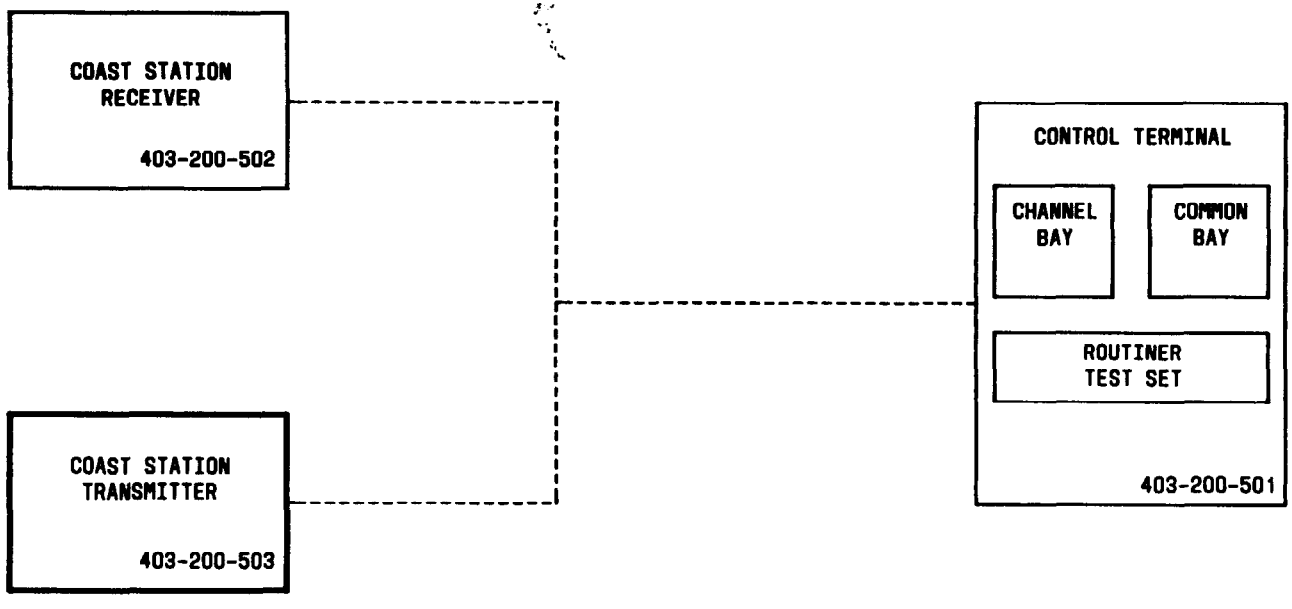
MM COASTAL HARBOR RADIO
TOP DOCUMENTATION
THREE VOLUMES



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

403-200-503
Issue 2, February 1979

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.

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

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

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

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

ACCEPTANCE TASK LIST	PROCEDURE NUMBER
NONE REQUIRED	

CIRCUIT ORDER LIST – COAST STATION TRASMITTERS

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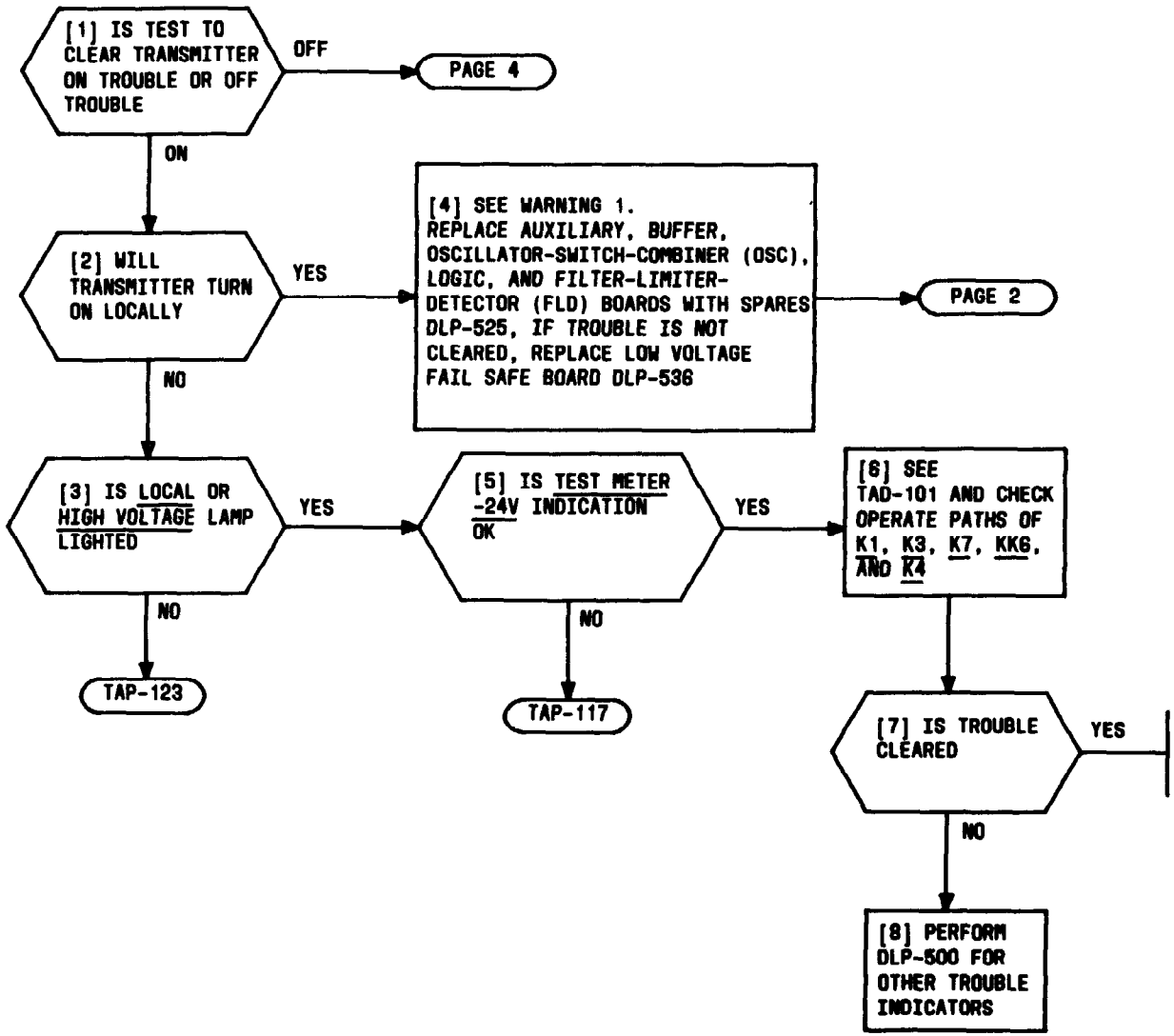
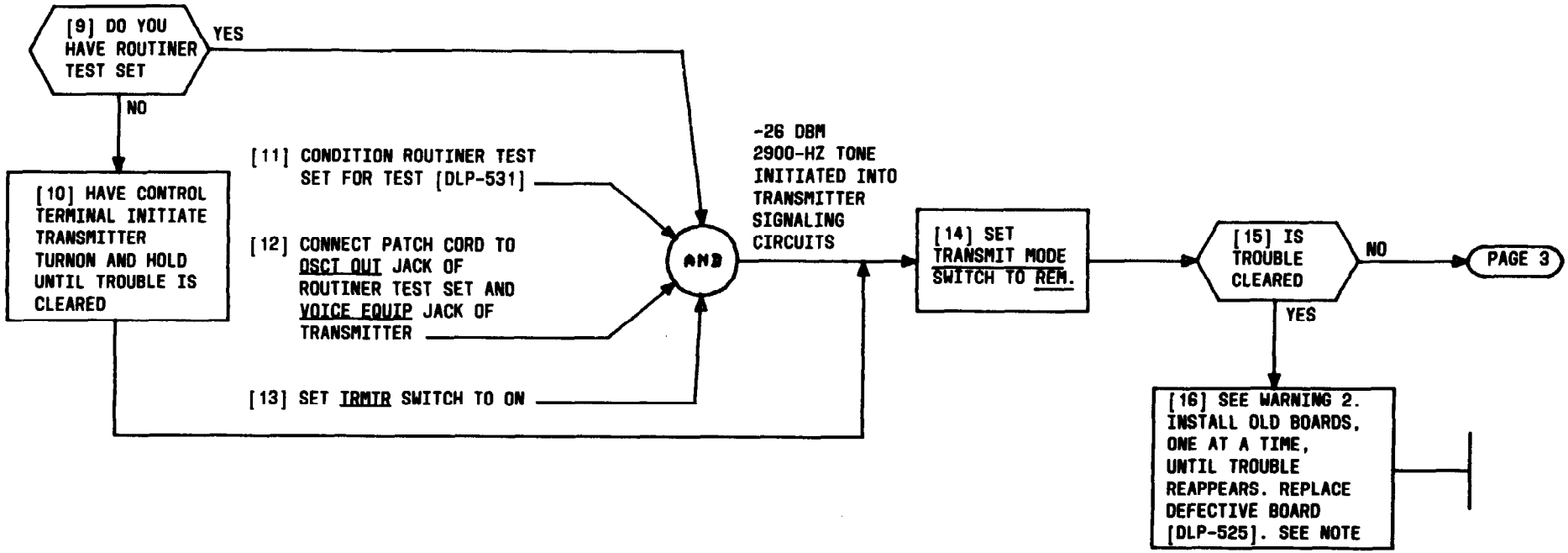
TROUBLE INDICATED	MAY ALSO BE REPORTED AS	PROCEDURE NUMBER
MAINTENANCE PHILOSOPHY		TAD-136
AUTOMATIC DEVICES		
TRANSMITTER ALARM LAMP		TAP-114
VSWR/TUBE ALARM LAMP		TAP-115
TRANSMITTER FUSE LAMP		TAP-132
TROUBLE REPORTS		
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT		TAP-132



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



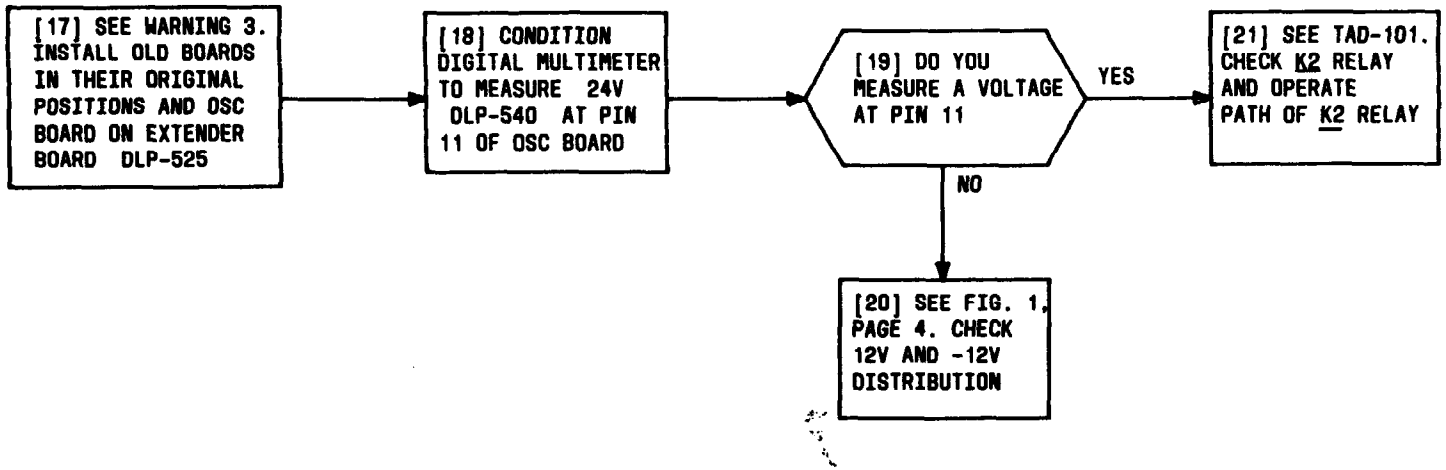
NOTE

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

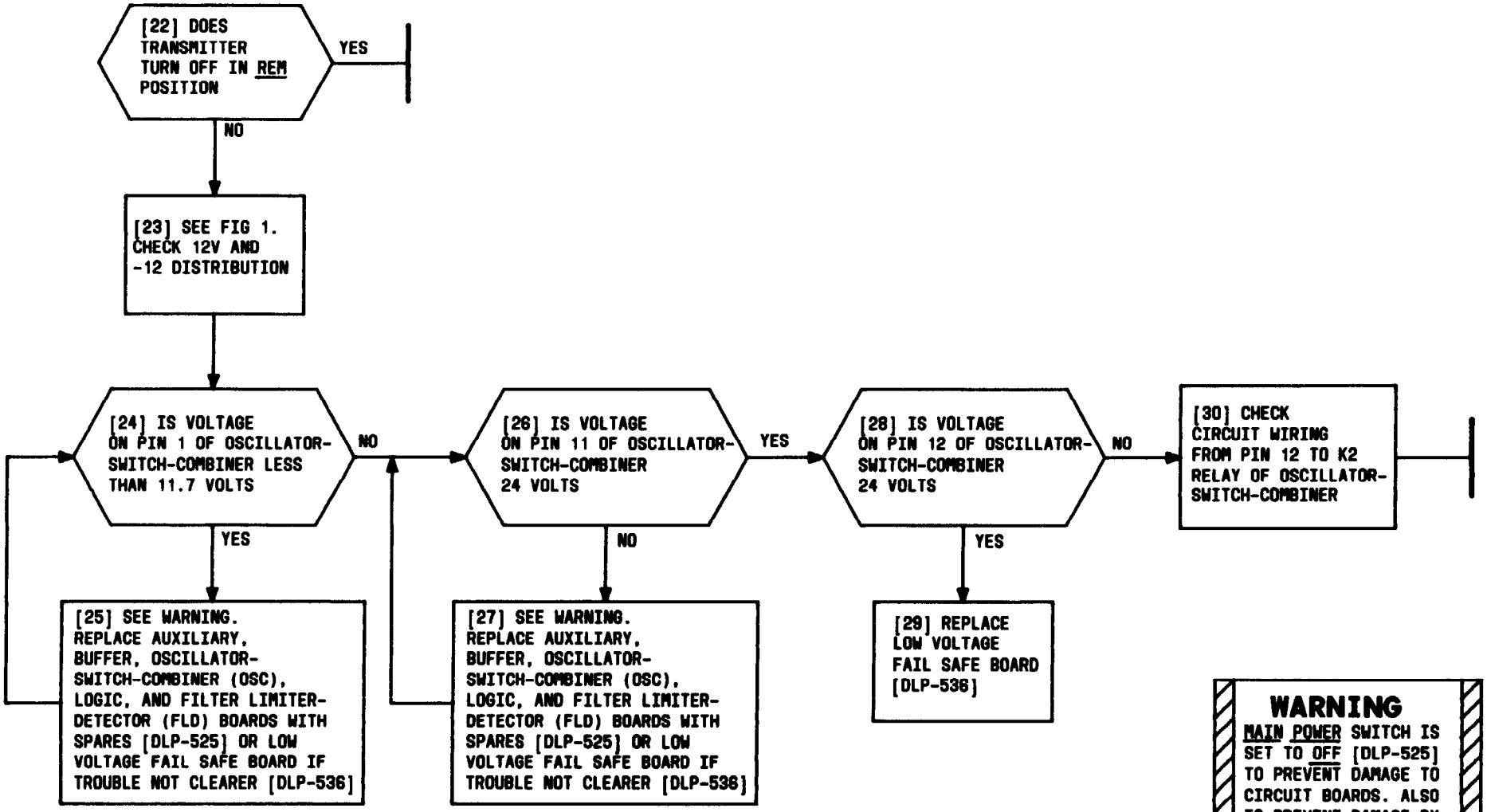
CLEAR TRANSMITTER ON AND/OR OFF TROUBLE



WARNING 3

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



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

CLEAR TRANSMITTER ON AND/OR OFF TROUBLE

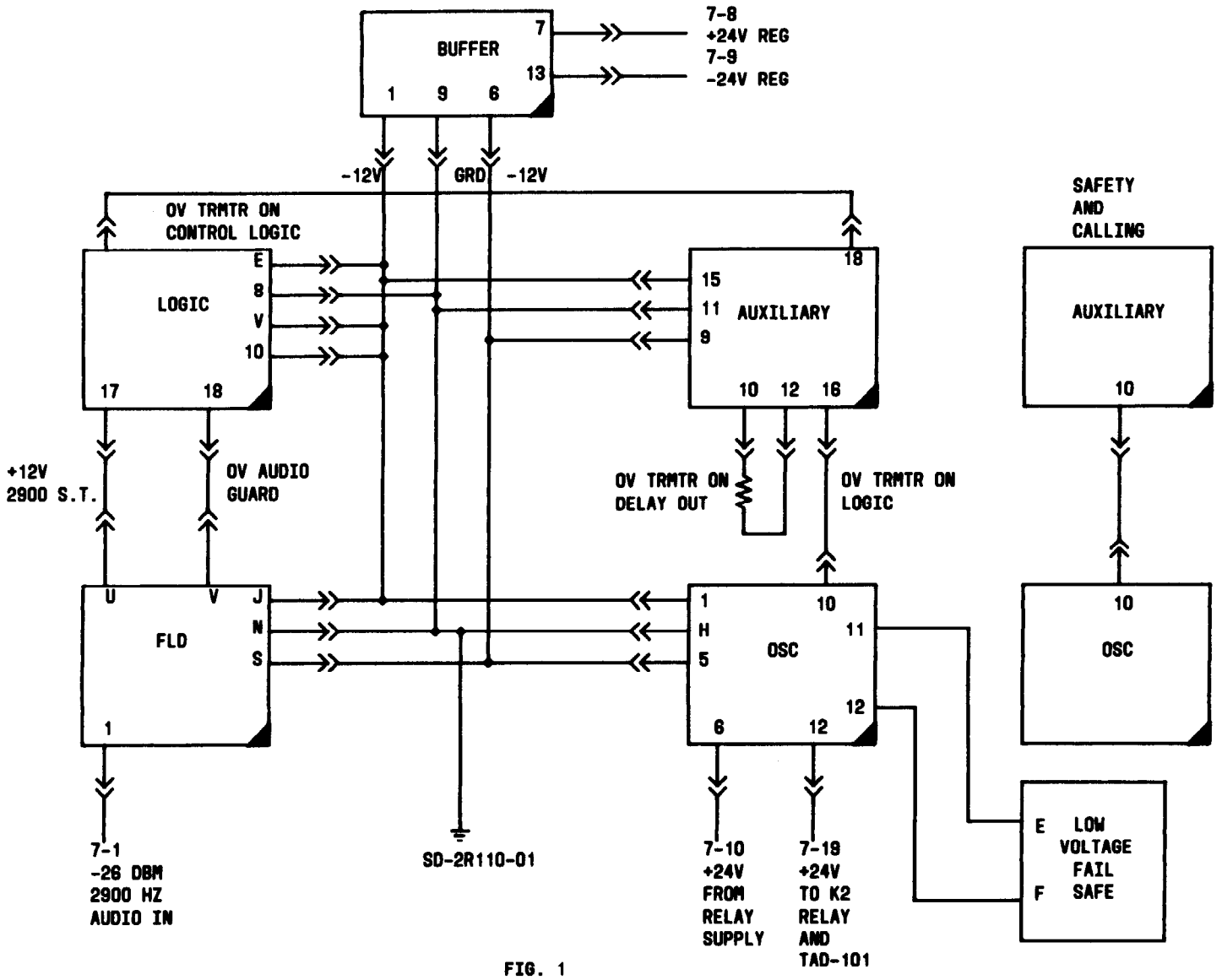


FIG. 1

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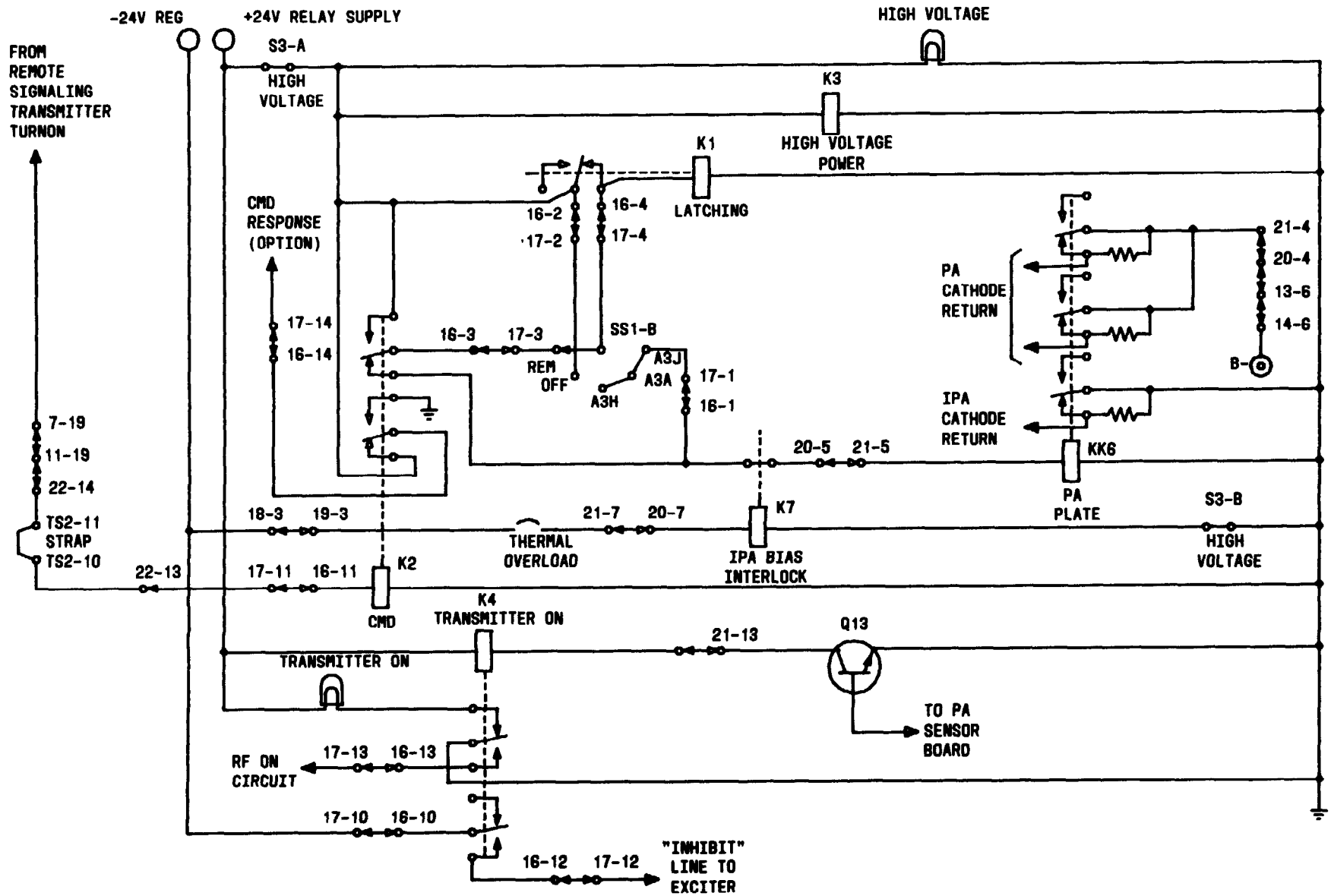
CLEAR TRANSMITTER ON AND/OR OFF TROUBLE



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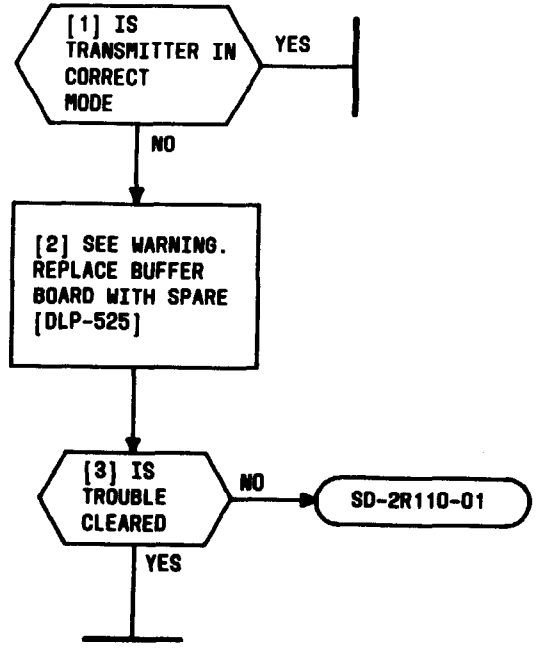
TRANSMITTER TORNON SCHEMATIC DIAGRAM



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

CLEAR MODE COMMAND TROUBLE

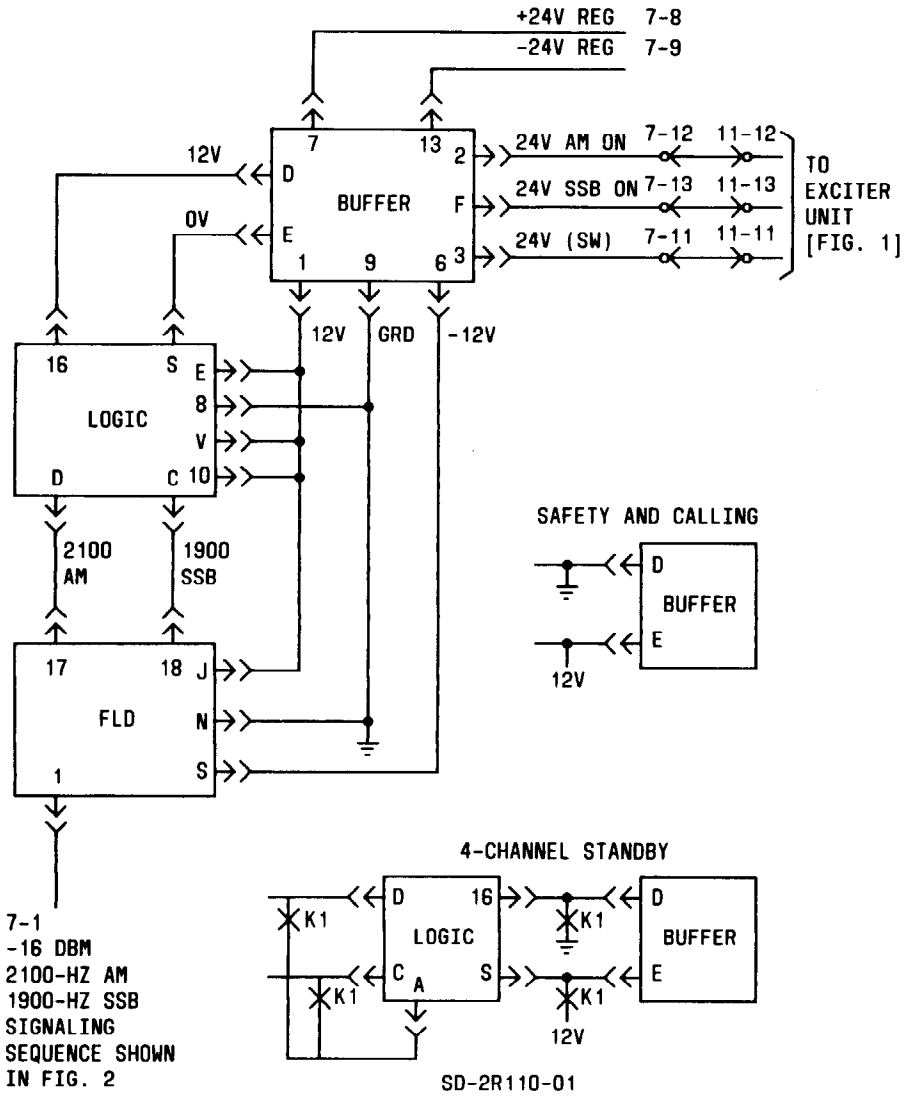


FIG. 1

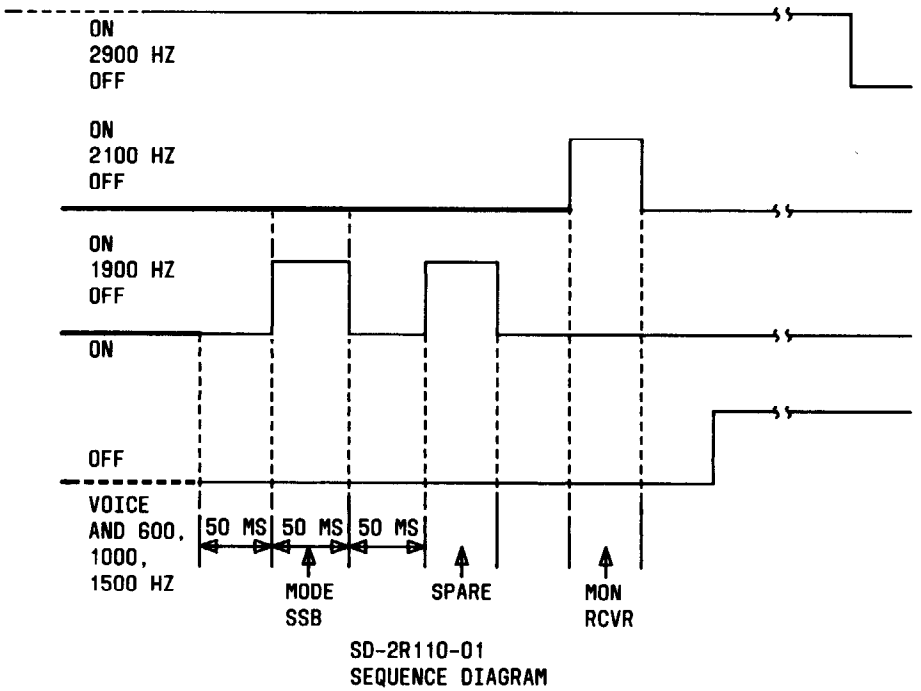
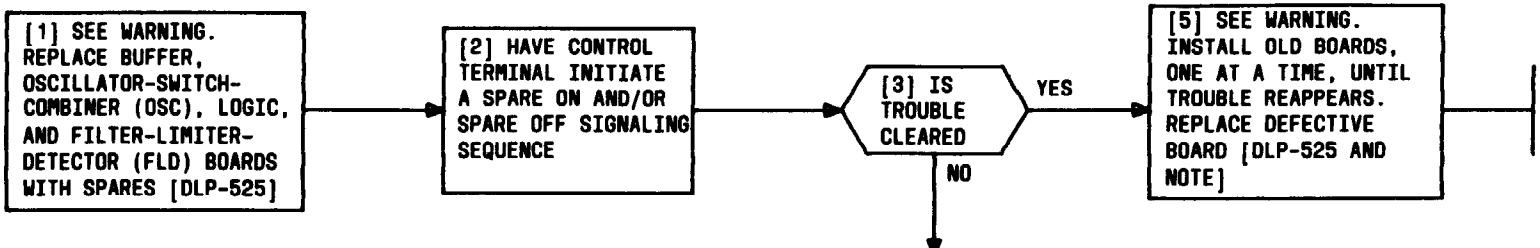


FIG. 2

CLEAR MODE COMMAND TROUBLE



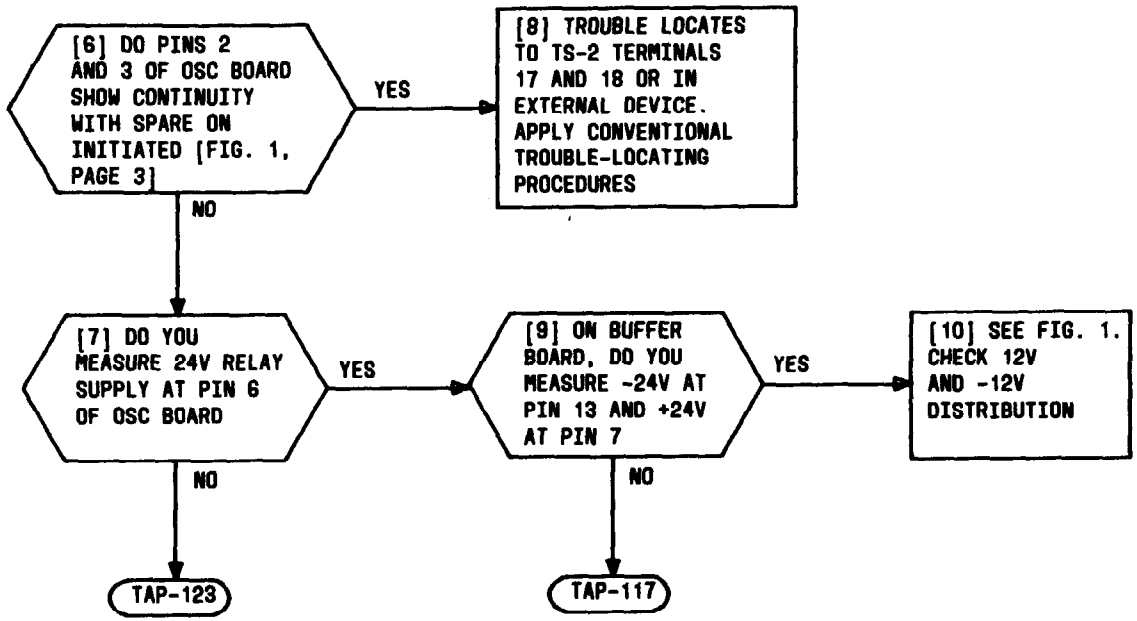
WARNING

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

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



CLEAR SPARE ON/OFF COMMAND TROUBLE

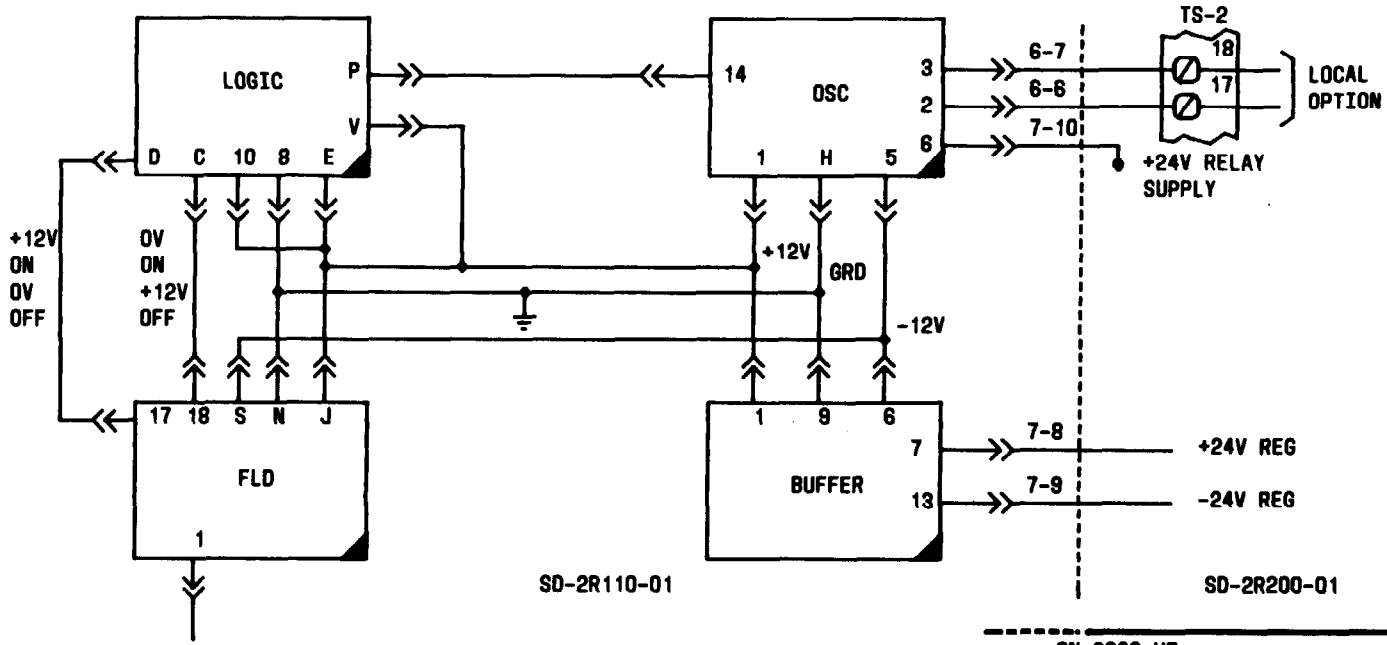


FIG. 1

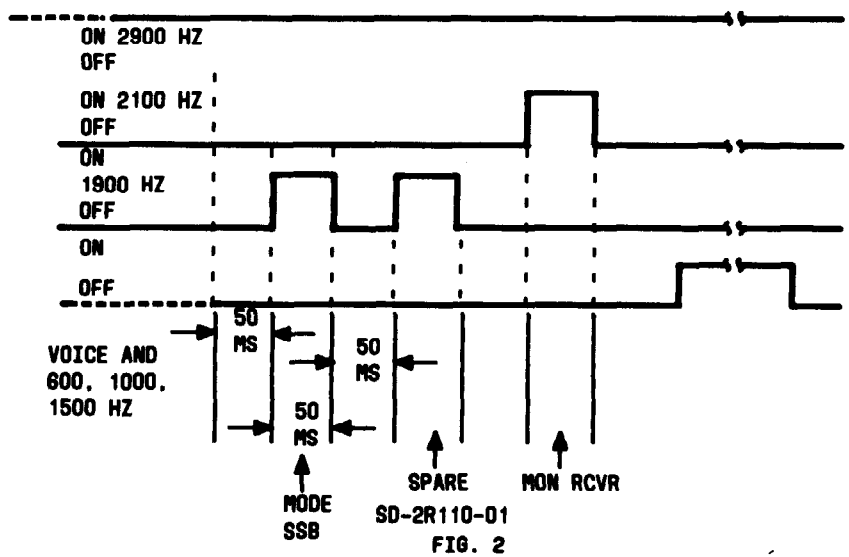


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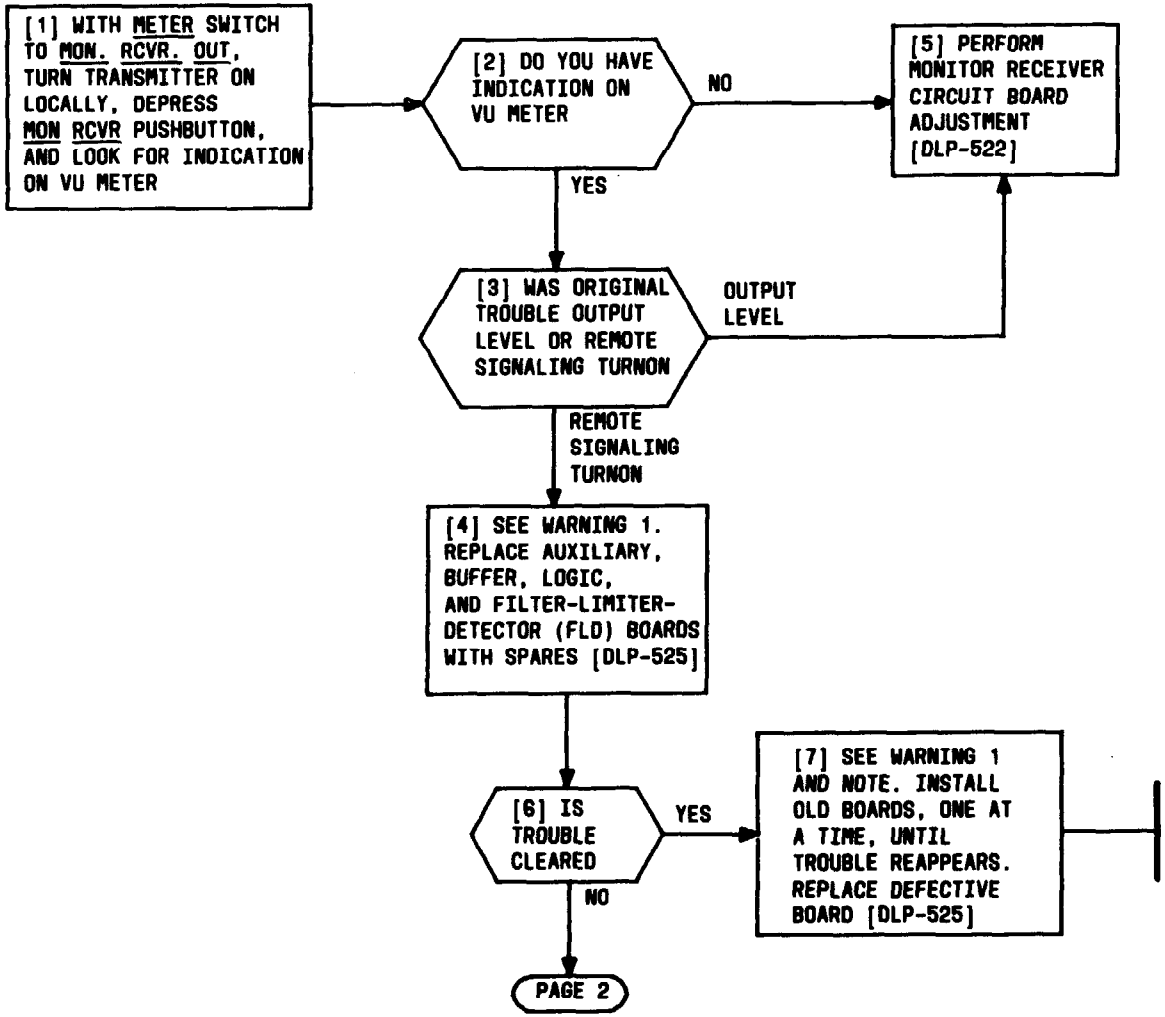
FIG. 2

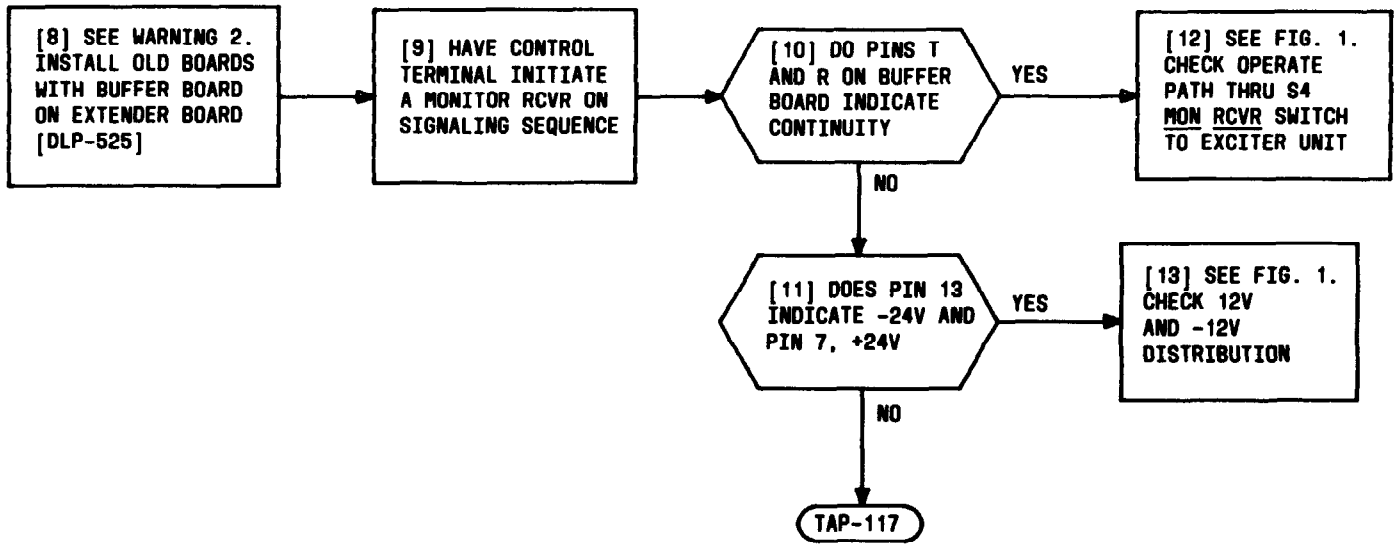
CLEAR SPARE ON/OFF COMMAND TROUBLE



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

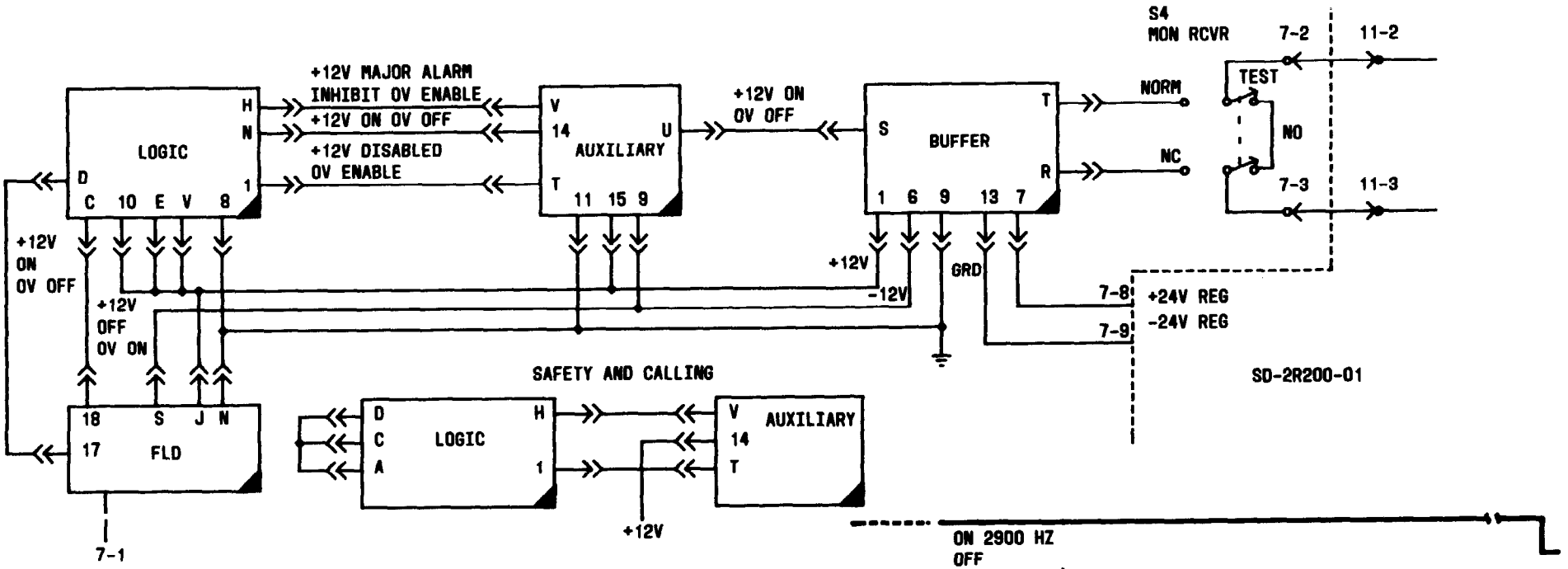
CLEAR MONITOR RECIVER ON/OFF COMMAND TROUBLE



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

CLEAR MONITOR RECEIVER ON/OFF COMMAND TROUBLE



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

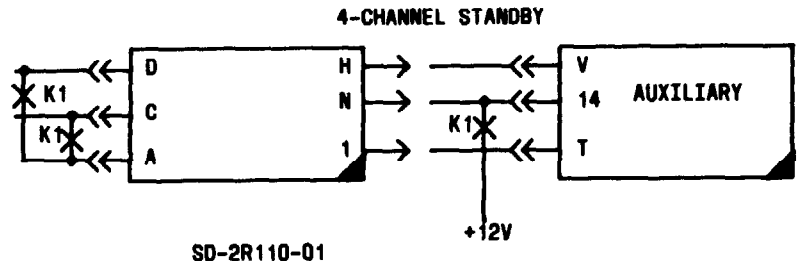


FIG. 1

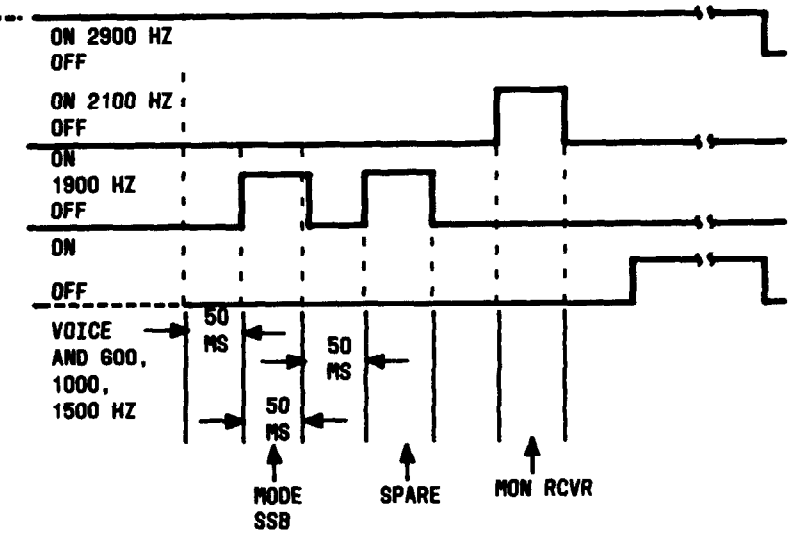


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FIG. 2

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CLEAR MONITOR RECEIVER ON/OFF COMMAND TROUBLE

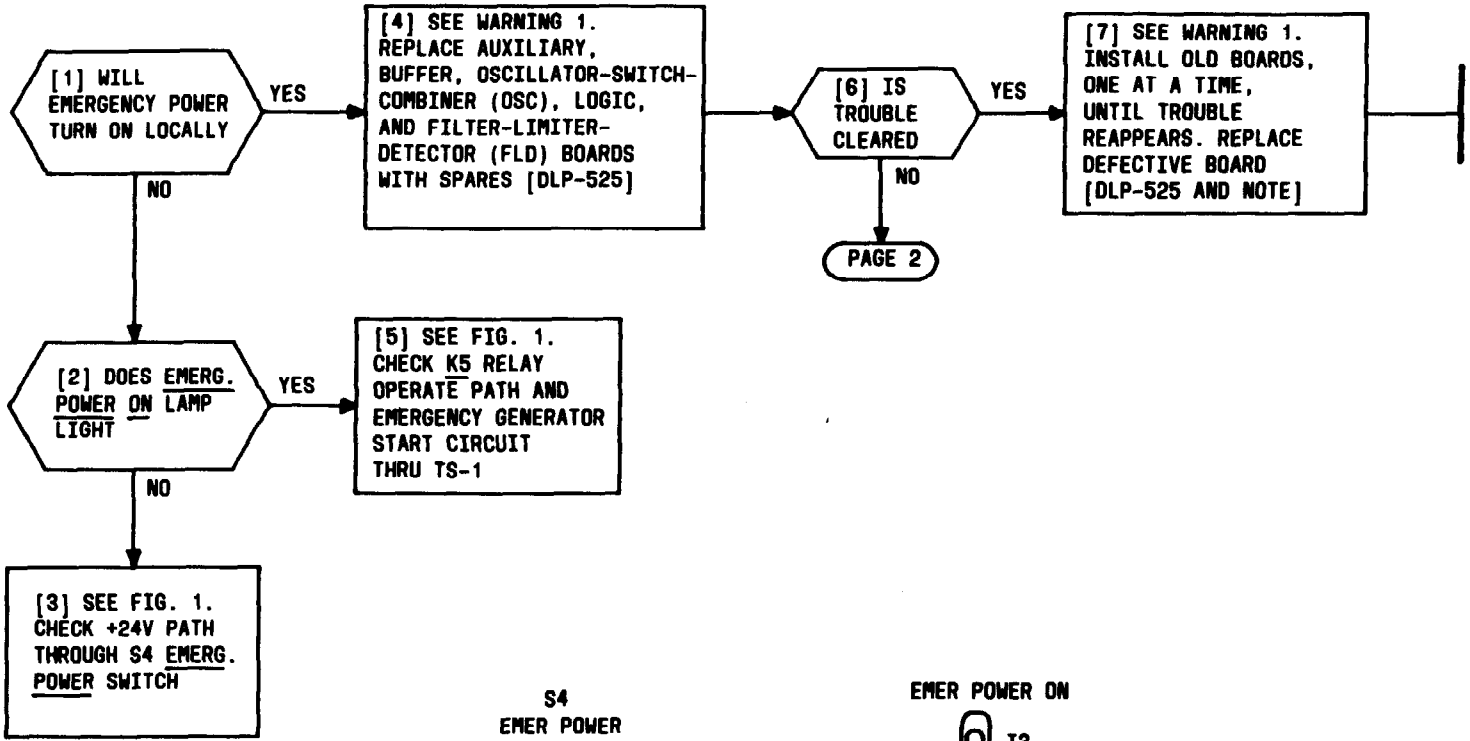


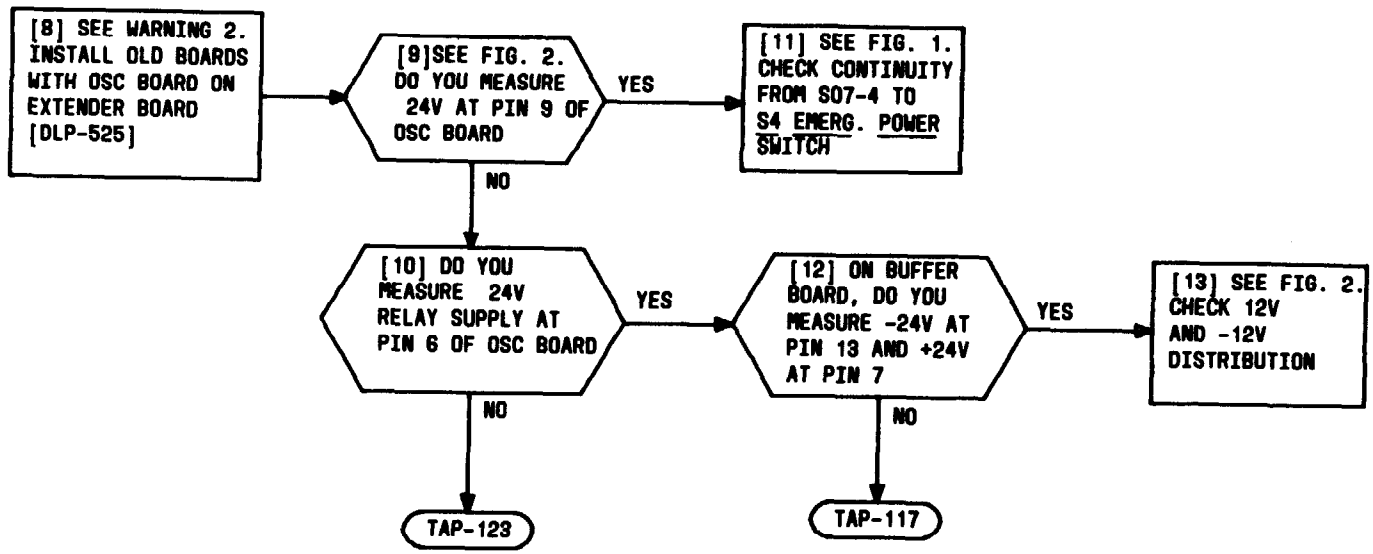
FIG. 1

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

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

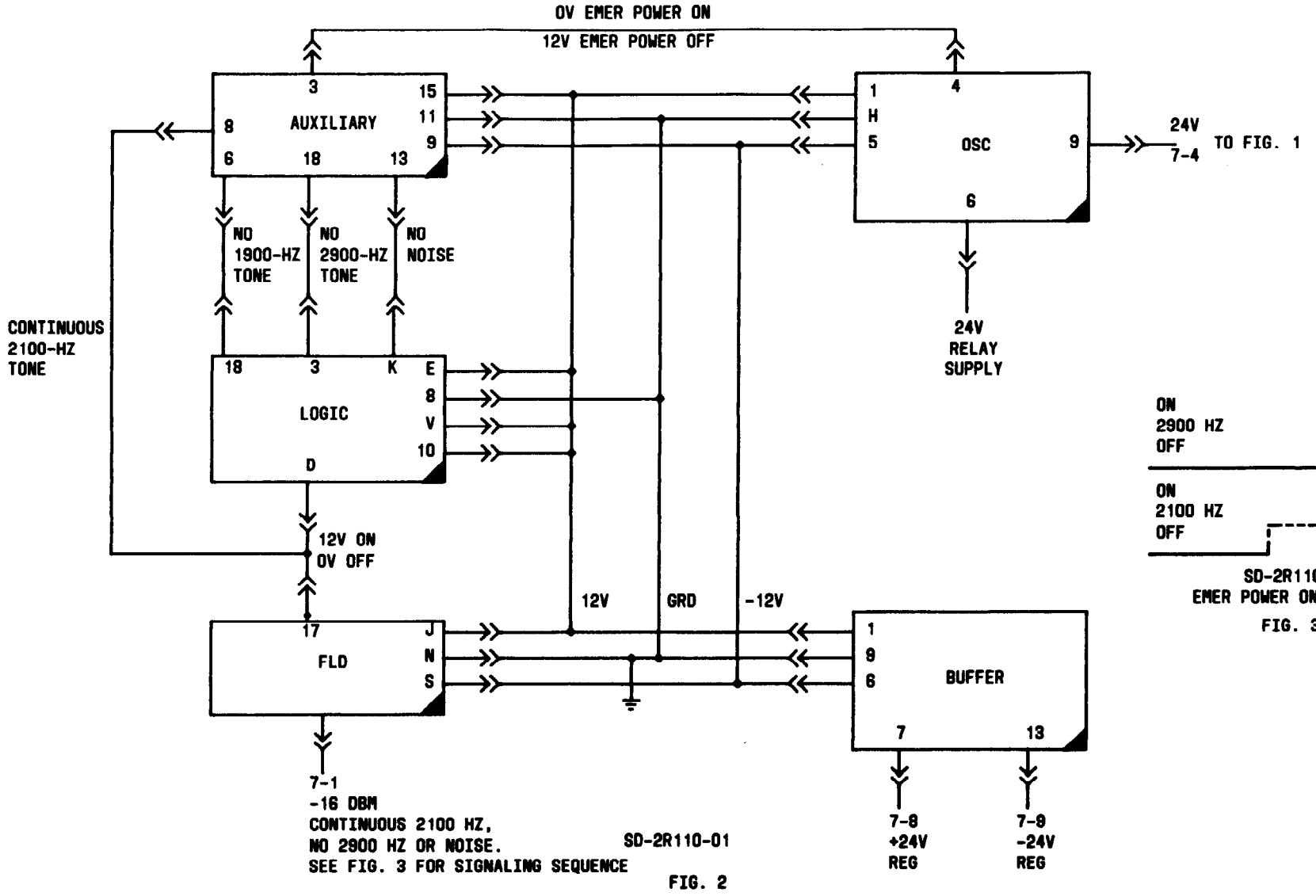
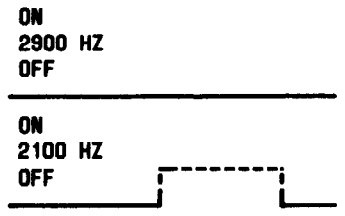


FIG. 2



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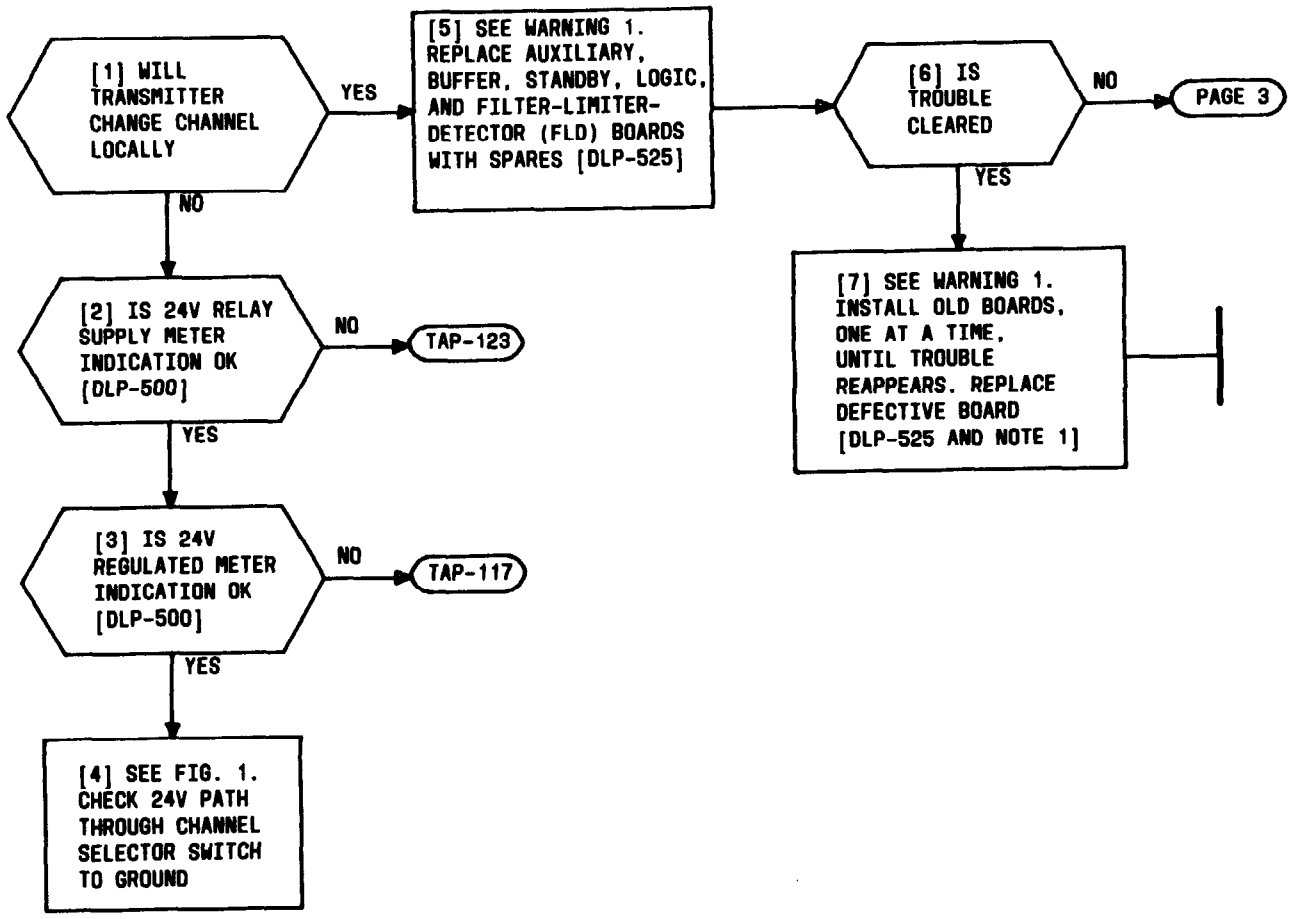
EMER POWER ON TEST

FIG. 3

CLEAR EMERGENCY POWER ON COMMAND TROUBLE

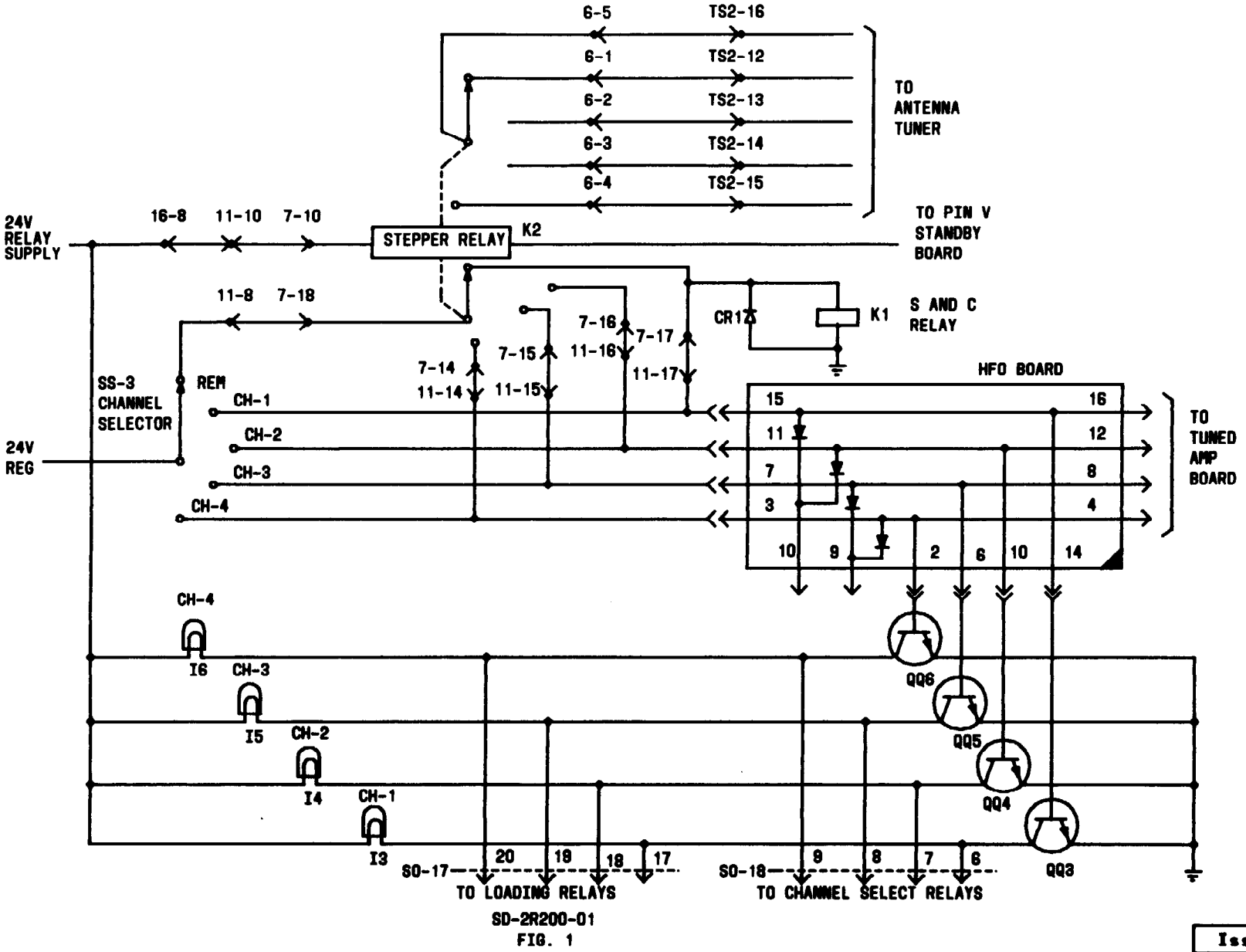


NOTE 1
IF AUXILIARY BOARD IS REPLACED, PERFORM DLP-539

WARNING 1

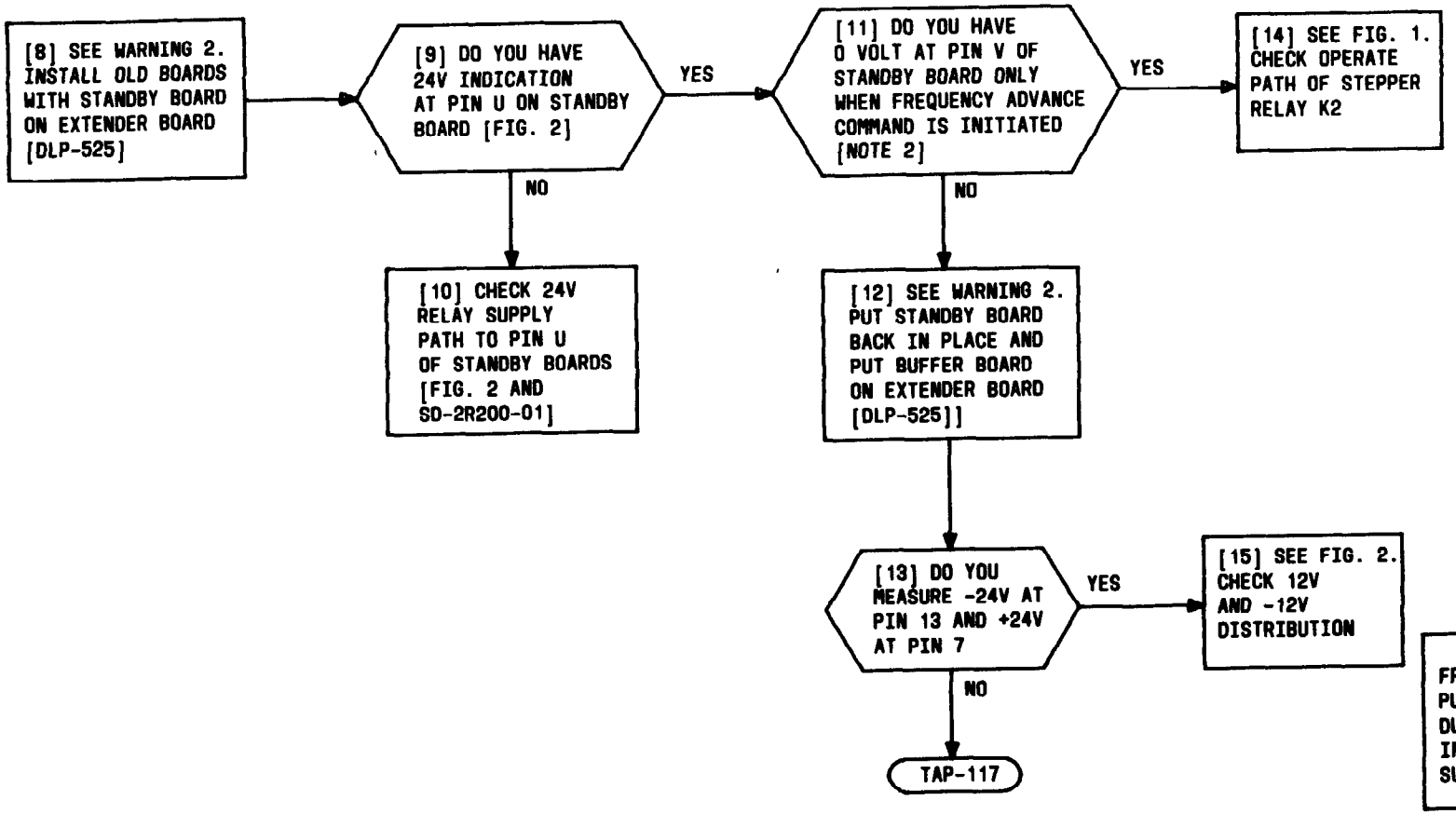
MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE



SD-2R200-01
FIG. 1

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE



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

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE

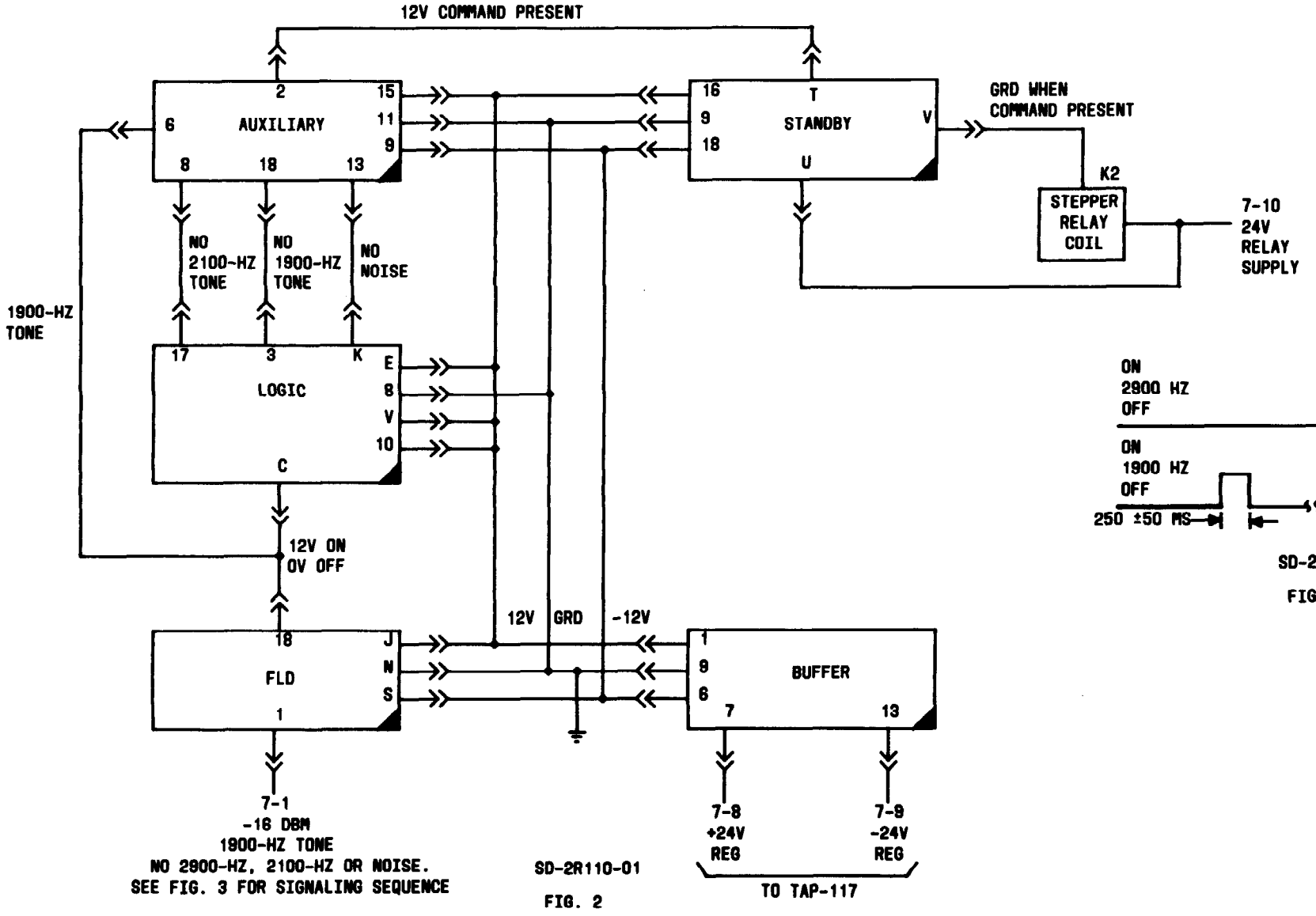


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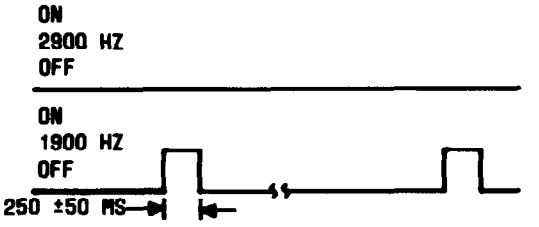
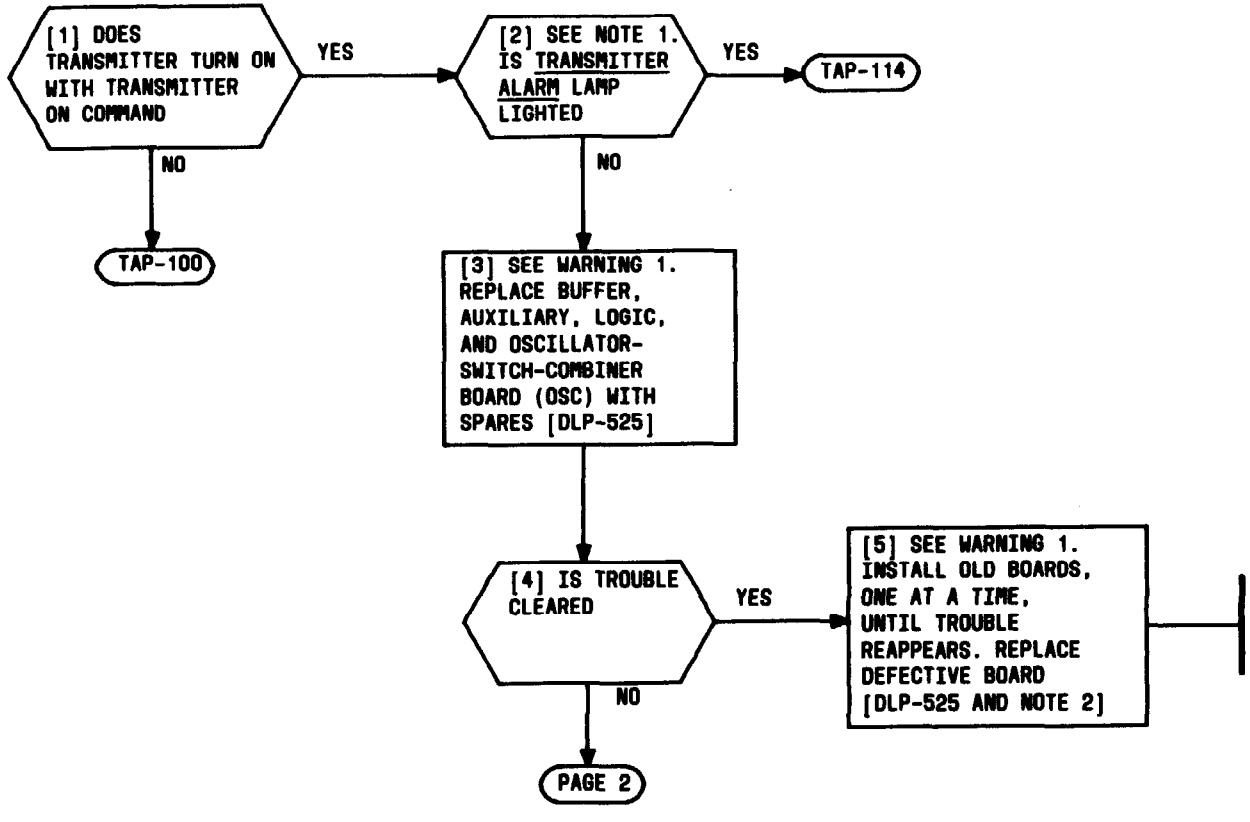
FIG. 2



SD-2R110-01

FIG. 3

CLEAR FREQUENCY ADVANCE COMMAND TROUBLE



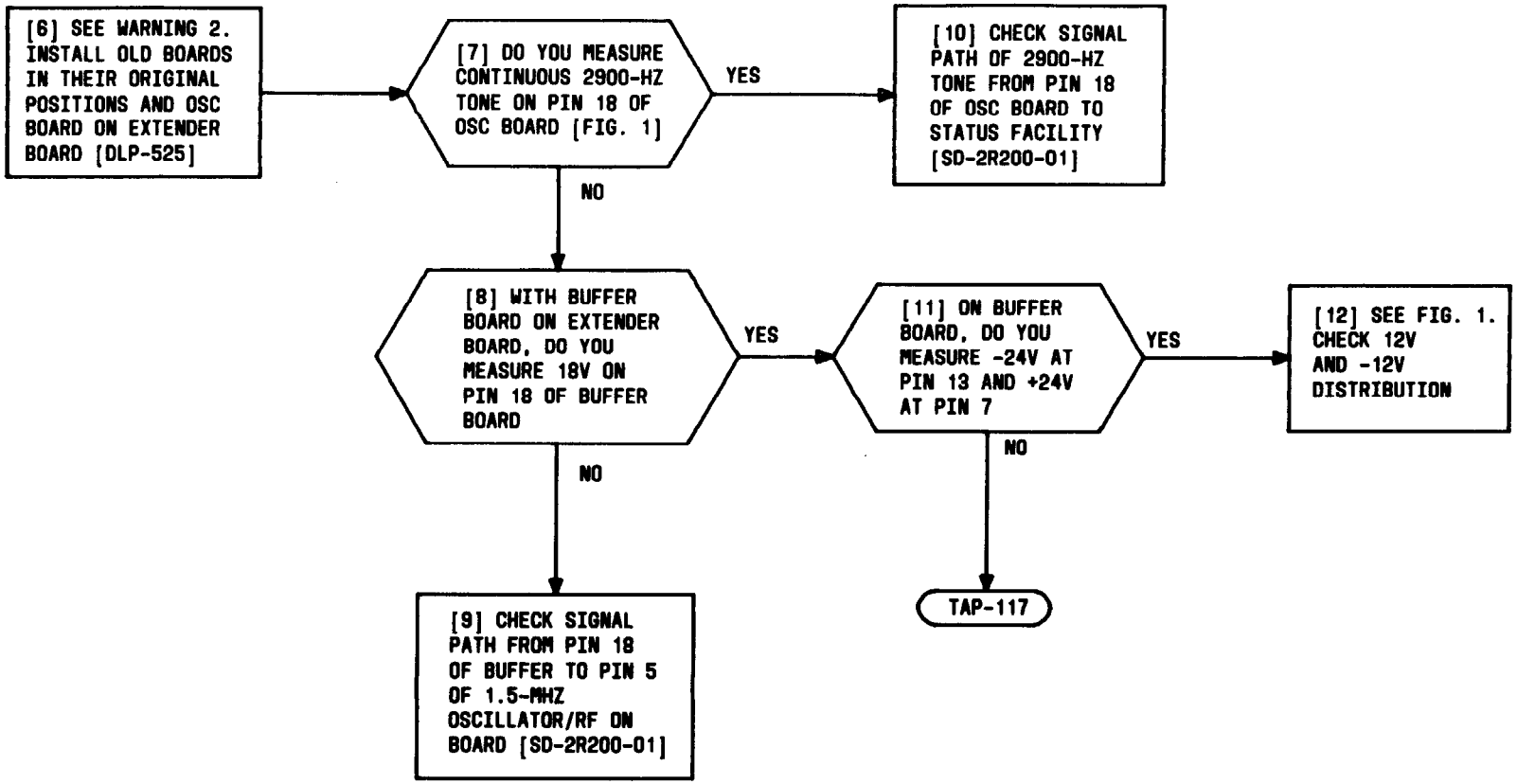
NOTES

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

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

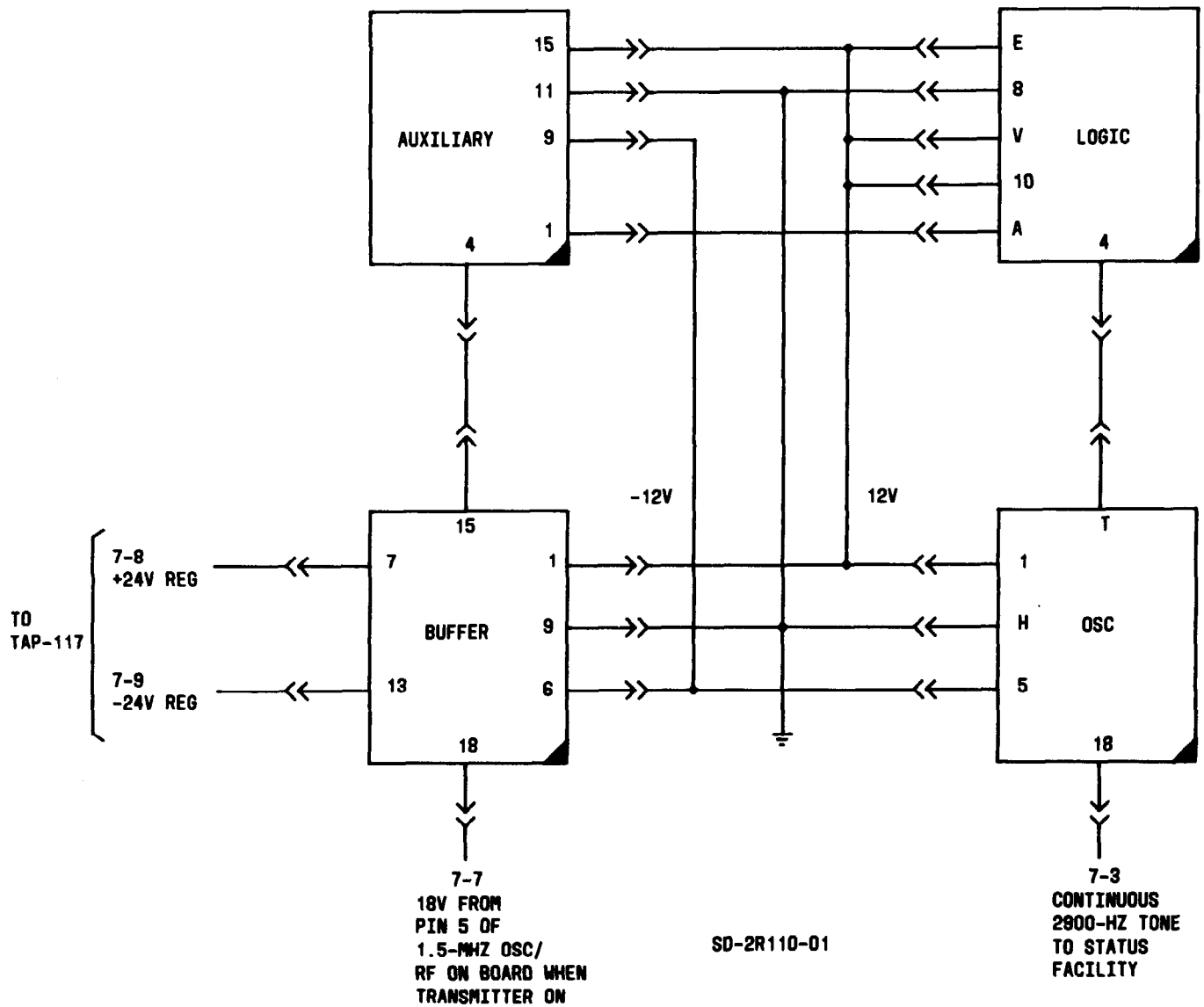


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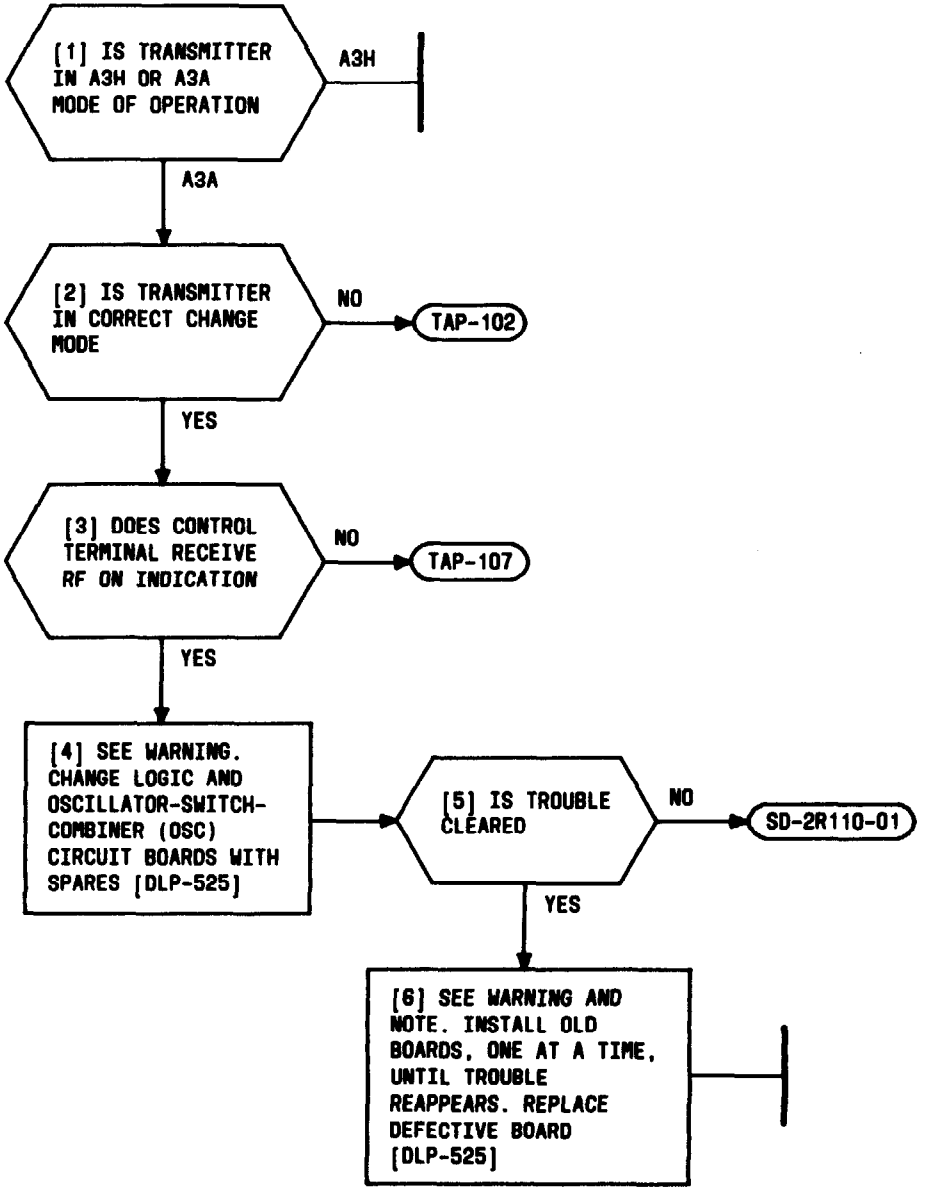
FIG. 1

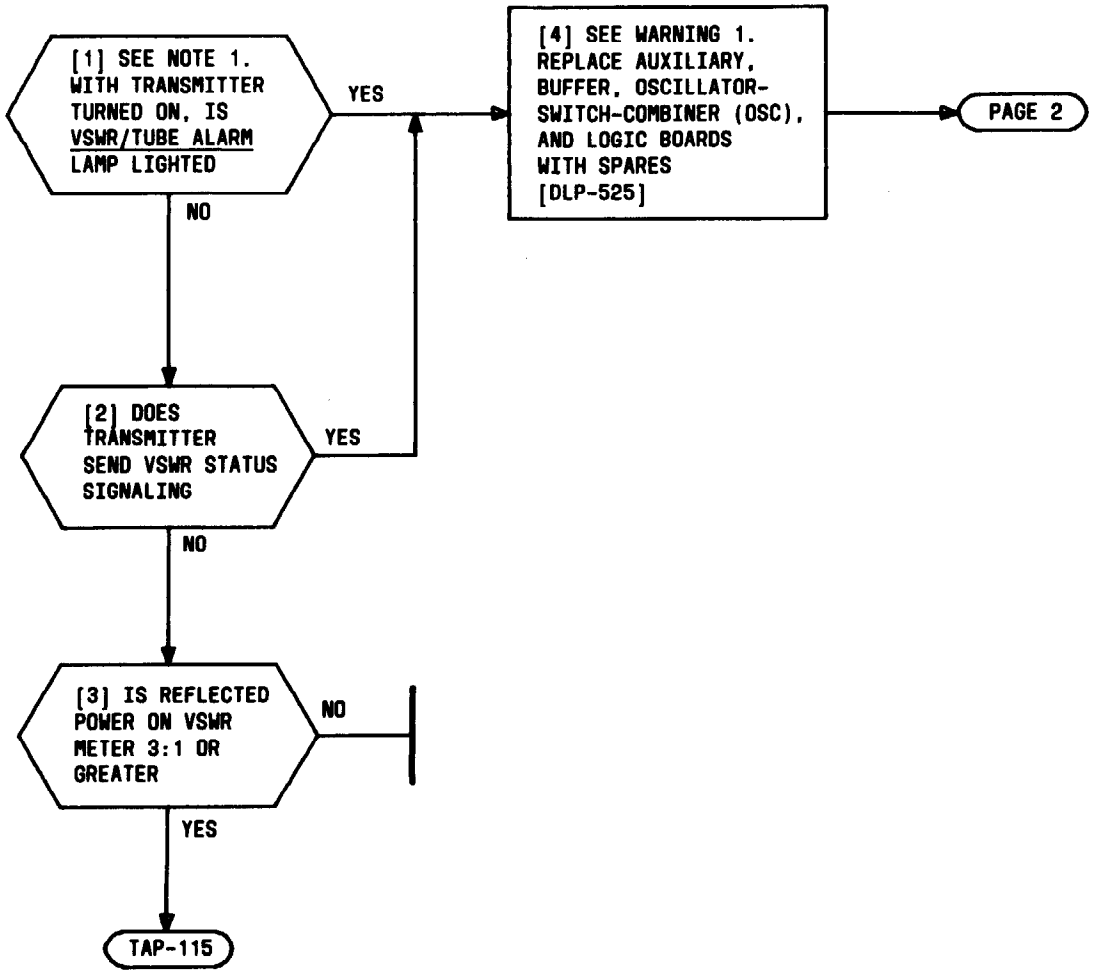
CLEAR RF ON STATUS TROUBLE



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

CLEAR MODE STATUS TROUBLE

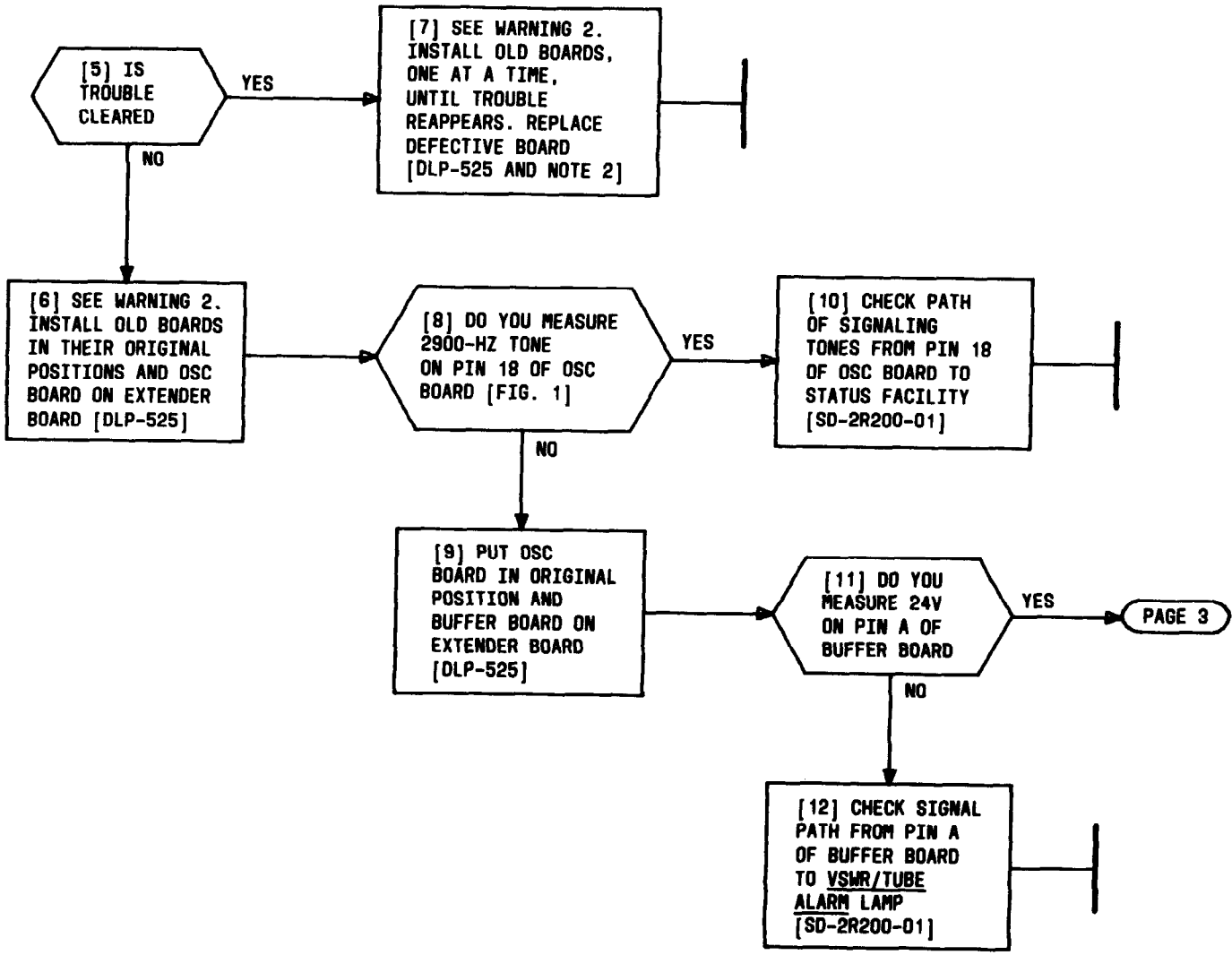


CLEAR VSWR STATUS TROUBLE

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

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



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

[13] ON BUFFER BOARD, DO YOU MEASURE -24V AT PIN 13 AND +24V AT PIN 7

YES → [14] SEE FIG. 1. CHECK 12V AND -12V DISTRIBUTION

NO → TAP-117

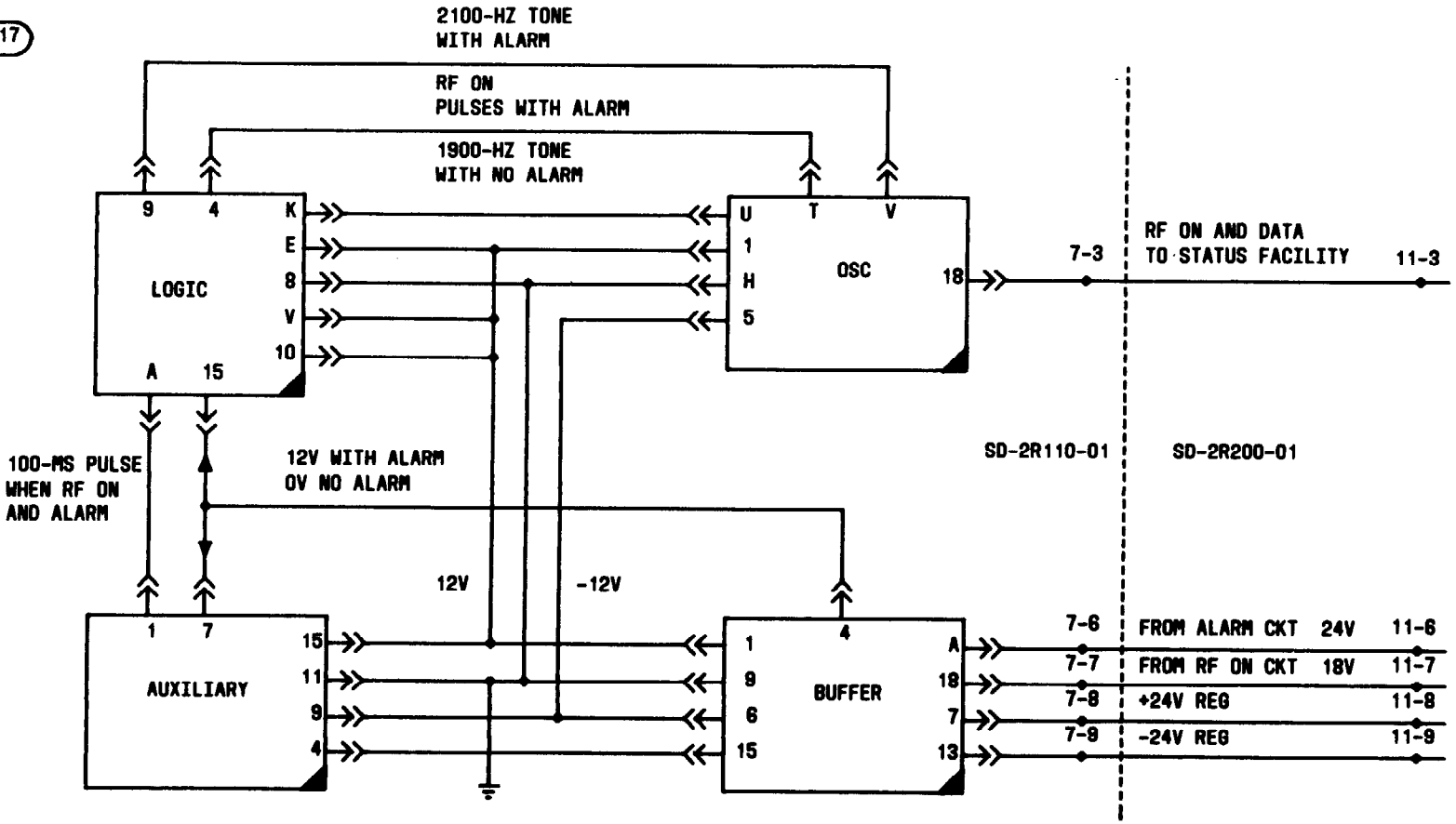
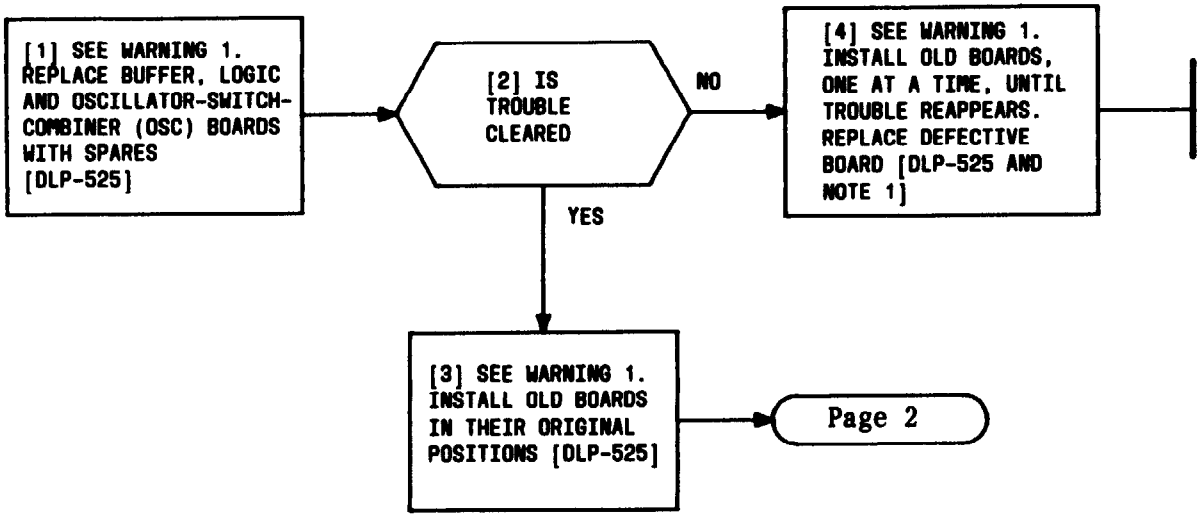


FIG. 1

CLEAR VSWR STATUS TROUBLE

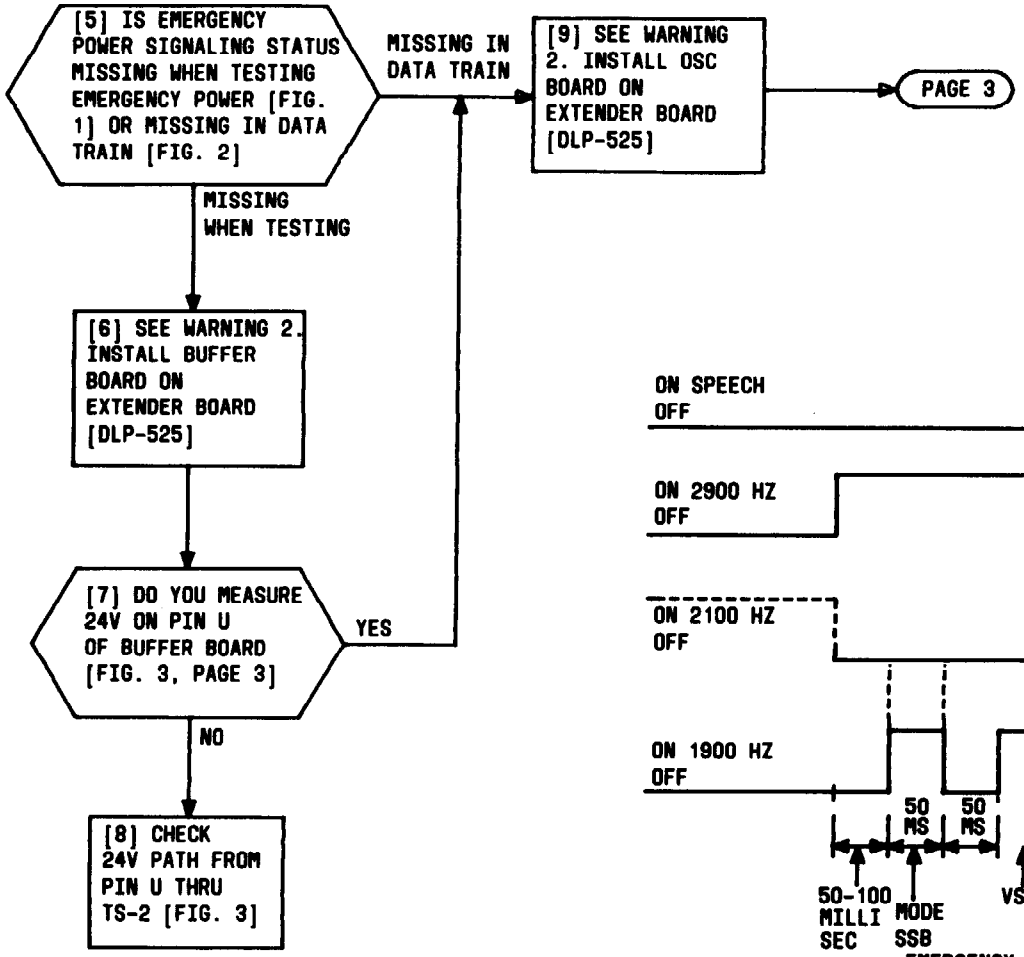


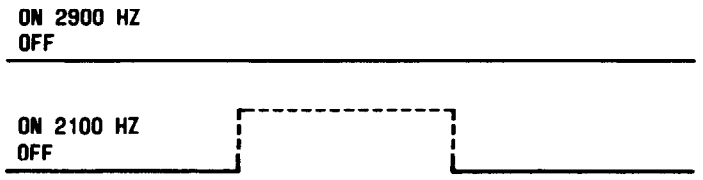
NOTE 1
IF OSC BOARD IS REPLACED, PERFORM DLP-505 AND DLP-506

WARNING 1

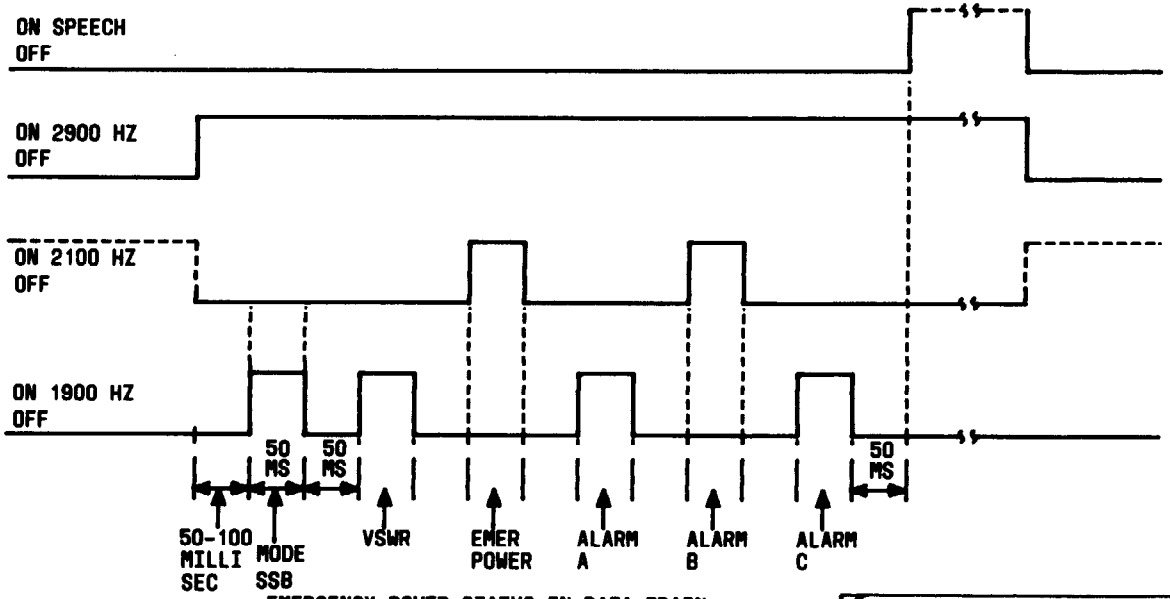
MAIN POWER SWITCH IS SET TO OFF [DLP-525] TO PREVENT DAMAGE TO CIRCUIT BOARDS. ALSO, TO PREVENT DAMAGE BY STATIC ELECTRICITY, DO NOT TOUCH ANY BARE SURFACE SUCH AS CONTACT POINTS

CLEAR EMERGENCY POWER ON STATUS TROUBLE





EMERGENCY POWER TEST - TRANSMITTER OFF THE AIR
SD-2R110-01
FIG. 1



EMERGENCY POWER STATUS IN DATA TRAIN
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FIG. 2

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 STATUS TROUBLE

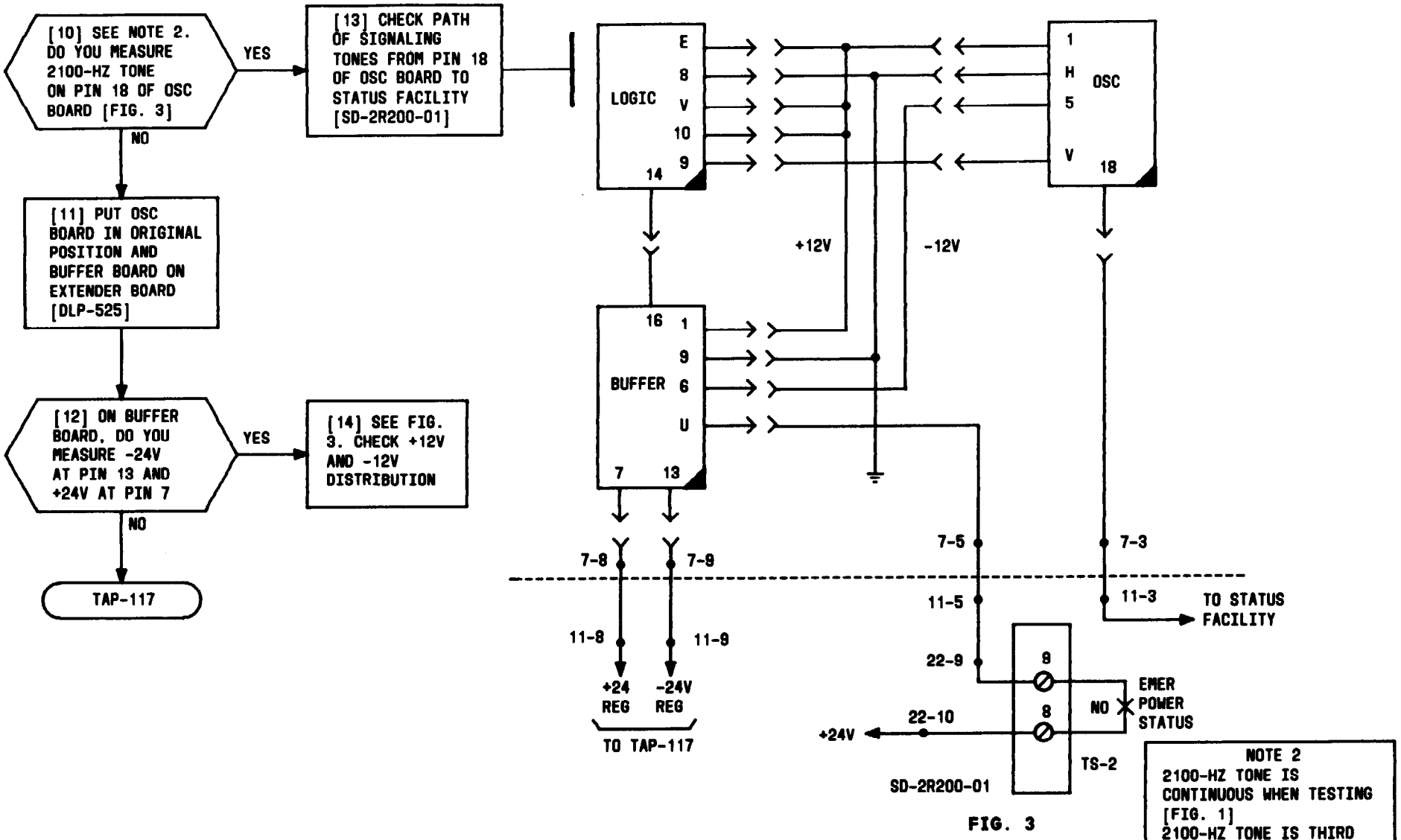

FIG. 3

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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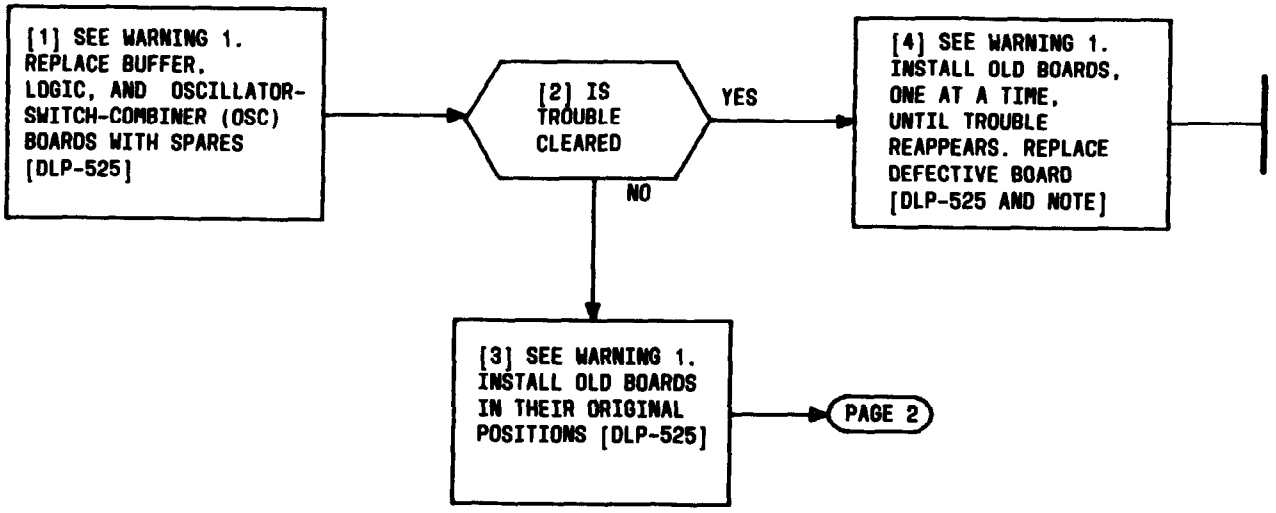
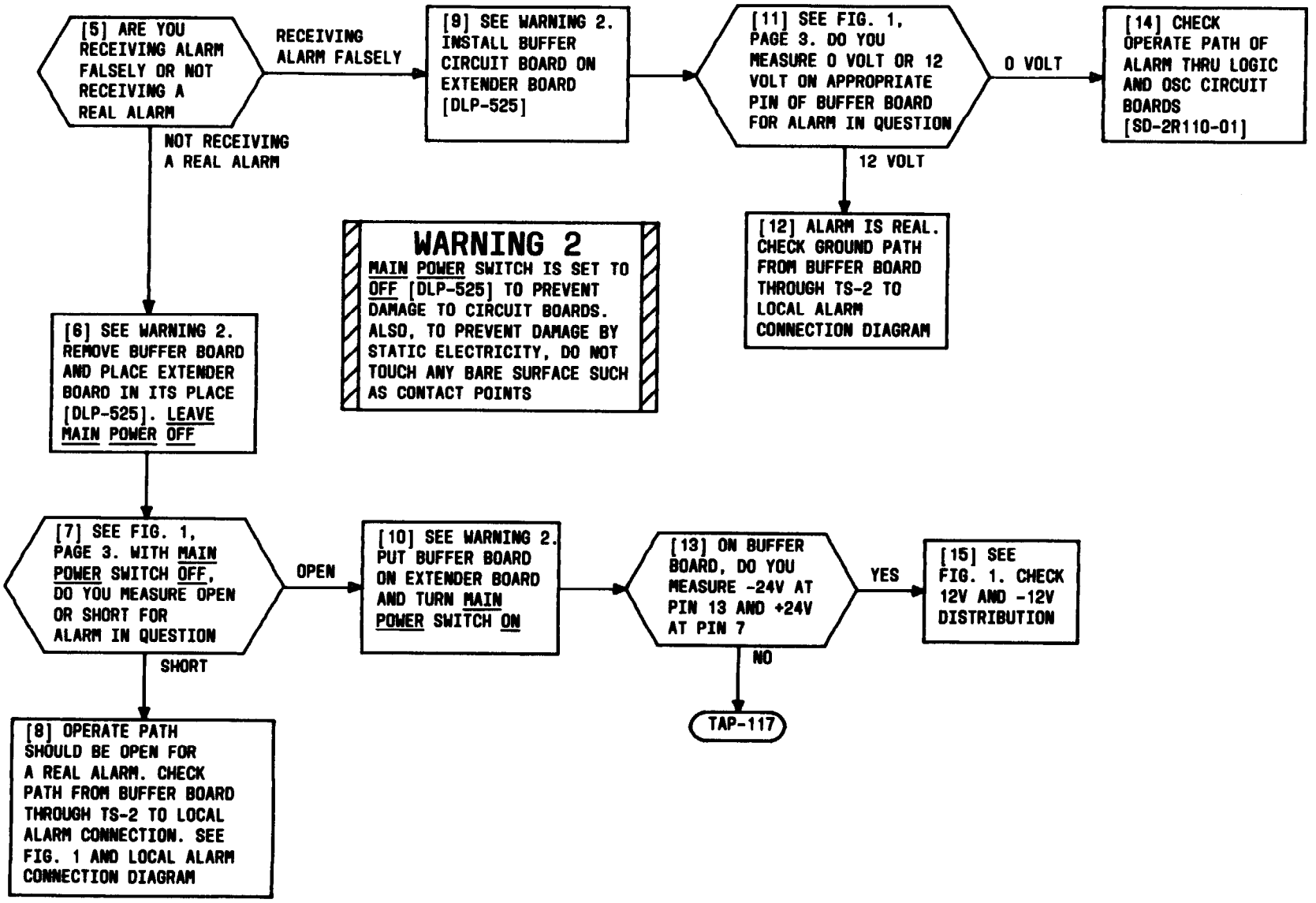
CLEAR EMERGENCY POWER ON STATUS TROUBLE



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

CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE



CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE

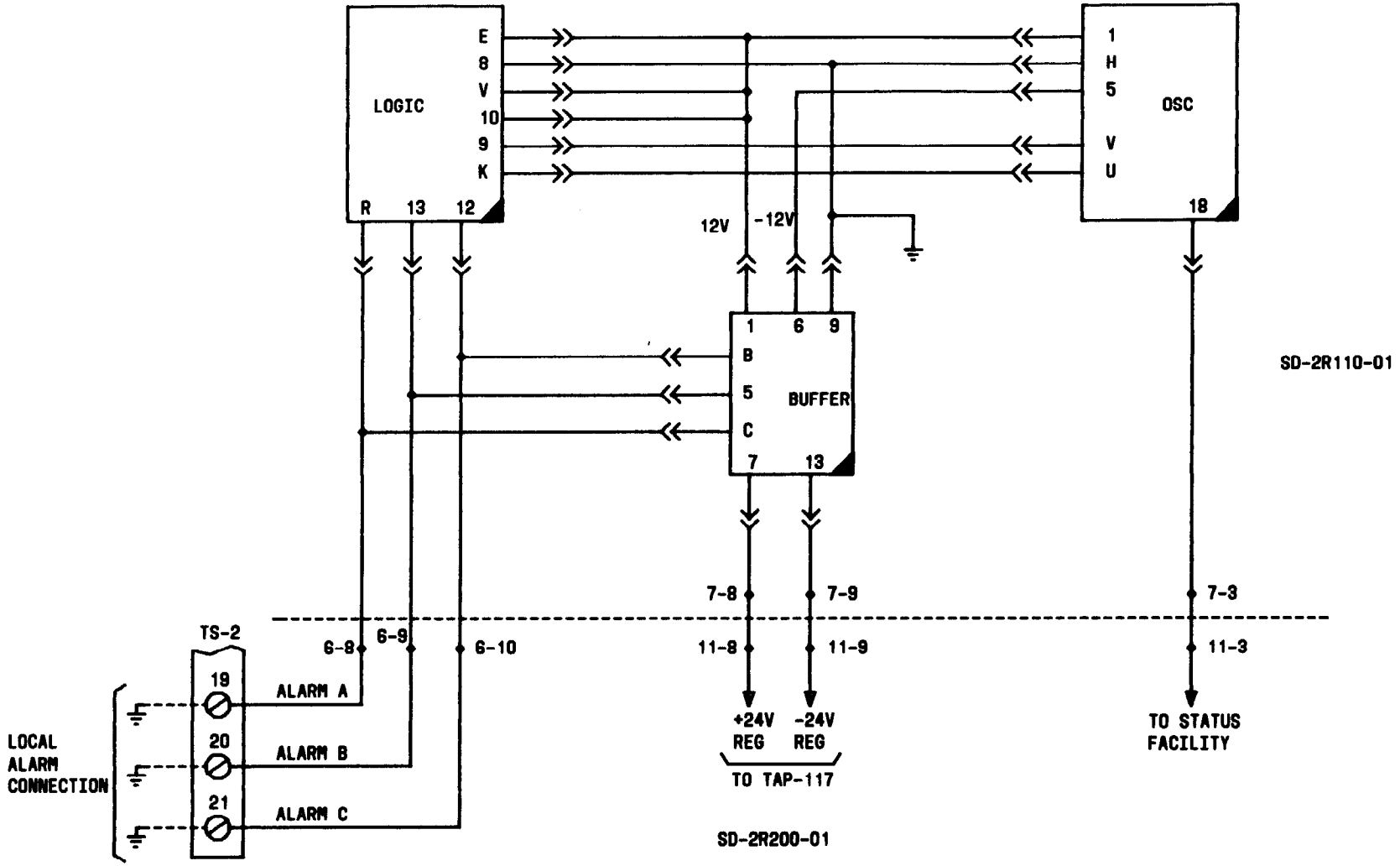


FIG. 1

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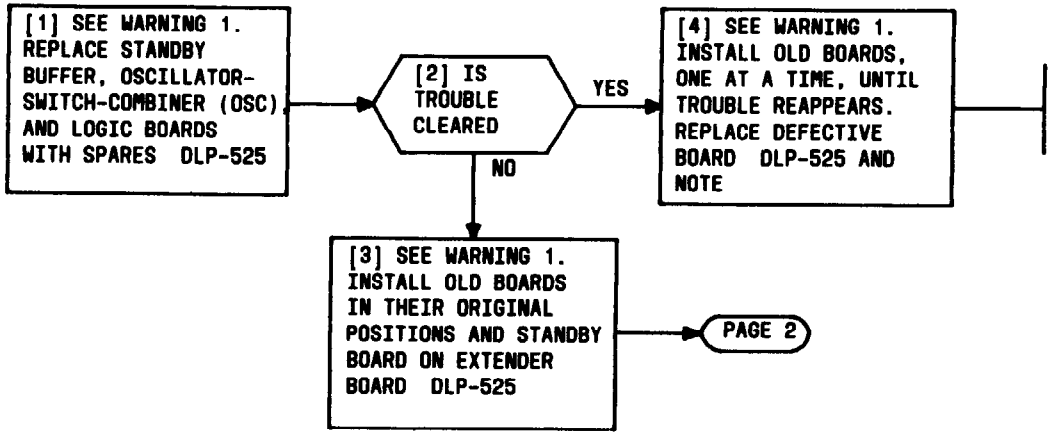
CLEAR TRANSMITTER A, B, AND C ALARM TROUBLE

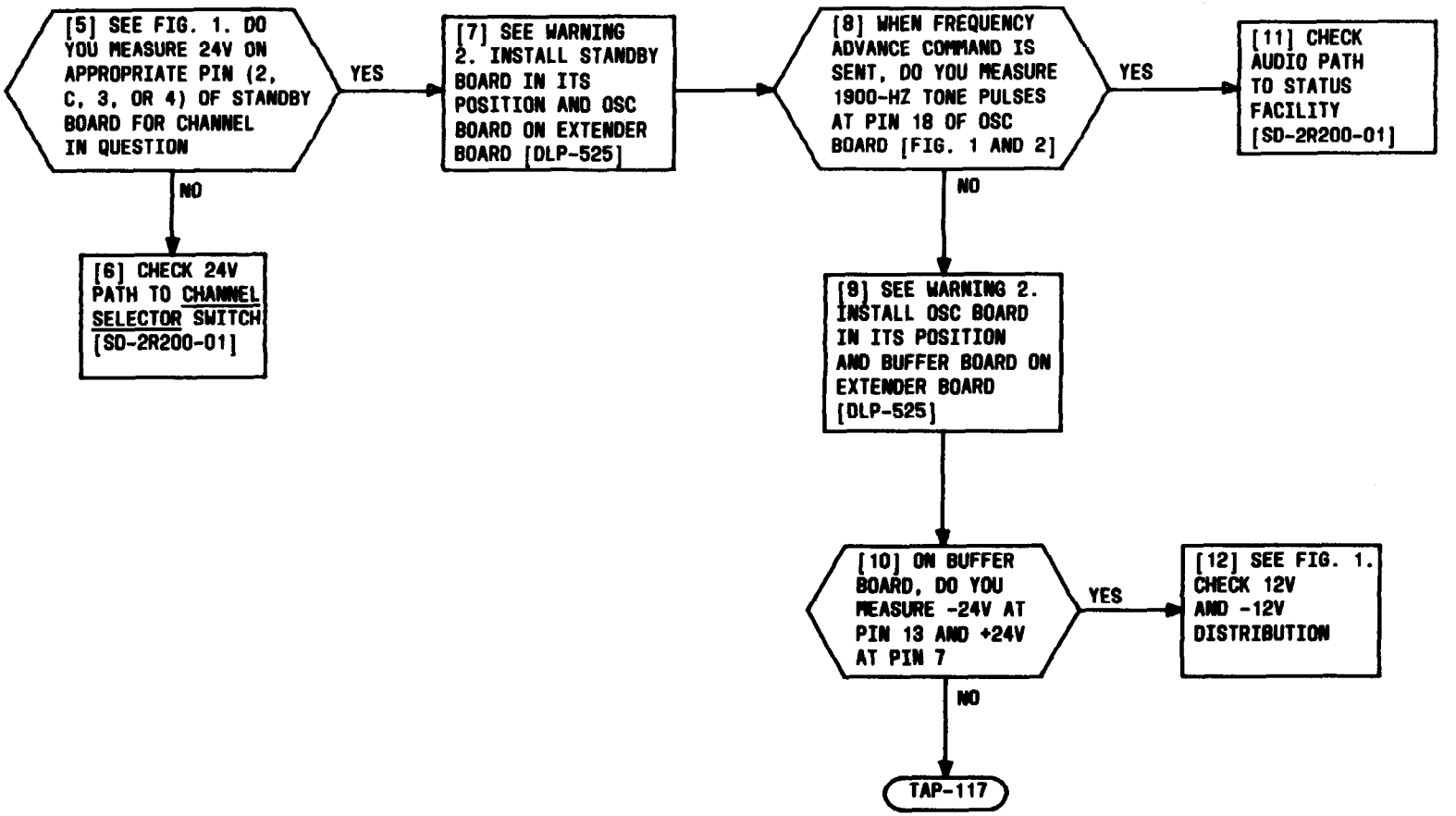


NOTE
IF OSC BOARD IS REPLACED, PERFORM DLP-505 AND DLP-506

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

CLEAR FREQUENCY ADVANCE 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 FREQUENCY ADVANCE STATUS TROUBLE

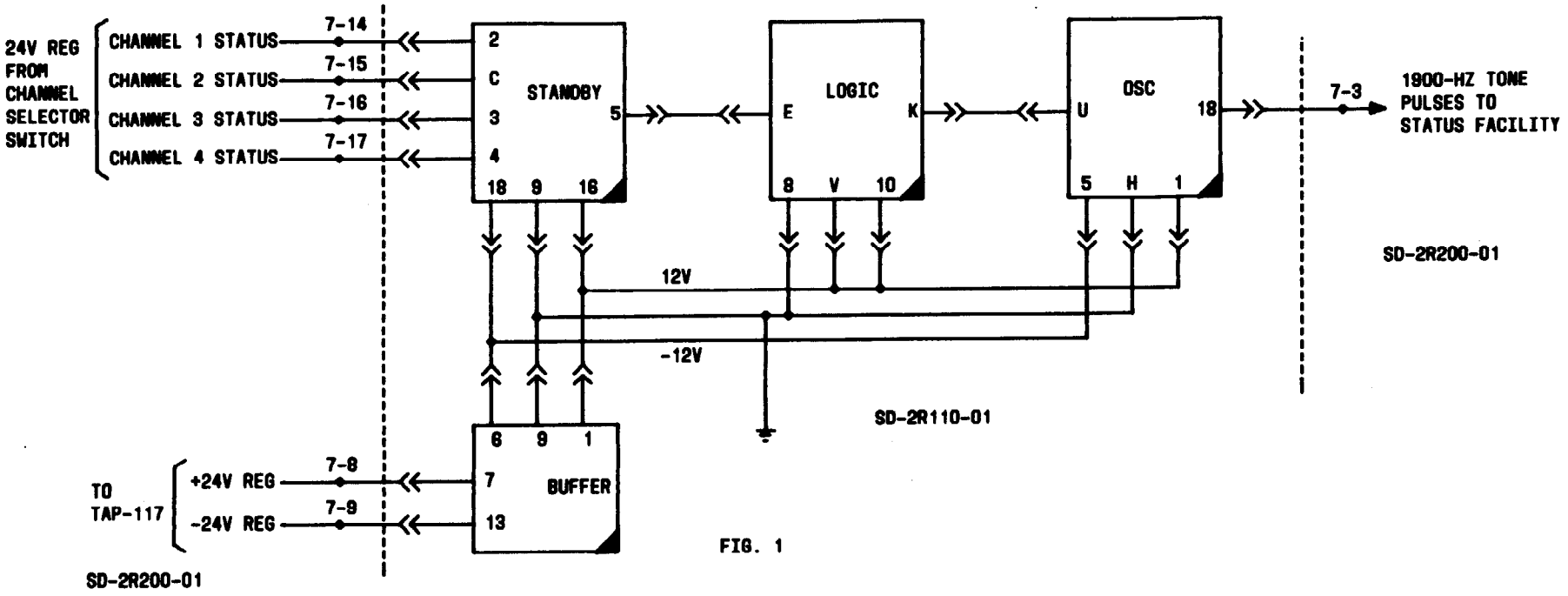


FIG. 1

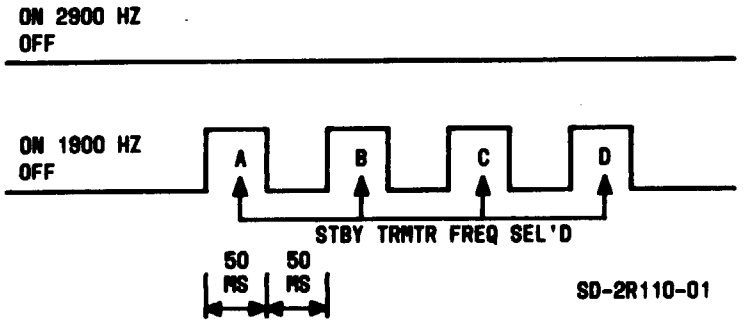
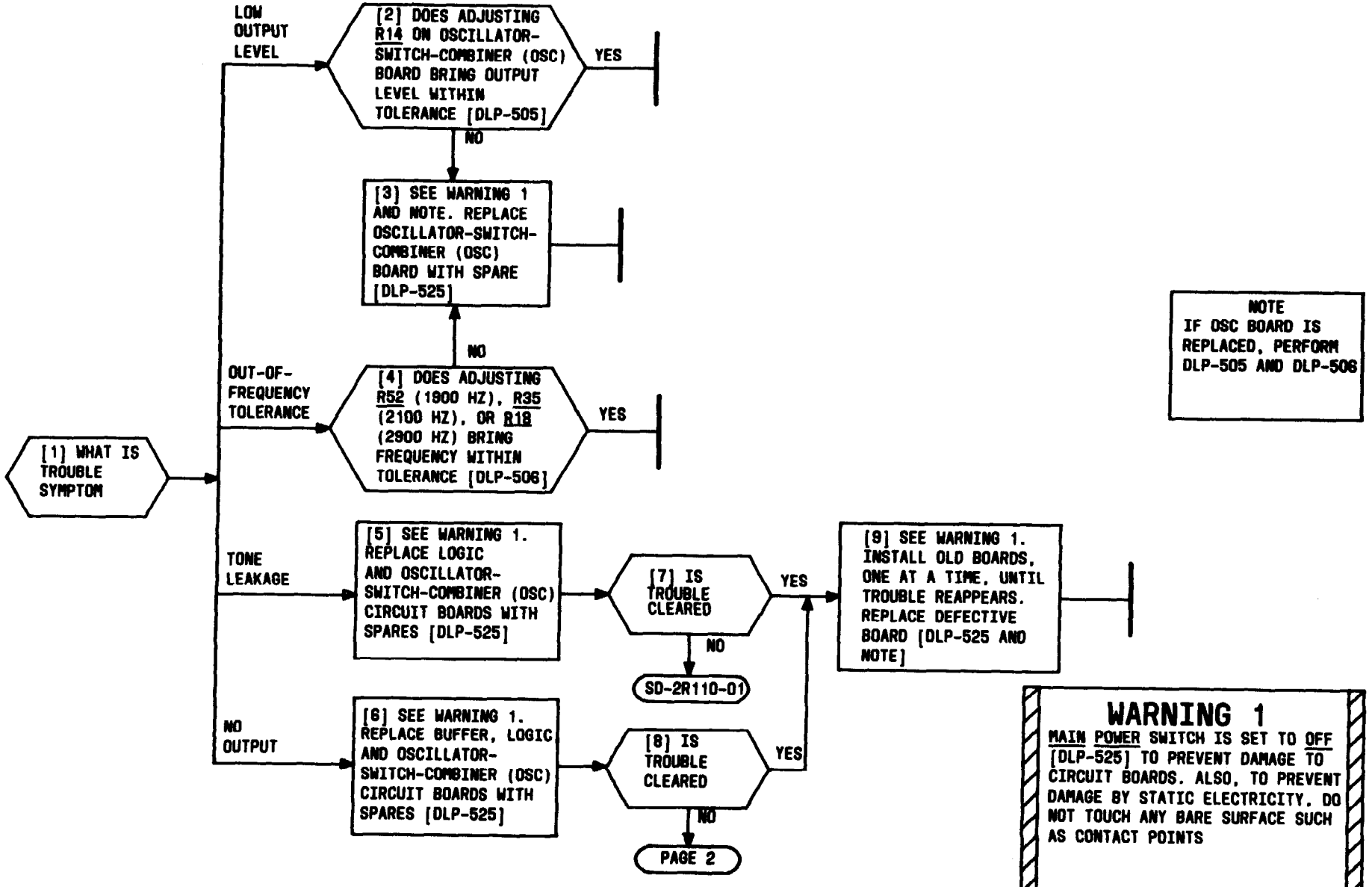


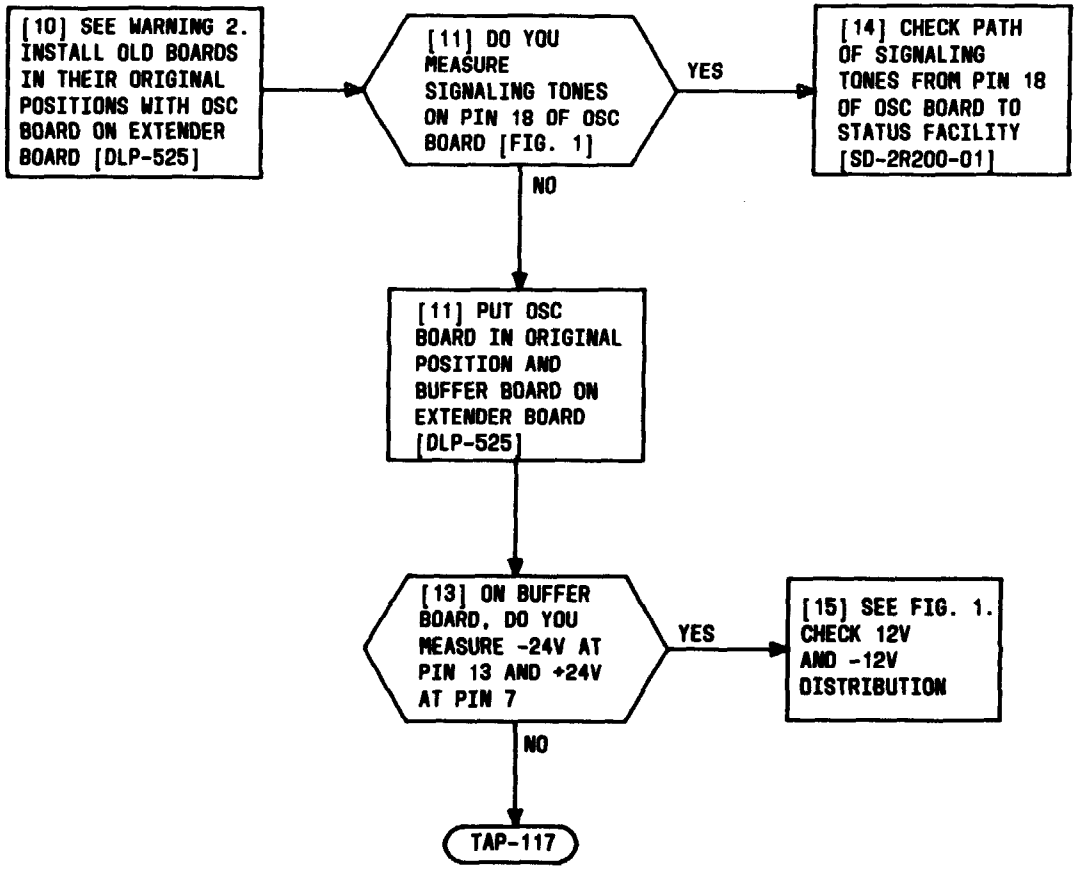
FIG. 2

STBY TRMTR FREQ	1900-HZ TONE PULSES SENT TO TERMINAL
1	A
2	A, B
3	A, B, C
4	A, B, C, D

CLEAR FREQUENCY ADVANCE STATUS TROUBLE



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

CLEAR SIGNALING TONE TROUBLE

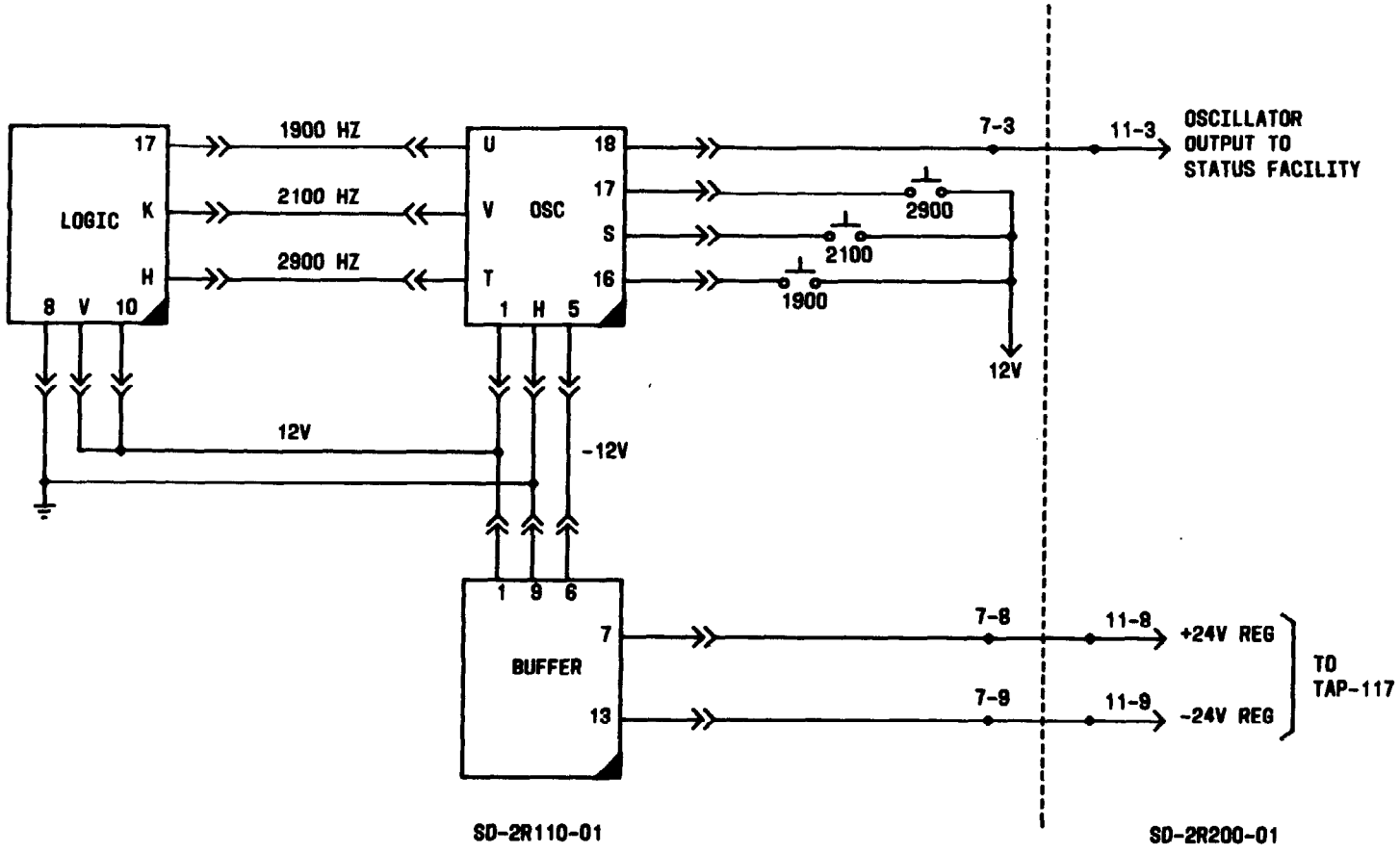


FIG. 1

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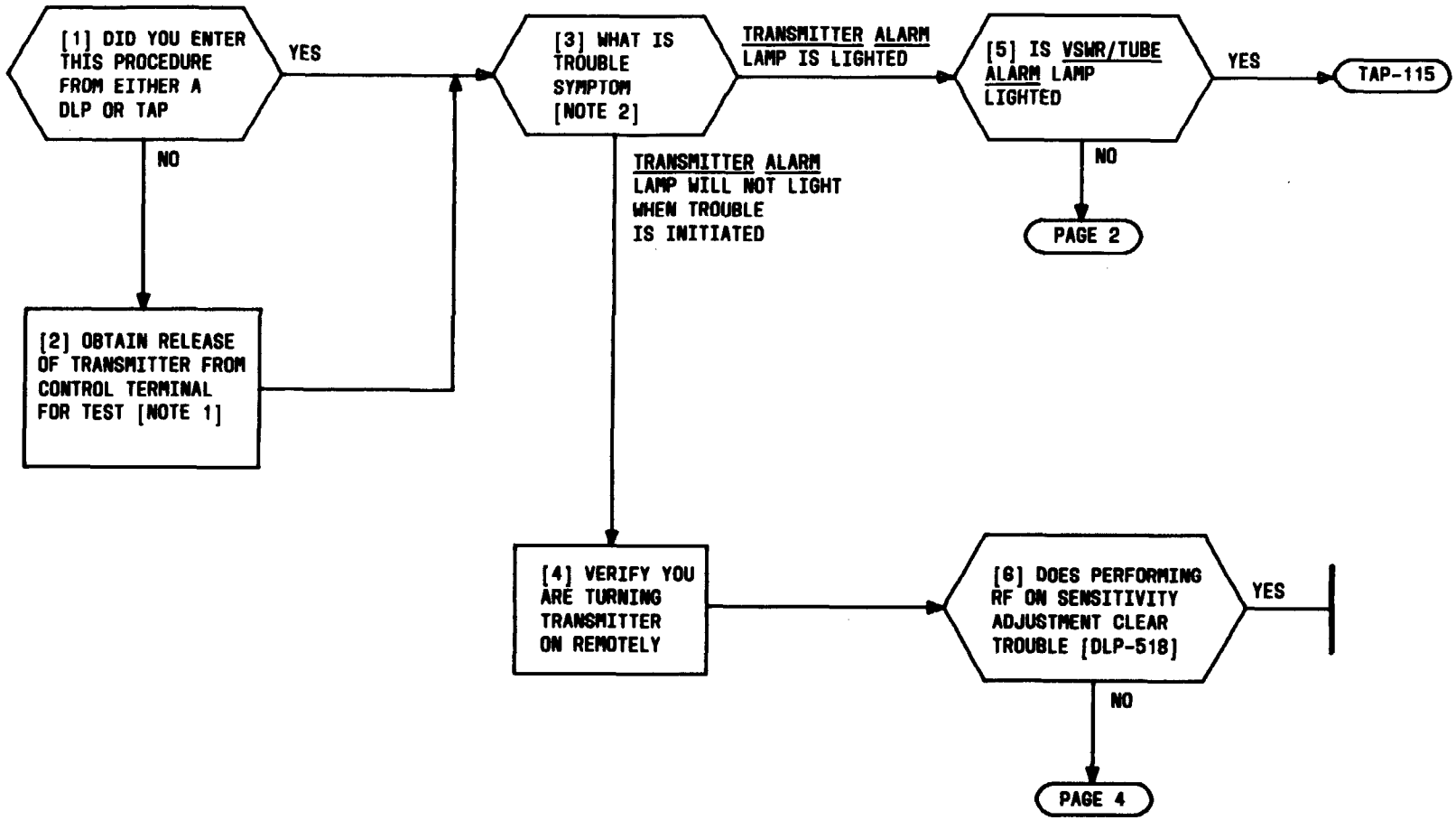
CLEAR SIGNALING TONE TROUBLE



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

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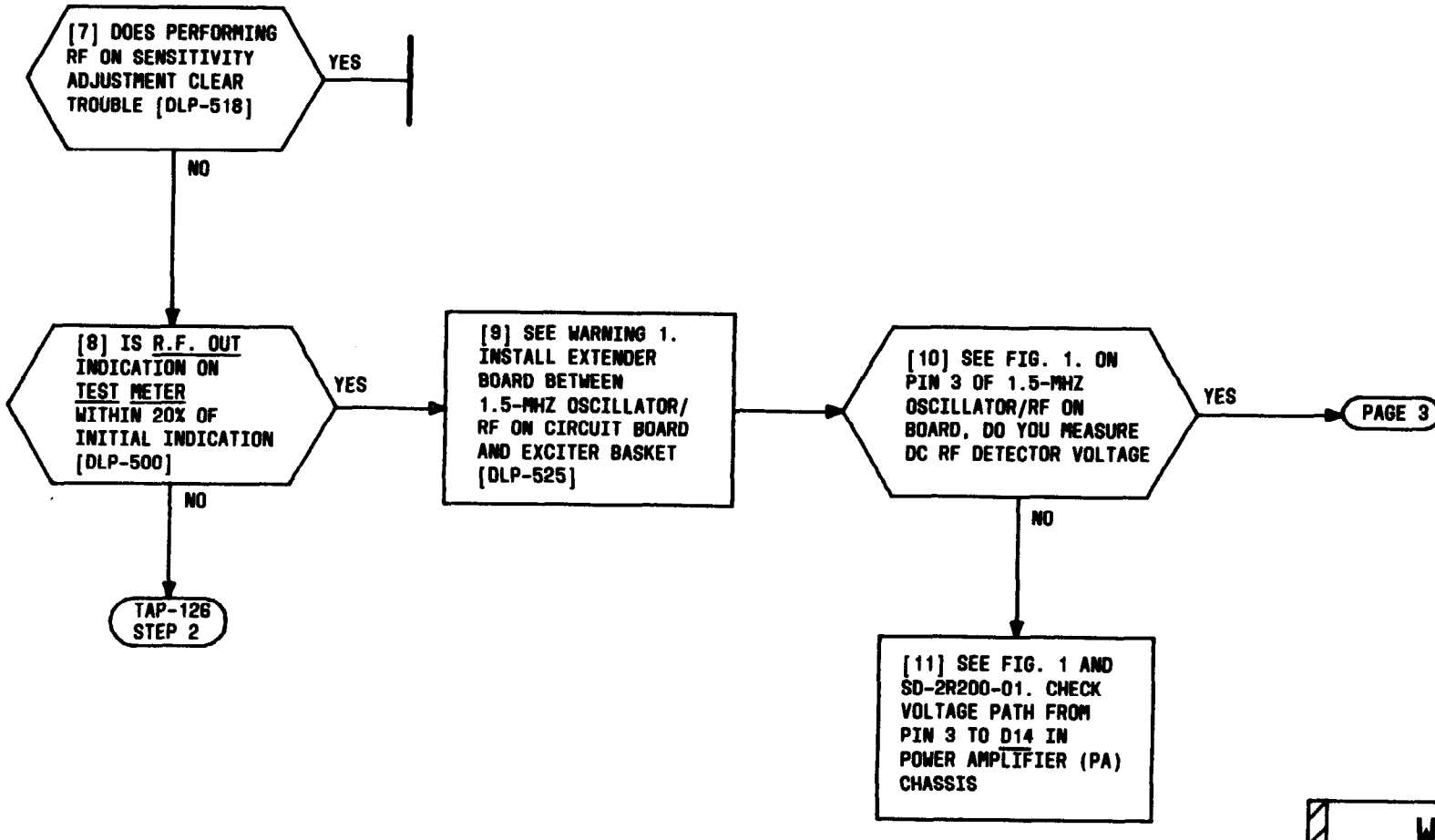
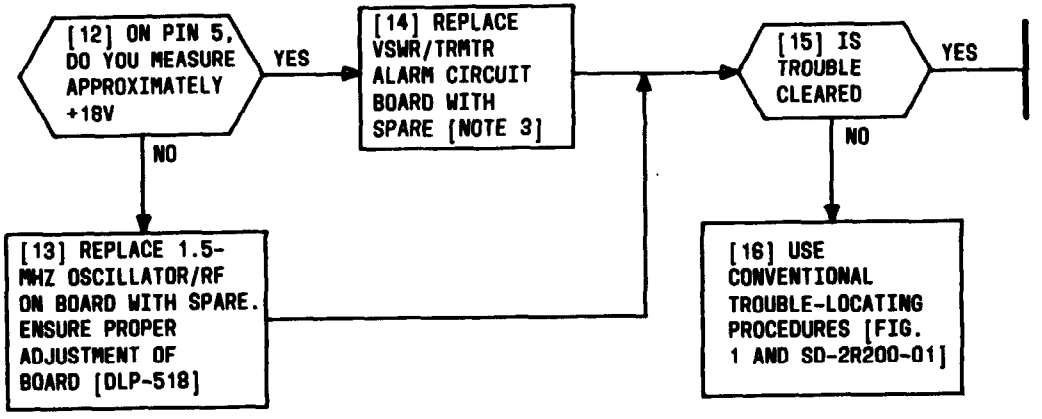
CLEAR TRANSMITTER ALARM TROUBLE



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



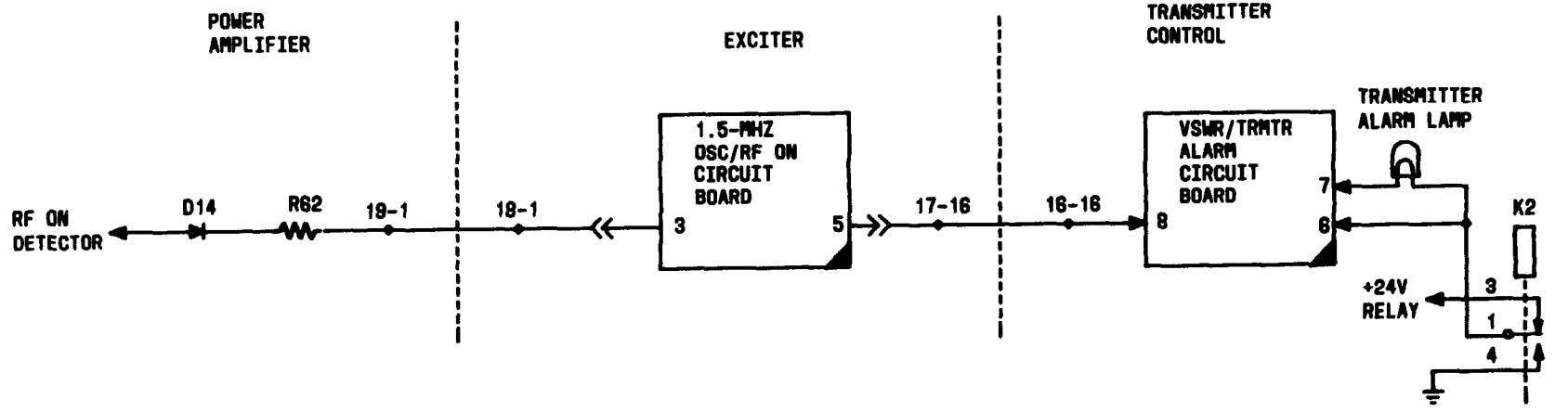


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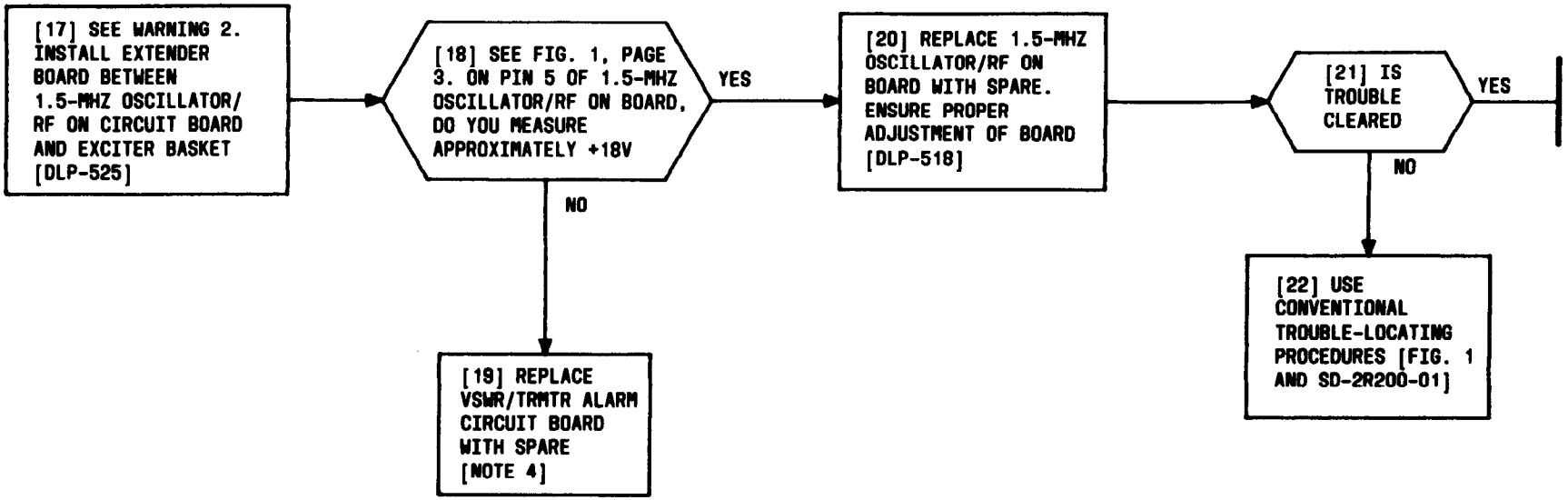
FIG. 1

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

CLEAR TRANSMITTER ALARM TROUBLE



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

CLEAR TRANSMITTER ALARM TROUBLE

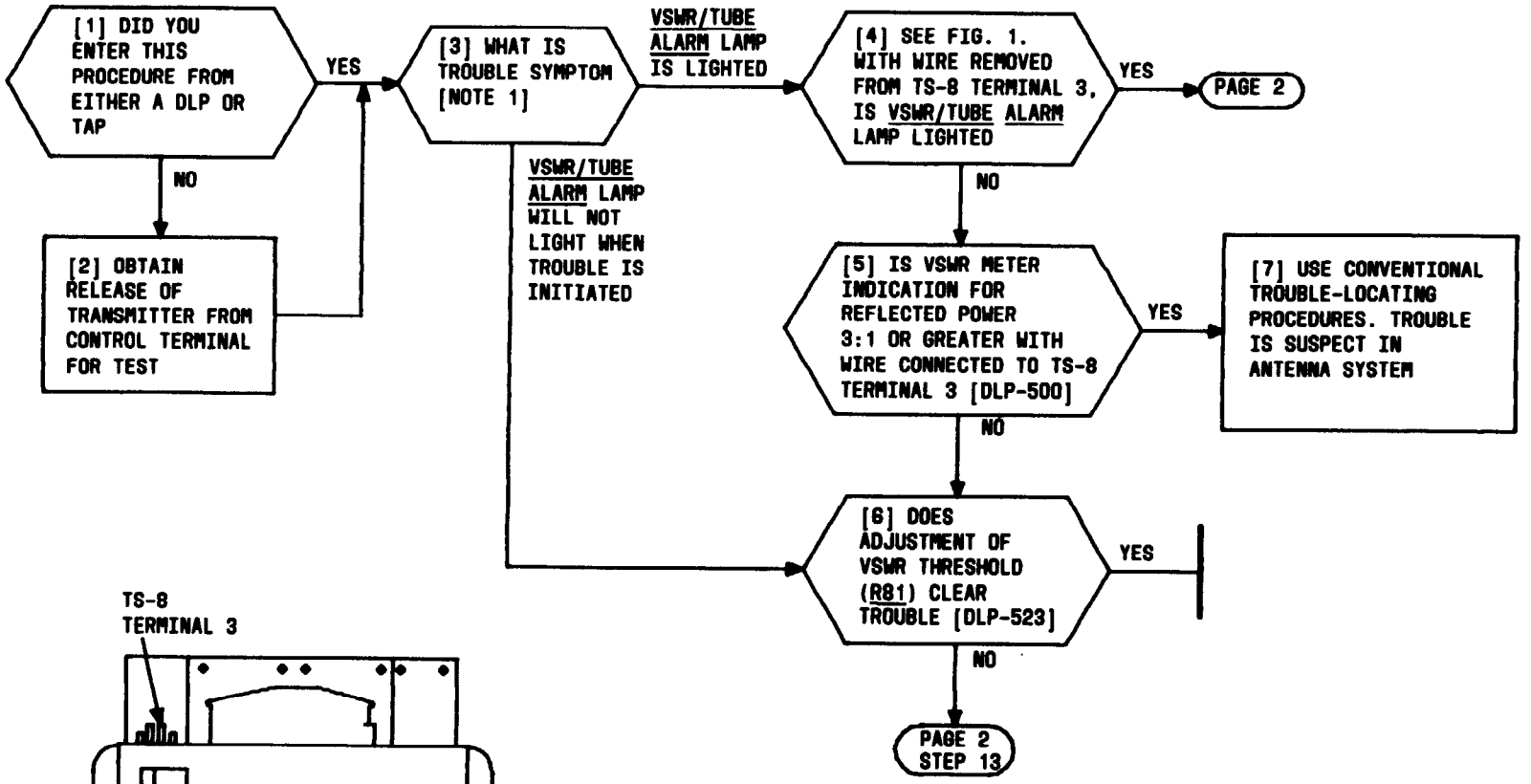
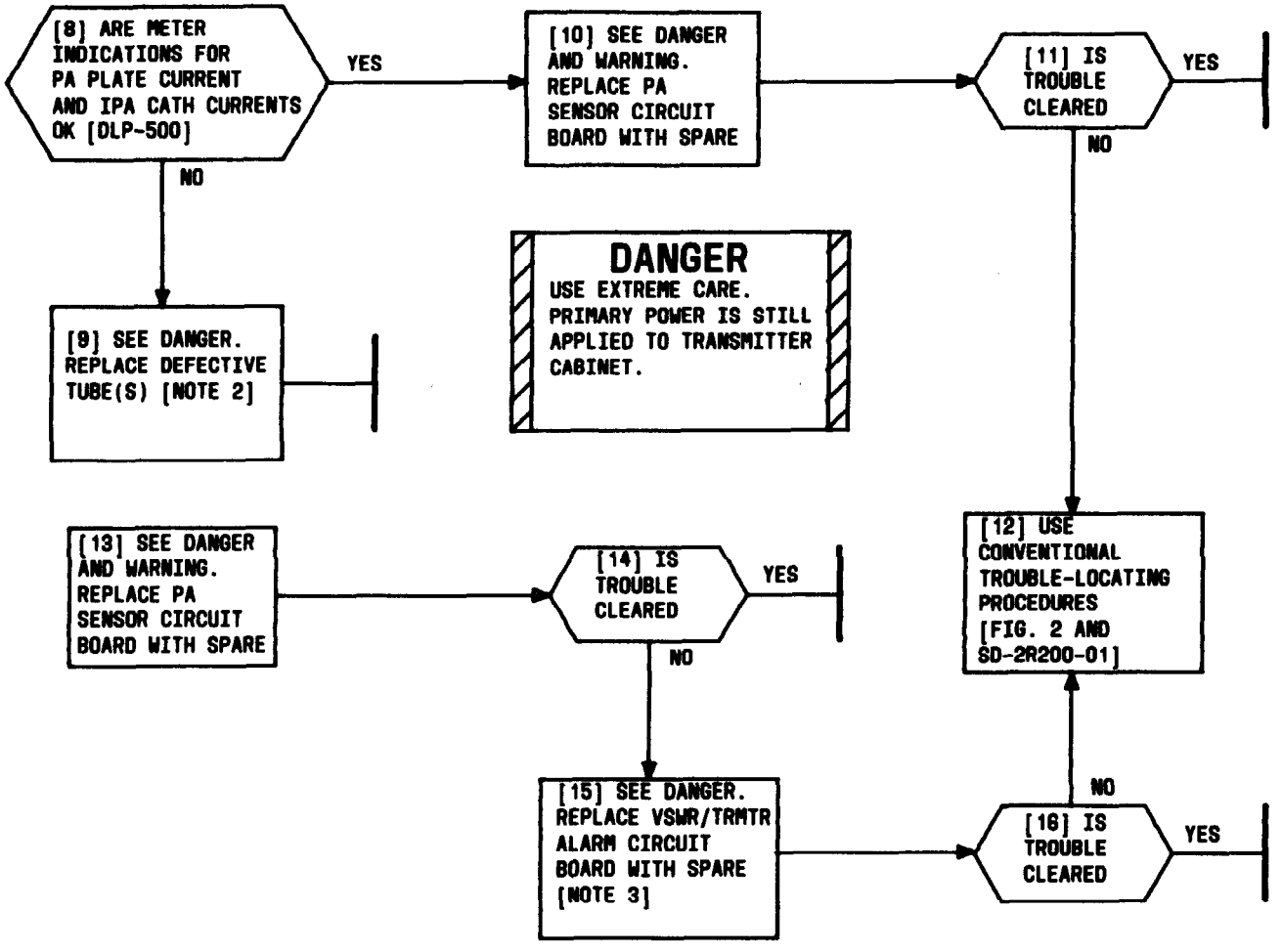


FIG. 1

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

CLEAR VSWR/TUBE ALARM TROUBLE



NOTES

2. IT IS RECOMMENDED TO REPLACE ALL TUBES TO ENSURE PROPER BALANCE
3. 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

CLEAR VSWR/TUBE ALARM TROUBLE

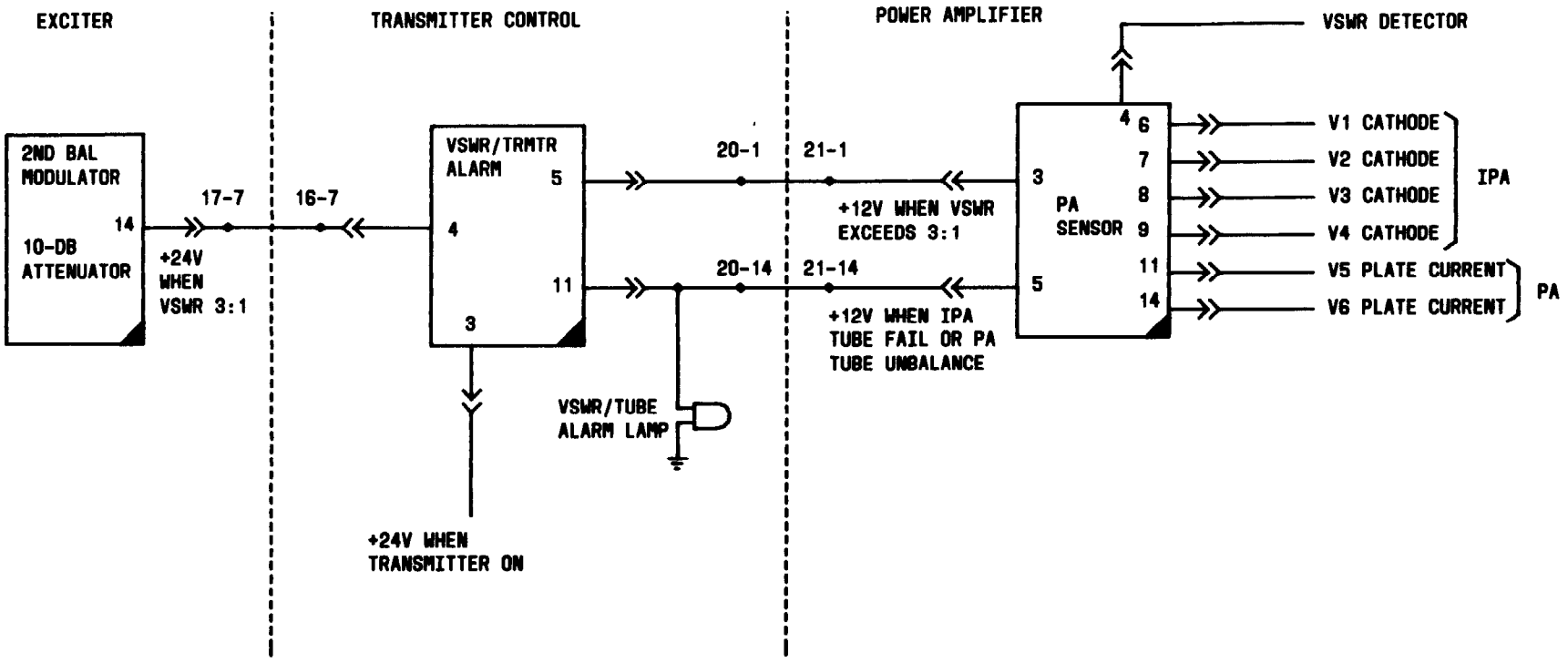


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FIG. 2

CLEAR VSWR/TUBE ALARM TROUBLE

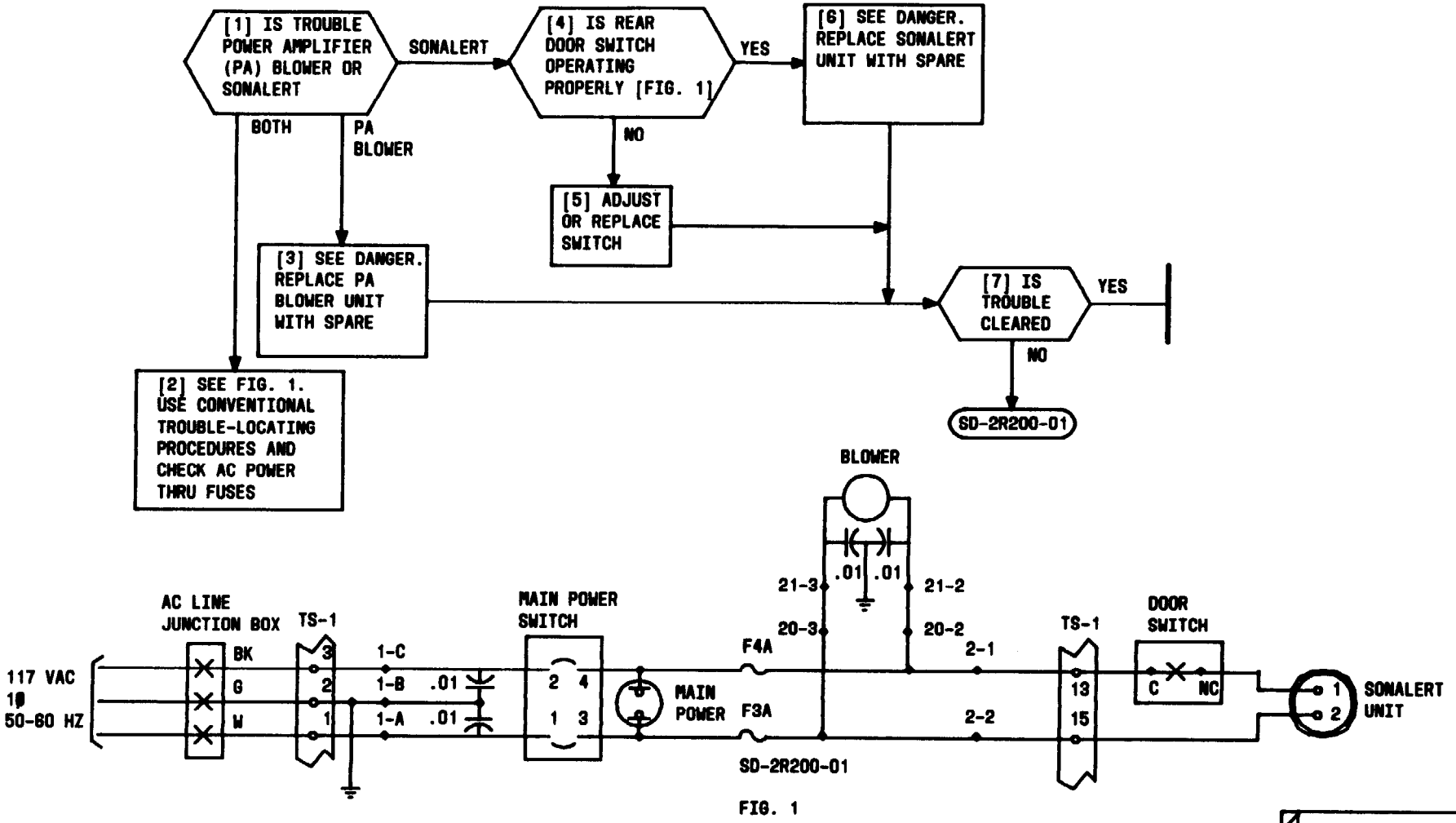

FIG. 1

DANGER
REMOVE PRIMARY POWER FROM TRANSMITTER CABINET

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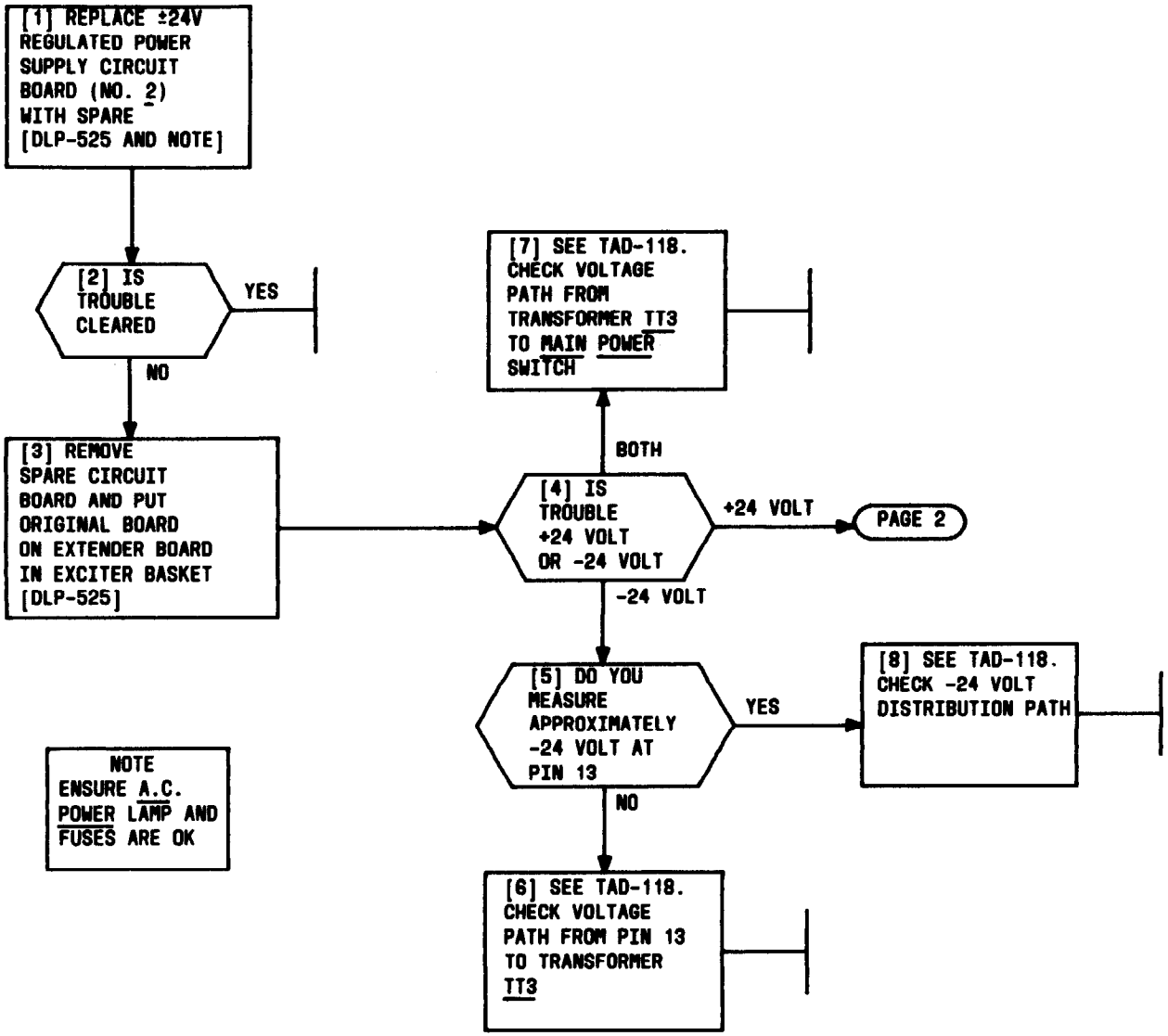
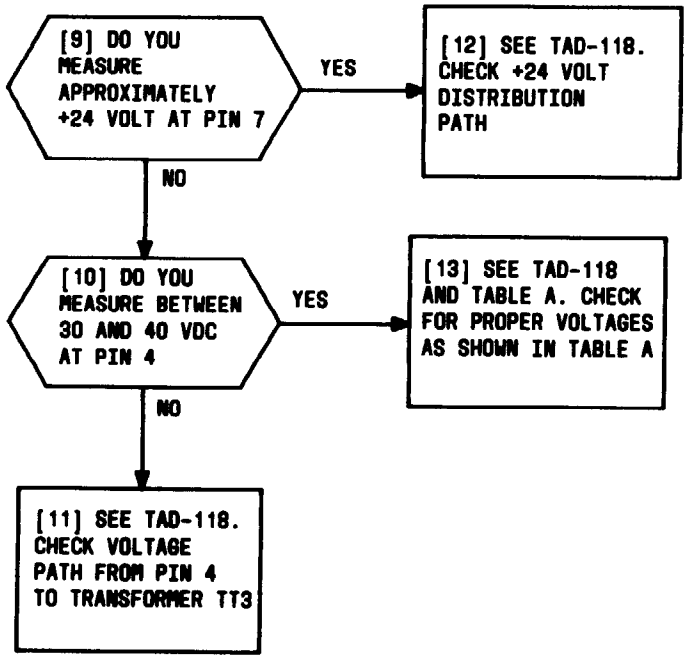
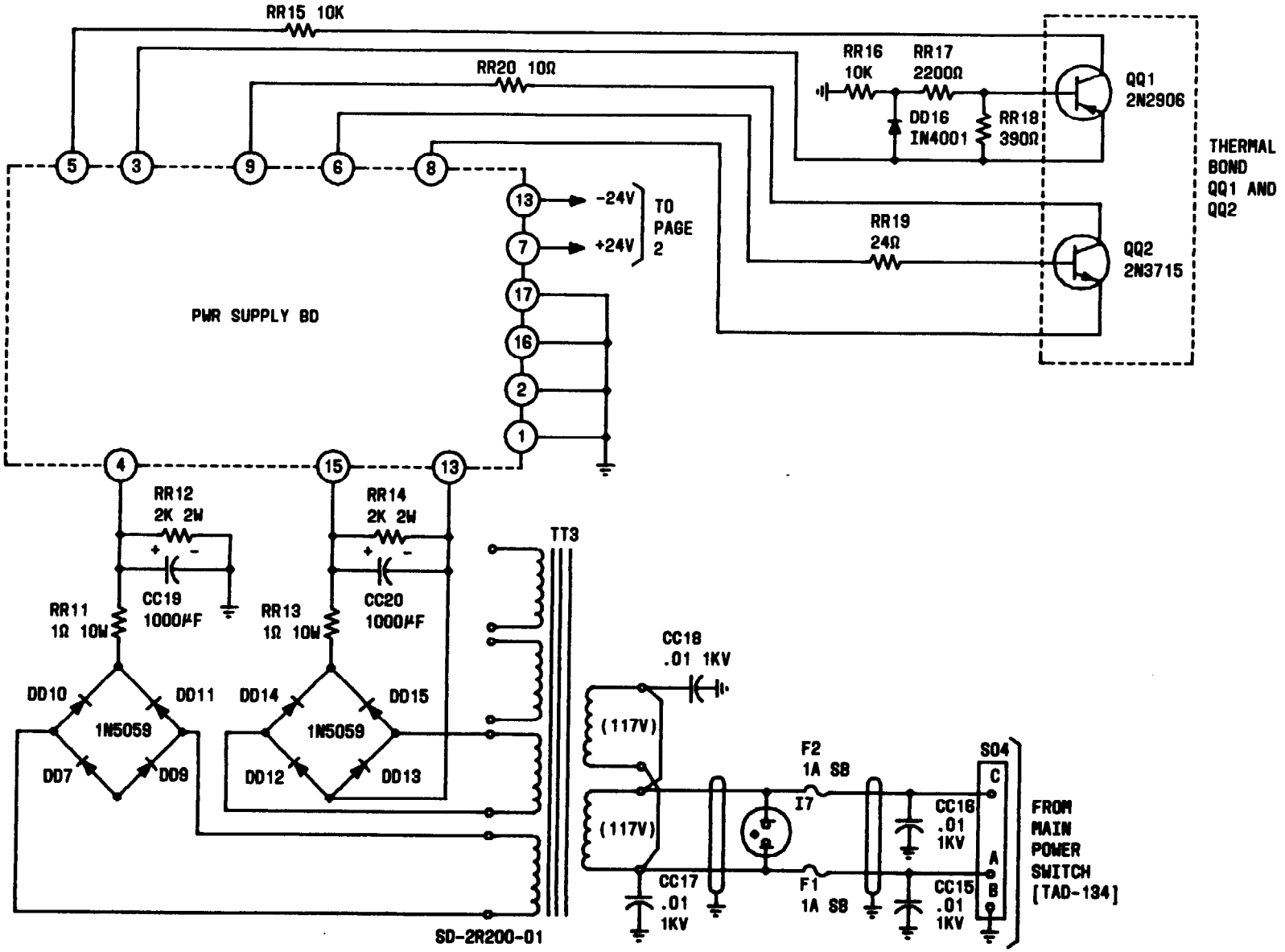
CLEAR POWER AMPLIFIER (PA) BLOWER/SONALERT TROUBLE



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



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



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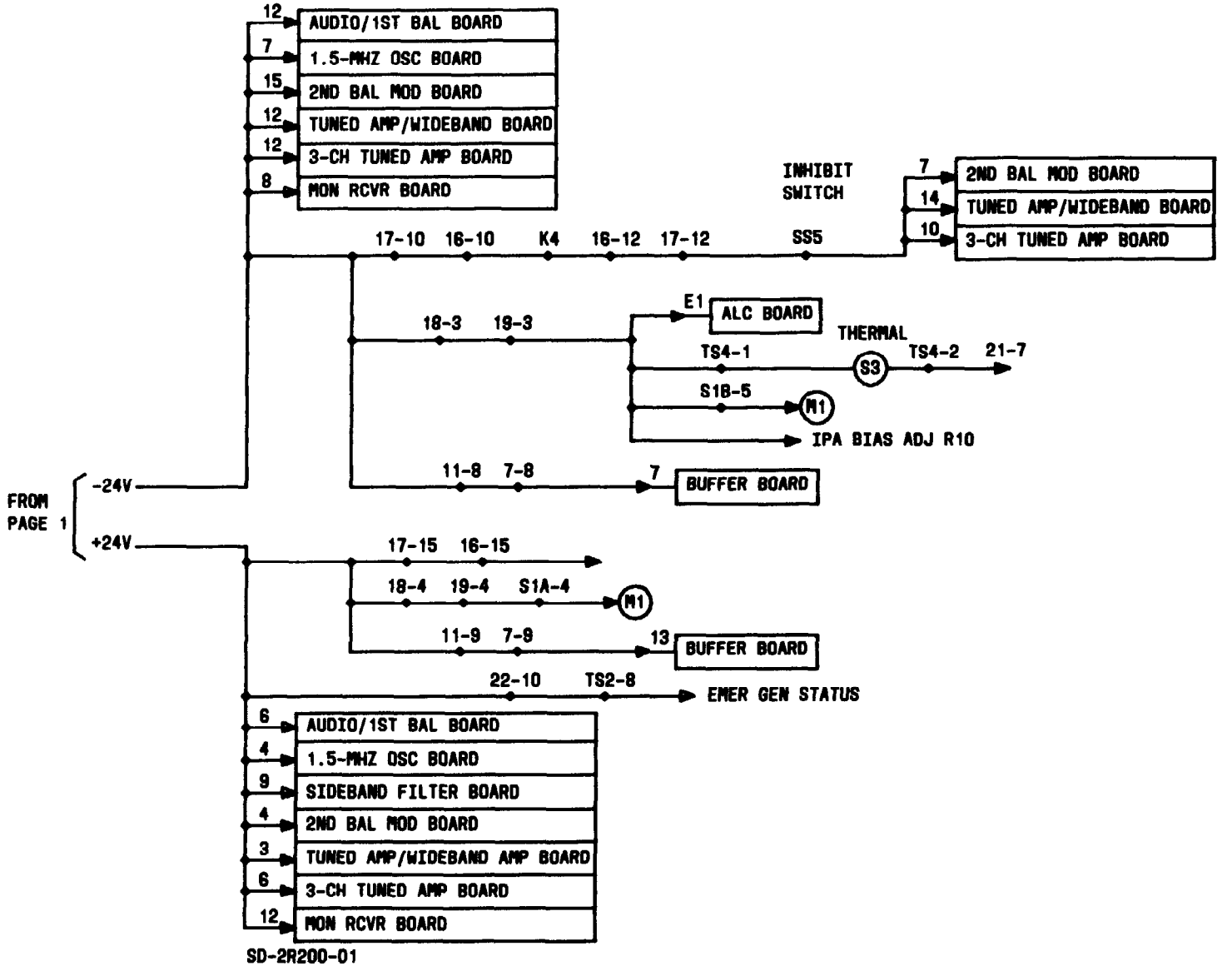
+24 VOLT, –24 VOLT REGULATED POWER SUPPLY DISTRIBUTION



+24 VOLT, –24 VOLT REGULATED POWER SUPPLY DISTRIBUTION

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CLEAR HIGH-VOLTAGE POWER SUPPLY TROUBLE.

[1] SEE DANGER 1. DO YOU MEASURE APPROXIMATELY 117 VAC AT H.V. POWER A.C. FUSE ON FRONT PANEL

YES → [3] SEE NOTE. IS HIGH VOLTAGE LAMP LIGHTED

NO → [2] SEE NOTE. IS HIGH VOLTAGE LAMP LIGHTED

YES → [5] SEE FIG. 2. CHECK OPERATE PATH OF RELAY K3

NO → PAGE 2

NO → [4] SEE FIG. 2. CHECK OPERATE PATH FOR HIGH VOLTAGE LAMP

YES → [6] SEE DANGERS 1 AND 2 AND FIG. 1. DOES HIGH VOLTAGE FUSE IN REAR OF CABINET CHECK OK

YES → [9] TROUBLE LOCATES TO HIGH-VOLTAGE POWER SUPPLY CHASSIS. USE CONVENTIONAL TROUBLE-LOCATING PROCEDURE [FIG. 3]

NO → [7] DOES REPLACING FUSE CLEAR TROUBLE

YES

NO → [8] TROUBLE IS POSSIBLE SHORT CIRCUIT ON POWER AMPLIFIER (PA) CHASSIS. USE CONVENTIONAL TROUBLE-LOCATING PROCEDURE [SD-2R200-01]

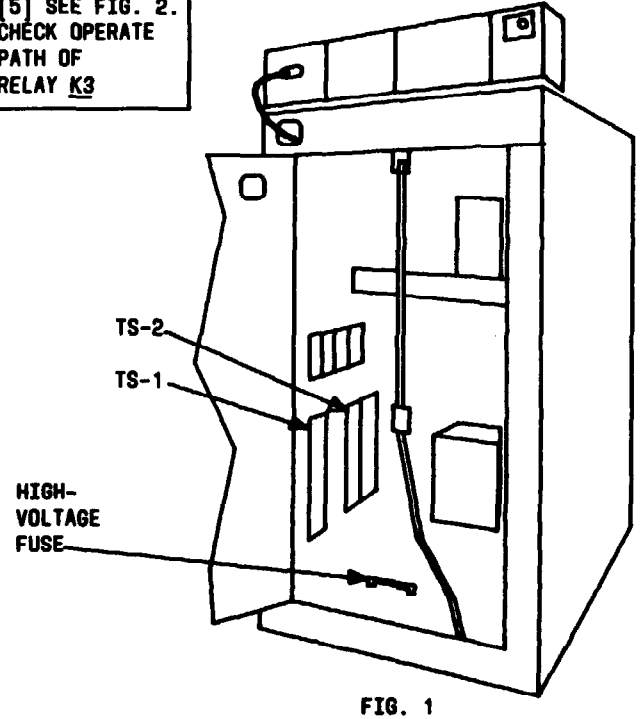
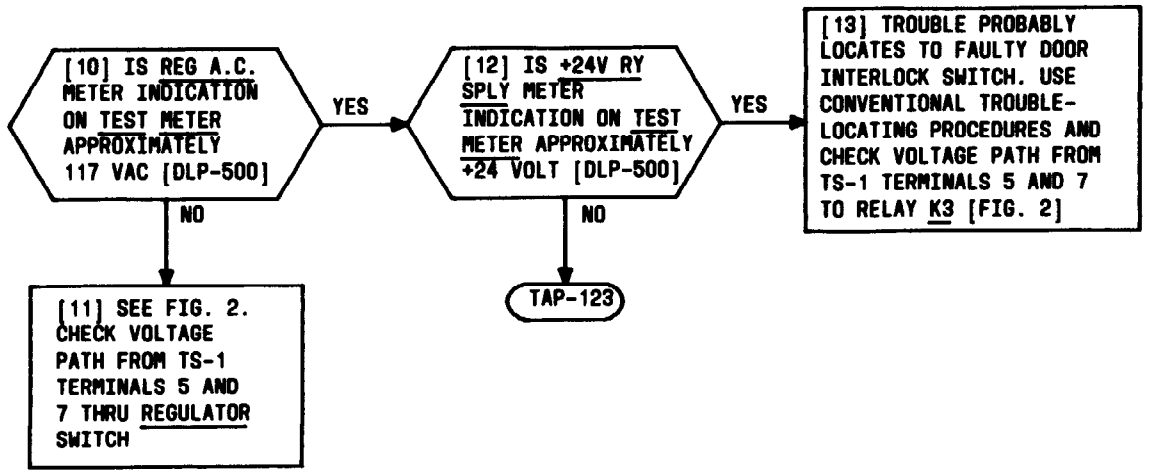


FIG. 1

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



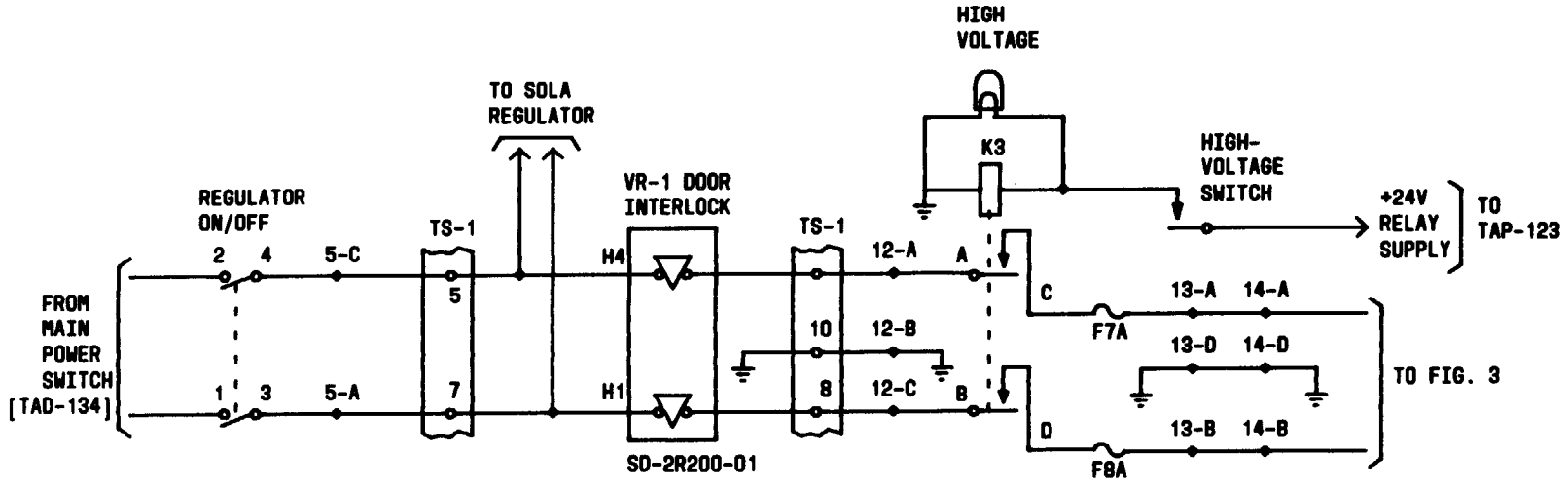


FIG. 2

CLEAR HIGH-VOLTAGE POWER SUPPLY TROUBLE

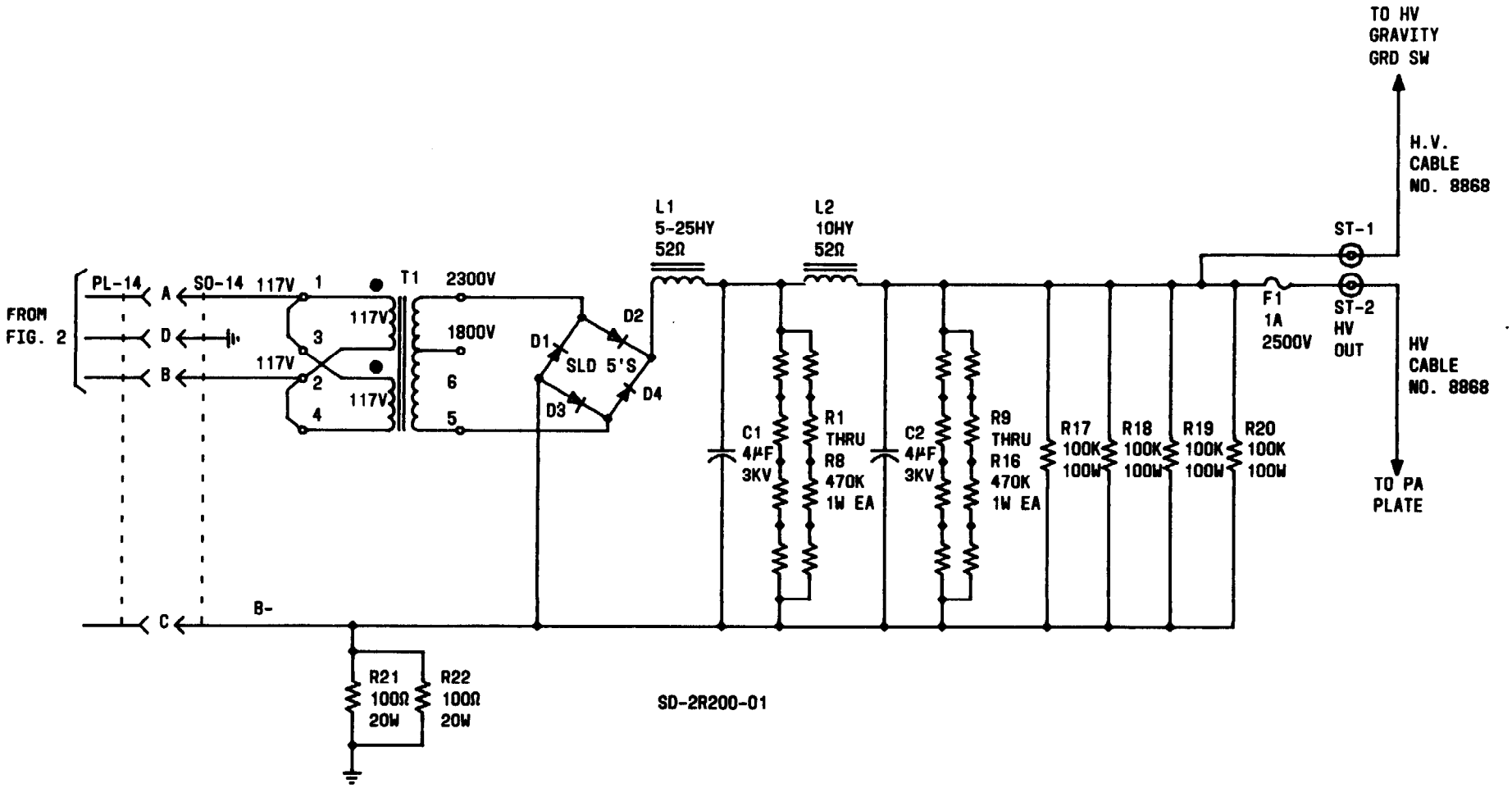
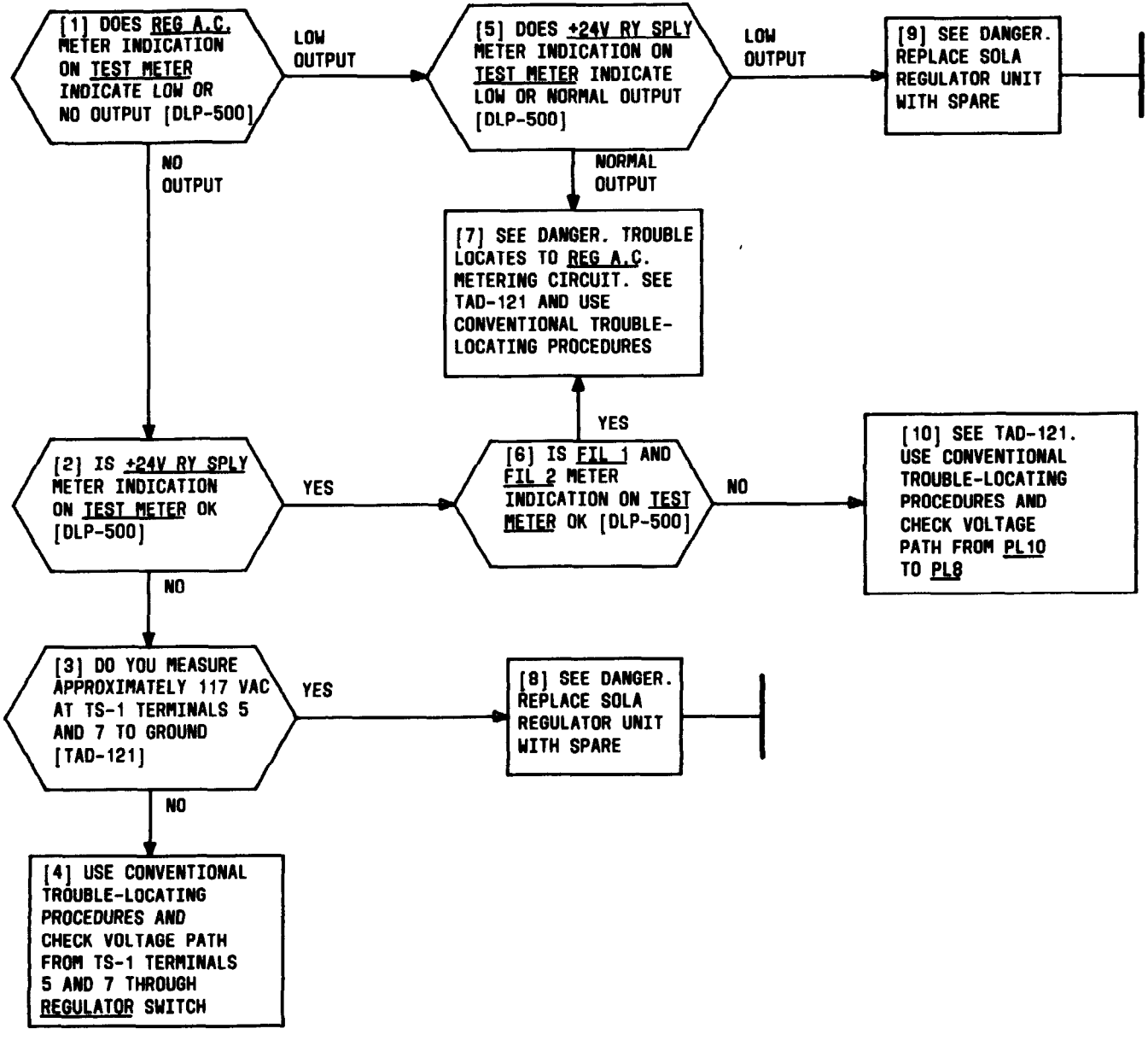


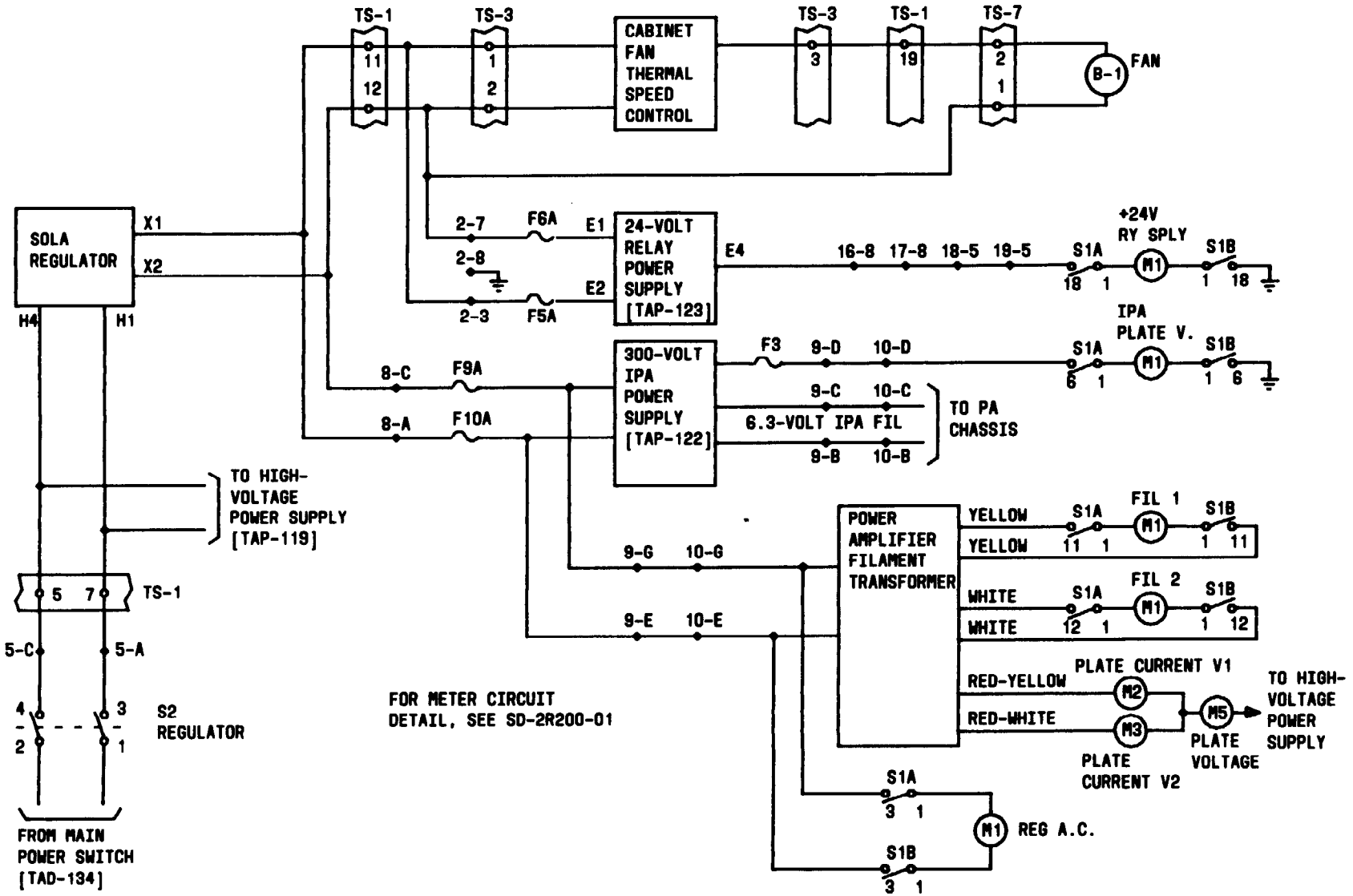
FIG. 3

CLEAR HIGH-VOLTAGE POWER SUPPLY TROUBLE



DANGER
PRIMARY POWER SHOULD BE REMOVED FROM TRANSMITTER CABINET WHEN POSSIBLE

CLEAR 117-VOLT AC REGULATED POWER SUPPLY TROUBLE



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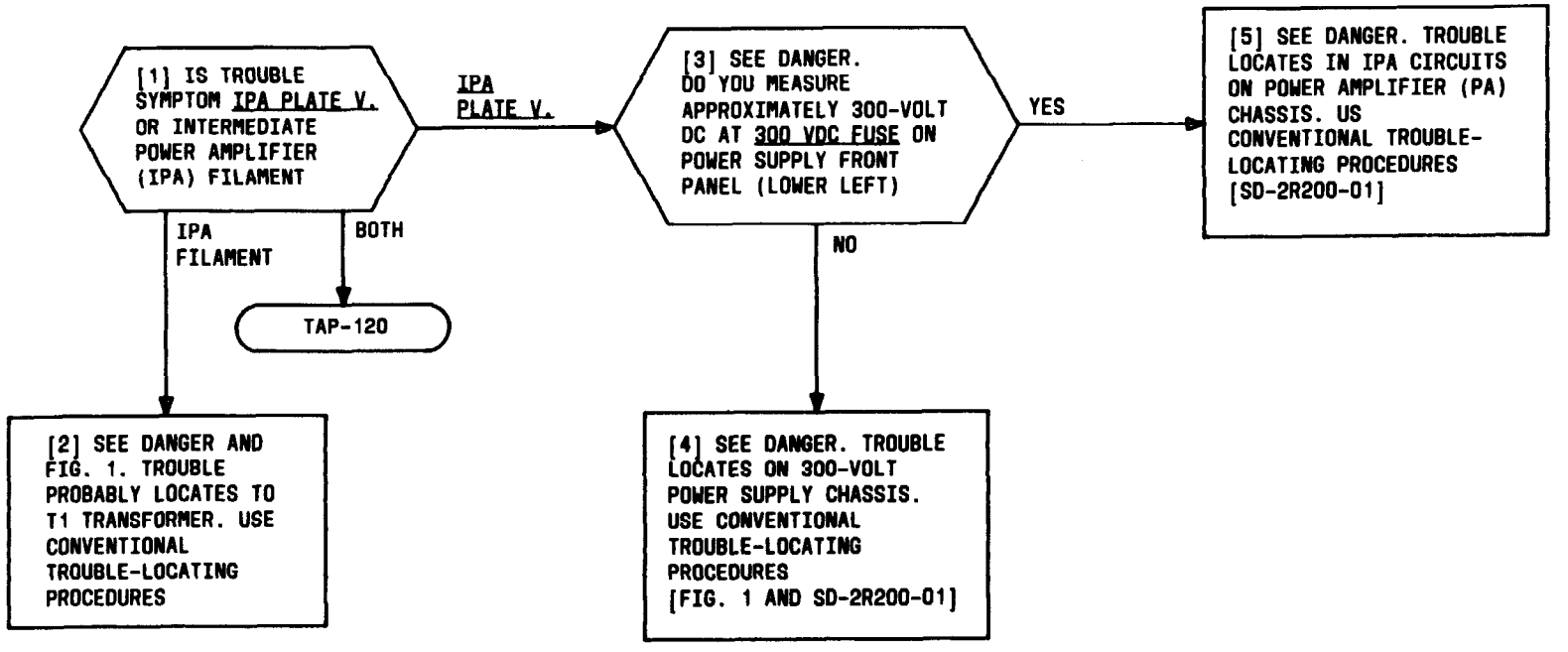

DANGER
USE EXTREME CARE. PRIMARY POWER IS STILL APPLIED TO TRANSMITTER CABINET

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

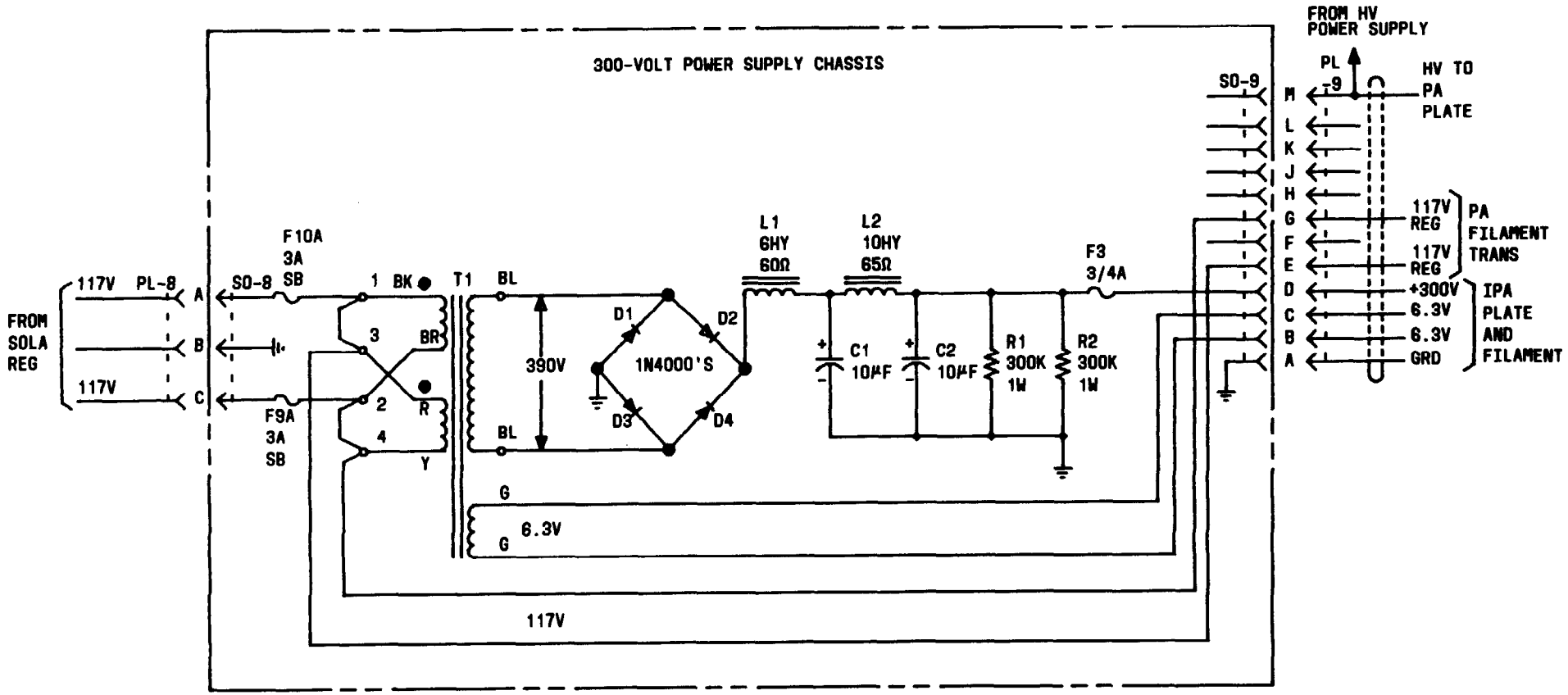

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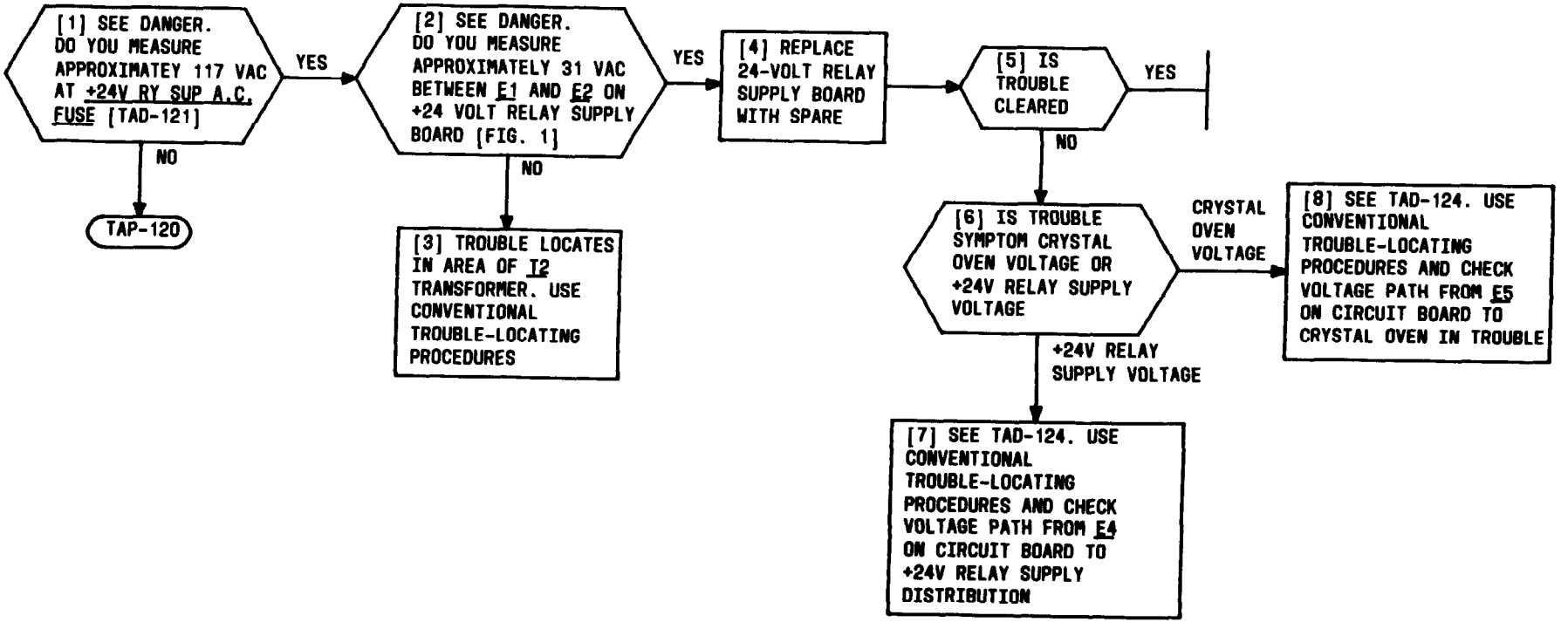
FIG. 1

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



DANGER

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

CLEAR +24 VOLT RELAY POWER SUPPLY TROUBLE

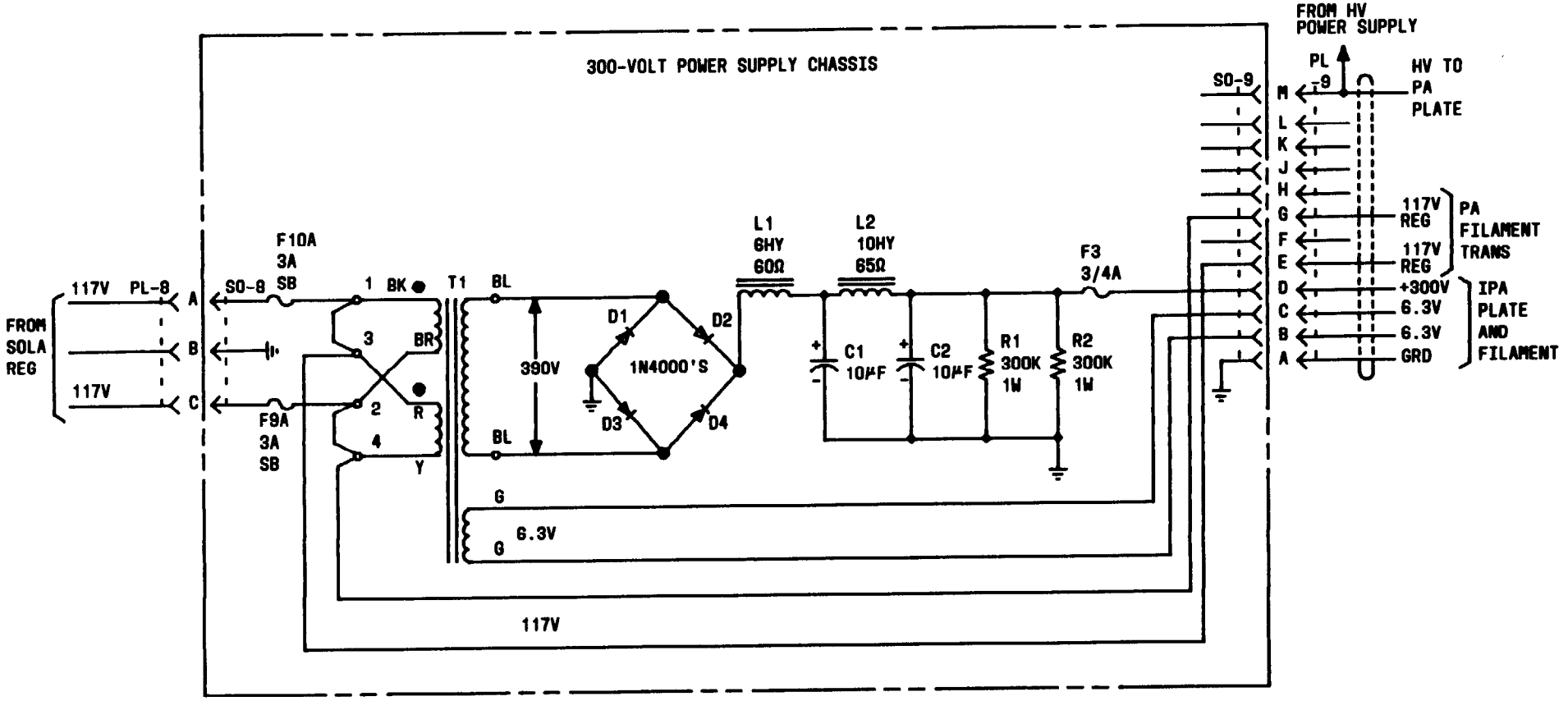


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FIG. 1

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

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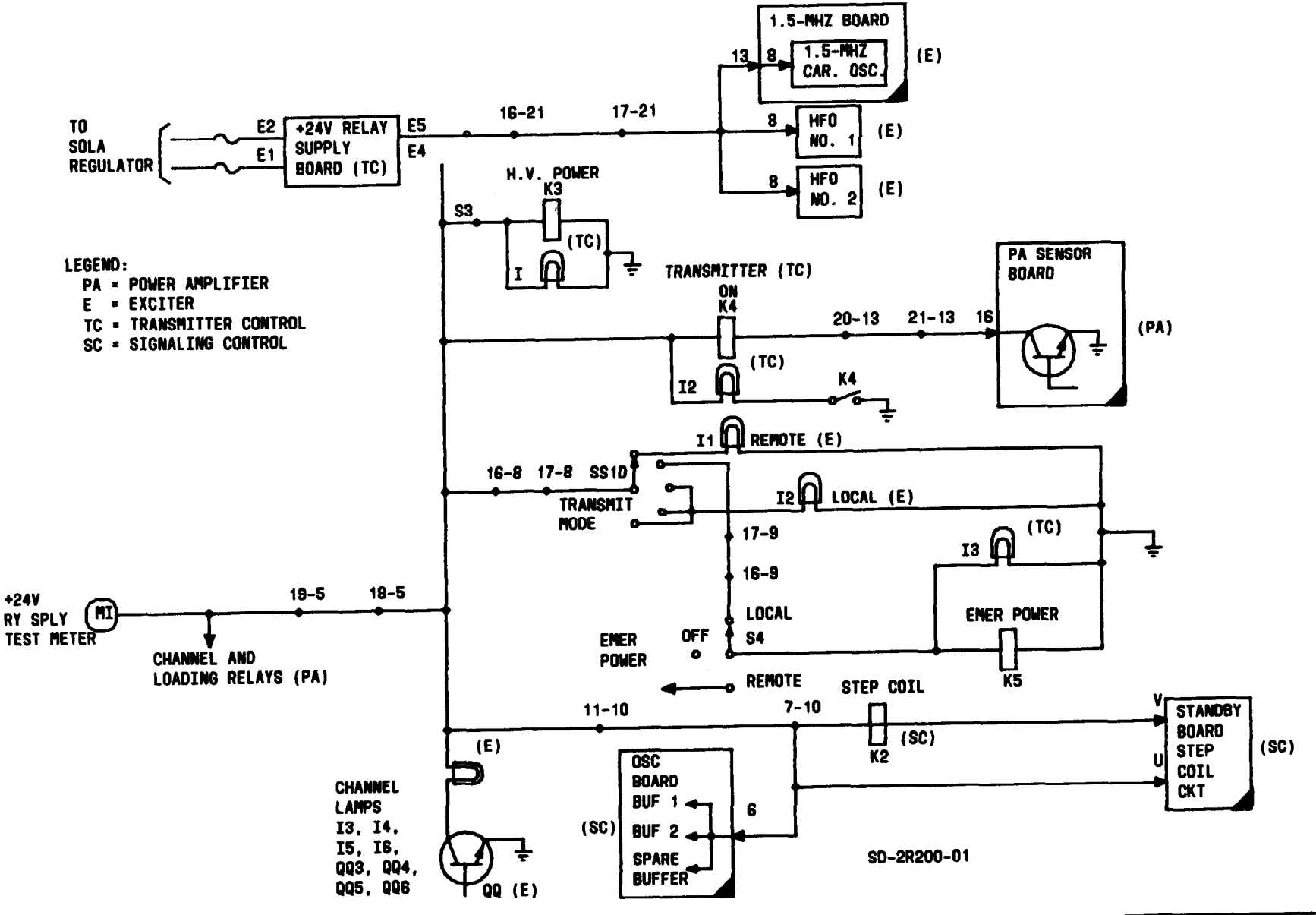

LEGEND:
PA = POWER AMPLIFIER
E = EXCITER
TC = TRANSMITTER CONTROL
SC = SIGNALING CONTROL

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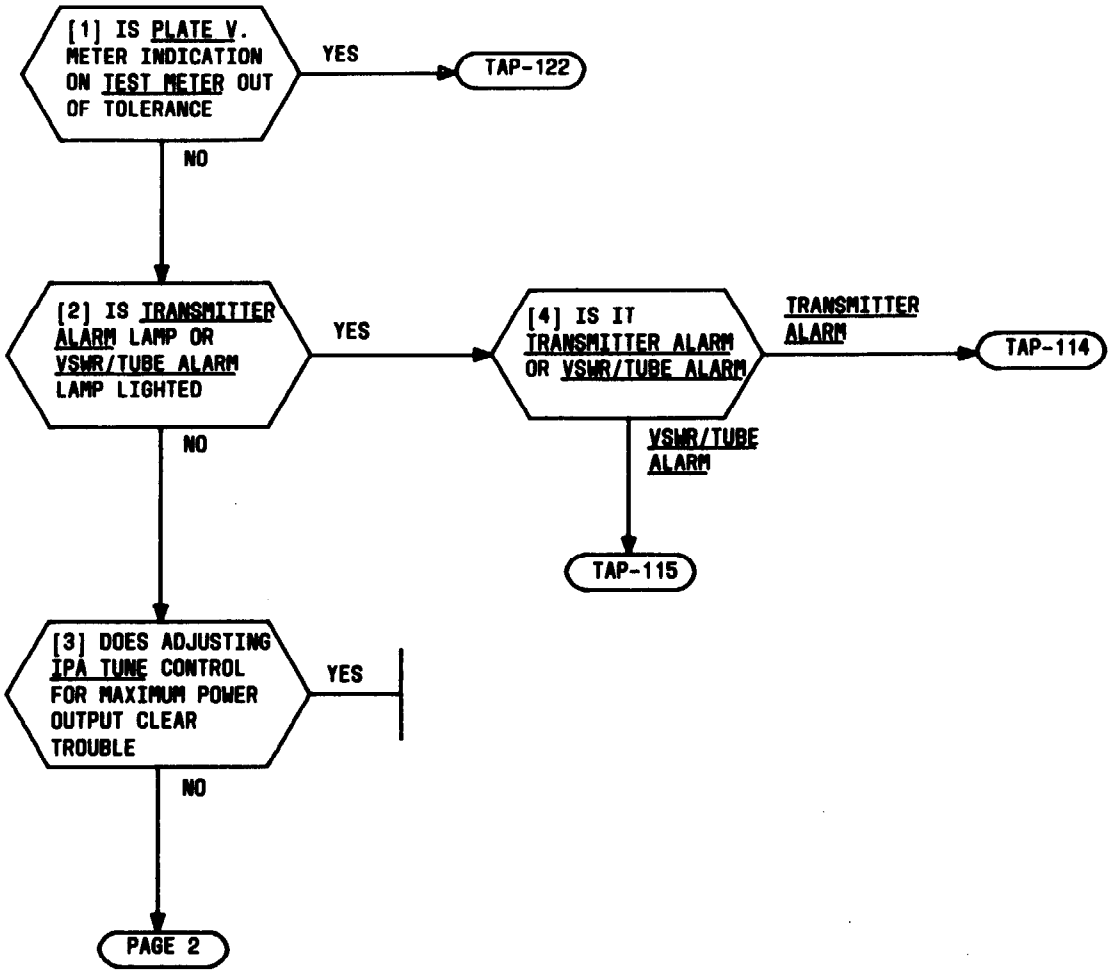
+24 VOLT RELAY POWER SUPPLY VOLTAGE DISTRIBUTION



CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE

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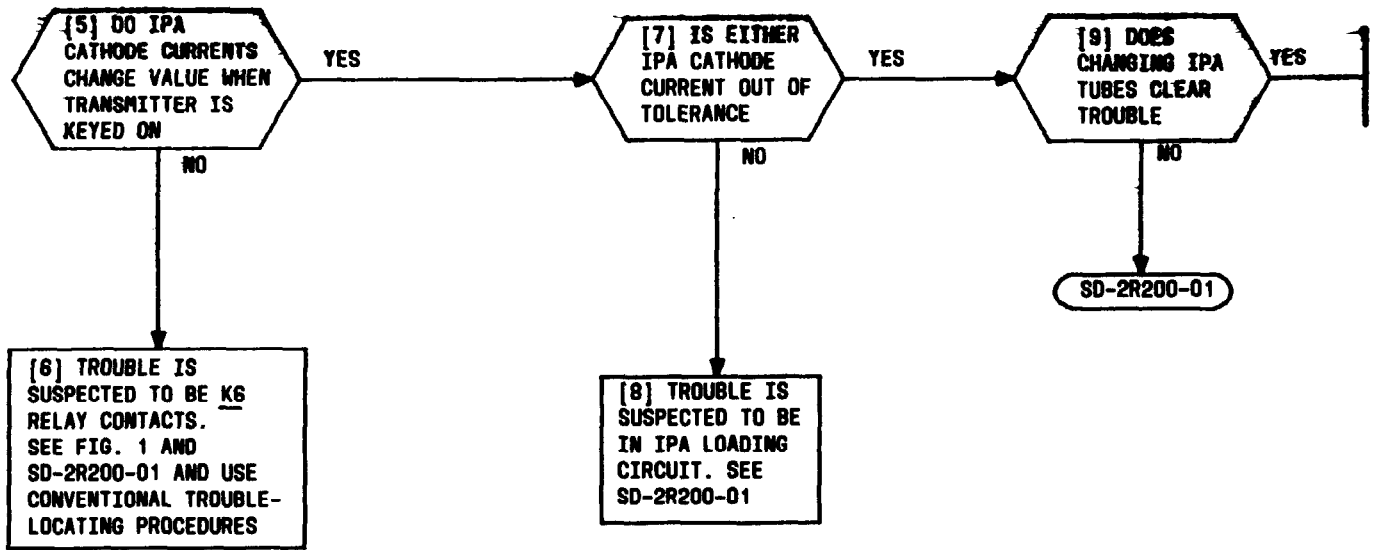

CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE

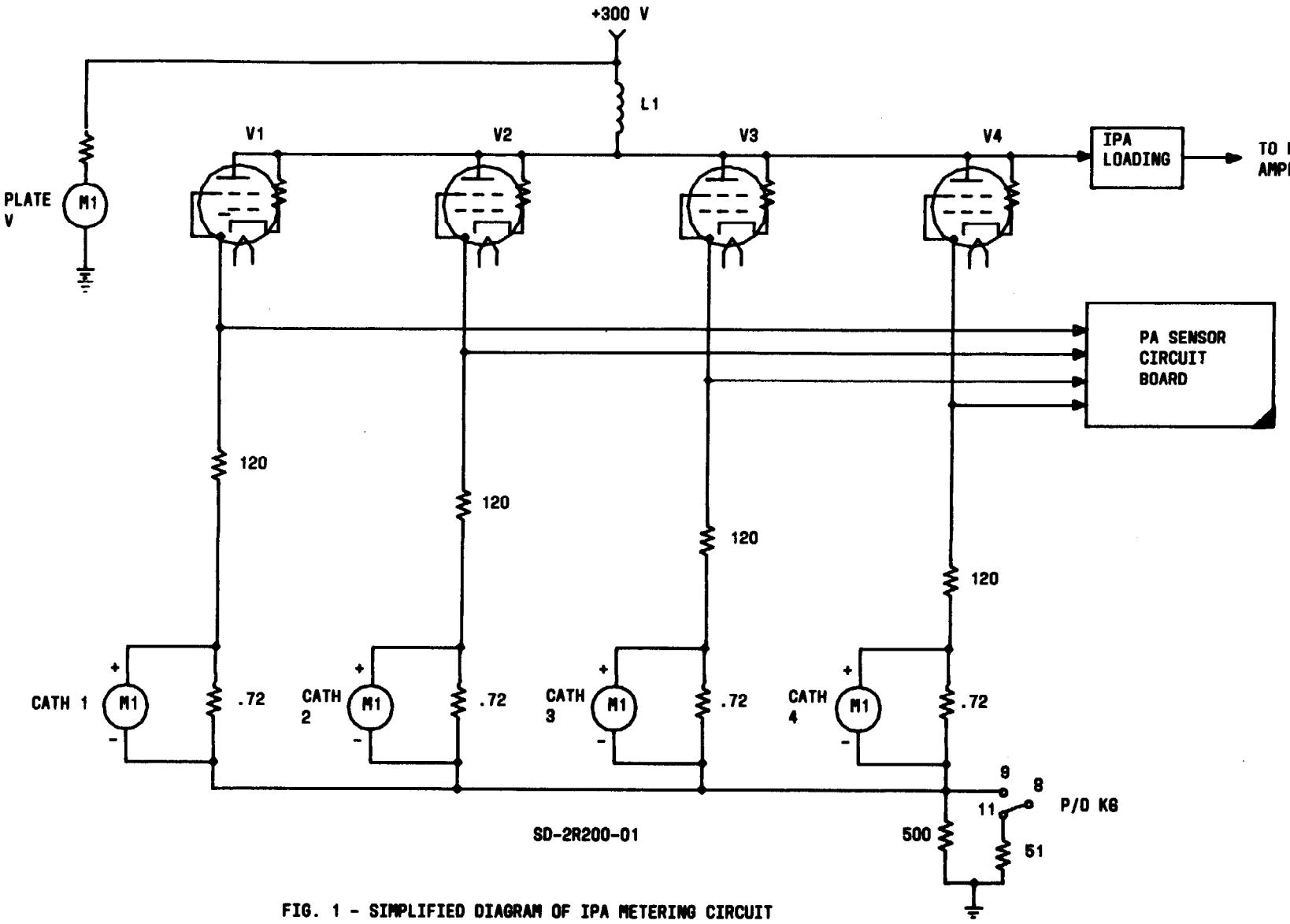

FIG. 1 - SIMPLIFIED DIAGRAM OF IPA METERING CIRCUIT

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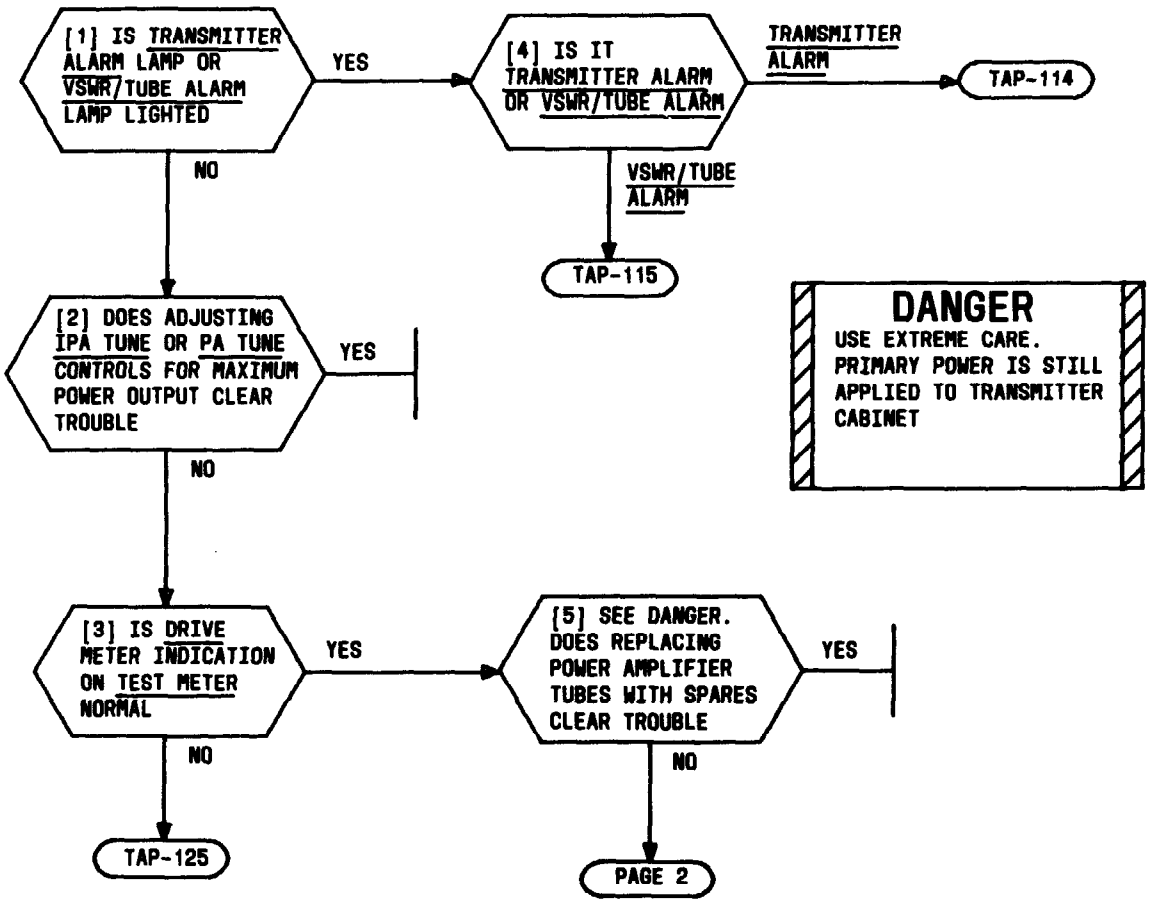
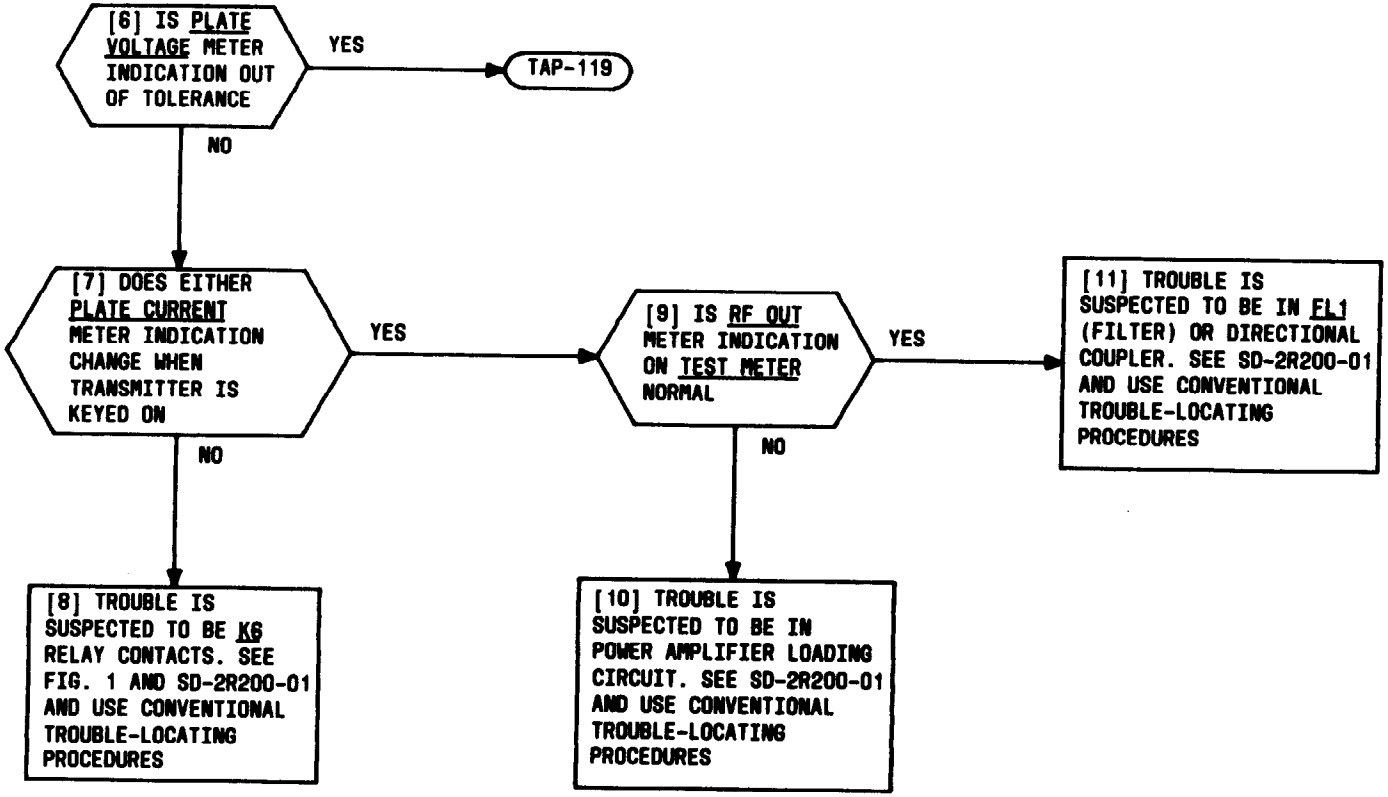
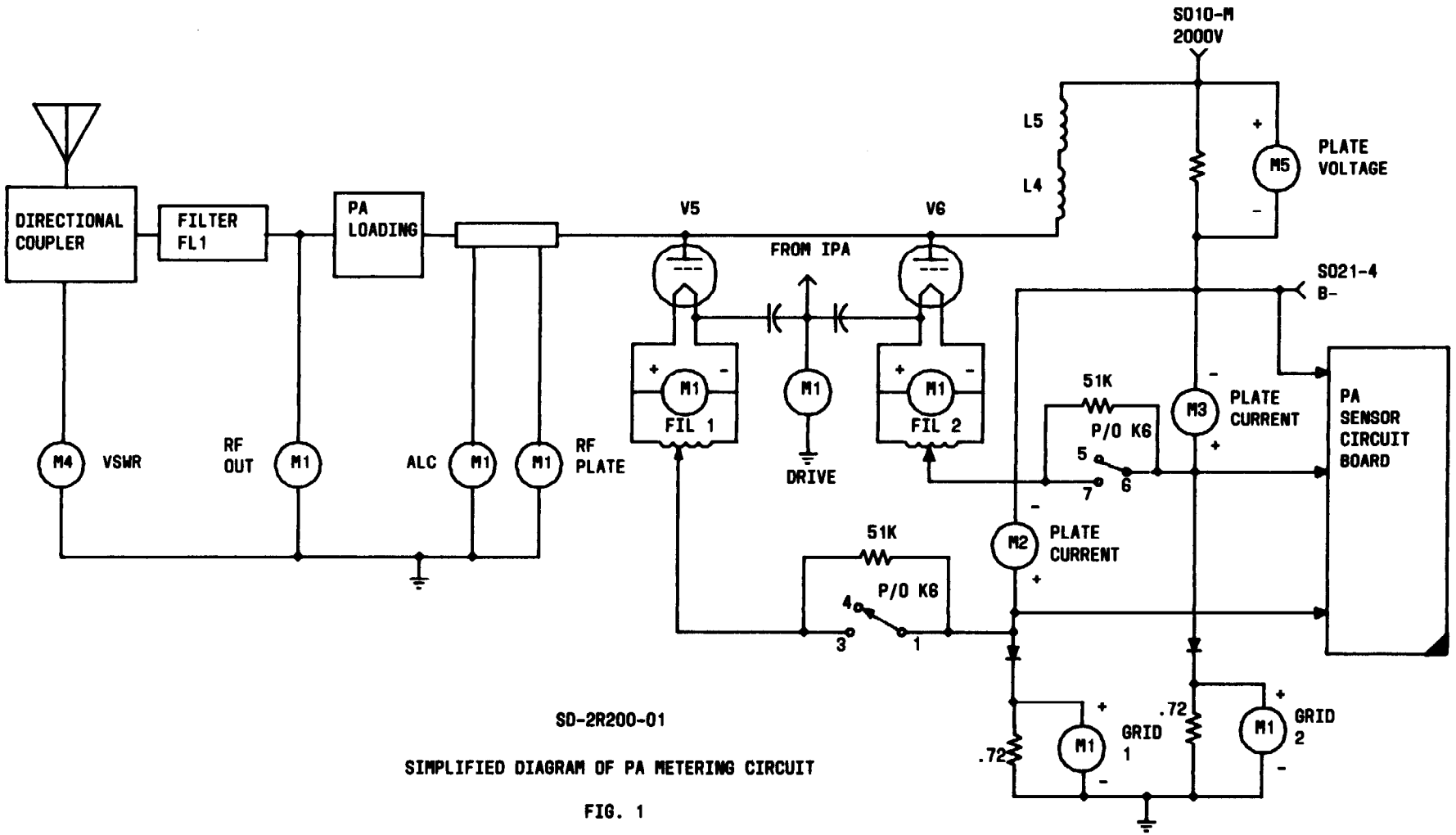
CLEAR INTERMEDIATE POWER AMPLIFIER METER INDICATION TROUBLE



CLEAR POWER AMPLIFIER METER INDICATION TROUBLE



CLEAR POWER AMPLIFIER METER INDICATION TROUBLE



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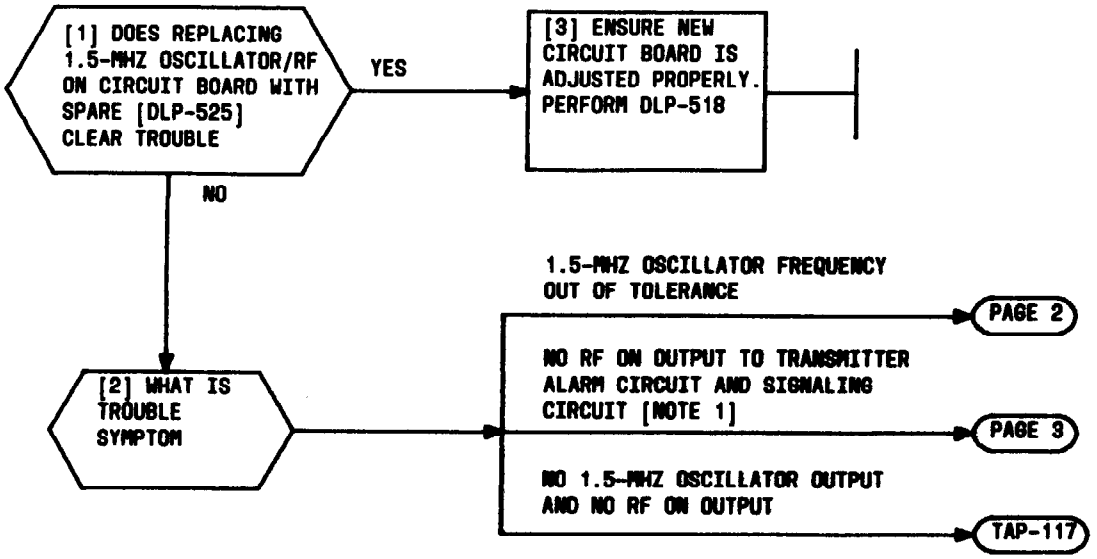
SIMPLIFIED DIAGRAM OF PA METERING CIRCUIT

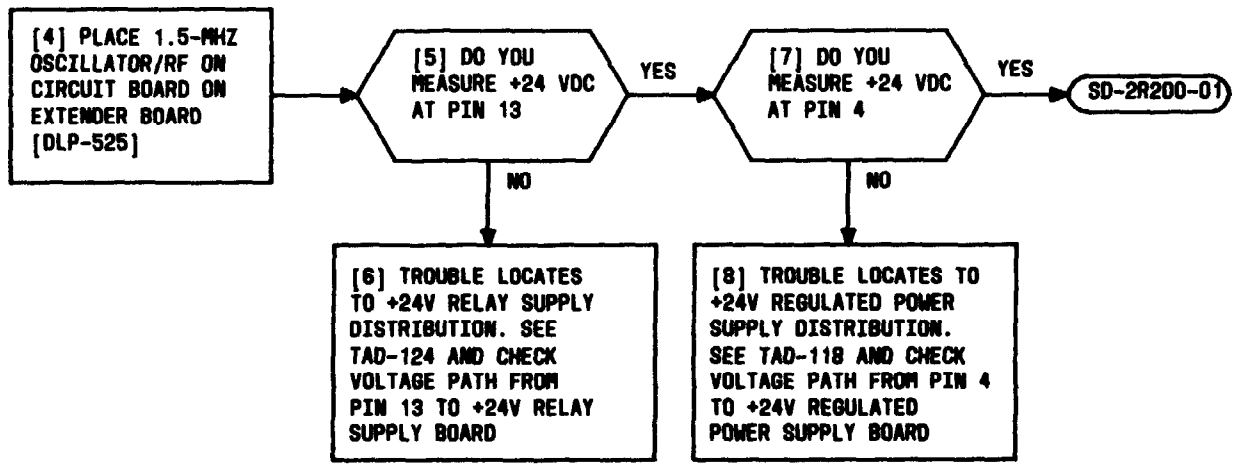
FIG. 1

CLEAR POWER AMPLIFIER METER INDICATION TROUBLE

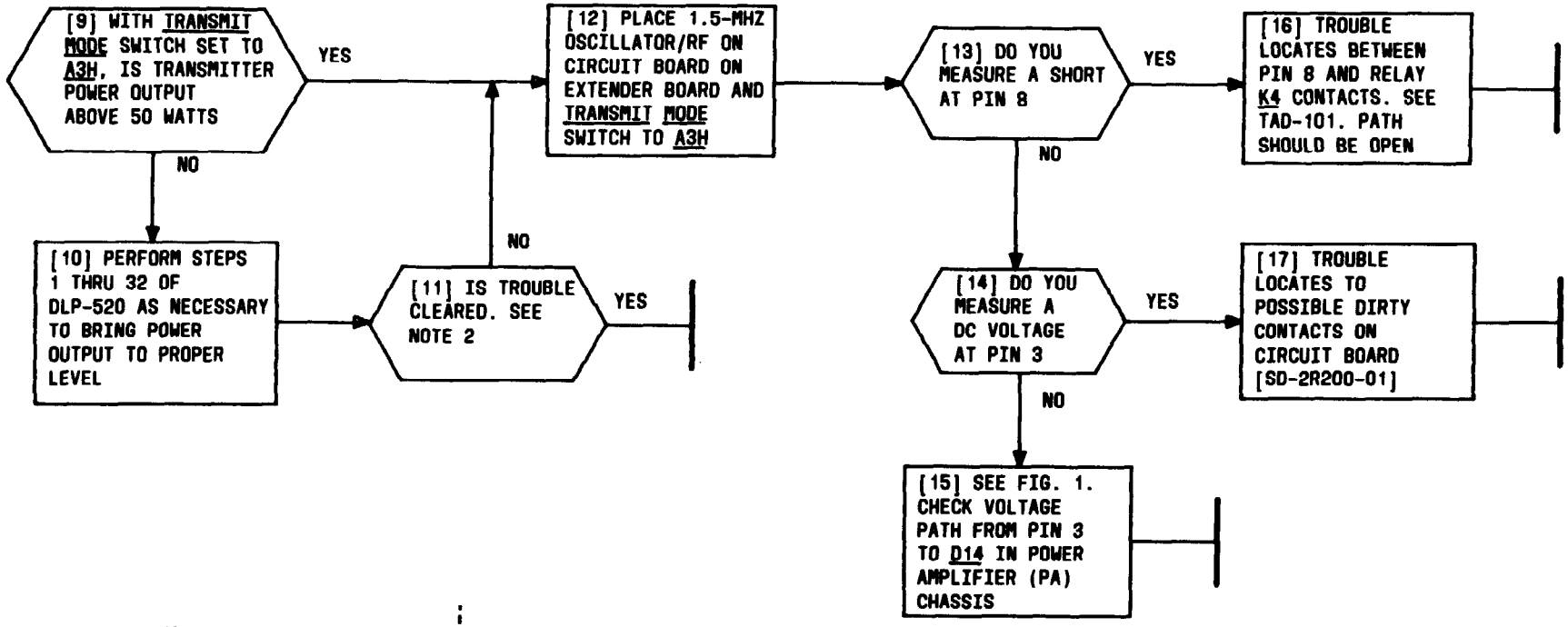


NOTE 1
WHEN TRANSMITTER IS TURNED ON REMOTELY AND RF ON OUTPUT IS MISSING, THE TRANSMITTER ALARM LAMP WILL LIGHT

CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE



CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE



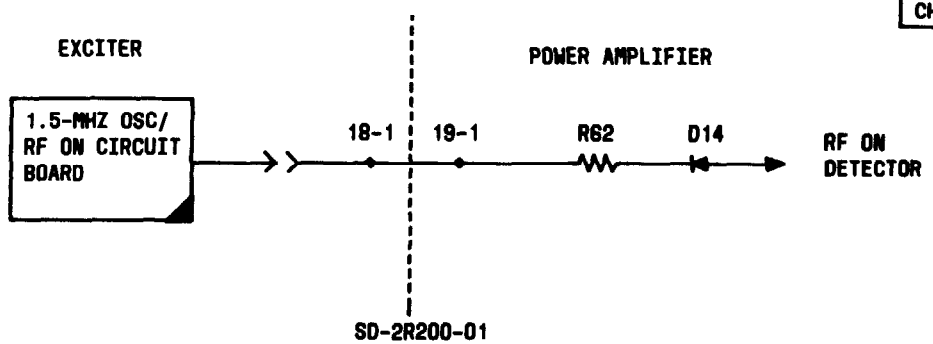
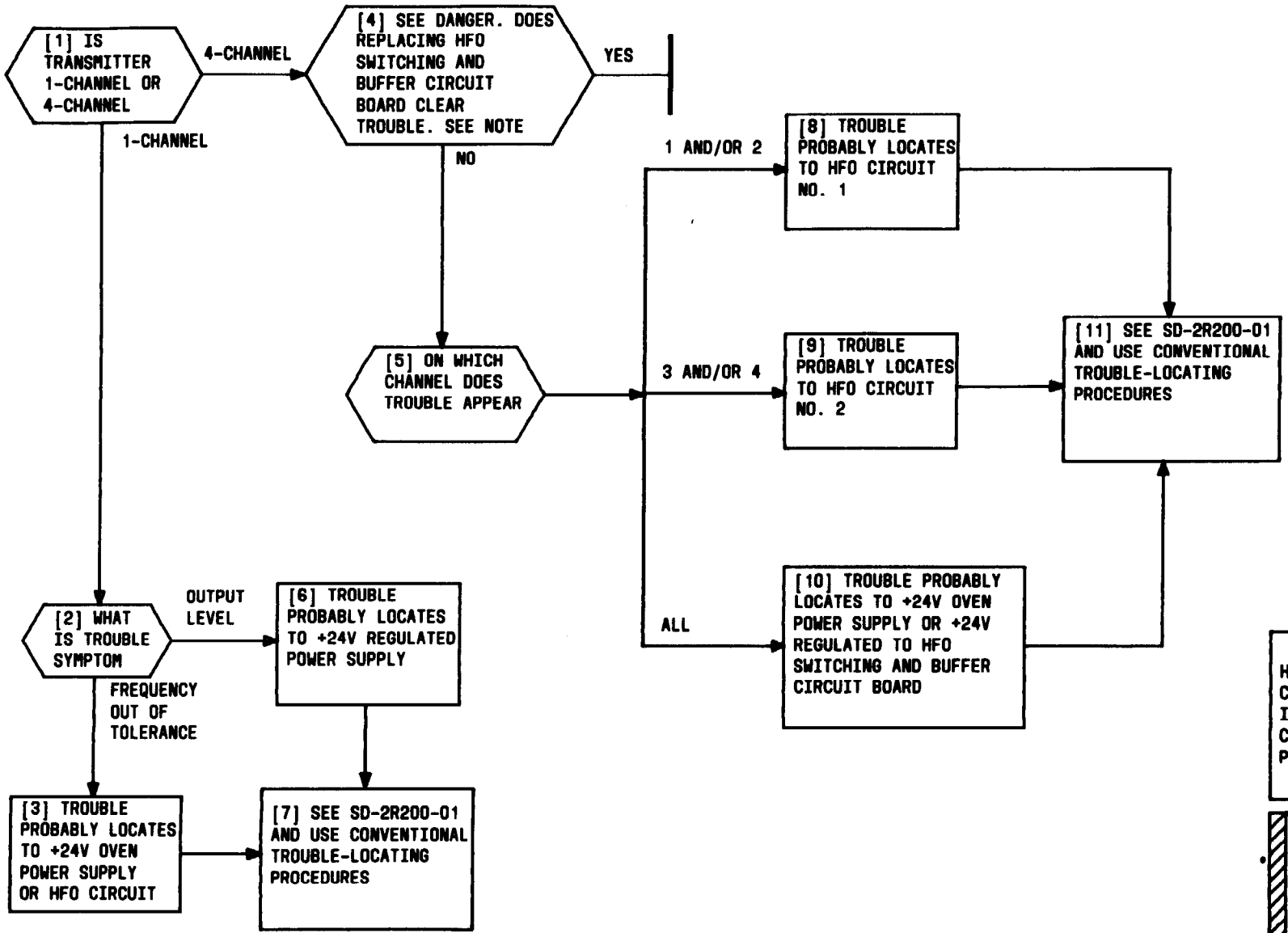


FIG.1

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

CLEAR 1.5-MHZ OSCILLATOR OUTPUT TROUBLE



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

CLEAR HFO OUTPUT TROUBLE

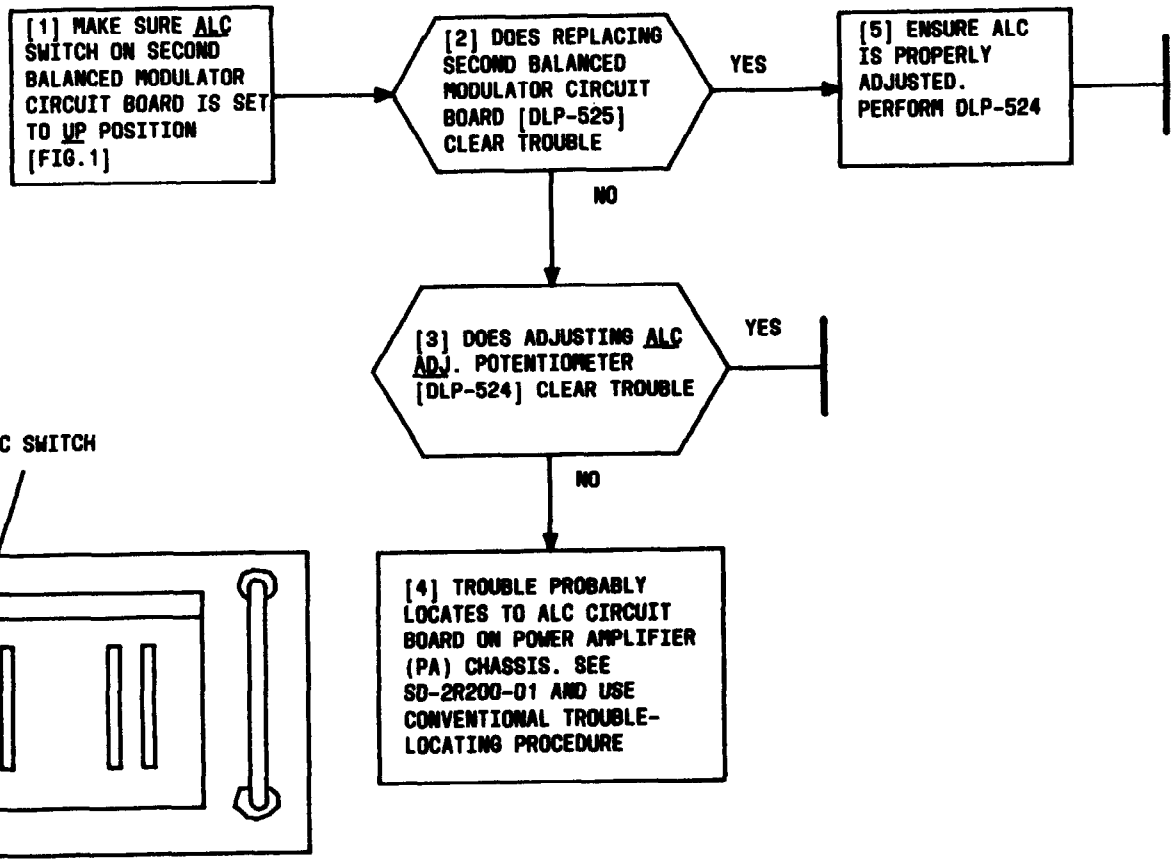
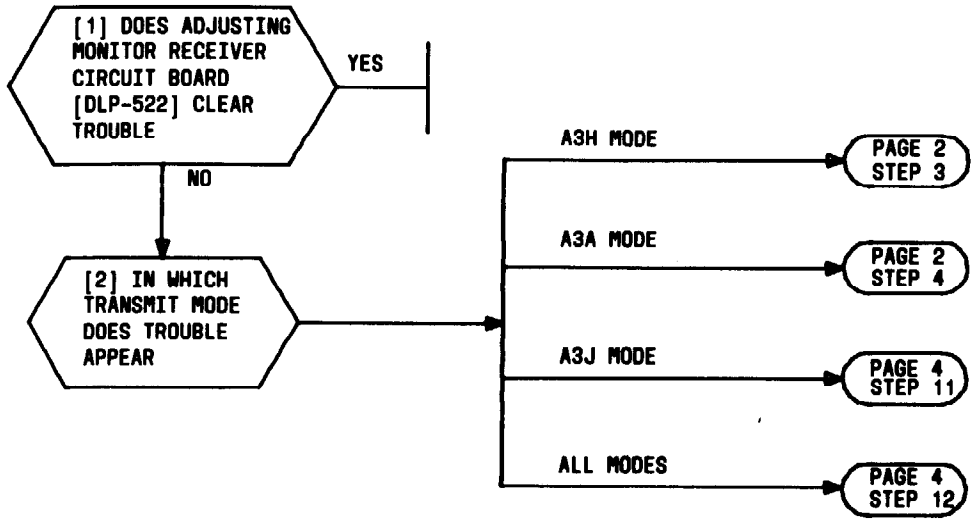
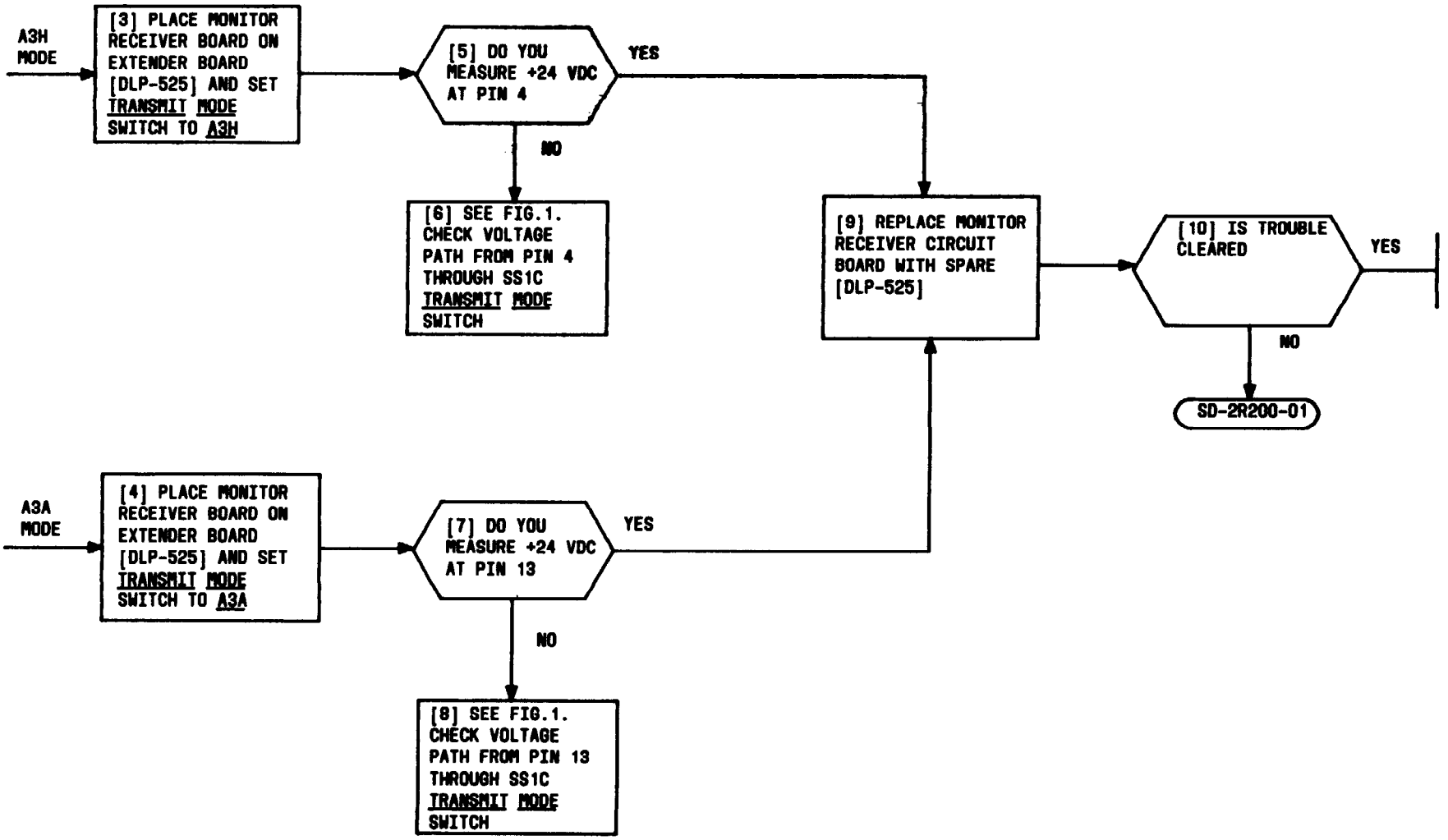


FIG.1

CLEAR AUTOMATIC LEVEL CONTROL (ALC) TROUBLE



CLEAR MONITOR RECEIVER OUTPUT TROUBLE



CLEAR MONITOR RECEIVER OUTPUT TROUBLE

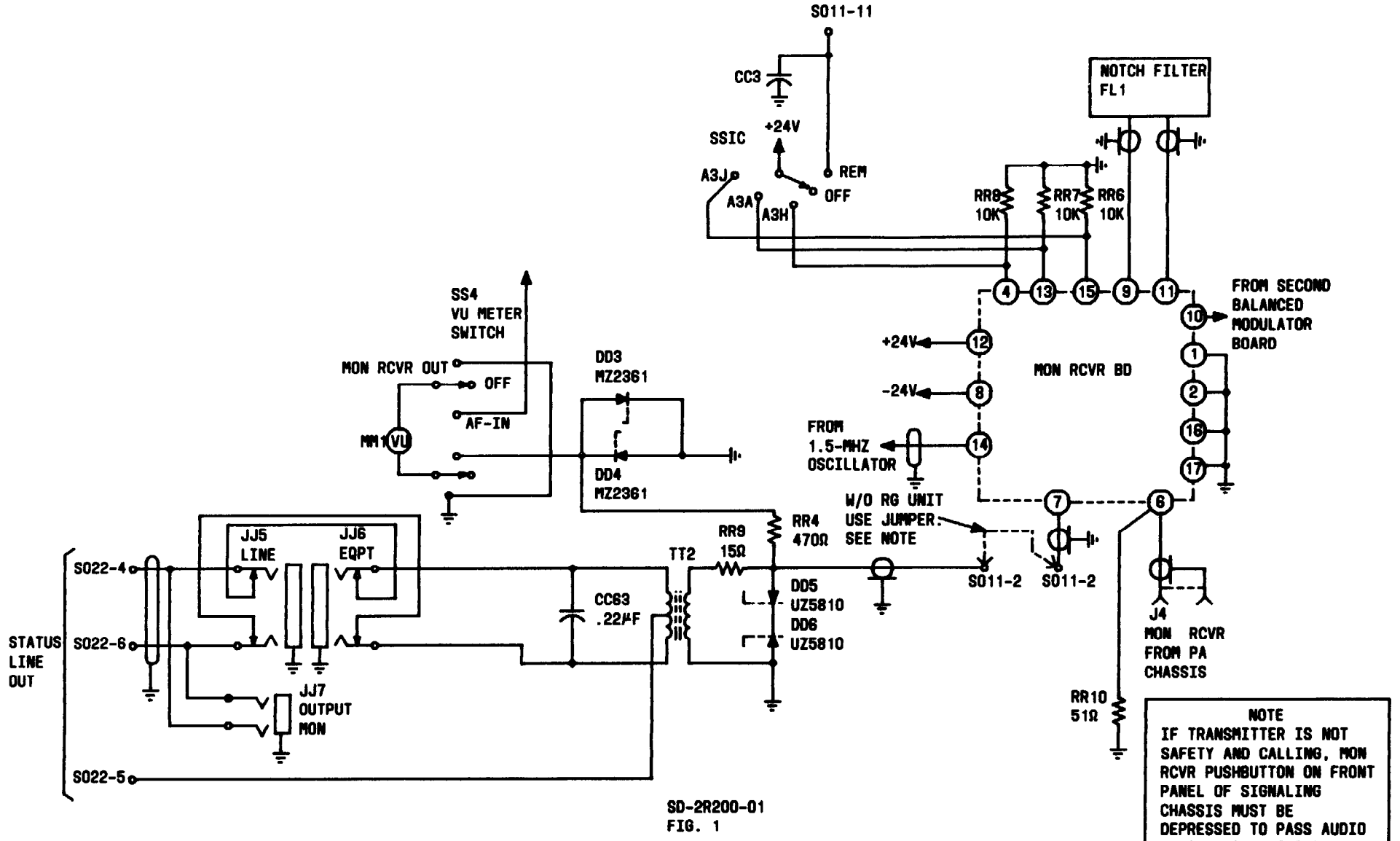


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FIG. 1

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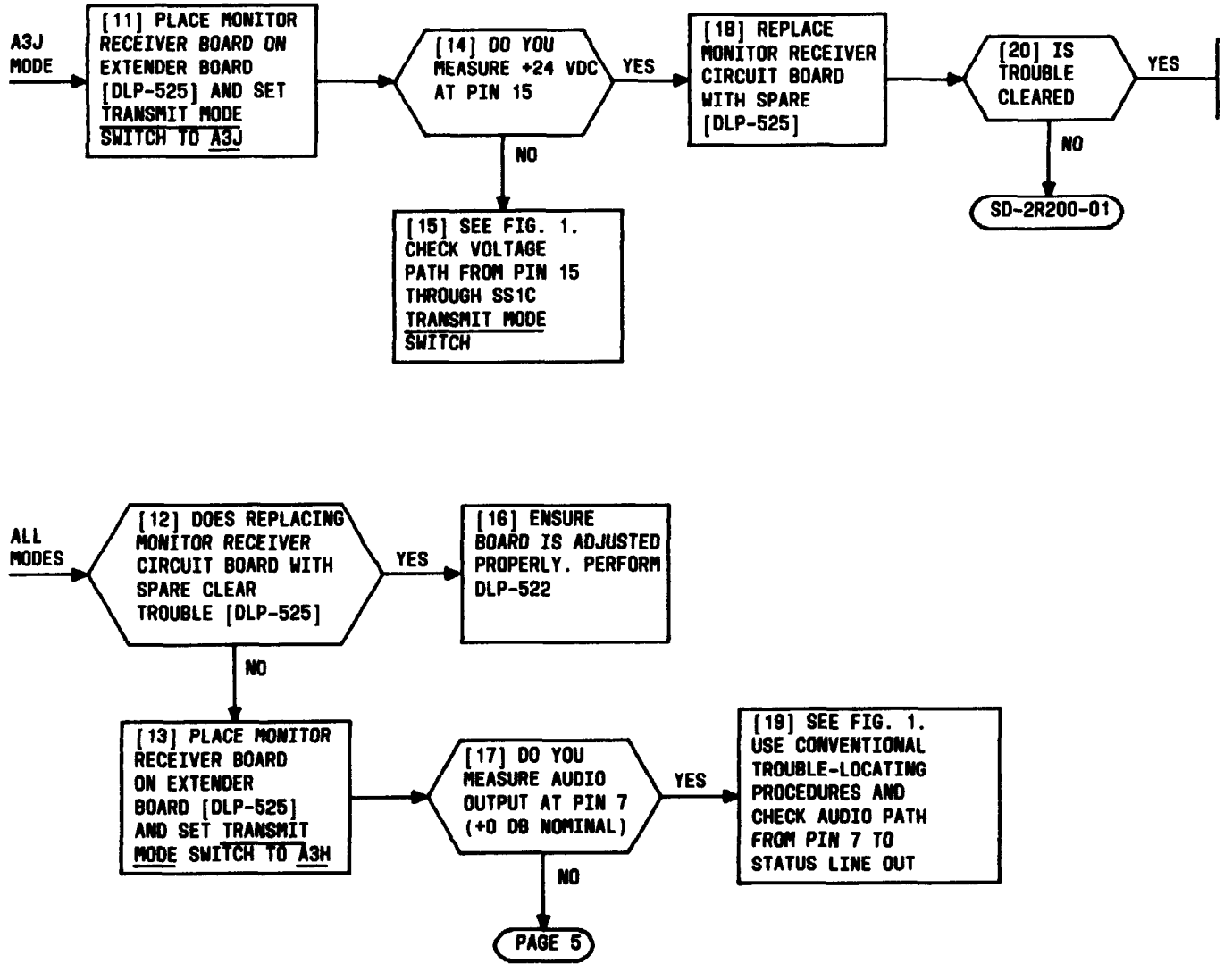
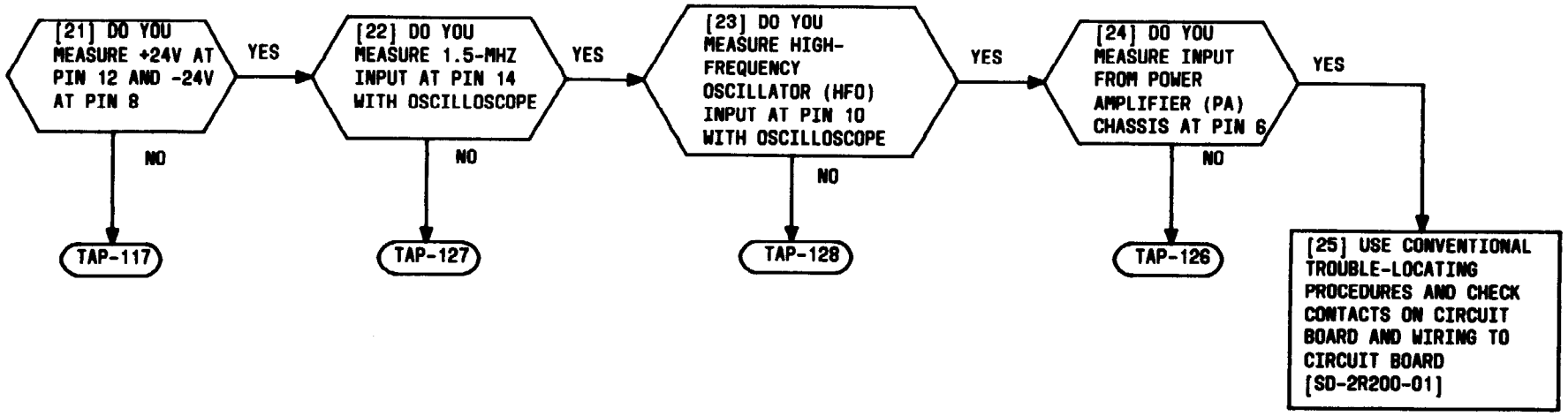
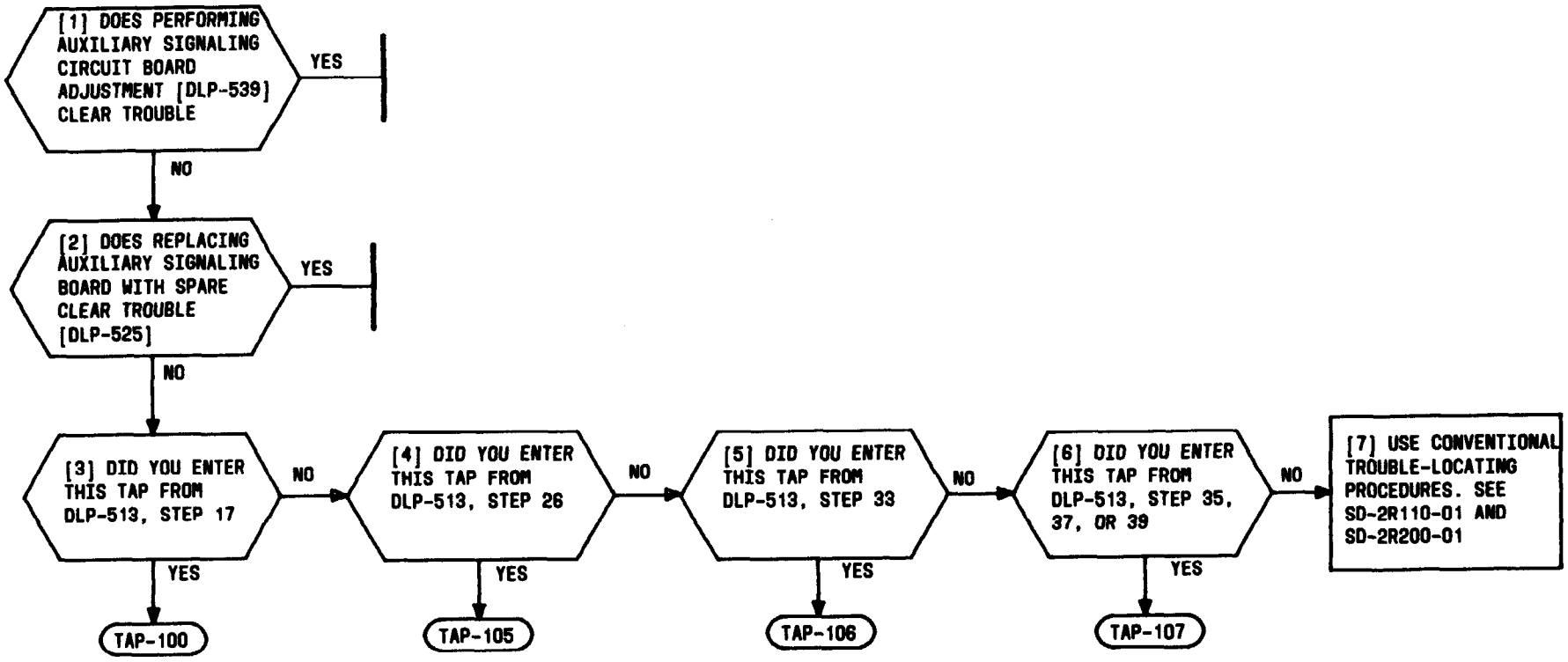
CLEAR MONITOR RECEIVER OUTPUT TROUBLE



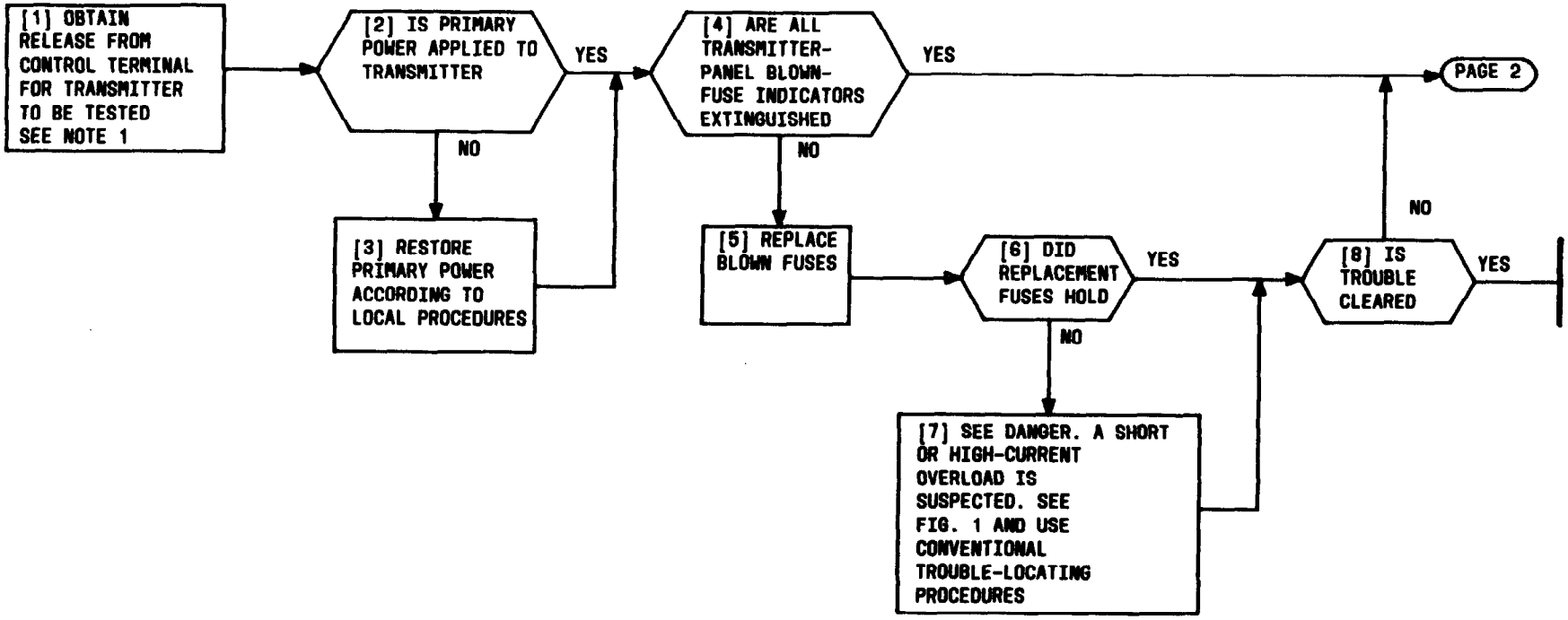
CLEAR MONITOR RECEIVER OUTPUT TROUBLE



CLEAR MONITOR RECEIVER OUTPUT TROUBLE



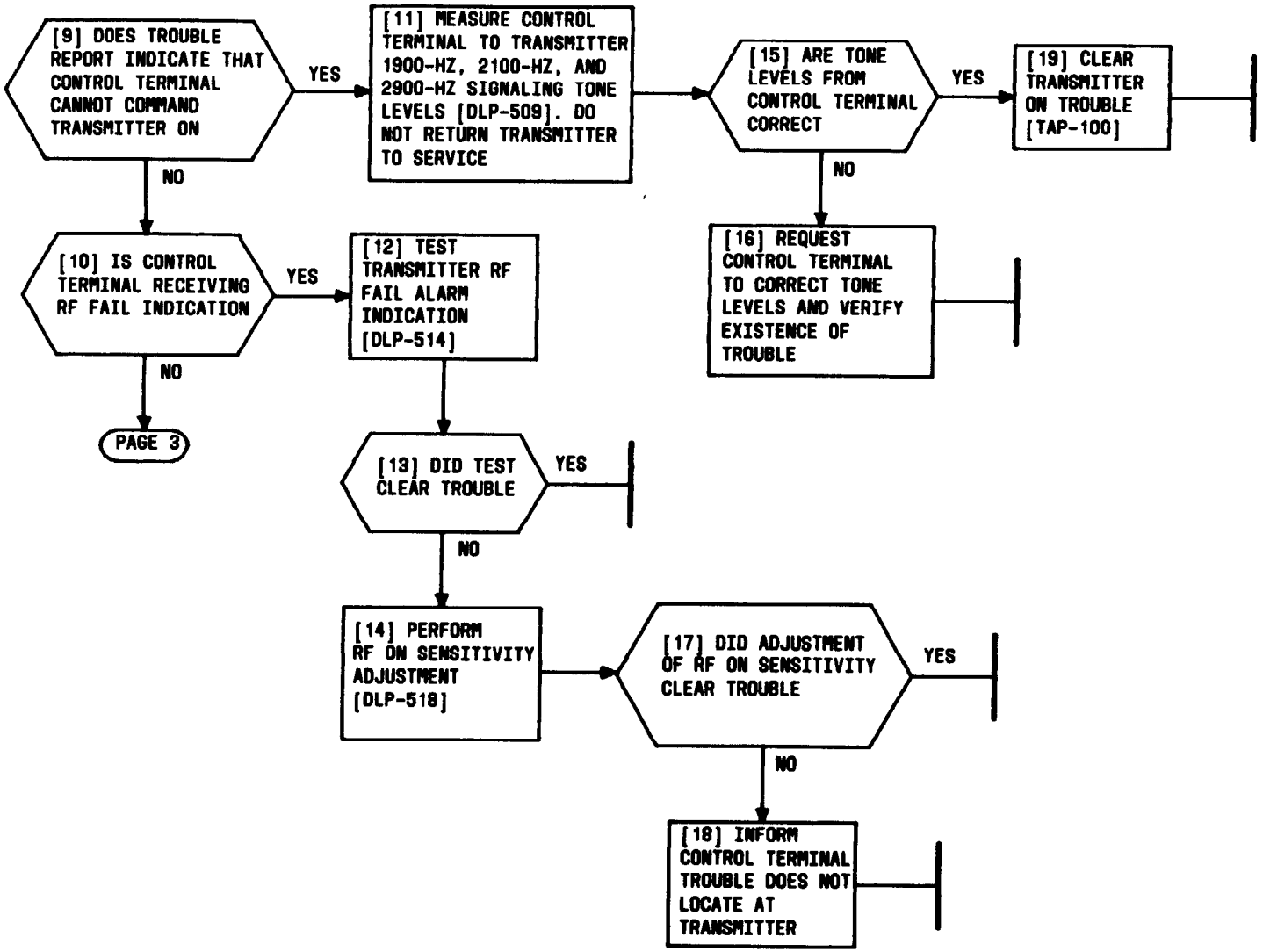
CLEAR AUXILIARY SIGNALING CIRCUIT TROUBLE



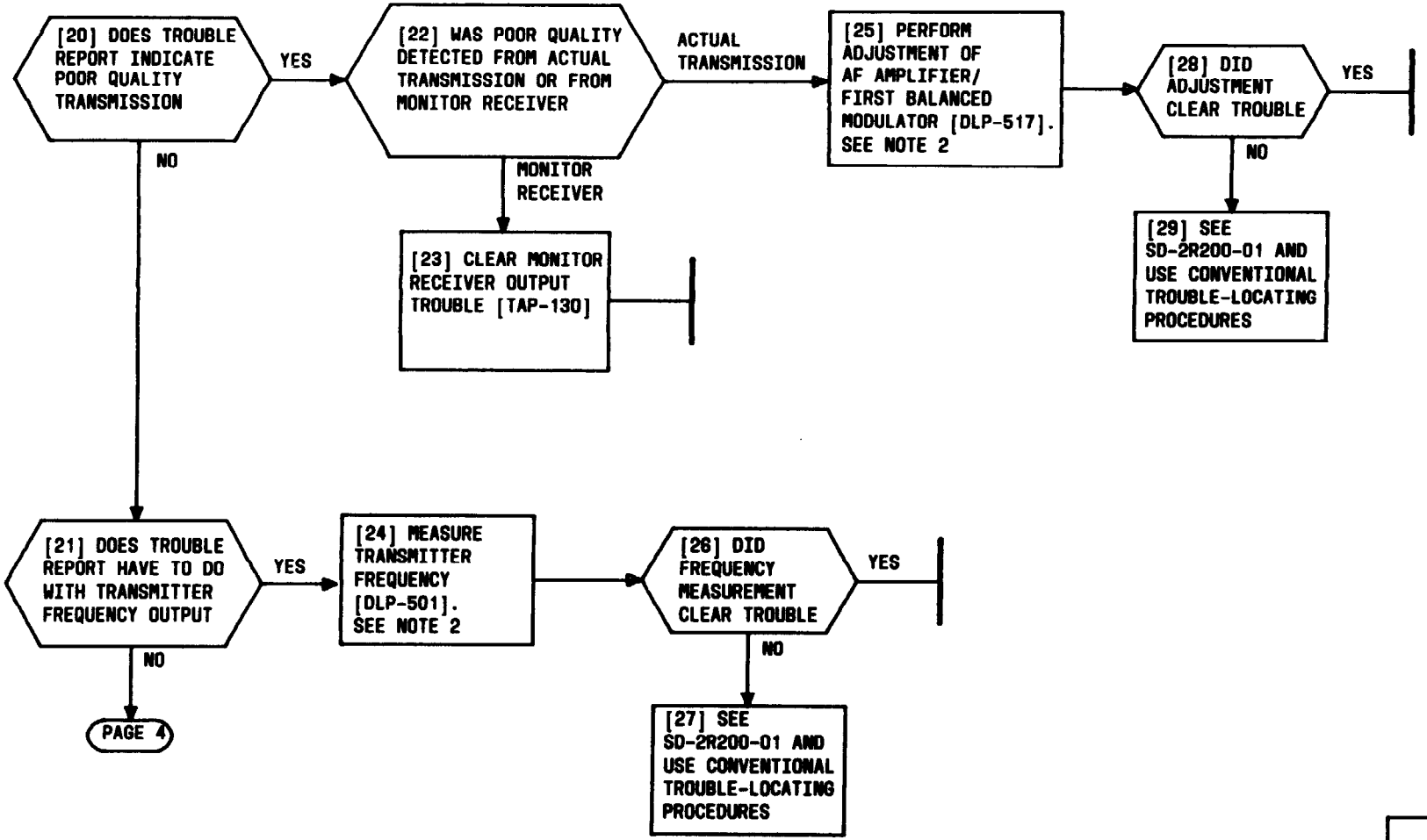
NOTE 1
RETURN TRANSMITTER TO SERVICE WHEN TROUBLE IS CLEARED AND MAKE ENTRIES IN FCC TECHNICAL LOG AS REQUIRED

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

LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



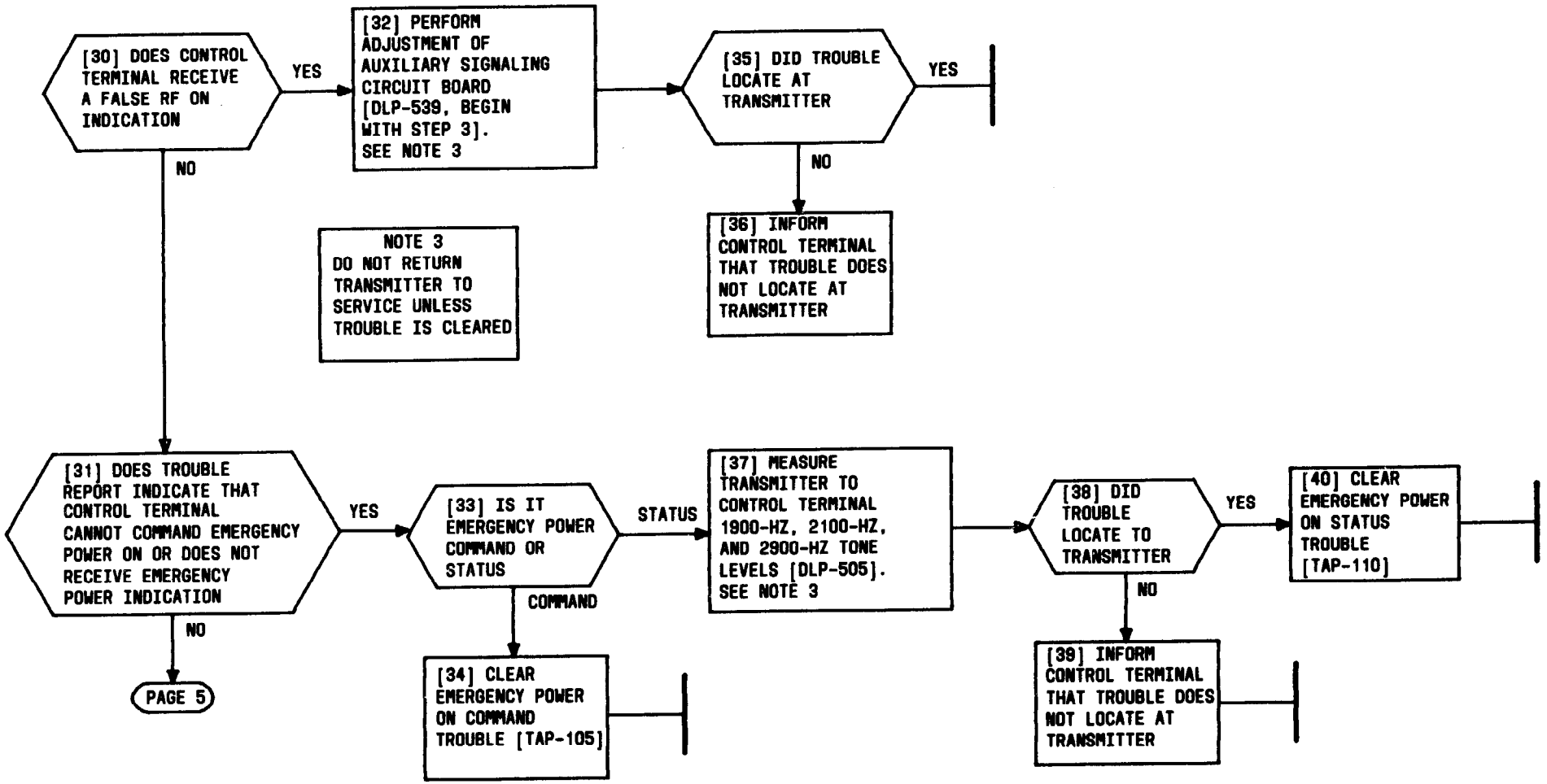
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



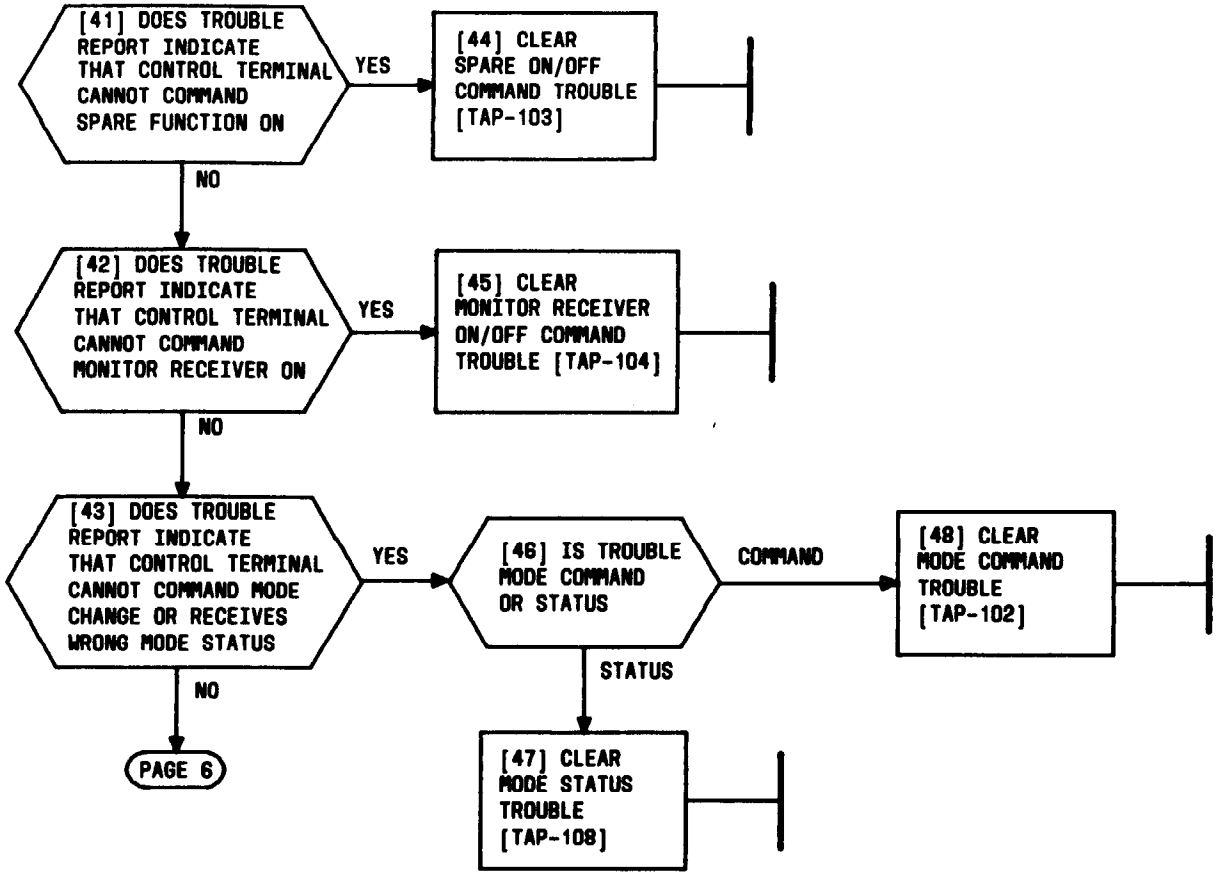
NOTE 2

DO NOT RETURN TRANSMITTER TO SERVICE UNLESS TROUBLE IS CLEARED

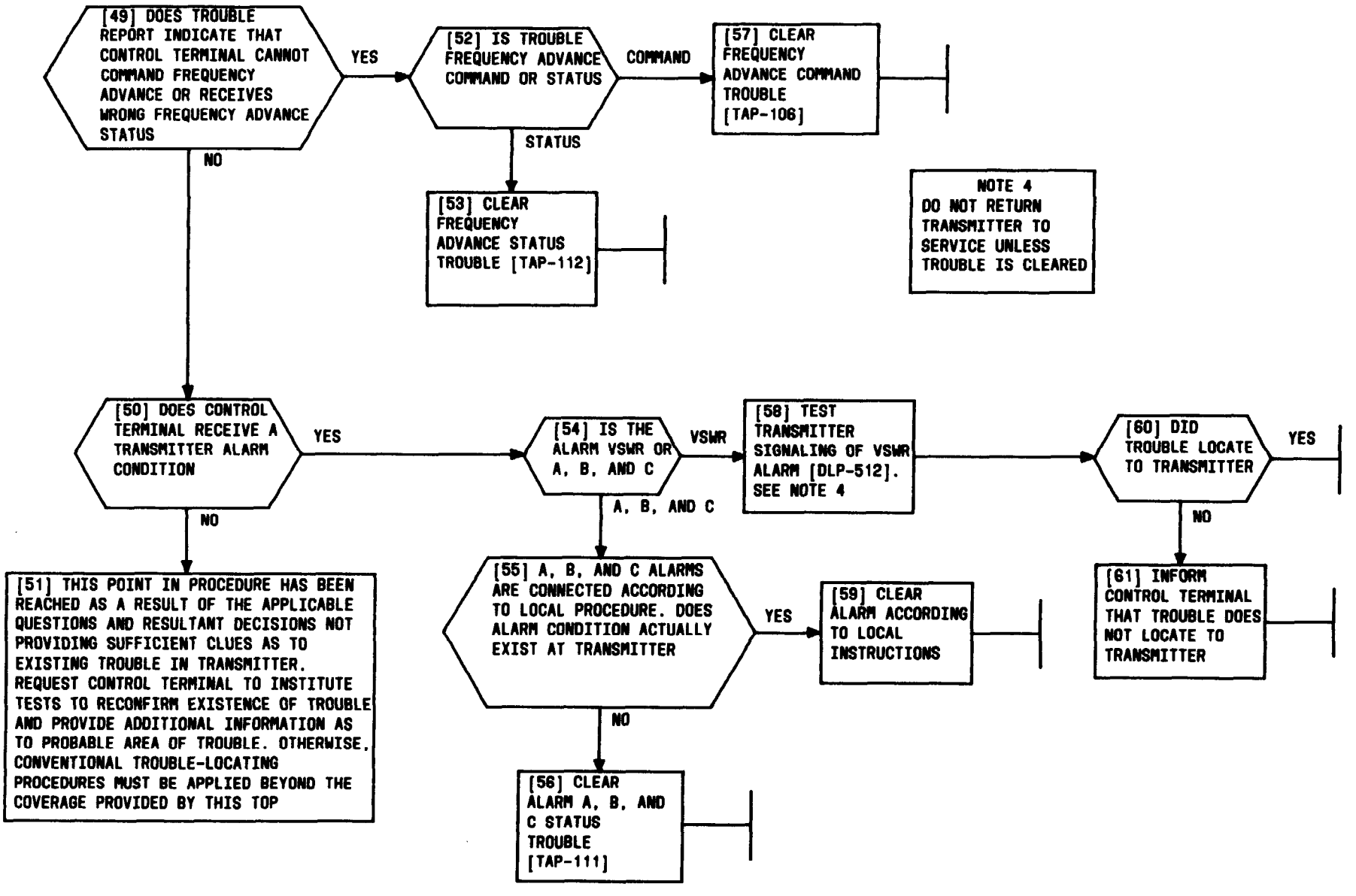
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



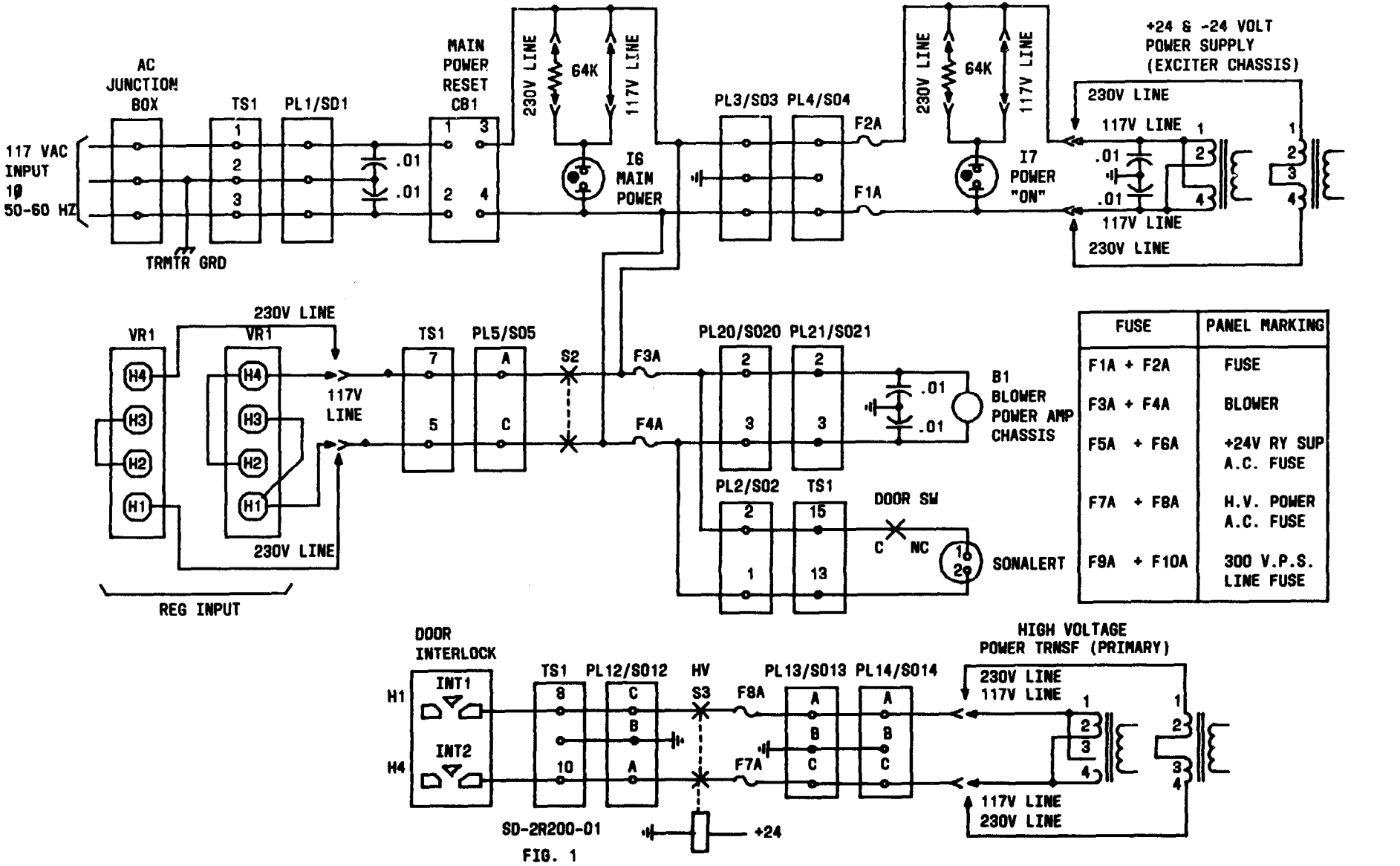
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



FUSE	PANEL MARKING
F1A + F2A	FUSE
F3A + F4A	BLOWER
F5A + F6A	+24V RY SUP A.C. FUSE
F7A + F8A	H.V. POWER A.C. FUSE
F9A + F10A	300 V.P.S. LINE FUSE

FIG. 1

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LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT

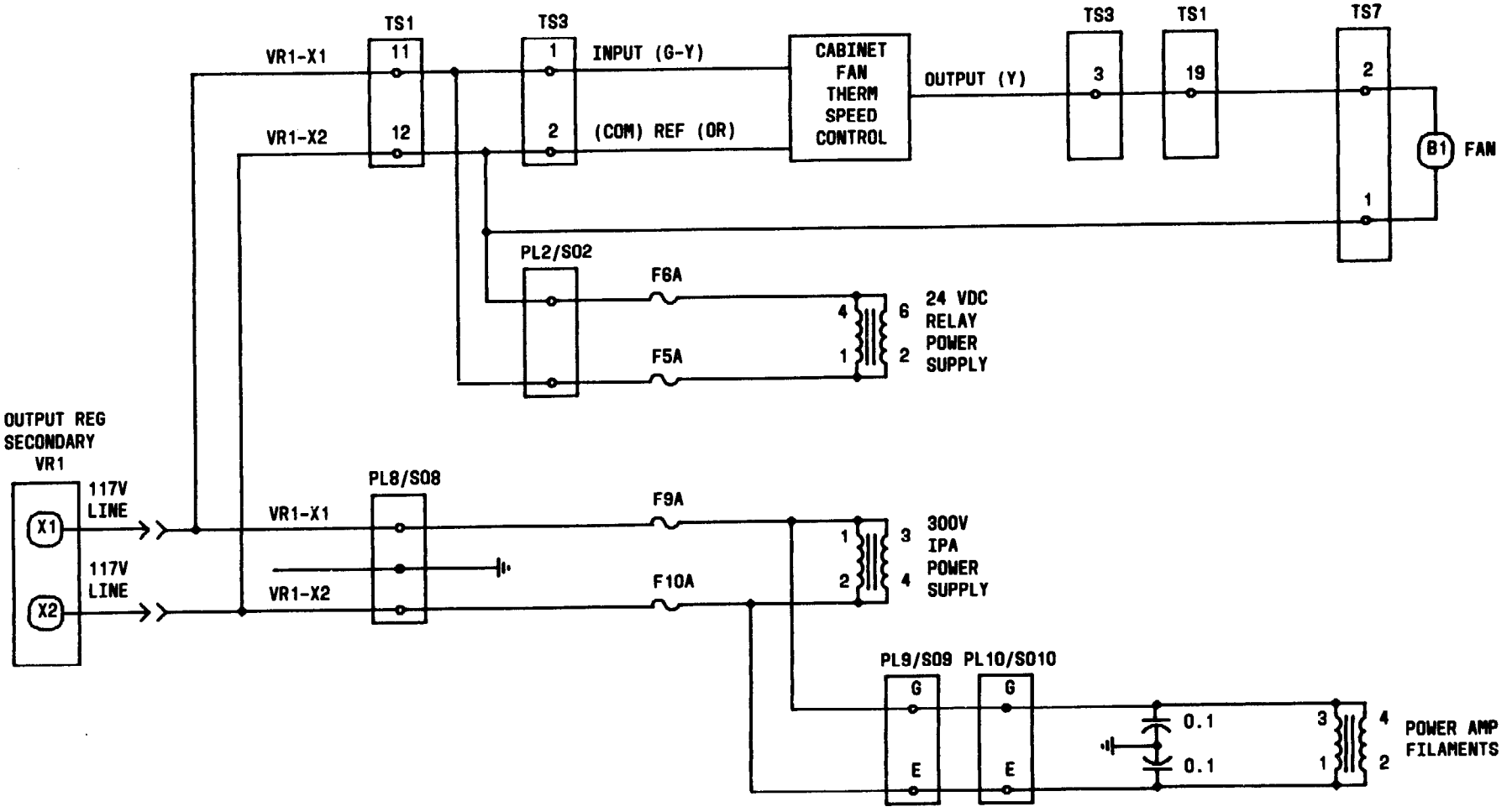

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FIG. 1 (CONT)

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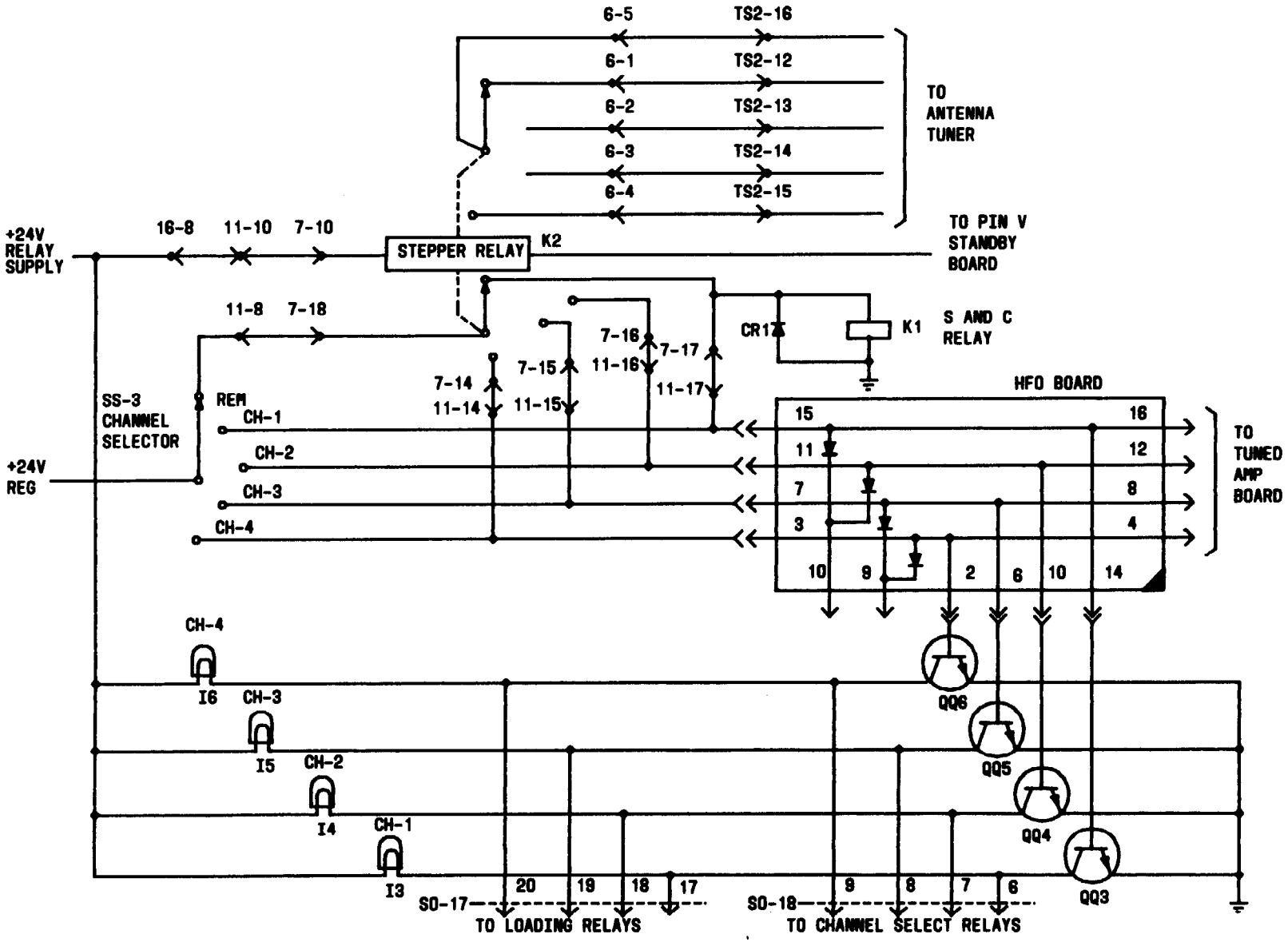
LOCATE TRANSMITTER FAULT FROM TROUBLE REPORT



SIMPLIFIED DIAGRAM OF CHANNEL LAMP CIRCUIT

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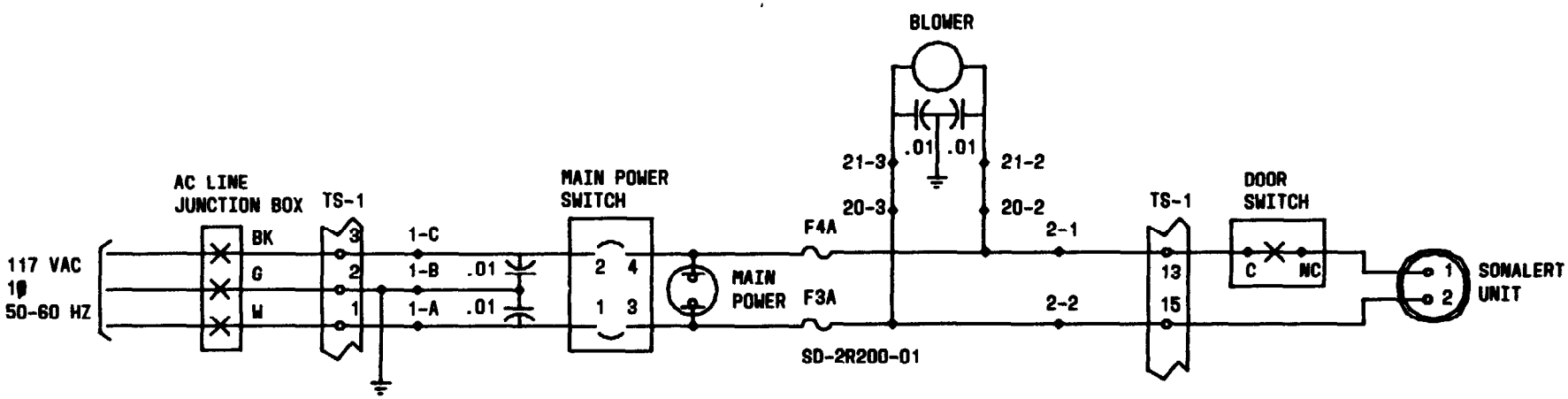

SIMPLIFIED DIAGRAM OF MAIN POWER CIRCUIT

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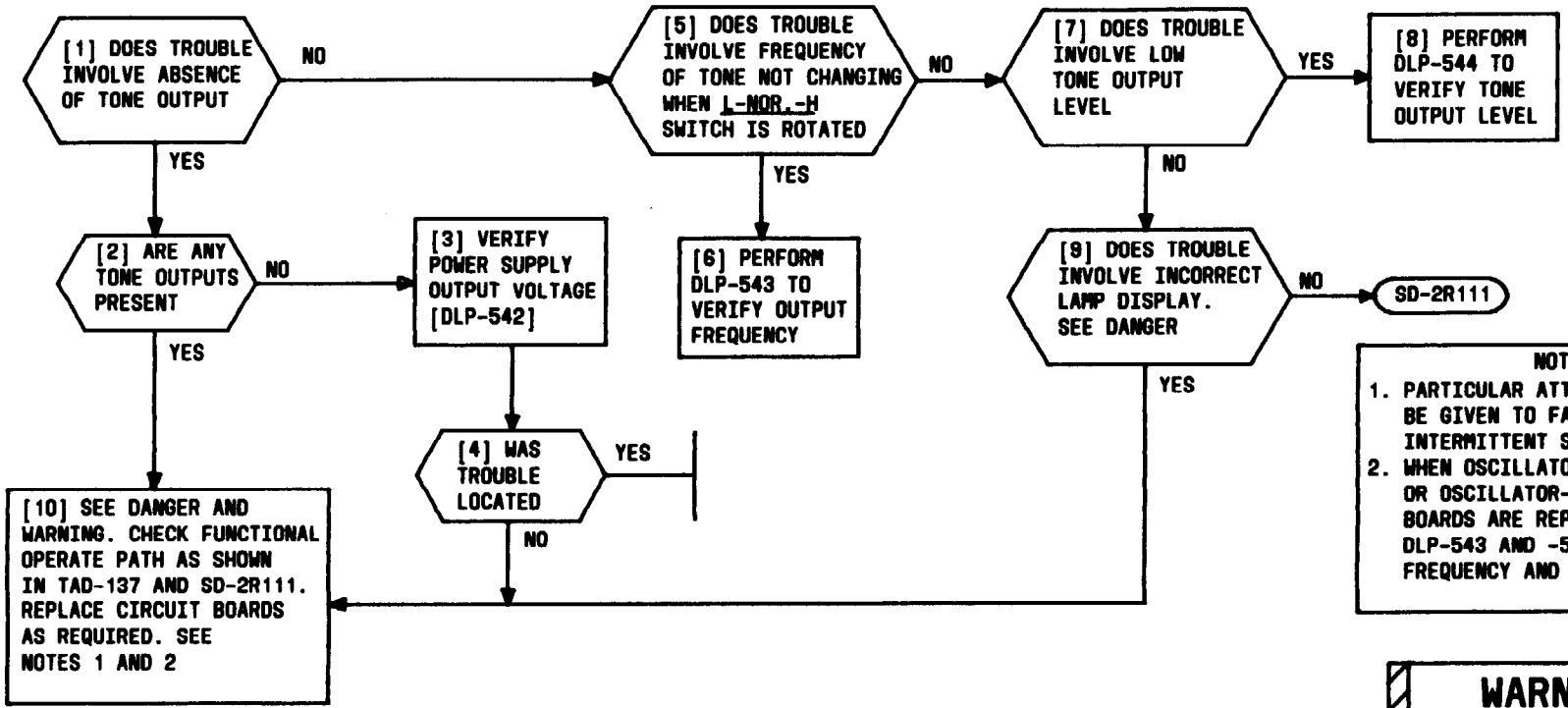


NOTES

1. PARTICULAR ATTENTION SHOULD BE GIVEN TO FAULTY AND INTERMITTENT SWITCH CONTACTS
2. 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

CLEAR ROUTINER TEST SET TROUBLES

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

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 LEDS, 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 DISCHARE 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 MEDUM 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

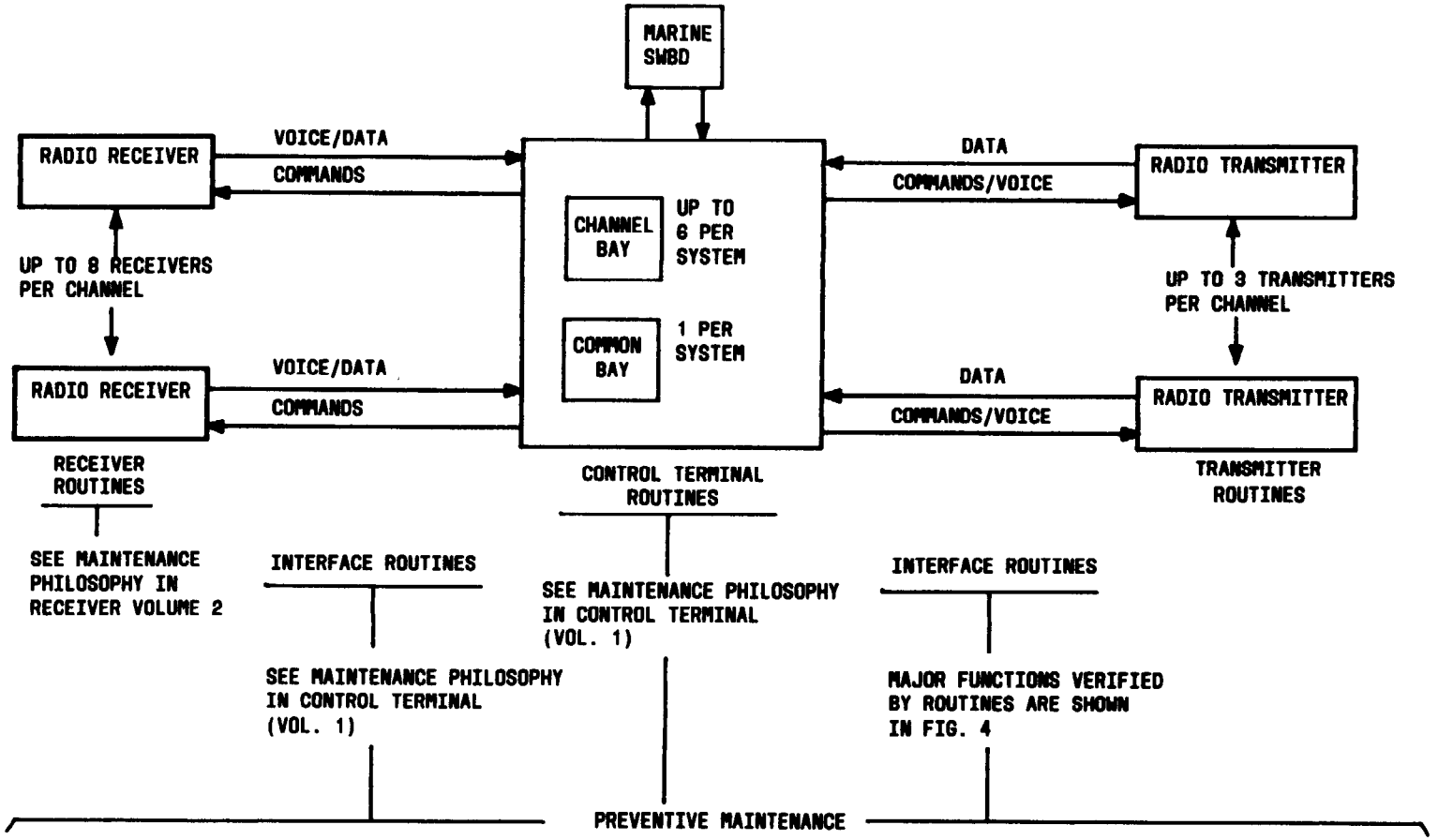
50H ELEMENT COULD BE CHANGED IF TRANSMIT MODE IS SET TO A3H

WARNING

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

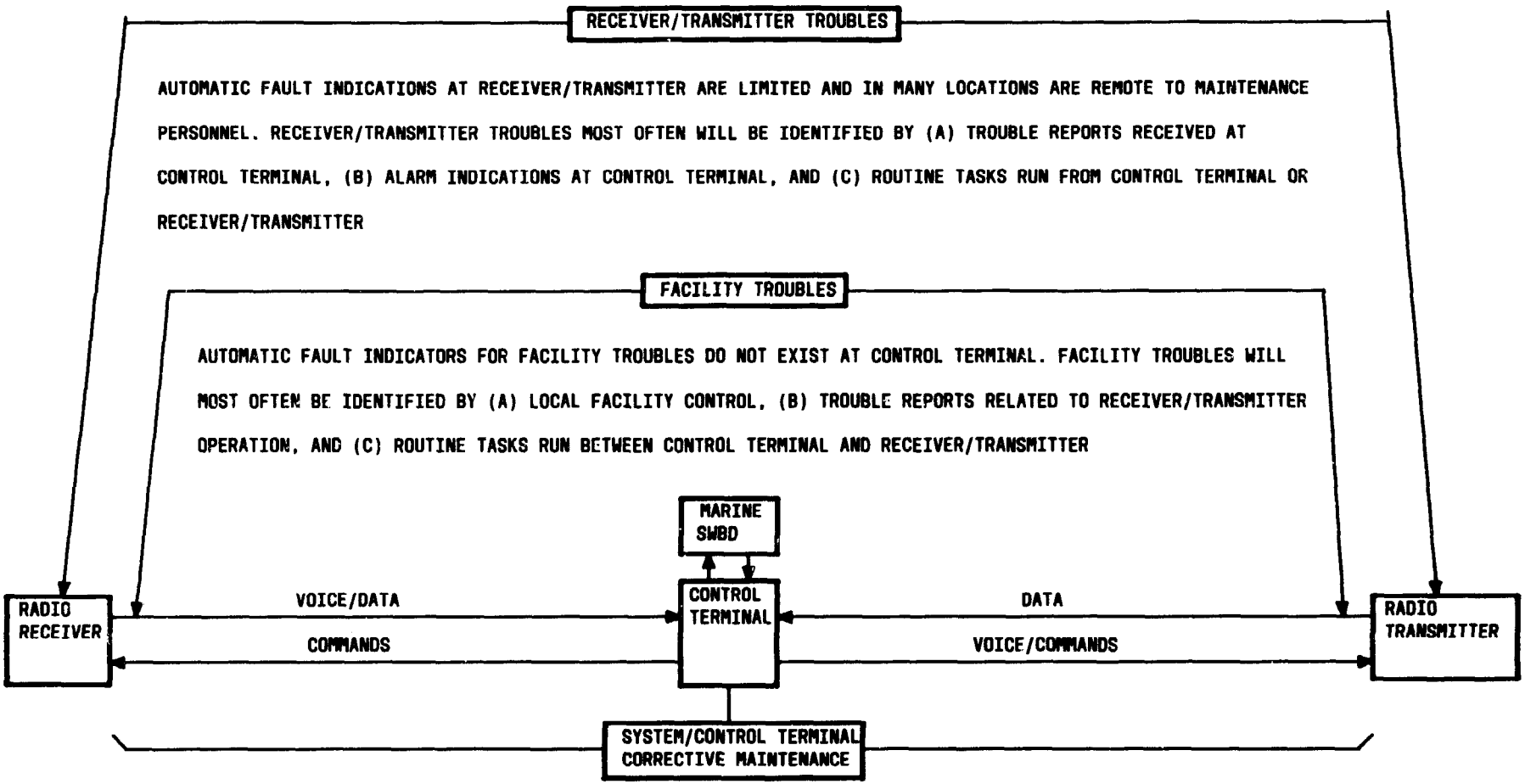
WARNING

MAIN POWER SWITCH IS SET TO 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



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 CONROL 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



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

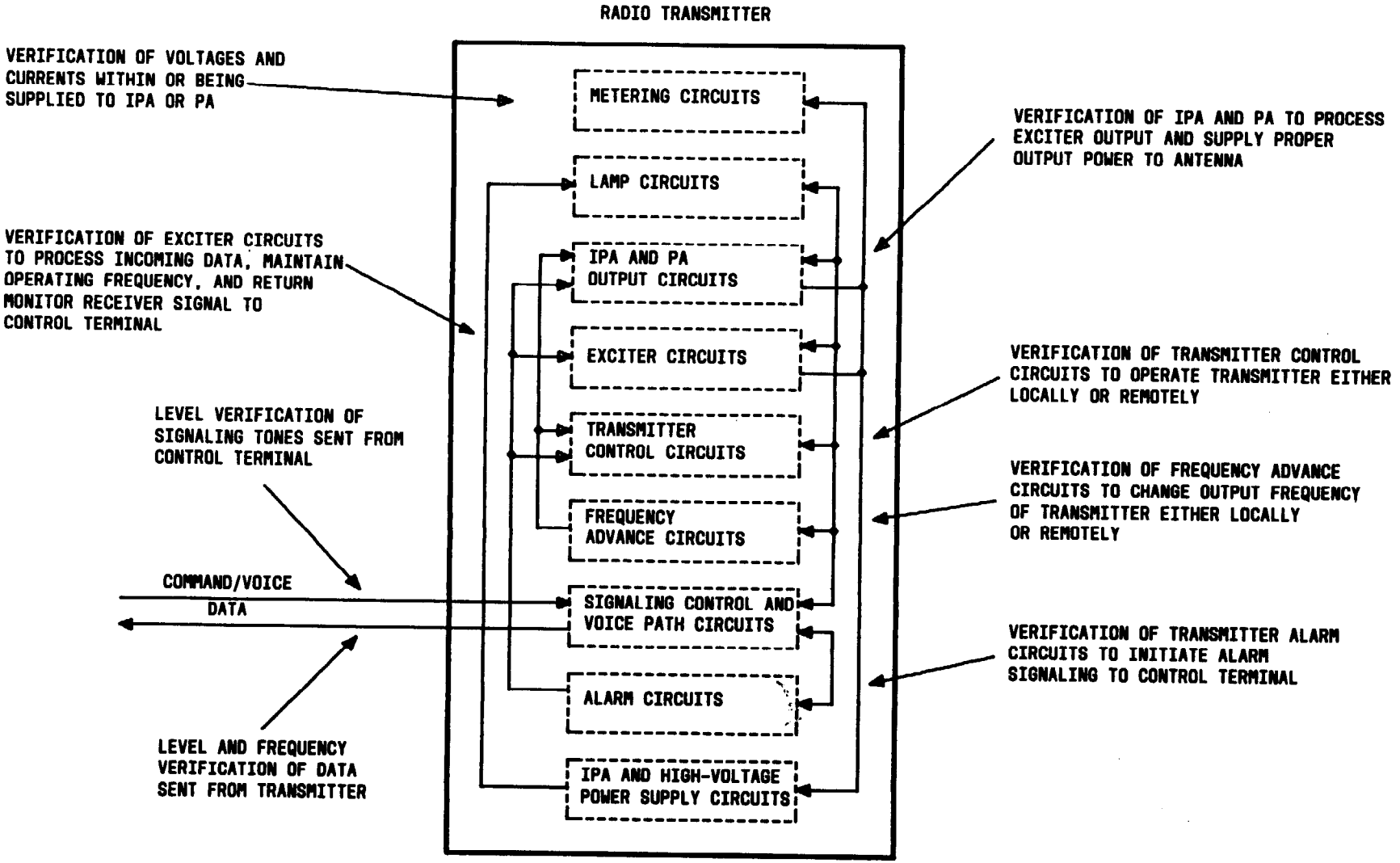

RADIO TRANSMITTER
VERIFICATION OF VOLTAGES AND CURRENTS WITHIN OR BEING SUPPLIED TO IPA OR PA
METERING CIRCUITS
LAMP CIRCUITS
IPA AND PA OUTPUT CIRCUITS
EXCITER CIRCUITS
TRANSMITTER CONTROL CIRCUITS
FREQUENCY ADVANCE CIRCUITS
SIGNALING CONTROL AND VOICE PATH CIRCUITS
ALARM CIRCUITS
IPA AND HIGH-VOLTAGE POWER SUPPLY CIRCUITS
VERIFICATION OF IPA AND PA TO PROCESS EXCITER OUTPUT AND SUPPLY PROPER OUTPUT POWER TO ANTENNA
VERIFICATION OF EXCITER CIRCUITS TO PROCESS INCOMING DATA, MAINTAIN OPERATING FREQUENCY, AND RETURN MONITOR RECEIVER SIGNAL TO CONTROL TERMINAL
VERIFICATION OF TRANSMITTER CONTROL CIRCUITS TO OPERATE TRANSMITTER EITHER LOCALLY OR REMOTELY
LEVEL VERIFICATION OF SIGNALING TONES SENT FROM CONTROL TERMINAL
VERIFICATION OF FREQUENCY ADVANCE CIRCUITS TO CHANGE OUTPUT FREQUENCY OF TRANSMITTER EITHER LOCALLY OR REMOTELY
COMMAND/VOICE
DATA
VERIFICATION OF TRANSMITTER ALARM CIRCUITS TO INITIATE ALARM SIGNALING TO CONTROL TERMINAL
LEVEL AND FREQUENCY VERIFICATION OF DATA SENT FROM TRANSMITTER

FIG. 3

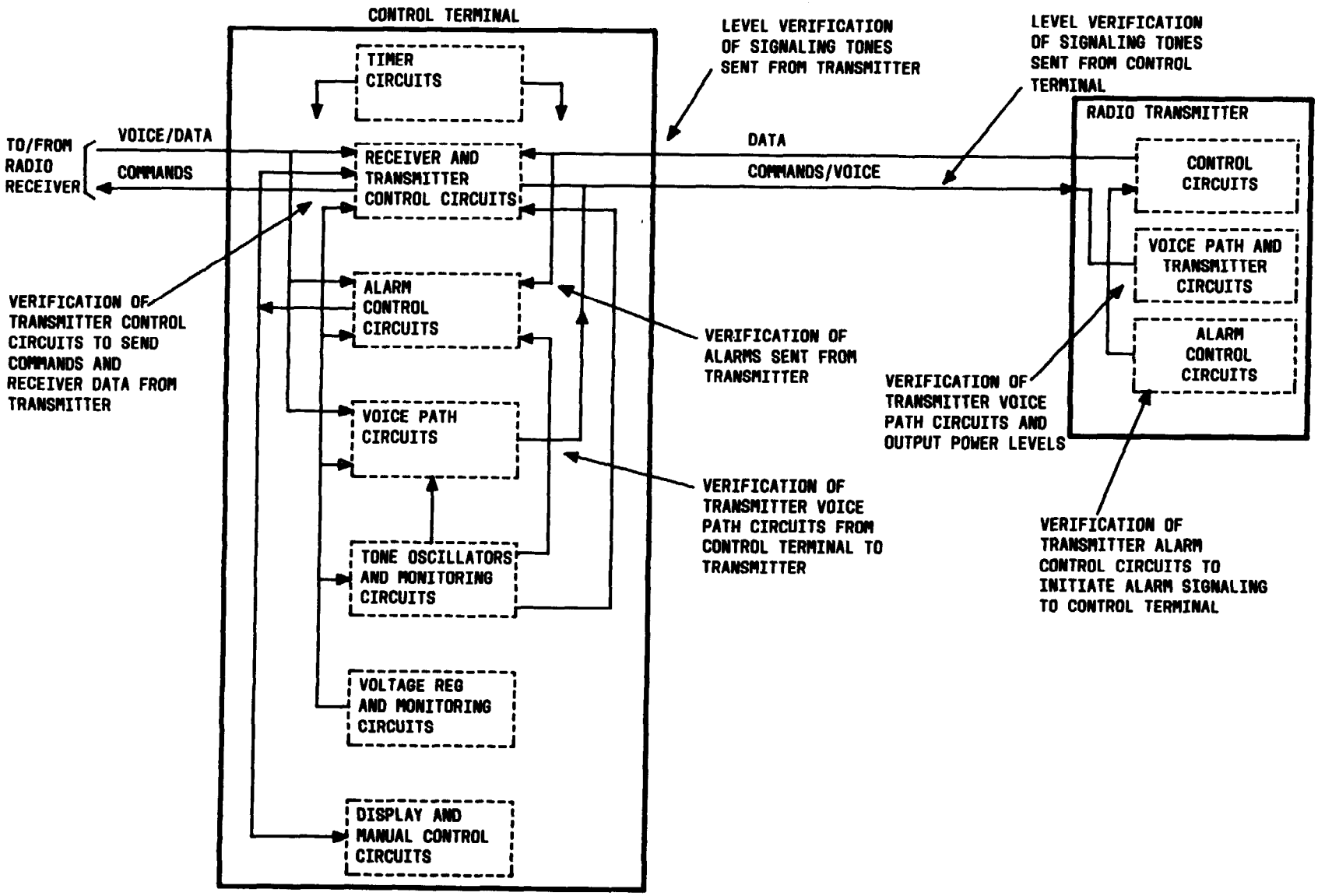


FIG. 4 - MAJOR FUNCTIONS VERIFIED BY CONTROL TERMINAL TO/FROM TRANSMITTER INTERFACE ROUTINES

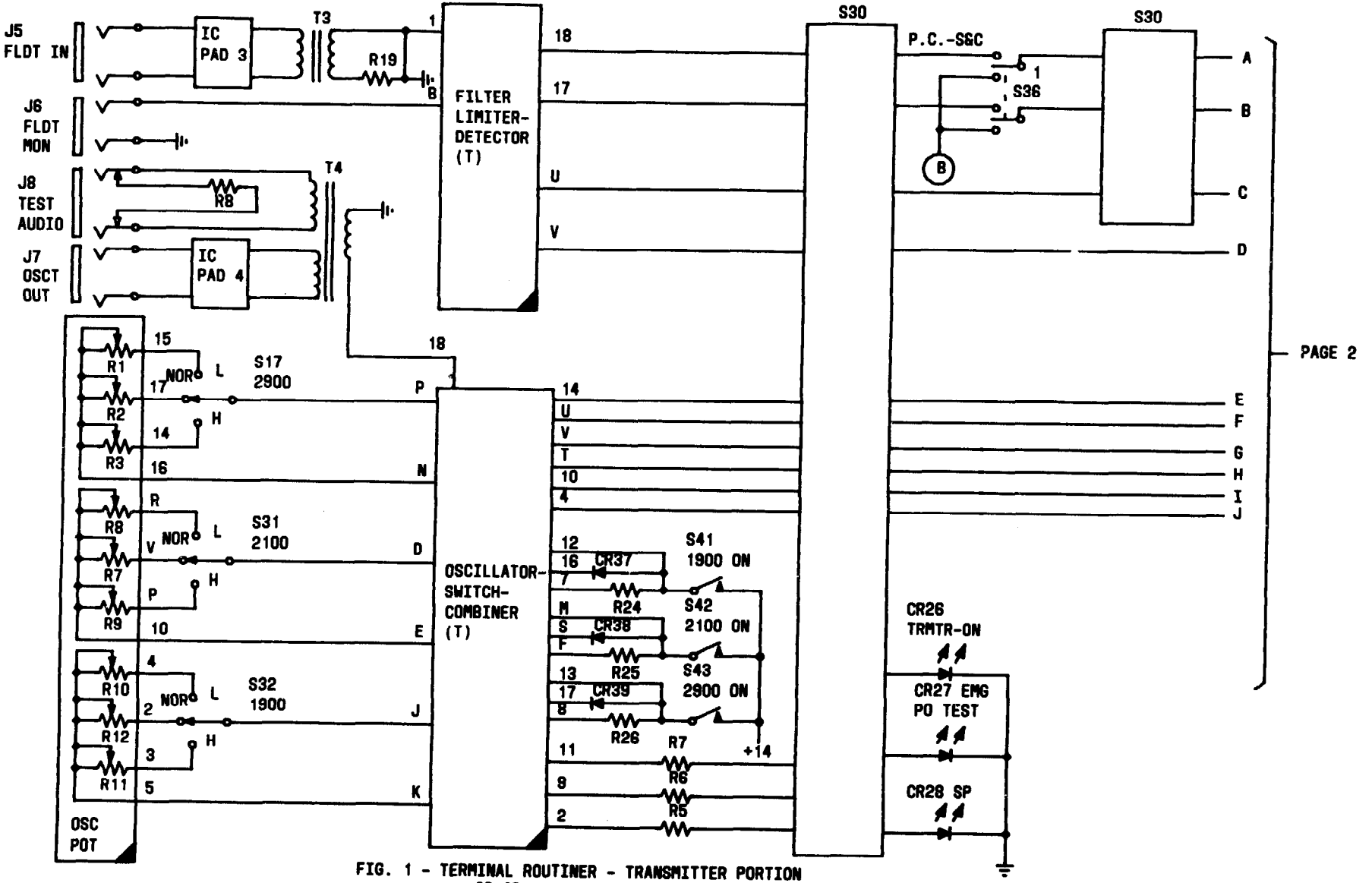


FIG. 1 - TERMINAL ROUTINER - TRANSMITTER PORTION
SD-2R111

ROUTINER TEST SET CIRCUITS

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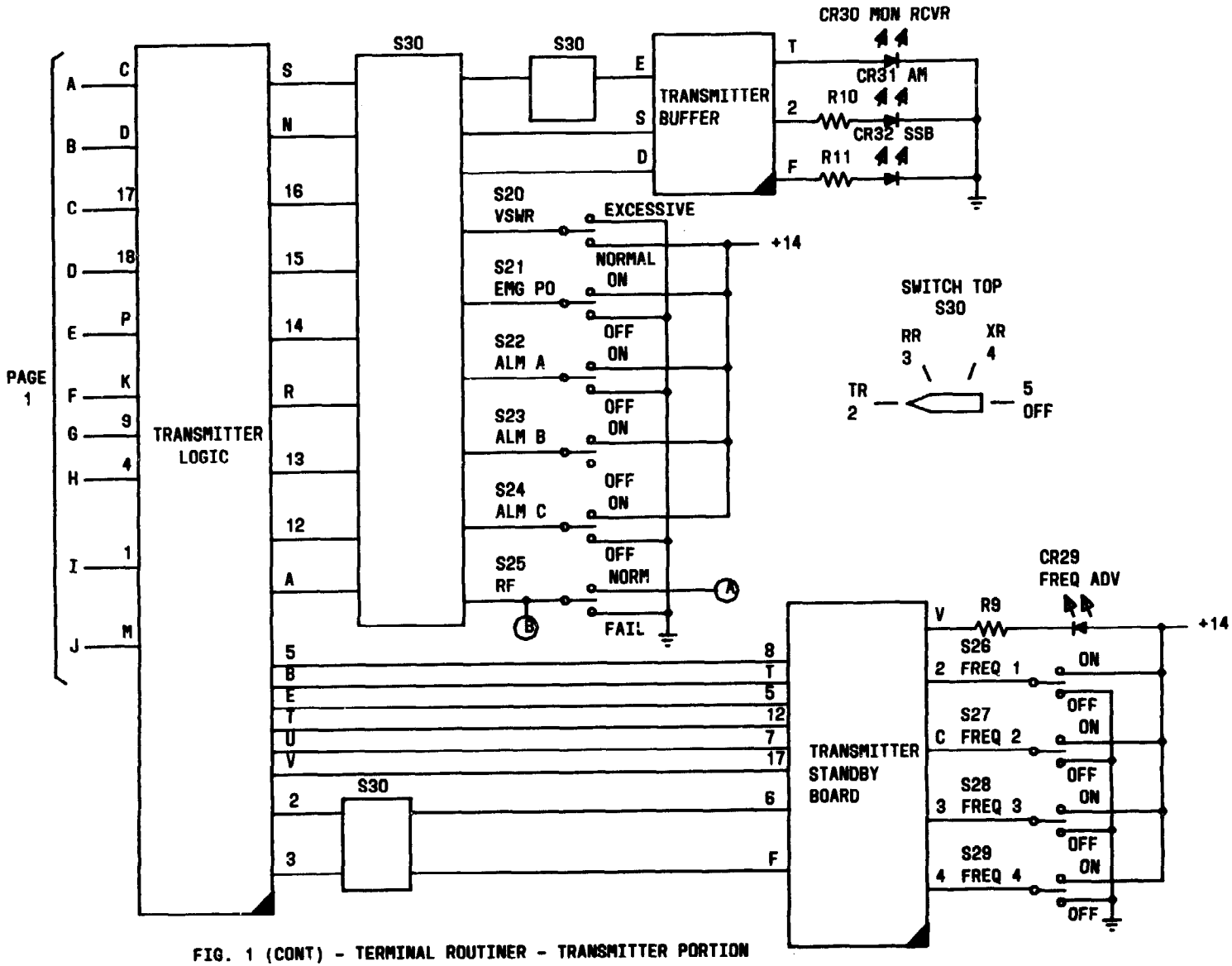

FIG. 1 (CONT) - TERMINAL ROUTINER - TRANSMITTER PORTION
SD-2R111

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ROUTINER TEST SET CIRCUITS

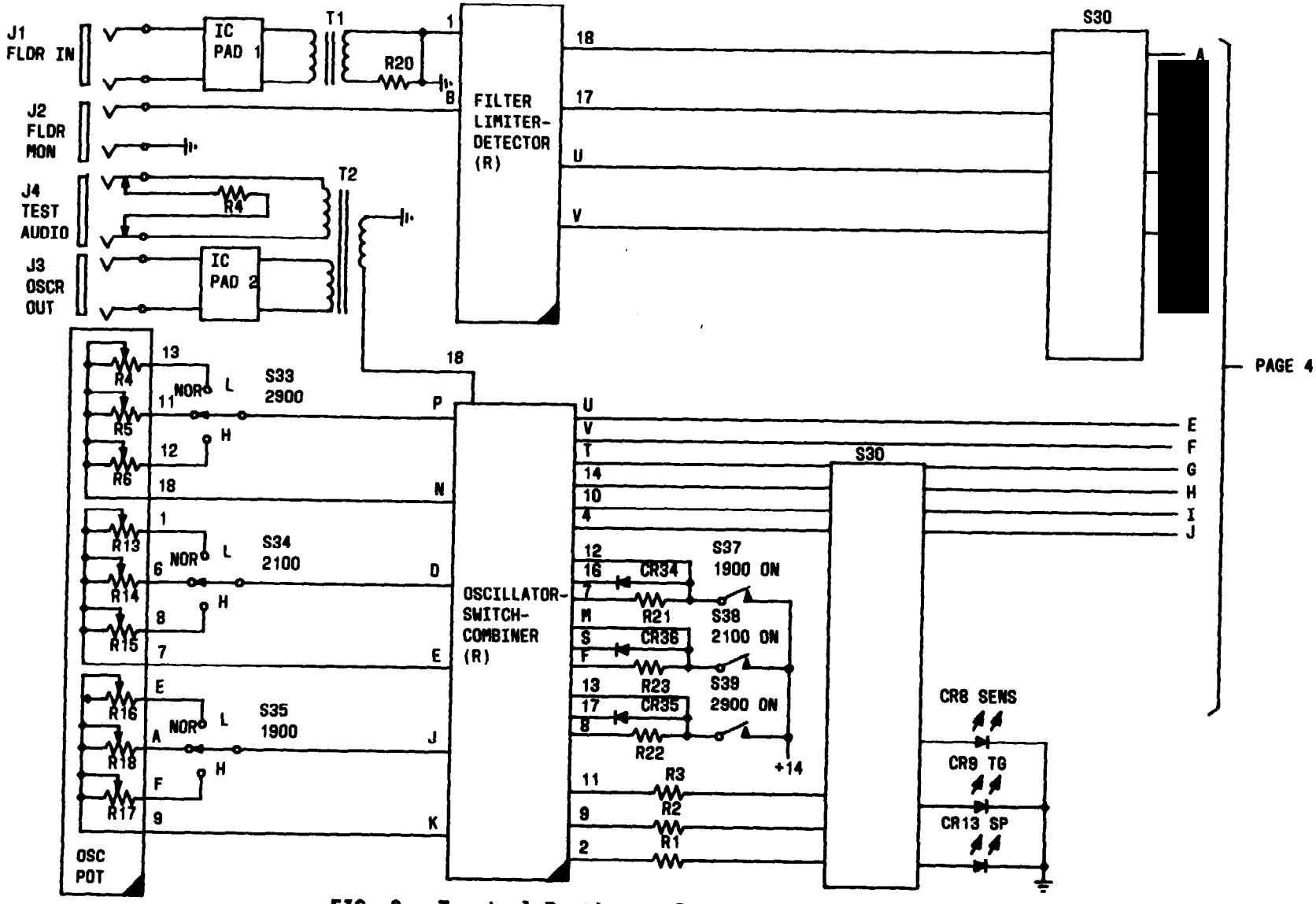

FIG. 2 - Terminal Routiner – Receiver Portion
SD-2R111

ROUTINER TEST SET CIRCUITS

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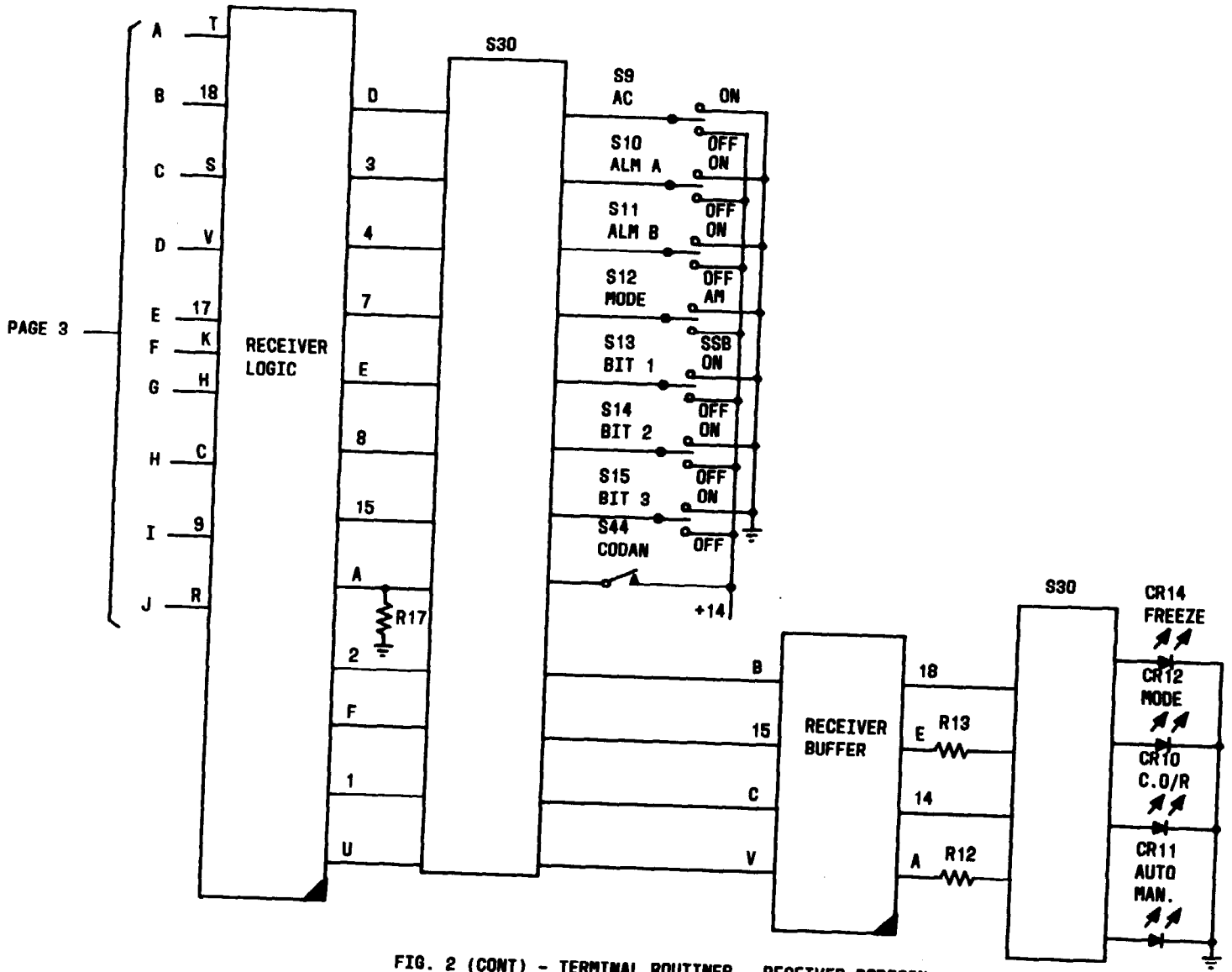

FIG. 2 (CONT) - TERMINAL ROUTINER - RECEIVER PORTION
SD-2R111

ROUTINER TEST SET CIRCUITS

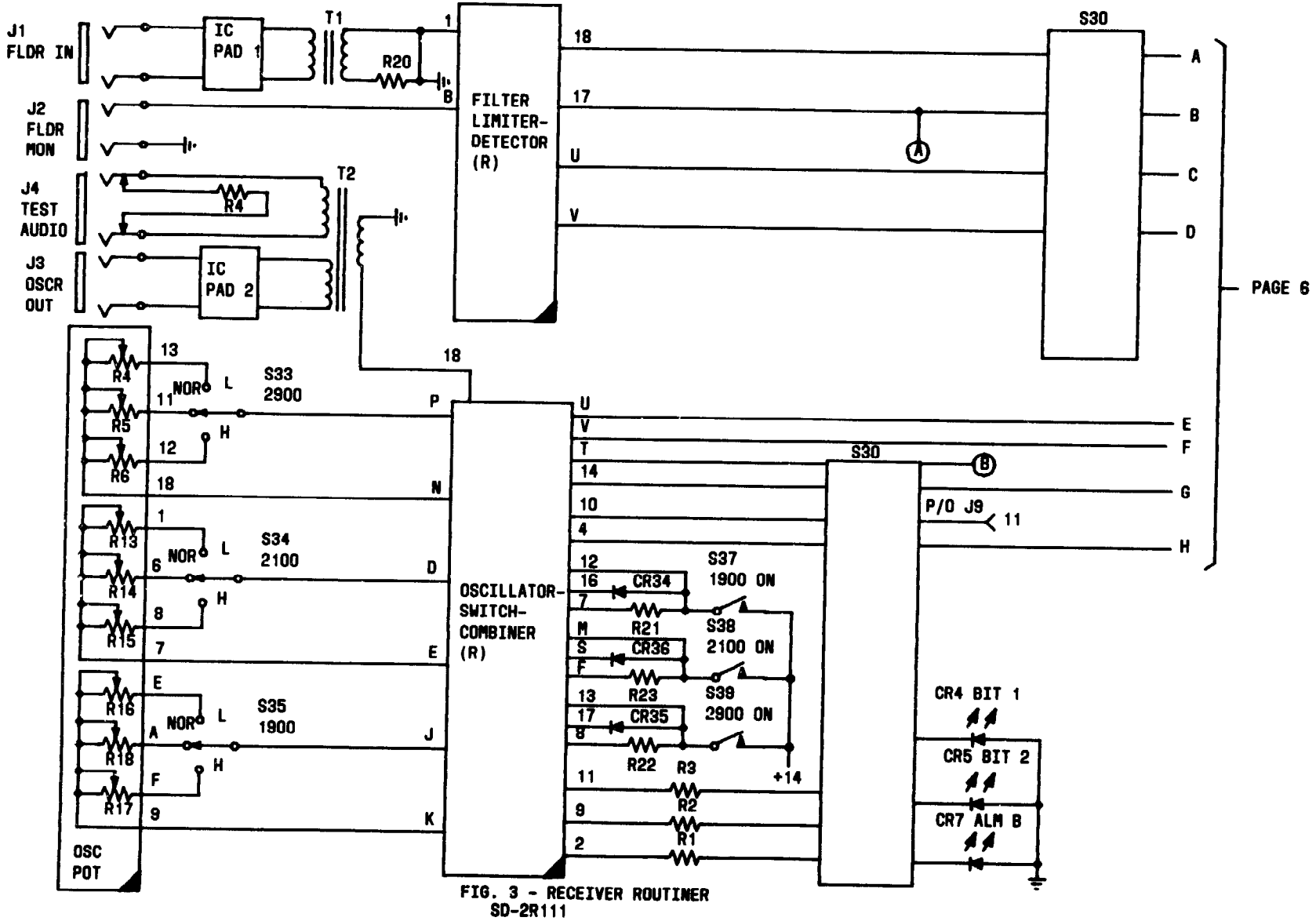

FIG. 3 - RECEIVER ROUTINER
SD-2R111

ROUTINER TEST SET CIRCUITS

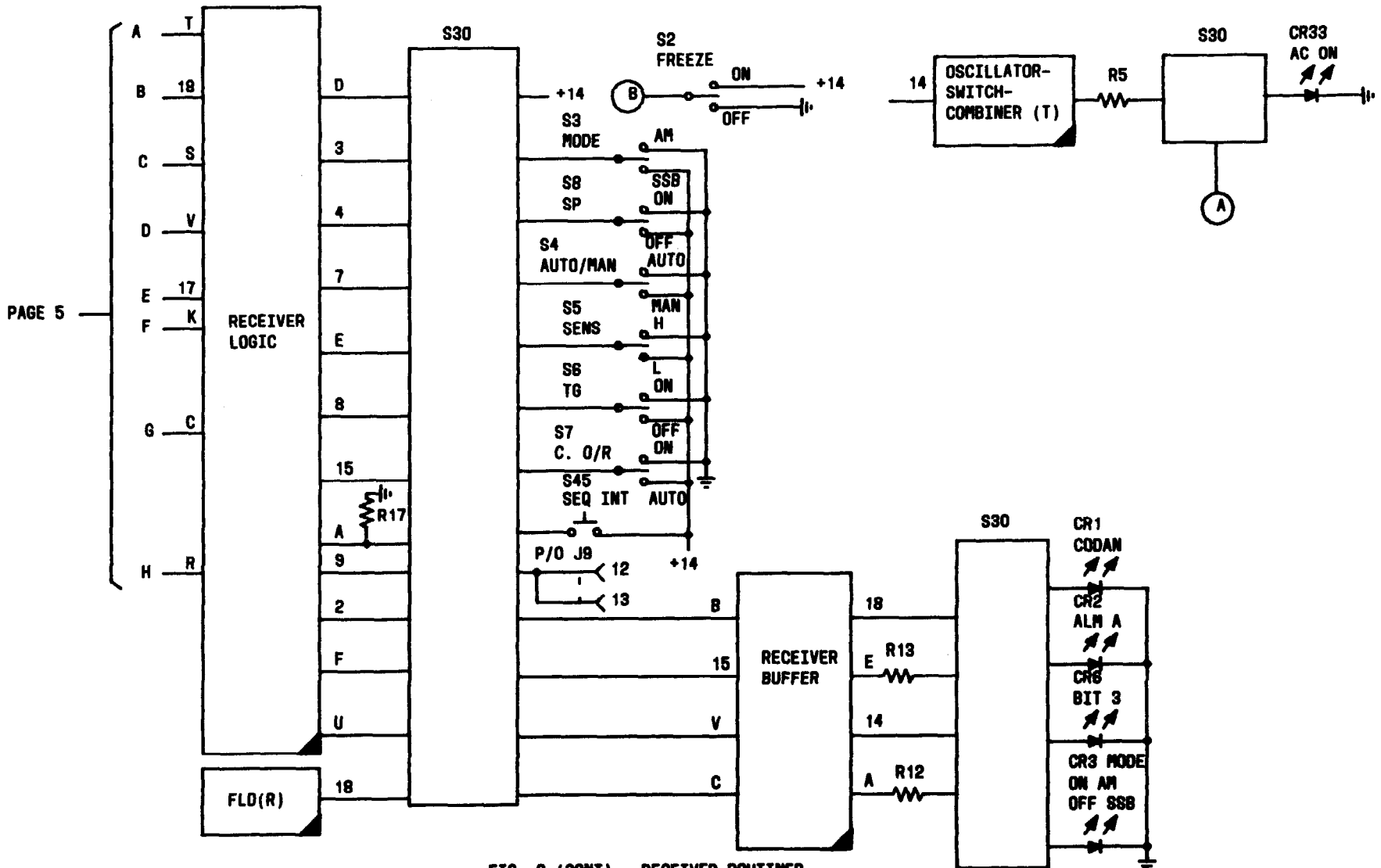

FIG. 3 (CONT) - RECEIVER ROUTINER
SD-2R111

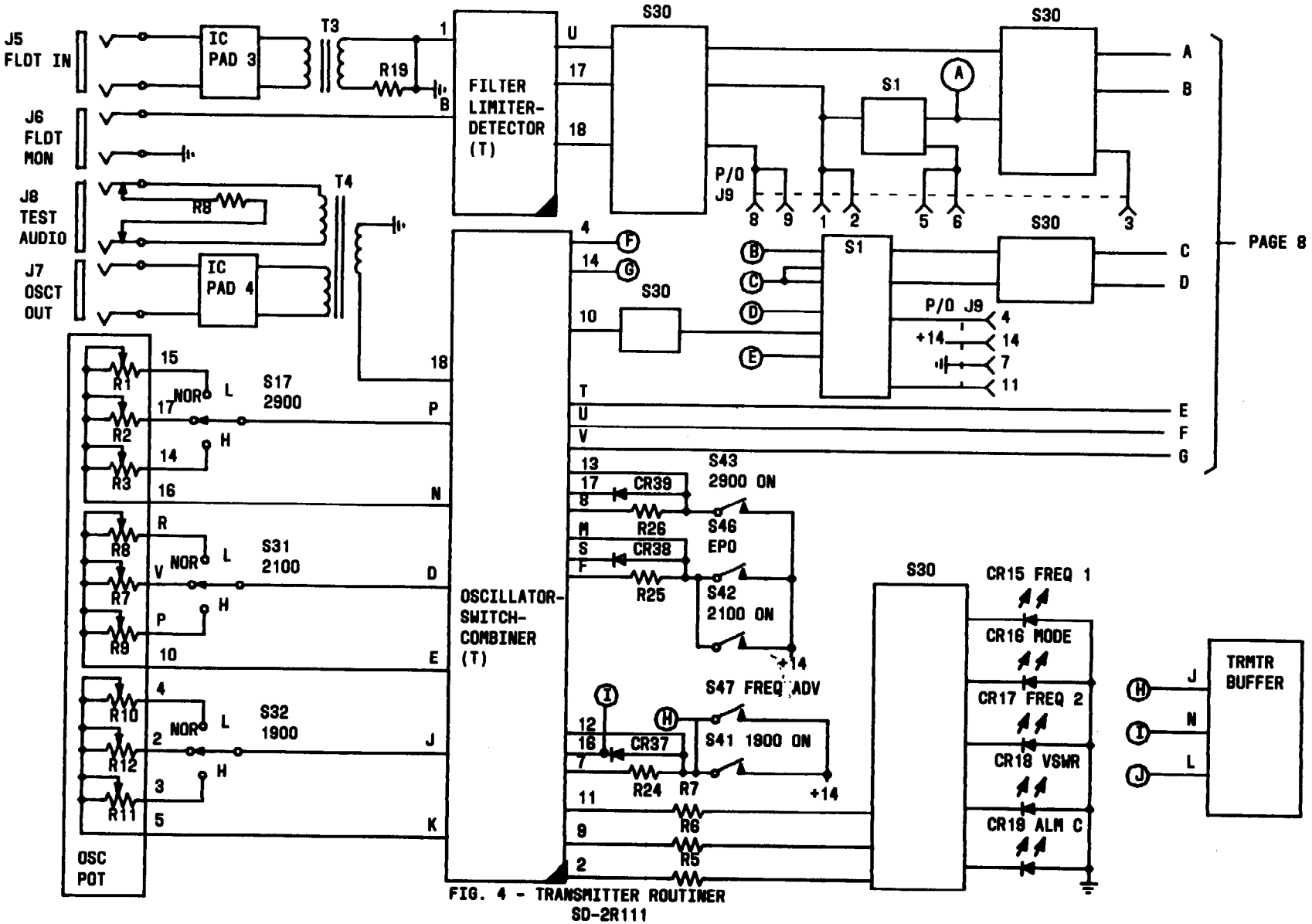

FIG. 4 - TRANSMITTER ROUTINER
SD-2R111

ROUTINER TEST SET CIRCUITS

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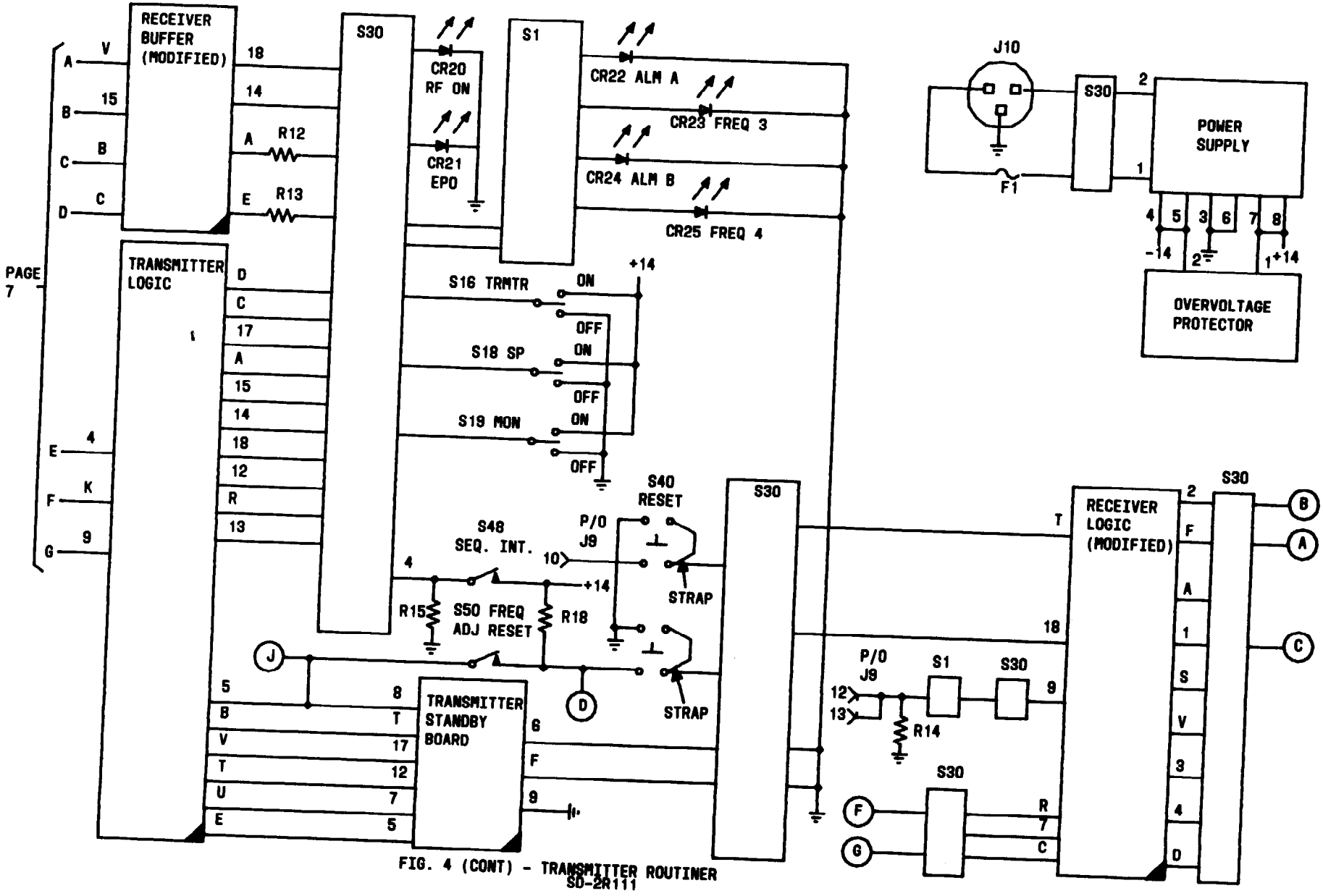


FIG. 4 (CONT) - TRANSMITTER ROUTINER SD-2R111

ROUTINER TEST SET CIRCUITS

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]

AND → TEST CONNECTIONS COMPLETE → PAGE 2

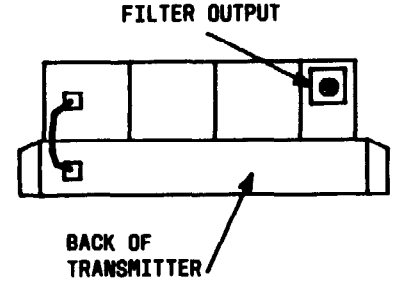
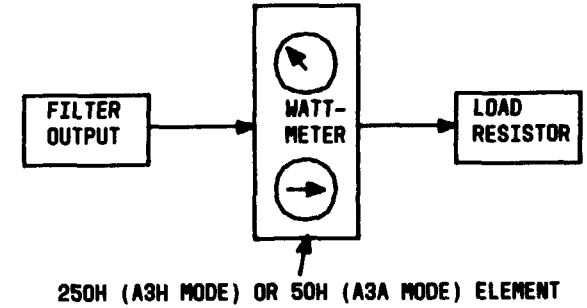


FIG. 1

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



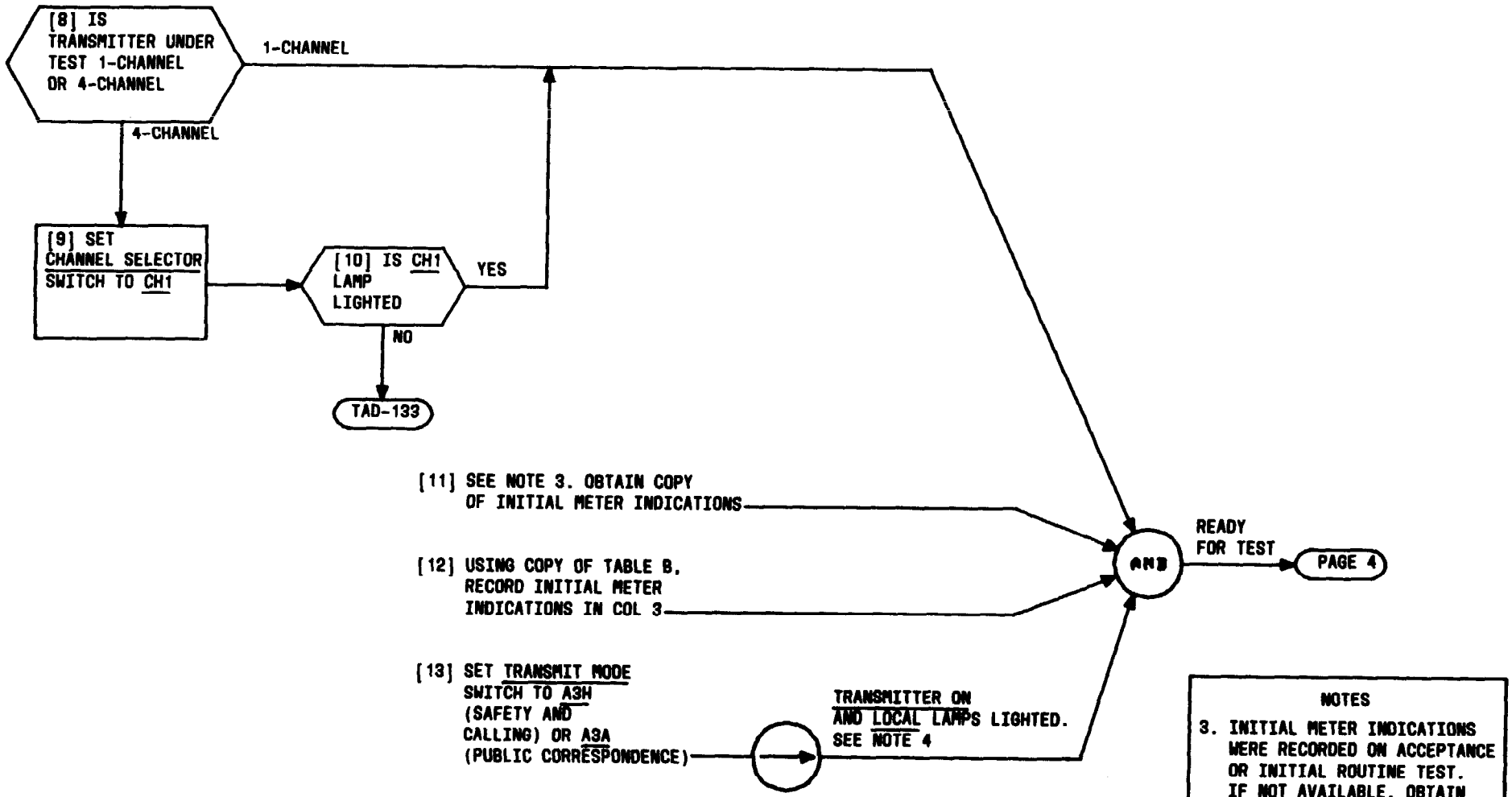
250H (A3H MODE) OR 50H (A3A MODE) ELEMENT

FIG. 2

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



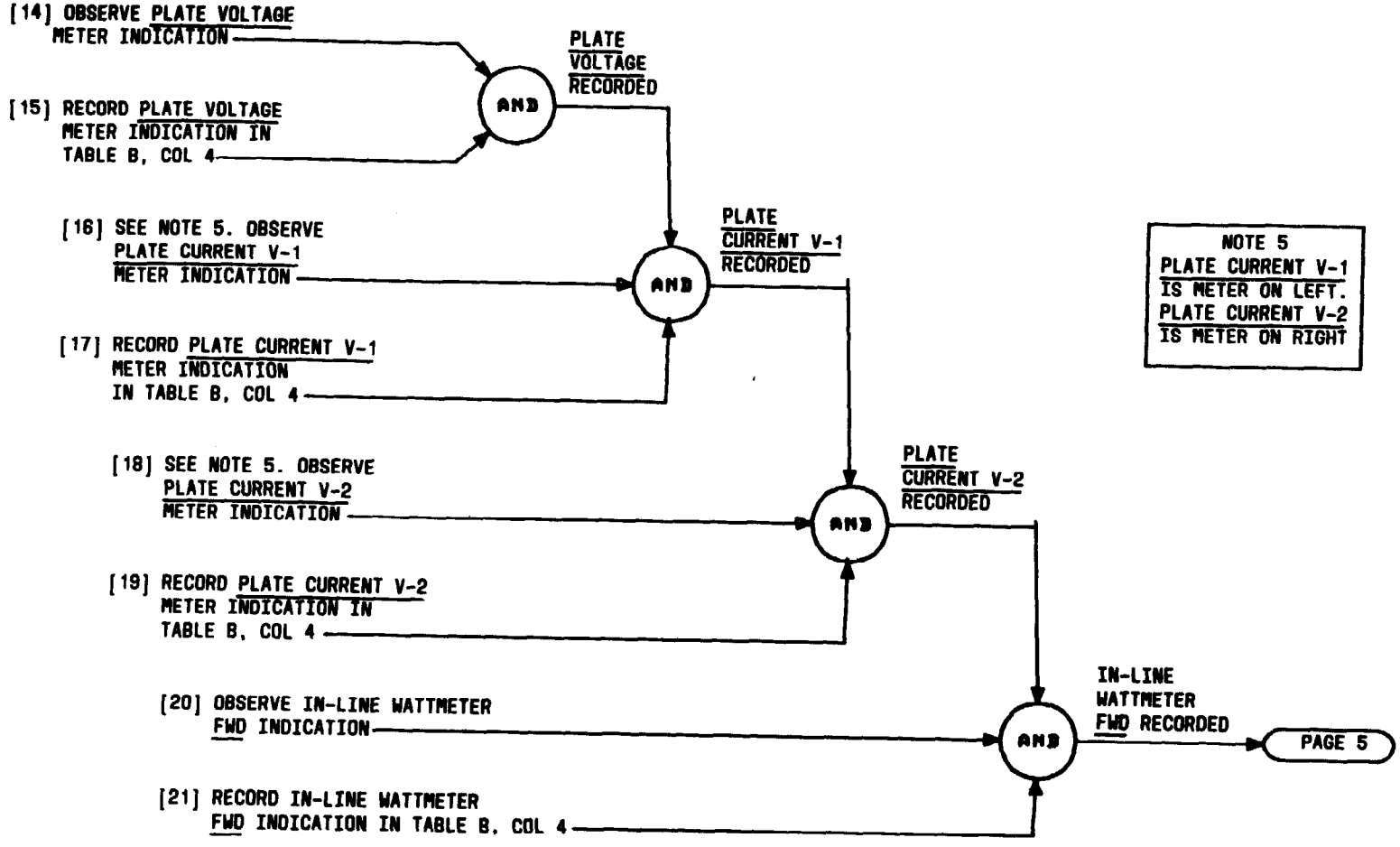
NOTES

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

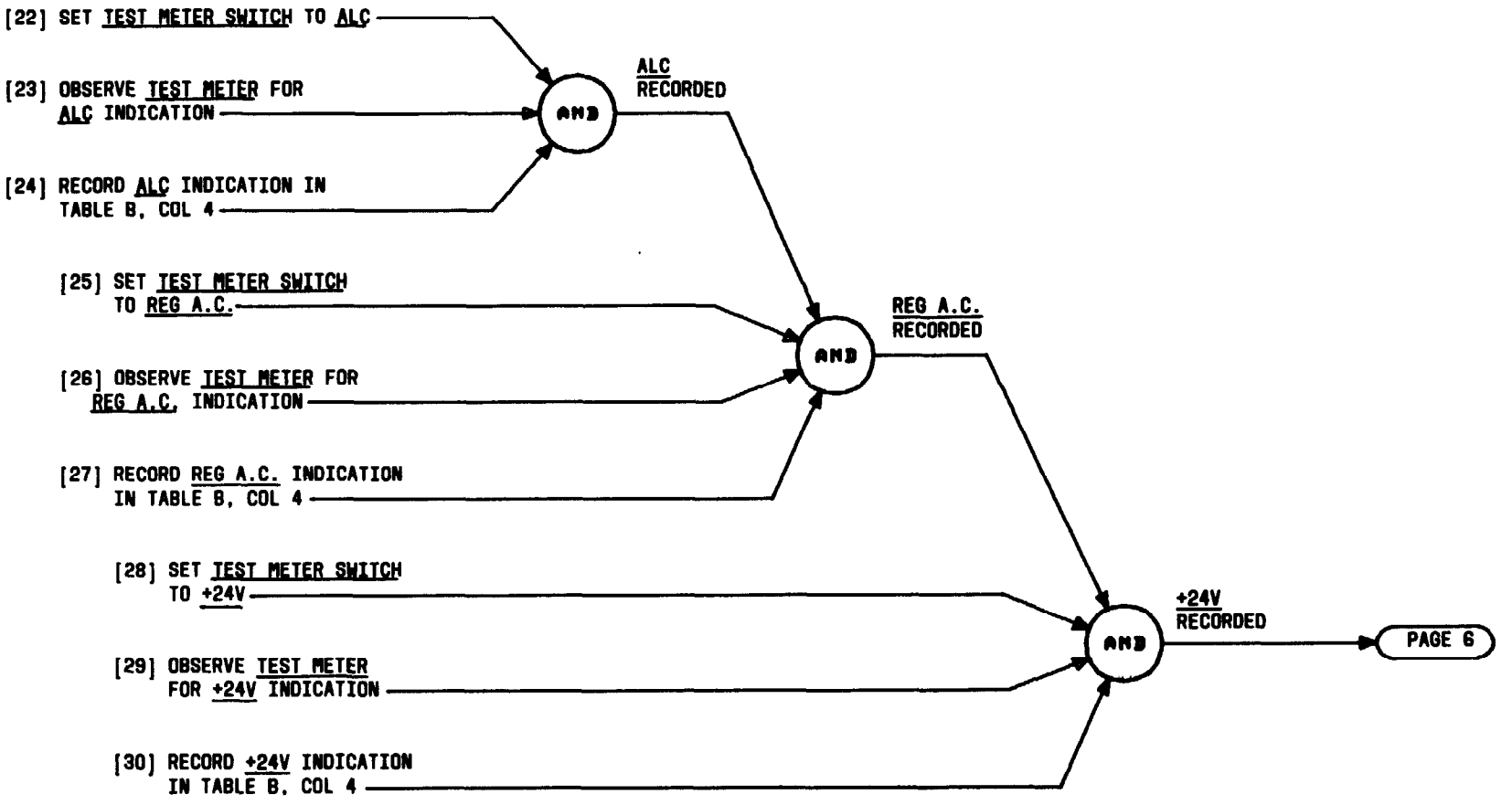
CHECK TRANSMITTER METER INDICATIONS

TABLE B					
FUNCTION 1		METER FULL SCALE 2	INITIAL INDICATIONS 3	PRESENT INDICATIONS 4	COLUMN 4 DIVIDED BY COLUMN 3 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			

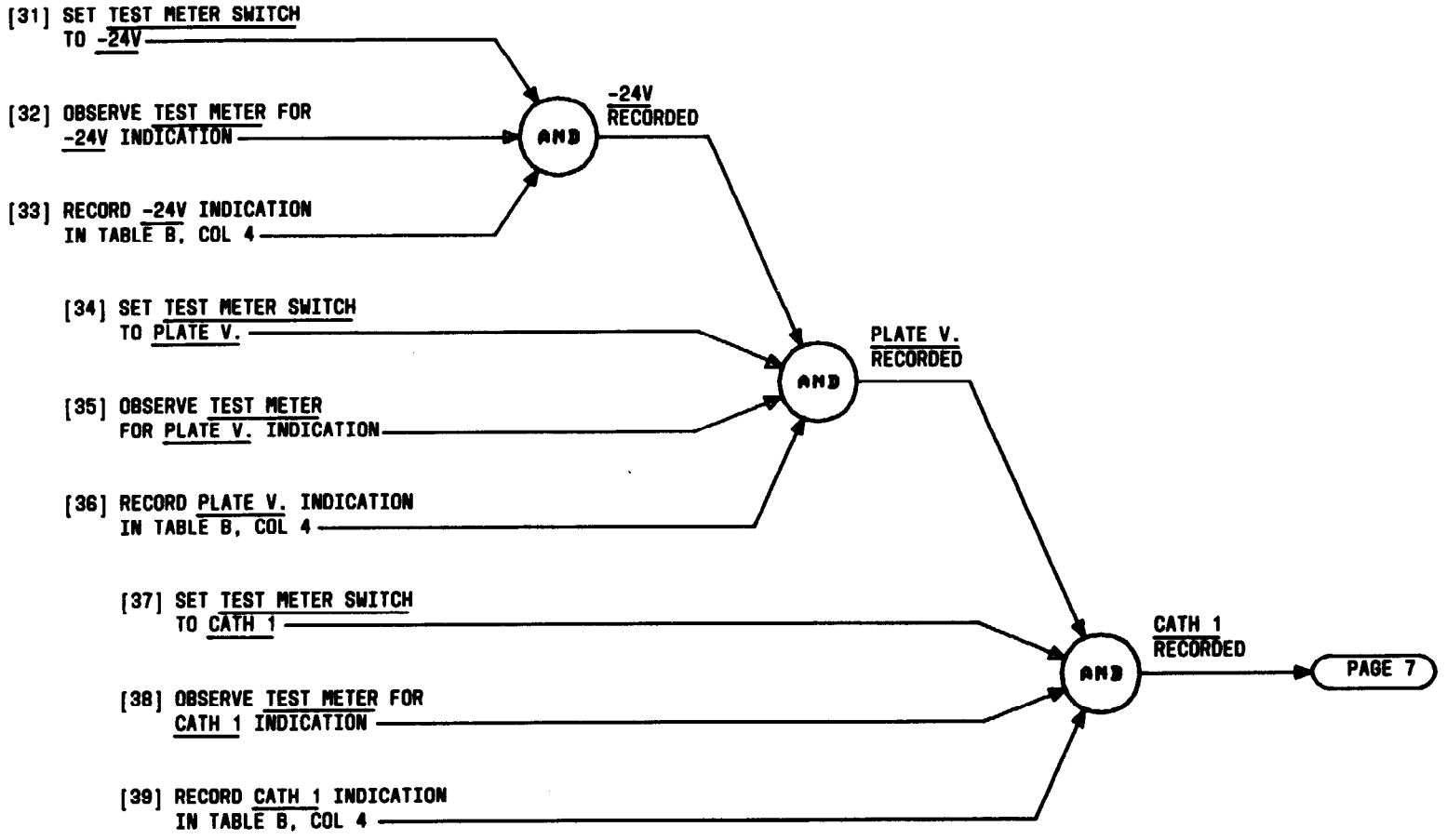
CHECK TRANSMITTER METER INDICATIONS



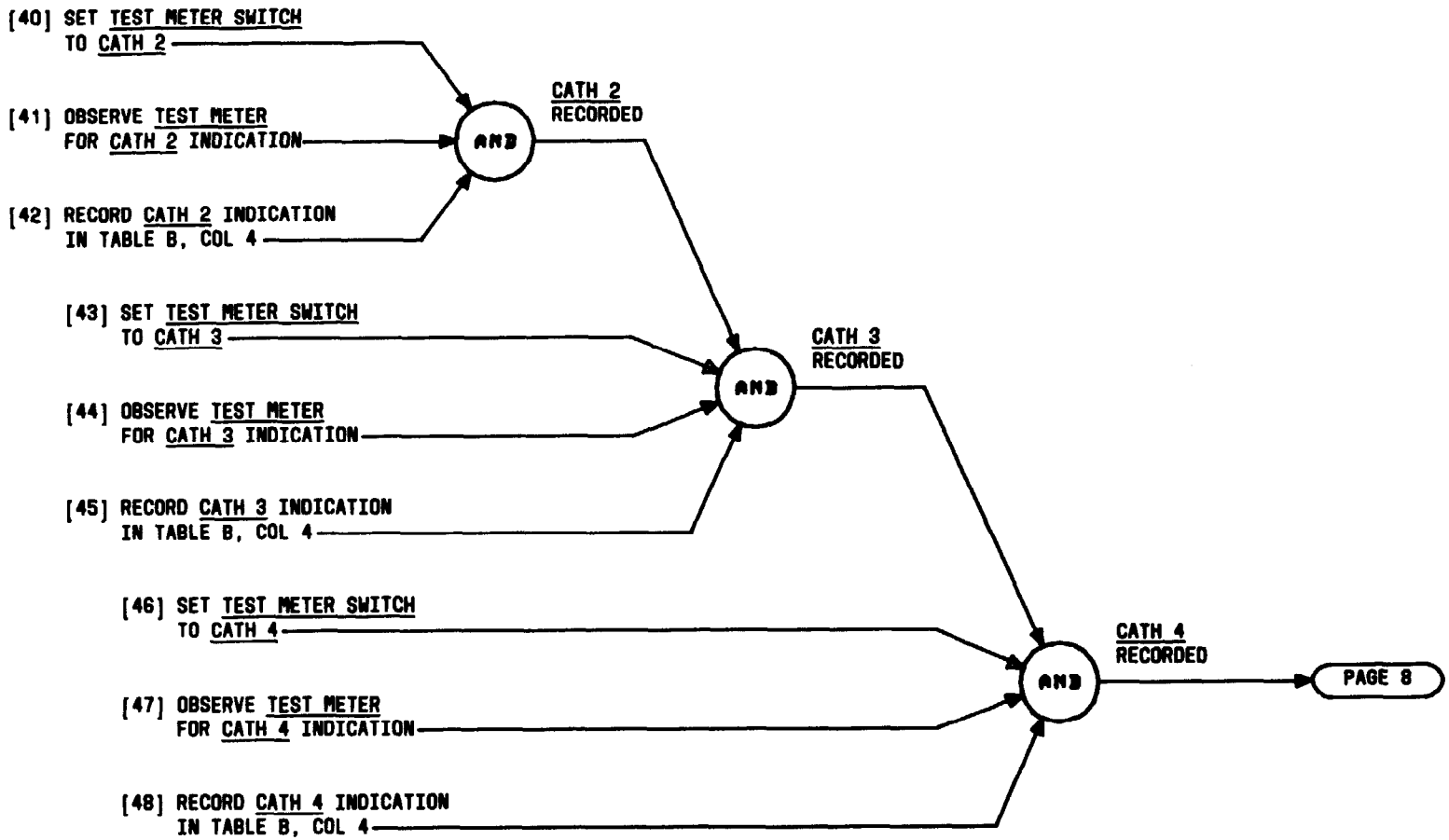
CHECK TRANSMITTER METER INDICATIONS



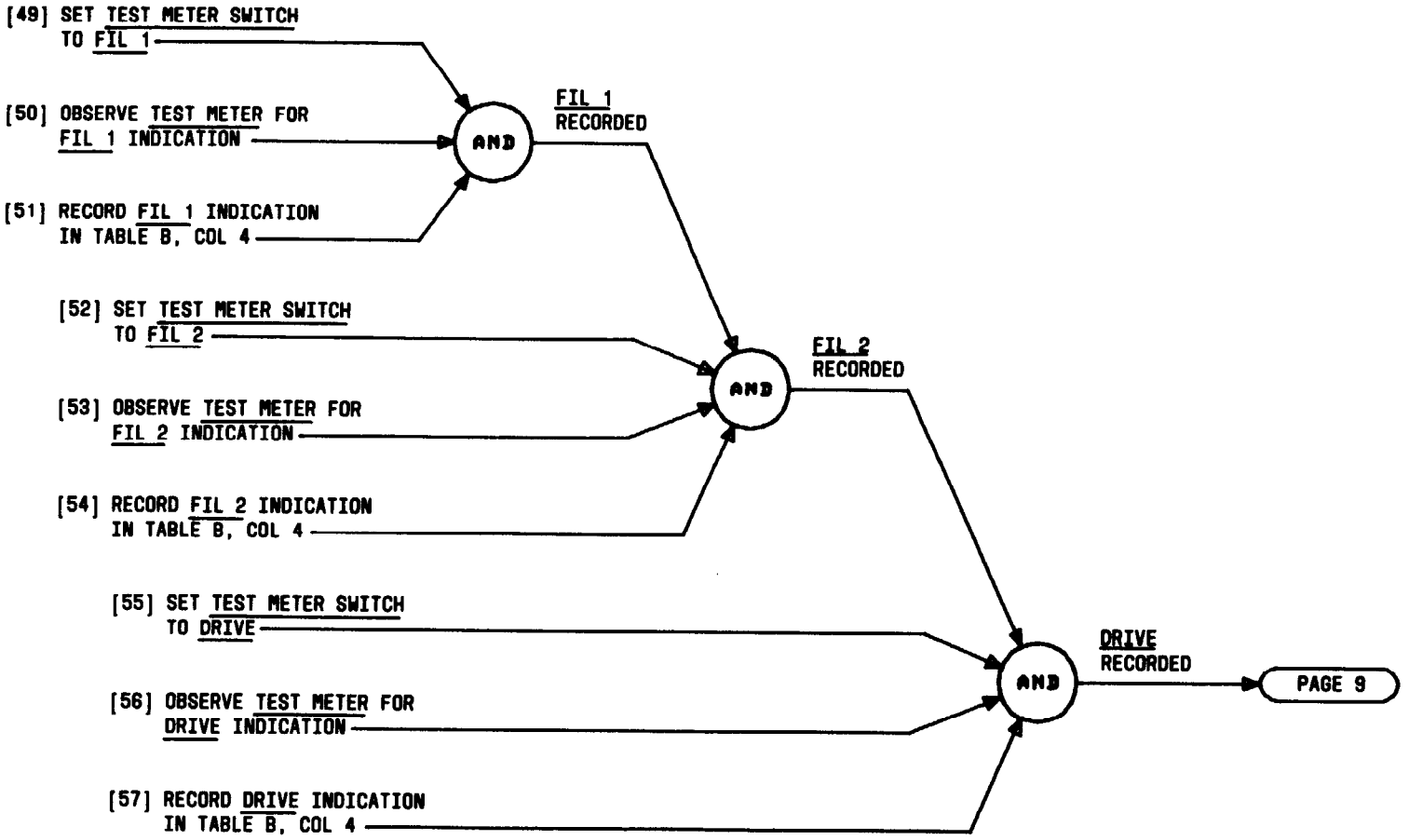
CHECK TRANSMITTER METER INDICATIONS



CHECK TRANSMITTER METER INDICATIONS



CHECK TRANSMITTER METER INDICATIONS



CHECK TRANSMITTER METER INDICATIONS

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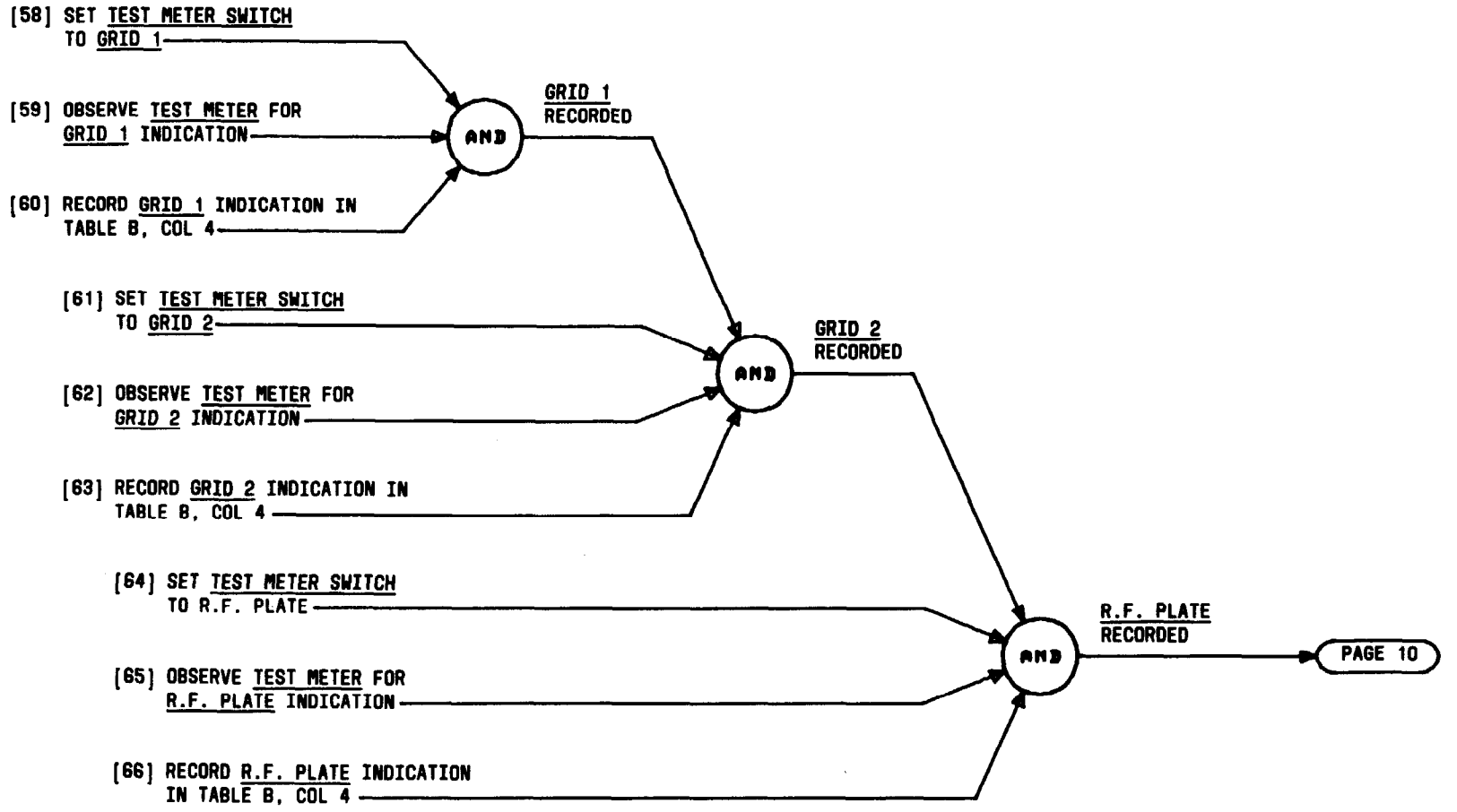
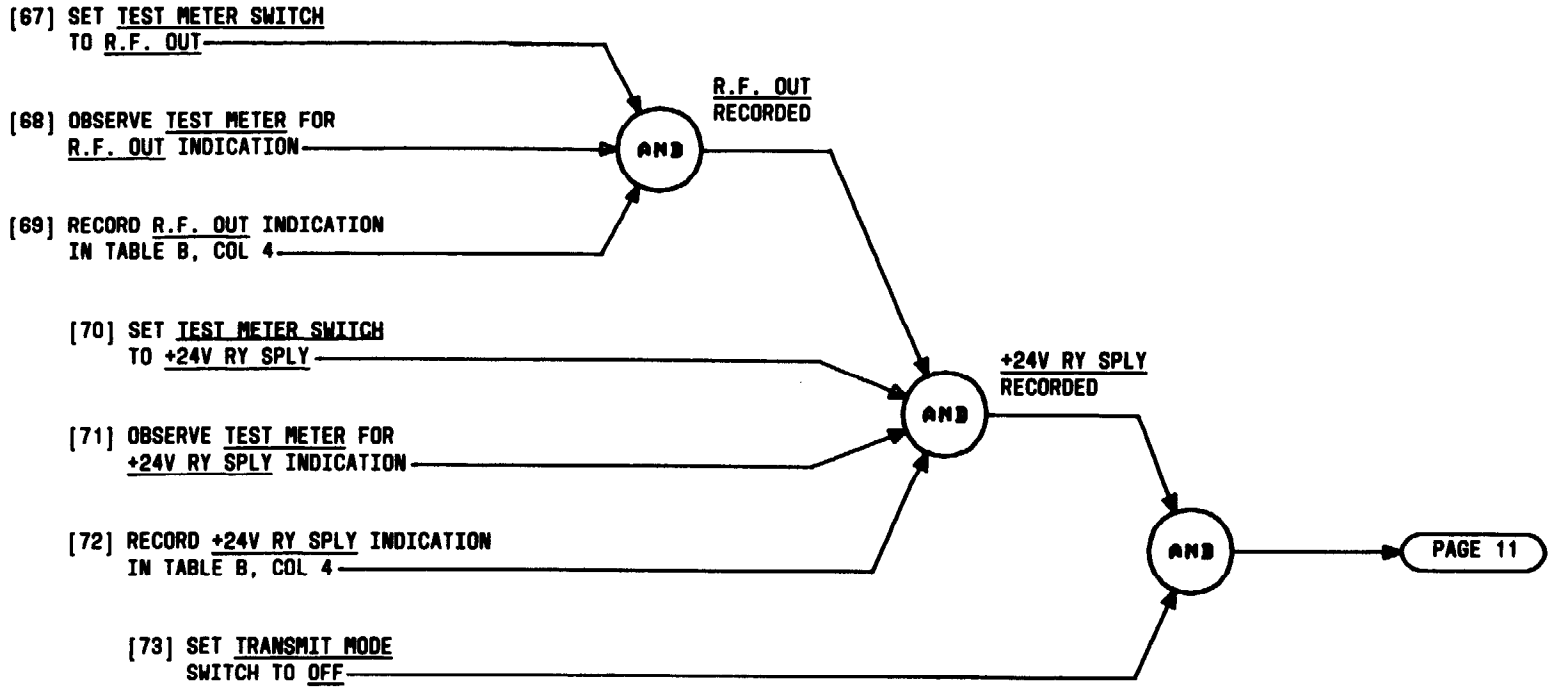
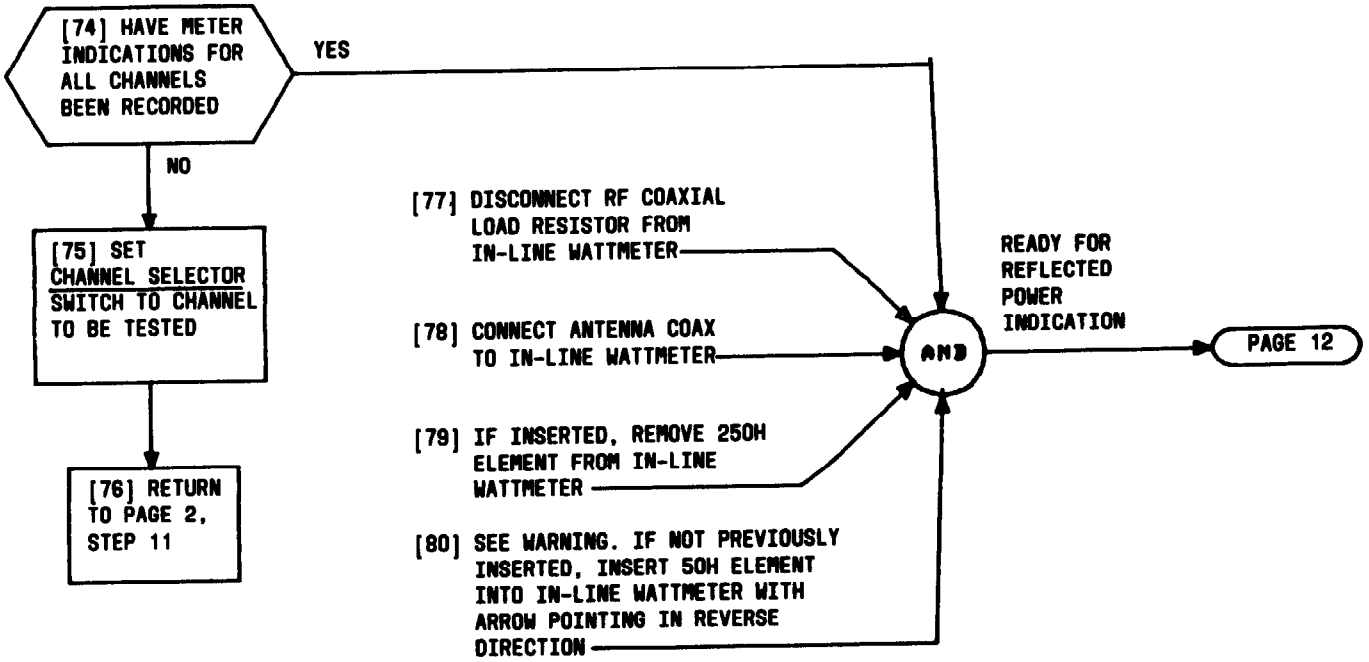


CHECK TRANSMITTER METER INDICATIONS



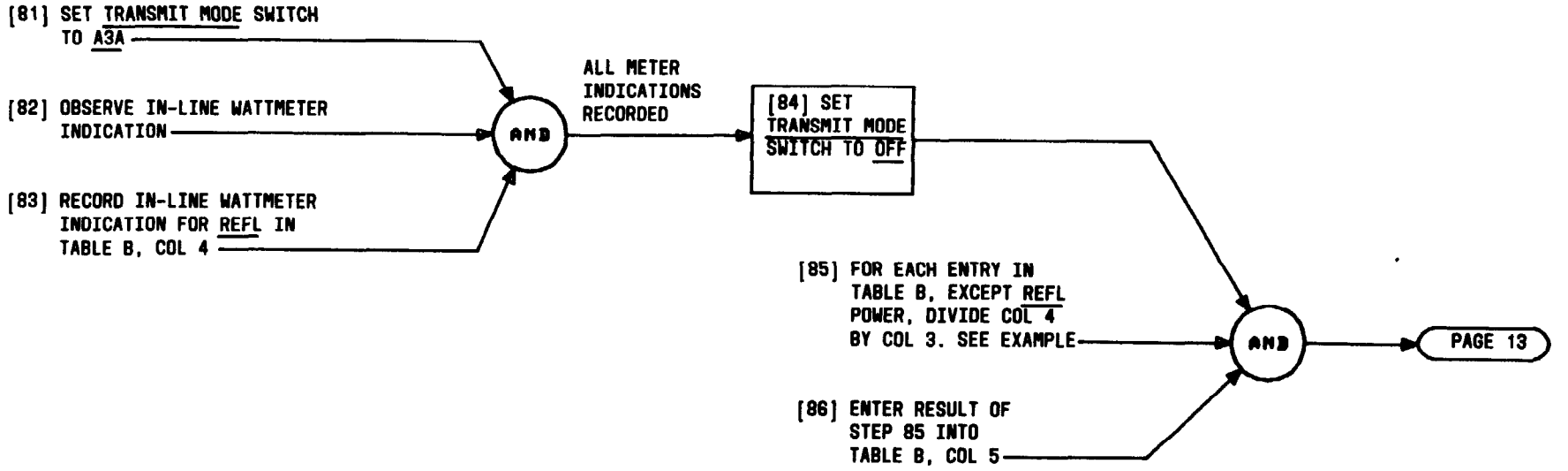
CHECK TRANSMITTER METER TRANSMISSIONS



WARNING

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

CHECK TRANSMITTER METER INDICATIONS



EXAMPLE

PLATE VOLTAGE COLUMN 4 = 2030

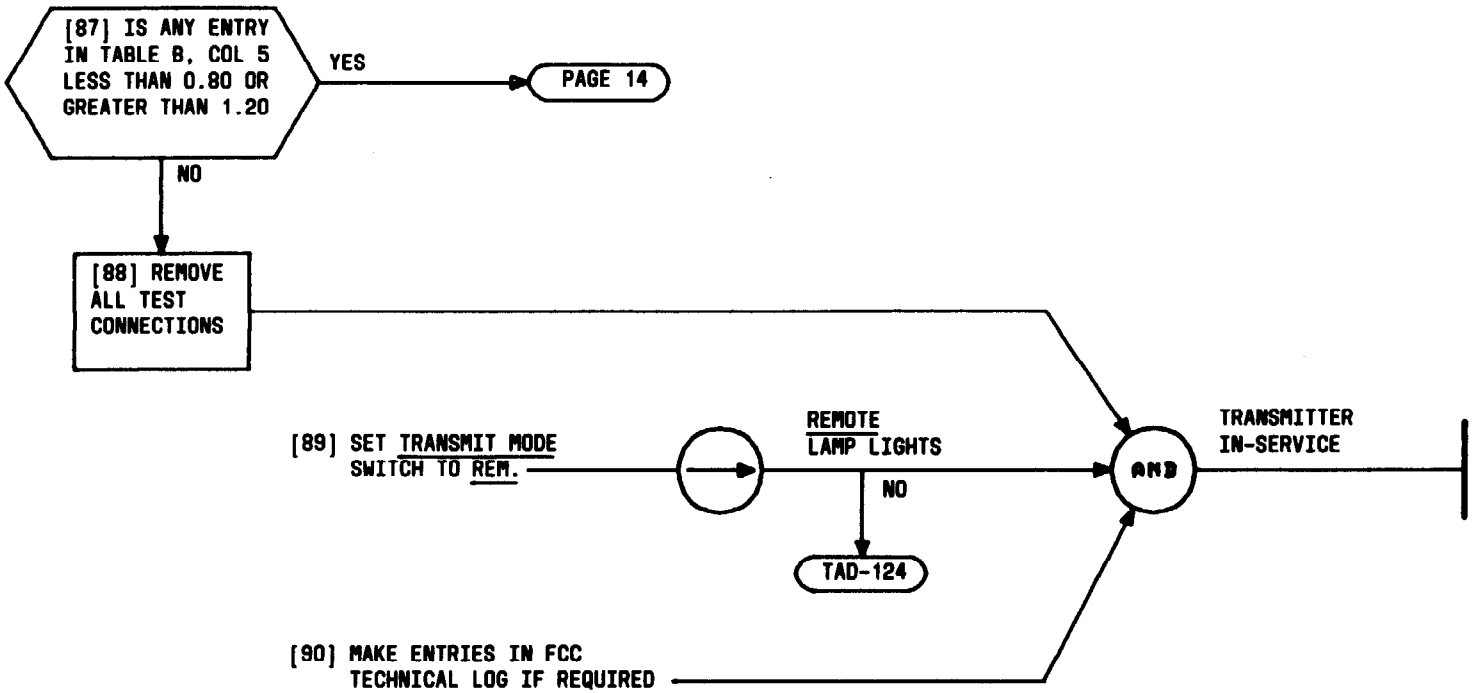
DIVIDE BY

PLATE VOLTAGE COLUMN 3 = 2070

RESULT 0.98

ENTER INTO COLUMN 5

CHECK TRANSMITTER METER INDICATIONS



CHECK TRANSMITTER METER INDICATIONS

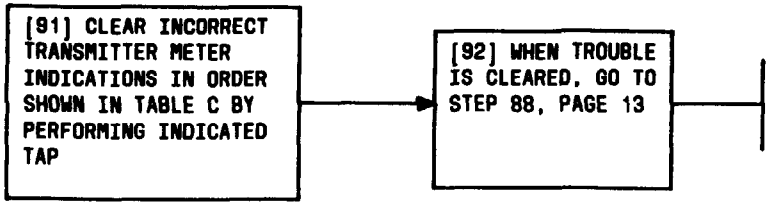
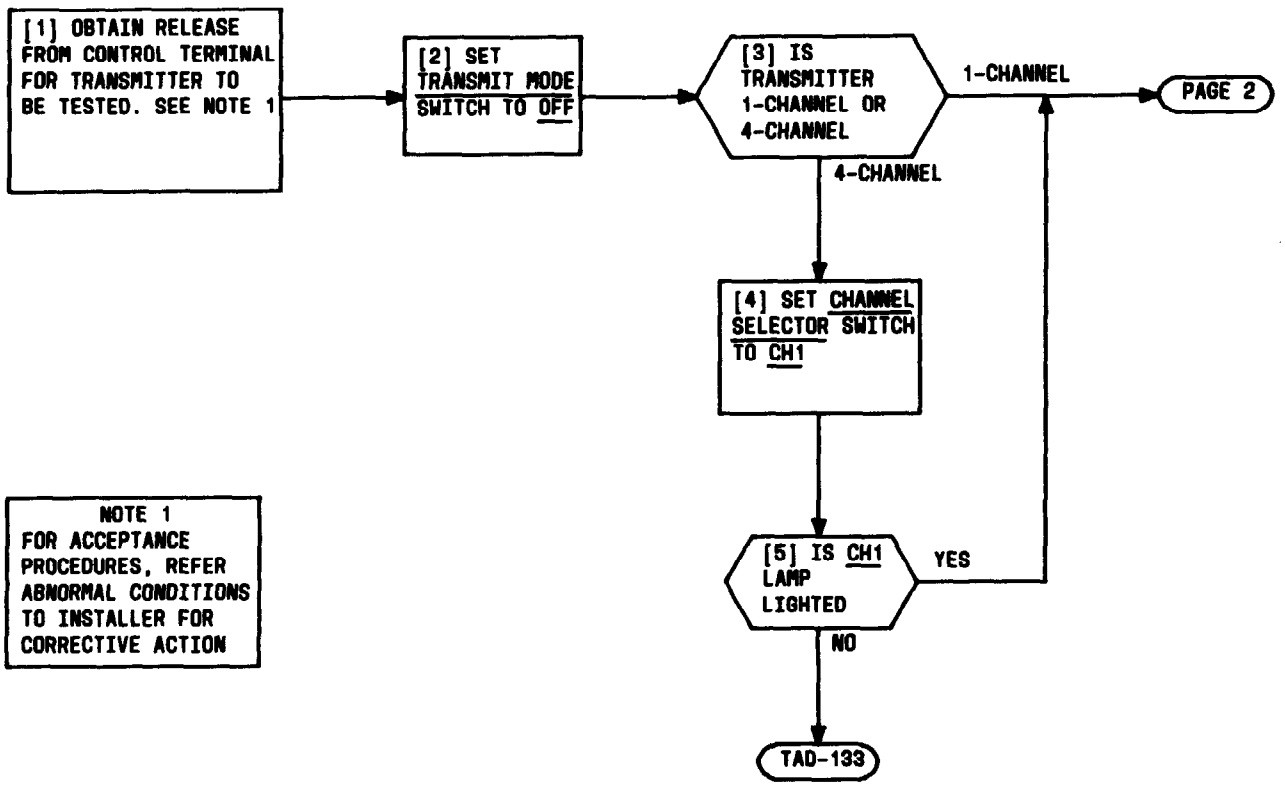


TABLE C	
INCORRECT METER INDICATIONS	CORRECTIVE ACTION TAP
1. REG A.C.	TAP-120
2. -24V AND +24V	TAP-117
3. +24V RY SPLY	TAP-123
4. PLATE V	TAP-125
5. CATH 1, 2, 3, AND 4	TAP-125
6. DRIVE	TAP-126
7. FIL 1 AND 2	TAP-126
8. GRID 1 AND 2	TAP-126
9. PLATE CURRENT 1 AND 2	TAP-126
10. PLATE VOLTAGE	TAP-126
11. ALC	TAP-129
12. RF PLATE	TAP-126
13. RF OUT	TAP-126
14. WATTMETER FWD	TAP-126
15. WATTMETER REFL	TAP-126

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

[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

AND

TEST SETUP COMPLETE

AND

TRANSMITTER ON

PAGE 3

TRANSMITTER ON LAMP AND LOCAL LAMP LIGHT. SEE NOTE 2

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

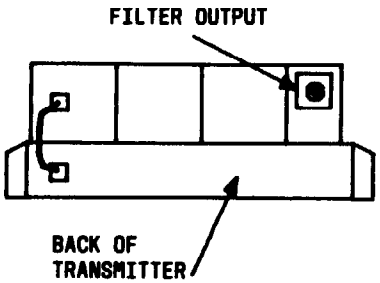


FIG. 1

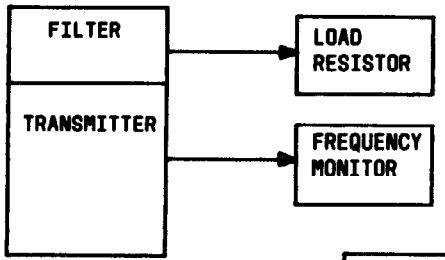


FIG. 2

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

MEASURE TRANSMITTER FREQUENCY

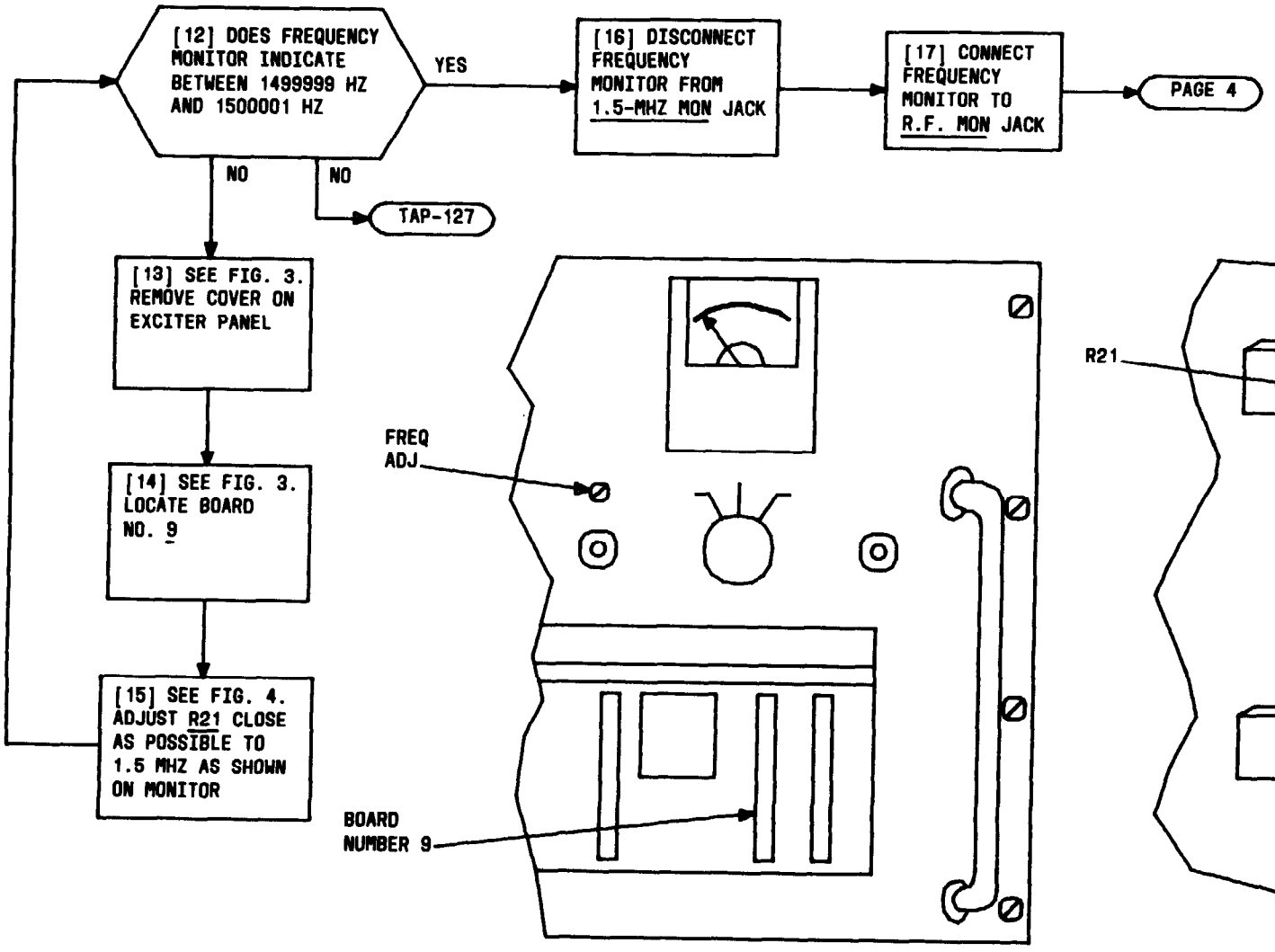


FIG. 3

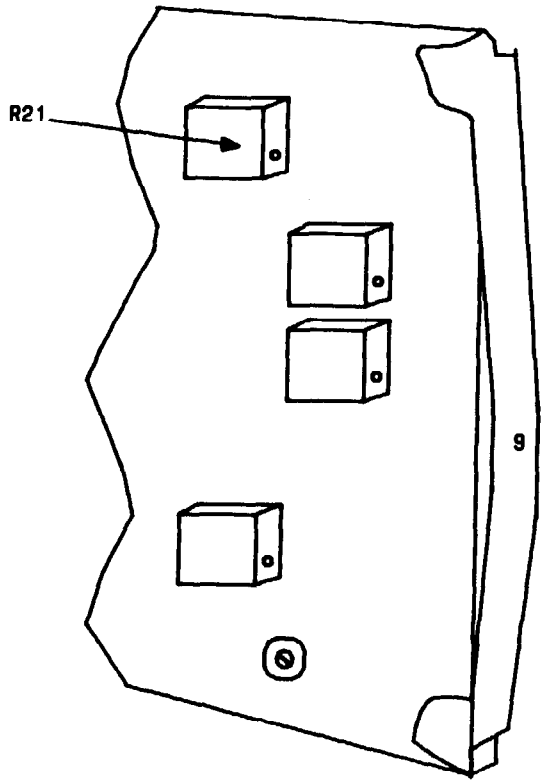


FIG. 4

MEASURE TRANSMITTER FREQUENCY

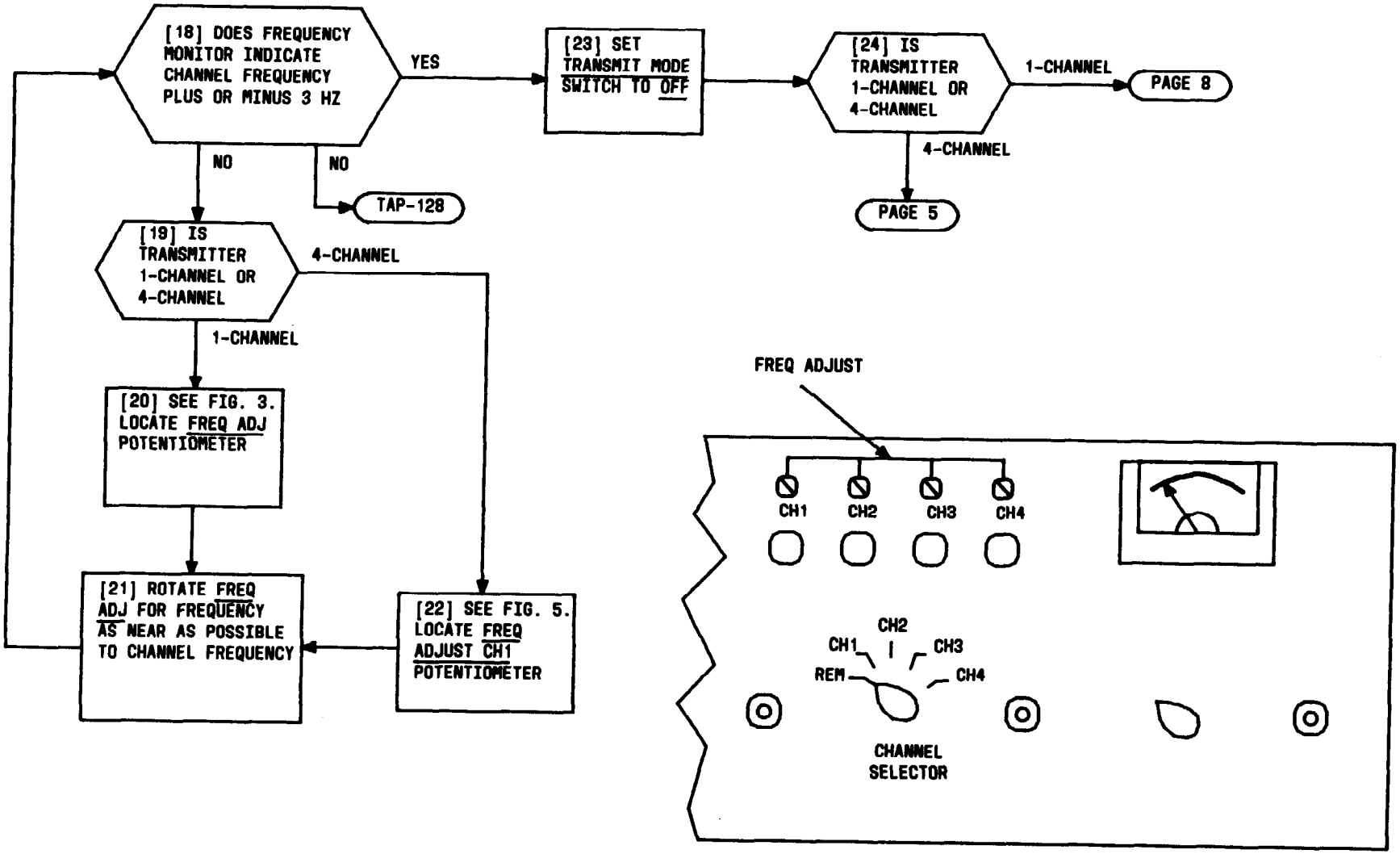
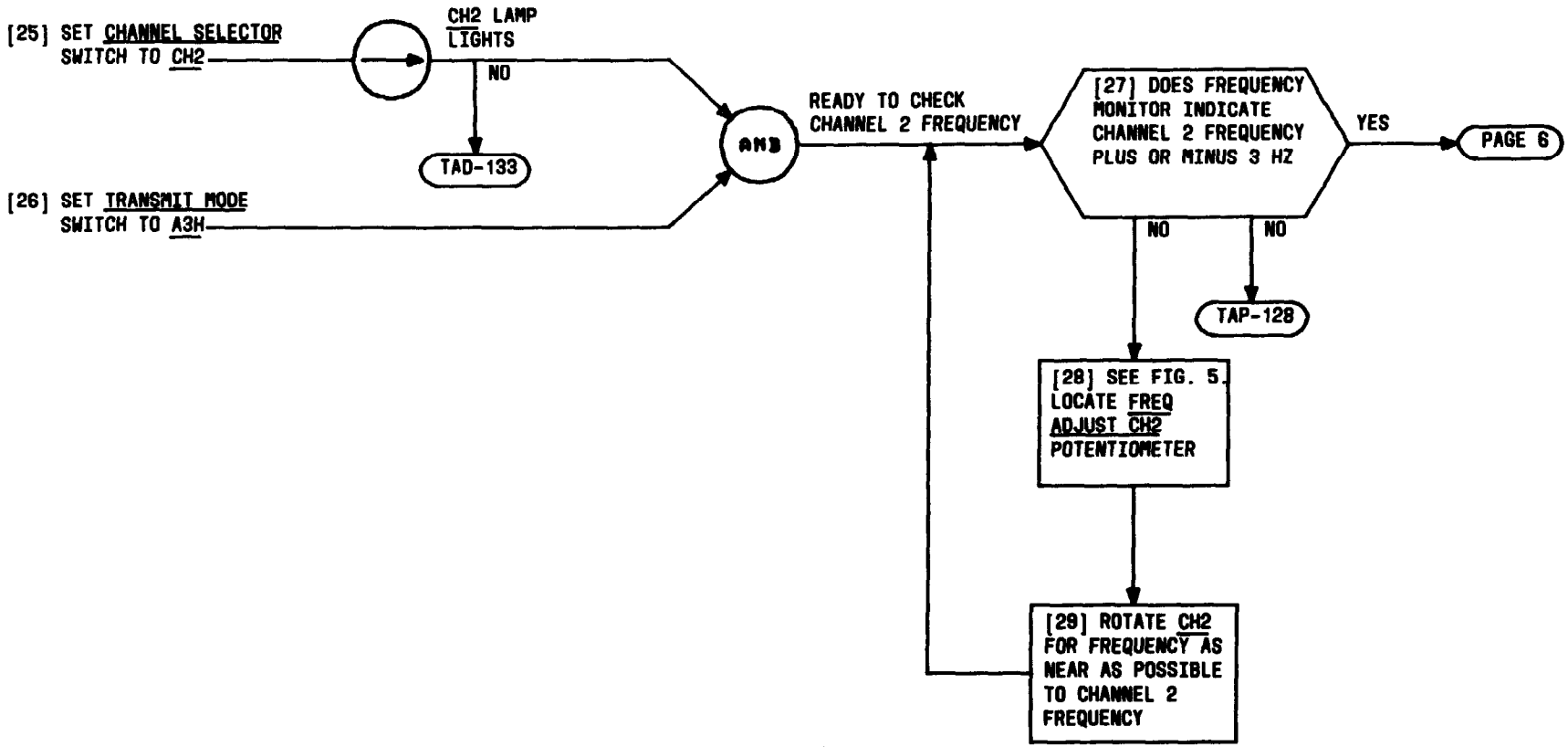
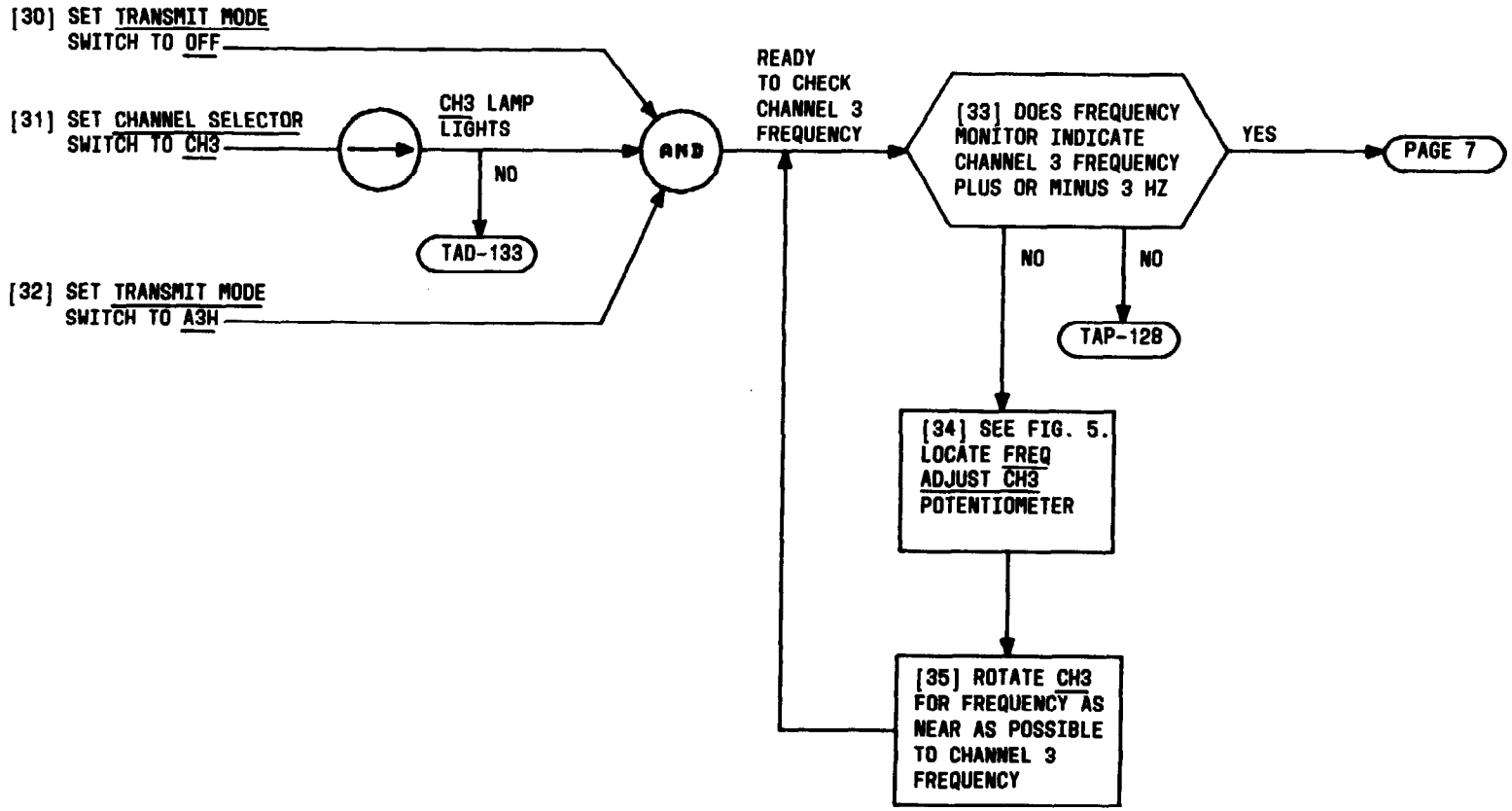


FIG. 5

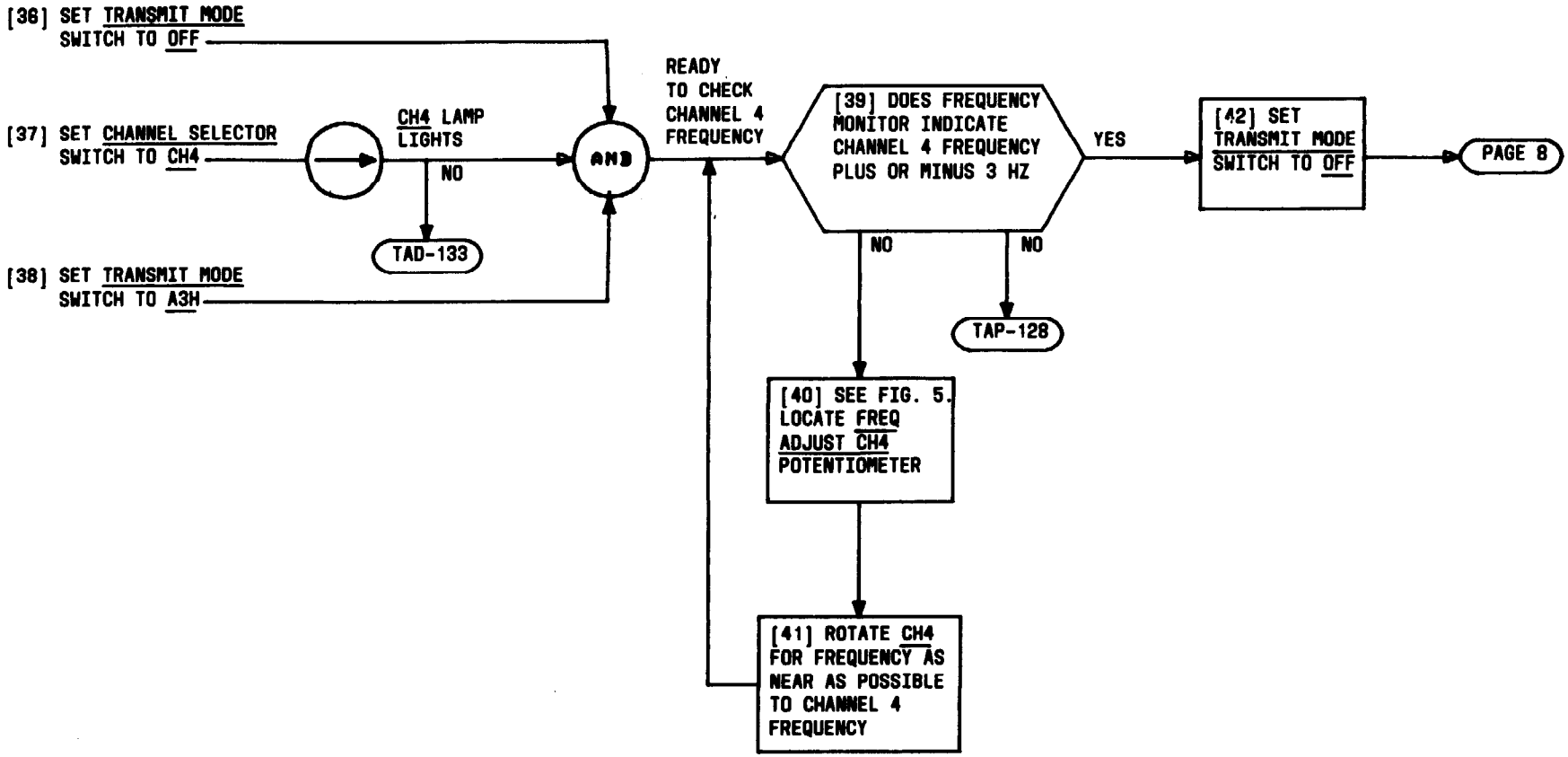
MEASURE TRANSMITTER FREQUENCY



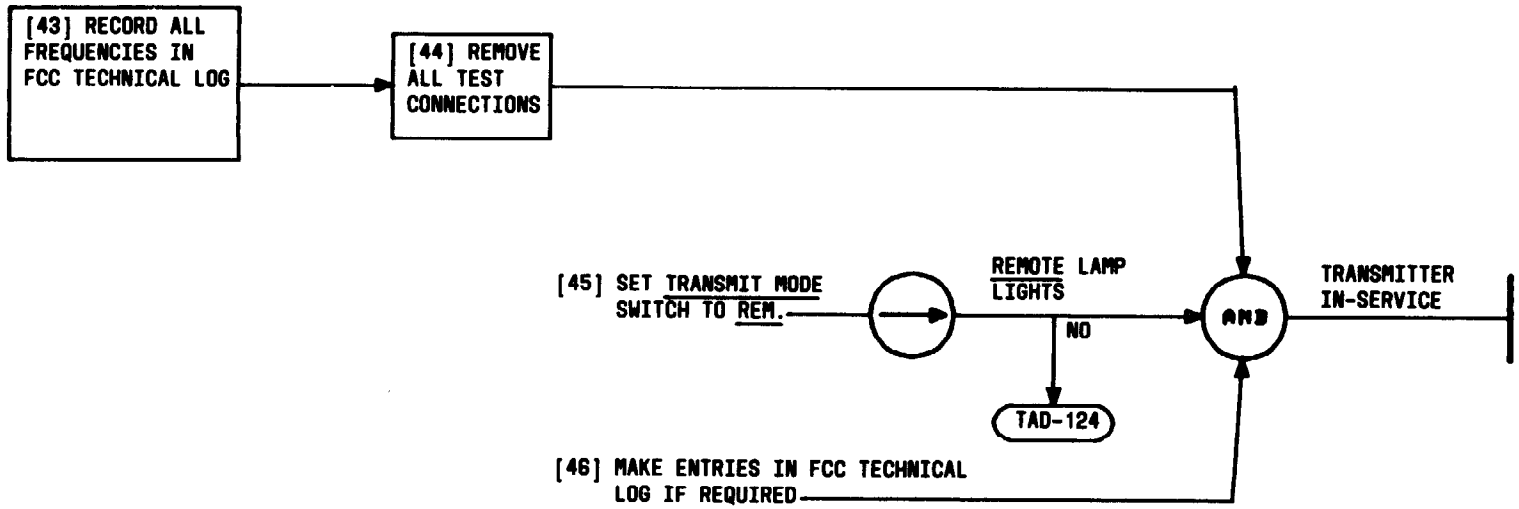
MEASURE TRANSMITTER FREQUENCY



MEASURE TRANSMITTER FREQUENCY



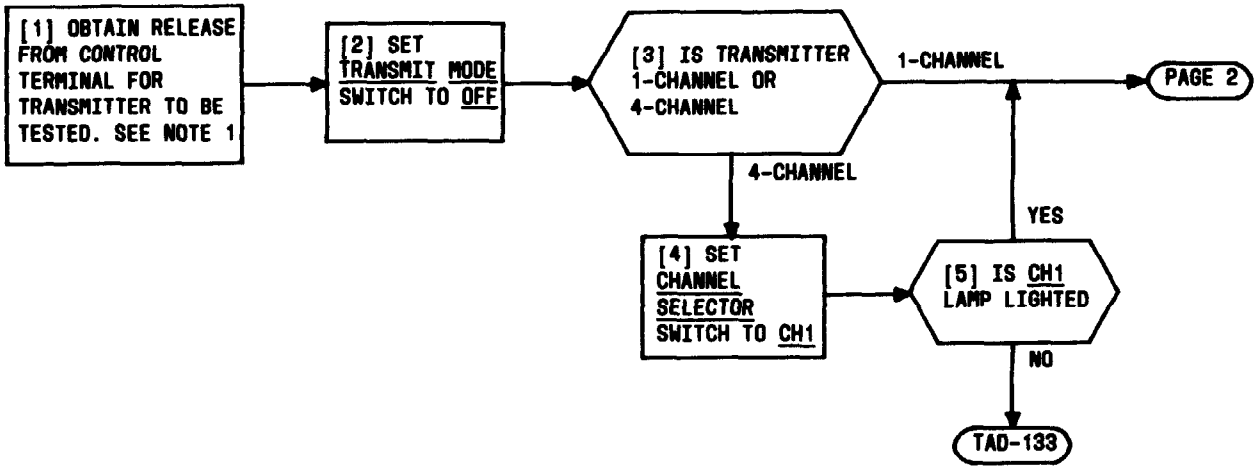
MEASURE TRANSMITTER FREQUENCY



MEASURE TRANSMITTER FREQUENCY

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

MEASURE TRANSMITTER CARRIER POWER OUTPUT

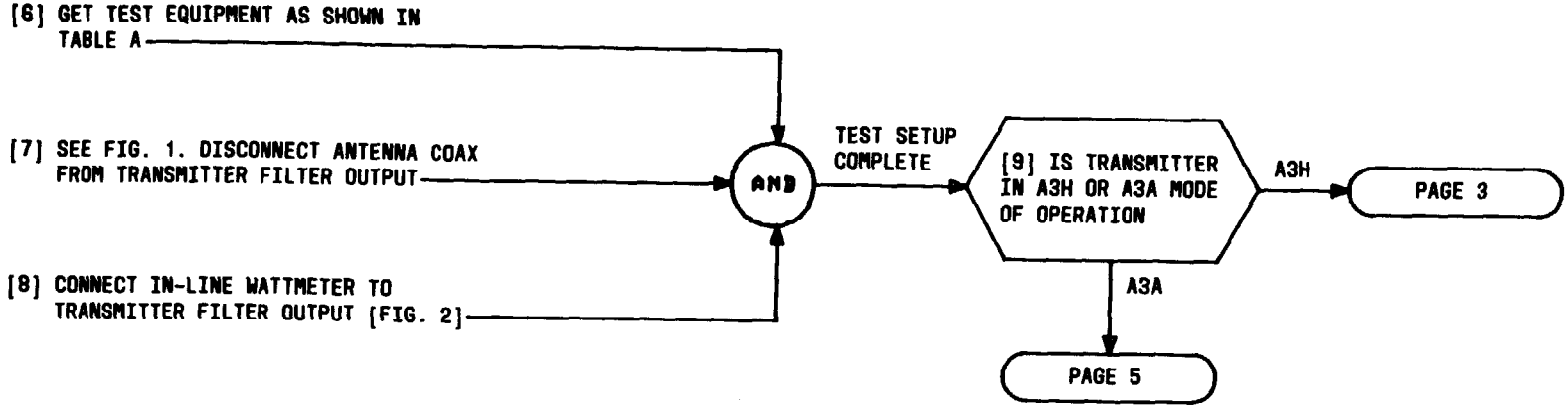


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
IN-LINE WATTMETER	BIRD MODEL 43 WITH 250H AND 50H ELEMENTS

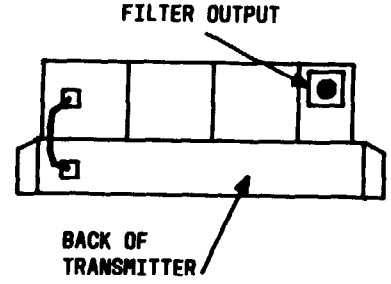


FIG. 1

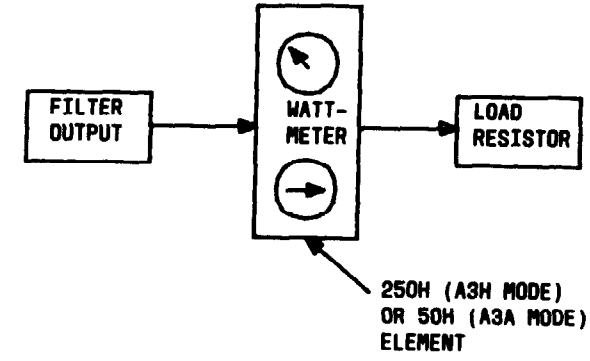
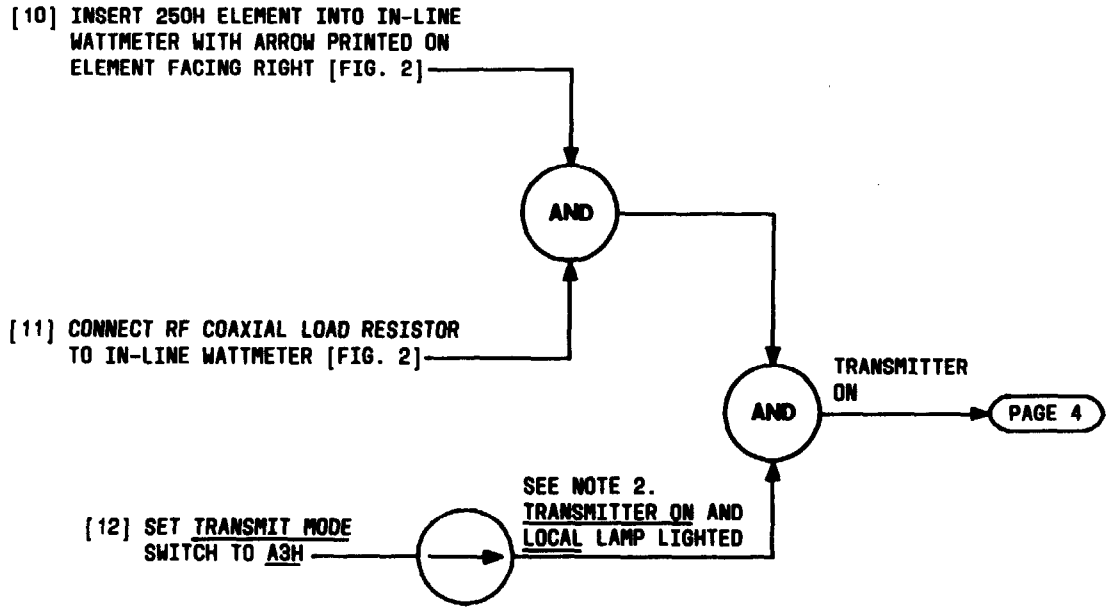


FIG. 2

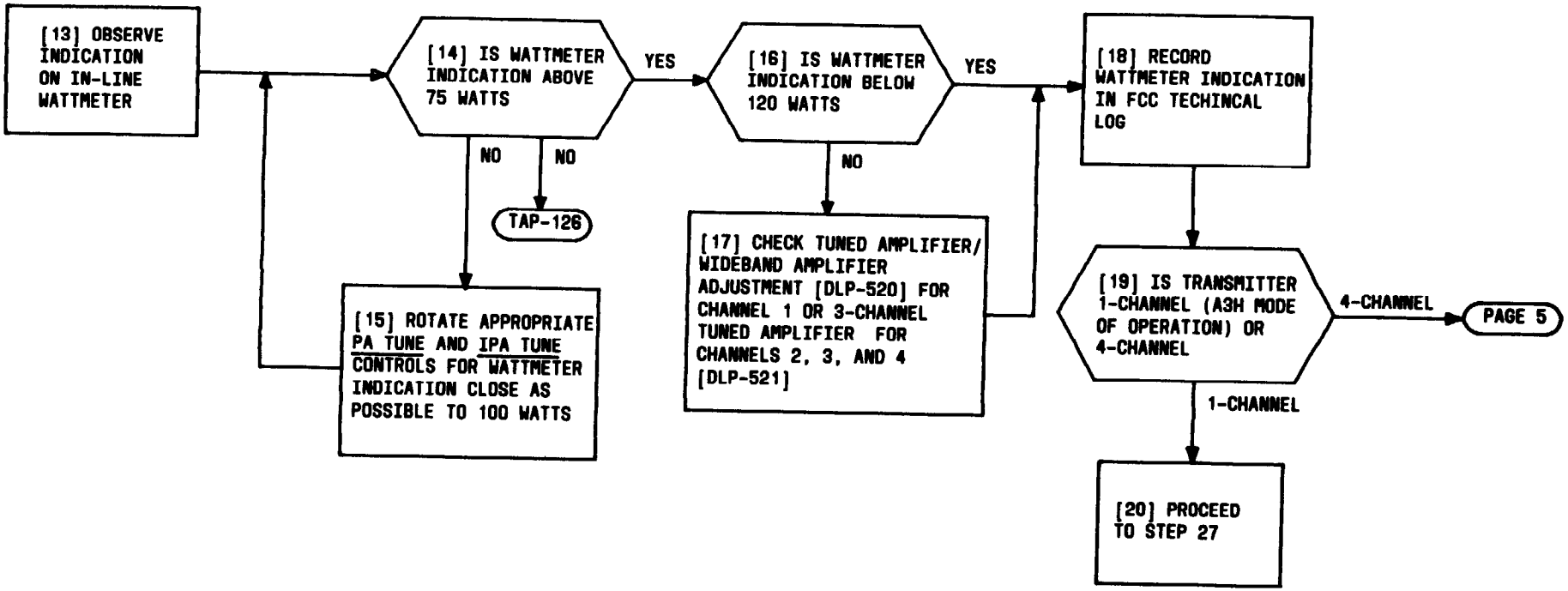
MEASURE TRANSMITTER CARRIER POWER OUTPUT



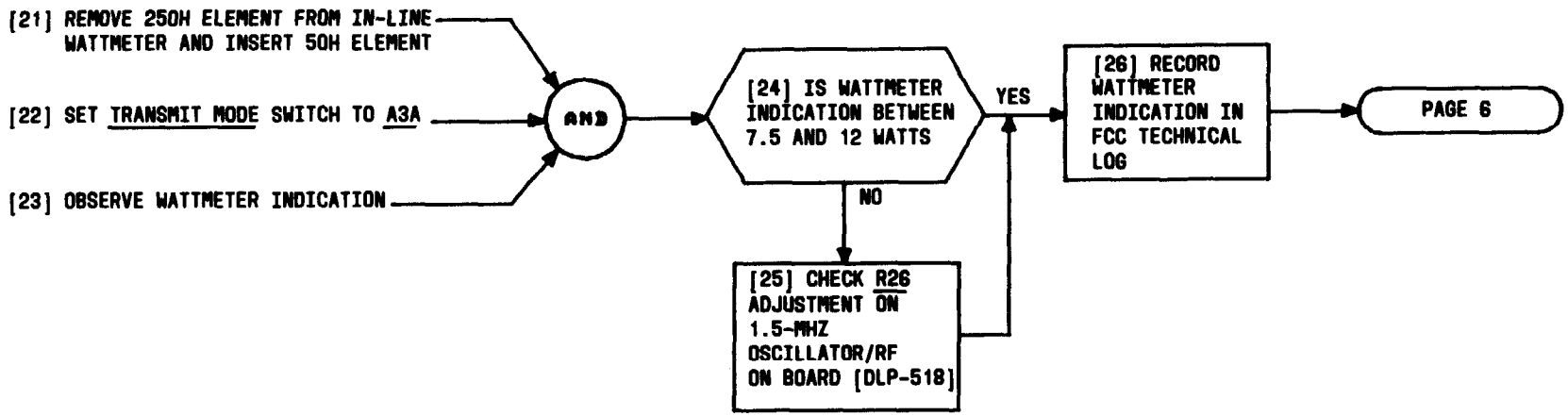
NOTE 2

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

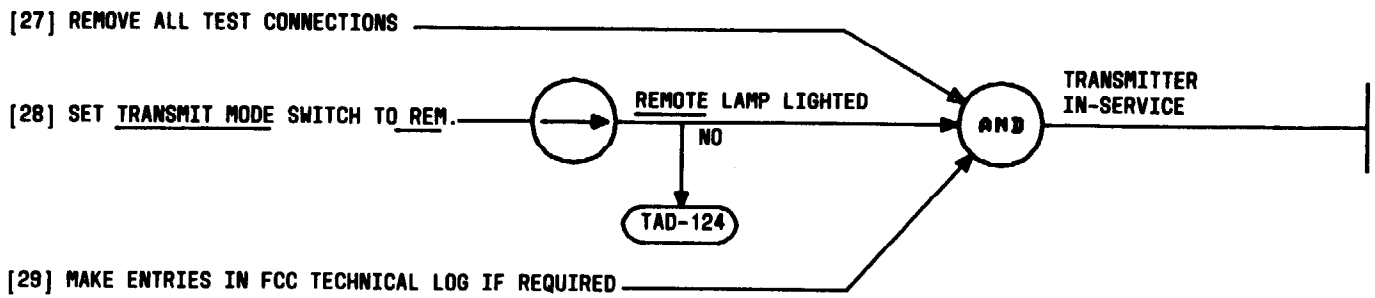
MEASURE TRANSMITTER CARRIER POWER OUTPUT



MEASURE TRANSMITTER CARRIER POWER OUTPUT



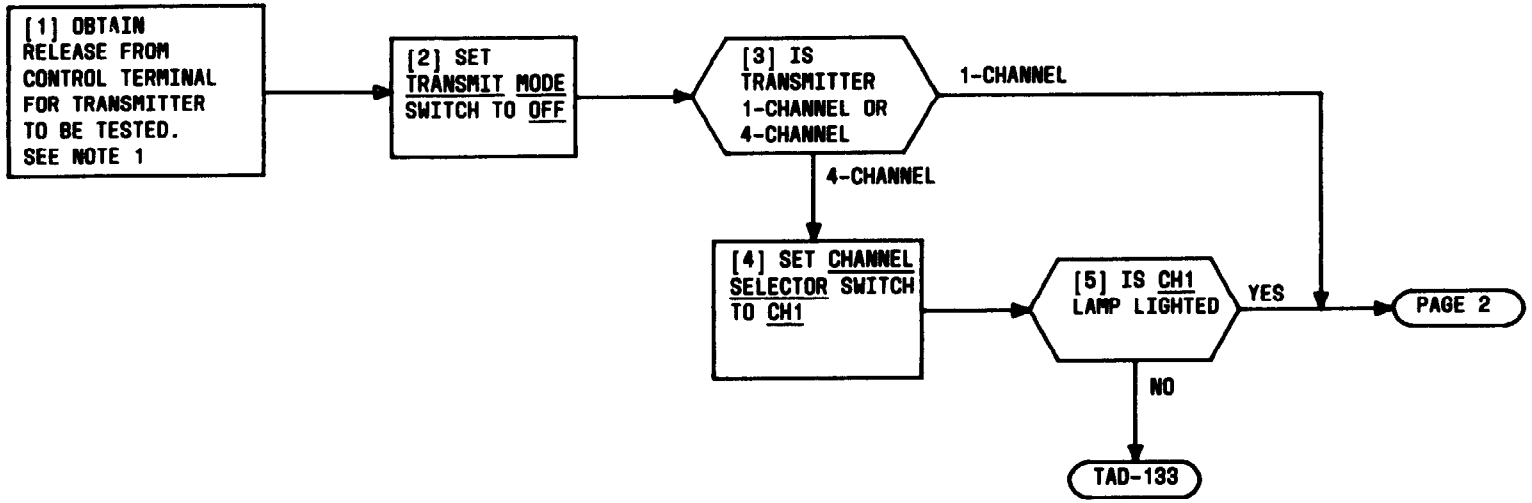
MEASURE TRANSMITTER CARRIER POWER OUTPUT



MEASURE TRANSMITTER CARRIER POWER OUTPUT

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

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TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

[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

AND → 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	

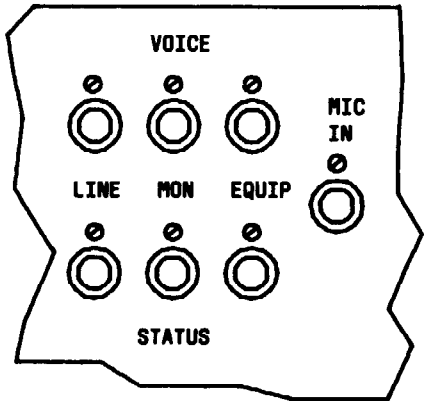


FIG. 1

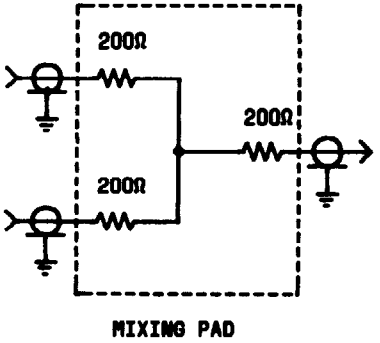


FIG. 2

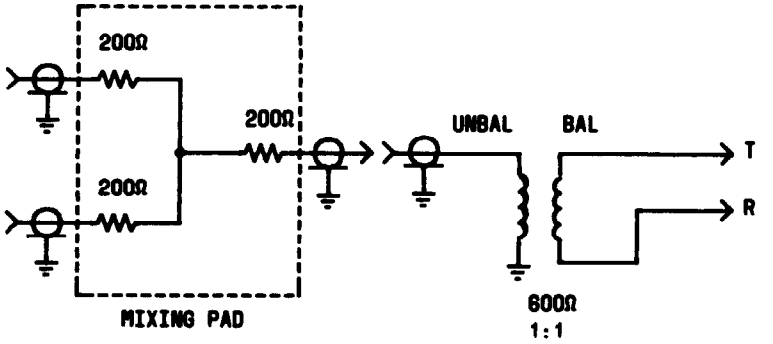


FIG. 3

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

[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

AND

700-HZ OUTPUT SET AT -22 DB

PAGE 4

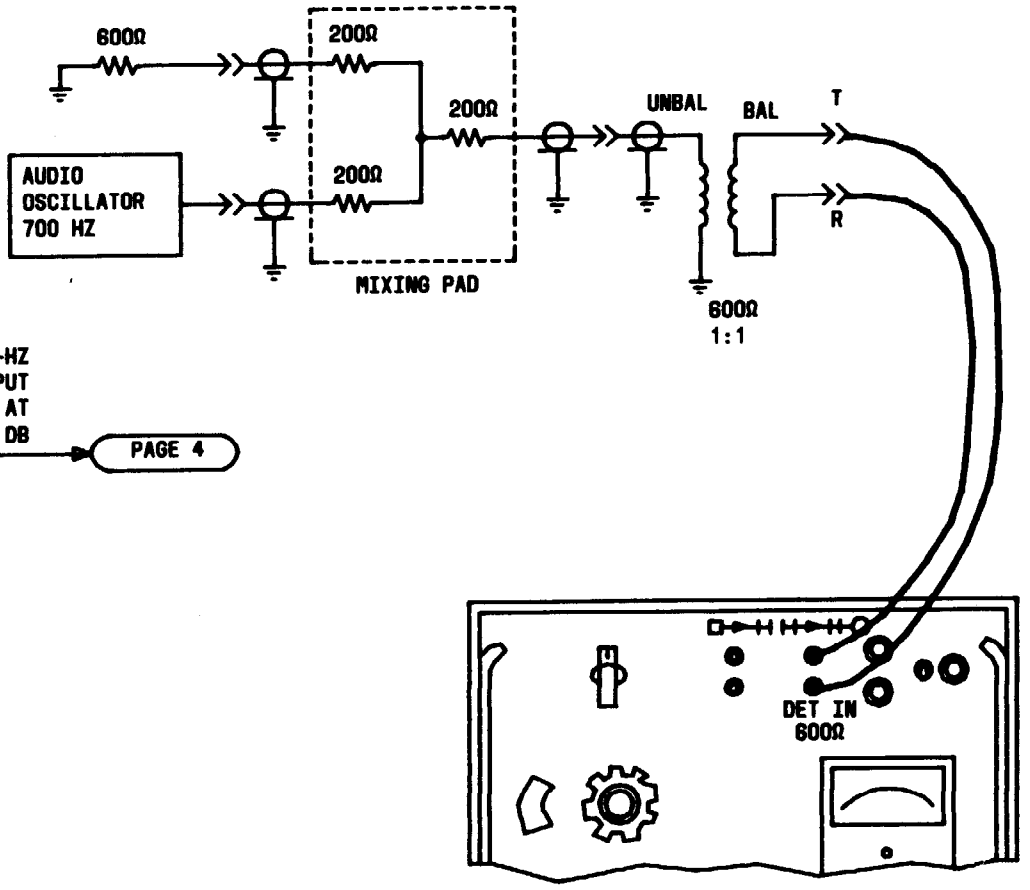


FIG. 4

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

[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]

AND

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

PAGE 5

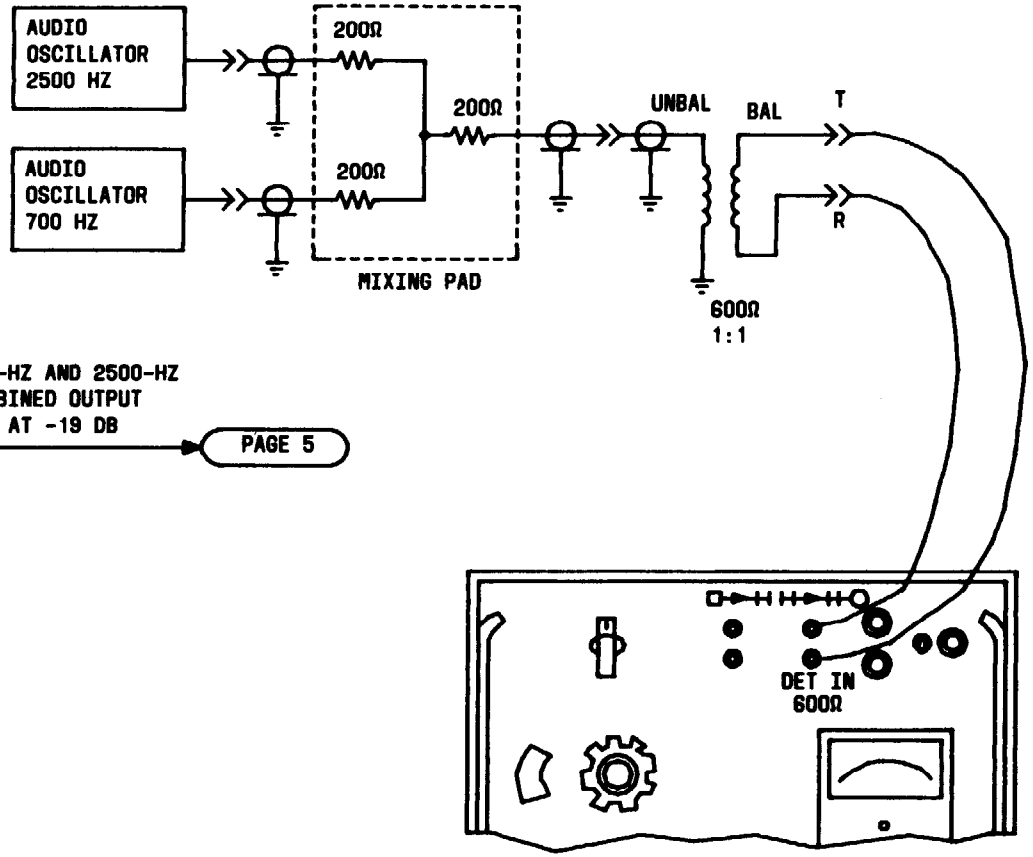


FIG. 5

TEST AUTOMATIC LEVEL CONTROL (ALC) OPRERATION

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

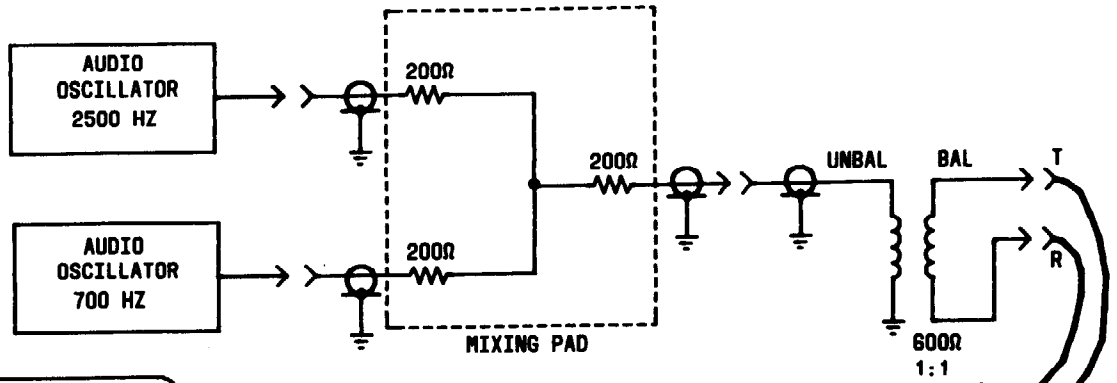
[21] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[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 THRULINE WATTMETER

AND

PAGE 6



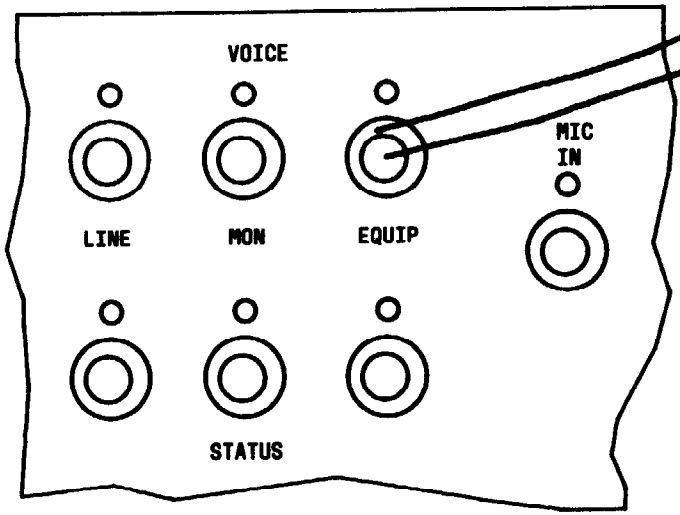


FIG. 6

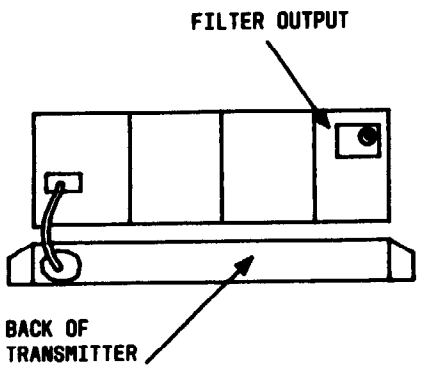


FIG. 7

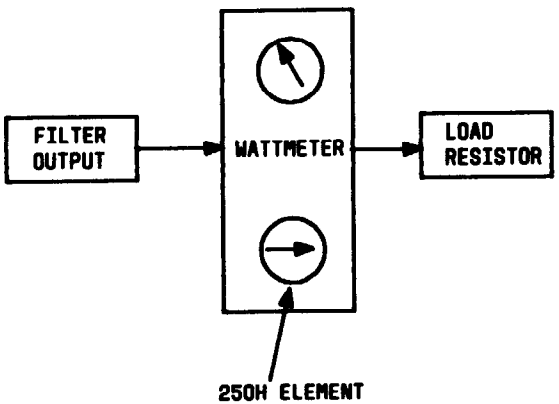
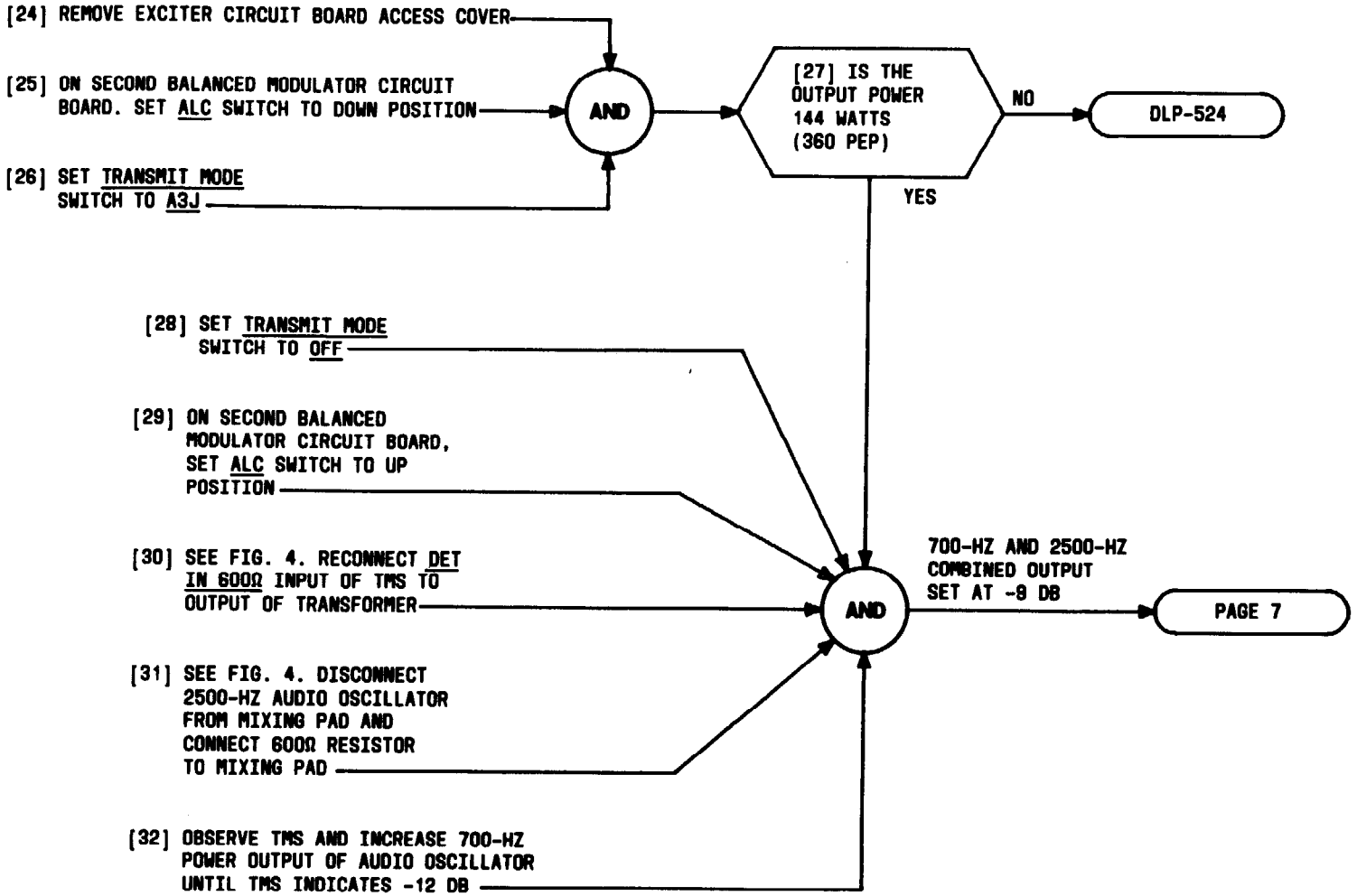
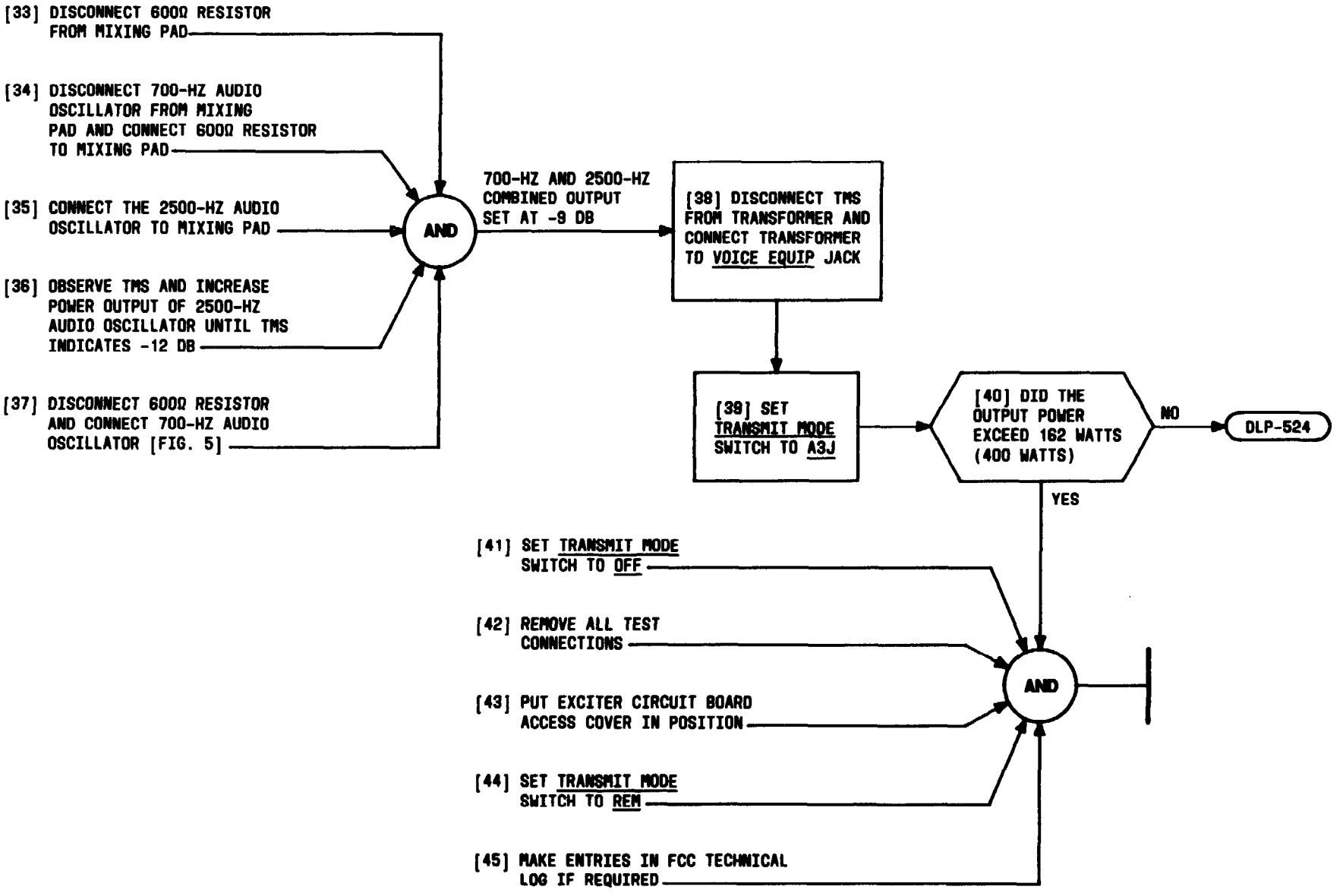


FIG. 8

TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION



TEST AUTOMATIC LEEL CONTROL (ALC) OPERATION



TEST AUTOMATIC LEVEL CONTROL (ALC) OPERATION

[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

AND

TEST SETUP COMPLETE

[8] IS TRANSMITTER 1-CHANNEL OR 4-CHANNEL

4-CHANNEL → PAGE 2

1-CHANNEL

[9] IS TRANSMITTER IN A3H OR A3A MODE OF OPERATION

A3H

A3A → PAGE 3

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

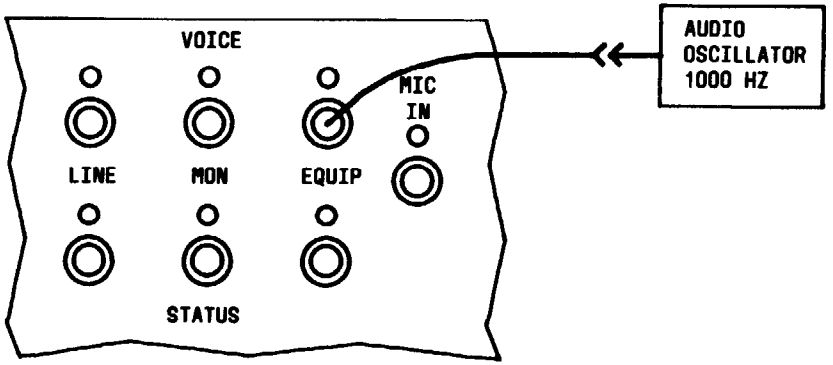


FIG. 2

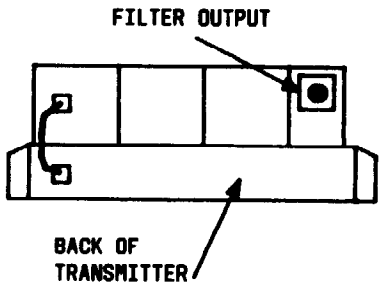


FIG. 1

TEST MONITOR RECEIVER OUTPUT

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

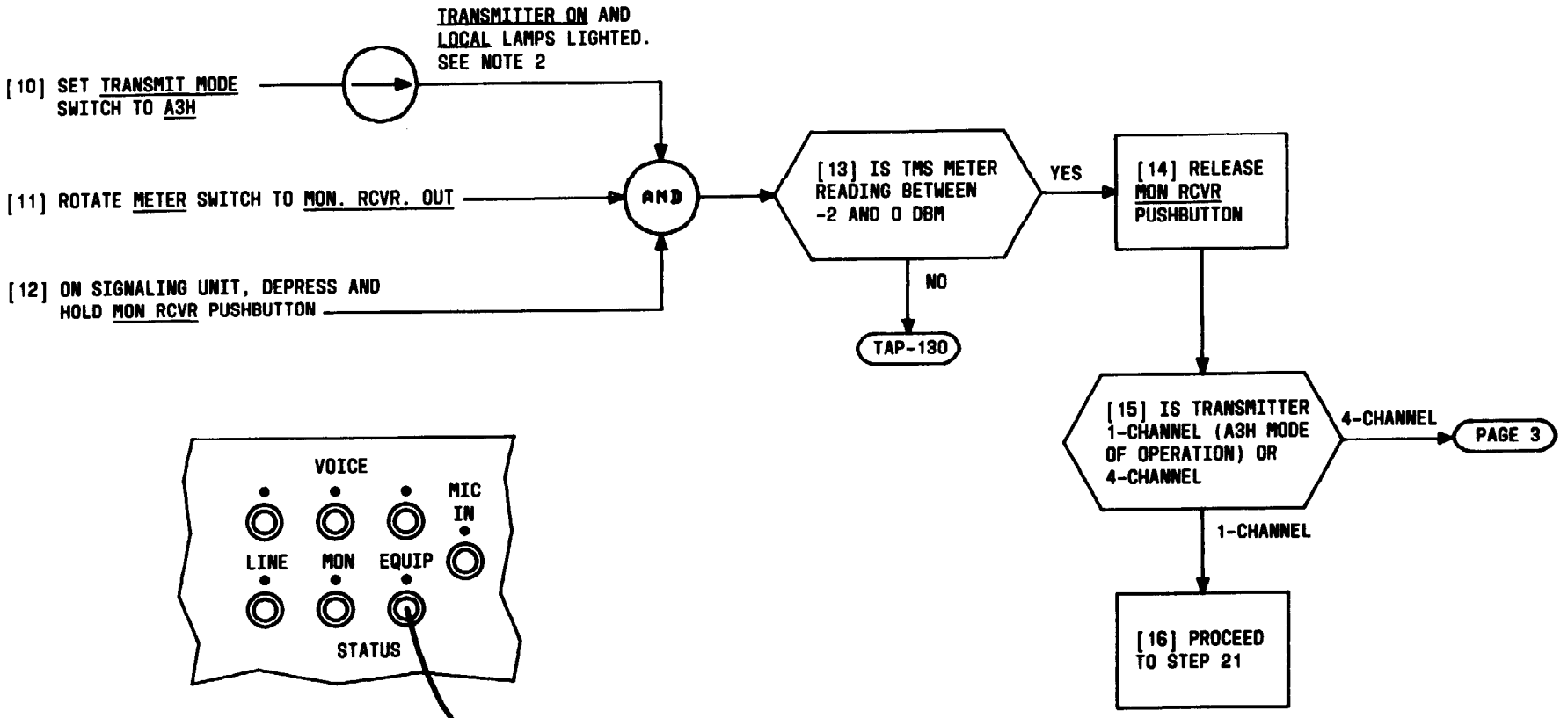


FIG. 3

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

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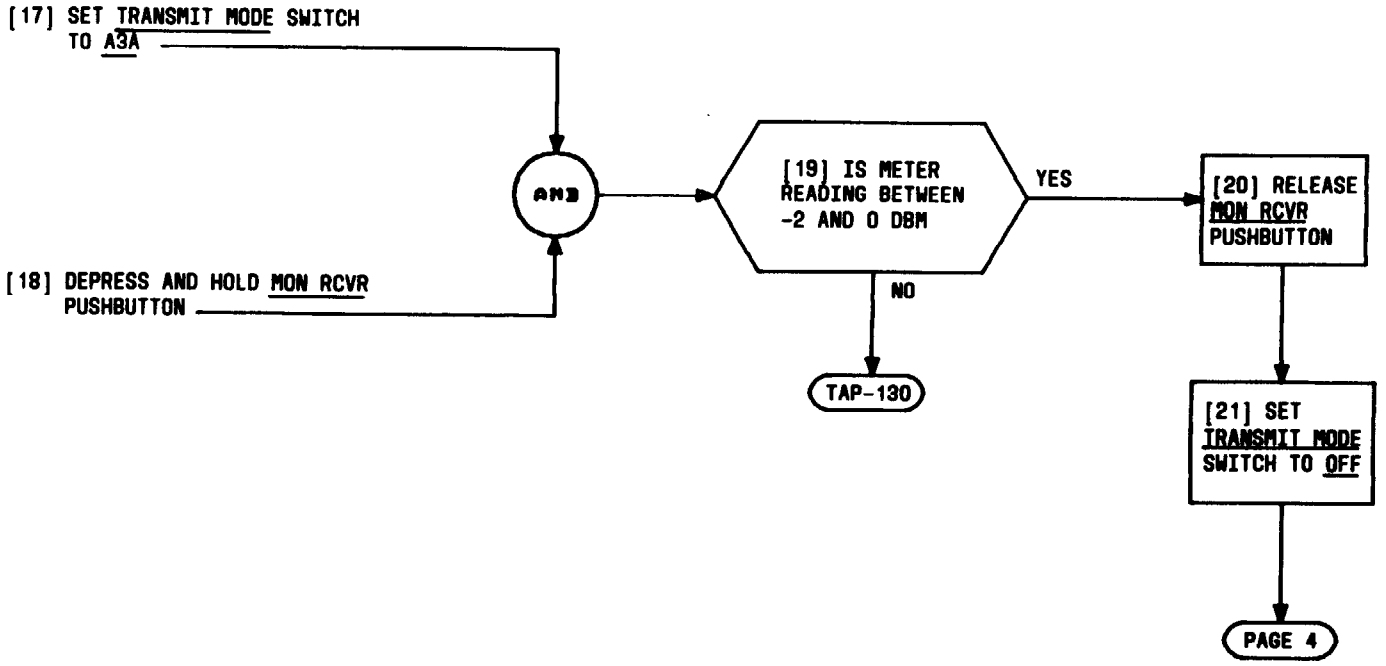
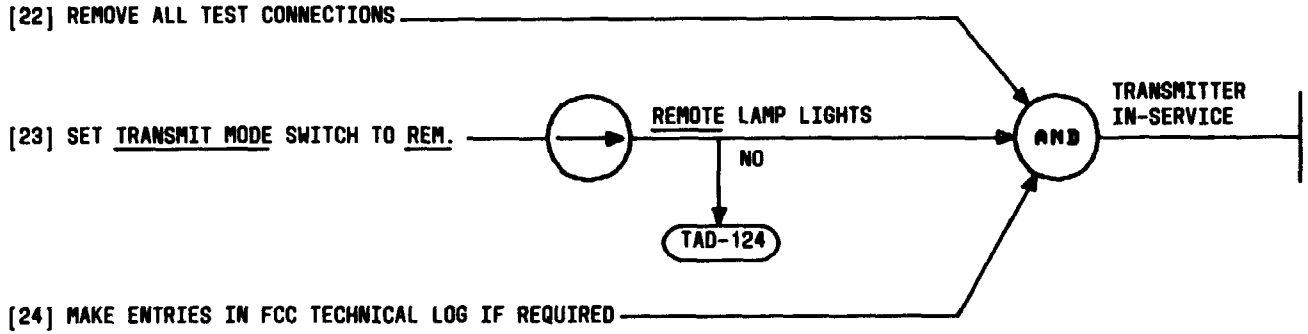
TEST MONITOR RECEIVER OUTPUT



TEST MONITOR RECEIVER OUTPUT



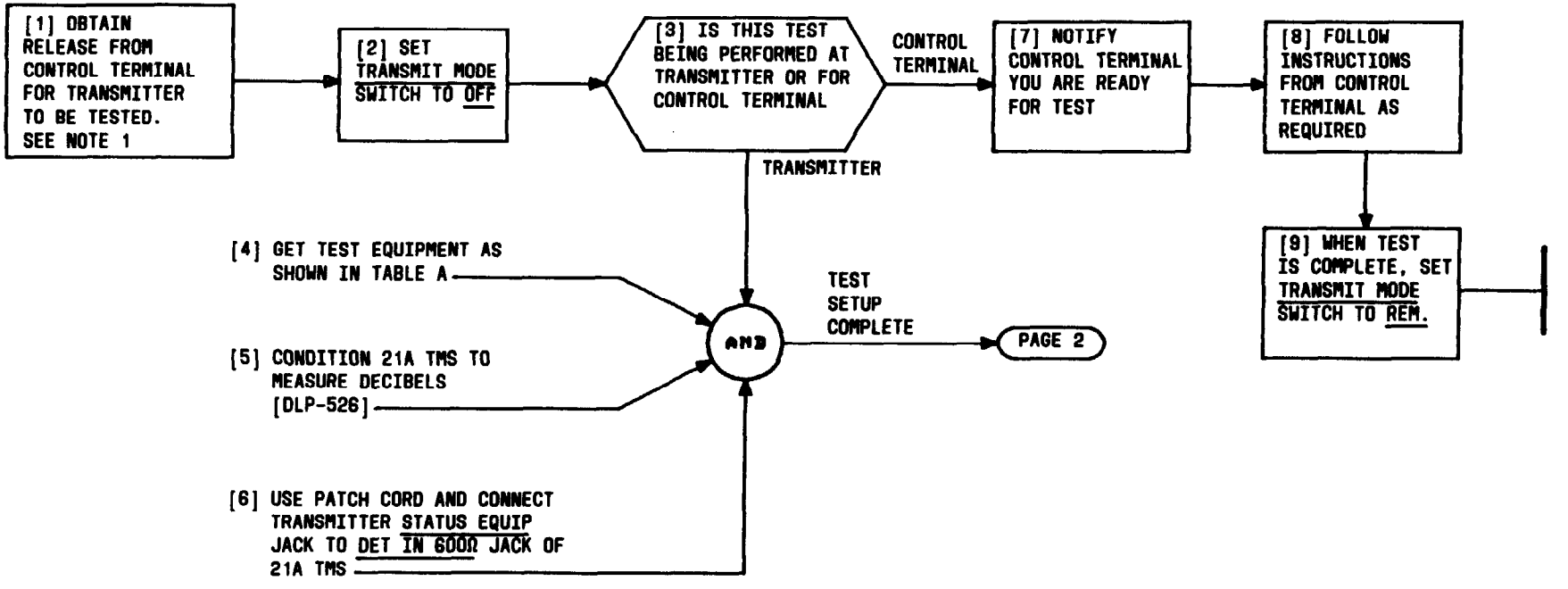
TEST MONITOR RECEIVER OUTPUT

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



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

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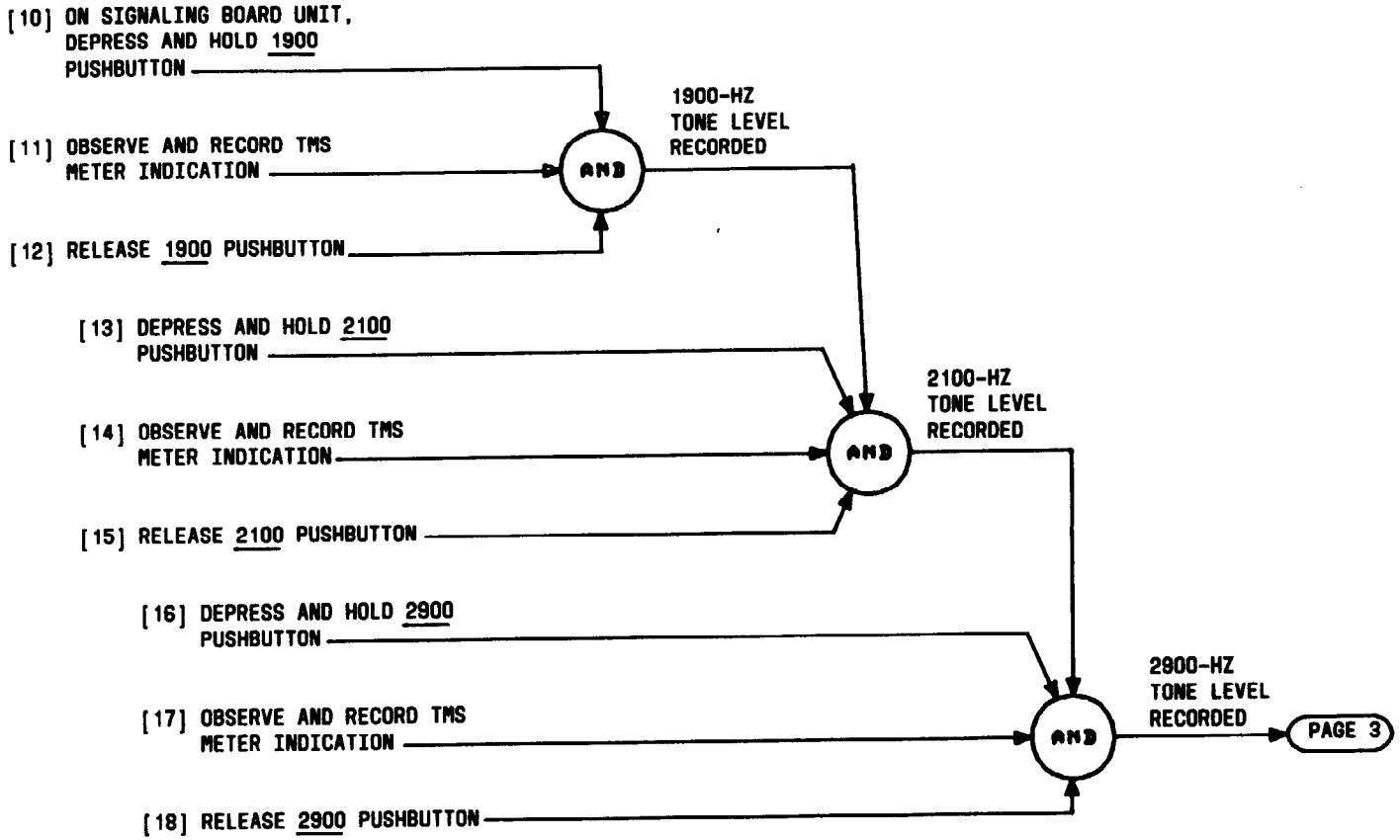
MEASURE TRANSMITTER TO CONTROL TERMINAL 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS



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

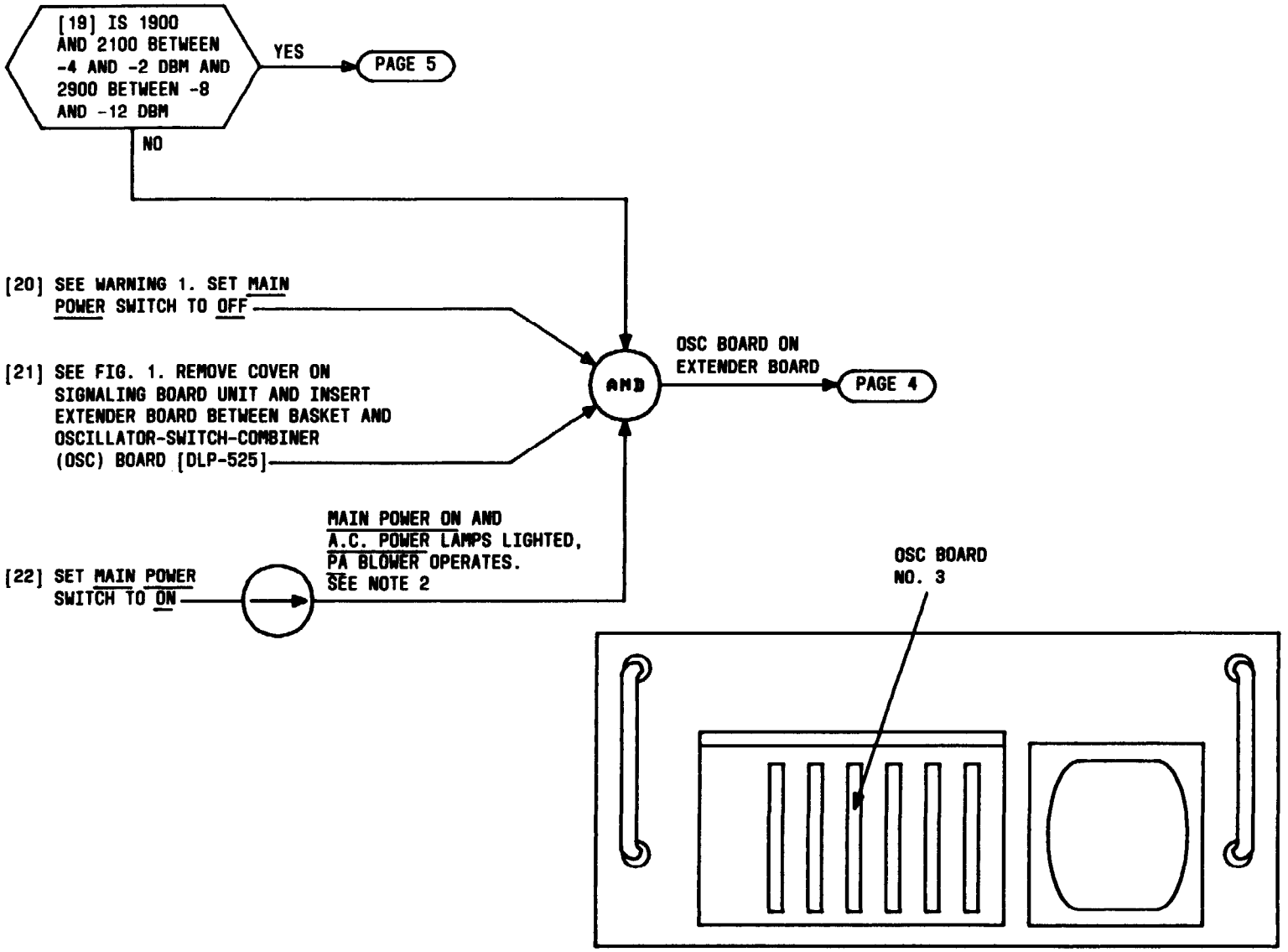
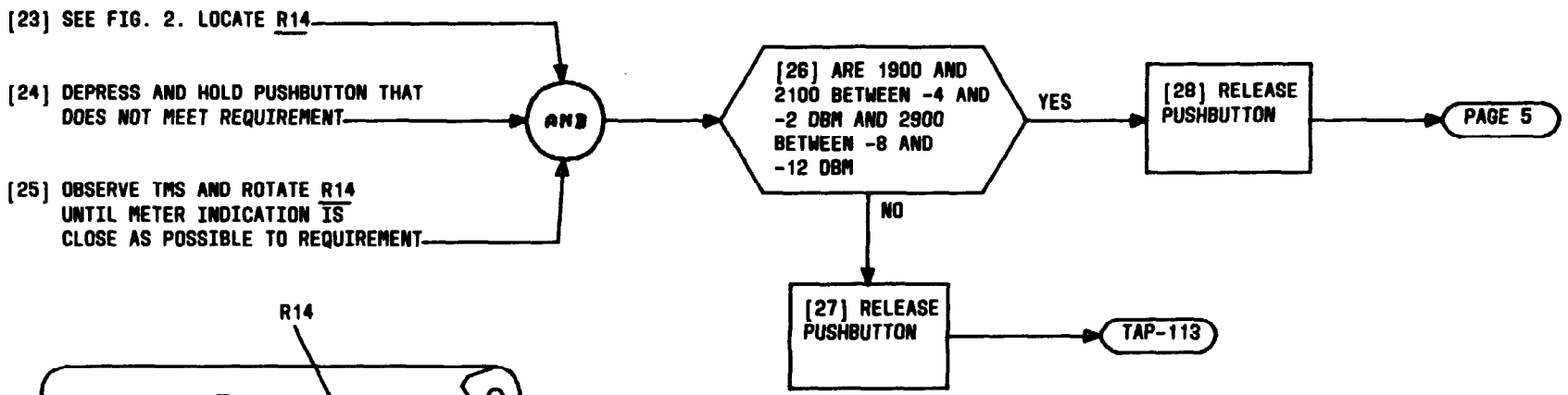


FIG. 1

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

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



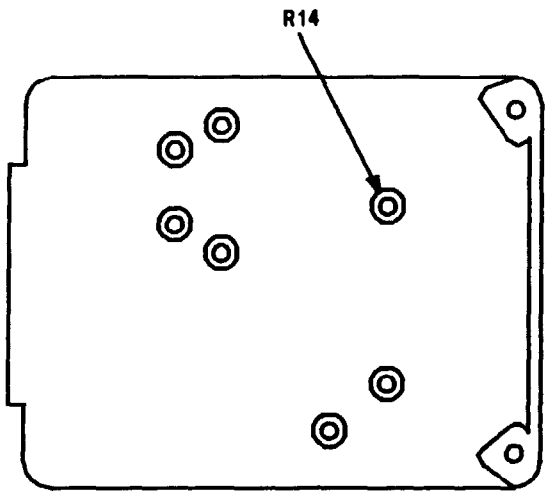
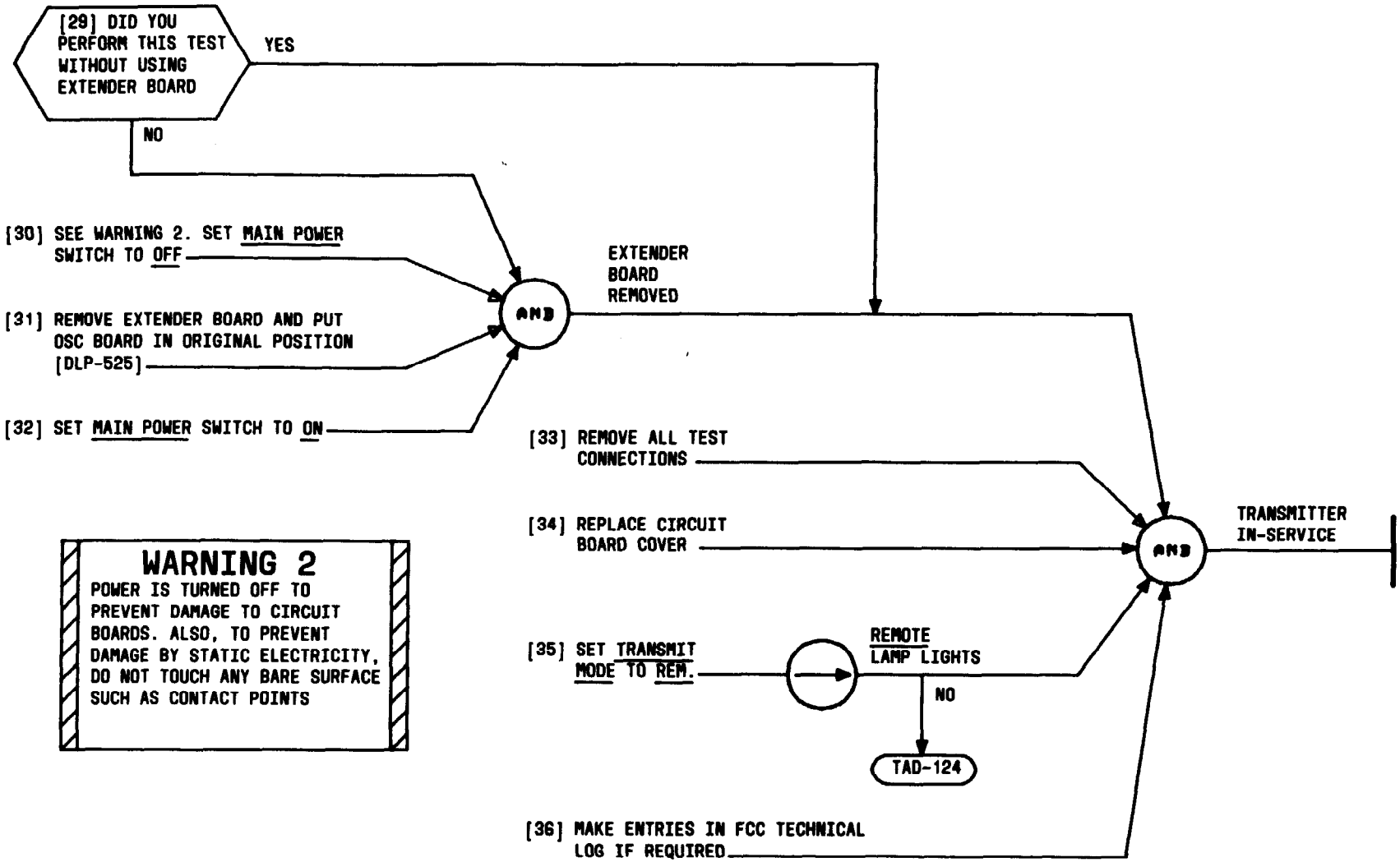


FIG. 2

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



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

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

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

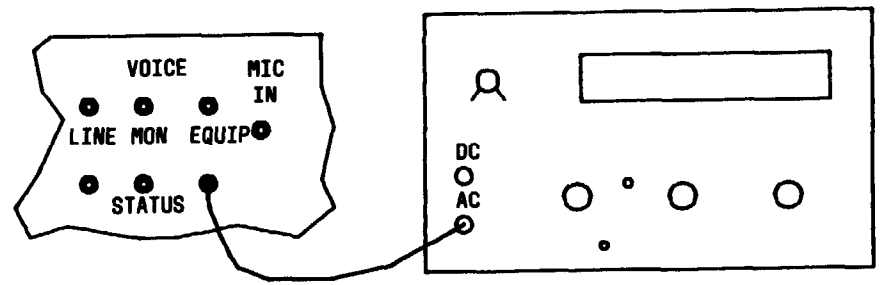


FIG. 1

[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] CONDITION HP 5245L FREQUENCY COUNTER TO MEASURE FREQUENCY [DLP-527]

[5] SEE FIG. 1. USE PATCH CORD AND CONNECT TRANSMITTER STATUS EQUIP JACK TO INPUT OF FREQUENCY MONITOR

AND

TEST CONNECTIONS COMPLETE

PAGE 2

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

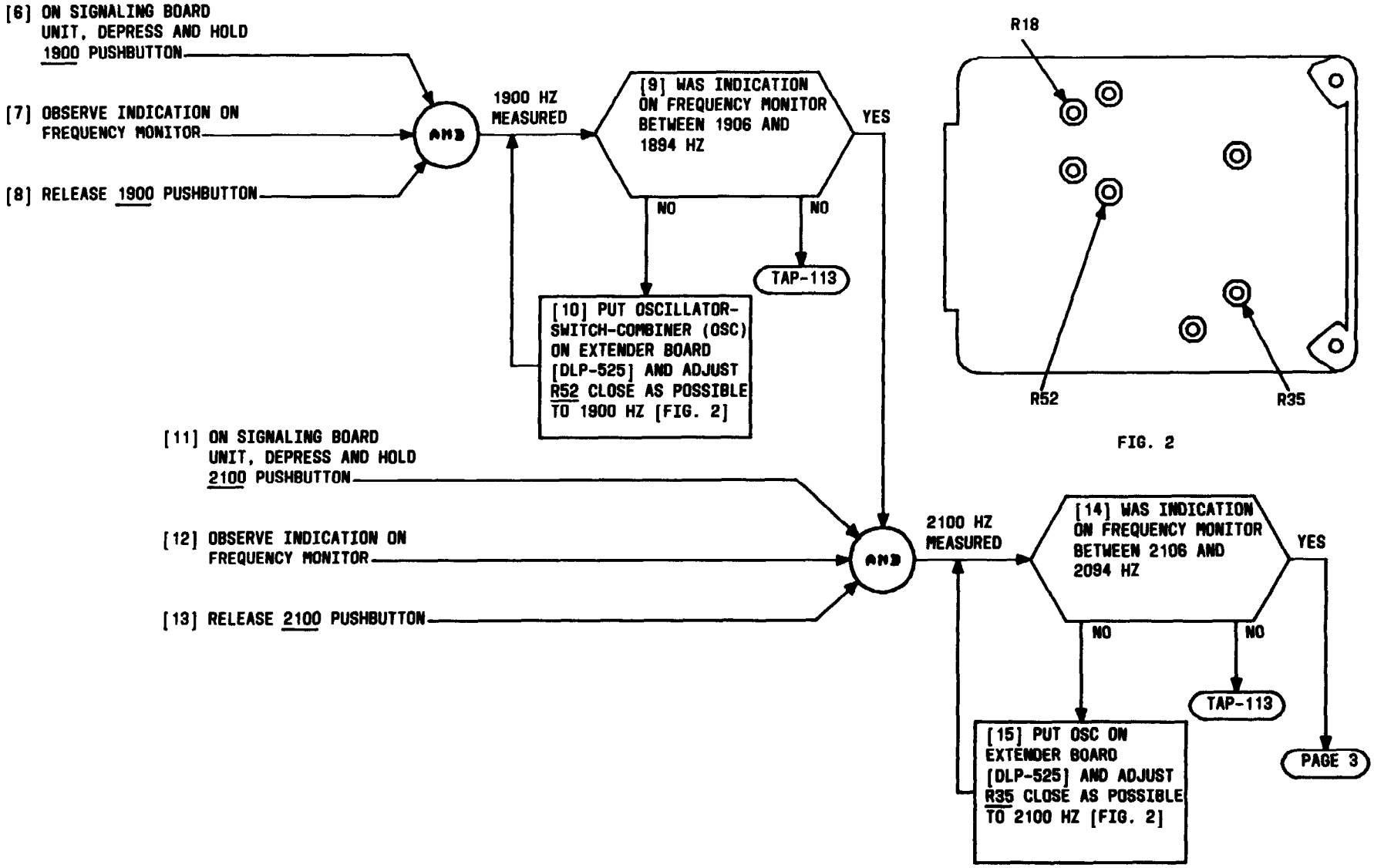
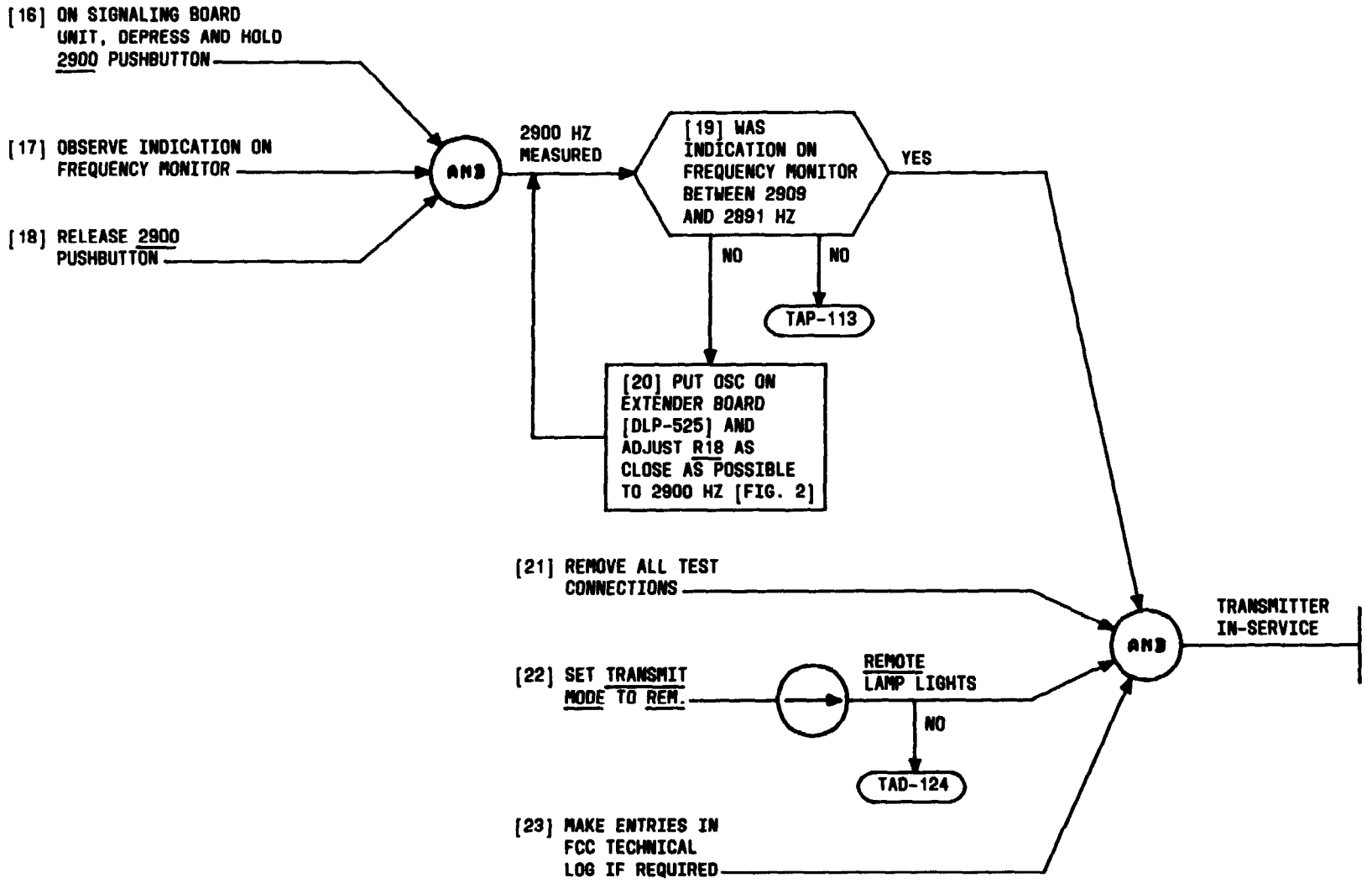


FIG. 2

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



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

AND

TEST CONNECTIONS COMPLETE → PAGE 2

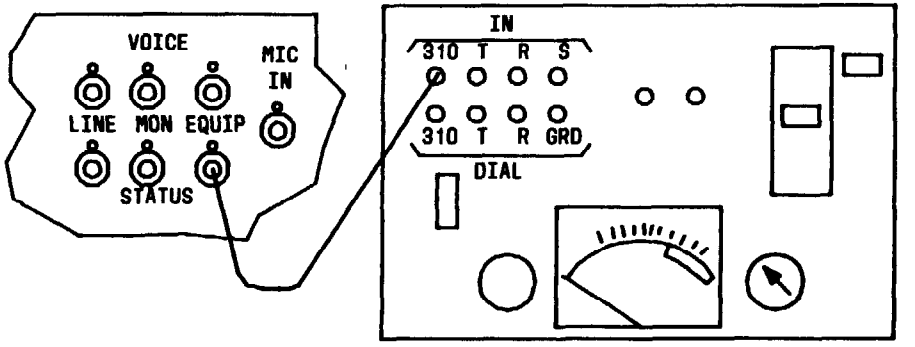


FIG. 1

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

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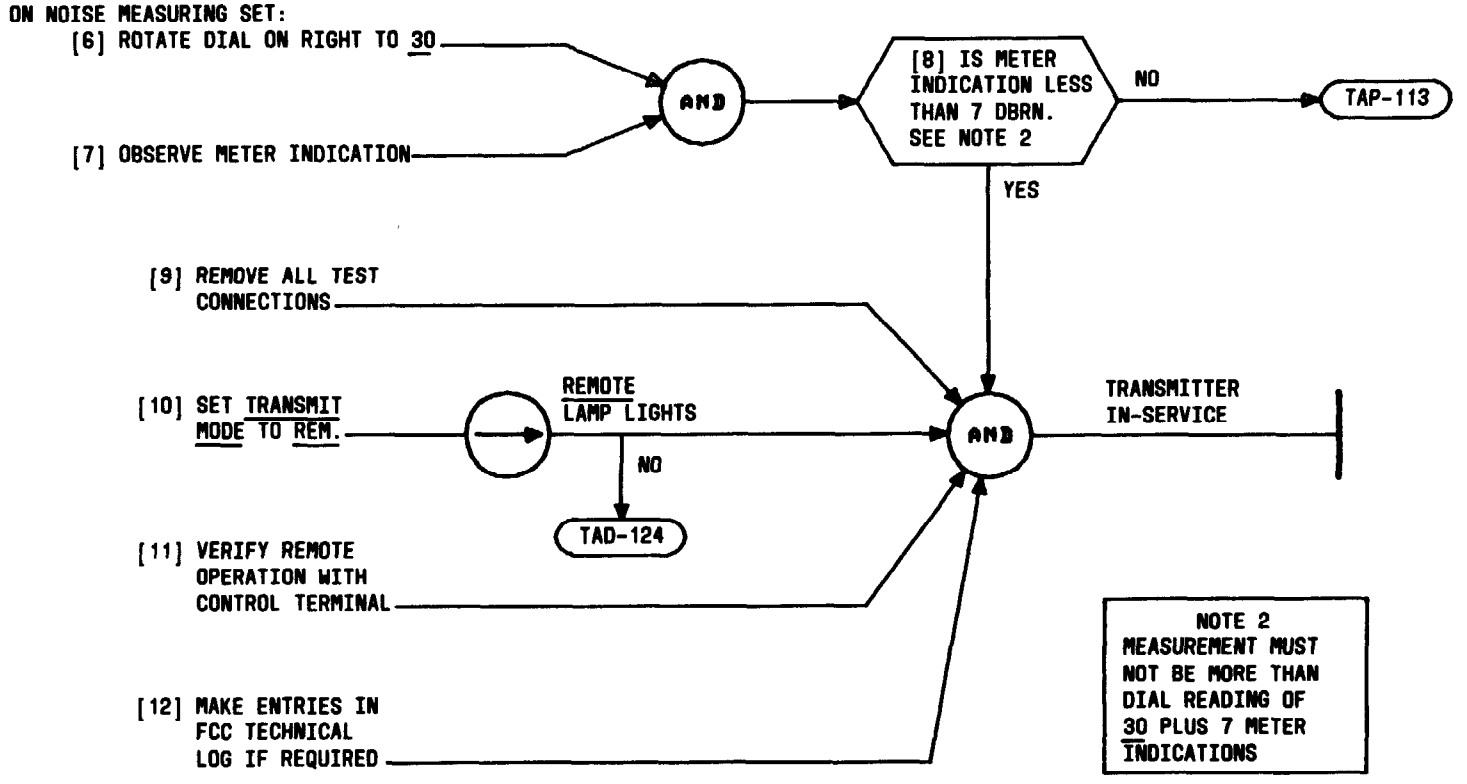
MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE



MEASURE TRANSMITTER TO CONTROL TERMINAL SIGNALING TONE LEAKAGE

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

[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 FOR 600-OHM OUTPUT OF 1000 HZ AT A LEVEL OF 0.0 DBM (DLP-526)

[5] SET METER RANGE SELECTOR SWITCH OF TMS TO ITS LEAST SENSITIVE POSITION

[6] USE PATCH CORD AND CONNECT OUTPUT OF TMS TO STATUS LINE JACK OF TRANSMITTER. SEE FIG. 1

AND → READY FOR TEST → PAGE 2

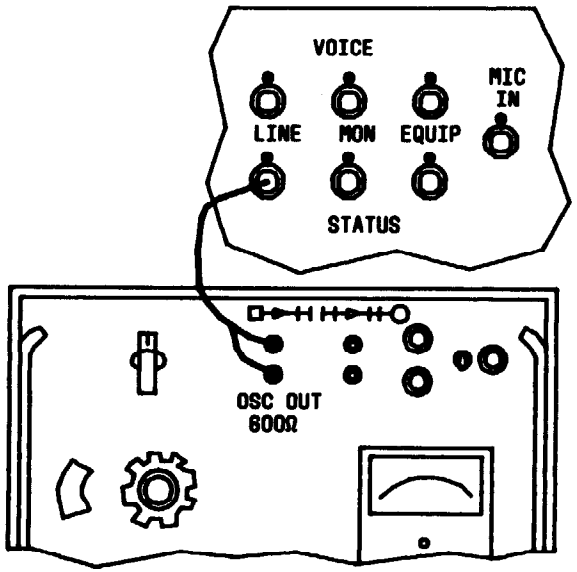
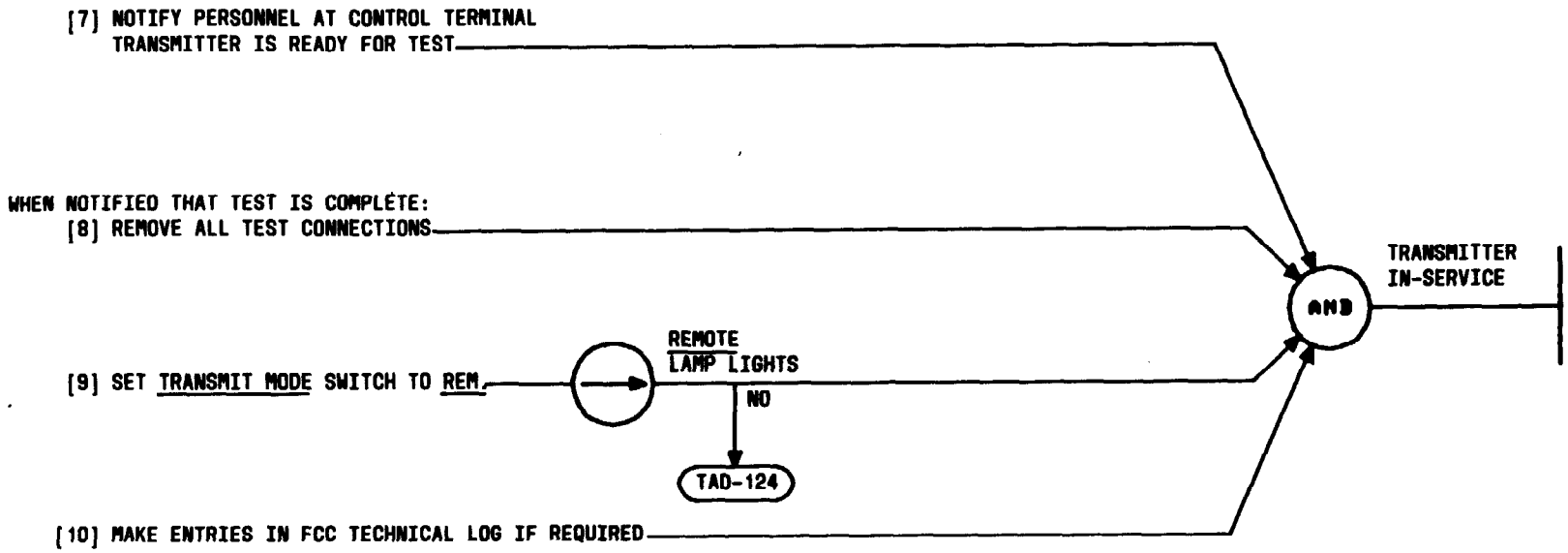


FIG. 1

MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL



MEASURE TRANSMITTER TO CONTROL TERMINAL 1000-HZ TONE LEVEL

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

[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-OHM INPUT OF TMS TO VOICE LINE JACK OF TRANSMITTER

AND

READY FOR TEST

PAGE 2

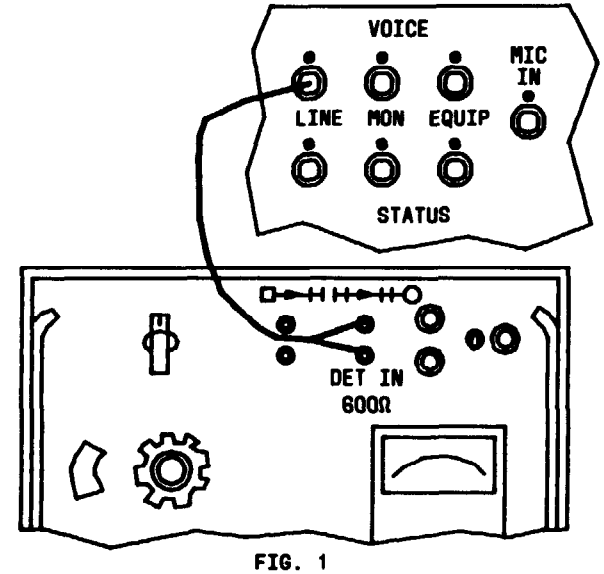


FIG. 1

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

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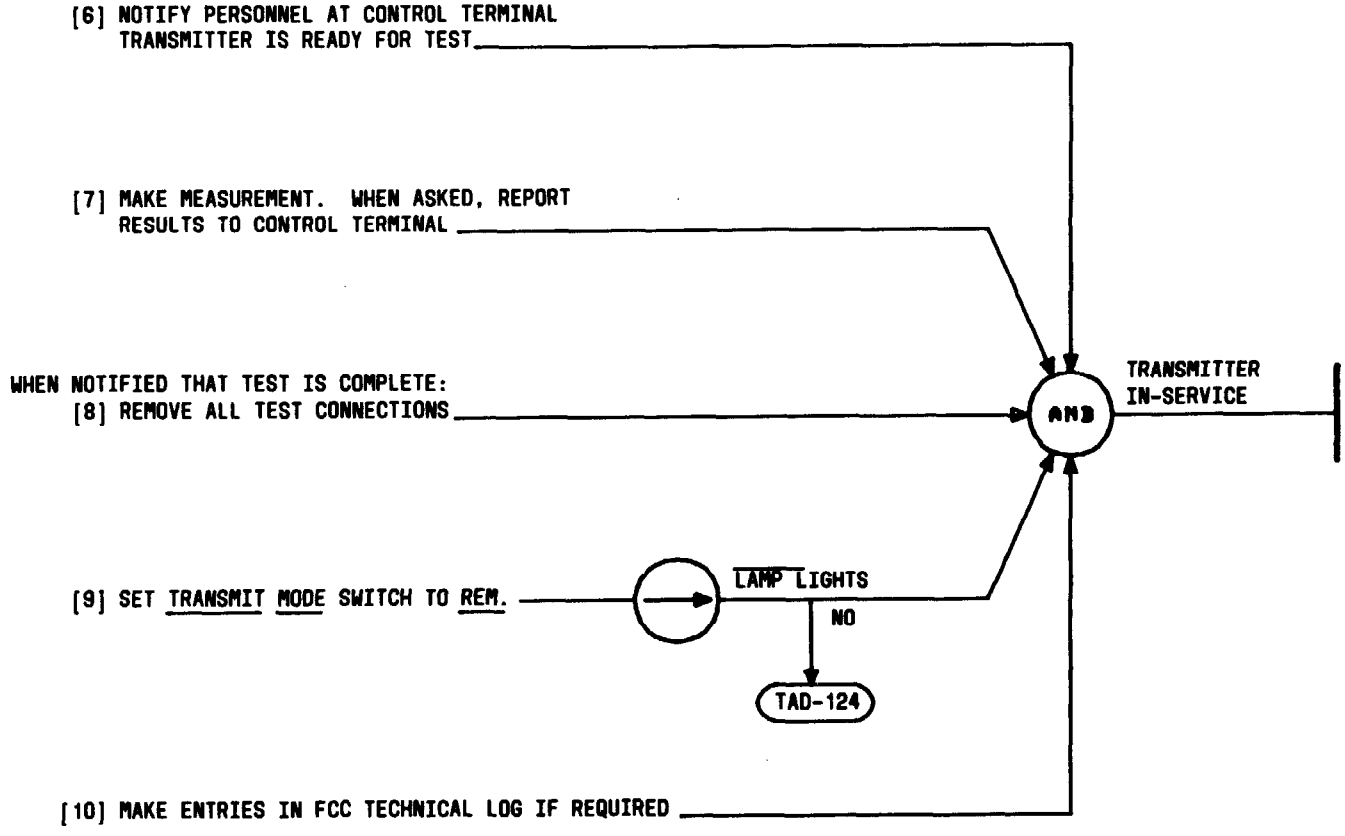


MEASURE CONTROL TERMINAL TO TRANSMITTER 1900-HZ, 2100-HZ, AND 2900-HZ SIGNALING TONE LEVELS

Issue 2	FEB 1979
403-200-503	DLP
PAGE 2 of 2	509

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

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
TRANSMISSION MEASURING SET	WECO J94021A
PATCH CORD	3P178

[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-OHM INPUT OF TMS TO VOICE LINE JACK OF TRANSMITTER

AND

READY FOR TEST

PAGE 2

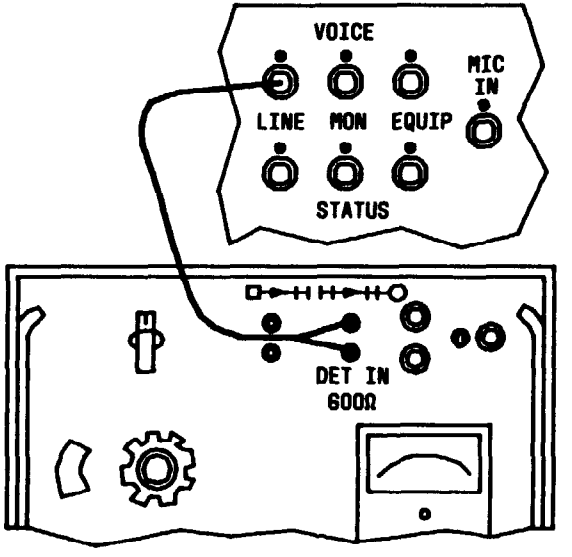
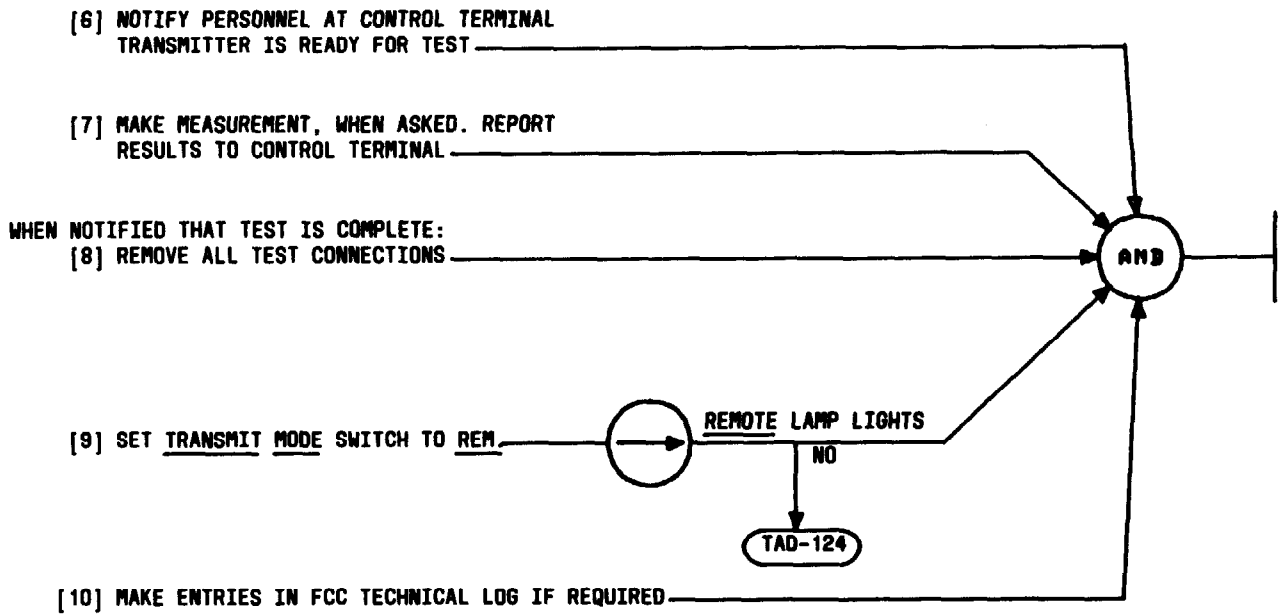


FIG. 1

MEASURE CONTROL TERMINAL TO TRANSMITTER 1000-HZ TONE LEVEL



MEASURE CONTROL TERMINAL TO TRANSMITTER 1000-HZ TONE LEVEL

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

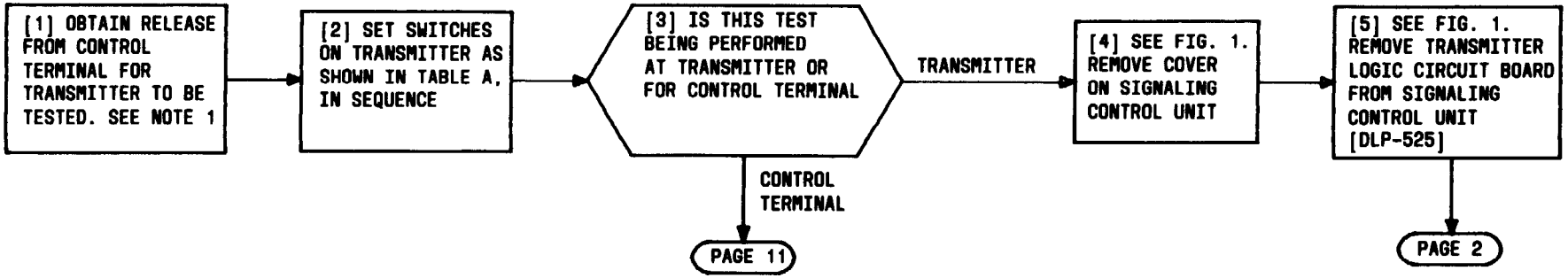


TABLE A		
SEQUENCE	SWITCH	POSITION
1	TRANSMIT MODE	OFF
2	HIGH VOLTAGE	OFF
3	REGULATOR	OFF
4	MAIN POWER	OFF

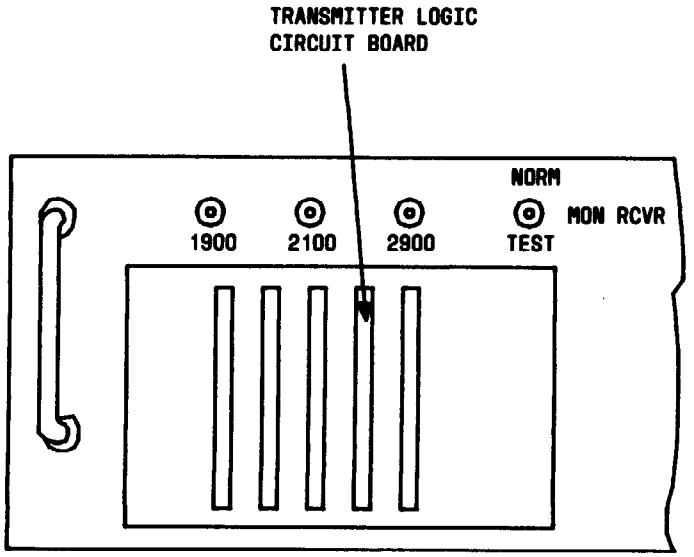


FIG. 1

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

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

[6] SEE FIG. 2. INSPECT AREA IN UPPER LEFT CORNER OF TRANSMITTER LOGIC CIRCUIT BOARD

[7] SEE FIG. 2. DETERMINE FROM WIRING ON TERMINAL POST IF ALARMS ARE WIRED MAJOR OR MINOR. SEE NOTE 2

[8] INSERT TRANSMITTER LOGIC CIRCUIT BOARD BACK INTO SIGNALING CONTROL UNIT [DLP-525]

[9] PLACE COVER BACK ON SIGNALING CONTROL UNIT

PAGE 3

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

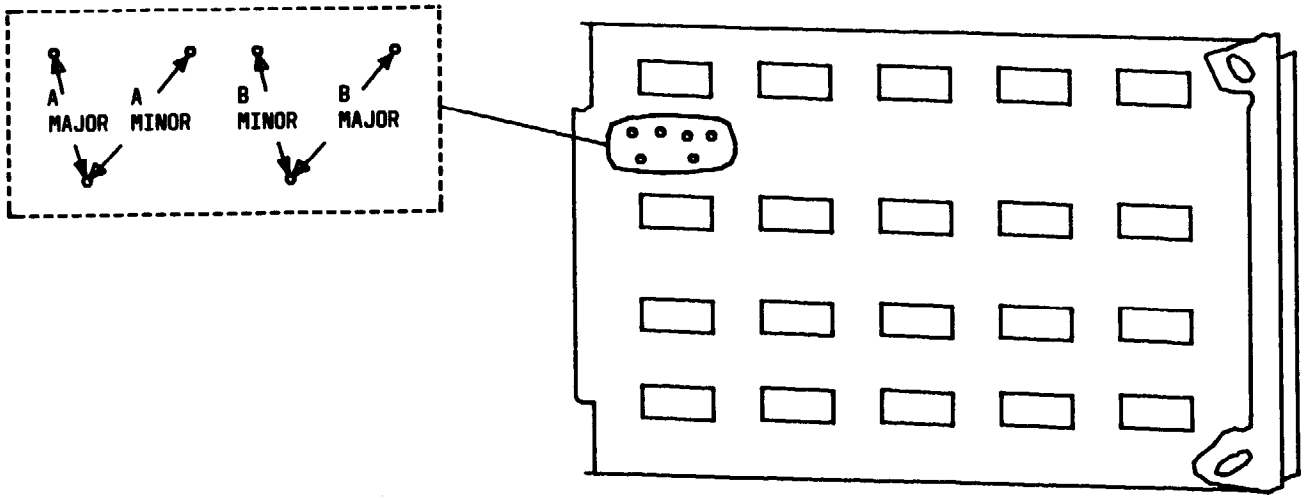


FIG. 2

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

[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 → PAGE 4

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

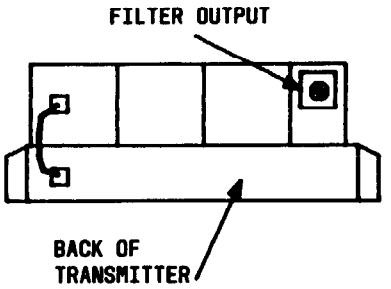


FIG. 3

[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

AND

TEST CONNECTIONS COMPLETED

PAGE 5

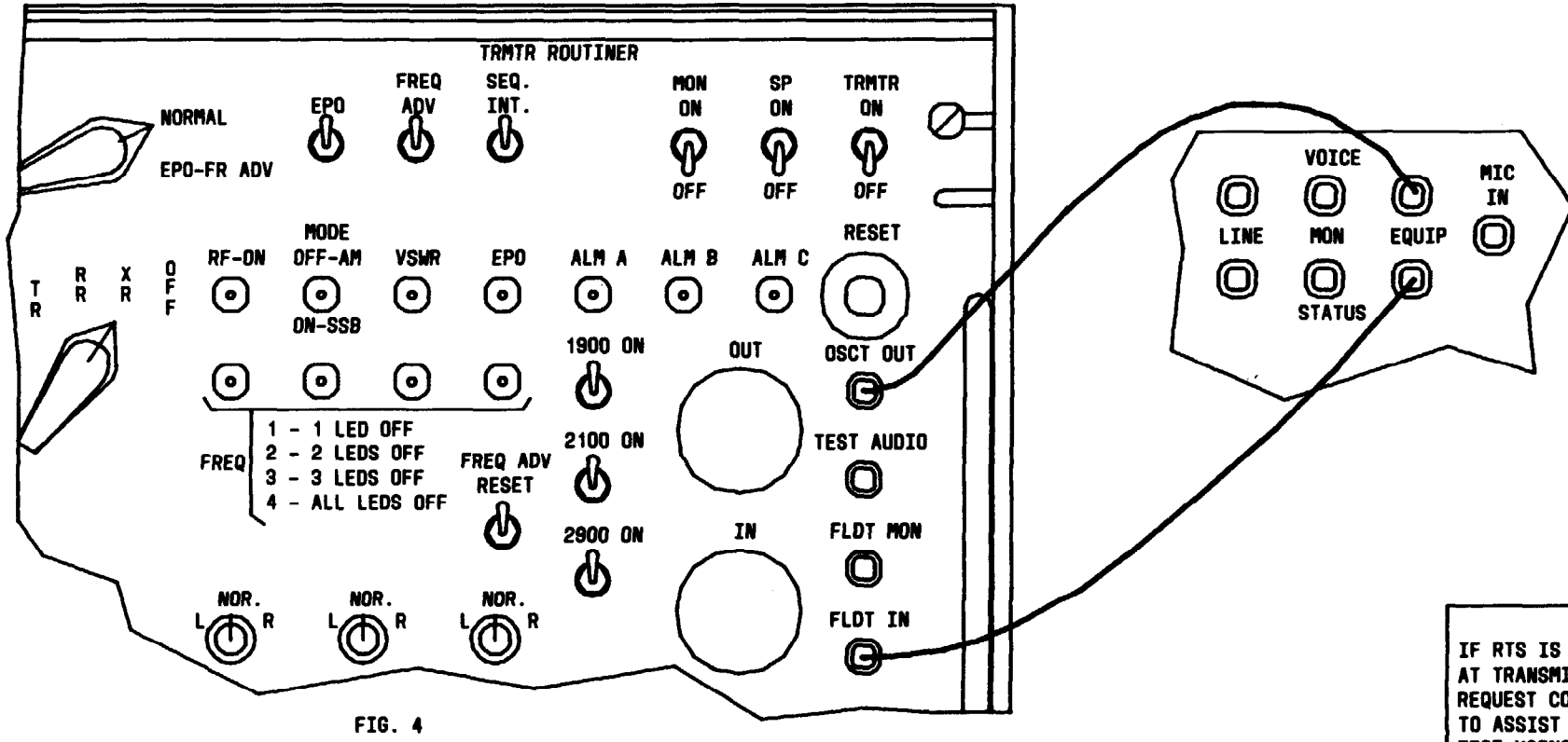


FIG. 4

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

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

[17] SET MAIN POWER AND REGULATOR SWITCHES TO ON

MAIN POWER ON LAMP LIGHTED, A.C. POWER LAMP LIGHTED, BLOWER OPERATES. SEE NOTE 4

[18] SEE DANGER 1. OPEN REAR DOOR OF TRANSMITTER CABINET [FIG. 5]

SONALERT OPERATES

NO

TAP-116

[19] SET MAIN POWER TO OFF

MAIN POWER ON AND A.C. POWER LAMPS OFF. SEE NOTE 4

[20] SEE DANGER 1. PLACE GROUNDING STICK ON LEFT SIDE OF HIGH-VOLTAGE FUSE [FIG. 5]

AND

[21] IS ALARM A MAJOR OR MINOR

MINOR

PAGE 8

MAJOR

[22] SEE DANGER 1. LOCATE TS-2 AND DISCONNECT GREY WIRE FROM TERMINAL 19 [FIG. 6]

[23] PLACE GROUNDING STICK ON HOOK AT TOP OF CABINET AND CLOSE REAR DOOR [FIG. 5]

PAGE 6

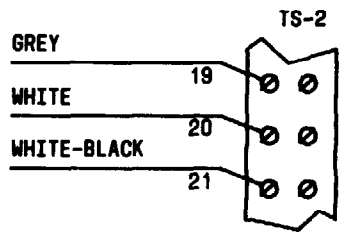


FIG. 6

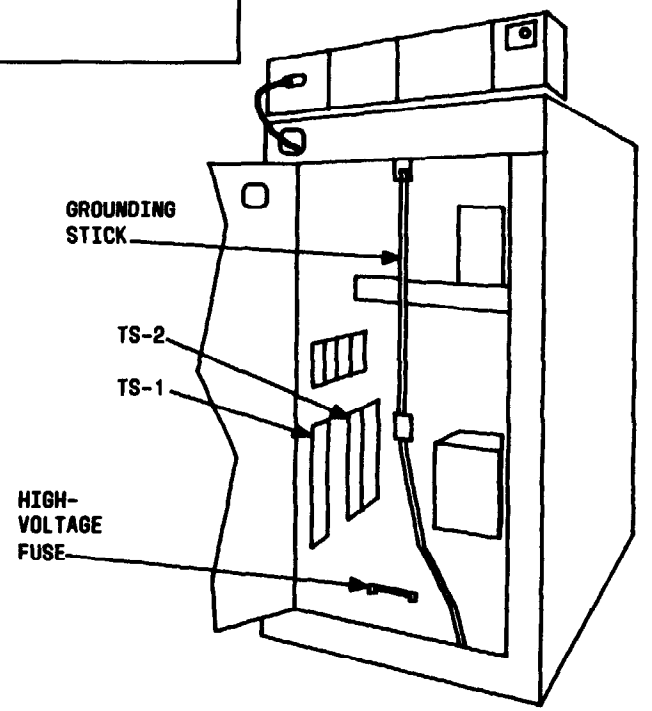
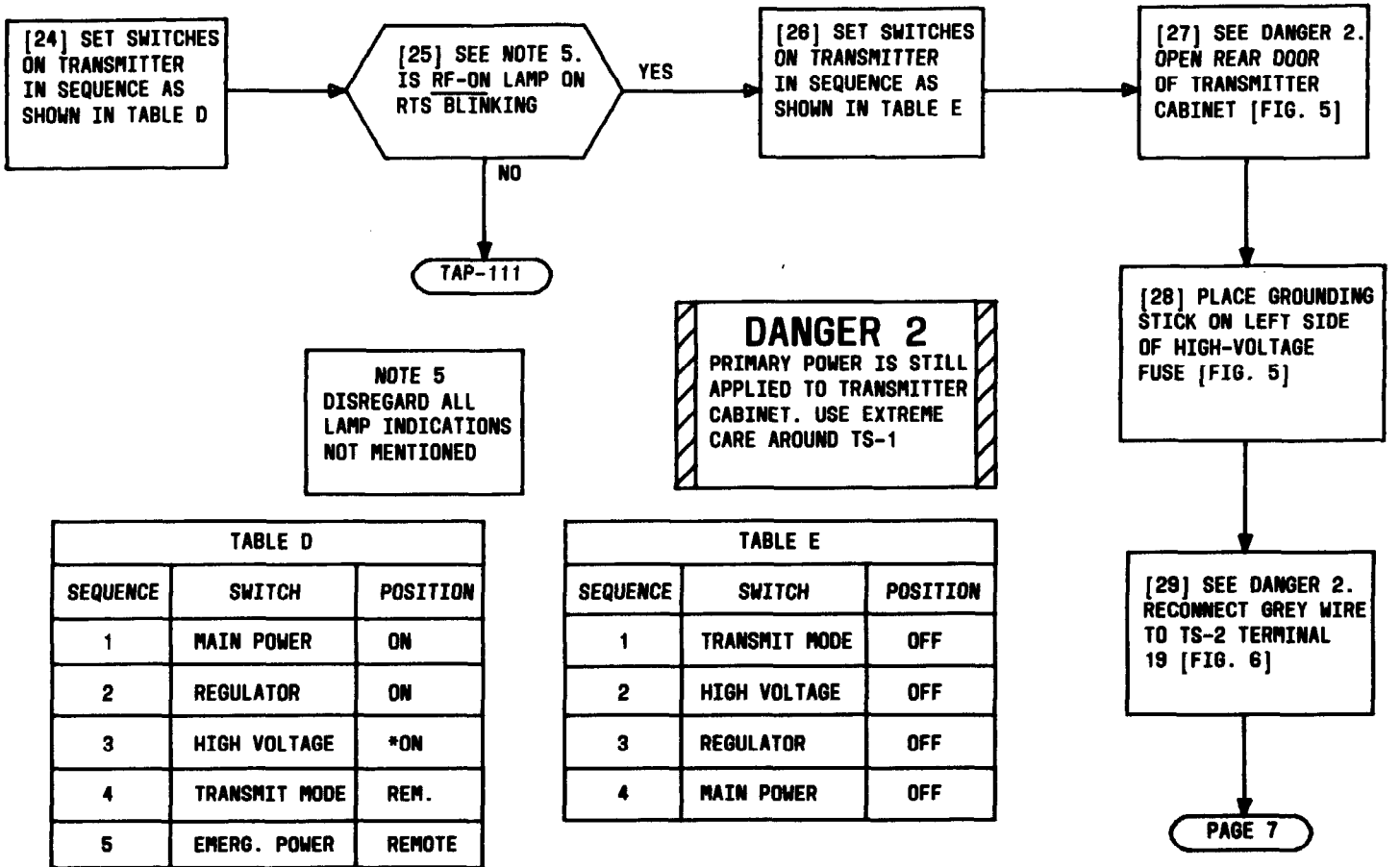


FIG. 5

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

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

TABLE D

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 E

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

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

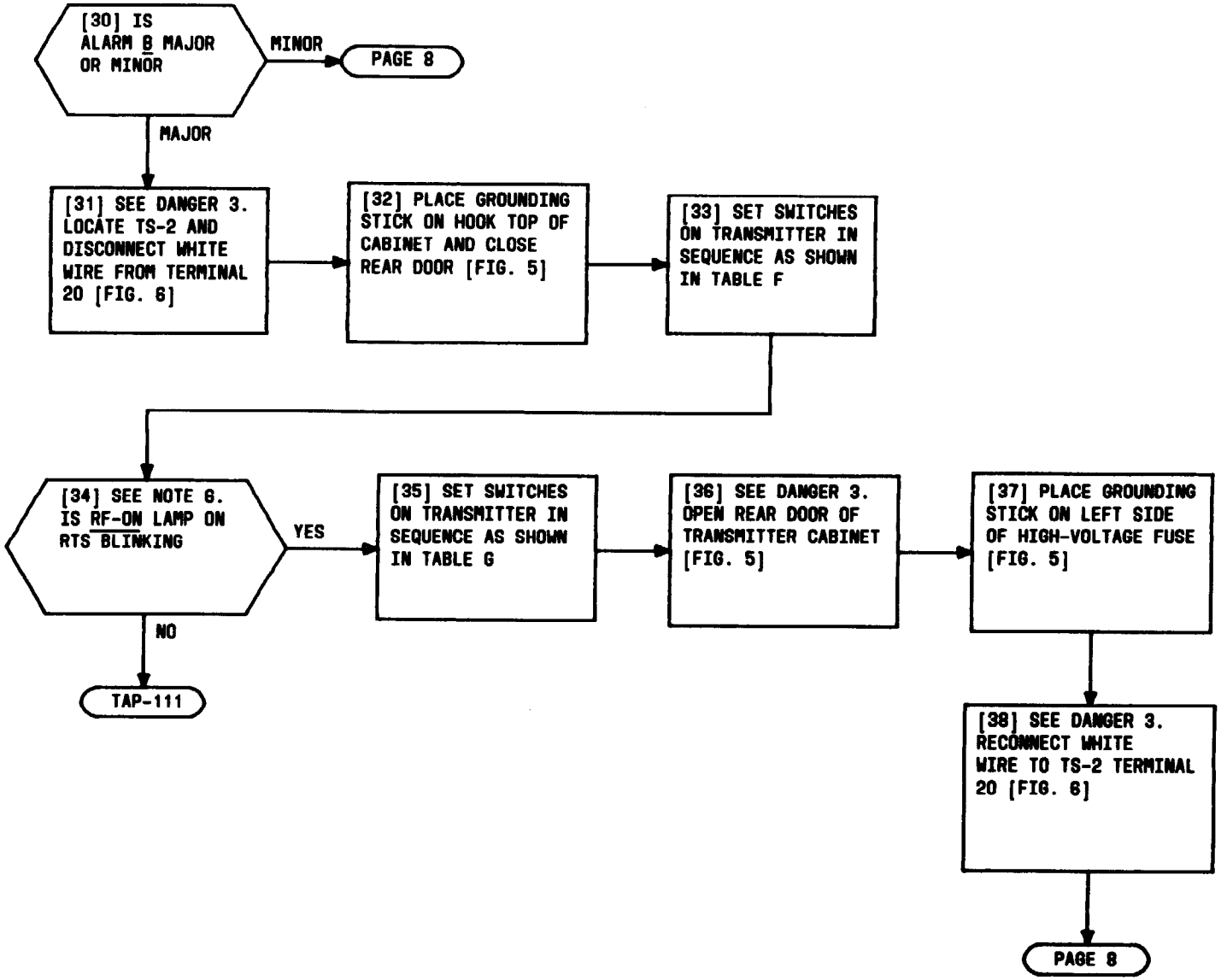


TABLE F		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	ON
4	TRANSMIT MODE	REM.

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

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

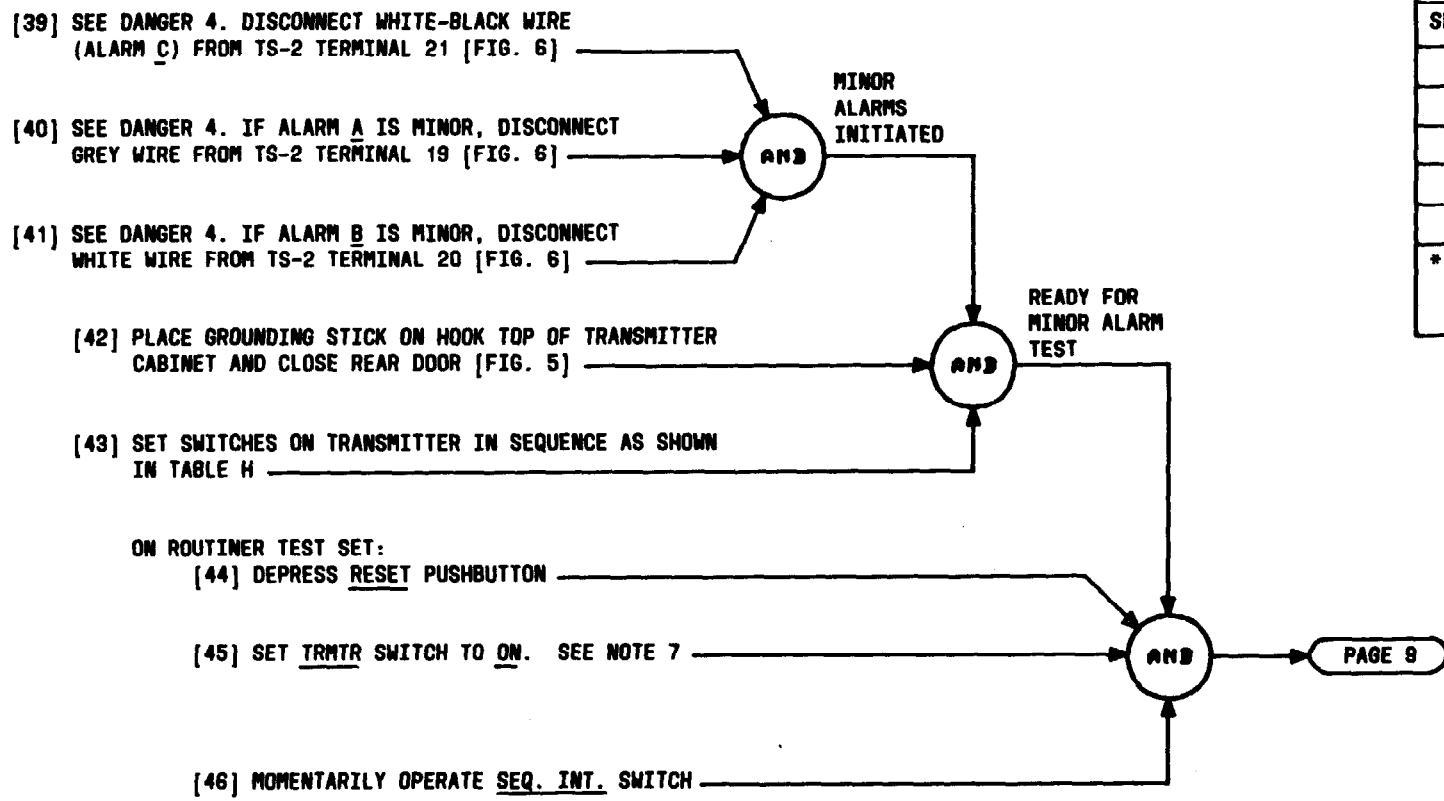


TABLE H		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* 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

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

[47] SEE FIG. 7. ON RTS, ARE ALARM LAMPS LIGHTED THAT CORRESPOND TO MINOR ALARMS

NO → TAP-111

YES

[48] ON RTS, SET TRMTR SWITCH TO OFF

[49] ON TRANSMITTER, SET SWITCHES TO POSITION SHOWN IN TABLE I

[50] OPEN REAR DOOR OF TRANSMITTER CABINET AND PLACE GROUNDING STICK ON LEFT SIDE OF HIGH-VOLTAGE FUSE [FIG. 5]

[51] SEE DANGER 5. RECONNECT ALL WIRES THAT WERE DISCONNECTED FROM TS-2 TERMINALS 19, 20, AND 21 [FIG. 6]

[52] PLACE GROUNDING STICK ON HOOK TOP OF TRANSMITTER CABINET AND CLOSE REAR DOOR [FIG. 5]

[53] REMOVE ALL TEST CONNECTIONS FROM TRANSMITTER

AND → PAGE 10

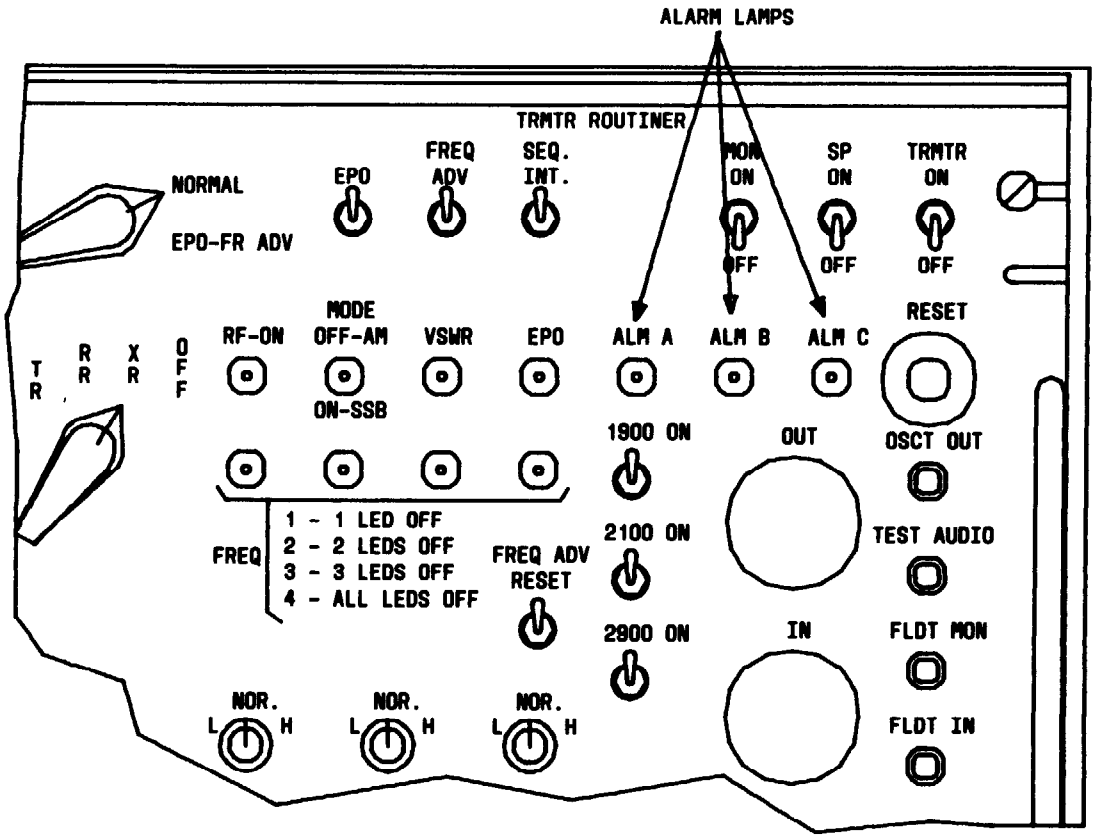


FIG. 7

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

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

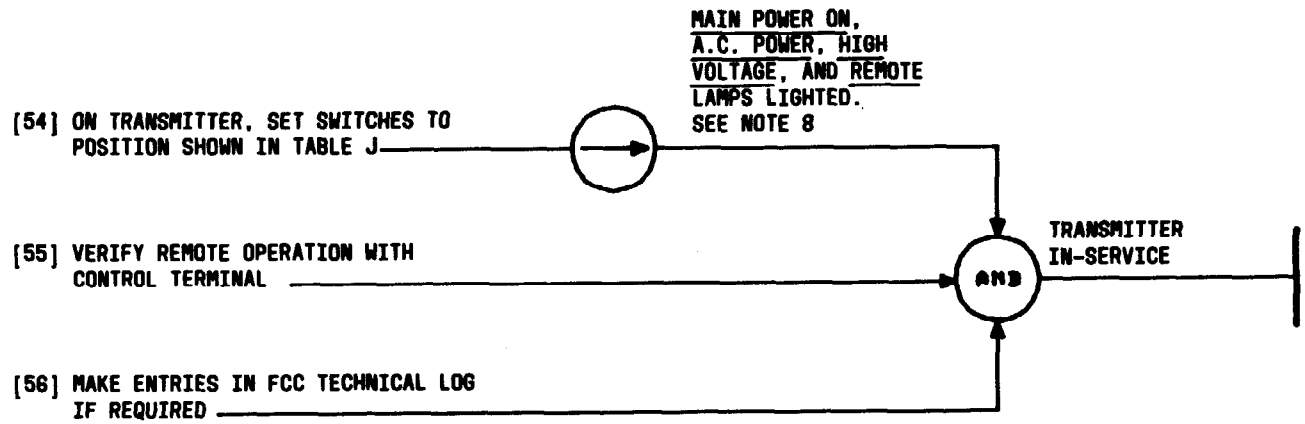


TABLE J		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE
* WAIT UNTIL VSWR/TUBE ALARM LAMP IS EXTINGUISHED BEFORE TURNING ON HIGH VOLTAGE		

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

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

[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]

AND

PAGE 12

DANGER 6

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

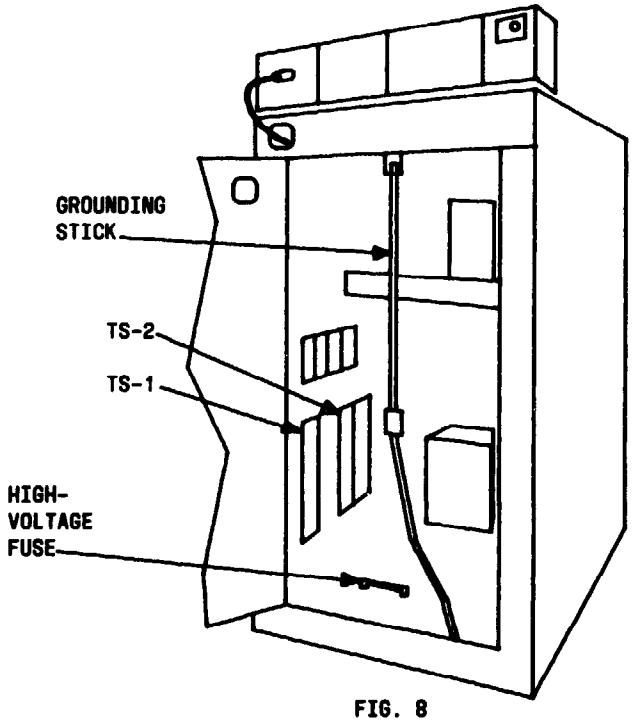


FIG. 8

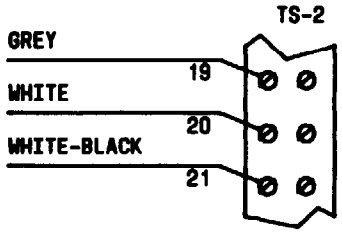
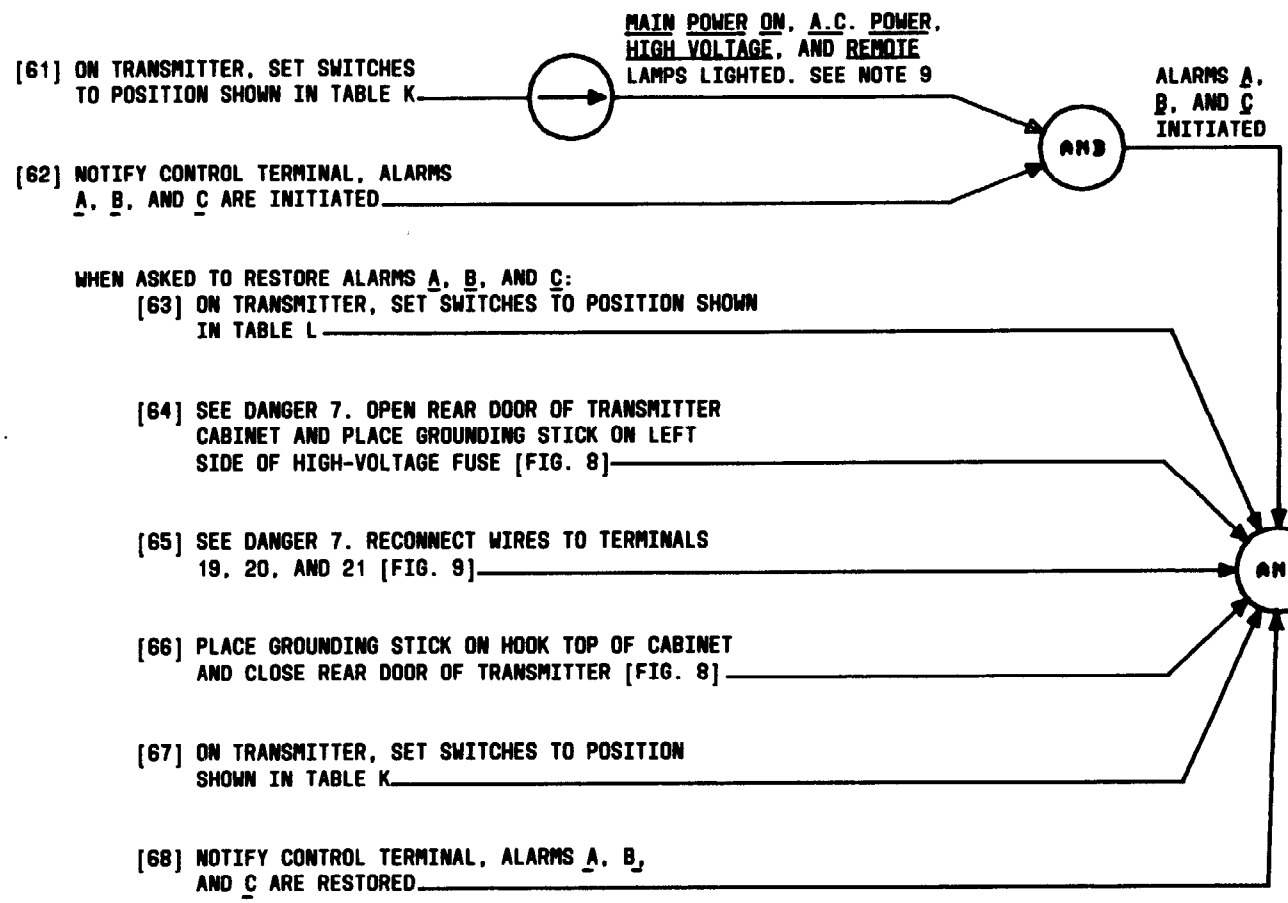


FIG. 9

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



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

TABLE L

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

TABLE K

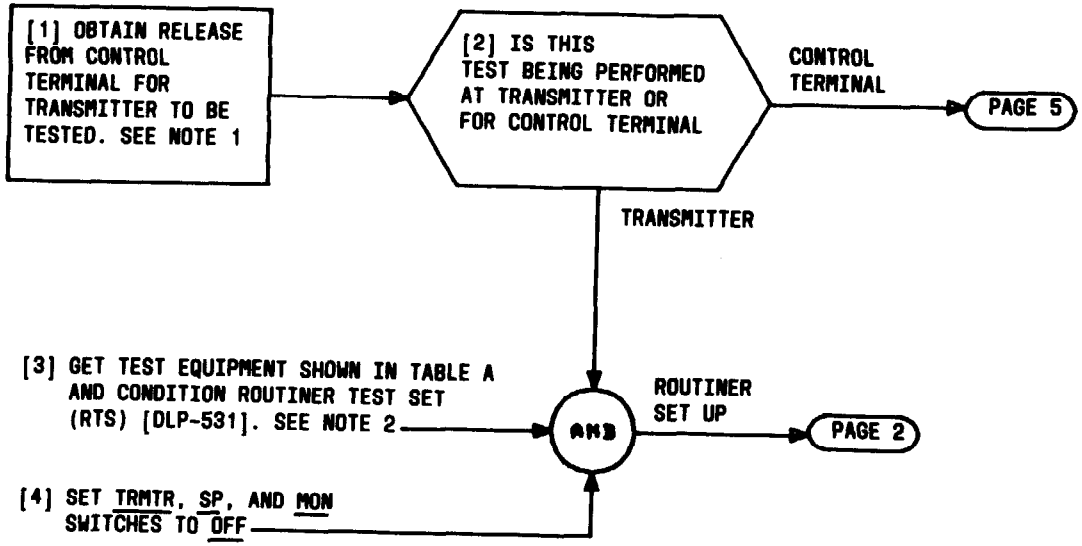
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

* 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 TRASMITTER 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	369A

TEST TRANSMITTER SIGNALING OF VSWR ALARM

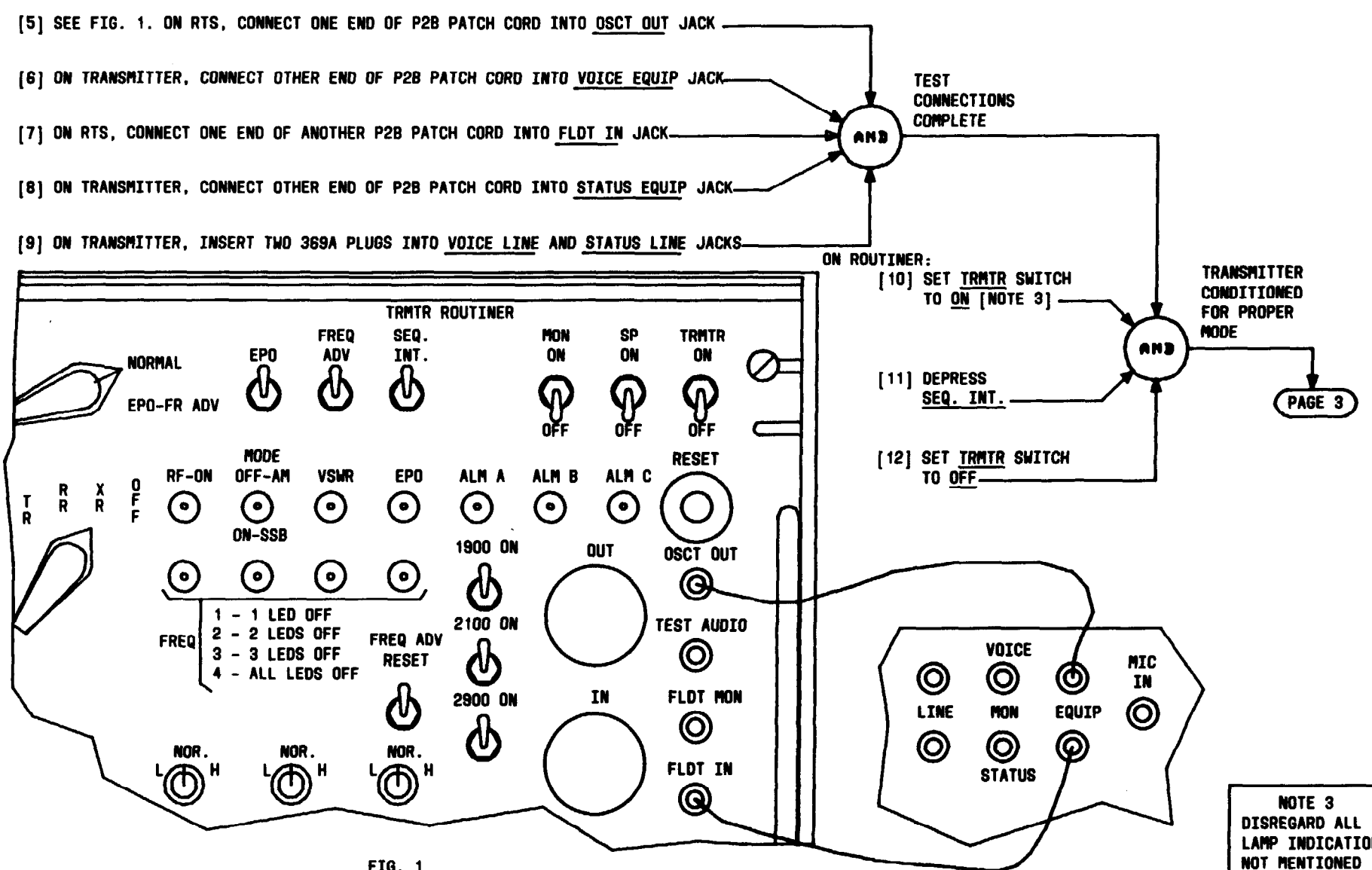


FIG. 1

TEST TRANSMITTER SIGNALING OF VSWR ALARM

[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

AND

[16] ON ROUTINER, DEPRESS SEQ. INT.

[17] IS ROUTINER VSWR LAMP LIGHTED

NO → TAP-109

YES

[18] ON ROUTINER, SET TRMTR SWITCH TO OFF → PAGE 4

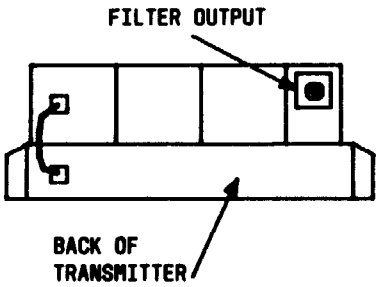
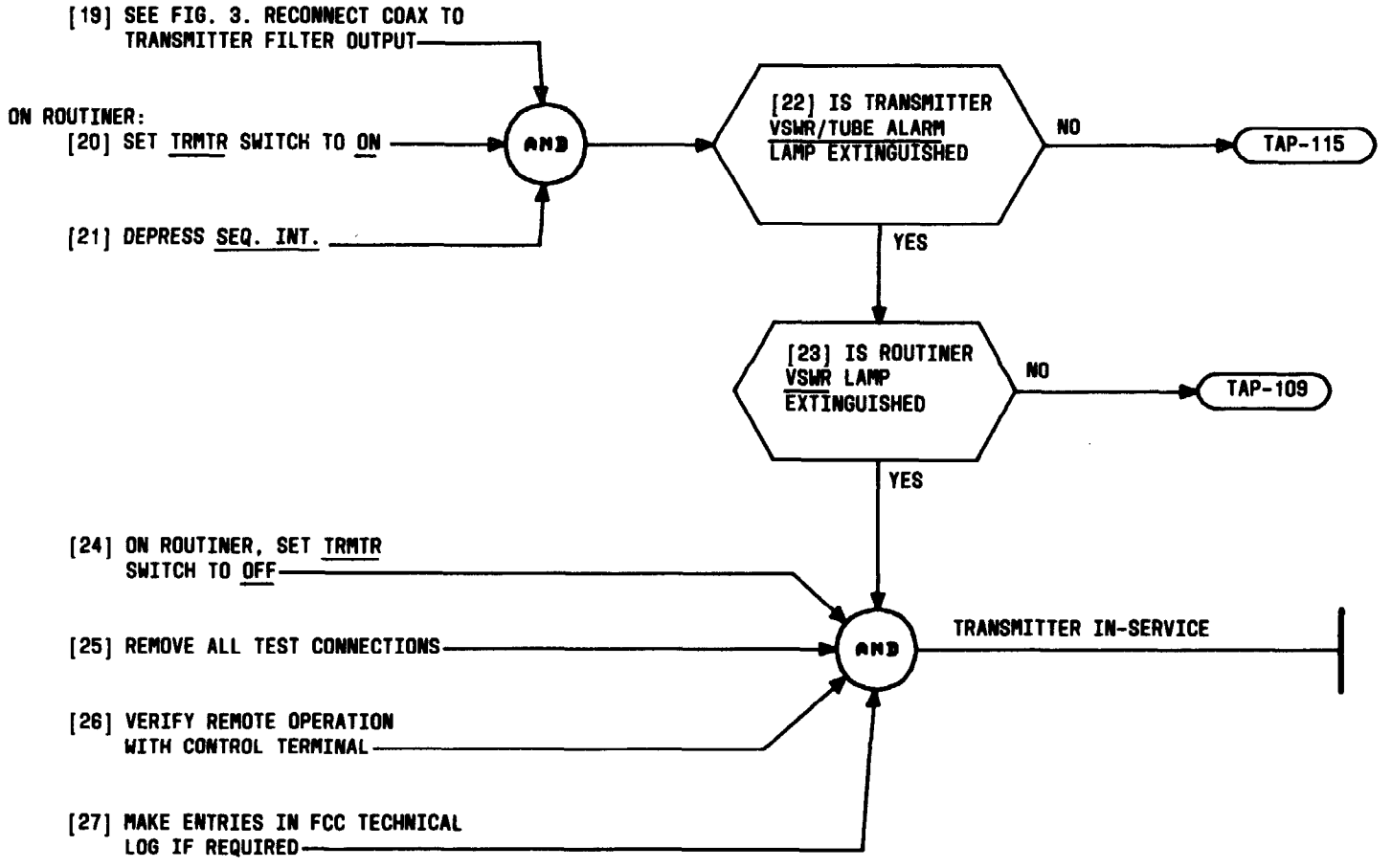


FIG. 2

NOTES

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

TEST TRANSMITTER SIGNALING OF VSWR ALARRM



TEST TRANSMITTER SIGNALING OF VSWR ALARM

WHEN NOTIFIED:

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

[29] NOTIFY CONTROL TERMINAL WHEN ANTENNA IS DISCONNECTED

AND

ANTENNA COAX 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

AND

TRANSMITTER IN-SERVICE

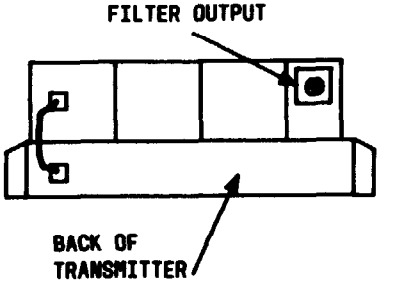


FIG. 3

TEST TRANSMITTER SIGNALING OF VSWR ALARM

SUMMARY

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 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

[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 89BN RESISTORS	WITH KS-21277
1 PATCH CORD	TAPE RECORDER TO NOISE MEASURING SET

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

[3] CONDITION 3C NOISE MEASURING SET (NMS) FOR MEASUREMENT [DLP-532]

[4] SEE FIG. 1. PATCH TAPE RECORDER OUTPUT TO NMS

[5] TURN ON TAPE RECORDER AND OBSERVE NMS

[6] SET OUTPUT LEVEL OF TAPE RECORDER FOR 70 DBRN

[7] TURN OFF TAPE RECORDER

[8] DISCONNECT TAPE RECORDER FROM NMS

[9] SEE FIG. 2. PATCH OUTPUT OF TAPE RECORDER TO TRANSMITTER VOICE EQUIP JACK

AND

TAPE RECORDER SET UP → PAGE 3

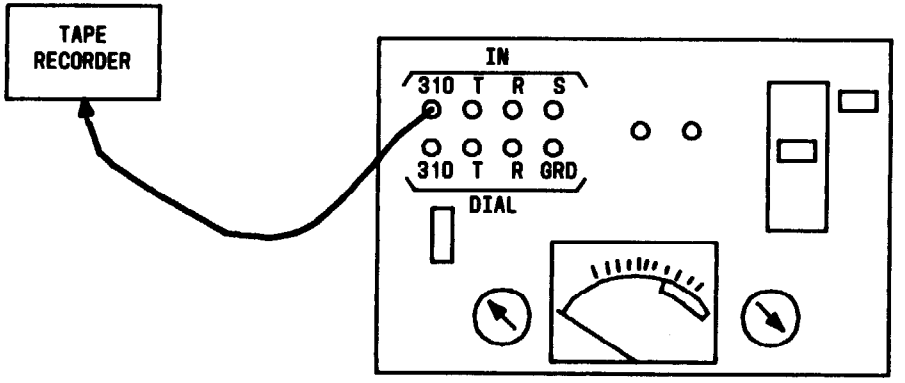


FIG. 1

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

[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

AND

TEST CONNECTIONS COMPLETED

[14] ENSURE TRANSMIT MODE SWITCH IS SET TO REM

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

AND

[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

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

YES → PAGE 4

NO → TAP-131

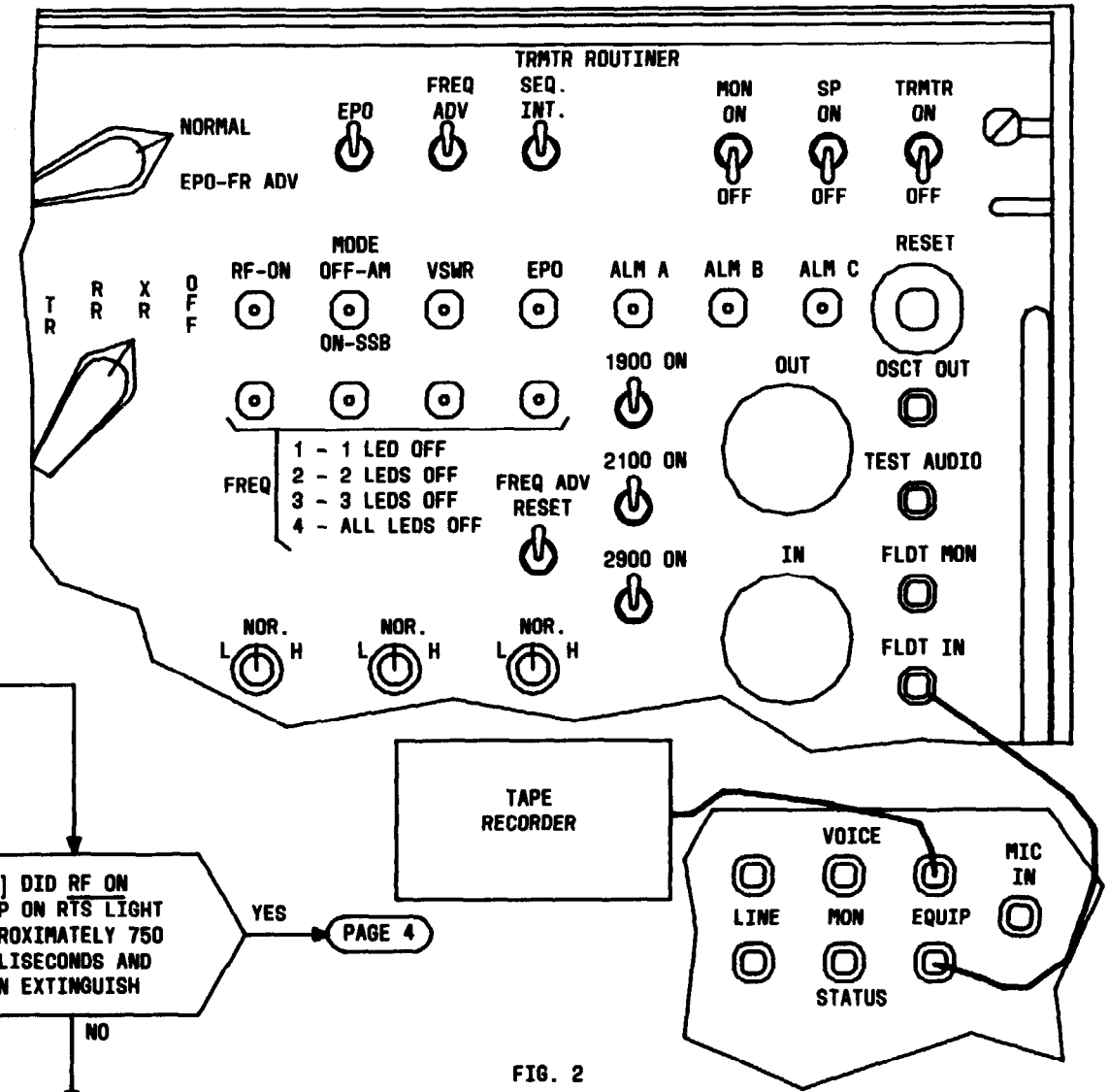


FIG. 2

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

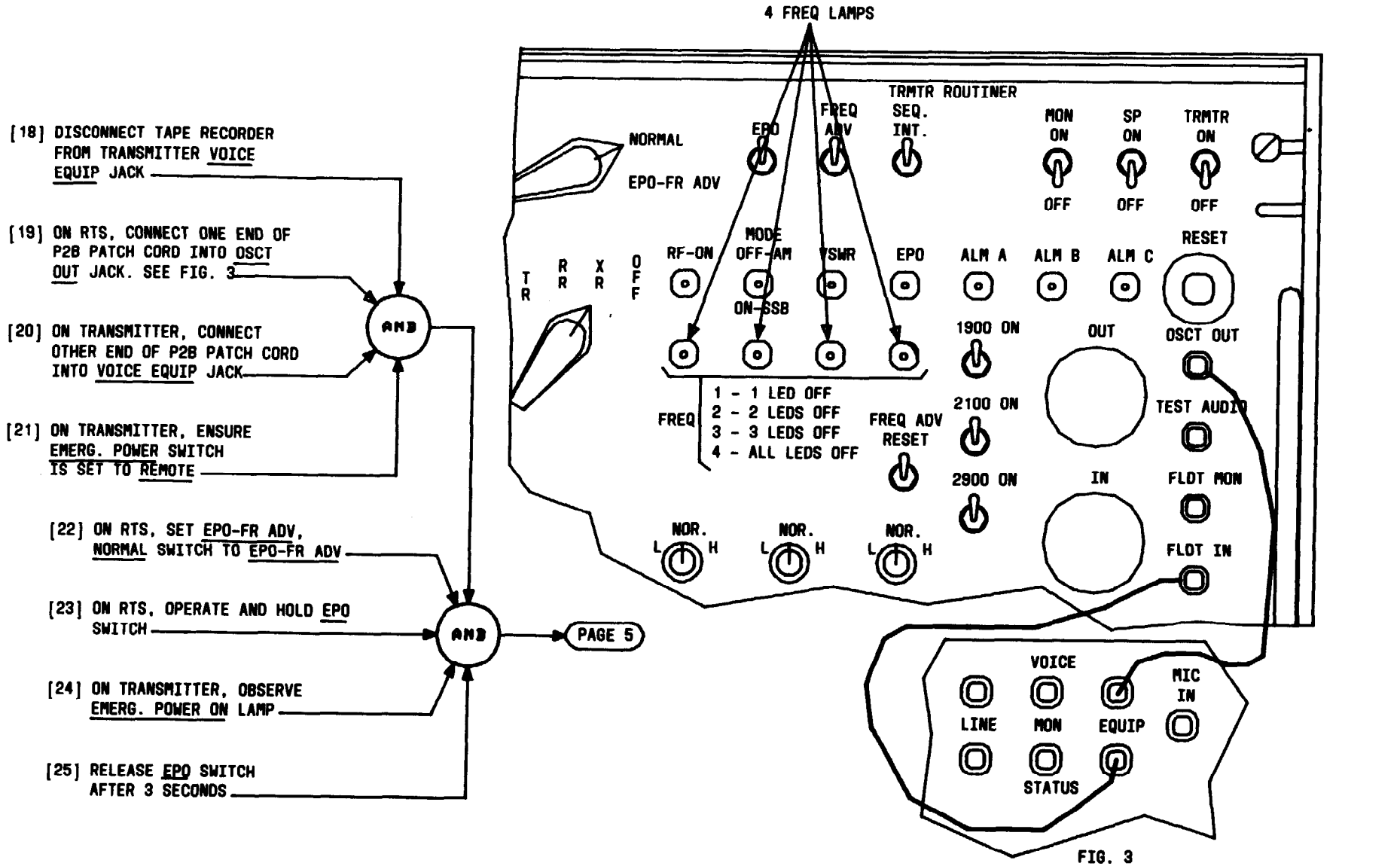


FIG. 3

TEST TRANSMITTER AUXILIARY SIGNALING BOARD

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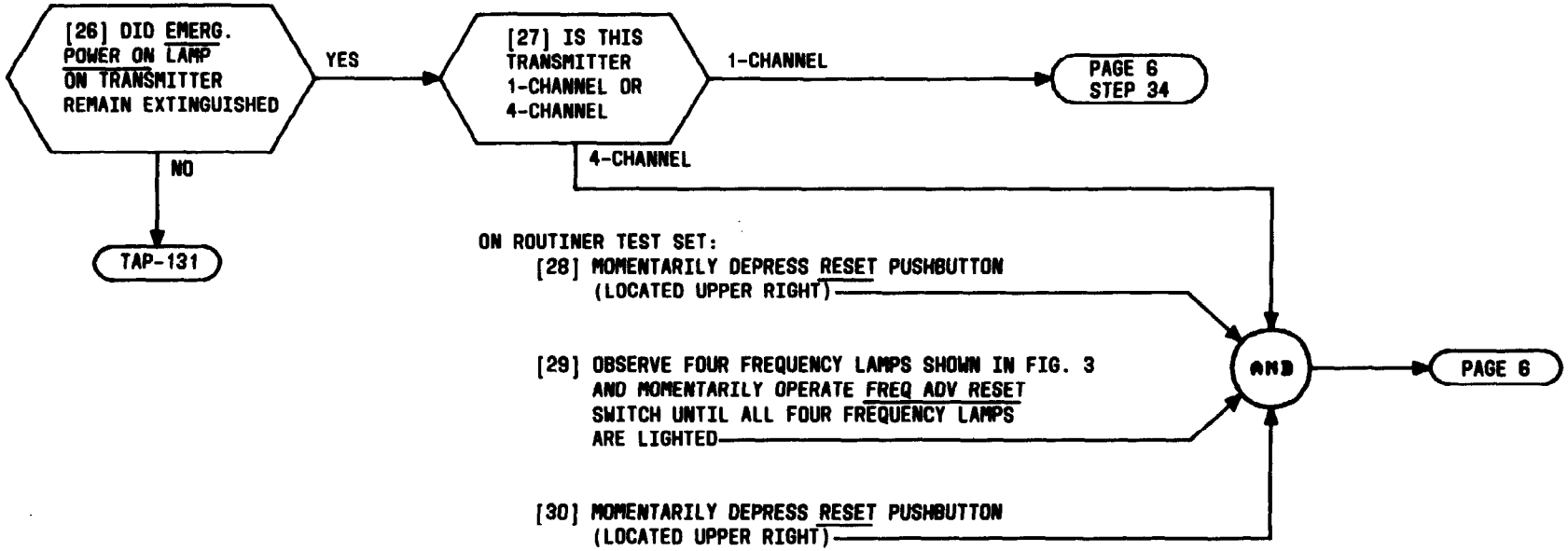


TEST TRANSMITTER AUXILIARY SIGNALING BOARD

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

[32] ON RTS, MOMENTARILY OPERATE FREQ ADV SWITCH

AND

[33] DID LAMP OBSERVED IN STEP 31 REMAIN LIGHTED

NO → TAP-131

YES

[34] ON RTS, OBSERVE RF ON LAMP AND SET TRMTR SWITCH TO ON. SEE NOTE 5

[35] DID RF ON LAMP LIGHT AFTER APPROXIMATELY 3 SECONDS DELAY

NO → TAP-131

YES

[36] ON RTS, OBSERVE RF ON LAMP AND SET TRMTR SWITCH TO OFF

PAGE 7

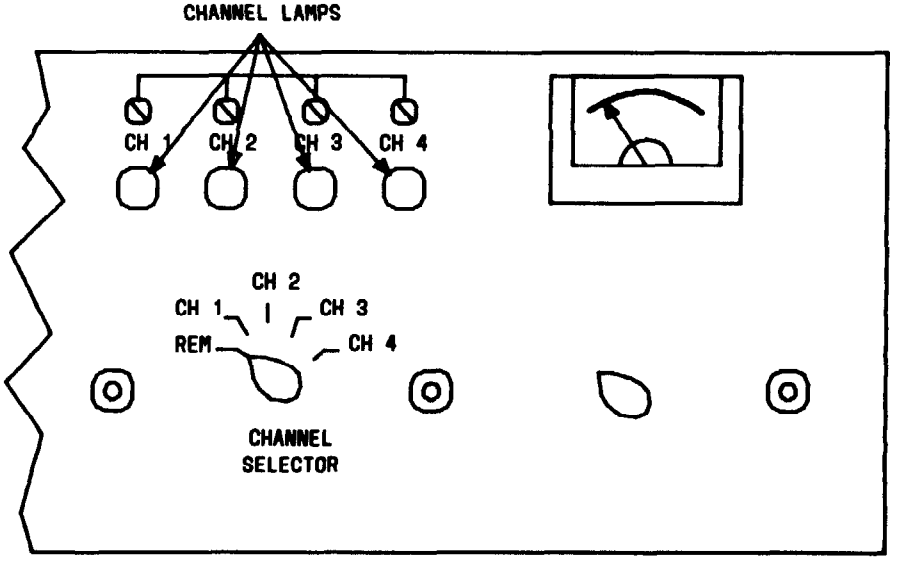
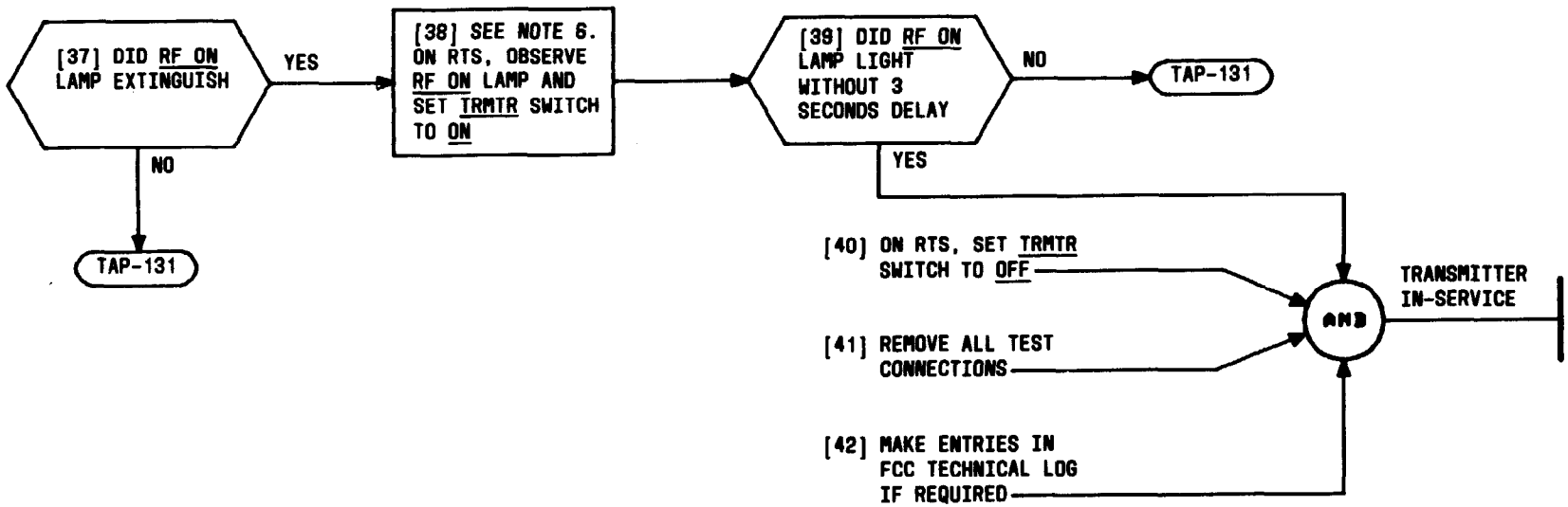


FIG. 4

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

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

AND

STANDING BY FOR TEST

[8] IS TRANSMITTER IN A3H OR A3A MODE OF OPERATION

A3A → PAGE 4

A3H → PAGE 2

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

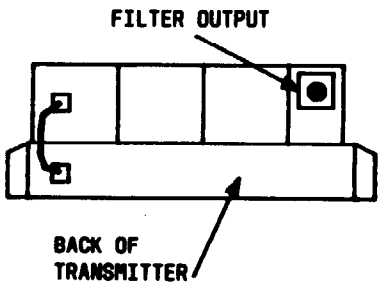


FIG. 1

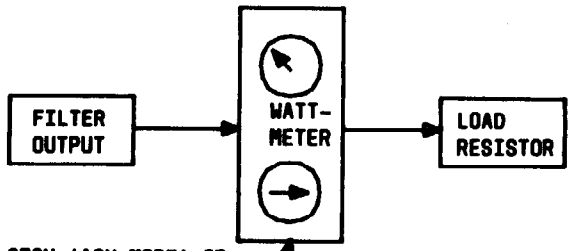


FIG. 2

TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

WHEN NOTIFIED TO PREPARE FOR RF ON FAILURE TEST:

[9] SET TRANSMIT MODE SWITCH TO A3H

TRANSMITTER ON AND LOCAL LAMPS LIGHTED. SEE NOTE 1

[10] OBSERVE IN-LINE WATTMETER AND RECORD INDICATION [NOTE 2]

[11] SEE FIG. 3. REMOVE COVER FROM EXCITER UNIT

[12] ON WIDEBAND AMPLIFIER BOARD [FIG. 3], LOCATE R1 [FIG. 4]

[13] OBSERVE WATTMETER AND ROTATE R1 FOR INDICATION OF 45 WATTS

AND

READY FOR RF ON FAILURE TEST

PAGE 3

[14] SET TRANSMIT MODE SWITCH TO REM. AND REPORT TO CONTROL TERMINAL READY FOR RF ON FAILURE TEST

REMOTE LAMP LIGHTED. SEE NOTE 1

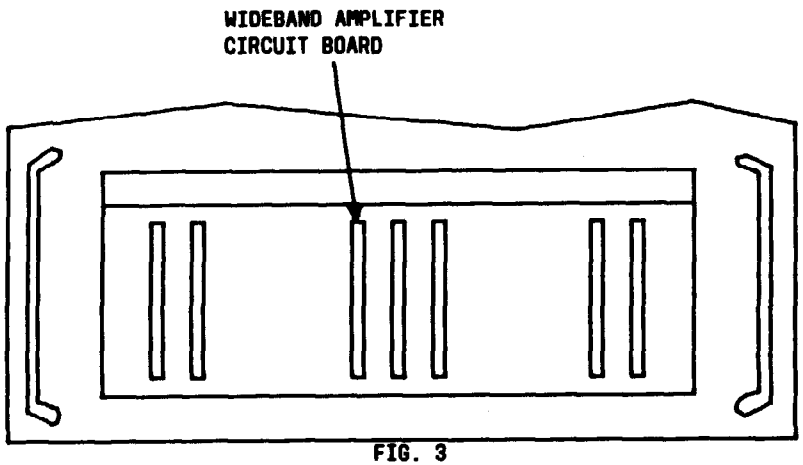


FIG. 3

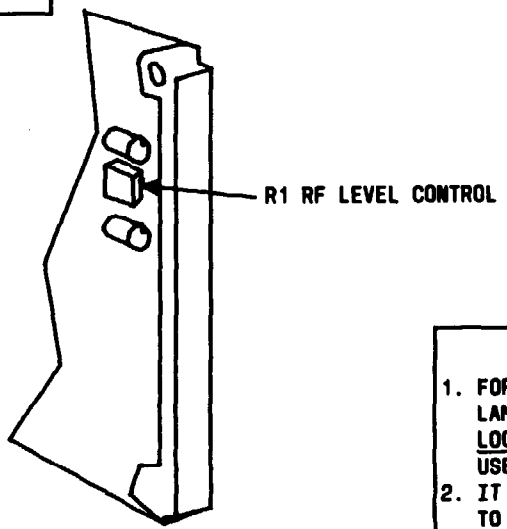
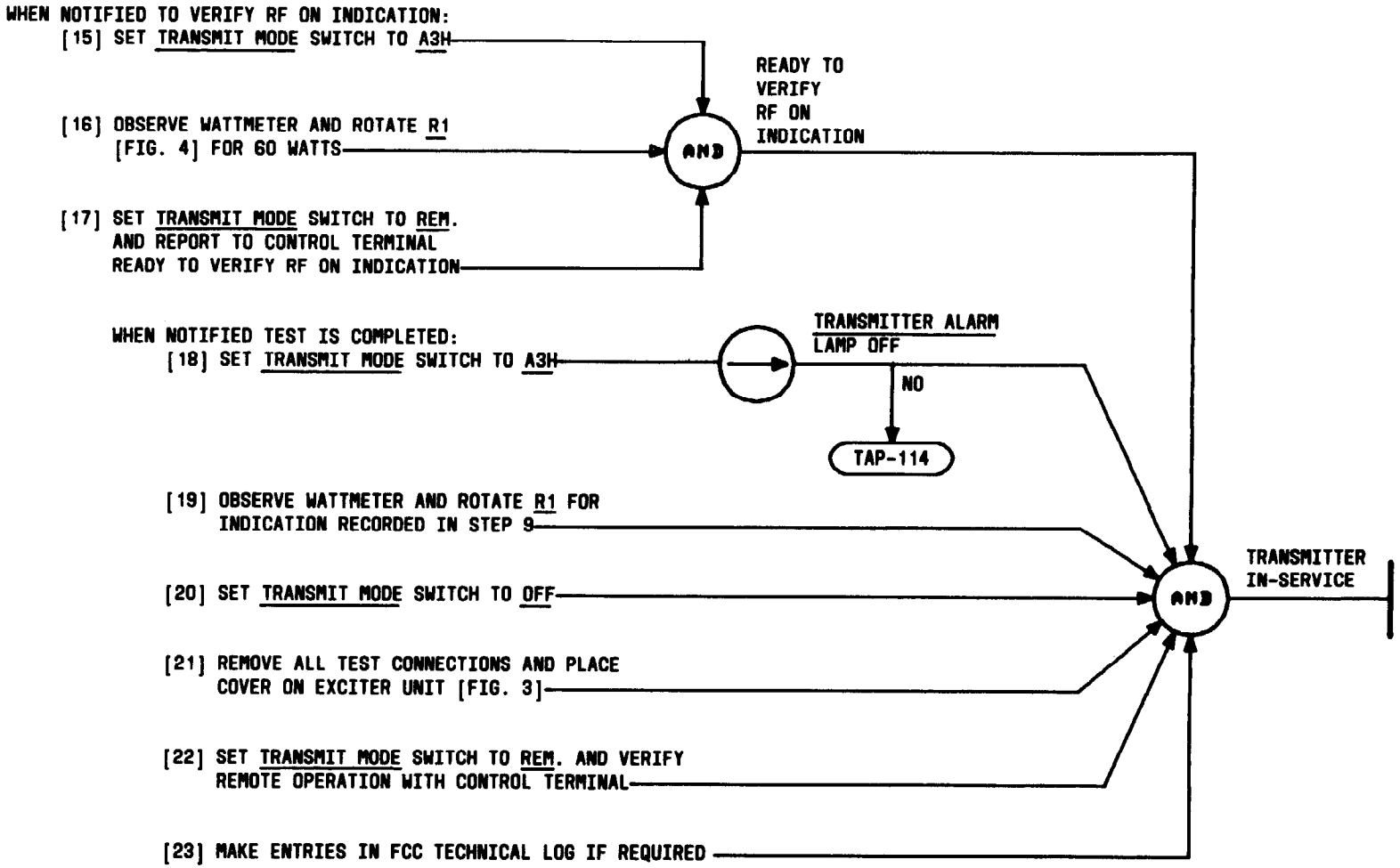


FIG. 4

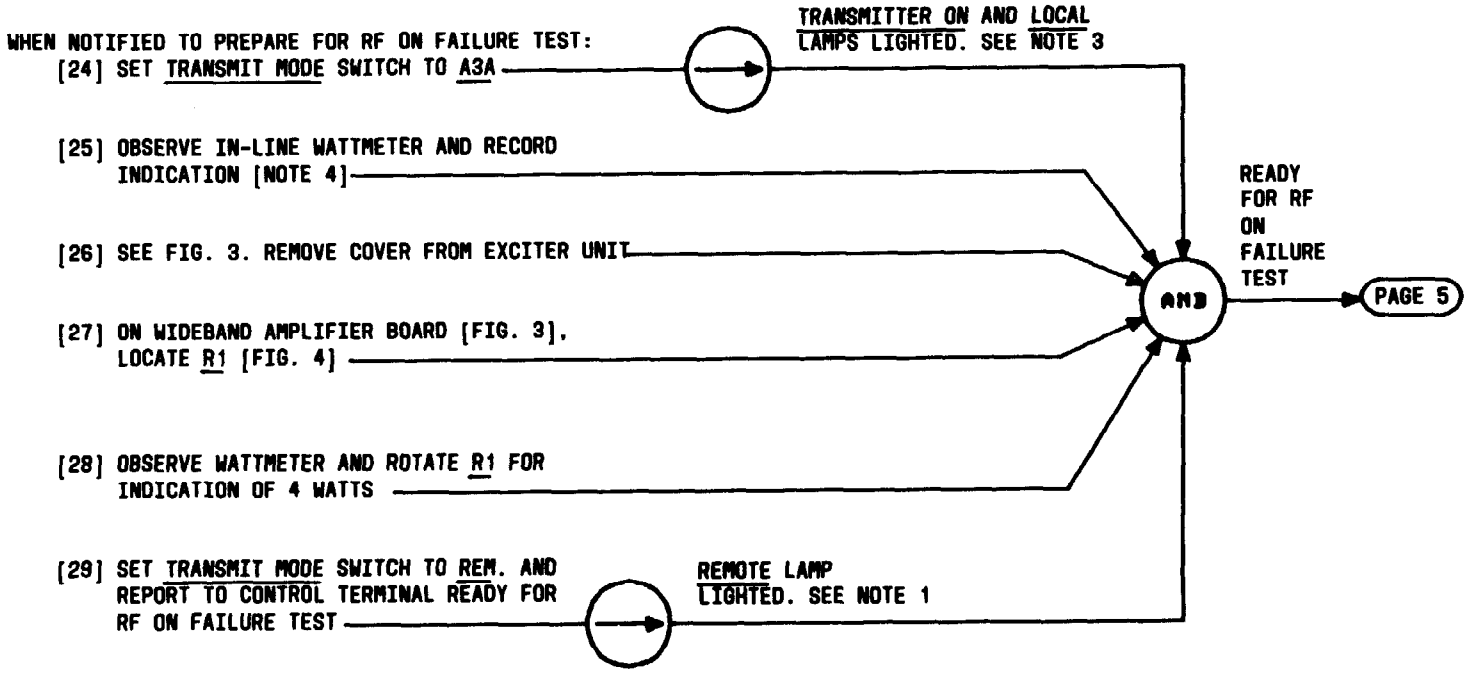
NOTES

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

TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL



TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL



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

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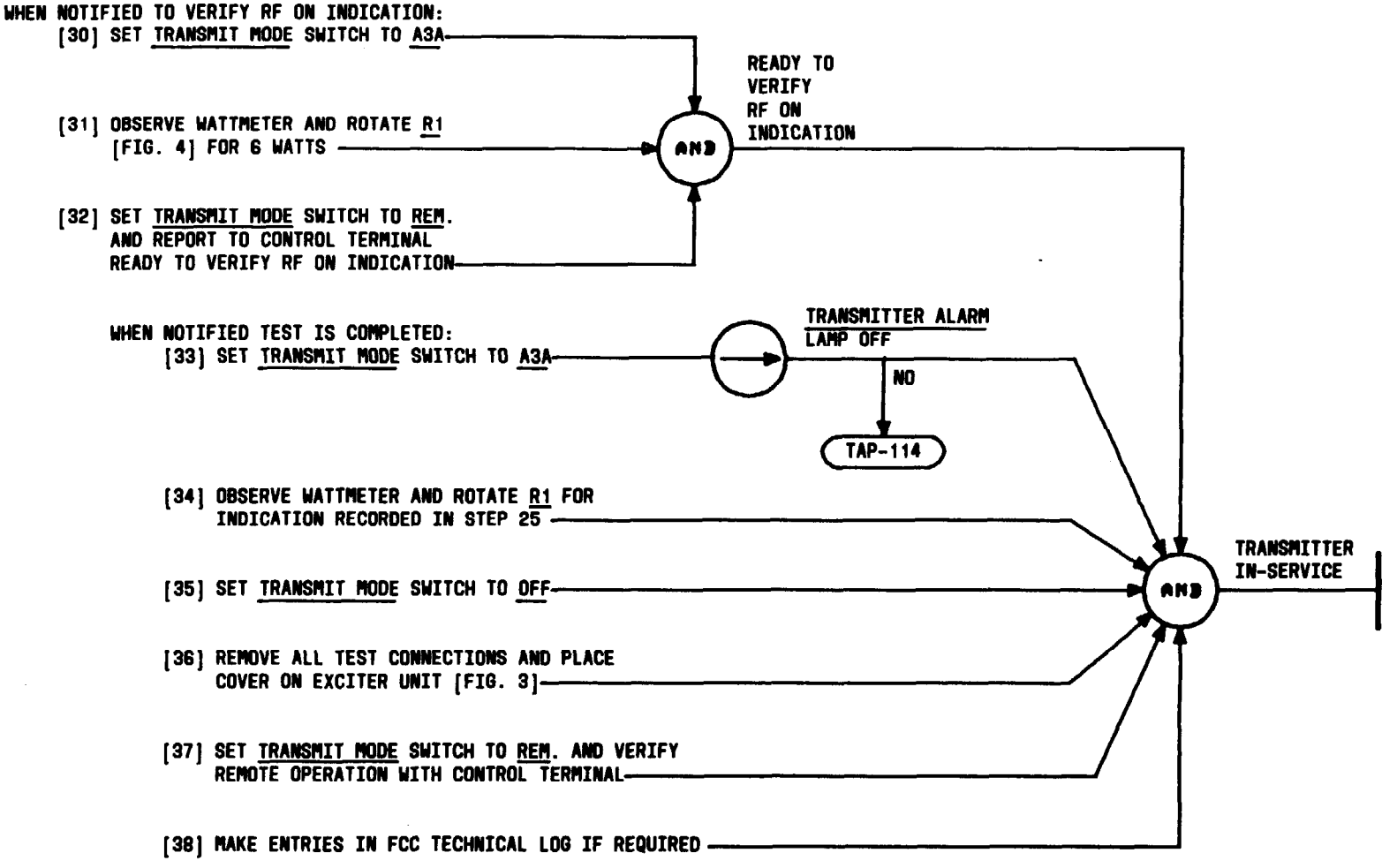
TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL



TEST TRANSMITTER RF FAIL ALARM INDICATION FROM CONTROL TERMINAL

SUMMARY

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 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

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

[2] SET SWITCHES ON TRANSMITTER AS SHOWN IN TABLE A, IN SEQUENCE

[3] GET TERMINAL STRIP AND APPROX 35 FEET HOOKUP WIRE. MAKE TEST ARRANGEMENT SHOWN IN FIG. 1. SEE NOTE 2

PAGE 2

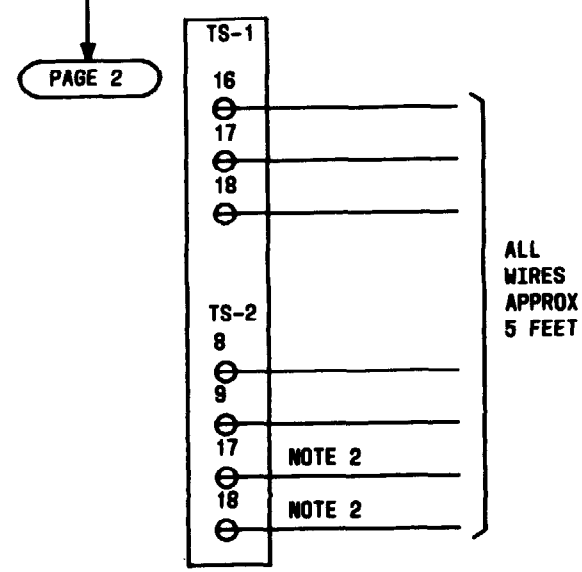


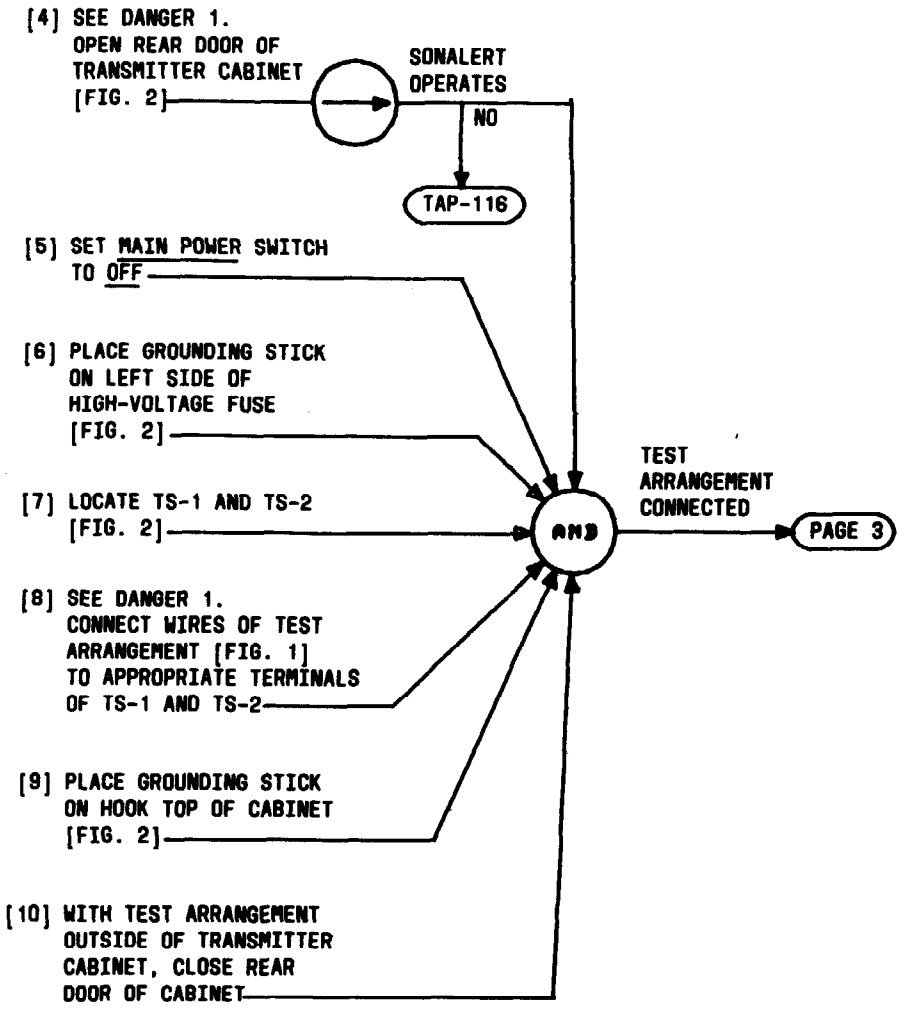
FIG. 1

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

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

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



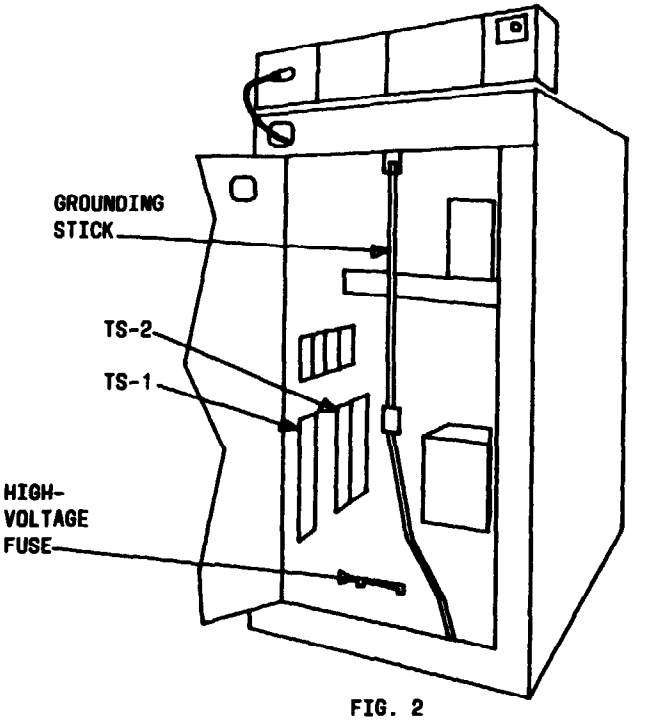


FIG. 2

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, TRMTR ON, SPARE, MONITOR RCVR, AND EMERGENCY POWER COMMANDS

[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]

AND

RF COAXIAL LOAD RESISTOR AND IN-LINE WATTMETER CONNECTED

PAGE 4

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 89BN RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 LINE TERMINATIONS	369A
HEADSET OR EQUIVALENT	509 HEAD RECEIVER/ 2W4A CORD
VOLT-OHM-METER	KS-14510A

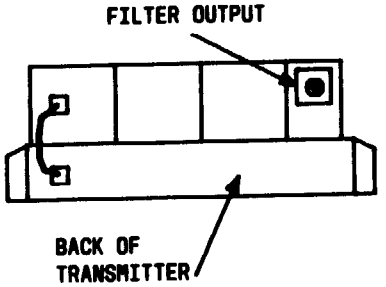


FIG. 3

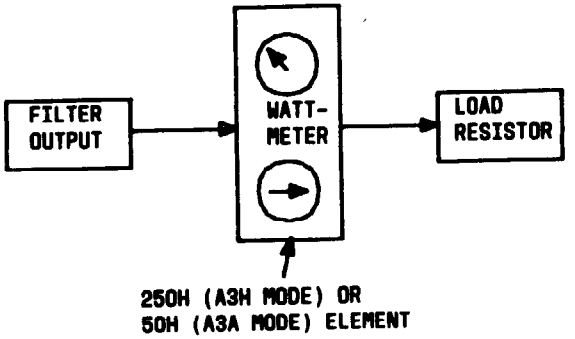


FIG. 4

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

[16] SET SWITCHES ON TRANSMITTER IN SEQUENCE AS SHOWN IN TABLE C

[17] ARE MAIN POWER ON, A.C. POWER, AND HIGH VOLTAGE LAMPS LIGHTED

YES

NO

TABLE D

[18] SEE FIG. 5. CONDITION ROUTINER TEST SET (RTS) [DLP-531]. SEE NOTE 3

AND

PAGE 5

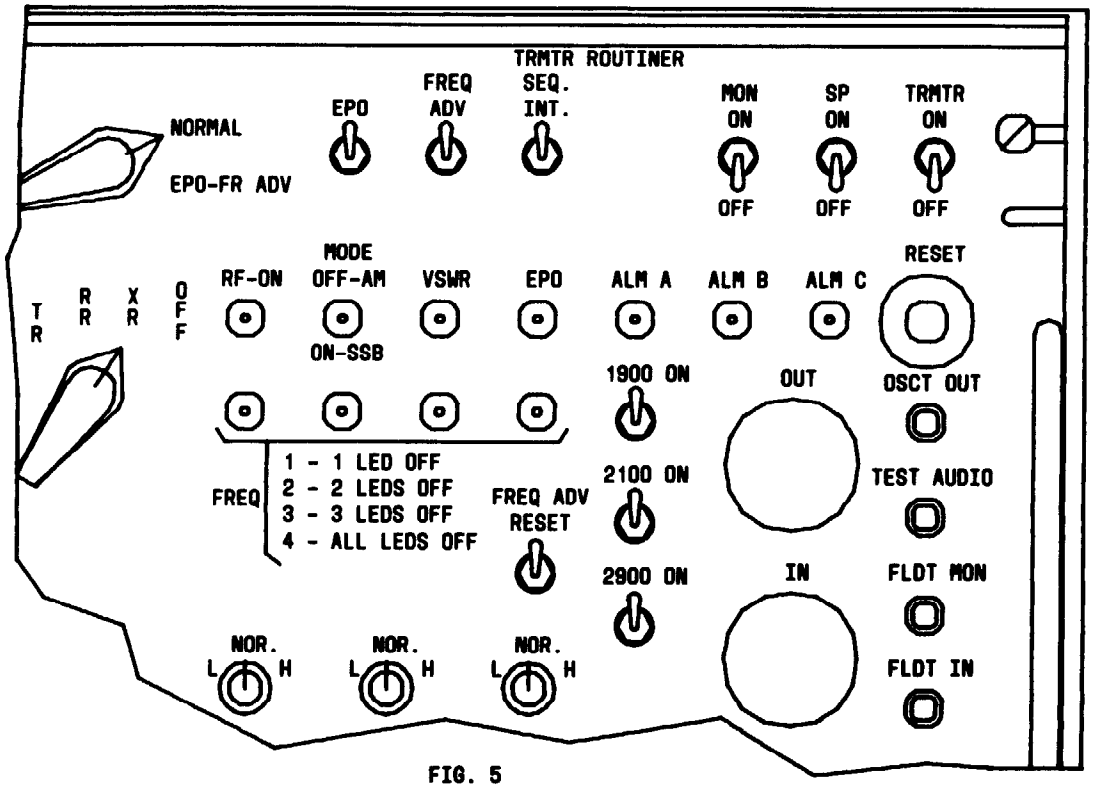


FIG. 5

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

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 P28 PATCH CORD INTO FLDT IN JACK [FIG. 6]

[22] ON TRANSMITTER, CONNECT OTHER END OF P28 PATCH CORD TO STATUS EQUIP JACK [FIG. 6]

[23] ON RTS, CONNECT ONE END OF P28 PATCH CORD INTO OSCT OUT JACK [FIG. 6]

[24] ON TRANSMITTER, CONNECT OTHER END OF P28 PATCH CORD TO VOICE EQUIP JACK [FIG. 6]

AND

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

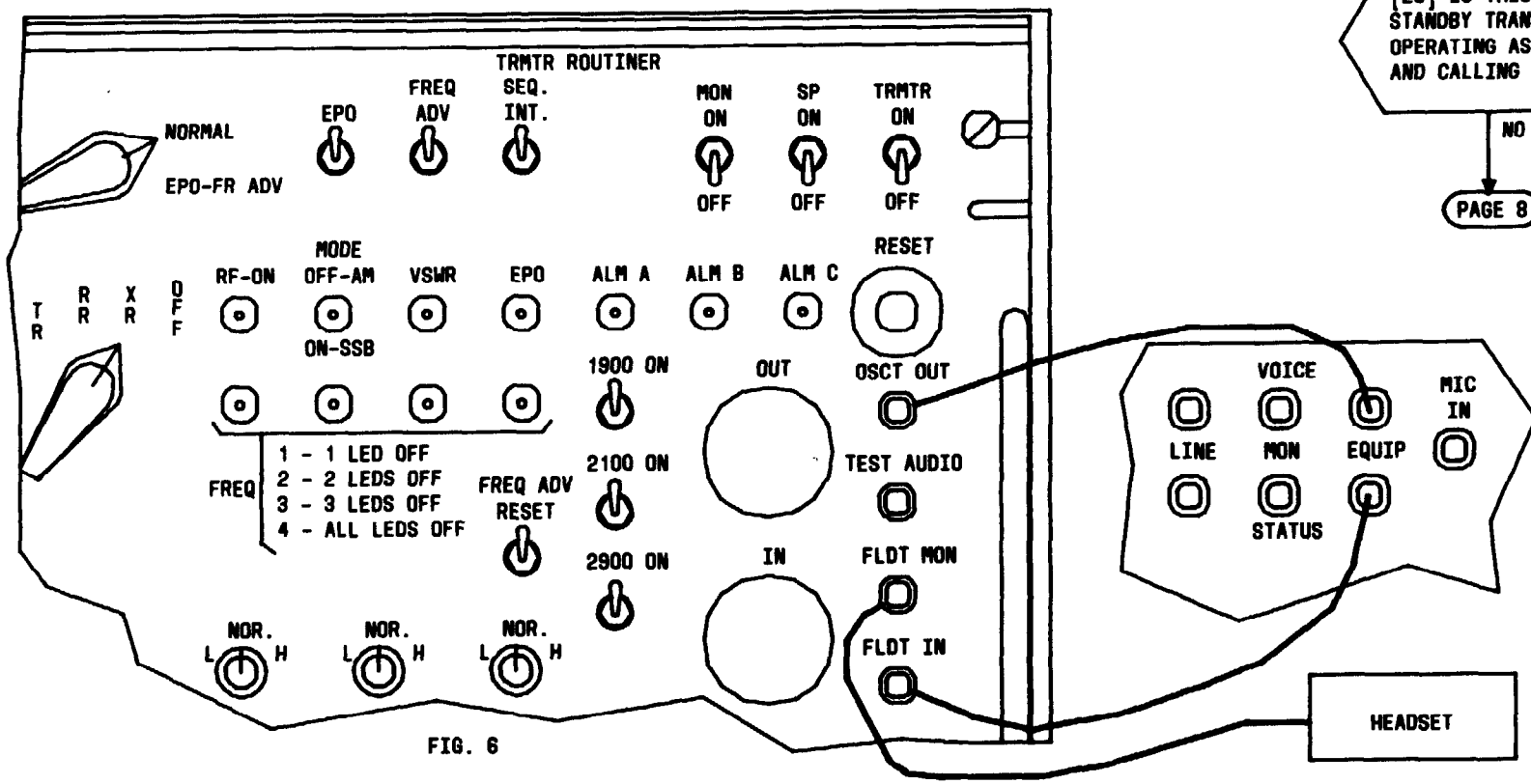
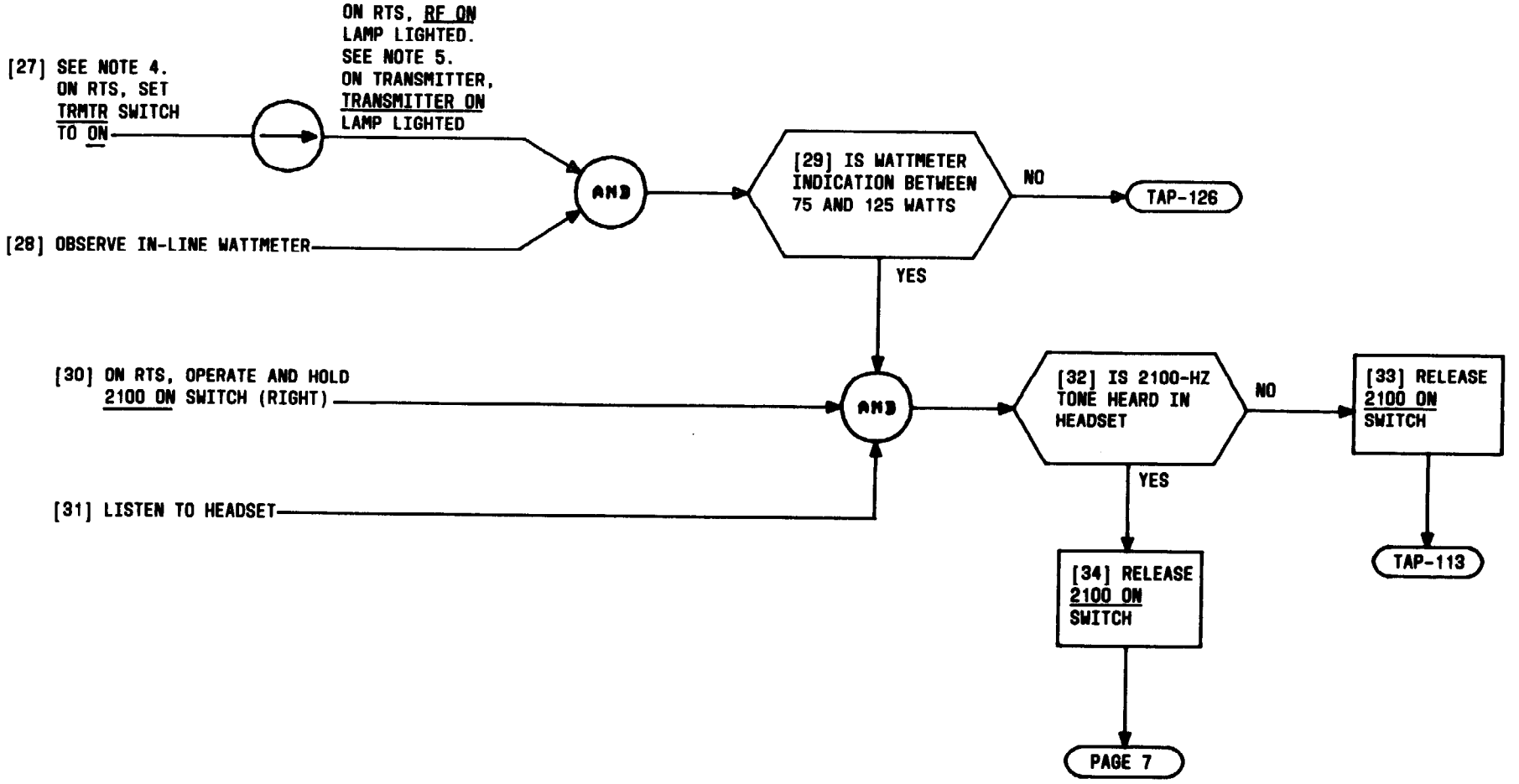


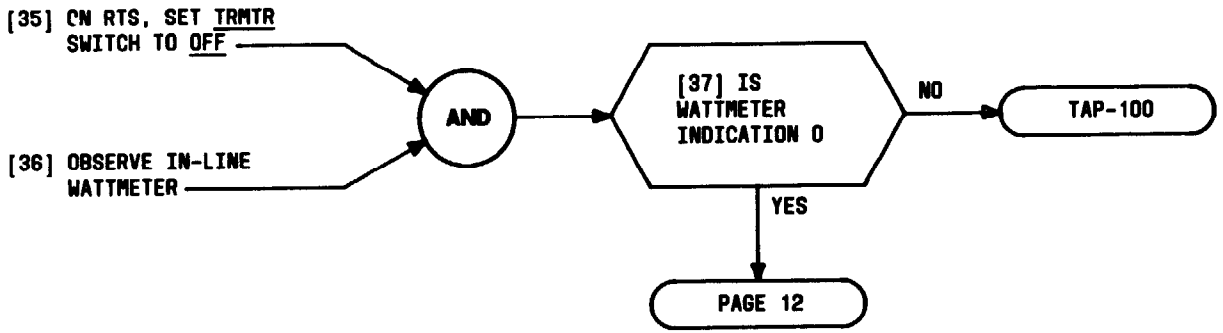
FIG. 6

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

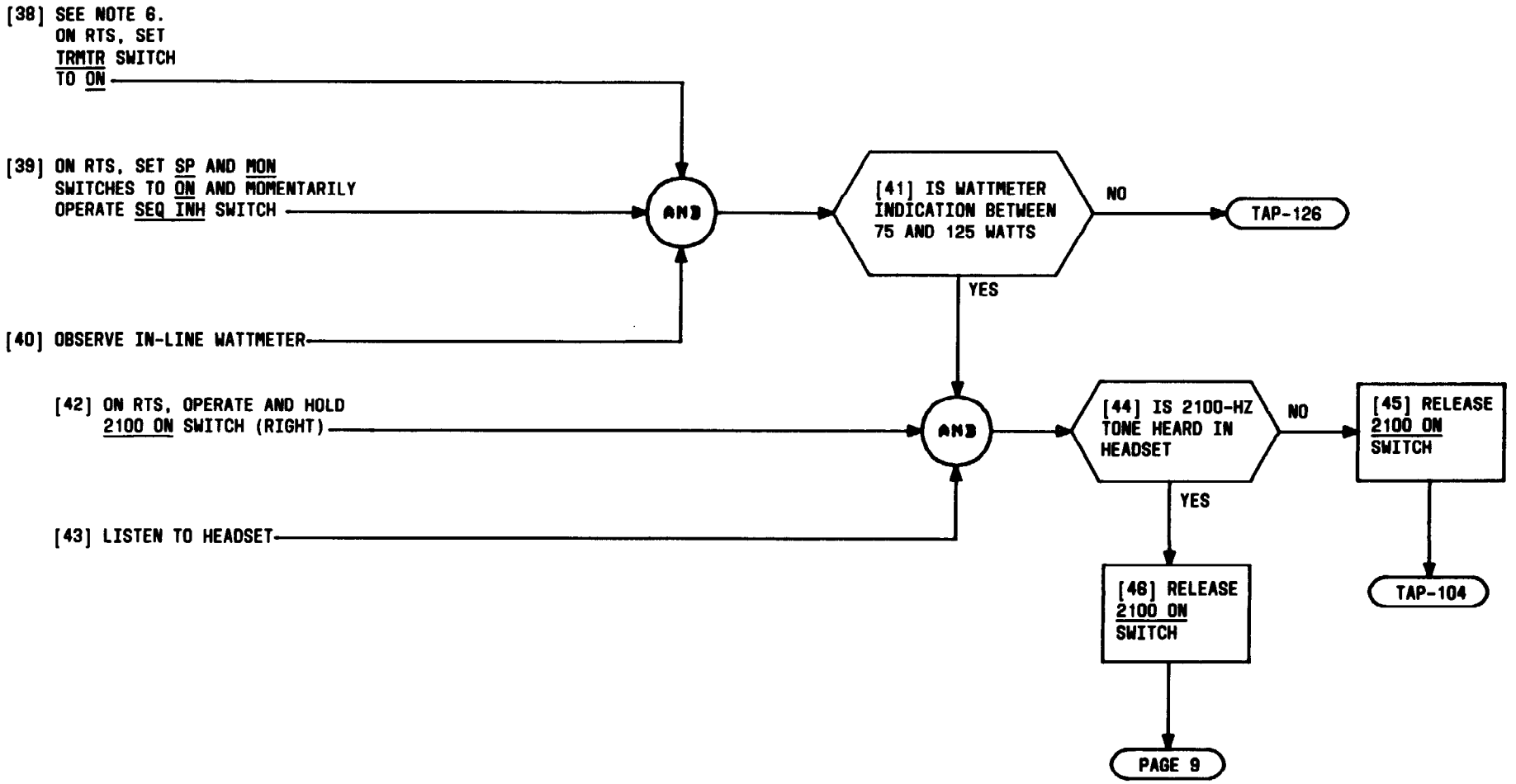


NOTES
4. DISREGARD ALL LAMP INDICATIONS NOT MENTIONED
5. FOR RF ON LAMP, USE TAP-107. FOR TRANSMITTER ON LAMP, USE TAP-100

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



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



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

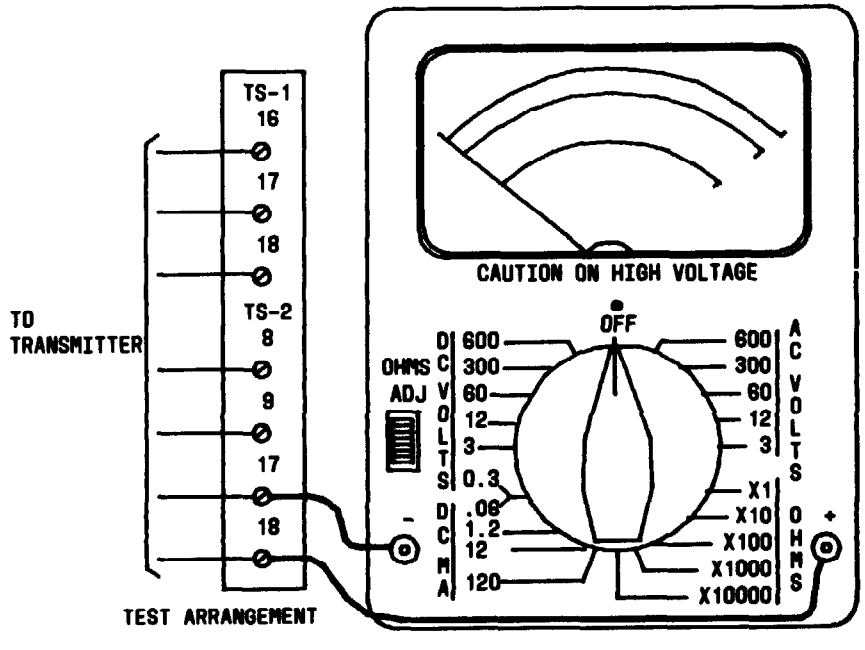
[49] OBSERVE VOM INDICATION

AND

[50] DOES VOM INDICATE 0 OHM

YES → PAGE 10

NO → TAP-103



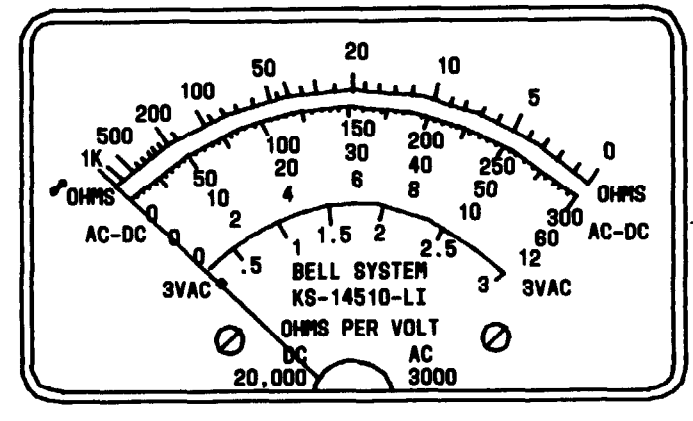
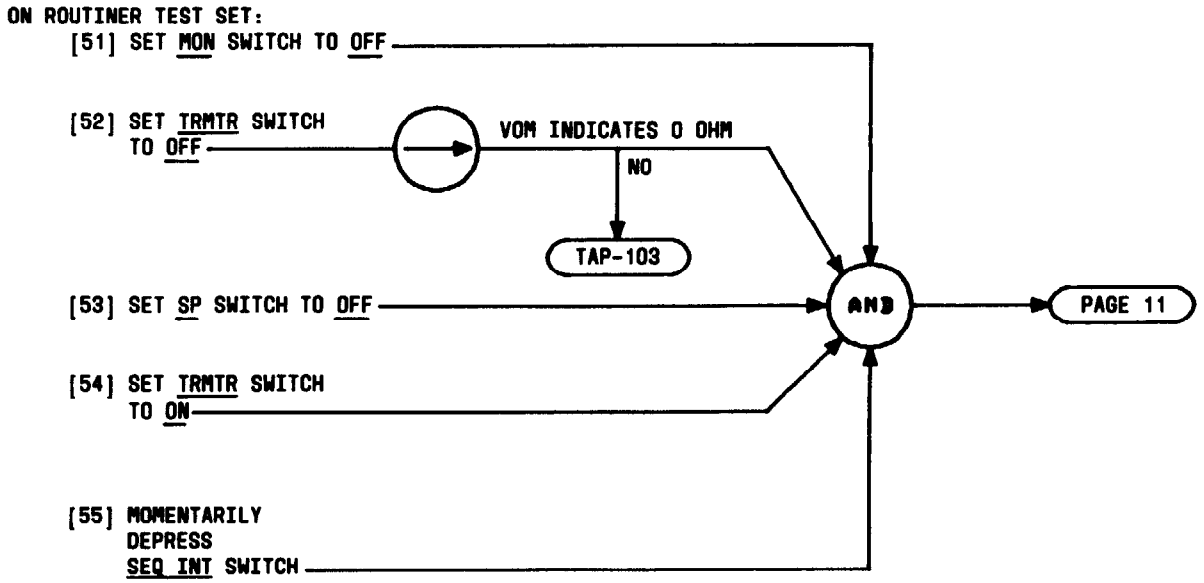
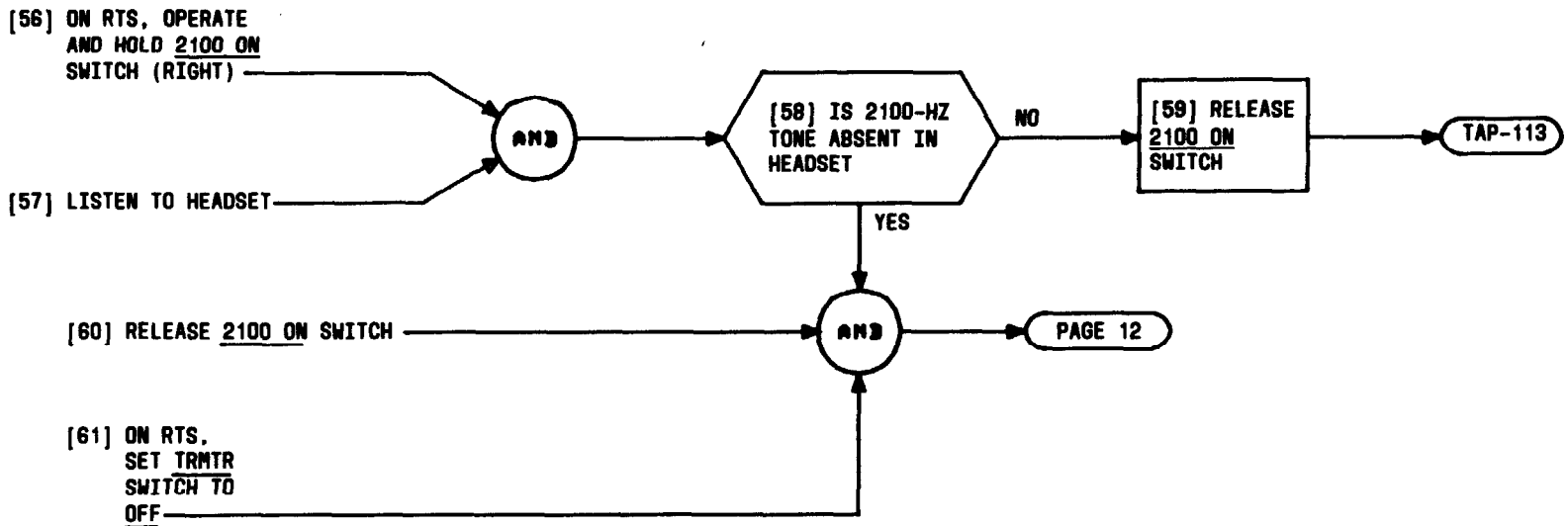


FIG. 7

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



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



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

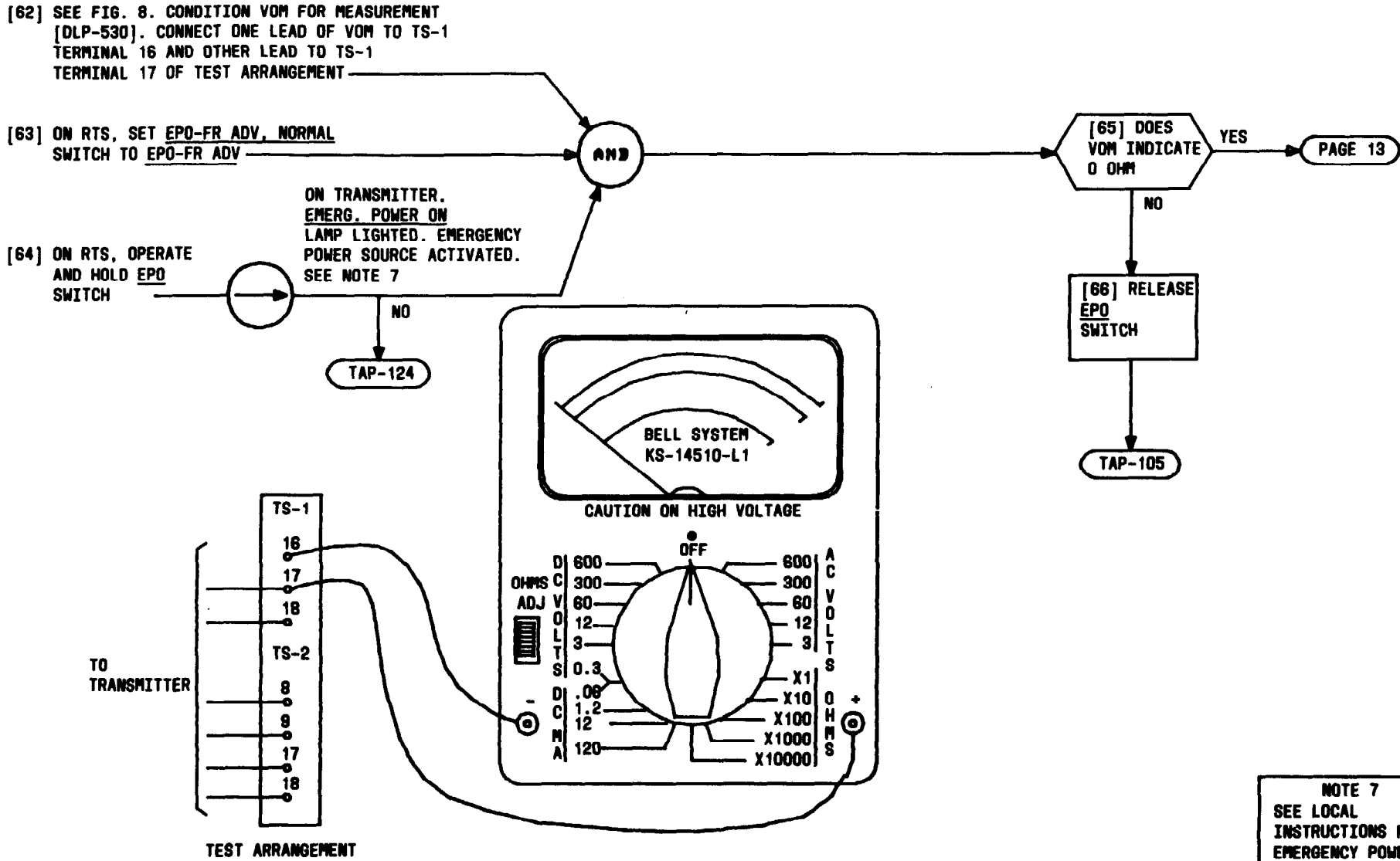
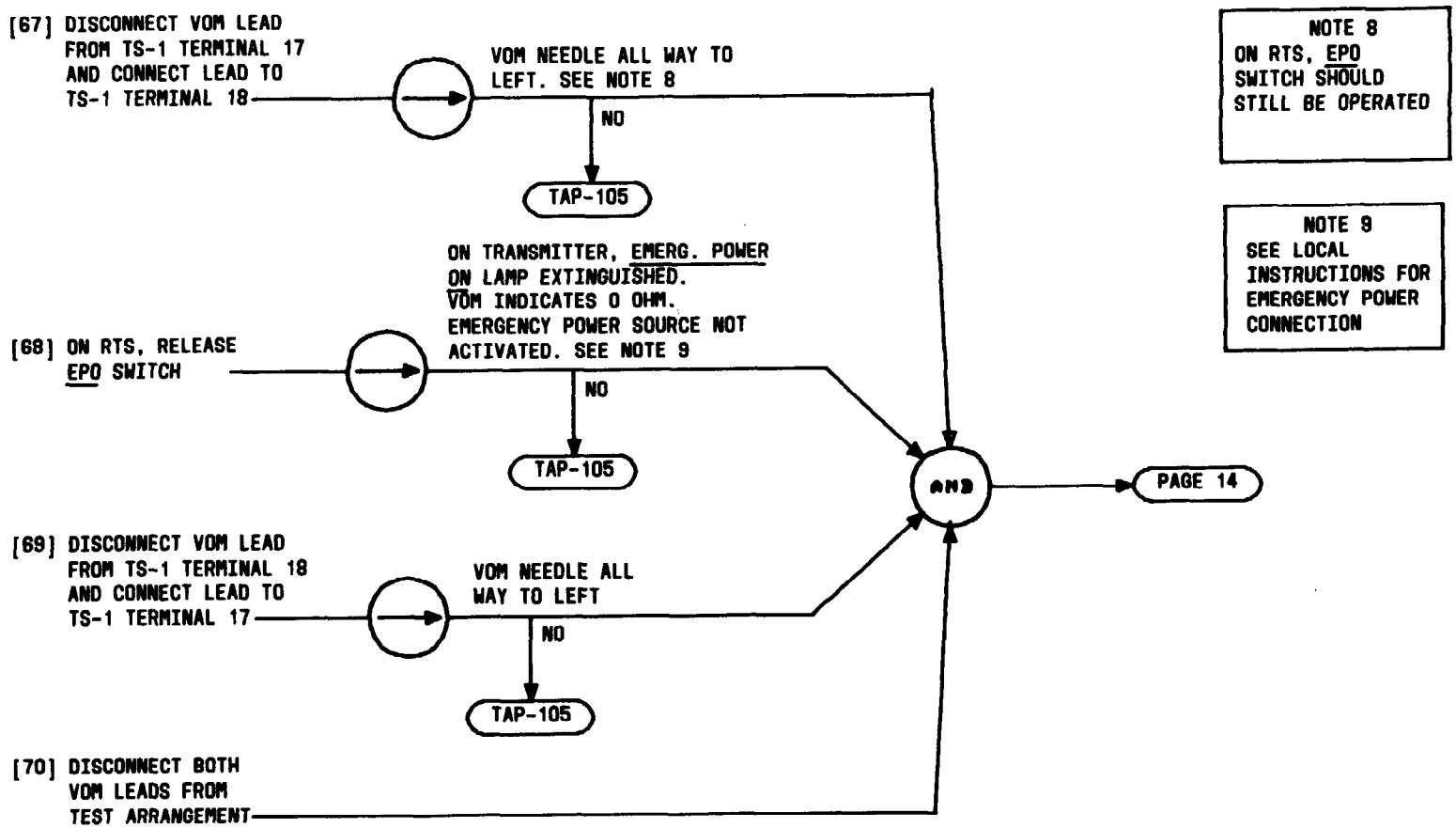


FIG. 8

NOTE 7
SEE LOCAL INSTRUCTIONS FOR EMERGENCY POWER CONNECTION

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



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

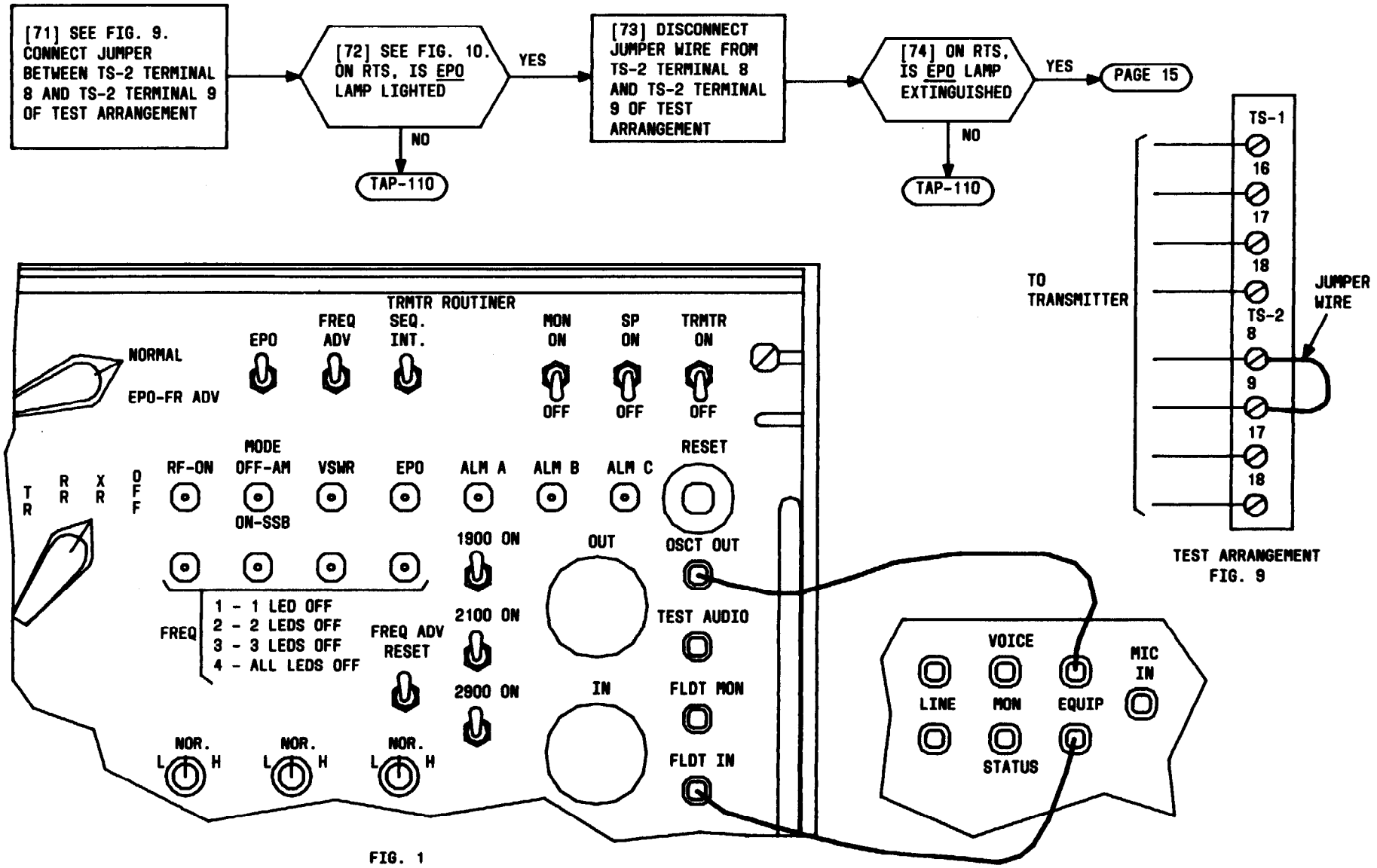


FIG. 1

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

[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]

AND

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

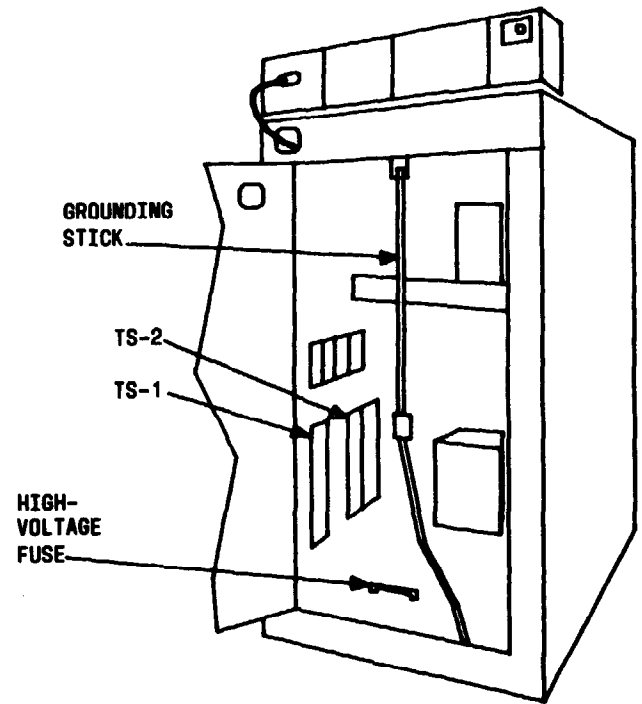


FIG. 11

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

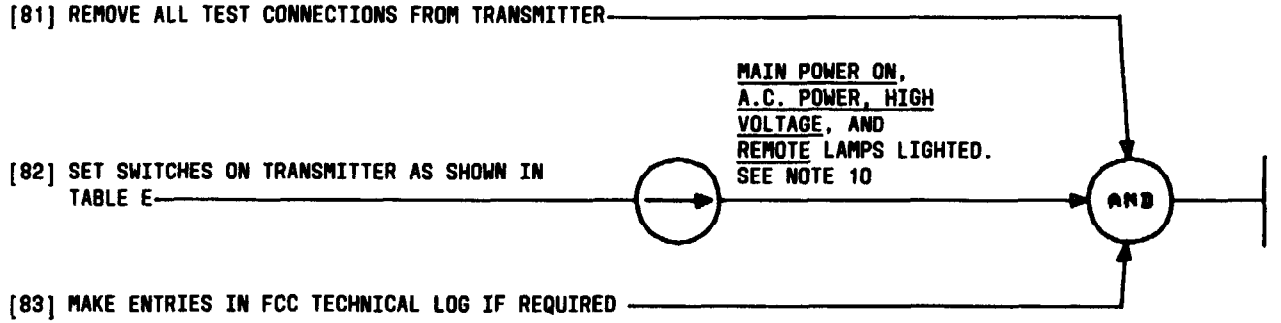


TABLE E		
SEQUENCE	SWITCH	POSITION
1	MAIN POWER	ON
2	REGULATOR	ON
3	HIGH VOLTAGE	*ON
4	TRANSMIT MODE	REM.
5	EMERG. POWER	REMOTE

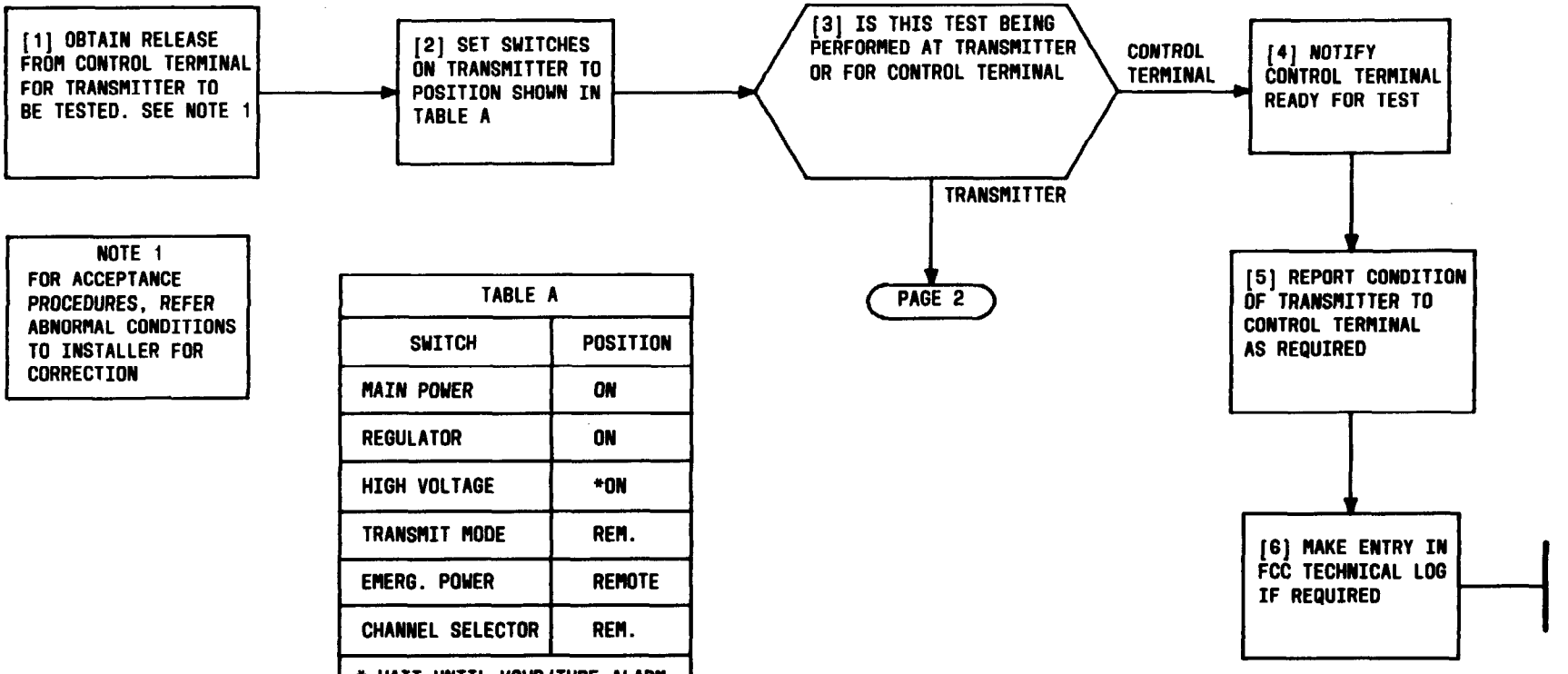
* WAIT UNTIL VSWR/TUBE ALARM LAMP EXTINGUISHES BEFORE TURNING ON HIGH VOLTAGE

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

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



NOTE 1

FOR ACCEPTANCE PROCEDURES, REFER ABNORMAL CONDITIONS TO INSTALLER FOR CORRECTION

TABLE A

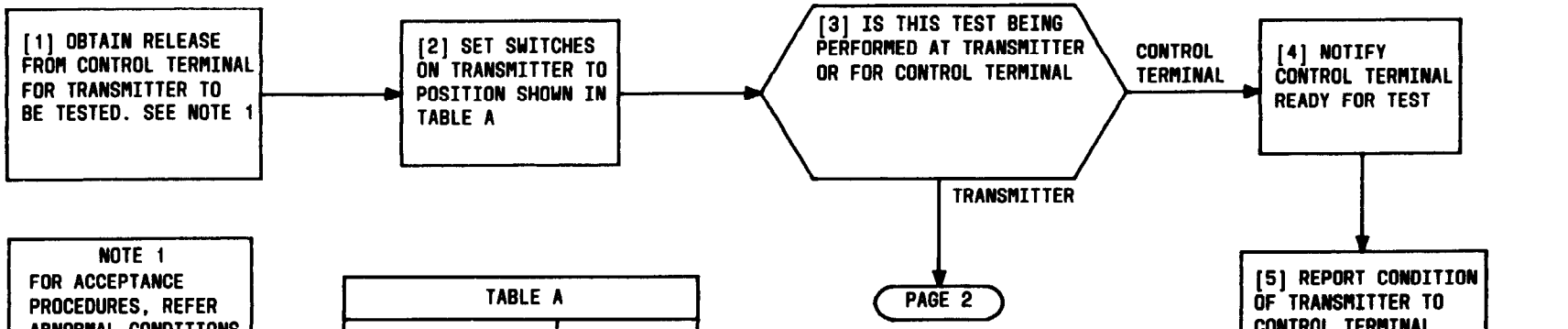
SWITCH	POSITION
MAIN POWER	ON
REGULATOR	ON
HIGH VOLTAGE	*ON
TRANSMIT MODE	REM.
EMERG. POWER	REMOTE
CHANNEL SELECTOR	REM.

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

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



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

TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

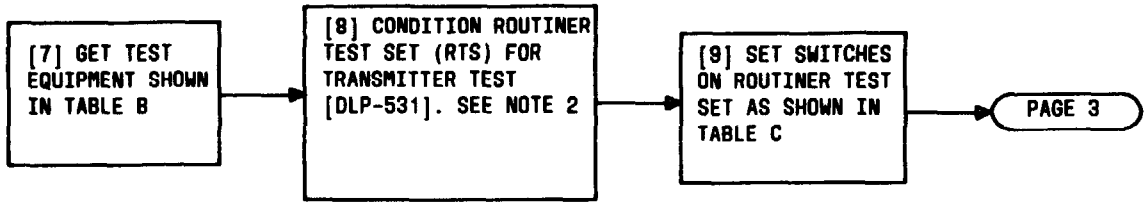


TABLE B	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
ROUTINER TEST SET	KS-21277
2 898N RESISTORS	WITH KS-21277
2 PATCH CORDS	P2B
2 LINE TERMINATIONS	369A

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]

AND

TEST CONNECTIONS COMPLETED

PAGE 4

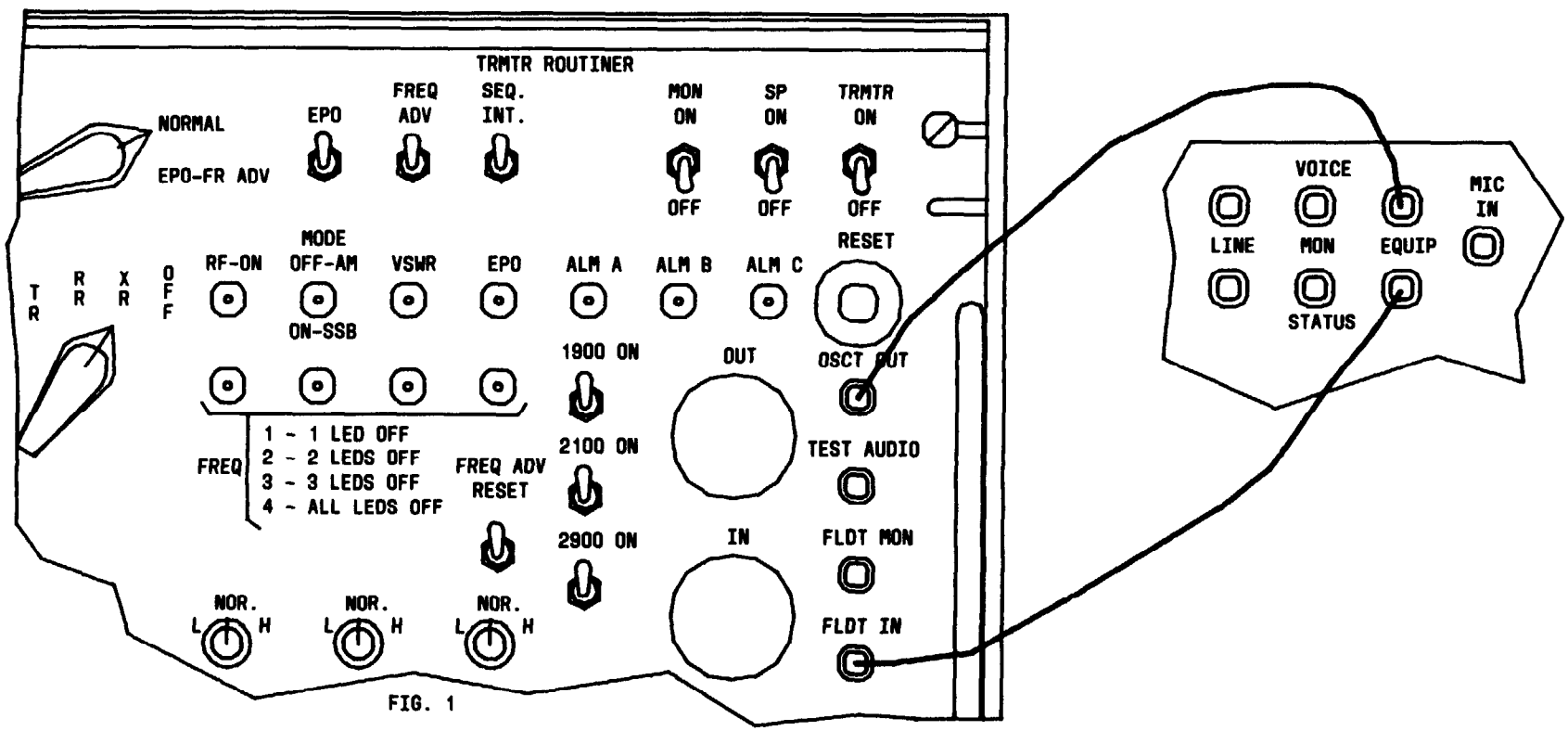


FIG. 1

TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

[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

AND

[19] DID TRANSMITTER ADVANCE TO NEXT CHANNEL

NO → TAP-106

YES

[20] DO CHANNEL LAMPS ON TRANSMITTER AND FREQUENCY LAMPS ON RTS CORRESPOND AS SHOWN IN TABLE D

YES → [22] REPEAT STEPS 15 THROUGH 22 UNTIL ALL CHANNELS HAVE BEEN SELECTED → PAGE 5

NO → [21] YOU POSSIBLY RESET IMPROPERLY. RETURN TO STEP 15

NO → TAP-112

NOTE 3
DISREGARD ALL LAMP INDICATIONS NOT MENTIONED

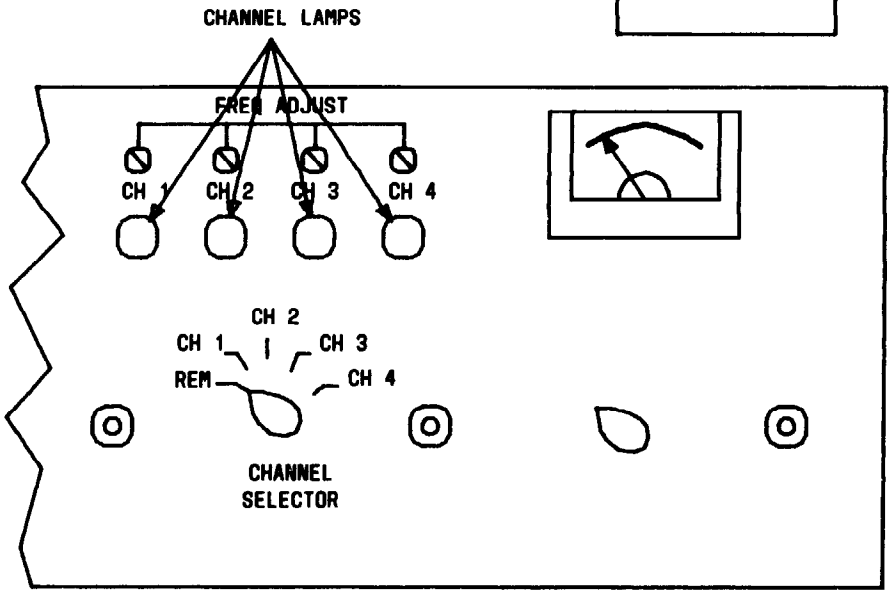
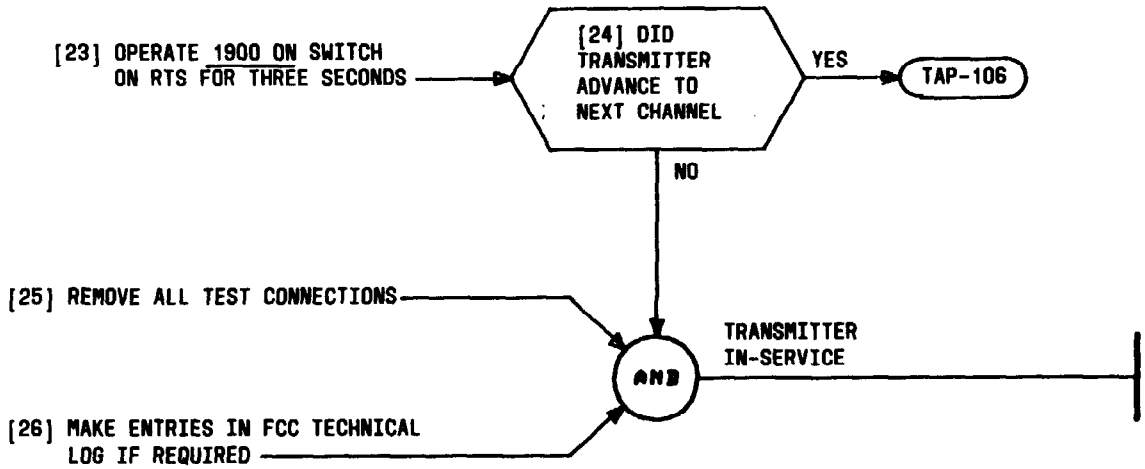


FIG. 2

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



TEST STANDBY TRANSMITTER RESPONSE TO CONTROL TERMINAL SIGNALING FREQUENCY ADVANCE COMMANDS

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

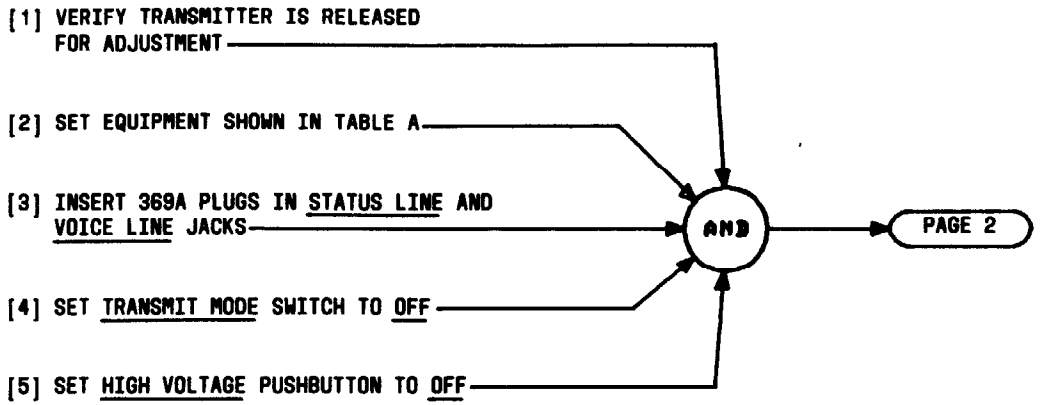


TABLE A

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
2 TERMINATIONS, STANDARD	369A

ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

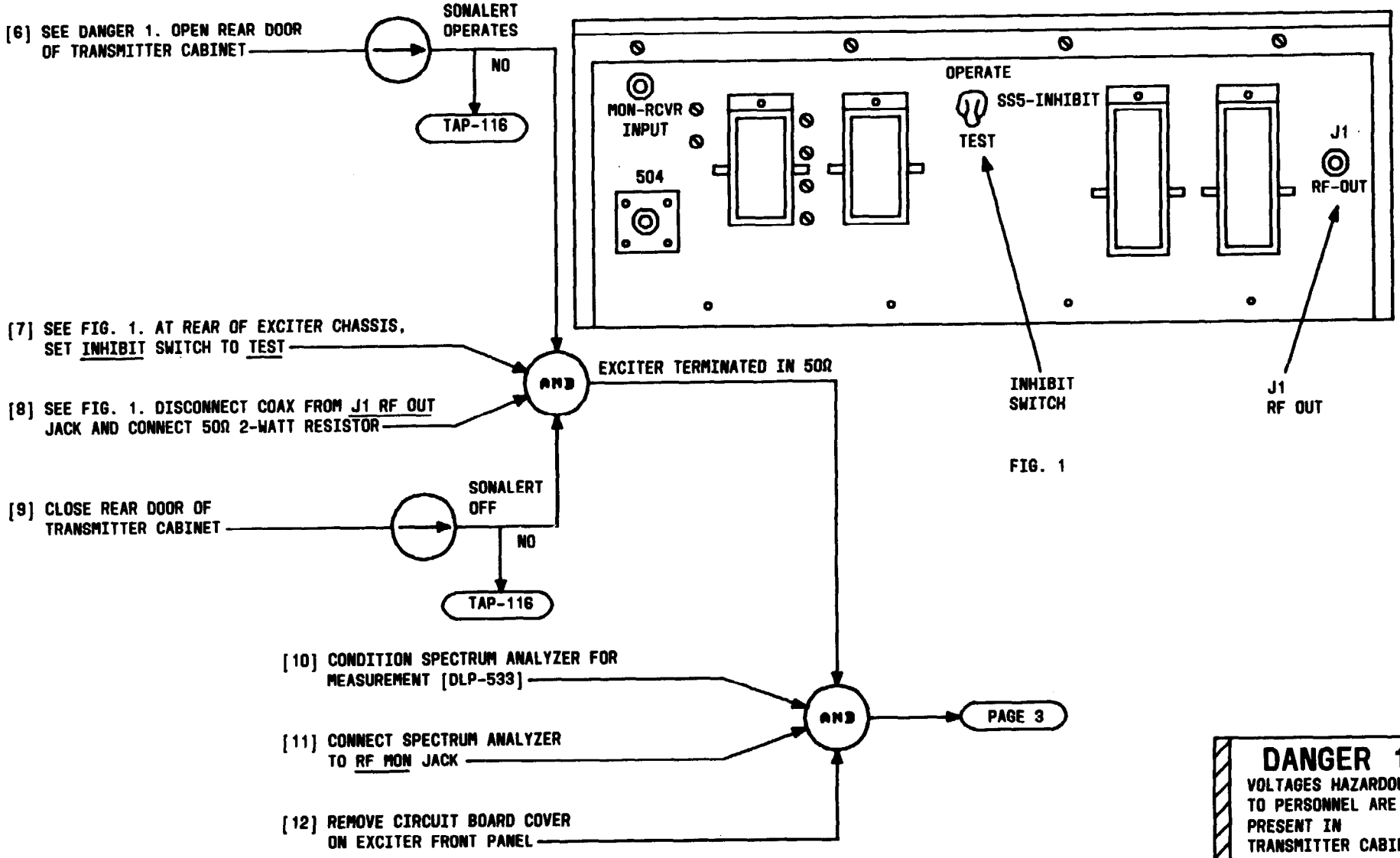


FIG. 1

DANGER 1
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET

ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

[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

AND

R34 AND R60 ADJUSTED

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

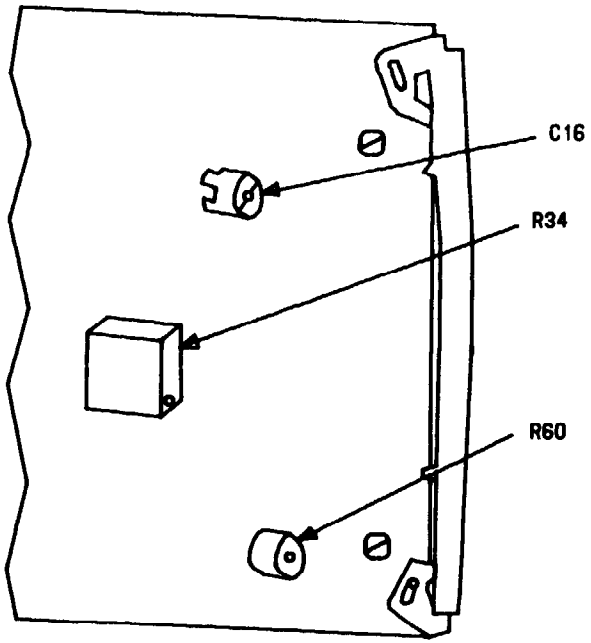


FIG. 2

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

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

AND

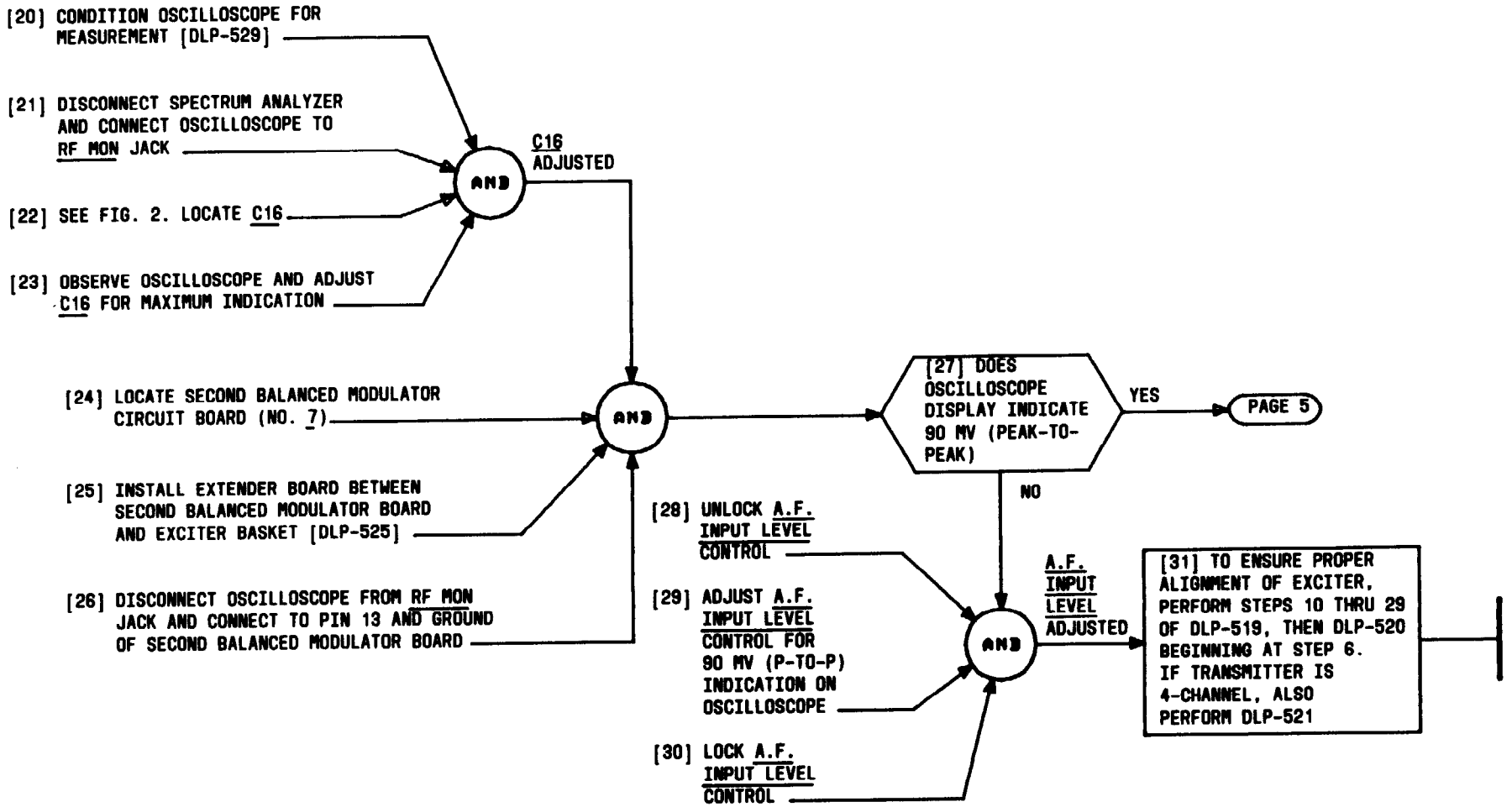
PAGE 4

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

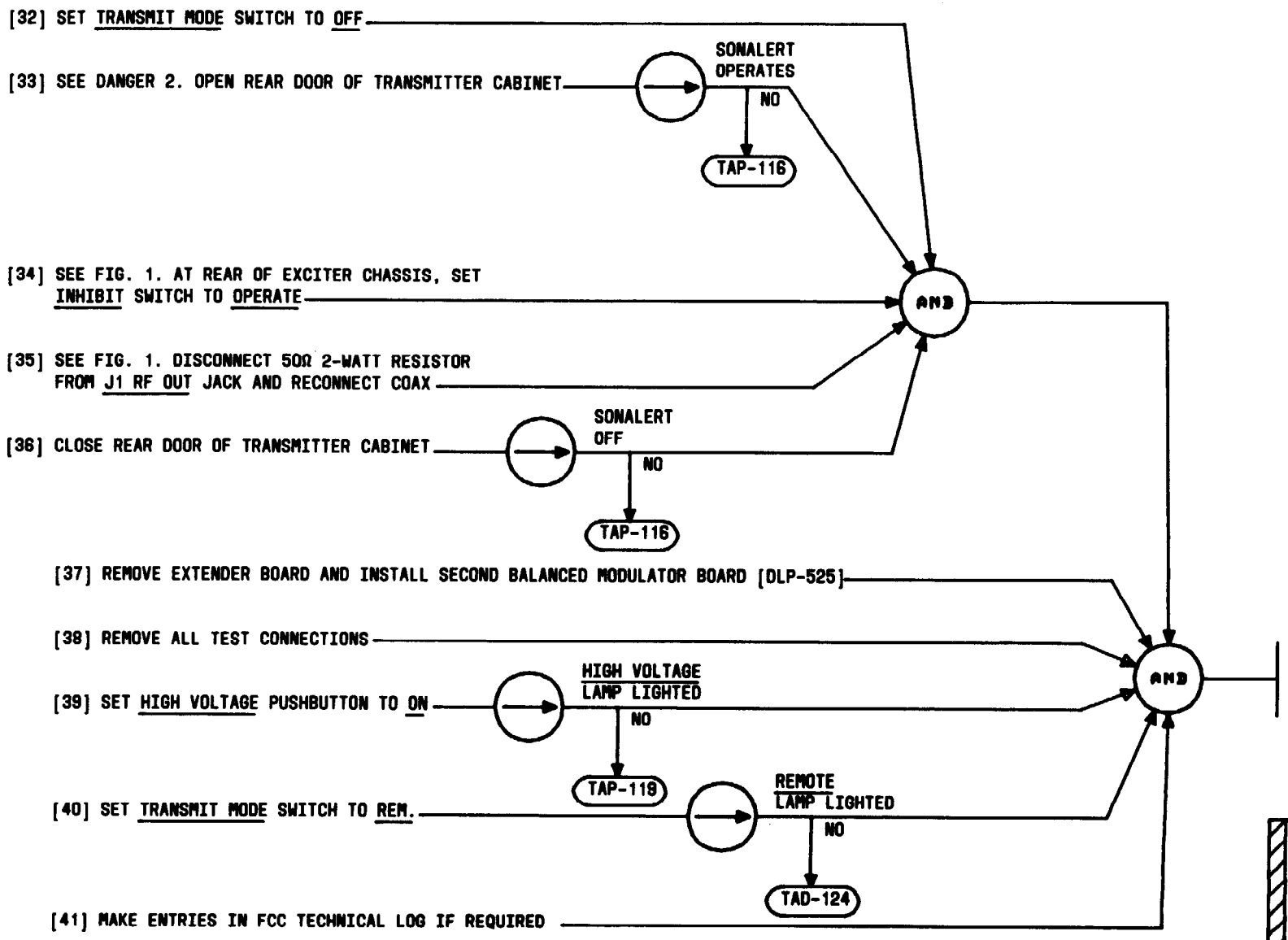
[19] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

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



ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD



DANGER 2
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET

ADJUST AF AMPLIFIER/FIRST BALANCED MODULATOR CIRCUIT BOARD

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 -18 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.

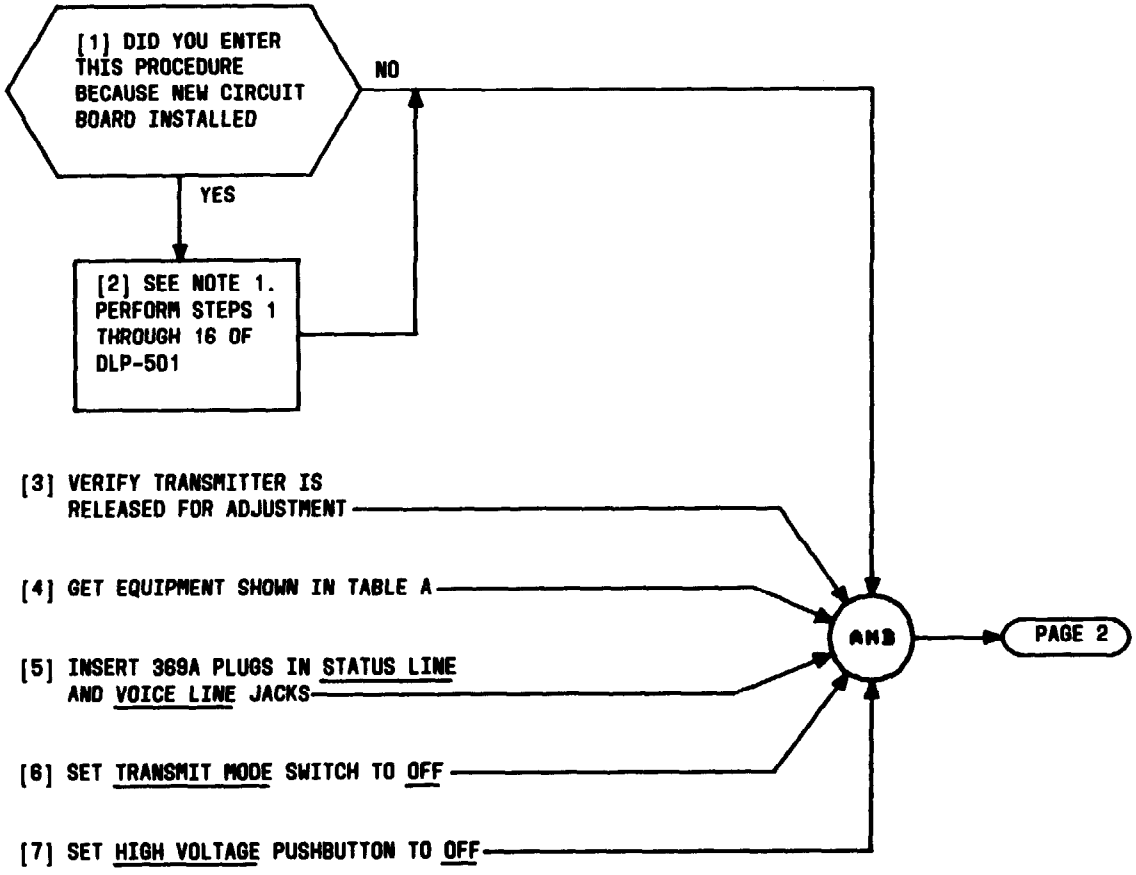


TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRULINE	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

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

AND

WATTMETER AND LOAD RESISTOR CONNECTED

[12] DID YOU ENTER THIS PROCEDURE TO ADJUST CARRIER REINSERTION (CXR REIN) OR RF ON SENSITIVITY

RF ON SENSITIVITY

PAGE 6

BOTH

CXR REIN

[13] ADJUST CXR REIN, THEN RF ON SENSITIVITY

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

AND

EXTENDER BOARD INSTALLED

PAGE 3

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

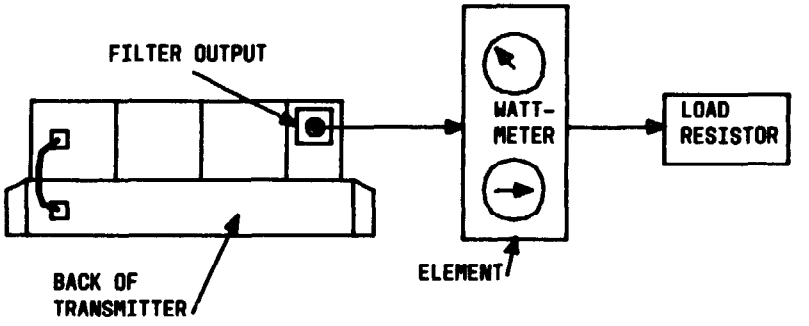


FIG. 1

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

[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)

AND

R23 A3H CARRIER REINSERTION LEVEL ADJUSTED

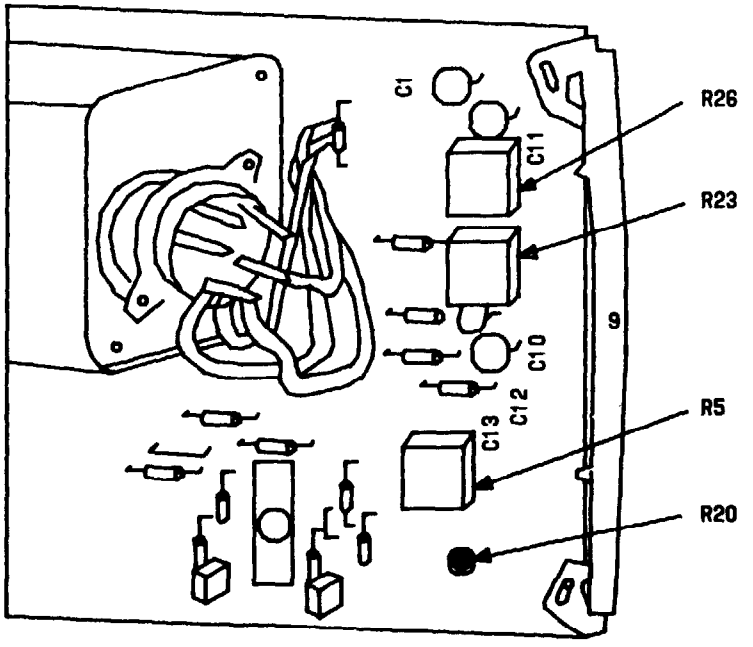


FIG. 2

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

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

AND

AUDIO OSCILLATOR CONNECTED

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

[23] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

PAGE 4

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

[24] DISCONNECT OSCILLOSCOPE FROM PIN 9 AND CONNECT IT TO PIN 13

[25] LOOSEN LOCKING NUT ON A.F. INPUT LEVEL POTENTIOMETER AND ADJUST A.F. INPUT LEVEL FOR 90 MV PEAK-TO-PEAK INDICATION ON OSCILLOSCOPE

[26] LOCK A.F. INPUT LEVEL POTENTIOMETER IN PLACE WITH LOCKING NUT

[27] DISCONNECT OSCILLOSCOPE FROM PIN 13

AND

A.F. INPUT LEVEL ADJUSTED

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

[29] CONNECT SPECTRUM ANALYZER TO RF MON JACK

[30] INCREASE OUTPUT LEVEL OF AUDIO OSCILLATOR TO -16 DBM

[31] SEE FIG. 3. ON SECOND BALANCED MODULATOR BOARD (NO. 7), LOCATE R57

[32] OBSERVE SPECTRUM ANALYZER AND ADJUST R57 FOR EQUAL AMPLITUDE OF CARRIER SIGNAL AND SIDEBAND SIGNAL

AND

R57 SB/CXR RATIO ADJUSTED

PAGE 5

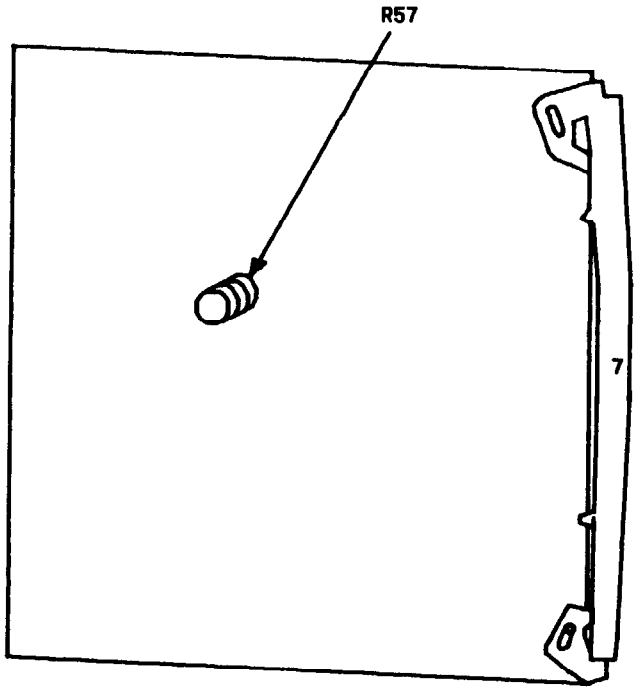
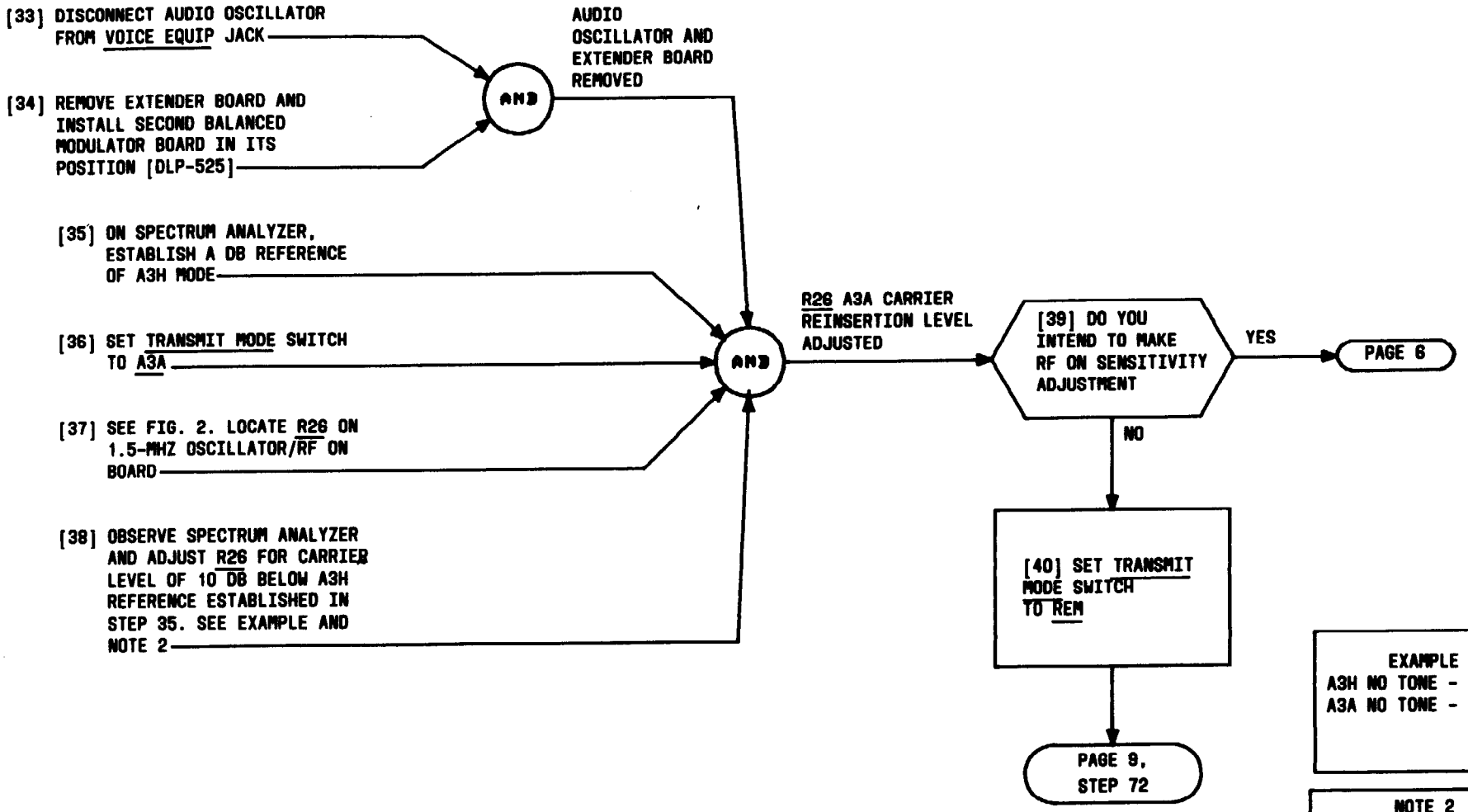


FIG. 3

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD



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

SGC → PAGE 8

PC

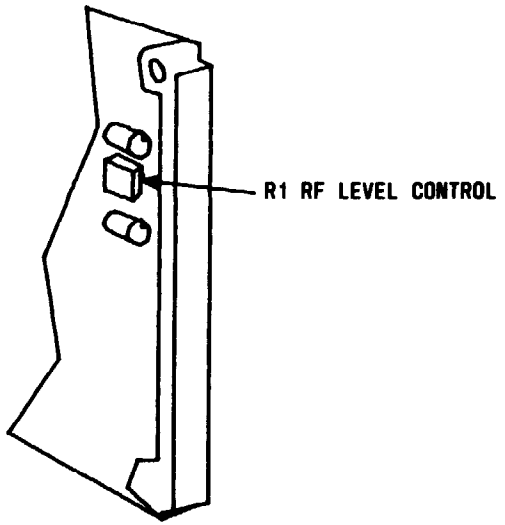


FIG. 4

[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.

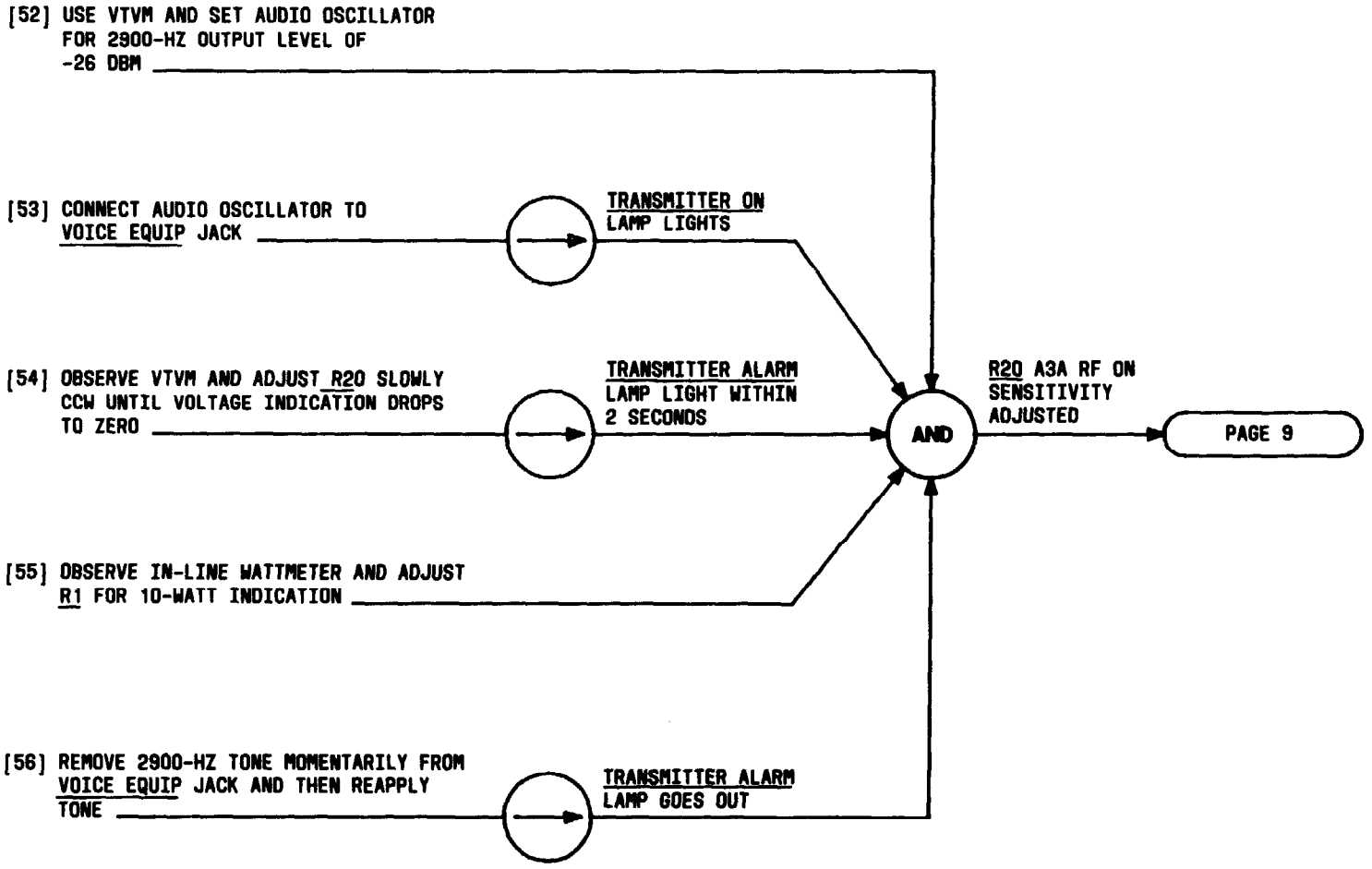
[51] ADJUST R20 FULLY CW

AND → PAGE 7

WARNING

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

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD



ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD

[57] SET TRANSMIT MODE SWITCH TO A3H

[58] INSTALL 250H ELEMENT INTO IN-LINE WATTMETER

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

AND

[60] OBSERVE IN-LINE WATTMETER AND ADJUST R1 FOR 50-WATT INDICATION

[61] SET TRANSMIT MODE SWITCH TO REM.

[62] ADJUST R5 FULLY CW

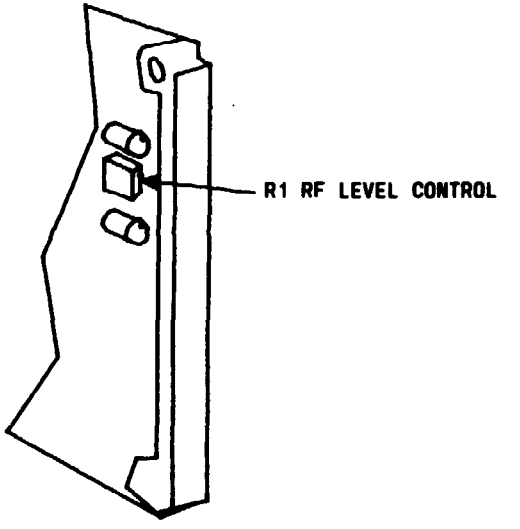


FIG. 4

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

[64] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

TRANSMITTER ON LAMP LIGHTS

TRANSMITTER ALARM LAMP LIGHT WITHIN 2 SECONDS

[65] OBSERVE VTVM AND ADJUST R5 SLOWLY CCW UNTIL VOLTAGE INDICATION DROPS TO ZERO

[66] OBSERVE IN-LINE WATTMETER AND ADJUST R1 FOR 100-WATT INDICATION

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

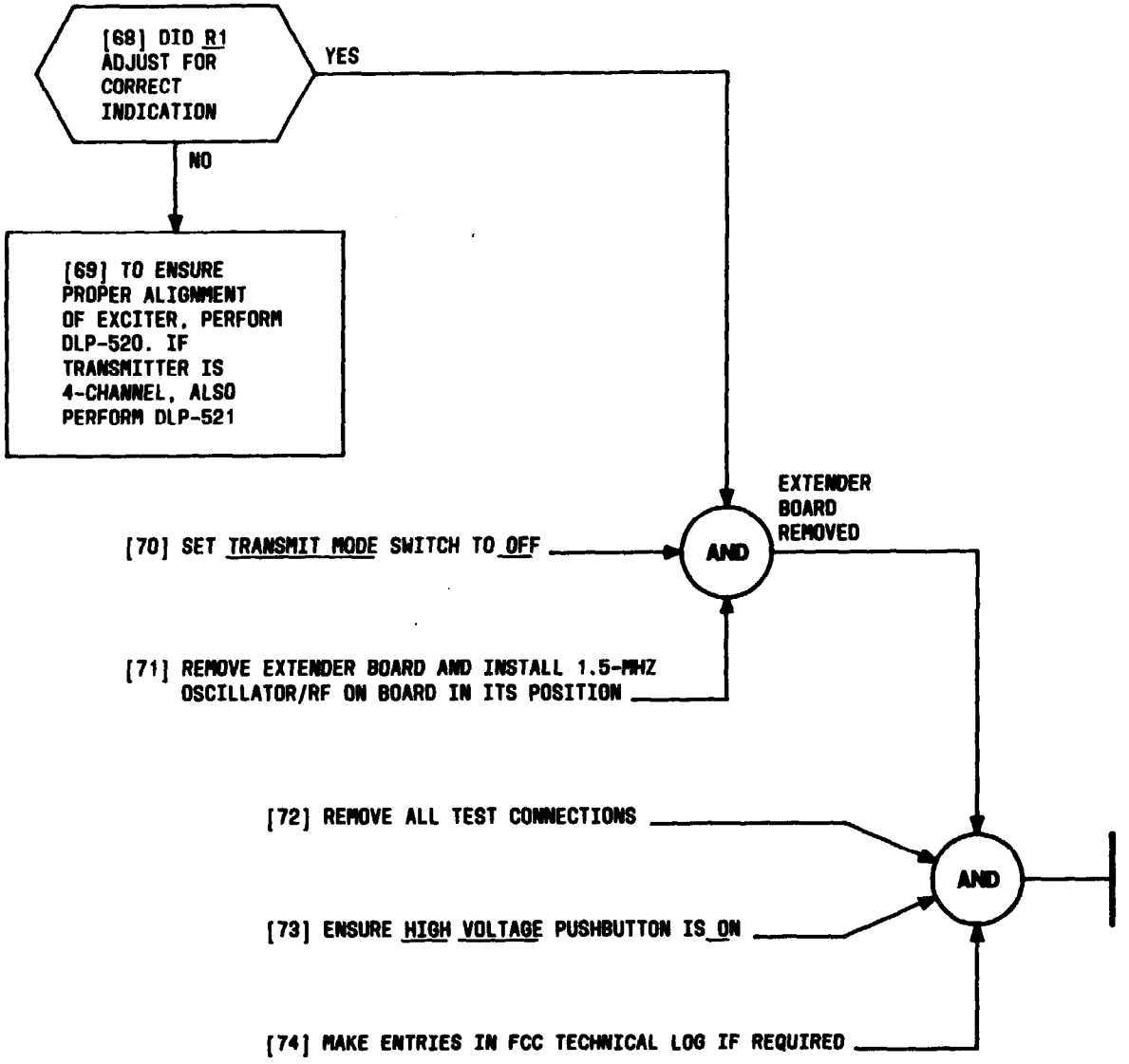
TRANSMITTER ALARM LAMP GOES OUT

AND

R5 A3H RF ON SENSITIVITY ADJUSTED

PAGE 8

ADJUST 1.5-MHZ OSCILLATOR/RF ON CIRCUIT BOARD



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

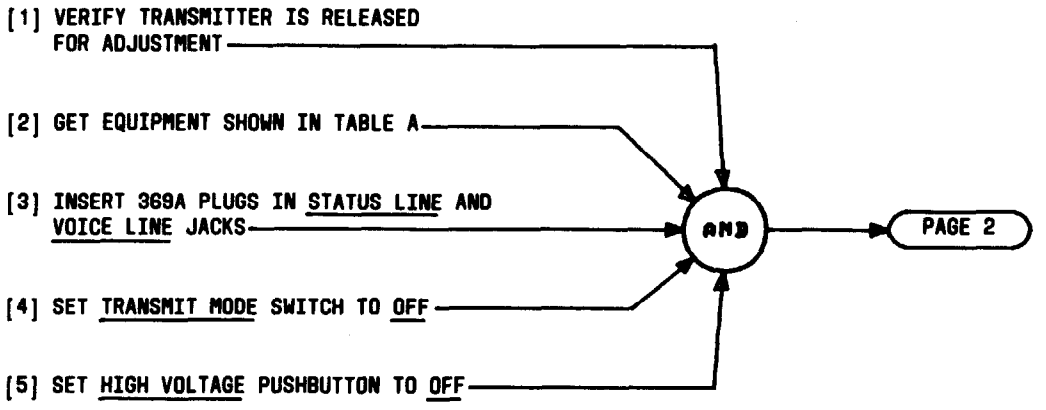
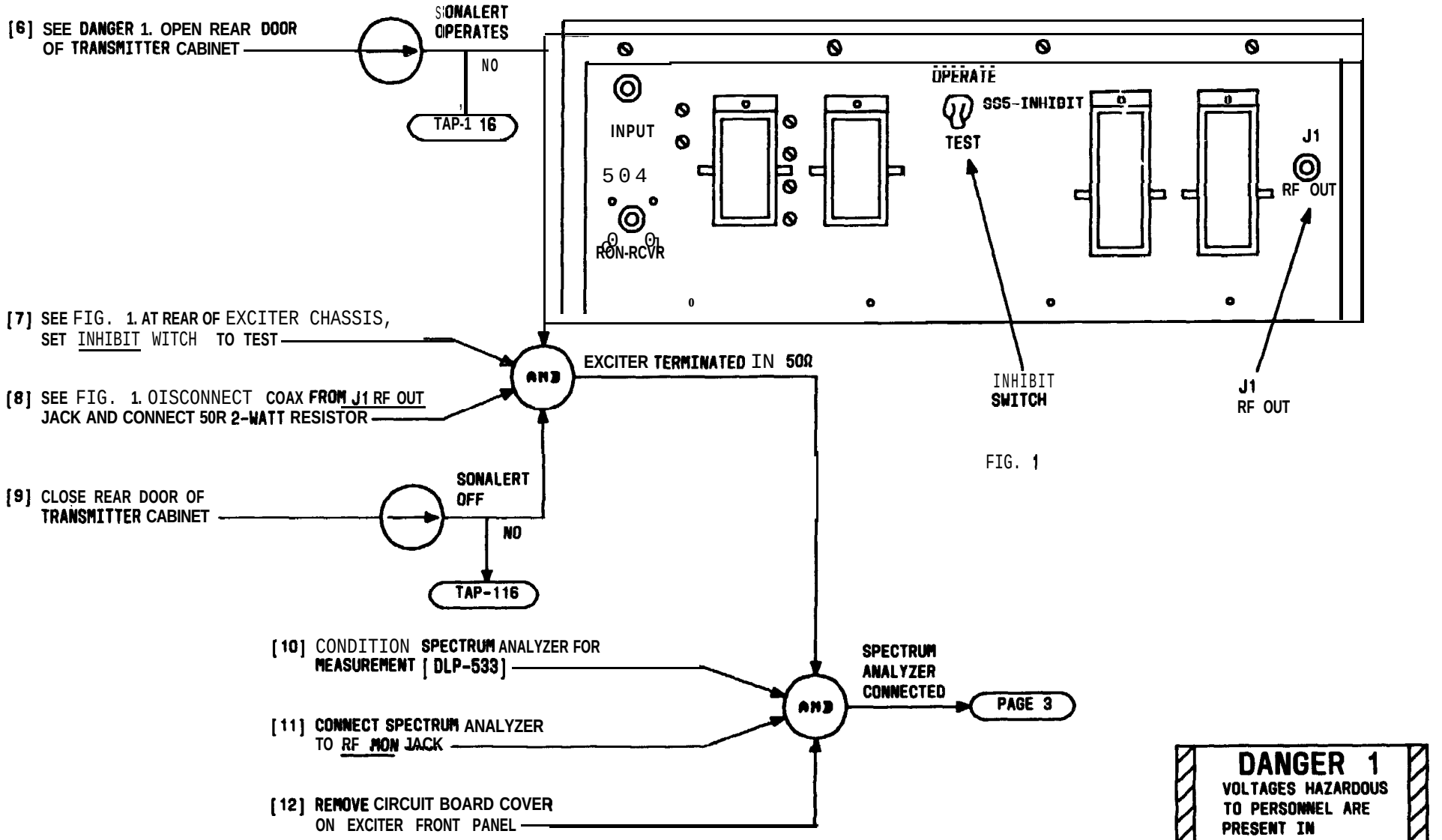


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
DUMMY LOAD	50 OHMS, 2 WATTS WITH BNC MALE CONNECTOR
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8552B IF HP MODEL 8553B RF
2 TERMINATIONS, STANDARD	369A

ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD



DANGER 1
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET

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AOJUST SECOND BALANCED MODULATOR CIRCUIT BOARD

[13] INSTALL EXTENDER BOARD BETYEEN SECOND BALANCED ROOULATOR 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 CI2 AND C32 FOR MAXIMUM CARRIER AMPLITUDE

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

AND

EXTENDER BOARD INSTALLED AND R25 ADJUSTED FOR MINIMUM HFO

PAGE 4

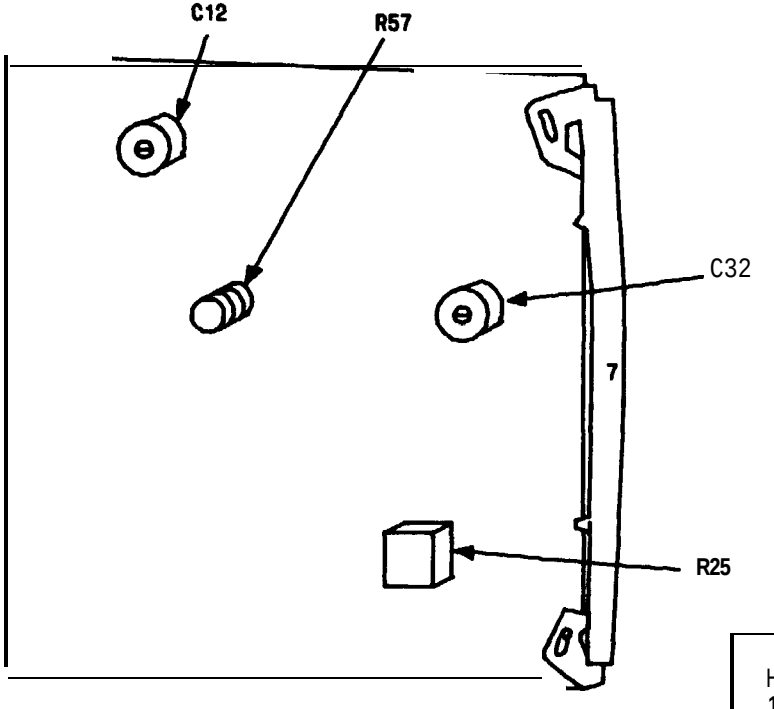


FIG. 2

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

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

AND

EXTENDER BOARD INSTALLED AND R25 ADJUSTED FOR MINIMUM HFO

PAGE 4

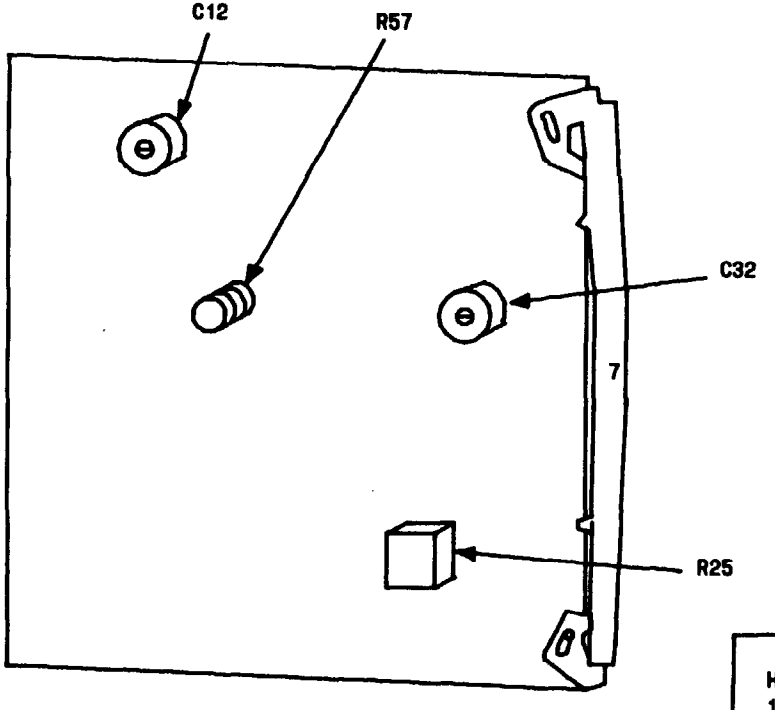
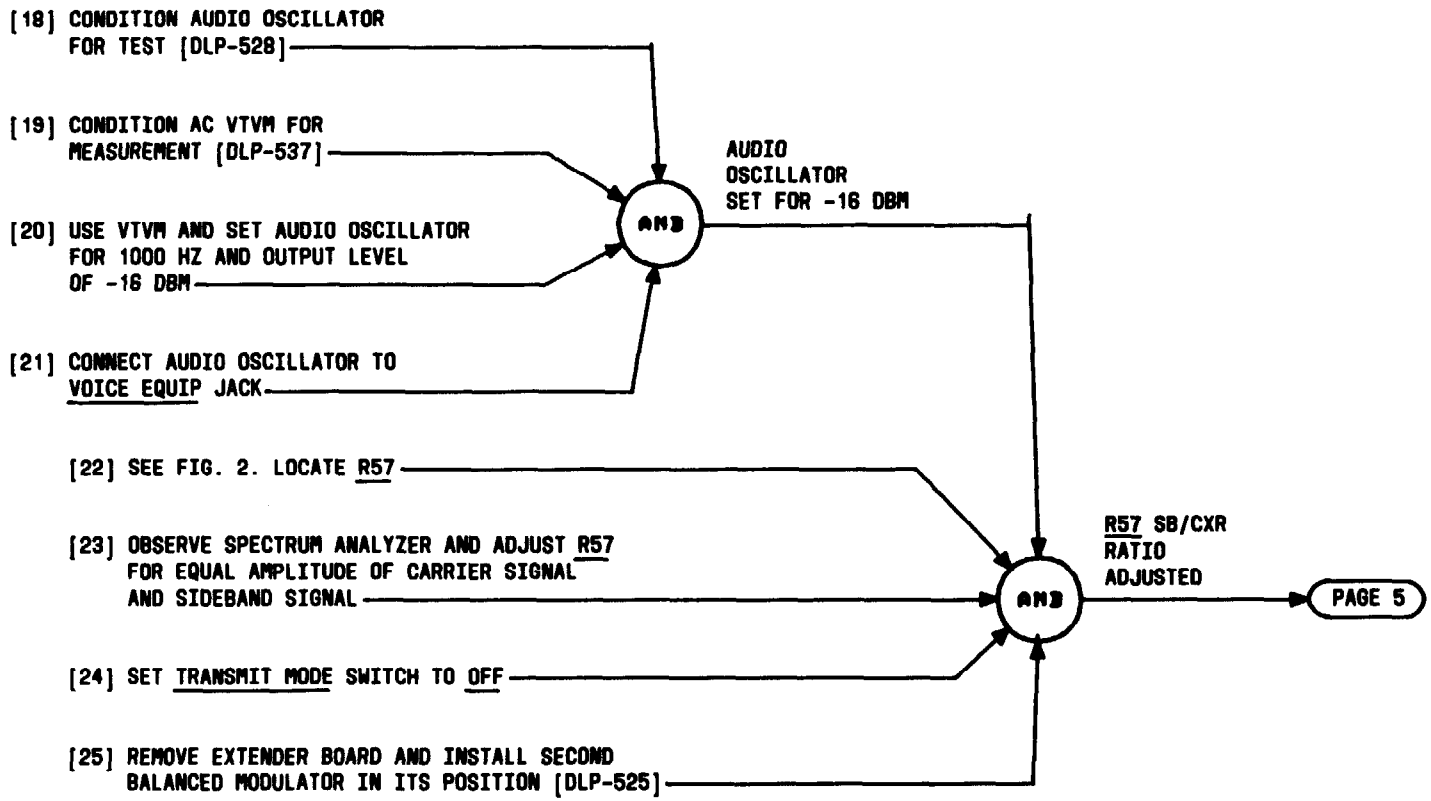


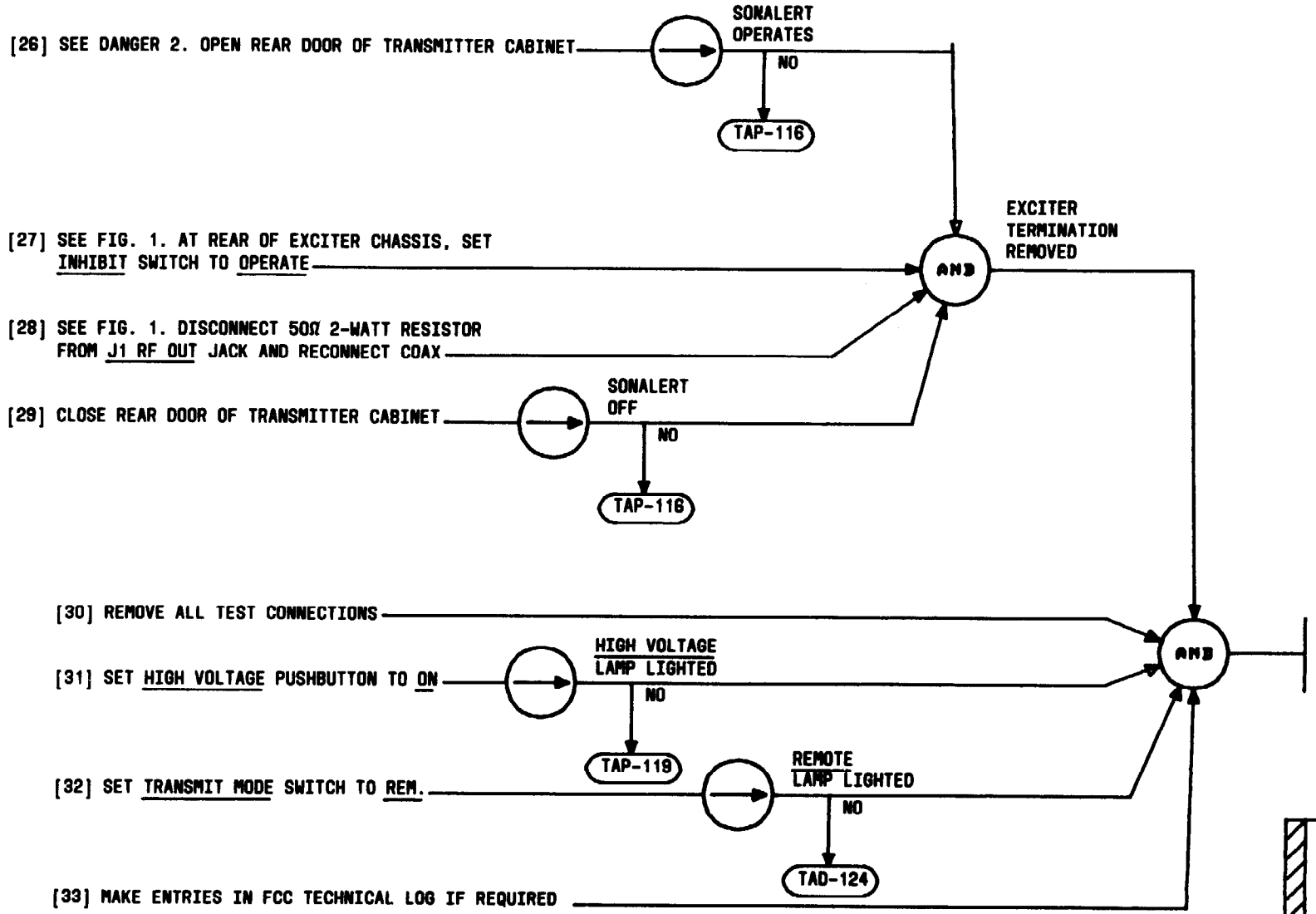
FIG. 2

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

ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD



ADJUST SECOND BALANCED MODULATOR CIRCUIT BOARD



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).

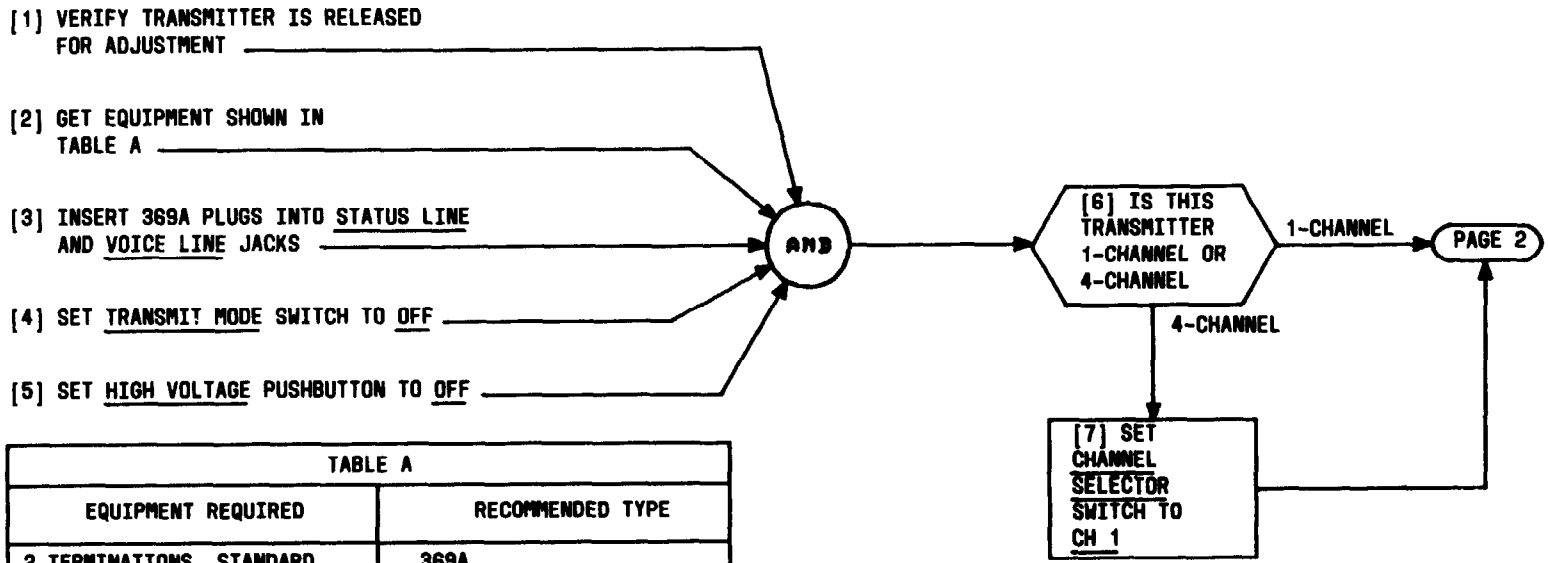


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRULINE	BIRD MODEL 43 WITH 250H ELEMENT
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
SPECTRUM ANALYZER	HP MODEL 141T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

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

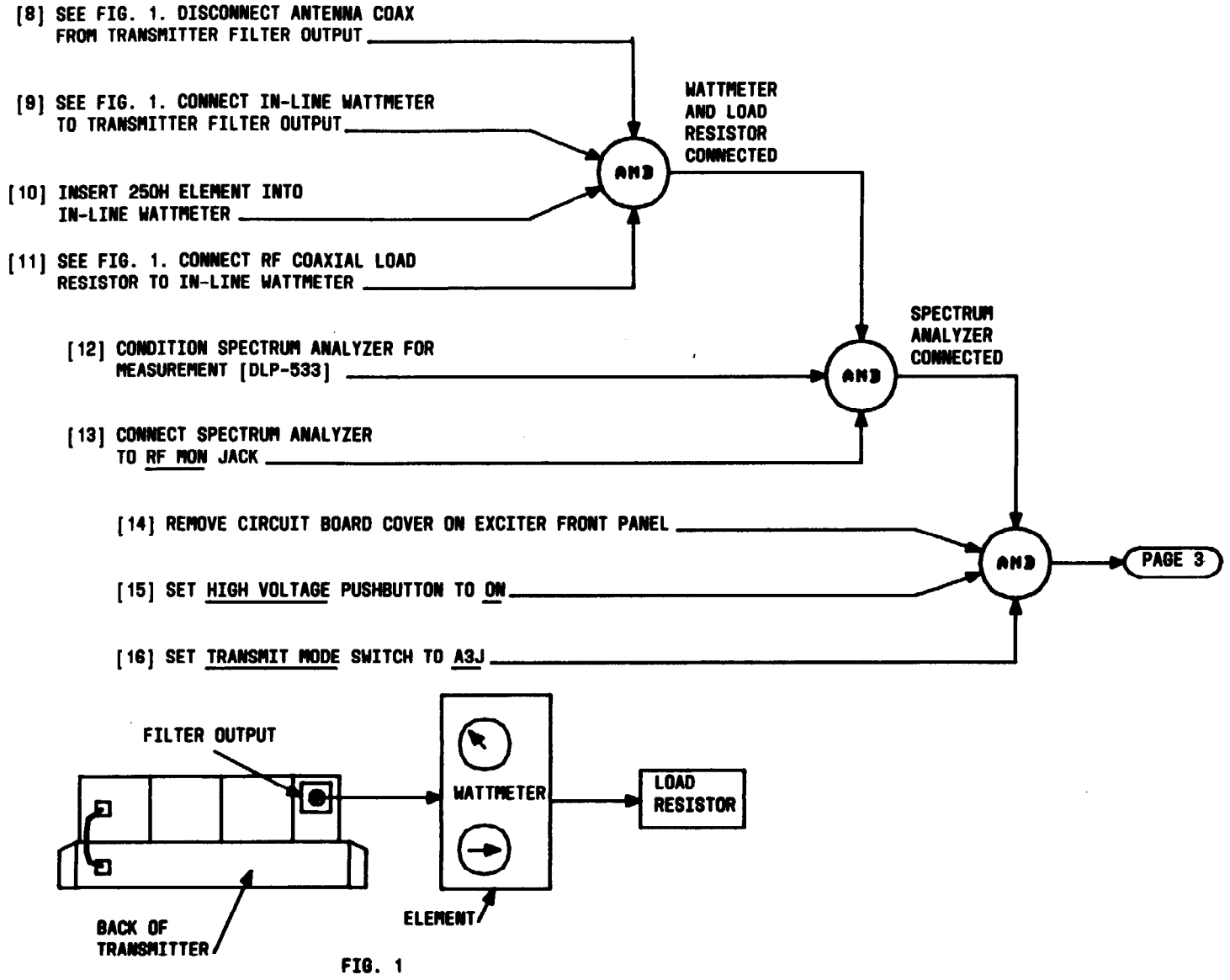


FIG. 1

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

[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

AND

C26 AND C28 ADJUSTED

[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

AND

AUDIO OSCILLATOR CONNECTED AND SET FOR -16 DBM

PAGE 4

[22] CONNECT AUDIO OSCILLATOR TO VOICE EQUIP JACK

[23] SET TRANSMIT MODE SWITCH TO A3H

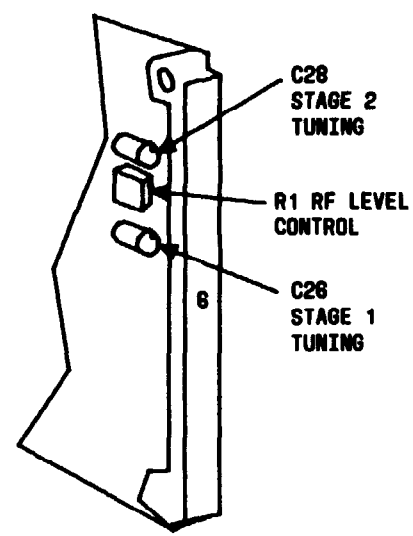


FIG. 2

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

[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

AND

R1 RF LEVEL ADJUSTED

[28] DID R1 ADJUST TO 162.5 WATTS

YES → PAGE 5

NO → TAP-126

NO → [29] DISCONNECT AUDIO OSCILLATOR

[30] REPLACE TUNED AMPLIFIER/ WIDEBAND AMPLIFIER BOARD WITH NEW ONE [DLP-525]

[31] RETURN TO STEP 16

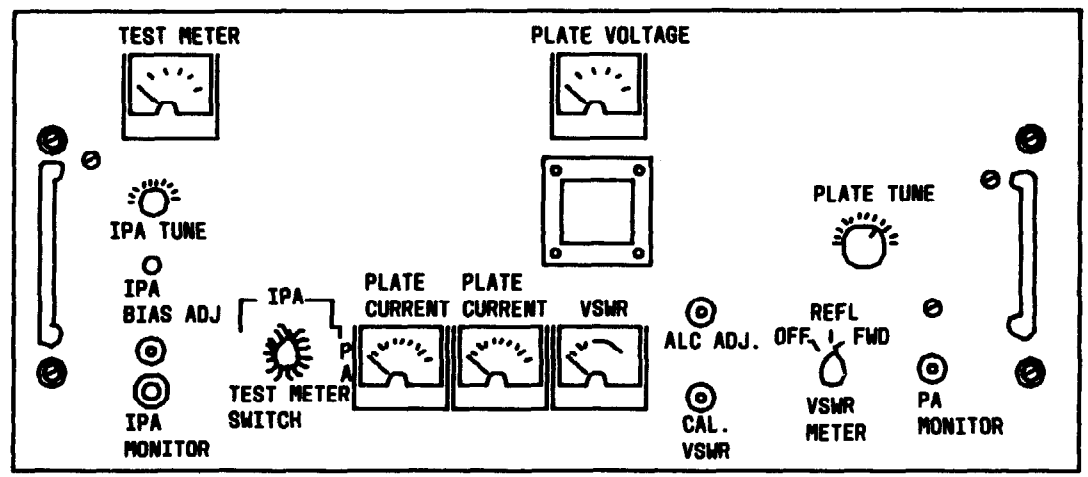
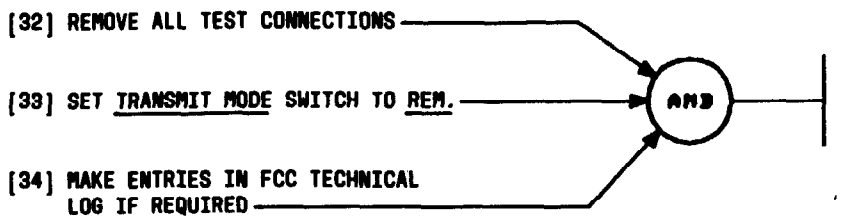


FIG. 3

ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD



ADJUST TUNED AMPLIFIER/WIDEBAND AMPLIFIER CIRCUIT BOARD

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

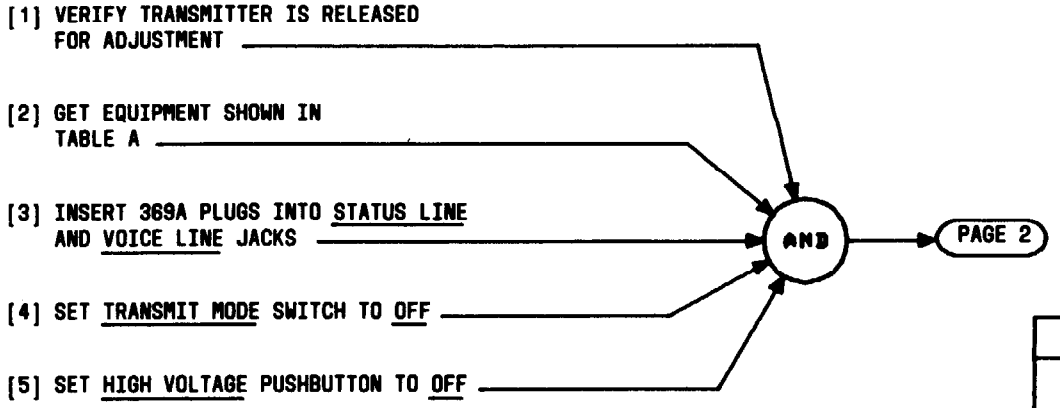
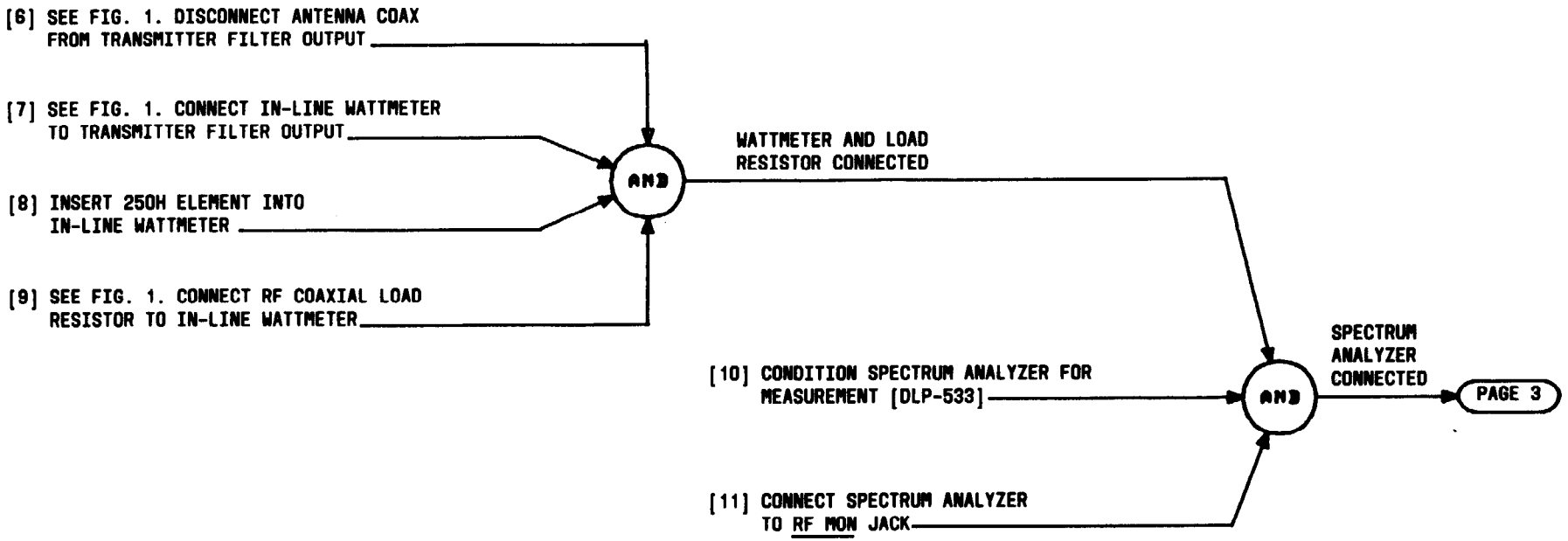


TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 TERMINATIONS, STANDARD	369A
RF COAXIAL LOAD RESISTOR	BIRD MODEL 8201
WATTMETER, THRULINE	BIRD MODEL 43 WITH 250H ELEMENT
TOOL KIT	NONMETALLIC TUNING TOOLS; SCREWDRIVER
AC VTVM	HP MODEL 400D
AUDIO OSCILLATOR	HP MODEL 200CD
SPECTRUM ANALYZER	HP MODEL 141T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

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



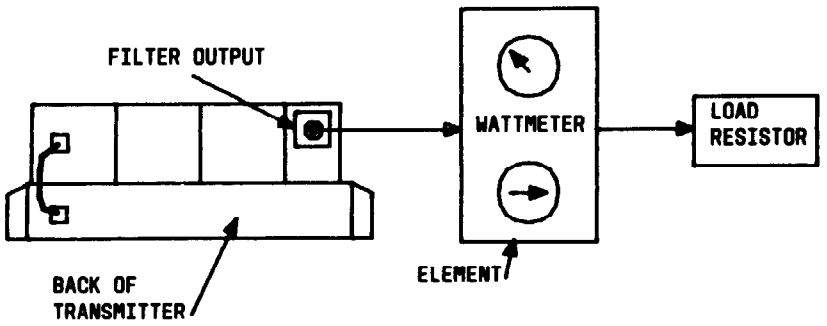
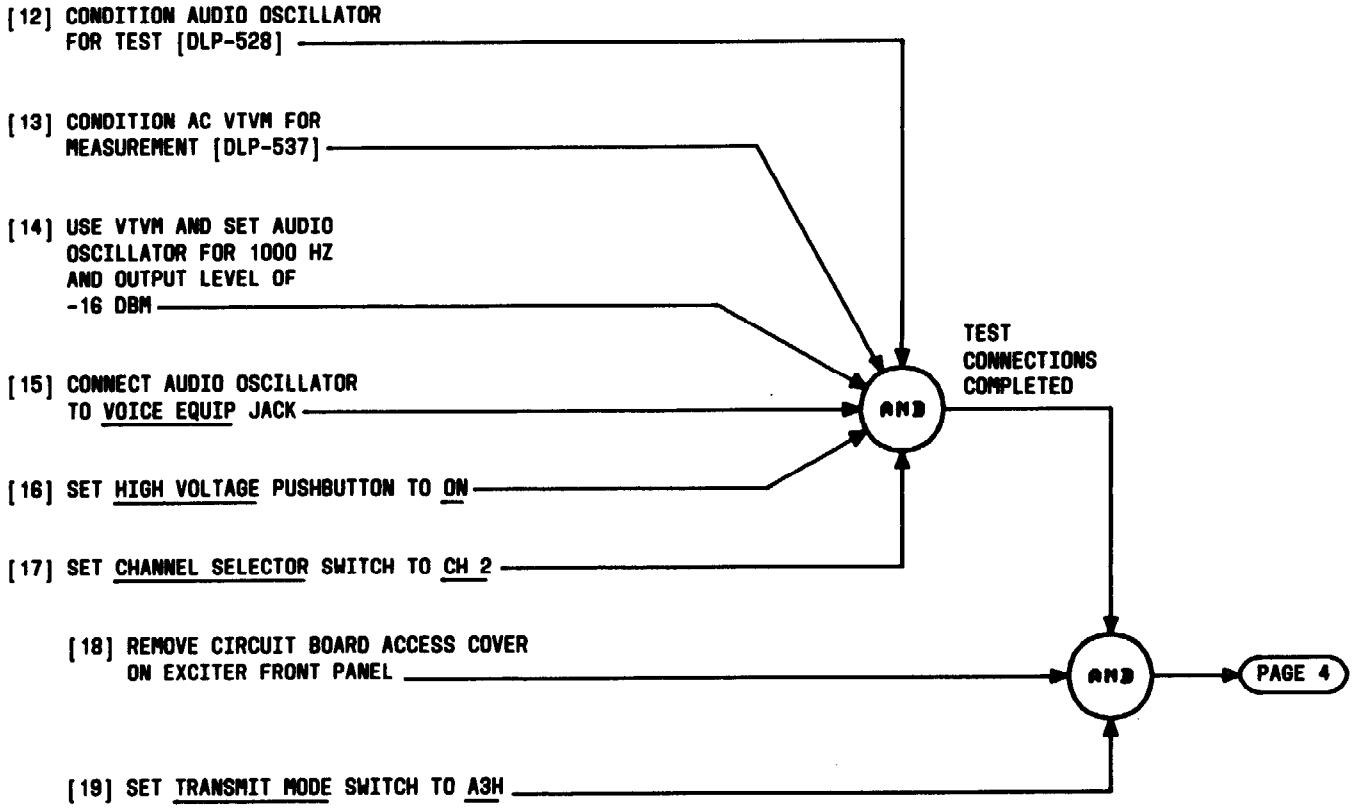


FIG. 1

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

[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

AND

CHANNEL 2 RF LEVEL ADJUSTED

PAGE 5

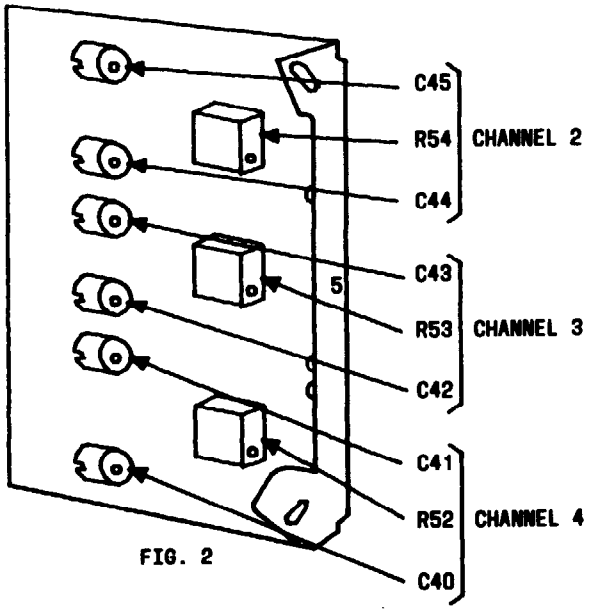


FIG. 2

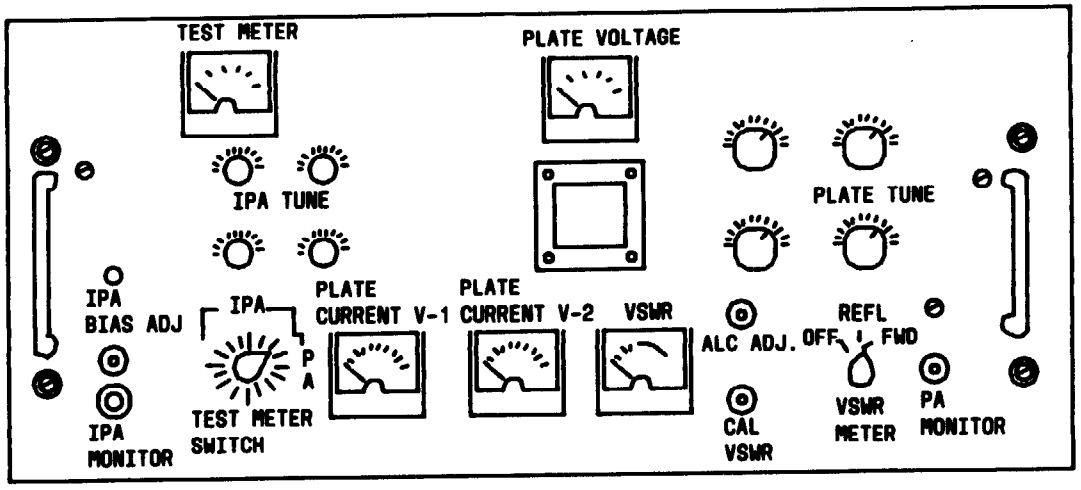
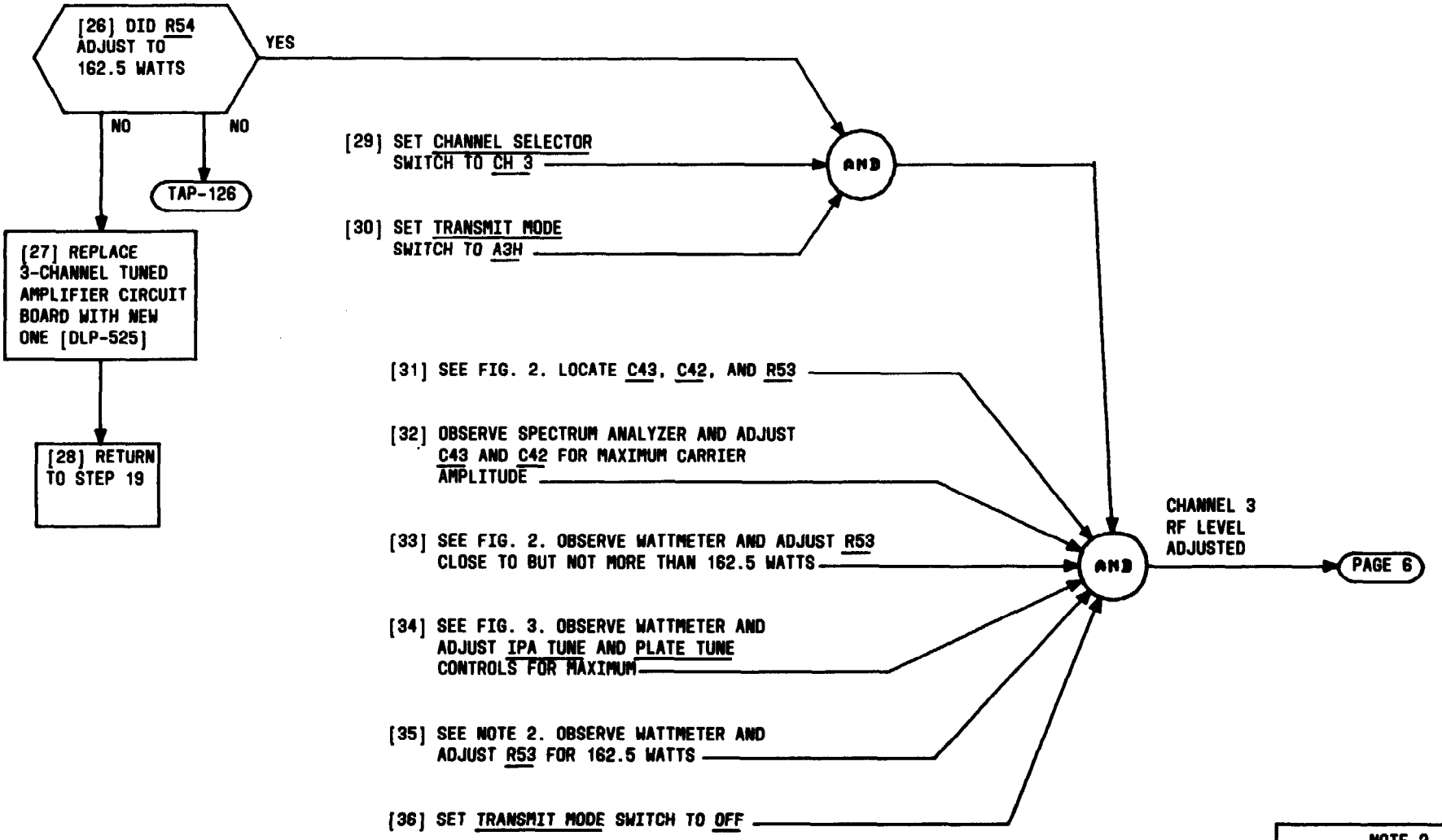


FIG. 3

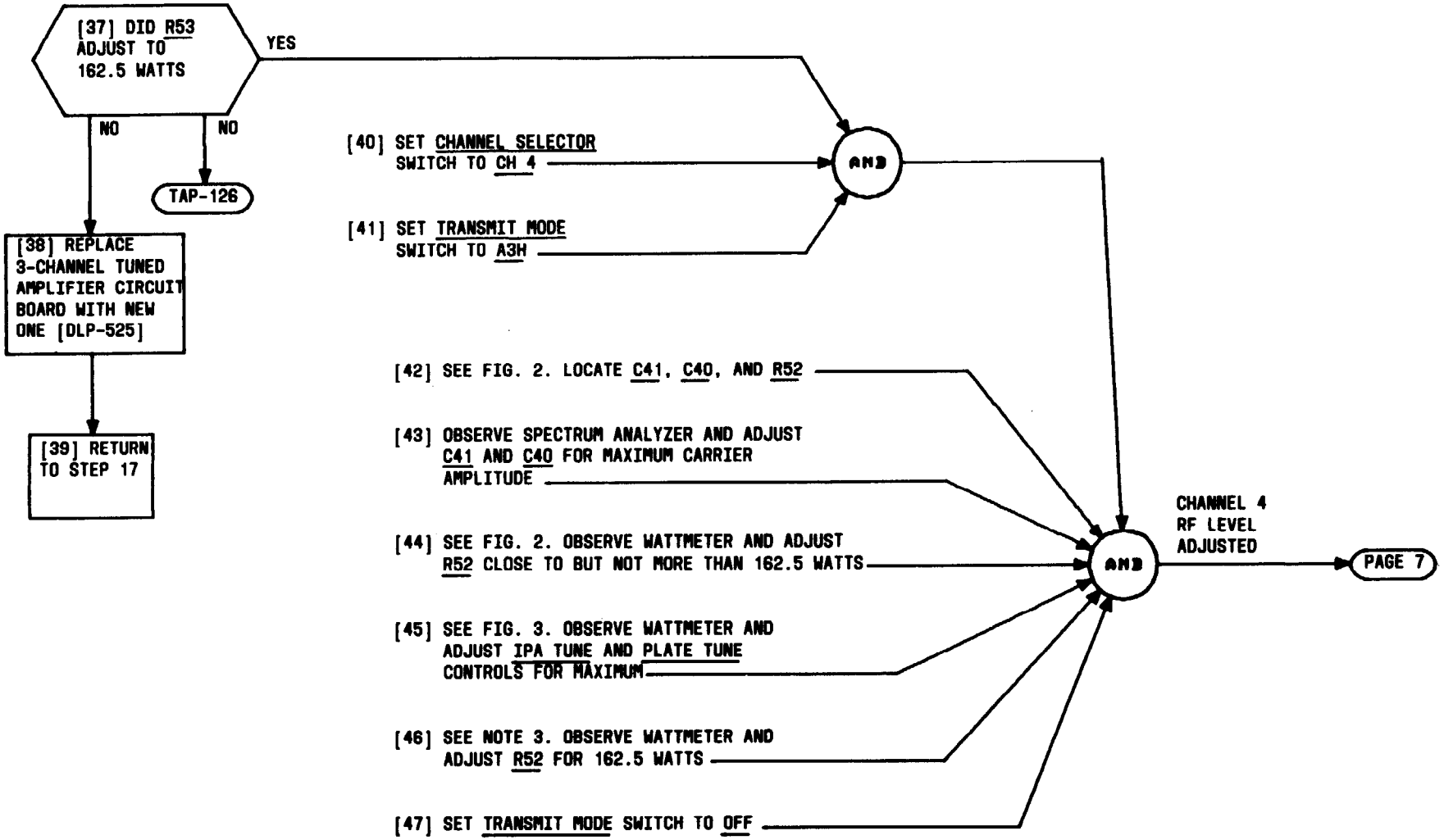
NOTE 1
IT MAY BE NECESSARY TO REPEAT STEPS 23 AND 24 SEVERAL TIMES TO GET EXPECTED INDICATION

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



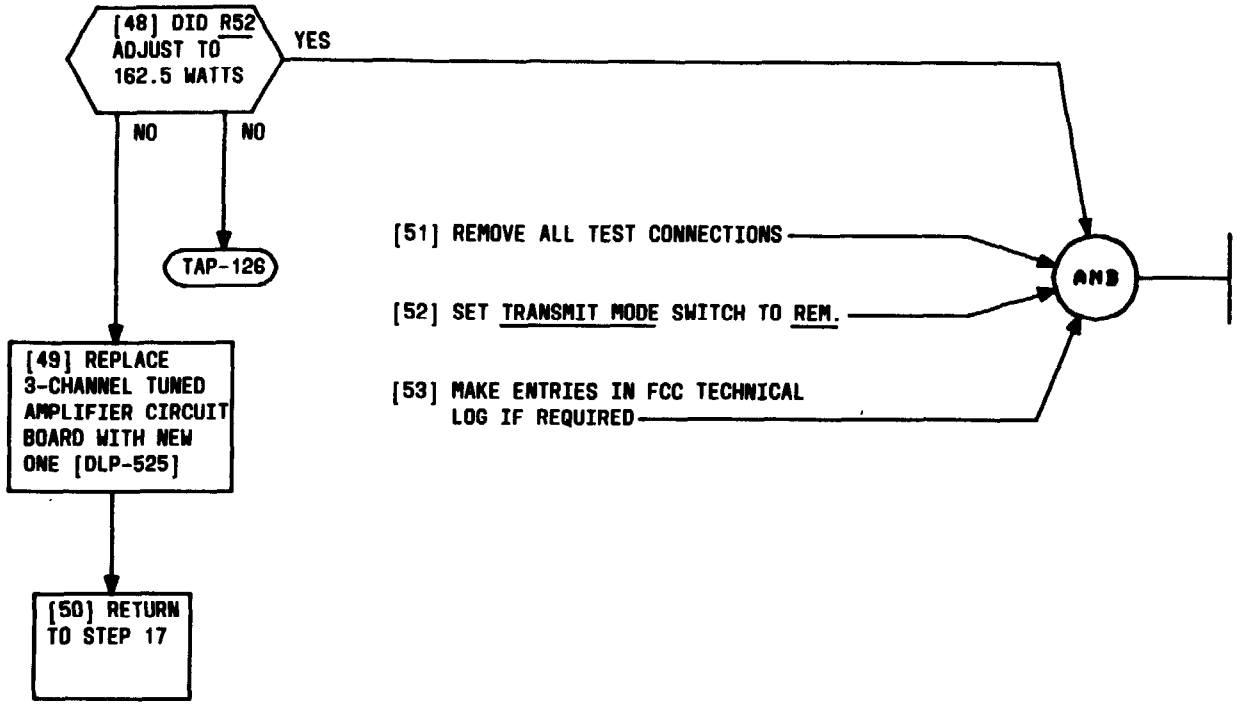
NOTE 2
IT MAY BE NECESSARY TO REPEAT STEPS 34 AND 35 SEVERAL TIMES TO GET EXPECTED INDICATION

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

ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD



ADJUST 3-CHANNEL TUNED AMPLIFIER CIRCUIT BOARD

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	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	

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

ADJUST MONITOR RECEIVER CIRCUIT BOARD

[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

AND

TEST
CONNECTIONS
COMPLETED

PAGE 3

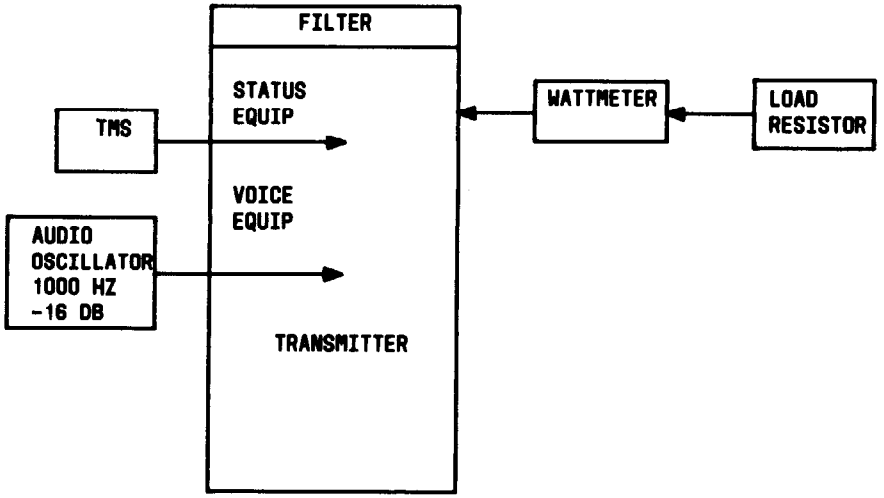


FIG. 1

ADJUST MONITOR RECEIVER CIRCUIT BOARD

[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

AND

AND

PAGE 4

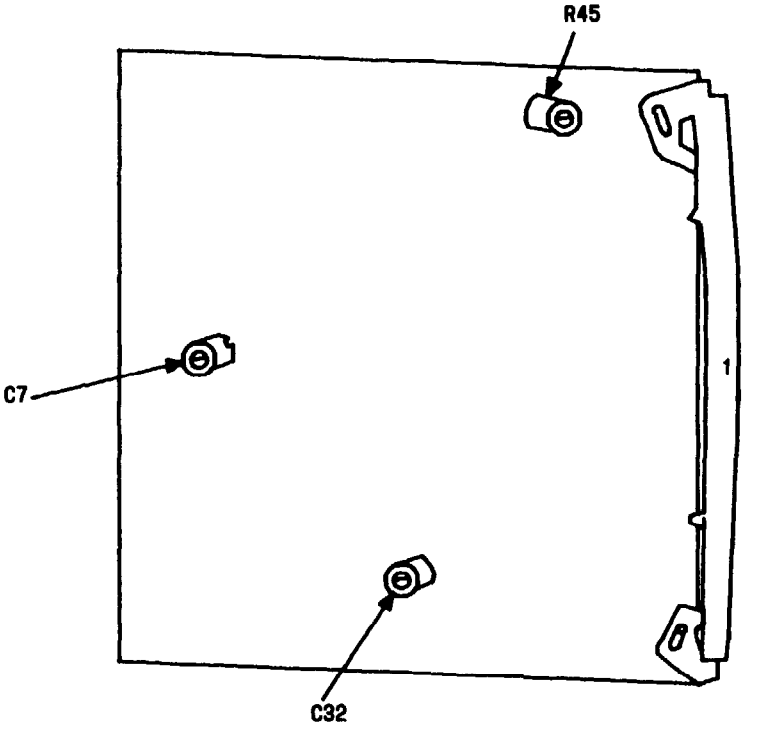


FIG. 2

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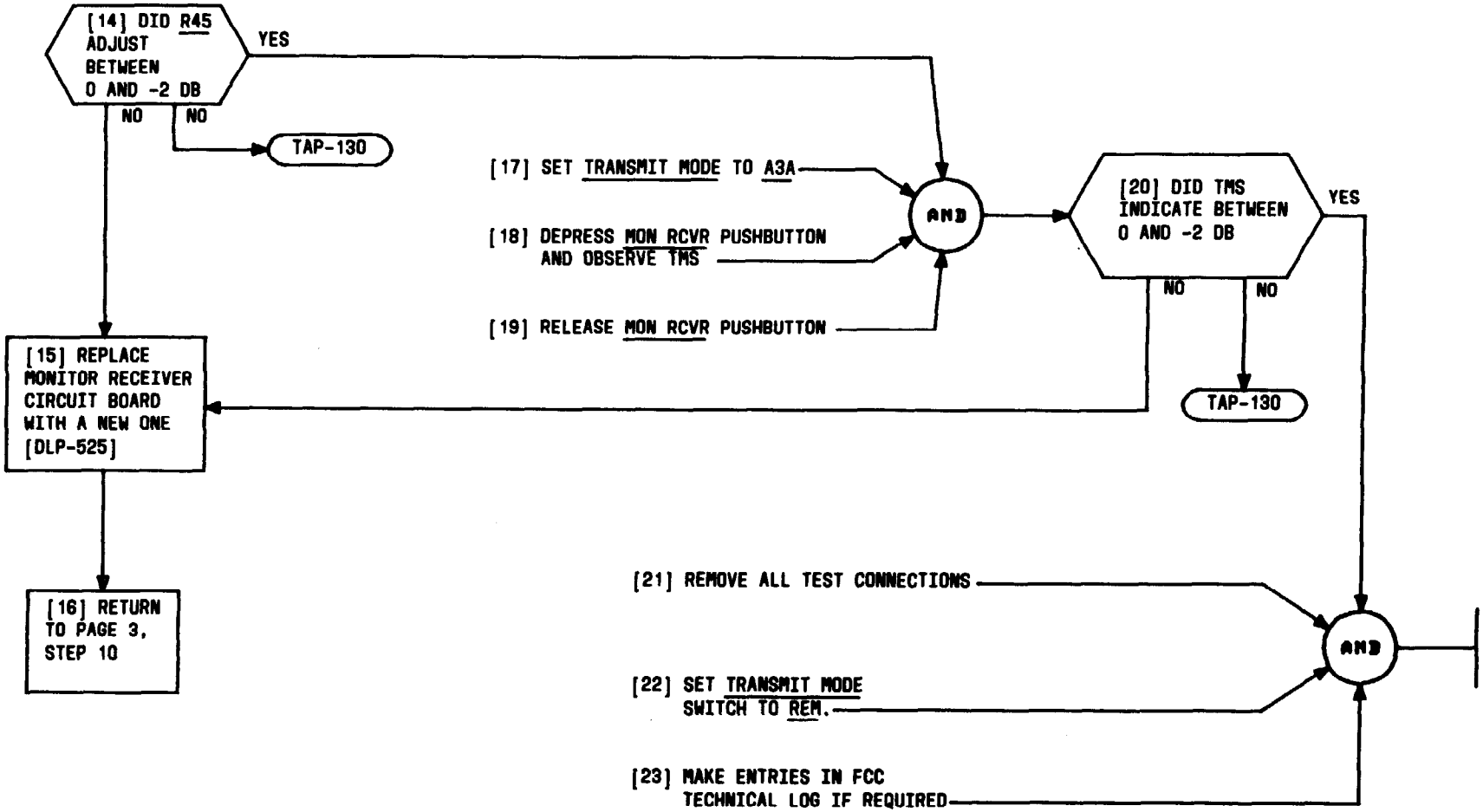
ADJUST MONITOR RECEIVER CIRCUIT BOARD



ADJUST MONITOR RECEIVER CIRCUIT BOARD

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

AND

TEST CONNECTIONS COMPLETED

PAGE 2

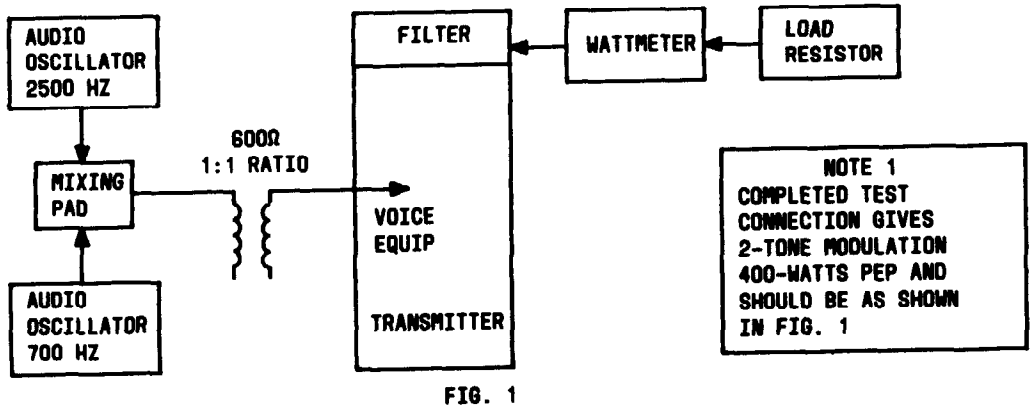


FIG. 1

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

ADJUST VSWR THRESHOLD

ADJUST VSWR THRESHOLD

[5] SET VSWR METER SWITCH TO FWD

[6] SET TRANSMIT MODE SWITCH TO A3A

[7] LOCATE CAL. VSWR POTENTIOMETER ON PA PANEL

[8] OBSERVE VSWR METER AND ROTATE CAL. VSWR POTENTIOMETER UNTIL VSWR METER INDICATES FULL SCALE

AND

VSWR METER CALIBRATED

[9] SEE FIG. 2. LOCATE R1 RF LEVEL POTENTIOMETER ON WIDEBAND AMPLIFIER BOARD (NO. 6)

[10] OBSERVE VSWR METER AND ROTATE R1 TO FULLY DECREASE POWER OUTPUT. SEE NOTE 2

[11] SET TRANSMIT MODE SWITCH TO OFF

[12] SEE FIG. 3. LOCATE TS-8 AND DISCONNECT WIRE FROM TERMINAL 1

[13] DISCONNECT WIRE FROM TERMINAL 3 AND CONNECT WIRE TO TERMINAL 1

AND

READY TO CHECK THRESHOLD SETTING

PAGE 3

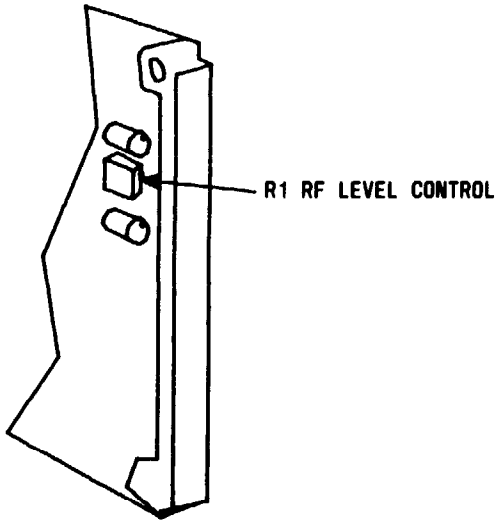


FIG. 2

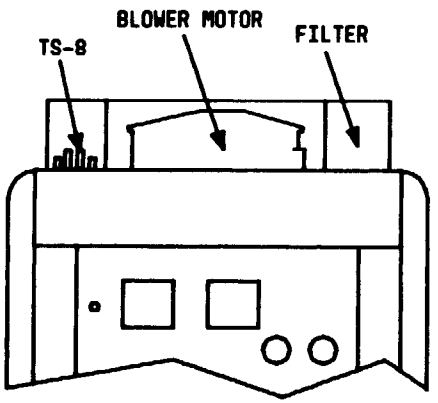
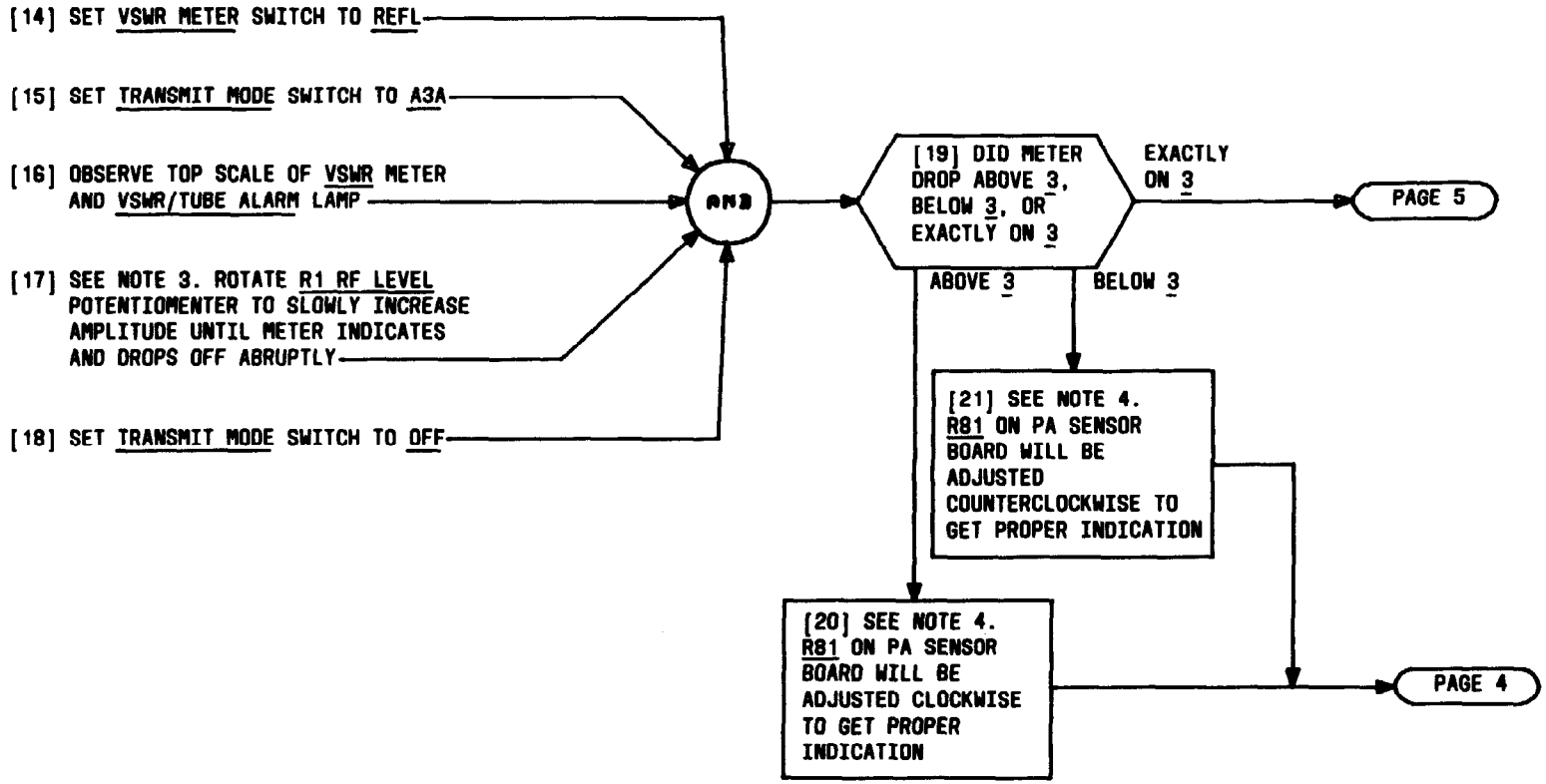


FIG. 3

NOTE 2
DISREGARD ALL LAMP INDICATIONS



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

ADJUST VSWR THRESHOLD

[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

AND

[29] RETURN TO PAGE 3, STEP 16

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

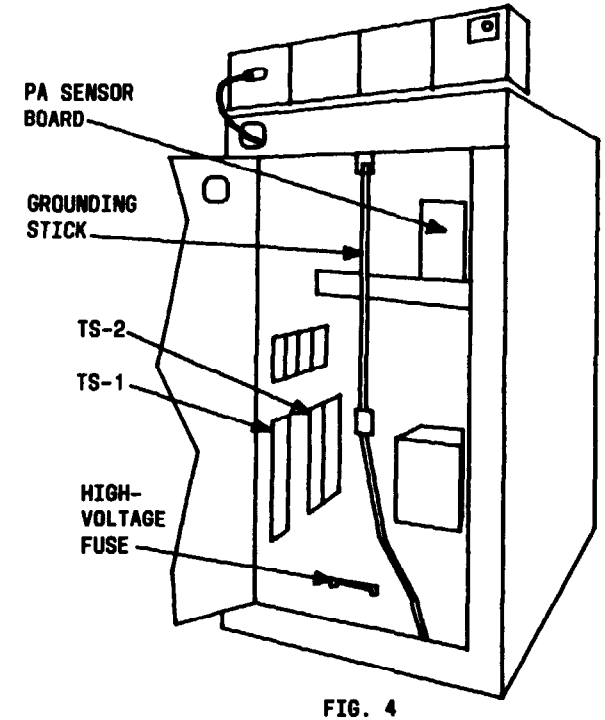


FIG. 4

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

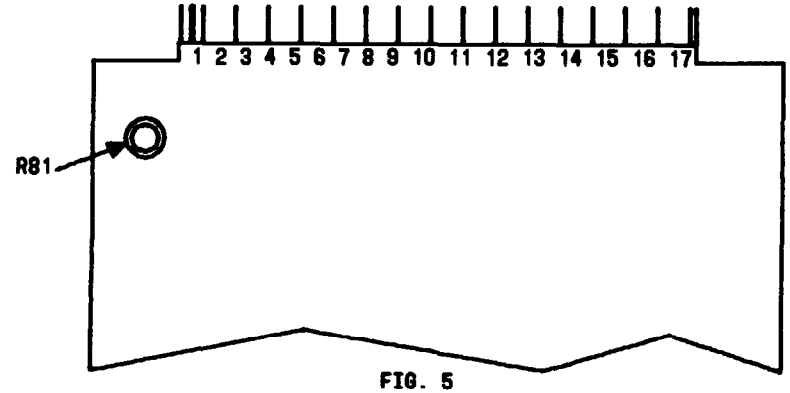
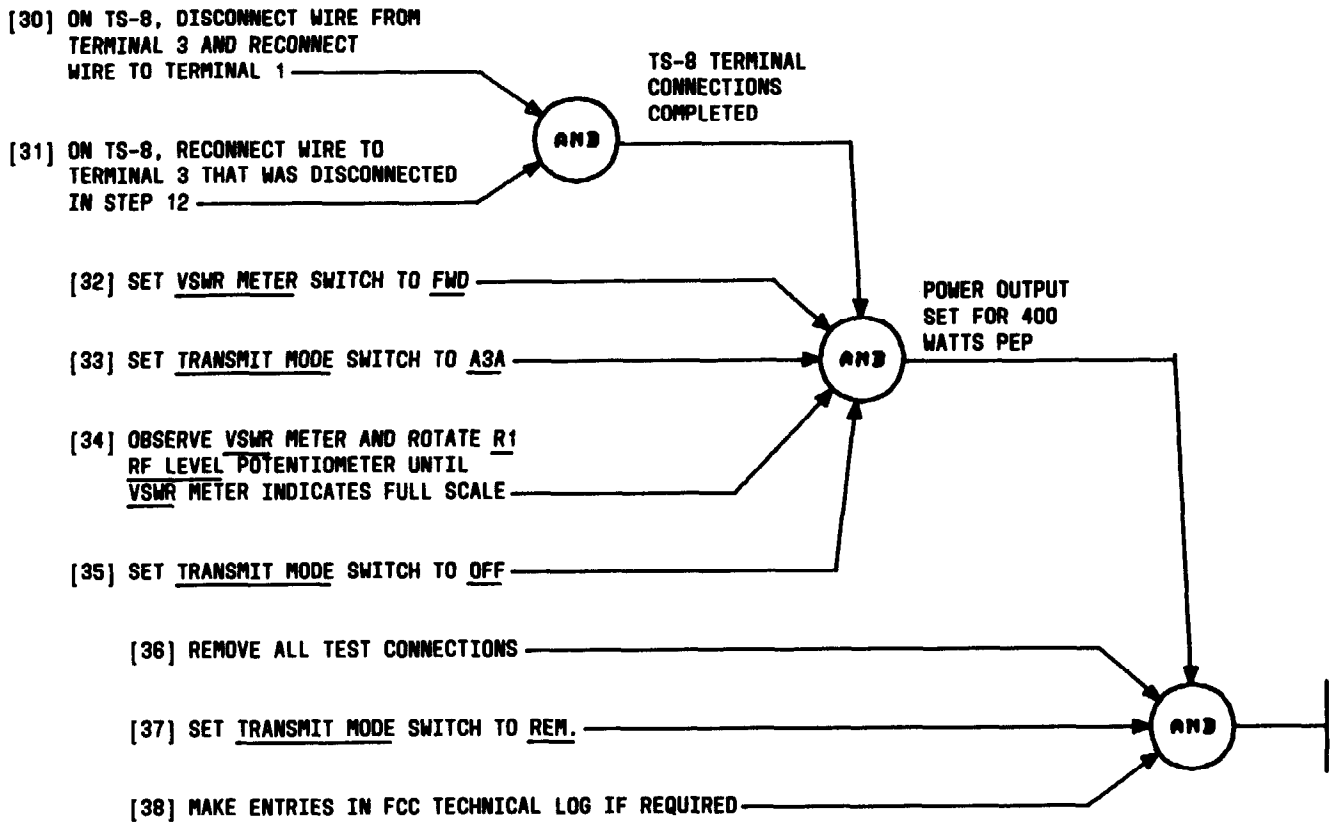


FIG. 5

DANGER
VOLTAGES HAZARDOUS TO PERSONNEL ARE PRESENT IN TRANSMITTER CABINET

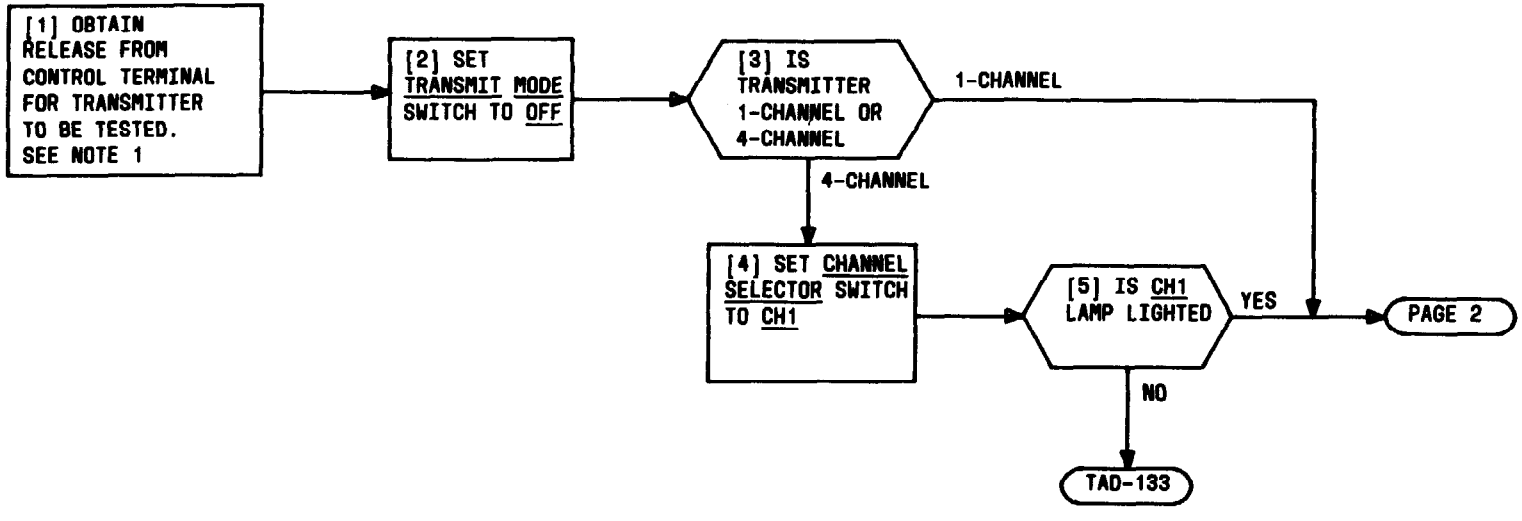
ADJUST VSWR THRESHOLD



ADJUST VSWR THRESHOLD

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

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

AND

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	

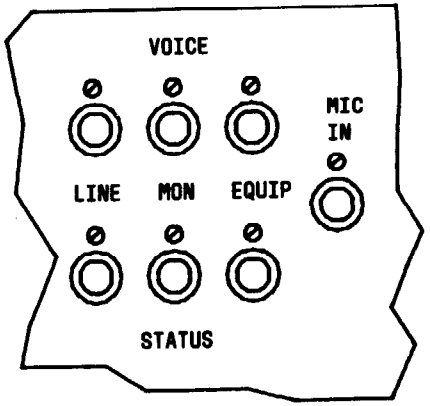


FIG. 1

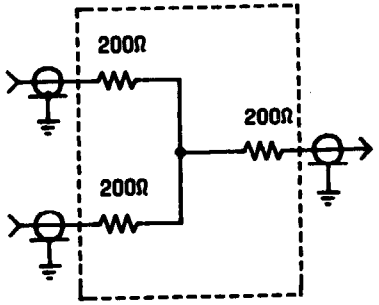


FIG. 2

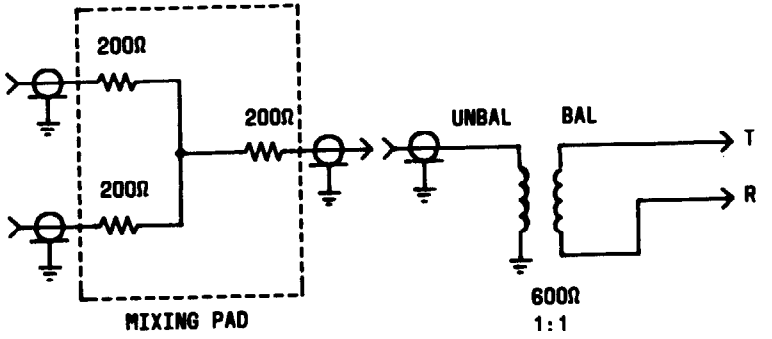


FIG. 3

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

[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

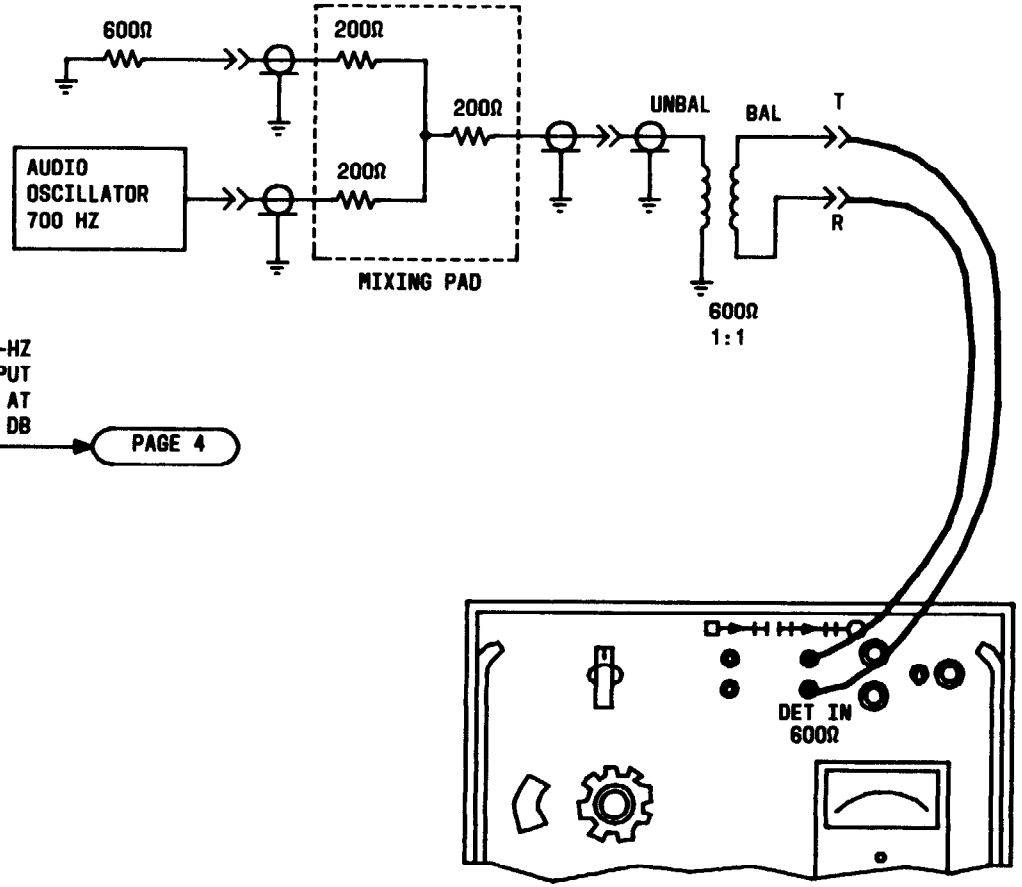


FIG. 4

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

[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]

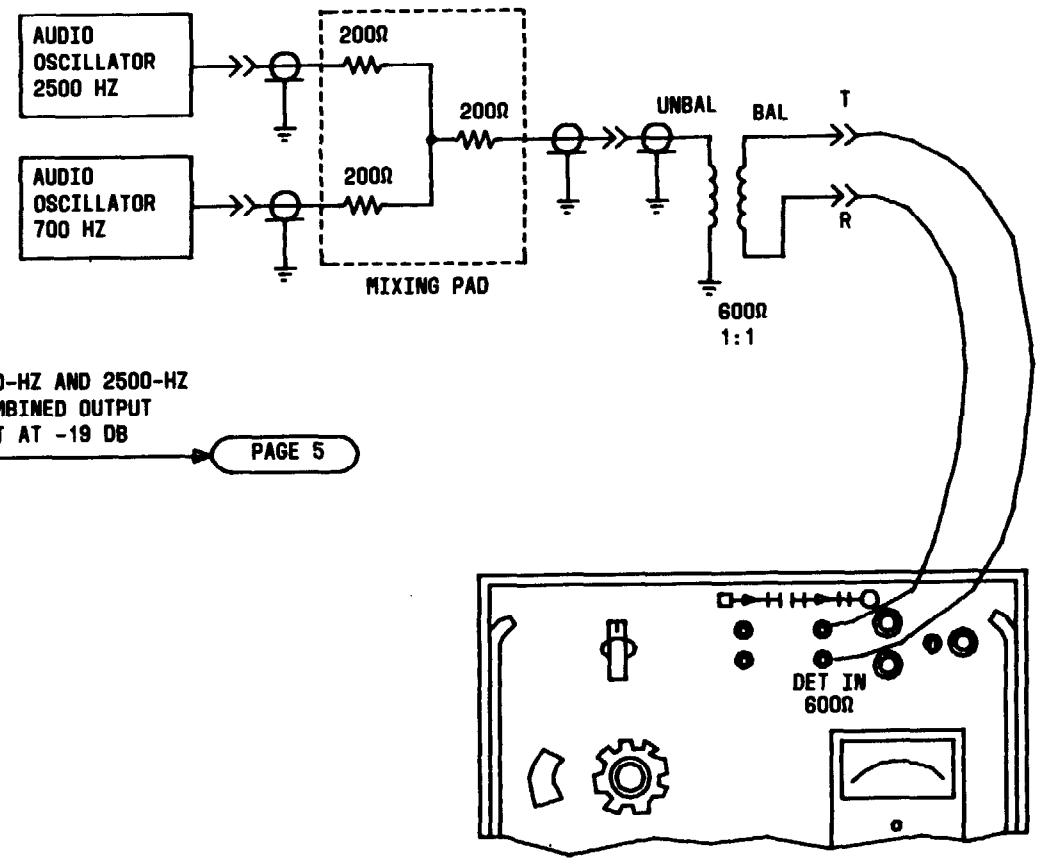


FIG. 5

ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD

[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 THRULINE WATTMETER

AND

PAGE 6

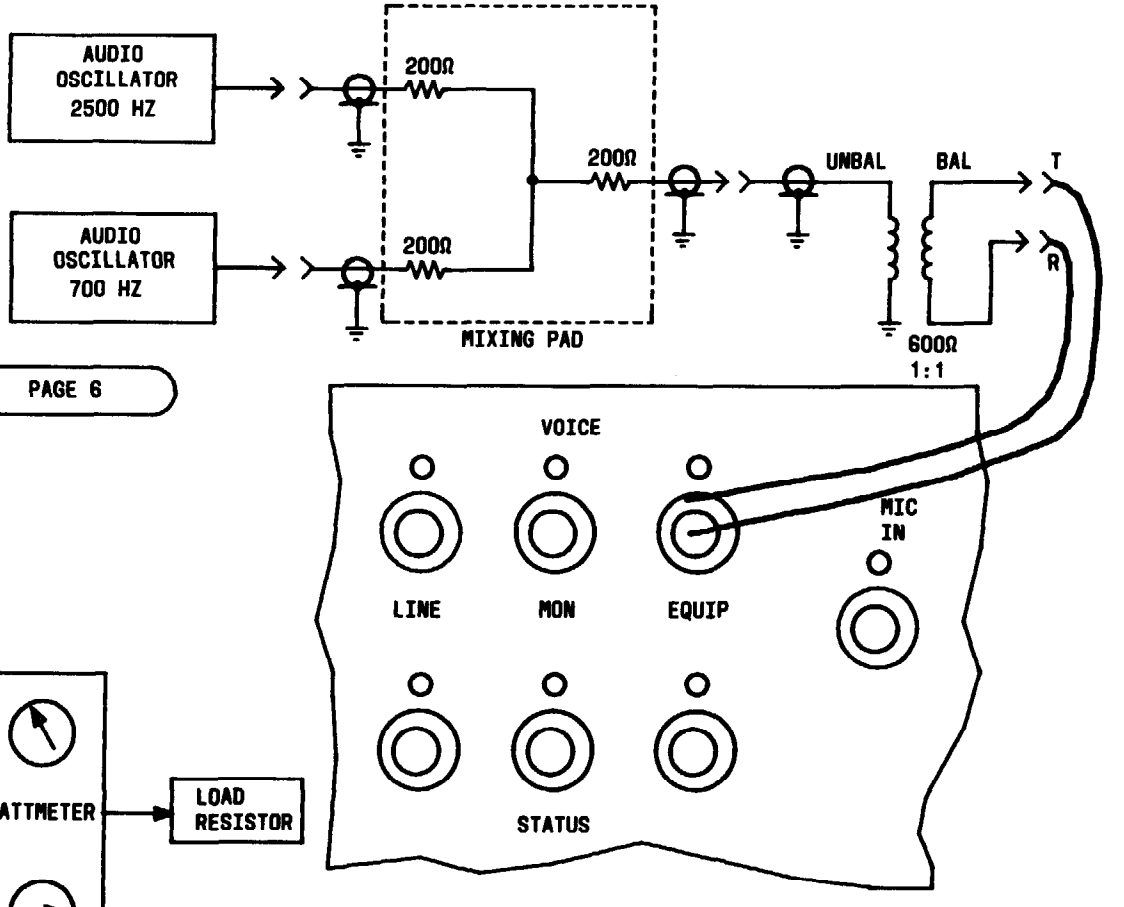


FIG. 6

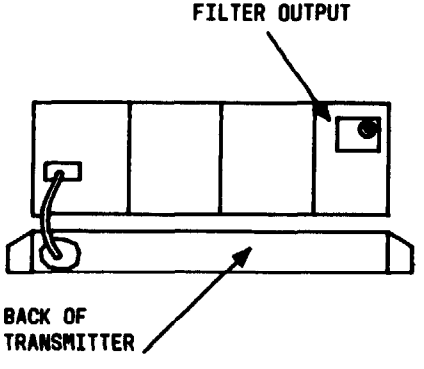


FIG. 7

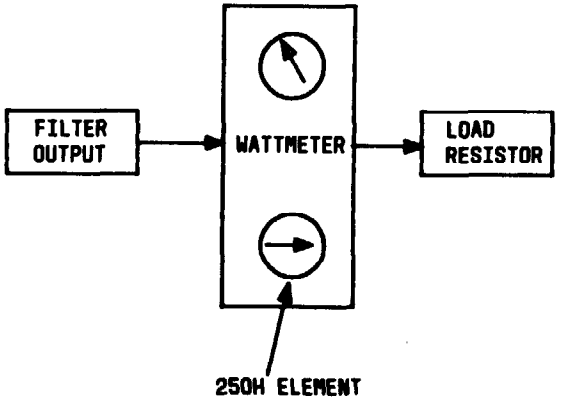


FIG. 8

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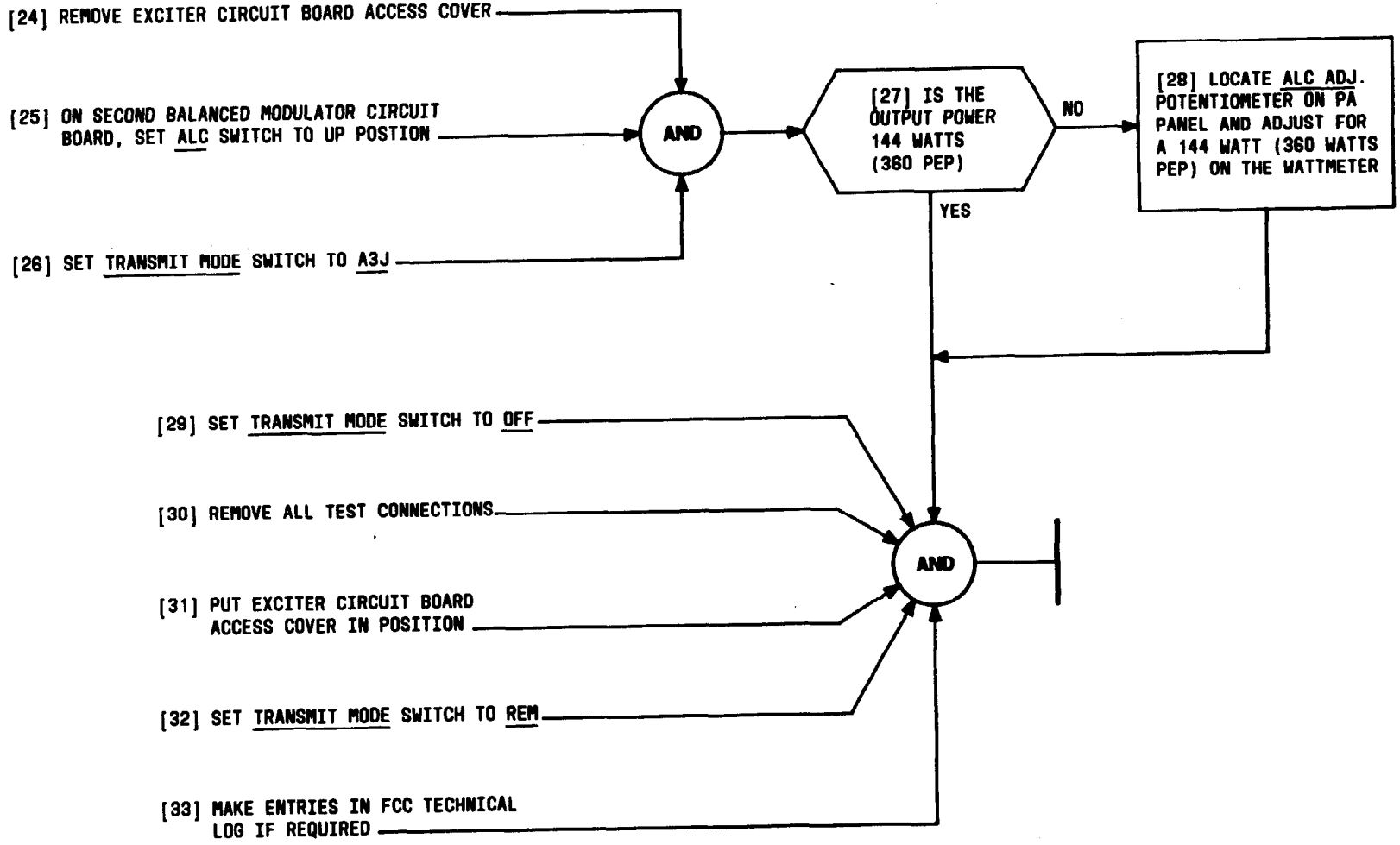
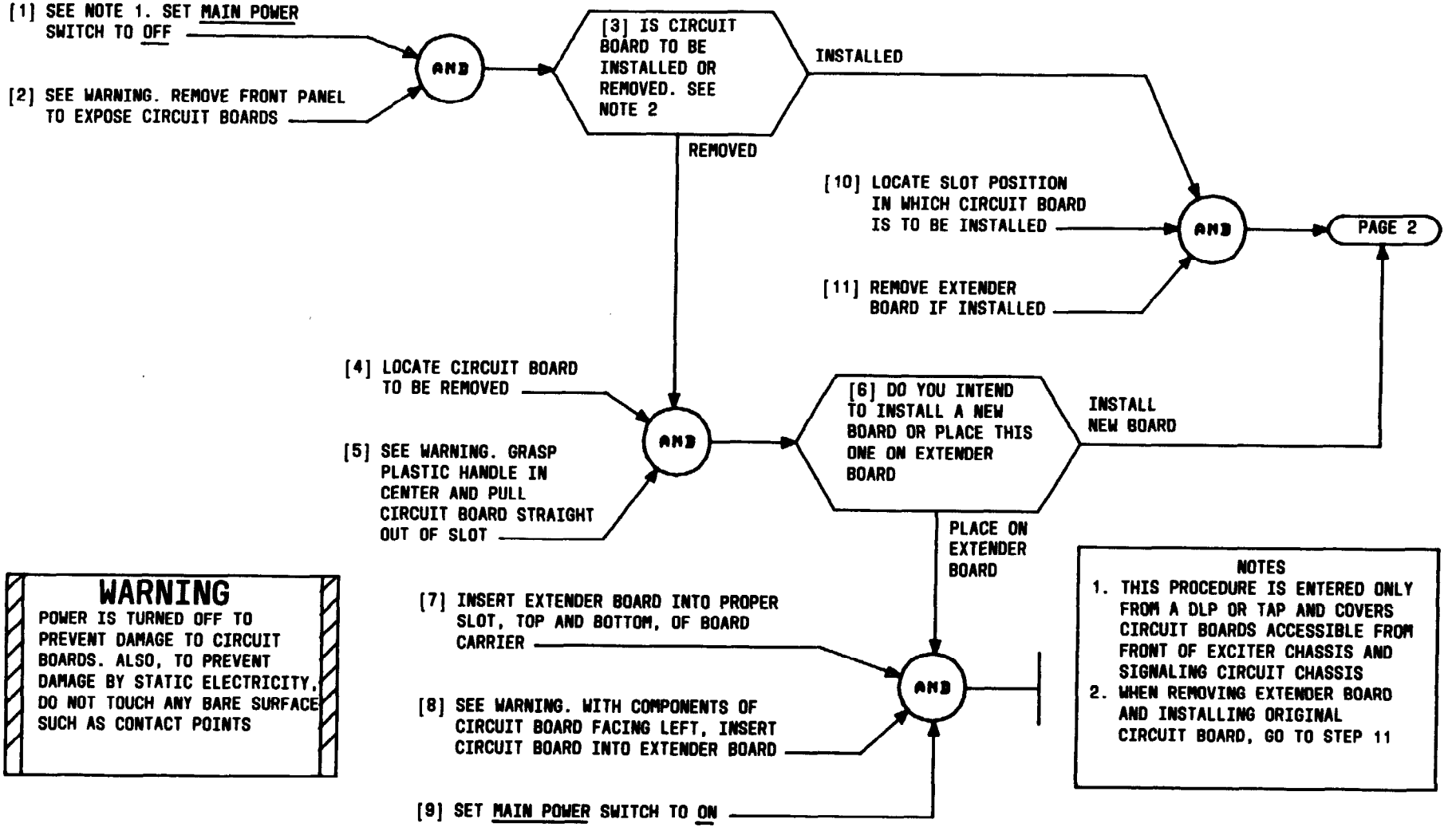
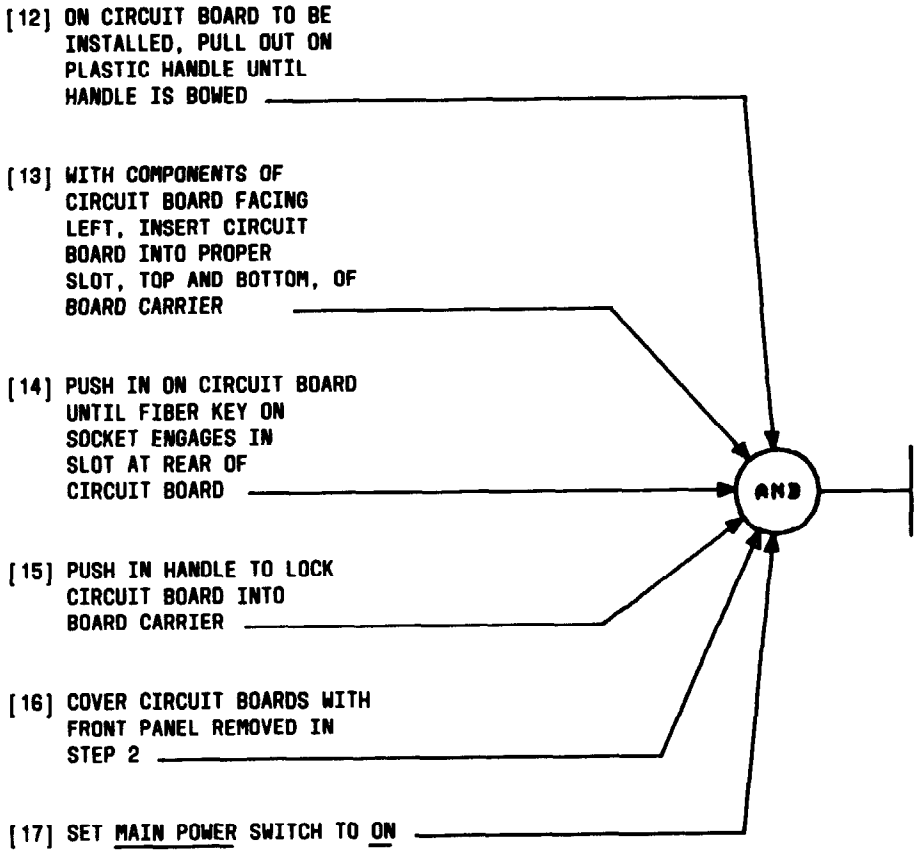
ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD



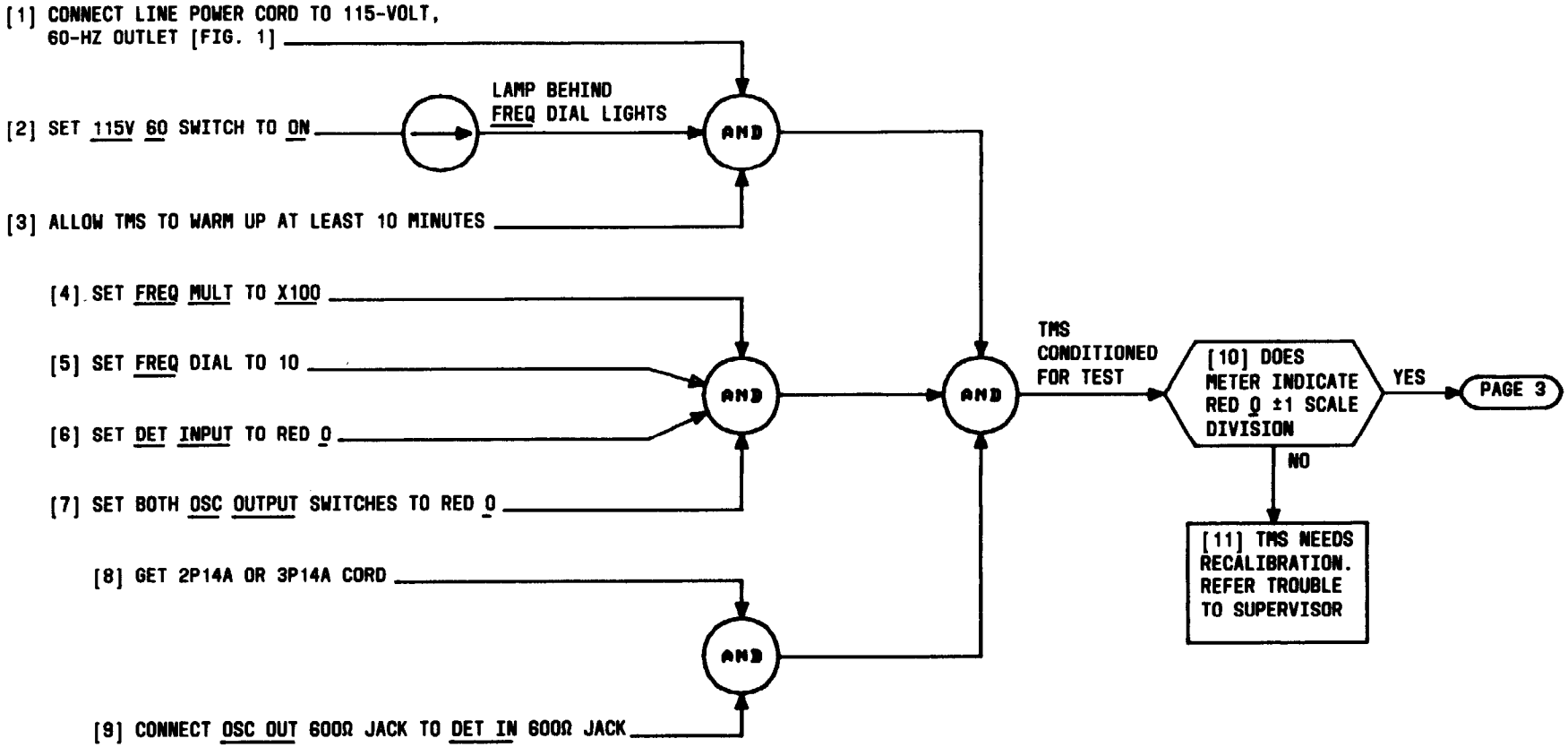
ADJUST AUTOMATIC LEVEL CONTROL (ALC) THRESHOLD



REMOVE AND/OR INSTALL CIRCUIT BOARD



REMOVE AND/OR INSTALL CIRCUIT BOARD



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

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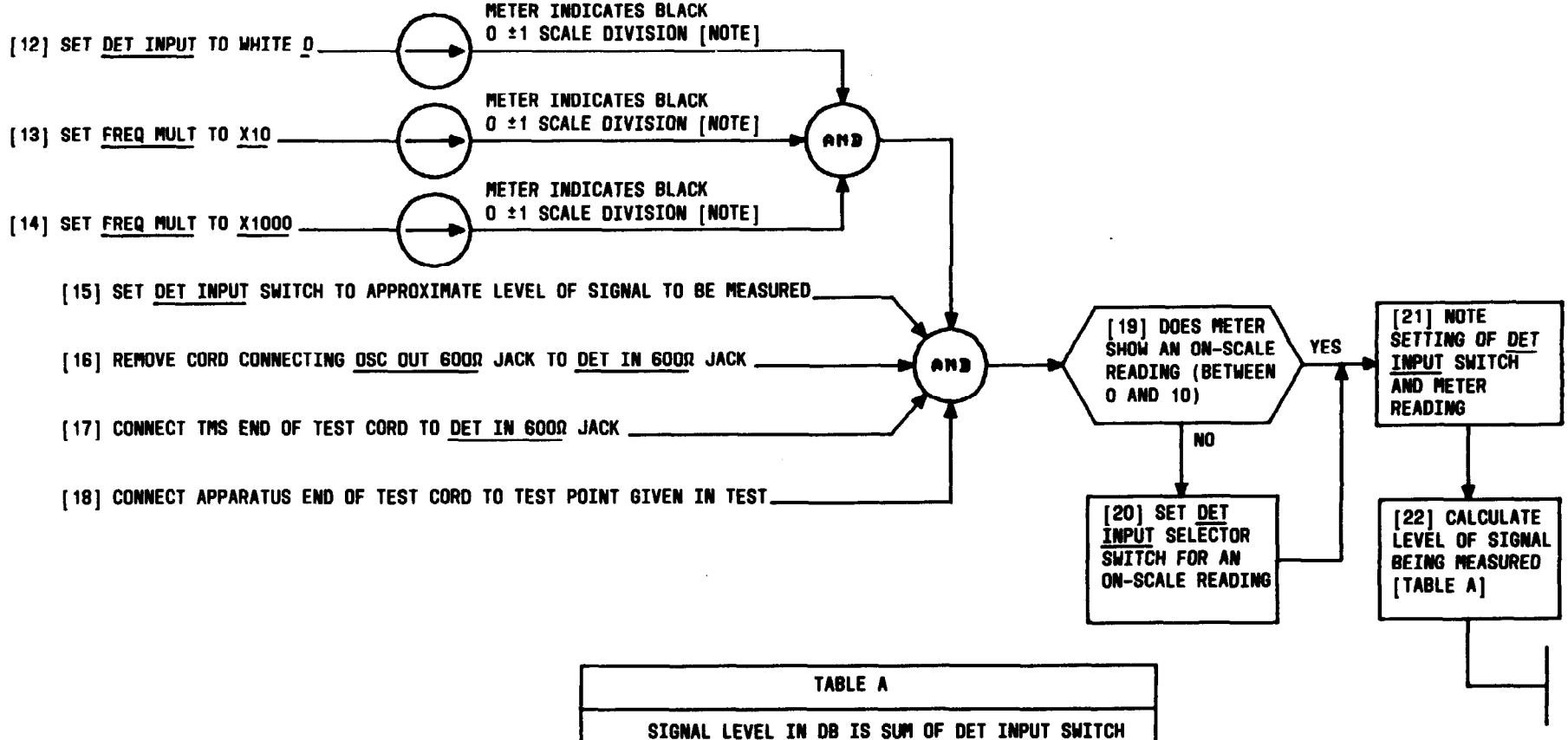


TABLE A				
SIGNAL LEVEL IN DB IS SUM OF DET INPUT SWITCH SETTING (RED OR WHITE) AND METER INDICATION (RED OR BLACK SCALE)				
EXAMPLES				
DET INPUT SETTING DB METER INDICATION	-30 - 3 -33 DB	-10 - 5 -15 DB	+10 + 3 +13 DB	+30 + 3 +33 DB

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

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

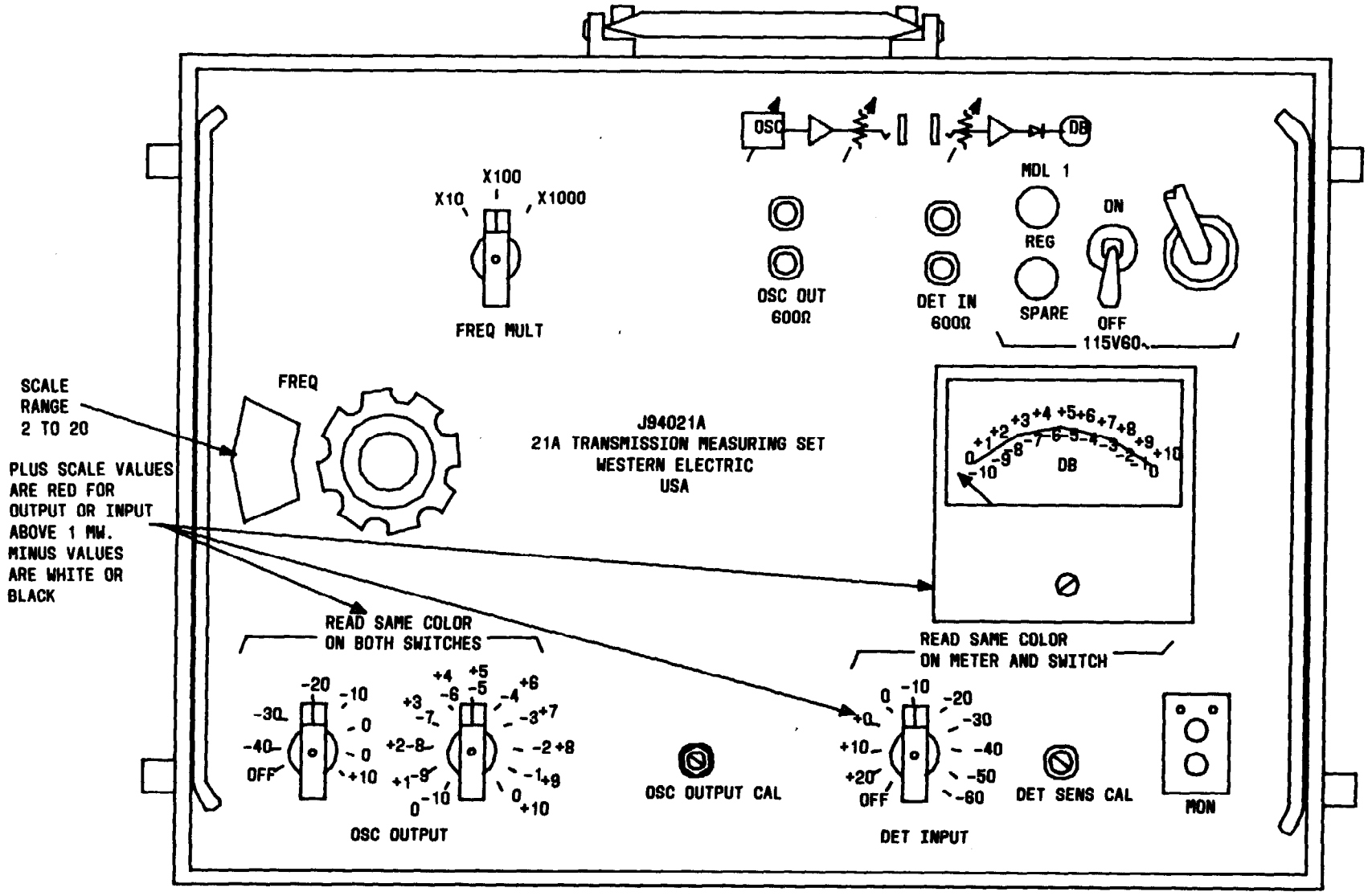


FIG. 1

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

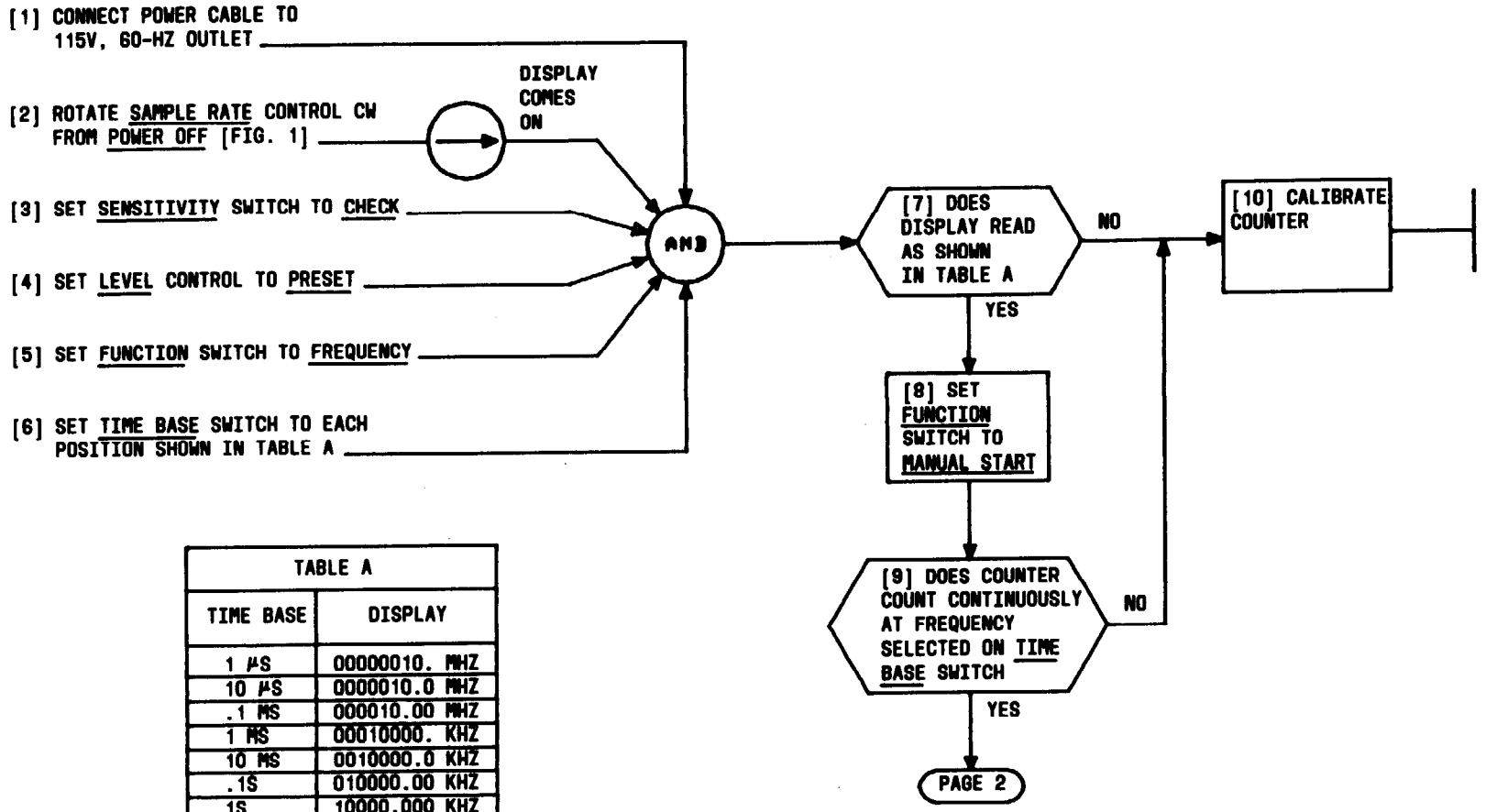


TABLE A	
TIME BASE	DISPLAY
1 µS	00000010. MHZ
10 µS	0000010.0 MHZ
.1 MS	000010.00 MHZ
1 MS	00010000. KHZ
10 MS	0010000.0 KHZ
.1S	010000.00 KHZ
1S	10000.000 KHZ
10S	0000.0000 KHZ

CONDITION HP 5245L FREQUENCY COUNTER TO MEASURE FREQUENCY

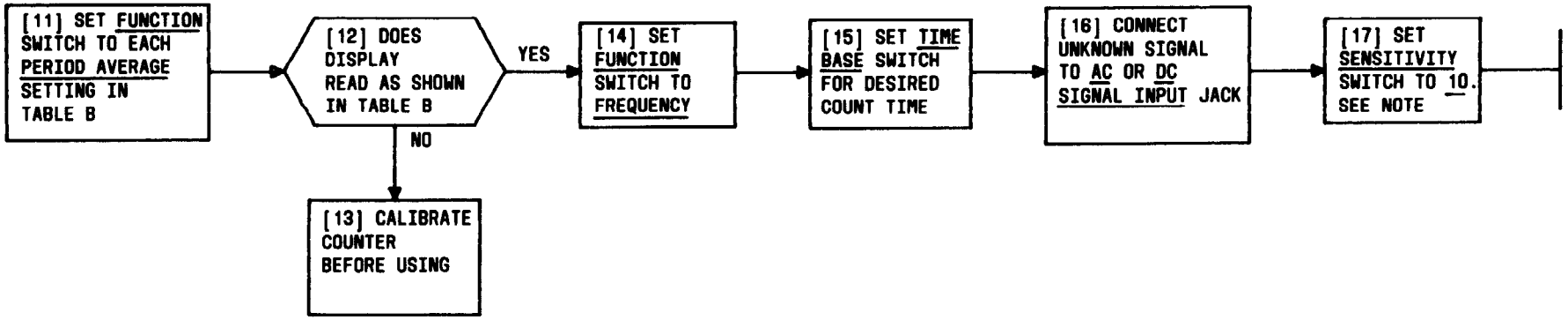


TABLE B	
PERIOD AVERAGE	DISPLAY
1	00000001
10	00000010
100	00000100
1K	00001000
10K	00010000
100K	00100000

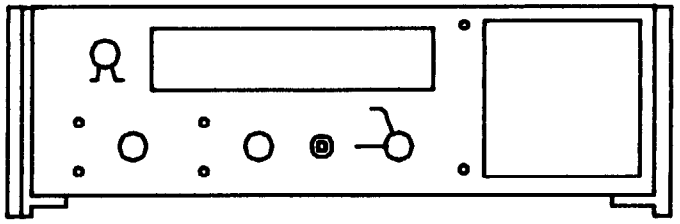


FIG. 1

NOTE
IF THERE IS NO COUNT, OR IF COUNT IS UNCERTAIN, PROGRESSIVELY CHANGE SENSITIVITY TO LOWER RANGES

CONDITION HP 5245L FREQUENCY COUNTER TO MEASURE FREQUENCY

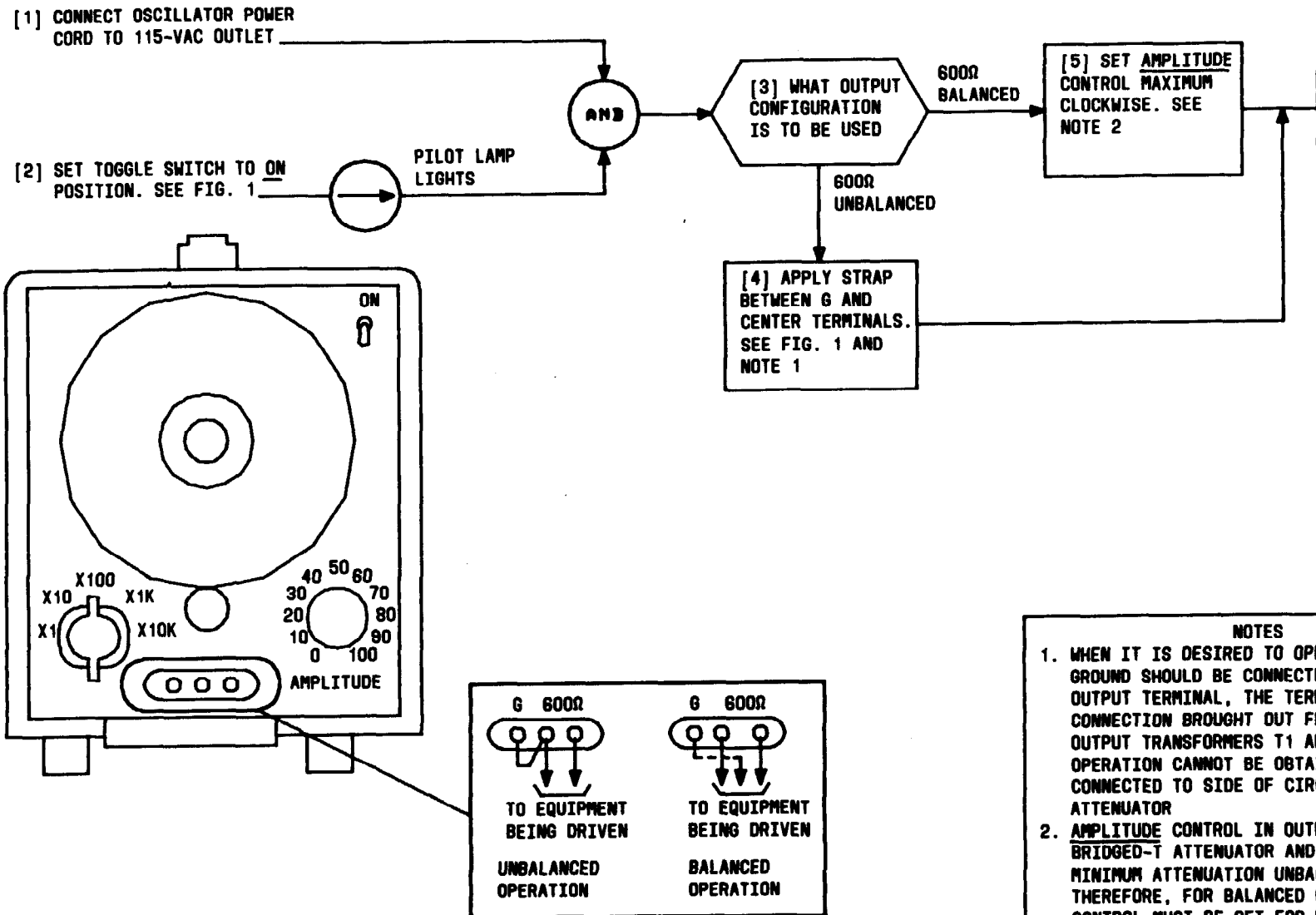


FIG. 1

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 G 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

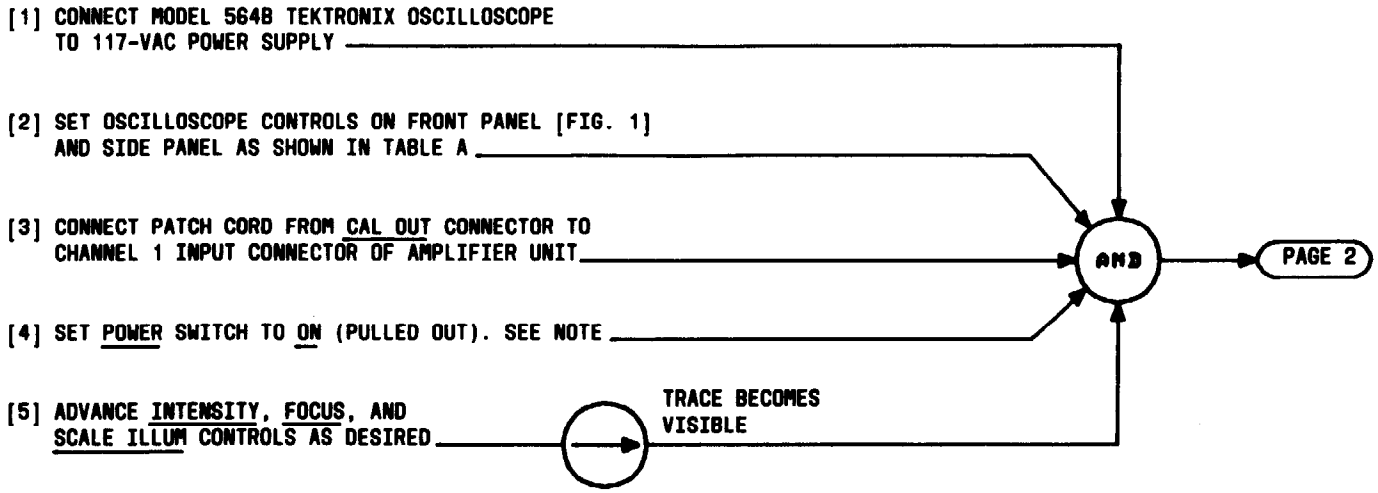
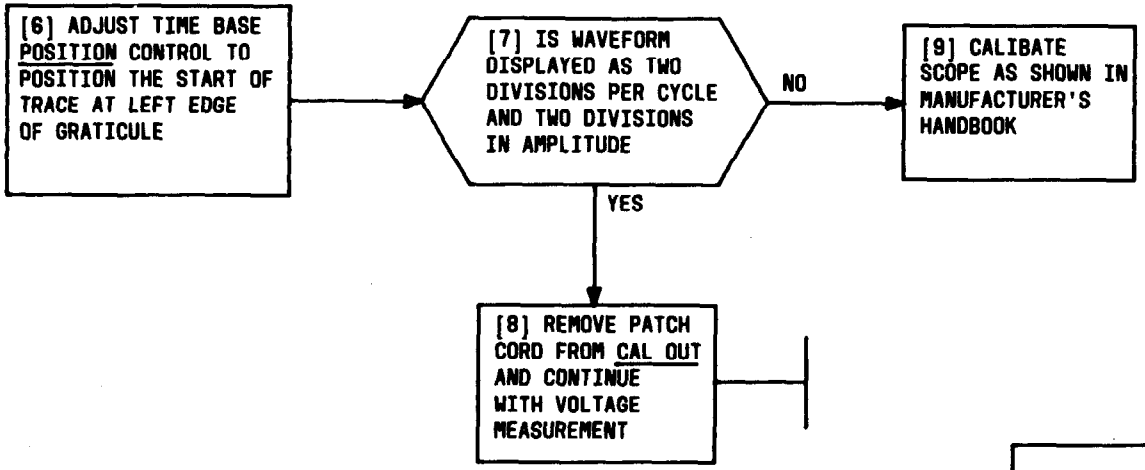


TABLE A

FRONT PANEL CONTROLS			FRONT PANEL CONTROLS		
CONTROL TYPE	CONTROL	SETTING	CONTROL TYPE	CONTROL	SETTING
CRT CONTROLS	INTENSITY	COUNTERCLOCKWISE	TIME-BASE UNIT (FOR EXAMPLE, TYPE 3B3)	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	+
				COUPLING	AUTO
AMPLIFIER UNIT (FOR EXAMPLE, TYPE 3A6)	POSITION	CENTERED			
	MODE	NORMAL (CHANNEL 1)			
	VOLTS/DIV	2			
	VARIBLE (VOLTS/DIV)	CALIBRATED			
	INPUT COUPLING	DC			

NOTE
ALLOW APPROXIMATELY 2 MINUTES WARM-UP TIME

CONDITION TEKTRONIX 564B OSCILLOSCOPE FOR MEASUREMENT



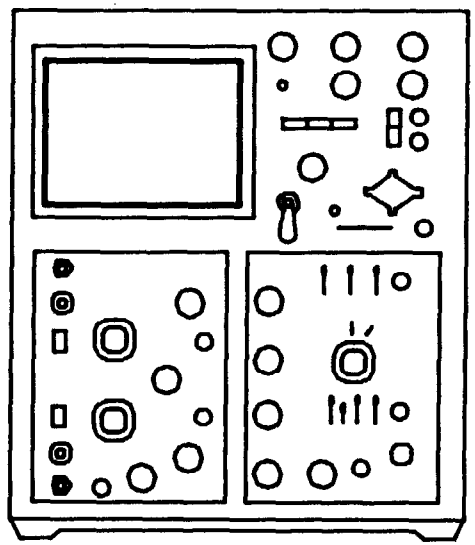


FIG. 1

CONDITION TEKTRONIX 564B OSCILLOSCOPE FOR MEASUREMENT

[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

AND

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

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

AND

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

PAGE 2

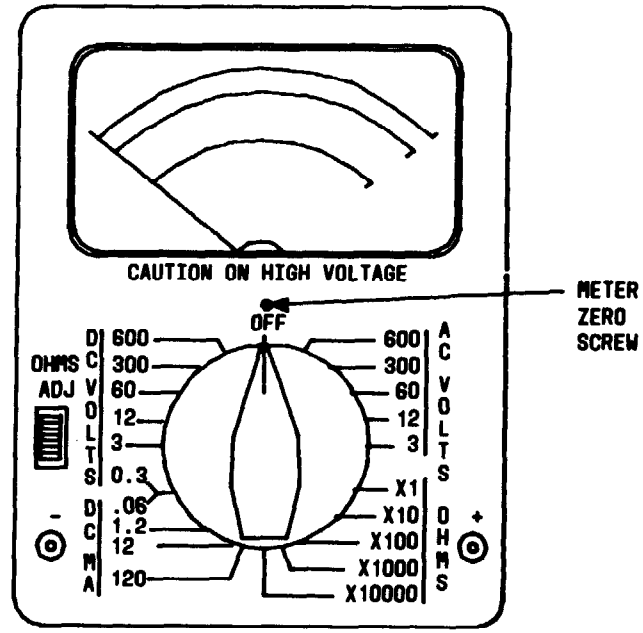


FIG. 1

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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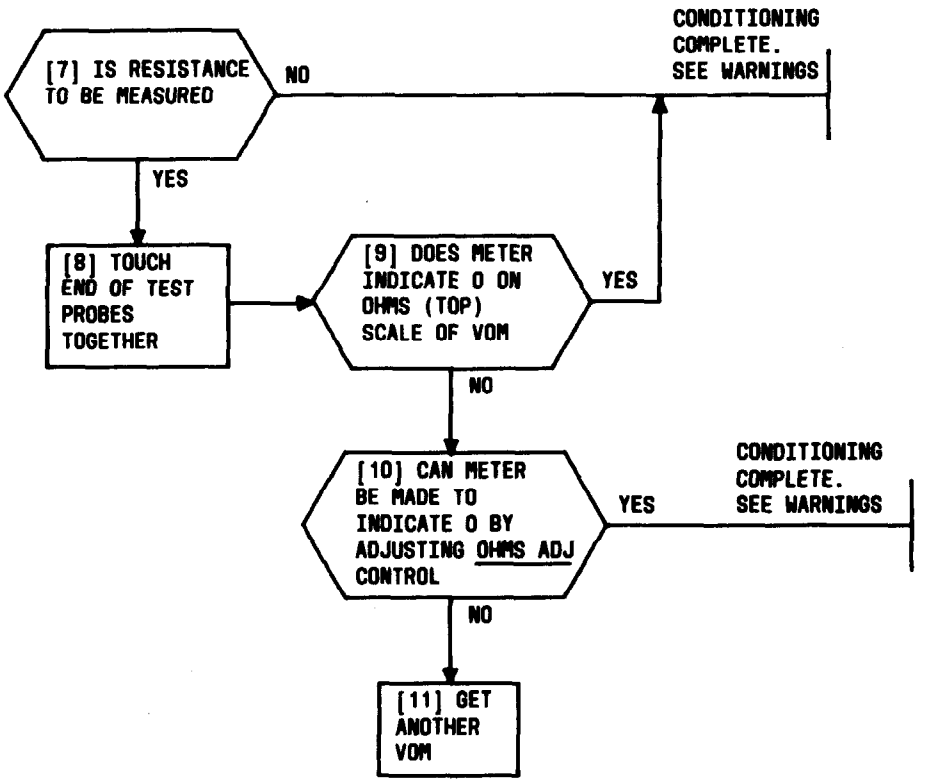
CONDITION KS-14510 METER (VOM) FOR MEASUREMENT



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

CONDITION KS-14510 METER (VOM) FOR MEASUREMENT

[1] GET TEST EQUIPMENT SHOWN IN TABLE A

[2] SEE FIG. 1 AND NOTE 1. SET SWITCHES SHOWN IN TABLE B

[3] INSERT 89BN 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

AND

PAGE 2

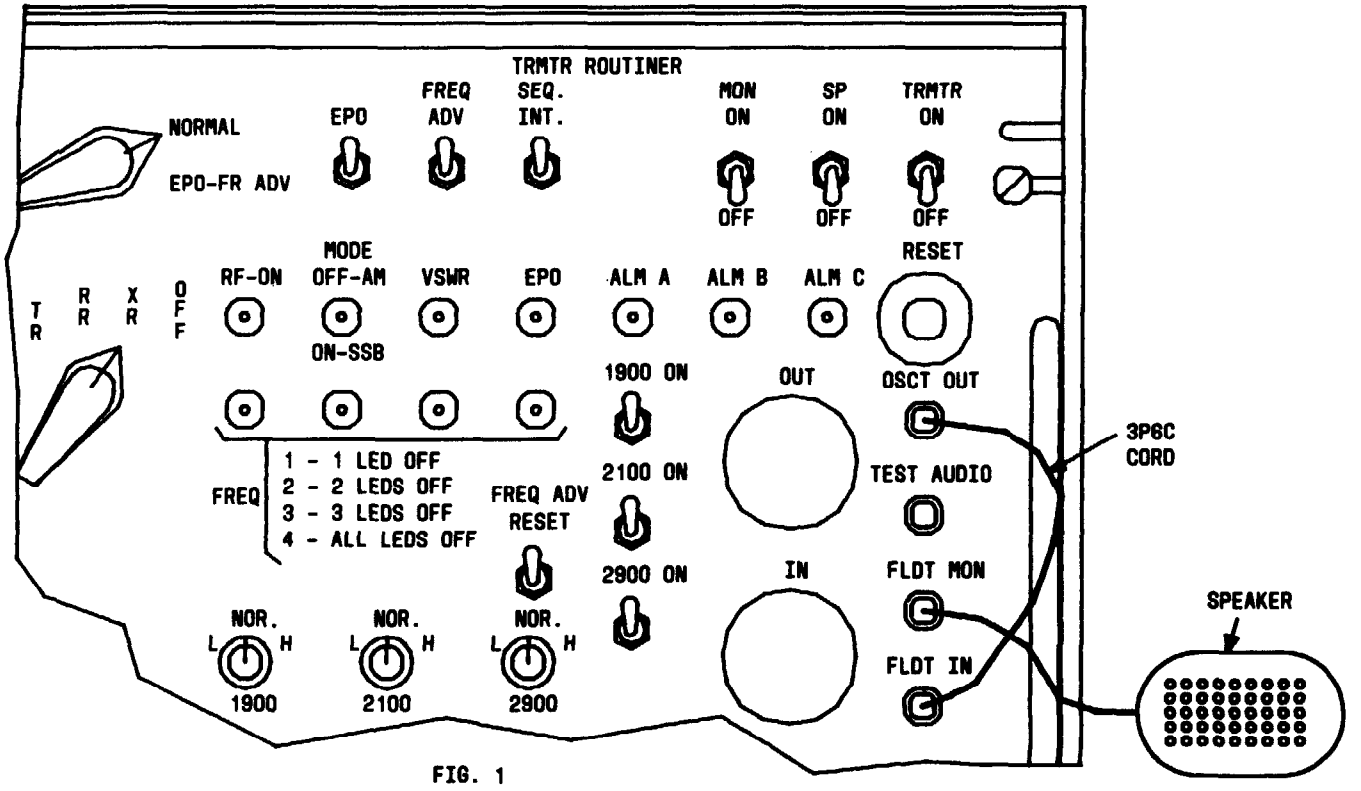


FIG. 1

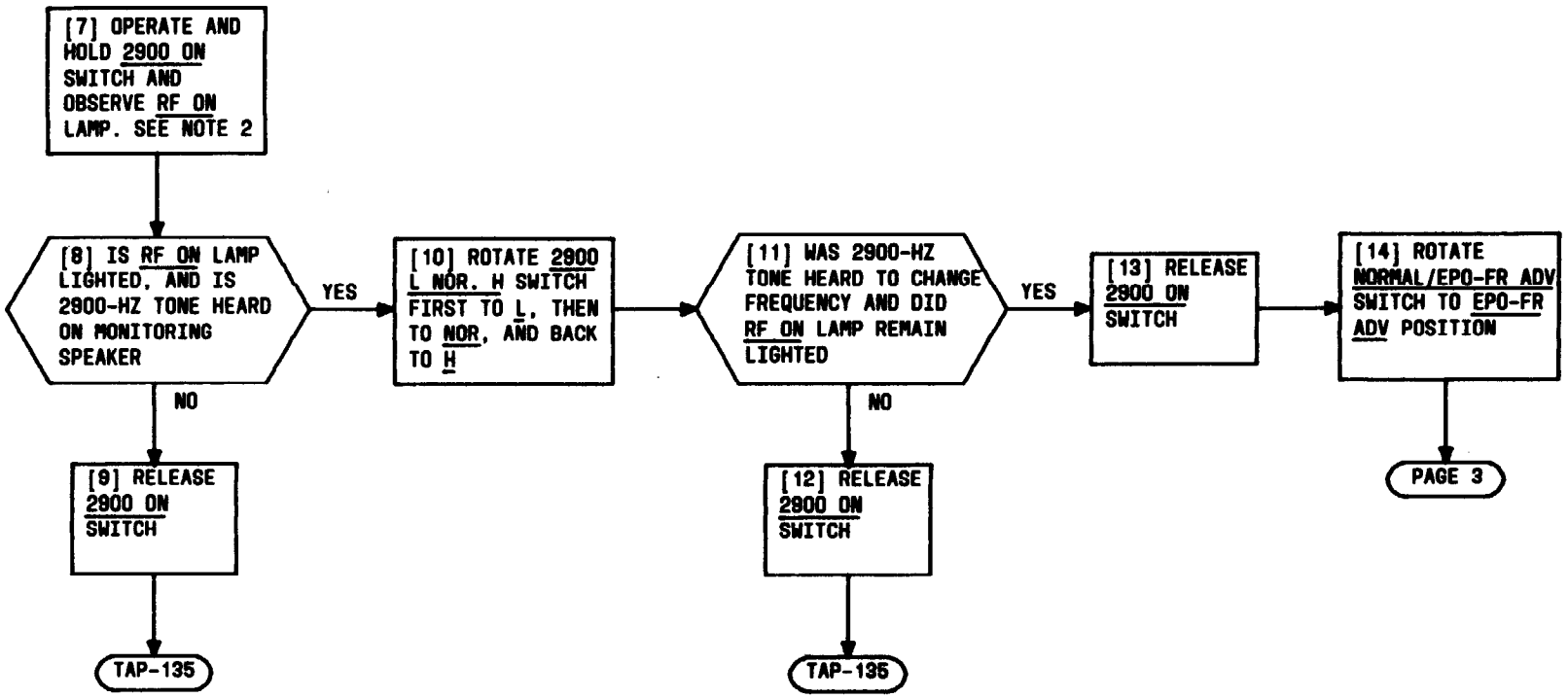
TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
ROUTINER TEST SET	KS-21277
TELEPHONE PATCH CORD	3P6C
2 RESISTORS	89BN
RESISTOR	89A
MONITORING SPEAKER	EQUIPPED WITH 310 PLUG

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

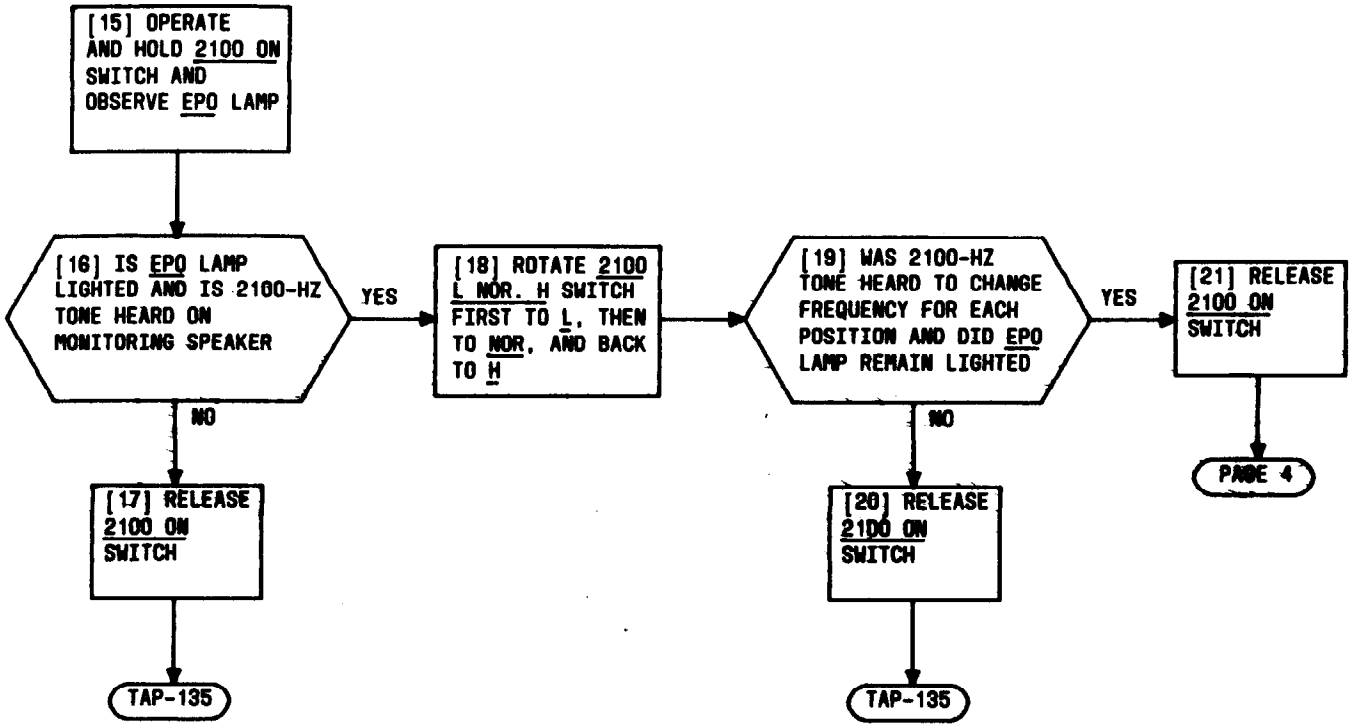
NOTE 1
TRANSMITTER PORTION OF ROUTINER TEST SET IS LOCATED AT UPPER RIGHT OF PANEL. SWITCHES AND LAMPS ARE COLOR-CODED RED OR BLACK

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



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

NOTE 2
DISREGARD ALL LAMP INDICATIONS NOT MENTIONED



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

[22] OPERATE AND HOLD EPO SWITCH

[23] IS EPO LAMP LIGHTED AND IS 2100-HZ TONE HEARD ON MONITORING SPEAKER

YES

NO

[24] RELEASE EPO SWITCH

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[25] RELEASE EPO SWITCH

[26] SEE FIG. 2. OPERATE FREQ ADV RESET SWITCH UNTIL ALL FOUR FREQUENCY LAMPS ARE LIGHTED

[27] MOMENTARILY OPERATE RESET SWITCH

[28] OPERATE AND HOLD FREQ ADV SWITCH

AND

[29] IS 1900-HZ TONE BURST HEARD ON MONITORING SPEAKER

YES

PAGE 5

NO

[30] RELEASE FREQ ADV SWITCH

TAP-135

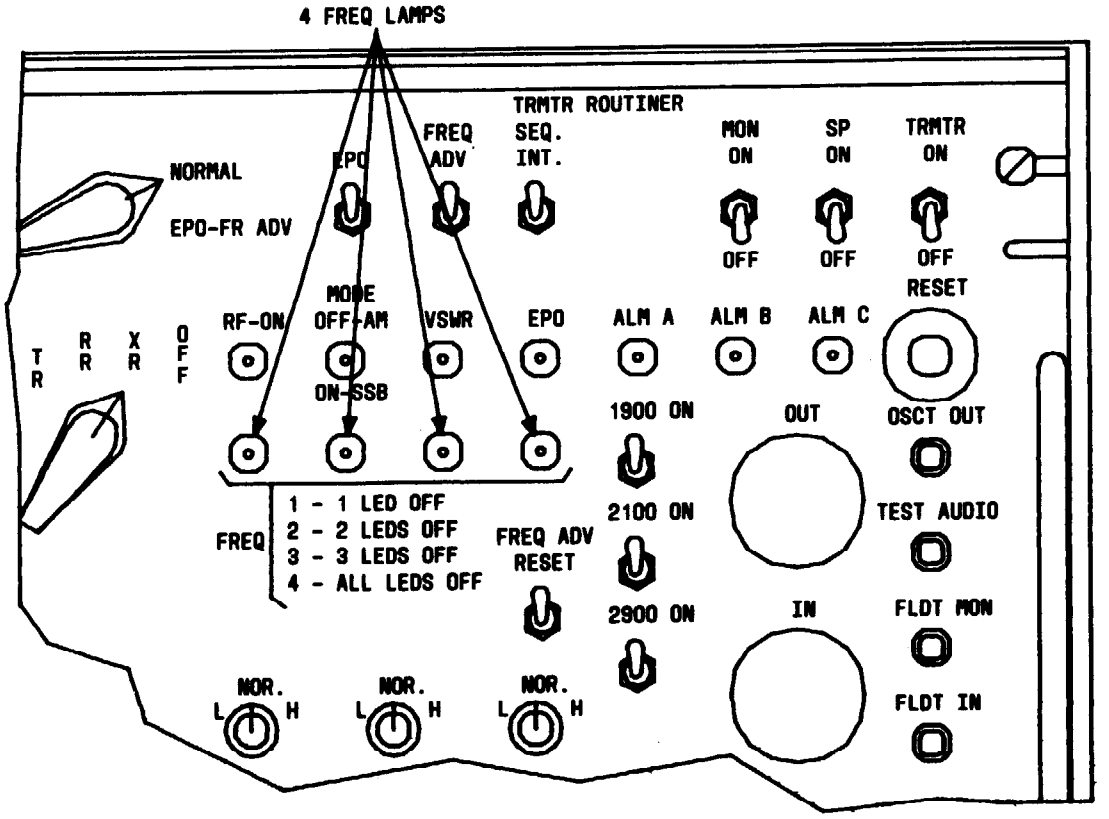
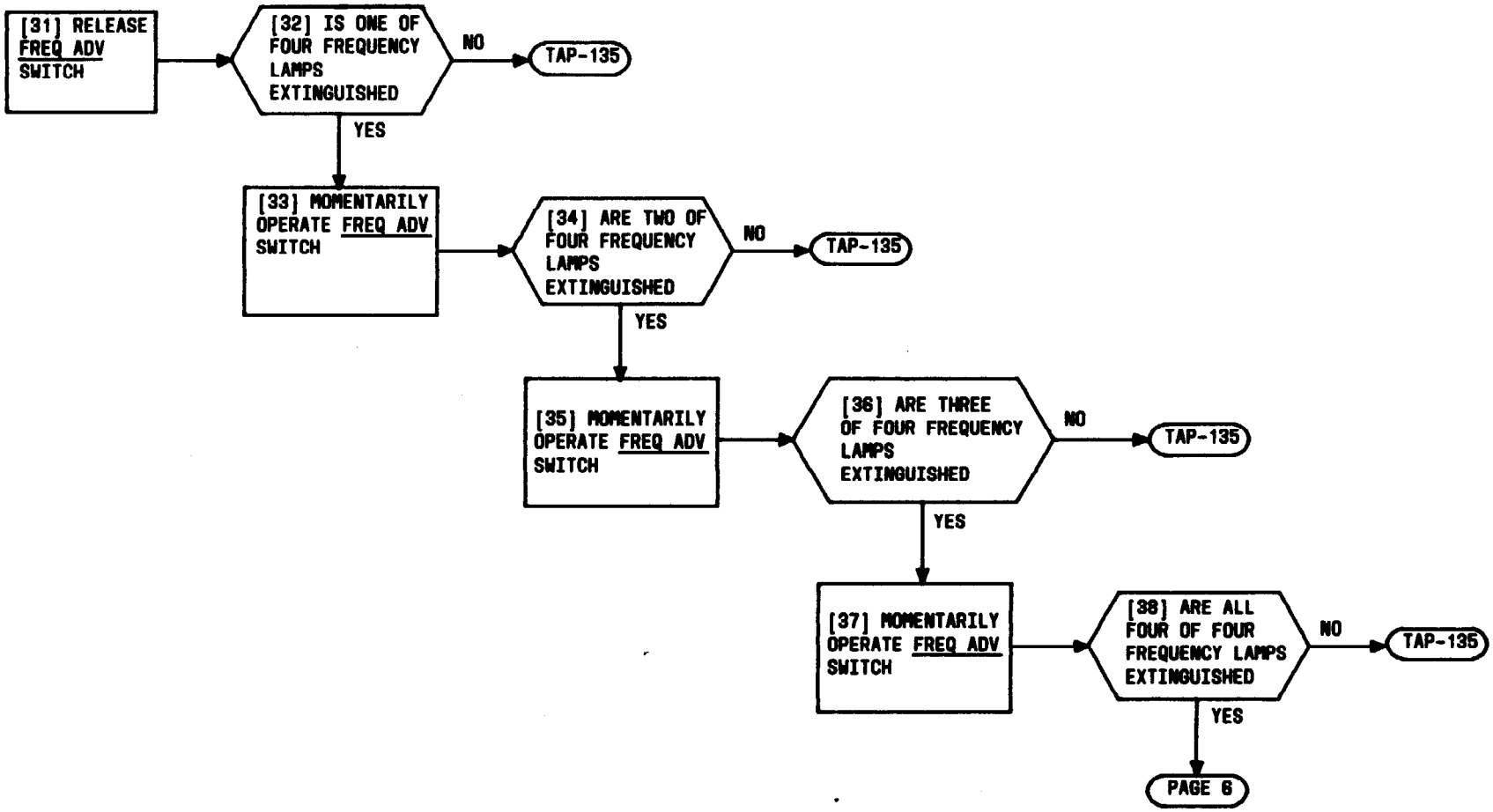
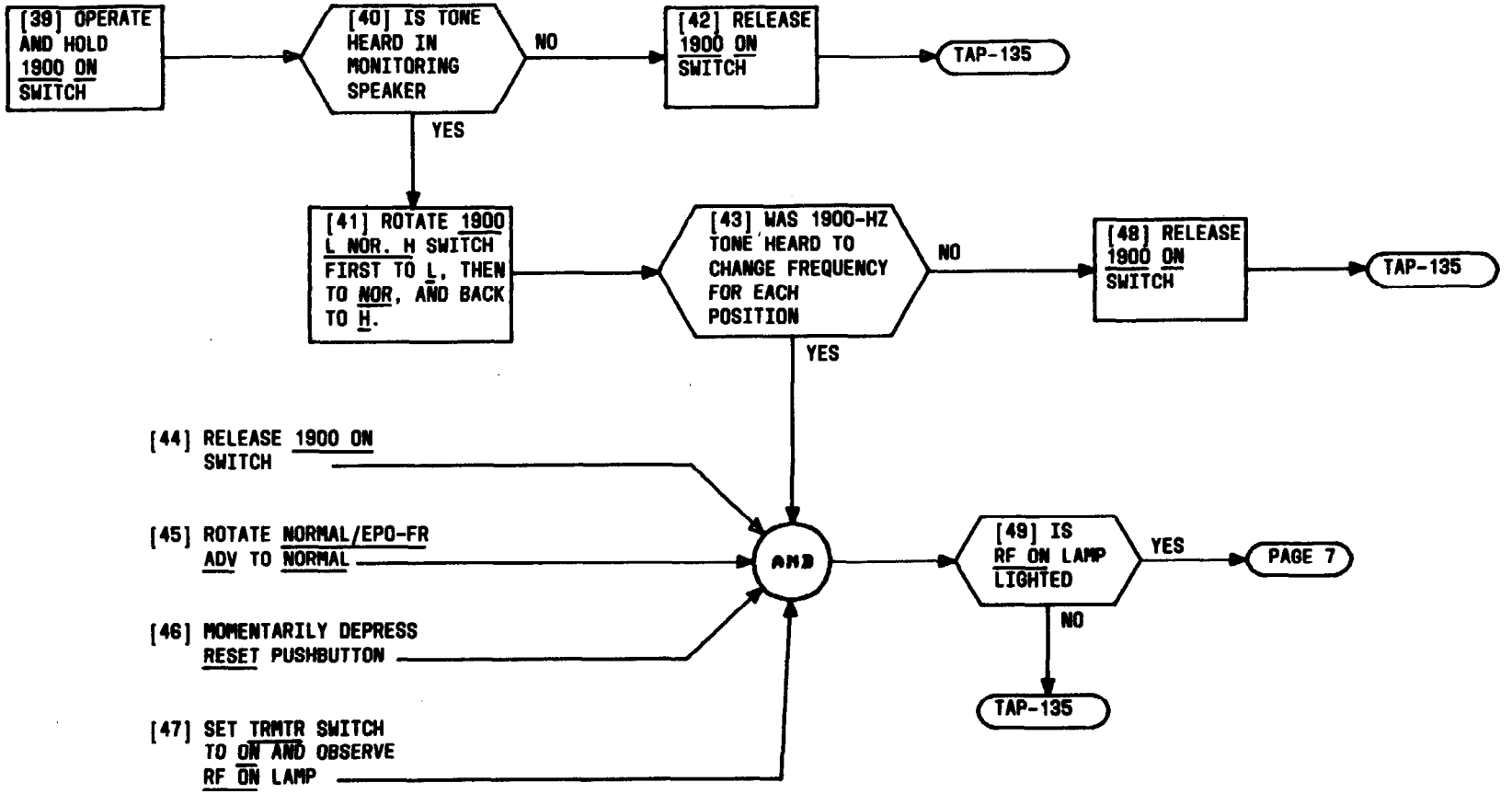


FIG. 2

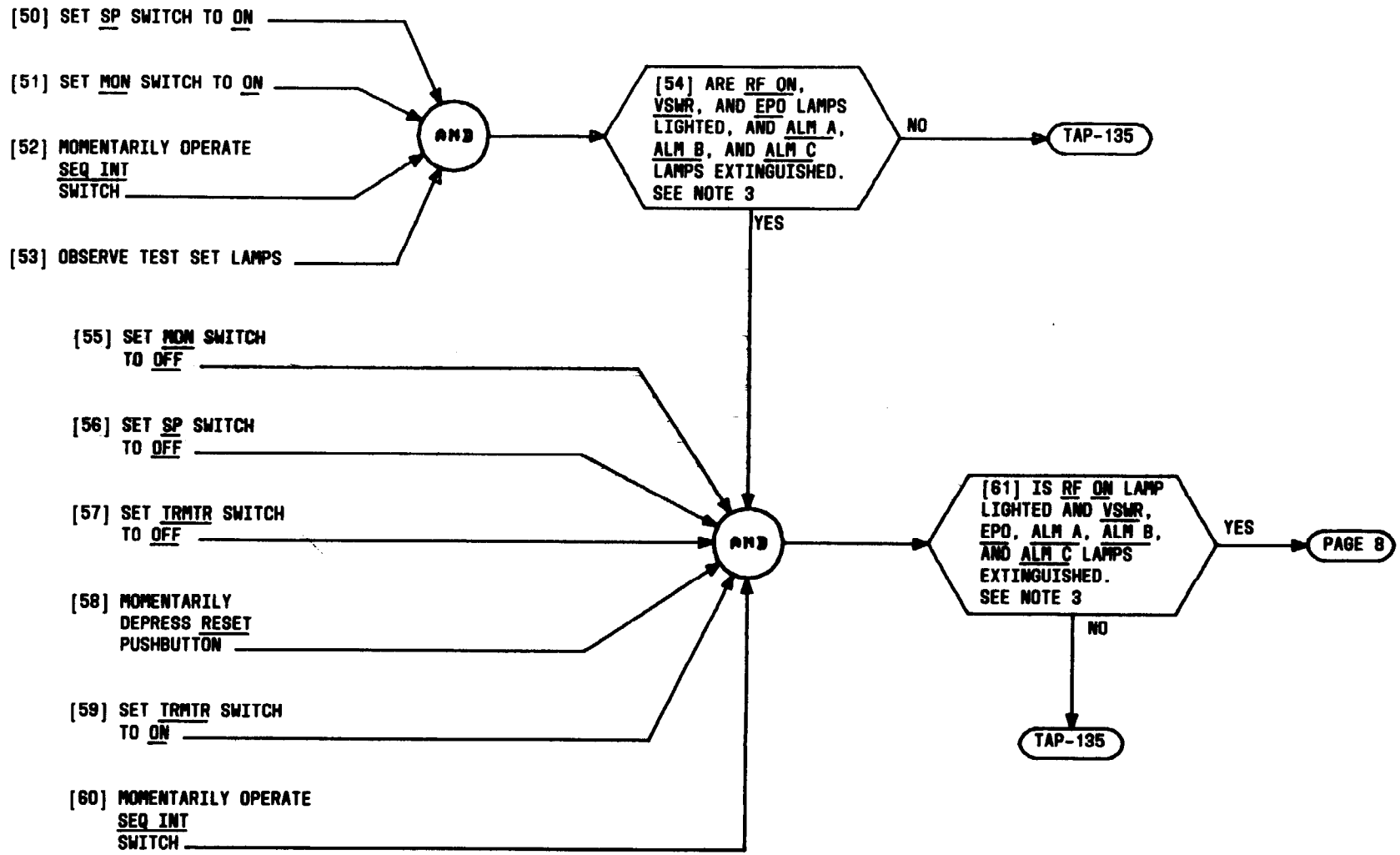
SELF-CHECK KS-21277 ROUTINER TEST SET FOR TRANSMITTER TEST



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



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



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

NOTE 3 DISREGARD THE MODE LAMP INDICATION	
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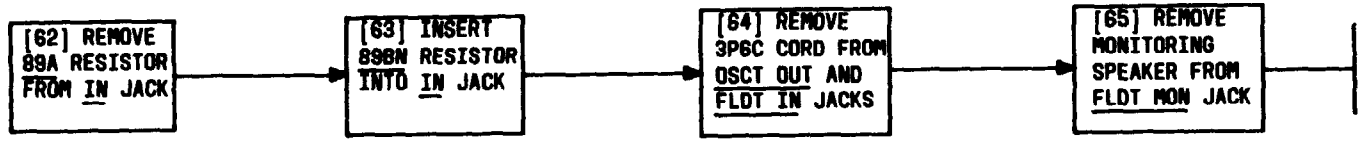

SELF-CHECK KS-21277 ROUTINER TEST SET
FOR TRANSMITTER TEST

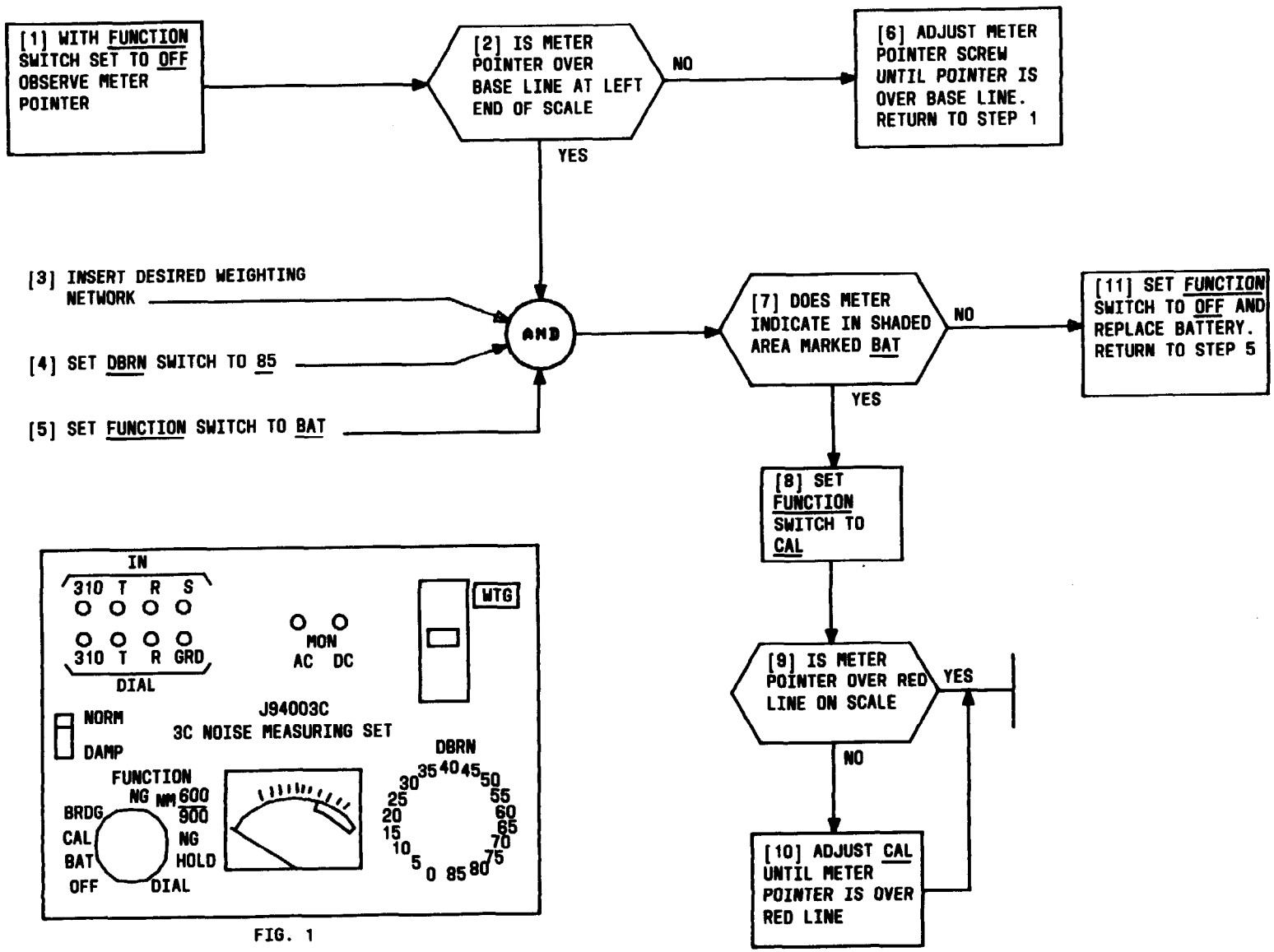

FIG. 1

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

AND

[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

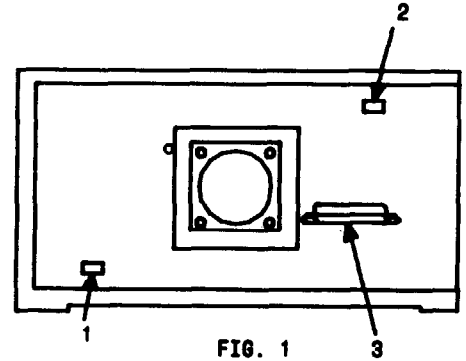


FIG. 1

NOTE 1

LOAD ASSEMBLY PROVIDED WITH INSTRUMENT AND MAY ALREADY BE CONNECTED

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

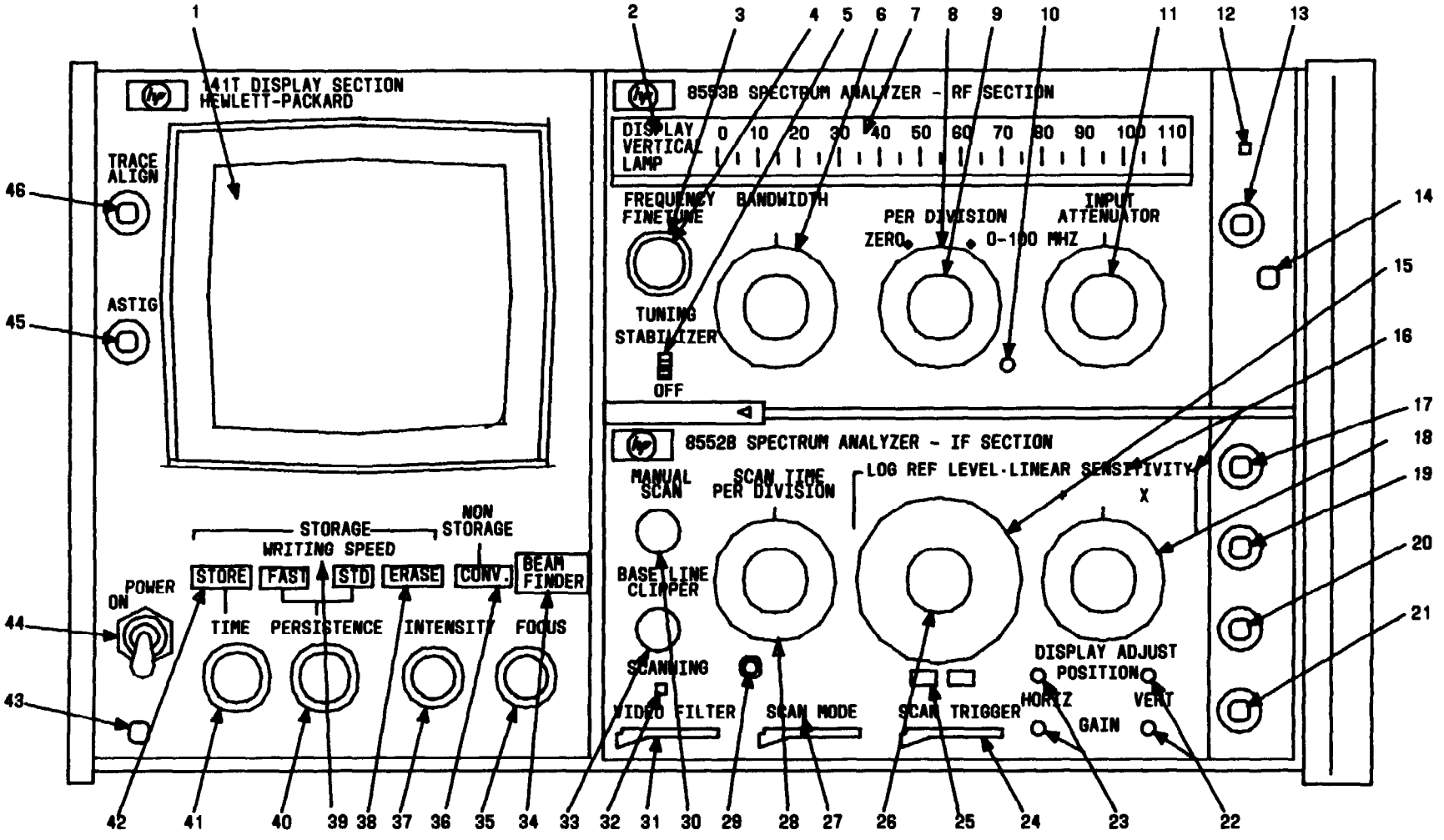


FIG. 2

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

TABLE A
SPECTRUM ANALYZER CONTROL INDICATORS AND CONNECTORS

FIG. 2 ITEM	FUNCTION
1	DISPLAY SCREEN WITH GRATICULE [FIG. 3 AND TABLE B]
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
3	FREQUENCY (OUTER CONTROL): COARSE-TUNES ANALYZER CENTER FREQUENCY
4	FINE TUNE (INNER CONTROL): FINE TUNES ANALYZER CENTER FREQUENCY
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
6	BANDWIDTH: SELECTS 3 DB IF BANDWIDTHS
7	CENTER FREQUENCY MHZ SCALE: INDICATES CENTER FREQUENCY TO WHICH INSTRUMENT IS TUNED
8	SCAN WIDTH PER DIVISION - OUTER KNOB: INDICATES PER-DIVISION SCAN WIDTH
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
12	RANGE MHZ SWITCH: CONTROLS TUNING RANGE OF FREQUENCY CONTROL. IN 0-11 MHZ, TUNING RANGE OF FREQUENCY CONTROL IS LIMITED TO 11 MHZ
13	RF-INPUT: 50-OHM COAXIAL INPUT CONNECTOR
14	PROBE POWER: SUPPLIES POWER TO ACTIVE PROBE
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)
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
17	CAL OUTPUT: PROVIDES A 30-MHZ SIGNAL AT -30 DBM FOR AMPLITUDE CALIBRATION OF SPECTRUM ANALYZER
18	LINEAR SENSITIVITY: INDICATES 1-DB INCREMENTS FOR LOGARITHMIC AMPLIFICATION; INDICATES MULTIPLICATION FACTORS UP TO UNITY FOR LINEAR AMPLIFICATION
19	PEN LIFT OUTPUT: PROVIDES OUTPUT TO RECORDERS, PROVIDES BLANKING INPUT FOR EXTERNAL SCAN MODE OPERATION AND INPUT FOR EXTERNAL TRIGGER OPERATION

TABLE A (CONTINUED)

FIG. 2 ITEM	FUNCTION
20	VERTICAL OUTPUT: DETECTED VIDEO OUTPUT PROPORTIONAL TO VERTICAL DEFLECTION ON CRT
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
22	DISPLAY ADJUST VERTICAL: ADJUSTS VERTICAL POSITION OF GAIN TRACE
23	DISPLAY ADJUST HORIZONTAL: ADJUSTS HORIZONTAL POSITION AND GAIN OF TRACE
24	SCAN TRIGGER: SELECTS SCAN TRIGGER MODE
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)
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
27	SCAN MODE SWITCH: SELECTS SCAN RAMP MODE. RAMP IS INTERNALLY GENERATED FOR SINGLE/INT POSITIONS BUT MUST BE EXTERNALLY SUPPLIED FOR EXT POSITION
28	SCAN TIME PER DIVISION: CONTROLS SCAN TIME
29	SINGLE SCAN SWITCH: PRESS TO INITIATE SCAN WITH SCAN MODE SWITCH TO SINGLE; PRESS DURING SCAN TO STOP AND RESET SCAN
30	MANUAL SCAN: CONTROLS SCAN IN MAN POSITION OF SCAN MODE SWITCH (ITEM 27)
31	VIDEO FILTER: SELECTS 100 HZ, 10 KHZ, OR OFF POSITION OF LOW-PASS FILTER FOR DETECTED VIDEO
32	SCANNING: LIGHTS FOR DURATION OF SCAN FOR SINGLE AND INT SCAN MODES
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
34	NOT USED WITH THIS INSTRUMENT
35	FOCUS: FOCUSES CRT BEAM
36	NONSTORAGE CONV: SELECTS NONSTORAGE FUNCTION **WARNING** USE STORAGE FUNCTION WHEN POSSIBLE TO PREVENT DAMAGE TO CRT
37	INTENSITY: ADJUSTS BRIGHTNESS OF CRT TRACE

TABLE A (CONT)	
FIG. 2 ITEM	FUNCTION
38	STORAGE ERASE: PRESS TO ERASE WHEN IN STD OR FAST WRITING SPEED
39	WRITING SPEED: SELECTS FAST OR STD WRITING SPEED
40	PERSISTANCE: VARIES TIME THE TRACE IS VISIBLE
41	STORAGE TIME: SELECTS STORAGE TIME
42	STORE: PRESS TO STORE SIGNAL DISPLAY. STORAGE TIME (RELATIVE DISPLAY BRIGHTNESS) IN STORAGE MODE IS ADJUSTED IN ITEM 41.
43	ON LAMP: LIGHTS WHEN INSTRUMENT IS TURNED ON
44	POWER ON: SWITCHES LINE VOLTAGE TO INSTRUMENT
45	ASTIG: USED WITH FOCUS (ITEM 35) TO OBTAIN SMALLEST SPOT WITH MAXIMUM ROUNDNESS
46	TRACE ALIGN: MAKES BASE LINE PARALLEL WITH HORIZONTAL GRATICULE LINE

TABLE B	
FIG. 3 ITEM	FUNCTION
1	LINEAR CALIBRATION (READ FROM BOTTOM TO TOP SCREEN)
2	LO SIGNAL: ZERO FREQUENCY
3	30-MHZ CAL OUTPUT
4	RELATIVE FREQUENCIES WITH RESPECT TO CENTER FREQUENCY
5	NEGATIVE MARKER CONTROLLED BY COARSE FREQUENCY CONTROL
6	CENTER FREQUENCY OF SELECTED SCAN WIDTH
7	LOGARITHMIC CALIBRATION (READ FROM TOP LOG REF LINE TOWARDS BOTTOM OF SCREEN)
8	3RD HARMONIC 90 MHZ OF CALIBRATION 30-MHZ SIGNAL
9	2ND HARMONIC 60 MHZ OF CALIBRATION 30-MHZ SIGNAL

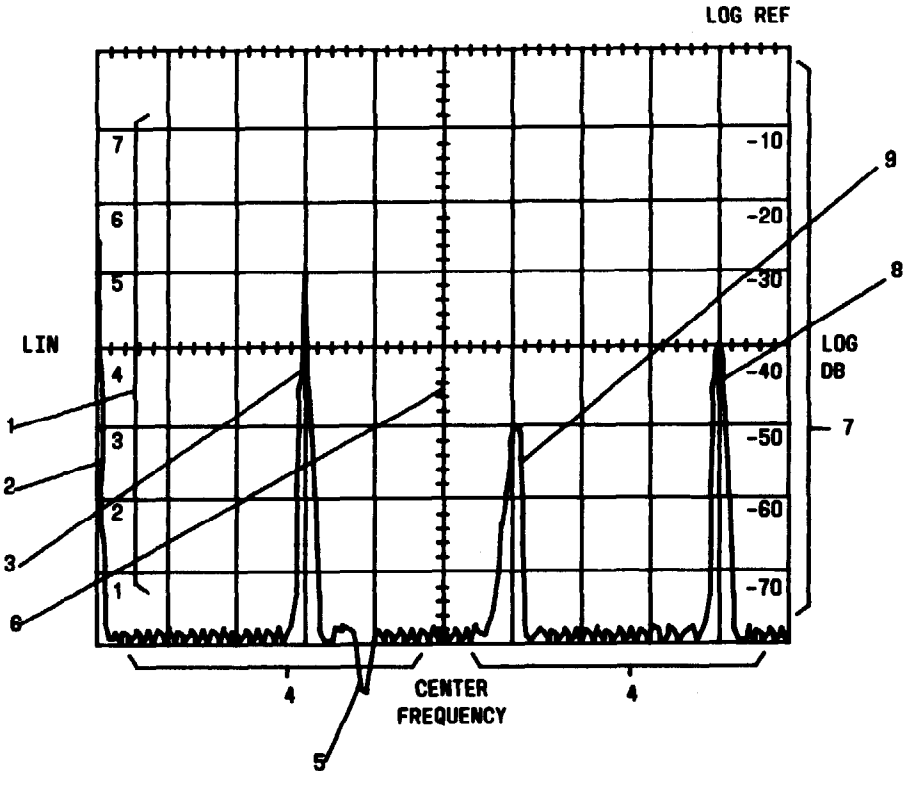


FIG. 3

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

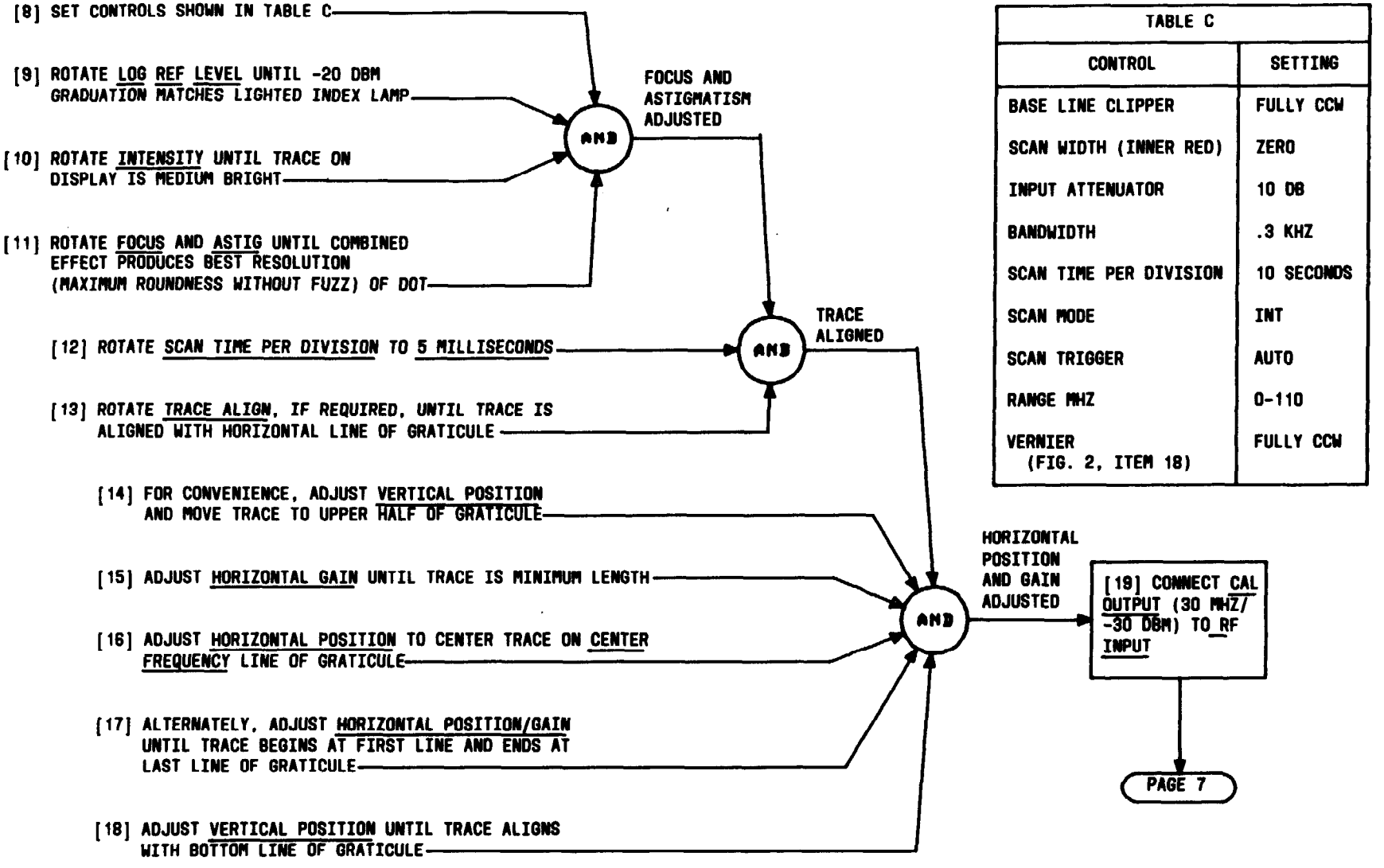


TABLE C	
CONTROL	SETTING
BASE LINE CLIPPER	FULLY CCW
SCAN WIDTH (INNER RED)	ZERO
INPUT ATTENUATOR	10 DB
BANDWIDTH	.3 KHZ
SCAN TIME PER DIVISION	10 SECONDS
SCAN MODE	INT
SCAN TRIGGER	AUTO
RANGE MHZ	0-110
VERNIER (FIG. 2, ITEM 18)	FULLY CCW

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

AND

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

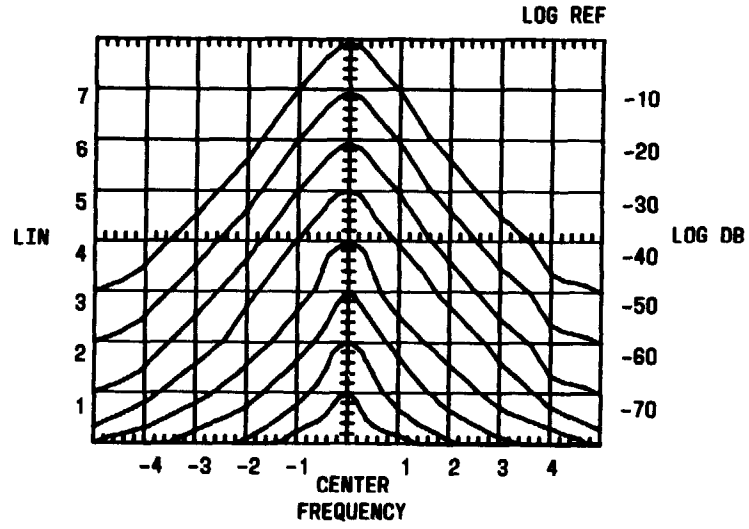
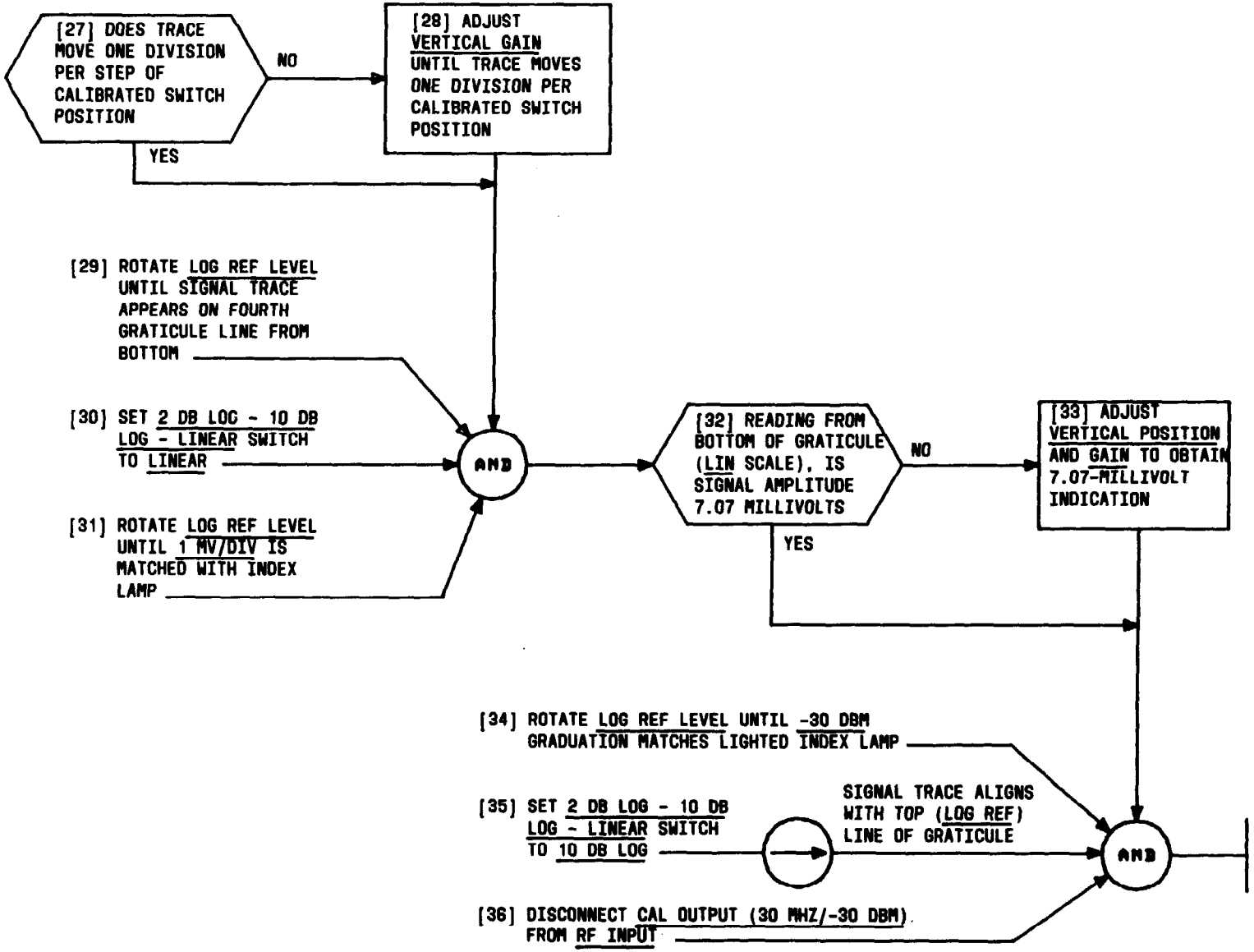


FIG. 4

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

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 THRULINE 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

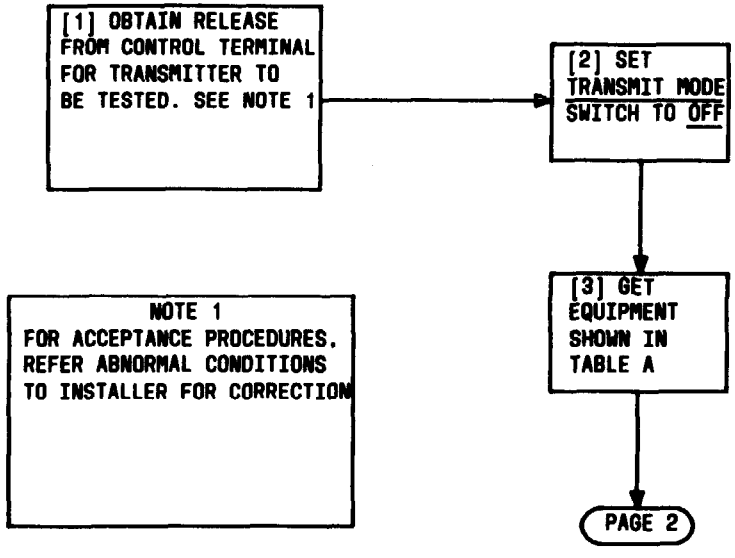


TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
2 STANDARD TERMINATIONS	369A
AUDIO MIXING PAD	3 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	
SPECTRUM ANALYZER	HP MODEL 141T DISPLAY HP MODEL 8553B RF HP MODEL 8552B IF

CHECK TRANSMITTER CARRIER BALANCE

[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

AND

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

PAGE 3

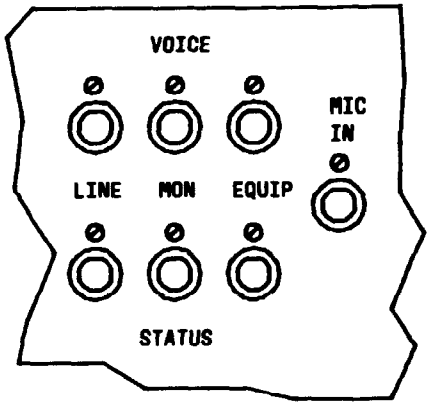


FIG. 1

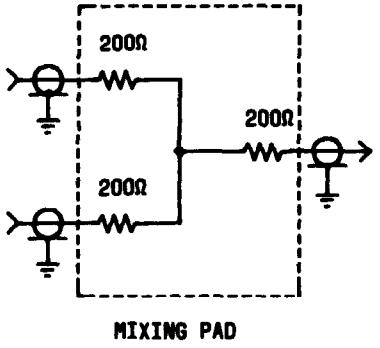


FIG. 2

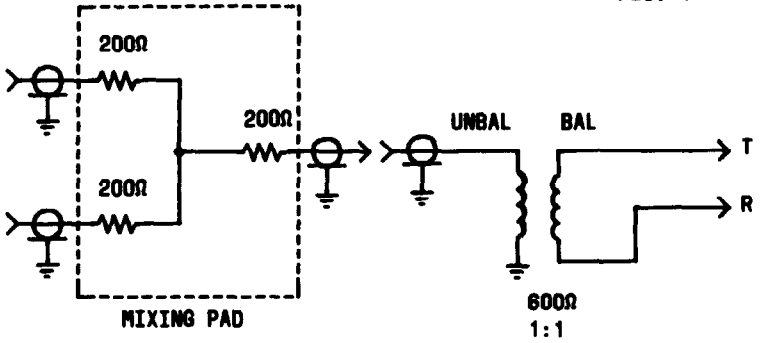


FIG. 3

CHECK TRANSMITTER CARRIER BALANCE

[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

AND

700-HZ OUTPUT SET AT -22 DB

PAGE 4

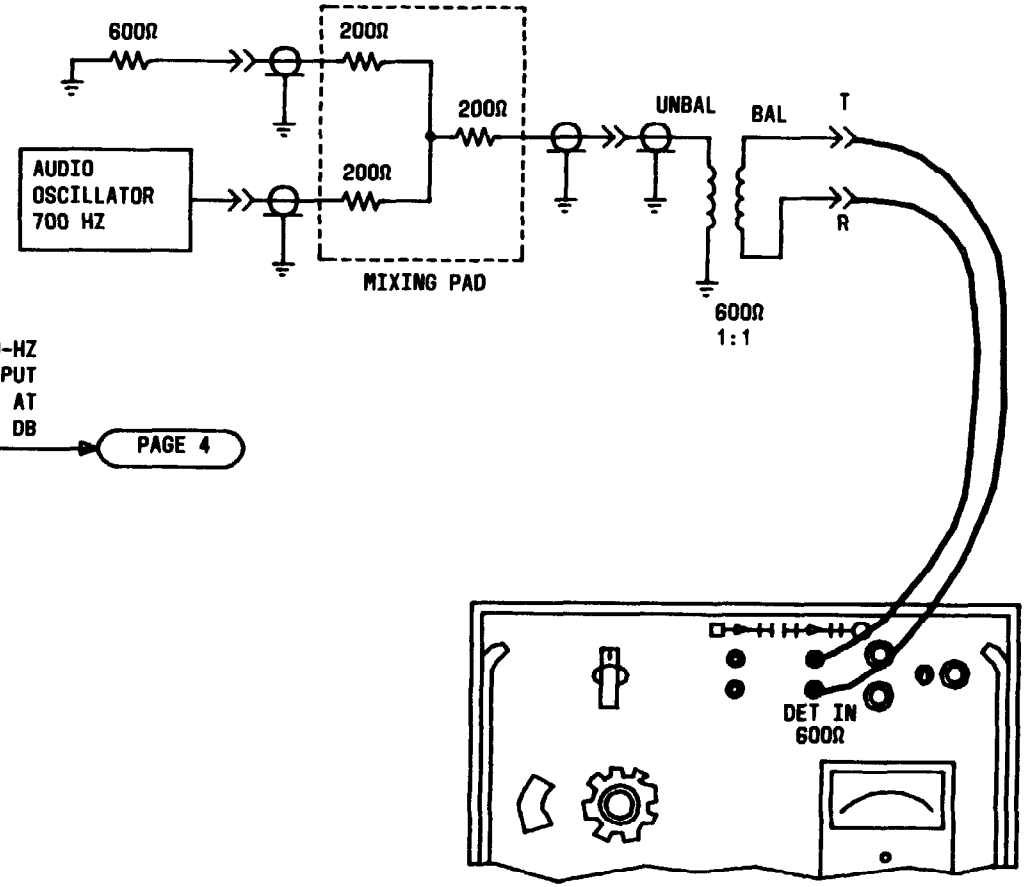


FIG. 4

CHECK TRANSMITTER CARRIER BALANCE

[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]

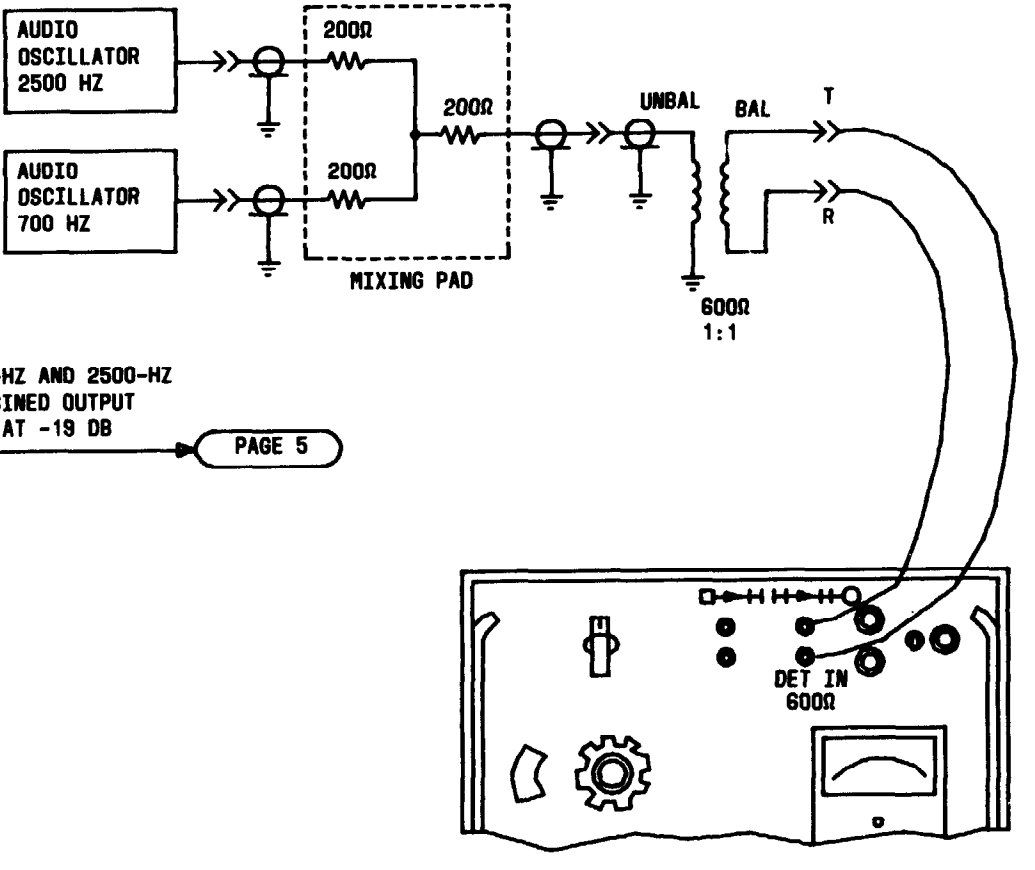


FIG. 5

CHECK TRANSMITTER CARRIER BALANCE

[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 THRULINE WATTMETER

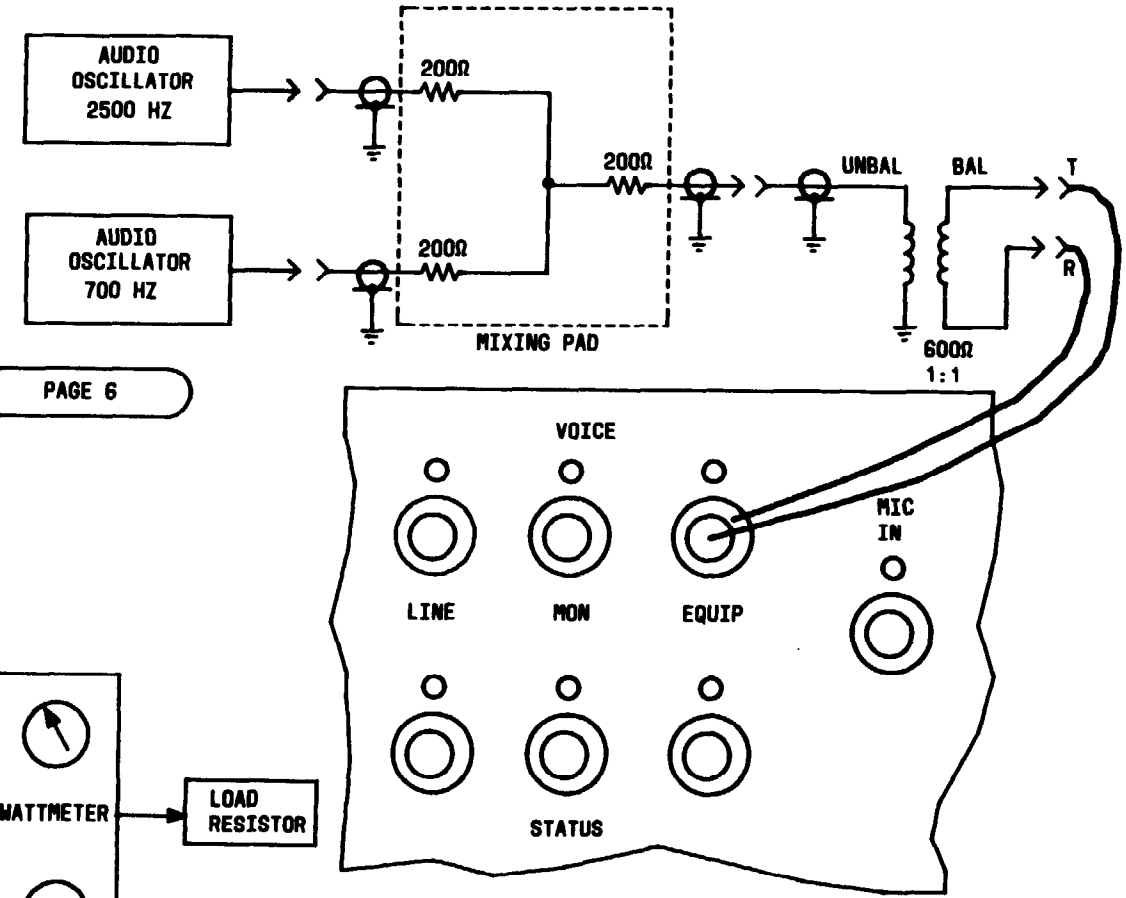


FIG. 6

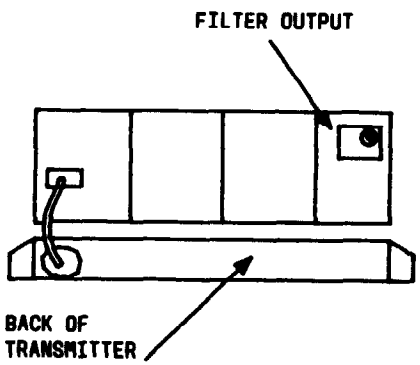


FIG. 7

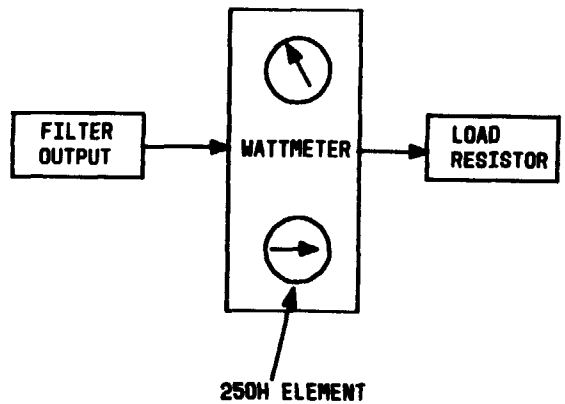


FIG. 8

CHECK TRANSMITTER CARRIER BALANCE

[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

AND

TEST CONNECTIONS COMPLETE

PAGE 7

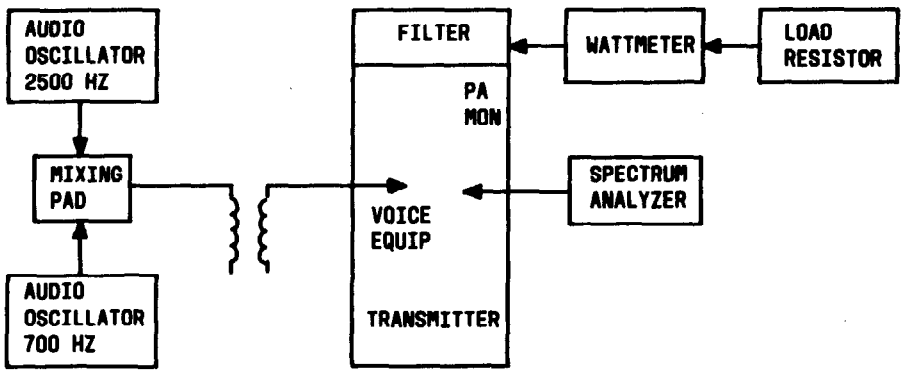


FIG. 9

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

[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

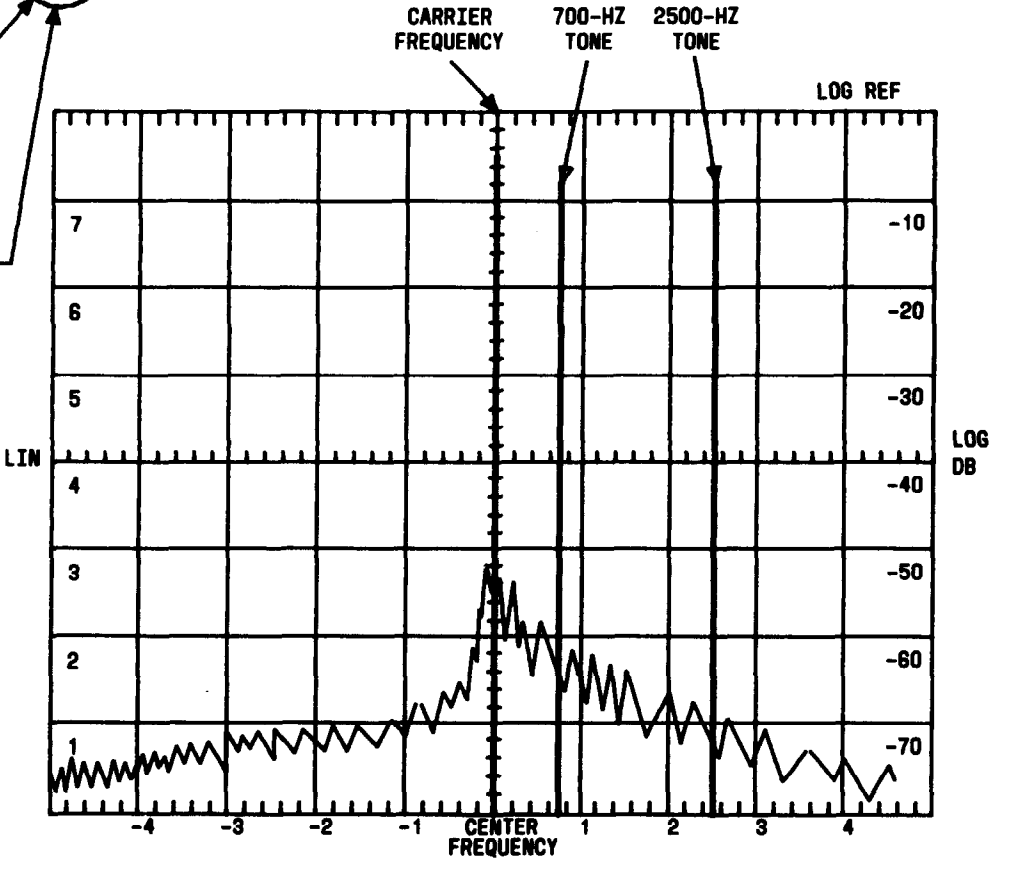
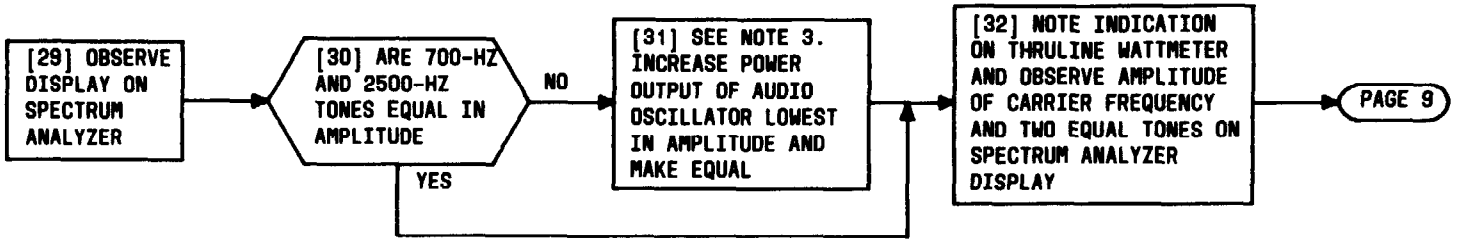


FIG. 10

CHECK TRANSMITTER CARRIER BALANCE



NOTE 3
NORMALLY, 2500-HZ AMPLITUDE IS LOWEST

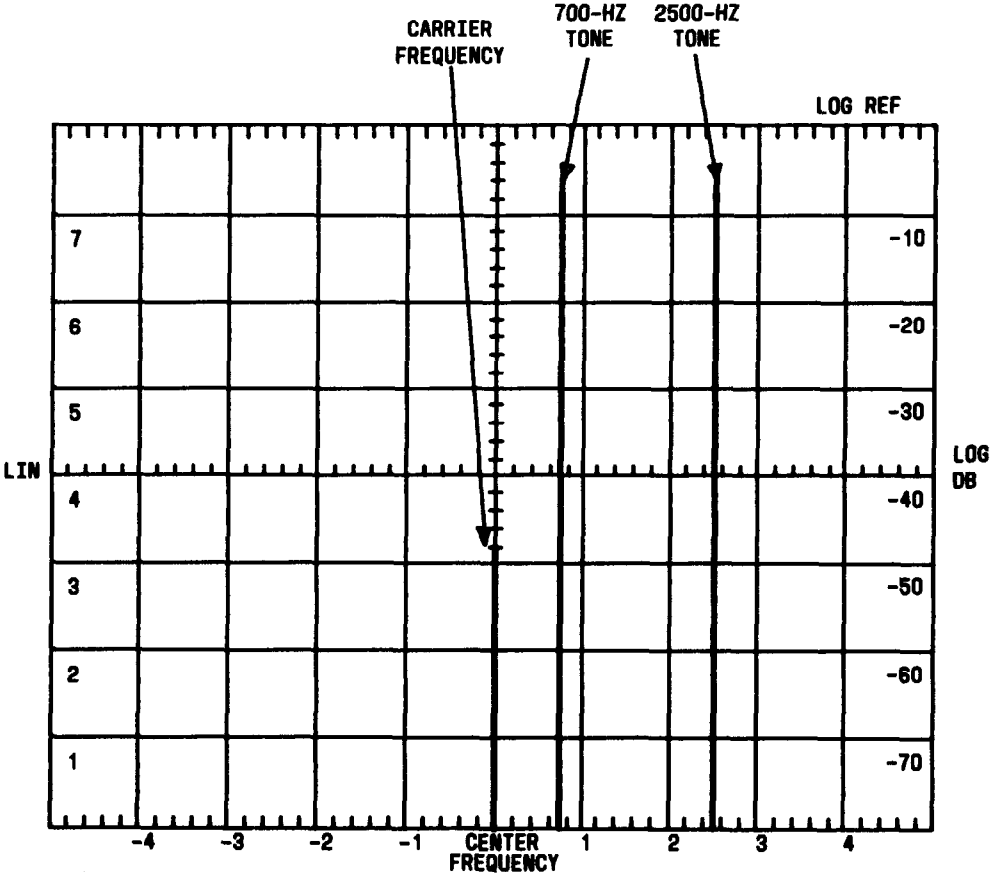
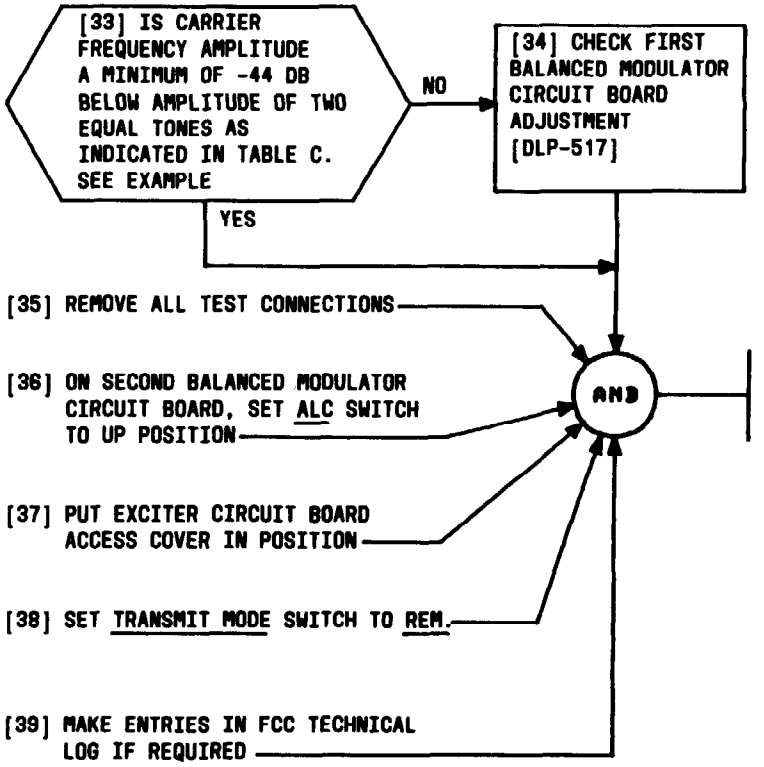


FIG. 11

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

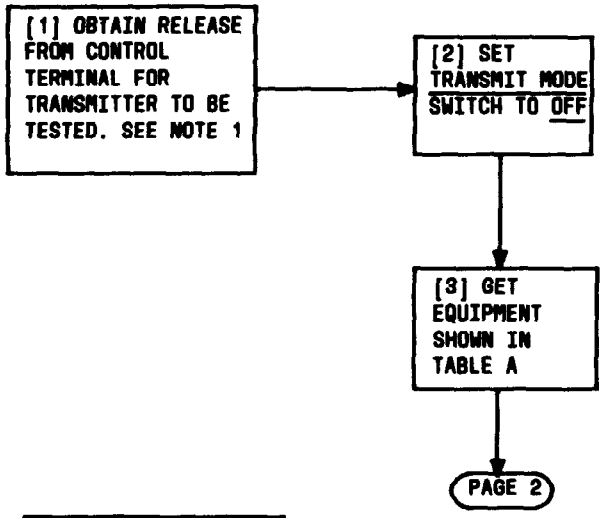
TABLE C

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 THRULINE 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



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 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	
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

AND

PAGE 3

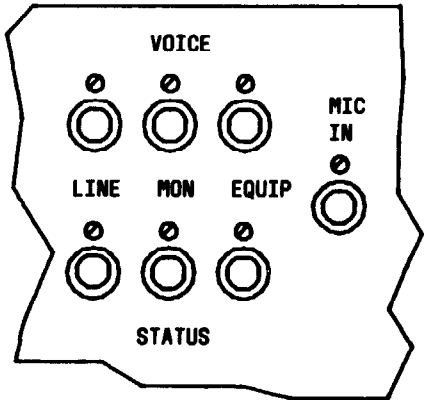


FIG. 1

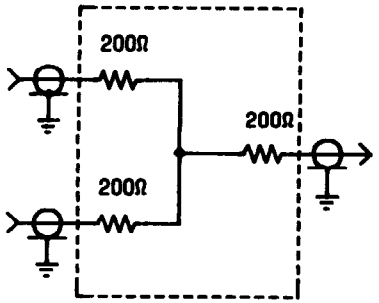


FIG. 2

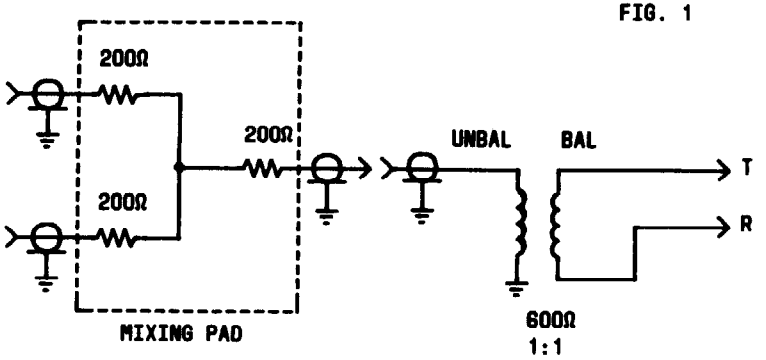


FIG. 3

CHECK TRANSMITTER CARRIER LEVEL

[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

AND

700-HZ OUTPUT SET AT -19 DB

PAGE 4

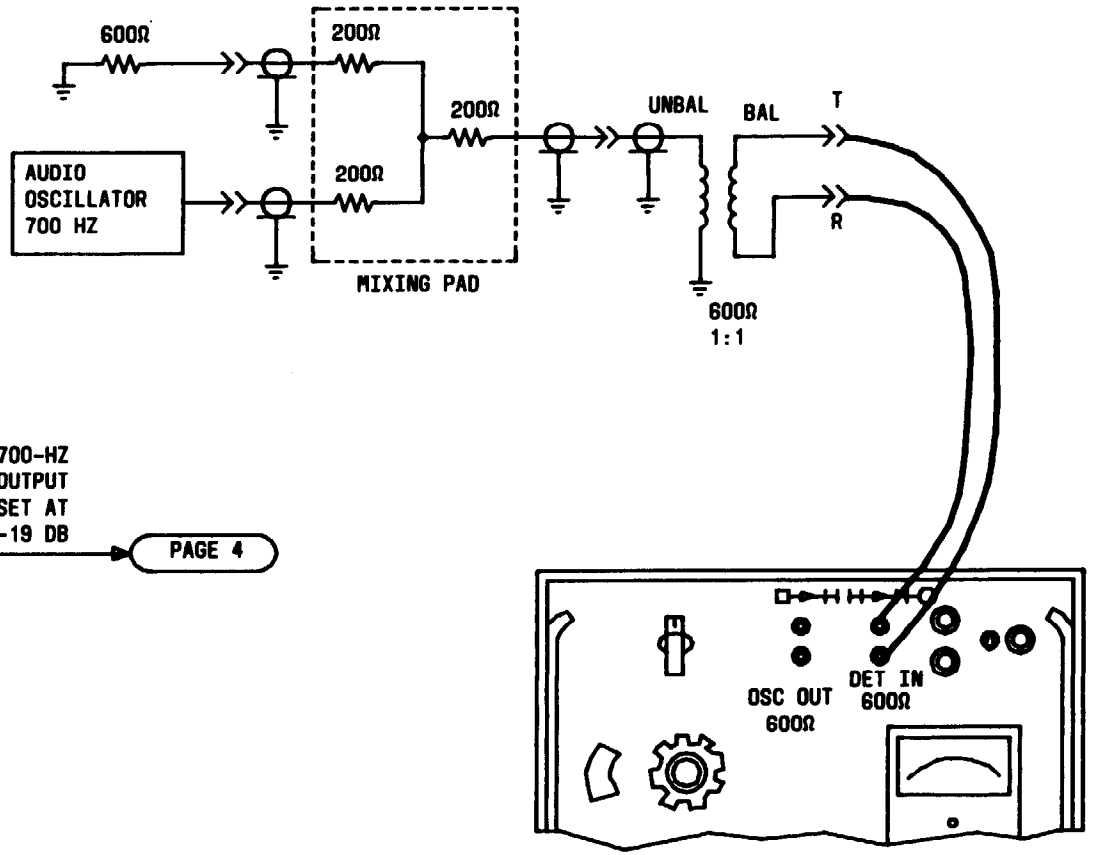


FIG. 4

CHECK TRANSMITTER CARRIER LEVEL

[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]

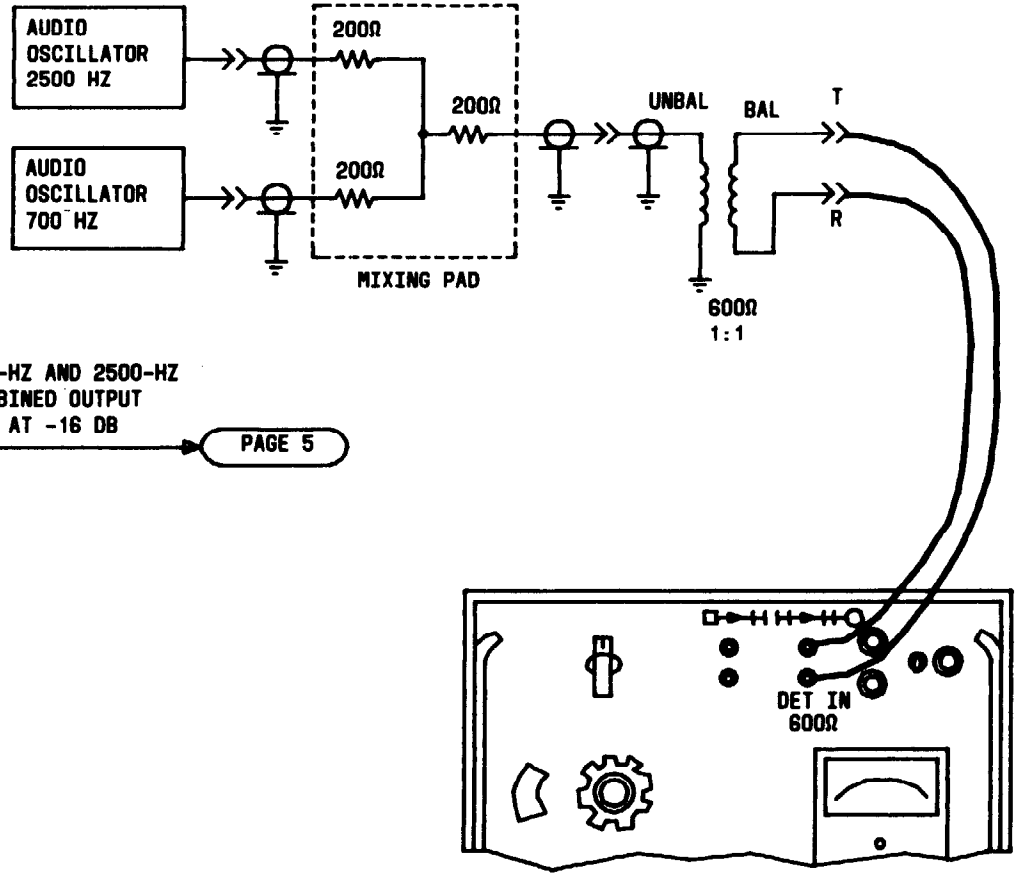


FIG. 5

CHECK TRANSMITTER CARRIER LEVEL

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

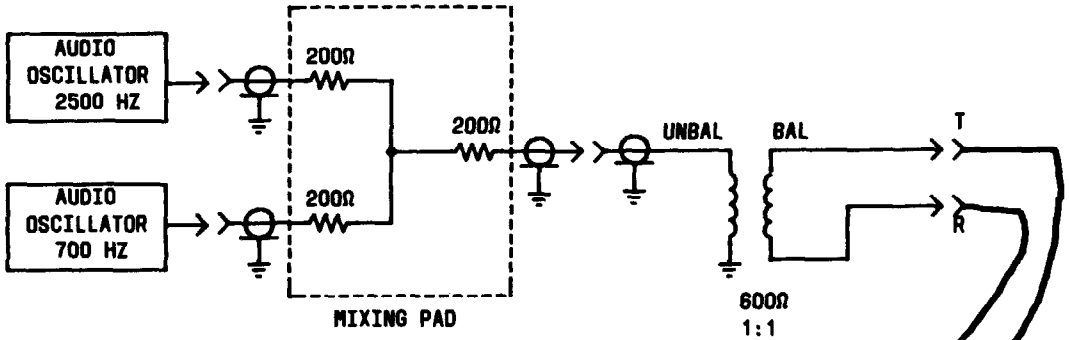
[18] SEE FIG. 7. DISCONNECT ANTENNA COAX FROM TRANSMITTER FILTER OUTPUT

[19] SEE FIG. 8. CONNECT THRULINE 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 THRULINE WATTMETER

AND

PAGE 6



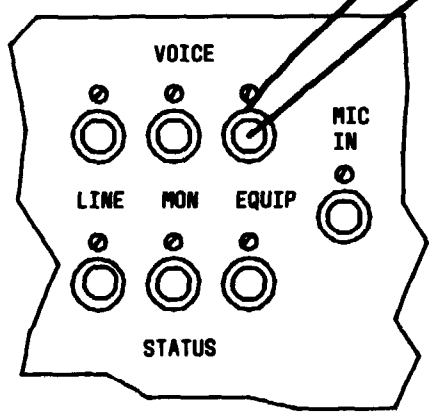


FIG. 6

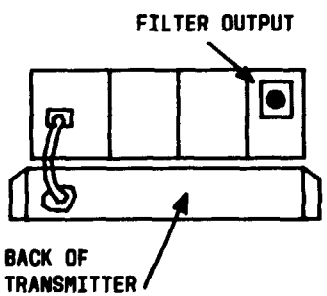


FIG. 7

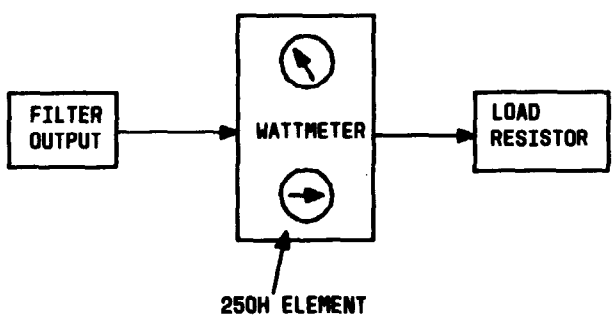


FIG. 8

CHECK TRANSMITTER CARRIER LEVEL

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

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

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

AND

TEST CONNECTIONS COMPLETE

PAGE 7

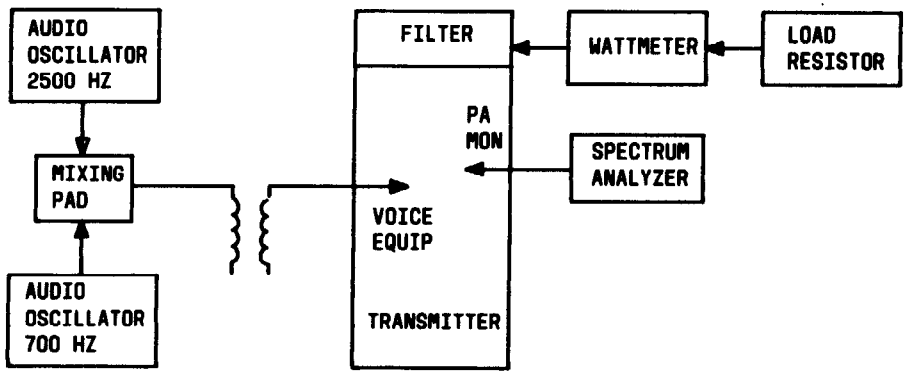


FIG. 9

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 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

AND

PAGE 8

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

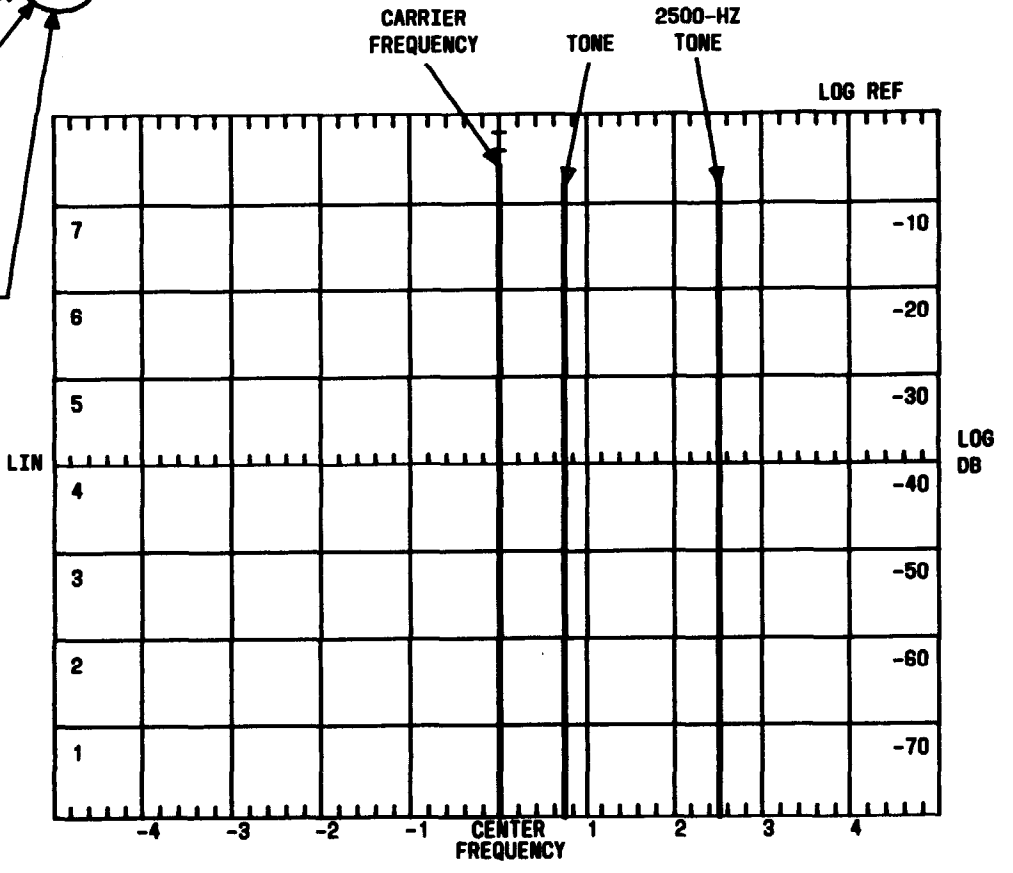
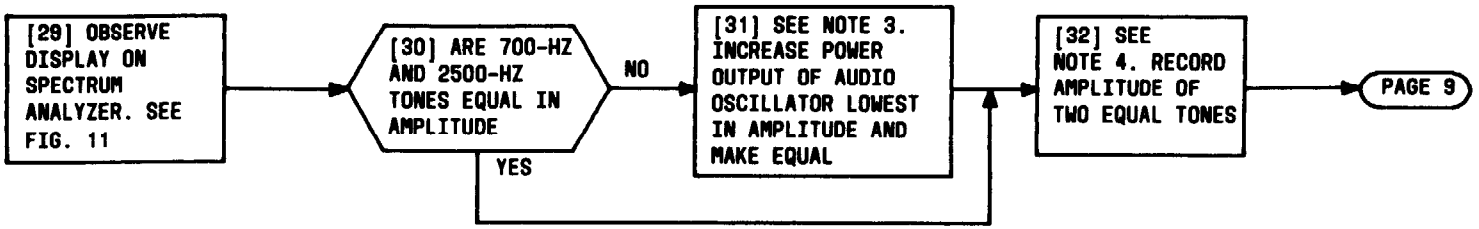


FIG. 10

CHECK TRANSMITTER CARRIER LEVEL



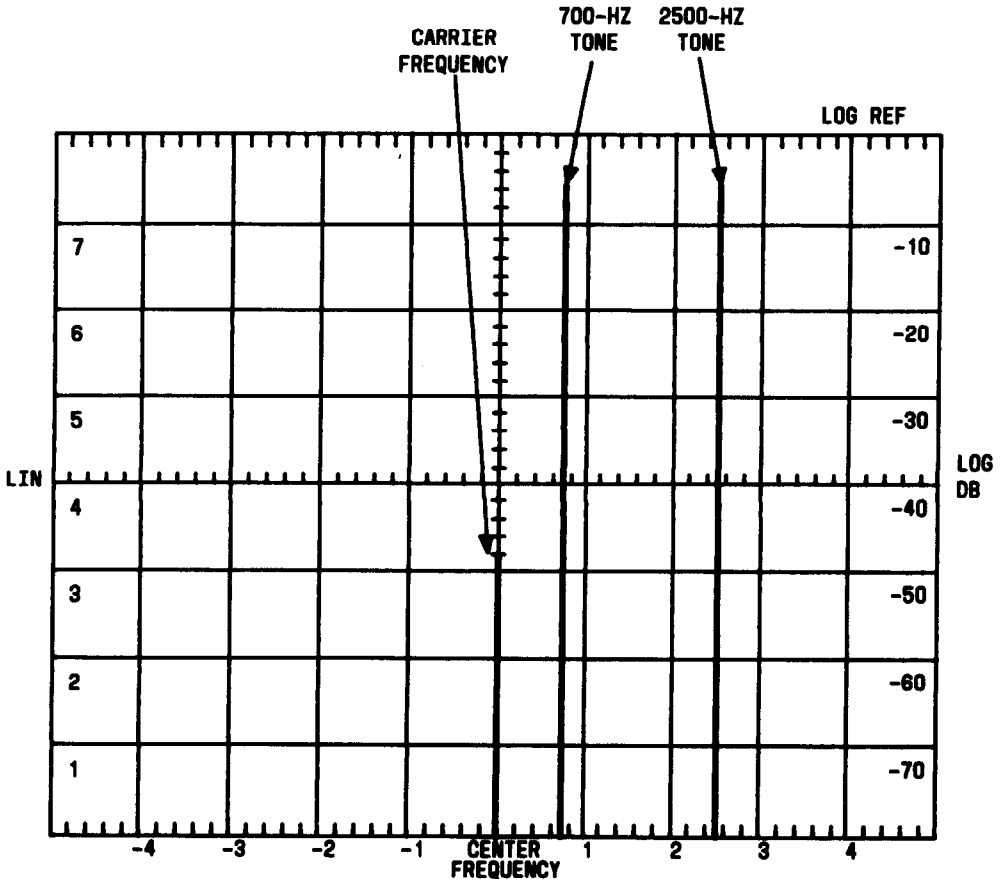
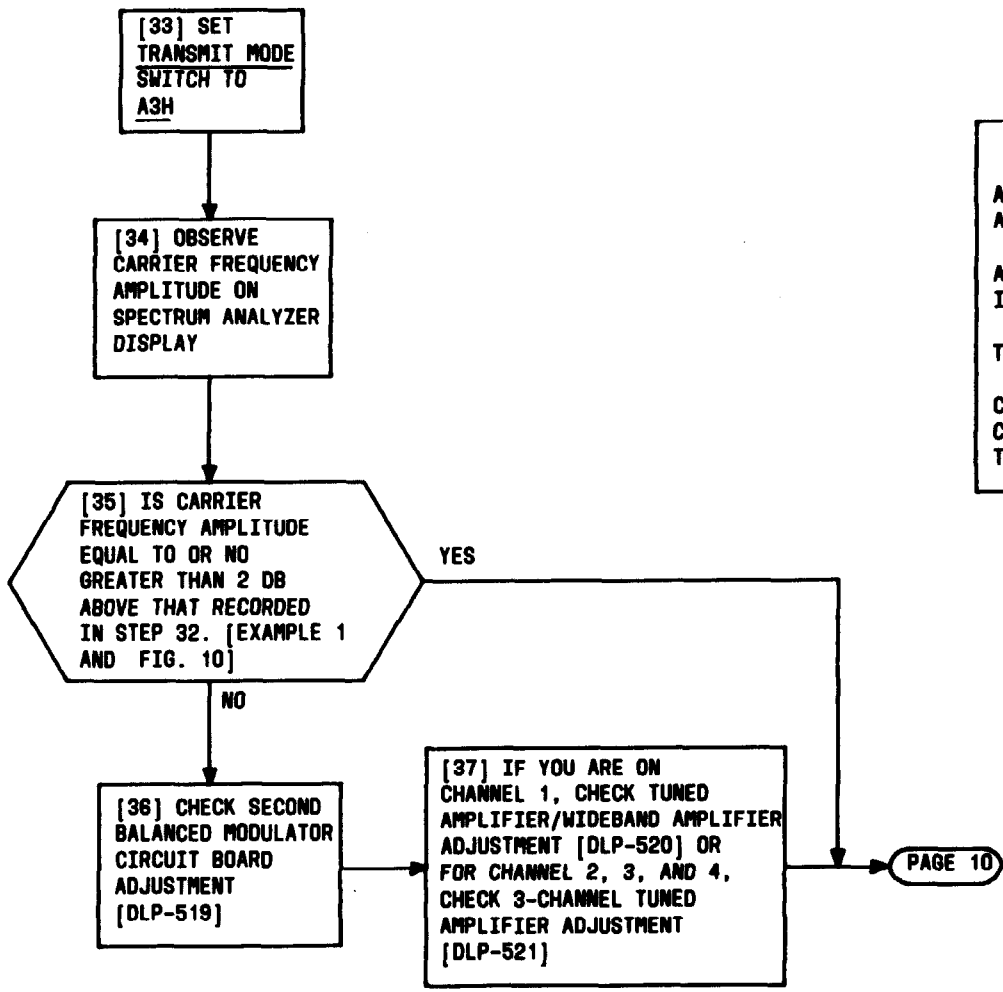


FIG. 11

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

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

[38] SET TRANSMIT MODE SWITCH TO A3A

[39] OBSERVE CARRIER FREQUENCY AMPLITUDE ON SPECTRUM ANALYZER DISPLAY

[40] IS CARRIER FREQUENCY AMPLITUDE AT LEAST 8 DB AND NO MORE THAN 12 DB BELOW THAT RECORDED IN STEP 32 [EXAMPLE 2 AND FIG. 12]

YES → PAGE 11

NO

[41] CHECK 1.5-MHZ OSCILLATOR ADJUSTMENT R26 [DLP-518]

EXAMPLE 2

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

AMPLITUDE OF CARRIER FREQUENCY IN A3A OF FIG. 12 = -15 DB

TEST PASSES.

CARRIER FREQUENCY AMPLITUDE COULD BE BETWEEN -13 DB AND -17 DB TO MEET REQUIREMENT

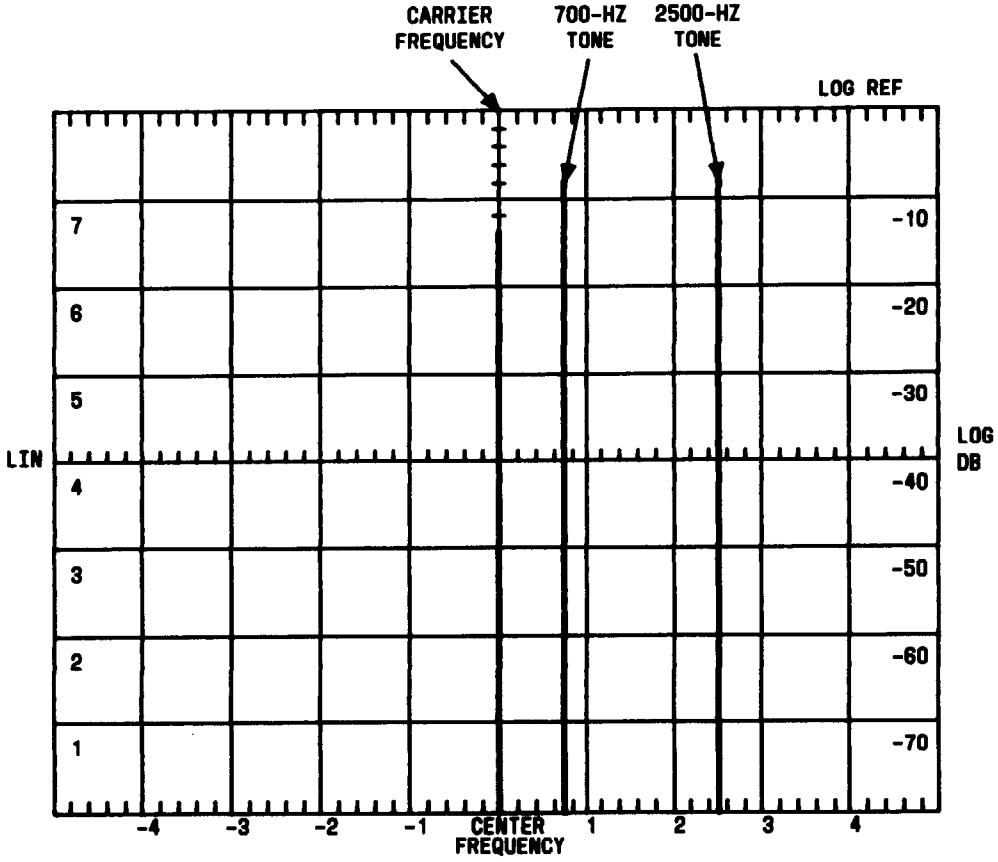
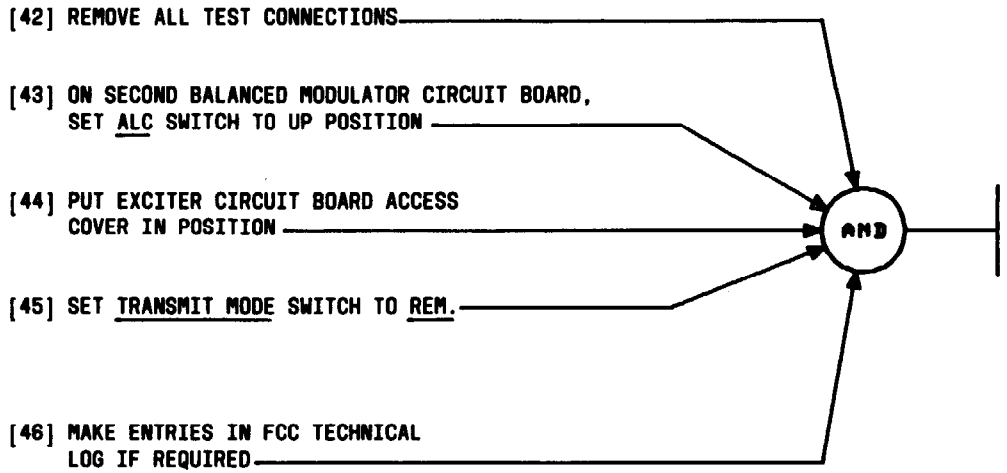


FIG. 12

CHECK TRANSMITTER CARRIER LEVEL



CHECK TRANSMITTER CARRIER LEVEL

[1] SET MAIN POWER SWITCH TO OFF

[2] SEE WARINING. 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

SONALART OPERATE

TAP-116

[4] DISCONNECT THE GROUND STRAP, S06, S07, AND TS3 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

AND

[7] IS LOW VOLTAGE FAIL-SAFE CIRCUIT BOARD TO BE INSTALLED OR REMOVED

INSTALLED → PAGE 2

REMOVED

LOW VOLTAGE FAIL-SAFE (REAR OF UNIT)

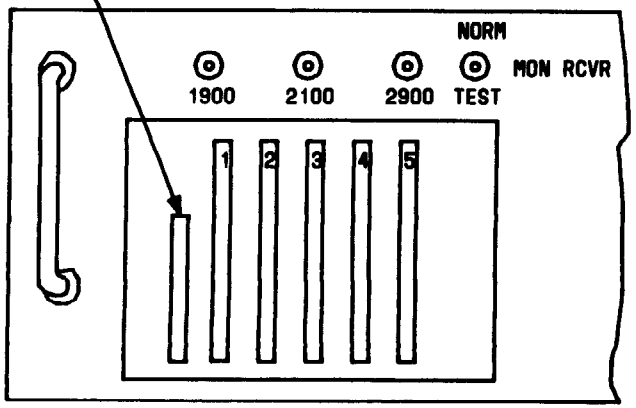


FIG. 1

[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

AND

[10] REMOVE THE TWO SCREWS SECURING CIRCUIT BOARD

[11] REMOVE CIRCUIT BOARD

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

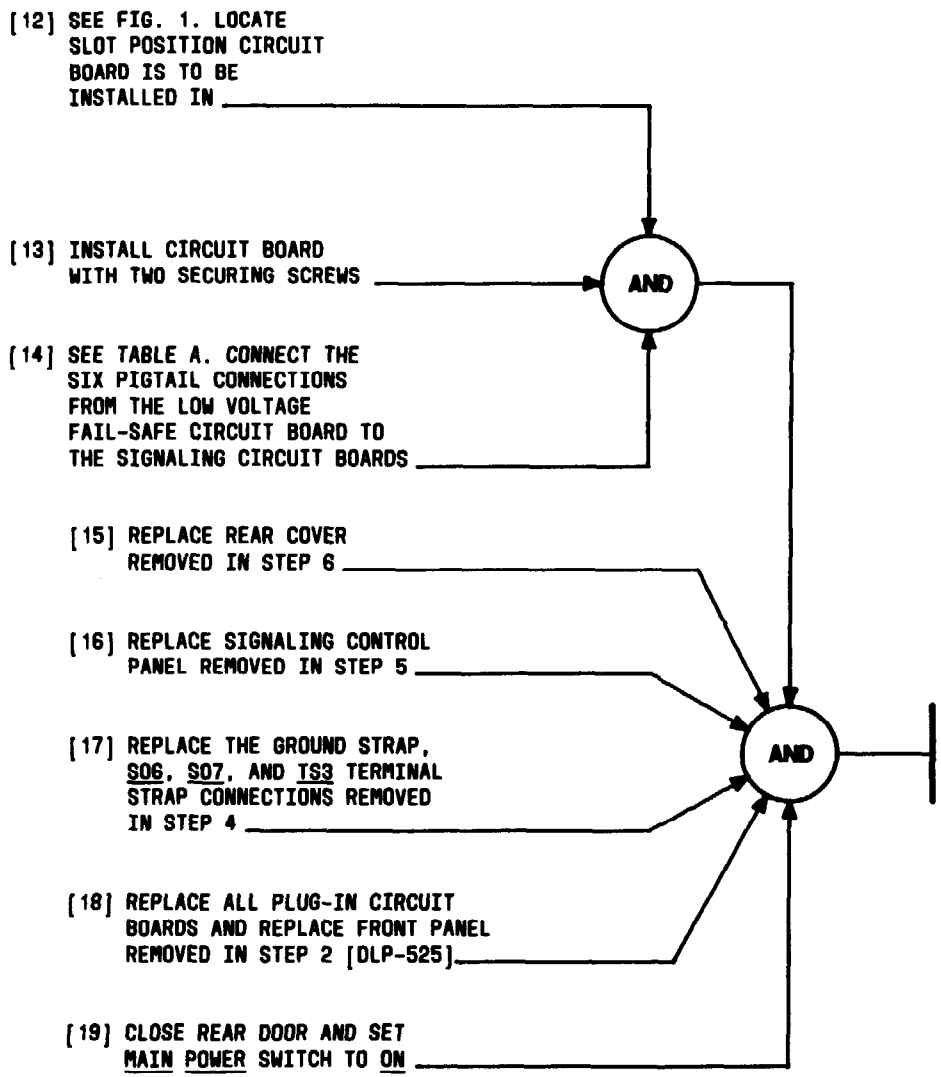

TABLE A			
SIGNALING CIRCUITS		LOW VOLTAGE FAIL SAFE CIRCUIT BOARD	
CIRCUIT BOARDS	PIN	COLOR CODE	TERMINAL
AUXILIARY SIGNALING (1)	15	RED	A
AUXILIARY SIGNALING (1)	GND	BLACK	B
AUXILIARY SIGNALING (1)	9	BROWN	C
TRANSMITTER BUFFER (2)	13	ORANGE	D
OSCILLATOR-SWITCH COMBINER (3)	11	YELLOW	E
OSCILLATOR-SWITCH COMBINER (3)	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

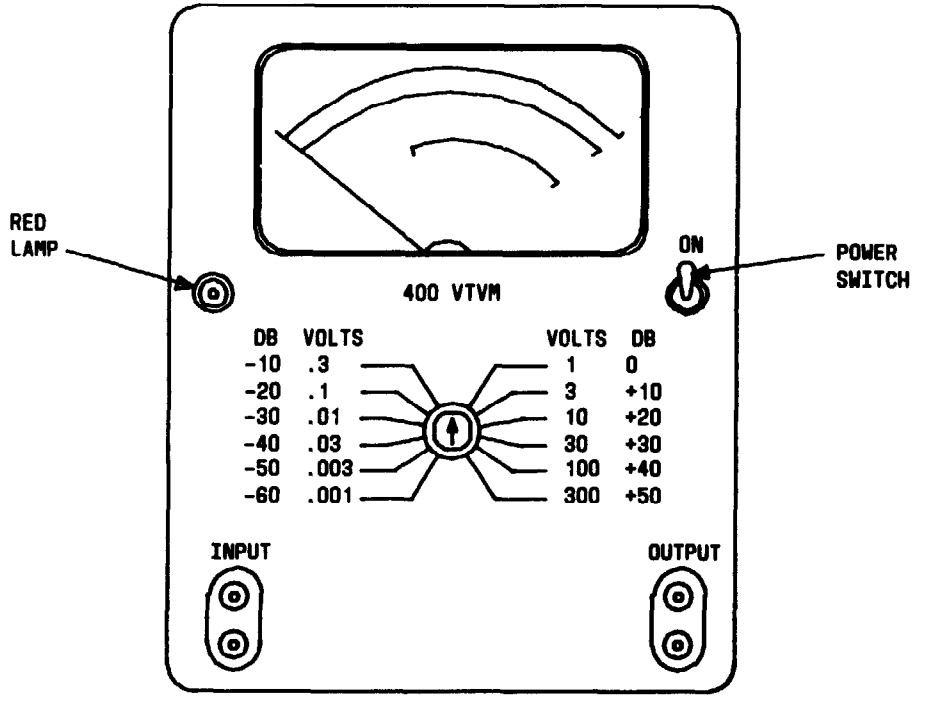

FIG. 1

CONDITION HP 400 ( ) VTVM FOR MEASUREMENT

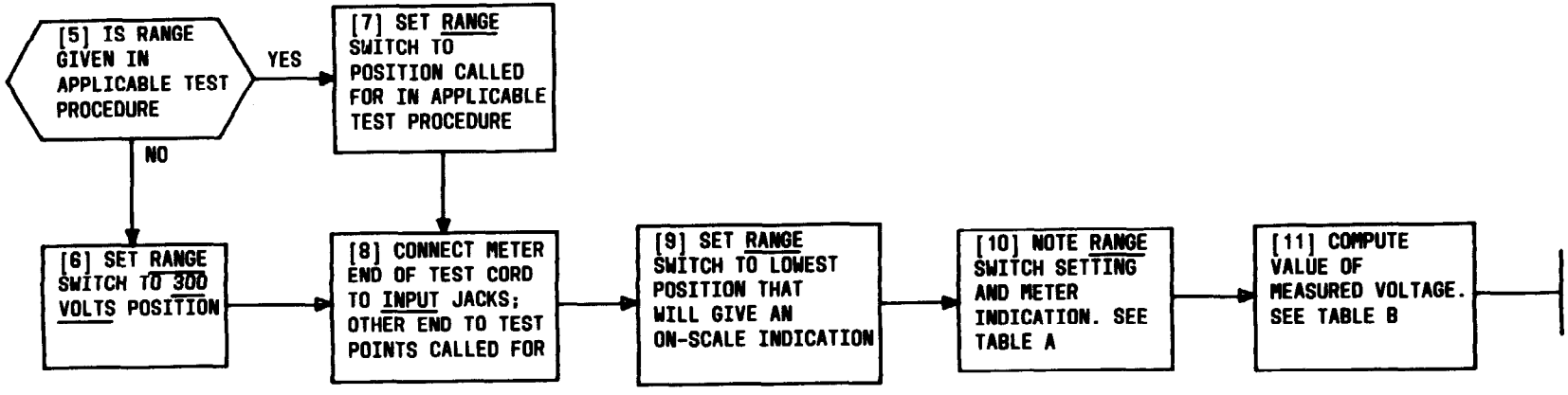

TABLE A

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

TABLE B
EXAMPLES OF VOLTAGE COMPUTATION

$$\text{MEASURED VOLTAGE} = \frac{\text{RANGE SWITCH SETTING}}{\text{METER FULL SCALE VALUE}} \times \text{METER INDICATION}$$

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

CONDITION HP 400 ( ) VTVM FOR MEASUREMENT

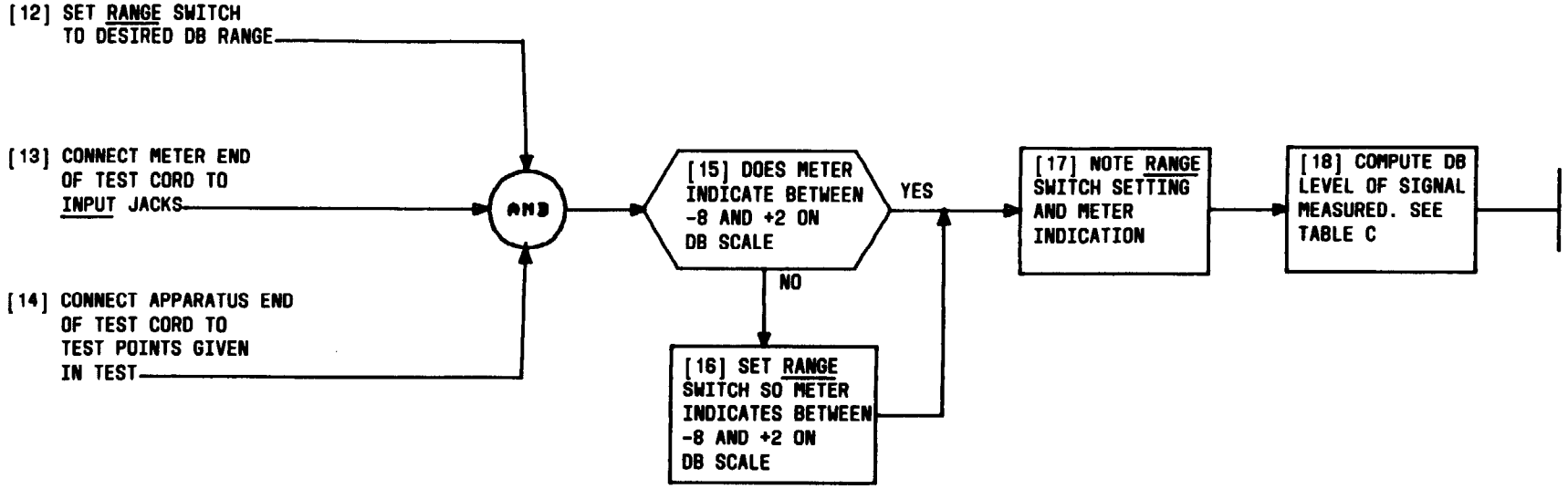

TABLE C
EXAMPLES OF DB COMPUTATION

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

AND

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

[9] OBSERVE METER FOR FLUCTUATION

[10] IS FLUCTUATION ABOUT ONE METER DIVISION, OR IS IT FLUCTUATING ABOUT FIVE METER DIVISIONS

ONE

[12] NOISE GENERATOR READY FOR USE

FIVE

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

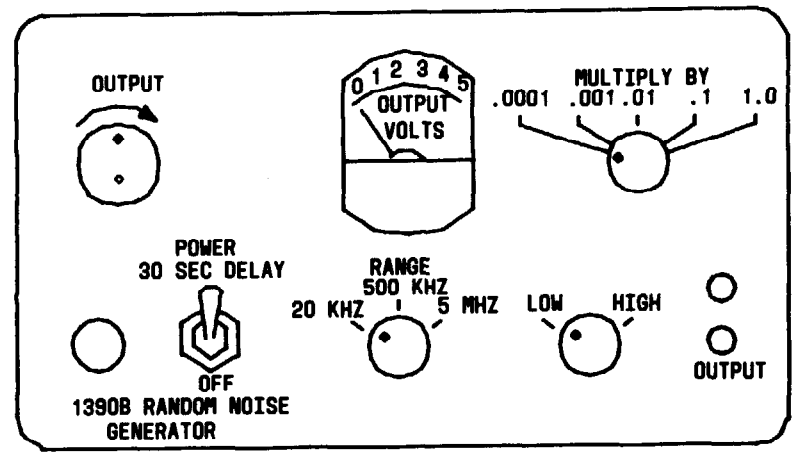

FIG. 1

CONDITION 1390B RANDOM NOISE GENERATOR FOR TEST

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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

[1] HAVE YOU PERFORMED DLP-513 FOR AUXILIARY SIGNALING BOARD UNDER TEST

YES

NO

[2] PERFORM DLP-513

[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]

AND

PAGE 2

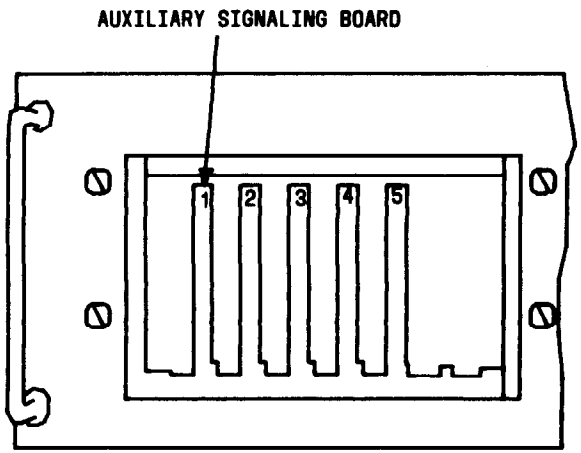


FIG. 1

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

[7] CONDITION KS-14510 VOM FOR MEASUREMENT [DLP-530]

[8] CONNECT VOM TO TP7 OF AUXILIARY SIGNALING BOARD WITH REFERENCE GROUND. SEE FIG. 2

[9] CONDITION 1390B RANDOM NOISE GENERATOR FOR TEST [DLP-538]

[10] CONNECT 1390B TO VOICE EQUIP JACK

[11] CONDITION 3C NMS FOR MEASUREMENT [DLP-532]

[12] SET 3C NMS FOR 3KC FLAT AND CONNECT TO VOICE MON JACK

[13] SET NOISE OUTPUT OF 1390B UNTIL 3C INDICATES 60 DBRN

AND

TEST CONNECTIONS COMPLETED

PAGE 3

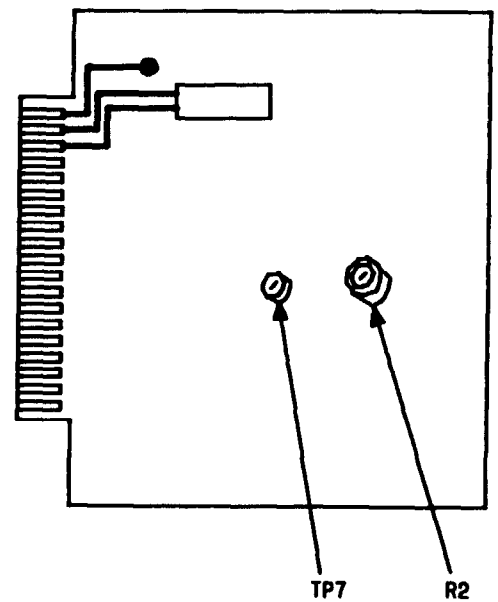
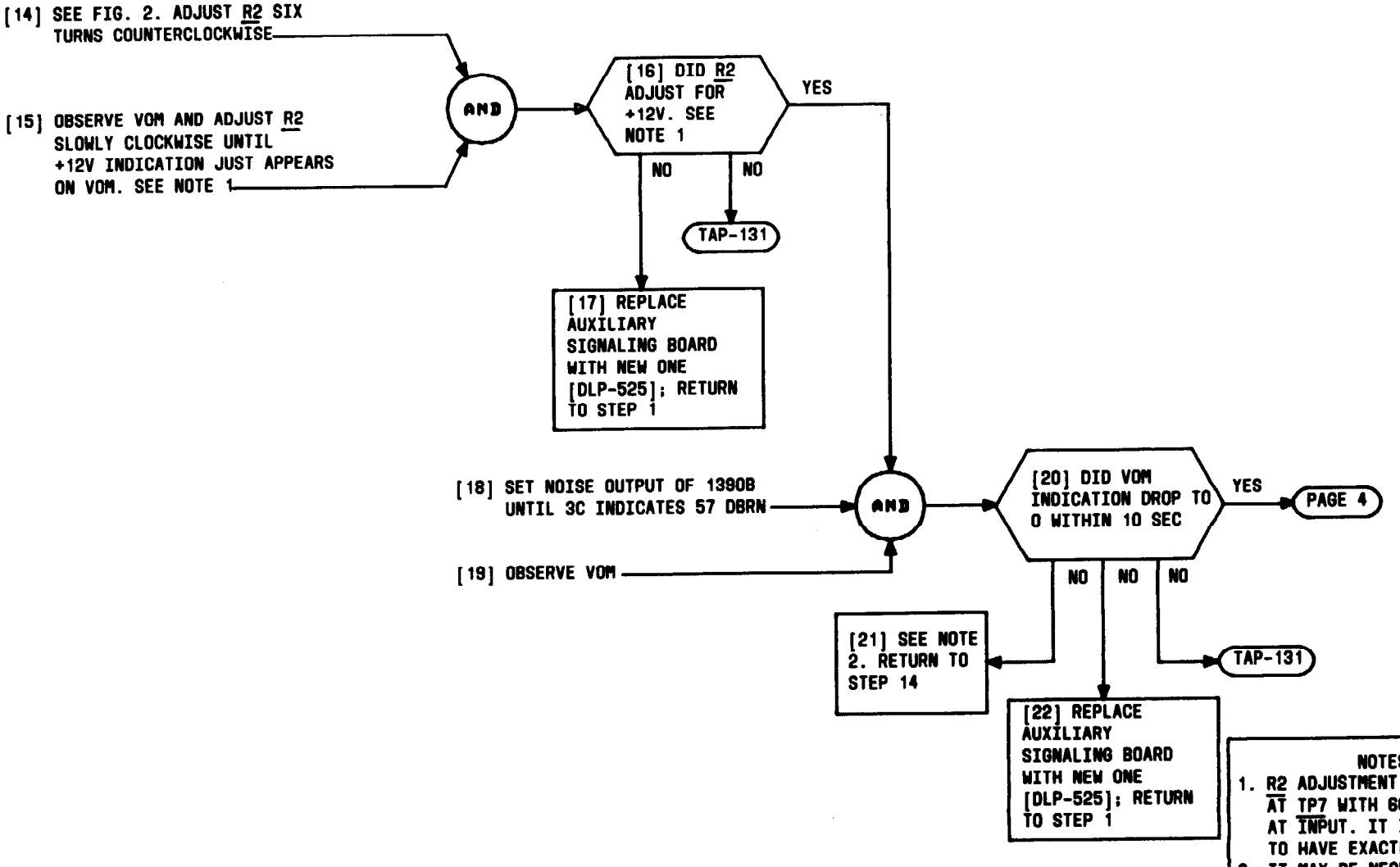


FIG. 2

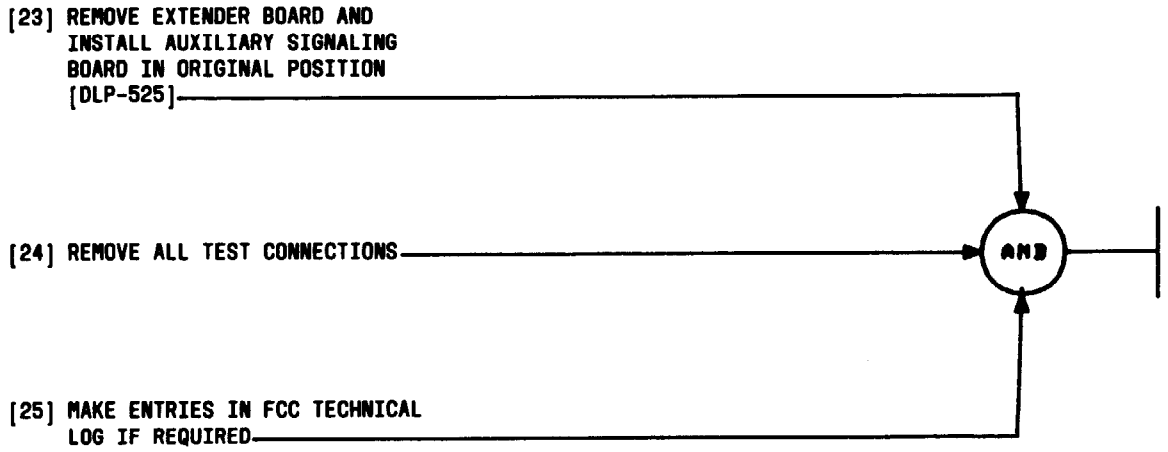
ADJUST AUXILIARY SIGNALING CIRCUIT BOARD



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



ADJUST AUXILIARY SIGNALING CIRCUIT BOARD

[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

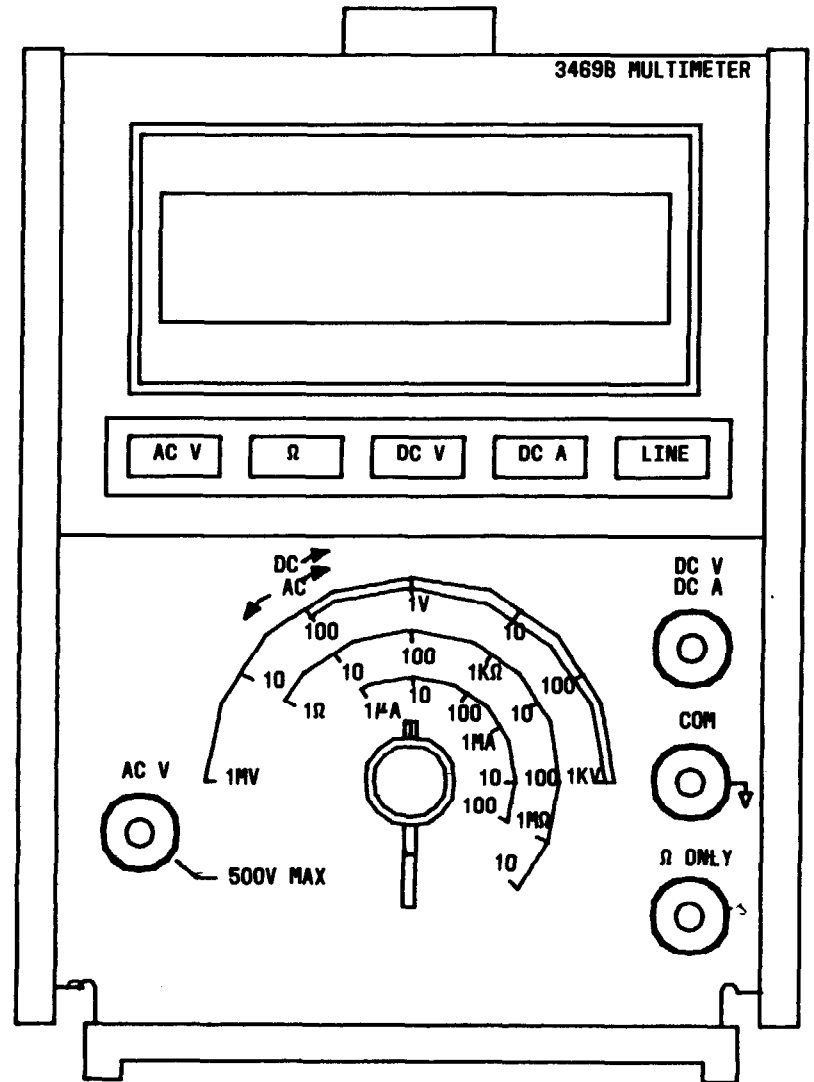


FIG. 1

CONDITION HEWLETT-PACKARD 3469B DIGITAL MULTIMETER FOR MEASUREMENT

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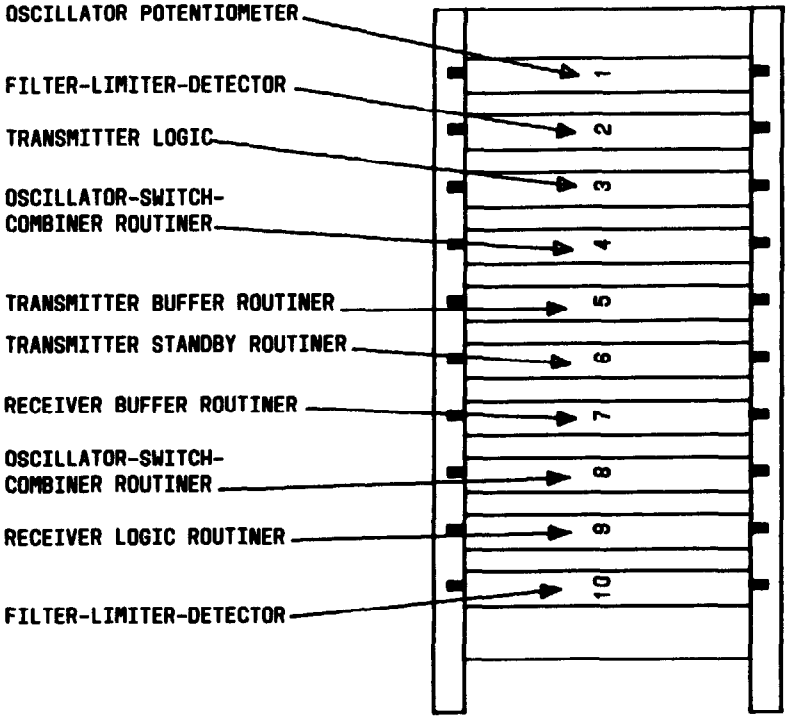
[13] WHEN CIRCUIT BOARD TEST IS COMPLETED, IF NECESSARY, REMOVE CIRCUIT AND/OR EXTENDER BOARDS. INSTALL WORKING CIRCUIT BOARD INTO BOARD CARRIER USING STEPS 10 THRU 12. STORE EXTENDER BOARD

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

AND

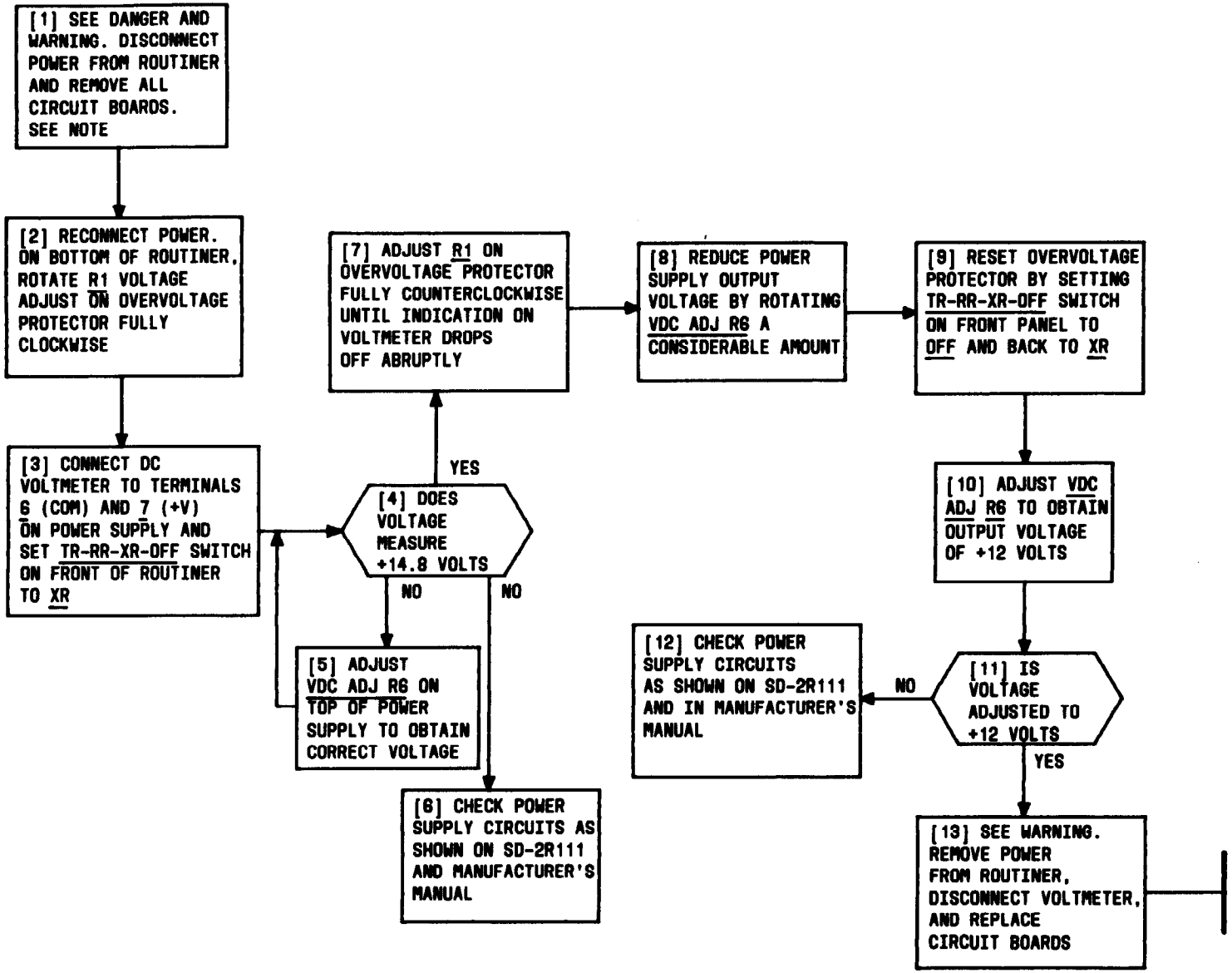
[15] CONNECT CASE AND ROUTINER TEST SET USING FOUR SCREWS REMOVED IN STEP 3



ROUTINER FRONT PANEL
(BACK SIDE)

FIG. 1

REMOVE AND INSTALL ROUTINER TEST SET CIRCUIT BOARD



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

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.

AND

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

PAGE 2

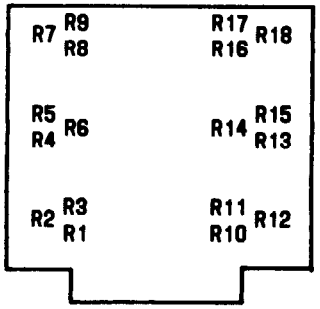


FIG. 1 - OSCILLATOR POTENTIOMETER BOARD

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 L 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

[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

[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

[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

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

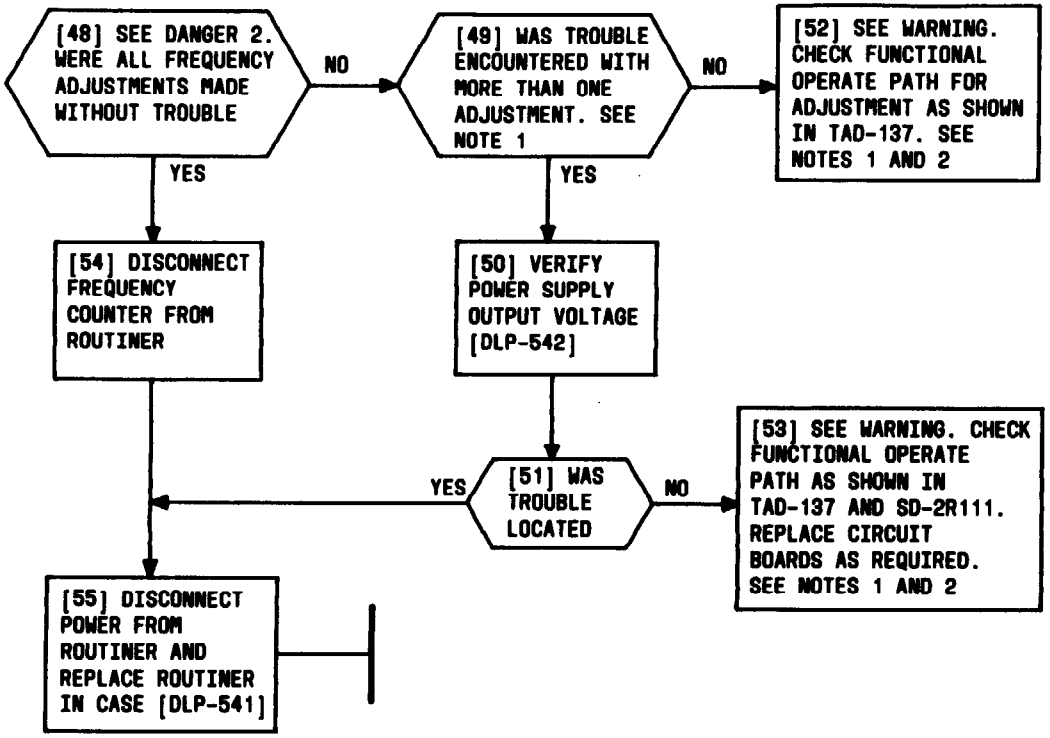
[43] OBSERVE FREQUENCY COUNTER AND ADJUST R17 FOR AN INDICATION OF 1911 HZ AND RELEASE 1900 ON SWITCH

[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



NOTES

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

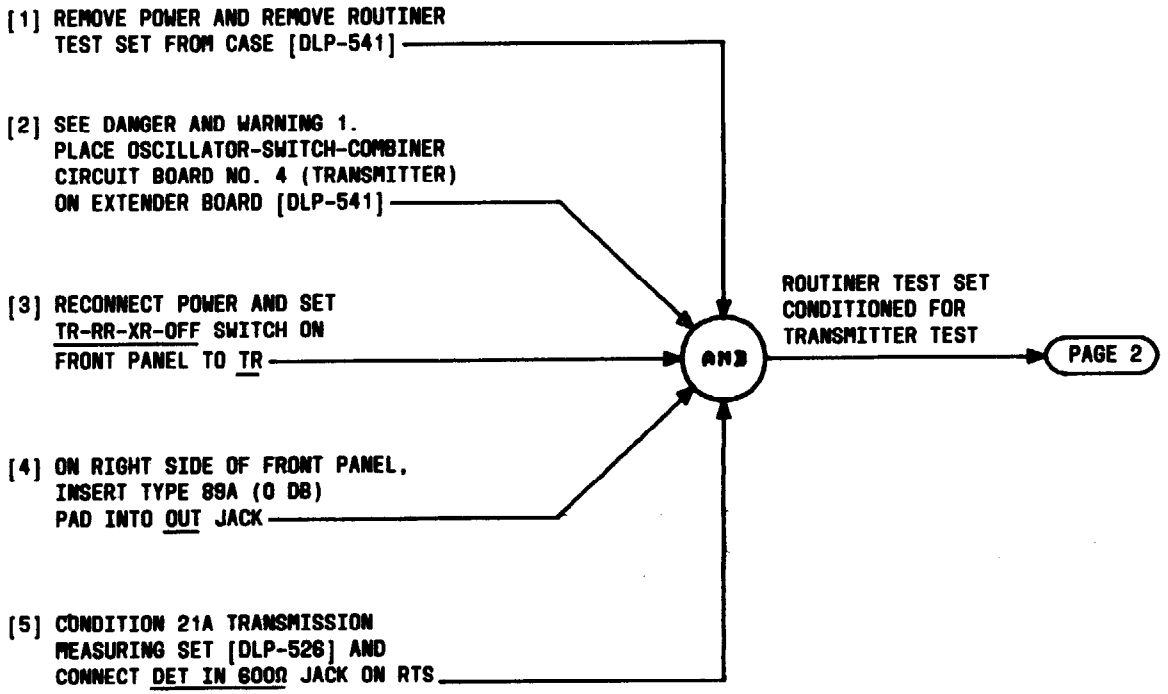
WARNING

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

ADJUST ROUTINER TEST SET OUTPUT FREQUENCIES



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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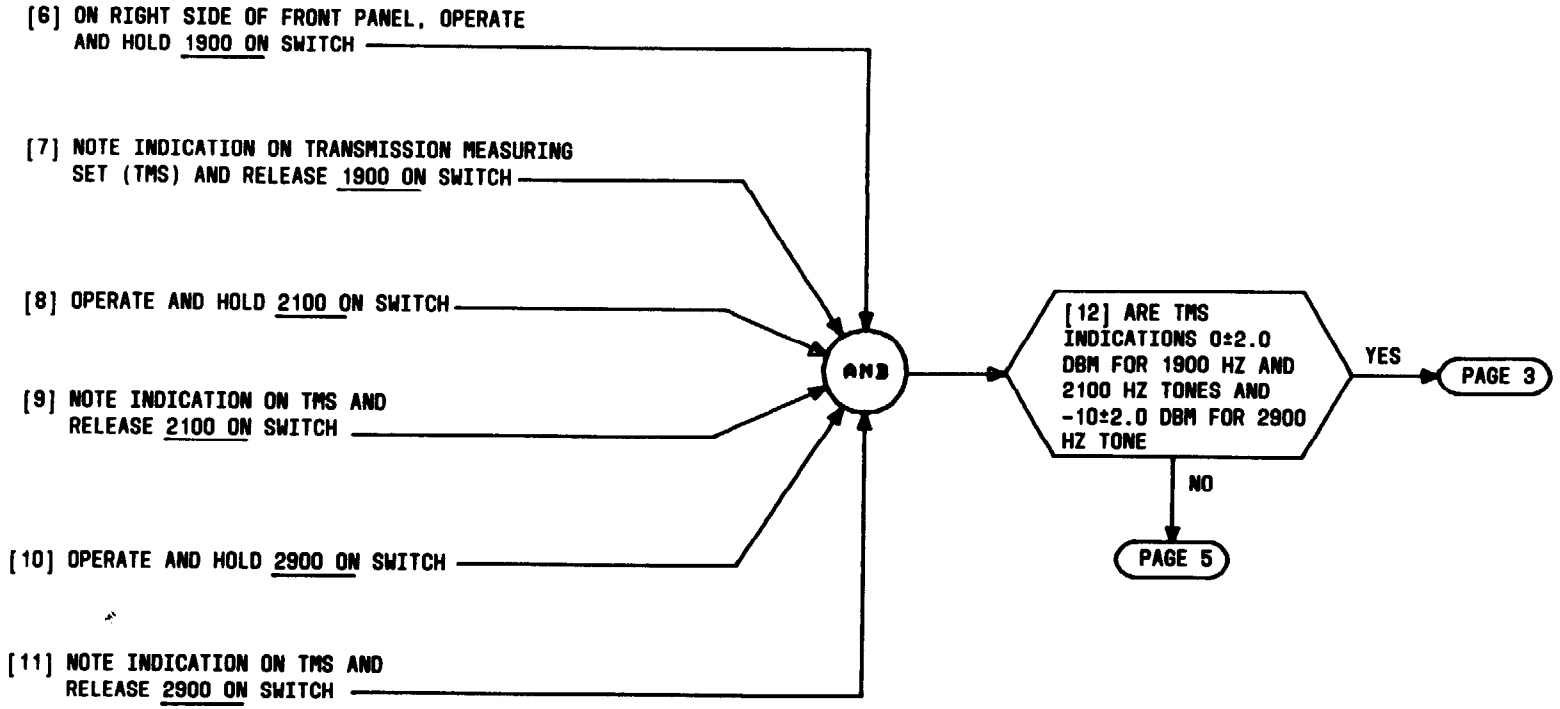
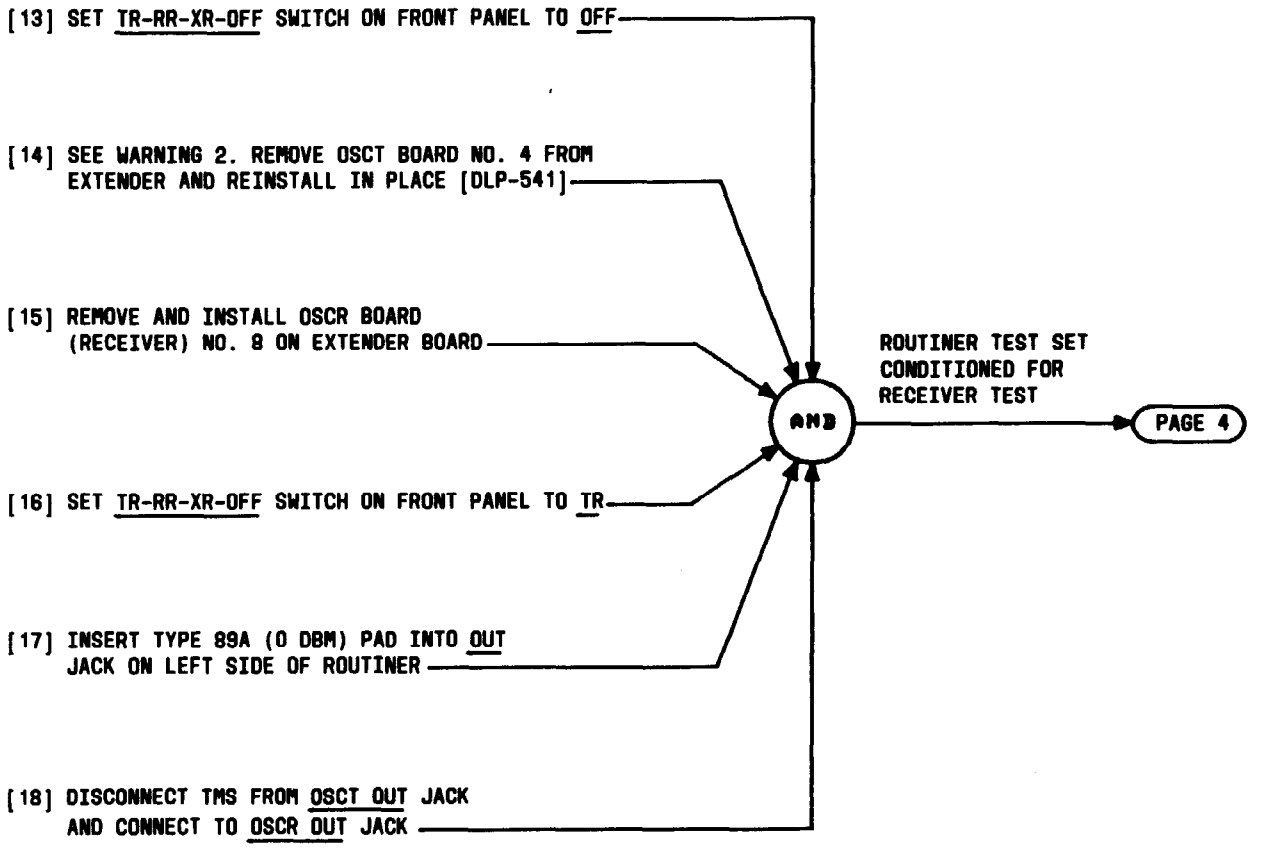
ADJUST ROUTINER TEST SET OUTPUT LEVELS



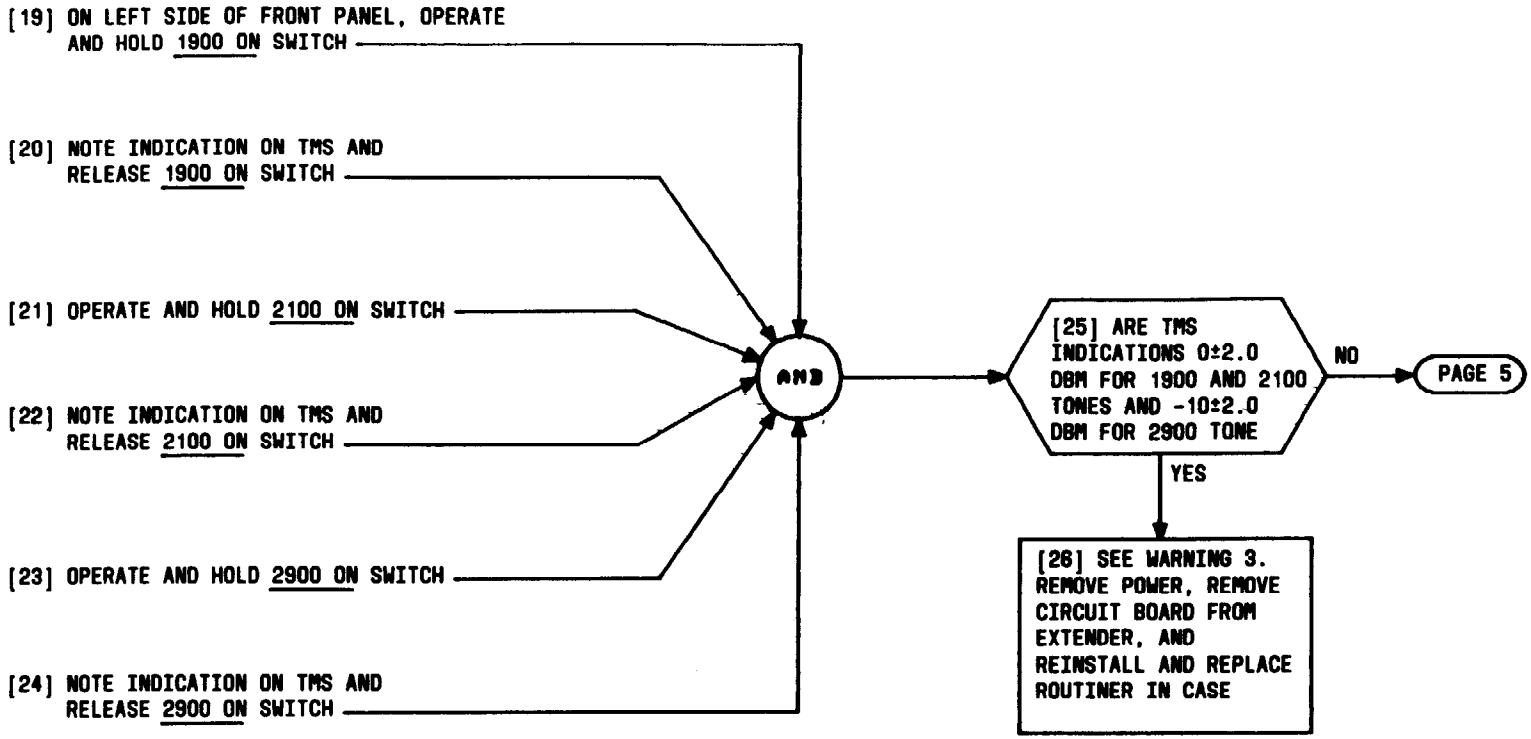
ADJUST ROUTINER TEST SET OUTPUT LEVELS

ADJUST ROUTINER TEST SET OUTPUT LEVELS



WARNING 2

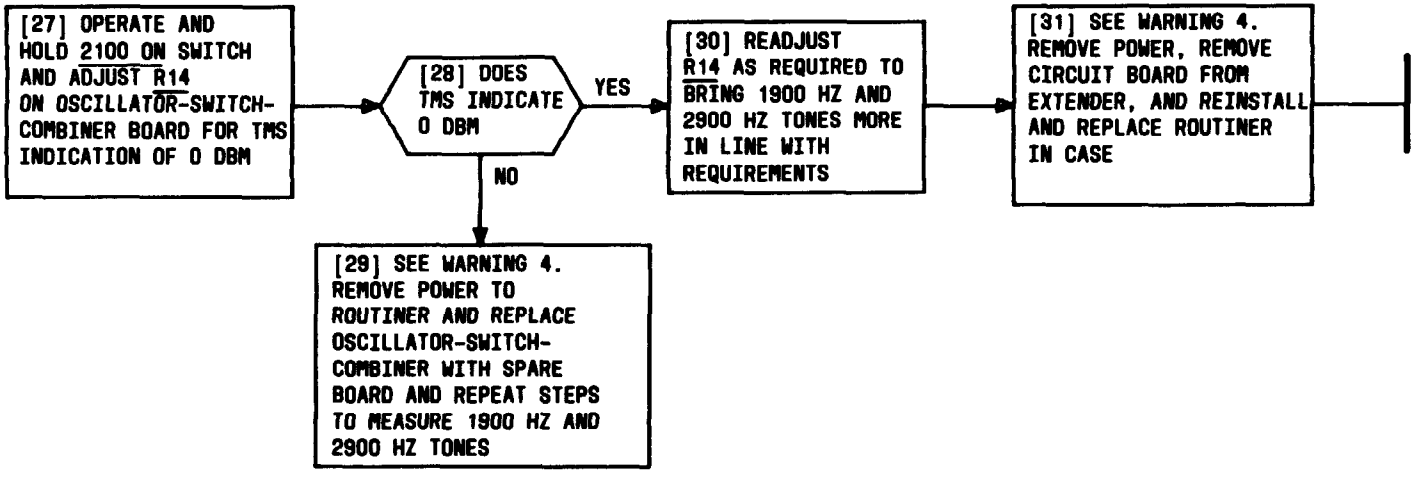
WHEN REMOVING OR INSTALLING CIRCUIT BOARDS, FOLLOW PROCEDURES OUTLINED IN DLP-541 TO PREVENT DAMAGE TO EQUIPMENT



WARNING 3

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

ADJUST ROUTINER TEST SET OUTPUT LEVELS



WARNING 4

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

ADJUST ROUTINER TEST SET OUTPUT LEVELS

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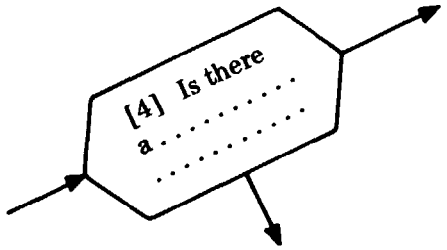
INDEX



This is a . . . . . .

TASK ORIENTED PRACTICE . . . . . or TOP

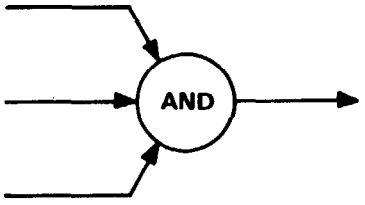
The next few pages will tell you how to use this document.

TAP

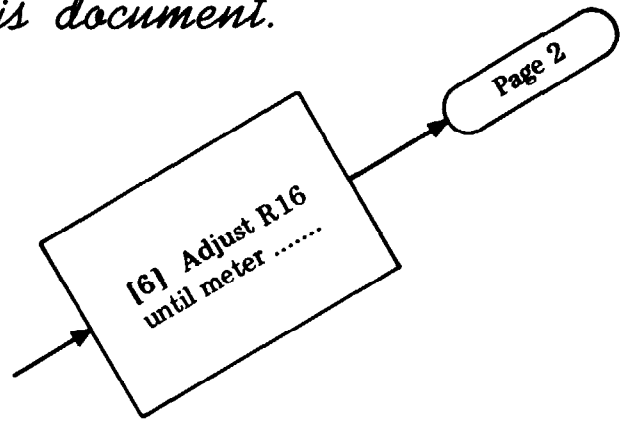
TIL

ATP

ATL



[DLP-540]



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.

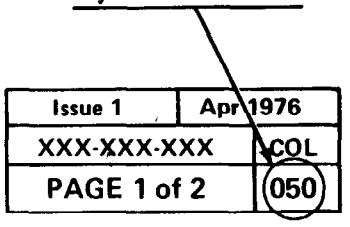
Trouble Clearing

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*.



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."

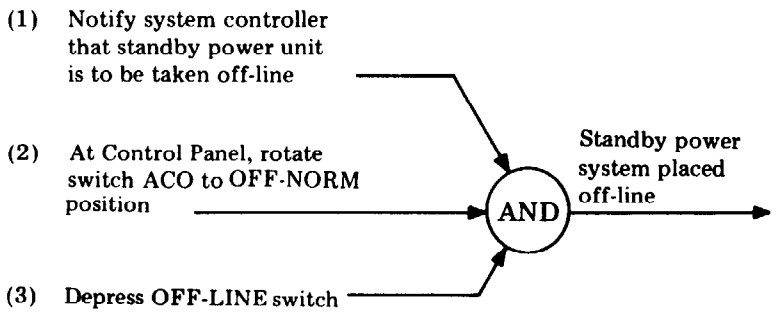
Here are some of the things designed into TOP to help you "bypass" information you may already know:

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

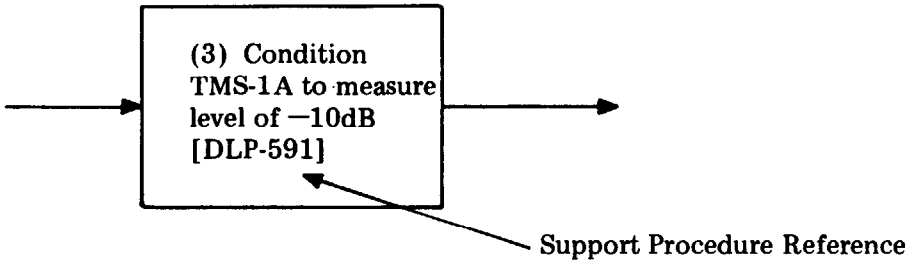
A result statement may be used in a flow-charted procedure along with the "AND" symbol. Here is an example of the "AND" symbol and a *result statement:*



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

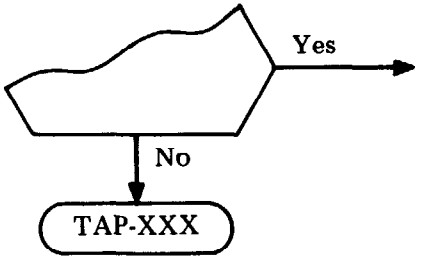
When you see this kind of reference in TOP, it refers to a support procedure.



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.

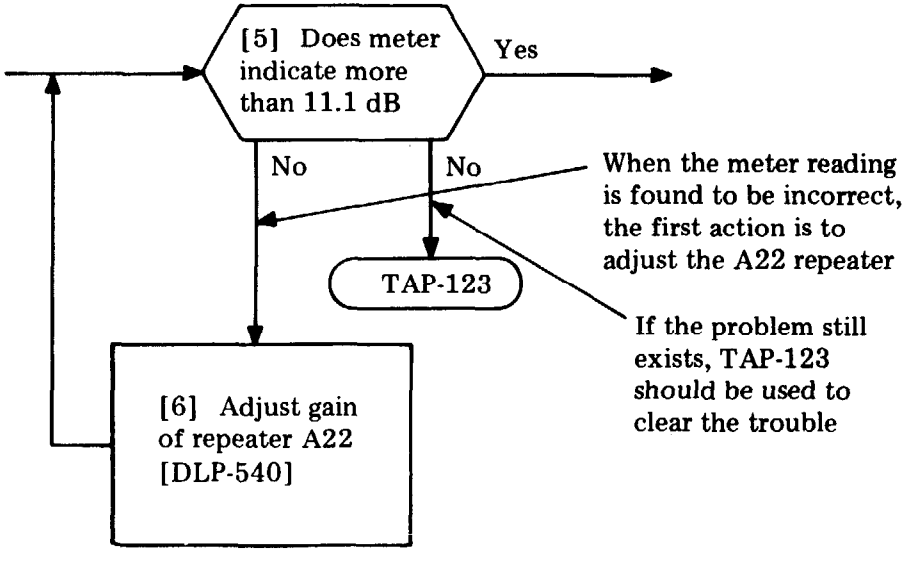
So far, the Company Order type jobs have been the main topic; however, you will find that the Routine and Acceptance categories are used in the same manner. You may come across a couple of new abbreviations in those categories; namely, Acceptance Task Procedure (ATP) and Routine Task Procedure (RTP).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

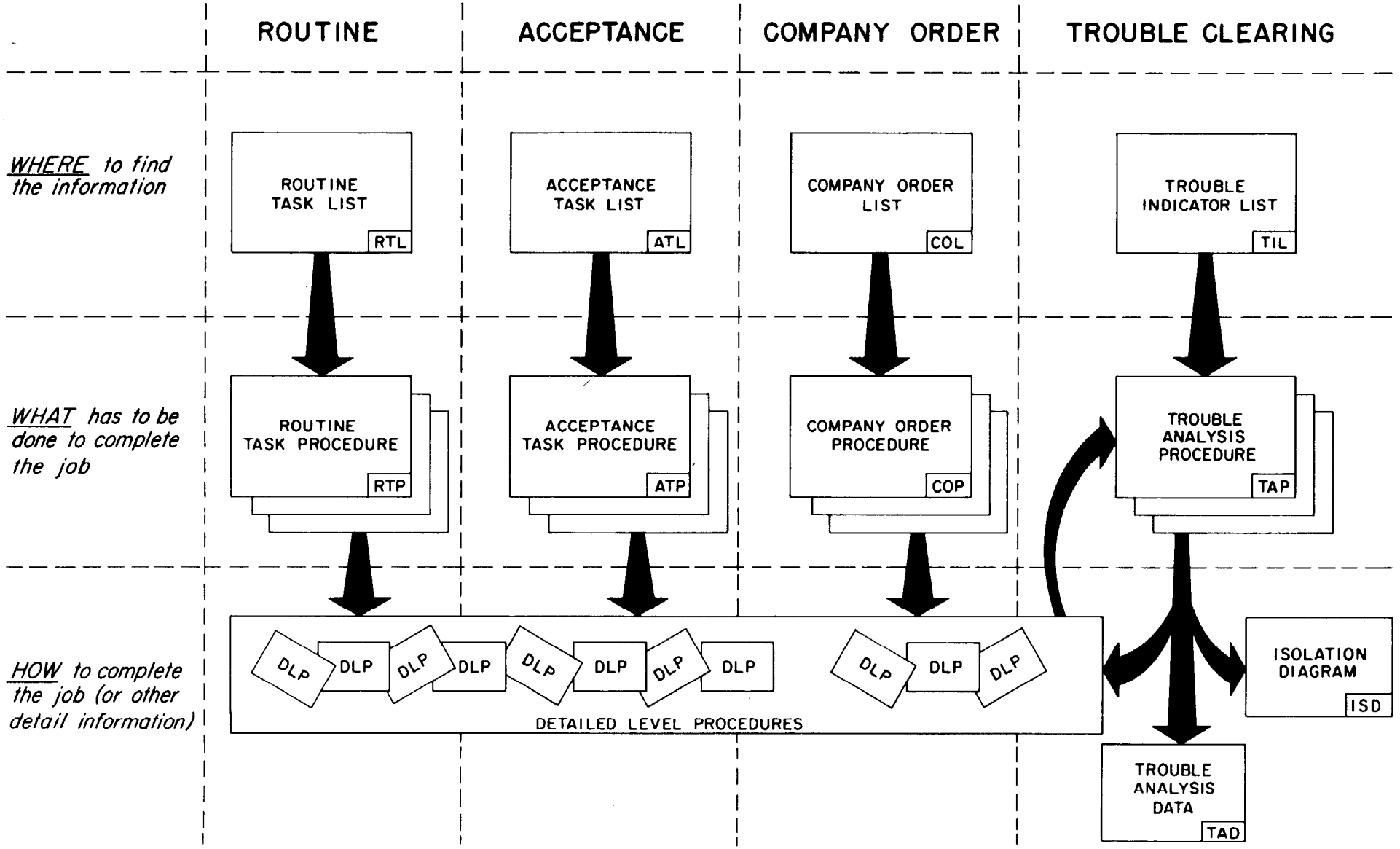
DANGER – *means there is a possibility of personal injury*

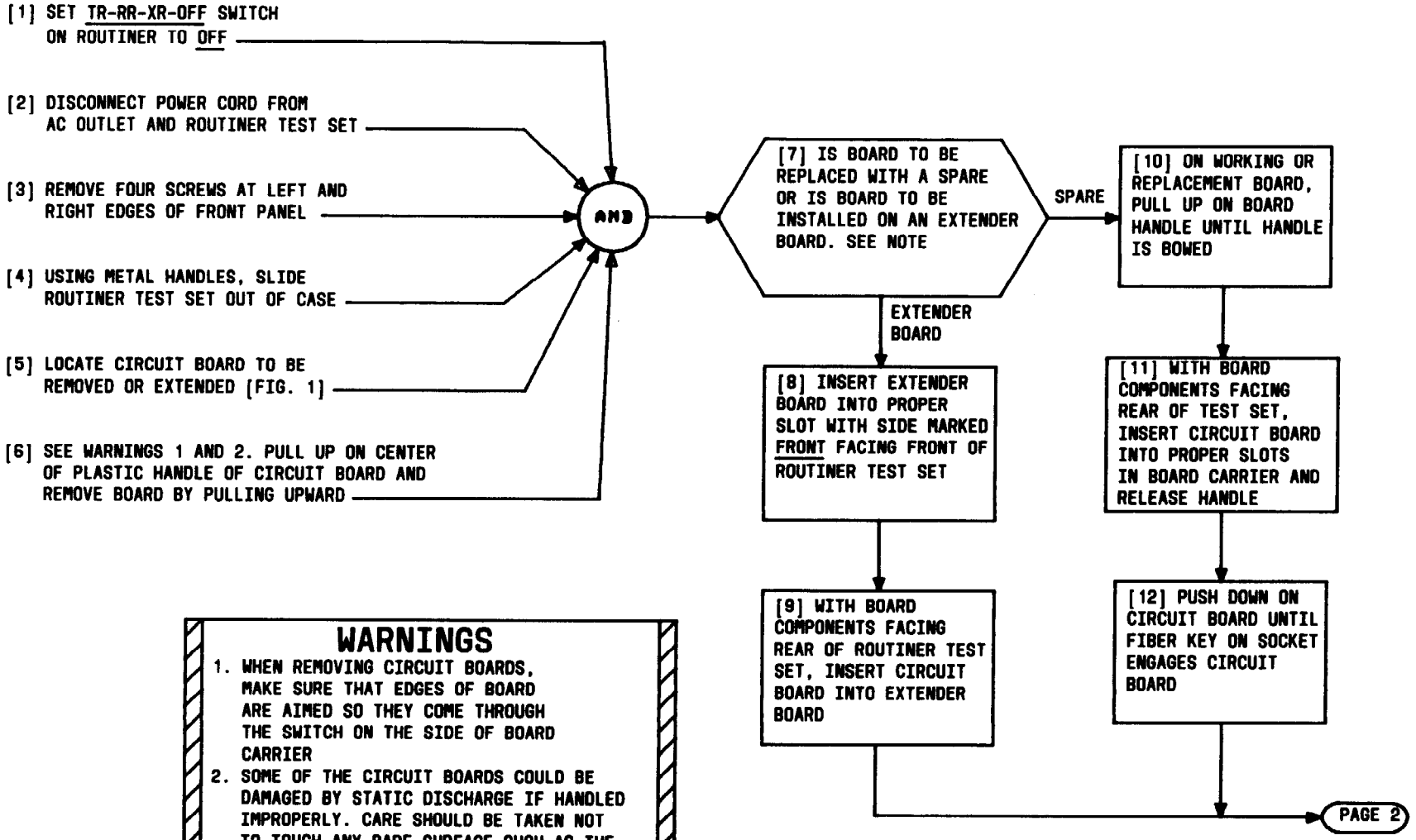
CAUTION – *means there is a possibility of service interruption*

WARNING – *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.


ROUTINE
ACCEPTANCE
COMPANY ORDER
TROUBLE CLEARING
WHERE to find the information
WHAT has to be done to complete the job
HOW to complete the job (or other detail information)
ROUTINE TASK LIST
RTL
ACCEPTANCE TASK LIST
ATL
COMPANY ORDER LIST
COL
TROUBLE INDICATOR LIST
TIL
ROUTINE TASK PROCEDURE
RTP
ACCEPTANCE TASK PROCEDURE
ATP
COMPANY ORDER PROCEDURE
COP
TROUBLE ANALYSIS PROCEDURE
TAP
DLP
DETAILED LEVEL PROCEDURES
ISOLATION DIAGRAM
ISD
TROUBLE ANALYSIS DATA
TAD



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