR RECEIVER CIRCUIT BOARD (NO. 1)
ON EXTENDER BOARD [DLP-525]

[6] CONDITION THE 21A TMS TO MEASURE 0 DB [DLP-536]

[7] CONNECT TMS TO STATUS EQUIP JACK

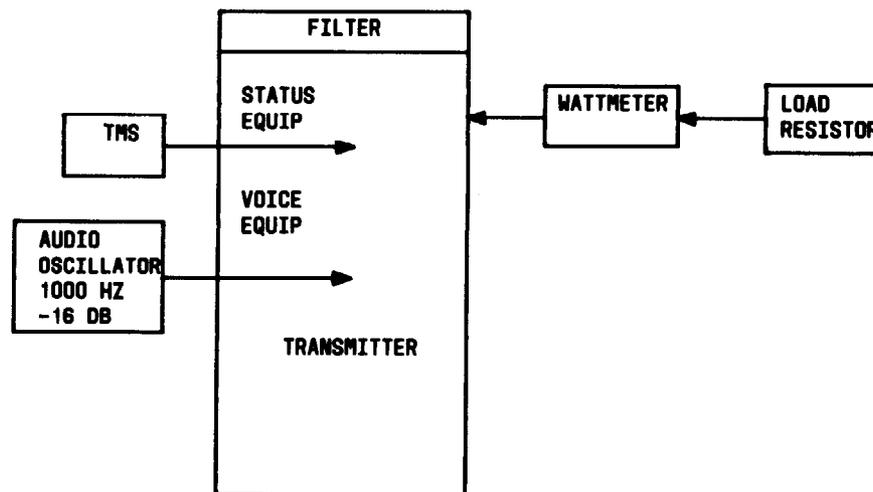


FIG. 1

ADJUST MONITOR RECEIVER CIRCUIT BOARD

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[8] SET SWITCHES ON TRANSMITTER AS SHOWN IN TABLE C

TABLE C	
SWITCH	POSITION
MAIN POWER	ON
REGULATOR	ON
HIGH VOLTAGE	ON
TRANSMIT MODE	A3H

[9] SEE FIG. 2. LOCATE C7, C32, AND R45 ON MONITOR RECEIVER CIRCUIT BOARD (NO. 1)

[10] DEPRESS AND HOLD MON RCVR PUSHBUTTON (LOCATED ON SIGNALING CIRCUIT PANEL)

[11] OBSERVE TMS AND ADJUST C7 AND C32 FOR MAXIMUM INDICATION. SEE NOTE

[12] ADJUST R45 CLOSE AS POSSIBLE BETWEEN 0 AND -2 DB

[13] RELEASE MON RCVR PUSHBUTTON

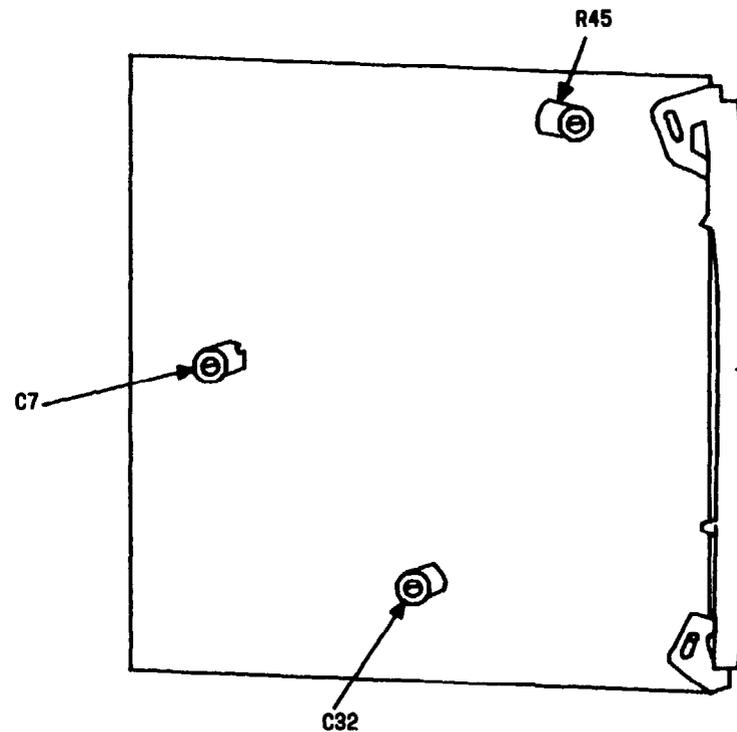
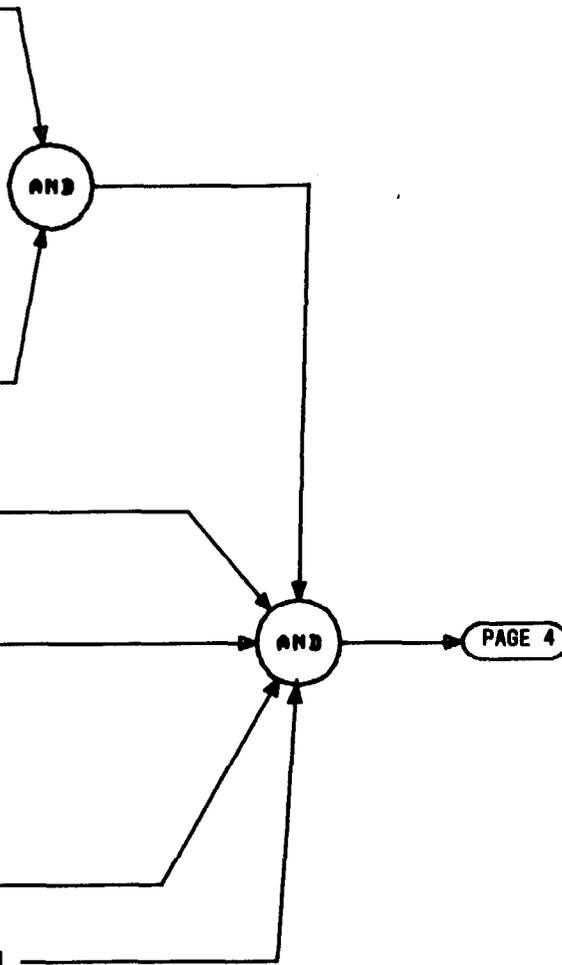
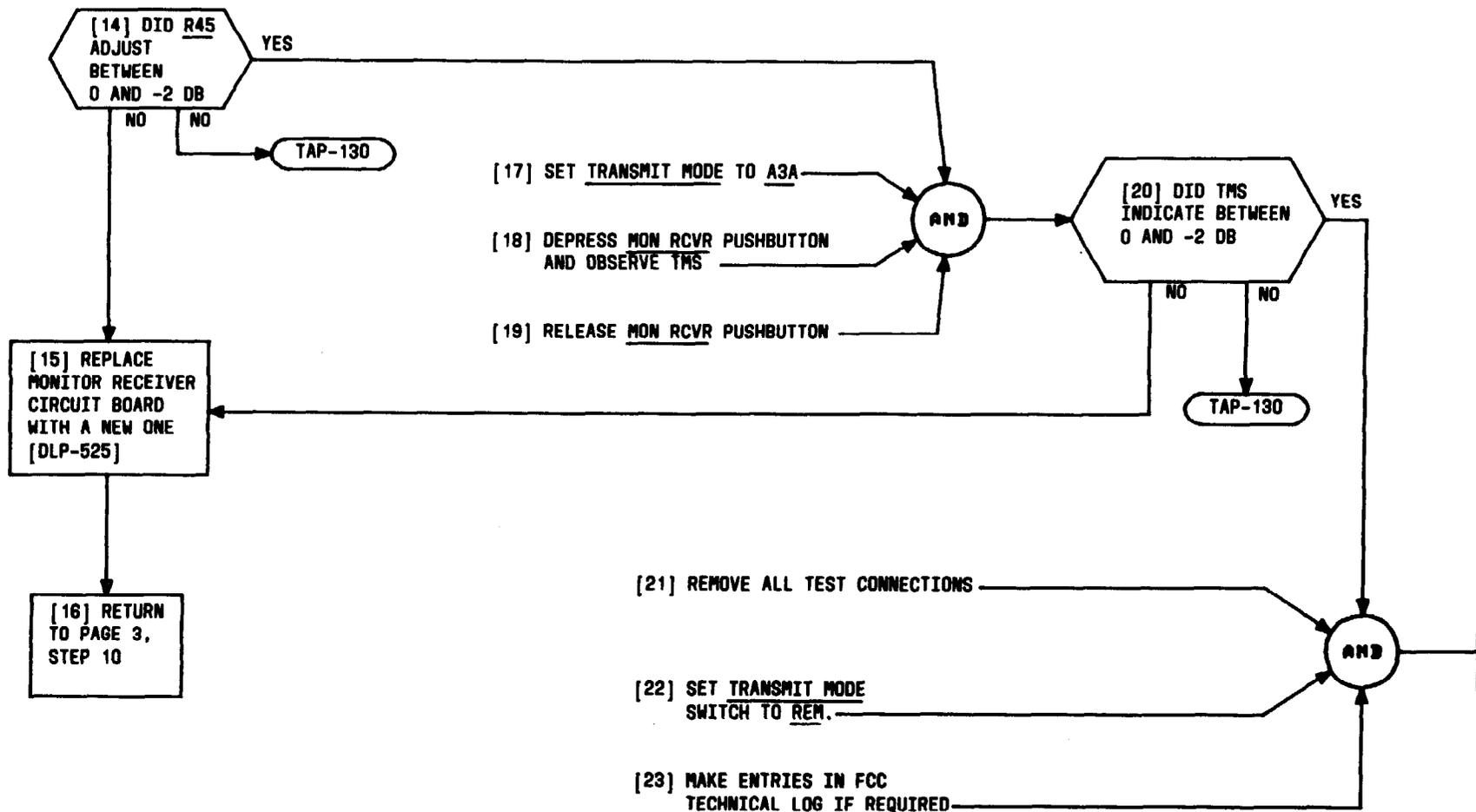


FIG. 2

NOTE	
IF NECESSARY, ADJUST R45 FOR RESPONSE	
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ADJUST MONITOR RECEIVER CIRCUIT BOARD



ADJUST MONITOR RECEIVER CIRCUIT BOARD

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SUMMARY
 GET EQUIPMENT SHOWN IN TABLE A AND MAKE TEST CONNECTIONS USING DLP-534, STEPS 4 THROUGH 20. CALIBRATE VSWR METER FOR FULL SCALE WITH CAL. VSWR POTENTIOMETER LOCATED ON PA PANEL. ON LOW-PASS FILTER REVERSE CONNECTION OF TS-8 OF POWER DETECTORS. ROTATE R1

(LOCATED ON WIDEBAND AMPLIFIER BOARD) FOR TOP-SCALE INDICATION OF 3 ON VSWR METER. LOCATE R81 ON PA SENSOR BOARD AND ADJUST UNTIL VSWR/TUBE ALARM LAMP IS LIGHTED

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED

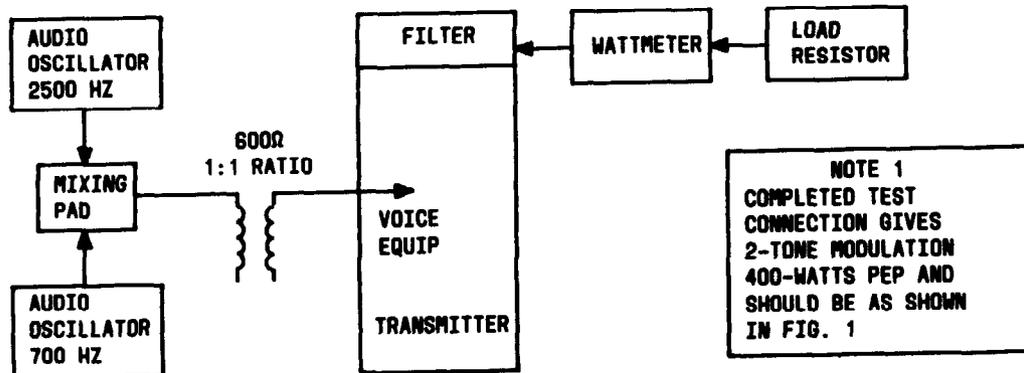
[2] SET TRANSMIT MODE SWITCH TO OFF

[3] GET EQUIPMENT SHOWN IN TABLE A

[4] MAKE TEST CONNECTIONS USING DLP-534, STEPS 4 THROUGH 20. SEE NOTE 1 AND FIG. 1



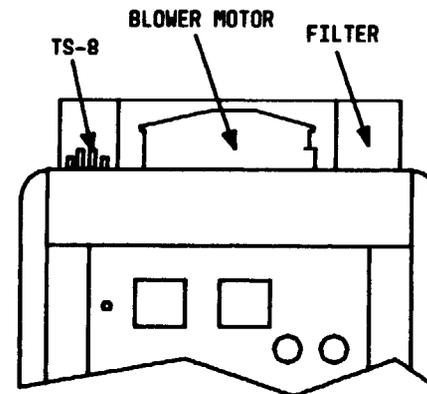
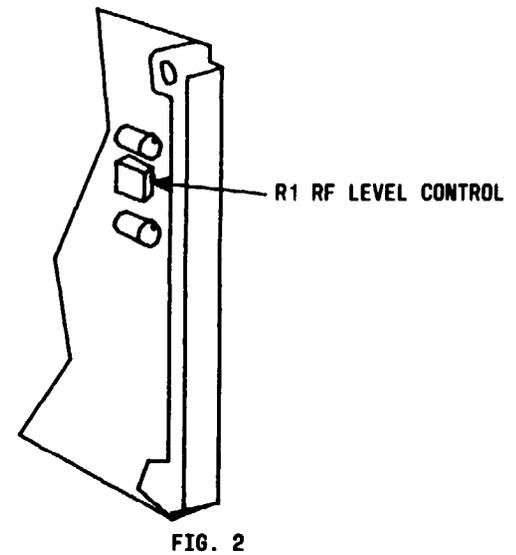
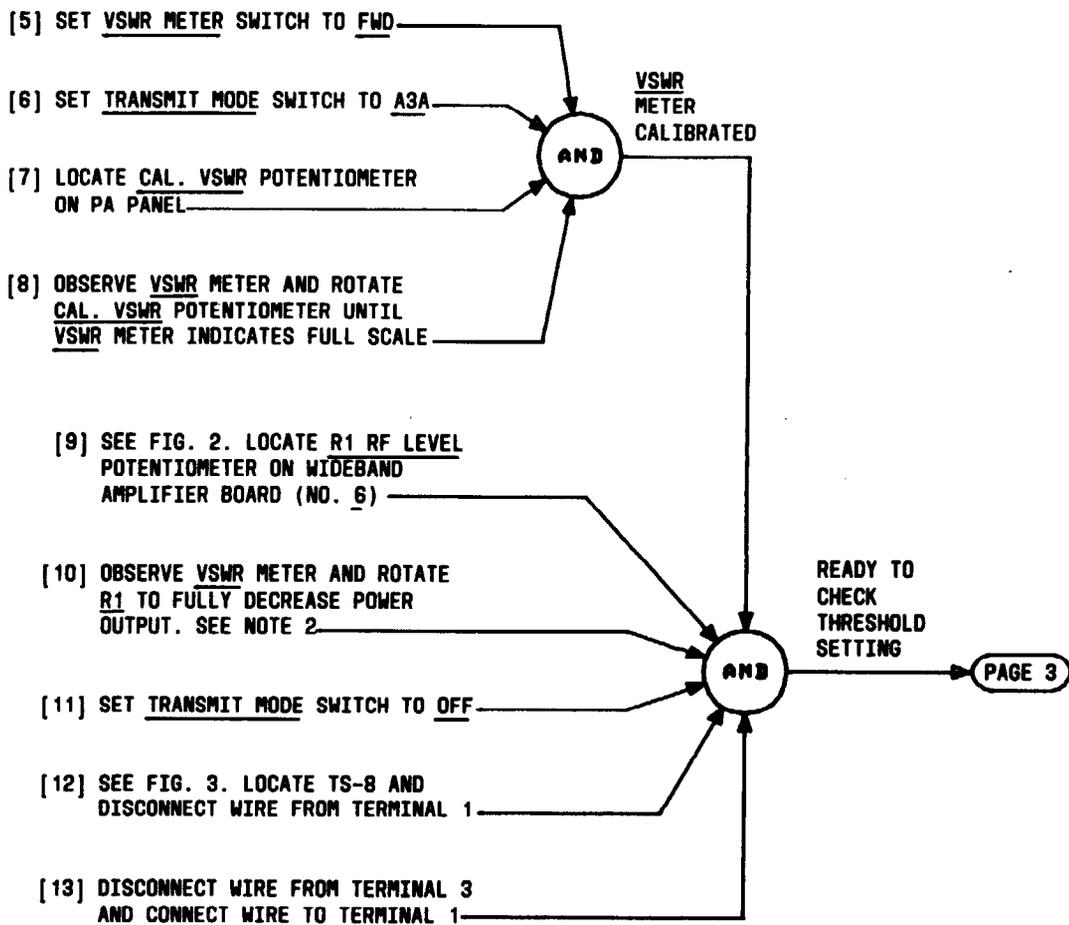
TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 200Ω RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600Ω 1:1 RATIO
TRANSMISSION MEASURING SET	WECO J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600Ω 1/2 WATT RESISTOR
THRULINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	



NOTE 1
 COMPLETED TEST CONNECTION GIVES 2-TONE MODULATION 400-WATTS PEP AND SHOULD BE AS SHOWN IN FIG. 1

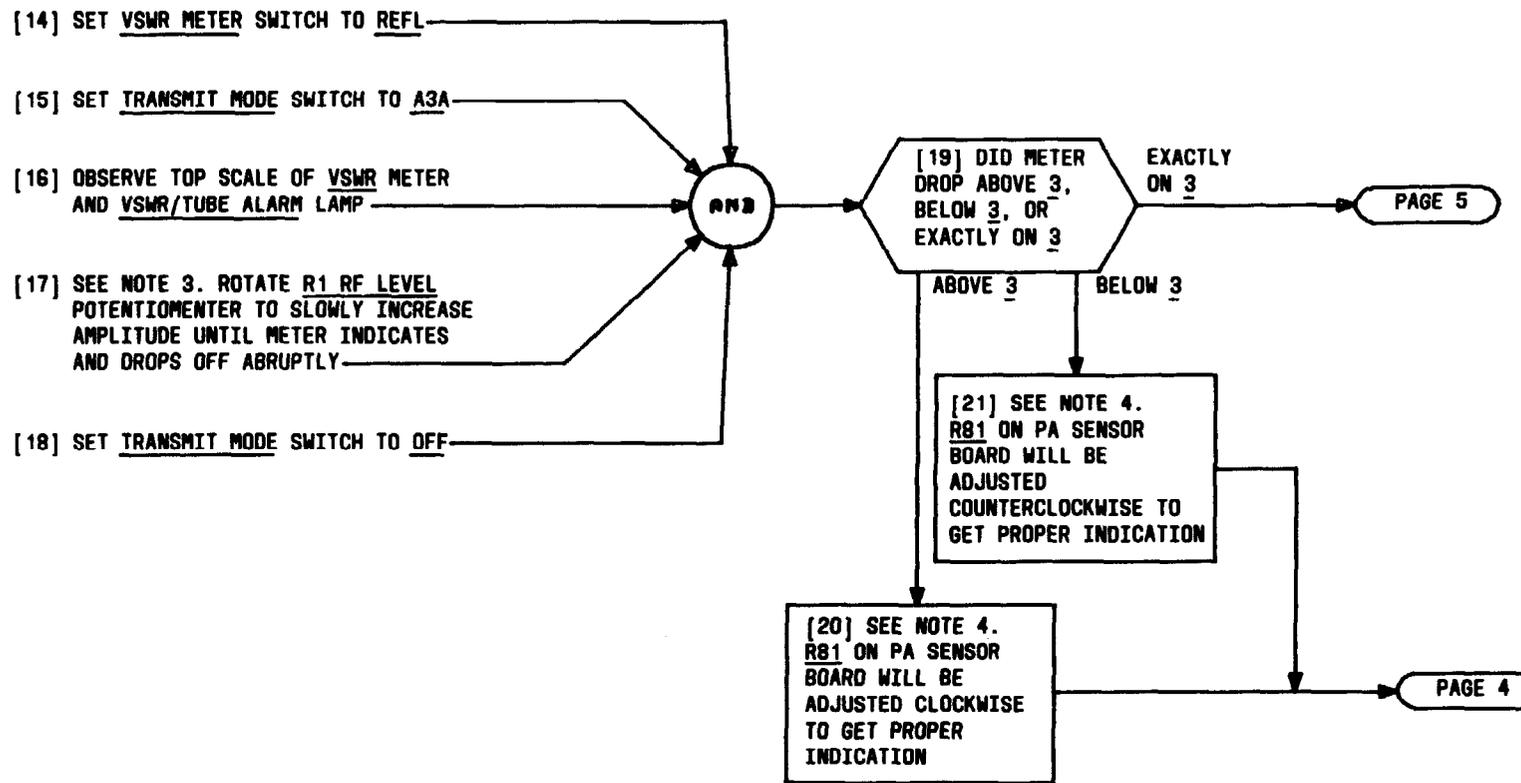
FIG. 1

ADJUST VSWR THRESHOLD



NOTE 2 DISREGARD ALL LAMP INDICATIONS	
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ADJUST VSWR THRESHOLD



ADJUST VSWR THRESHOLD

NOTES

3. VSWR THRESHOLD IS SET PROPERLY IF METER DROPS ABRUPTLY WHEN AMPLITUDE REACHES 3 ON TOP SCALE

4. R81 ON PA SENSOR BOARD WILL BE ADJUSTED IN SMALL STEPS BECAUSE OF INTERLOCKS AND POSITION OF BOARD ON PA CHASSIS. IT MAY BE NECESSARY TO REPEAT THIS ADJUSTMENT SEVERAL TIMES TO GET EXPECTED INDICATION

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[22] DECREASE R1 RF LEVEL AMPLITUDE AND SET SWITCHES SHOWN IN TABLE B

[23] SEE DANGER AND FIG. 4. OPEN REAR DOOR OF TRANSMITTER CABINET AND PLACE GROUNDING STICK ON LEFT SIDE OF HIGH - VOLTAGE POWER SUPPLY FUSE

[24] SEE FIG. 4. REMOVE PA SENSOR BOARD AND COVER PLATE

[25] LOCATE AND MAKE SMALL ADJUSTMENT TO R81. SEE FIG. 5 AND NOTE 4

[26] INSTALL PA SENSOR BOARD AND COVER PLATE BACK INTO CONNECTOR ON PA ASSEMBLY

[27] PLACE GROUNDING STICK ON HOOK AND CLOSE REAR DOOR

[28] SET SWITCHES SHOWN IN TABLE C

TABLE B	
SWITCH	POSITION
HIGH VOLTAGE	OFF
REGULATOR	OFF
MAIN POWER	OFF

[29] RETURN TO PAGE 3, STEP 16

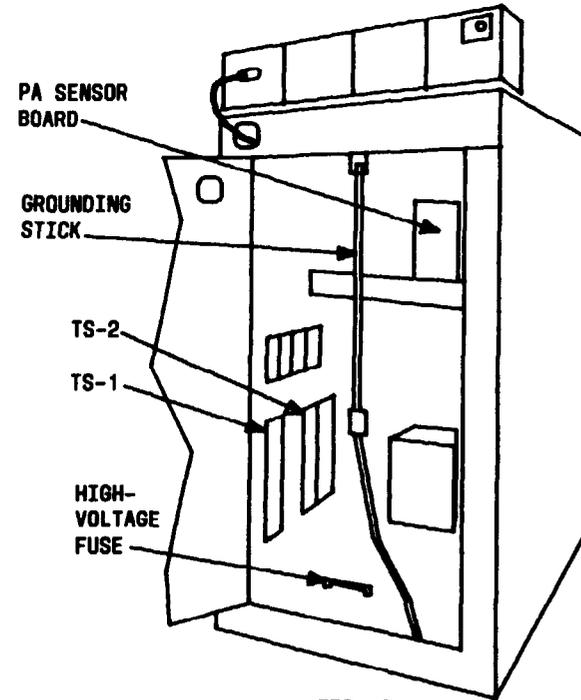


FIG. 4

TABLE C	
SWITCH	POSITION
MAIN POWER	ON
REGULATOR	ON
HIGH VOLTAGE	ON
TRANSMIT MODE	A3A

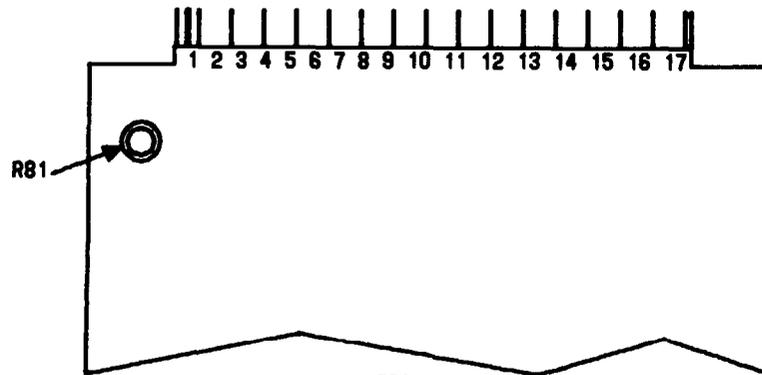
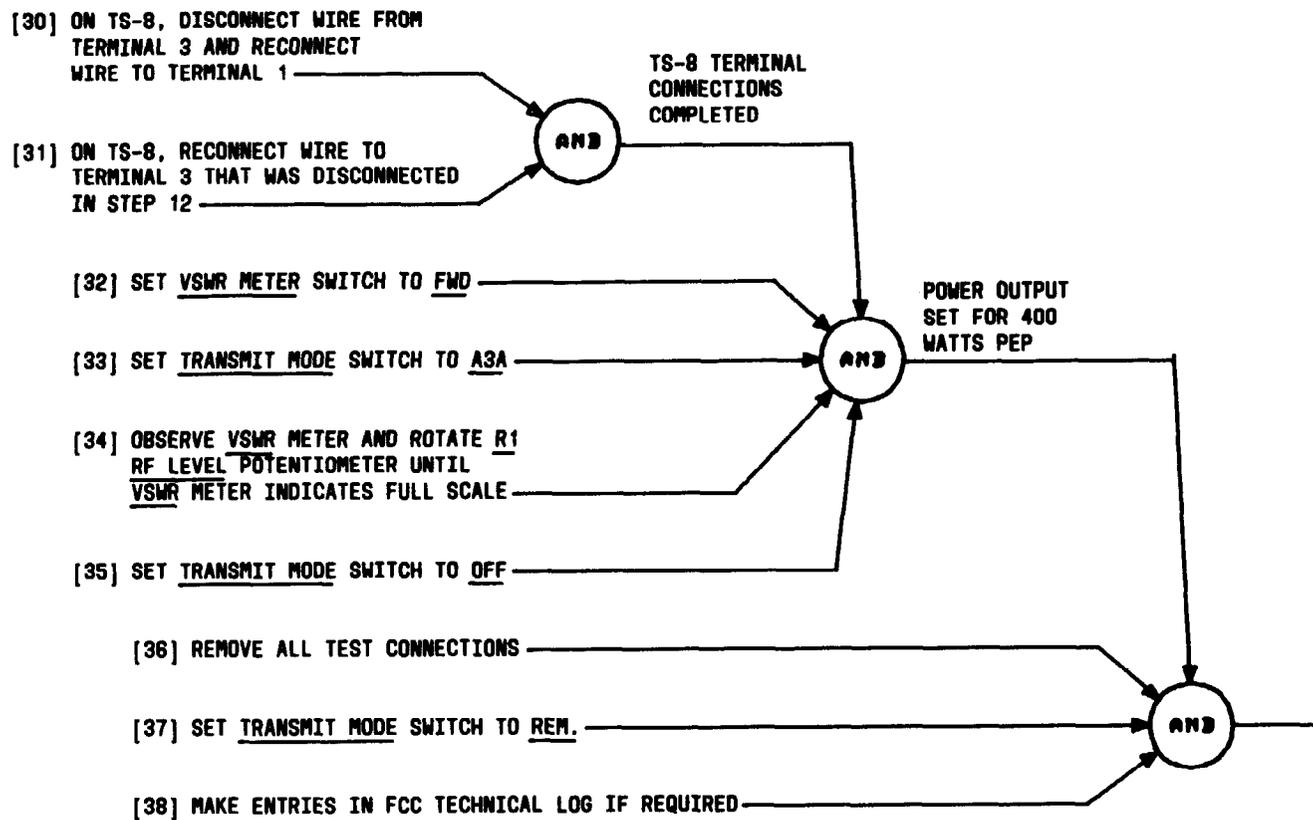


FIG. 5

ADJUST VSWR THRESHOLD

DANGER	
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET	
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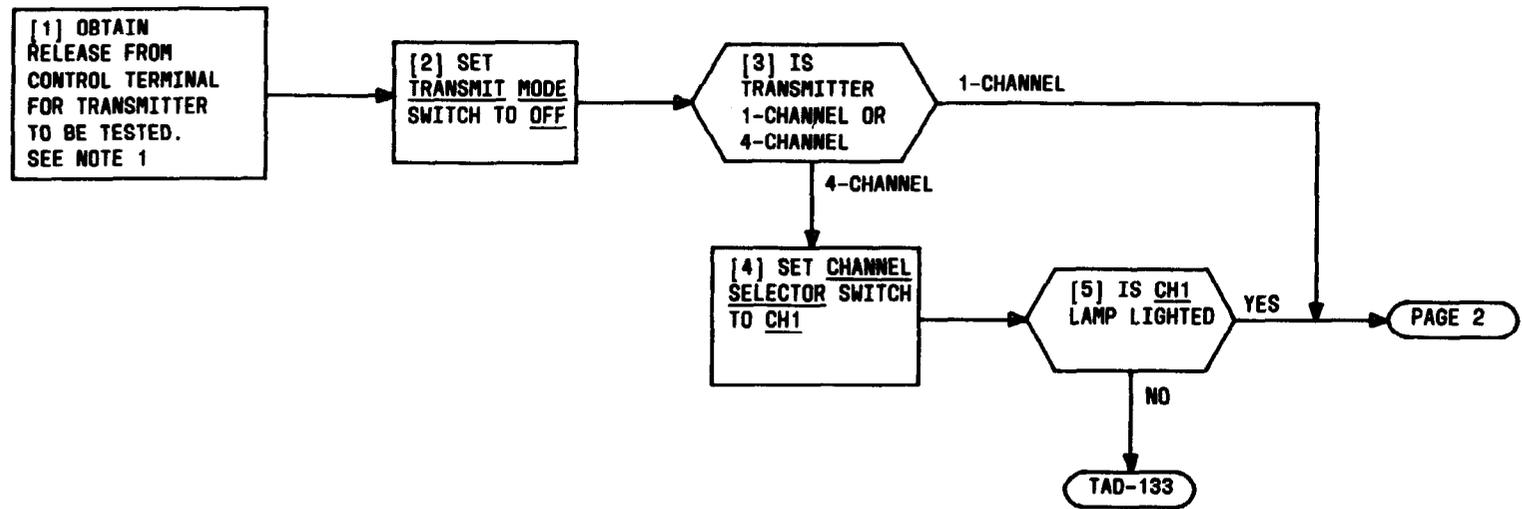


ADJUST VSWR THRESHOLD

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SUMMARY

GET TEST EQUIPMENT SHOWN IN TABLE A AND MAKE 2-TONE TEST CONNECTION, ROTATE ALC ADJ POTENTIOMETER UNTIL WATTMETER INDICATION IS 144 WATTS (360 WATTS PEP)



NOTE 1	
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTIVE ACTION	
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ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

[6] GET TEST EQUIPMENT AS SHOWN IN TABLE A

[7] INSERT ONE 369A TERMINATION INTO VOICE LINE JACK AND ONE 369A TERMINATION INTO STATUS LINE JACK [FIG. 1]

[8] USE THREE 200Ω RESISTORS AND SUITABLE CONNECTORS AND MAKE MIXING PAD AS SHOWN IN FIG. 2

[9] CONNECT MIXING PAD TO TRANSFORMER AS SHOWN IN FIG. 3

PAGE 3

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 200Ω RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600Ω 1:1 RATIO
TRANSMISSION MEASURING SET (TMS)	WECO J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600Ω 1/2 WATT RESISTOR
THRULINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	

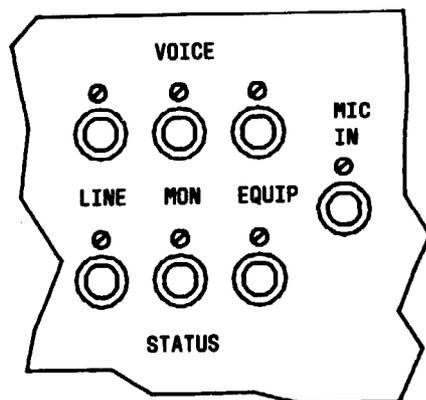


FIG. 1

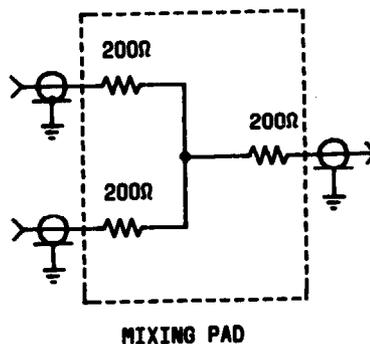


FIG. 2

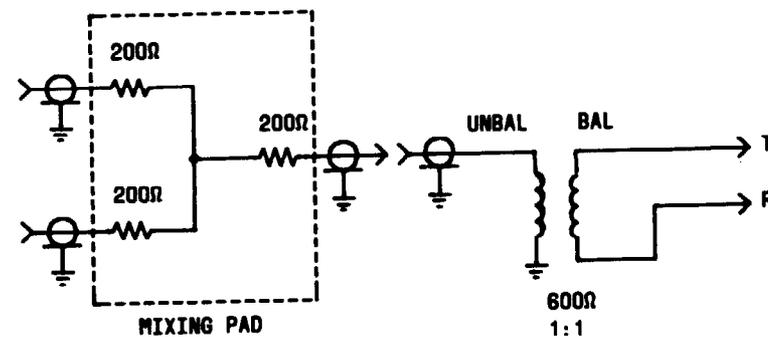


FIG. 3

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

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[10] CONDITION 21A TMS TO MEASURE DB [DLP-526]

[11] SEE FIG. 4. CONNECT DET IN 600Ω INPUT OF TMS TO OUTPUT OF TRANSFORMER

[12] SEE FIG. 4. CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528] AND CONNECT TO MIXING PAD

[13] SEE FIG. 4. CONNECT 600Ω RESISTOR TO MIXING PAD

[14] OBSERVE TMS AND INCREASE POWER OUTPUT OF AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB

[15] DISCONNECT 600Ω RESISTOR FROM MIXING PAD

700-HZ
OUTPUT
SET AT
-22 DB

PAGE 4

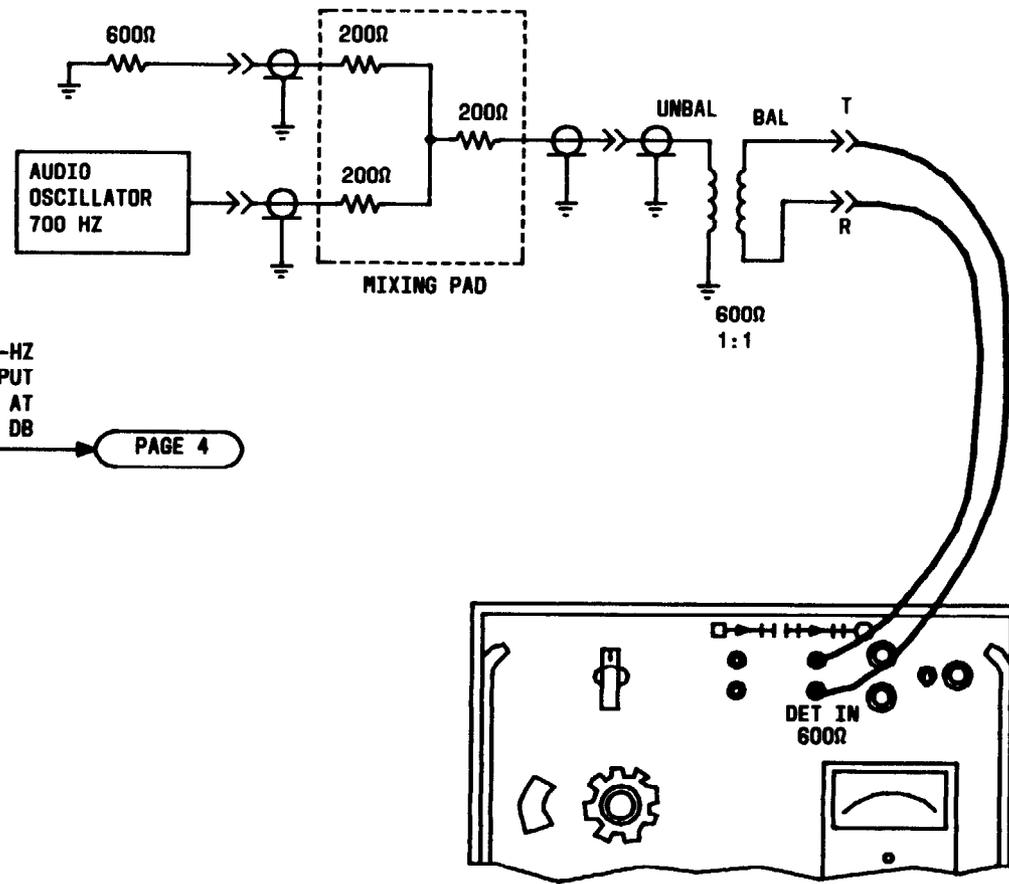


FIG. 4

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

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[16] SEE FIG. 5. CONDITION OTHER AUDIO OSCILLATOR FOR 2500-HZ OUTPUT AND CONNECT TO MIXING PAD [DLP-528]

[17] DISCONNECT 700-HZ AUDIO OSCILLATOR FROM MIXING PAD AND CONNECT 600Ω RESISTOR TO MIXING PAD

[18] OBSERVE TMS AND INCREASE POWER OUTPUT OF 2500-HZ AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB

[19] DISCONNECT 600Ω RESISTOR AND CONNECT 700-HZ AUDIO OSCILLATOR [FIG. 5]

700-HZ AND 2500-HZ COMBINED OUTPUT SET AT -19 DB

PAGE 5

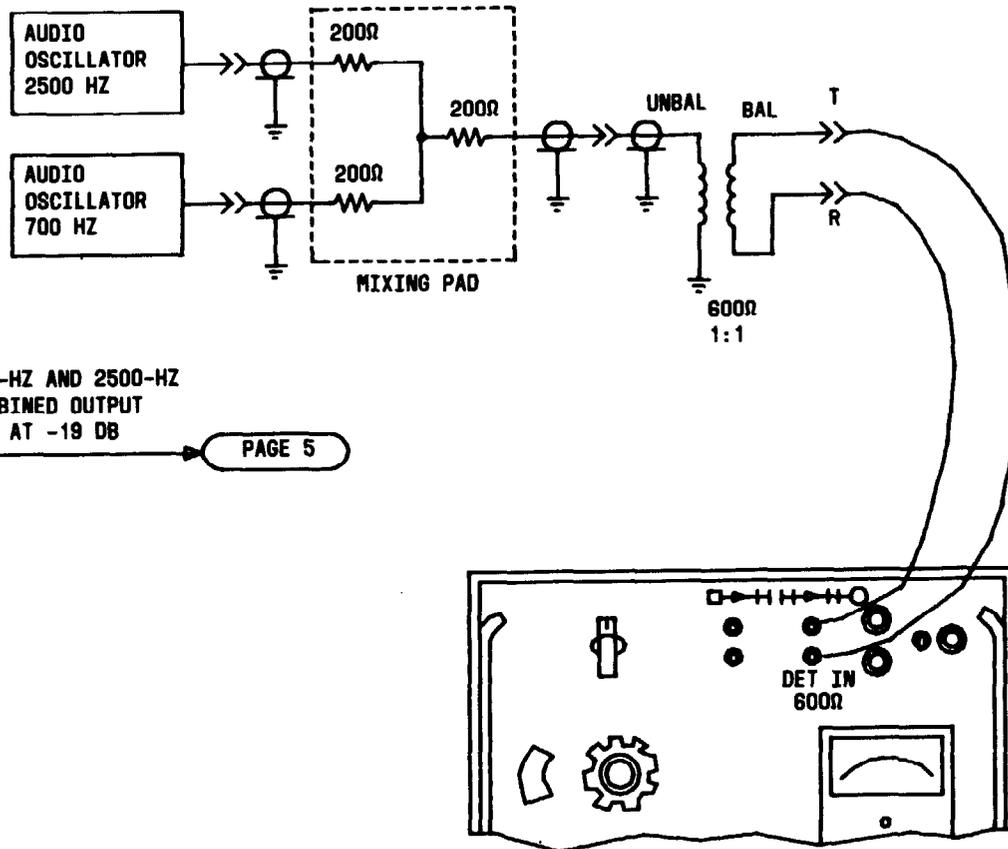


FIG. 5

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

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[20] SEE FIG. 6. DISCONNECT TMS FROM TRANSFORMER AND CONNECT TRANSFORMER TO VOICE EQUIP JACK

[21] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[22] SEE FIG. 8. CONNECT THRU-LINE WATTMETER TO FILTER OUTPUT AND INSERT 250H ELEMENT INTO WATTMETER WITH ARROW PRINTED ON ELEMENT FACING RIGHT

[23] SEE FIG. 8. CONNECT RF COAXIAL LOAD RESISTOR TO THRU-LINE WATTMETER

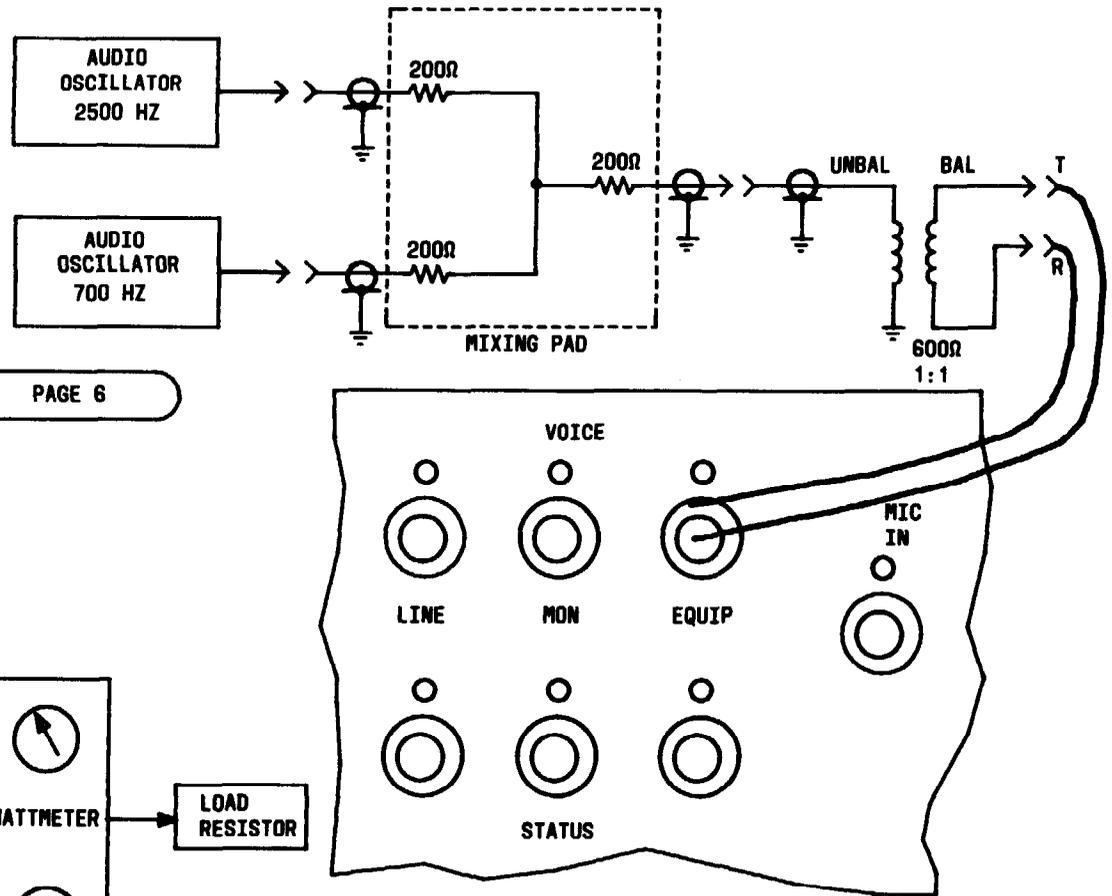


FIG. 6

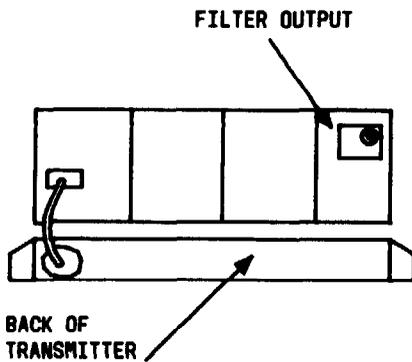


FIG. 7

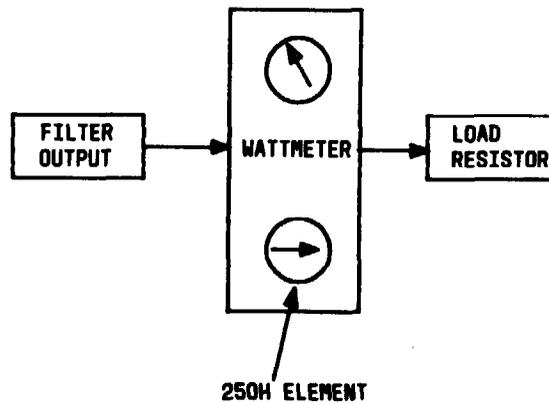
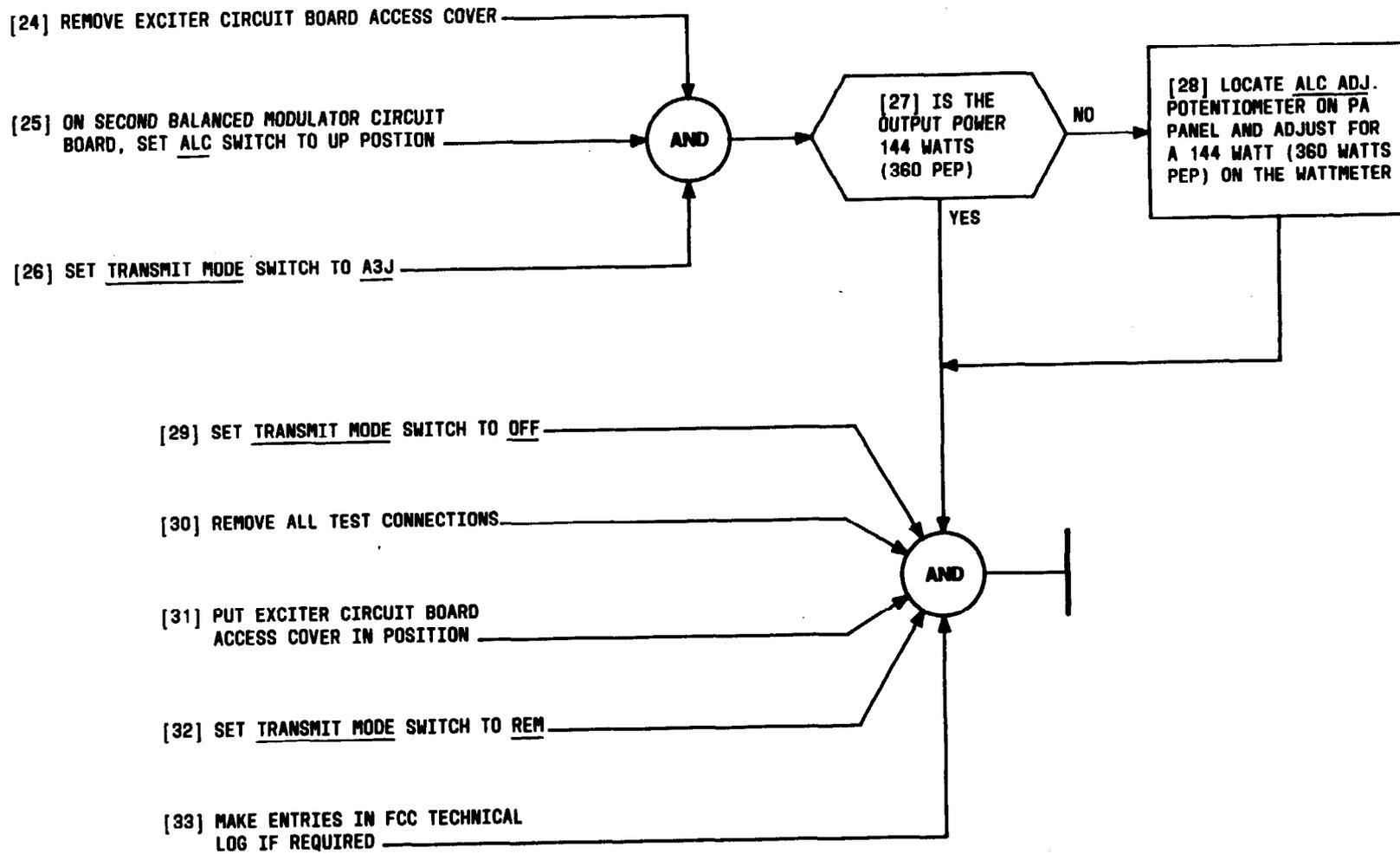


FIG. 8

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

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ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

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[1] SEE NOTE 1. SET MAIN POWER SWITCH TO OFF

[2] SEE WARNING. REMOVE FRONT PANEL TO EXPOSE CIRCUIT BOARDS

[3] IS CIRCUIT BOARD TO BE INSTALLED OR REMOVED. SEE NOTE 2

INSTALLED

REMOVED

[10] LOCATE SLOT POSITION IN WHICH CIRCUIT BOARD IS TO BE INSTALLED

[11] REMOVE EXTENDER BOARD IF INSTALLED

PAGE 2

[4] LOCATE CIRCUIT BOARD TO BE REMOVED

[5] SEE WARNING. GRASP PLASTIC HANDLE IN CENTER AND PULL CIRCUIT BOARD STRAIGHT OUT OF SLOT

[6] DO YOU INTEND TO INSTALL A NEW BOARD OR PLACE THIS ONE ON EXTENDER BOARD

INSTALL NEW BOARD

PLACE ON EXTENDER BOARD

[7] INSERT EXTENDER BOARD INTO PROPER SLOT, TOP AND BOTTOM, OF BOARD CARRIER

[8] SEE WARNING. WITH COMPONENTS OF CIRCUIT BOARD FACING LEFT, INSERT CIRCUIT BOARD INTO EXTENDER BOARD

[9] SET MAIN POWER SWITCH TO ON

WARNING
POWER IS TURNED OFF TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

NOTES
1. THIS PROCEDURE IS ENTERED ONLY FROM A DLP OR TAP AND COVERS CIRCUIT BOARDS ACCESSIBLE FROM FRONT OF EXCITER CHASSIS AND SIGNALING CIRCUIT CHASSIS
2. WHEN REMOVING EXTENDER BOARD AND INSTALLING ORIGINAL CIRCUIT BOARD, GO TO STEP 11

REMOVE AND/OR INSTALL CIRCUIT BOARD

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[12] ON CIRCUIT BOARD TO BE
INSTALLED, PULL OUT ON
PLASTIC HANDLE UNTIL
HANDLE IS BOWED

[13] WITH COMPONENTS OF
CIRCUIT BOARD FACING
LEFT, INSERT CIRCUIT
BOARD INTO PROPER
SLOT, TOP AND BOTTOM, OF
BOARD CARRIER

[14] PUSH IN ON CIRCUIT BOARD
UNTIL FIBER KEY ON
SOCKET ENGAGES IN
SLOT AT REAR OF
CIRCUIT BOARD

[15] PUSH IN HANDLE TO LOCK
CIRCUIT BOARD INTO
BOARD CARRIER

[16] COVER CIRCUIT BOARDS WITH
FRONT PANEL REMOVED IN
STEP 2

[17] SET MAIN POWER SWITCH TO ON

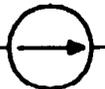
AND

REMOVE AND/OR INSTALL CIRCUIT BOARD

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[1] CONNECT LINE POWER CORD TO 115-VOLT,
60-HZ OUTLET [FIG. 1]

[2] SET 115V 60 SWITCH TO ON



LAMP BEHIND
FREQ DIAL LIGHTS



[3] ALLOW TMS TO WARM UP AT LEAST 10 MINUTES

[4] SET FREQ MULT TO X100

[5] SET FREQ DIAL TO 10

[6] SET DET INPUT TO RED 0

[7] SET BOTH OSC OUTPUT SWITCHES TO RED 0

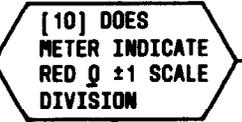


[8] GET 2P14A OR 3P14A CORD

[9] CONNECT OSC OUT 600R JACK TO DET IN 600R JACK



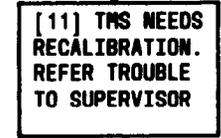
TMS
CONDITIONED
FOR TEST



YES



NO



**CONDITION J94021A (21A) TRANSMISSION
MEASURING SET (TMS) FOR TEST**

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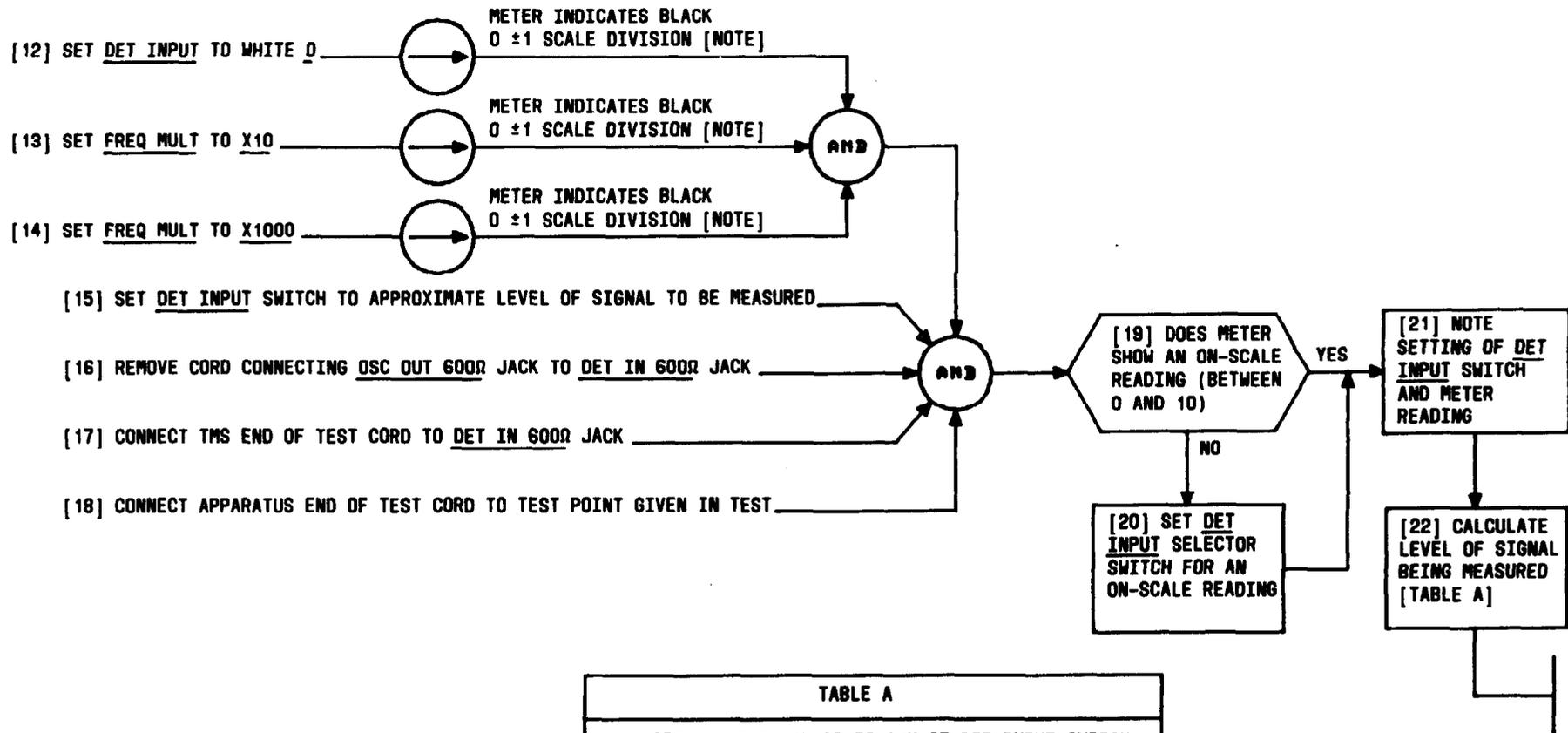


TABLE A				
SIGNAL LEVEL IN DB IS SUM OF DET INPUT SWITCH SETTING (RED OR WHITE) AND METER INDICATION (RED OR BLACK SCALE)				
EXAMPLES				
DET INPUT SETTING	-30	-10	+10	+30
DB METER INDICATION	- 3	- 5	+ 3	+ 3
	<u>-33 DB</u>	<u>-15 DB</u>	<u>+13 DB</u>	<u>+33 DB</u>

NOTE IF METER REQUIREMENT IS NOT MET, TMS NEEDS RECALIBRATION. REFER TROUBLE TO SUPERVISOR	
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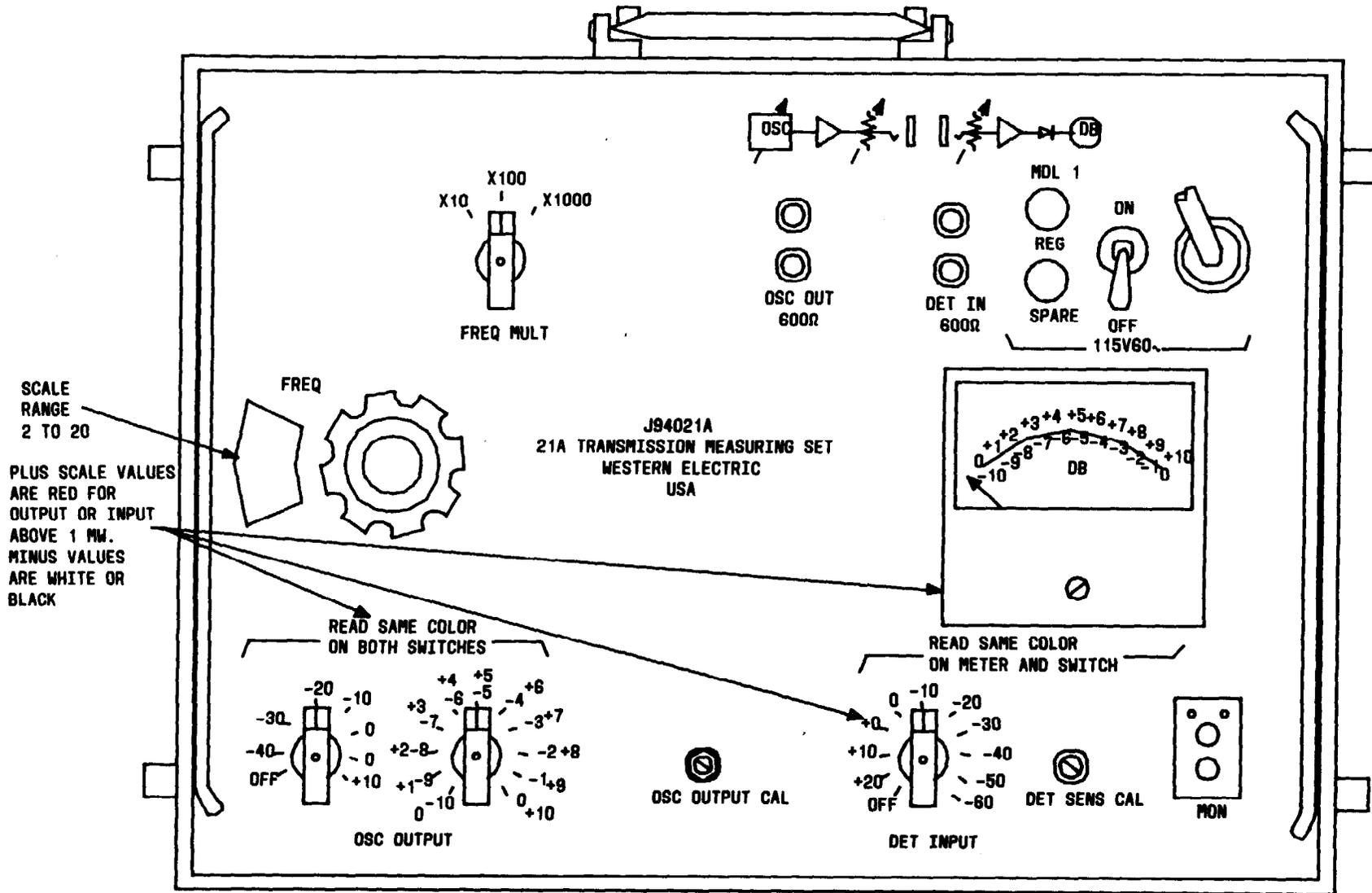


FIG. 1

CONDITION J94021A (21A) TRANSMISSION
MEASURING SET (TMS) FOR TEST

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[1] CONNECT POWER CABLE TO 115V, 60-HZ OUTLET

[2] ROTATE SAMPLE RATE CONTROL CW FROM POWER OFF [FIG. 1]

[3] SET SENSITIVITY SWITCH TO CHECK

[4] SET LEVEL CONTROL TO PRESET

[5] SET FUNCTION SWITCH TO FREQUENCY

[6] SET TIME BASE SWITCH TO EACH POSITION SHOWN IN TABLE A

DISPLAY COMES ON

AND

[7] DOES DISPLAY READ AS SHOWN IN TABLE A

[8] SET FUNCTION SWITCH TO MANUAL START

[9] DOES COUNTER COUNT CONTINUOUSLY AT FREQUENCY SELECTED ON TIME BASE SWITCH

[10] CALIBRATE COUNTER

PAGE 2

TABLE A	
TIME BASE	DISPLAY
1 μ S	0000010. MHZ
10 μ S	000010.0 MHZ
.1 MS	000010.00 MHZ
1 MS	00010000. KHZ
10 MS	0010000.0 KHZ
.1S	010000.00 KHZ
1S	10000.000 KHZ
10S	0000.0000 KHZ

CONDITION HP 5245L FREQUENCY COUNTER TO MEASURE FREQUENCY

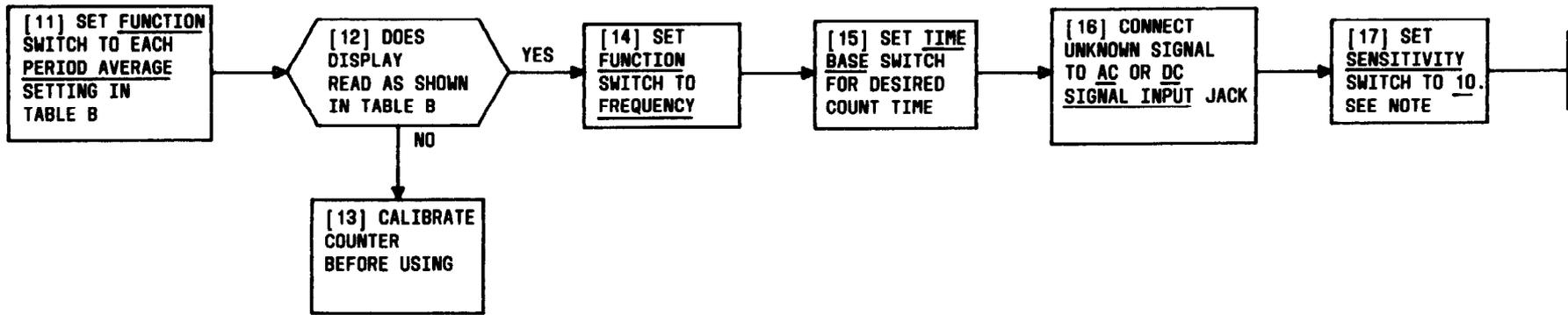


TABLE B	
PERIOD AVERAGE	DISPLAY
1	0000001
10	0000010
100	0000100
1K	00001000
10K	00010000
100K	00100000

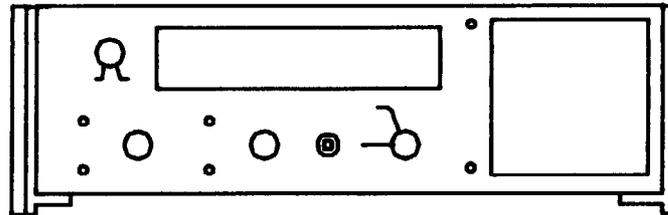


FIG. 1

CONDITION HP 5245L FREQUENCY COUNTER TO MEASURE FREQUENCY

NOTE	
IF THERE IS NO COUNT, OR IF COUNT IS UNCERTAIN, PROGRESSIVELY CHANGE SENSITIVITY TO LOWER RANGES	
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[1] CONNECT OSCILLATOR POWER CORD TO 115-VAC OUTLET

[2] SET TOGGLE SWITCH TO ON POSITION. SEE FIG. 1

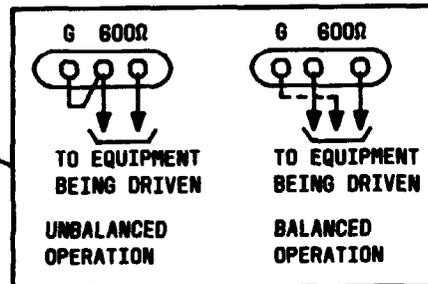
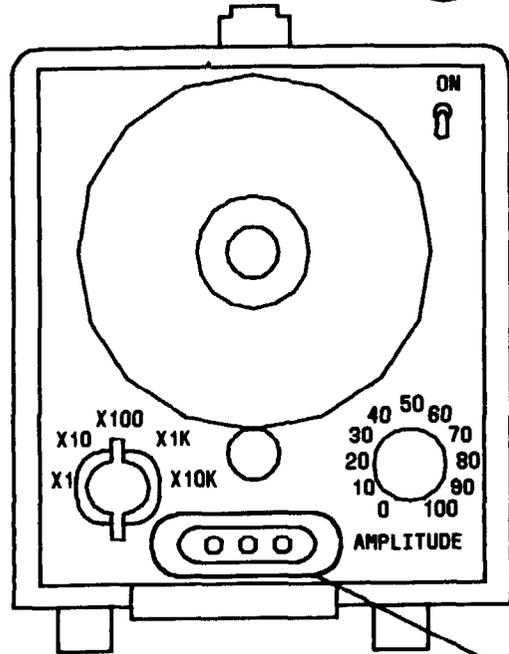
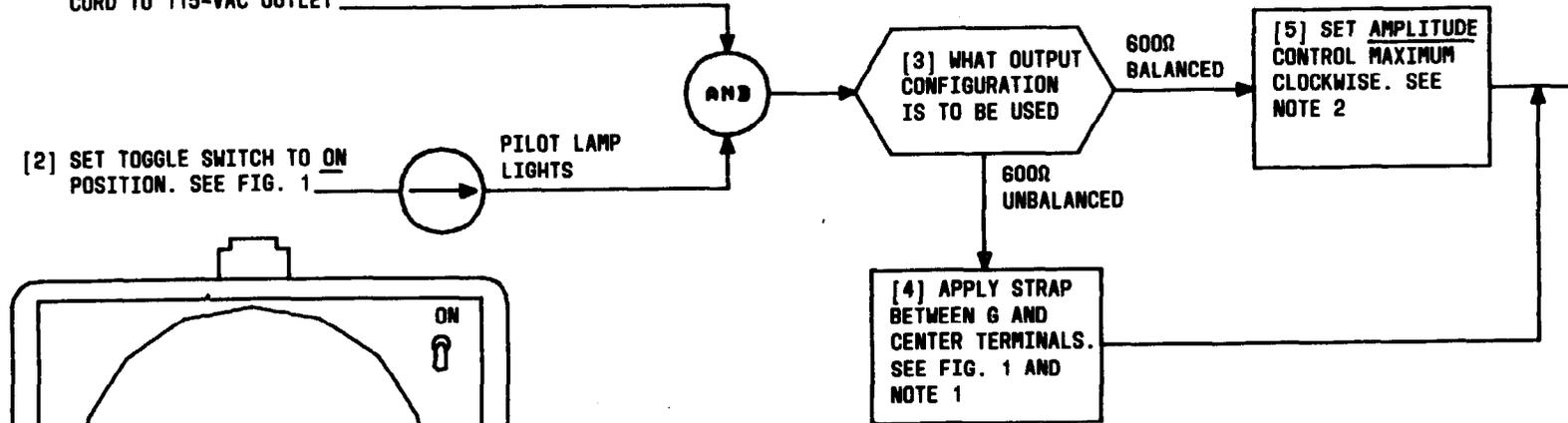


FIG. 1

- NOTES
1. WHEN IT IS DESIRED TO OPERATE UNBALANCED, GROUND SHOULD BE CONNECTED TO CENTER OUTPUT TERMINAL, THE TERMINATION FOR CONNECTION BROUGHT OUT FROM TERMINAL 6 OF OUTPUT TRANSFORMERS T1 AND T2. PROPER OPERATION CANNOT BE OBTAINED IF GROUND IS CONNECTED TO SIDE OF CIRCUIT WHICH INCLUDES ATTENUATOR
 2. AMPLITUDE CONTROL IN OUTPUT CIRCUIT IS A BRIDGED-T ATTENUATOR AND AT ANY SETTING EXCEPT MINIMUM ATTENUATION UNBALANCES CIRCUIT. THEREFORE, FOR BALANCED OPERATION, AMPLITUDE CONTROL MUST BE SET FOR MAXIMUM OUTPUT (FULLY CLOCKWISE)

CONDITION HP 200CD WIDE RANGE OSCILLATOR FOR TEST

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[1] CONNECT MODEL 564B TEKTRONIX OSCILLOSCOPE
TO 117-VAC POWER SUPPLY

[2] SET OSCILLOSCOPE CONTROLS ON FRONT PANEL [FIG. 1]
AND SIDE PANEL AS SHOWN IN TABLE A

[3] CONNECT PATCH CORD FROM CAL OUT CONNECTOR TO
CHANNEL 1 INPUT CONNECTOR OF AMPLIFIER UNIT

[4] SET POWER SWITCH TO ON (PULLED OUT). SEE NOTE

[5] ADVANCE INTENSITY, FOCUS, AND
SCALE ILLUM CONTROLS AS DESIRED

TRACE BECOMES
VISIBLE

AND

PAGE 2

TABLE A

FRONT PANEL CONTROLS			FRONT PANEL CONTROLS		
CONTROL TYPE	CONTROL	SETTING	CONTROL TYPE	CONTROL	SETTING
CRT CONTROLS	INTENSITY	COUNTERCLOCKWISE	TIME-BASE UNIT (FOR EXAMPLE, TYPE 383)	TIME/DIV	.5 MS
	FOCUS	MIDRANGE		VARIABLE (TIME/DIV)	CALIBRATED
	SCALE ILLUM	COUNTERCLOCKWISE		MAGNIFIER	OFF
	CALIBRATOR	4V		MODE	NORMAL
	STORE (BOTH)	NON-STORE (OUT)		NORMAL-SINGLE SWEEP	NORMAL
	ENHANCE (BOTH)	OFF (OUT)		LEVEL	CLOCKWISE (FREE RUN)
	LEVEL	COUNTERCLOCKWISE		TRIGGERING SOURCE	INTERNAL
	CRT CATHODE SELECTOR (REAR PANEL)	NORM		SLOPE	+
AMPLIFIER UNIT (FOR EXAMPLE, TYPE 3A6)	POSITION	CENTERED	COUPLING	AUTO	
	MODE	NORMAL (CHANNEL 1)			
	VOLTS/DIV	2			
	VARIABLE (VOLTS/DIV)	CALIBRATED			
	INPUT COUPLING	DC			

NOTE
ALLOW APPROXIMATELY
2 MINUTES WARM-UP
TIME

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CONDITION TEKTRONIX 564B OSCILLOSCOPE FOR MEASUREMENT

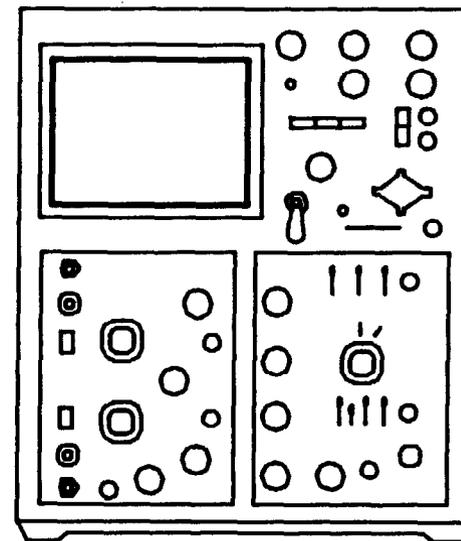
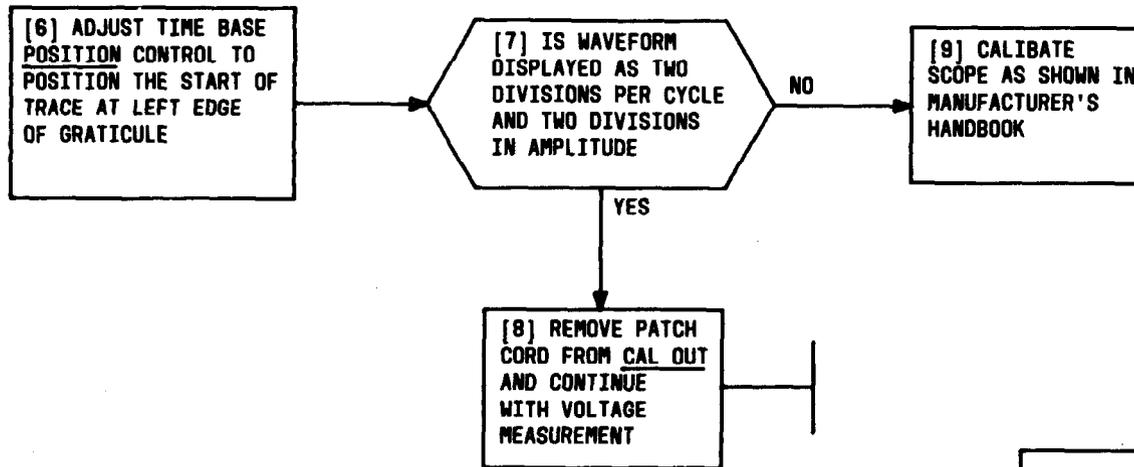


FIG. 1

[1] PLACE METER ON HORIZONTAL SURFACE WITH FRONT OF METER UP [NOTE]

[2] SET FUNCTION SWITCH TO OFF [FIG. 1]

[3] ADJUST METER ZERO SCREW FOR ZERO INDICATION

[4] INSERT SHORT PIN PLUG OF RED TEST LEAD IN + JACK

[5] INSERT SHORT PIN PLUG OF BLACK TEST LEAD IN - JACK

[6] SEE FIG. 1 AND WARNINGS. SET FUNCTION SWITCH TO PARAMETER TO BE MEASURED AND TO REQUIRED RANGE

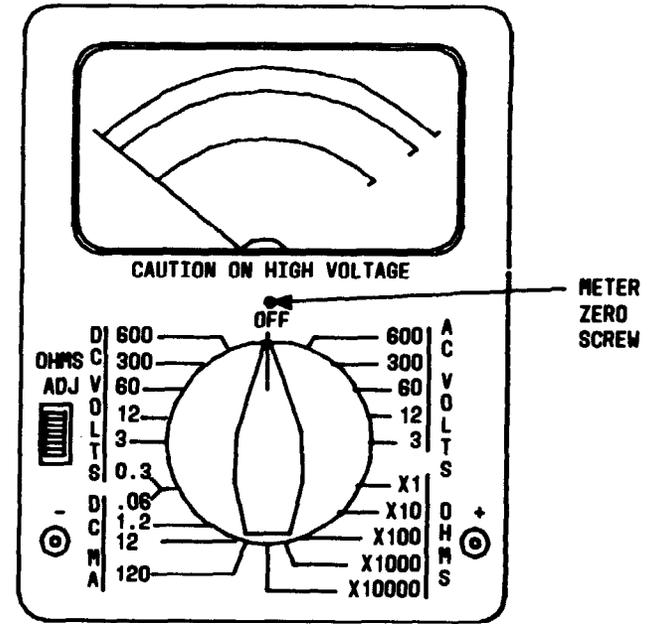
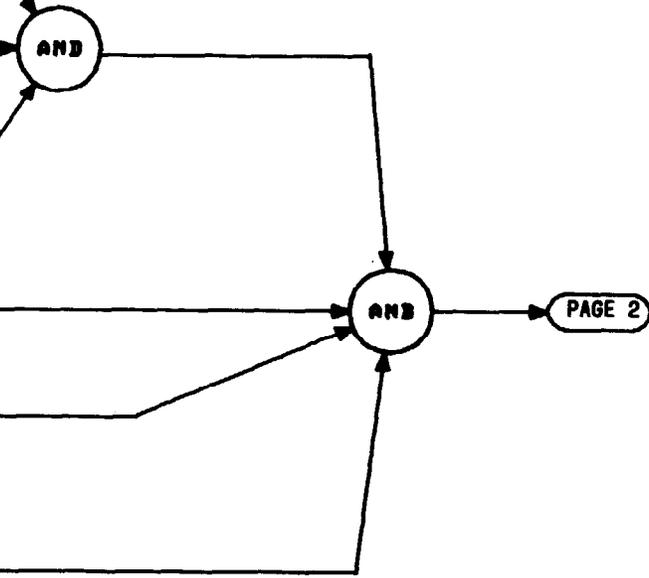
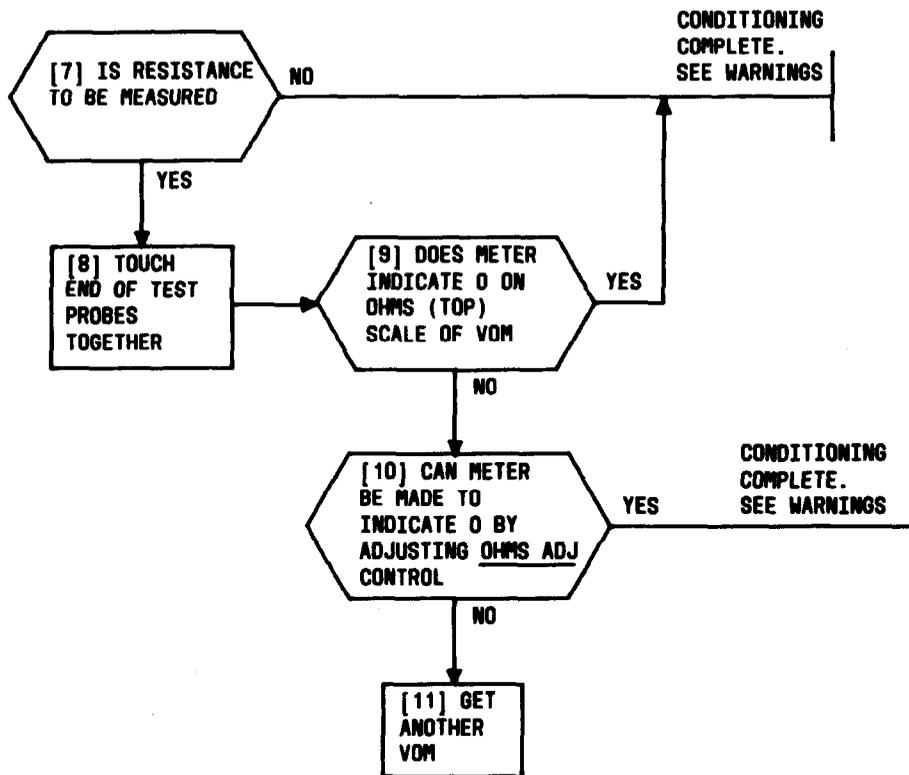


FIG. 1

NOTE	
METER SHOULD NOT BE PLACED ON A MAGNETIC SURFACE OR OTHER LOCATION WHERE METER MOVEMENT WILL BE SUBJECT TO INFLUENCE OF MAGNETIC FIELD	
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CONDITION KS-14510 METER (VOM) FOR MEASUREMENT



WARNINGS	
1.	WHEN MAKING RESISTANCE MEASUREMENTS, MAKE SURE THAT POWER IS NOT APPLIED TO CIRCUIT BEING MEASURED, AS DAMAGE TO METER WILL RESULT
2.	WHEN MAKING EITHER CURRENT OR VOLTAGE MEASUREMENTS, SET FUNCTION SWITCH TO PROPER RANGE BEFORE MAKING CONTACT WITH TEST PROBES TO CIRCUIT BEING MEASURED. IF THERE IS ANY DOUBT AS TO APPROXIMATE VALUE OF VOLTAGE OR CURRENT TO BE MEASURED, SET FUNCTION SWITCH TO HIGHEST VALUE FOR INITIAL TEST AND THEN DECREASE STEP-BY-STEP UNTIL PROPER RANGE IS REACHED

- [1] GET TEST EQUIPMENT SHOWN IN TABLE A _____
- [2] SEE FIG. 1 AND NOTE 1. SET SWITCHES SHOWN IN TABLE B _____
- [3] INSERT 898N RESISTOR INTO OUT JACK AND 89A RESISTOR INTO IN JACK (RIGHT SIDE OF ROUTINER TEST SET) _____
- [4] CONNECT ONE END OF 3P6C CORD INTO OSCT OUT JACK AND OTHER END INTO FLDT IN JACK _____
- [5] CONNECT MONITORING SPEAKER INTO FLDT MON JACK _____
- [6] CONNECT ROUTINER TEST SET TO 115-VAC OUTLET WITH CORD AND PLUG ASSEMBLY _____

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TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
ROUTINER TEST SET	KS-21277
TELEPHONE PATCH CORD	3P6C
2 RESISTORS	898N
RESISTOR	89A
MONITORING SPEAKER	EQUIPPED WITH 310 PLUG

TABLE B	
SWITCH	POSITION
EPO-FR ADV, NORMAL	NORMAL
*FUNCTION	XR
MON	OFF
SP	OFF
TRMTR	OFF
L NOR. H (3)	NOR.

* THE FUNCTION SWITCH IS NOT MARKED FUNCTION. IT IS LOCATED TOP CENTER OF FRONT PANEL

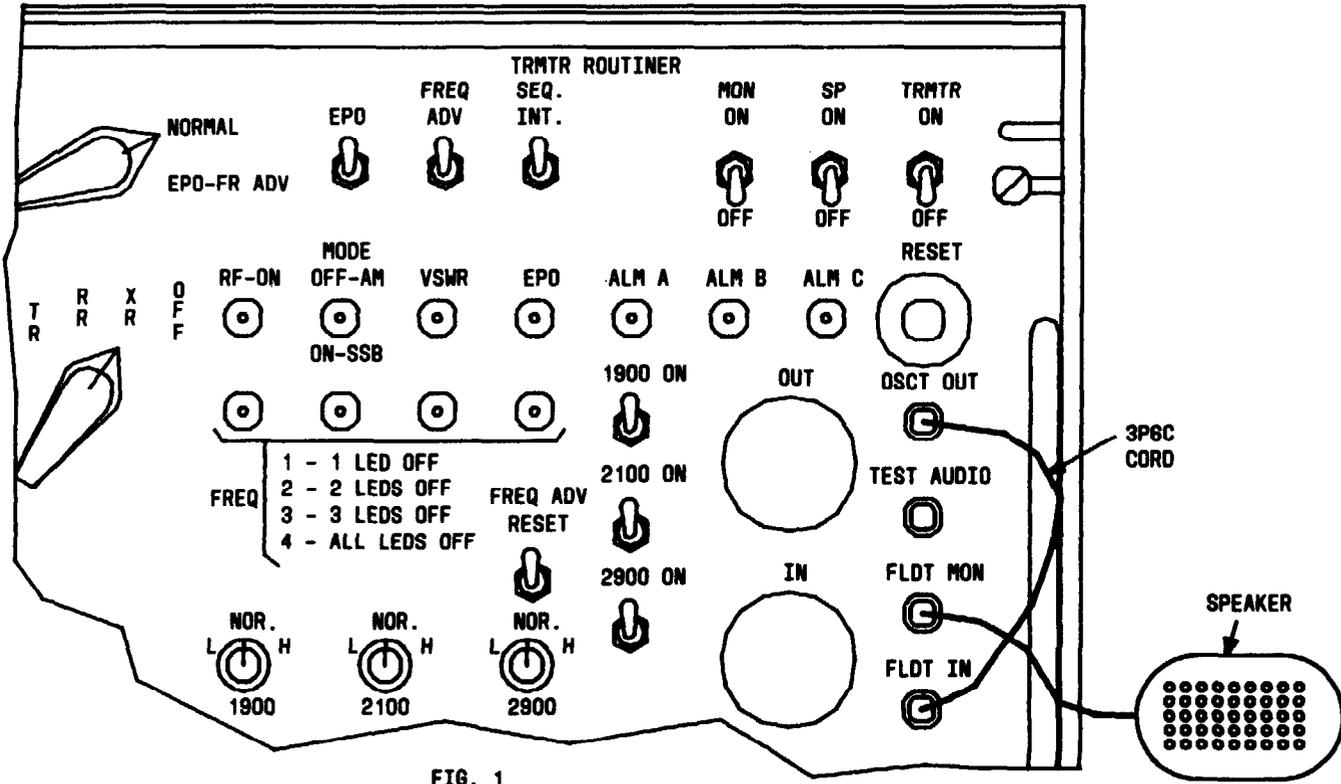
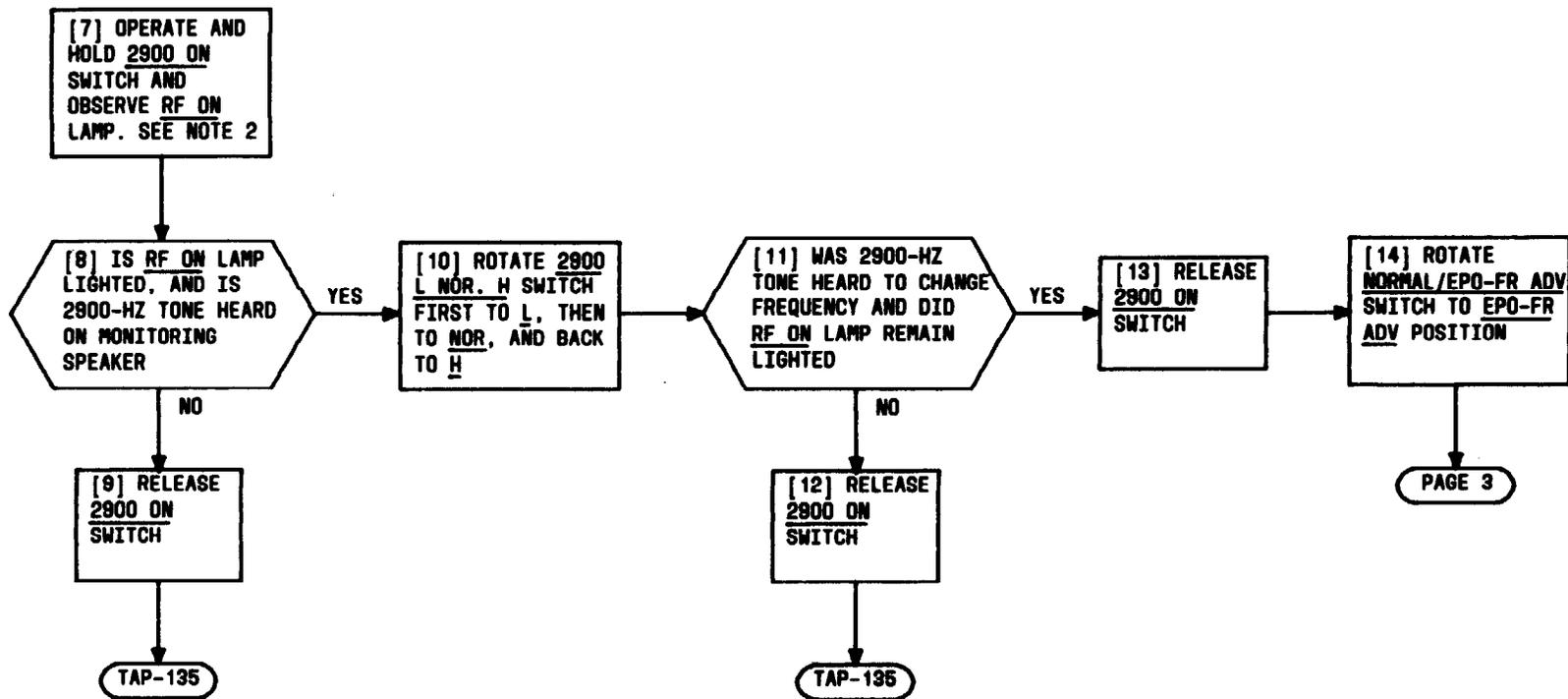


FIG. 1

NOTE 1
 TRANSMITTER PORTION OF ROUTINER TEST SET IS LOCATED AT UPPER RIGHT OF PANEL. SWITCHES AND LAMPS ARE COLOR-CODED RED OR BLACK

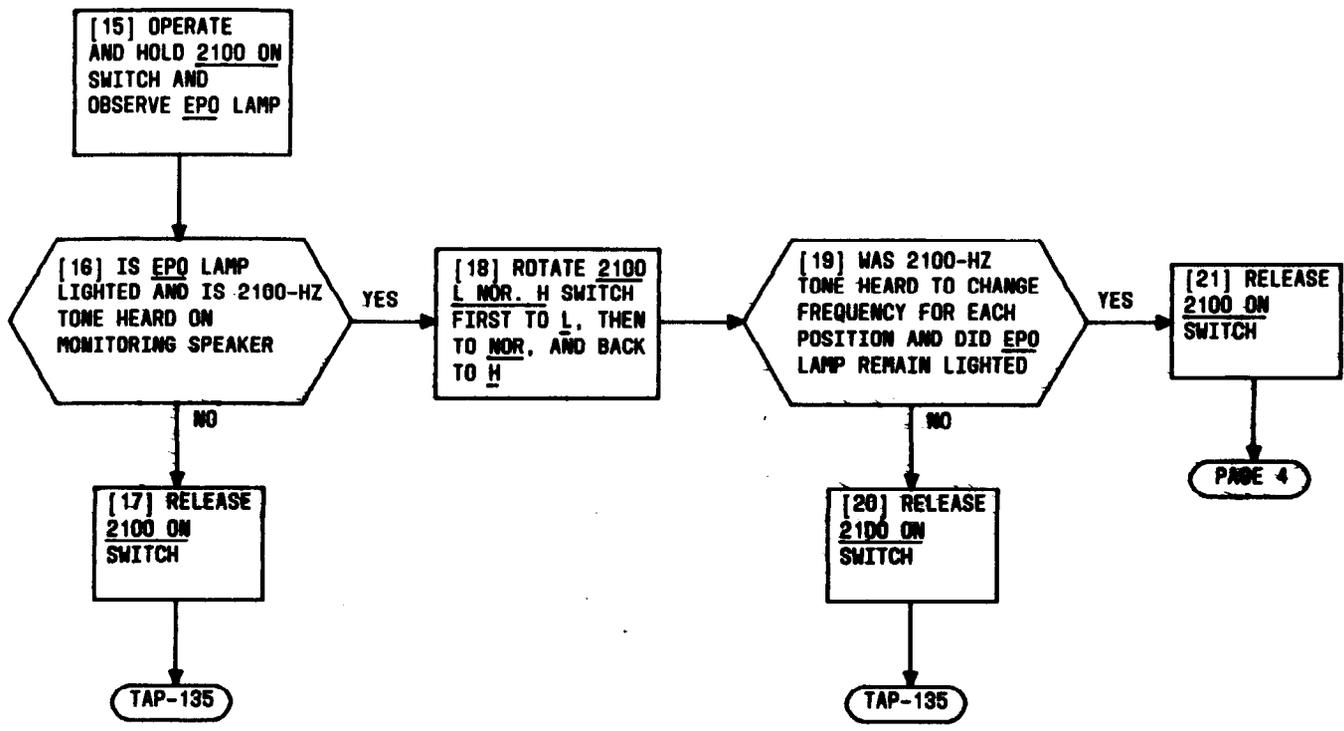
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SELF-CHECK KS-21277 ROUTINER TEST SET FOR TRANSMITTER TEST



NOTE 2 DISREGARD ALL LAMP INDICATIONS NOT MENTIONED		
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**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**



**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

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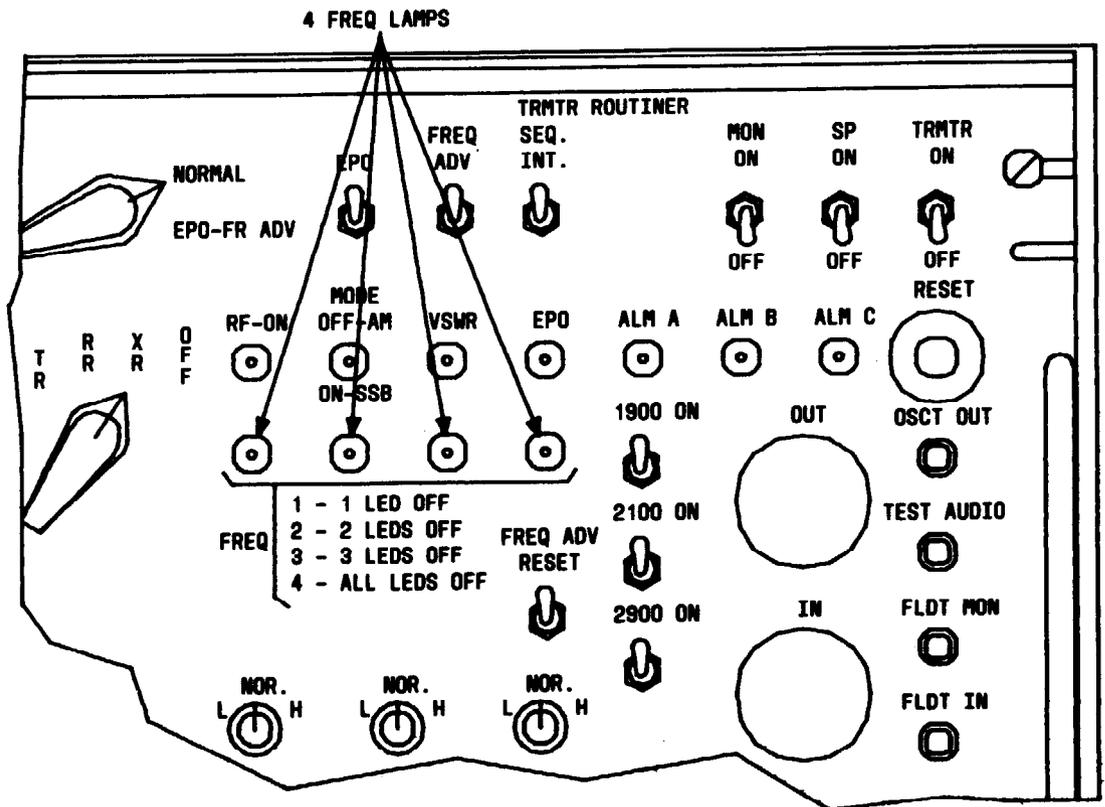
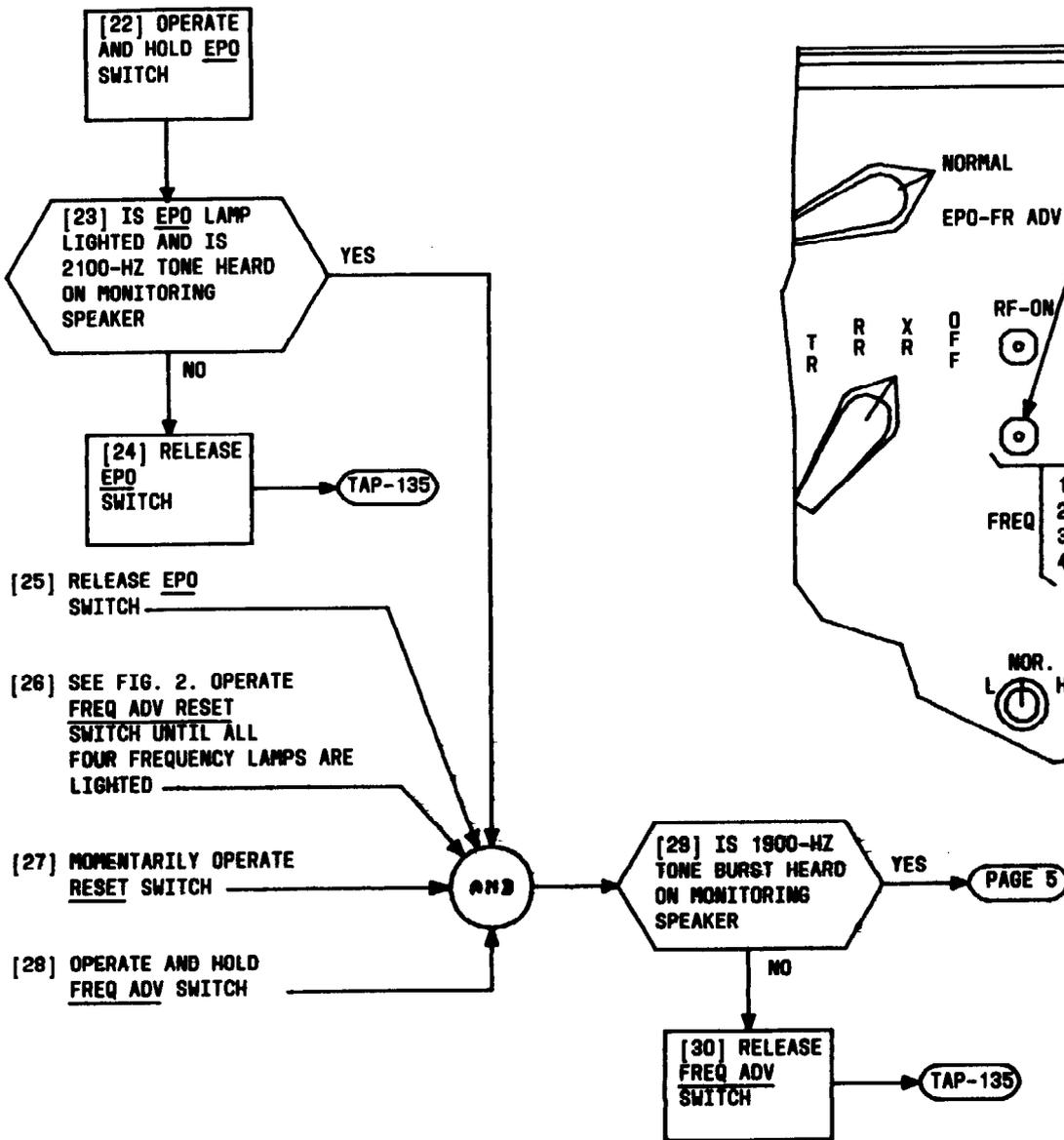
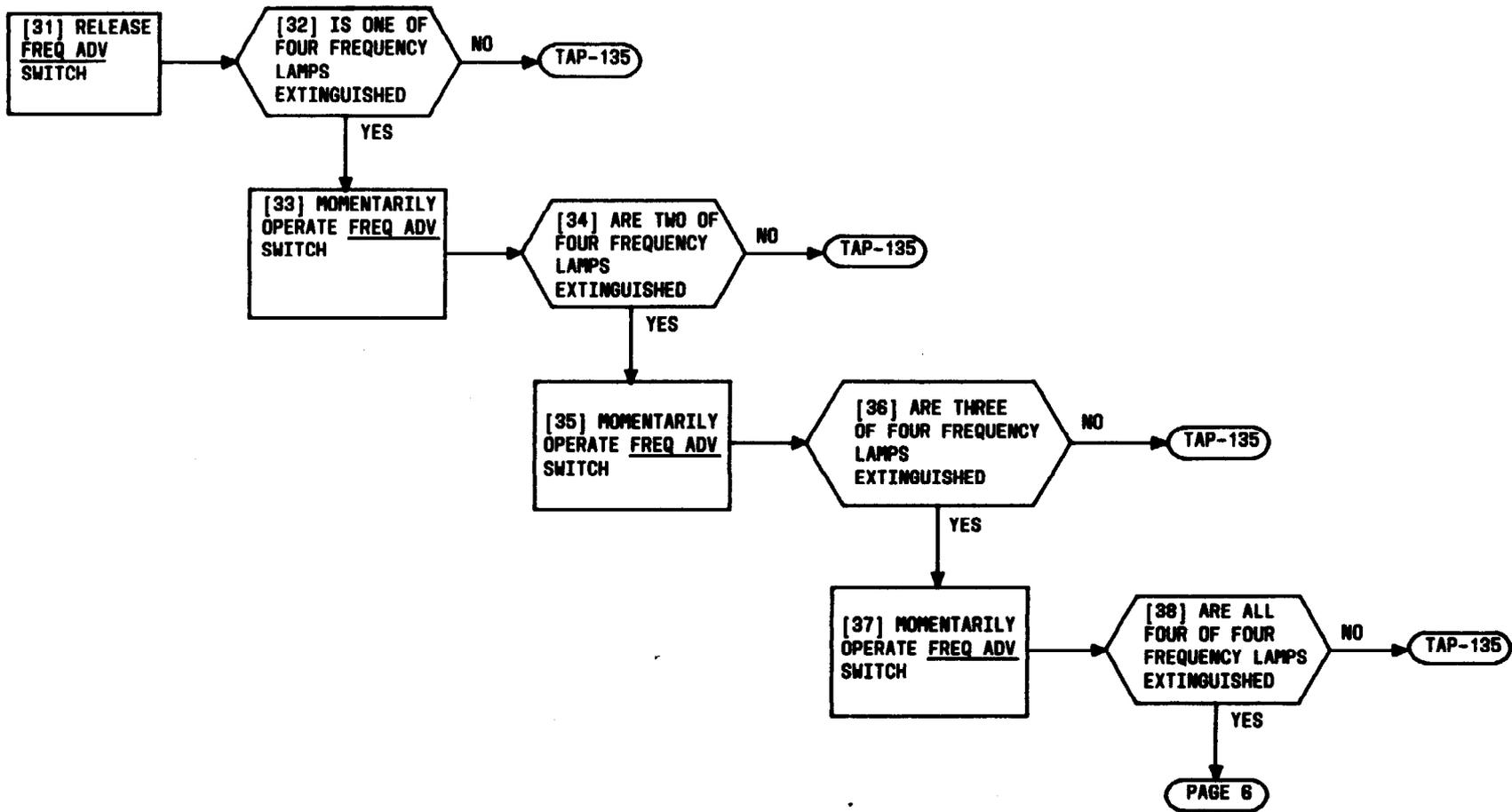


FIG. 2

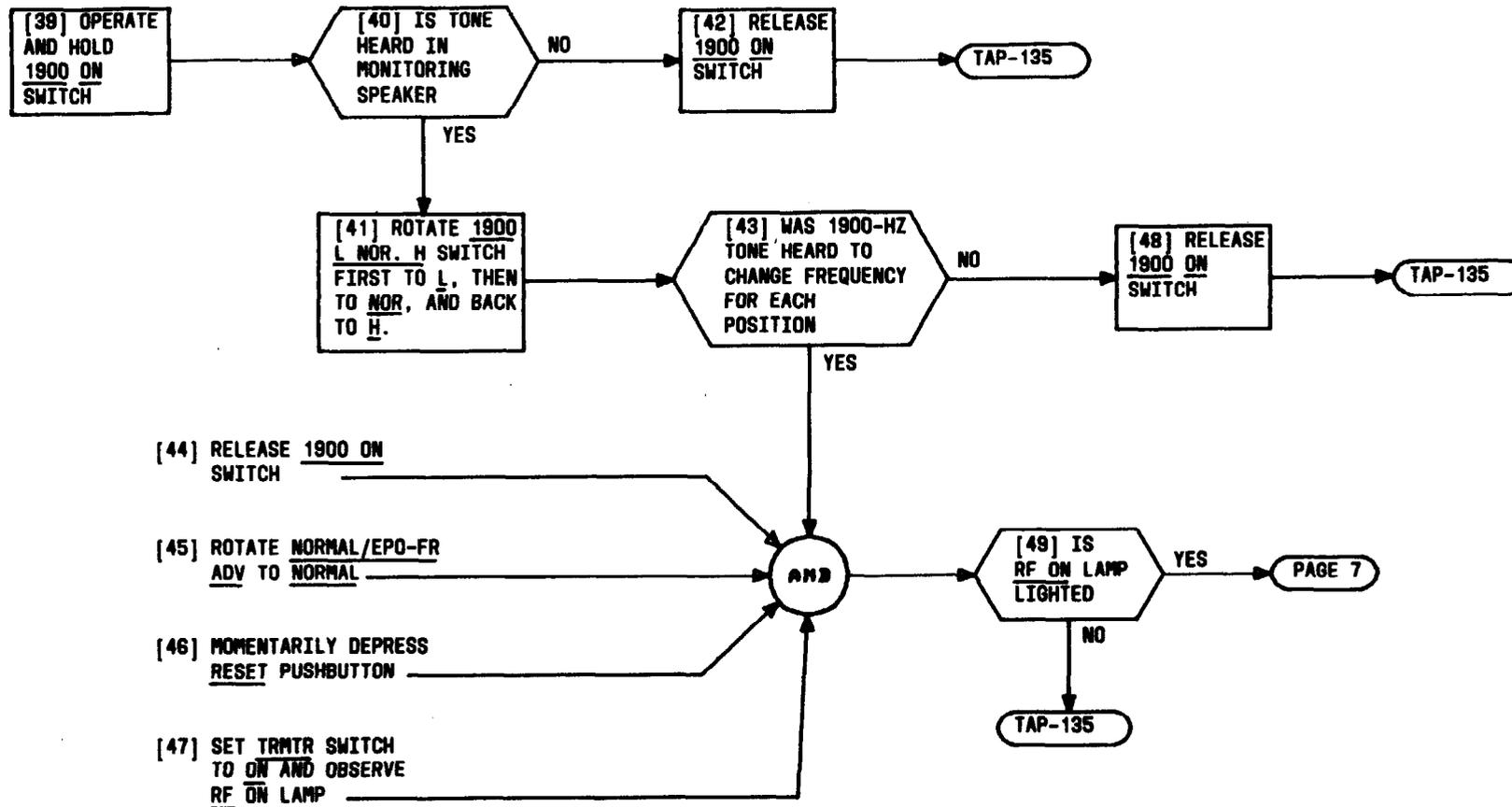
**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

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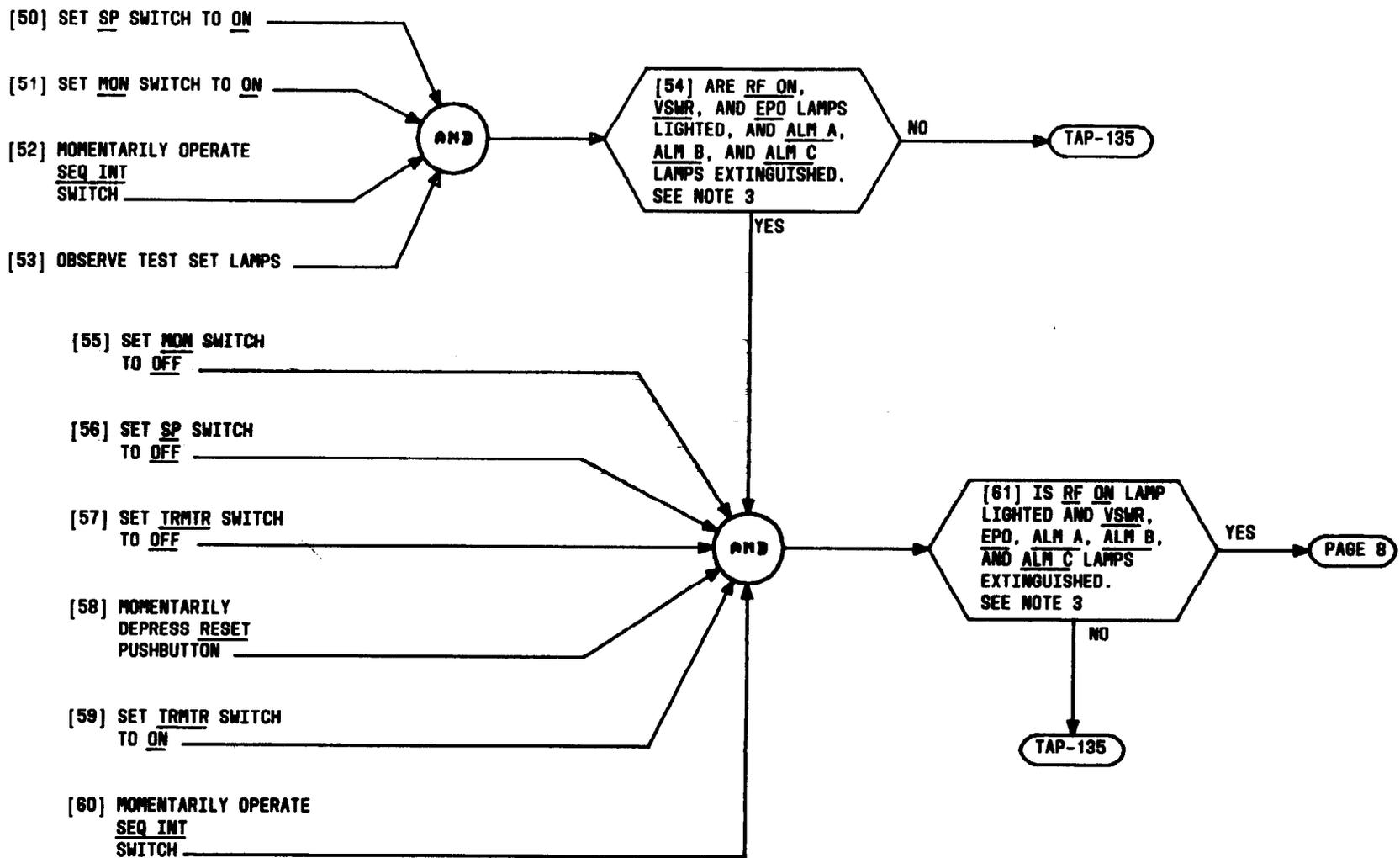
**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

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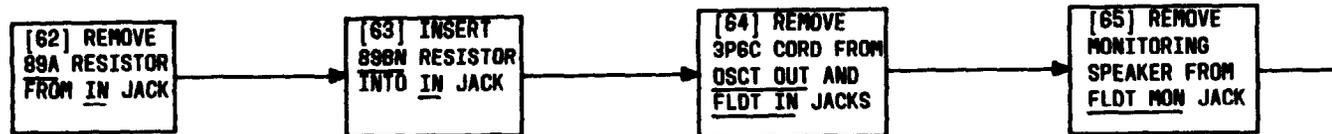
**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

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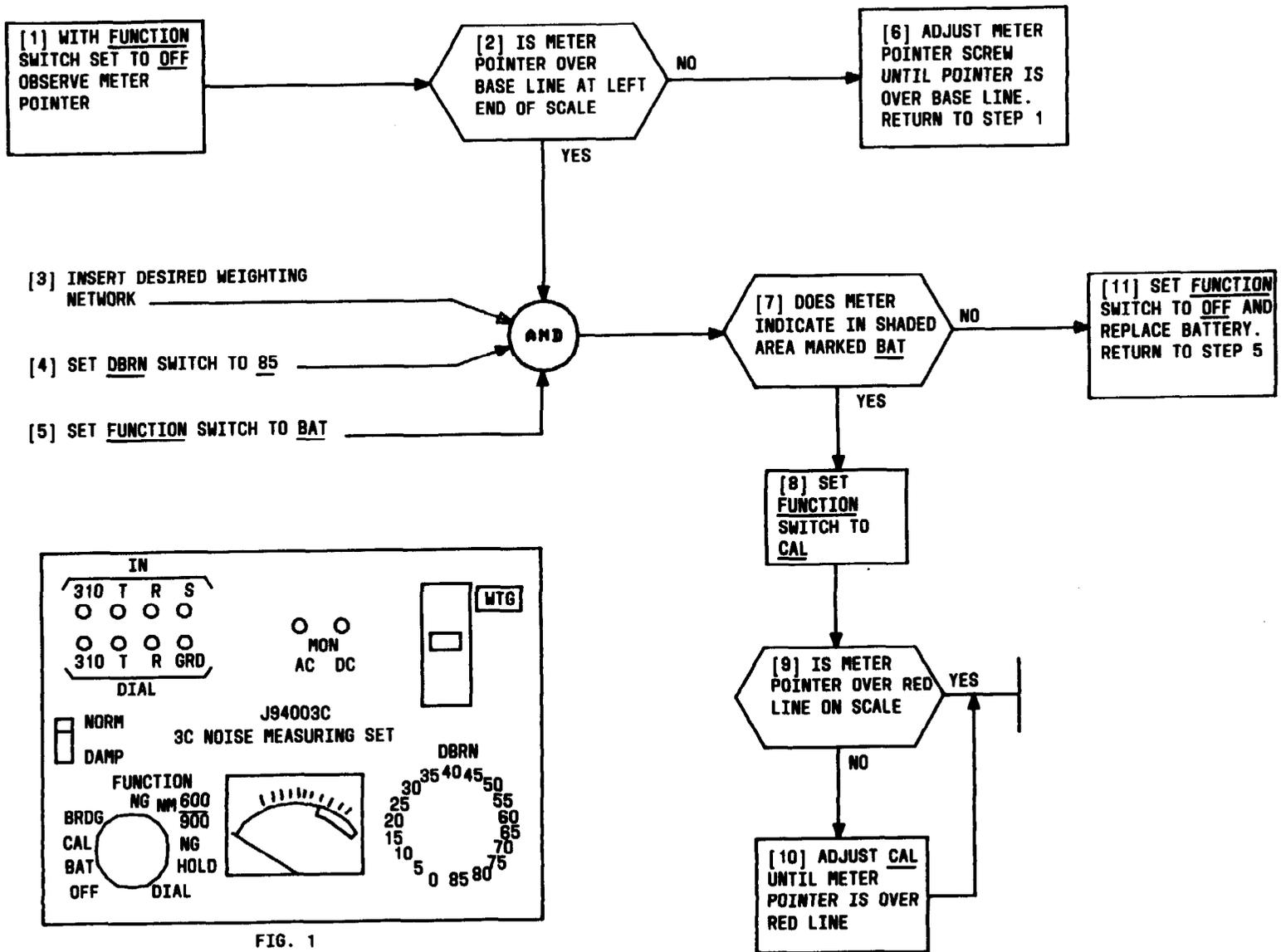
**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

NOTE 3 DISREGARD THE MODE LAMP INDICATION	
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**SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST**

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CONDITION 3C NOISE MEASURING SET FOR MEASUREMENT

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SUMMARY
 SET SPECTRUM ANALYZER FOR 115-VOLT 60-HZ OPERATION. ADJUST DISPLAY CONTROLS FOR MEDIUM BRIGHTNESS AND BEST RESOLUTION. ALIGN TRACE WITH HORIZONTAL LINE OF GRATICULE. ADJUST HORIZONTAL AND VERTICAL POSITION AND GAIN CONTROLS FOR PROPER LENGTH AND POSITION. ADJUST FOR PROPER LINEAR ALIGNMENT. WITH LOG REF LEVEL CONTROL SET FOR 1 MV/DIV, AMPLITUDE SHOULD BE 7.07 MILLIVOLTS. ADJUST FOR PROPER LOGARITHMIC ALIGNMENT. WITH LOG REF LEVEL CONTROL SET FOR -30 DBM, SIGNAL TRACE SHOULD ALIGN WITH TOP (LOG REF) LINE OF GRATICULE

ON REAR OF ANALYZER [FIG. 1]:

- [1] SET 115/230V SLIDE SWITCH TO 115V (LEFT) POSITION
- [2] SET INT/EXT SWITCH TO INT (RIGHT) POSITION
- [3] SEE NOTE 1. TERMINATE AUXILIARY A WITH 50-OHM LOAD ASSEMBLY (HP00553660122)
- [4] CONNECT POWER CORD TO INPUT JACK AND OTHER END TO 115-V 60-HZ OFFICE OUTLET

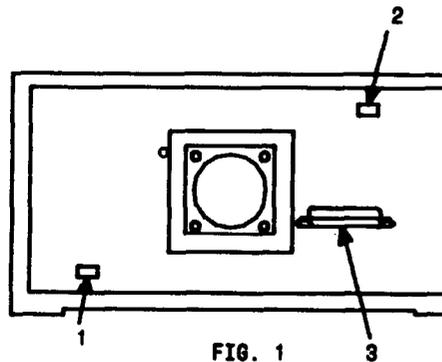


FIG. 1

[5] ON FRONT PANEL, SET POWER SWITCH TO ON AND OBSERVE THAT ON LAMP IS LIGHTED AND FAN RUNNING

[6] ARE YOU FAMILIAR WITH SPECTRUM ANALYZER CONTROLS AND INDICATORS

YES

PAGE 6

NO

[7] SEE FIG. 2, FIG. 3, TABLE A, AND TABLE B

**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
 (HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)**

NOTE 1

LOAD ASSEMBLY PROVIDED WITH INSTRUMENT AND MAY ALREADY BE CONNECTED

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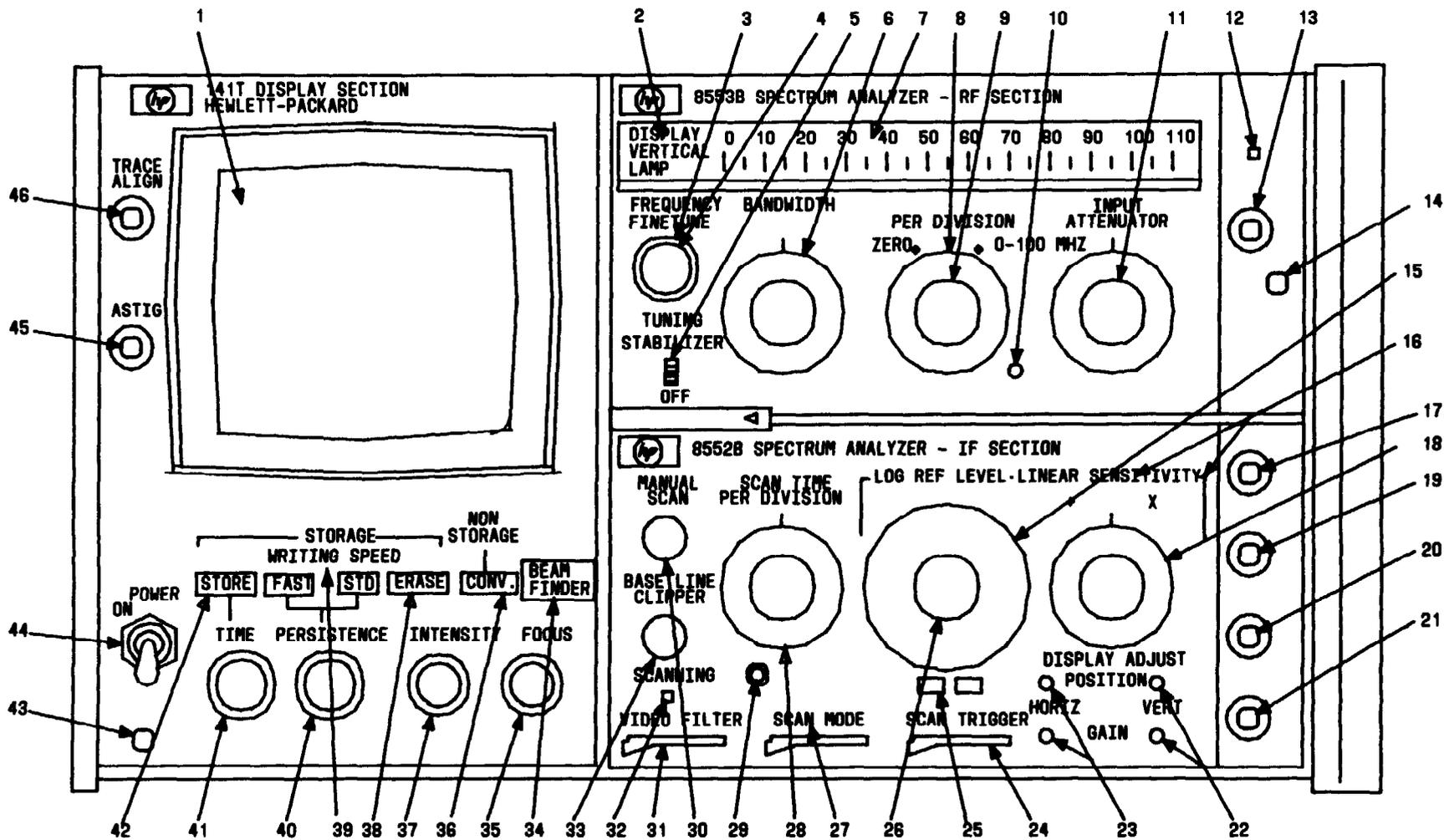


FIG. 2

**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT (HEWLETT-PACKARD
8553B RF/8552B IF/141T DISPLAY)**

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**TABLE A
SPECTRUM ANALYZER CONTROL INDICATORS AND CONNECTORS**

FIG. 2 ITEM	FUNCTION	FIG. 2 ITEM	FUNCTION
1	DISPLAY SCREEN WITH GRATICULE [FIG. 3 AND TABLE B]	12	RANGE MHZ SWITCH: CONTROLS TUNING RANGE OF FREQUENCY CONTROL. IN 0-11 MHZ, TUNING RANGE OF FREQUENCY CONTROL IS LIMITED TO 11 MHZ
2	DISPLAY UNCAL LAMP: LIGHTS WHEN RELATIONSHIP BETWEEN SCAN TIME, SCAN WIDTH, BANDWIDTH, AND VIDEO FILTERING IS SUCH THAT ACCURACY OF VERTICAL CALIBRATION IS IMPAIRED	13	RF-INPUT: 50-OHM COAXIAL INPUT CONNECTOR
3	FREQUENCY (OUTER CONTROL): COARSE-TUNES ANALYZER CENTER FREQUENCY	14	PROBE POWER: SUPPLIES POWER TO ACTIVE PROBE
4	FINE TUNE (INNER CONTROL): FINE TUNES ANALYZER CENTER FREQUENCY	15	LOG REF LEVEL: WITH 2 DB LOG, 10 DB LOG LINEAR SWITCH (ITEM 25) SET TO 10-DB LOG, LIGHTED INDEX LAMP REFERS MATCHING DB GRADUATION TO TOP LOG LINE OF GRATICULE. FOR EXAMPLE, IF -30 DBM IS OPPOSITE LIGHTED LAMP, THEN TOP LOG REF LINE IS -30 DBM AND SO SERVES AS AN ABSOLUTE AMPLITUDE REFERENCE. WITH (ITEM 25) SET TO LINEAR, LIGHTED INDEX LAMP INDICATES THE MATCHING VOLTAGE GRADUATION TO BE USED AS A PER DIVISION MULTIPLIER FOR CALIBRATED VOLTAGE READINGS (BLUE MARKINGS)
5	TUNING STABILIZER-USE FINE TUNE ONLY (SLIDE SWITCH): IN (UP) POSITION, FIRST LO IS AUTOMATICALLY PHASE-LOCKED TO A REFERENCE CRYSTAL HARMONIC FOR SCAN WIDTHS OF 20 KHZ/DIV AND LESS	16	PLUS "+" LIGHTS WHEN LOGARITHMIC AMPLIFICATION (25) IS SELECTED; TIMES "X" LIGHTS WHEN LINEAR AMPLIFICATION IS SELECTED. WITH "+" LIGHTED, LOG REF LINE IS SUM (BLACK NUMERALS) OF LOG REF LEVEL CONTROLS. WITH "X" LIGHTED PER DIVISION ABSOLUTE VOLTAGE AMPLITUDE IS PRODUCT (BLUE NUMERALS) OF LINEAR SENSITIVITY CONTROL
6	BANDWIDTH: SELECTS 3 DB IF BANDWIDTHS	17	CAL OUTPUT: PROVIDES A 30-MHZ SIGNAL AT -30 DBM FOR AMPLITUDE CALIBRATION OF SPECTRUM ANALYZER
7	CENTER FREQUENCY MHZ SCALE: INDICATES CENTER FREQUENCY TO WHICH INSTRUMENT IS TUNED	18	LINEAR SENSITIVITY: INDICATES 1-DB INCREMENTS FOR LOGARITHMIC AMPLIFICATION; INDICATES MULTIPLICATION FACTORS UP TO UNITY FOR LINEAR AMPLIFICATION
8	SCAN WIDTH PER DIVISION - OUTER KNOB: INDICATES PER-DIVISION SCAN WIDTH	19	PEN LIFT OUTPUT: PROVIDES OUTPUT TO RECORDERS, PROVIDES BLANKING INPUT FOR EXTERNAL SCAN MODE OPERATION AND INPUT FOR EXTERNAL TRIGGER OPERATION
9	SCAN WIDTH INNER KNOB: SELECTS 0-100 MHZ FULL SPECTRUM "PRESET" SCAN, PER DIVISION SCAN AS DETERMINED BY SETTING OF OUTER DIAL (ITEM 8) OR "FIXED-FREQUENCY" RECEIVER, IN ZERO SCAN POSITION		
10	AMPL CAL: RF AMPLITUDE GAIN CALIBRATION		
11	INPUT ATTENUATION: ATTENUATES INPUT SIGNAL IN 10-DB STEPS AND LIGHTS ONE INDEX LAMP (ITEM 15) FOR EACH OF ITS SIX POSITIONS. THE LEFT INDEX LAMP IS FOR 0 (ZERO) ATTENUATION. THE LIGHTED LAMP AND STEPS IN ATTENUATION THEN PROGRESS IN CLOCKWISE ORDER		

**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
(HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)**

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TABLE A (CONTINUED)

FIG. 2 ITEM	FUNCTION	FIG. 2 ITEM	FUNCTION
20	VERTICAL OUTPUT: DETECTED VIDEO OUTPUT PROPORTIONAL TO VERTICAL DEFLECTION ON CRT	28	SCAN TIME PER DIVISION: CONTROLS SCAN TIME
21	SCAN IN/OUT: FOR RECEIVING AN EXTERNAL SCAN RAMP OR OUTPUT COUPLED FOR INTERNALLY GENERATED SCAN RAMP. INPUT/OUTPUT FUNCTION DETERMINED BY INT/EXT POSITIONS OF SCAN MODE SWITCH	29	SINGLE SCAN SWITCH: PRESS TO INITIATE SCAN WITH SCAN MODE SWITCH TO SINGLE; PRESS DURING SCAN TO STOP AND RESET SCAN
22	DISPLAY ADJUST VERTICAL: ADJUSTS VERTICAL POSITION OF GAIN TRACE	30	MANUAL SCAN: CONTROLS SCAN IN MAN POSITION OF SCAN MODE SWITCH (ITEM 27)
23	DISPLAY ADJUST HORIZONTAL: ADJUSTS HORIZONTAL POSITION AND GAIN OF TRACE	31	VIDEO FILTER: SELECTS 100 HZ, 10 KHZ, OR OFF POSITION OF LOW-PASS FILTER FOR DETECTED VIDEO
24	SCAN TRIGGER: SELECTS SCAN TRIGGER MODE	32	SCANNING: LIGHTS FOR DURATION OF SCAN FOR SINGLE AND INT SCAN MODES
25	2 DB LOG/10 DB LOG/LINEAR SWITCH: SELECTS LINEAR, 10 DB LOG, OR 2 DB LOG DISPLAY MODES. TO USE 2 DB LOG, FIRST FIND SIGNAL, USING 10 DB LOG; DISPLAY DESIRED PORTION IN TOP 16 DB OF SCREEN; THEN, SWITCH TO 2 DB LOG. TOP OF SCREEN (LOG REF) REMAINS THE SAME, -70 DB LINE IS NOW -14 DB (EACH MAJOR DIVISION IS 2 DB)	33	BASE LINE CLIPPER: BLANKS LOWER PART OF TRACE TO PREVENT OVEREXPOSURE OF PHOTOGRAPHS (DUE TO HIGH-INTENSITY BASE LINE). BLANKING ALSO PREVENTS BLOOMING WITH A VARIABLE-PERSISTANCE/STORAGE DISPLAY SECTION
26	LOG REF LEVEL: ASSUMING THAT DB GRADUATION (BLACK NUMERALS) MATCHES POSITION OF LIGHTED INDEX LAMP, LOG REF GRATICULE LINE INDICATES POWER LEVEL WHEN 2 DB LOG/10 DB LOG/LINEAR SWITCH (ITEM 25) IS SET TO 10 DB LOG WITH (ITEM 25) SET TO LINEAR, INDICATES PER DIVISION MULTIPLIER FOR CALIBRATED VOLTAGE AMPLITUDE FOR WHATEVER VOLTAGE GRADUATION (BLUE NUMERALS) MATCHES POSITION OF LIGHTED INDEX LAMP	34	NOT USED WITH THIS INSTRUMENT
27	SCAN MODE SWITCH: SELECTS SCAN RAMP MODE. RAMP IS INTERNALLY GENERATED FOR SINGLE/INT POSITIONS BUT MUST BE EXTERNALLY SUPPLIED FOR EXT POSITION	35	FOCUS: FOCUSES CRT BEAM
		36	NONSTORAGE CONV: SELECTS NONSTORAGE FUNCTION
			<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>WARNING USE STORAGE FUNCTION WHEN POSSIBLE TO PREVENT DAMAGE TO CRT</p> </div>
		37	INTENSITY: ADJUSTS BRIGHTNESS OF CRT TRACE

**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
(HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)**

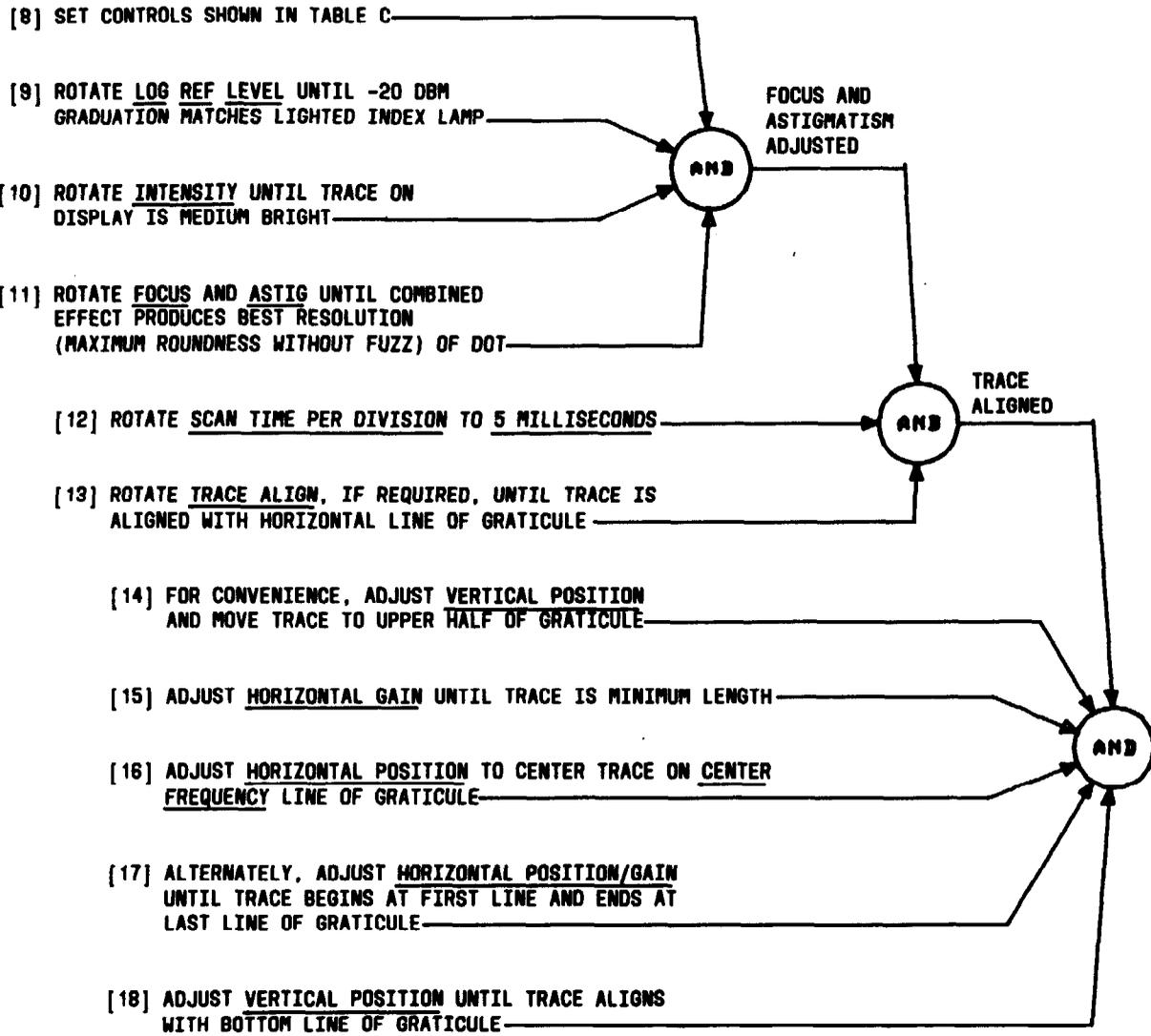


TABLE C	
CONTROL	SETTING
BASE LINE CLIPPER	FULLY CCM
SCAN WIDTH (INNER RED)	ZERO
INPUT ATTENUATOR	10 DB
BANDWIDTH	.3 KHZ
SCAN TIME PER DIVISION	10 SECONDS
SCAN MODE	INT
SCAN TRIGGER	AUTO
RANGE MHZ	0-110
VERNIER (FIG. 2, ITEM 18)	FULLY CCM

**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
(HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)**

[20] SET SCAN WIDTH (INNER/RED)
TO 0-100 MHZ

[21] TUNE FREQUENCY CONTROL UNTIL
NEGATIVE MARKER (TABLE B,
ITEM 5) CAUSES MAXIMUM DIP
IN SIGNAL APPEARING ON -2
VERTICAL LINE OF GRATICULE
(TABLE B, ITEM 3). SEE NOTE 2

[22] SET CONTROLS AS SHOWN
IN TABLE D

[23] ROTATE LOG REF LEVEL UNTIL
-30 DBM GRADUATION MATCHES
LIGHTED INDEX LAMP

[24] ROTATE FREQUENCY FINE TUNE FOR
MAXIMUM AMPLITUDE OF SIGNAL

[25] ROTATE AMPL CAL UNTIL TRACE
IS CENTERED ON TOP LINE OF
GRATICULE AT CENTER FREQUENCY
POSITION

[26] SEE FIG. 4. ROTATE LOG REF LEVEL
CCW AND NOTE SIGNAL DECREASES
ONE DIVISION (10 DB) FOR EACH
CALIBRATED POSITION

VERTICAL
POSITION
AND GAIN
ADJUSTED

PAGE 8

TABLE D	
CONTROL	SETTING
SCAN WIDTH (INNER RED) (OUTER BLACK)	PER DIVISION 0.2 KHZ
BANDWIDTH	300 KHZ
2 DB LOG-10 DB LOG-LINEAR	10 DB LOG
INPUT ATTENUATION	+10 DB
VERNIER (TABLE A, ITEM 18)	FULLY CCW

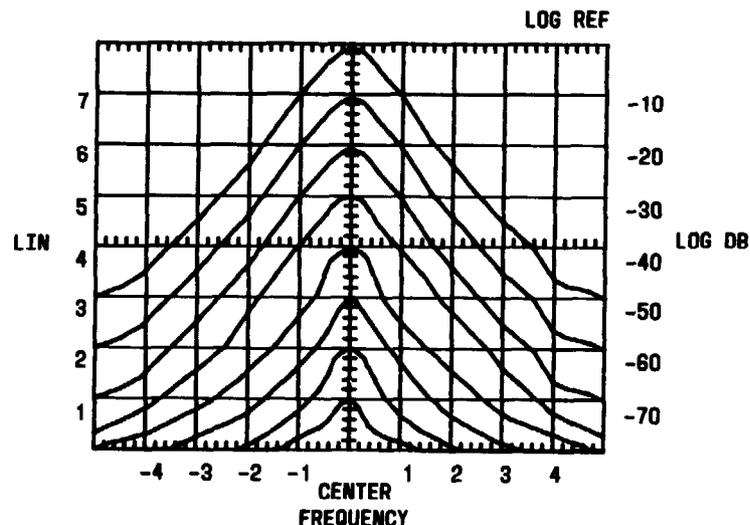
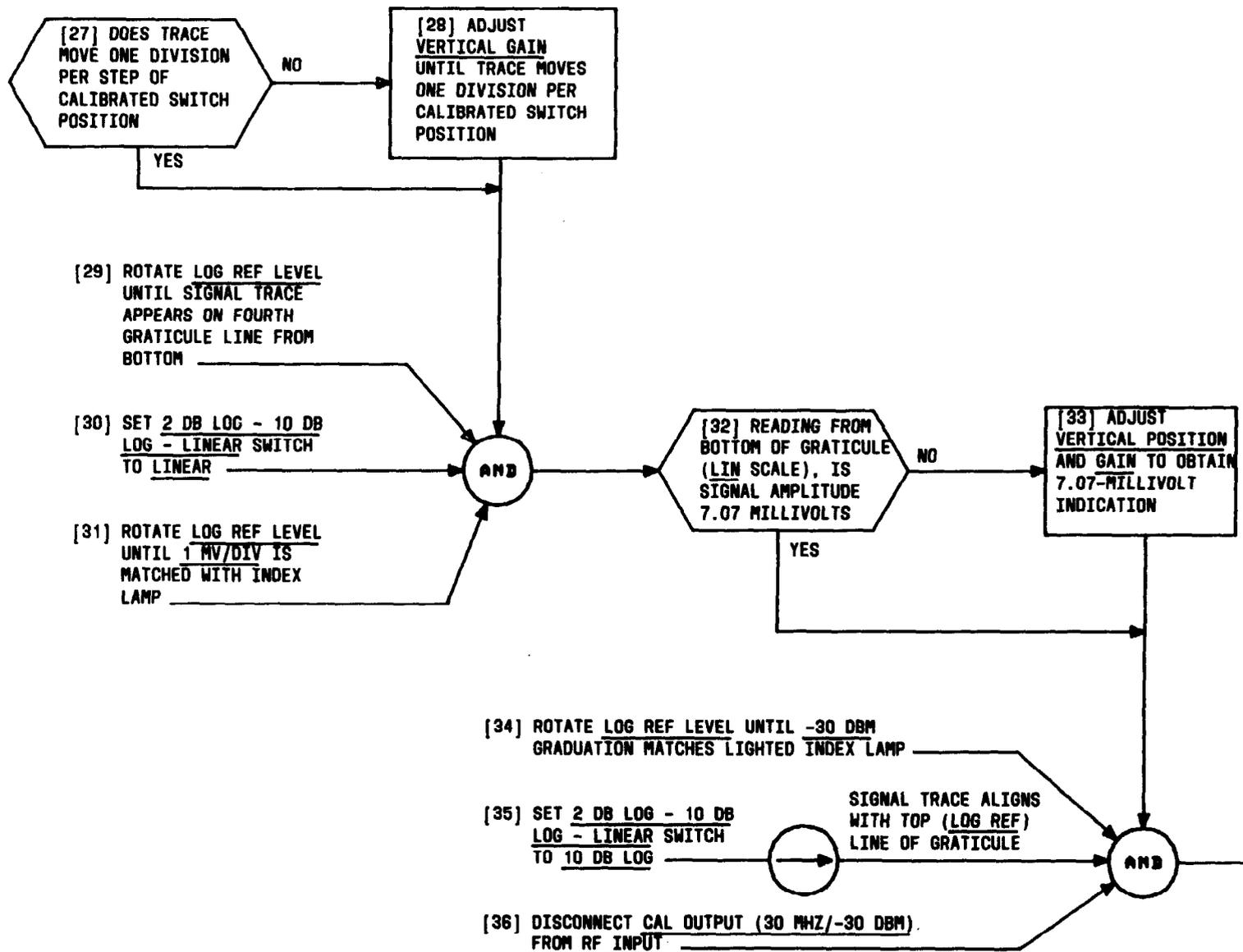


FIG. 4

NOTE 2
RED MARKER SHOULD
BE INDICATING
30 MHZ ON CENTER
FREQUENCY MHZ SCALE

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CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
(HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)



**CONDITION SPECTRUM ANALYZER FOR MEASUREMENT
(HEWLETT-PACKARD 8553B RF/8552B IF/141T DISPLAY)**

SUMMARY
 CONNECT THRLINE WATTMETER AND RF COAXIAL LOAD RESISTOR TO TRANSMITTER FILTER OUTPUT. MODULATE TRANSMITTER IN A3J TRANSMIT MODE WITH 700 HZ AT AN OUTPUT OF -19 DB AND 2500 HZ AT AN OUTPUT OF -19 DB AND A COMBINED OUTPUT OF -16 DB THROUGH A MIXING PAD. OBSERVE SPECTRUM ANALYZER AND DETERMINE THAT CARRIER FREQUENCY IS AT LEAST -44 DB BELOW THE TWO EQUAL TONES AT 400 WATTS PEP

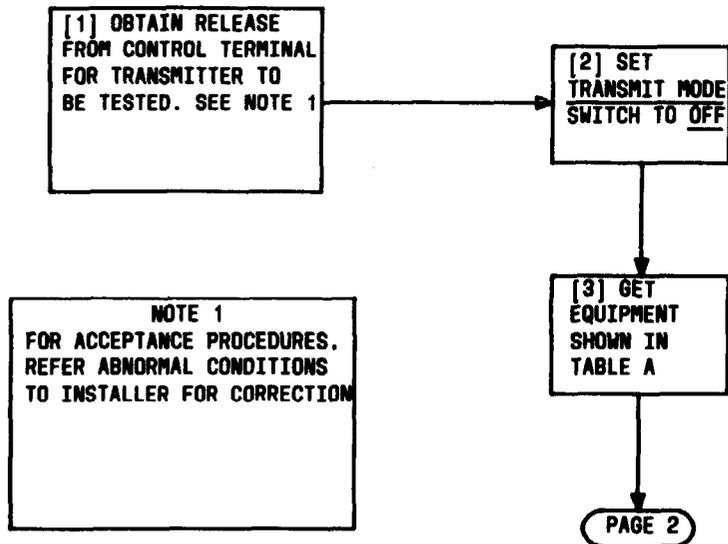


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 200R RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600R 1:1 RATIO
TRANSMISSION MEASURING SET (TMS)	WECO J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600R 1/2 WATT RESISTOR
THRLINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8553B RF HP MODEL 8552B IF

CHECK TRANSMITTER CARRIER BALANCE

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[4] INSERT ONE 369A TERMINATION INTO VOICE LINE JACK AND ONE 369A TERMINATION INTO STATUS LINE JACK [FIG. 1]

[5] USE THREE 200Ω RESISTORS AND SUITABLE CONNECTORS AND MAKE MIXING PAD AS SHOWN IN FIG. 2

[6] CONNECT MIXING PAD TO TRANSFORMER AS SHOWN IN FIG. 3

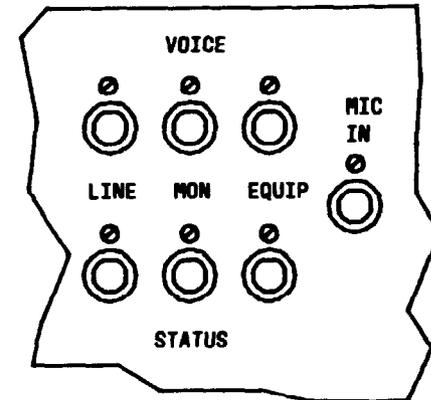
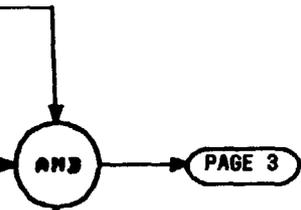


FIG. 1

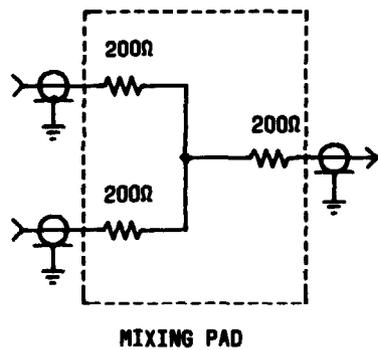


FIG. 2

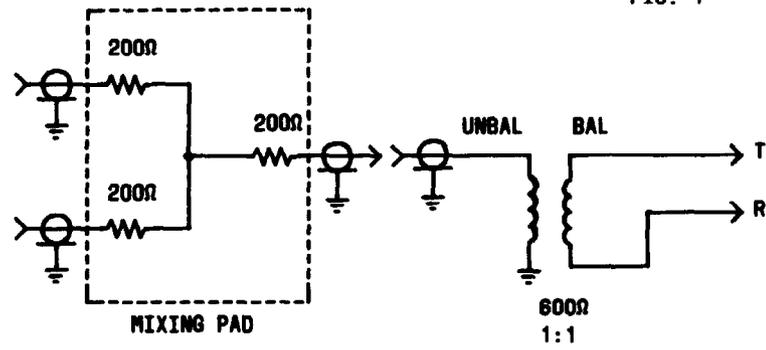


FIG. 3

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- [7] CONDITION 21A TMS TO MEASURE DB [DLP-526]
- [8] SEE FIG. 4. CONNECT DET IN 600Ω INPUT OF TMS TO OUTPUT OF TRANSFORMER
- [9] SEE FIG. 4. CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528] AND CONNECT TO MIXING PAD
- [10] SEE FIG. 4. CONNECT 600Ω RESISTOR TO MIXING PAD
- [11] OBSERVE TMS AND INCREASE POWER OUTPUT OF AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB
- [12] DISCONNECT 600Ω RESISTOR FROM MIXING PAD

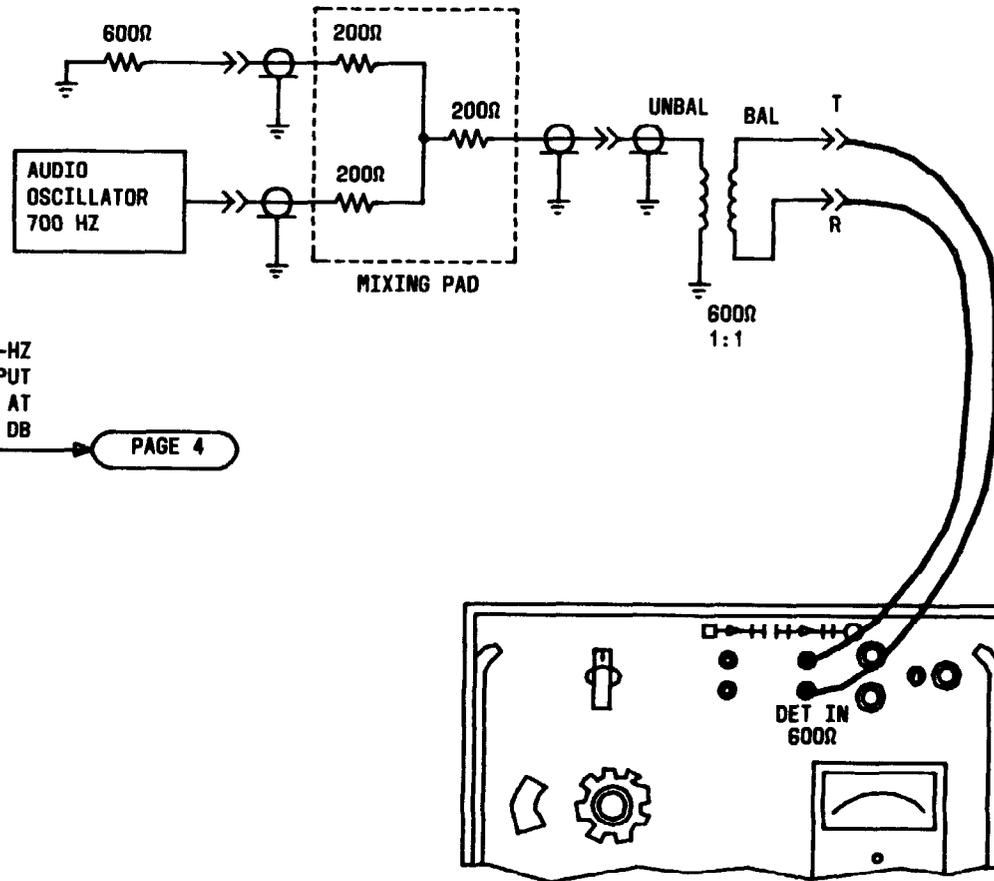


FIG. 4

CHECK TRANSMITTER CARRIER BALANCE

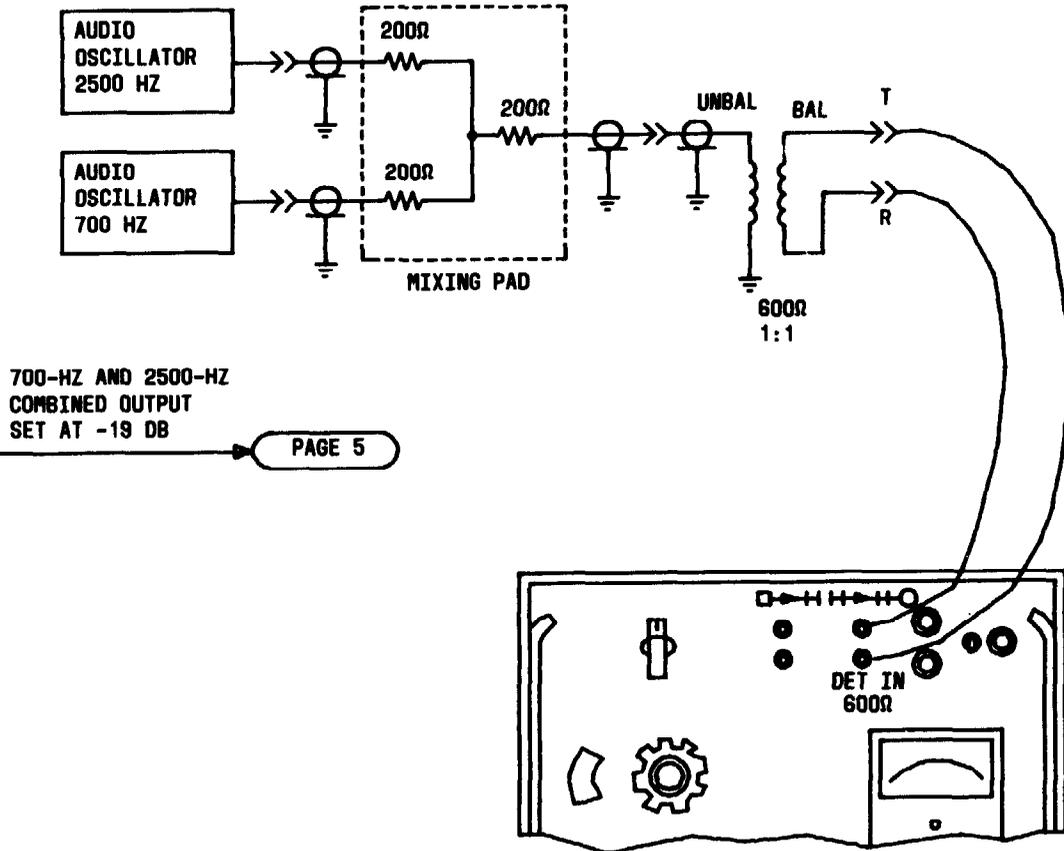
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[13] SEE FIG. 5. CONDITION OTHER AUDIO OSCILLATOR FOR 2500-HZ OUTPUT AND CONNECT TO MIXING PAD [DLP-528]

[14] DISCONNECT 700-HZ AUDIO OSCILLATOR FROM MIXING PAD AND CONNECT 600Ω RESISTOR TO MIXING PAD

[15] OBSERVE TMS AND INCREASE POWER OUTPUT OF 2500-HZ AUDIO OSCILLATOR UNTIL TMS INDICATES -22 DB

[16] DISCONNECT 600Ω RESISTOR AND CONNECT 700-HZ AUDIO OSCILLATOR [FIG. 5]



700-HZ AND 2500-HZ COMBINED OUTPUT SET AT -19 DB

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FIG. 5

CHECK TRANSMITTER CARRIER BALANCE

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[17] SEE FIG. 6. DISCONNECT TMS FROM TRANSFORMER AND CONNECT TRANSFORMER TO VOICE EQUIP JACK

[18] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[19] SEE FIG. 8. CONNECT THRU-LINE WATTMETER TO FILTER OUTPUT AND INSERT 250H ELEMENT INTO WATTMETER WITH ARROW PRINTED ON ELEMENT FACING RIGHT

[20] SEE FIG. 8. CONNECT RF COAXIAL LOAD RESISTOR TO THRU-LINE WATTMETER

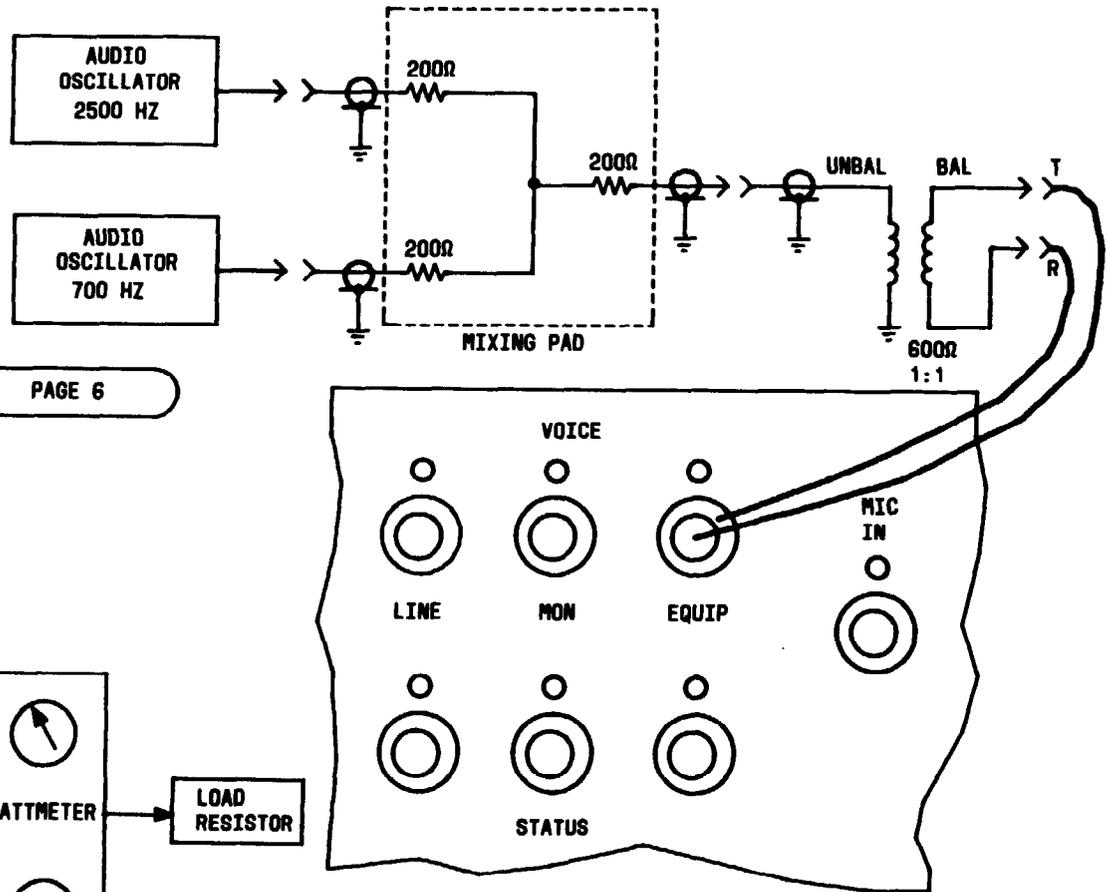


FIG. 6

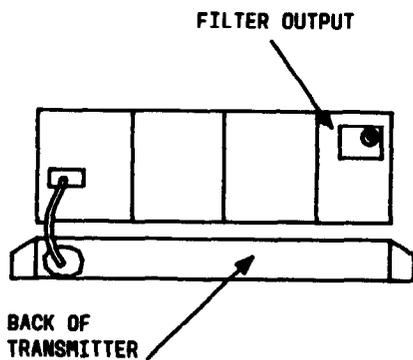


FIG. 7

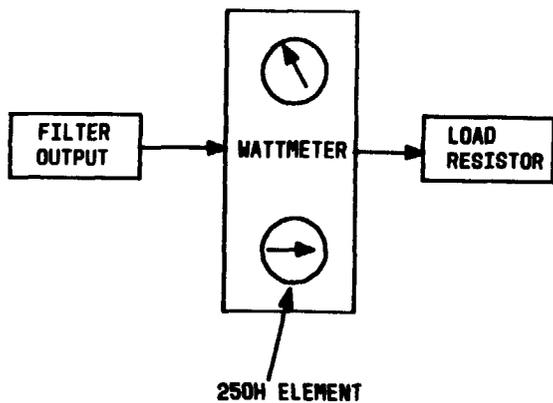


FIG. 8

CHECK TRANSMITTER CARRIER BALANCE

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[21] CONDITION SPECTRUM ANALYZER FOR SIGNAL ANALYSIS [DLP-533]

[22] SET CONTROLS ON SPECTRUM ANALYZER AS SHOWN IN TABLE B

[23] SEE FIG. 9. CONNECT SPECTRUM ANALYZER TO PA MON JACK

TEST CONNECTIONS COMPLETE

PAGE 7

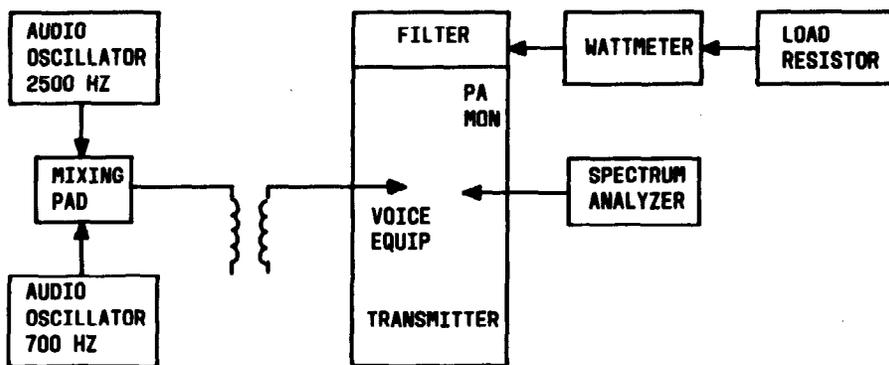


FIG. 9

TABLE B

SWITCH	POSITION
RANGE MHZ	0-11
FREQUENCY	DESIRED FREQUENCY
FINE TUNE	UP
BASE LINE CLIPPER	MAXIMUM CCW
VIDEO FILTER	10 HZ
SCAN MODE	INT
SCAN TRIGGER	AUTO
SCAN TIME PER DIVISION	.2 SEC
2 DB LOG 10 DB LOG LINEAR	10 DB LOG
LOG REF LEVEL	-10
BANDWIDTH	.03 KHZ
SCAN WIDTH (RED) (BLACK)	PER DIVISION 1 KHZ
INPUT ATTENUATION	10 DB

CHECK TRANSMITTER CARRIER BALANCE

- [24] ON TRANSMITTER, SET TRANSMIT MODE SWITCH TO A3H → **TRANSMITTER ON AND LOCAL LAMPS LIGHTED**
- [25] SEE NOTE 2 AND FIG. 10. ROTATE SPECTRUM ANALYZER FINE TUNE CONTROL UNTIL CARRIER FREQUENCY IS ON CENTER FREQUENCY LINE → **AND** → **PAGE 8**
- [26] REMOVE EXCITER CIRCUIT BOARD ACCESS COVER → **AND**
- [27] ON SECOND BALANCED MODULATOR CIRCUIT BOARD, SET ALC SWITCH TO DOWN POSITION → **AND**
- [28] ON TRANSMITTER, SET TRANSMIT MODE SWITCH TO A3J → **AND**

NOTE 2
 MAKE ADJUSTMENT, AS NECESSARY, TO DISPLAY CONTROLS AND INPUT ATTENUATION TO OBTAIN DISPLAY SIMILAR TO FIG. 10. FREQUENCIES NOT IMPORTANT TO TEST WILL APPEAR ON DISPLAY BUT ARE NOT DRAWN IN FIGURES

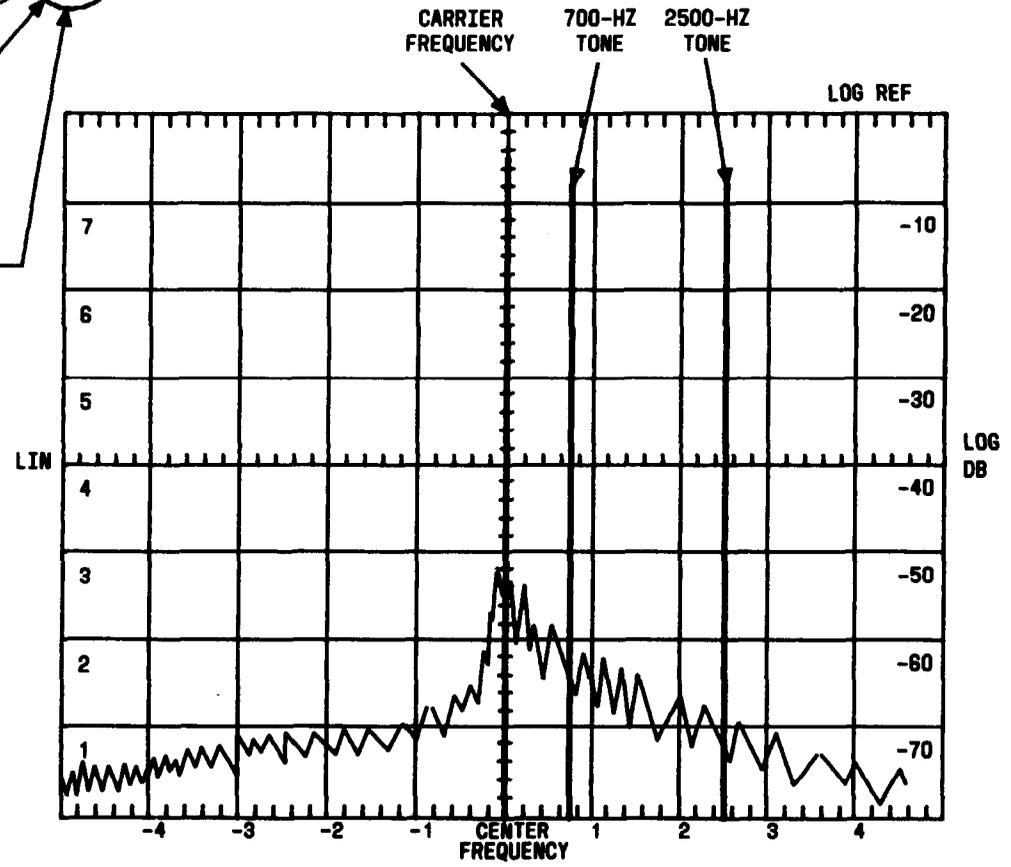
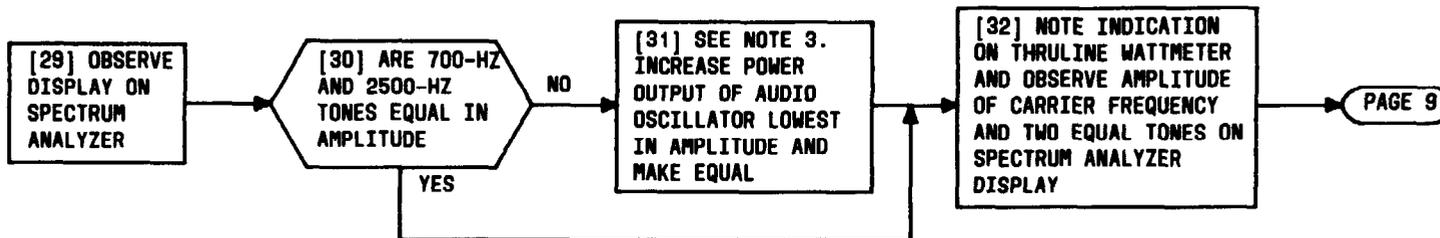


FIG. 10

CHECK TRANSMITTER CARRIER BALANCE



NOTE 3
 NORMALLY,
 2500-HZ
 AMPLITUDE IS
 LOWEST

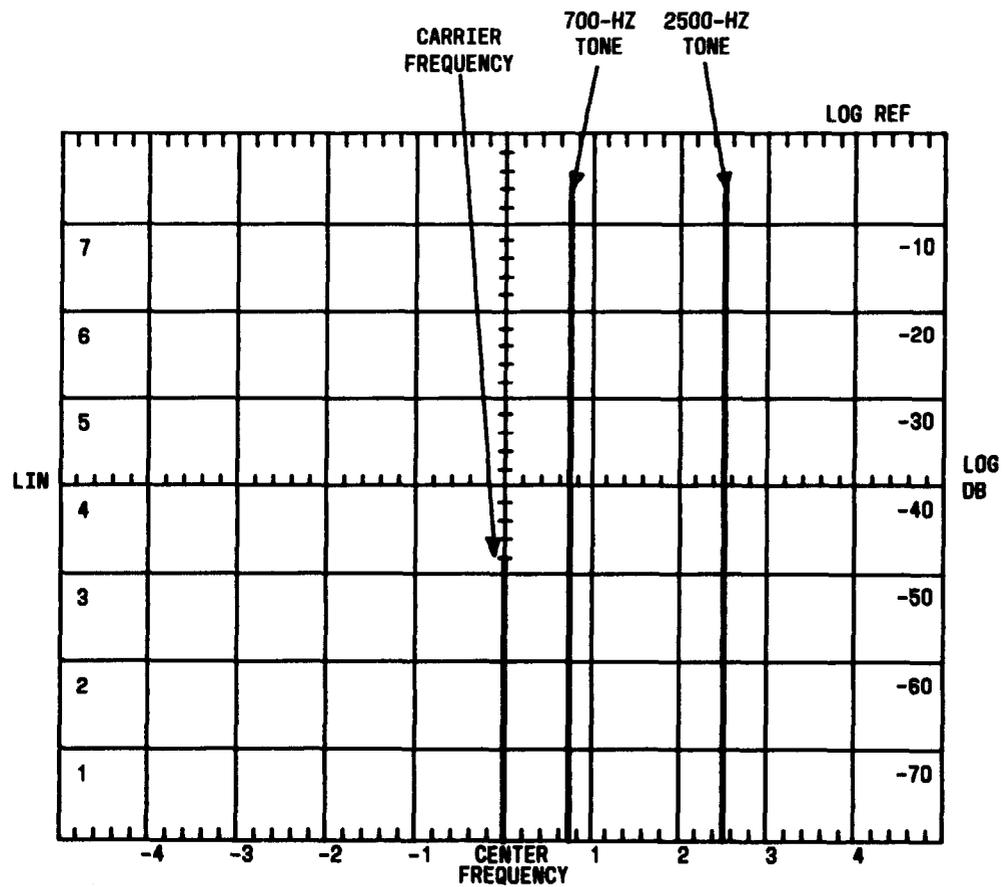
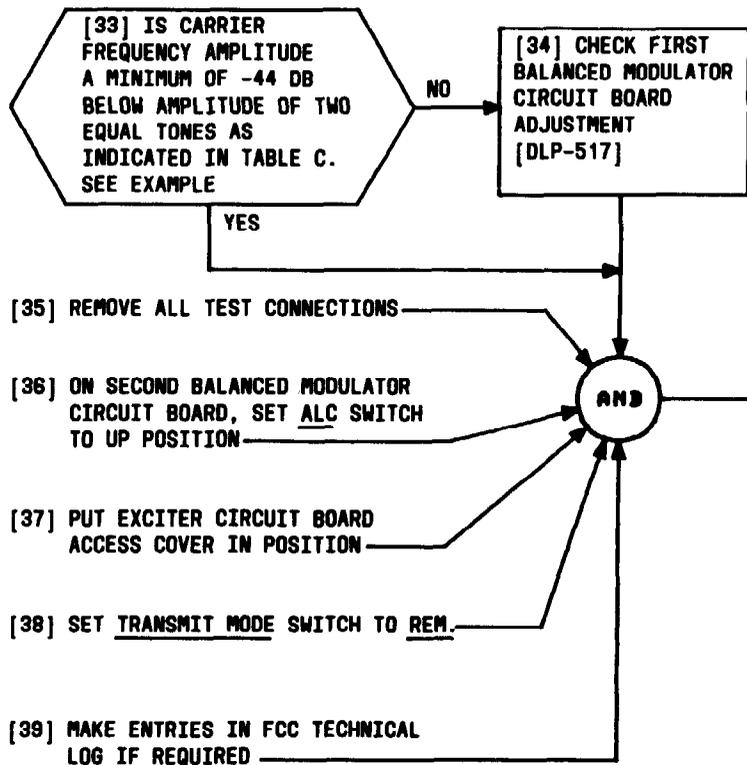


FIG. 11

CHECK TRANSMITTER CARRIER BALANCE



EXAMPLE
FROM TABLE C
WATTMETER = 162 WATTS
MIN DIFFERENCE = 44 DB

SHOWN IN FIG. 11
2-TONE AMP = -5 DB
CARRIER AMP = -49 DB
DIFFERENCE = 44 DB

EXAMPLE MEETS MINIMUM
REQUIREMENT; THEREFORE,
CARRIER BALANCE TEST PASSES

TABLE C	
WATTMETER INDICATION	MINIMUM AMPLITUDE DIFFERENCE
162	44 DB
144	43.5 DB
129	43 DB
115	42.5 DB
102	42 DB
91	41.5 DB
81	41 DB

CHECK TRANSMITTER CARRIER BALANCE

SUMMARY

CONNECT THRU LINE WATTMETER AND RF COAXIAL LOAD RESISTOR TO TRANSMITTER FILTER OUTPUT. CONDITION ONE AUDIO OSCILLATOR FOR AN OUTPUT OF 700 HZ AT -19 DB AND ONE AUDIO OSCILLATOR FOR AN OUTPUT OF 2500 HZ AT -19 DB AND A COMBINED OUTPUT OF -16 DB THROUGH A MIXING PAD. IN A3H MODE, LOCATE CARRIER FREQUENCY TO CENTER FREQUENCY LINE OF SPECTRUM ANALYZER DISPLAY. IN A3J MODE, ESTABLISH AN AMPLITUDE REFERENCE OF TWO EQUAL TONES. IN A3H, CARRIER AMPLITUDE IS EQUAL TO OR NO GREATER THAN 2 DB ABOVE REFERENCE. IN A3A, CARRIER AMPLITUDE IS AT LEAST 8 DB BELOW AND NO MORE THAN 12 DB BELOW REFERENCE

[1] OBTAIN RELEASE FROM CONTROL TERMINAL FOR TRANSMITTER TO BE TESTED. SEE NOTE 1

[2] SET TRANSMIT MODE SWITCH TO OFF

[3] GET EQUIPMENT SHOWN IN TABLE A

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NOTE 1
FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 200R RESISTORS WITH SUITABLE CONNECTORS; MAKE UP LOCALLY
TRANSFORMER	600R 1:1 RATIO
TRANSMISSION MEASURING SET (TMS)	WECC J94021A 21A
2 AUDIO OSCILLATORS	HP MODEL 200CD
NONINDUCTIVE LOAD	600R 1/2 WATT RESISTOR
THRU LINE WATTMETER	BIRD MODEL 43 WITH 250H ELEMENT
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
SUITABLE PATCH CORDS	
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8553B RF HP MODEL 8552B IF

CHECK TRANSMITTER CARRIER LEVEL

[4] INSERT ONE 369A TERMINATION INTO VOICE LINE JACK AND ONE 369A TERMINATION INTO STATUS LINE JACK [FIG. 1]

[5] USE THREE 200Ω RESISTORS AND SUITABLE CONNECTORS AND MAKE MIXING PAD AS SHOWN IN FIG. 2

[6] CONNECT MIXING PAD TO TRANSFORMER AS SHOWN IN FIG. 3

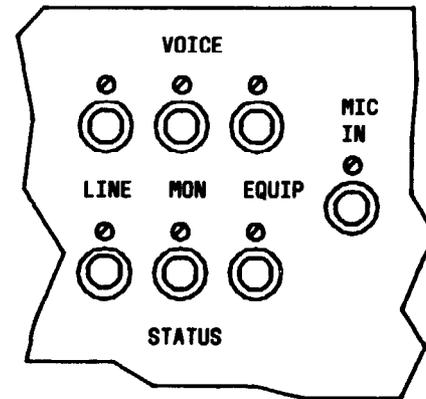
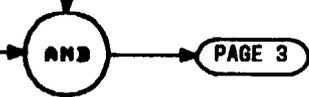
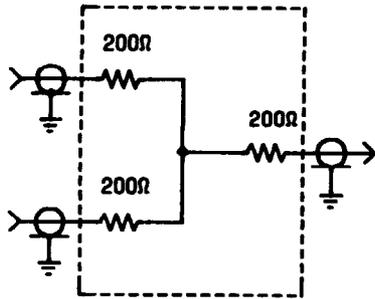


FIG. 1



MIXING PAD

FIG. 2

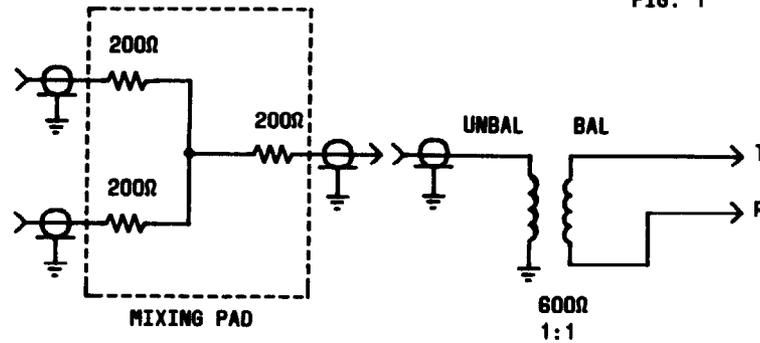
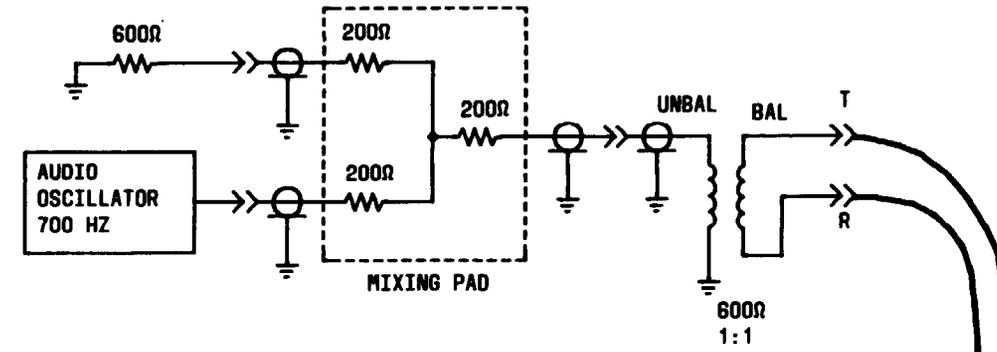


FIG. 3

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- [7] CONDITION 21A TMS TO MEASURE DB [DLP-526]
- [8] SEE FIG. 4. CONNECT DET IN 600Ω INPUT OF TMS TO OUTPUT OF TRANSFORMER
- [9] SEE FIG. 4. CONDITION AUDIO OSCILLATOR FOR TEST [DLP-528] AND CONNECT TO MIXING PAD
- [10] SEE FIG. 4. CONNECT 600Ω RESISTOR TO MIXING PAD
- [11] OBSERVE TMS AND INCREASE POWER OUTPUT OF AUDIO OSCILLATOR UNTIL TMS INDICATES -19 DB
- [12] DISCONNECT 600Ω RESISTOR FROM MIXING PAD



700-HZ
OUTPUT
SET AT
-19 DB

PAGE 4

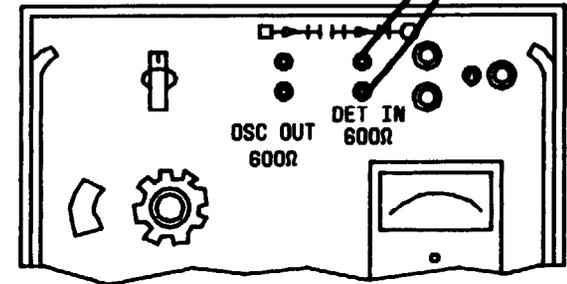


FIG. 4

CHECK TRANSMITTER CARRIER LEVEL

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[13] SEE FIG. 5. CONDITION OTHER AUDIO OSCILLATOR FOR 2500-HZ OUTPUT AND CONNECT TO MIXING PAD

[14] DISCONNECT 700-HZ AUDIO OSCILLATOR FROM MIXING PAD AND CONNECT 600Ω RESISTOR TO MIXING PAD

[15] OBSERVE TMS AND INCREASE POWER OUTPUT OF 2500-HZ AUDIO OSCILLATOR UNTIL TMS INDICATES -19 DB

[16] DISCONNECT 600Ω RESISTOR AND CONNECT 700-HZ AUDIO OSCILLATOR [FIG. 5]

700-HZ AND 2500-HZ COMBINED OUTPUT SET AT -16 DB

PAGE 5

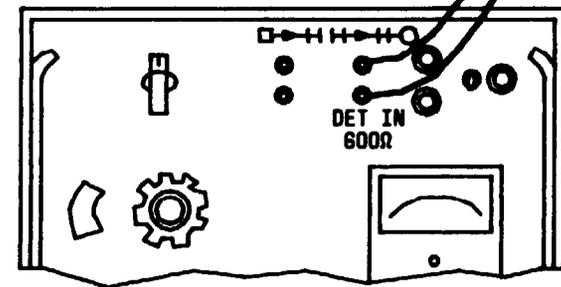
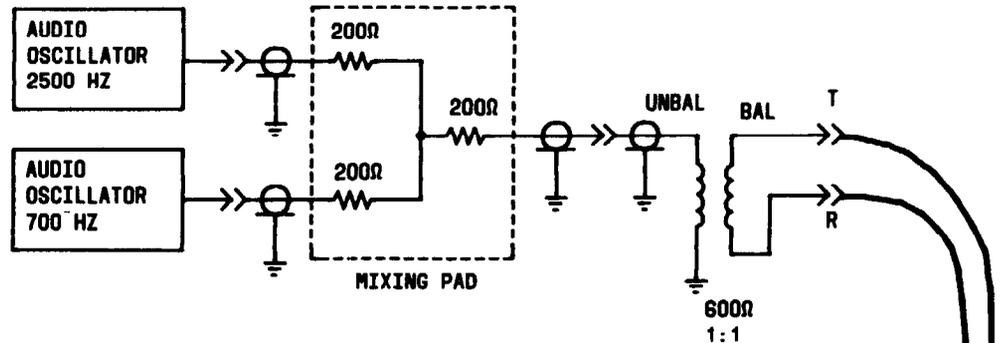


FIG. 5

CHECK TRANSMITTER CARRIER LEVEL

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[17] SEE FIG. 8. DISCONNECT TMS FROM TRANSFORMER AND CONNECT TRANSFORMER TO VOICE EQUIP JACK

[18] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[19] SEE FIG. 8. CONNECT THRU LINE WATTMETER TO FILTER OUTPUT AND INSERT 250H ELEMENT INTO WATTMETER WITH ARROW PRINTED ON ELEMENT FACING RIGHT

[20] SEE FIG. 8. CONNECT RF COAXIAL LOAD RESISTOR TO THRU LINE WATTMETER

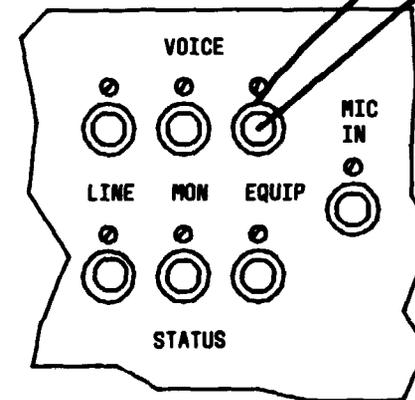
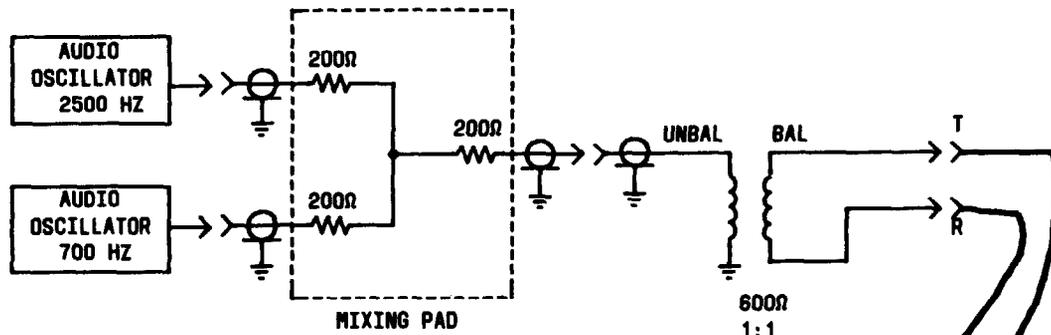


FIG. 6

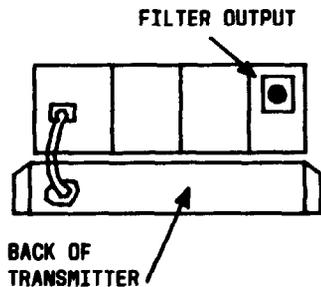


FIG. 7

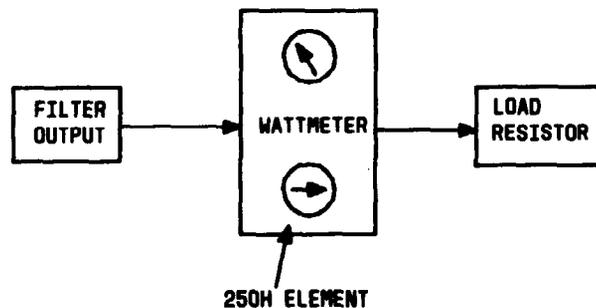


FIG. 8

AND

PAGE 6

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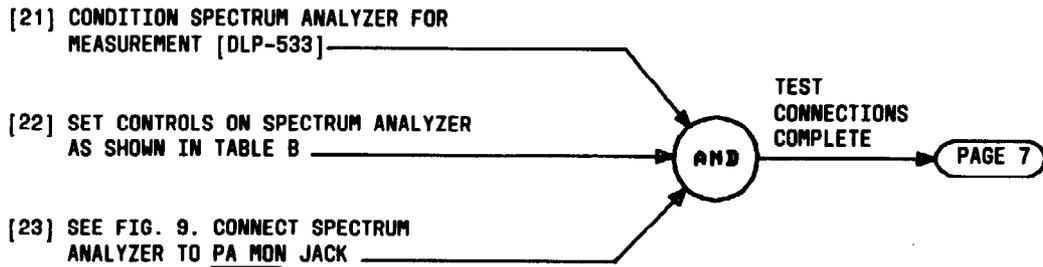


TABLE B	
SWITCH	POSITION
RANGE MHZ	0-11
FREQUENCY	DESIRED FREQUENCY
FINE TUNE	UP
BASE LINE CLIPPER	MAXIMUM CCW
VIDEO FILTER	10 HZ
SCAN MODE	INT
SCAN TRIGGER	AUTO
SCAN TIME PER DIVISION	.2 SEC
2 DB LOG 10 DB LOG LINEAR	10 DB LOG
LOG REF LEVEL	-10
BANDWIDTH	.03 KHZ
SCAN WIDTH (RED) (BLACK)	PER DIVISION 1 KHZ
INPUT ATTENUATION	10 DB

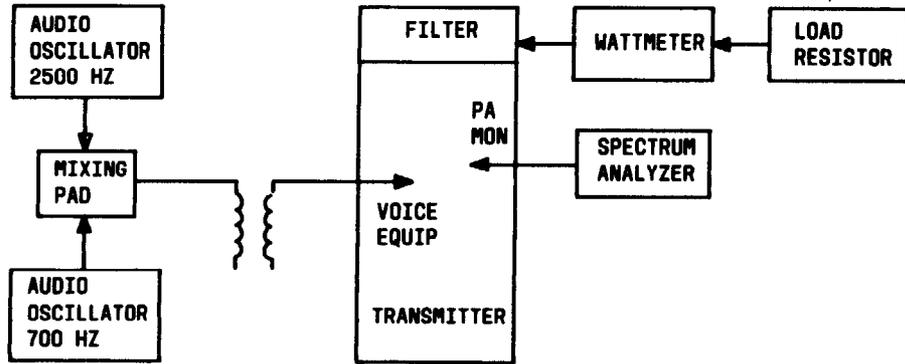


FIG. 9

CHECK TRANSMITTER CARRIER LEVEL

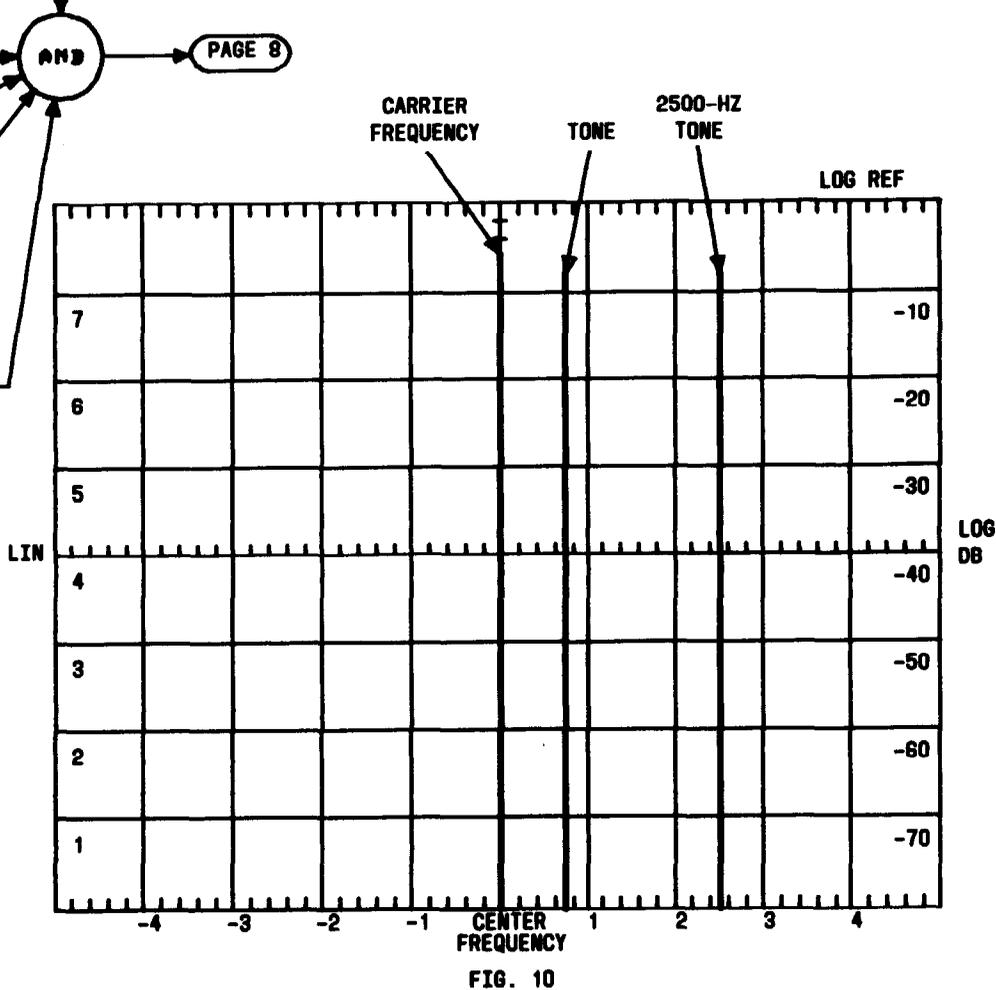
[24] ON TRANSMITTER, SET TRANSMIT MODE SWITCH TO A3H  TRANSMITTER ON AND LOCAL LAMPS LIGHTED

[25] SEE NOTE 2 AND FIG. 10. ROTATE SPECTRUM ANALYZER FINE TUNE CONTROL UNTIL CARRIER FREQUENCY IS ON CENTER FREQUENCY LINE

[26] REMOVE EXCITER CIRCUIT BOARD ACCESS COVER

[27] ON SECOND BALANCED MODULATOR CIRCUIT BOARD, SET ALC SWITCH TO DOWN POSITION

[28] ON TRANSMITTER, SET TRANSMIT MODE SWITCH TO A3J



NOTE 2
 MAKE ADJUSTMENT, AS NECESSARY, TO DISPLAY CONTROLS AND INPUT ATTENUATION TO OBTAIN DISPLAY SIMILAR TO FIG. 10. FREQUENCIES NOT IMPORTANT TO TEST WILL APPEAR ON DISPLAY BUT ARE NOT DRAWN IN FIGURES

CHECK TRANSMITTER CARRIER LEVEL

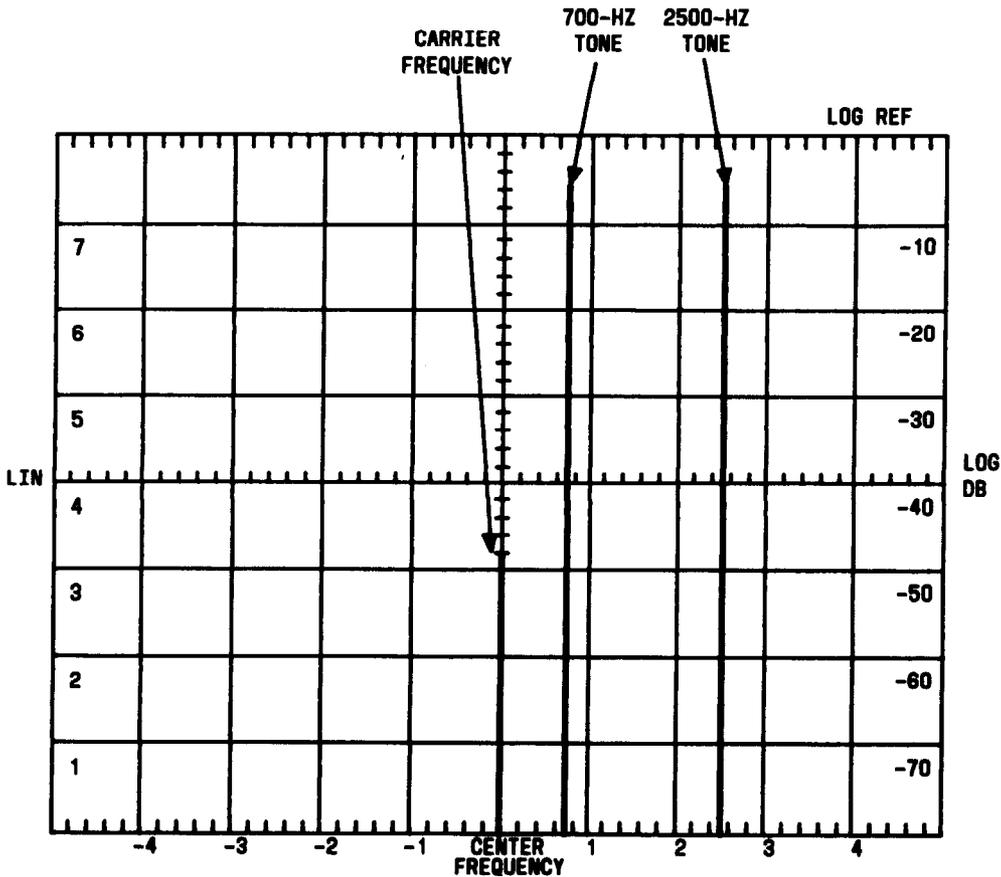
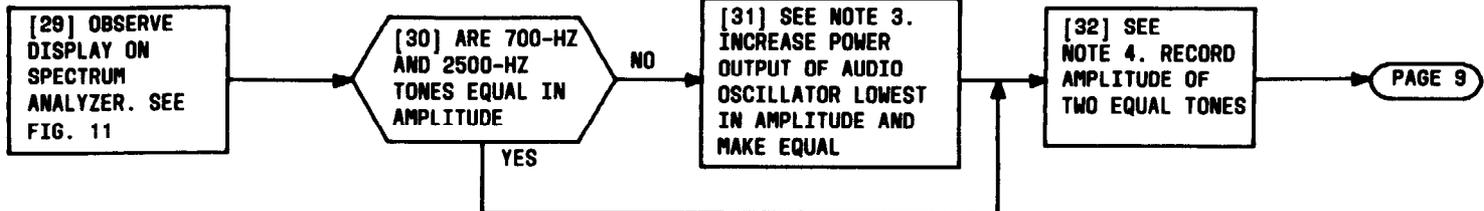


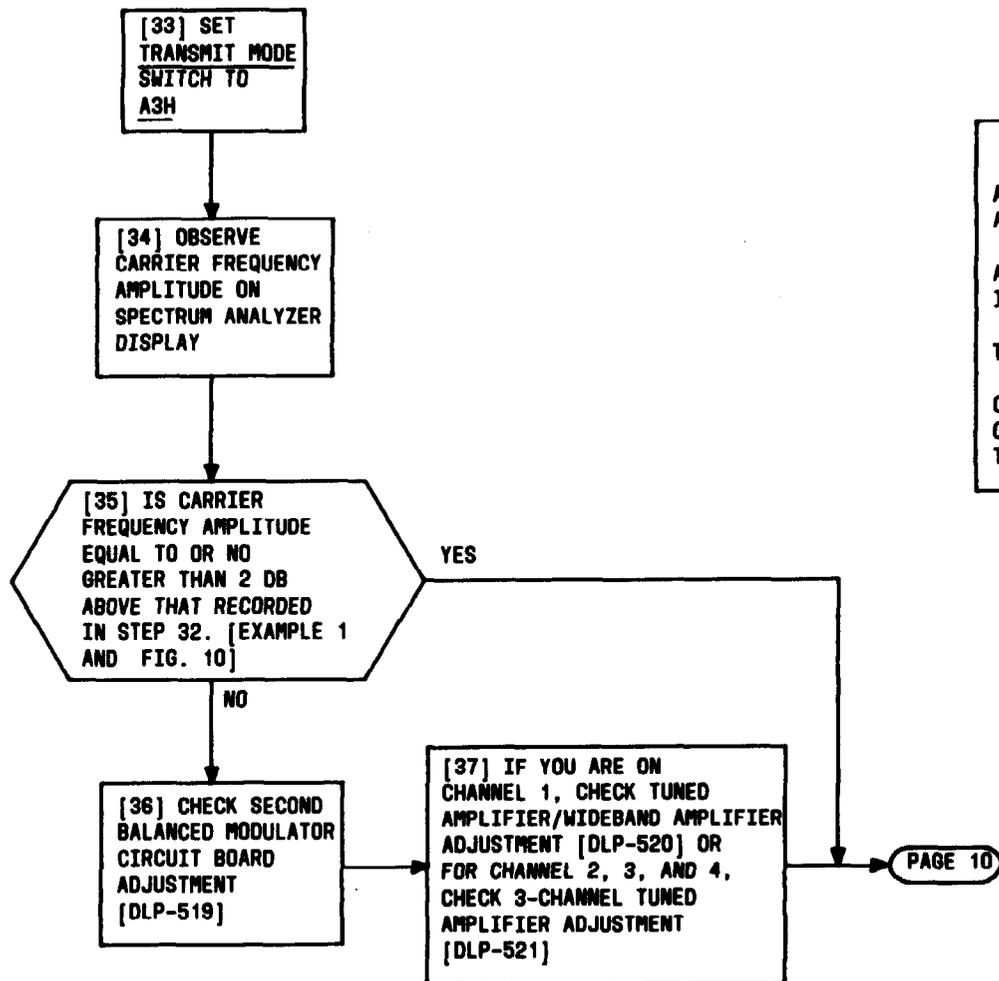
FIG. 11

NOTES

3. NORMALLY, 2500-HZ TONE AMPLITUDE IS LOWEST
4. AMPLITUDE OF TWO EQUAL TONES IN A3J MODE IS REFERENCE FOR TEST. FIG. 11 SHOWS THE TWO EQUAL TONES AT -5 DB

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CHECK TRANSMITTER CARRIER LEVEL



EXAMPLE 1

AMPLITUDE OF TWO EQUAL TONES IN A3J OF FIG. 11 = -5 DB

AMPLITUDE OF CARRIER FREQUENCY IN A3H OF FIG. 10 = -5 DB

TEST PASSES.

CARRIER FREQUENCY AMPLITUDE COULD BE BETWEEN -5 DB AND -3 DB TO MEET REQUIREMENT

CHECK TRANSMITTER CARRIER LEVEL

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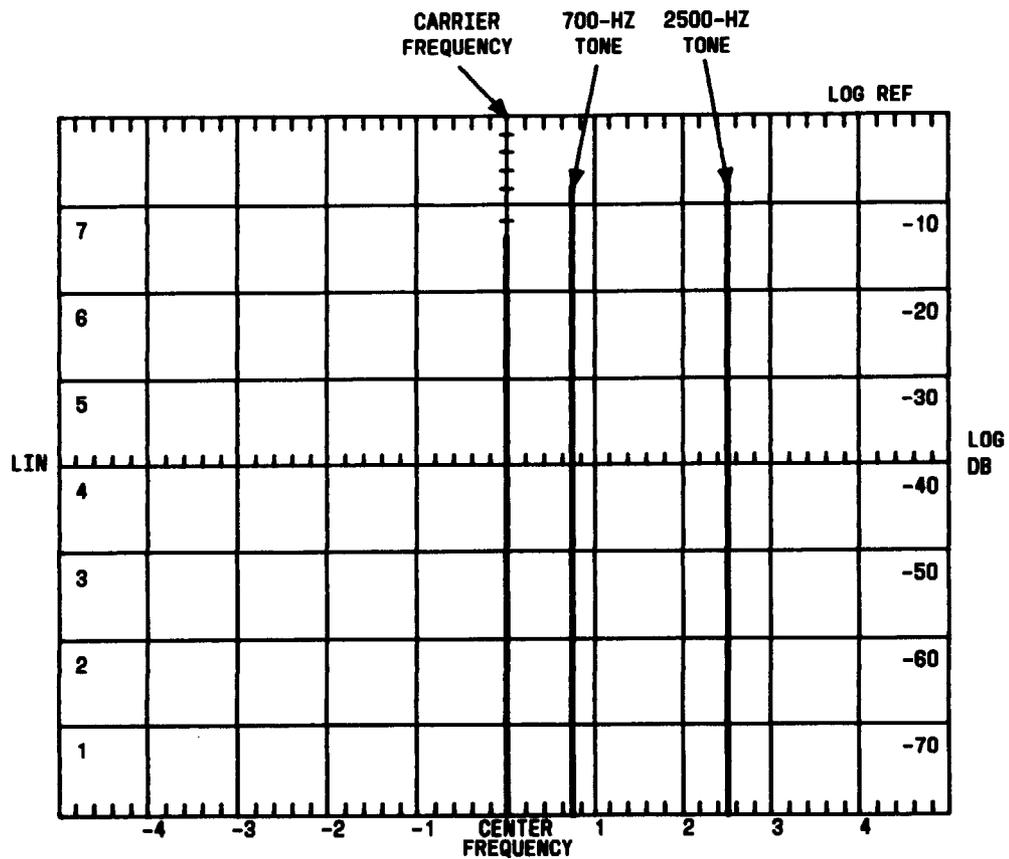
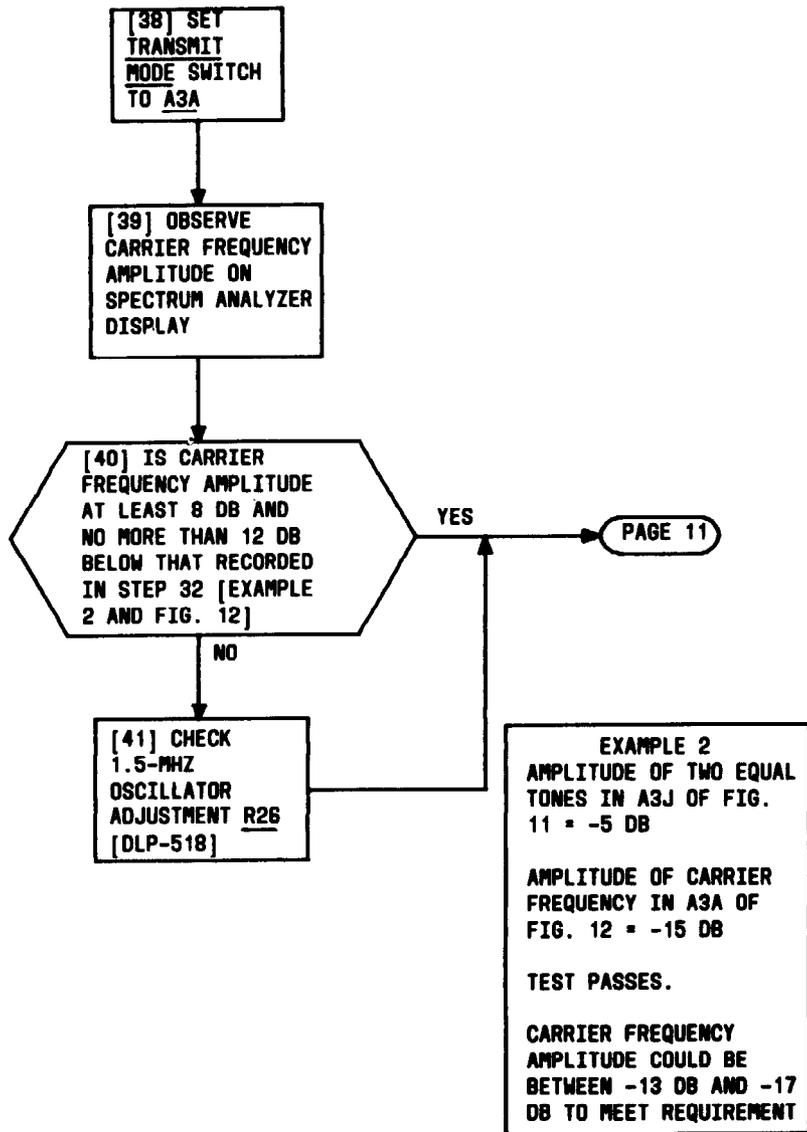
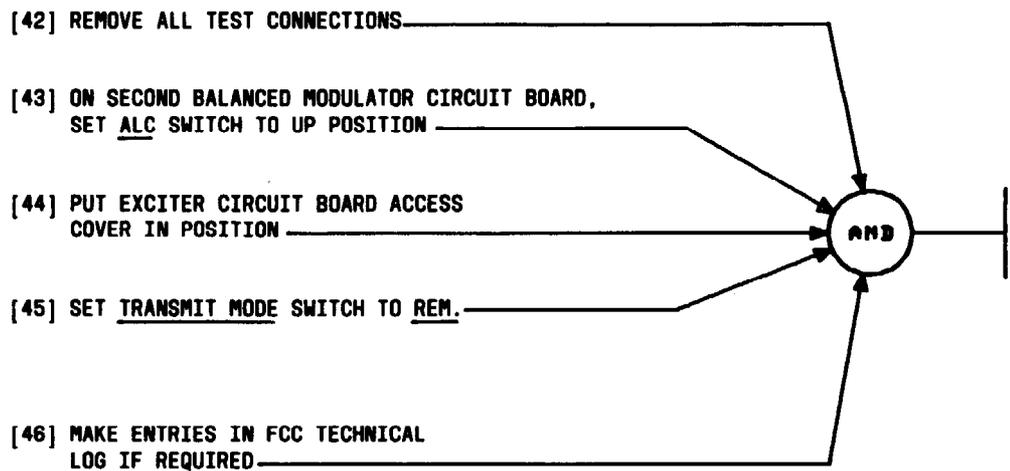


FIG. 12

CHECK TRANSMITTER CARRIER LEVEL



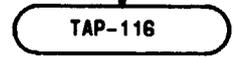
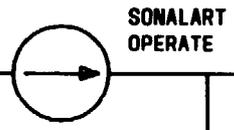
CHECK TRANSMITTER CARRIER LEVEL

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[1] SET MAIN POWER SWITCH TO OFF

[2] SEE WARNING. REMOVE FRONT PANEL ON SIGNALING CONTROL UNIT AND REMOVE ALL PLUG-IN TYPE CIRCUIT BOARDS [DLP-525]

[3] SEE DANGER. OPEN REAR DOOR TO TRANSMITTER CABINET



[4] DISCONNECT THE GROUND STRAP, S06, S07, AND IS3 TERMINAL STRIP CONNECTIONS ON THE REAR OF THE SIGNALING CONTROL UNIT

[5] REMOVE SIGNALING CONTROL PANEL FROM RADIO BAY

[6] REMOVE REAR COVER ON CIRCUIT BOARDS

LOW VOLTAGE FAIL-SAFE (REAR OF UNIT)

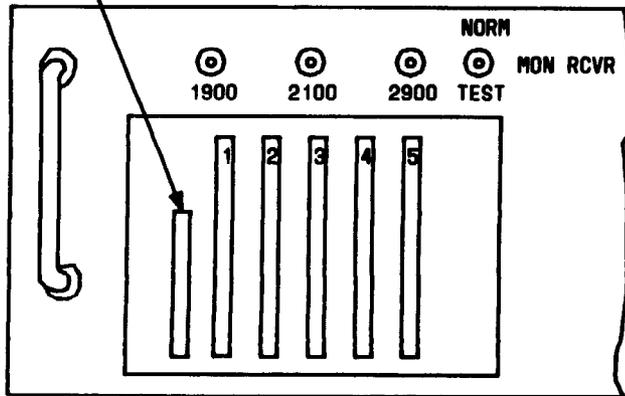


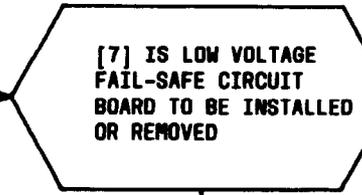
FIG. 1

[8] SEE FIG. 1. LOCATE CIRCUIT BOARD TO BE REMOVED

[9] SEE TABLE A. DISCONNECT THE SIX PIGTAIL CONNECTIONS COMING FROM LOW VOLTAGE FAIL-SAFE CIRCUIT BOARD

[10] REMOVE THE TWO SCREWS SECURING CIRCUIT BOARD

[11] REMOVE CIRCUIT BOARD



INSTALLED



REMOVED



DANGER
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET

WARNING
POWER IS TURNED OFF TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

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REMOVE AND/OR INSTALL LOW VOLTAGE FAIL-SAFE CIRCUIT BOARD

[12] SEE FIG. 1. LOCATE
SLOT POSITION CIRCUIT
BOARD IS TO BE
INSTALLED IN _____

[13] INSTALL CIRCUIT BOARD
WITH TWO SECURING SCREWS _____

[14] SEE TABLE A. CONNECT THE
SIX PIGTAIL CONNECTIONS
FROM THE LOW VOLTAGE
FAIL-SAFE CIRCUIT BOARD TO
THE SIGNALING CIRCUIT BOARDS _____

[15] REPLACE REAR COVER
REMOVED IN STEP 6 _____

[16] REPLACE SIGNALING CONTROL
PANEL REMOVED IN STEP 5 _____

[17] REPLACE THE GROUND STRAP,
S06, S07, AND IS3 TERMINAL
STRAP CONNECTIONS REMOVED
IN STEP 4 _____

[18] REPLACE ALL PLUG-IN CIRCUIT
BOARDS AND REPLACE FRONT PANEL
REMOVED IN STEP 2 [DLP-525] _____

[19] CLOSE REAR DOOR AND SET
MAIN POWER SWITCH TO ON _____

AND

AND

TABLE A

SIGNALING CIRCUITS		LOW VOLTAGE FAIL SAFE CIRCUIT BOARD	
CIRCUIT BOARDS	PIN	COLOR CODE	TERMINAL
AUXILIARY SIGNALING (1)	15	RED	A
AUXILIARY SIGNALING (1)	GND	BLACK	B
AUXILIARY SIGNALING (1)	9	BROWN	C
TRANSMITTER BUFFER (2)	13	ORANGE	D
OSCILLATOR-SWITCH COMBINER	11	YELLOW	E
OSCILLATOR-SWITCH COMBINER	12	GREEN	F

REMOVE AND/OR INSTALL LOW VOLTAGE FAIL-SAFE CIRCUIT BOARD

[1] CONNECT LINE POWER
CORD TO 115-V, 60-HZ
OUTLET

[2] SET POWER SWITCH
TO ON [FIG. 1]

RED LAMP
LIGHTS

AND

[3] ALLOW VTVM
TO WARM UP FOR
AT LEAST 5
MINUTES BEFORE
USE

[4] ARE YOU
GOING TO
MEASURE VOLTAGE
OR DECIBELS

VOLTAGE

PAGE 2

DECIBELS

PAGE 3

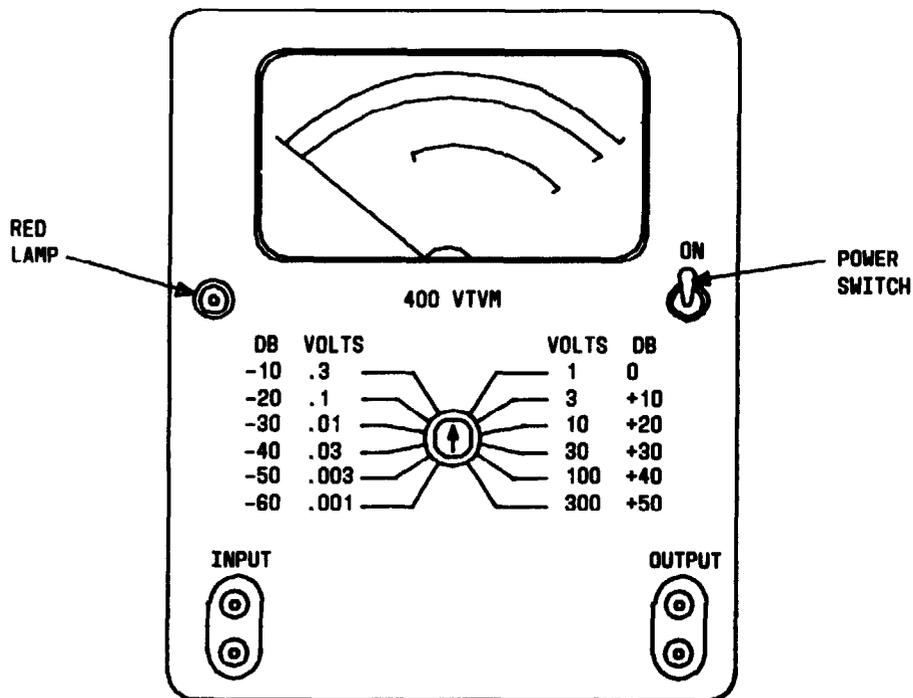
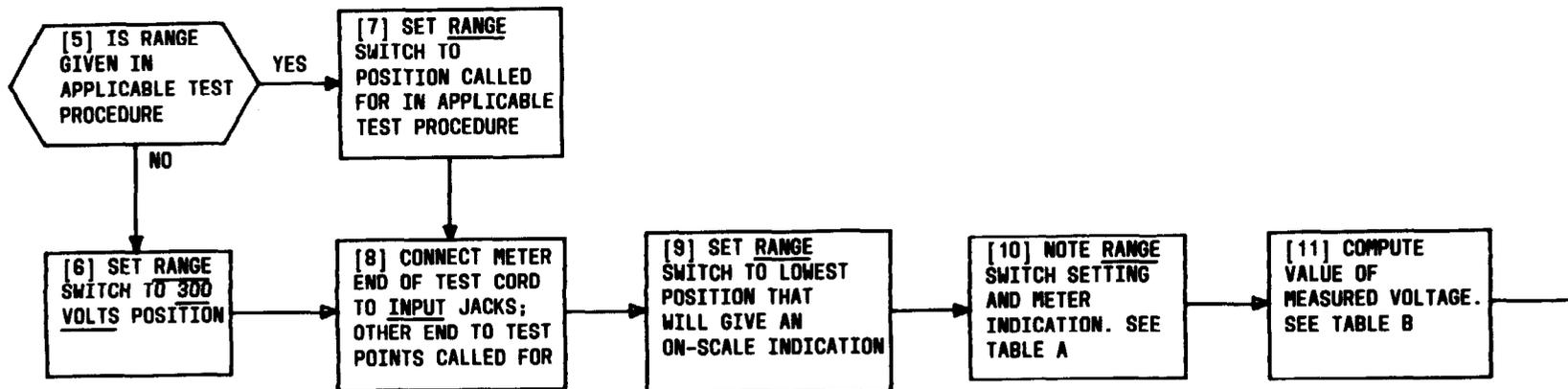


FIG. 1

CONDITION HP 400 () VTVM FOR MEASUREMENT

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RANGE SWITCH SETTING (VOLTS)	READ RMS VOLTS	
	ON 0 - 1.0 SCALE	ON 0 - 3 SCALE
.001	X	
.003		X
.01	X	
.03		X
.1	X	
.3		X
1	X	
3		X
10	X	
30		X
100	X	
300		X

MEASURED VOLTAGE = $\frac{\text{RANGE SWITCH SETTING}}{\text{METER FULL SCALE VALUE}} \times \text{METER INDICATION}$		
CONDITIONS	COMPUTATION	
METER INDICATION 1.5 RANGE SWITCH SETTING .03 METER FULL SCALE VALUE 3	$\frac{.03}{3} \times 1.5 = .015 \text{ VOLT}$	
METER INDICATION .8 RANGE SWITCH SETTING 10 METER FULL SCALE VALUE 1	$\frac{10}{1} \times .8 = 8 \text{ VOLTS}$	

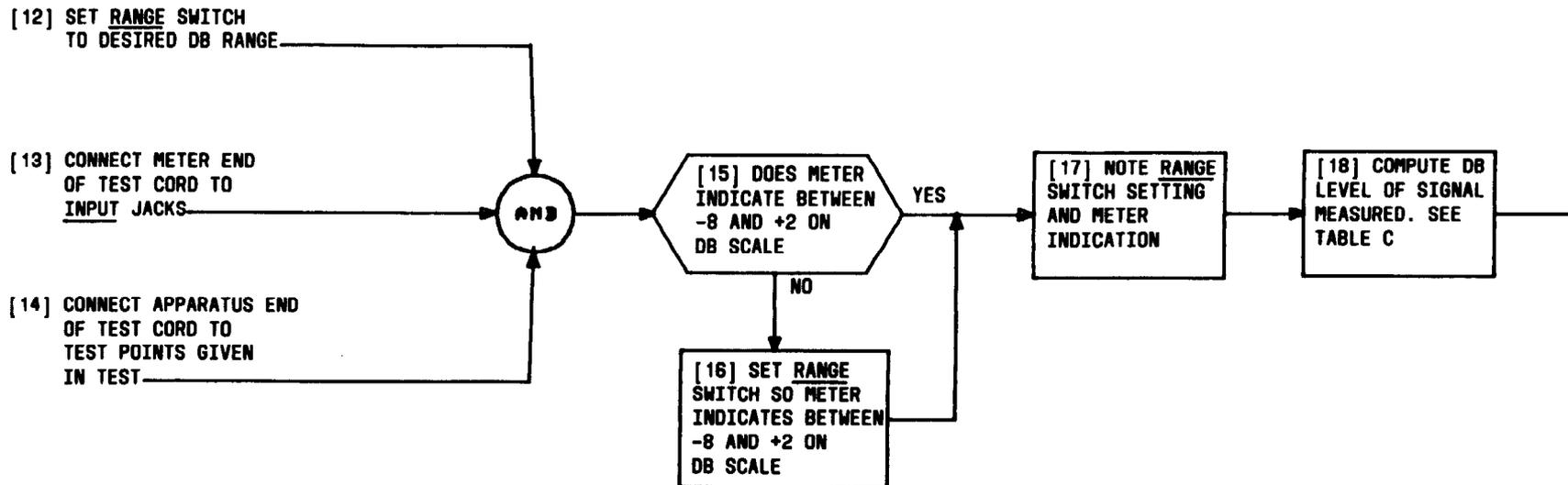


TABLE C EXAMPLES OF DB COMPUTATION				
SIGNAL LEVEL IN DB IS THE RANGE SWITCH SETTING PLUS OR MINUS THE METER DB SCALE INDICATION				
CONDITIONS	COMPUTATION			
RANGE SWITCH SETTING	-10 DB	-20.0 DB	+30.0 DB	+10.0 DB
METER INDICATION	+ 2 DB	- 1.2 DB	+ 2.5 DB	- 2.4 DB
SIGNAL LEVEL	- 8 DB	-21.2 DB	+32.5 DB	+ 7.6 DB

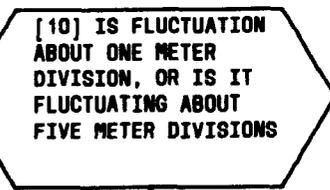
CONDITION HP 400 () VTVM FOR MEASUREMENT

- [1] CONNECT NOISE GENERATOR TO 115-VAC OUTLET WITH CORD-AND-PLUG ASSEMBLY
- [2] SET MULTIPLY BY SWITCH TO 1.0 POSITION. SEE FIG. 1
- [3] SET LOW HIGH SWITCH TO LOW POSITION
- [4] SET RANGE SWITCH TO 20 KHZ POSITION
- [5] ADJUST OUTPUT CONTROL TO MIDRANGE POSITION
- [6] SET POWER SWITCH TO 30 SEC DELAY POSITION
- [7] WAIT 30-45 SECONDS



[8] OBSERVE OUTPUT VOLTS METER AND ADJUST OUTPUT CONTROL FOR CONVENIENT METER INDICATION

[9] OBSERVE METER FOR FLUCTUATION



[12] NOISE GENERATOR READY FOR USE

[11] REFER TO MANUFACTURER'S SERVICE MANUAL FOR CONNECTING SPOTTER IN GAS TUBE CIRCUIT

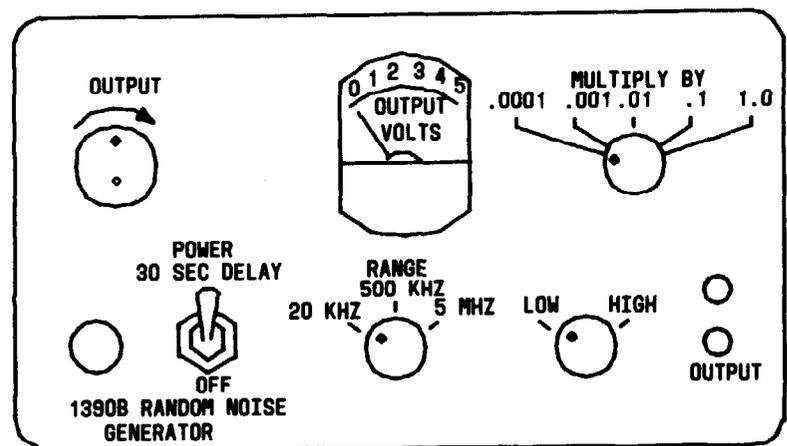
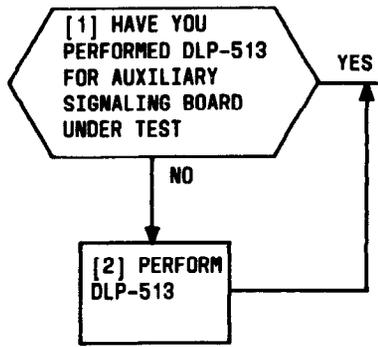


FIG. 1

SUMMARY

CONNECT 1390B RANDOM NOISE GENERATOR TO VOICE EQUIP JACK WITH OUTPUT OF 60 DBRN. WITH VOM CONNECTED TO TP7 OF AUXILIARY SIGNALING BOARD, ADJUST R2 SLOWLY FOR +12 VOLT INDICATION ON VOM. SET OUTPUT OF 1390B FOR 57 DBRN AND OBSERVE VOM DROPS TO 0 VOLT



- [3] GET EQUIPMENT SHOWN IN TABLE A
- [4] INSTALL 369A TERMINATIONS IN VOICE LINE AND STATUS LINE JACKS
- [5] SEE FIG. 1. REMOVE SIGNALING BOARD ACCESS COVER AND LOCATE AUXILIARY SIGNALING BOARD (NO. 1)
- [6] INSTALL EXTENDER BOARD BETWEEN AUXILIARY SIGNALING BOARD AND SIGNALING BOARD BASKET [DLP-525]



AUXILIARY SIGNALING BOARD

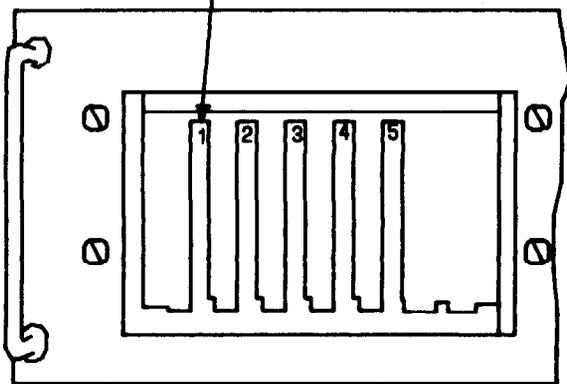


FIG. 1

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
NOISE MEASURING SET (NMS)	WECO MODEL 3C
2 TERMINATIONS, STANDARD	369A
RANDOM NOISE GENERATOR	GENERAL RADIO MODEL 1390B
VOLT-OHM-AMMETER (VOM)	KS-14510

ADJUST AUXILIARY SIGNALING CIRCUIT BOARD

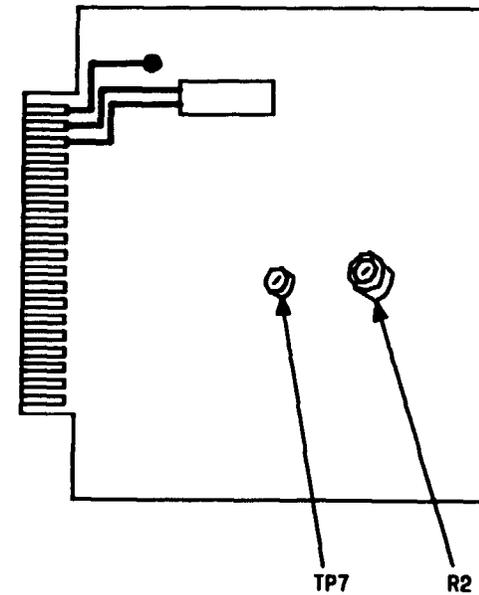
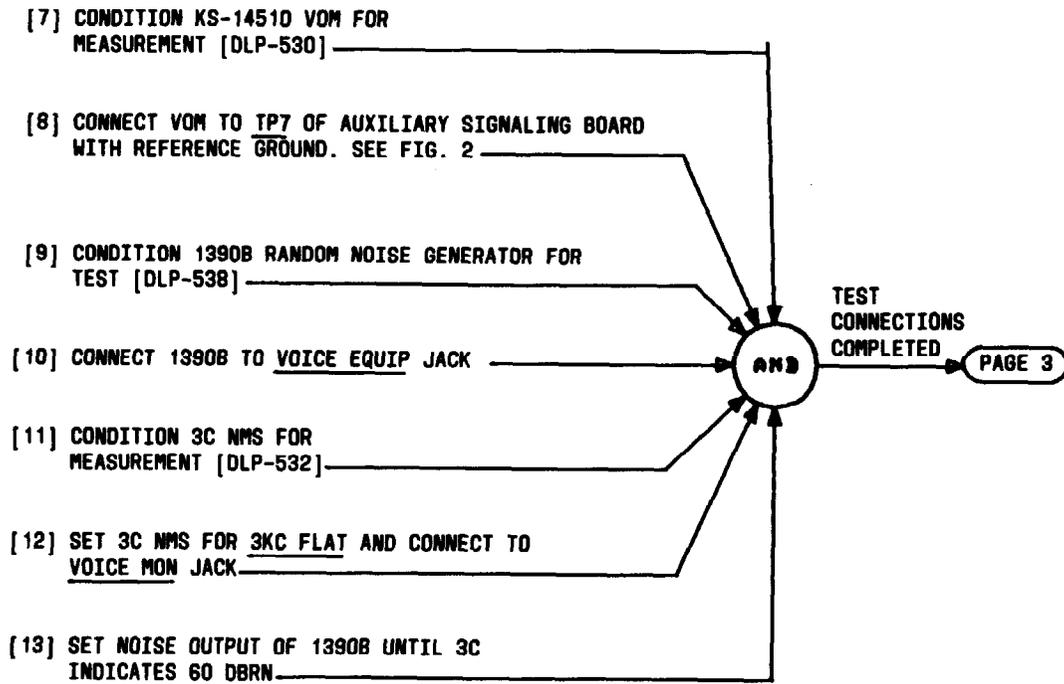


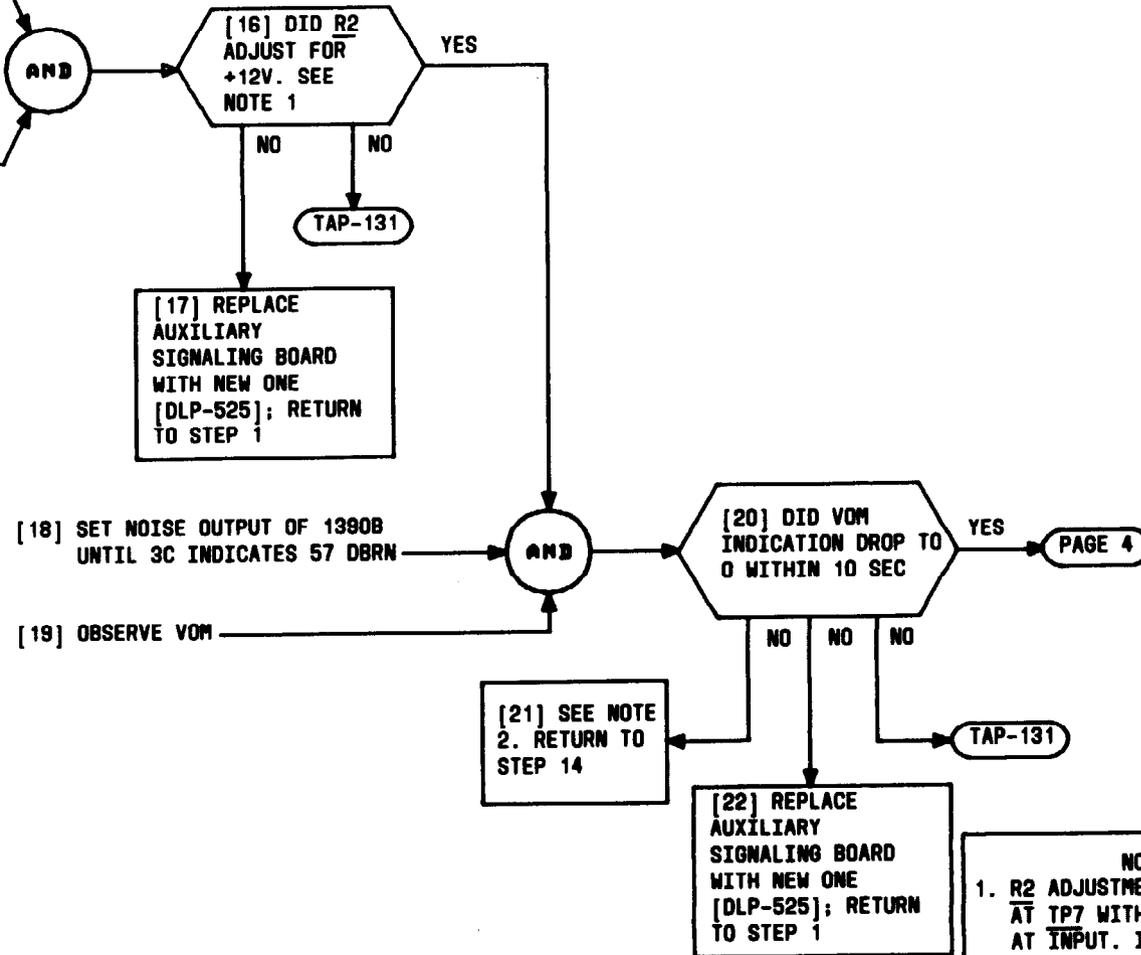
FIG. 2

ADJUST AUXILIARY SIGNALING CIRCUIT BOARD

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[14] SEE FIG. 2. ADJUST R2 SIX
TURNS COUNTERCLOCKWISE

[15] OBSERVE VOM AND ADJUST R2
SLOWLY CLOCKWISE UNTIL
+12V INDICATION JUST APPEARS
ON VOM. SEE NOTE 1



[18] SET NOISE OUTPUT OF 1390B
UNTIL 3C INDICATES 57 DBRN

[19] OBSERVE VOM

[21] SEE NOTE
2. RETURN TO
STEP 14

[22] REPLACE
AUXILIARY
SIGNALING BOARD
WITH NEW ONE
[DLP-525]; RETURN
TO STEP 1

NOTES
1. R2 ADJUSTMENT SETS A LOGIC 1
AT TP7 WITH 60-DBRN NOISE
AT INPUT. IT IS NOT NECESSARY
TO HAVE EXACTLY +12V AT TP7
2. IT MAY BE NECESSARY TO REPEAT
THIS ADJUSTMENT SEVERAL TIMES
TO GET EXPECTED INDICATION

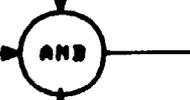
ADJUST AUXILIARY SIGNALING CIRCUIT BOARD

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[23] REMOVE EXTENDER BOARD AND
INSTALL AUXILIARY SIGNALING
BOARD IN ORIGINAL POSITION
[DLP-525]

[24] REMOVE ALL TEST CONNECTIONS

[25] MAKE ENTRIES IN FCC TECHNICAL
LOG IF REQUIRED



ADJUST AUXILIARY SIGNALING CIRCUIT BOARD

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- [1] CONNECT LINE CORD TO 117-VAC POWER SUPPLY
- [2] DEPRESS PUSHBUTTON OF FUNCTION TO BE MEASURED [FIG. 1]
- [3] CONNECT TEST LEADS FOR SPECIFIC MEASUREMENT TO BE MADE
- [4] DEPRESS LINE PUSHBUTTON → DISPLAY APPEARS
- [5] SET RANGE SWITCH TO DESIRED RANGE
- [6] SEE WARNING. CONNECT TEST LEADS TO EQUIPMENT UNDER TEST

WARNING

WHEN MAKING RESISTANCE MEASUREMENTS, MAKE SURE THAT POWER IS NOT APPLIED TO THE CIRCUIT BEING MEASURED, AS DAMAGE TO THE METER WILL RESULT

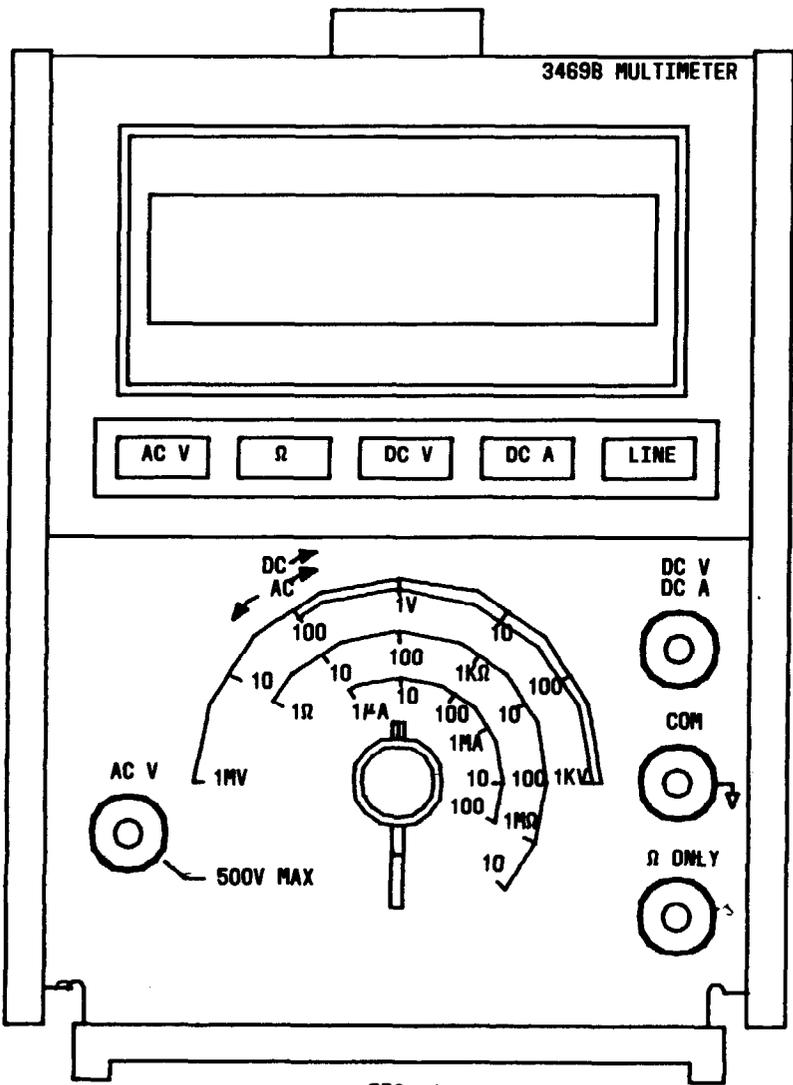


FIG. 1

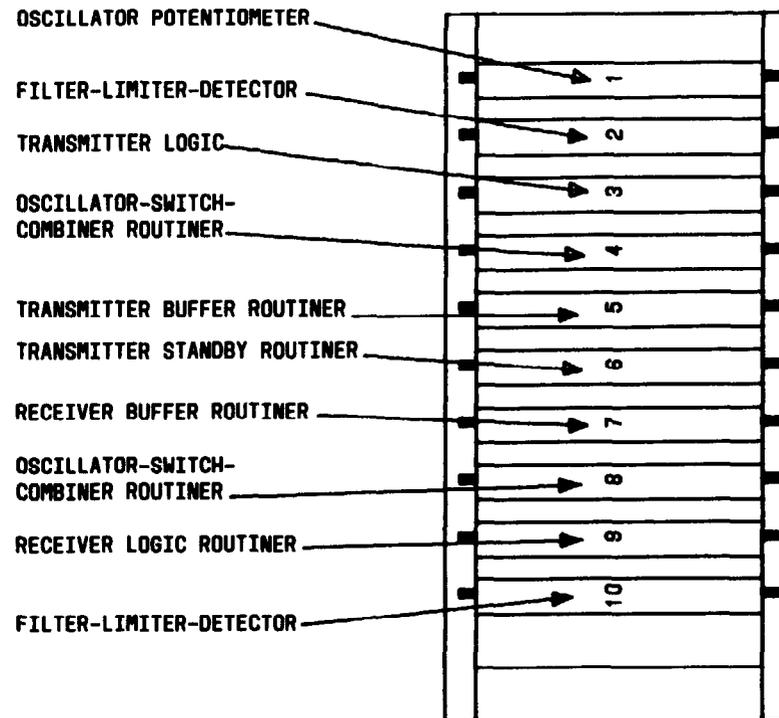
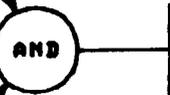
CONDITION HEWLETT-PACKARD 3469B DIGITAL MULTIMETER FOR MEASUREMENT

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[13] WHEN CIRCUIT BOARD TEST IS COMPLETED, IF NECESSARY, REMOVE CIRCUIT AND/OR EXTENDER BOARDS. INSTALL WORKING CIRCUIT BOARD INTO BOARD CARRIER USING STEPS 10 THRU 12. STORE EXTENDER BOARD

[14] USING METAL HANDLES, SLIDE ROUTINER TEST SET INTO CASE

[15] CONNECT CASE AND ROUTINER TEST SET USING FOUR SCREWS REMOVED IN STEP 3

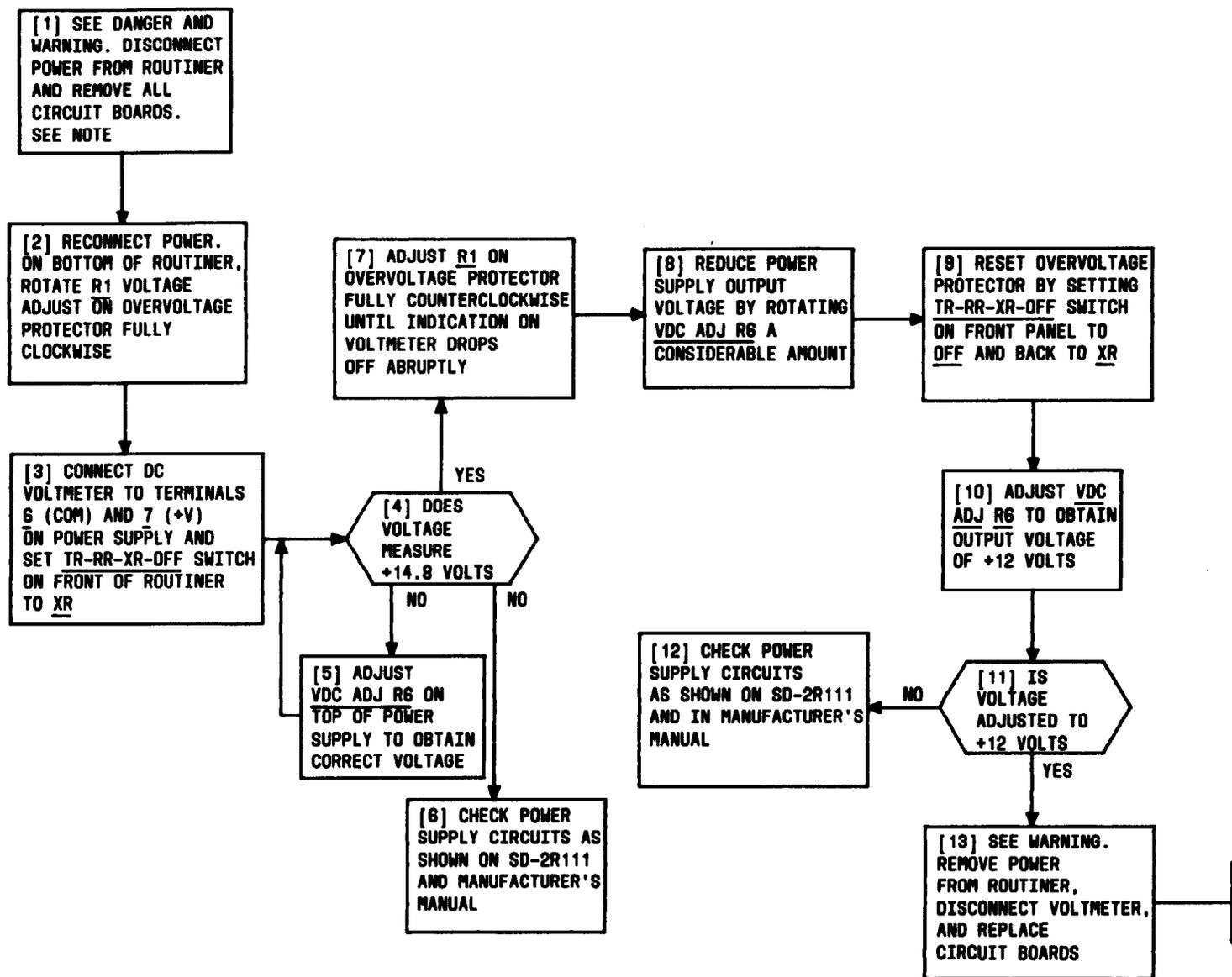


ROUTINER FRONT PANEL
(BACK SIDE)

FIG. 1

REMOVE AND INSTALL ROUTINER TEST SET CIRCUIT BOARD

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NOTE
MANUFACTURER'S MANUALS FOR POWER SUPPLY AND OVERVOLTAGE PROTECTOR ARE SUPPLIED WITH ROUTINER

WARNING

WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT

DANGER

120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE

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POWER SUPPLY OUTPUT

[1] SEE DANGER 1. REMOVE POWER AND CONNECTIONS FROM ROUTINER, AND REMOVE ROUTINER FROM CASE [DLP-541]

[2] RECONNECT POWER AND SET TR-RR-XR-OFF SWITCH ON FRONT PANEL OF ROUTINER TO TR

[3] CONDITION FREQUENCY COUNTER DLP-527 AND CONNECT COUNTER INPUT TO OSCT OUT JACK

[4] ON RIGHT MIDDLE SIDE OF ROUTINER, SET 1900, 2100, AND 2900 SWITCHES TO NOR.

ROUTINER CONDITIONED FOR OSCILLATOR FREQUENCY MEASUREMENT

[5] SEE TABLE A AND FIG. 1. PERFORM STEPS 6 THRU 47 TO MEASURE FREQUENCY AND MAKE ADJUSTMENTS AS REQUIRED. IF TROUBLE IS ENCOUNTERED, CONTINUE TO NEXT STEP

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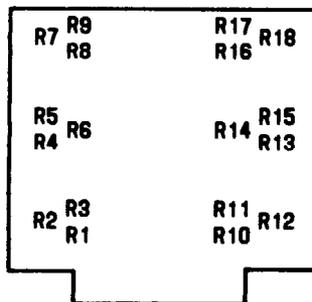


FIG. 1 - OSCILLATOR POTENTIOMETER BOARD

TABLE A - OSCILLATOR ADJUSTMENTS

POTENTIOMETER	FREQUENCY	POTENTIOMETER	FREQUENCY
R1	2900 (T) L	R10	1900 (T) L
R2	2900 (T) NOR.	R11	1900 (T) H
R3	2900 (T) H	R12	1900 (T) NOR.
R4	2900 (R) L	R13	2100 (R) L
R5	2900 (R) NOR.	R14	2100 (R) NOR.
R6	2900 (R) H	R15	2100 (R) H
R7	2100 (T) NOR.	R16	1900 (R) L
R8	2100 (T) L	R17	1900 (R) H
R9	2100 (T) H	R18	1900 (R) NOR.

* (T) TRANSMITTER SIDE
(R) RECEIVER SIDE

DANGER 1
120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE

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ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

- [6] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH
- [7] OBSERVE FREQUENCY COUNTER AND ADJUST R12 FOR AN INDICATION OF 1900 HZ AND RELEASE 1900 ON SWITCH
- [8] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH
- [9] OBSERVE FREQUENCY COUNTER AND ADJUST R7 FOR AN INDICATION OF 2100 HZ AND RELEASE 2100 ON SWITCH
- [10] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 2900 ON SWITCH
- [11] OBSERVE FREQUENCY COUNTER AND ADJUST R2 FOR AN INDICATION OF 2900 HZ AND RELEASE 2900 ON SWITCH
- [12] ON RIGHT SIDE MIDDLE OF FRONT PANEL, ROTATE 1900, 2100, AND 2900 SWITCHES TO THE 1 POSITION
- [13] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH
- [14] OBSERVE FREQUENCY COUNTER AND ADJUST R10 FOR AN INDICATION OF 1889 HZ AND RELEASE 1900 ON SWITCH

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

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- [15] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH
- [16] OBSERVE FREQUENCY COUNTER AND ADJUST R8 FOR AN INDICATION OF 2089 HZ AND RELEASE 2100 ON SWITCH
- [17] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 2900 ON SWITCH
- [18] OBSERVE FREQUENCY COUNTER AND ADJUST R1 FOR AN INDICATION OF 2886 HZ AND RELEASE 2900 ON SWITCH
- [19] ON RIGHT SIDE MIDDLE OF FRONT PANEL, ROTATE 1900, 2100, AND 2900 SWITCHES TO THE H POSITION
- [20] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH
- [21] OBSERVE FREQUENCY COUNTER AND ADJUST R11 FOR AN INDICATION OF 1911 HZ AND RELEASE 1900 ON SWITCH
- [22] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH
- [23] OBSERVE FREQUENCY COUNTER AND ADJUST R9 FOR AN INDICATION OF 2111 HZ AND RELEASE 2100 ON SWITCH

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

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- [24] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD THE 2900 ON SWITCH
- [25] OBSERVE FREQUENCY COUNTER AND ADJUST R3 FOR AN INDICATION OF 2914 HZ AND RELEASE THE 2900 ON SWITCH
- [26] DISCONNECT FREQUENCY COUNTER FROM OSCT OUT JACK AND CONNECT FREQUENCY COUNTER TO OSCR OUT JACK
- [27] ON LEFT SIDE MIDDLE OF FRONT PANEL, ROTATE 1900, 2100, AND 2900 SWITCHES TO NOR POSITION
- [28] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH
- [29] OBSERVE FREQUENCY COUNTER AND ADJUST R18 FOR AN INDICATION OF 1900 HZ AND RELEASE 1900 ON SWITCH
- [30] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH
- [31] OBSERVE FREQUENCY COUNTER AND ADJUST R14 FOR AN INDICATION OF 2100 HZ AND RELEASE 2100 ON SWITCH
- [32] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2900 ON SWITCH
- [33] OBSERVE FREQUENCY COUNTER AND ADJUST R5 FOR AN INDICATION OF 2900 HZ AND RELEASE 2900 ON SWITCH

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

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- [34] ON LEFT SIDE MIDDLE OF FRONT PANEL, ROTATE 1900, 2100, AND 2900 SWITCHES TO THE L POSITION
- [35] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH
- [36] OBSERVE FREQUENCY COUNTER AND ADJUST R16 FOR AN INDICATION OF 1889 HZ AND RELEASE 1900 ON SWITCH
- [37] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH
- [38] OBSERVE FREQUENCY COUNTER AND ADJUST R13 FOR AN INDICATION OF 2089 HZ AND RELEASE 2100 ON SWITCH
- [39] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2900 ON SWITCH
- [40] OBSERVE FREQUENCY COUNTER AND ADJUST R4 FOR AN INDICATION OF 2886 HZ AND RELEASE 2900 ON SWITCH
- [41] ON LEFT SIDE MIDDLE OF FRONT PANEL, ROTATE 1900, 2100, AND 2900 SWITCHES TO H POSITION

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

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[42] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH

[43] OBSERVE FREQUENCY COUNTER AND ADJUST R17 FOR AN INDICATION OF 1911 HZ AND RELEASE 1900 ON SWITCH

[44] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2100 ON SWITCH

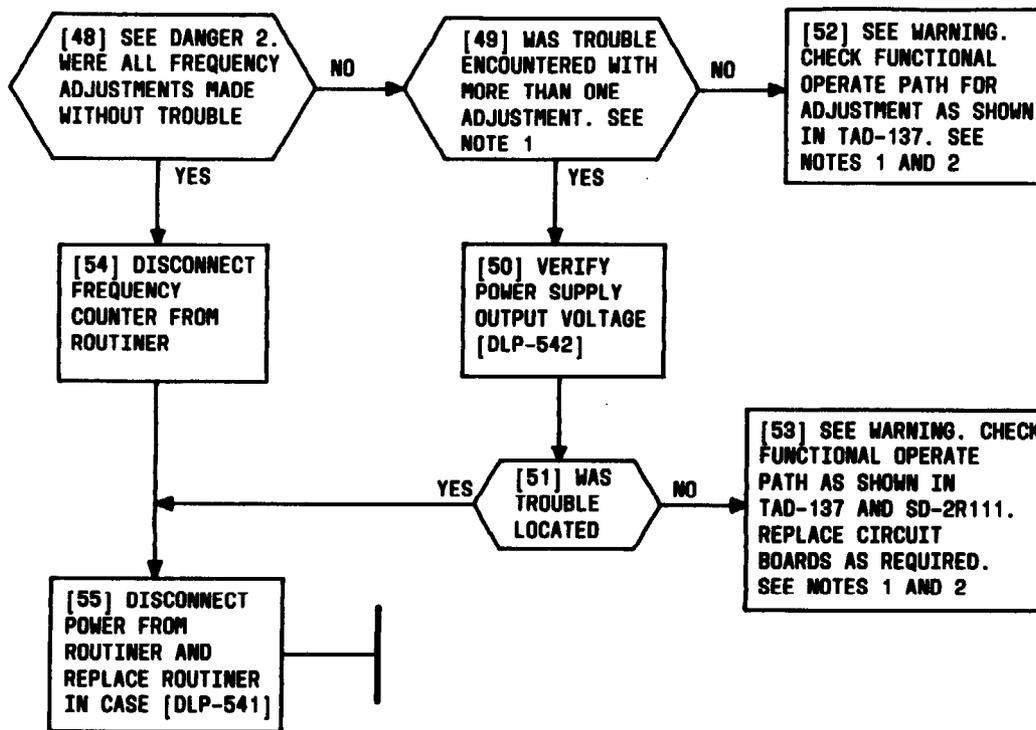
[45] OBSERVE FREQUENCY COUNTER AND ADJUST R15 FOR AN INDICATION OF 2111 HZ AND RELEASE 2100 ON SWITCH

[46] ON LEFT SIDE OF FRONT PANEL, OPERATE AND HOLD 2900 ON SWITCH

[47] OBSERVE FREQUENCY COUNTER AND ADJUST R6 FOR AN INDICATION OF 2914 HZ AND RELEASE 2900 ON SWITCH

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

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ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES

NOTES	
<ol style="list-style-type: none"> 1. PARTICULAR ATTENTION SHOULD BE GIVEN TO FAULTY AND INTERMITTENT SWITCH CONTACTS 2. WHEN OSCILLATOR POTENTIOMETER OR OSCILLATOR-SWITCH-COMBINER BOARDS ARE REPLACED, ALL ADJUSTMENTS ON THIS PROCEDURE MUST BE REPEATED AND DLP-544 MUST BE PERFORMED 	
WARNING	
WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT	
DANGER 2	
120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE	
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[1] REMOVE POWER AND REMOVE ROUTINER TEST SET FROM CASE [DLP-541]

[2] SEE DANGER AND WARNING 1. PLACE OSCILLATOR-SWITCH-COMBINER CIRCUIT BOARD NO. 4 (TRANSMITTER) ON EXTENDER BOARD [DLP-541]

[3] RECONNECT POWER AND SET TR-RR-XR-OFF SWITCH ON FRONT PANEL TO TR

[4] ON RIGHT SIDE OF FRONT PANEL, INSERT TYPE 89A (0 DB) PAD INTO OUT JACK

[5] CONDITION 21A TRANSMISSION MEASURING SET [DLP-526] AND CONNECT DET IN 800Ω JACK ON RTS

ROUTINER TEST SET
CONDITIONED FOR
TRANSMITTER TEST

AND

PAGE 2

ADJUST ROUTINER TEST SET OUTPUT LEVELS

WARNING 1

WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT

DANGER

120 VOLTS AC IS PRESENT IN THIS UNIT. USE CAUTION NOT TO TOUCH EXPOSED POINTS CARRYING THIS VOLTAGE

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[6] ON RIGHT SIDE OF FRONT PANEL, OPERATE AND HOLD 1900 ON SWITCH

[7] NOTE INDICATION ON TRANSMISSION MEASURING SET (TMS) AND RELEASE 1900 ON SWITCH

[8] OPERATE AND HOLD 2100 ON SWITCH

[9] NOTE INDICATION ON TMS AND RELEASE 2100 ON SWITCH

[10] OPERATE AND HOLD 2900 ON SWITCH

[11] NOTE INDICATION ON TMS AND RELEASE 2900 ON SWITCH

AND

[12] ARE TMS INDICATIONS 0 ± 2.0 DBM FOR 1900 HZ AND 2100 HZ TONES AND -10 ± 2.0 DBM FOR 2900 HZ TONE

YES

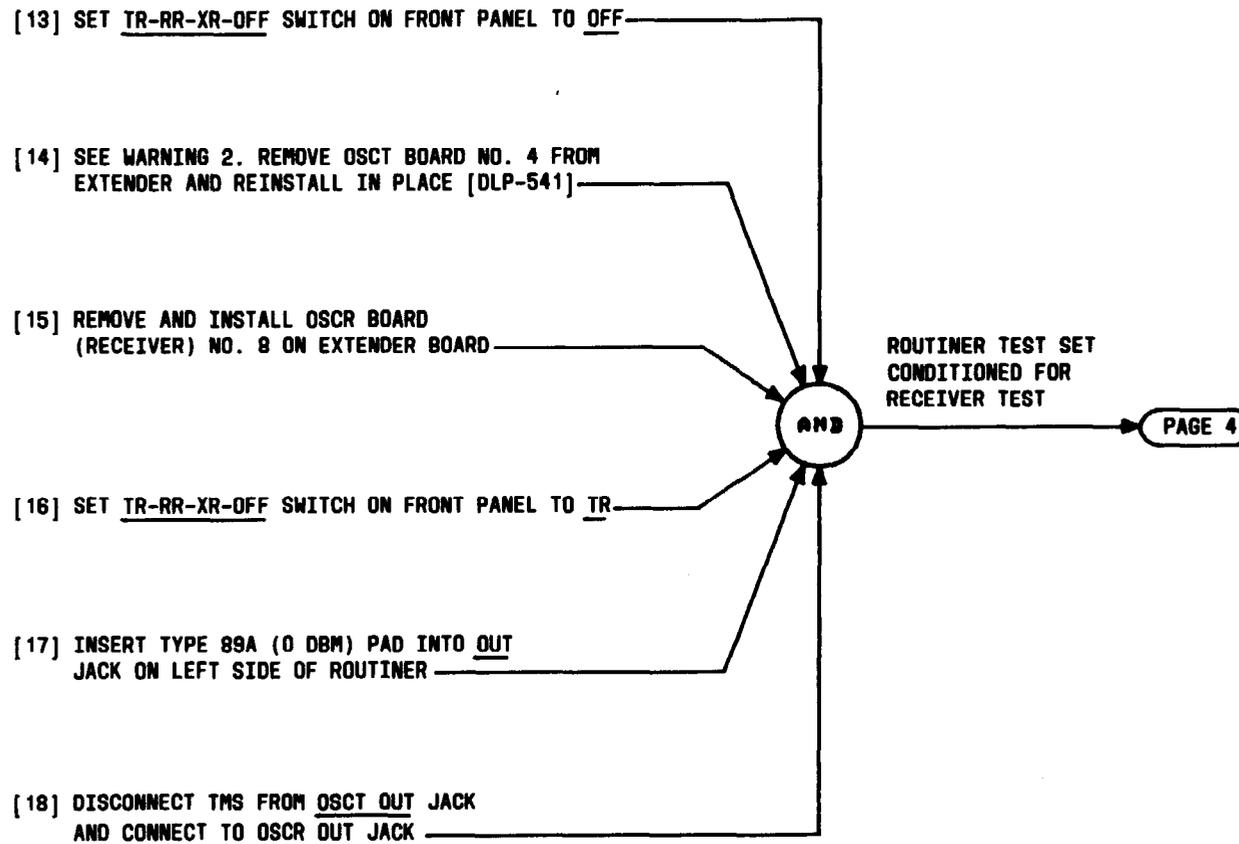
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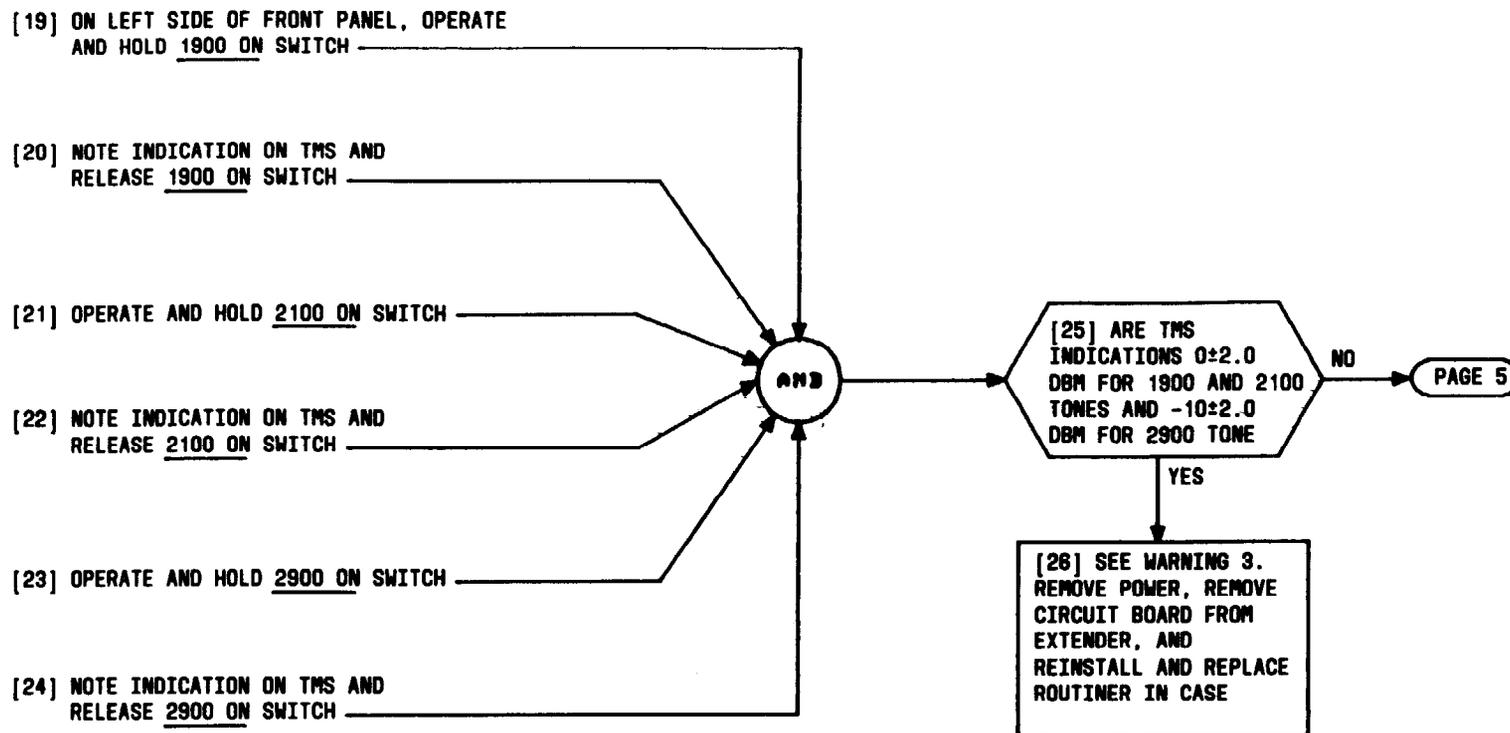
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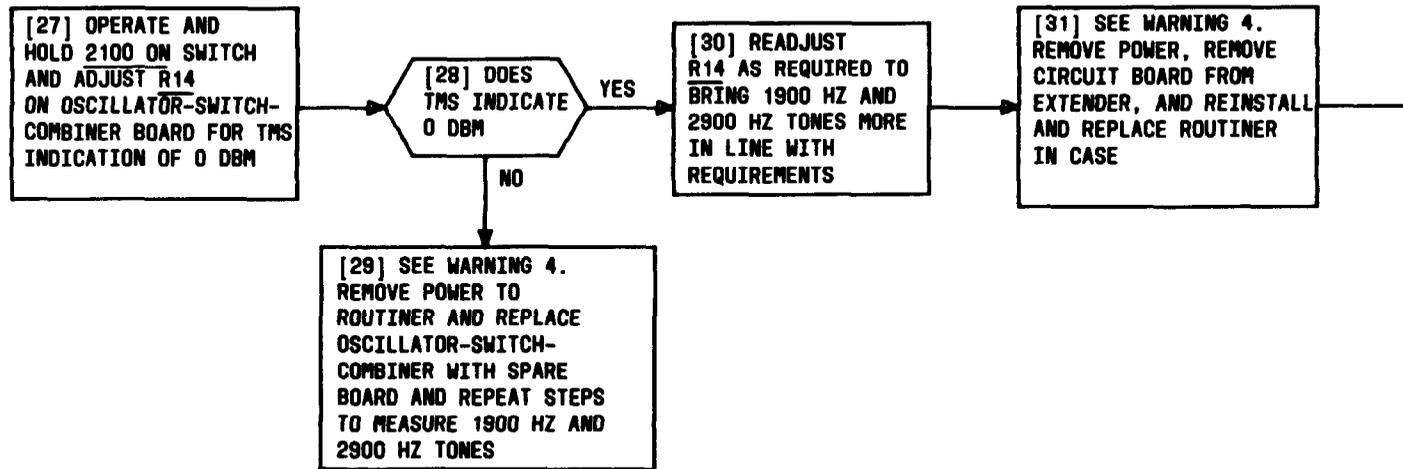
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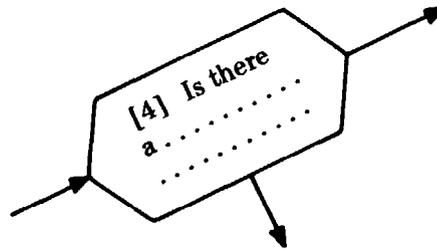
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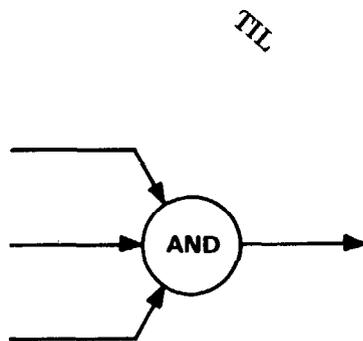


This is a

TASK ORIENTED PRACTICE or TOP

The next few pages will tell you how to use this document.

TAP

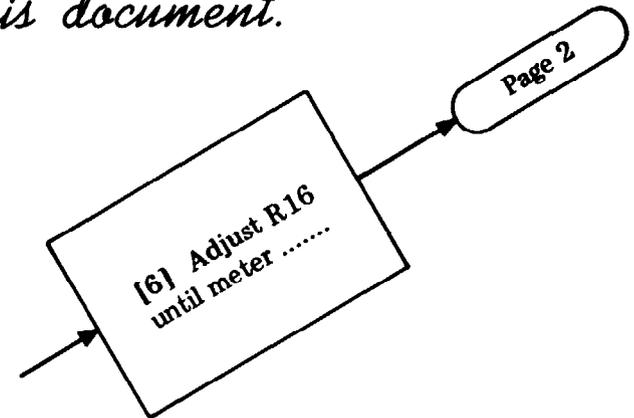


TIL

ATP

ATL

[DLP-540]



HOW TO USE THIS "TOP"

This book is called a Task Oriented Practice or a "TOP." It is a type of programmed document — one which gives you step-by-step instructions of how to do a job (or task). A TOP can be a big help in your everyday work, but you must know how to use it correctly. Take a few minutes, say 15 or 20, and study these few pages until you feel you understand how to use a TOP. Taking this time now will very likely save you time and effort later on.

An important thing to remember about TOP is that it contains all the needed instructions to complete a job. If you are doing the job for the first time, you will be directed through each action without having to guess or remember where to find the necessary information. If you are experienced on a particular job, TOP can provide just that information which you may have forgotten.

Almost all of your jobs can be classified into one of four types — *Routine*, *Acceptance*, *Company Order*, or *Trouble Clearing*. This is how TOP defines these four work types:

Routine

that work you do as part of a Controlled Maintenance Plan like scheduled cleaning or scheduled tests. Routine work may also include those things you do as a "routine" part of your job like requesting a TTY printout or turning on equipment in the mornings and off in the evenings.

Acceptance

that work you do to verify that equipment is installed properly. Normally this is a test or inspection you perform when Western Electric has completed a new installation or addition. It could

also be a test you perform when another group from *your* Company has completed an installation or addition of equipment. Acceptance work, however, is always related to testing or checking newly installed equipment.

Company Order

that work you do in response to one of several different "orders" which may be given to you. Some of the orders you may be familiar with are: Circuit Orders, Service Orders, Traffic Orders, Recent Change Orders, etc. Normally, company order type work is something done to install, establish, change, or discontinue some service offered by the telephone company.

Trouble Clearing

is simply what it says—that work you do to clear and repair troubles in the system. Trouble clearing may be done in answering a customer complaint, responding to some office alarm, an abnormal TTY printout, etc.

Try to fix these four work types firmly in your mind. As you will see, you must classify each job you get in one of these four types before you will be able to look up the instructions in the TOP.

Now glance briefly at the front cover: there are several things which will be useful there. In the upper-right corner is the 9-digit volume number. Near the center is the volume title which tells you something about the contents—such things as the system (or subsystem) name and perhaps the type of jobs included in the volume. Next is a four-line index located in the lower-left corner. This index provides the location of four "lists" which are simply a listing of all the jobs in each of the

four job types. If a nine-digit (XXX-XXX-XXX) number appears on the front cover index, that particular list is located in another volume of the TOP. A three-digit number on the line means that the list is in this volume, and the list can be located by searching the lower-right corner of each page for the referenced number.

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These numbers will always be arranged in numerical order; however, all numbers in the sequence will not be used.

Some TOP volumes may cover only a small part of a system, so on the inside of each front cover you will find a documentation plan. This plan will give a bird's-eye view of all the volumes in the TOP and can help you quickly determine the correct volume.

Locate one of the TOP volumes which contains a Company Order List, and note from the front cover that this list is numbered "050." Turn to that number in the TOP.

This Company Order List (COL) is simply a listing of all the Circuit Order jobs, Service Order jobs, etc, that may be done on this system. Once you know the job you have to do, use the lists as an index to find the number of the "procedure" which tells you *what to do* to complete that job.

Now pick one of these jobs from the list which references to a COP (Company Order Procedure), and using the referenced number, locate that procedure in the TOP. Look over this procedure and note that it gives all the items which must be done to complete the job.

The items are numbered and must be completed in that order; however, you may see some lettered (A, B, C...) items in the procedure. These letters are assigned to options or other items which may be done differently because of equipment variations, etc. Look over the following example to get a better idea of what is meant by the numbers (1,2,3...) and letters (A,B,C...) which may be used in the procedure.

ITEM	SUBTASKS	PROCEDURE NUMBER
1	Do the first thing first	DLP-XXX
2	Do the second item next	DLP-XXX
3	Do the following optional items as required by the Company Order or as is required by the system you are working on	
	A. An optional item	DLP-XXX
	B. Another optional item	—
	C. Another optional item which must be done in the sequence below	
	1. First part of Option "C"	DLP-XXX
	2. Last part of Option "C"	DLP-XXX
4	Do the next part of the job	DLP-XXX
5	Do the last part of the job	DLP-XXX

Remember that this procedure tells you *what* to do in order to complete the total job. If you know *how* to do an item in the procedure, you should go ahead and complete it. If you need further information on *how* to do part of the job, then you should turn to the referenced DLP or Detail Level Procedure. When you complete all the steps in the DLP, then you must turn back to the COP or Company Order Procedure to find the next item to be done.

TOP is designed so that you will have to read only what is necessary to get your job done. At any time when you know how to perform all the steps in an item, it is not necessary to look further for the “how to” information—simply complete the item and go on to the next one. This idea, in TOP, is known as “bypassing.”

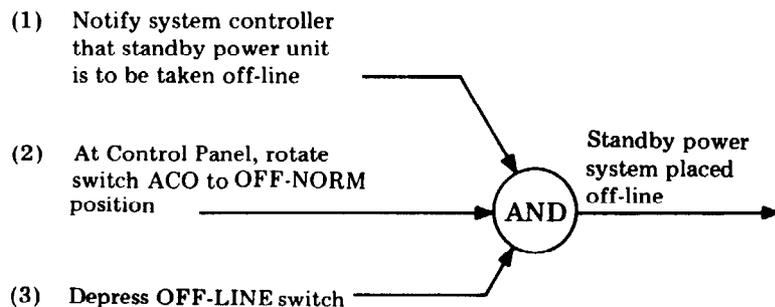
Here are some of the things designed into TOP to help you “bypass” information you may already know:

Summary Statement

A summary statement is used with a DLP (or the flow-charted procedures). It tells you briefly what the procedure does and what type measurement or result can be observed. After reading the summary, you may be able to complete the procedure without reading further. Some shorter DLPs, of course, do not have summary statements.

Result Statement

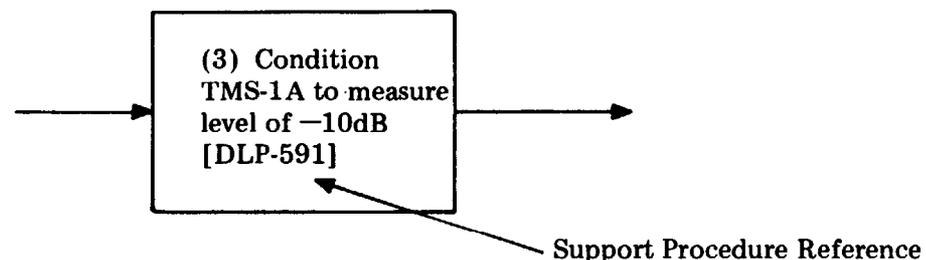
A result statement may be used in a flow-charted procedure along with the “AND” symbol. Here is an example of the “AND” symbol and a *result statement*:



When using a procedure, read the result statement first. If you know how to place standby power system in off-line status, it would be unnecessary to read steps 1, 2, and 3.

Support Procedures

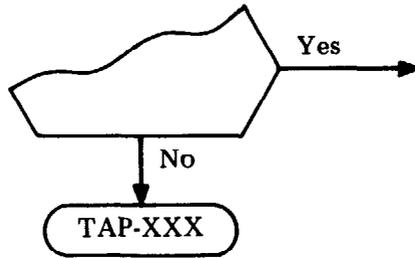
When you see this kind of reference in TOP, it refers to a support procedure.



The support procedure (DLP-591) would provide information about how to operate the TMS-1A. Of course, if you are familiar with the TMS-1A, there is no reason to look up DLP-591.

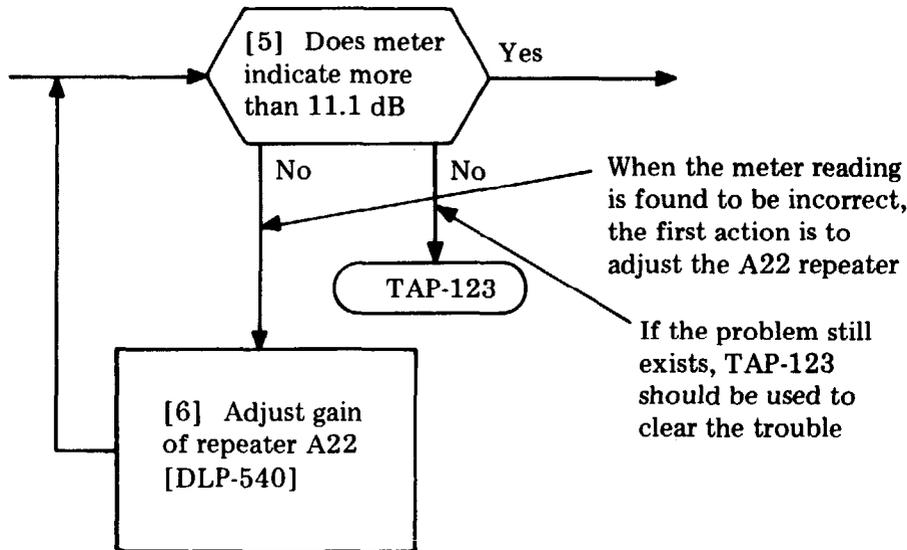
So far, the Company Order type jobs have been the main topic; however, you will find that the Routine and Acceptance categories are used in the same manner. You may come across a couple of new abbreviations in those categories; namely, Acceptance Task Procedure (ATP) and Routine Task Procedure (RTP). These categories are used in the same way that the Company Order Procedure (COP) is used in the Company Order work.

While using TOP, you probably will run across a reference similar to this:



This reference to TAP-XXX indicates that the equipment is not operating correctly and the TAP (Trouble Analysis Procedure) should be used to help you find and repair the trouble.

This idea can be carried further. In some cases, a decision block may have more than one abnormal output. This simply means that you should try more than one solution to the problem. See the example below.

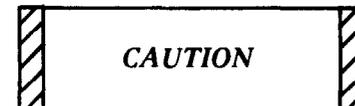


Trouble clearing information in TOP is basically used the same way as the other types. When a trouble report or equipment alarm requires you to troubleshoot a system, the Trouble Indicator List (TIL) is the place to start. This (TIL) is a listing of trouble symptoms or alarms with a reference to a Trouble Analysis Procedure (TAP). The TAP is an aid in analyzing and locating the cause of the trouble. The TAP may reference to other information such as a Trouble Analysis Data (TAD) or an Isolation Diagram (ISD) as an aid in the trouble clearing process.

Any job must always be done safely and it is no different with TOP. Here are three items which you should look for in TOP:



– means there is a possibility of personal injury



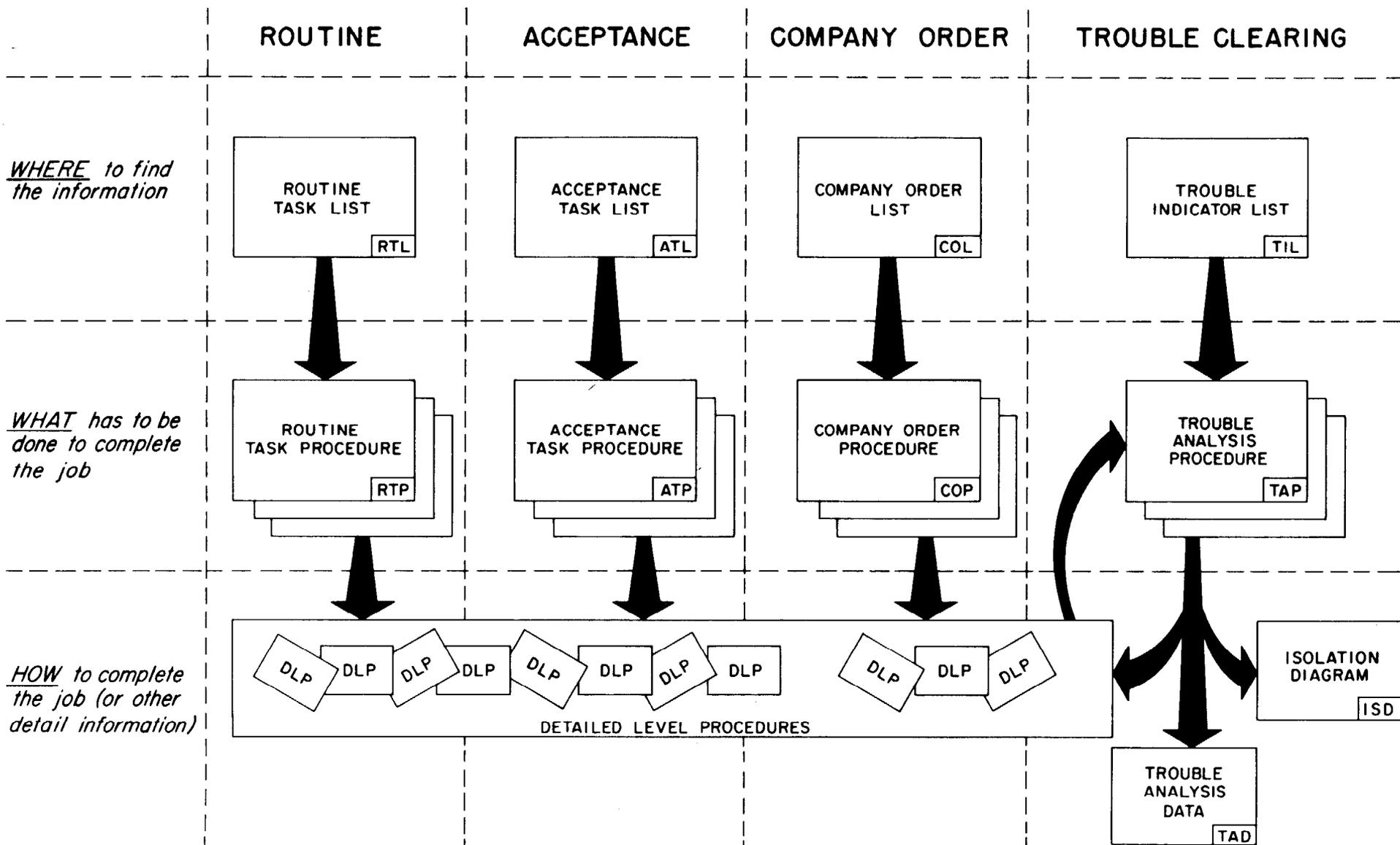
– means there is a possibility of service interruption



– means there is a possibility of equipment damage

The last page of this introductory section is a diagram which shows all the elements used to make up a TOP and basically how they are organized to make a complete document. The diagram may, at first, seem to be complex; but remember, TOP is a programmed document and it always tells you where to find the next bit of information required to do the job. The diagram, however, may be useful later if you need to know the words which DLP, TAP, etc, represent or simply a memory jogger about TOP in general.

While using any TOP, if you find errors, or if a procedure is inadequate or missing, your comments are greatly needed. They may be forwarded by using the standard form E3973 which is available through your Company. Thank you for helping us prepare better documentation.



[1] SET TR-RR-XR-OFF SWITCH ON ROUTINER TO OFF

[2] DISCONNECT POWER CORD FROM AC OUTLET AND ROUTINER TEST SET

[3] REMOVE FOUR SCREWS AT LEFT AND RIGHT EDGES OF FRONT PANEL

[4] USING METAL HANDLES, SLIDE ROUTINER TEST SET OUT OF CASE

[5] LOCATE CIRCUIT BOARD TO BE REMOVED OR EXTENDED [FIG. 1]

[6] SEE WARNINGS 1 AND 2. PULL UP ON CENTER OF PLASTIC HANDLE OF CIRCUIT BOARD AND REMOVE BOARD BY PULLING UPWARD

AND

[7] IS BOARD TO BE REPLACED WITH A SPARE OR IS BOARD TO BE INSTALLED ON AN EXTENDER BOARD. SEE NOTE

SPARE

[10] ON WORKING OR REPLACEMENT BOARD, PULL UP ON BOARD HANDLE UNTIL HANDLE IS BOWED

EXTENDER BOARD

[8] INSERT EXTENDER BOARD INTO PROPER SLOT WITH SIDE MARKED FRONT FACING FRONT OF ROUTINER TEST SET

[11] WITH BOARD COMPONENTS FACING REAR OF TEST SET, INSERT CIRCUIT BOARD INTO PROPER SLOTS IN BOARD CARRIER AND RELEASE HANDLE

[9] WITH BOARD COMPONENTS FACING REAR OF ROUTINER TEST SET, INSERT CIRCUIT BOARD INTO EXTENDER BOARD

[12] PUSH DOWN ON CIRCUIT BOARD UNTIL FIBER KEY ON SOCKET ENGAGES CIRCUIT BOARD

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WARNINGS

1. WHEN REMOVING CIRCUIT BOARDS, MAKE SURE THAT EDGES OF BOARD ARE AIMED SO THEY COME THROUGH THE SWITCH ON THE SIDE OF BOARD CARRIER
2. SOME OF THE CIRCUIT BOARDS COULD BE DAMAGED BY STATIC DISCHARGE IF HANDLED IMPROPERLY. CARE SHOULD BE TAKEN NOT TO TOUCH ANY BARE SURFACE SUCH AS THE CONTACT POINTS. IF A CIRCUIT BOARD IS TO BE STORED, IT SHOULD BE PLACED IN A CONDUCTIVE MEDIUM SUCH AS ALUMINUM FOIL.

NOTE

EXTENDER BOARD IS STORED ON SIDE OF CIRCUIT BOARD CARRIER

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REMOVE AND INSTALL ROUTINER TEST SET CIRCUIT BOARD