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OPERATION AND SYMPTOM COLLECTION MANUAL,
HIGH POWER ILLUMINATOR RADAR (HPIR) AN/MPQ-39
(EXPERIMENTAL MANUAL)

Human Resources Research Organization

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OPERATION AND
SYMPTOM COLLECTION MANUAL
HPIR AN/MPQ-39

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TABLE OF CONTENTS

	<u>DIAGRAM</u>	<u>PAGE</u>	
How To Use This Manual!		I	Ant Pos Subsystem
Index To Indicators		II-IX	Antenna Power
HP/IR Conditions		X	Manual Az & El
HP/IR System		1	Search Az & El
Power Circuits Subsystem	P	3	Remote Ant Pos
Main Power	P1	5	Antenna Weekly
Standby Energize	P2	6,7	Computer Subsystem
RSG Fil Pwr Sups	P3	9	Rng & Az Cmptr
Xmtr Fil Pwr Sups	P4	11	El & TOF Cmptr
Radiate Energize	P5	12,13	In Rng-Out Of Rng
Radiate Warning Lamps	P5.1	14,15	Computer Weekly
RSG LV Pwr Sups	P6	17	Xmtr Subsystem
Xmtr LV Pwr Sups	P7	19	MO Pwr, Mod Bias, MO RF
Utility Circuits Subsystem			Sw Bias, PA Pwr, PA RF
Glycol Heater	U1	20	Xmtr LO Tuning
Freon Heater	U2	20	Noise Cancellation
1050W Heater	U3	20	Xmtr Weekly
3600W Heater	U4	20	Rcvr Subsystem
Xmtr Group Fan	U5	21	Rcvr LO Ref
Liquid Cooler Blower	U6	21	Rcvr Nulling
Pedestal Blower	U7	21	Receiver Weekly
RSG Console Blower	U8	21	Doppler Subsystem
PA Collector Low Temp	U9	22	Lock & Recycle
Glycol Liquid Level	U10	22	Delay Lock & Memory
Waveguide Low Pressure	U11	22	Doppler Audio
HVPS Liquid Level	U12	22	Doppler Weekly Checks
Convenience Outlets	U13	23	Ant Tck
Time Meters	U14	23	Rng Mod
			Ground Speed Computer
			El Cos Pot

TABLE OF CONTENTS

	<u>DIAGRAM</u>	<u>PAGE</u>
	A . . .	25
	A1 . . .	27
	A2 . . .	28,29
	A3 . . .	30,31
	A4 . . .	33
	AW1-5 . . .	35
	C . . .	37
	C1 . . .	38,39
	C2 . . .	40,41
	C3 . . .	43
	CH1-6 . . .	44,45
	X . . .	47
NO RF . . .	X1 . . .	48,49
PA RF . . .	X2 . . .	50,51
	X3 . . .	52,53
on . . .	X4 . . .	54,55
	AW1-13 . . .	56-63
	R . . .	65
	R1 . . .	66,67
	R2 . . .	68,69
	RW1-4 . . .	71-73
	D . . .	75
	D1 . . .	76,77
ory . . .	D2 . . .	79
	D3 . . .	81
necks . . .	DW1-6 . . .	82,83
	AUTO1 . . .	85
	AUTO2 . . .	87
ter . . .	AUTO3 . . .	89
	AUTO4 . . .	99

	<u>DIAGRAM</u>	<u>PAGE</u>
Az & El Memory Bal	AUTO5 . . .	91
Tracking Response Control	AUTO6 . . .	93
Computer Memory	AUTO7 . . .	95
Rng Deviation Control	AUTO8 . . .	95
Special Ckt Weekly	ECCM1-12 . . .	97-103
Az Repeat Back Mark	BCC1 . . .	104
Target Altitude	BCC2 . . .	104
Range Mark	BCC3 . . .	105
Eff Firing Rng Ring	BCC4 . . .	105
Missile Ready & Fire Lamps	FCC5 . . .	107
Launcher Positioning	MGL1 . . .	109
Memory Track Thru Launch	MGL2 . . .	111
Destruct Cmd	MGL3 . . .	113
Location Diagram		114,115
Chassis List		116

ACCESSION log

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A 23

HOW TO USE THIS MANUAL

IDENTIFY BAD INDICATOR

Locate a bad indication by your own observation, or by its being reported (verify it yourself). If until the first bad indication is observed. If radar is not energized to proper level, use TM9-14.

DETERMINE SYMPTOM COLLECTION CHECKS

1. Determine subsystem with which indicator is associated. If you don't remember, this may be found:
 - a. Turn to Index and locate the name of the indicator.
 - b. If more than one symptom or condition is listed for that indicator, locate symptom and/or condition.
 - c. Opposite this entry in Index, locate subsystem in column headed SUBSYSTEM.
2. Determine necessary system checks from chart on HPIR SYSTEM page.

PERFORM SYMPTOM COLLECTION CHECKS

Perform necessary system checks until a bad check is found, or until all necessary checks are made.

1. If a bad check is found:
 - a. Proceed to related subsystem diagram. Perform checks on subsystem diagram until first bad check is found.
 - b. Proceed to the detailed diagram. Perform checks on detailed diagram. When first bad indication is found, identify the subassemblies which could be causing the trouble in this circuit.
2. If all necessary system checks are good, and initial indicator was located in a subsystem check:
 - a. Locate indicator listing again in Index and determine page on which this indicator is shown.
 - b. Locate the indicator circuit on that page. This is a bad circuit. No further symptom collection is necessary.
 - c. Identify the subassemblies which could be causing the trouble in this circuit.
3. If all necessary system checks are good, and initial indicator was located in a subsystem not ECCM, BCC, M&L):
 - a. Locate indicator listing again in Index and determine detailed diagram on which this indicator is shown.
 - b. Proceed to that diagram and perform any checks indicated until the bad circuit is found.
 - c. Identify the subassemblies which could be causing the trouble in this circuit.

SIGNAL TRACE AND TROUBLESHOOT TO PIECE PART

When a bad circuit and its subassemblies have been identified, signal trace and troubleshoot to the correct trouble by replacing subassembly(ies). After a piece-part or subassembly has been replaced, correct.

TO USE THIS MANUAL

g reported (verify it yourself). If necessary, perform a daily and/or a weekly check energized to proper level, use TM9-1430-511-12/1 to energize.

If you don't remember, this may be found in Index.

At indicator, locate symptom and/or condition appropriate to your initial bad check.

in headed SUBSYSTEM.

page.

until all necessary checks are made.

on subsystem diagram until first bad indication is noted.

ailed diagram. When first bad indication noted, you have determined the bad circuit area.

trouble in this circuit.

tor was located in a subsystem checked in system checks (P, A, C, X, R, D):

age on which this indicator is shown. This is given in column headed DETAILED DIAGRAM.

bad circuit. No further symptom collection checks need be made.

trouble in this circuit.

tor was located in a subsystem not checked in system checks (U, AW, XW, RW, DW, AUTO,

etailed diagram on which this indicator is shown.

ed until the bad circuit is found.

trouble in this circuit.

PART

signal trace and troubleshoot to the piece-part using TMs 9-1430-511-12/2 and -20, ce-part or subassembly has been replaced, verify that initial bad indication has been

13

INDEX TO INDICATORS

• Perform following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1130-511-12/1, Table 16, Steps 13-15
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified PM diagram.

• Perform following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1130-511-12/1, Table 20, Steps 1.4-1.7, 2
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified DM diagram.

** Perform following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1130-511-12/1, Table 16, Steps 13-15
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECM diagram.
3. TWO-1130-511-12/1, Table 20, Step 3
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECM diagram.

// Perform following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1130-511-12/1, Table 18, Steps 7 & 8
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified DM diagram.

NOTE: Perform the following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1130-511-12/1, Tables 14-20
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified diagram.
3. If above checks good and trouble occurred during suspected ECM environment, proceed to most appropriate diagram on ECM12.

INDEX TO IND

HPIR PANELS

SUBSYSTEM

DETAILED DIAGRAM

CONTROL & INDICATOR PANEL

LINE VOLT M9 P . . . P1

LOCK Lamp

LOCK sw: LOCK HOLD or LOCK DISABLE . . . D . . . D1
Pause Lock D . . . D1
Doppler Applied from Target S'mulator . . DW~ . . . DW6
Doppler Applied from Sig Gen TS . . . DWff . . . DW4
Bad while Tracking or Attempting to
Track Target SEE NOTE

LV PWR SUPPLIES M6

+6.3V (LH) P . . . P3
-100V (LH) P . . . P1
+100V (LH) P . . . P6
+250V (LH) P . . . P6
+250V (RH) P . . . P6
+150V (RH) P . . . P6
-100V (RH) P . . . P6
+6.3V (RH) P . . . P3

MAIN POWER cb P . . . P1

MAN TRACK Lamp A . . . A1

MEMORY Lamp

Memory Track Thru Launch M&L . . . M&L2
All Other Indications D . . . D2

MOTOR-GENERATOR cb A . . . A1

NOISE M3

FM pos X . . . X1
AM pos XW . . . XW4

RADIATE Lamp P . . . P5

RAD READY Lamp P . . . P6

RECEIVER FUNCTIONS M5

LO POWER pos P . . . R1
DISC pos R . . . R1
REF LEVEL pos R . . . R1
SIDE LOBE pos R . . . R2
MAIN FEED pos P . . . P2

RF POWER OUTPUT M7 X . . . X2

SERVO FIELD CURRENT M3 AW . . . AW1

SERVO FIELD CURRENT M4 AW . . . AW1

SIGNAL STRENGTH M2

TGT SIM TS Chks DW~ . . . P46
Bad While Tracking or Attempting to
Track Target SEE NOTE

SPECIAL LOCK Lamp

Weekly Checks ECCM** . . . ECCM7,8,10
All Other Conditions SEE NOTE

STANDBY Lamp P . . . P5

HPIR PANELS

CONTROL & INDICATOR PANEL

TARGET SPEED M1

LOCK sw: LOCK HOLD (no drift) . . .
LOCK sw: LOCK DISABLE (sweep) . . .
Sig Gen TS Chks
Tgt Sim TS Chks
Bad While Tracking or Attempting to
Track Target

MAIN FUSE PANEL

Convenience Outlets
EQUIPMENT TIME M1
Loudspeaker

MAIN POWER DIST BOX

PHASE Light

NOISE MONITOR PANEL

RECEIVER FUNCT/XMTR NOISE M1

LO PCWER pos
MAIN FEED pos
SIDE FEED pos
XMTR NOISE pos

SUB DIST BOX

BATTLE SHORT ON Lamp

XMTR PANEL NO. 1

BLOWER CONSOLE XMTR cb
BLOWER HEAT EXCHANGER cb
FREON PREHEAT cb
GLYCOL LIQUID LEVEL WARNING Lamp
GLYCOL PREHEAT cb
HVPS LIQUID LEVEL Lamp
HVPS LOW P'ESSURE Lamp
KLYSTRON TIME M4
MAIN POWER cb
Standby Cmd Intlk
Overload Sensing
MASTER OSCILLATOR FILAMENT cb
Standby Cmd Intlk
Overload Sensing
MASTER OSCILLATOR FILAMENT AMPERES M2
MO LOW FLOW Lamp
PA BODY LOW FLOW Lamp
PA COLL HI TEMP WARNING Lamp
PA COLL LOW FLOW Lamp

A

INDEX TO INDICATORS

PANELS	SUBSYSTEM	DETAILED DIAGRAM
INDICATOR PANEL		
RED M1		
LOCK HOLD (no drift)	DW	DW5
LOCK DISABLE (sweep)	D	D1
TS Chks	DW//	DW4
TS Chks	DW	DW6
Tracking or Attempting to		
Target	SEE NOTE	

OUTLETS	U	U13
TIME M1	U	U14
	D	D3

BOX	P	P1
-----	---	----

PANEL		
FUNCTION/XMTR NOISE M1		
pos	R	R1
pos	R	R2
pos	R	R2
pos	RW*	RW2

ON Lamp	P	P2
NO. 1		
SOLE XMTR cb	U	U5
EXCHANGER cb	U	U6
cb	U	U2
FLUID LEVEL WARNING Lamp	U	U10
cb	U	U1
LEVEL Lamp	U	U12
PRESSURE Lamp	P	P5.1
TIME M4	U	U14
cb		
Cmd Intlk	P	P2
Sensing	P	P4
ILLATOR FILAMENT cb		
Cmd Intlk	P	P2
Sensing	P	P4
ILLATOR FILAMENT AMPERES M2	P	P4
Lamp	P	P5.1
FLOW Lamp	P	P5.1
TEMP WARNING Lamp	P	P5.1
FLOW Lamp	P	P5.1

HPIR PANELS

XMTR PANEL NO. 1

PA COLL LOW TEMP WARNING Lamp	U	U9
POWER AMPLIFIER FILAMENT cb		
Standby Cmd Intlk	P	P2
Overload Sensing	P	P4
POWER AMPLIFIER FILAMENT VOLTAGE M3	P	P4
PUMP cb	P	P5.1
RADIATE Lamp	P	P5
RADIATE READY Lamp	P	P5
STANDBY Lamp	P	P5
WAVEGUIDE LOW PRESSURE WARNING Lamp	U	U11

XMTR PANEL NO. 2

Convenience Outlets	U	U13
MASTER OSCILLATOR		
BEAM cb	X	X1
BEAM AMPERES M3	X	X1
BEAM VOLTAGE M4	X	X1
OVERLOAD COLLECTOR cb		
Rad Cmd Intlk	P	P5
Overload Sensing	X	X1
POWER AMPLIFIER		
BEAM cb	X	X2
BEAM AMPERES m	X	X2
BEAM VOLTAGE m	X	X2
OVERLOAD BODY CURRENT cb		
Rad Cmd Intlk	P	P5
Overload Sensing	X	X2
REGULATOR SCREEN & FILAMENT cb	X	X2
REGULATOR VOLTS M6		
M6 pos	X	X1
PA pos	X	X2

XMTR PANEL NO. 3

DEGENERATION FUNCTION MONITOR M3		
BRIDGE NULL pos	X	X4
CAVITY XTAL pos	X	X4
DISC pos	X	X3
LO POWER pos	X	X3
REF LEVEL pos	X	X3
DEGENERATION POWER SUPPLY MONITOR M4		
+250V pos	P	P7
+150V pos	P	P7
-100V pos	P	P7
+6.3V pos	P	P4
FORWARD RF POWER M5		
M6 pos	X	X1
PA pos	X	X2
REFLECTED RF POWER M1	X	X2
TRANSMITTER NOISE M2		
AM pos	XW	XW
FM pos	X	X4

INDEX TO INDICAT

CHASSIS INDICATORS

ANTENNA POSITIONING SYSTEM

ANTENNA PEDESTAL

	SUBSYSTEM	DETAILED DIAGRAM
Convenience Outlets	U	U13
M1 (NULL METER)	A	A2
TROUBLE Lamp	U	U13

AZIMUTH CONTROL AMPLIFIER

J2 Synchro Error	A	A2
J3 Synchro Error	A	A2
J4 Tracking Error	AUTO	AUTO1
J5 Tracking Error	AUTO	AUTO1
J7 Reference Generator	AUTO	AUTO1

ELEVATION CONTROL AMPLIFIER

J2 Synchro Error	A	A2
J3 Synchro Error	A	A2
J4 Tracking Error	AUTO	AUTO1
J5 Tracking Error	AUTO	AUTO1
J7 Reference Generator	AUTO	AUTO1

MOTOR GEN ASSY

MOTOR GENERATOR MG1	A	A2
-------------------------------	-----------	----

POWER SUPPLIES

XMTR LV POWER SUPPLY

J3 -100V	P	P7
J4 +250V	P	P7
J5 +150V	P	P7
J6 -6.3V	P	P4
J7 +6.3V	P	P4

-100, 100/150, 250VDC PS (LEFT HAND - RSG)

J5 -100V	P	P6
J2 +250V	P	P6
J3 100/150V	P	P6

-100, 100/150, 250VDC PS (RIGHT HAND - RCVR)

J5 -100V	P	P6
J2 +250V	P	P6
J3 100/150V	P	P6

CHASSIS INDICATORS

RECEIVER

APPROACH DOPPLER AMPLIFIER

J3 AGC	RW*
J2 DOPPLER	RW*

DOPPLER AMPLIFIER

J2 AGC	RW*
J4 DOPPLER	
ECOM	ECOM*
Rcvr Weekly	RW*

FERRITE MODULATOR DRIVER AMPL UNIT 1 (FRONT)

J2 IN	R
J3 EXT SIG	Used
J4 OUT	R
J5 IN	R
J6 EXT SIG	Used
J7 PHASE	R
J8 OUT	R

FERRITE MODULATOR DRIVER AMPL UNIT 2 (SIDE)

J2 IN	R
J3 EXT SIG	Used
J4 OUT	R
J5 IN	R
J6 EXT SIG	Used
J8 OUT	R

RF RECEIVER ASSEMBLY

J1 RF TEST POINT	Used
----------------------------	------

* Perform following checks:

1. HPDR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWC-1120-511-12/1, Table 16, Steps 1-14
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.

** Perform following checks:

1. HPDR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWC-1120-511-12/1, Table 16, Steps 1-14
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.
3. TWC-1120-511-12/1, Table 20, Step 8
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.

TO INDICATORS

SUBSYSTEM DETAILED
DIAGRAM

.....	RW*	....	RW2
.....	RW*	....	RW2
.....	RW*	....	RW1
.....	ECCM**	..	ECCM1
.....	RW*	....	RW1
.....	R	....	R2
.....	Used to inject signal		
.....	R	....	R2
.....	R	....	R2
.....	Used to inject signal		
.....	R	....	R2
.....	R	....	R2
.....	R	....	R2
.....	Used to inject signal		
.....	R	....	R2
.....	R	....	R2
.....	Used to inject signal		
.....	R	....	R2
.....	Used to inject signal		

CHASSIS INDICATORS

RECEIVER

RECEIVER KTCA

J2 DISCR H	.....	R	....	R1
J3 DISCR L	.....	R	....	R1
J4 REPELLER V	.....	R	....	R1
J5 ANODE DEGENERATION	.....	R	....	R1
J7 BAL	.....	R	....	R1
J8 BAL	.....	R	....	R1
J9 LIM GRD	.....	R	....	R1

RECEIVER TEST STRIP

J18 +250V	.....	P	....	P6
J19 +150V	.....	P	....	P6
J20 -100V	.....	P	....	P6
J21 +6.3V	.....	P	....	P3
J24 SIDE CHAN FEED THRU MON	.....	R	....	R2
J23 MAIN CHAN FEED THRU MON	.....	R	....	R2
J25 LO XTAL MON	.....	R	....	R1
J30 Ø1 GEN REF				
Ant Tck	.....	AUTO	....	AUTO1
Rcvr Weekly	.....	RW*	....	RW3
J31 Ø2 GEN REF	.....	AUTO	....	AUTO1

SIDE LOBE COMPARATOR AMPLIFIER

J2 SL AGC	.....	ECCM**	..	ECCM5
J4 COMP AGC	.....	ECCM**	..	ECCM4
J5 SL VIDEO	.....	ECCM**	..	ECCM5
J6 COMP VIDEO	.....	ECCM**	..	ECCM4

SIDE LOBE COMPARATOR

ENABLE Lamp				
Weekly Chks	.....	ECCM**	..	ECCM3-5
All Other Conditions	.....	SEE NOTE		
J4 GATE CMD	.....	ECCM**	..	ECCM4
J6 GATE CMD	.....	ECCM**	..	ECCM4

NOTE: Perform the following checks:

1. NRIN SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TCM-1230-11-12/1, Tables 11-20
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified diagram.
3. If above checks good and trouble occurred during suspected ECM environment, proceed to most appropriate diagram or ECCM12.

ing checks:

TCM checks 1-5
If a check is found, proceed to related diagram.

TCM-12/1, Table 16, Steps 8-15
If a bad check is found, locate bad step in INDEX TO INDICATORS and proceed to related diagram.

ing checks:

TCM checks 1-6
If a check is found, proceed to related diagram.

TCM-12/1, Table 16, Steps 13-15
If a check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified diagram.

TCM-12/1, Table 20, Step 8
If a bad check is found, locate bad step in INDEX TO INDICATORS and proceed to related ECCM diagram.

INDEX TO INDICA

CHASSIS INDICATORS

TARGET INTERCEPT COMPUTER

RANGE & AZIMUTH COMPUTER

RANGE dial

APPROACH-RECEDE sw:

APPROACH or RECEDE C C1

APPROACH-RECEDE sw: NORMAL

Sig Gen TS Chks AUTO AUTO2

Bad For Close Rng Tgts Only AUTO+ AUTO8

Memory AUTO+ AUTO7

Bad While Tracking or Attempting to

Track Target SEE NOTE

Range Unit Drive Chk AUTO AUTO2

AZIMUTH dial

APPROACH-RECEDE sw:

APPROACH or RECEDE C C1

APPROACH-RECEDE sw: normal AUTO AUTO4

Memory AUTO+ AUTO7

Bad While Tracking or Attempting to

Track Target SEE NOTE

ELEVATION & TIME OF FLIGHT COMPUTER

ELEVATION dial

APPROACH-RECEDE sw: APPROACH

or RECEDE C C2

APPROACH-RECEDE sw: normal AUTO AUTO4

Memory AUTO+ AUTO7

Bad While Tracking or Attempting to

Track Target SEE NOTE

TIME OF FLIGHT dial

APPROACH-RECEDE sw: APPROACH

or RECEDE C C2

APPROACH-RECEDE sw: normal AUTO AUTO4

Memory AUTO+ AUTO7

Bad While Tracking or Attempting to

Track Target SEE NOTE

RANGE INTERLOCK COMPUTER

IN RANGE Lamp C C3

OUT OF RANGE Lamp C C3

Either or Both Lamps Bad While Tracking or
Attempting to Track Target SEE NOTE

TRACKING COMPUTER

RANGE UNIT

J3 (REFERENCE) XW XW12

J4 (RANGE) AUTO AUTO2

GROUND SPEED COMPUTER

CALIBRATE M1 AUTO AUTO3

J2 TEST AUTO AUTO3

J3 TEST AUTO AUTO3

CHASSIS INDICATORS

TRANSMITTER

BNA & CT

J3 PH CONT

J4 AM CONT

J5 B+ CONT

J6 REF CONT

FERRITE SW CONT & PS

RADIATE INTLK OPEN IND Lamp

Radar Will Not Go Into Radiate

Ion Test

Arc Detector Test

J2 XTAL BAL

J3 SW MONITOR

J4 ISOLATION MOD I

XMTR KTCA

J2 DISCR H

J3 DISCR L

J4 REPELLER V

J5 ANODE DEGENERATION

J7 BAL

J8 BAL

J9 LIM GRD

MONITOR AMPLIFIER

J2 IF OUT

ISO-MOD SHORT ADJ

J4 NOISE MON

J6 COMMAND TEST

RF XMTR ASSEMBLY

J1 (RF Noise Test W12J1)

CODING DEVIATION, CODING AM Chk

RANGE & COD AMPL OSC

J3 CODING OUT

J5 RANGE REF

A

PER

TEST	SUBSYSTEM	DETAILED DIAGRAM
.....	X	X4
.....	X	X4
.....	X	X4
.....	X	X4
RT & PS		
OPEN INL Lamp		
Will Not Go Into Radiate	P	P5.1
.....	XW	XW1
Factor Test	XW	XW2
.....	XW	XW2
.....	X	X2
MOD I	X	X1
.....	X	X3
.....	X	X3
V	X	X3
GENERATION	X	X3
.....	X	X3
.....	X	X3
.....	X	X3
HER		
SHORT ADJ	XW	XW3
.....	X	X4
TEST	ECCM**	ECCM
ONLY		
Test W12J1)		
VIATION, CODING AM Chk	XWf	XW5
PL OSC		
.....	XWf	XW9
.....	XWf	XW6

MISCELLANEOUS INDICATORS

ANTENNA

Automatic Tracking			
Normal (non-ECM) condition	AUTO . . .	AUTO1	
Difficulty Tracking Close Range			
Targets Only	AUTO++ . .	AUTO6	
All Other Tracking Conditions		SEE NOTE	
Manual Hdwhl			
Local	A . . .	A2	
Remote	A . . .	A4	
Memory	AUTO++ . .	AUTO5	
Search			
Local	A . . .	A3	
Remote	A . . .	A4	

BLOWERS

Ant Ped			
PEDESTAL BLOWER	U	. . .	U7
Liquid Cooler			
BLOWER ASSY	U	. . .	U6
Radar Set Group			
CONSOLE BLOWER	U	. . .	U8
Xmtr Group			
BLOWER MOTOR	U	. . .	U5

IER

SHORT ADJ , ...	XW . . .	XW3
.	X . . .	X4
TEST	ECCM** . .	ECCM6
ONLY		
Test W12J1)		
DEVIATION, CODING AM Chk	XW/ . . .	XW5
WPL OSC		
W	XW/ . . .	XW9
.	XW/ . . .	XW6

† Perform following checks:

1. HPFR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1430-511-12/1, Table 18, Step 10
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified AUTO DIAGRAM.

tt Perform following checks:

1. MPR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. W9-1430-511-12/1, Table 20, Steps 2, 3, 4, 5, & 6
When first bad check is found, locate bad step name in INDEX to INDICATORS and proceed to specified AUTO diagram.

1 Perform following checks:

1. HFIR SYSTEM checks 1-4
If a bad check is found, proceed to related subsystem diagram.
2. TW-1630-511-17/1, Table 15, Steps 18-22
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified XV diagram.

INDEX TO INDICATORS

MISCELLANEOUS INDICATORS

SUBSYSTEM

DETAILED DIAGRAM

HEATERS/COOLER

Antenna Pedestal
PEDESTAL BLOWER U U7

HVPS

FREON HEATER HR1 U U2

Liquid Cooler

BLOWER ASSY U U6
GLYCOL HEATER HR1 U U1
ROTARY PUMP P P5.1

RSG

CONSOLE BLOWER U U8

RSG Console Heaters

HIGH HEATER (3.6KW) U U4
LOW HEATER (1050W) U U3

Xmtr Group Fan

BLOWER MOTOR U U5

MOTOR CAMS AND/OR SHAFTS

Rcvr LO Assy

Local Osc Tun Shaft R R1

Rf Xmtr Assembly

CAVITY TUNING MOTOR SHAFT X X4
LO TUNING MOTOR SHAFT X X3

MOTORS (28V TYPE)

Receiver LO Assy

LOCAL OSC TUNING B1 R R1

Rf Xmtr Assy

CAVITY TUNING B1 X X4
LOCAL OSC TUNING B1 X X3

RSG Cont Relay Assy

FIVE MIN DELAY B1 P P5

MISCELLANEOUS INDICATORS

SUBSYSTEM

MOTORS (AC TYPE)

Antenna Pedestal
Az Drive Motor A
El Drive Motor A
PEDESTAL BLOWER U

Elevation & TOF Cmptr

ELEVATION B2 C
TIME OF FLIGHT B1 C

Liquid Cooler

LIQUID COOLER UNIT
(BLOWER ASSY) A3 U
ROTARY PUMP A2 P

Motor Gen Assy

MOTOR-GEN MG1 A

Rf Rcvr Assy

ROTATING SCANNER MTR-GEN
Ant Tck AUTO
Rcvr Weekly RW*

Range & Azimuth Cmptr

AZIMUTH B3 C
RANGE B1 C

RSG

CONSOLE BLOWER U

Xmtr Group Fan

BLOWER MOTOR U

PUMPS

Liquid Cooler

ROTARY PUMP P

TO INDICATORS

INDICATORS	SUBSYSTEM	DETAILED DIAGRAM
.....	A	A2
.....	A	A2
.....	U	U7
.....	C	C2
.....	C	C2
MT A3	U	U6
.....	P	P5.1
.....	A	A2
MTR-GEN	AUTO	AUTO1
.....	RW*	RW3
.....	C	C1
.....	C	C1
.....	U	U8
.....	U	U5
.....	P	P5.1

RECEIVER TEST SET

Blower Motor	RW*	RW1
DISCHARGE CURRENT Meter	RW*	RW1
NOISE-REF Gen Meter		
NOISE pos	RW*	RW1
REF GEN pos	RW*	RW3
POWER ON Lamp	RW*	RW1

SIGNAL GENERATOR TEST SET

Blower Motor	AUTO	AUTO2
FREQUENCY Meter (all sw pos)	AUTO	AUTO2
FUNCTION Meter		
DEVIATION pos	AUTO	AUTO2
NOISE pos	ECCM**	ECCM1,2
PHASING pos	AUTO	AUTO2
SIGNAL pos	AUTO	AUTO2
POWER ON Lamp	AUTO	AUTO2

TRANSMITTER TEST SET

Blower Motor	XWf	XW5
CODING AM Meter	XWf	XW10
CODING PHASE Meter	XWf	XW11
DEVIATION NULL Meter	XWf	XW6
FUNCTION Meter		
AM PHASE pos	XWf	XW11
CODING AM pos	XWf	XW10
CODING DEV pos	XWf	XW9
RANGE DEV pos	XWf	XW7,8
POWER ON Lamp	XWf	XW5
TUNING BALANCE Meter	XWf	XW5
TUNING LEVEL Meter	XWf	XW5

RADAR TARGET SIMULATOR TEST SET

Blower Motor	D	D3
POWER ON Lamp	D	D3

B

INDEX TO INDICA

BCC PANEL INDICATORS

SUBSYSTEM

DETAILED DIAGRAM

ACTIVE Lamp	P	...	P5
CHANGE TARGETS (TCC) Lamp	M&L	...	M&L3
COAST Lamp	D	...	D2
DESTROY (FCC) Lamp	M&L	...	M&L3
DESTROY (TCC) Lamp	M&L	...	M&L3
DESTROY CIRCUIT OK Lamp (Firing Intlk Assy)	M&L	...	M&L3
DESTROYED (STATUS IND) Lamp	M&L	...	M&L3
FIRE pb Lamp	BCC ^φ	...	BCC5
FCC Scope			
Az Repeat Back Mark	BCC	...	BCC1
Eff Firing Rng Ring (HPIR Teks Tgt OK)	BCC	...	BCC4
Range Mark (HPIR Tracks Tgt OK) Incorrect for Close Rng Tgts Only	AUTO ⁺	...	AUTO8
Incorrect for all Rngs	BCC	...	BCC3
HPIR Will Not Track Tgt	SEE NOTE		
HEADSET			
No Audio (HPIR Cannot Track Tgt)	SEE NOTE		
No Audio (All Other Conditions)	D	...	D3
ILLUM LOCK Lamp			
HPIR Cannot Track Tgt	SEE NOTE		
All Other Conditions	D	...	D2
JAMMING Lamp	SEE NOTE		
MISSILE READY Lamps	BCC ^φ	...	BCC5
SEARCHING Lamp	A	...	A4
SIGNAL STRENGTH Meter			
HPIR Cannot Track Tgt	SEE NOTE		
All Other Conditions	DW ⁻	...	DW6
STANDBY Lamp	P	...	P2
TARGET ALTITUDE Meters			
HPIR Cannot Track Tgt	SEE NOTE		
All Other Conditions	BCC	...	BCC2
TARGET SPEED KM/HR Meter			
HPIR Cannot Track Tgt	SEE NOTE		
All Other Conditions	AUTO	...	AUTO3

LAUNCHER

Launcher Positioning	M&L	...	M&L1
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• Perform following ch

1. HPIR SYSTEM ch
If a bad check is
subsystem diagram
2. TWO-1130-511-127
When first bad
name in INDEX TO
specified NW dia

•• Perform following ch

1. HPIR SYSTEM ch
If a bad check is
subsystem diagram
2. TWO-1130-511-127
If a bad check is
in INDEX TO INDI
ECOM diagram.
3. TWO-1130-511-127
When first bad
name in INDEX TO
specified ECOM

/ Perform following ch

1. HPIR SYSTEM ch
If a bad check is
subsystem diagram
2. TWO-1130-511-127
When first bad
name in INDEX TO
specified NW dia

INDEX TO INDICATORS

* Perform following checks:

1. HPIR SYSTEM checks 1-5
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 16, Steps 8-10
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified XW diagram.

** Perform following checks:

1. HPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 16, Steps 13-15
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.
3. TM9-1430-511-12/1, Table 20, Step 8
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.

/ Perform following checks:

1. HPIR SYSTEM checks 1-4
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 15, Steps 18-22
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified XW diagram.

* Perform the following checks:

1. HPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 15, Steps 18-22
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to appropriate XW diagram.
3. Check that launcher takes lead angle
If launcher does not take lead angle proceed to MALL.
4. Proceed to BCCS

* Perform following checks:

1. HPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 20, Steps 1.1-1.7, 2
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified IW diagram.

† Perform following checks:

1. HPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 18, Step 10
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified AUTO diagram.

NOTE: Perform the following checks:

1. HPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Tables 14-20
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified diagram.
3. If above checks good and trouble occurred during suspected ECM environment, proceed to most appropriate diagram on ECOM12.

INDEX TO INDICATORS

WEEKLY CHECKS

POWER SUPPLIES

	SUBSYSTEM	DETAILED DIAGRAM
Check Phase	P	P1
Check Voltage	P	P1
Standby	P	P2
MO Filament Supply	P	P4
PA Filament Supply	P	P4
RSG 6.3 vdc PS	P	P3
Pedestal 6.3 vdc PS	P	P3
Xmtr 6.3 vdc PS	P	P4
Radiate Ready	P	P5
Radiate	P	P5
Xmtr Low Voltage PS	P	P7
RSG Low Voltage PS	P	P6
Pedestal Low Voltage PS	P	P6
300, 90 vdc PS	A	A1
28 vdc PS	P	P2

/ Perform following checks:

1. HFIR SYSTEM checks 1-4
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 15, Steps 18-22
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified XW diagram.

* Perform following checks:

1. HFIR SYSTEM checks 1-5
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 16, Steps 8-10
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified PW diagram.

** Perform following checks:

1. HFIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TM9-1430-511-12/1, Table 16, Steps 1-15
If a bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.
3. TM9-1430-511-12/1, Table 20, Step 8
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified ECOM diagram.

WEEKLY CHECKS

TRANSMITTER

Ion Test	
Master Osc & Power Ampl	
Master Osc Ind.	
Power Ampl Ind.	
FORWARD RF POWER m	
ARC DET TEST pb: dep	
ARC DET TEST pb: rel	
Power Ampl Cavities	
Meter - XTAL BAL jack	
All Other Indications	
Collector Voltage	
Isomodulator Null	
Master Osc Forward RF Power	
Arc Detector	
Reference Level	
Discriminator	
LO Crystal Current	
Klystron Mode & AFC Lock	
Nulling Functions	
Cav Tun & Bridge Nulling	
Isomodulator Short Adj.	
AM Noise	
FM Noise	
Range Deviation	
TUN LEVEL & BAL m	
DEV NULL m	
FUNCT m & sw: RNG DEV	
FUNCT m: APP-REC sw: APPROACH	
Coding Deviation	
Coding Tuning	
Coding AM	
Coding Phase	
Range Phase	
Check & Adj MO Freq	

TO INDICATORS

	SUBSYSTEM	DETAILED DIAGRAM
.....	XW	XW1
Ampl	X	X1
.....	X	X2
REC m	XW	XW2
pb: dep	X	X2
pb: rel	XW	XW2
AL jack	X	X2
ications	X	X2
.....	X	X1
RF Power	X	X1
.....	XW	XW2
.....	X	X3
.....	X	X3
.....	X	X3
Lock	X	X4
.....	X	X4
Nulling	X	X4
Adj.	XW	XW3
.....	XW	XW4
.....	X	X4
AL m	XW	XW5
.....	XW	XW6
RNG DEV	XW	XW7
REC sw: APPROACH	XW	XW8
.....	XW	XW9
.....	XW	XW9
.....	XW	XW10
.....	XW	XW11
.....	XW	XW12
req	XW	XW13

WEEKLY CHECKS

RECEIVER

Reference Level	R	R1
Discriminator	R	R1
Local Oscillator	R	R1
Klystron Mode & AFC Lock	R	R1
Main & Side Feed Nulling		
Chks using RECVR FUNCT/XMTR NOISE m	R	R2
Chks using Multimeter	RW	RW4
Noise Figure	RW*	RW1
Transmitter Noise	RW*	RW2
Spin Motor Speed	RW*	RW3
Special Ckt System Noise	ECCM**	ECCM1
Special Ckt Calibration	ECCM**	ECCM2
Special Ckt Adjust		
ENABLE lamp extinguishes	ECCM**	ECCM3
BLANK ADJ	ECCM**	ECCM4
SIDE LOBE ADJ	ECCM**	ECCM5
Special Ckt Modulation	ECCM**	ECCM6
Special Lock	ECCM**	ECCM7

INDEX TO INDICATORS

WEEKLY CHECKS

TARGET INTERCEPT COMPUTER

	SUBSYSTEM	DETAILED DIAGRAM
Rng & Az Cont Ampl Bal.	C . . .	C1
El & TOF Cont Ampl Bal.	C . . .	C2
Approaching Target		
IN RANGE lamp	C . . .	C3
RANGE dial	C . . .	C1
AZIMUTH dial	C . . .	C1
ELEVATION dial	C . . .	C2
TIME OF FLIGHT dial	C . . .	C2

Receding Target		
OUT OF RANGE lamp	C . . .	C3
RANGE dial	C . . .	C1
AZIMUTH dial	C . . .	C1
ELEVATION dial	C . . .	C2
TIME OF FLIGHT dial	C . . .	C2

TIC Voltage Calibration		
Approach - R9	CW . . .	CW1
Approach - R6	CW . . .	CW2
Approach - R7	CW . . .	CW3
Approach - R10	CW . . .	CW4
Recede - R5	CW . . .	CW5
Recede - R7	CW . . .	CW6

TRACKING COMPUTER

Pause Lock Rate	D . . .	D1
Stonevall Adj		
FREQ sw: CAL 1	DWff . . .	DW1
FREQ sw: pos 1	DWff . . .	DW2
Speed Calibration		
TGT SPEED m & VTVM ind zero	DWff . . .	DW3
All Other Indications	DWff . . .	DW4
Range Balanced Mod Balance	AUTO . . .	AUTO2
Range Unit Drive	AUTO . . .	AUTO2
Ground Speed Computer	AUTO . . .	AUTO3
Ground Speed Computer Calibration	AUTO . . .	AUTO3

// Perform following checks:

1. NPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TMO-1430-511-12/1, Table 18, Steps 7 & 8
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified DW diagram.

++ Perform following checks:

1. NPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TMO-1430-511-12/1, Table 20, Steps 2, 3, 4, 5 & 6
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified AUTO diagram.

WEEKLY CHECKS

ANTENNA POSITIONING

	SUBSYSTEM
Az Servo Ampl	
Ant Follows Az Handwheel	A . . .
Servo Meter	AW . . .
El Servo Ampl	
Ant Follows El Handwheel	A . . .
Servo Meter	AW . . .
Az Balance.	A . . .
El Balance.	A . . .
Az Memory Balance	AUTO++
El Memory Balance	AUTO++
Az Hum Balance	AW . . .
Az Synchro Gain	A . . .
El Hum Balance	AW . . .
El Synchro Gain	A . . .
Az Spin Ref Gain	AUTO . . .
El Spin Ref Gain	AUTO . . .
El Low Search	A . . .
El High Search	A . . .
El Sector Width	A . . .
El Search Rate	A . . .
Az 60° Search	A . . .
Az 120° Search	A . . .
Az 360° Search	A . . .
Az Sector Width	A . . .
Az Search Rate	A . . .
Minimum El Cutout	C . . .
Minimum Launch Angle	M&L . . .
Memory Sensitivity	D . . .
Memory Duration	D . . .
Time of Flight	
TGT SPEED Meter	DWff . . .
TIME OF FLIGHT dial	AUTO . . .
Effective Range	BCC . . .
Maximum Time of Flight	AUTO . . .
Minimum Range	AUTO . . .
Computer Memory	AUTO+ . . .
Lock Thru Launch	M&L . . .

TO INDICATORS

SUBSYSTEM DETAILED
DIAGRAM

WEEKLY CHECKS

SUBSYSTEM DETAILED
DIAGRAM

TARGET SIGNAL

Dynamic Locking & Holding Sensitivity	D	D3
Pause Lock Rate	D	D1
Lock Hold	D	D1
Lock Disable	D	D1
Sig Gen TS Disc Bal		
FUNCT sw: SIGNAL (Lock Lamp, TGT SPEED m)	DW~	DW4
FUNCT sw: NOISE	DW~	DW1
FUNCT sw: SIGNAL (Lock Lamp)	DW~	DW2
LOCK sw: LOCK HOLD	DW~	DW5
Locking & Holding Sensitivity	DW~	DW4
System Noise Disc Bal	DW~	DW5
Stonewall Adj		
FREQ sw: CAL 1	DW~	DW1
FREQ sw: pos 1	DW~	DW2
Antenna Alinement	DW~	DW6
Automatic Track	AUTO	AUTO1
Locking Sensitivity	AUTO	AUTO1
Az Track	AUTO	AUTO1
EI Track	AUTO	AUTO1
Track-On-Jam		
DUTY CYCLE sw: 100%	ECCM**	ECCM8
Antenna Alines	ECCM**	ECCM9
DUTY CYCLE: 80%, 60%, 40%	ECCM**	ECCM10
Blanking On Scope	ECCM**	ECCM11
Az Radar Gain	AUTO	AUTO1
EI Radar Gain	AUTO	AUTO1

Perform following checks:

1. NPPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1430-511-12/1, Table 20, Steps 1.4-1.7, 2
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified DW diagram.

† Perform following checks:

1. NPPIR SYSTEM checks 1-6
If a bad check is found, proceed to related subsystem diagram.
2. TWO-1430-511-12/1, Table 18, Step 10
When first bad check is found, locate bad step name in INDEX TO INDICATORS and proceed to specified AUTO diagram.

HPIR CONDITIONS

This is a list of switch settings of the HPIR for the conditions used in the starred checks of this manual. These are minimal conditions. If the HPIR is in a condition below that required for a check, it must be brought up by using TM9-1430-511-12/1. However, if the HPIR is in a condition above that required (i.e., in *MO on* or *PA on* when *Radiate* is called for) it need not be brought down to the lesser condition.

WARNING: When operating antenna inside building, MO & PA BEAM cb's must be OFF!

Main Power

MAIN POWER sw: ON
RSG MAIN POWER cb: ON

Standby

Main Power (in *Remote*, also - BCC MAIN POWER cb: ON, & BCC FCC CONSOLE POWER sw: ON)
Xmtr MAIN POWER cb: ON
PA FIL cb: ON
MO FIL cb: ON
REG SCREEN & FIL cb: ON
Xmtr STANDBY pb (in *Remote*, BCC STANDBY pb): dep & rel

Radiate

Standby + approx 5 min
Xmtr RADIATE pb (in *Remote*, BCC ACTIVE pb): dep & rel

MO on

Radiate
MO BEAM cb: ON

PA on

MO on
PA BEAM cb: ON

Antenna Operate

Radiate
Az Stow: Off
El Stow: Off
El Holding: Off
SAFE-OPERATE sw: OPERATE
MOTOR GENERATOR cb: ON

Local

LOCAL-REMOTE sw: LOCAL
Xmtr Door open

Remote

LOCAL-REMOTE sw: REMOTE
Xmtr Door closed

NOTE: For HPIR SYSTEM checks 1-5, the LOCAL-REMOTE sw will be left in the position it was in when the

CKT
COND

**Power:
Radiate**

LVPS sw: all pos
DEGEN PS sw: all pos
LVPS m: in tol all pos
DEGEN PS m: in tol all pos
MO FIL A m: in tol
PA FIL V m: in tol

IND

CKT
COND

Ant Pos

Antenna Operate
 AUTO-MAN sw: MAN
 Hdwhls: individually rotated
 Search pbs: individually dep & rel
 Ant does not drift & moves properly for all
 conditions

IND

CKT
COND

**Computer
Radiate**

Position ant above 53 #.
Perform Target Intercept Computer daily-
Approach-Recede Tgt (Steps 1 & 2, Table 10,
TM-511-12/1)
All checks in tol

IND

CKT
COND

Xmtr

PA *or*

```

Antenna above 200 m
FORWARD RF POWER sw: PA
DEGEN FUNCT sw: CAV XTAL & BRIDGE NULL
NOISE sw: FM
HF DISABLE pb: dep & rel
FORWARD RF POWER m: in to l
DEGEN FUNCT m (CAV XTAL): lock
DEGEN FUNCT m (BRIDGE NULL): min
NOISE m: rises when HF DISABLE pb dep
NOISE m: min when HF DISABLE pb rel

```

IND

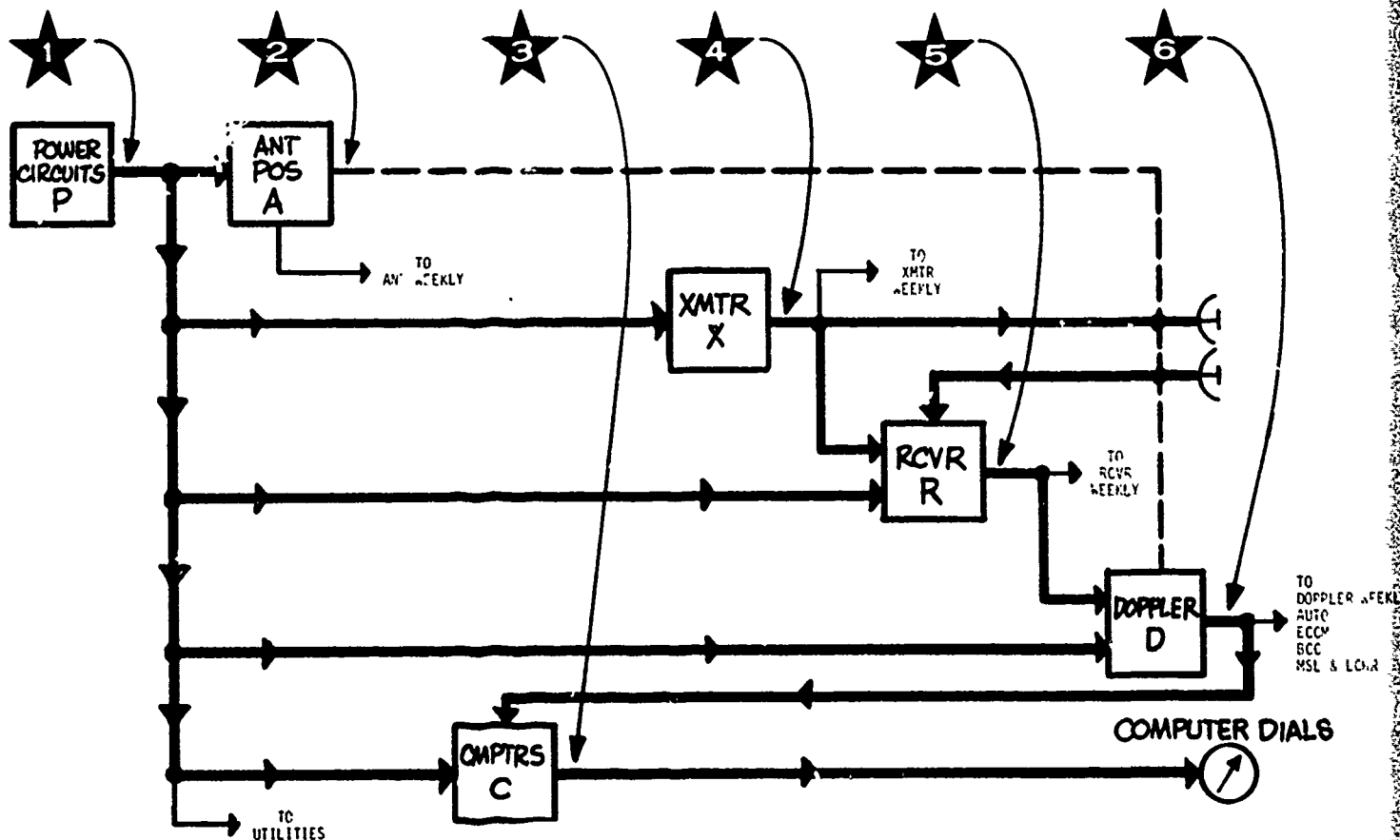
CKT
COND

Rcvr

PA 01

```
RCVR FUNCT sw: REF LEVEL, MAIN FEED, & SIDE LOBE
RCVR FUNCT m (REF LEVEL): lock
RCVR FUNCT m (MAIN FEED): min
RCVR FUNCT m (SIDE LOBE): min
```

IND



A

in the position it was in when the bad indication was first noted.

above 200 μ
 RF POWER sw: PA
 FCT sw: CAV XTAL & BRIDGE NULL
 FM
 LE pb: dep & rel
 RF POWER m: in to l
 FCT m (CAV XTAL): lock
 FCT m (BRIDGE NULL): min
 rises when HF DISABLE pb dep
 min when HF DISABLE pb rel

ET sw: REF LEVEL, MAIN FEED, & SIDE LOBE
 ET m (REF LEVEL): lock
 ET m (MAIN FEED): min
 ET m (SIDE LOBE): min

★
 CKT
 COND

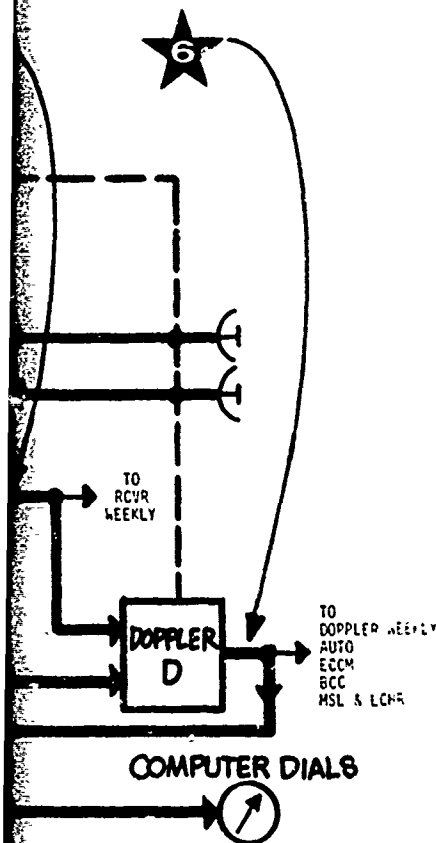
IND

COND

IND
 COND

IND

Doppler
 Radiate
 Local
 WBT sw: WBT OFF
 LOCK sw: LOCK HOLD, LOCK DISABLE, & NORMAL
 LOCK lamp: on (LOCK HOLD), off (LOCK DISABLE),
 pause lock (NORMAL)
 TARGET SPEED m: steady (LOCK HOLD), sweep
 (LOCK DISABLE)
 Radiate
 Local
 WBT sw: WBT OFF
 MO & PA BEAM cb's: off
 AUTO-MAN sw: AUTO
 LOCK sw: LOCK HOLD until MEMORY lamp flashes
 then to NORMAL
 MEMORY lamp: on for 10 sec then off
 PA on
 Local
 WBT sw: WBT OFF
 Antenna stop locked above 800 μ E1
 SAFE-OPERATE sw: SAFE
 RCVR FUNCT/XMTR NOISE sw: NOISE FIGURE
 LOCK sw: NORMAL
 VOLUME cont: turned fully cw
 Radar Tgt Sim TS: energized & hooked up
 (fig 1.1, TM-511-12/1)
 Radar Tgt Sim SELECTOR sw: SIGNAL
 Radar Tgt Sim ATTENUATOR: rotated
 LOCK lamp: stays on
 Loudspeaker: Doppler audio



SUBSYSTEM

P (Power)
 A (Ant Pos)
 C (Cmptr)
 X (Xmtr)
 R (Rcvr)
 D (Doppler)
 U (Utility)
 AW (Ant Weekly)
 CW (Cmptr Weekly)
 XW (Xmtr Weekly)
 RW (Rcvr Weekly)
 DW (Doppler Weekly)
 AUTO
 ECCM
 BCC
 MSL (Msl & Lchr)

HPIR SYSTEM checks

1 (Power only)
 1-2 (thru Ant Pos)
 1-3 (thru Cmptr)
 1-4 (thru Xmtr)
 1-5 (thru Rcvr)
 1-6 (all)
 1 (Power only)
 1-2 (thru Ant pos)
 1-3 (thru Cmptrs)
 1-4 (thru Xmtr)
 1-5 (thru Rcvr)
 1-6 (all)
 1-6 (all)
 1-6 (all)
 1-6 (all)
 1-6 (all)

NOTE: LOCAL-REMOTE sw: same as when trouble occurred.

★ 1 CKT Main Power
COND Main Power
IND LINE VOLT m: correct ind

★ 2 CKT Standby Energize
COND Standby
IND Battle Short sw: stet
Any push-to-test lamp: comes on when dep

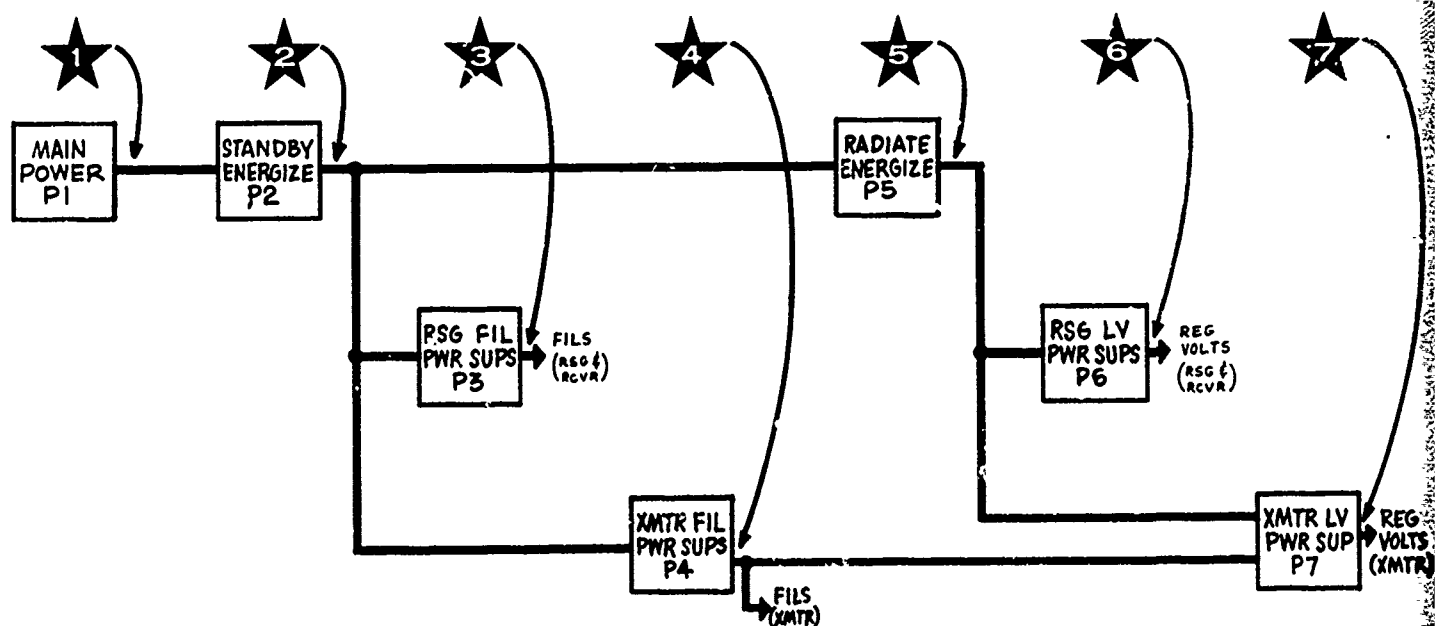
★ 3 CKT RSG Fil Pwr Sups
COND Standby
IND LV PWR SUPS sw: LH +6.3V & RH +6.3V
LV PWR SUPS m: in tol for both pos

★ 4 CKT Xmtr Fil Pwr Sups
COND Standby
IND DEGEN PWR SUP sw: +6.3V
DEGEN PWR SUP m) all in tol
MO FIL AMP m)
PA FIL VOLT m)

★ 5 CKT Radiate Energize
COND Radiate
IND RSG RADIATE lamp: on

★ 6 CKT RSG Lv Pwr Sups
COND Radiate
IND LV PWR SUPS sw: LH +250V, +100V, -10V
RH +250V, +150V, -10V
LV PWR SUPS m: all in tol

★ 7 CKT Xmtr Lv Pwr Sup
COND Radiate
IND DEGEN PWR SUP sw: +250V, +150V, -10V
DEGEN PWR SUP m: all in tol

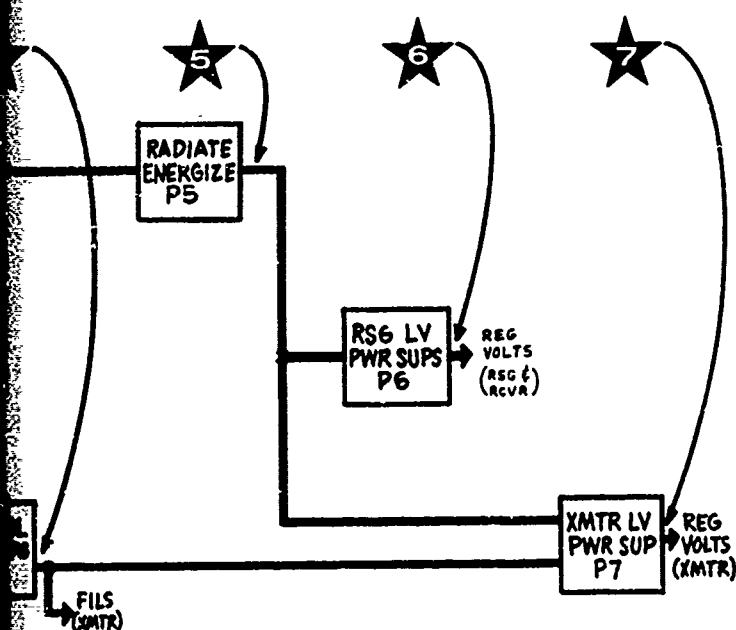
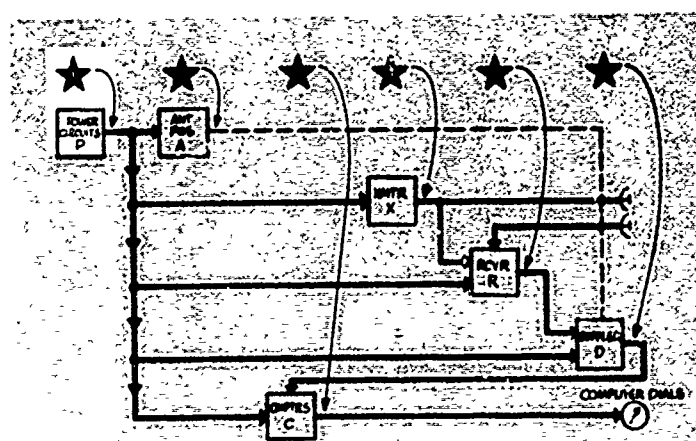


★
 4
 CKT
 COND
 Xmt Fil Pwr Sups
 Standby
 DEGEN PWR SUP sw: +6.3V
 DEGEN PWR SUP m)
 MO FIL AMP m) all in tol
 PA FIL VOLT m)

★
 5
 CKT
 COND
 IND
 Radiate Energize
 Radiate
 RSG RADIATE lamp: on

★
 6
 CKT
 COND
 IND
 RSG Lv Pwr Sups
 Radiate
 LV PWR SUPS sw: LH +250V, +100V, -100V
 RH +250V, +150V, -100V
 LV PWR SUPS m: all in tol

★
 7
 CKT
 COND
 IND
 Xmt Lv Pwr Sup
 Radiate
 DEGEN PWR SUP sw: +250V, +150V, -100V
 DEGEN PWR SUP m: all in tol

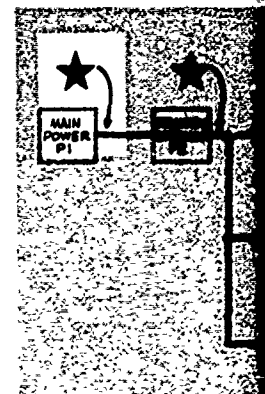


2

3

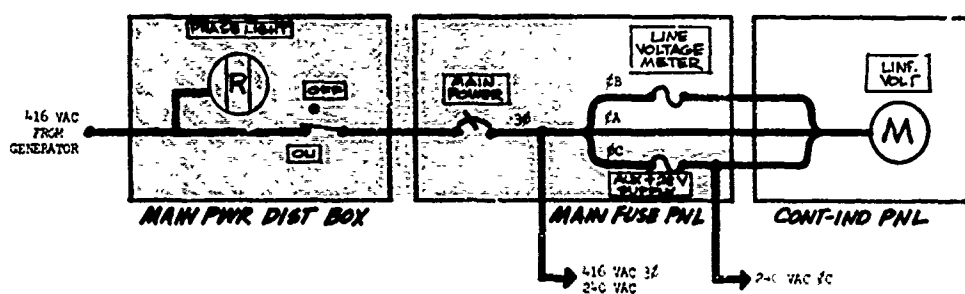
4

5



★ CKT
COND
IND Generator Power
Gen operating & cabled to KPIR
PHASE LIGHT: on

★ CKT
COND
IND Main Power Sw
Above chk good
This ckt bad

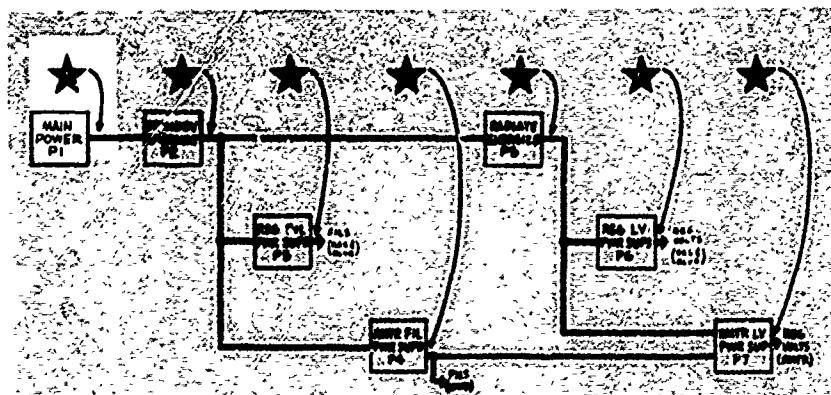


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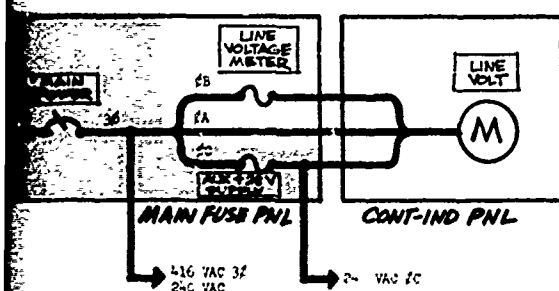
4

5

6



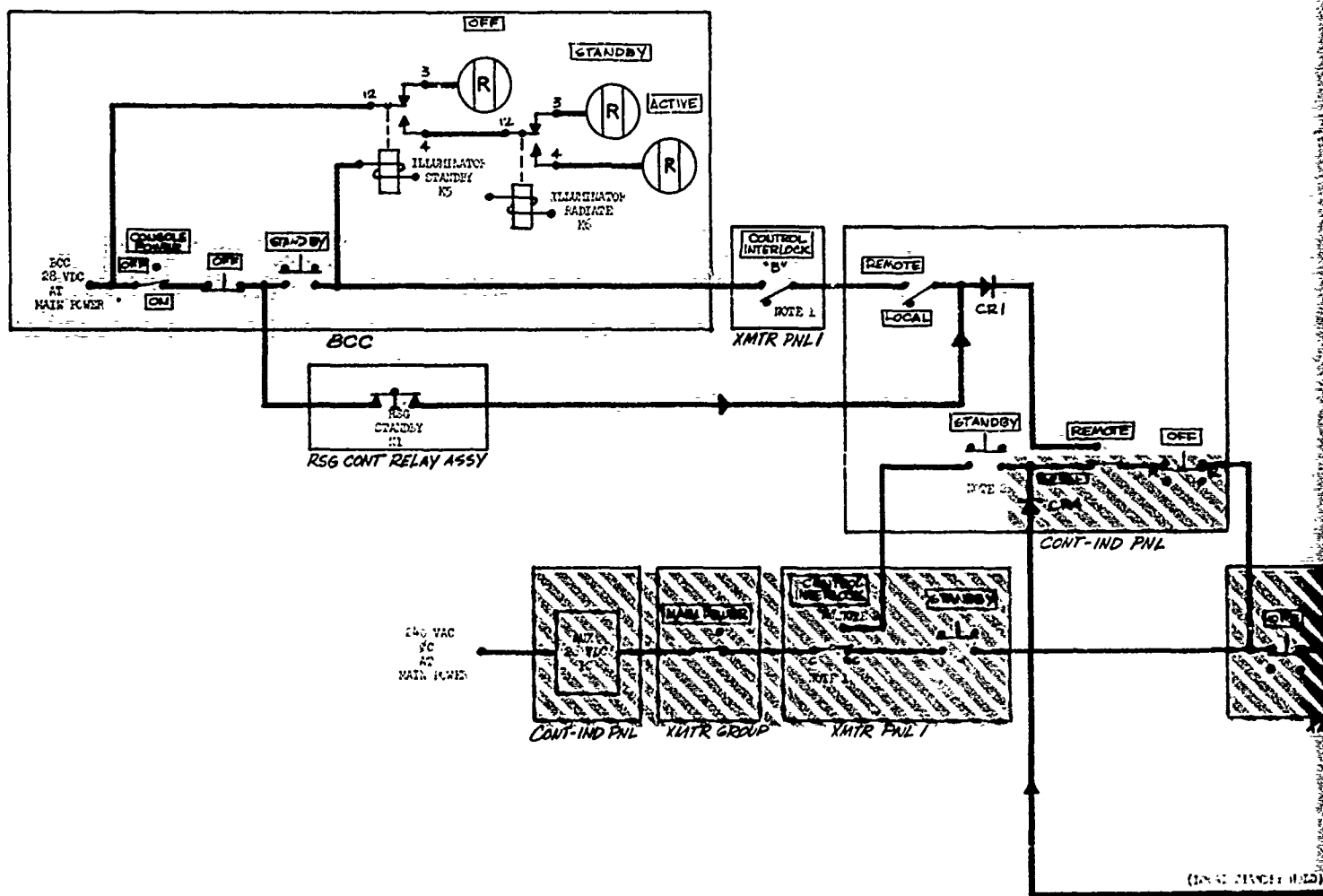
to HPIR



Generator Power_____

Main Power Sw_____

13
MAIN POWER P1



NOTE 1: Sw in position shown when XMTR door open.

NOTE 2: If **1** thru **6** good and HPIR cannot be placed into Standby from RS6, then Cont-Ind Pnl STANDBY pb or CONTROL INTERLOCK sw "A" deck bud.

6

NOTE: HPIR in *Local* for all P-2 checks.

CKT
COND

Main Power

Xmtr INTERI

Xmtr INTERLOCK OVERRIDE pb: dep & held

Xmtr STANDBY pb: dep & held

Heat-exchanger blower: on

CKT
COND

Xmtr Intlks

Main Power

Battle Short sw: NORMAL

Xmtr STANDBY pb: dep & held

Heat-exchanger blower: on



7

8

9

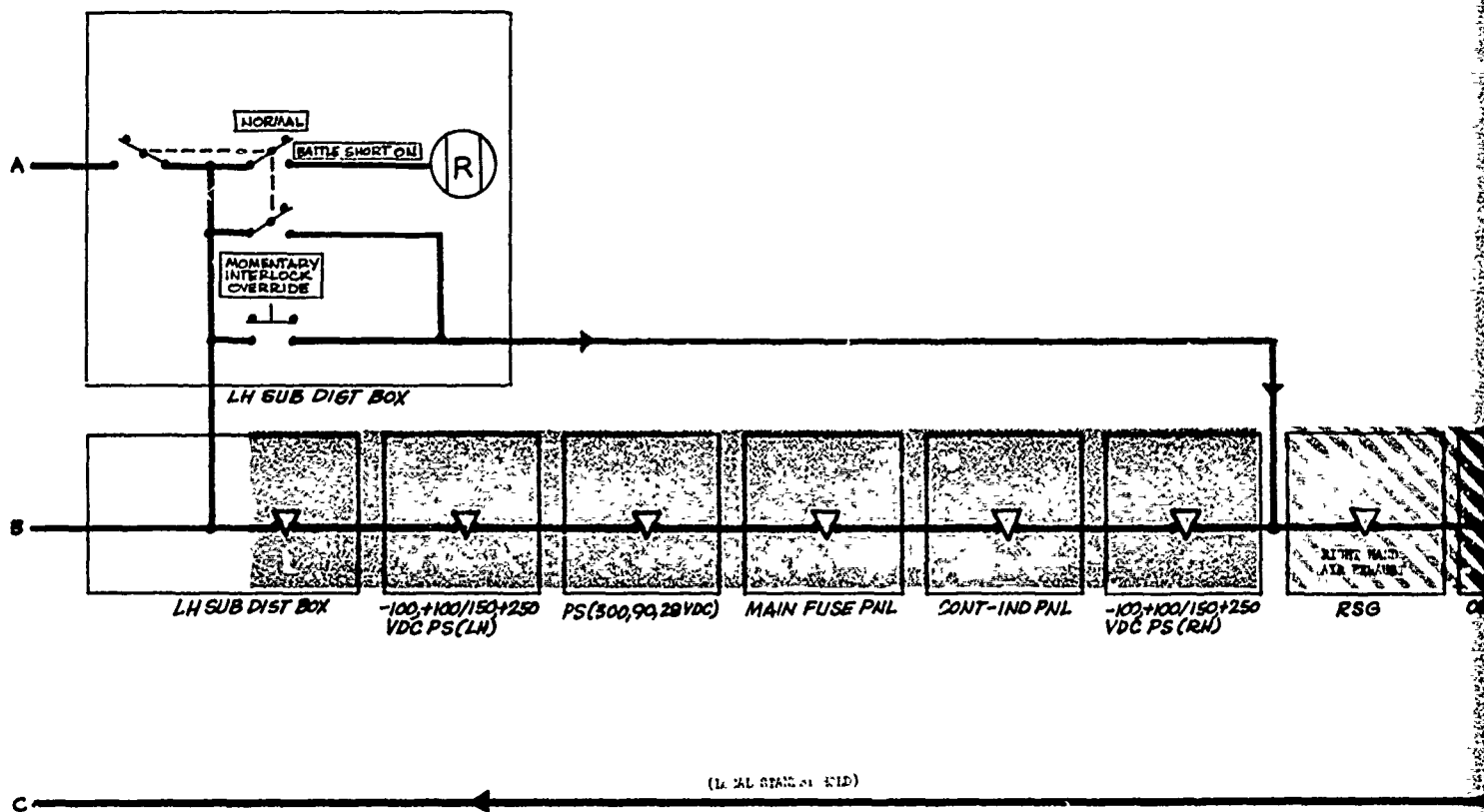
★ CKT RSG Air Intlks & Contactor
COND Two men req
Main Power
 Battle Short sw: on
 LV PWR SUPS sw: either 6.3V pos
 Xmtr STANDBY pb: dep & held
IND LV PWR SUPS m: other than max left

★ CKT RSG Drawer Intlks
COND Two men req
Main Power
 Battle Short sw: NORMAL
 LV PWR SUPS sw: either 6.3V pos
IND Xmtr STANDBY pb: dep & held
 LV PWR SUPS m: other than max left

★ CKT 28 VDC PS
COND *Main Power*
IND Xmtr STANDBY pb: dep & held
 Any push-to-test lamp: on when d

★ CKT Standby Hold
COND *Main Power*
IND Xmtr STANDBY pb: dep & rel
 Any push-to-test lamp: on when d
 (See Note 2)

★ CKT Remote Standby
COND Above chks good
IND This ckt bad



A

10

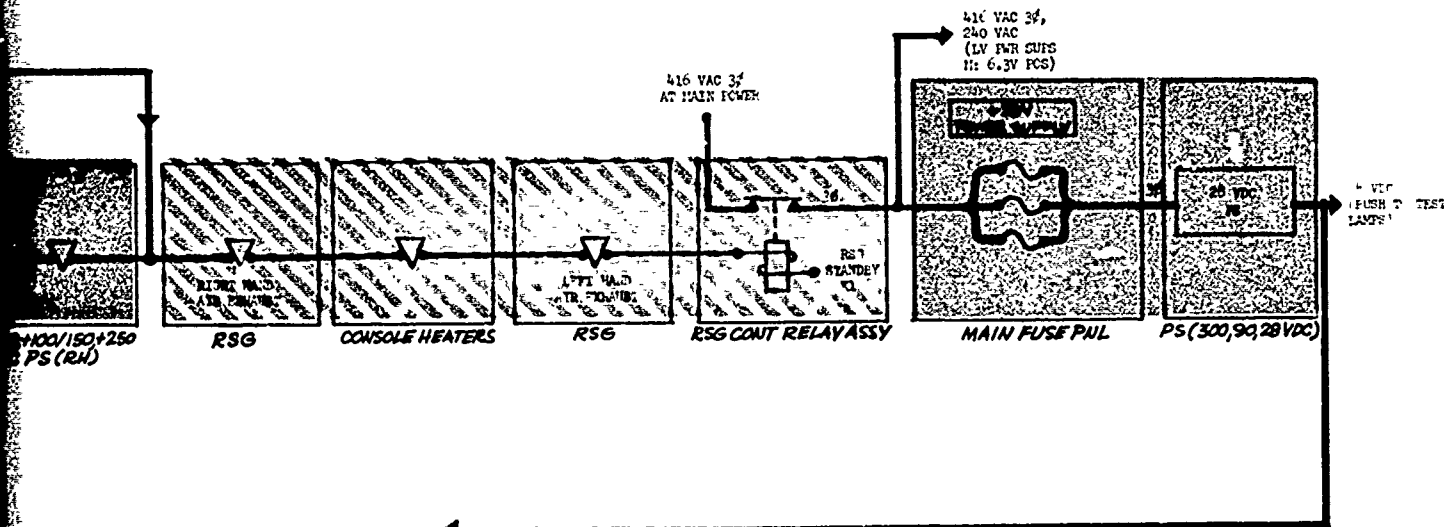
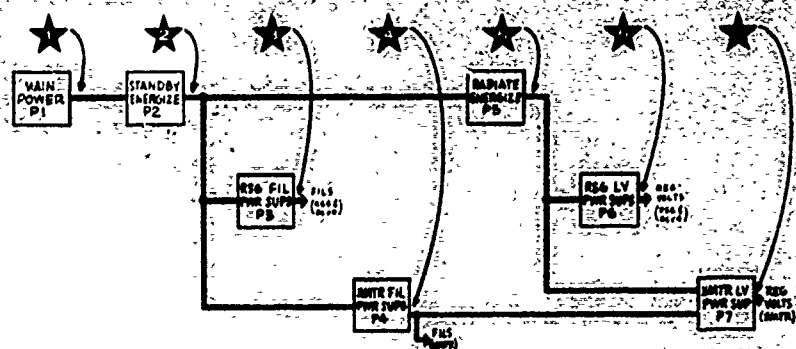
11

12

28 VDC PS
 In Power
 STANDBY pb: dep & held
 push-to-test lamp: on when dep

Standby Hold
 In Power
 STANDBY pb: dep & rel
 push-to-test lamp: on when dep
 (see Note 2)

Note Standby
 Give chks good
 Is ckt bad



Xmtr Standby Cmd _____

Xmtr Intlks _____

RSG Drawer Intlks _____

RSG Air Intlks & Contactor _____

28 VDC PS _____

Standby Hold _____

Remote Standby _____

B

STANDBY ENERGIZE P2

7

1 ★ CKT Meter
COND Standby
IND LV PWR SUPS sw: LH +6.3V & RH +6.3V
LV PWR SUPS m: in tol for either nos

2 ★ CKT RSG (LH) Fil Sup
COND Standby
IND LV PWR SUPS sw: LH +6.3V
LV PWR SUPS m: in tol

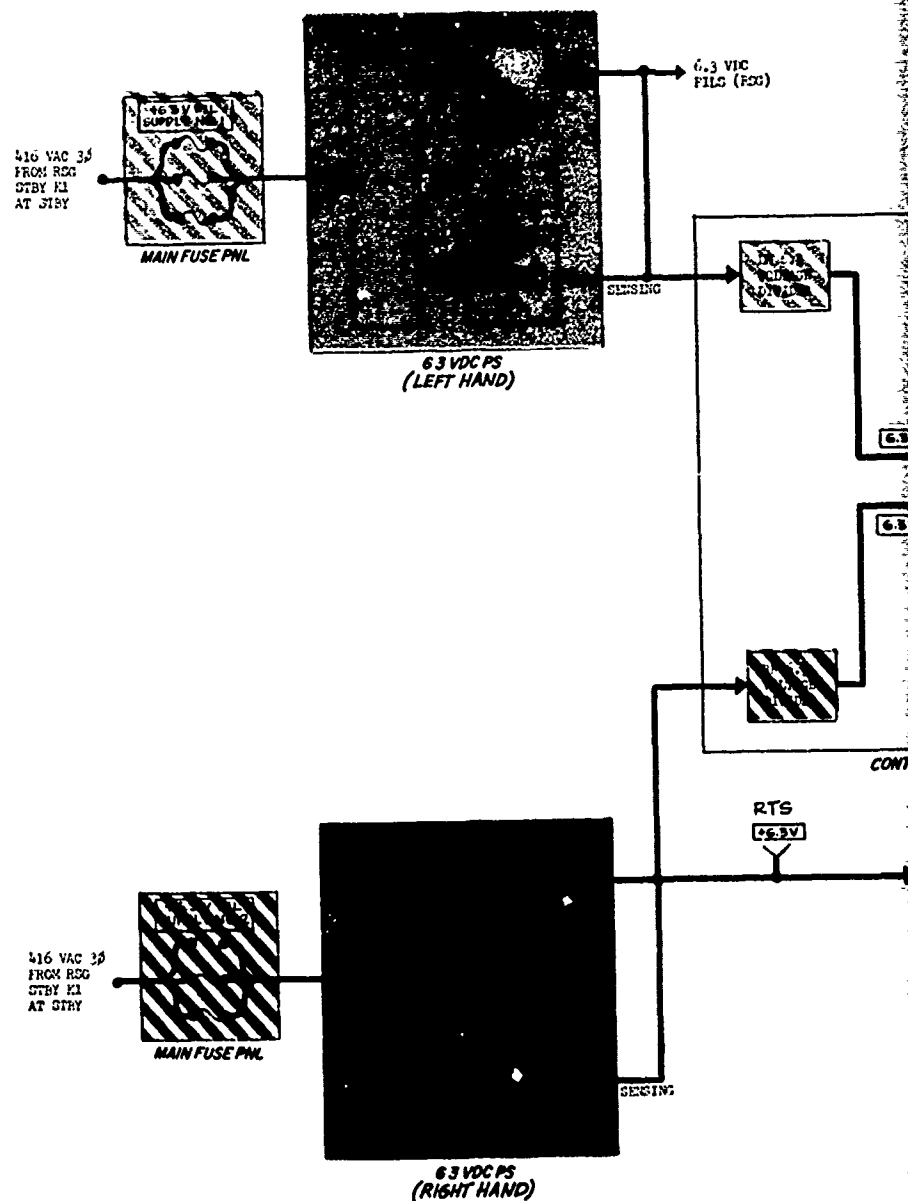
★ CKT 6.3 VDC PS (LH)
COND Standby
LV PWR SUPS sw: LH +6.3V
Swap the two 6.3 VDC PS chassis
LV PWR SUPS m: still out of tol
IND

★ CKT No. 1 (LH) Fuse & Volt Div
COND Above chks good
IND This ckt bad

3 ★ CKT Rcvr (RH) Fil Sup
COND Standby
IND LV PWR SUPS sw: RH +6.3V
LV PWR SUPS m: in tol

★ CKT 6.3 VDC PS (RH)
COND Standby
LV PWR SUPS sw: RH +6.3V
Swap the two 6.3 VDC PS
IND LV PWR SUPS m: still out

★ CKT No. 2 (RH) Fuse and Volt
COND Above chks good
IND This ckt bad

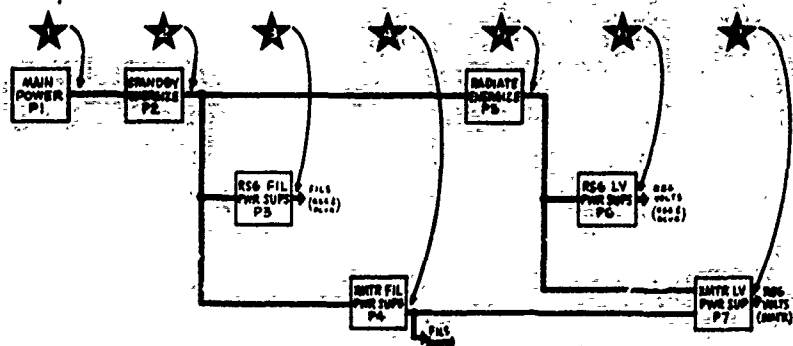


A

(RH) Fil Sup
 by
 MR SUPS sw: RH +6.3V
 MR SUPS m: in tol

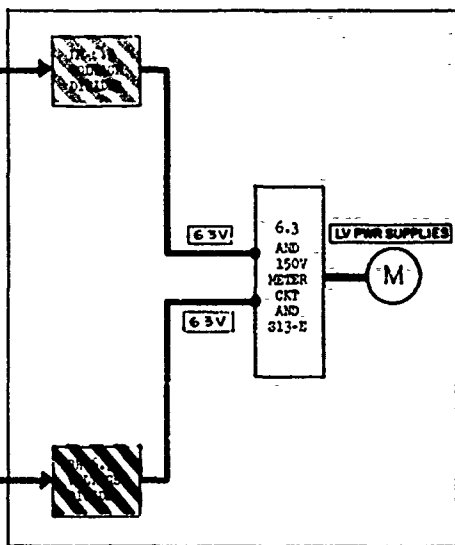
CKT 6.3 VDC PS (RH)
 COND Standby
 LV PWR SUPS sw: RH +6.3V
 Swap the two 6.3 VDC PS chassis
 IND LV PWR SUPS m: still out of tol

CKT No. 2 (RH) Fuse and Volt Div
 COND Above chks good
 IND This ckt bad



6.3 VDC
 FILS (RSG)

SENSING



RTS

6.3V

6.3 VDC
 FILS (RSG)

SENSING

Meter _____

RSG (LH) Fil Sup

6.3 VDC PS (LH) _____

No. 1 (LH) Fuse & Volt Div _____

Rcvr (RH) Fil Sup

6.3 VDC PS (RH) _____

No. 2 (RH) Fuse & Volt Div _____

B

RSG FIL PWR SUPS P3

9

1

2

3

A



CKT
COND
IND

Ac Pwr Input
Standby
DEGEN PWR SUPS m (+6.3V) or PA FIL VOLTS m: in tol



CKT
COND
IND

MO Fil
Standby
MO FIL AMP m:



CKT
COND
IND

Xmtr Fil
Standby
DEGEN PWR SUP sw: +6.3V
DEGEN PWR SUP m: in tol



CKT
COND
IND

PA Fil
Above chks good
This ckt bad



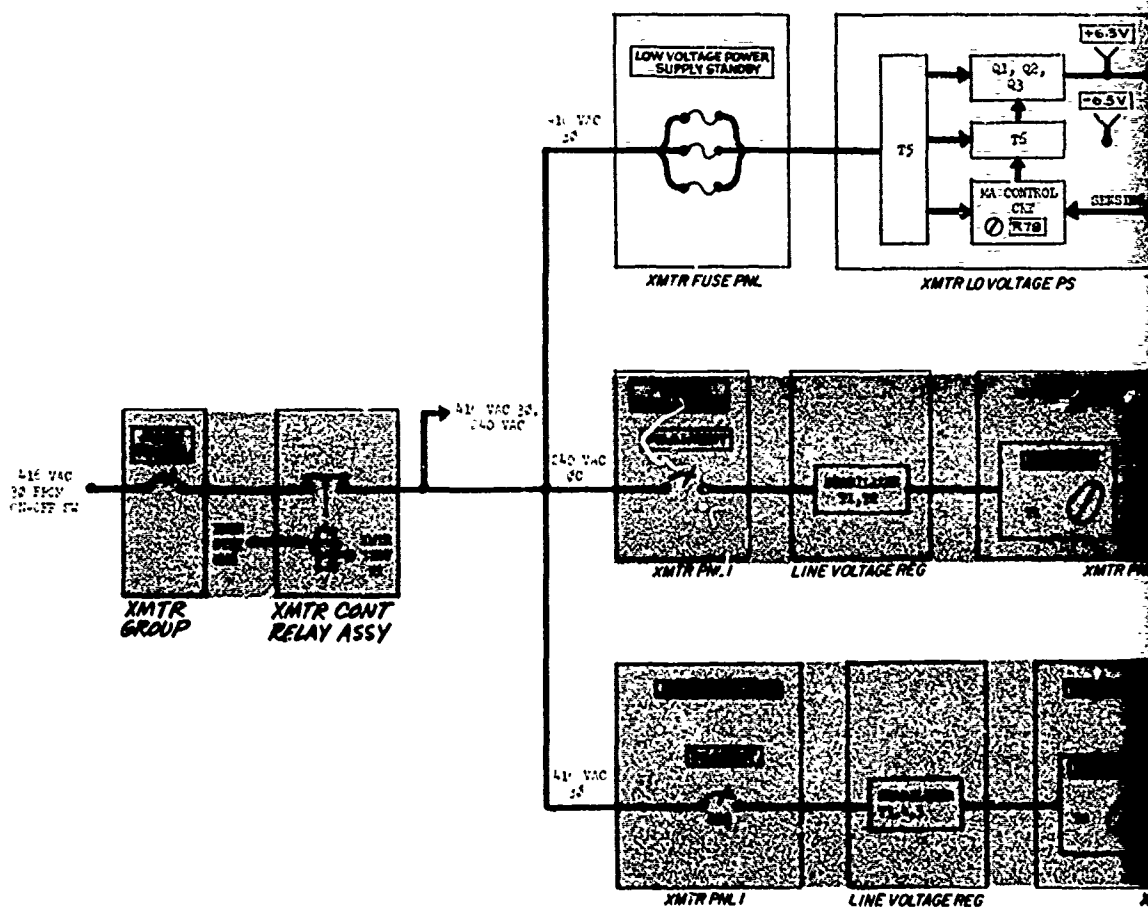
CKT
COND

Xmtr 6.3 VDC SUP
Standby
Multimeter set to measure dc voltage connected
between +6.3V & -6.3V jacks on Xmtr Lo
Voltage PS
Meter reads +6.3 VDC



CKT
COND
IND

Xmtr Fil Monitor
Above chks good
This ckt bad



A

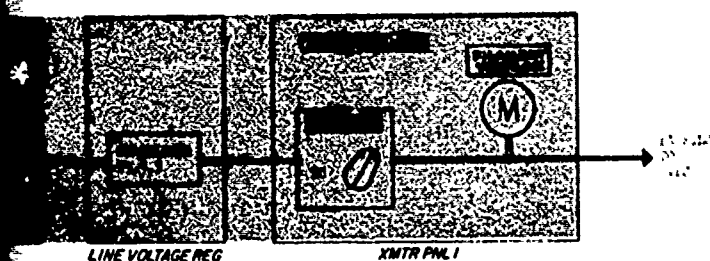
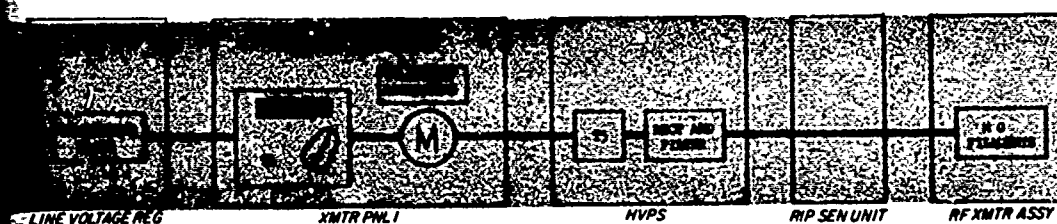
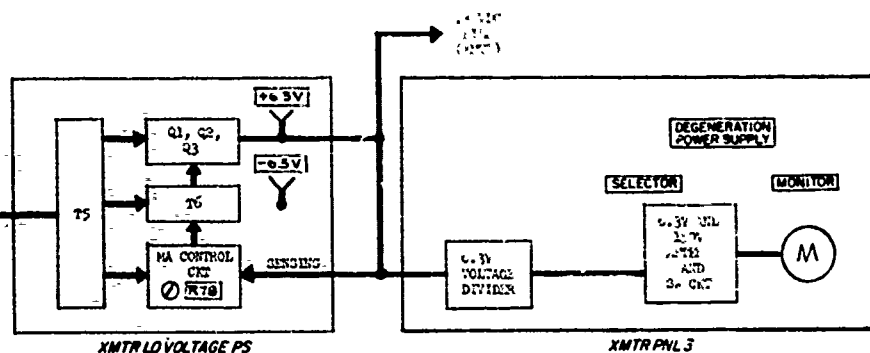
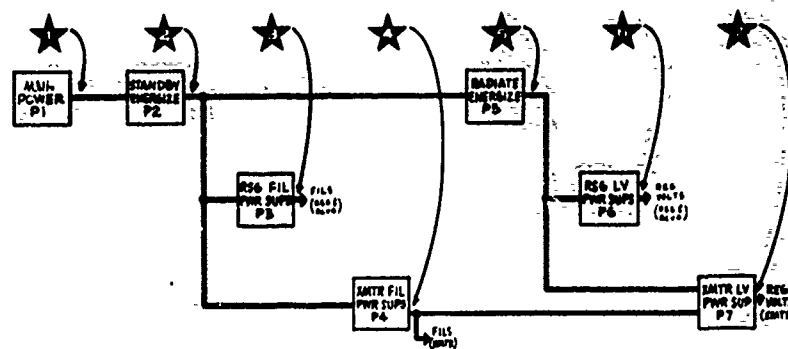
4

5

6

★ CKT MO Fil
COND Standby
IND MO FIL AMP m: in tol

★ CKT PA Fil
COND Above chks good
IND This ckt bad



Ac Pwr Input _____

Xmtr Fil _____

Xmtr 0.3 VDC Sup _____

Xmtr Fil Monitor _____

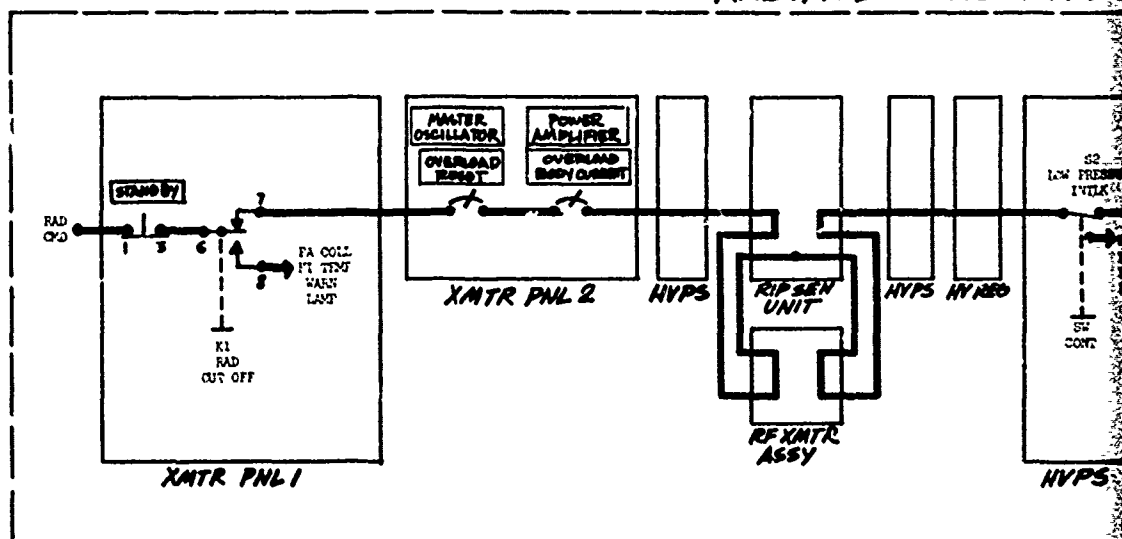
MO Fil _____

PA Fil _____

NOTE: HPIR IN LOCAL FOR ALL P-5 CHECKS

- | | | |
|---|-------------|--|
| ★ | <u>CKT</u> | Radiate Ready |
| | <u>COND</u> | Standby + approx 5 min (if HPIR in Radiate, dep & rel Xmtr STANDBY pb) |
| | <u>IND</u> | Xmtr RADIATE READY lamp: on |
| ★ | <u>CKT</u> | Standby Lamp |
| | <u>COND</u> | Main Power
OFF pb: dep & rel
Xmtr STANDBY pb: dep & rel |
| | <u>IND</u> | STANDBY lamp: on |
| ★ | <u>CKT</u> | Timer Motor |
| | <u>COND</u> | Standby |
| | <u>IND</u> | STANDBY lamp goes off approx 5 min after STANDBY pb is dep |
| ★ | <u>CKT</u> | Radiate Ready Lamp |
| | <u>COND</u> | Above chks good |
| | <u>IND</u> | This ckt is bad |
| ★ | <u>CKT</u> | Xmtr Radiate Lamp |
| | <u>COND</u> | Standby |
| | <u>IND</u> | RADIATE READY lamp: on
Xmtr RADIATE pb: dep & held
Xmtr RADIATE lamp: on |

RADIATE CMD INTL



★ CKT
COND

Radiate Intlks

Standby

Xmtr RADIATE pb: dep & held

DEGEN PWR SUP sw: +250 VDC

IND

DEGEN PWR SUP m: other than max left

★ CKT
COND

Radiate Warning Lamps

Standby

HVPS LOW PRESS lamp

MO LO FLOW lamp

PA BODY LOW FLOW lamp

PA COLL LOW FLOW lamp

PA COLL HI TEMP WARN lamp

RAD INTLK OPEN IND lamp

} off (if any on, go to
RADIATE WARNING LAMPS P5.1)

★ CKT
COND
IND

Overload CB's

Standby

MO OVERLOAD RESET cb: ON (if OFF, go to X1)

PA OVERLOAD BODY CURRENT cb: ON (if OFF, go to X2)



If lamps off and cb's on, signal trace RADIATE CMD INTLKS

★ CKT
COND

Xmtr Radiate Hold

Standby

Xmtr RADIATE READY lamp: on

Xmtr RADIATE pb: dep & rel

IND

RSG RADIATE lamp: on

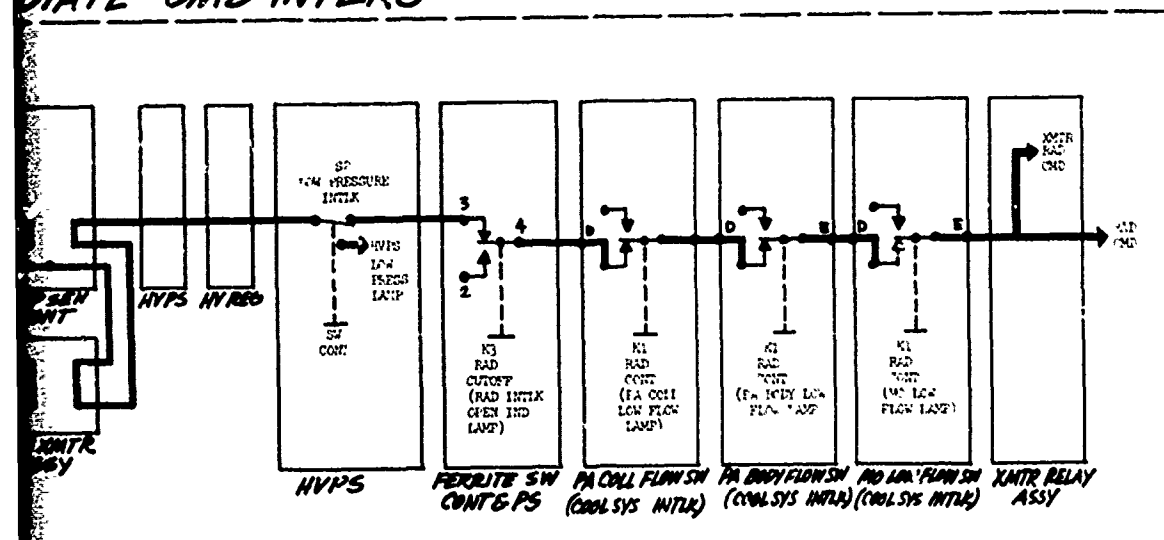
★ CKT
COND
IND

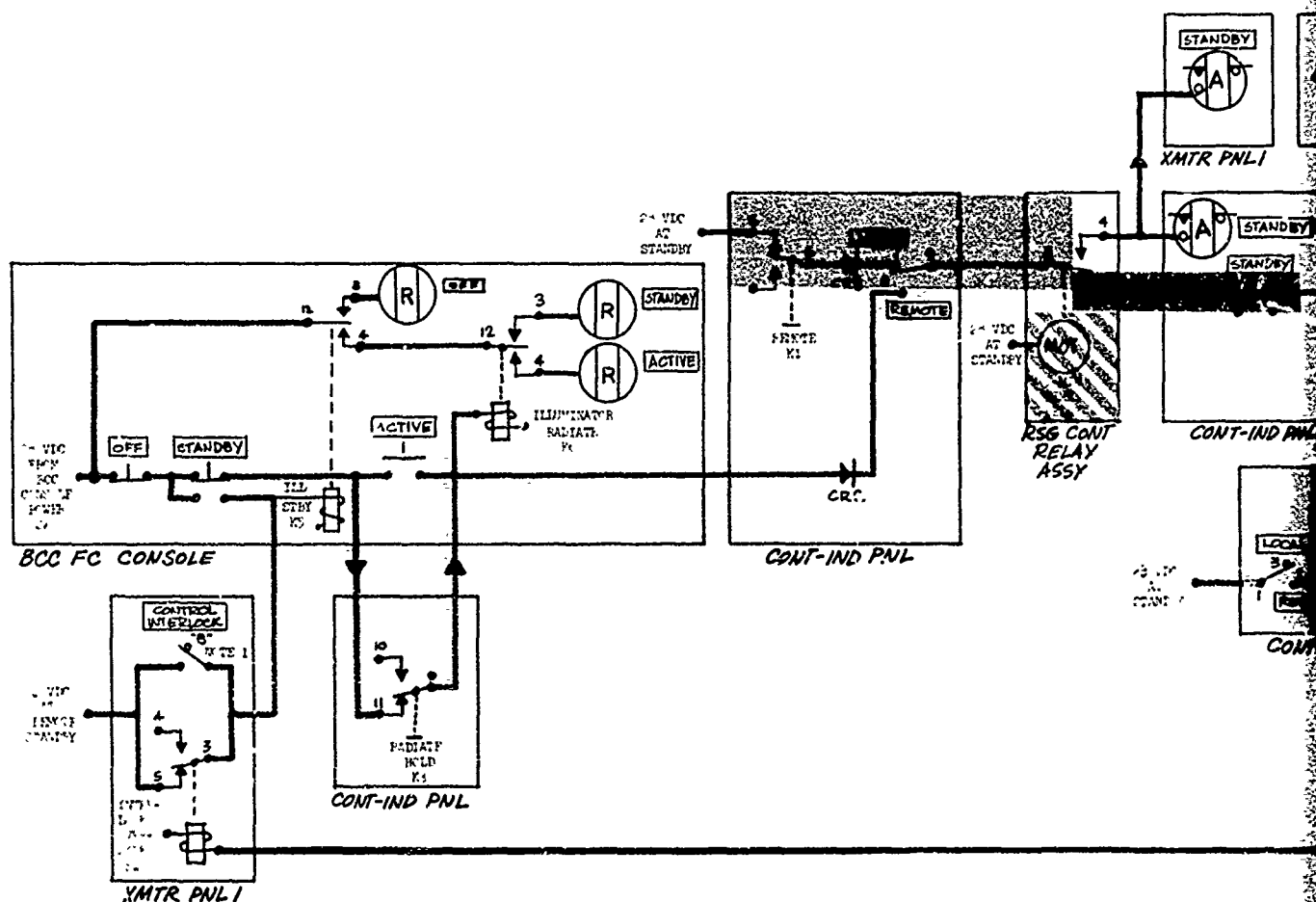
Remote Radiate

Above chks good

This ckt bad

RADIATE CMD INTLKS



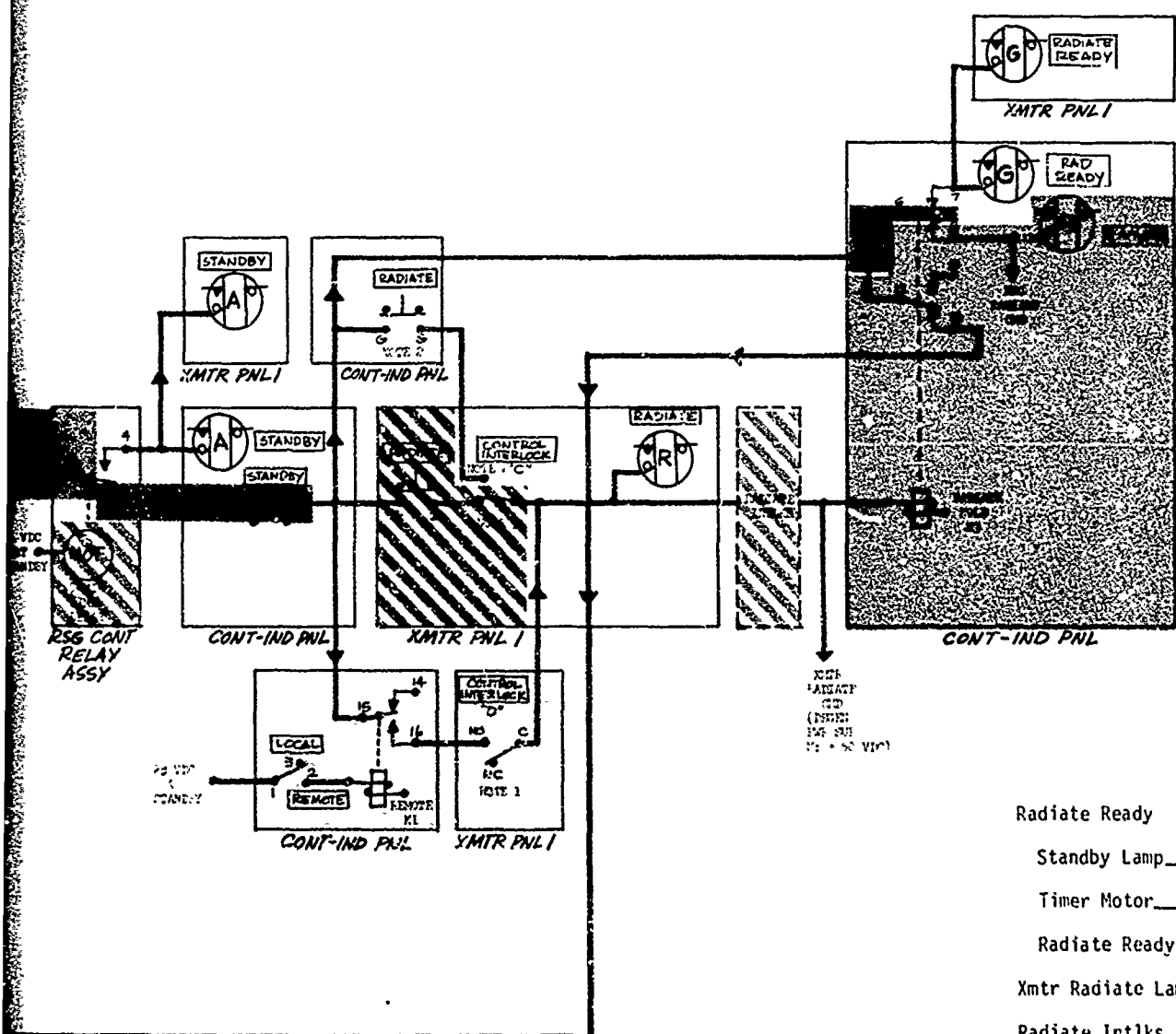
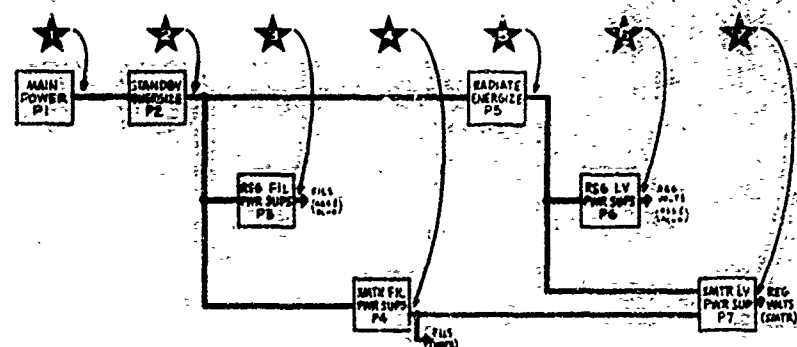


NOTE 2: If **1** thru **4** good and HPIR cannot be placed into Radiate from RSG, then Cont-Ind Pnl RADIATE pb or CONTROL INTERLOCK sw "C" deck bad.

4

5

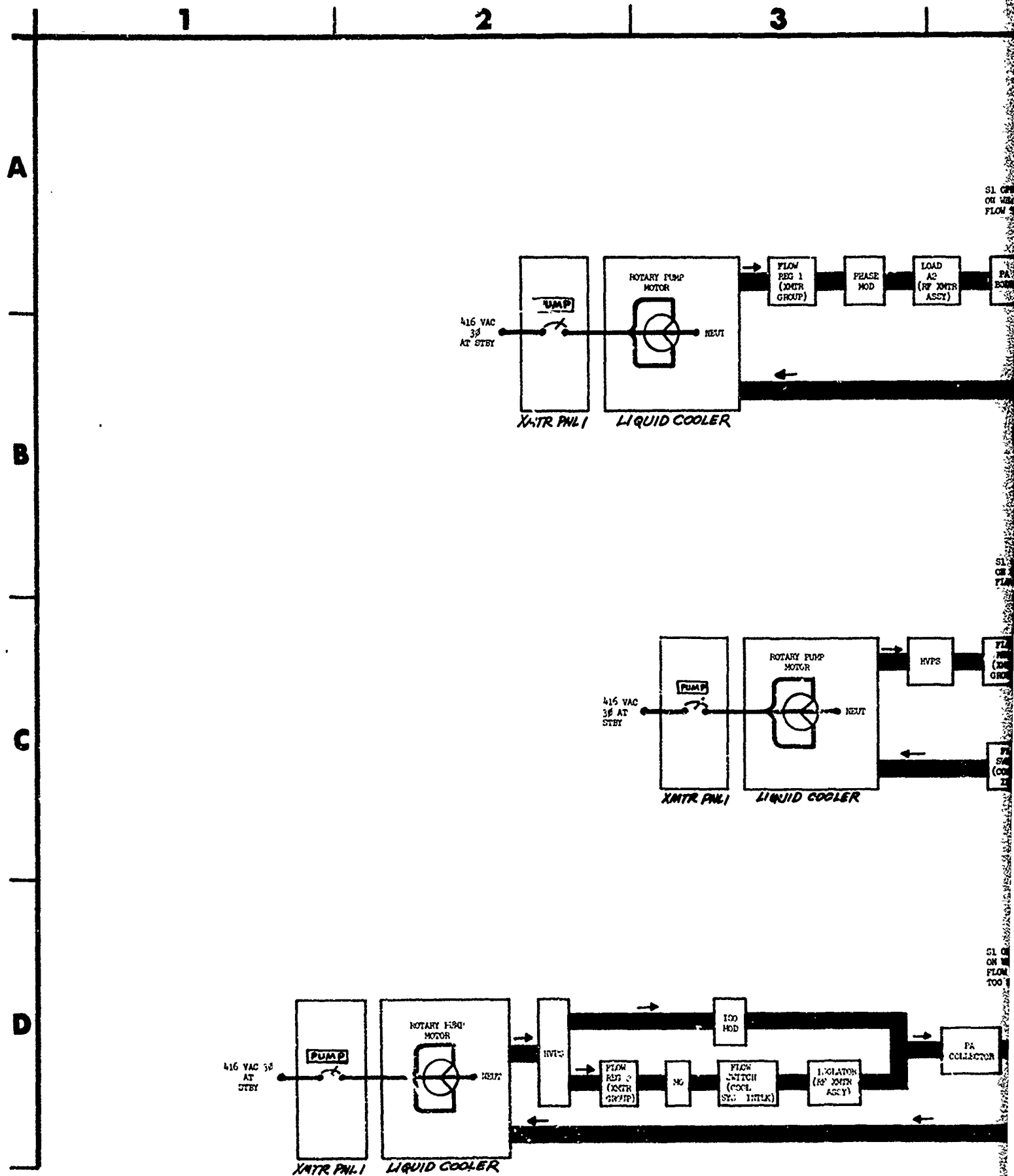
6



B

RADIATE ENERGIZE P5

13

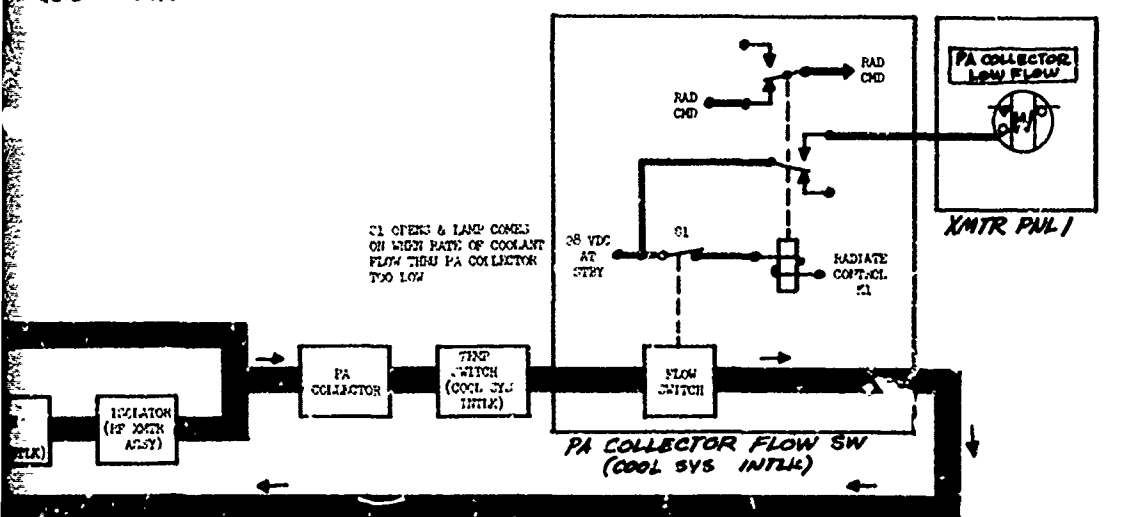
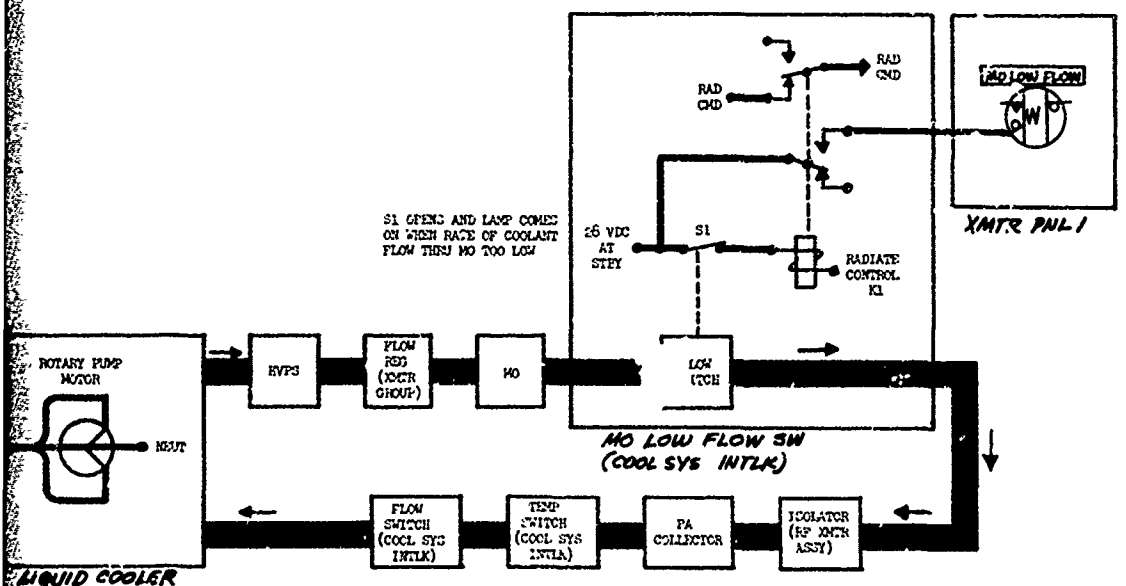
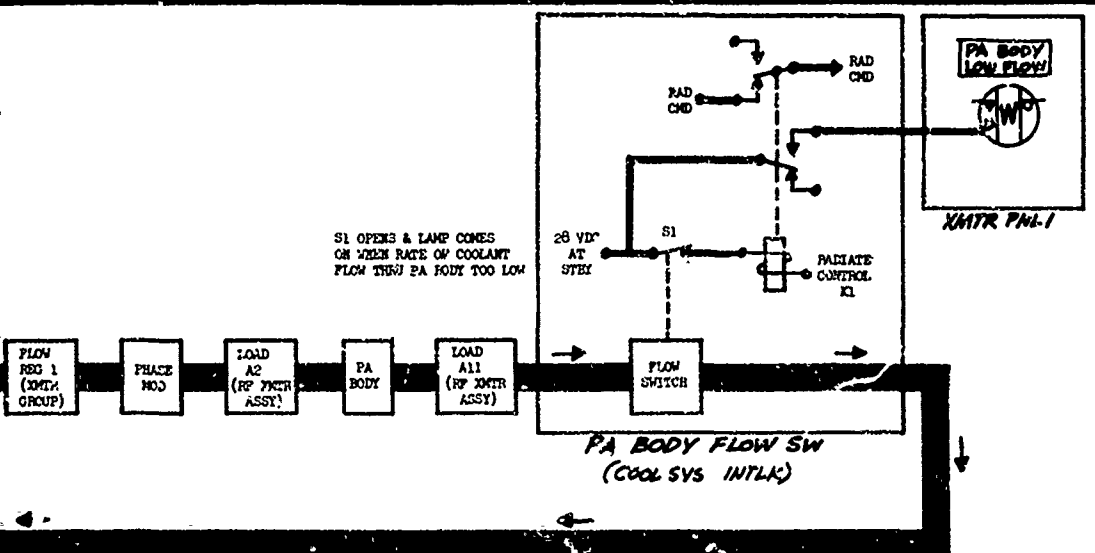


3

4

5

6



B

1

2

3

A

B

C

D



CKT
COND

Arcing Control
RAD INTLK RESET pb: dep & rel
PA BEAM cb: OFF
Eng to Radiate
RAD INTLK OPEN IND lamp: off (for 2.5 min)

IND



CKT
COND

Ion Det
RAD INTLK RESET pb: dep & held
PA BEAM cb: OFF
Eng to MC on
REFLECTED RF POWER m: high

IND



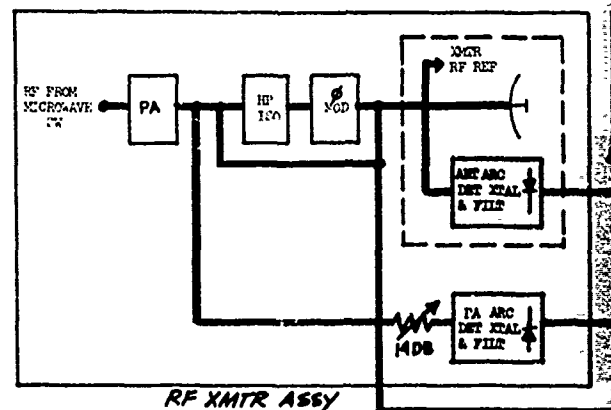
CKT
COND
IND

Cutoff Counter
Above chk good
This ckt bad



CKT
COND
IND

Arcing or Arc Det & Bal
Above chk good
Arcing in waveguide or above ckt bad

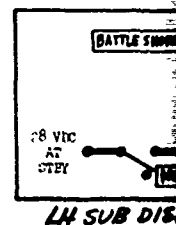


Arcing Control

Ion Det _____

Cutoff Counter _____

Arc Det & Bal _____



A

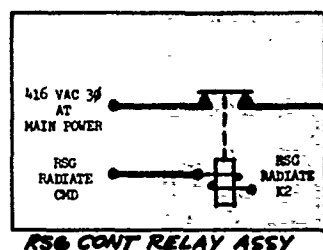
★ CKT Ac Pwr Input
COND Radiate
 LV PWR SUPS sw: LH -100V, 100V, & 250V;
 RH 250V, 150V, & -100V
IND LV PWR SUPS m: in tol for any pos

★ CKT 250 VDC
COND Radiate
 LV PWR SUPS sw: LH 250V & RH 250V
IND LV PWR SUPS m: in tol for both

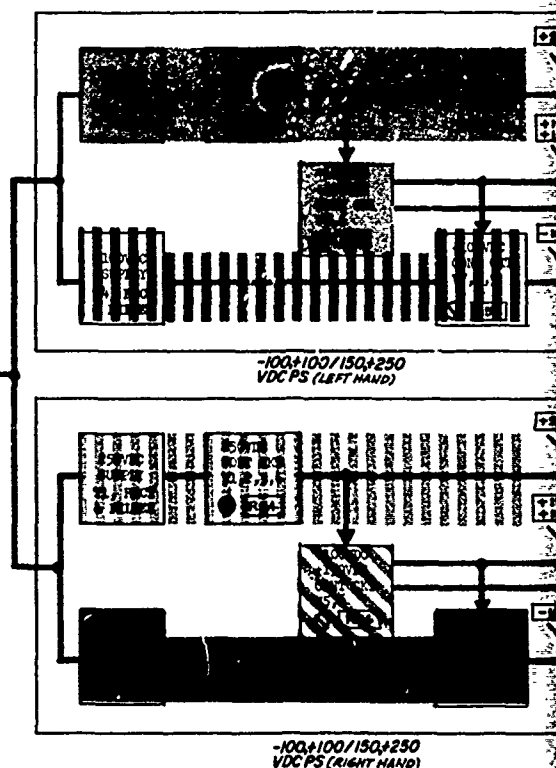
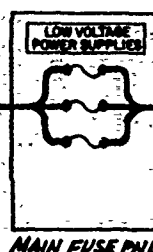
★ CKT 100 VDC
COND Radiate
 LV PWR SUPS sw: 100V
IND LV PWR SUPS m: in tol

★ CKT 150 VDC
COND Radiate
 LV PWR SUPS sw: +150V
IND LV PWR SUPS m: in tol

★ CKT -100 VDC
COND Above chks good
IND This ckt bad



416 VAC 3φ,
240 VAC



Ac Pwr Input
 250 VDC
 LH 250 VDC
 RH 250 VDC
 250 VDC Met

A

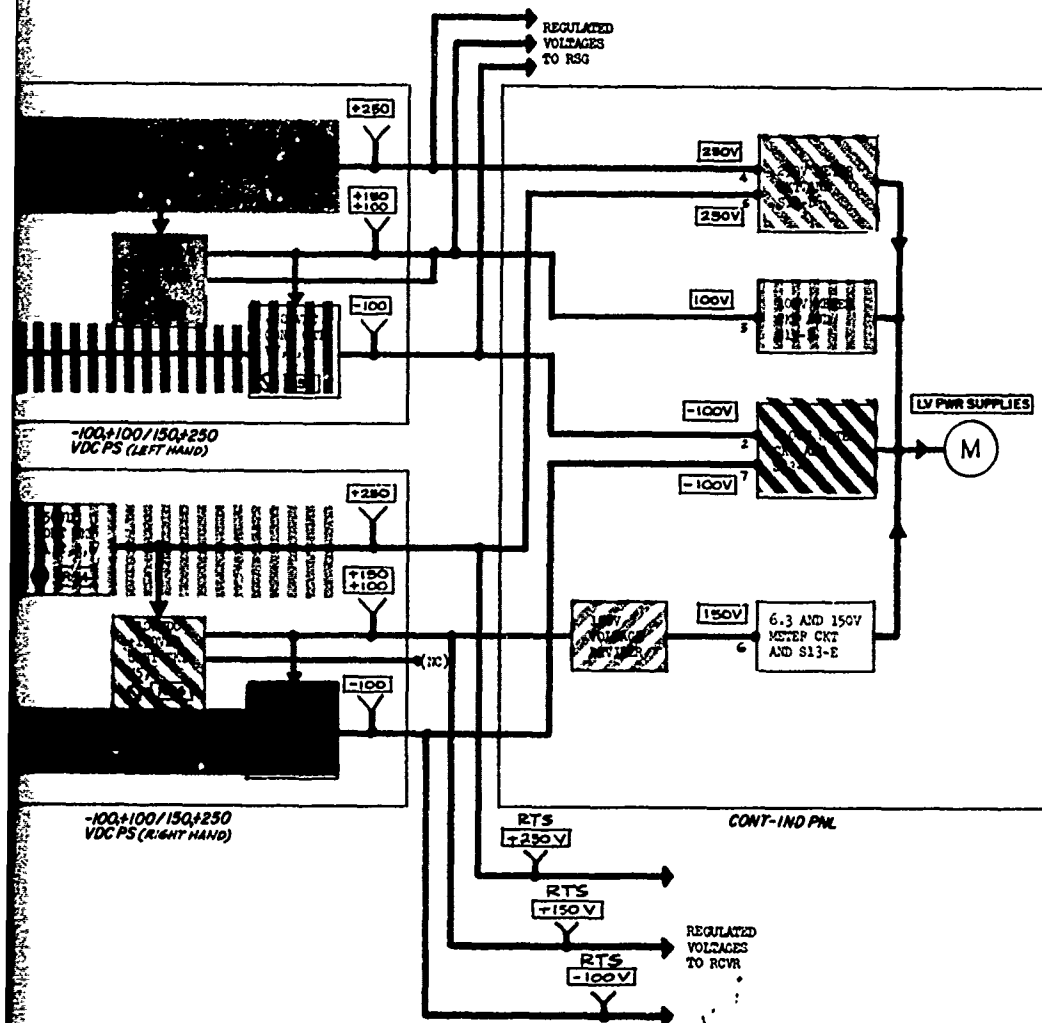
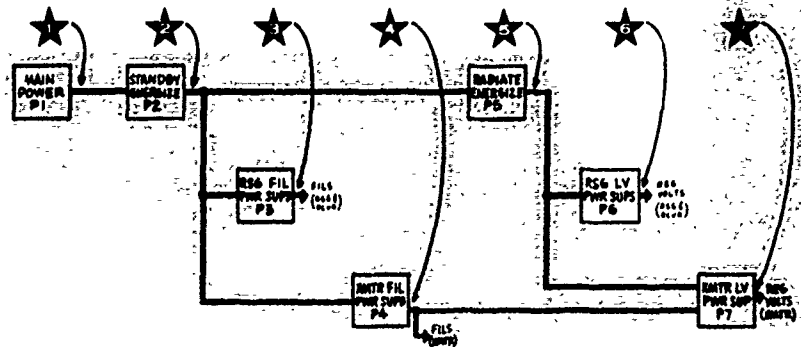
4

5

6

CKT 150 VDC
COND Radiate
IND LV PWR SUPS sw: +150
LV PWR SUPS m: in to l

CKT -100 VDC
COND Above chks good
IND This ckt bad



Ac Pwr Input _____

250 VDC

LH 250 VDC Sup _____

RH 250 VDC Sup _____

250 VDC Meter _____

100 VDC

LH VDC Sup _____

100. VDC Meter _____

150 VDC

RH 150 VDC Sup _____

150 VDC Volt Div _____

-100 VDC

LH -100 VDC Sup _____

RH -100 VDC Sup _____

-100 VDC Meter _____

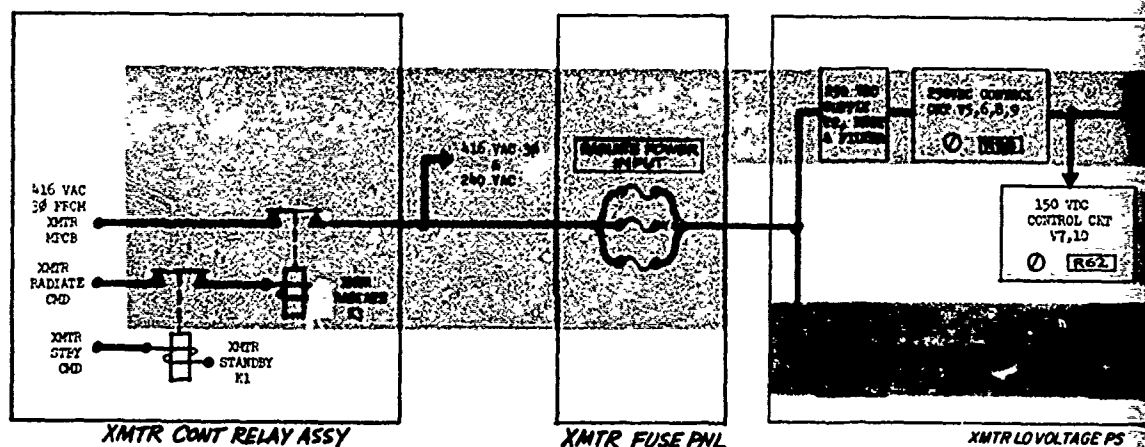
RSG LV PWR SUPS P6

17

★ CKT 250 VDC & Contactor
COND Radiator
IND DEGEN PWR SUP sw: +250 VDC
 DEGEN PWR SUP m: in tol

★ CKT 150 VDC
COND Radiator
IND DEGEN PWR SUP sw: +150 VDC
 DEGEN PWR SUP m: in tol

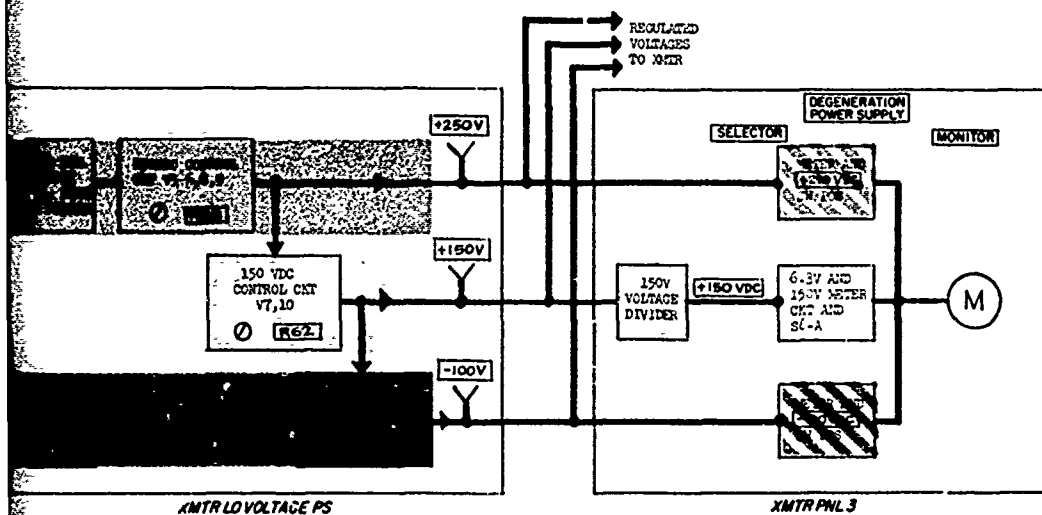
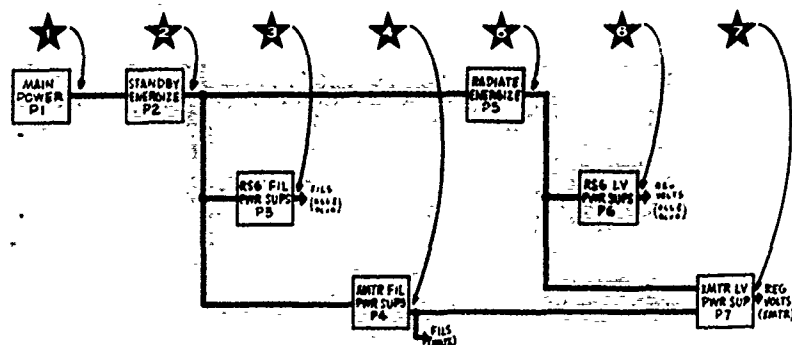
★ CKT -100 VDC
COND Above chks good
IND This ckt bad



4

5

6



250 VDC & Contactor

250 VDC Sup & Contactor_____

250 VDC Meter_____

150 VDC

150 VDC Sup_____

150 VDC Meter_____

-100 VDC

-100 VDC Sup_____

-100 VDC Meter_____

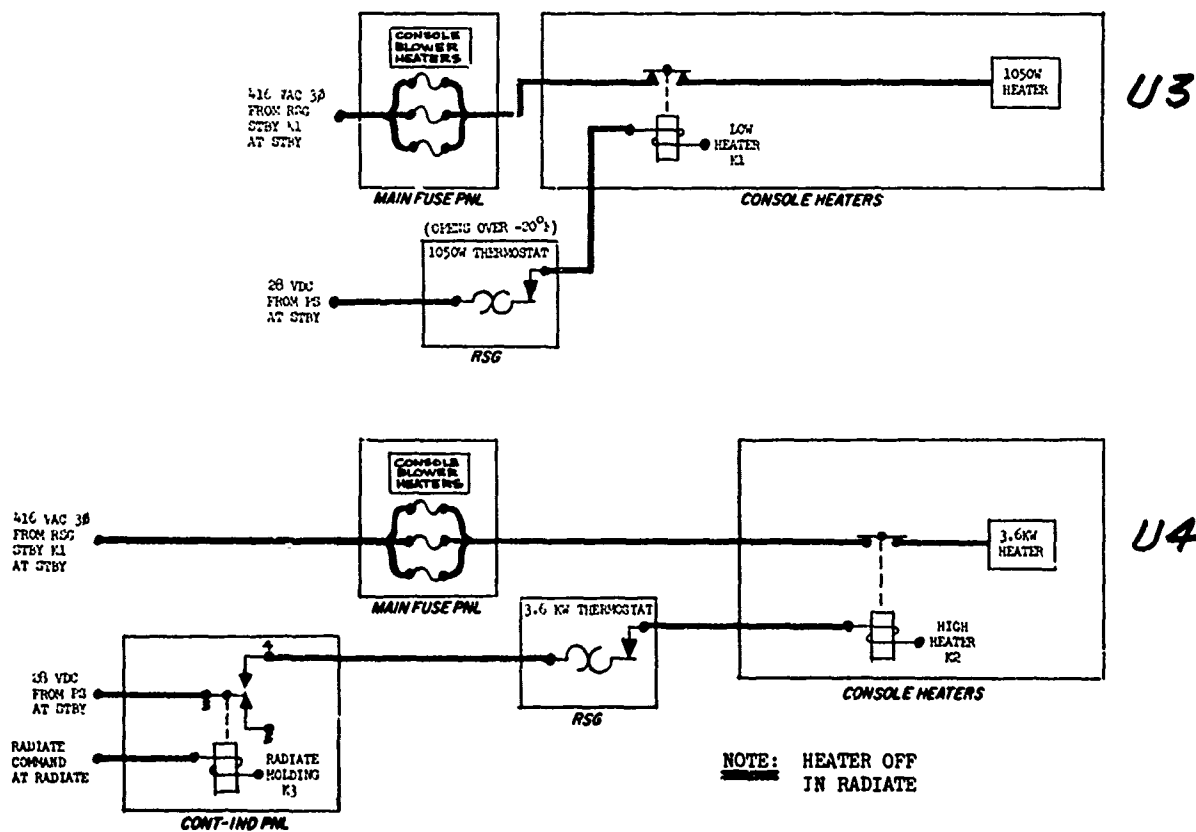
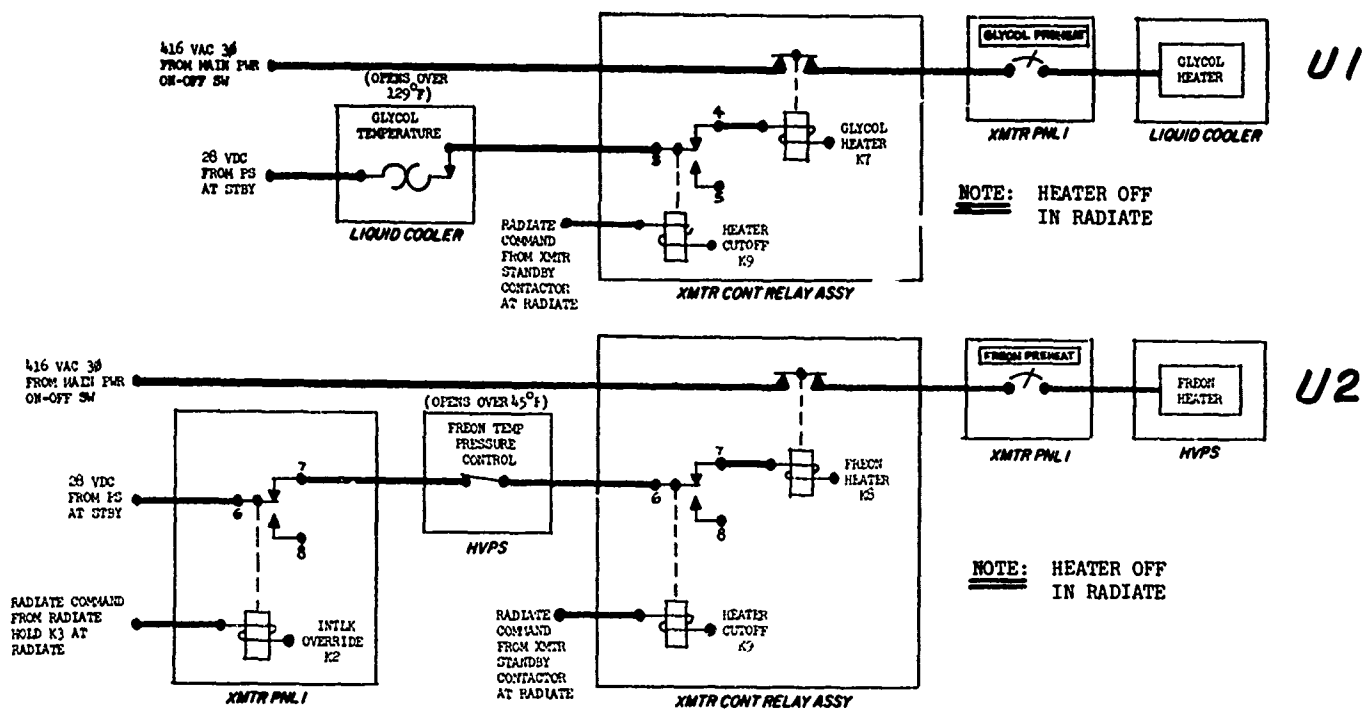
B

XMTR LV PWR SUP P7

2

3

4

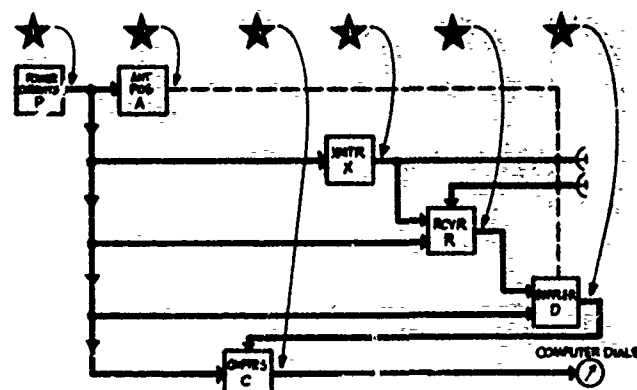


3

4

5

6



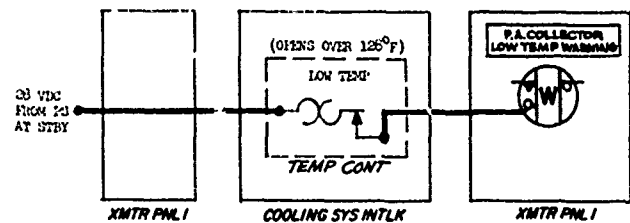
U1,2,3,4,5,6,7,8

1

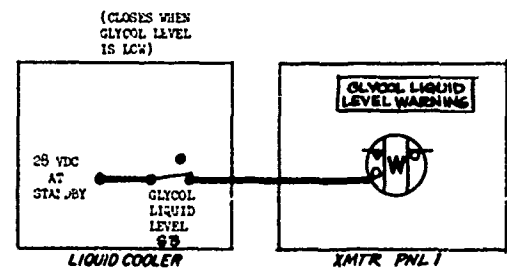
2

3

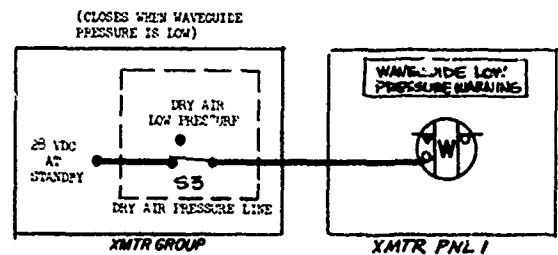
4



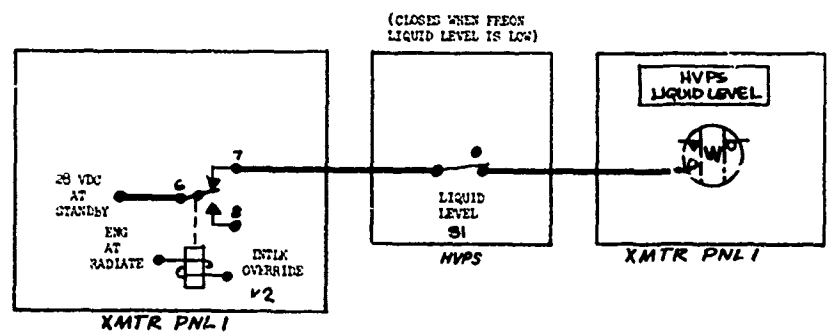
U9



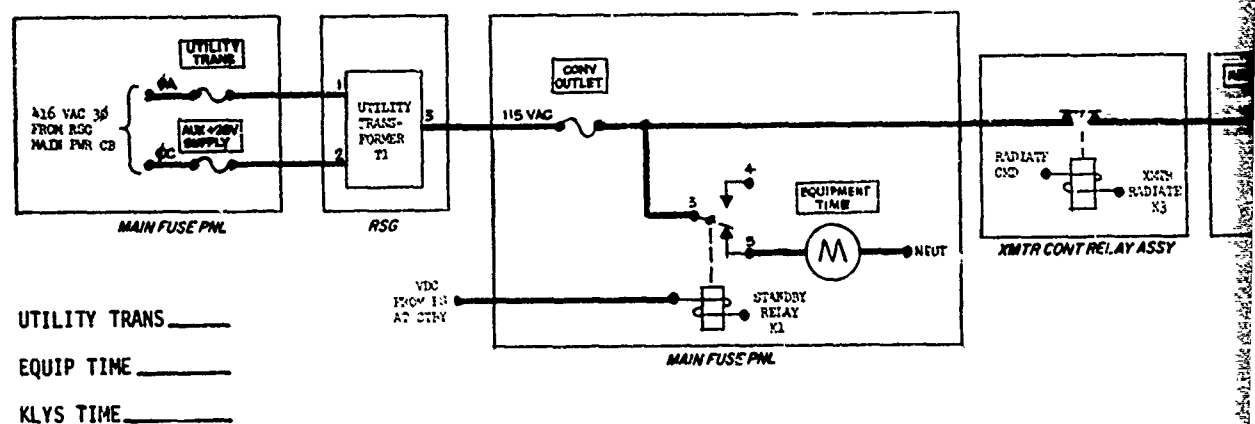
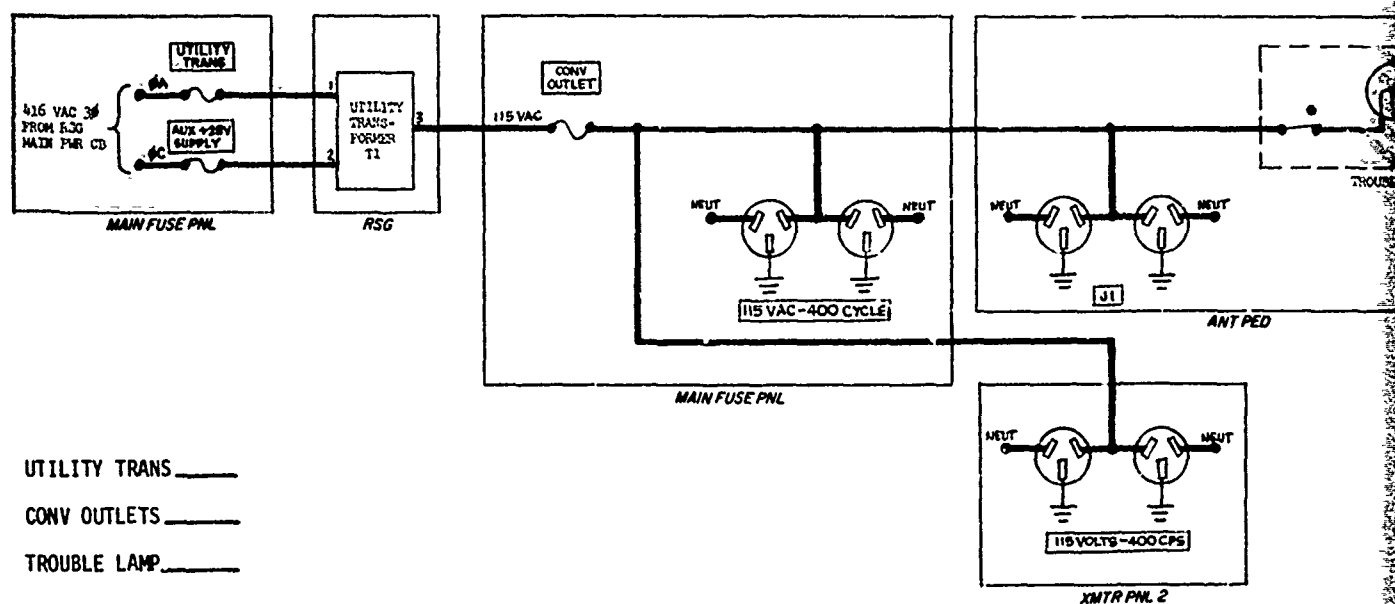
U10



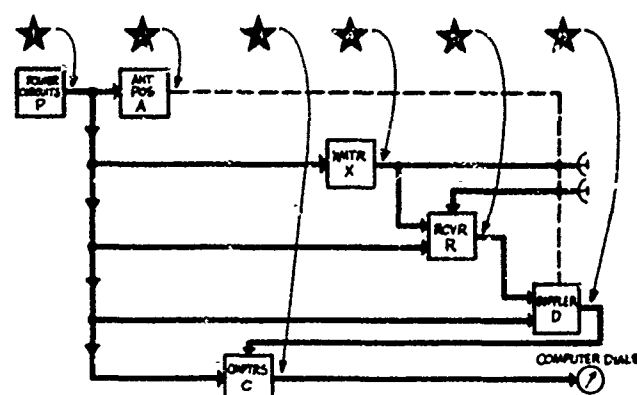
U11



U12



A

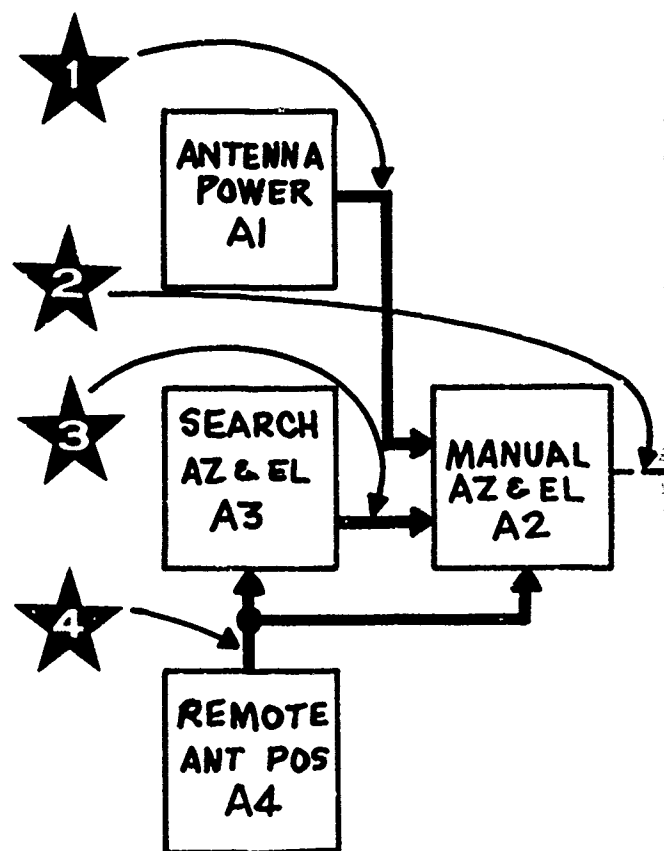


★ CKT Antenna Power
COND Antenna Operate
 LOCAL-REMOTE sw: LOCAL
 AUTO-MAN sw: MAN
 Az Hdwhl: rotated
 El Hdwhl: rotated
IND Antenna moves as either hdwhl is rotated

★ CKT Manual Az & El
COND Antenna Operate
 LOCAL-REMOTE sw: LOCAL
 AUTO-MAN sw: MAN
 Az Hdwhl: rotated
 El Hdwhl: rotated
IND Antenna does not drift in Az or El
 Antenna follows Az hdwhl properly
 Antenna follows El hdwhl properly

★ CKT Search Az & El
COND Antenna Operate
 LOCAL-REMOTE sw: LOCAL
 AUTO-MAN sw: MAN
 Three Az Search pb: dep & rel
 Antenna searches properly
IND Antenna searches properly
 LOCAL-REMOTE sw: LOCAL
 AUTO-MAN sw: MAN
 Both El Search pb: dep & rel
 Antenna searches properly

★ CKT Remote Ant Pos
COND Above chks good &
 Ant does not pos in Remote
IND This ckt bad



CKT
COND

Search Az & El
Antenna Operate
LOCAL-REMOTE sw: LOCAL
AUTO-MAN sw: MAN
Three Az Search pb: dep & rel
Antenna searches properly

IND
COND

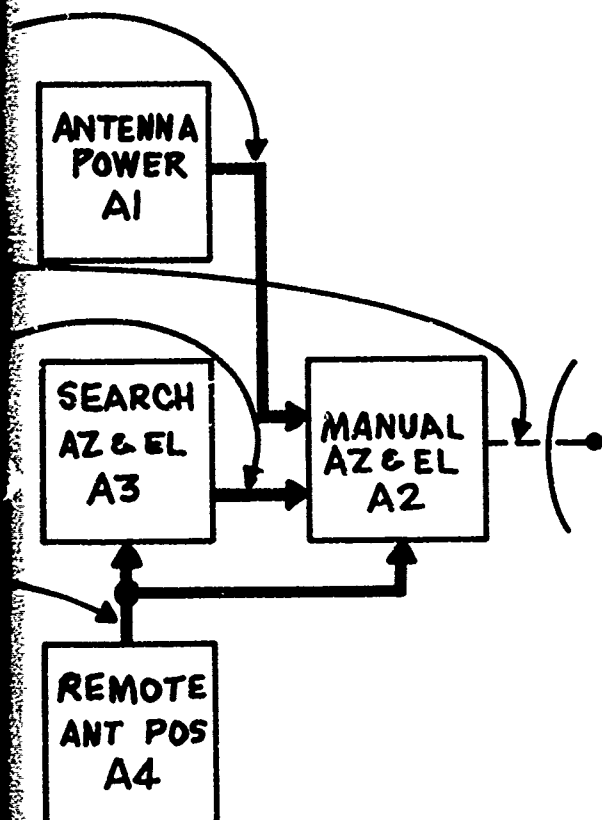
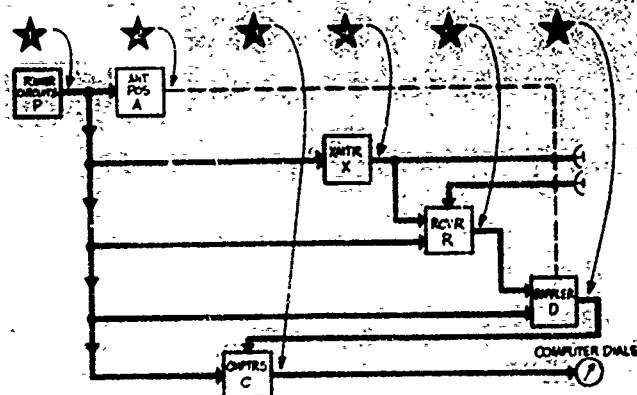
Antenna Operate
LOCAL-REMOTE sw: LOCAL
AUTO-MAN sw: MAN
Both E1 Search pb: dep & rel
Antenna searches properly

IND

CKT
COND

Remote Ant Pos
Above chks good &
Ant does not pos in Remote
This ckt bad

IND



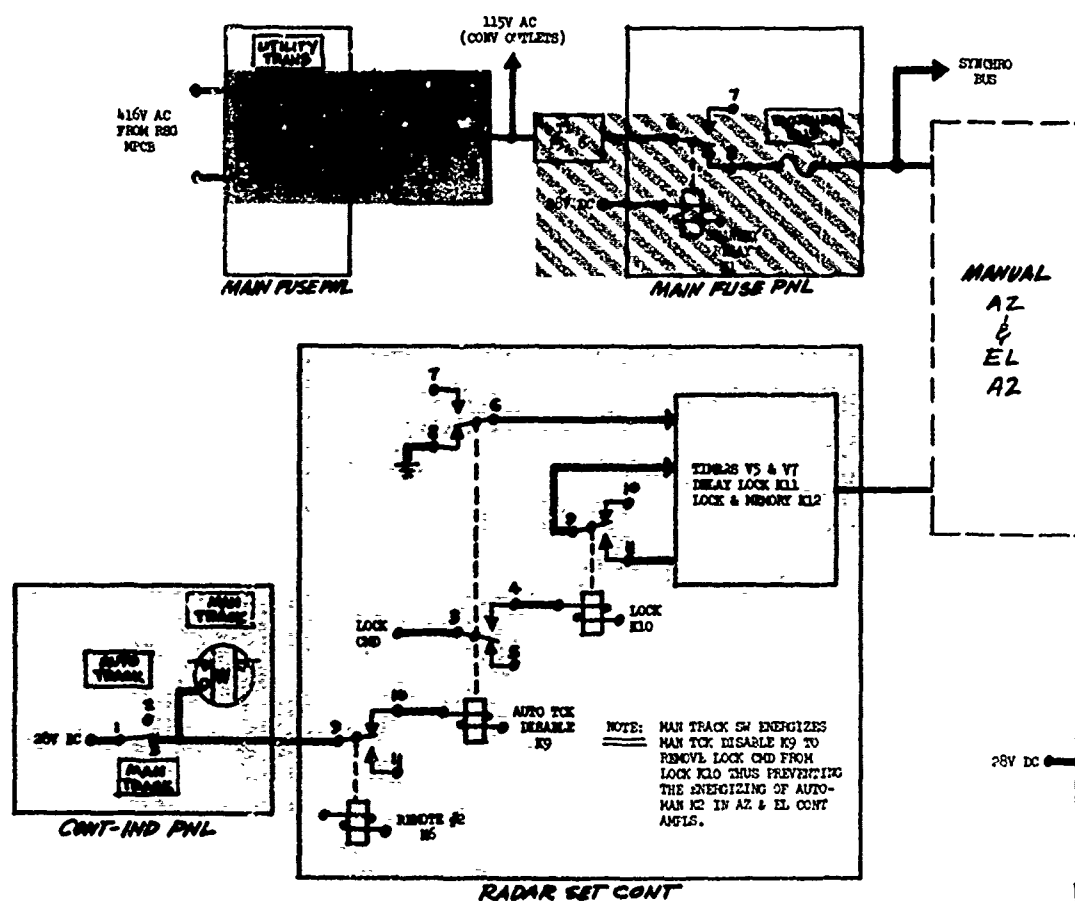
NOTE: Insure LOCAL-REMOTE sw: LOCAL

★ CKT
COND
IND
90V PS
Antenna Operate
AUTO-MAN sw: MAN
Antenna has torque in Az or El

★ CKT
COND
IND
300V PS
Radiate
AUTO-MAN sw: AUTO
LOCK sw: LOCK HOLD
MEMORY lamp: flashes or remains on

★ CKT
COND
IND
Mot-Gen Contactor
Antenna Operate
AUTO-MAN sw: MAN
SERVO FIELD CURRENT sw: AZ and/or EL
SERVO FIELD CURRENT m: any reading other than max left in either pos

★ CKT
COND
IND
Mot-Gen
Two men req
Antenna Operate
AUTO-MAN sw: MAN
MOTOR GENERATOR cb: turned OFF & ON
Hear motor start and stop as cb is thrown



A

4

5

6



CKT
COND

IND

Utility Trans

Main Power

Chk at Convenience Outlets for 115v ac
Convenience outlet has power



CKT
COND

IND

Synchro Bus

Standby

Azimuth hdwhl rotated

Nullmeter has varying reading



CKT
COND

IND

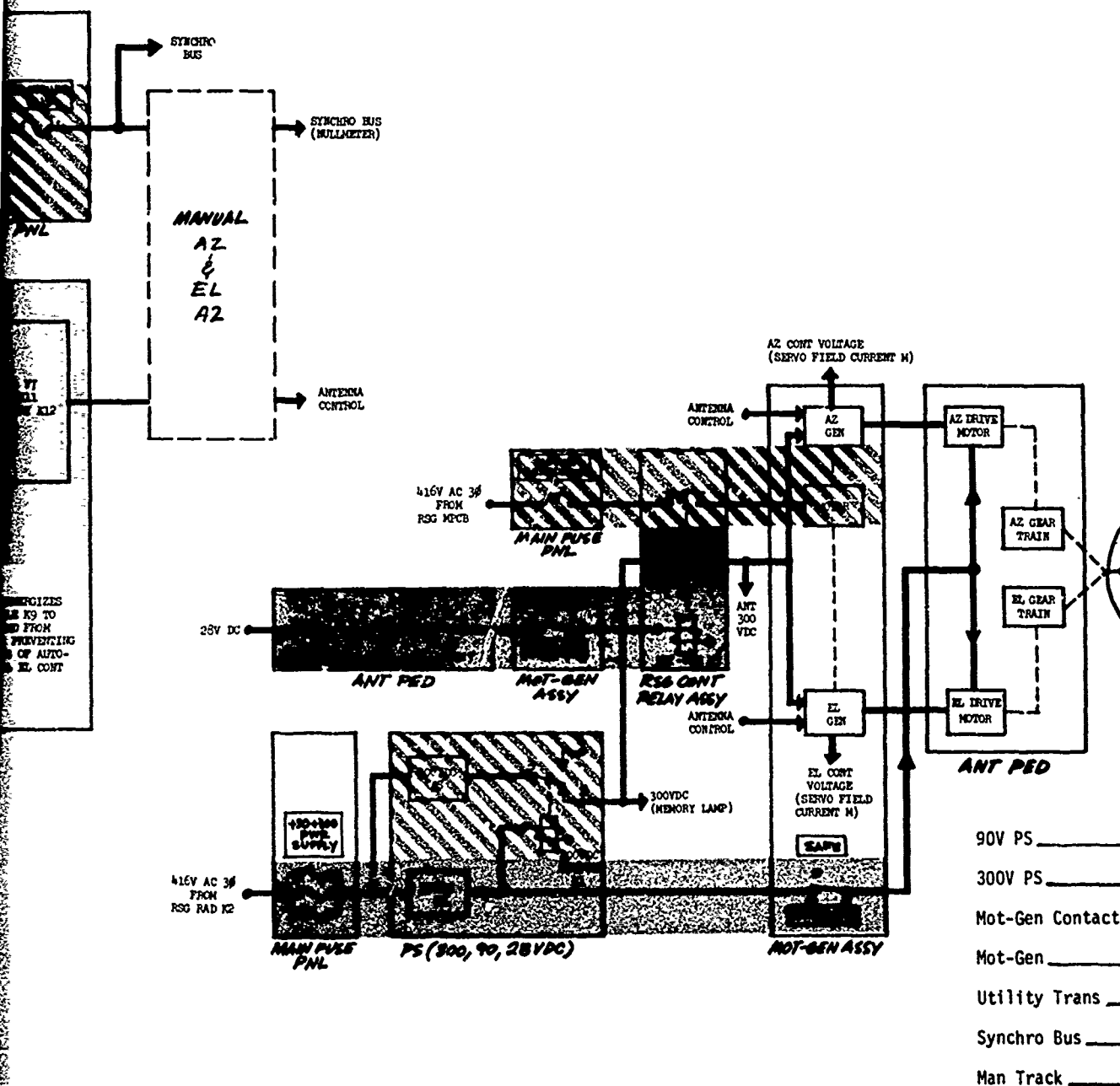
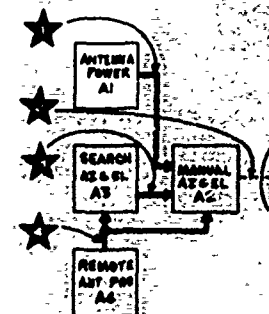
Man Track

Above chks good

This ckt bad

AZ and/or EL
any reading other than max left

Red OFF & ON
as cb is thrown



13

1

2

3

NOTE: Insure LOCAL-REMOTE sw: LOCAL

A



CKT
COND

Az Bal & El Bal

Antenna Operate

AUTO-MAN sw: MAN

IND

Antenna does not drift in either Az or El

(Perform Balance as in Steps 4, 5a-5e, Table 19,
TM-511-12/1)



CKT
COND

Az Positioning

Antenna Operate

AUTO-MAN sw: MAN

Azimuth Handwheel rotated

IND

Antenna follows properly



CKT
COND

Az Handwheel

Antenna Operate

AUTO-MAN sw: MAN

Azimuth Handwheel rotated

IND

Nullmeter has varying reading



CKT
COND

Az Cont Ampl

Antenna Operate

AUTO-MAN sw: MAN

Cont Ampl chassis swapped

Azimuth handwheel rotated

IND

Antenna still does not follow properly



CKT
COND
IND

Az Mech Link & Brushes

Above chks good

This ckt bad



CKT
COND

El Positioning

Antenna Operate

AUTO-MAN sw: MAN

El handwheel rotated

IND

Antenna follows properly



CKT
COND

El Cont Ampl

Antenna Operate

AUTO-MAN sw: MAN

Cont Ampl chassis swapped

El handwheel rotated

IND

Antenna still does not follow properly



CKT
COND
IND

El Hdwhl, Mech Link & Brushes

Above chks good

This ckt bad (If antenna moves properly
in one direction only, Limit Sw ckt
is bad)

C

D

3

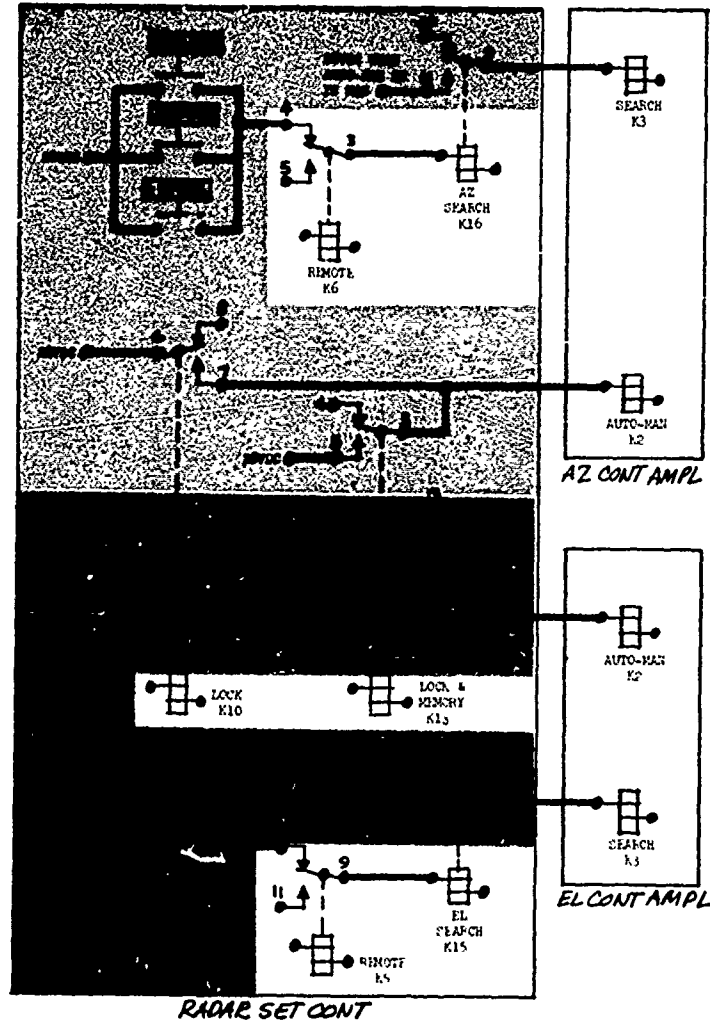
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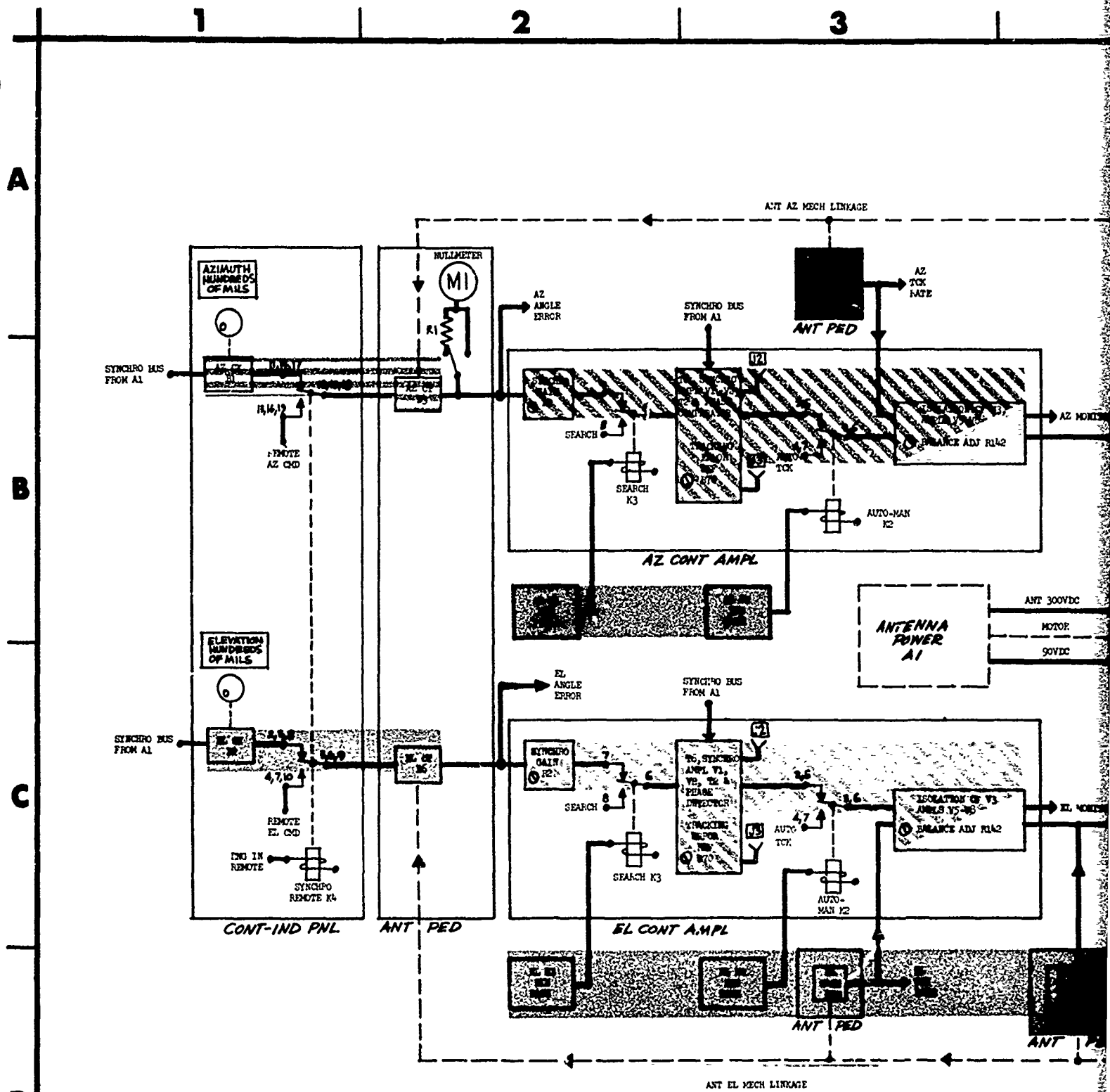
5

6

AZ & EL K2-K3 ENG PATHS

(Shorted contacts of switches or relays shown below could cause K2 or K3 to be eng when they should be deeng.)

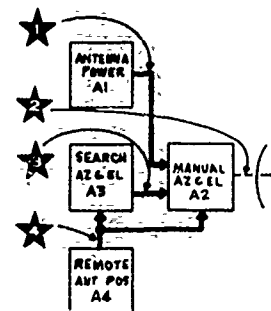
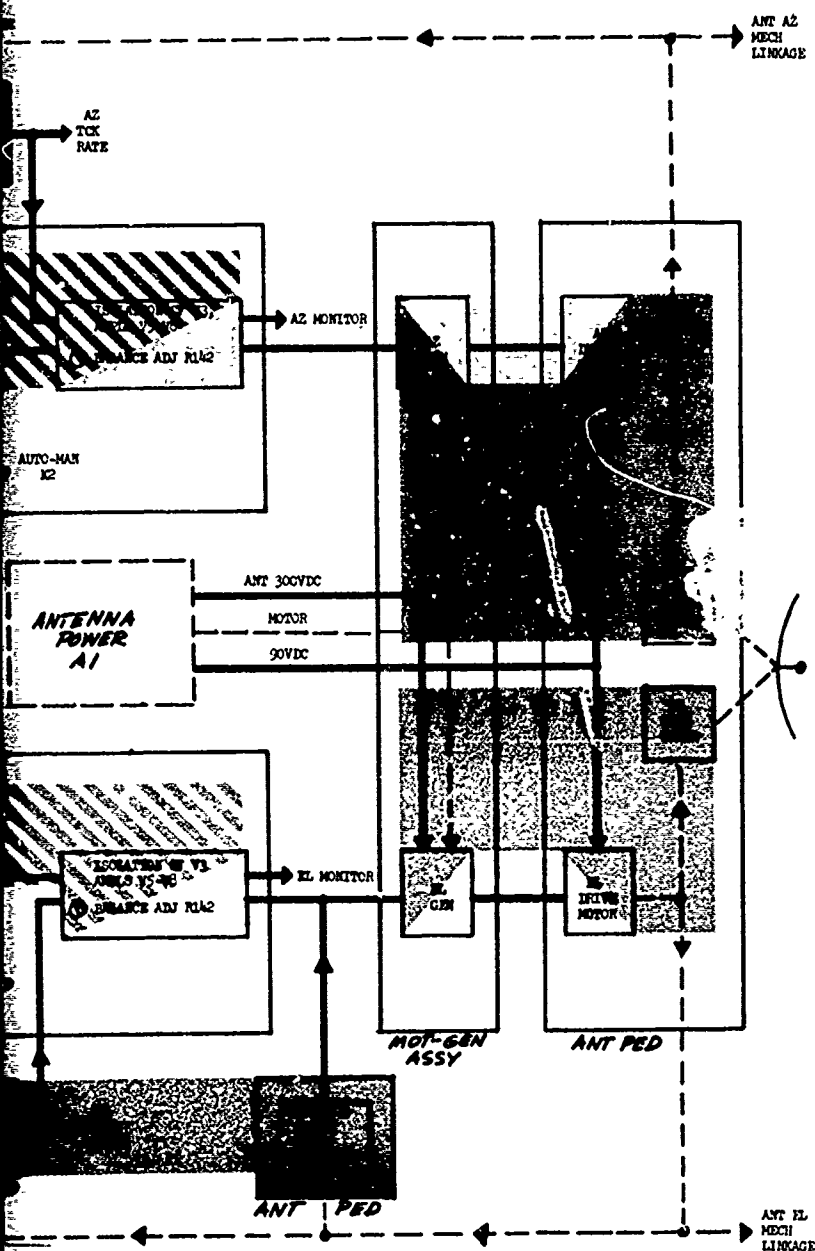




4

5

6



Az Bal _____

El Bal _____

Az Positioning

Az Handwheel _____

Az Cont Ampl _____

Az Mech Link and Brushes _____

El Positioning

El Cont Ampl _____

El Hdwhl, Mech Link, and Brushes _____

B

NOTE: Insure LOCAL-REMOTE sw: LOCAL

NOTE: Place ant



Az Search

Antenna Operate

AUTO-MAN sw: MAN

AZ ± 30 DEG pb: dep, held & rel

SEARCH ± 60 DEG pb: dep, held & rel

TEST ± 360 DEG pb: dep, held & rel

Antenna performs each search properly

IND

NOTE: If antenna moves in a box pattern when the AZ ± 30 DEG or SEARCH ± 60 DEG pb is dep, but one of the following search functions is incorrect, perform the specified adj:

± 30 Deg search limits - ± 30 DEG SEARCH (Radar Set Cont)

± 60 Deg search limits - ± 60 DEG SEARCH (Radar Set Cont)

E1 sector width - R107 (Az Cont Ampl)

Az search rate - R106 (Az Cont Ampl)



IND



CKT
COND

Search Control

Antenna Operate

AUTO-MAN sw: MAN

ELEV STEP-LOW pb: dep & rel

Antenna: any movement

IND



CKT
COND

Az Search Control

Antenna Operate

AUTO-MAN sw: MAN

All 3 Az Search pb: dep & rel

Antenna: any movement for any pb

IND



CKT
COND

Az Search Rate

Antenna Operate

AUTO-MAN sw: MAN

All 3 Az Search pb: dep & rel

Antenna: any movement in az for any pb

IND



CKT
COND

E1 Sector Width

Antenna Operate

AUTO-MAN sw: MAN

All 3 Az Search pb: dep & rel

Antenna: any movement in el for any pb

IND



CKT
COND

Az Search Limit

Antenna Operate

AUTO-MAN sw: MAN

± 30 DEG and/or ± 60 DEG pb: dep & held

Antenna reverses directions in Az or E1
(if bad, exchange Cont Ampl chassis to isolate
trouble between Cont Ampl & Radar Set Cont)

IND



CKT
COND

Azimuth ± 30 Deg

Antenna Operate

AUTO-MAN sw: MAN

AZIMUTH ± 30 DEG pb: dep & held

Antenna performs search properly

IND



CKT
COND

Search ± 60 Deg

Antenna Operate

AUTO-MAN sw: MAN

SEARCH ± 60 DEG pb: dep & held

Antenna performs search properly

IND



CKT
COND
IND

± 360 Deg

Above chks good

This ckt bad

NOTE: Place antenna at 800 mils elevation prior to the following checks.



CKT
COND

EI Search

Antenna Operate

AUTO-MAN sw: MAN

ELEV STEP-LOW pb: dep, held & rel

TEST HIGH pb: dep, held & rel

Antenna performs each search properly

IND

NOTE: If antenna moves in a box pattern when pb's dep, but one of the following search functions is incorrect, perform the specified adj:

Low search limits - LOW LIM (Radar Set Cont)

High search limits - HIGH LIM (Radar Set Cont)

Az sector width - R107 (EI Cont Ampl)

EI search rate - R106 (EI Cont Ampl)



CKT
COND

EI Search Control

Antenna Operate

AUTO-MAN sw: MAN

Either or both EI search pb: dep & rel

IND

Antenna: any movement for either pb



CKT
COND

EI Search Rate

Antenna Operate

AUTO-MAN sw: MAN

Either or both EI search pb: dep & rel

IND

Antenna: any movement in ei for any pb



CKT
COND

Az Sector Width

Antenna Operate

AUTO-MAN sw: MAN

Either or both EI search pb: dep & rel

IND

Antenna: any movement in az for any pb



CKT
COND

EI Search Limit

Antenna Operate

AUTO-MAN sw: MAN

Either or both EI Search pb: dep & held

IND

Antenna reverses directions in Az or EI
(If bad, exchange Cont Ampl chassis to isolate trouble between Cont Ampl & Radar Set Cont)



CKT
COND

Elev Step-Low

Antenna Operate

AUTO-MAN sw: MAN

ELEV STEP-LOW pb: dep & held

IND

Antenna performs search properly

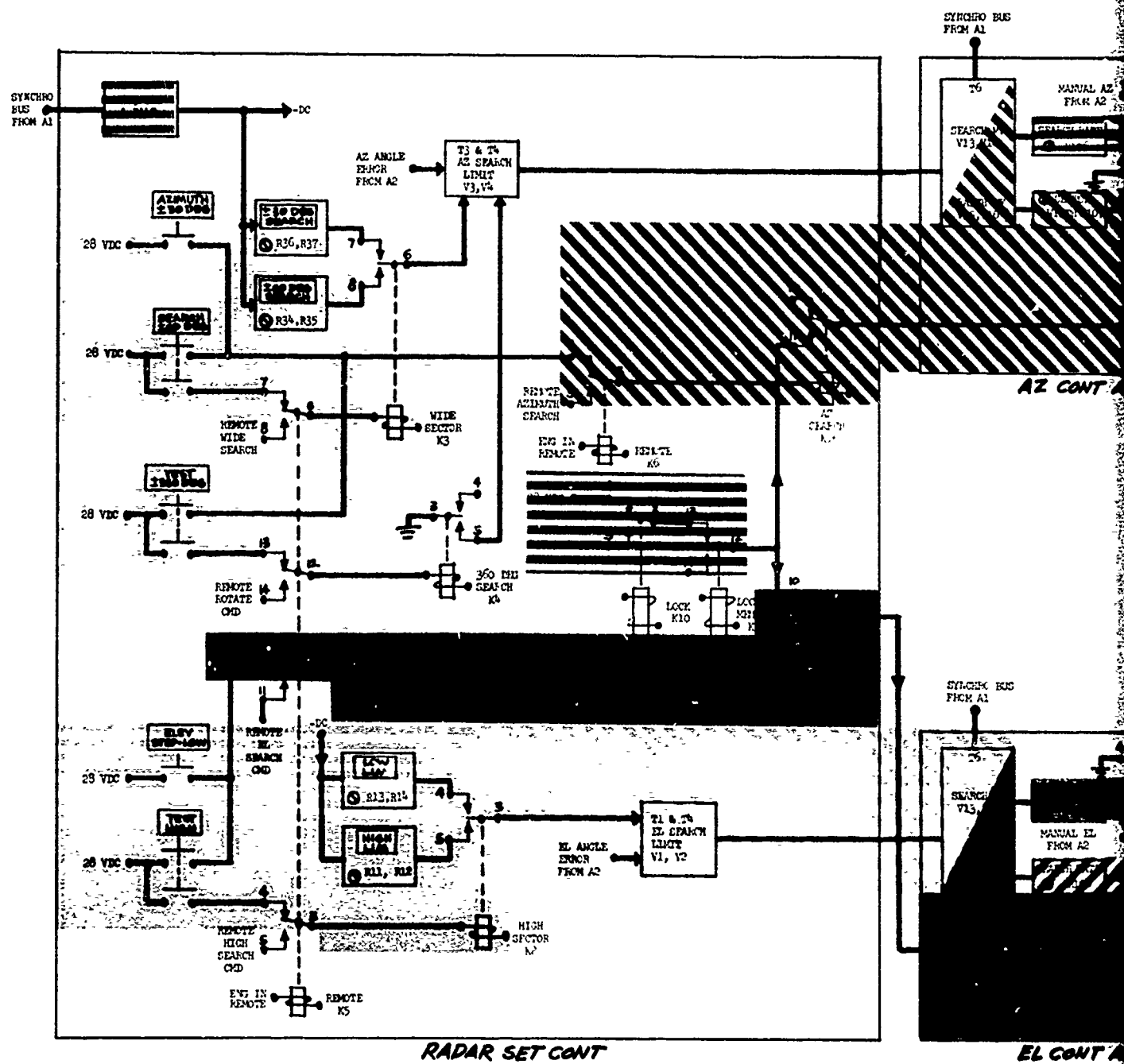


CKT
COND
IND

Test High

Above chks good

This ckt bad

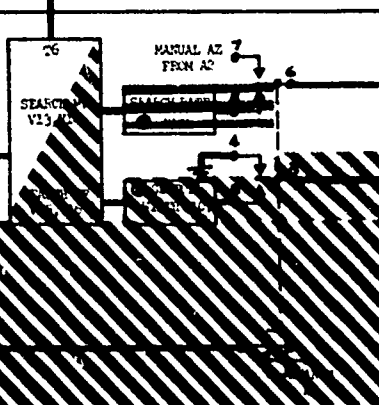


A

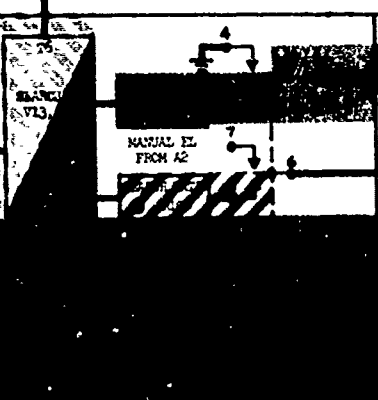
4

5

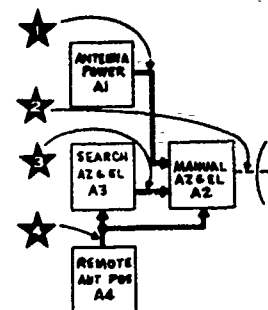
6

SYNCHRO BUS
FROM A1

AZ CONT AMPL

EL
CONT AMPLANTENNA
POWER
A1MANUAL
AZ
&
EL
A2SYNCHRO BUS
FROM A1

EL CONT AMPL



Search

Search Control _____

Az Search Control _____

Az Search Rate _____

El Sector Width _____

Az Search Limit _____

Az ± 30 Deg _____Search ± 60 Deg _____ ± 360 Deg _____

Search

El Search Control _____

El Search Rate _____

Az Sector Width _____

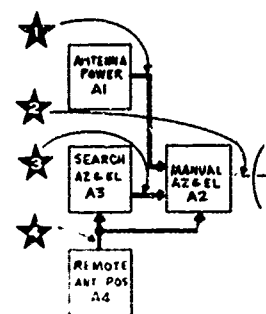
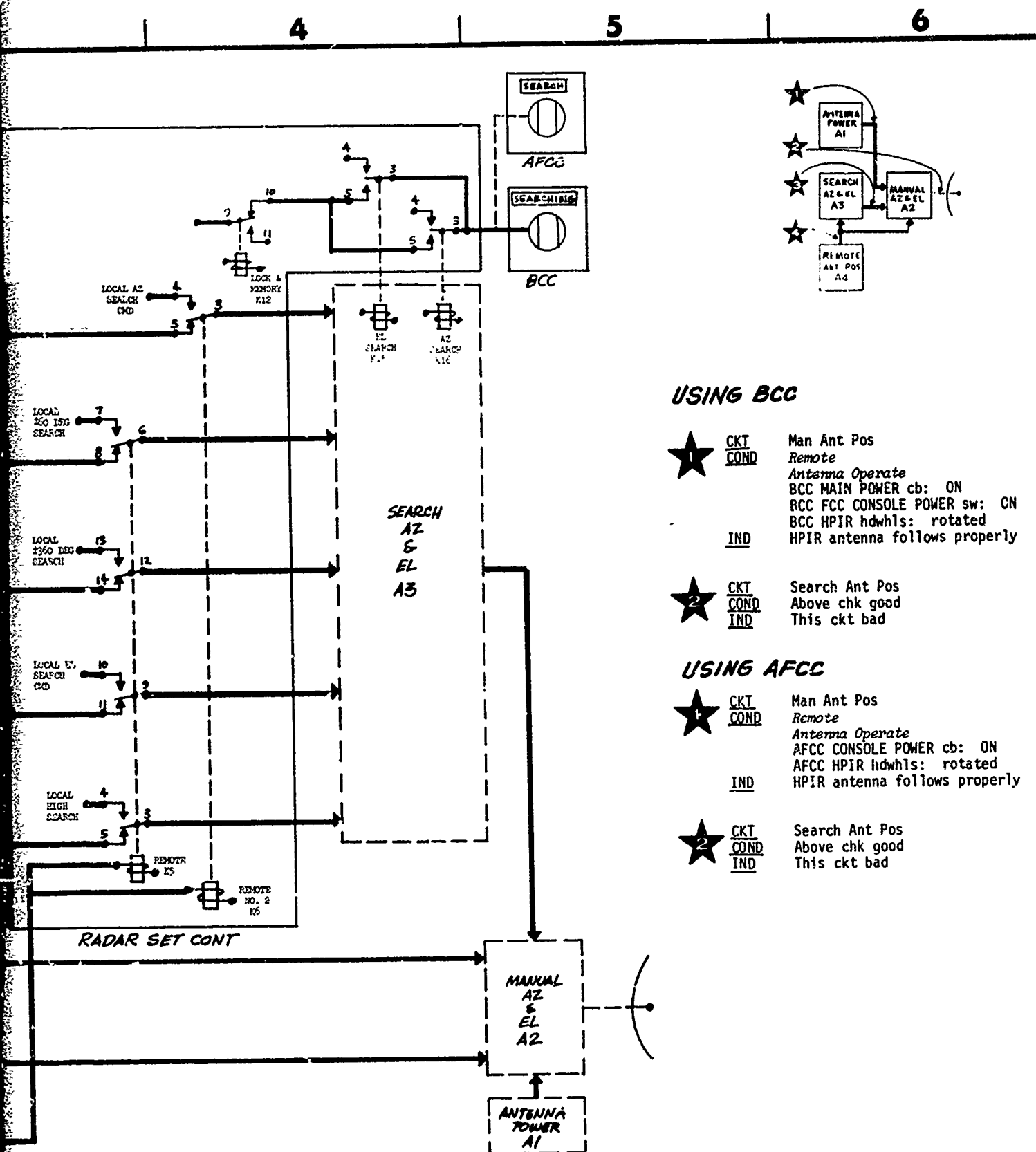
El Search Limit _____

Elev Step-Low _____

Test High _____

B

SEARCH AZ & EL A3 31



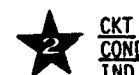
USING BCC



CKT
COND

Man Ant Pos
Remote
Antenna Operate
BCC MAIN POWER cb: ON
BCC FCC CONSOLE POWER sw: CN
BCC HPIR hdwhls: rotated
HPIR antenna follows properly

IND



CKT
COND
IND

Search Ant Pos
Above chk good
This ckt bad

USING AFCC



CKT
COND

Man Ant Pos
Remote
Antenna Operate
AFCC CONSOLE POWER cb: ON
AFCC HPIR hdwhls: rotated
HPIR antenna follows properly

IND



CKT
COND
IND

Search Ant Pos
Above chk good
This ckt bad

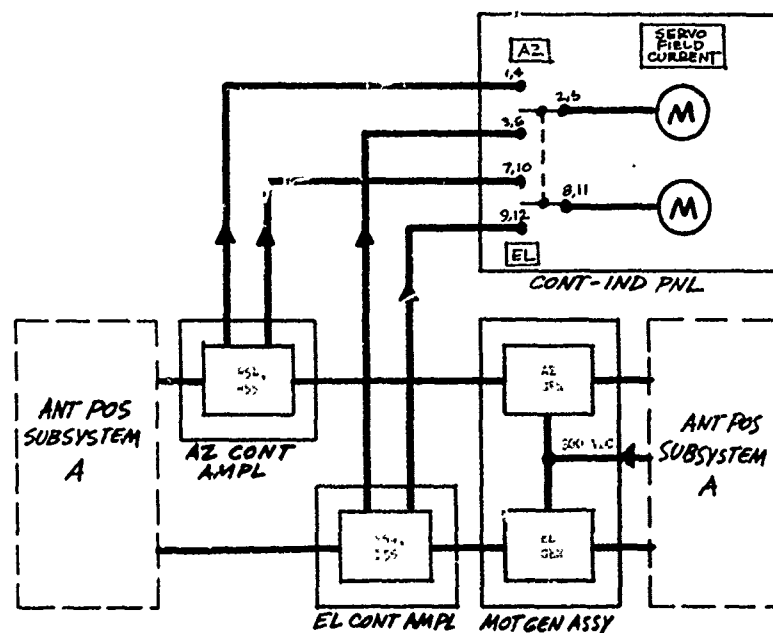
Man Ant Pos _____

Search Ant Pos _____

2

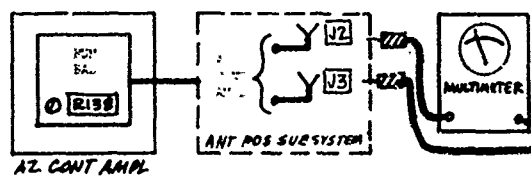
3

4



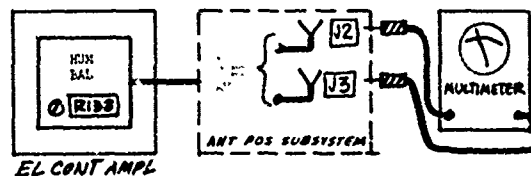
AW 1

AZ & EL SERVO AMPL
 STEPS 2g & 3b
 TABLE 19
 TM 511-12/1



AW 2

AL HUN BAL
 STEP 4
 TABLE 19
 TM 511-12/1



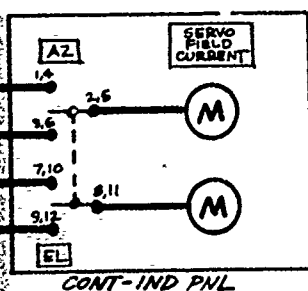
AW 3

EL HUN BAL
 STEP 4
 TABLE 19
 TM 511-12/1

4

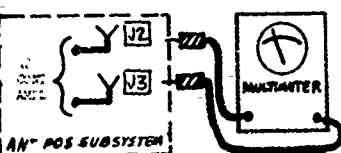
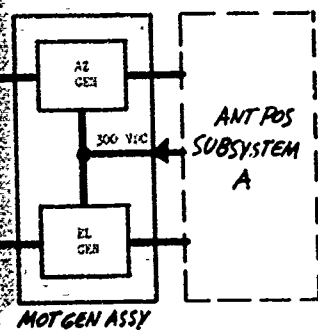
5

6



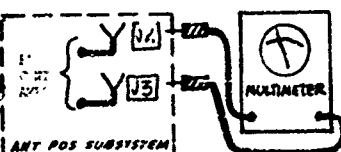
AW 1

AZ & EL SERVO AMPL
 STEPS 2g & 3b
 TABLE 19
 TM 511-12/1



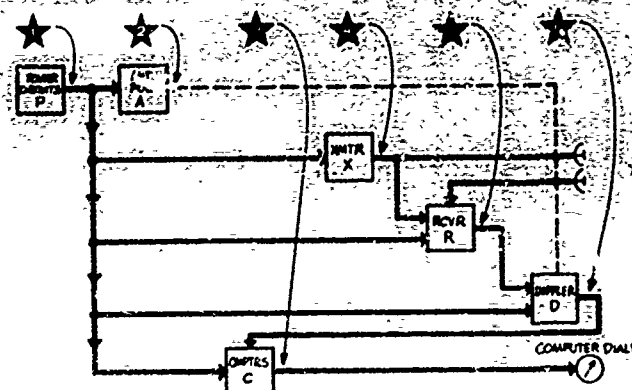
AW 2

AD HUY BAL
 STEP 5
 TABLE 19
 TM 511-12/1



AW 3

AD HUY BAL
 STEP 5
 TABLE 19
 TM 511-12/1



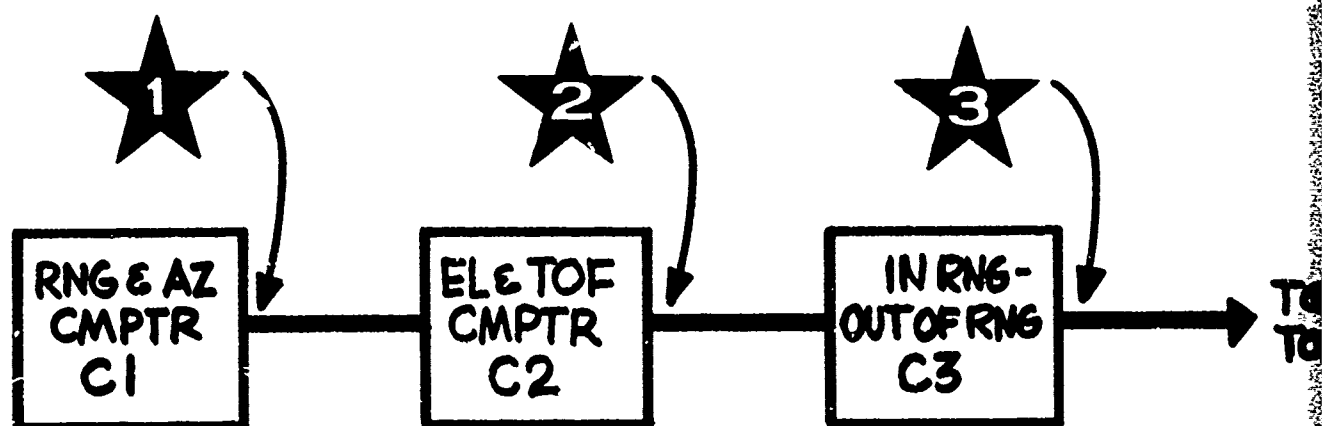
NOTE: Insure antenna above 53 ft.

★ CKT
COND
IND

Rng & Az Cmptr
Radiate
APPROACH-RECEDE sw: APPROACH & RECEDE
RANGE dial: in to both pos
AZIMUTH dial: in to both pos

★ CKT
COND
IND

E1 & TOF Cmptr
Radiate
APPROACH-RECEDE sw: APPROACH & RECEDE
ELEVATION dial: in to both pos
TIME OF FLIGHT dial: in to both pos



CKT
COND
IND

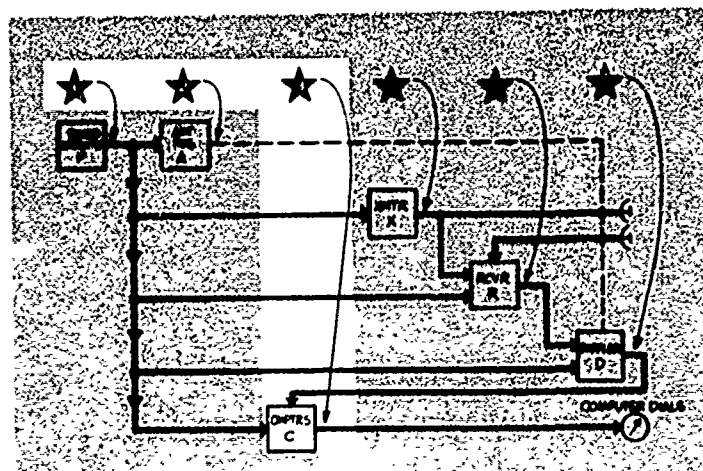
E1 & TOF Cmptr

Radiate

APPROACH-RECEDE sw: APPROACH & RECEDE

ELEVATION dial: in tol both pos

TIME OF FLIGHT dial: in tol both pos



CKT
COND

In Rng - Out of Rng

Radiate

APPROACH-RECEDE sw: APPROACH

IN RANGE lamp: on

IND
COND

Radiate

APPROACH-RECEDE sw: RECEDE

IND

OUT OF RANGE lamp: on

3

ING-
RNG

TGT IN RNG
TO BCC

★ CKT
COND
IND

Rng Cmptr
Radiate
APPROACH-RECEDE sw: APPROACH & RECEDE
RANGE dial: in tol both pos

★ CKT
COND
IND

Motor Ref & Bal
Radiate
APPROACH-RECEDE sw: rel
Maladj Rng Bal R16
RANGE dial: some movement
(Readj Bal R16 for 0 on RANGE dial)

★ CKT
COND
IND

Range Ampl, Chop & Follow Up
Radiate
APPROACH-RECEDE sw: both pos
RANGE dial: correct in either pos

★ CKT
COND
IND

Approach Rng
Radiate
APPROACH-RECEDE sw: APPROACH
RANGE dial: in tol

★ CKT
COND
IND

Recede Rng
Above chks good
This ckt bad

★ CKT
COND
IND

Az Cmptr
Radiate
APPROACH-RECEDE sw: APPROACH & RECEDE
AZIMUTH dial: in tol both pos

★ CKT
COND
IND

Az Motor & Bal
Radiate
APPROACH-RECEDE sw: rel
Maladj Az Bal R37
AZIMUTH dial: some movement
(Readj R37 for 0 on AZIMUTH dial)

★ CKT
COND
IND

Az Rate, Ampl & Follow Up
Above chk good
This ckt bad

★ 1 CKT
COND

IND

E1 Mtr Ref & Bal
Radiate
APPROACH-RECEDE sw: APPROACH
Note ELEVATION dial reading
Maladj E1 Bal R27
ELEVATION dial: some movement
(Readj R27 to reading noted)

★ 2 CKT
COND

IND

TOF Mtr Ref & Bal
Radiate
APPROACH-RECEDE sw: APPROACH
Note TIME OF FLIGHT dial reading
Maladj TOF Bal R39
TIME OF FLIGHT dial: some movement
(Readj R39 to reading noted)

★ 3 CKT
COND

IND

E1 Ampl
Radiate
Ant stow locked above 53 μ
APPROACH-RECEDE sw: APPROACH & RECEDE
ELEVATION dial: in tol for both pos
OR
ELEVATION and TOF dial: out of tol in
same direction for both pos

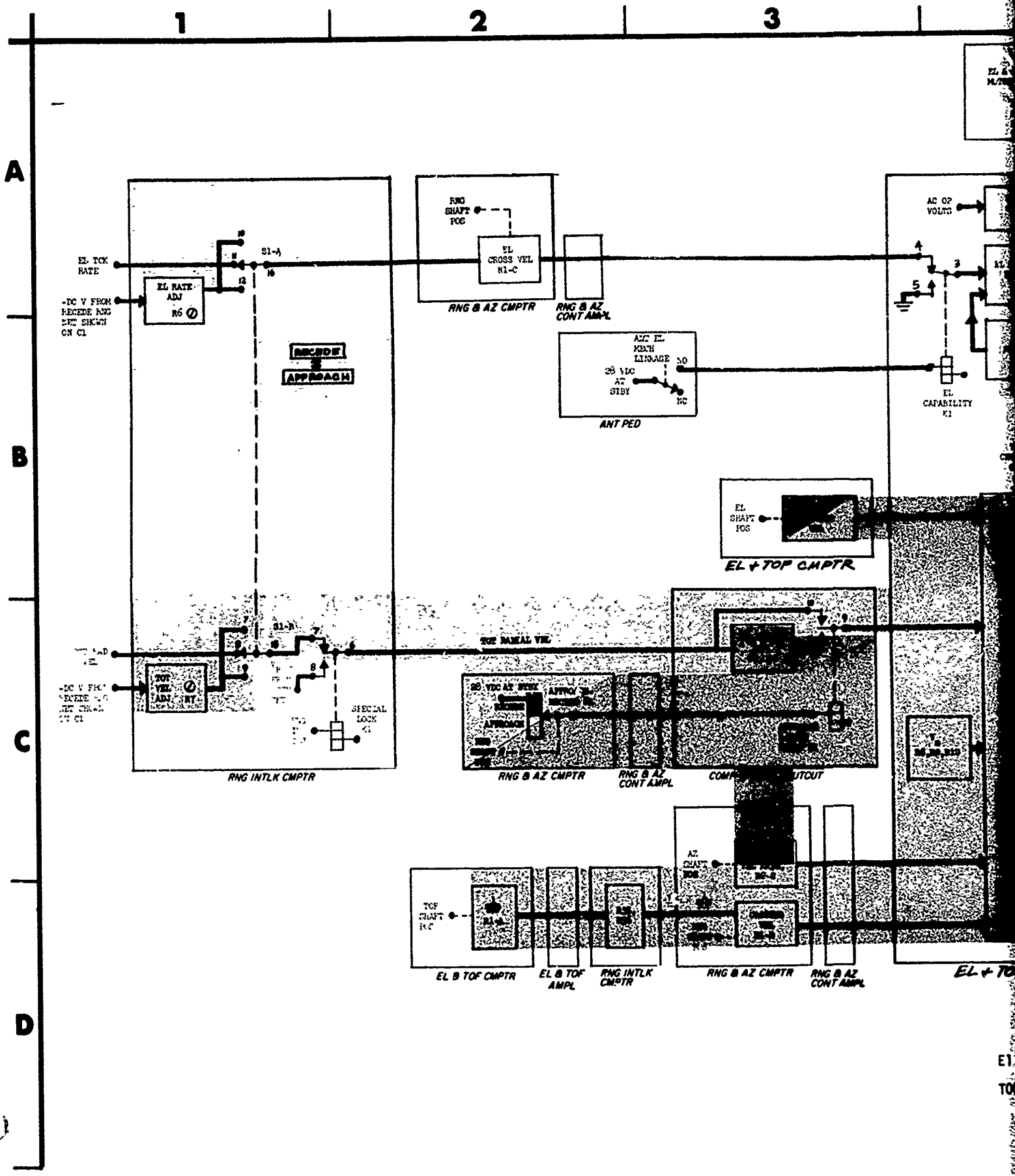
★ 4 CKT
COND

IND

TOF & Input Net
Radiate
APPROACH-RECEDE sw: APPROACH
TIME OF FLIGHT dial: in tol

★ 5 CKT
COND
IND

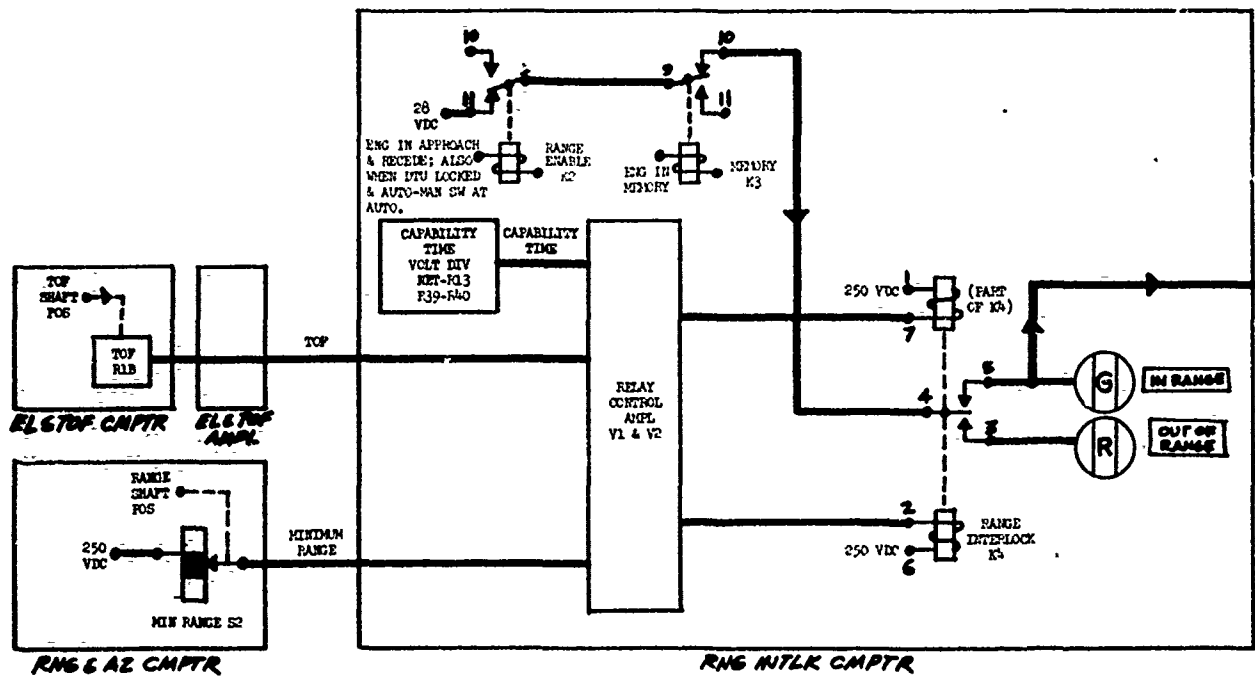
Recede Tgt
Above chks good
This ckt bad



1

2

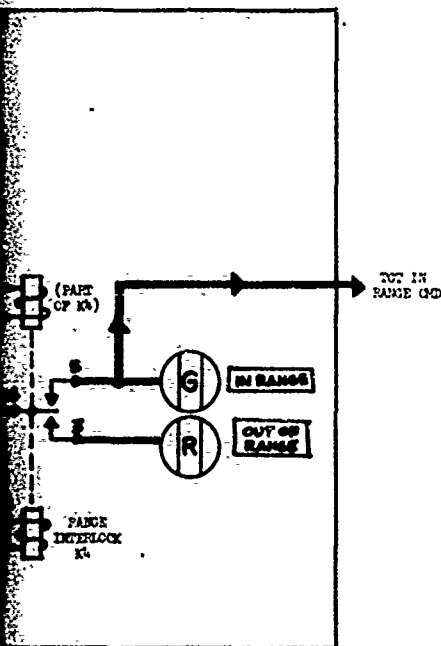
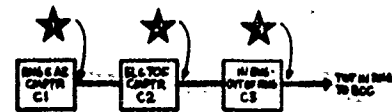
3



4

5

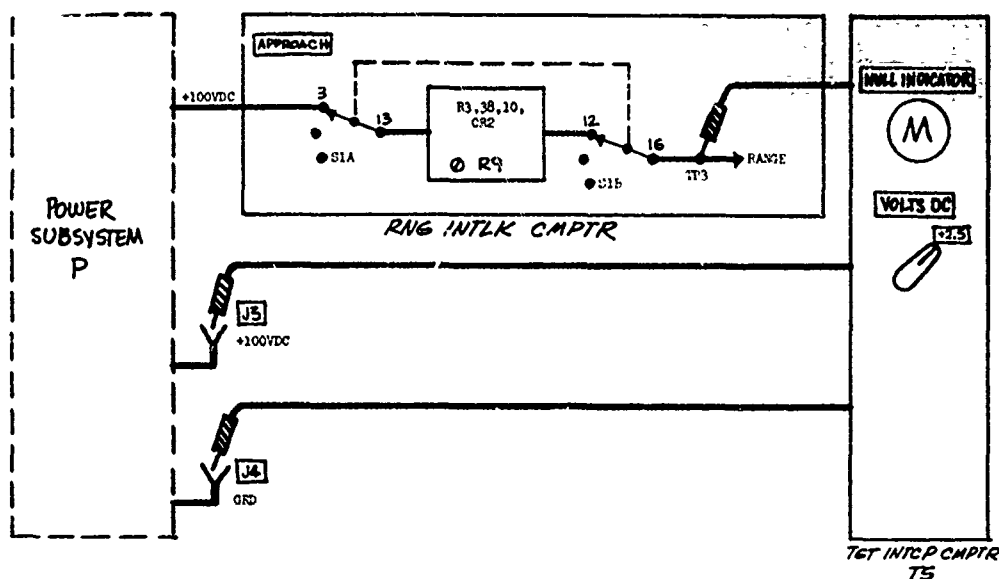
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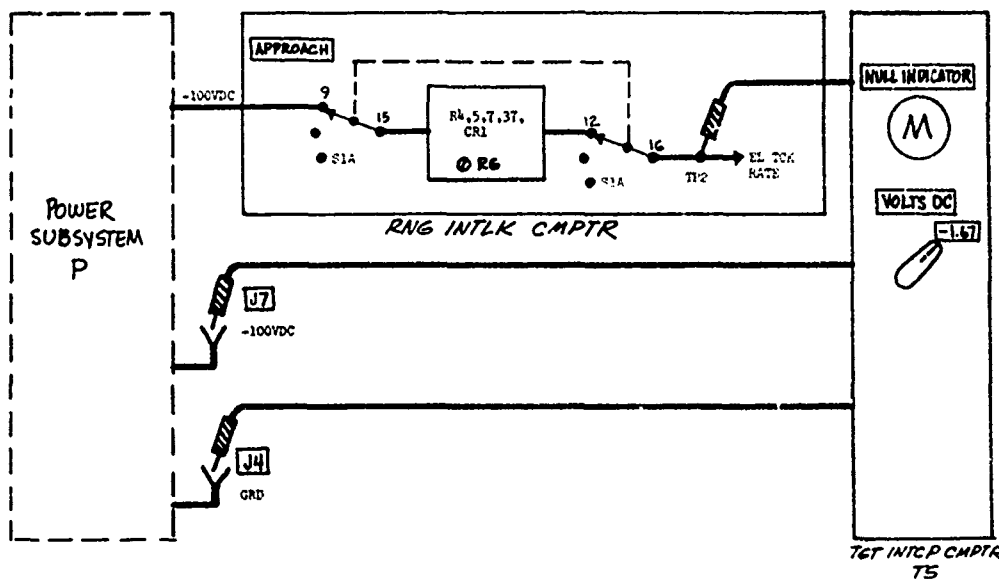
2

3

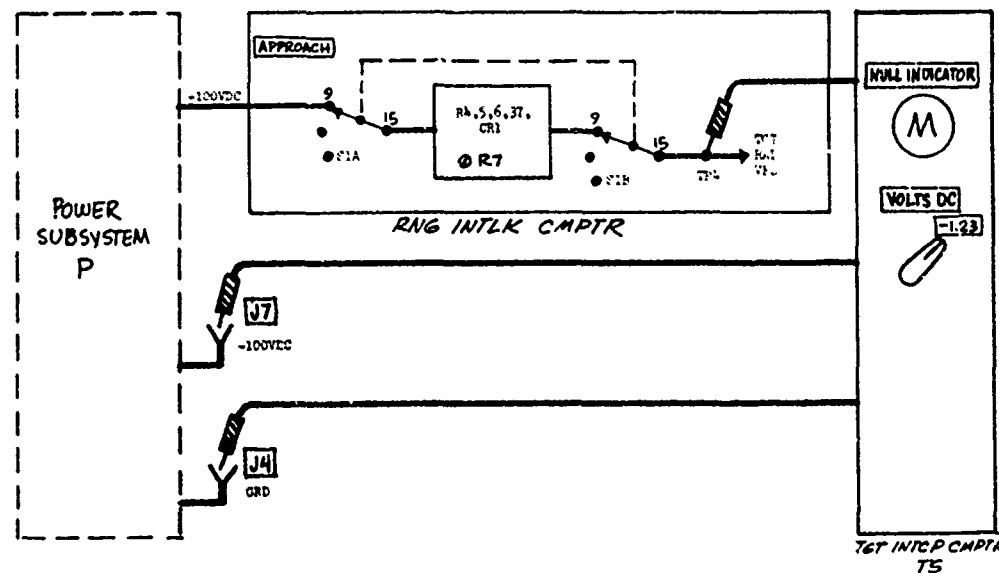
4



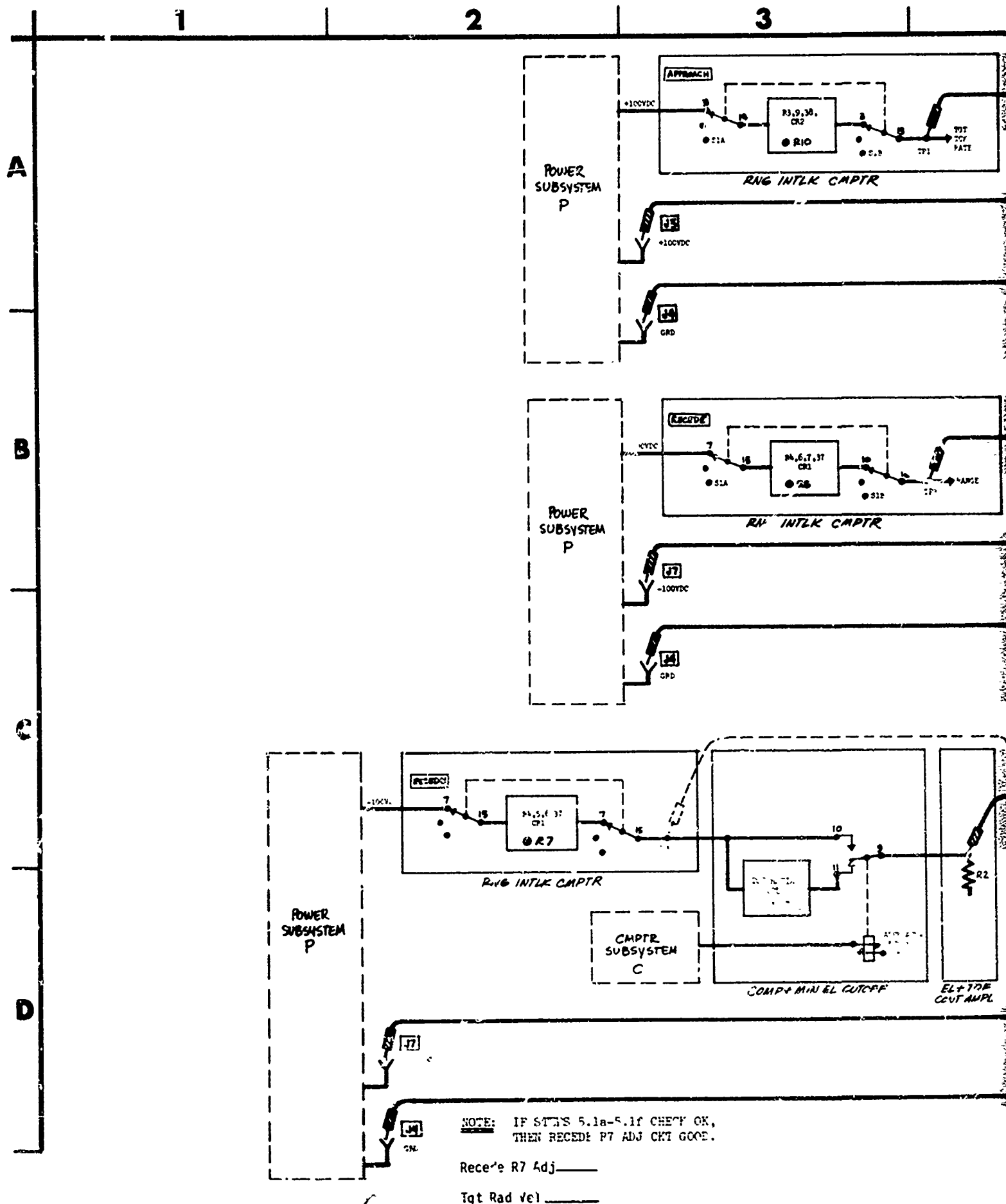
CW1
STEP 5a-5g
TABLE 17
TM-511-12/1



CW2
STEP 5h-5k
TABLE 17
TM-511-12/1



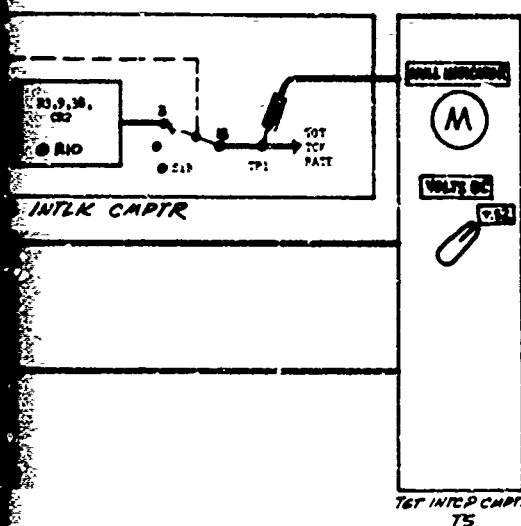
CW3
STEP 5l-5o
TABLE 17
TM-511-12/1



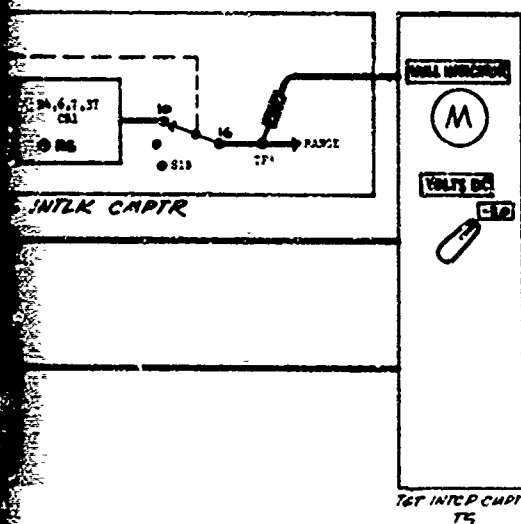
4

5

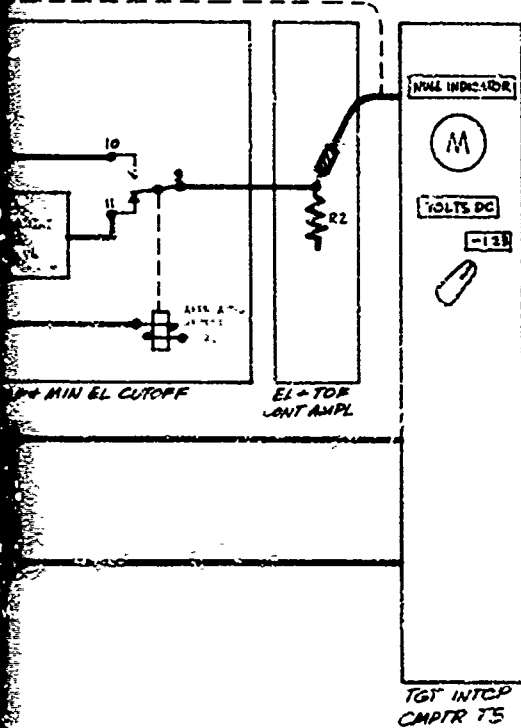
6



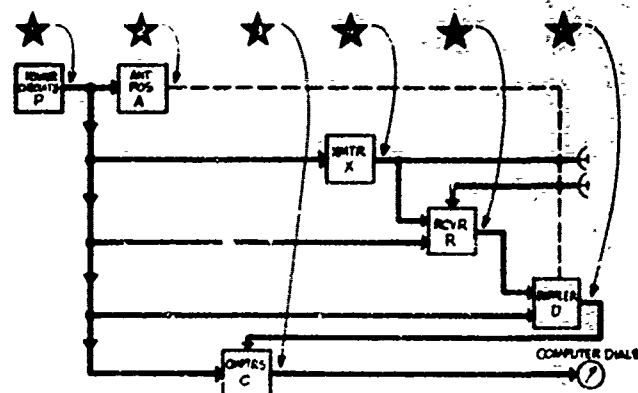
CW4
STEP 5p-5s
TABLE 17
TM-511-12/1



CW5
STEPS 5t-5w
TABLE 17
TM-511-12/1



CW6
STEP 5.1
TABLE 17
TM-511-12/1

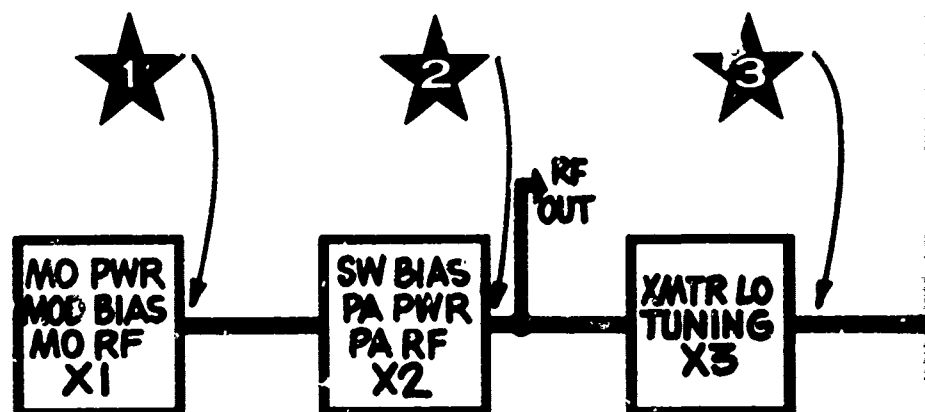


★ CKT MO Pwr, Mod Bias, MO RF
COND MO on
IND FORWARD RF POWER sw: MO
 MO BEAM AMP m: in tol
 FORWARD RF POWER m: in tol

★ CKT Sw Bias, PA Pwr, PA RF
COND PA on
IND FORWARD RF POWER sw: PA
 PA BEAM AMP m: in tol
 Xmtr FORWARD RF POWER m: in tol

★ CKT Xmtr LO Tuning
COND PA on
IND RCVR UNLOCK pb: dep & rel
 LO Tun Mtr turns both cw & c
COND PA on
IND DEGEN FUNCT sw: RE' LEVEL
 DEGEN FUNCT m: lock & in to

★ CKT Noise Cancellation
COND PA on
IND DEGEN FUNCT sw: CAV X'IAL &
COND DEGEN FUNCT m: in tol both
IND PA on
 NOISE sw: FM
 HF DISABLE pb: dep & rel
 NOISE m: rises then returns



A

Tr LO Tuning

on

WR UNLOCK pb: dep & rel

Tun Mtr turns both cw & ccw

on

SEN FUNCT sw: REF LEVEL

SEN FUNCT m: lock & in tol

oise Cancellation

on

SEN FUNCT sw: CAV XTAL & BRIDGE NULL

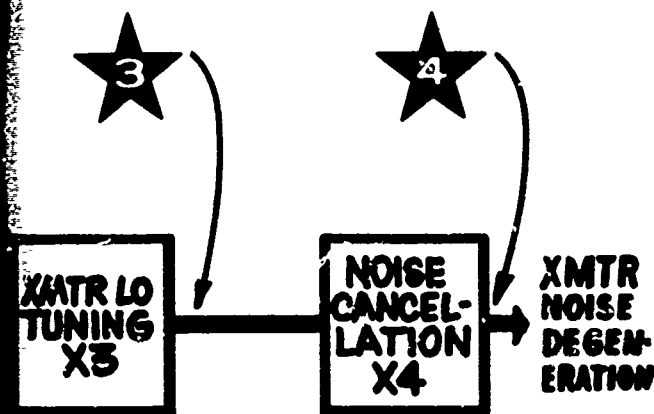
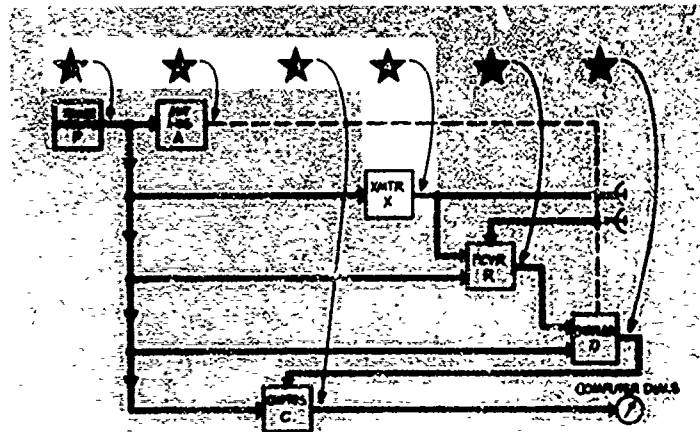
SEN FUNCT m: in tol both pos

on

NOISE sw: FM

DISABLE pb: dep & rel

NOISE m: rises then returns to tol



NOTE: If cb's tripping exchange these chassis, one at a time—

HV Reg
Rip Sen Unit
MO
HVPS



CKT
COND

MO High Voltage
MO on

IND

REG VOLTS sw: MO
MO INCREASE cont adj
MO BEAM VOLT m: in tol
MO BEAM AMP m: in tol
REG VOLTS m: in tol



CKT
COND

HVPS
MO on

IND

REG VOLTS sw: MO
Chk the 3 MO High Voltage m:
Both MO BEAM VOLT & REG VOLTS m are normal
OR
Any of the 3 m is high



CKT
COND

HV Reg
MO on

IND

REG VOLTS sw: MO
Both REG VOLTS & MO BEAM AMP m are the same (high, normal,
or low)



CKT
COND
IND

Master Osc
Above chks good
This ckt bad



CKT
COND

Iso-Mod Bias
MO on

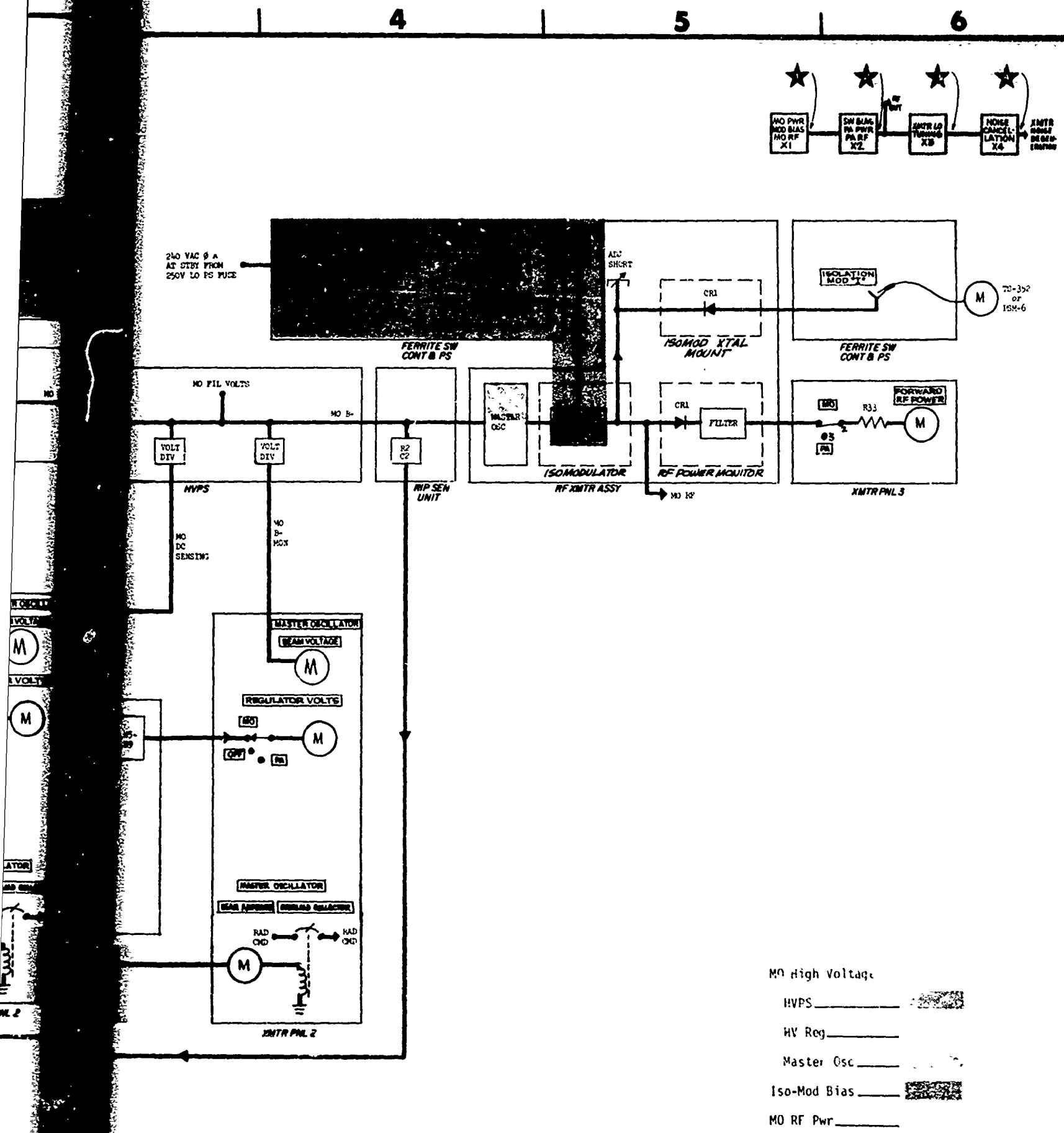
IND

Dc current m: ISO-MOD "I" & ground jacks
ISO-MOD BIAS ADJ: adj
Meter indicates null of less than 2ma



CKT
COND
IND

MO RF Pwr
Above chks good
This ckt bad



NOTE: If cb's are tripping exchange these chassis, one at a time—

HV Reg
Rip Sen Unit
PA
HVPS

★ CKT Micro Sw Bias Cont
COND NO on
PA BEAM cb: OFF
IND REFLECTED RF POWER m: red area

★ CKT PA High Voltage
COND PA on
REG VOLTS sw: PA
PA INCREASE cont adj
IND PA BEAM VOLT m: in tol
PA BEAM AMP m: in tol
REG VOLTS m: in tol

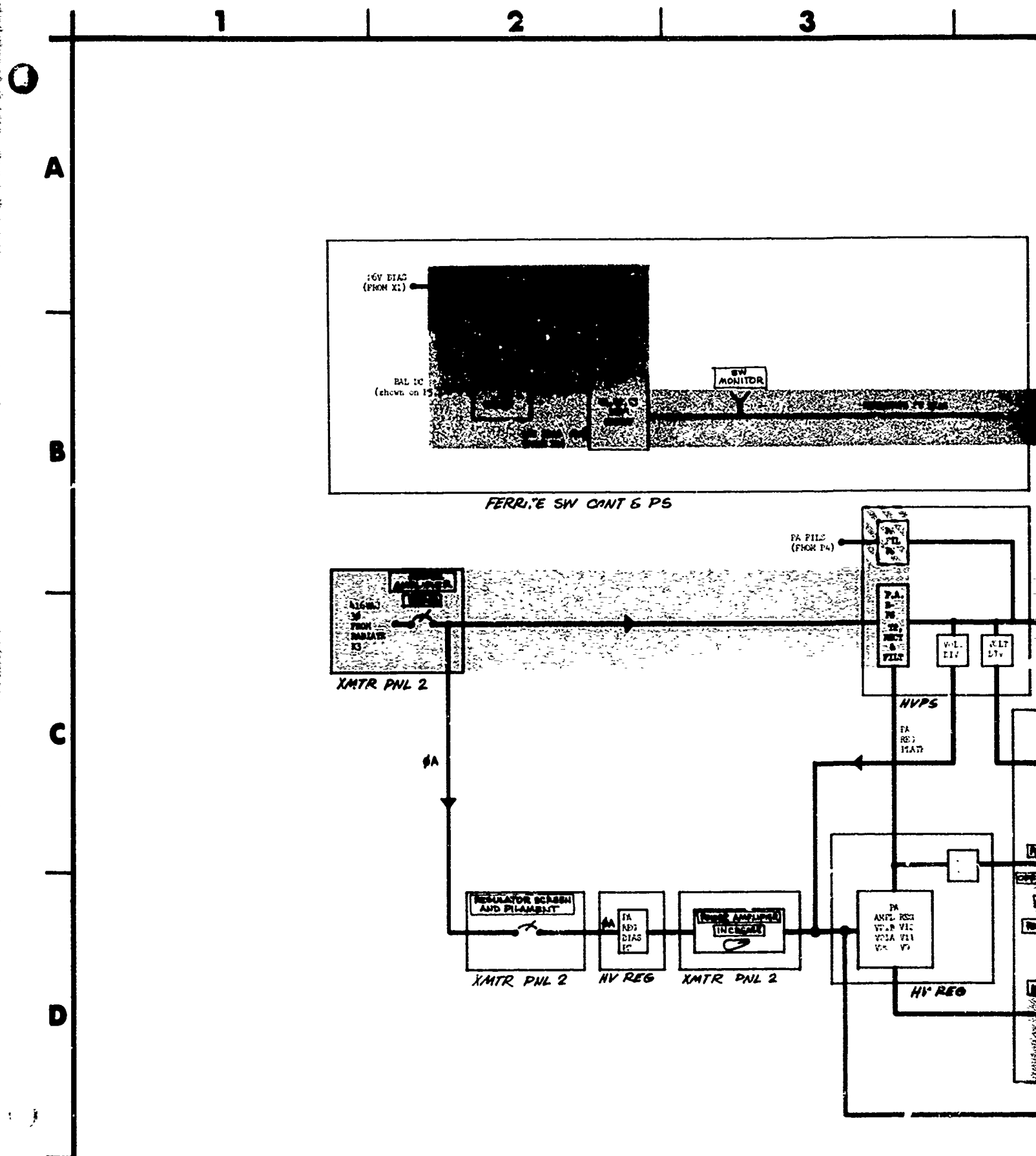
★ CKT HVPS
COND PA on
REG VOLTS sw: PA
IND Chk the 3 PA High Voltage m:
Both PA BEAM VOLT & REG VOLTS m are normal
OR
Any of the 3 m is high

★ CKT HV Reg
COND PA on
REG VOLTS sw: PA
Both REG VOLTS & PA BEAM AMP m are the same (high,
normal, or low)

★ CKT PA & Fil PS
COND Above chks good
IND This ckt bad

★ CKT PA RF
COND PA on
IND RSG RF PWR OUTPUT m: in tol

★ CKT Xmtr RF PWR m
COND Above chks good
IND This ckt bad

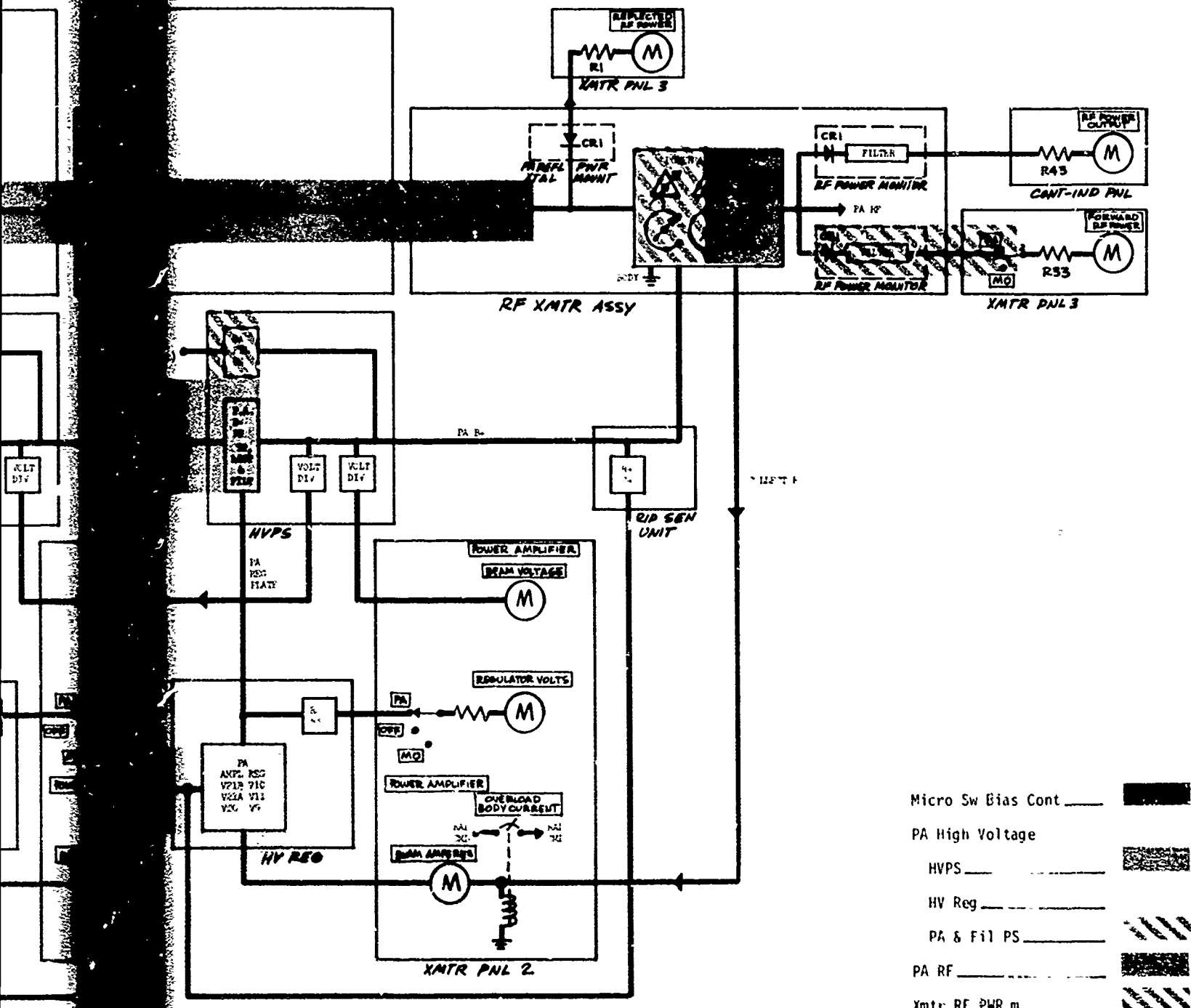
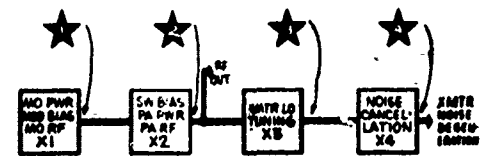


A

4

5

6



★ CKT
COND
IND LO Tun Mtr & -200 VDC PS
PA on
RCVR UNLOCK pb: dep & held
LO Tun Mtr: turns both cw & ccw

★ CKT
COND
IND LO Sweep
PA on
DEGEN FUNCT sw: DISC
RCVR UNLOCK pb: dep & held
DEGEN FUNCT m: sweeping & yellow area

★ CKT
COND
IND Disc
PA on
DEGEN FUNCT sw: DISC
RCVR UNLOCK pb: dep & held
DEGEN FUNCT m: varies thru yellow area

★ CKT
COND
IND Sweep Gen
Above chk good
This ckt bad

★ CKT
COND
IND LO Power
Radiate
DEGEN FUNCT sw:
RCVR UNLOCK pb:
DEGEN FUNCT m:
REPELLER V

★ CKT
COND
IND Ref IF
PA on
DEGEN FUNCT sw:
RCVR UNLOCK pb:
DEGEN FUNCT m:

★ CKT
COND
IND AFC Lock
PA on
RCVR UNLOCK pb:
DEGEN FUNCT sw:
DEGEN FUNCT m:

★ CKT
COND
IND Disc & Lock Co
Above chks good
This ckt bad

ower
ate
N FUNCT sw
UNLOCK pb
N FUNCT m:
PELLER V ADJ

IF
N FUNCT sw
UNLOCK pb
N FUNCT m:

Lock
UNLOCK pb
N FUNCT sw
N FUNCT m:

& Lock Co
e chks good
ckt bad

ollow arez



CKT
COND

IO Power
Indicate
DEGEN FUNCT sw: LO POWER
RCVR UNLOCK pb: dep & held
DEGEN FUNCT m: sweeping in orange area (If bad, perform
REPELLER V ADJ as in Step 10, Table 15, 511-12/1)

IND



CKT
COND

Ref IF
FA on
DEGEN FUNCT sw: REF LE'EL
RCVR UNLOCK pb: dep & rel (insure cam rotates)
DEGEN FUNCT m: kick

IND



CKT
COND

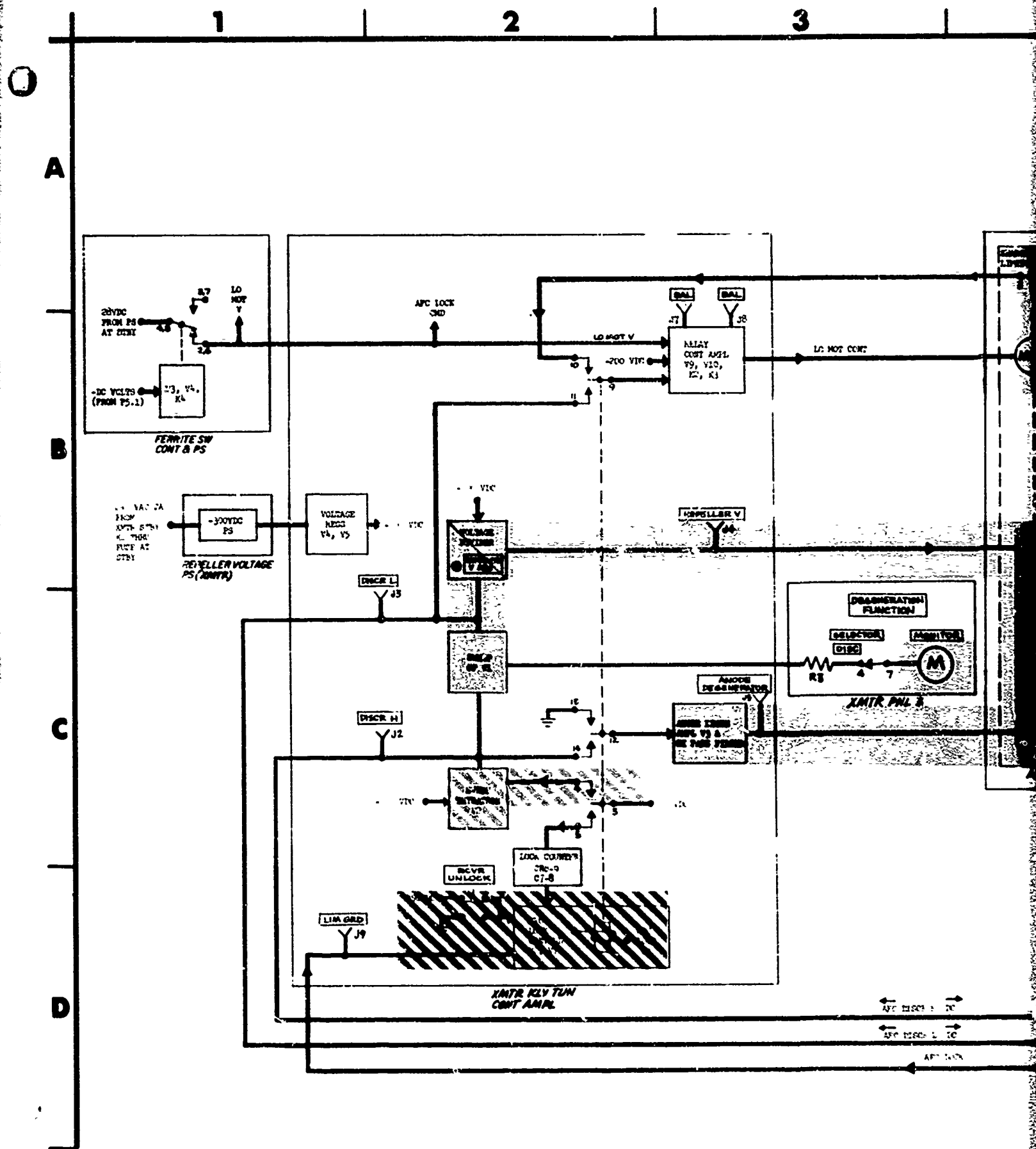
AFC Lock
FA on
RCVR UNLOCK pb: rel
DEGEN FUNCT sw: DISC
DEGEN FUNCT m: Stops sweeping (even momentarily)

IND



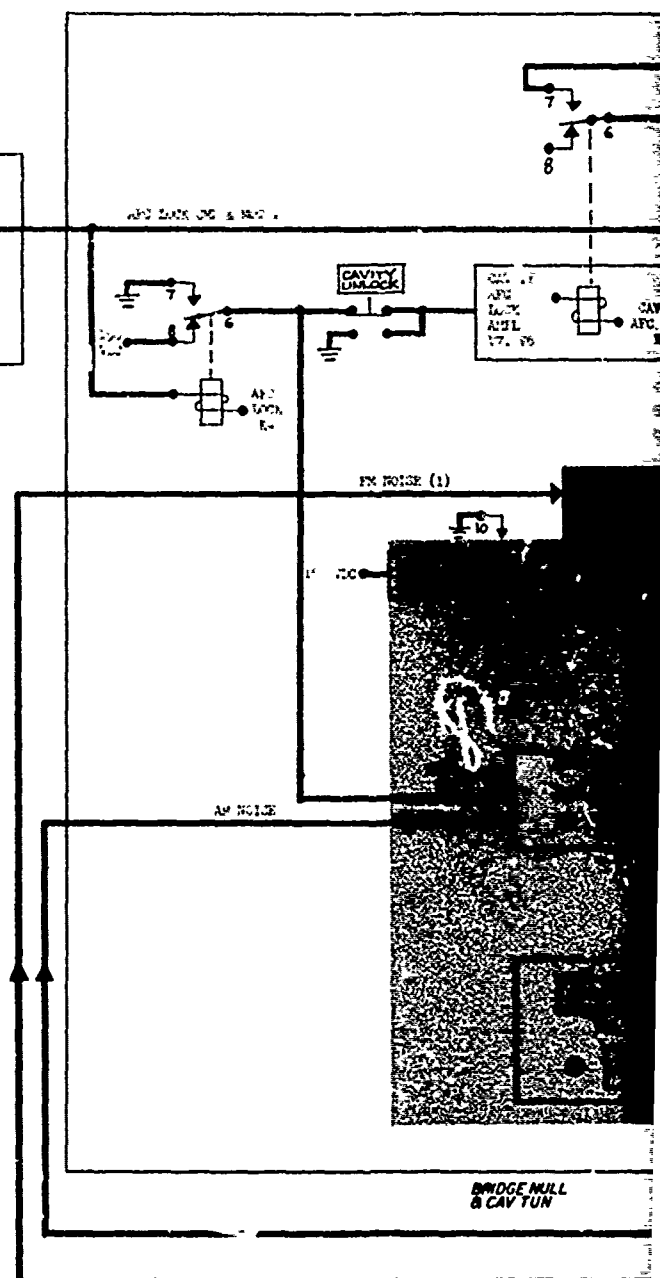
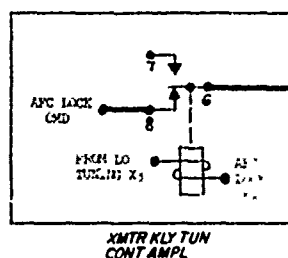
CKT
COND
IND

Disc & Lock Counter
Above chks good
This ckt bad





	1	2	3
A	★ <u>CKT</u> <u>COND</u> IND Cav Tun Mtr PA on CAVITY UNLOCK pb: dep & held Cavity Tun Mtr shaft rotates cw & ccw		★ <u>CKT</u> <u>COND</u> IND Front IF & Noise Ampl PA on NOISE sw: FM HF DISABLE pb: dep & held LF DISABLE pb: dep & held XMTR NOISE m: high
	★ <u>CKT</u> <u>COND</u> IND Cavity Lock PA on CAVITY UNLOCK pb: dep & rel DEGEN FUNCT sw: CAVITY XTAL DEGEN FUNCT m: lock or momentary lock		★ <u>CKT</u> <u>COND</u> IND Front IF PA on DEGEN FUNCT NOISE sw HF DISABLE LF DISABLE DEGEN FUNCT
	★ <u>CKT</u> <u>COND</u> IND Bridge Nulling PA on DEGEN FUNCT sw: BRIDGE NULL DEGEN FUNCT m: null in blue area (If bad, perform adj as in Step 12, Table 15, 511-12/1)		★ <u>CKT</u> <u>COND</u> <u>IND</u> Noise Ampl Above ch This ckt

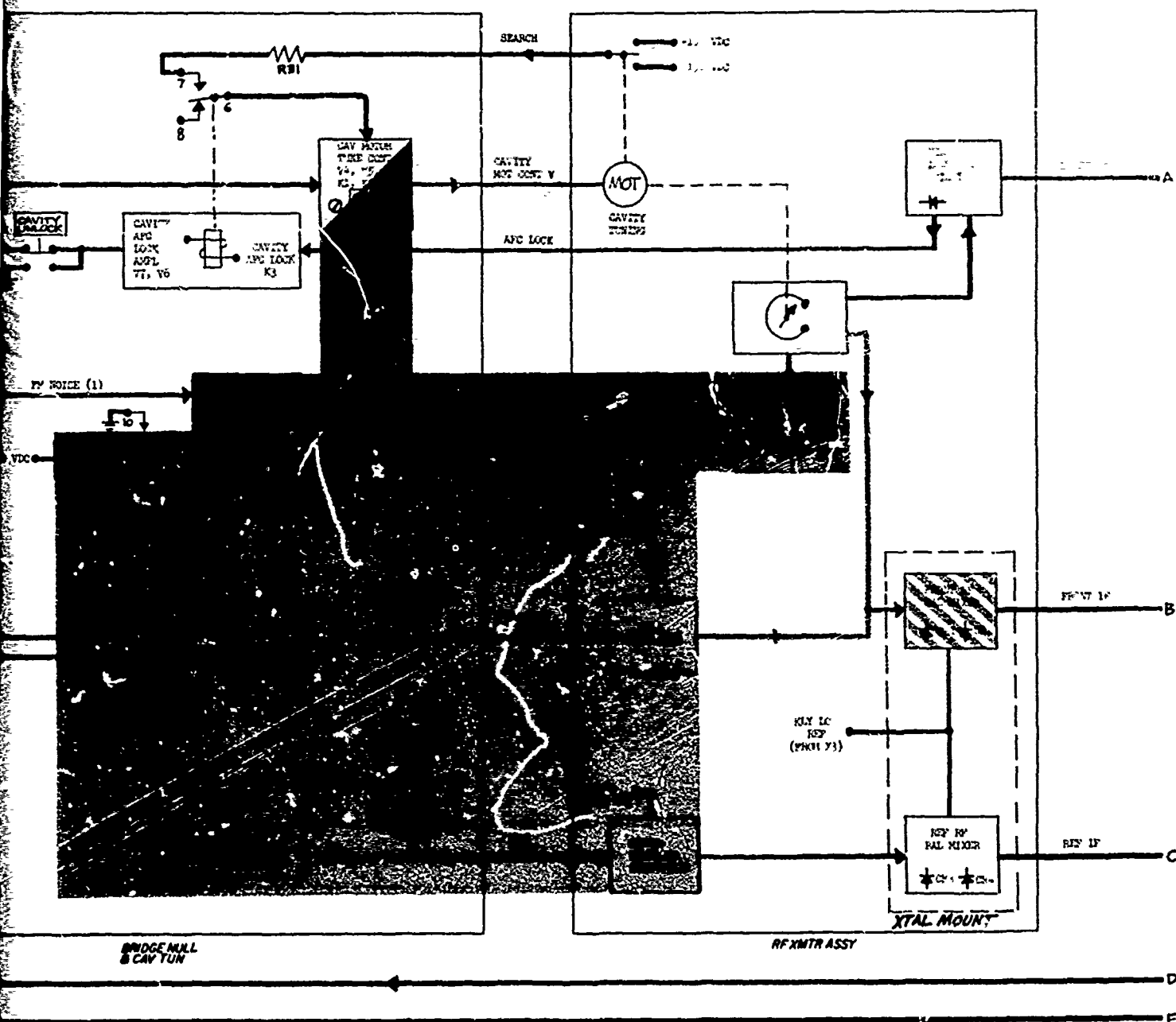


PA on
NOISE sw: FM
HF DISABLE pb: dep & held
LF DISABLE pb: dep & held
XMTR NOISE m: high

★ CKT Front IF
COND PA on
DEGEN FUNCT sw: BRIDGE NULL
NOISE sw: FM
HF DISABLE pb: dep & rel
LF DISABLE pb: dep & rel
IND DEGEN FUNCT m: reading changes when pb's are dep

★ CKT
COND
IND

Noise Ampl
Above chk good
This ckt bad



15

7

8

9



CKT
COND

IND

Adjustable Short
PA on
NOISE sw: FM
HF DISABLE pb: dep & held
XMTR NOISE m: does not decrease

NOTE: If XMTR NOISE m is pegged to the right the FM noise is too high. See IND under



CKT
COND

IND

HF Noise
PA on
NOISE sw: FM
HF DISABLE pb: dep & held
XMTR NOISE m: reading incre



CKT
COND

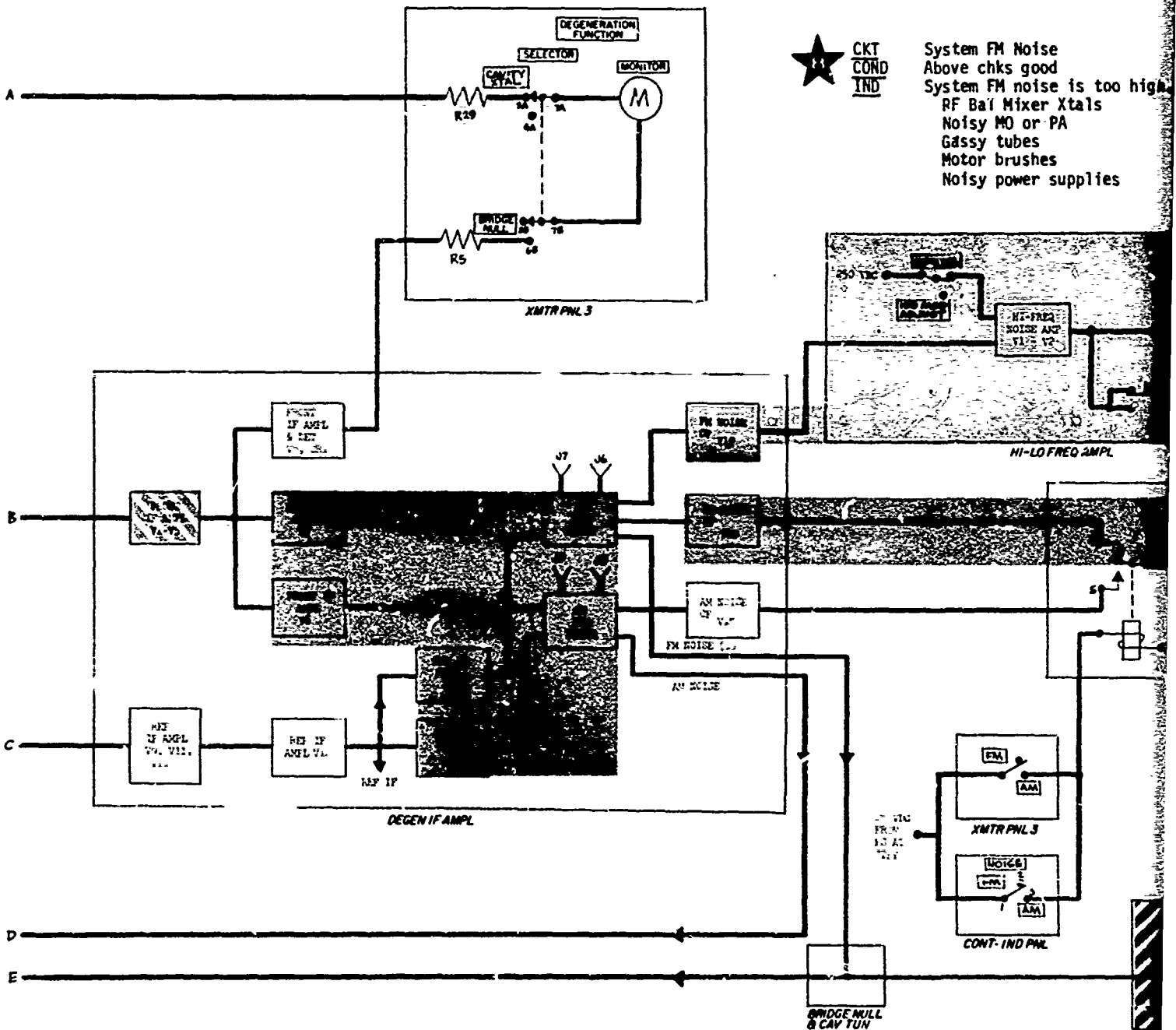
IND

LF Noise
PA on
NOISE sw: FM
LF DISABLE pb: dep & held
XMTR NOISE m: reading incre



CKT
COND
IND

System FM Noise
Above chks good
System FM noise is too high
RF Bal Mixer Xtals
Noisy MO or PA
Gassy tubes
Motor brushes
Noisy power supplies



A

10

11

12

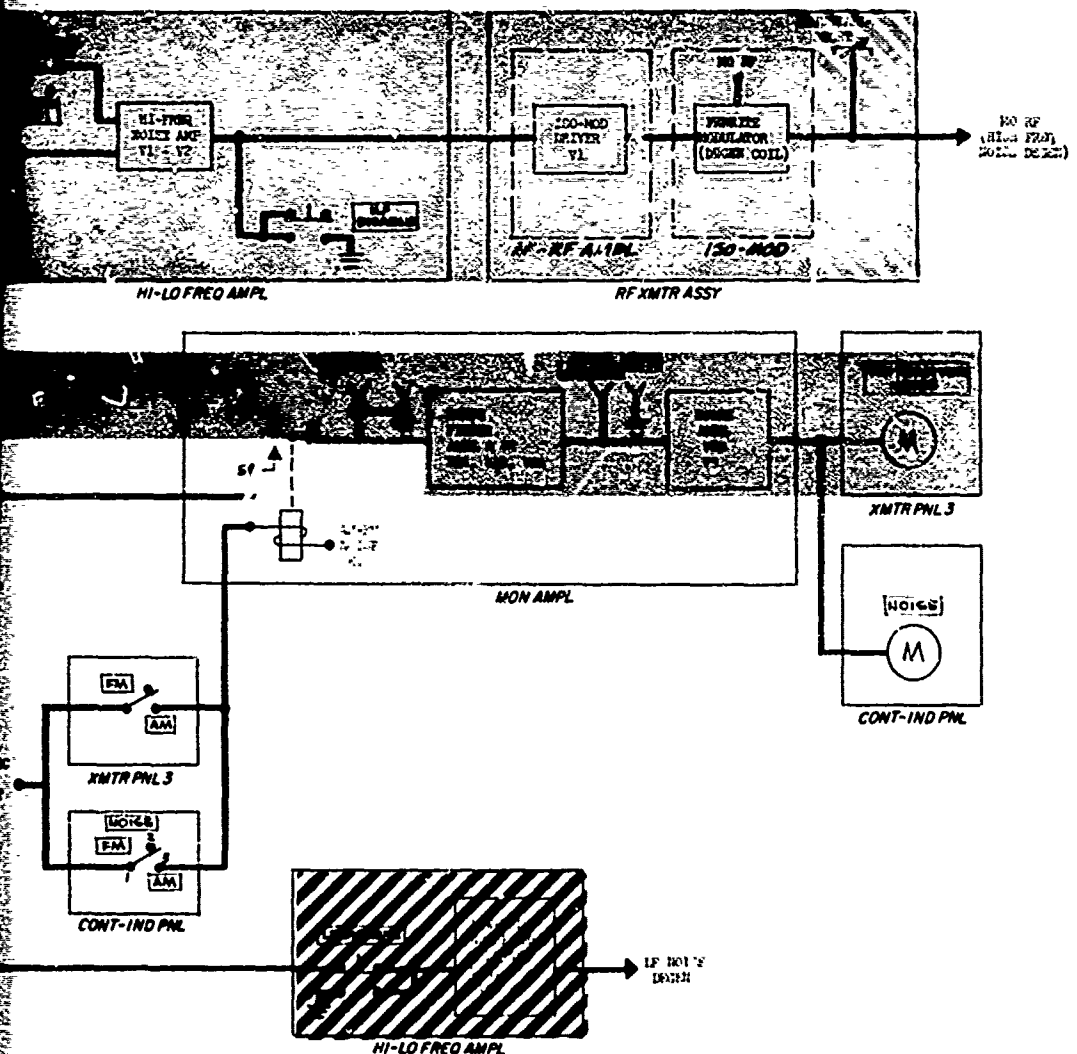
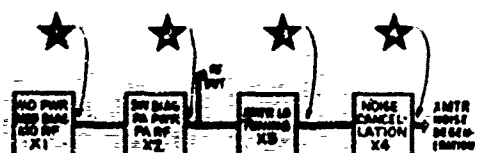
m is pegged to the right the next chks cannot be made. System too high. See IND under



HF Noise
PA on
NOISE sw: FM
HF DISABLE pb: dep & held
XMTR NOISE m: reading increases

LF NOISE
PA on
NOISE sw: FM
LF DISABLE pb: dep & held
XMTR NOISE m: reading increases

System FM Noise
Above chks good
System FM noise is too high. Some possible causes are:
RF Bal Mixer Xtals
Noisy MO or PA
Gassy tubes
Motor brushes
Noise power supplies



Cav Tun Mtr _____
Cavity Lock _____
Bridge Nulling _____
Front IF & Noise Ampl _____
Front IF _____
Noise Ampl _____
Adjustable Short _____
HF Noise _____
LF Noise _____

1

2

3

A



CKT
COND

Ion Cutoff

PA on

FORWARD RF POWER sw: PA

RADIATE INTLK RESET pb: dep & held

IONIZATION TEST sw: pos 2

FORWARD RF POWER m: indication drops to blue area

IND



CKT
COND

Relay Control

Radiate

RADIATE INTLK RESET pb: rel

IONIZATION TEST sw: pos 2

RADIATE INTLK OPEN IND lamp: on

IND



CKT
COND
IND

Test Sw

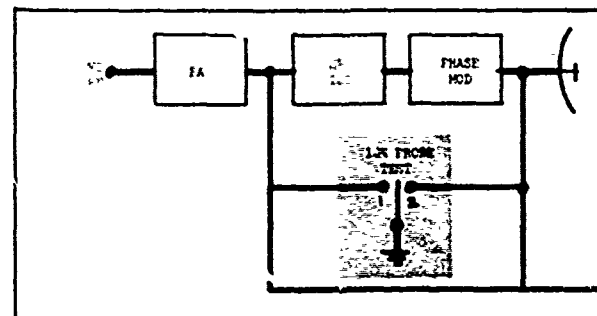
Above chks good

This ckt bad

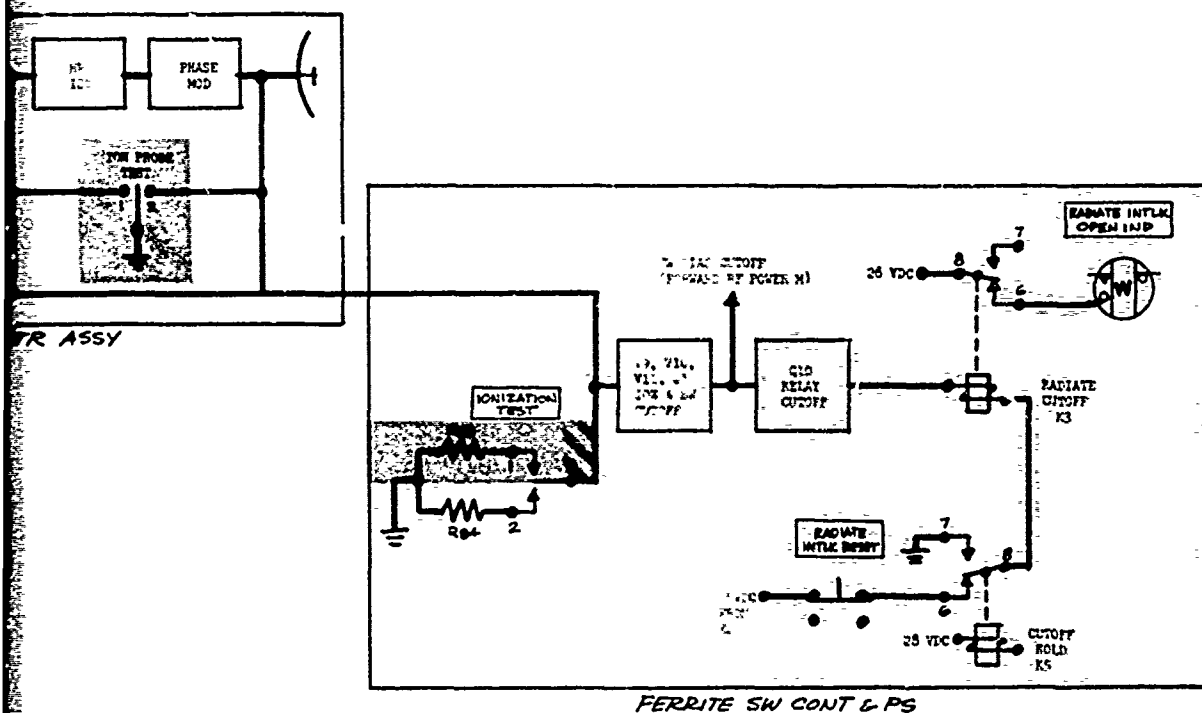
B

C

D



RF XMITR ASSY



XW/
ION TEST
STEP 1
TABLE 15
TX-511-12/1

Ion Cutoff._____

Relay Control

Test Sw_____

1

2

3

A



CKT
COND

Bias Cutoff

PA on

FORWARD RF POWER sw: PA

RADIATE INTLK RESET pb: dep & held

IONIZATION TEST sw: pos 2

FORWARD RF POWER m: indication drops to blue area

IND



CKT
COND

Arc Detection

PA on

FORWARD RF POWER sw: PA

RADIATE INTLK RESET pb: dep & held

ARC DETECTION TEST pb: dep & held

FORWARD RF POWER m: indication drops to blue area

IND



CKT
COND

Cutoff Relay

Radiate

RADIATE INTLK RESET pb: pos

IONIZATION TEST sw: pos

RADIATE INTLK OPEN IND

IND



CKT
COND

Cutoff Counter

Above chks good

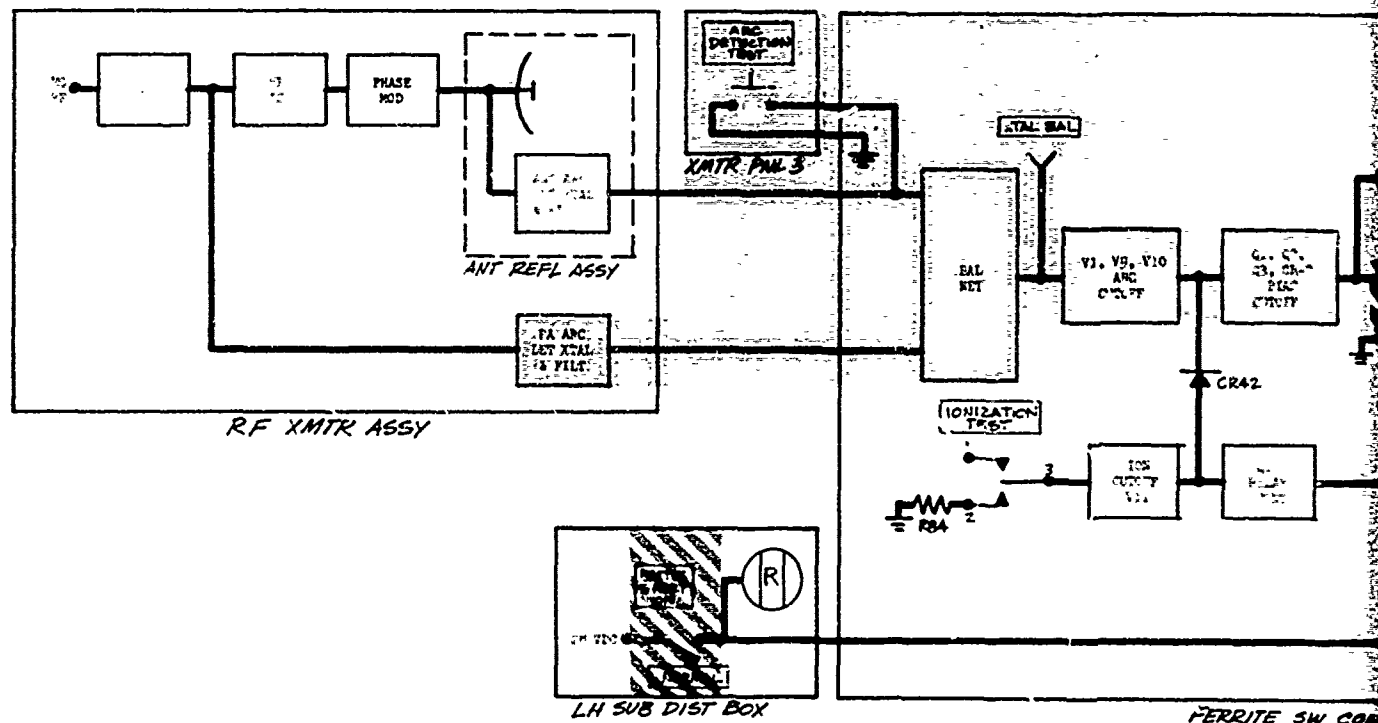
This ckt bad

IND

B

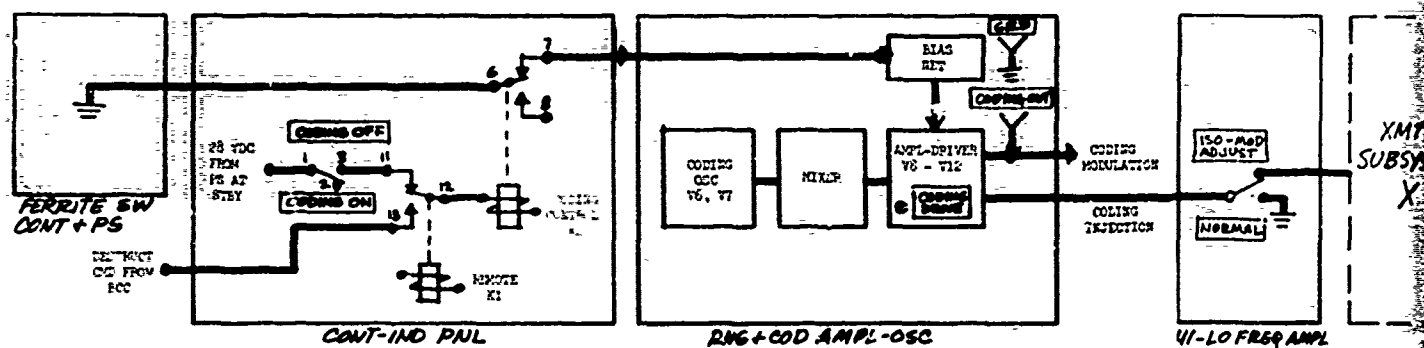
C

D



A

6

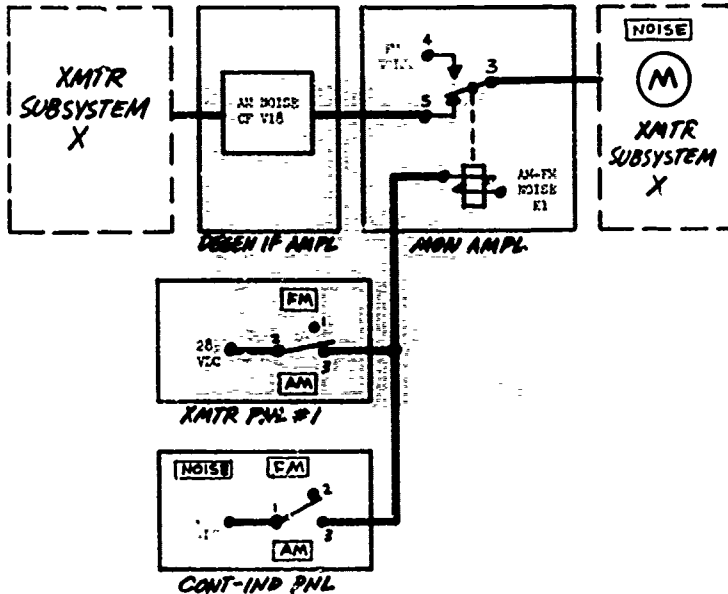
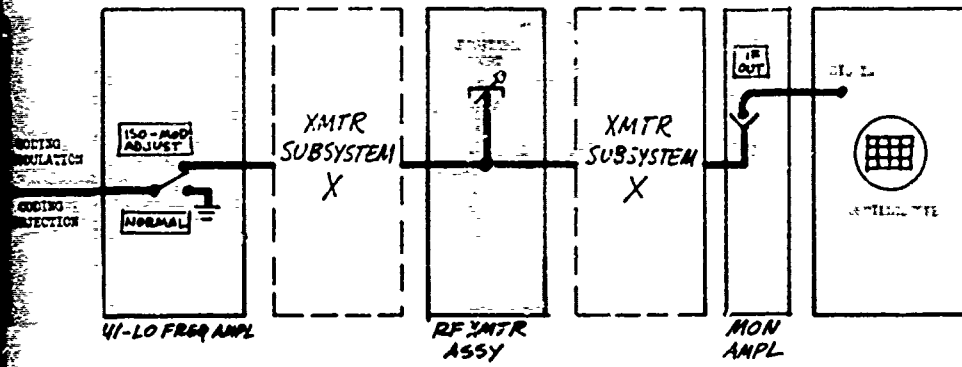
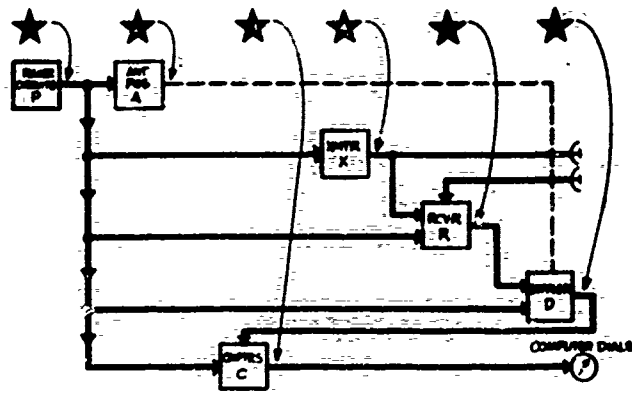


XMT
SUBSYSTEM
X

4

5

6



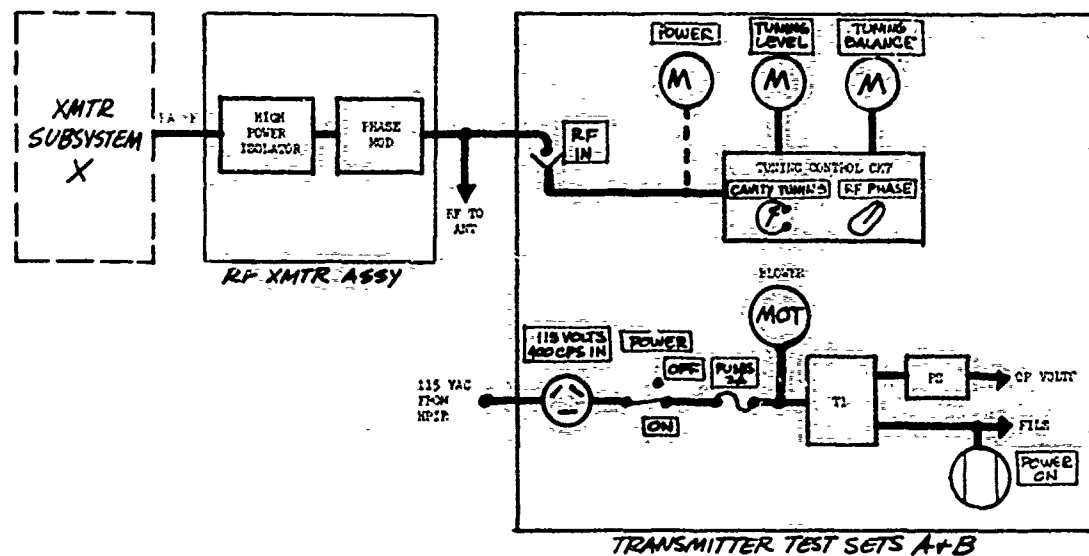
2

3

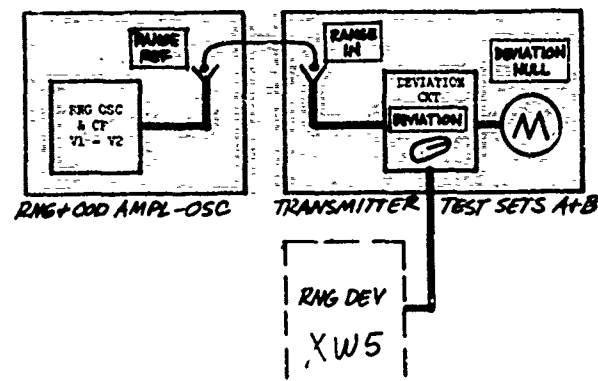
4

PRIOR CHECKS:

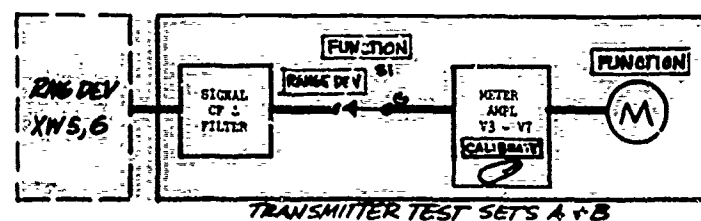
1. HPIR SYSTEM CHECKS 1-4
2. STEPS 18-22, TABLE 15, TM-511-12/1

**XW 5**

RNG DEV
STEP 18a-18m
TABLE 15
TM-511-12/1

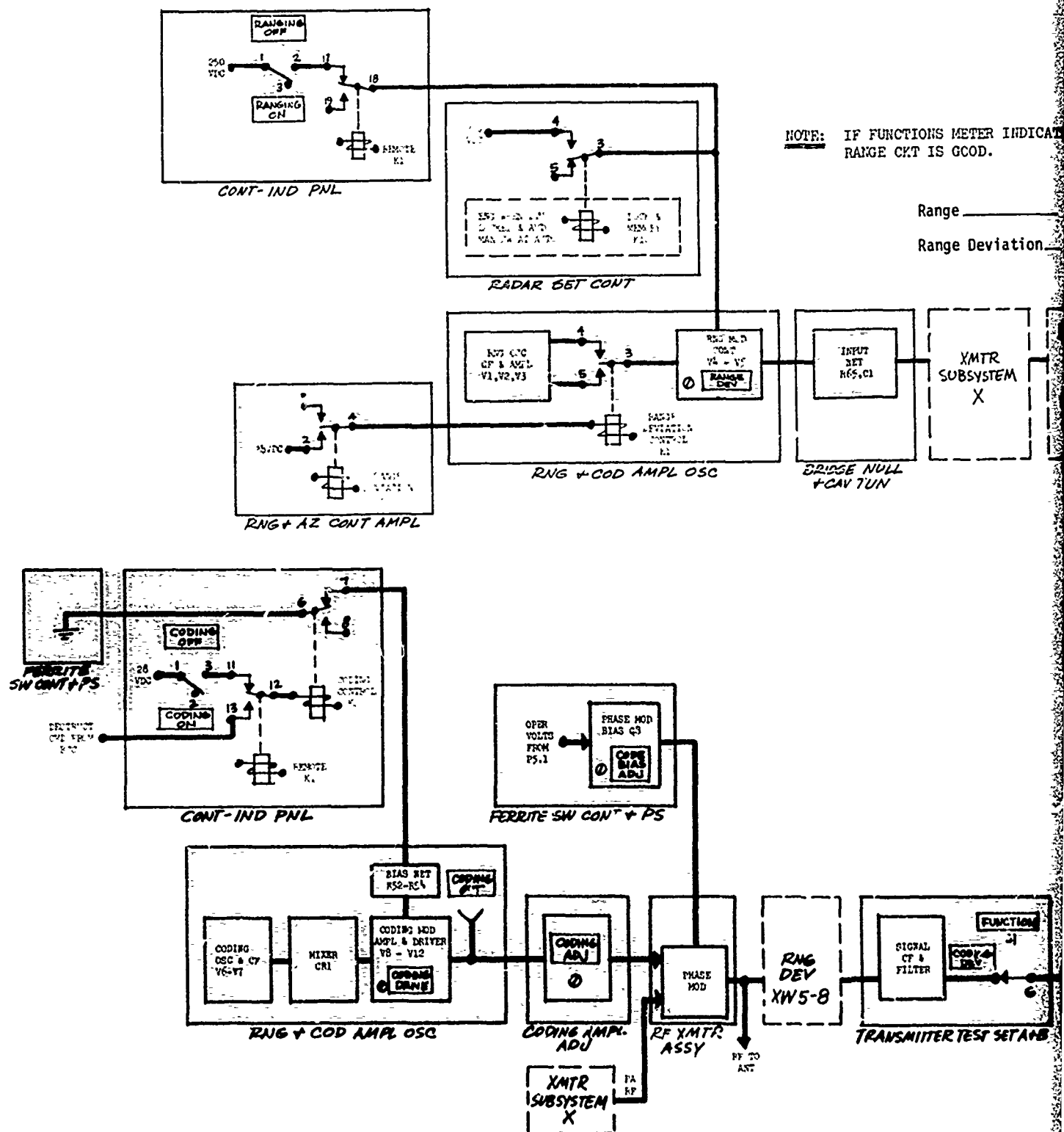
**XW 6**

RNG DEV
STEP 18n-18o
TABLE 15
TM-511-12/1

**XW 7**

RNG DEV
STEP 18p
TABLE 15
TM-511-12/1

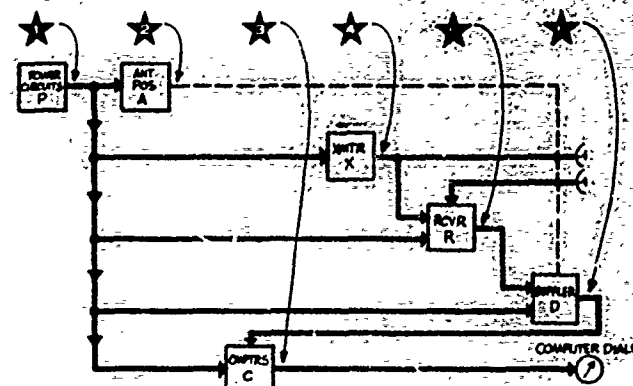
1. HPIR SYSTEM CHECKS 1-4
2. STEPS 18-22, TABLE 15, TM-511-12/1



4

5

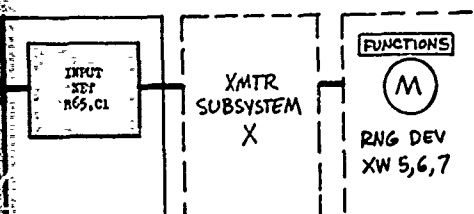
6



NOTE: IF FUNCTIONS METER INDICATES ABOVE RED LINE,
RANGE CKT IS GOOD.

Range _____

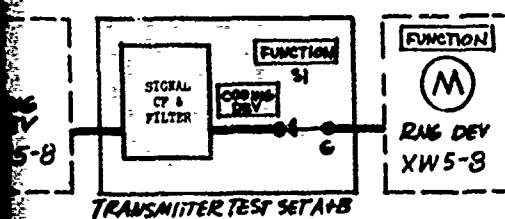
Range Deviation _____



BRIDGE NULL
+ CAV TUN

XW 8

RNG DEV
STEP 18q-18x
TABLE 15
TM-511-12/1



XW 9

CODING DEV
STEP 19
TABLE 15
TM-511-12/1

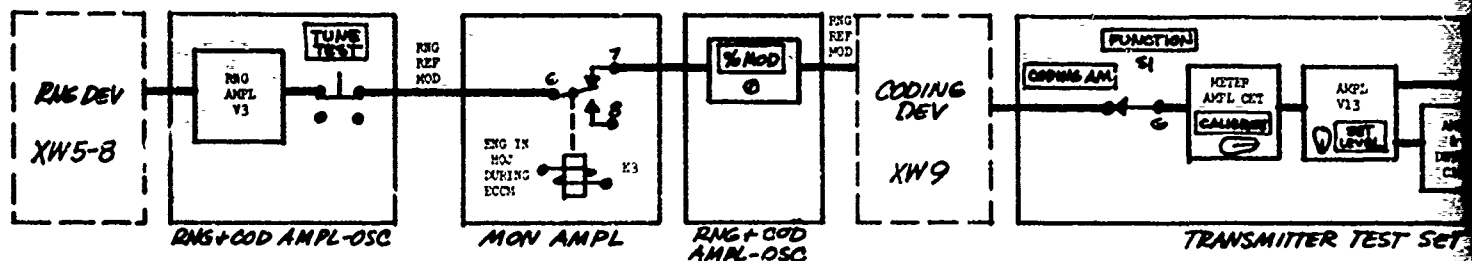
B

XW5,6,7,8,9 61

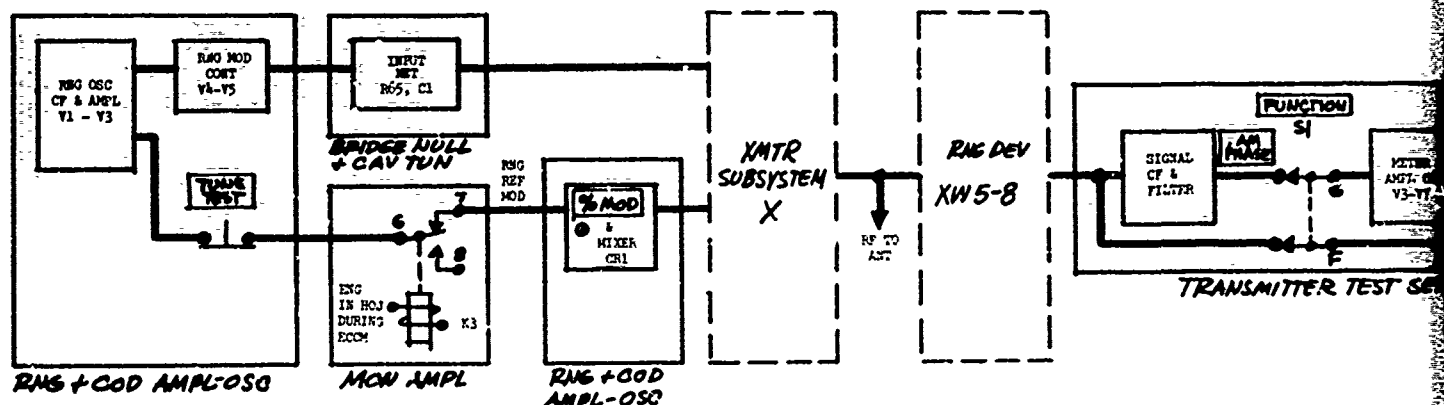
PRIOR CHECKS FOR XW 10-12:

1. HPIR SYSTEM CHECKS 1-4
2. STEPS 18-22, TABLE 15, TM-511-12/1

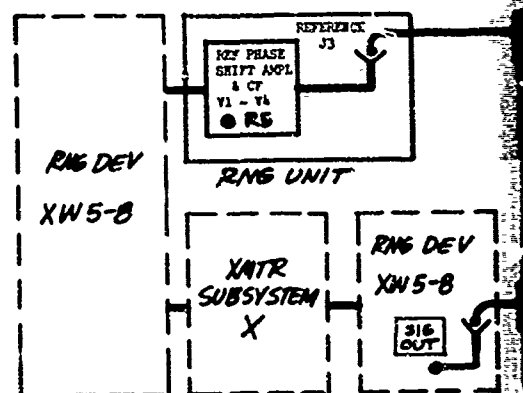
A



B



C

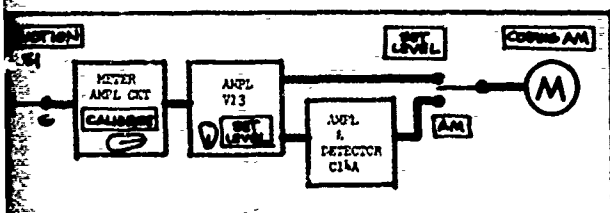


D

4

5

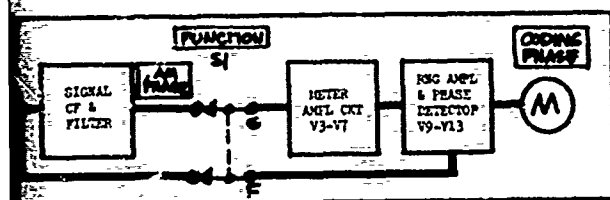
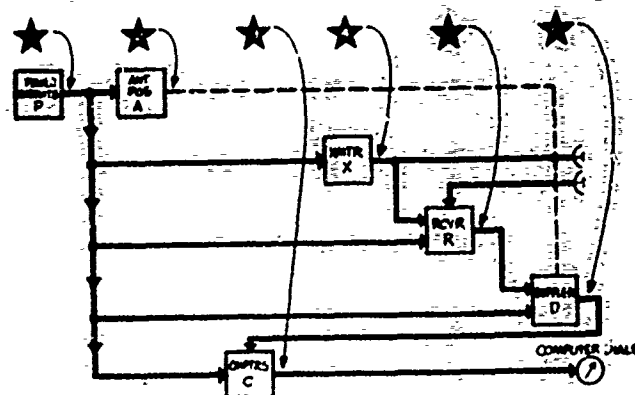
6



TRANSMITTER TEST SET A & B

XW 10

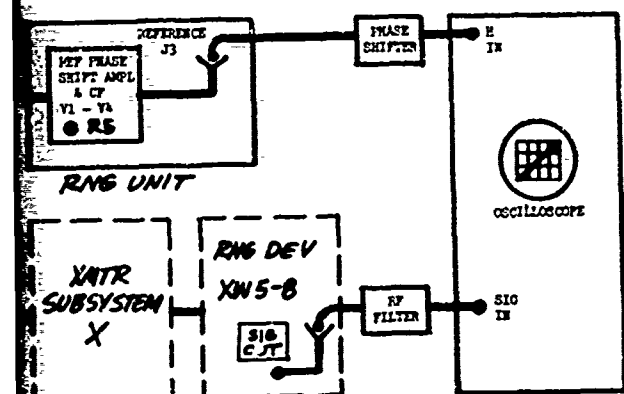
CODING AM
STEP 20
TABLE 15
TM-511-12/1



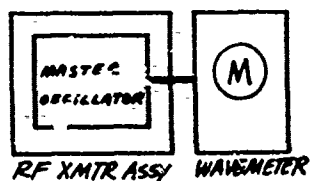
TRANSMITTER TEST SETS A & B

XW 11

CODING PHASE
STEP 21
TABLE 15
TM-511-12/1

**XW 12**

RNG PHASE
STEP 22
TABLE 15
TM-511-12/1

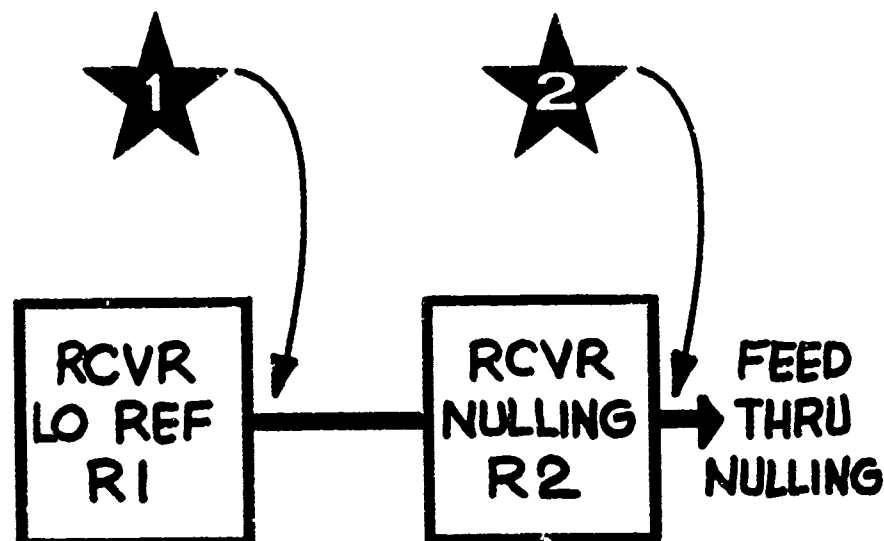
**XW 13**

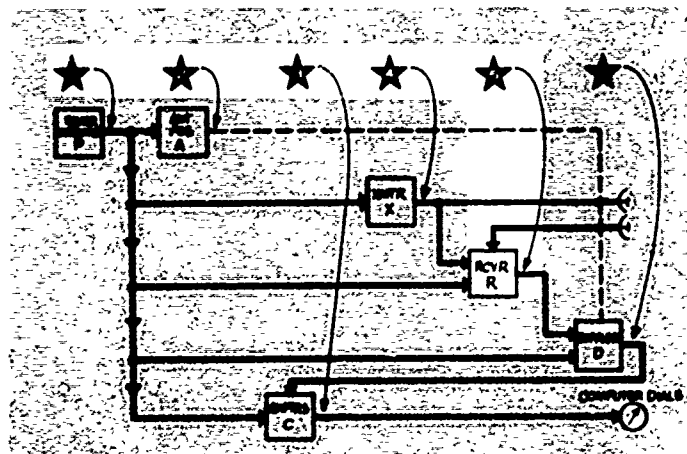
NO FREQ
STEP 23, 24
TABLE 15
TM-511-12/1

RF XMTR ASSY WAVEMETER

★ CKT Rcvr LO Ref
COND PA on
IND RCVR FUNCT sw: REF LEVEL
 RCVR FUNCT m: lock & in to1

★ CKT Rcvr Nulling
COND PA on
 Rcvr door closed or RCVR FUNCT/XMTR NOISE sw: NORMAL
IND RCVR FUNCT sw: MAIN FEED & SIDE LOBE
 RCVR FUNCT m: both in to1





LEVEL
& in tol

RCVR FUNCT/XMTR NOISE SW: NORMAL
FEED & SIDE LOBE
in tol



RCVR
NULLING
R2

FEED
THRU
NULLING

★ CKT LO Tun Mtr & -200 VDC PS
COND PA on
IND RCVR UNLOCK pb: dep & held
LO Tun Mtr: turns both cw & ccw

★ CKT LO Sweep
COND Two men req
PA on
RCVR FUNCT sw: DISC
RCVR UNLOCK pb: dep & held
IND RCVR FUNCT m: sweeping & yellow area

★ CKT Disc
COND Two men req
PA on
RCVR FUNCT m: DISC
RCVR UNLOCK pb: dep & held
IND RCVR FUNCT m: varies thru yellow area

★ CKT Sweep Gen
COND Above chk good
IND This ckt bad

★ CKT
COND
IND

LO Power
Two men req
Radiate
RCVR FUNCT sw: LO POWER
RCVR UNLOCK pb: dep & held
RCVR FUNCT m: sweeping in orange area (if bad, perform
REPELLER V ADJ as in TABLE 16, Step 4a, b, 511-12/1)

★ CKT
COND
IND

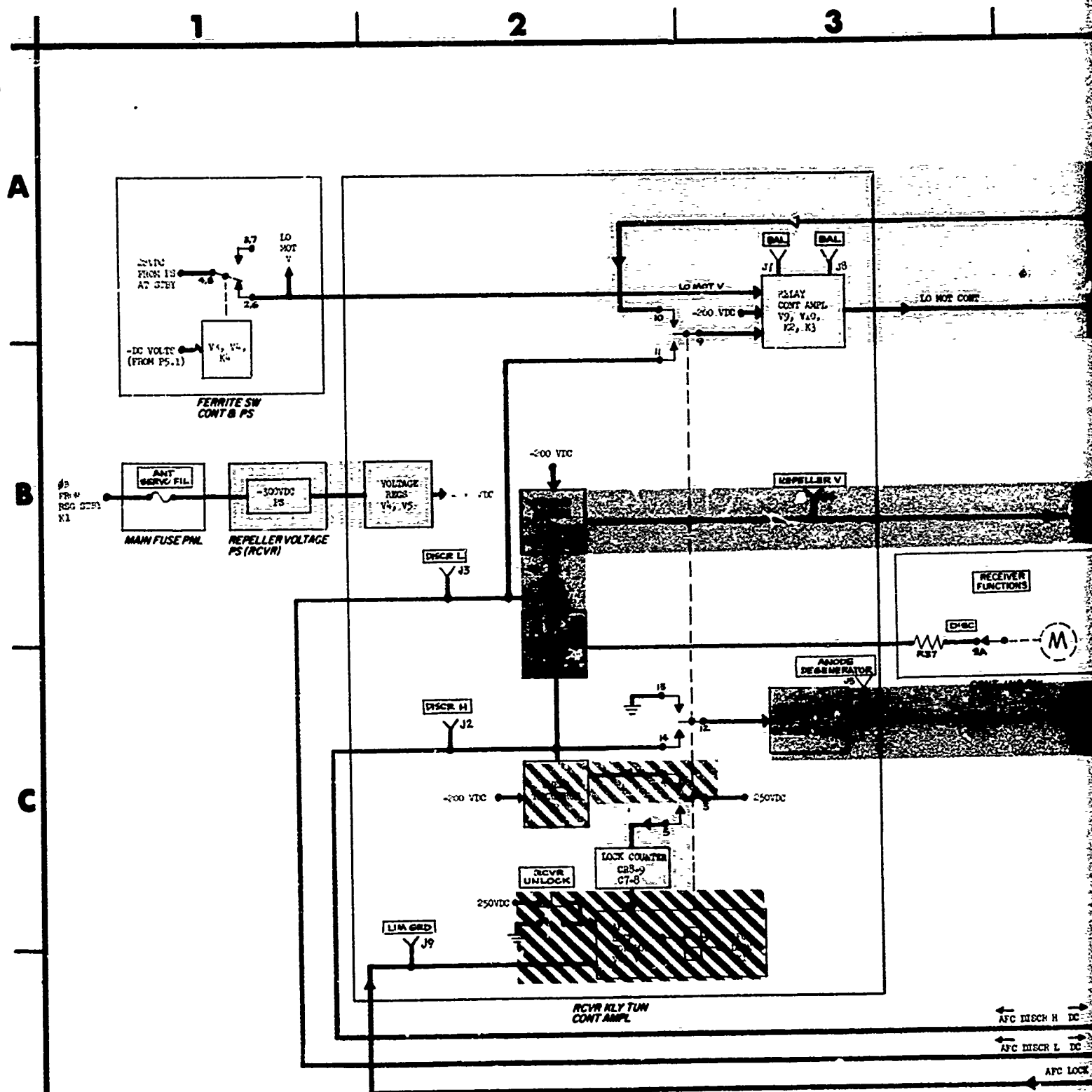
Ref IF
Two men req
PA on
RCVR FUNCT sw: REF LEVEL
RCVR UNLOCK pb: dep & rel (insure cam rotates)
RCVR FUNCT m: kick

★ CKT
COND
IND

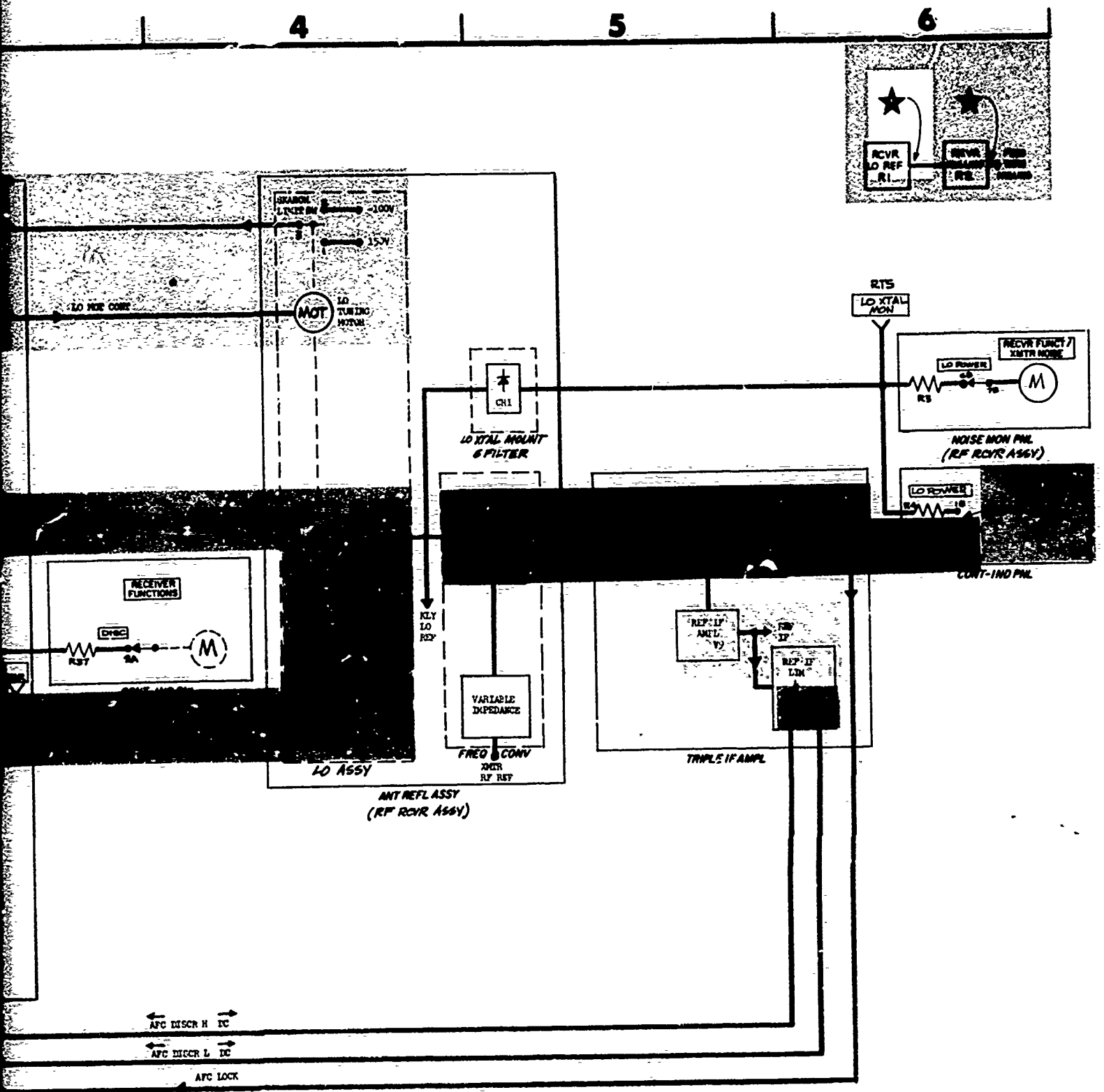
AFC Lock
PA on
RCVR UNLOCK pb: rel
RCVR FUNCT sw: DISC
RCVR FUNCT m: stops sweeping (even momentarily)

★ CKT
COND
IND

Disc & Lock Counter
Above chk good
This ckt bad



A



LO Tun Mtr & -200 VDC PS...

LO Sweep

Disc

Sweep Gen

LO Power

Ref IF

AFC Lock

Disc & Lock Counter

B

RCVR LO REF RI 67

★ CKT
COND

IND

Meter
PA on
RCVR FUNCT/XMTR NOISE sw: MAIN FEED & SIDE FEED
Meter readings agree with MAIN FEED & SIDE LOBE pos of
RCVR FUNCT m

★ CKT
COND

IND

★ CKT
COND

IND

Phase Adj
PA on
RCVR FUNCT/XMTR NOISE sw: MAIN FEED & SIDE FEED
Vary PHASE ADJ (Unit 1) for both sw pos
Nulls in one sw pos (if it nulls in both, the trouble has
been corrected.

★

Perform steps 7a-7k, TABLE 16, 511-12/1. If the correct
indications are obtained, the trouble has been corrected.
If not, proceed to

★

★ CKT
COND

IND

NOTE: After the trouble is corrected, return to
TABLE 16, 511-12/1.

DE FEED
LOBE pos of

★ CKT
COND
IND

Main Feed
PA on
RECVR FUNCT/XMTR NOISE sw: MAIN FEED
RECVR FUNCT m: blue area



CKT
COND

Main FMDA
PA on
Swap FMDA's
Perform Steps 7a-7f, TABLE 16, 511-12/1
7a-7f check indications still out of tol

IND



CKT
COND
IND

Main RF-IF
Above chk good
This ckt bad

orrect
ected.

★ CKT
COND
IND

Side Feed
PA on
RECVR FUNCT/XMTR NOISE sw: SIDE FEED
RECVR FUNCT/XMTR NOISE m: blue area



CKT
COND

Side FMDA
PA on
Swap FMDA's
Perform Steps 7g-7k, TABLE 16, 511-12/1
7g-7k check indications still out of tol

IND



CKT
COND
IND

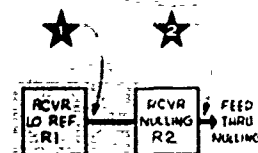
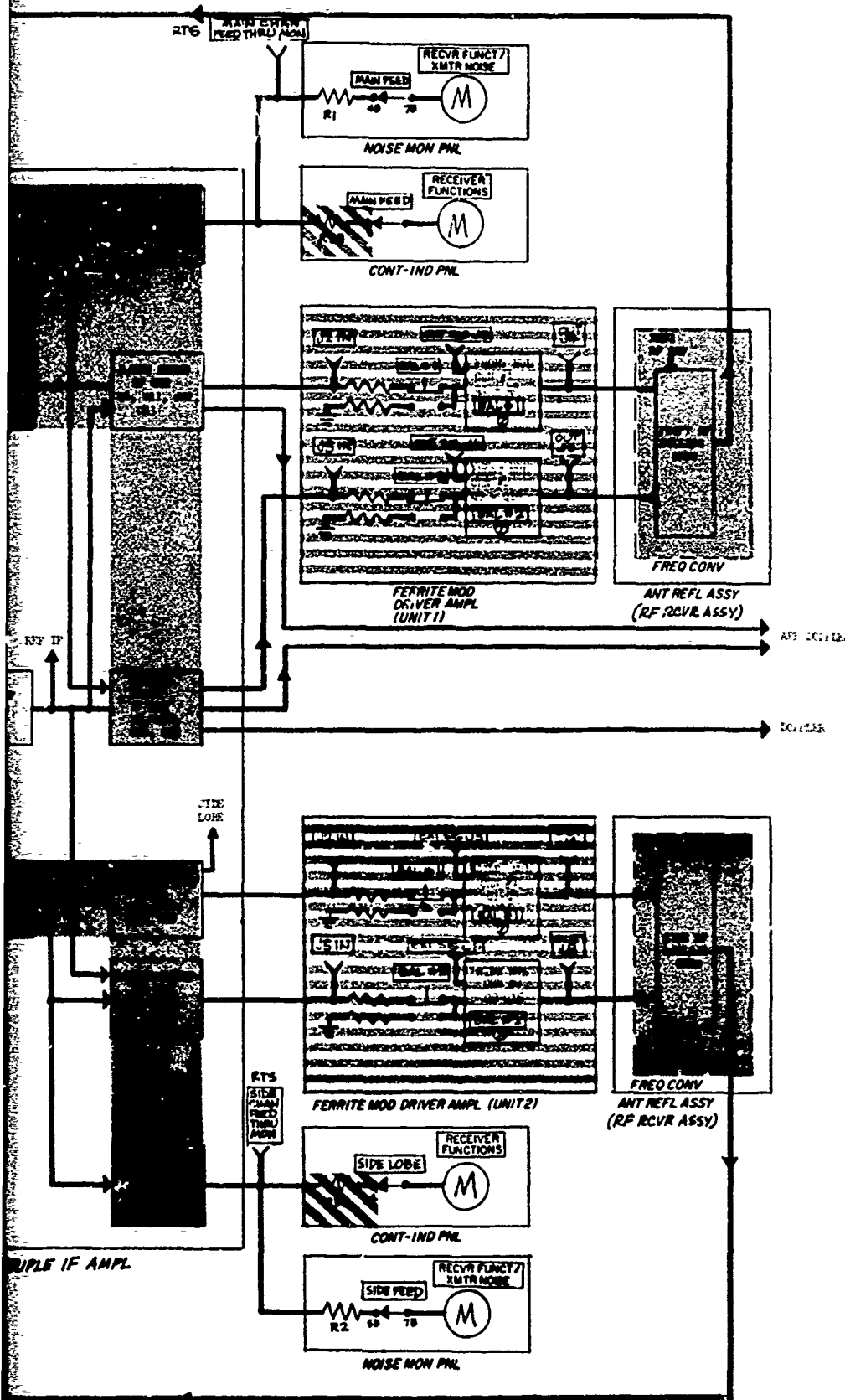
Side RF-IF
Above chk good
This ckt bad

NOTE: After the trouble has been located and corrected, perform Step 7,
TABLE 16, 511-12/1 to correct for any maladjustments.

4

5

6



Meter

Main Feed m

Side Lobe m

Phase Adj

Main Feed

Main FMDA

Main RF-IF

Side Feed

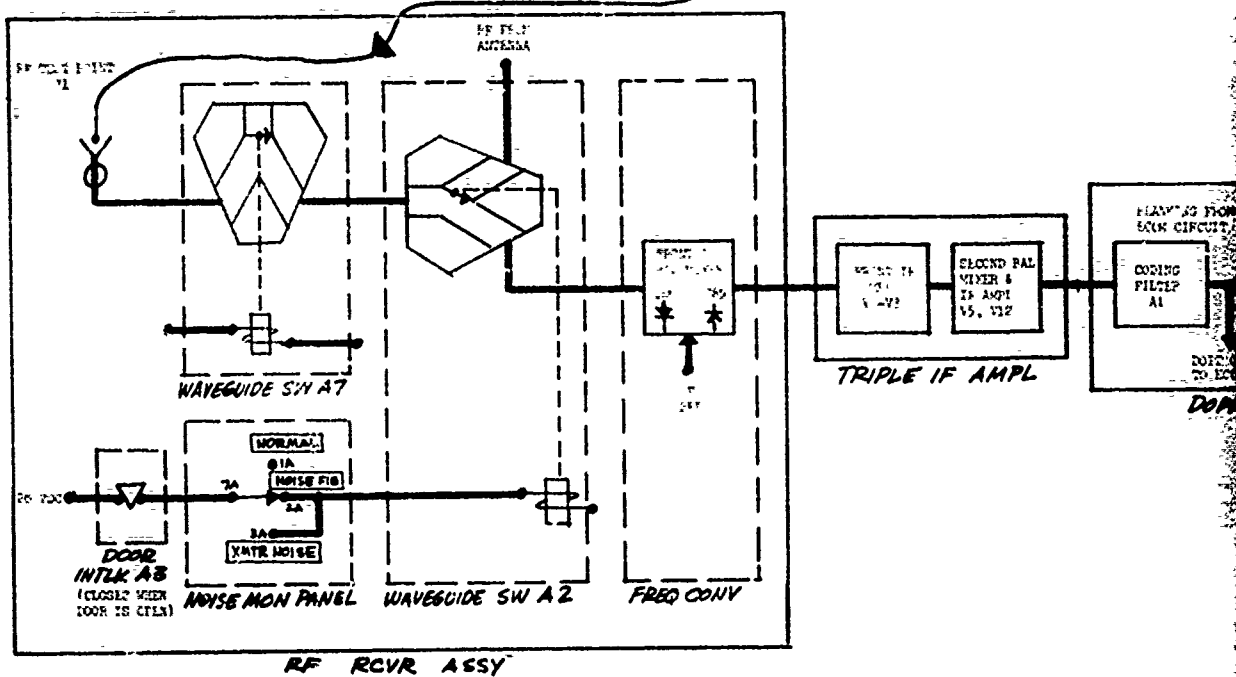
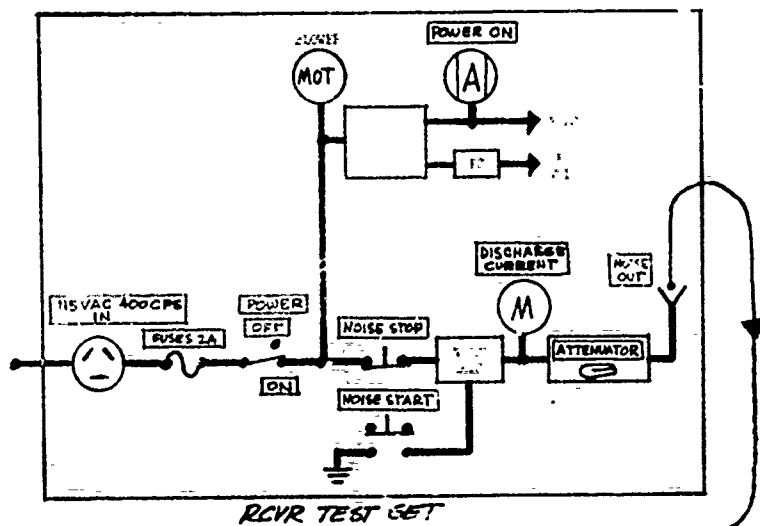
Side FMDA

Side RF-IF

B

PRIOR CHECKS:

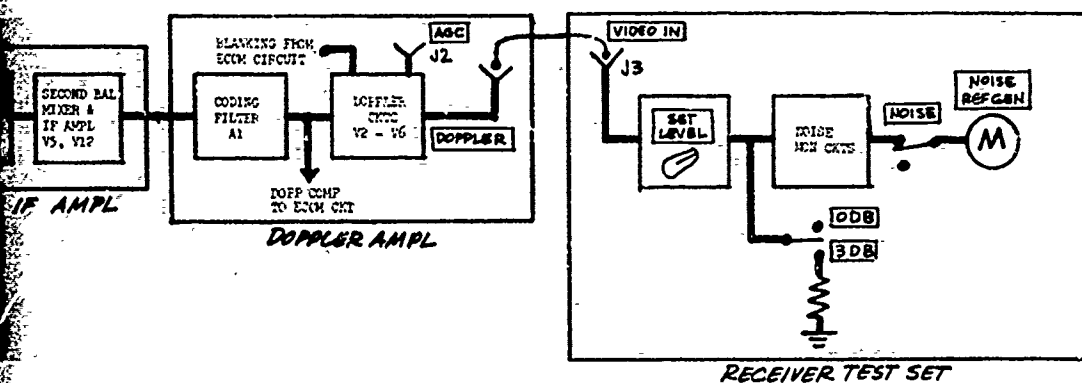
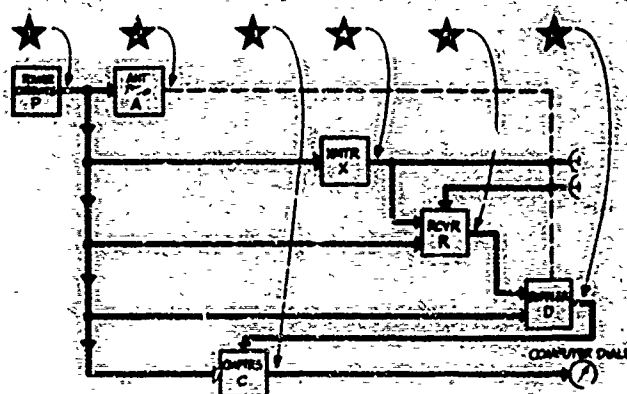
1. HPIR SYSTEM CHECKS 1-5
2. STEPS 8-10, TABLE 16, TM-511-12/1



4

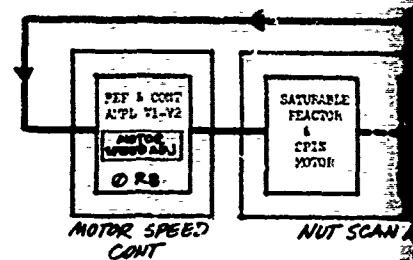
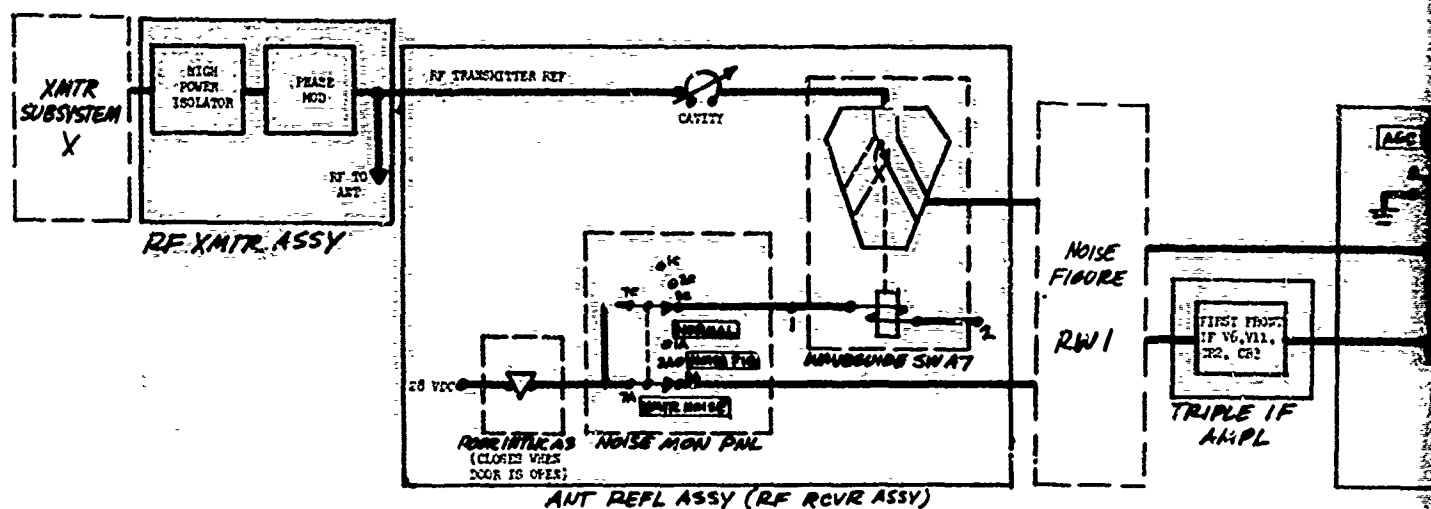
5

6

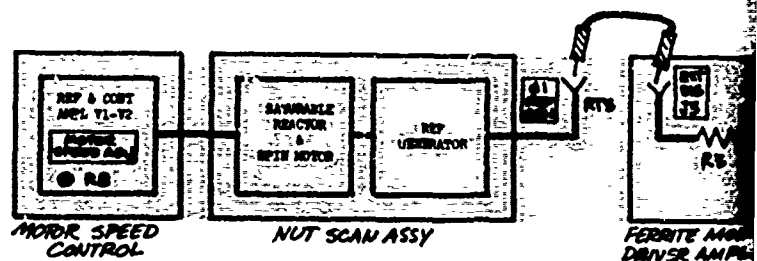


RW1
 NOISE FIGURE
 STEP 8
 TABLE 16
 TM-511-12/1

1. HPIR SYSTEM CHECKS 1-5
2. STEPS 8-10, TABLE 16, TM-511-12/1



1. HPIR SYSTEM CHECKS 1-5
2. STEP 7, TABLE 16, TM-511-12/1

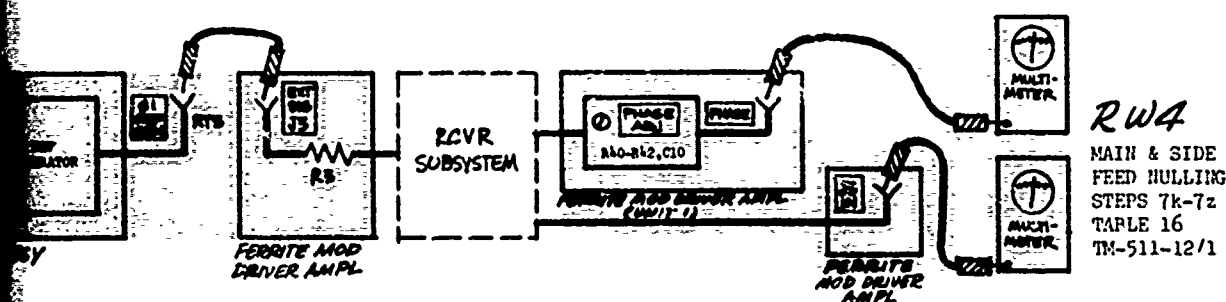
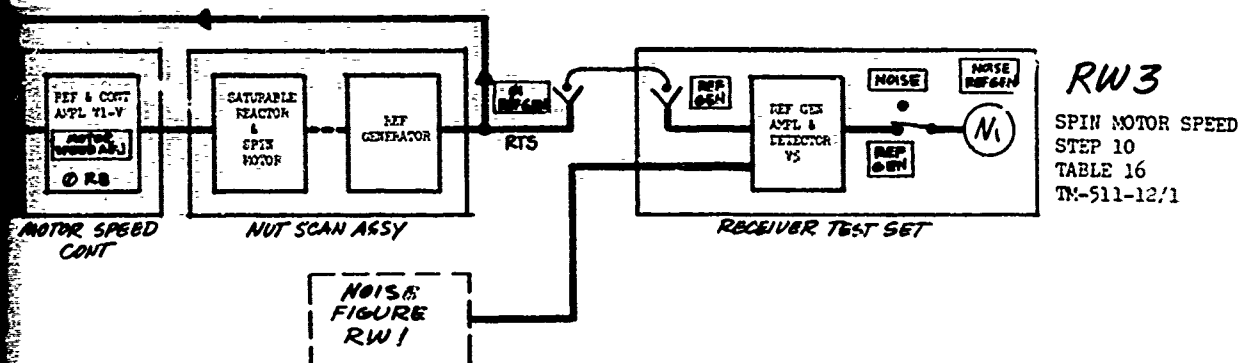
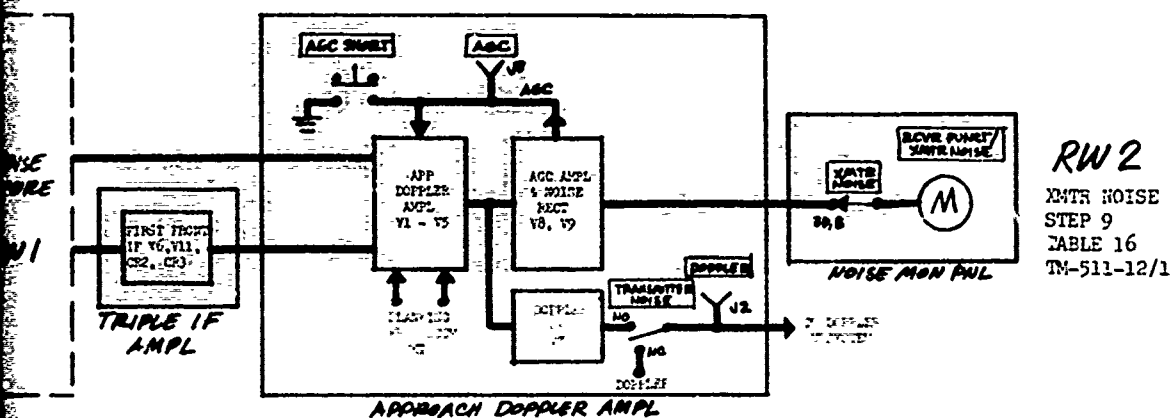
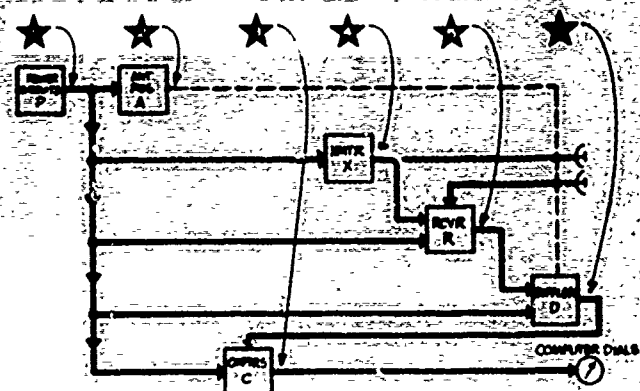


A

4

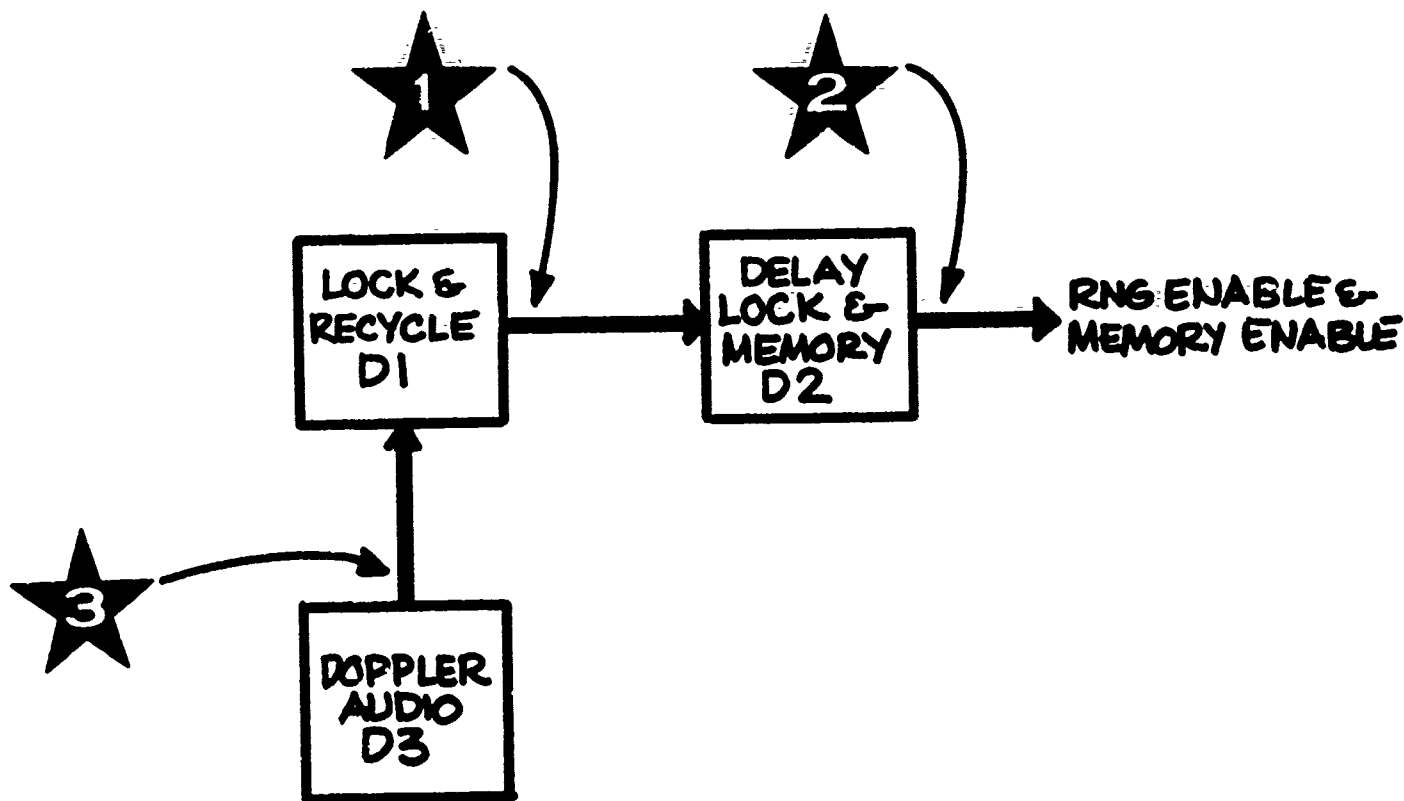
5

6



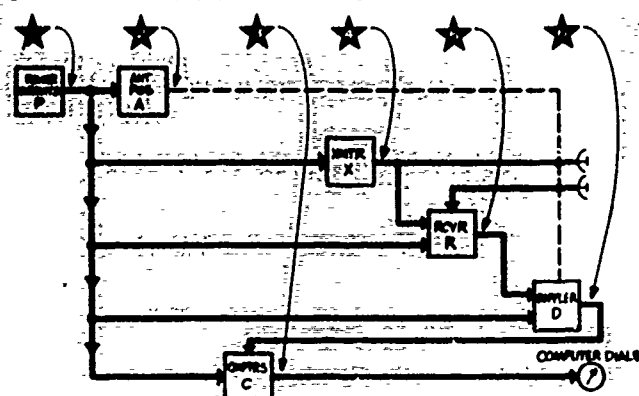
★ CKT
COND Lock & Recycle
Radiate
 LOCK sw: LOCK HOLD
 WBT sw: OFF
IND LOCK lamp: on
COND TARGET SPEED m: steady (no drift)
Radiate
 LOCK sw: LOCK DISABLE
 WBT sw: OFF
IND LOCK lamp: off
COND TARGET SPEED m: sweeping
Radiate
 LOCK sw: NORMAL
 WBT sw: OFF
IND LOCK lamp: pause locks

★ CKT
COND Delay Lock & Memory
Radiate
 AUTO-MAN sw: AUTO
 LOCK sw: LOCK HOLD
 MEMORY lamp: flashes
IND COND
Radiate
 AUTO-MAN sw: AUTO
 LOCK sw: NORMAL
IND MEMORY lamp: on for 10 sec, then off



W: AUTO
LOCK HOLD
p: flashes

Mode: AUTO
Normal
On: on for 10 sec, then off



**ING ENABLE &
MEMORY ENABLE**

★ 3 CKT
COND

PA on

Antenna stow locked at 800 ft EI

SAFE-OPERATE SW: SAFE

RCVR FUNCT/XMTR NOISE sw: NOISE FIGURE

LOCK SW: NORMAL

VOLUME cont: turned cw

Radar Tgt Sim TS: energized & hooked up
(fig 1.1, TM511-12/1)

Radar Tgt Sim SELECTOR sw: SIGNAL

Radar Tgt Sim ATTENUATOR: rotated

LOCK lamp: stays on

Loudspeaker: Doppler Audio

★
CKT
COND
IND

Lock
Radiate
LOCK sw: LOCK HOLD
LOCK lamp: on

★
CKT
COND
IND

Recycle
Radiate
LOCK sw: LOCK DISABLE
WBT sw: WBT OFF
LOCK lamp: off

★
CKT
COND
IND

DTU LO & SWEEP
Radiate
LOCK sw: LOCK DISABLE
TARGET SPEED m: sweeping

★
CKT
COND
IND

Doppler Input
Radiate
VOLUME cont: fully cw
Loudspeaker: NOISE

★
CKT
COND
IND

IF, Stonewall & Pause Lock
Radiate
LOCK sw: NORMAL
DSI (DTU): flashes at pause lock rate

★
CKT
COND
IND

Special TOJ
Radiate
WBT sw: WBT OFF
TOJ sw: TOJ ENABLE
ENABLE lamp: off

a. CKT TOJ Enable Timer
COND *Radiate*
IND TOJ sw: DISABLE
ENABLE lamp: off

b. CKT Relay Cont
COND Above chks good
IND This ckt bad

★
CKT
COND
IND

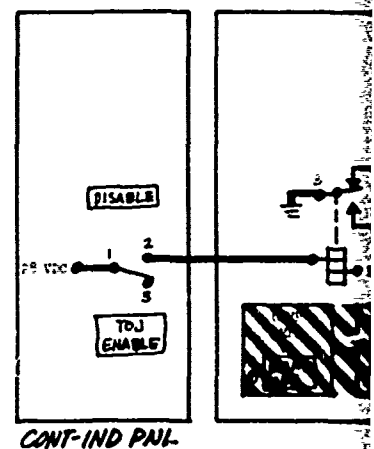
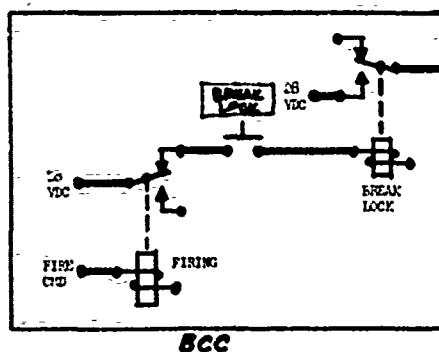
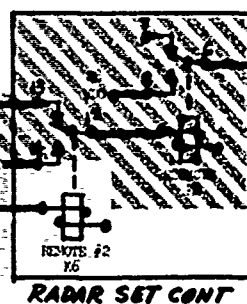
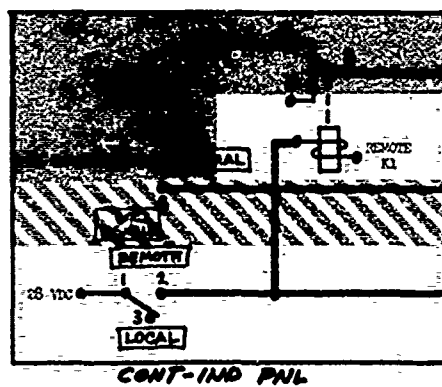
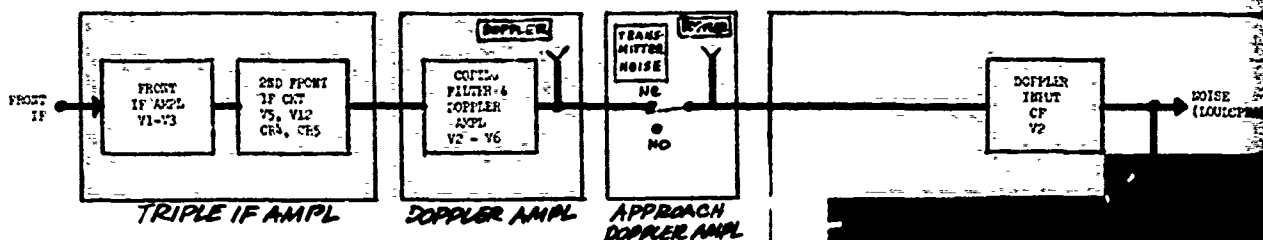
Remote Break Lock
Above chks good and trouble occurred in Remote
This ckt bad

1

2

3

Lock _____ DTU LO & Sweep _____
 Recycle _____ Doppler Input _____
 IF, Stonewall & Pause Lock _____



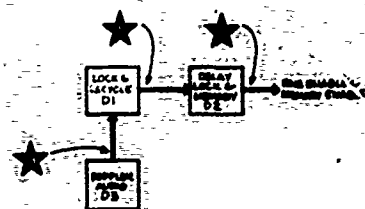
A

4

5

6

IO & Sweep _____ Special TOJ
 er Input _____ TOJ Enable Timer _____
 Stonewall & Pause Lock _____ Relay Cont _____
 Remote Break Lock _____



DOPPLER
INPUT
CP
Y2

NOISE
(LOUD PEAKER)

LOCK
THRU
LAUNCH

LOCK
CIR

CNT-IND
PNL

UNLOCK

LOCK HOLD

DOPPLER TCK UNIT

ENABLE

(R)

+DC V

DISABLE

TOJ
ENABLE

TOJ
DISABLE

SIDE LOBE COMP

RADAR SET ON

RNG UNIT

CRB

CR-4

WSTON

FA

CNT-IND
PNL

B

LOCK & RECYCLE DI 77

1

2

3



CKT
COND
IND

Track thru Launch
Radiate
LOCK sw: LOCK HOLD
MEMORY lamp: off



CKT
COND
IND

Delay Lock
Radiate
AUTO-MAN sw: AUTO
LOCK sw: LOCK DISABLE then back to LOCK HOLD
MEMORY lamp: flashes



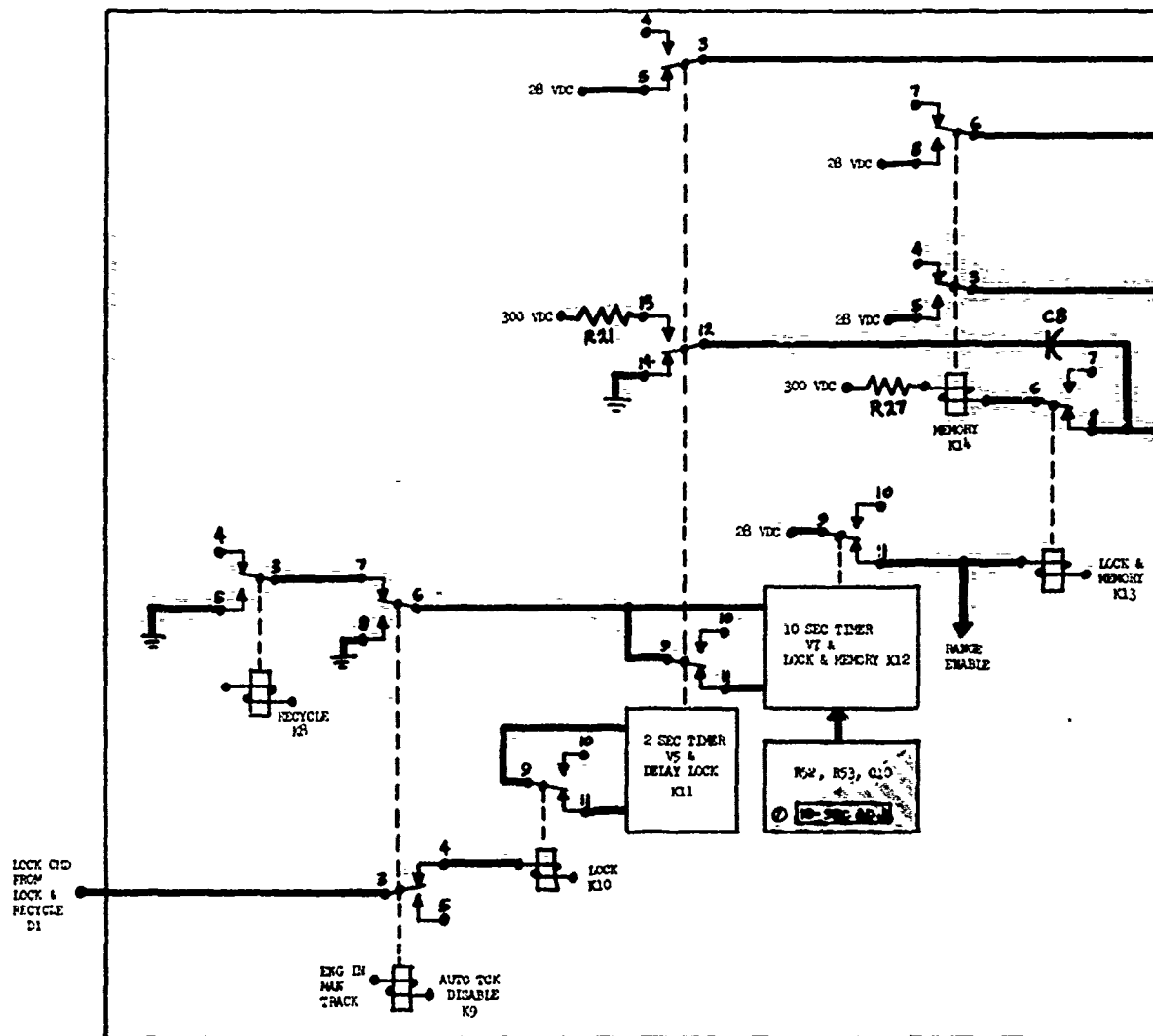
CKT
COND
IND

Memory Co
Radiate
AUTO-MAN
LOCK sw: then
MEMORY 1

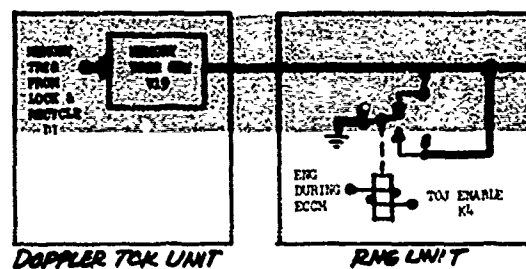


CKT
COND
IND

10 sec Ad
Above chk
This ckt



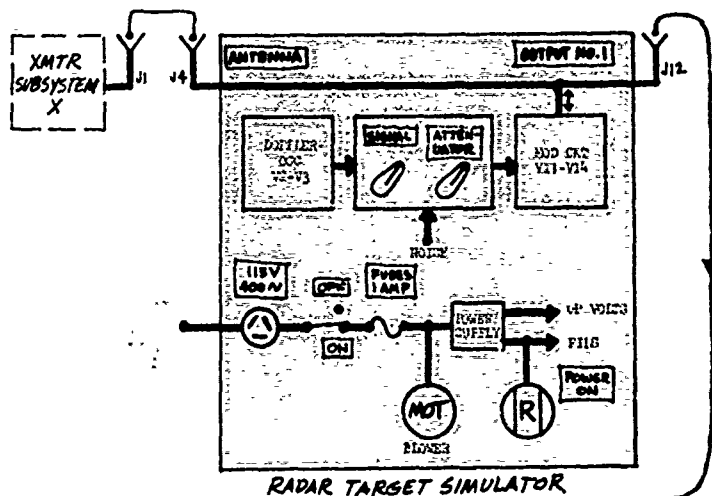
RADAR SET CONTROL



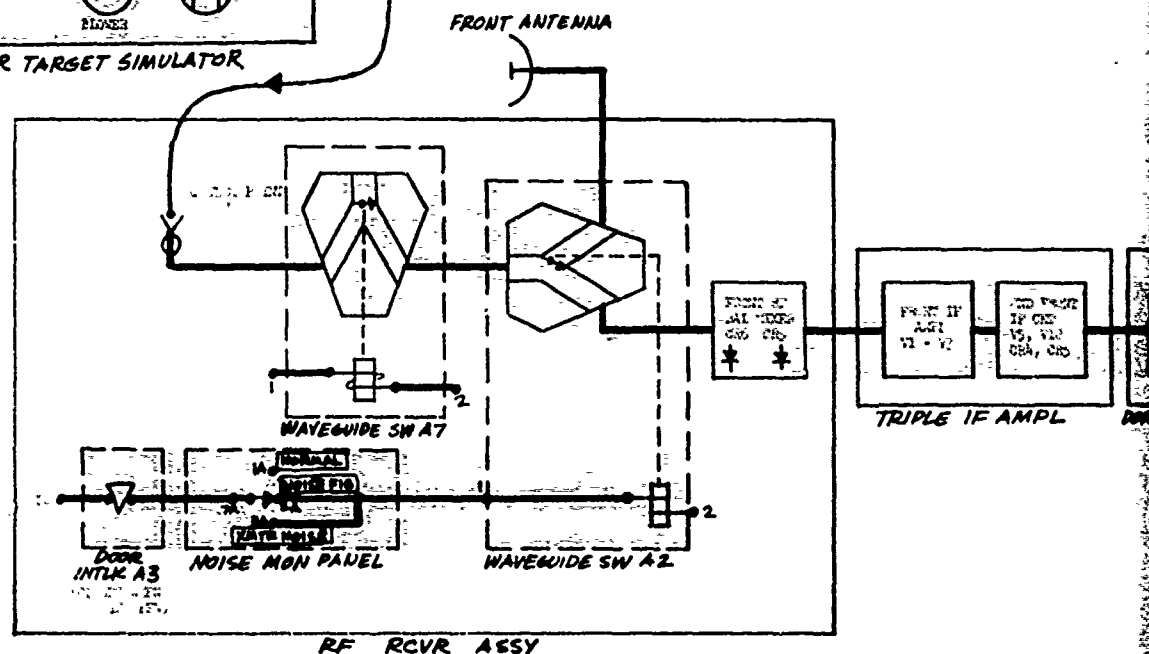
DOPPLER TCK UNIT

RANGE UNIT

A



RADAR TARGET SIMULATOR



RF RCVR ASSY

★ CKT Doppler Channel
COND Doppler Applied (See note)
IND LOCK sw: NORMAL
 VOLUME cont: turned cw
 LOCK lamp: stays on
 OR
 Loudspeaker: Doppler Audio

★ CKT Audio Ampl
COND Doppler Applied (See note)
IND VOLUME cont: turned cw
 Loudspeaker: Doppler audio

★ CKT IF & Pause Lock Net
COND Doppler Applied (See note)
IND LGCK sw: NORMAL
 LOCK lamp: pause locks

★ CKT Coherency
COND Above chks good
IND This ckt bad

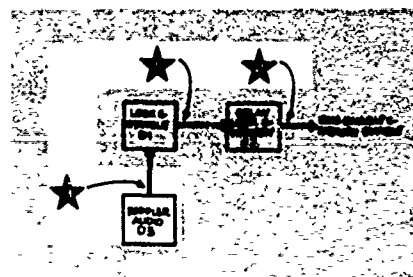
NOTE: Doppler Applied means--
 PA on
 Antenna stow locked at 800 μ E1
 SAFE-OPERATE sw: SAFE
 RCVR FUNCT/XMTR NOISE sw: NOISE
 Radar Tgt Sim TS: energized &
 (fig 1.1, TM-511-12/1)
 Radar Tgt Sim SELECTOR sw: SIG
 Radar Tgt Sim ATTENUATOR: rotate

4

5

6

Doppler Channel
 Doppler Applied (See note)
 X sw: NORMAL
 LIME cont: turned cw
 X lamp: stays on
 OR
 Loudspeaker: Doppler Audio



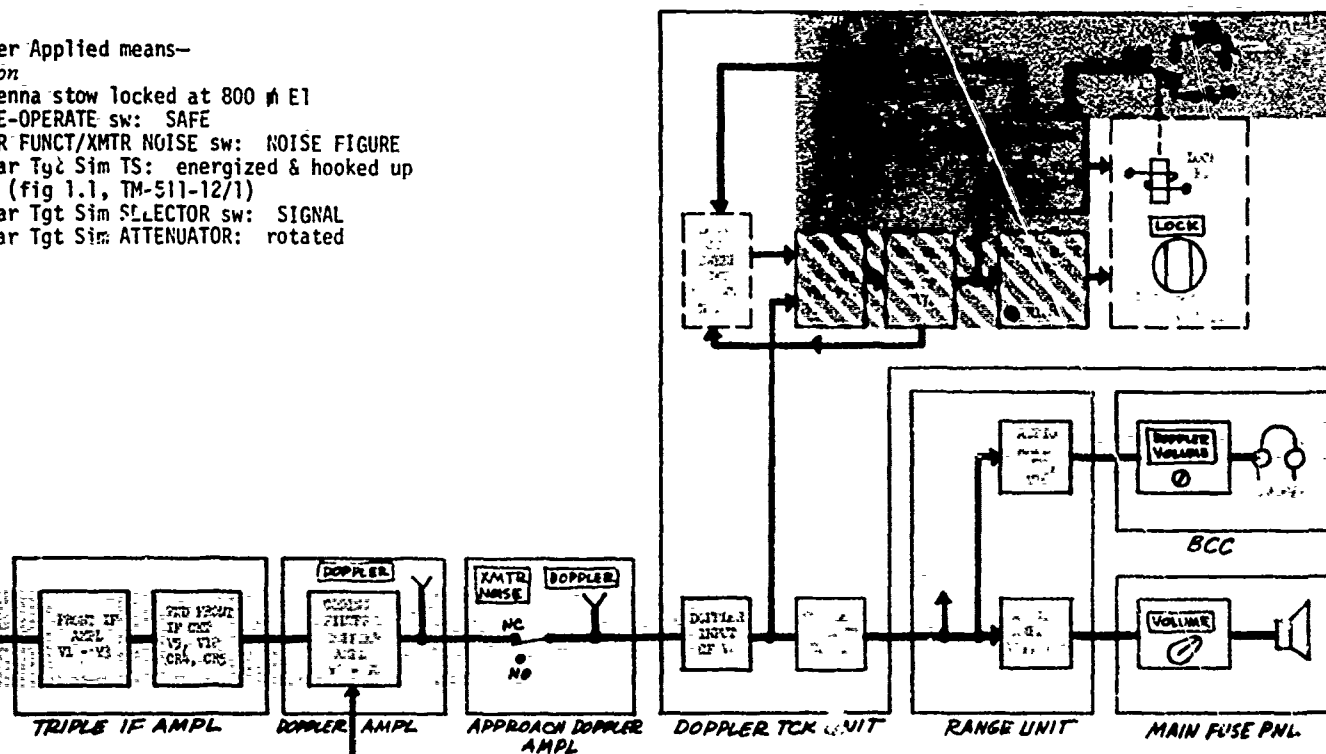
Audio Ampl
 Doppler Applied (See note)
 LIME cont: turned cw
 Loudspeaker: Doppler audio

IF & Pause Lock Net
 Doppler Applied (See note)
 X sw: NORMAL
 X lamp: pause locks

Coherency
 Ave chks good
 Is ckt bad

Doppler Applied means—
 PA on

Antenna stow locked at 800 μ E1
 SAFE-OPERATE sw: SAFE
 RCVR FUNCT/XMTR NOISE sw: NOISE FIGURE
 Radar Tgt Sim TS: energized & hooked up
 (fig 1.1, TM-511-12/1)
 Radar Tgt Sim SELECTOR sw: SIGNAL
 Radar Tgt Sim ATTENUATOR: rotated



Doppler Channel _____

Audio Ampl _____

IF & Pause Lock Net _____

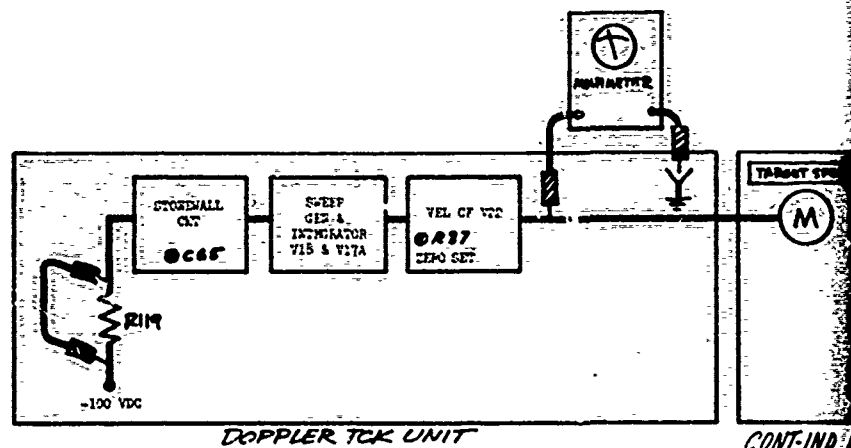
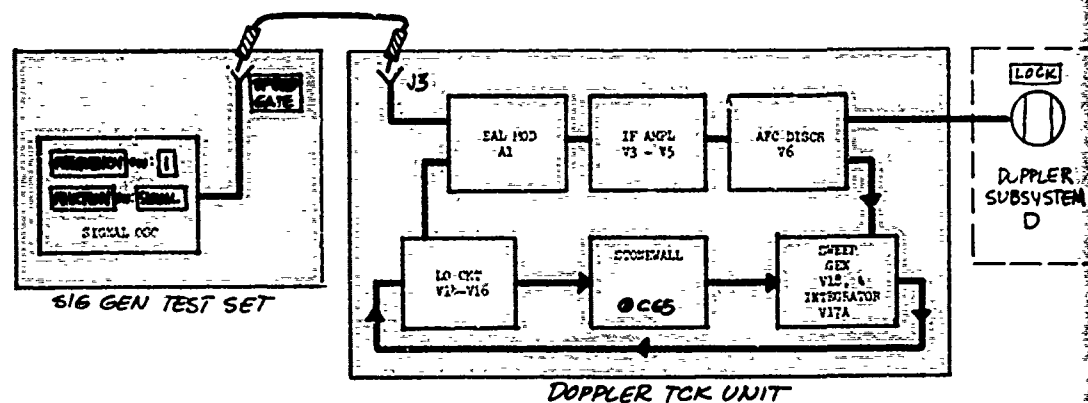
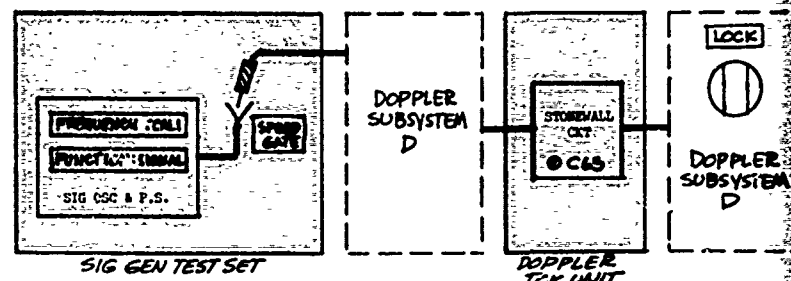
Coherency _____

BCC Headset _____

B

PRIOR CHECKS FOR DW1-DW5

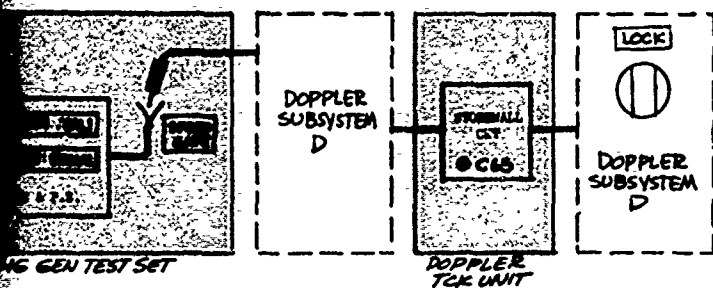
1. HPIR SYSTEM CHECKS 1-6
 2. USING TABLE 18 - STEPS 7 & 8
- OR
- USING TABLE 20 - STEPS 1.4-1.7



3

4

5



DW1

STEP 7a-7f

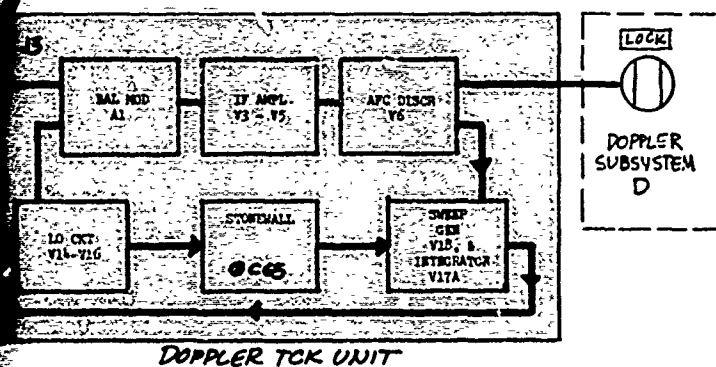
TABLE 18

OR

STEP 1.4g-1.4h, 1.7a-1.7b

TABLE 20

TM-511-12/1



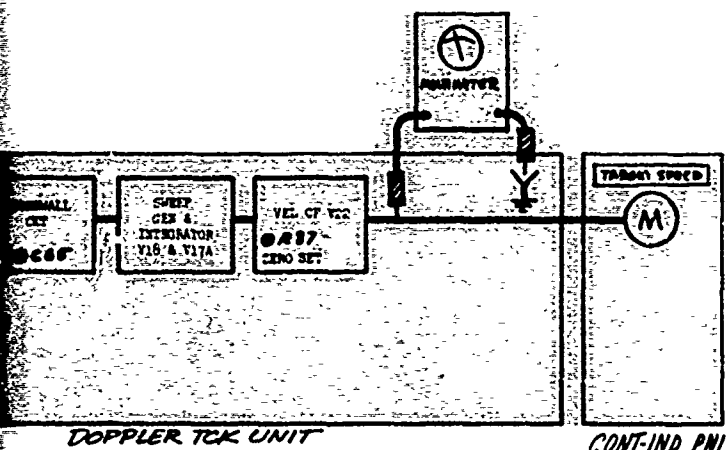
DW2

STEP 7g, TABLE 18

OR

STEP 1.4i, 1.7c, TABLE 20

TM-511-12/1



DW3

STEP 8a-8d

TABLE 18

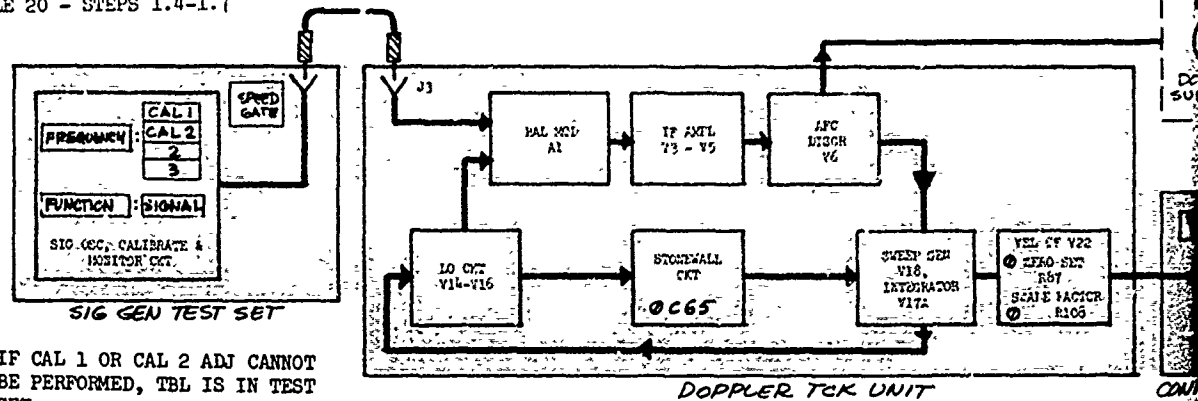
TM-511-12/1

B

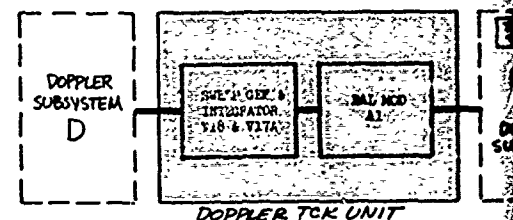
PRIOR CHECKS FOR DW1-DW5

1. HPIR SYSTEM CHECKS 1-6
 2. USING TABLE 18 - STEPS 7 & 8
- OR

USING TABLE 20 - STEPS 1.4-1.7

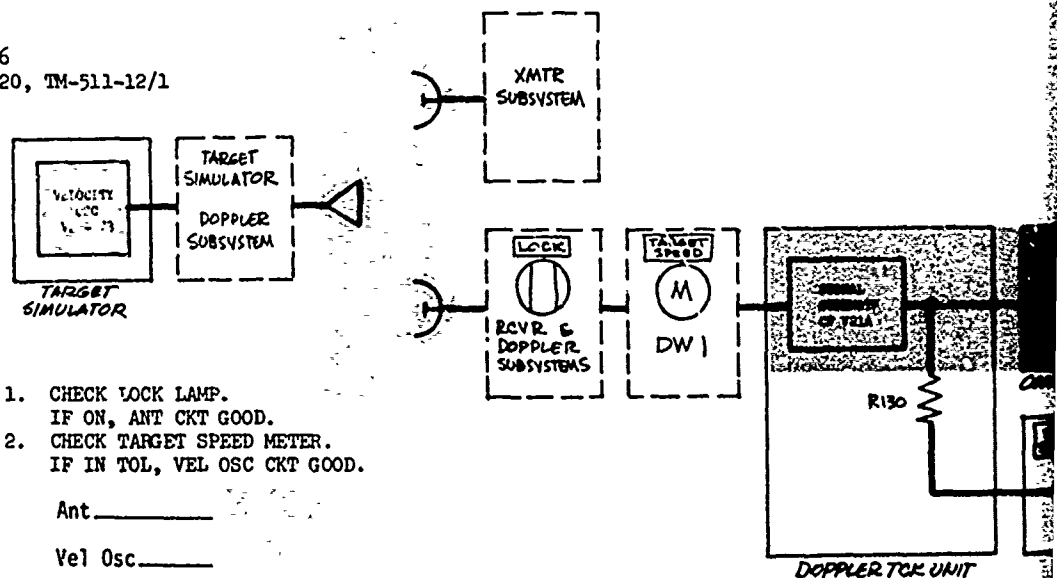


NOTE: IF CAL 1 OR CAL 2 ADJ CANNOT BE PERFORMED, TBL IS IN TEST SET.



PRIOR CHECKS FOR DW6:

1. HPIR SYSTEM CHECKS 1-6
2. STEPS 1.4-1.7, TABLE 20, TM-511-12/1



- NOTE:**
1. CHECK LOCK LAMP. IF ON, ANT CKT GOOD.
 2. CHECK TARGET SPEED METER. IF IN TOL, VEL OSC CKT GOOD.

Ant _____

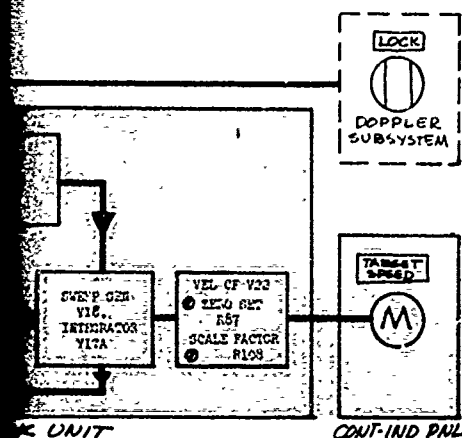
Vel Osc _____

Sig Strength _____

4

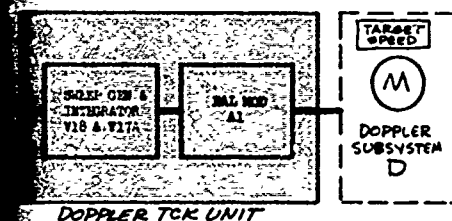
5

6



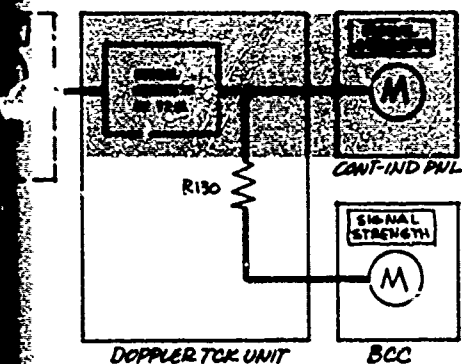
DW 4

STEP 1.4j - 1.4j
TABLE 18
OF
STEP 1.4a-1.4f, 1.5
TABLE 20
TM-511-12/1



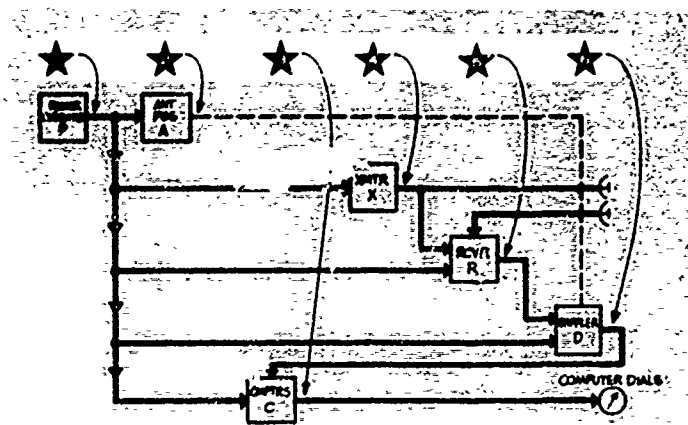
DW 5

STEP 1.4j - 1.4j, 1.6
TABLE 20
TM-511-12/1



DW 6

STEP 2
TABLE 20
TM-511-12/1



B

DW1,2,3,4,5,6 83

Az Tck Enable_____

E1 Tck Enable____

Radar Error_____

Az Auto Tck. _____

El Auto Tck_____

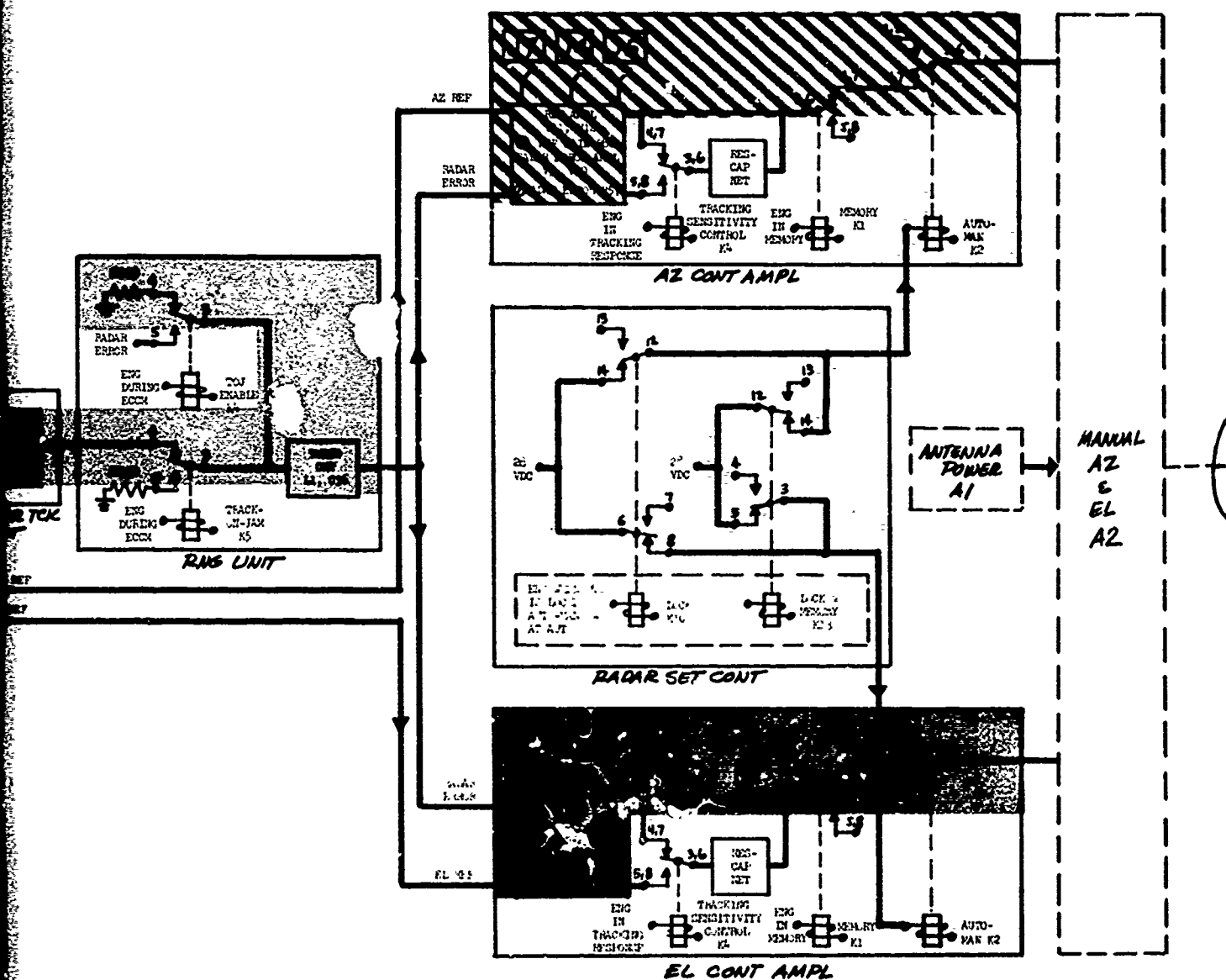
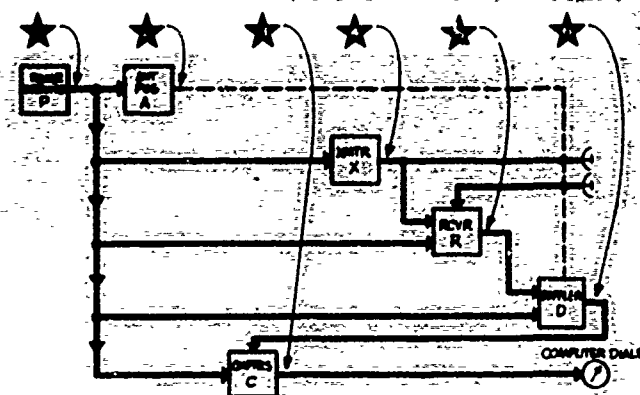
4

5

6

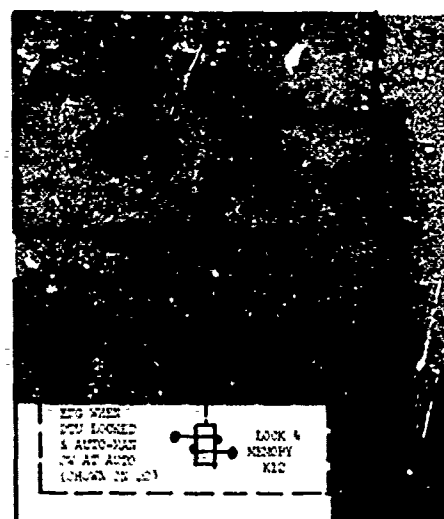
Az Auto Tck
 FA on
 Antenna Operate
 Perform Target Signal Weekly Check
 Az Tck (Step 5, Table 20)
 Antenna: performs properly

El Auto Tck
 Above chks good
 This ckt bad

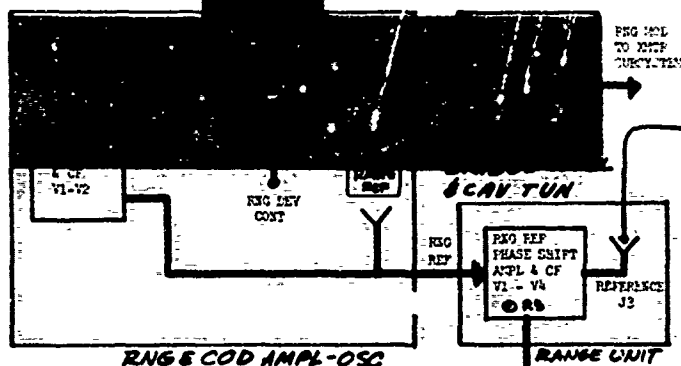


B

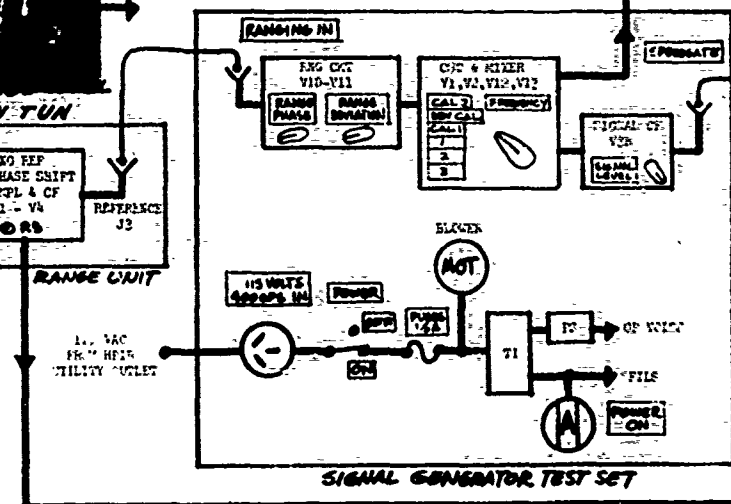
ANT TCK AUTO I 85



RAPAR SET CONT



RNG & COD AMPL-OSC



SIGNAL GENERATOR TEST SET



CKT
COND

Rng Osc, Ref Ampl & Test Set

PA on

Perform Tracking Computer Weekly check-
Energize Signal Generator TS (fig 22)
Range Unit Drive (Step 10a-10j; Table 18)

IND

FREQUENCY m: indicates correctly

FUNCTION m: indicates correctly

(If bad check at RANGE REF & Reference
jacks with oscilloscope)



CKT
COND

Tgt Rng

PA on

RANGING sw:
Perform Trg

Range Un

RANGE dial:

IND



CKT
COND

Rng Unit

PA on

RANGING sw: ON

Perform Tracking Computer Weekly check-

Range Unit Drive (Step 10k-10s, Table 18)

IND

FUNCTION m: indicates correctly



CKT
COND
IND

Rng Mod

Above chks

This ckt ba

4

5

6



CKT
COND

Tgt Rng

2A on

RANGING sw: ON

Perform Tracking Computer Weekly check—

Range Unit Drive (Step 10t-10aa, Table 18)

IND

RANGE dial: indicates correctly



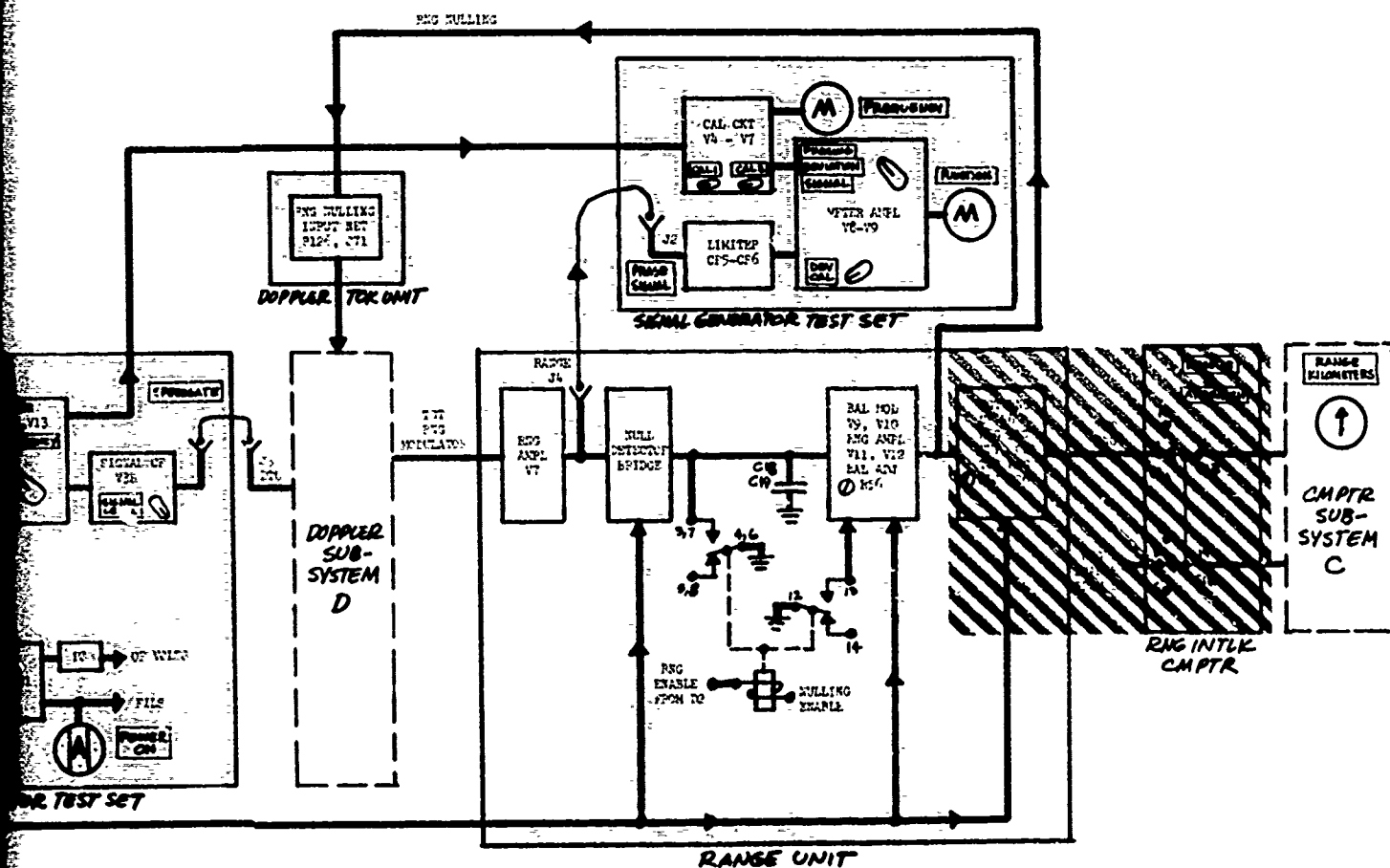
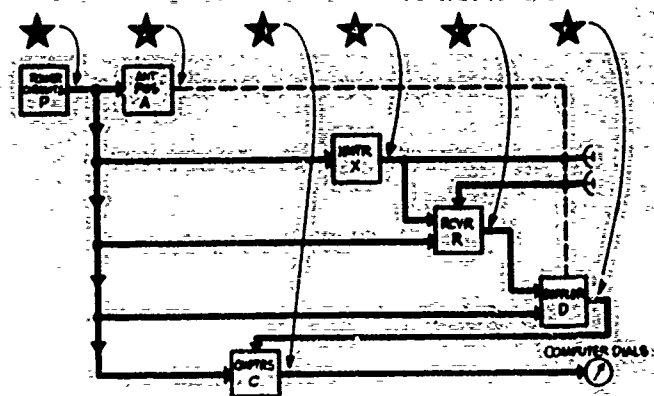
CKT
COND

Rng Mod

Above chks good

IND

This ckt bad



Rng Osc, Ref Ampl & Test Set _____

Rng Unit _____

Tgt Rng _____

Rng Mod _____



B

1

2

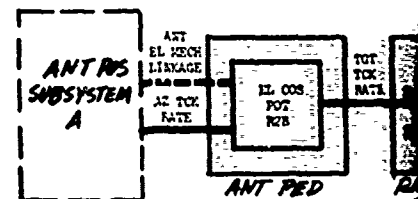
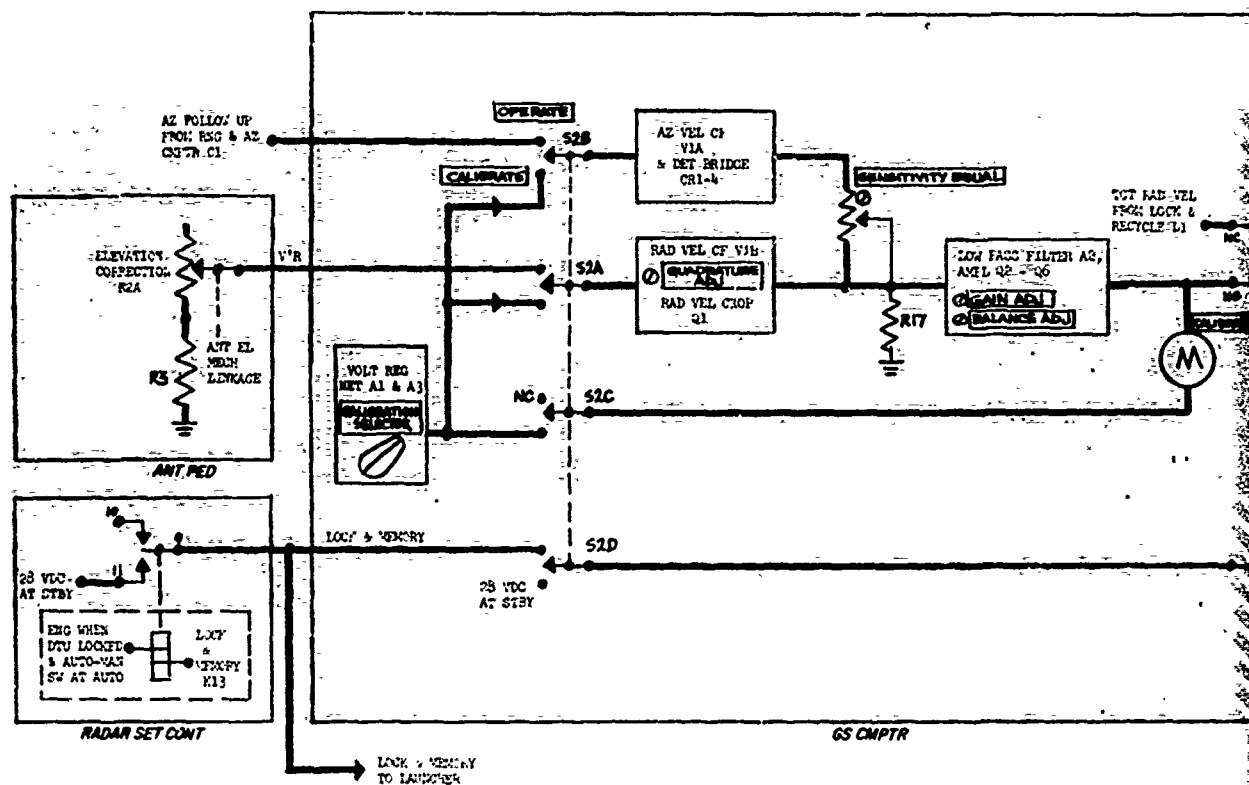
3

A

B

C

D

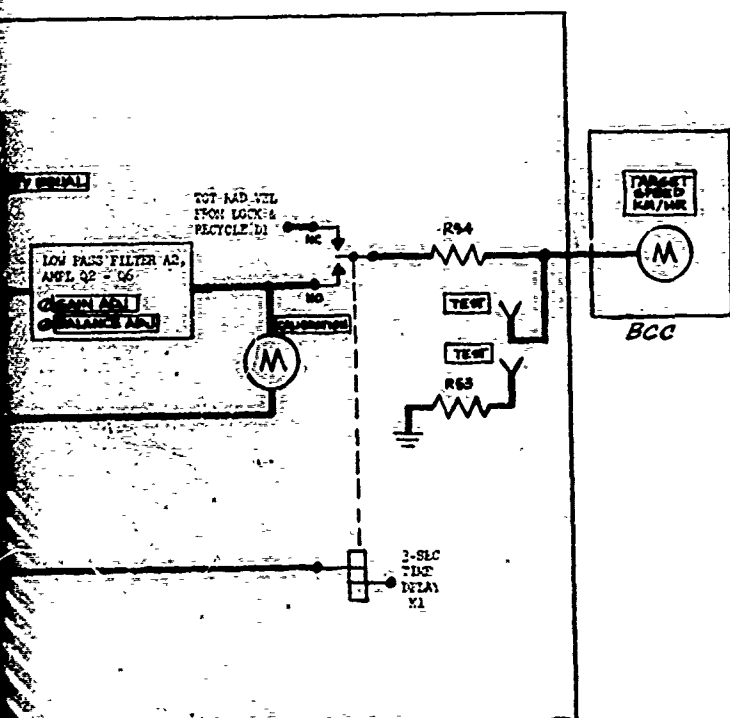
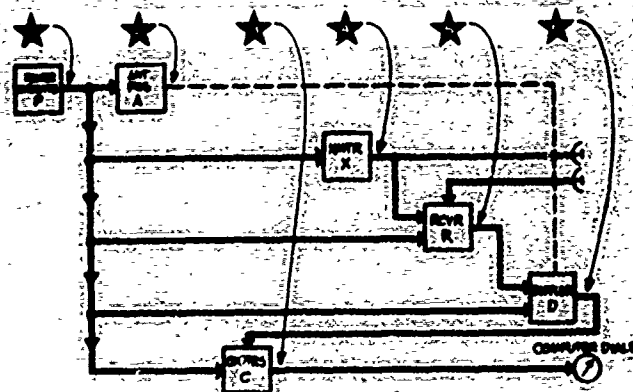


A

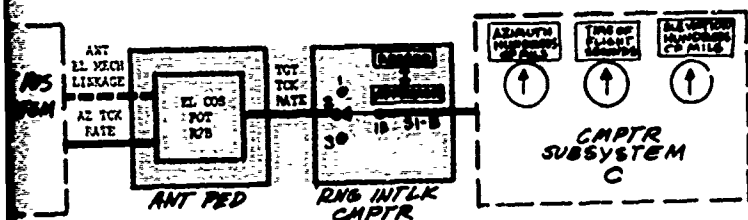
4

5

6

**AUTO 3**

GROUND SPEED CMPTR
STEP 11
TABLE 18
TM-511-12/1

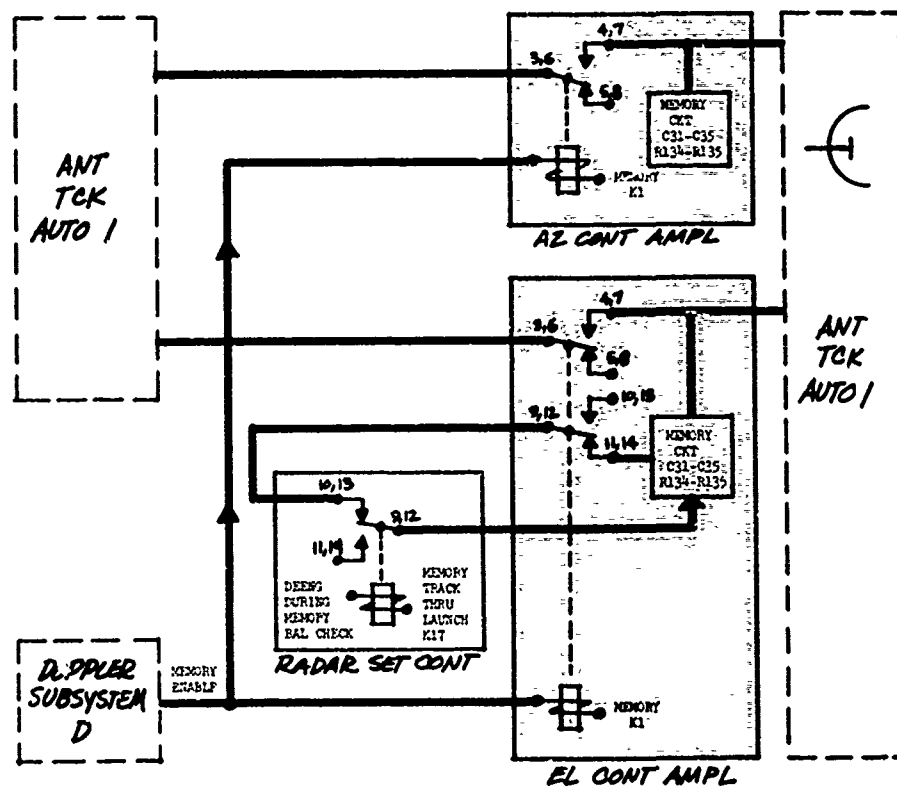
**AUTO 4**

TGT TCK
RATE

B

PRIOR CHECKS:

1. HPIR SYSTEM CHECKS 1-6
2. STEPS 2, 3, 4a, 5 & 6, TABLE 20, TM-511-12/1



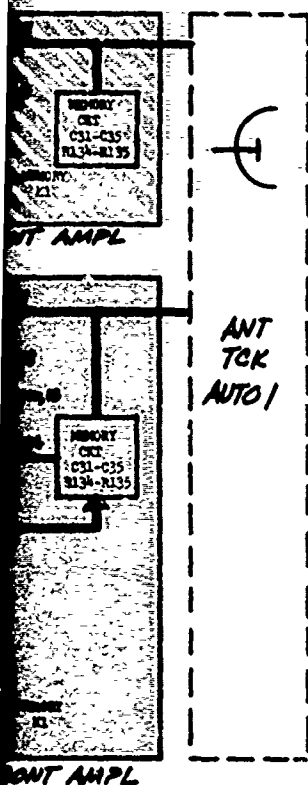
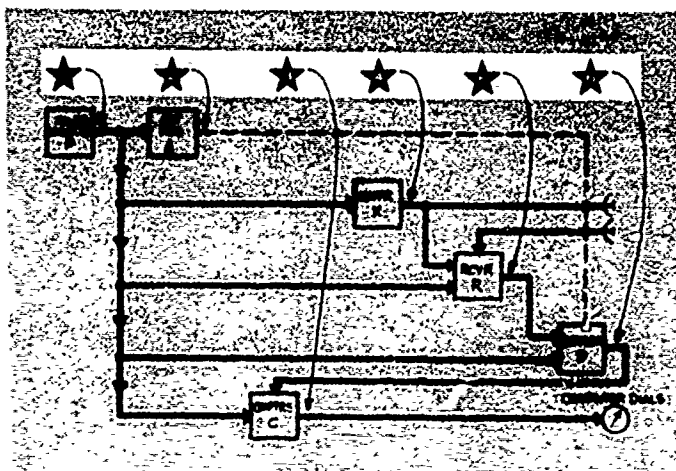
Az Memory

E1 Memory

4

5

6



AUTO 5

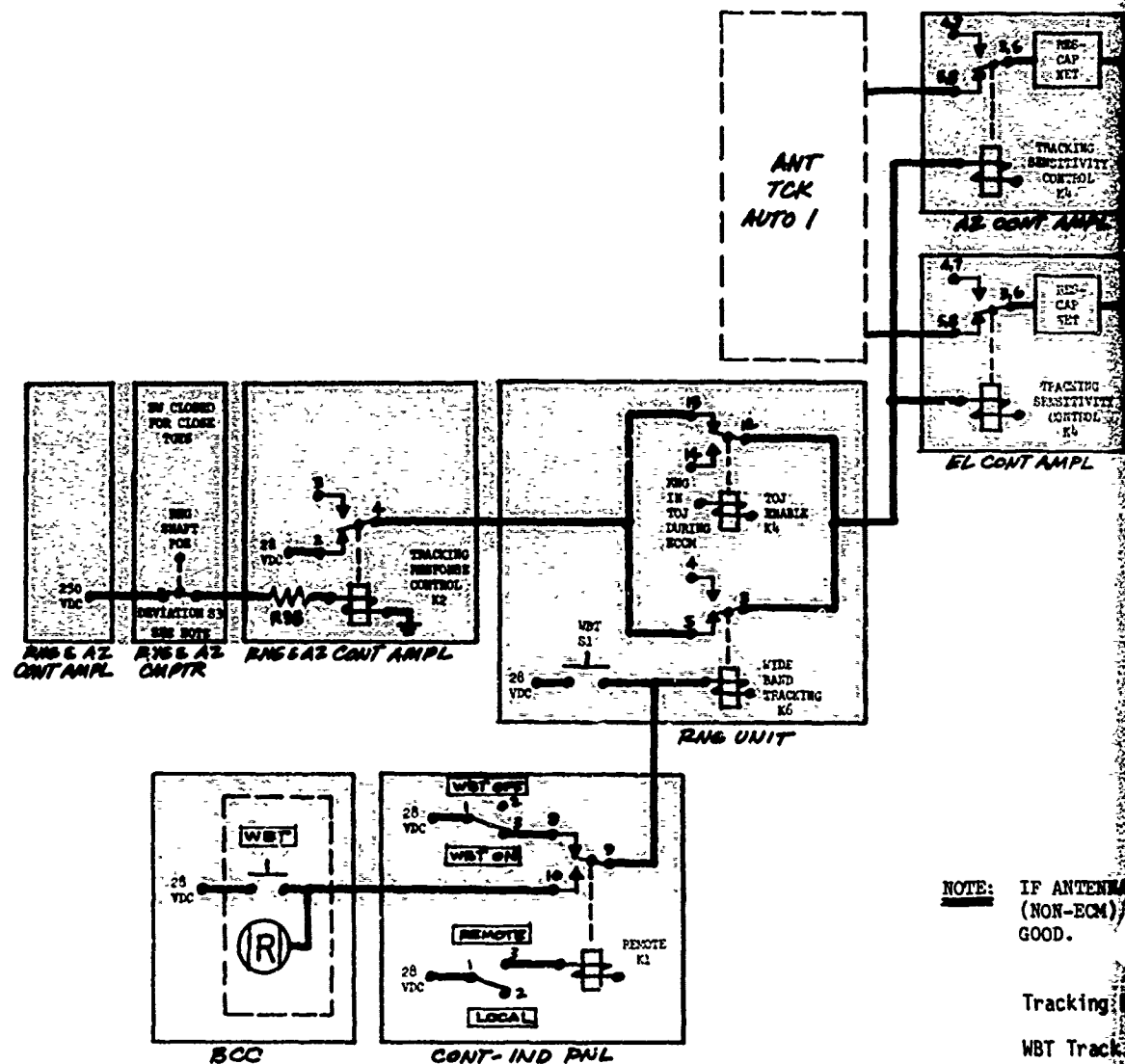
AZ & EL MEMORY BAL
 STEPS 6 & 7
 TABLE 19
 TM-511-12/1

Az Memory _____

El Memory _____

PRIOR CHECKS:

1. HPFR SYSTEM CHECKS 1-6
2. STEPS 2, 3, 4a, 5 & 6, TABLE 20, TM-511-12/1



NOTE: IF ANTENNA (NON-ECM) GOOD.

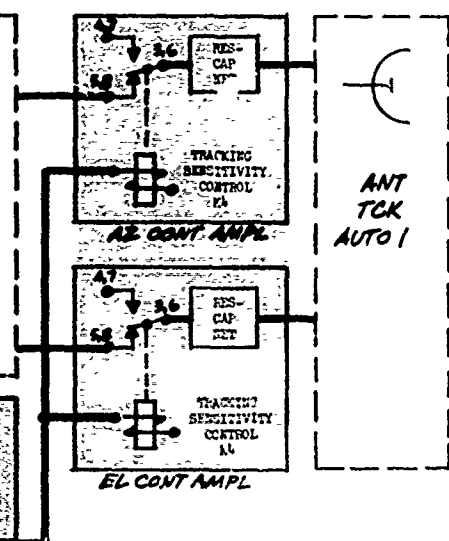
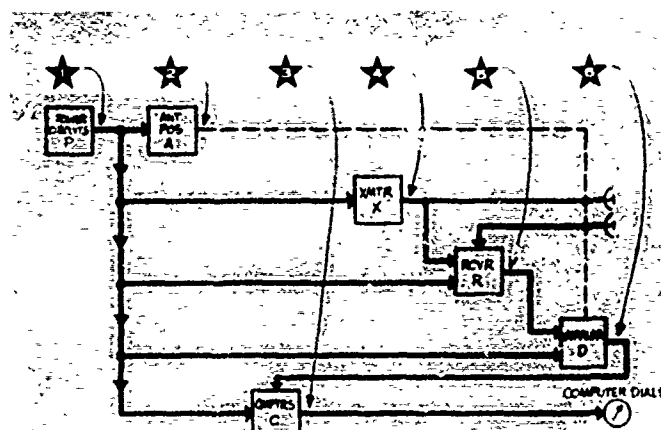
Tracking
WBT Track

A

4

5

6

**AUTO 6**ANT TCK
RESPONSE

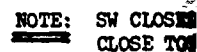
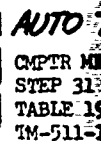
NOTE: IF ANTENNA TRACKS CLOSE RANGE TARGETS IN NORMAL (NON-ECM) ENVIRONMENT, TRACKING RESPONSE CKT IS GOOD.

Tracking Response _____

WBT Track _____

B

2. STEP 10, TABLE 18, RANGE UNIT DRIVE, TM-511-12/1

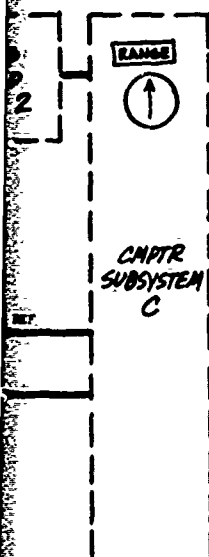
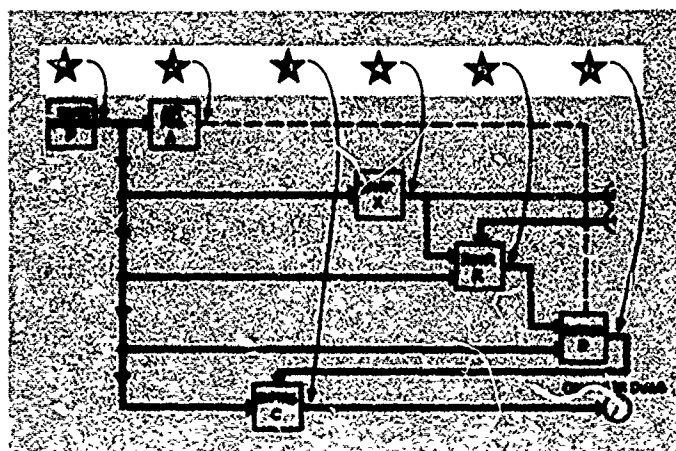


A

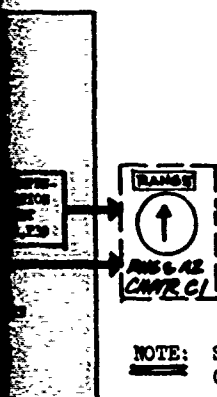
4

5

6

**AUTO 7**

CMPTR MEMORY
STEP 31
TABLE 19
TM-511-12/1

**AUTO 8**

RNG DEV CONTROL

NOTE: SW CLOSED FOR
CLOSE TGTS.

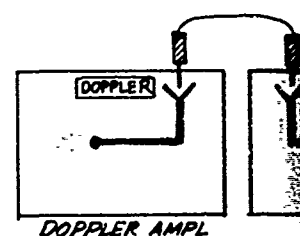
B

AUTO 7,8

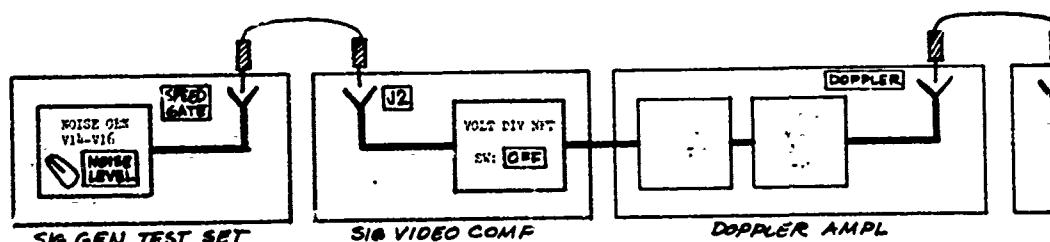
95

PRIOR CHECKS

1. NPIR SYSTEM CHECKS
2. STEPS 13-15, TABLE 10, RECEIVER WEEKLY CHECKS, TM-511-12/1
3. STEP 3, TABLE 20, TARGET SIGNAL WEEKLY CHECK, TM-511-12/1



DOPPLER AMPL



SIG GEN TEST SET

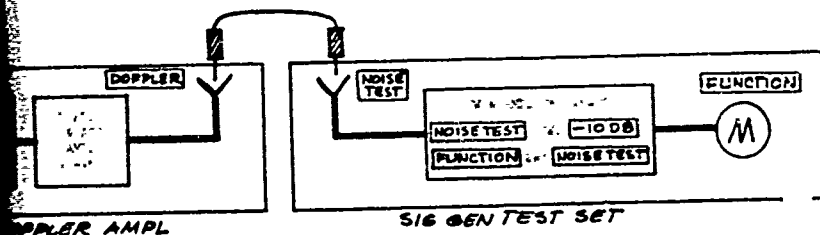
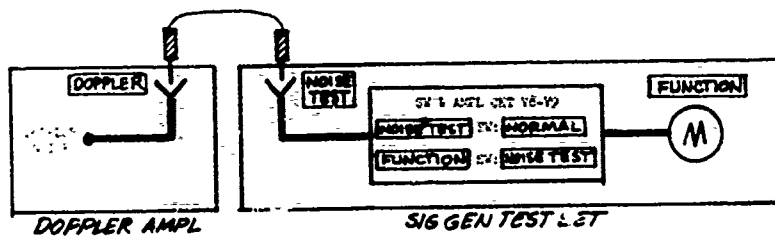
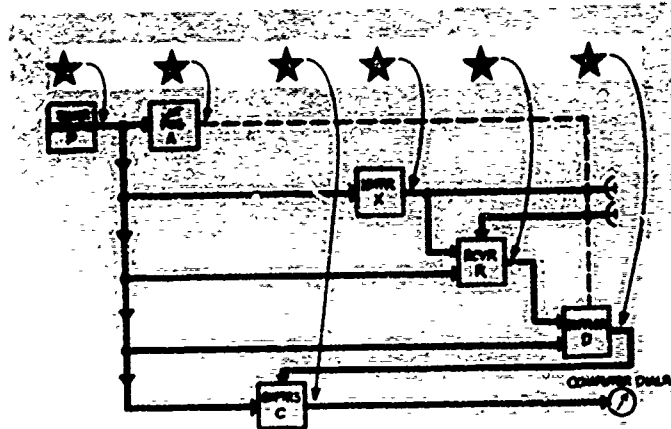
SIG VIDEO COMF

DOPPLER AMPL

4

5

6



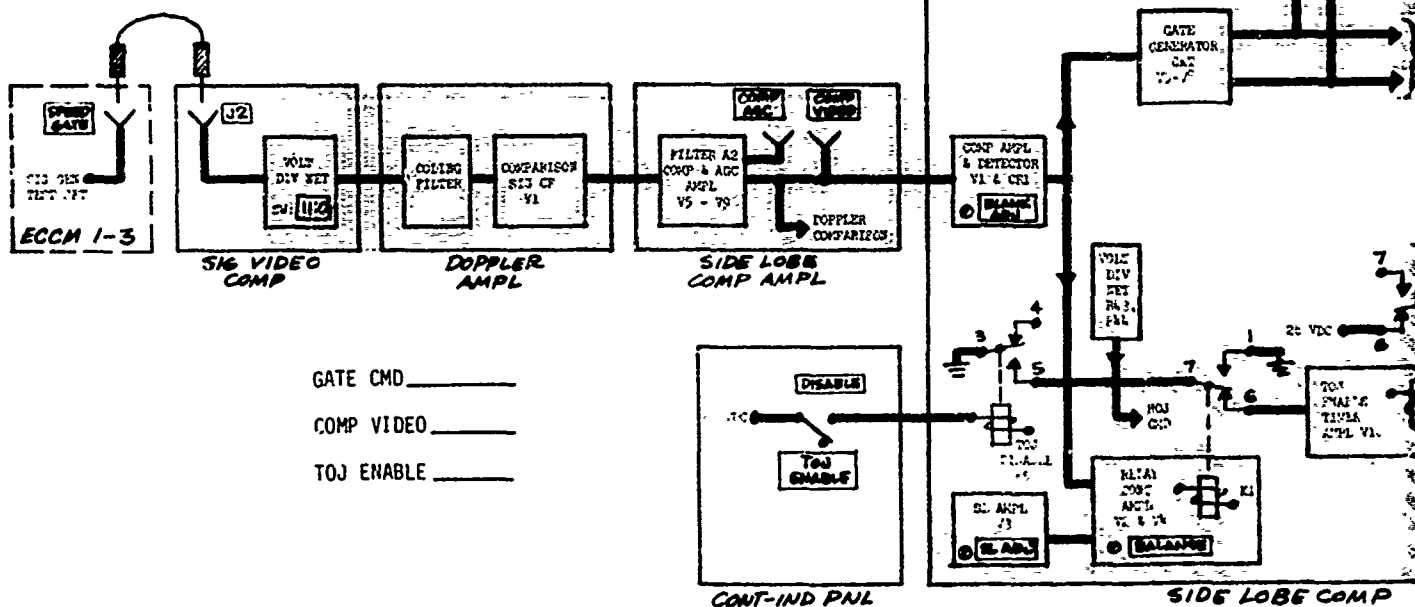
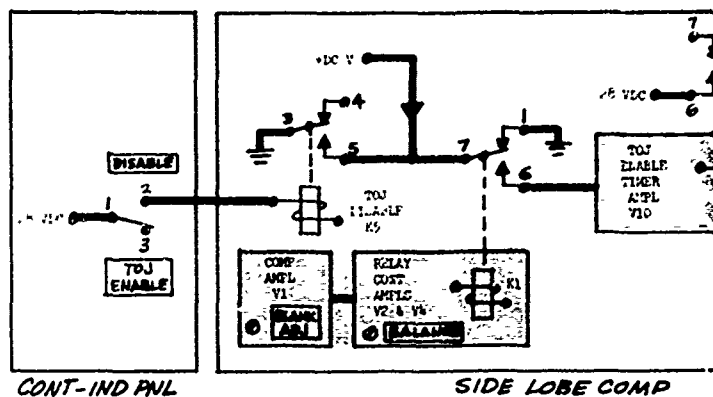
PRIOR CHECKS

1. HFIR SYSTEM CHECKS
2. STEPS 13-15, TABLE 16, RECEIVER WEEKLY CHECKS, TM-511-12/1
3. STEP 8, TABLE 20, TARGET SIGNAL WEEKLY CHECK, TM-511-12/1

NOTE: POSITION TOJ SW TO DISABLE. IF ENABLE LAMP GOES OFF, TOJ ENABLE TIMER AMPL CKT IS GOOD.

ENABLE TIMER _____

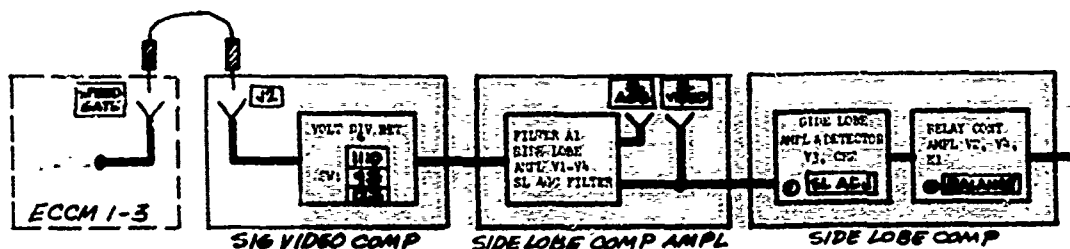
RELAY CONT _____



GATE CMD _____

COMP VIDEO _____

TOJ ENABLE _____

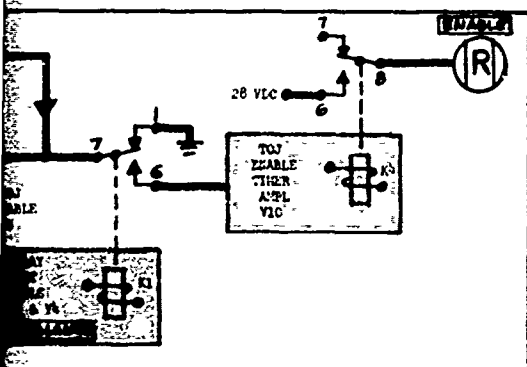


4

5

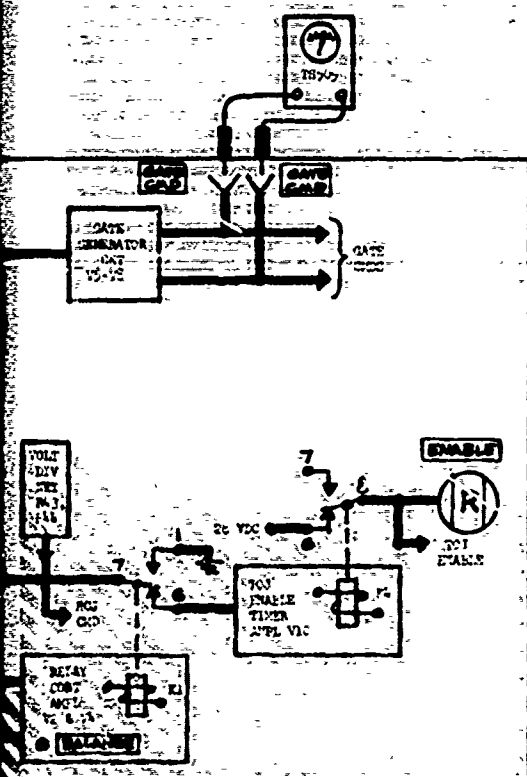
6

0

**ECCM 3**

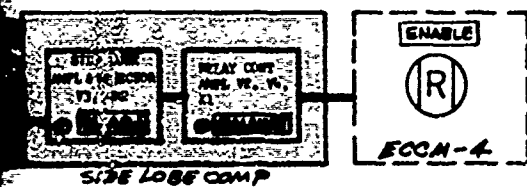
SPECIAL CKT ADJ.
STEP 13a-13c
TABLE 16
TM-511-12/1

SIDE LOBE COMP

**ECCM 4**

SPECIAL CKT ADJ
STEP 13d & 13e
TABLE 16
TM-511-12/1

SIDE LOBE COMP

**ECCM 5**

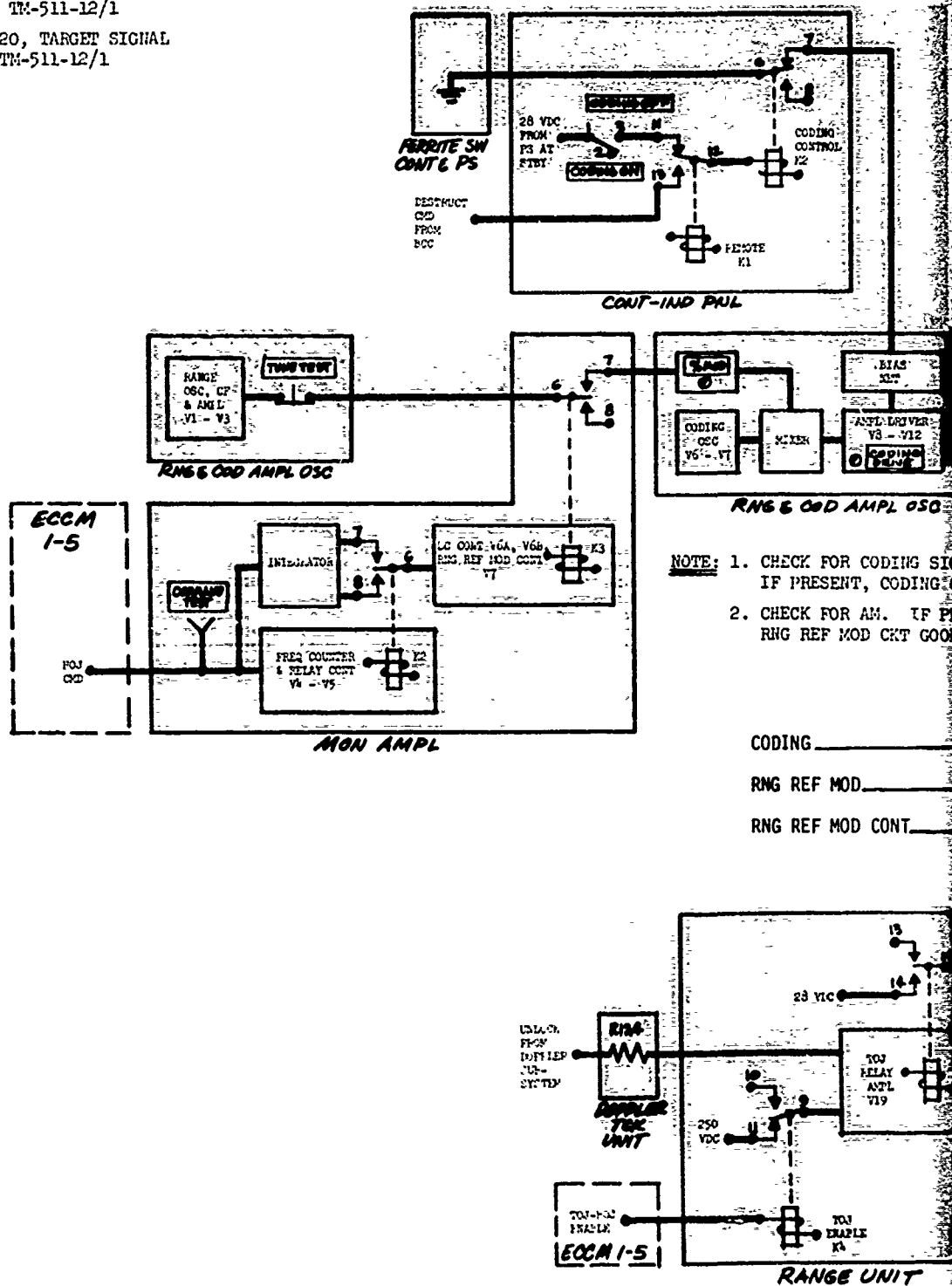
SPECIAL CKT ADJ
STEP 13f-13j
TABLE 12
TM-511-12/1

SIDE LOBE COMP

B

PRIOR CHECKS

1. HPIR SYSTEM CHECKS
2. STEPS 13-15, TABLE 16, RECEIVER WEEKLY CHECKS, TM-511-12/1
3. STEP 9, TABLE 20, TARGET SIGNAL WEEKLY CHECK, TM-511-12/1



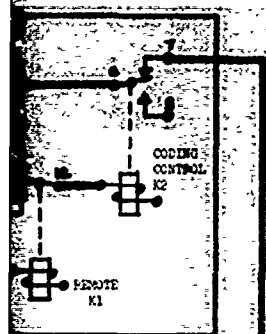
NOTE: 1. CHECK FOR CODING SIG IF PRESENT, CODING
2. CHECK FOR AM. IF PR RNG REF MOD CKT GOOD

CODING _____
RNG REF MOD _____
RNG REF MOD CONT _____

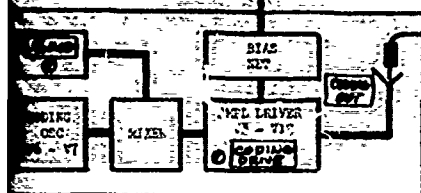
4

5

6



PUL



RNG & COD AMPL OSC

ECCM 6

SPECIAL CKT MOD
STEP 14
TABLE 16
TM-511-12/1

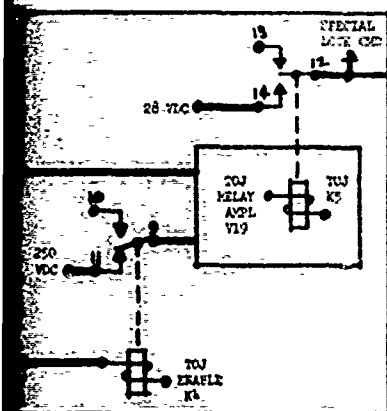


- NOTE: 1. CHECK FOR CODING SIG.
IF PRESENT, CODING CKT GOOD.
2. CHECK FOR AM. IF PRESENT,
RNG REF MOD CKT GOOD.

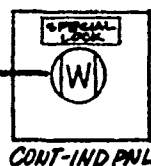
CODING _____

RNG REF MOD _____

RNG REF MOD CONT _____



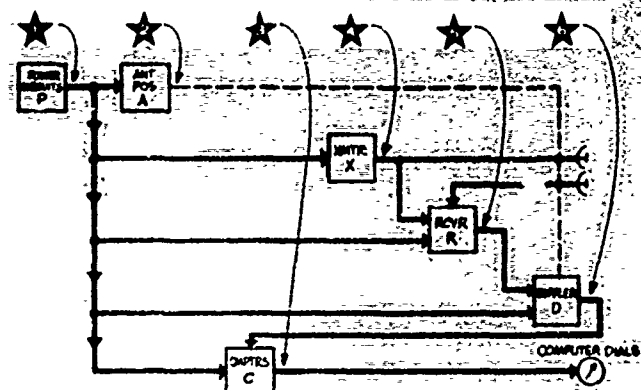
RANGE UNIT



CONT-IND PNL

ECCM 7

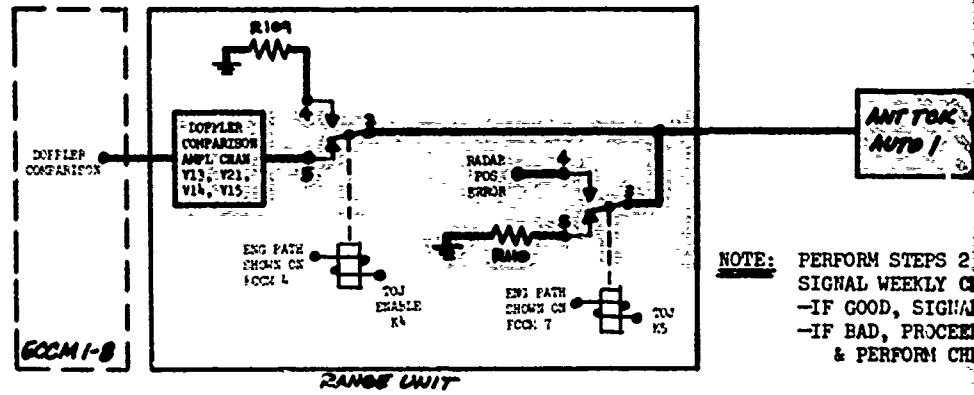
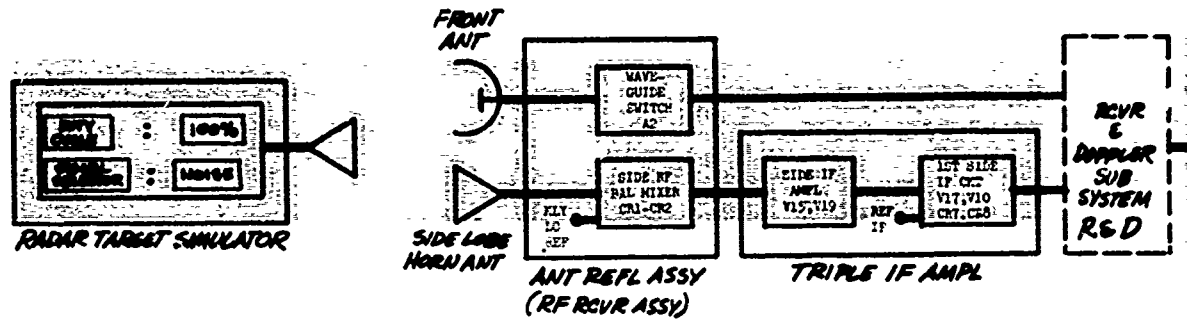
SPECIAL CKT MOD
STEP 14
TABLE 16
TM-511-12/1



B

PRIOR CHECKS

1. NPIR SYSTEM CHECKS
2. STEPS 13-15, TABLE 16, RECEIVER WEEKLY CHECKS, TM-511-12/1
3. STEP 8, TABLE 20, TARGET SIGNAL WEEKLY CHECK, TM-511-12/1



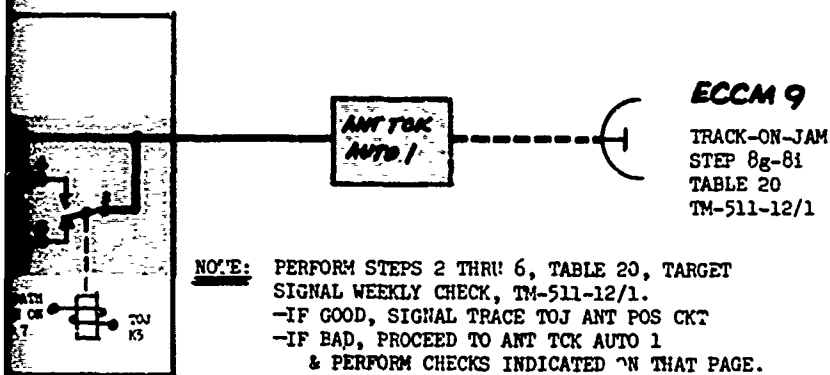
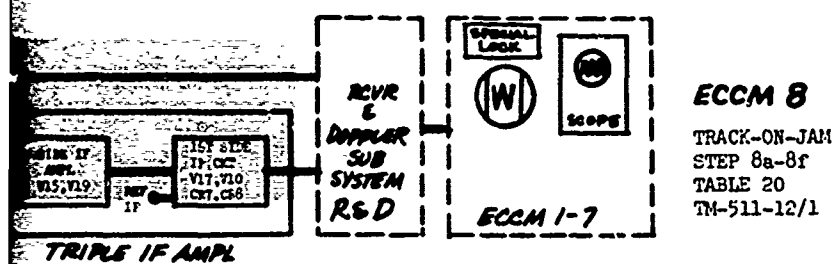
TCK AUTO 1
TOJ ANT POS

3

4

5

6

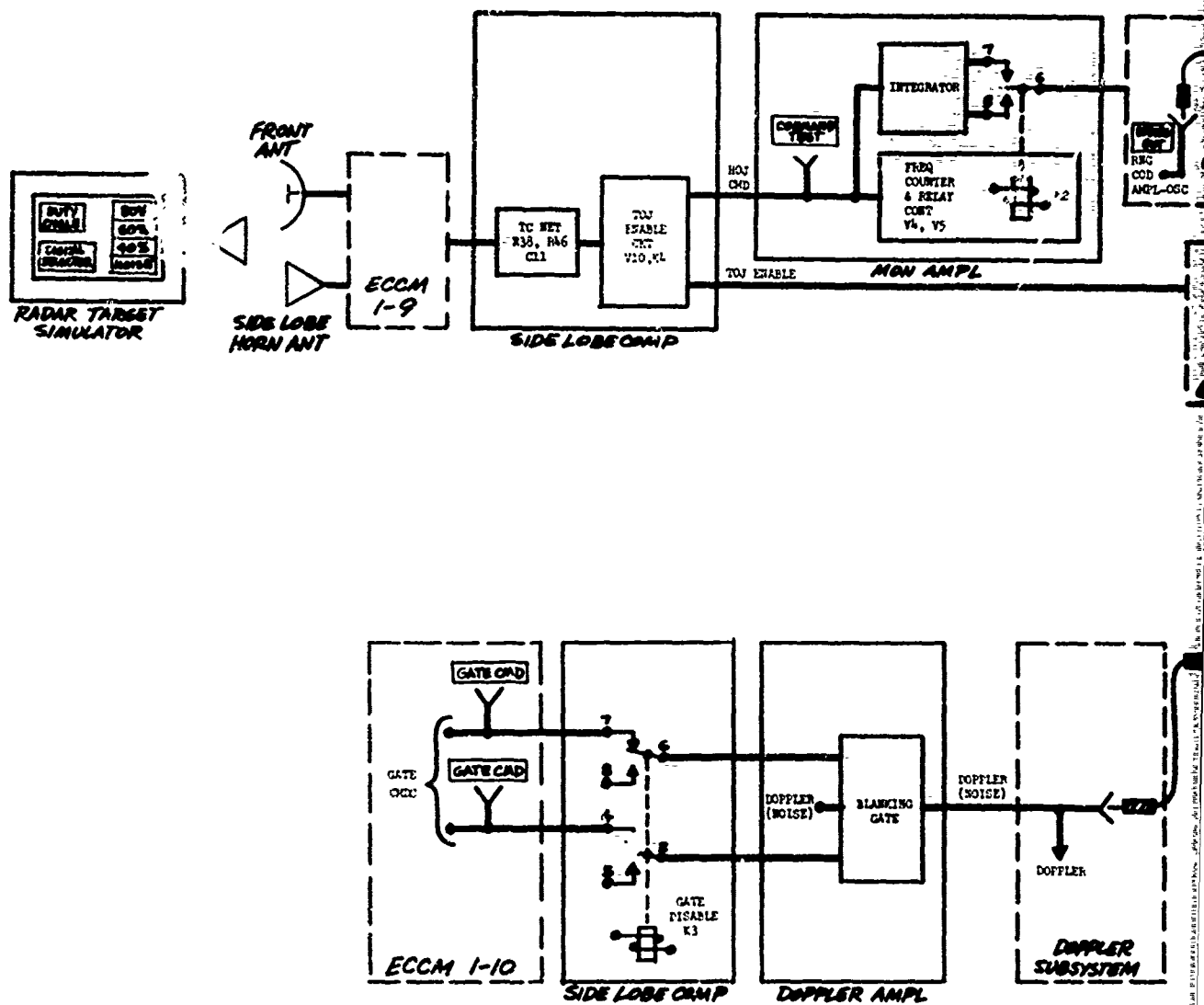


ANT TCK AUTO 1 _____

TOJ ANT POS _____

PRIOR CHECKS

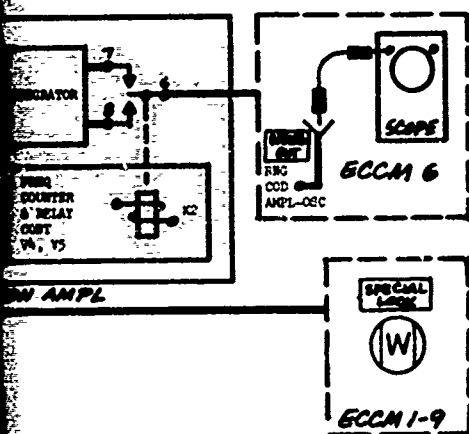
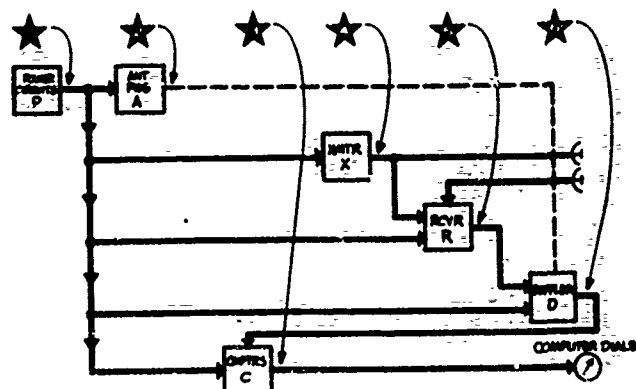
1. NPIR SYSTEM CHECKS
2. STEPS 13-15, TABLE 16, RECEIVER WEEKLY CHECKS, TM-511-12/1
3. STEP 8, TABLE 20, TARGET SIGNAL WEEKLY CHECK, TM-511-12/1



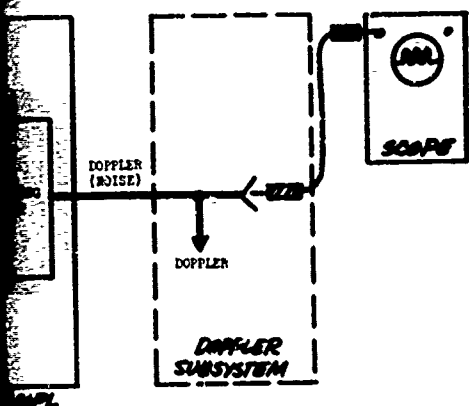
4

5

6

**ECCM 10**

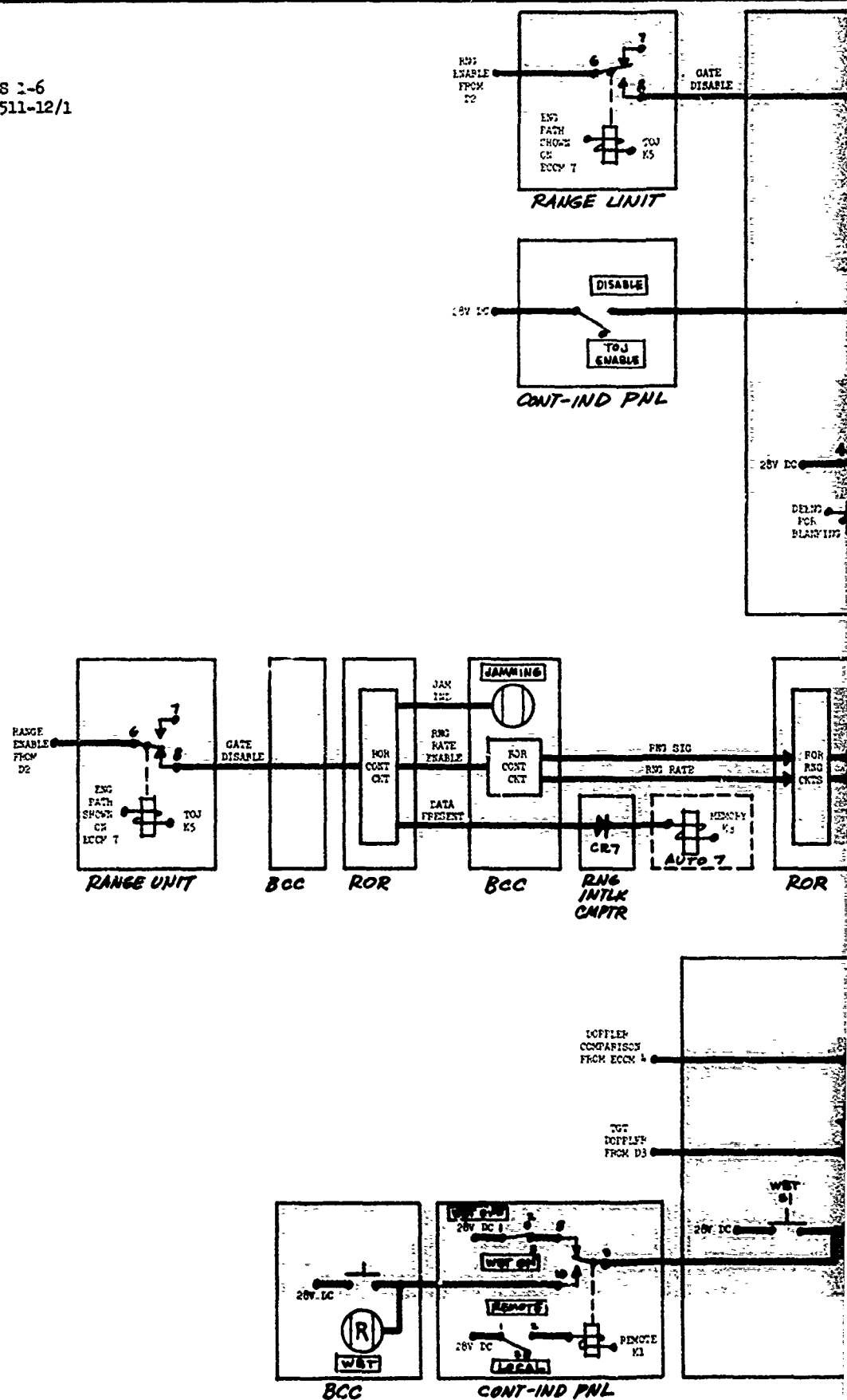
TRACK-ON-JAM
 STEP 8j-8ab
 TABLE 20
 TM-511-12/1

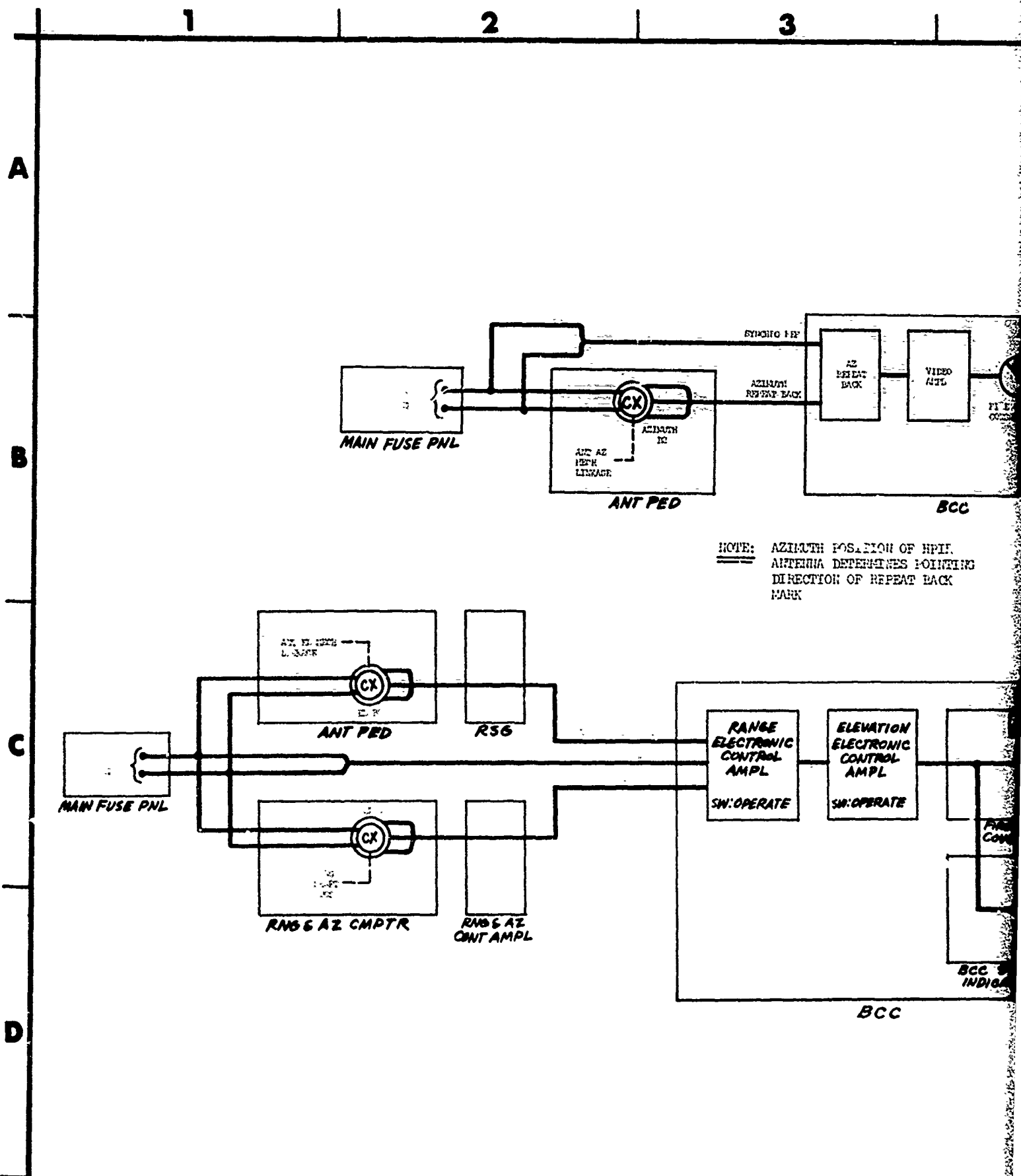
**ECCM 11**

TRACK-ON-JAM
 STEP 8ac-8af
 TABLE 20
 TM-511-12/1

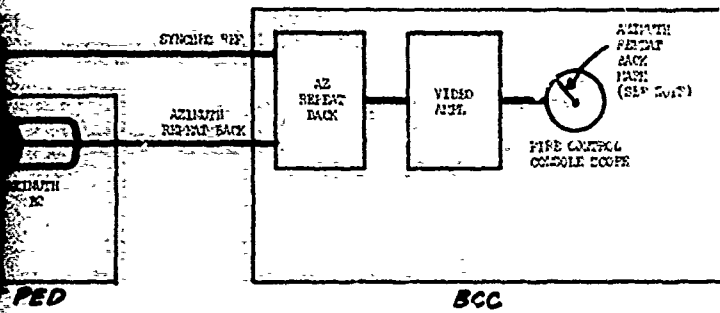
PRIOR CHECKS:

1. HPIR SYSTEM CHECKS 1-6
2. TABLES 14-20, TM-511-12/1





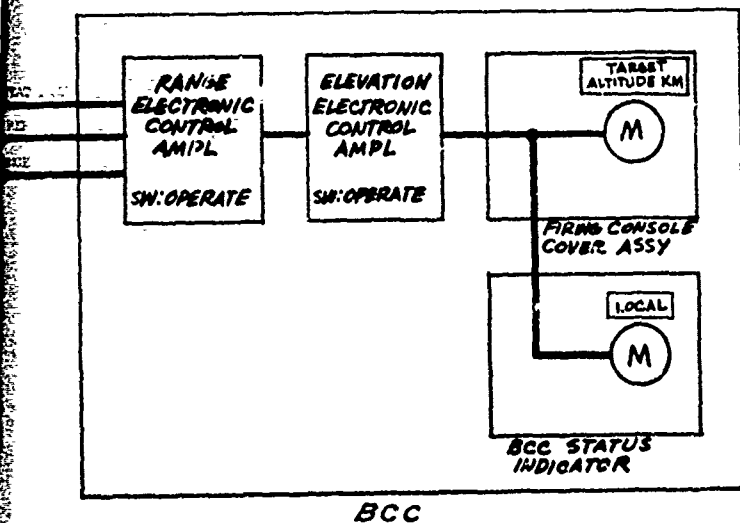
6



BCC 1

AZ REPEAT BACK
MARK

NOTE: AZIMUTH POSITION OF HPIR
ANTENNA DETERMINES POINTING
DIRECTION OF REPEAT BACK
MARK



BCC 2

TABLE 1. SUMMARY

1

2

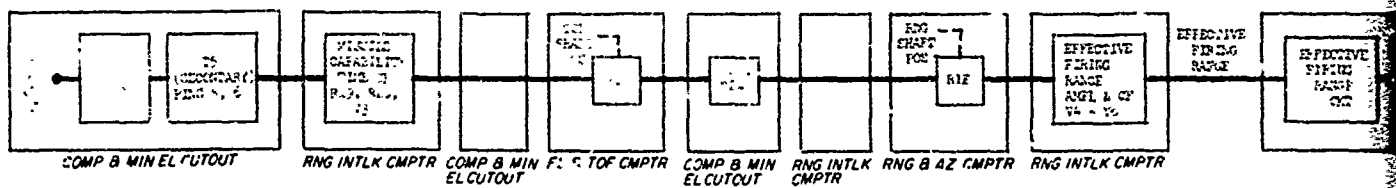
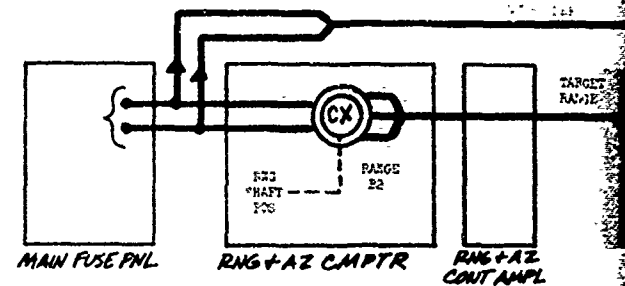
3

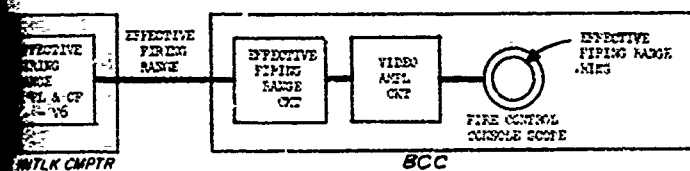
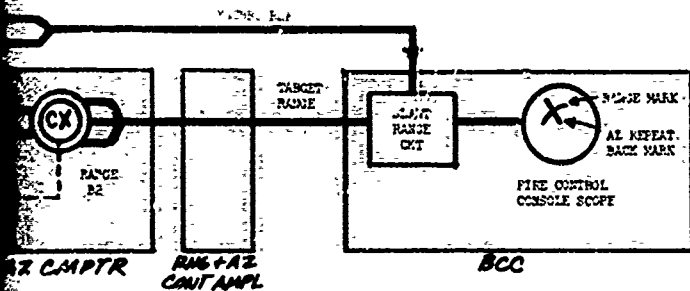
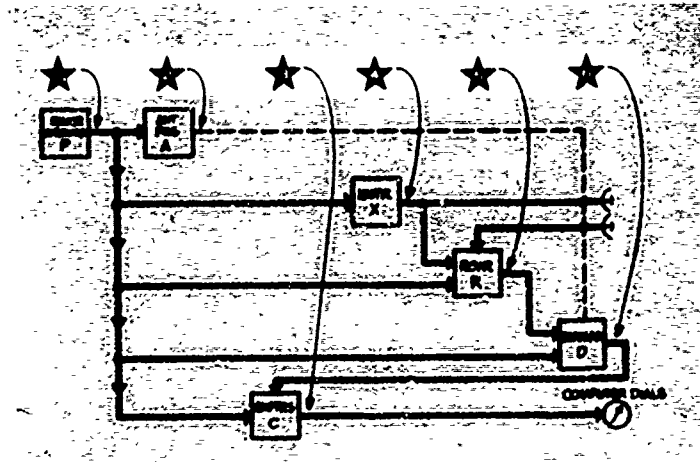
A

B

C

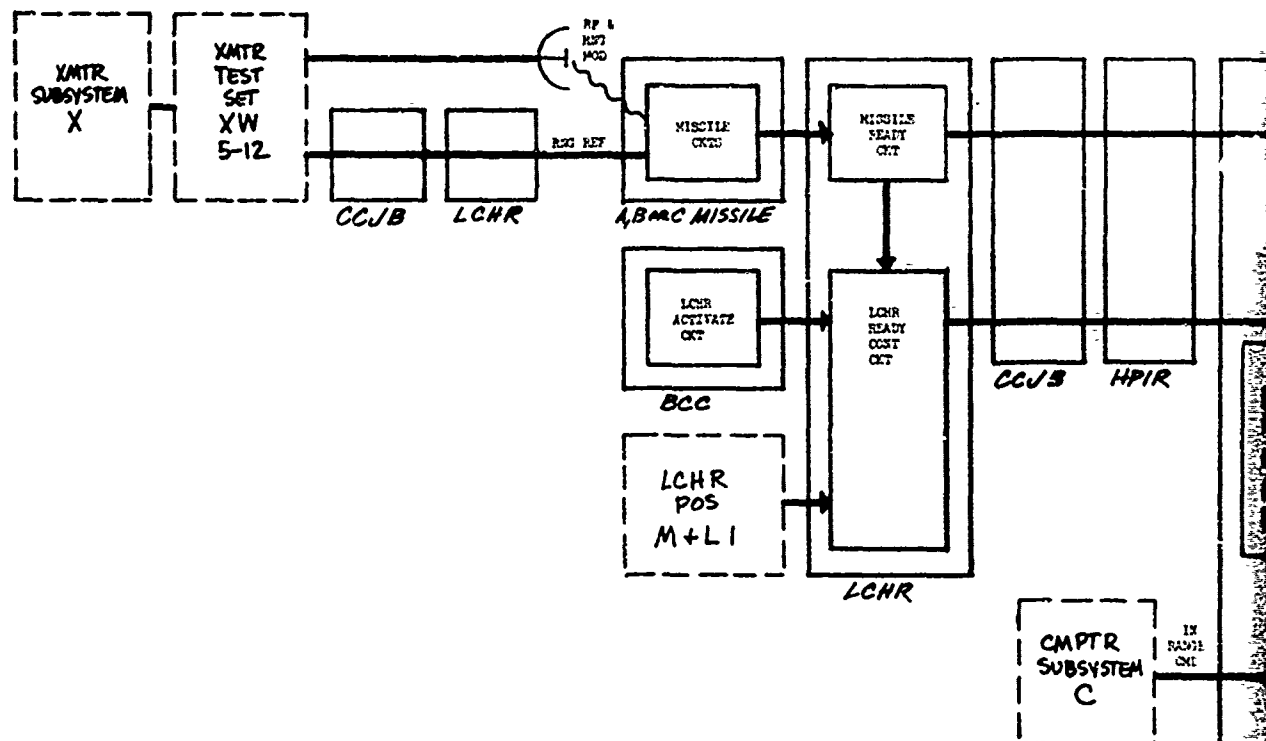
D



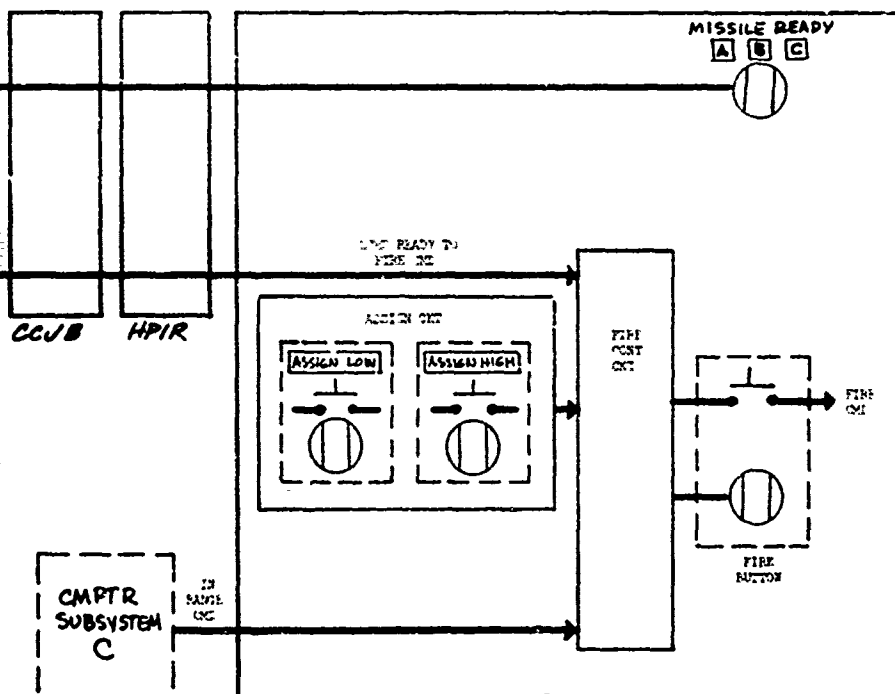


PRIOR CHECKS:

1. HPIR SYSTEM CHECKS 1-6
2. STEPS 18-22, TABLE 15, TM-511-12/1
3. LAUNCHER TAKES LEAD ANGLE



A



MISSILE READY
AND FIRE LAMPS

Lchr Ready_____

1

2

3



CKT
COND

Min E1
Antenna Operate
Perform Minimum Launch Angle check
Step 24, Table 19, TM-511-12
As stated in check procedures

IND



CKT
COND

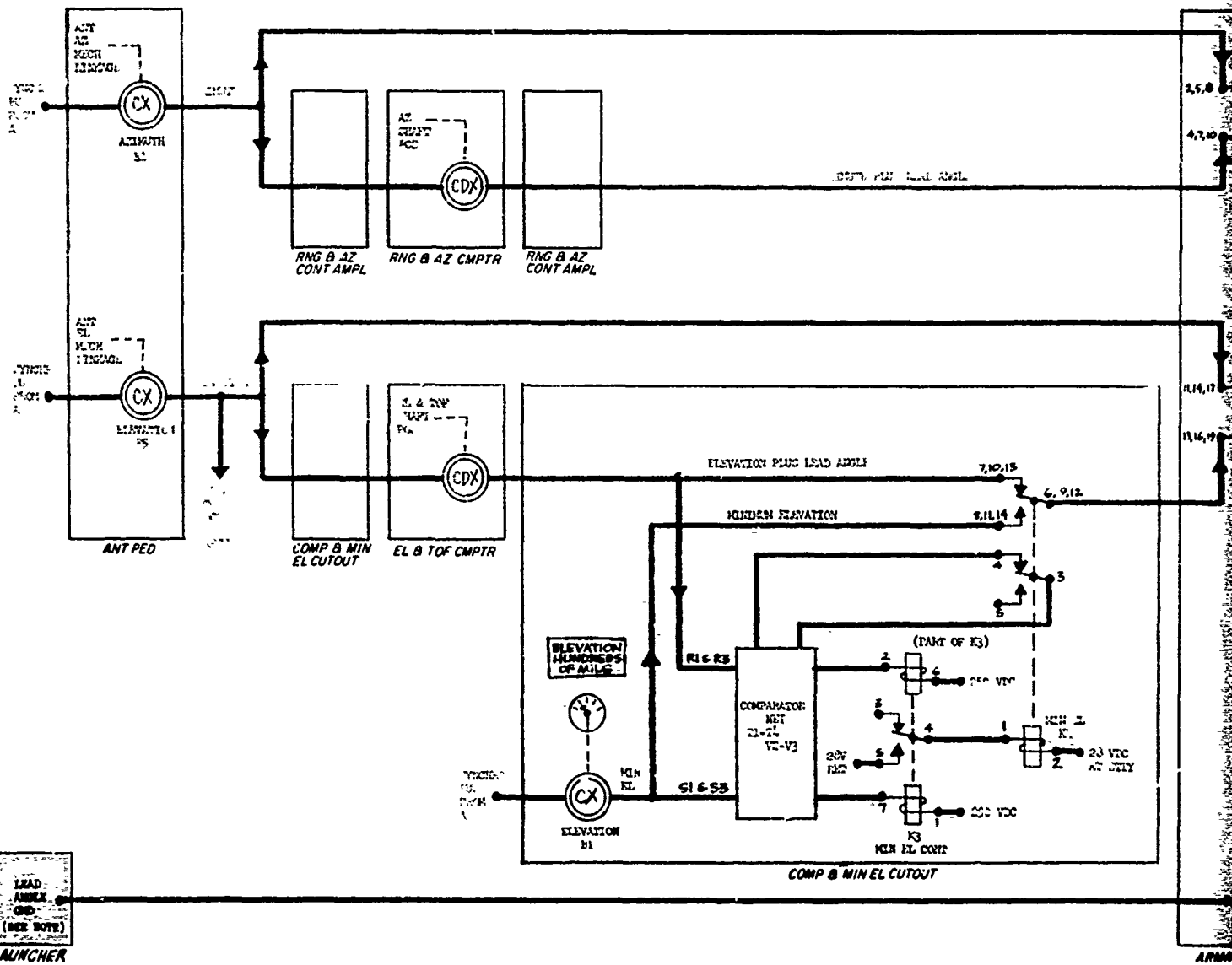
Az & E1 Launcher Pos
Antenna Operate
HPIR tracking target
Launcher follow HPIR ant pos

IND



CKT
COND
IND

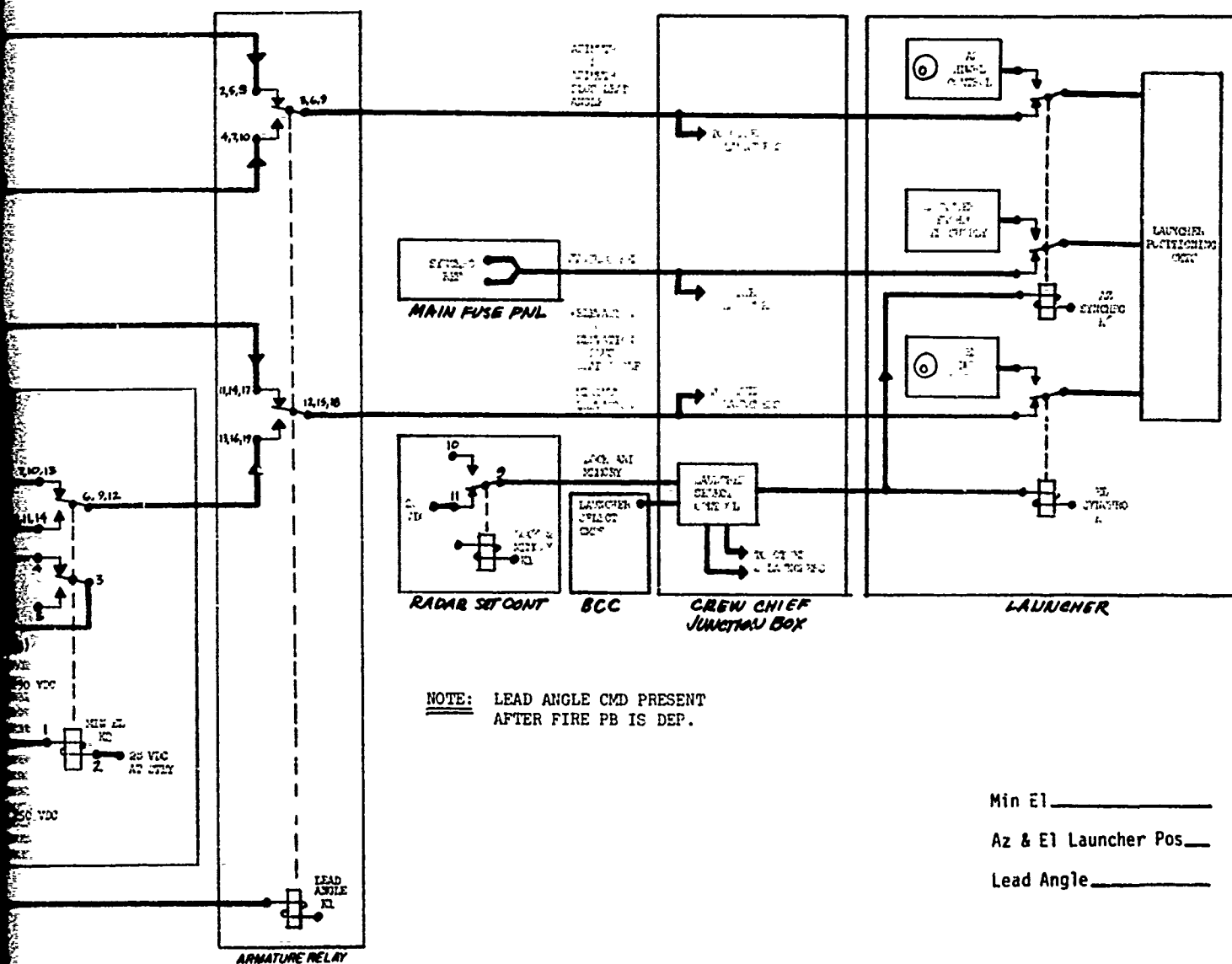
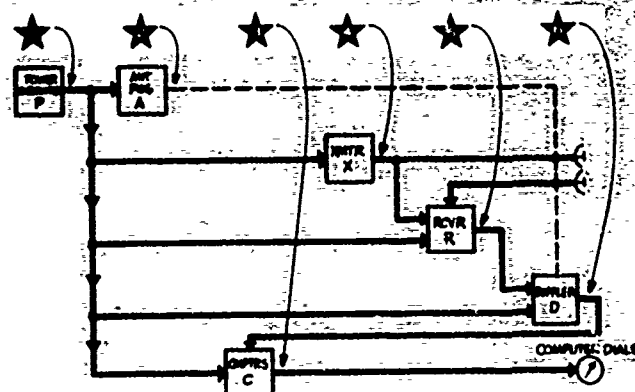
Lead Angle
Above chks good
This ckt bad



A

El Launcher Pos
and Operate
tracking target
er follow HPiR ant pos

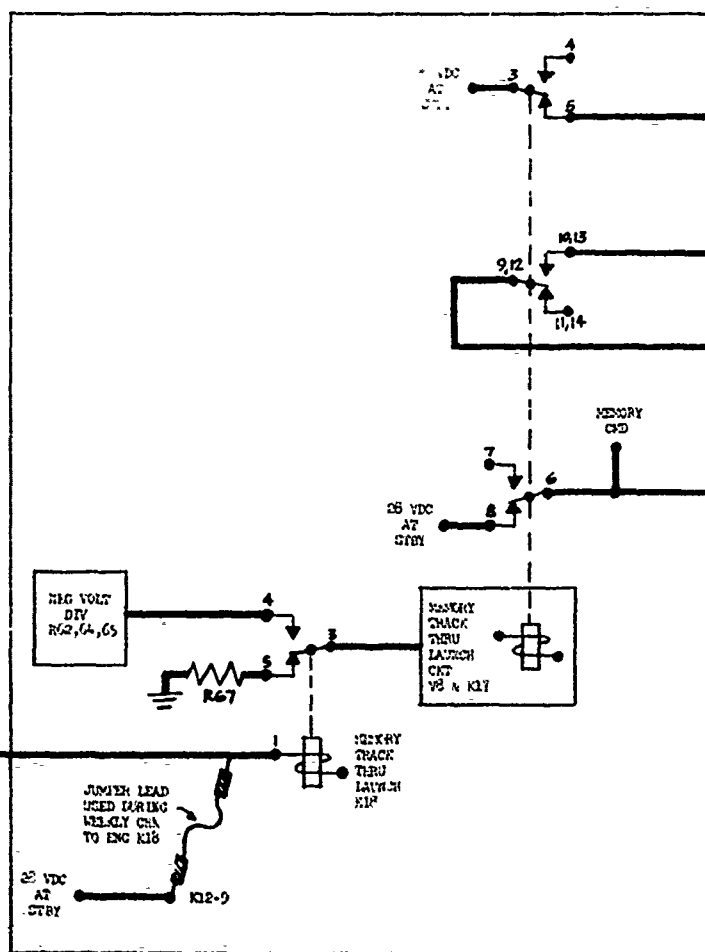
Angle
chks good
ckt bad



Min El _____
Az & El Launcher Pos _____
Lead Angle _____

3

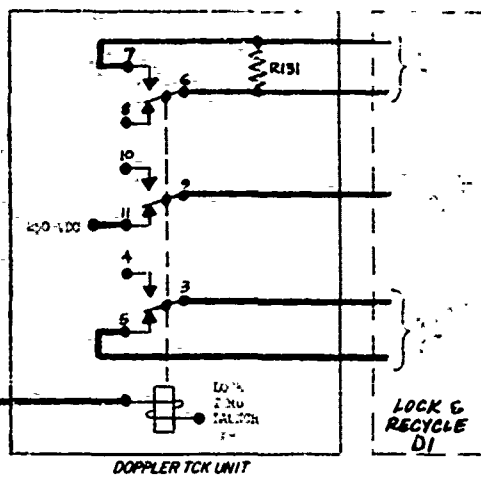
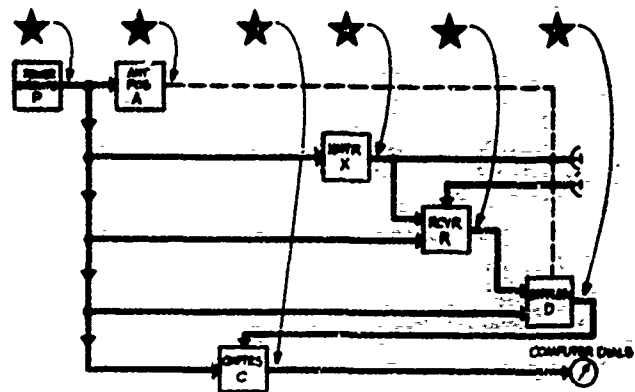
RADAR SET CONT



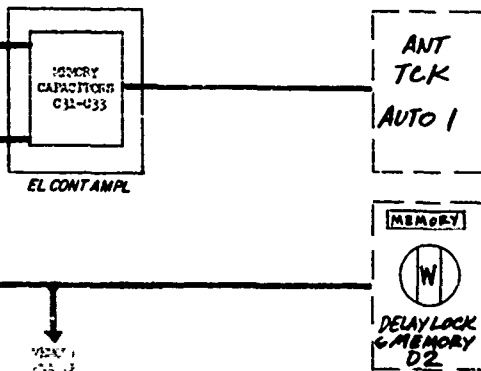
4

5

6



M+L 2

MEMORY TCK
THRU LAUNCH

Track Thru Launch _____

Lock Thru Launch _____

E1 Memory-Lead Angle _____

B

1

2

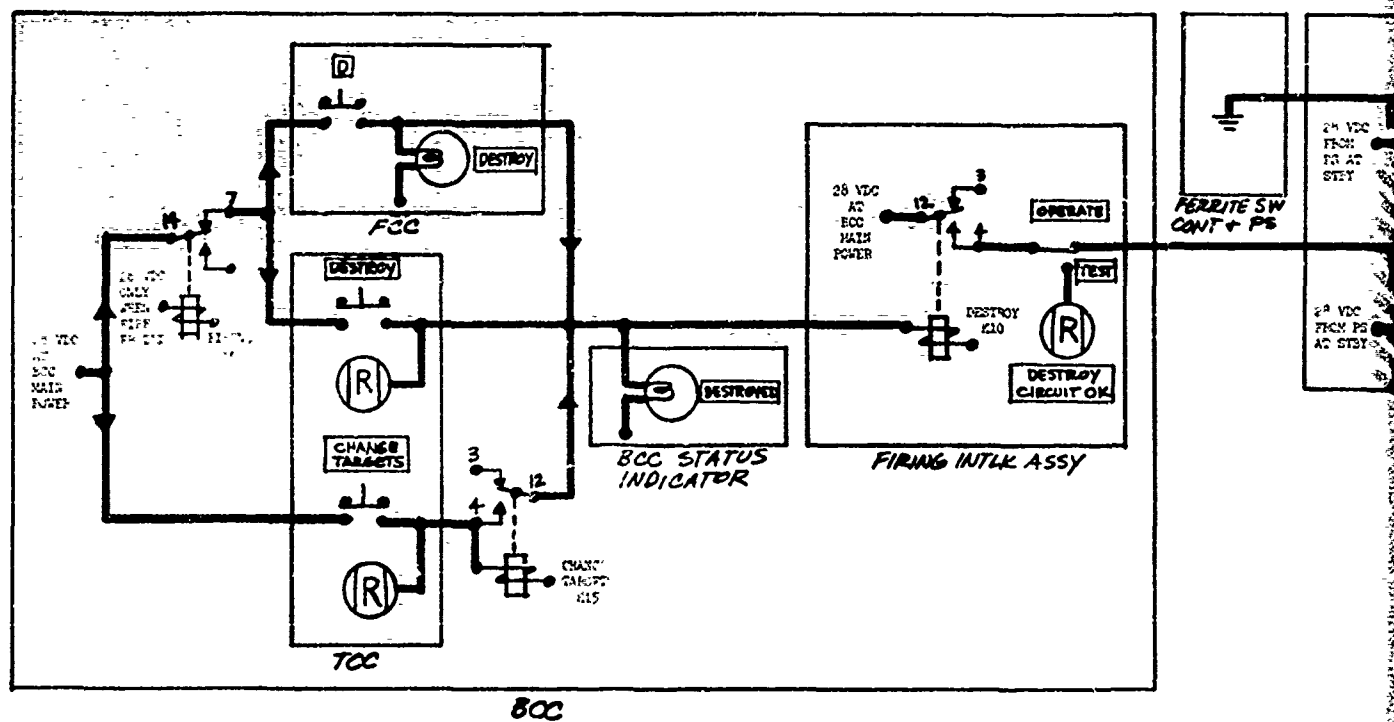
3

A

B

C

D

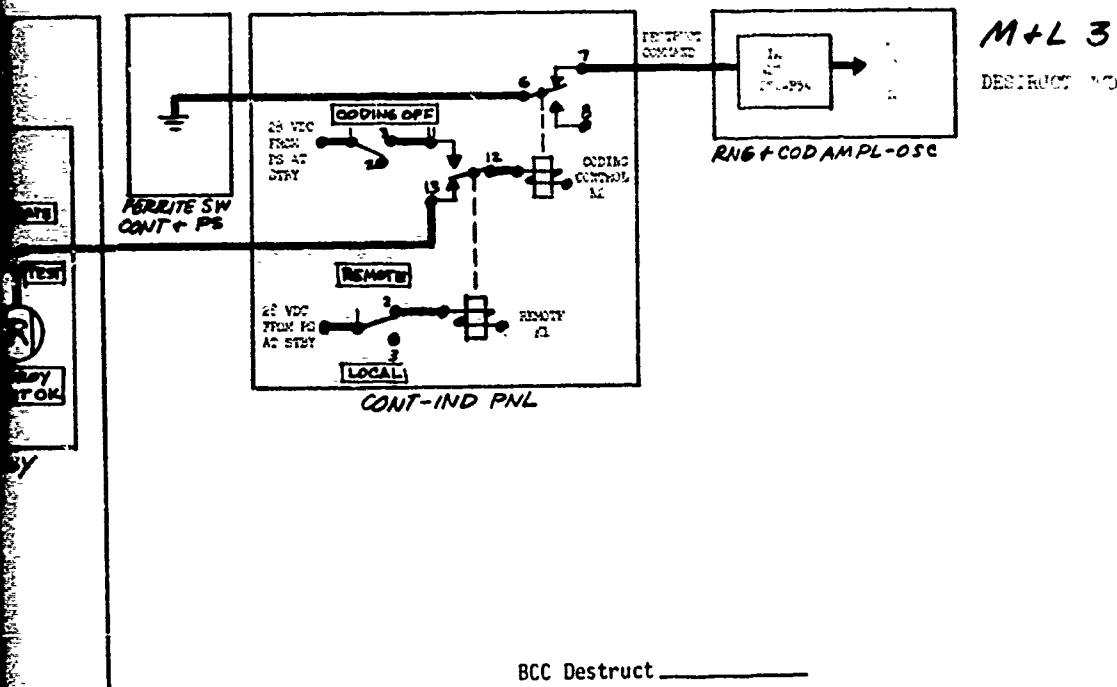
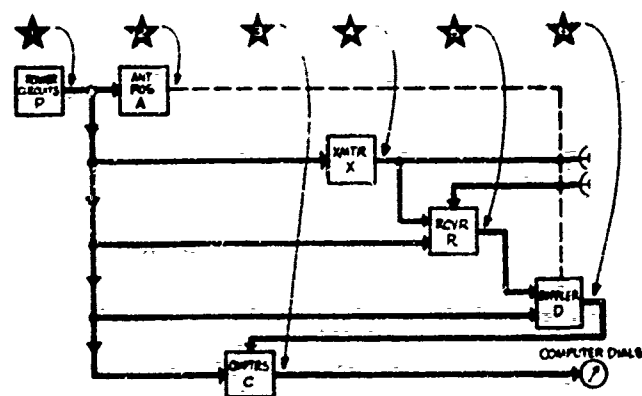


A

4

5

6

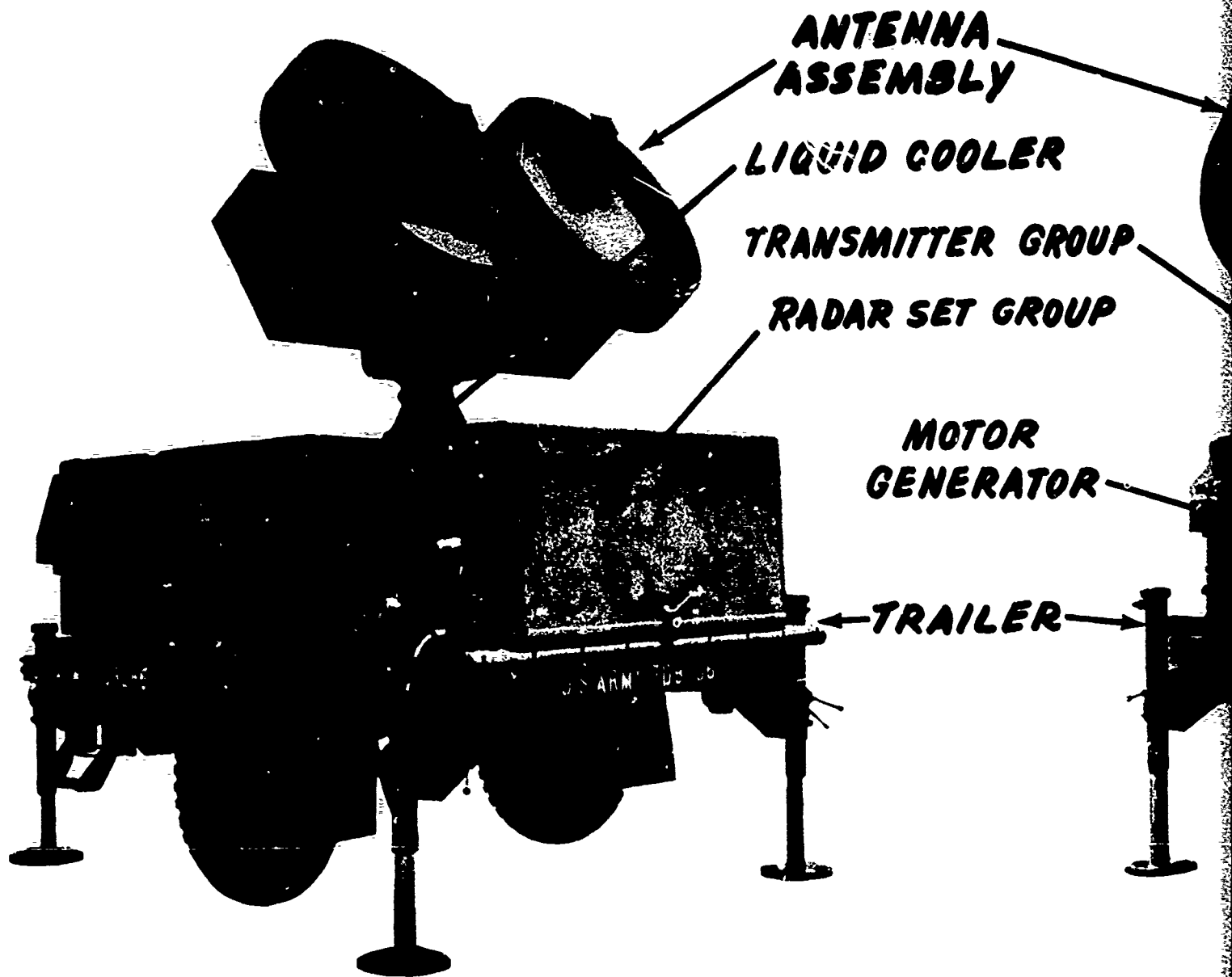


BCC Destruct _____

HPIR Destruct _____

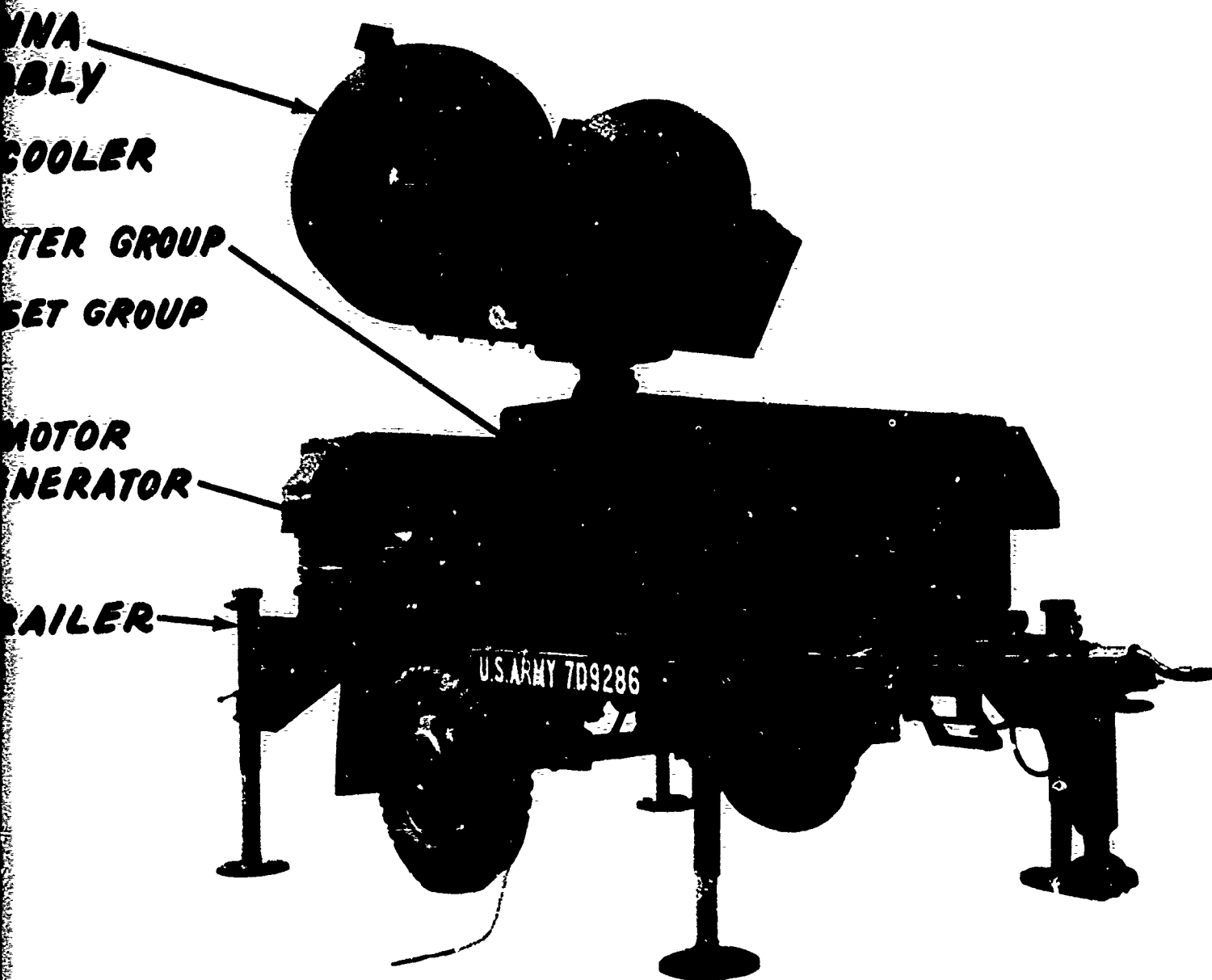
B

HIGH POWER ILLUMINATOR

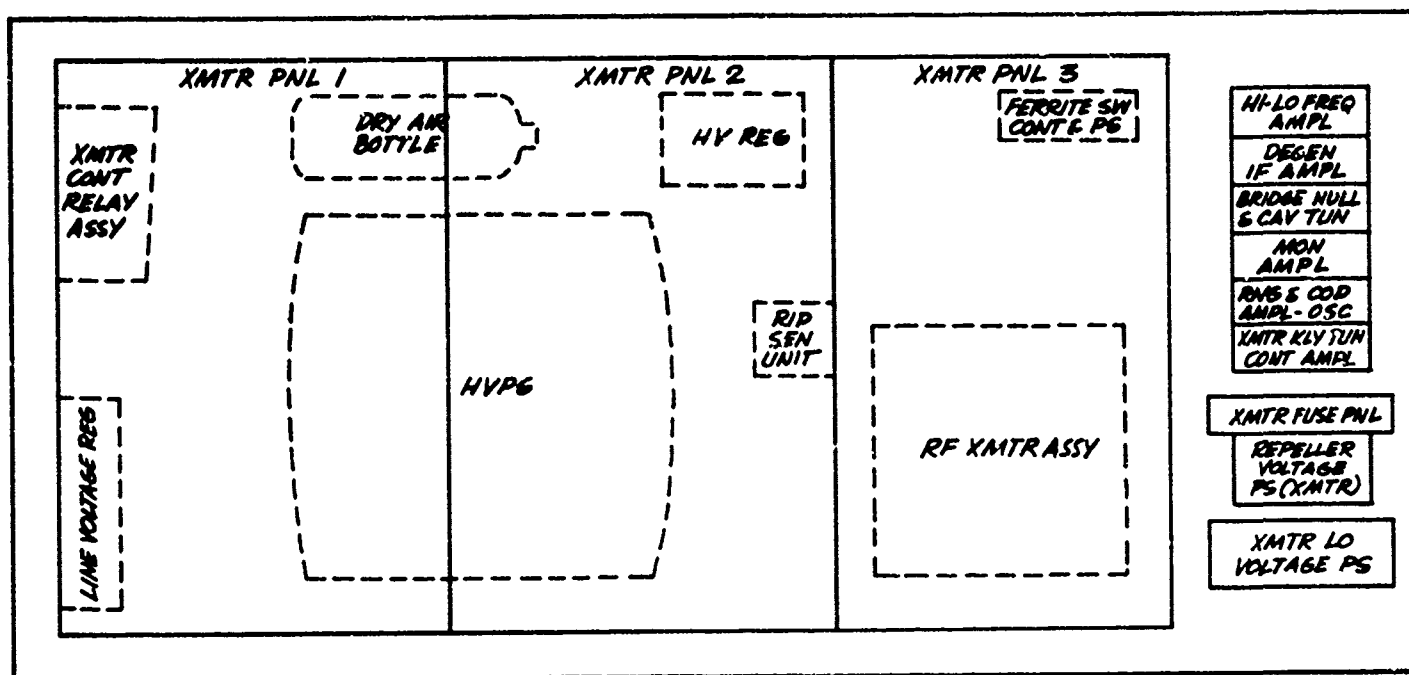


ROAD SIDE VIEW

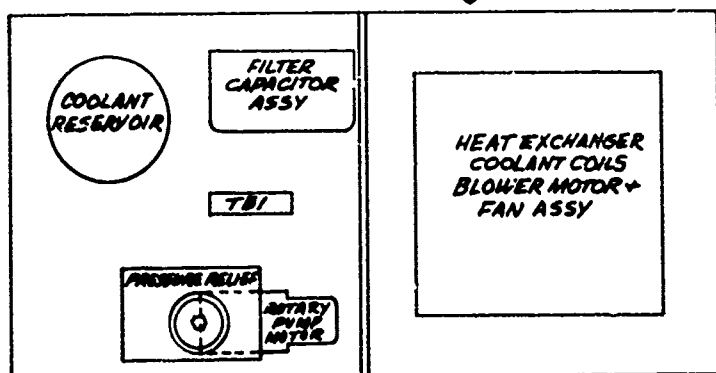
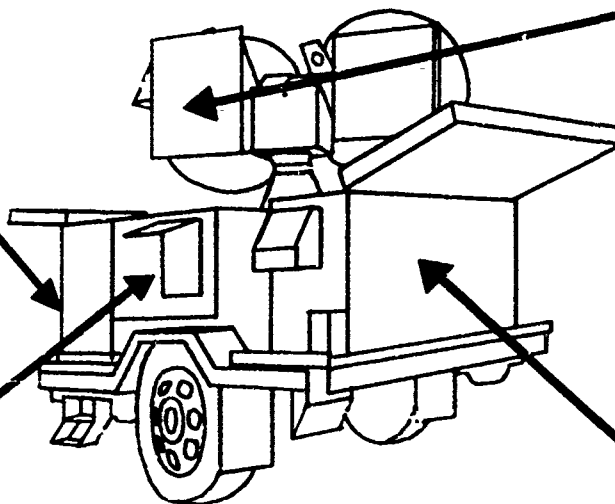
LUMINATOR RADAR



CURB SIDE VIEW

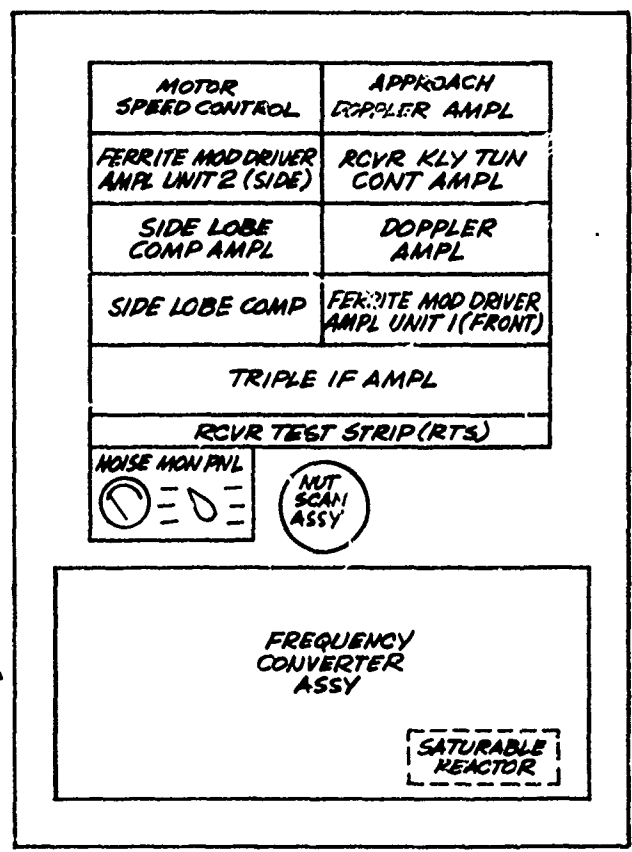
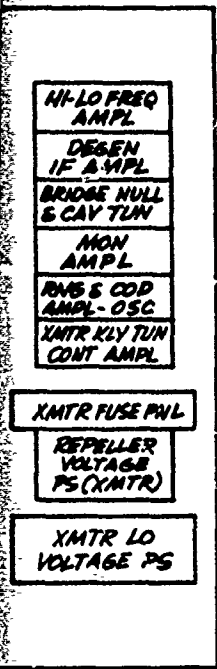


XMTR GROUP

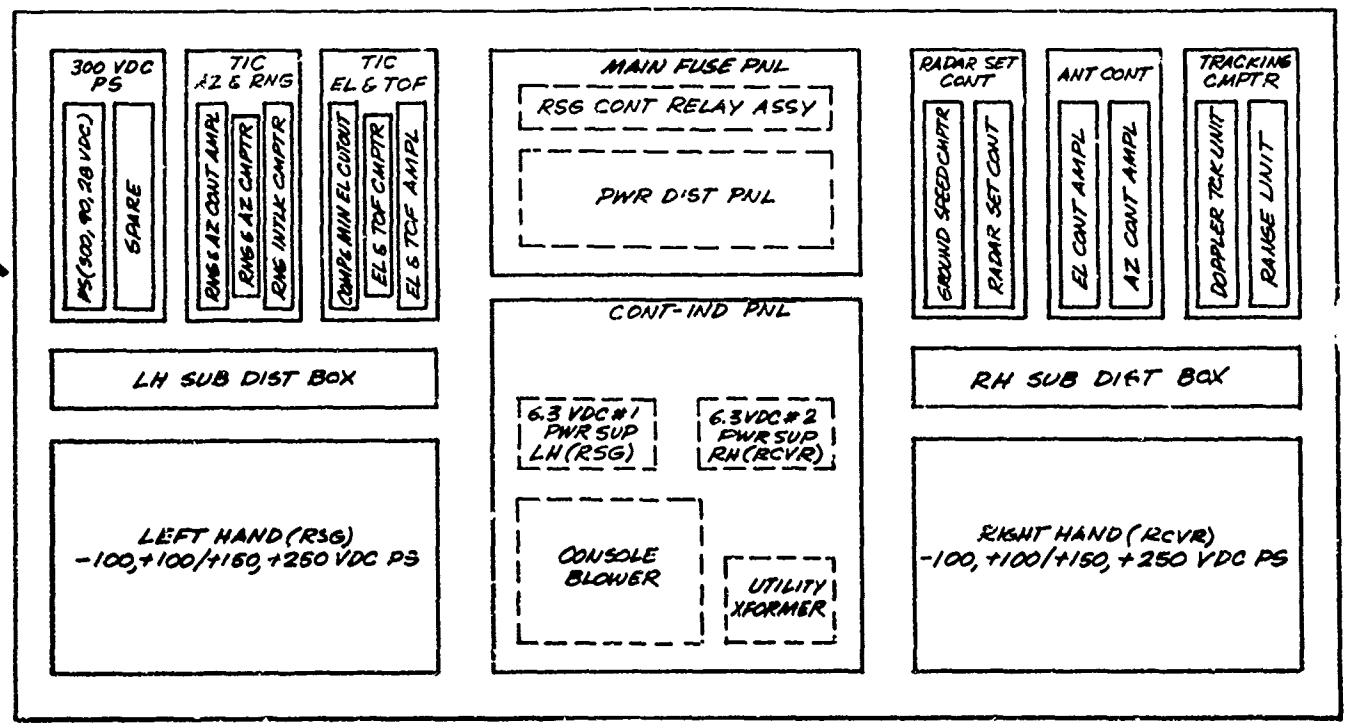


LIQUID COOLER





RECEIVER



RADAR SET GROUP

B

REPAIR AND REPLACEMENT

Reference Designation	TM Nomenclature	Ease of Replacement	Availability to Second Echelon	Repair Internally	Reference Designation
30A1A1	Transmitter Group	4	---	Yes	30A1A4A1A
30A1A1A1A1	High-Low Freq Ampl	1	S	**	30A1A4A2A
30A1A1A1A2	Degen IF Ampl	1	S	No	30A1A4A2A
30A1A1A1A3	Bridge Nulling Ampl & Cav Tuner	1	S	Yes	30A1A4A2A
30A1A1A1A4	Monitor Ampl	1	S	Yes	30A1A4A4
30A1A1A1A5	Rng & Coding Ampl-Qsc	1	S	Yes	30A1A4A5
30A1A1A1A6	Kly Tun Cont Ampl (Xmtr)	1	S	Yes	30A1A4A7
30A1A1A2	Low Voltage PS (Xmtr)	2	S	Yes	30A1A4A8
30A1A1A3	Ferrite Sw Cont & PS	2	S	Yes	30A1A4A9
30A1A1A4	Rf Xmtr Assy	4	---	Yes	30A1A4A11
30A1A1A4A14	Local Oscillator Assy (Xmtr)	3	*	Yes	30A1A4A13
30A1A1A5	High Voltage PS	3	*	No	30A1A4A13
30A1A1A6	High Voltage Regulator	2	S	Yes	30A1A4A14
30A1A1A7	Ripple Sensing Unit	3	*	No	30A1A4A14
30A1A1A10	Xmtr Pnl #1	4	---	Yes	30A1A4A15
30A1A1A11	Xmtr Pnl #2	4	---	No	30A1A4A15
30A1A1A12	Xmtr Pnl #3	4	---	No	30A1A4A16
30A1A1A14	Xmtr Contactor Relay Assy	3	*	No	30A1A4A16
30A1A1A15	Line Voltage Regulator	3	*	No	30A1A4A16
30A1A1A18	Cooling Sys Intlk	3	*	Yes	30A1A4A17
30A1A1A19	Xmtr Fuse Pnl	4	---	Yes	30A1A4A18
30A1A1A20	Repeller Voltage PS (Xmtr)	2	*	No	30A1A5
30A1A2	Liquid Cooler	4	---	Yes	30A1A6
30A1A3A1	Ant Ped	4	---	Yes	
30A1A3A1A1	Nut Scan Saturable Reactor	2	*	No	
30A1A3A1A2	Nut Scan Assy	4	---	No	
30A1A3A1A7	Repeller Voltage PS (Rcvr)	2	*	No	
30A1A3A1A4	Local Oscillator Assy (Rcvr)	3	*	Yes	
30A1A3A2A1	Nut Scan Motor Speed Cont	1	S	Yes	
30A1A3A2A2	Approach Doppler Ampl	1	*	**	
30A1A3A2A3	Side Lobe Comparator Ampl	1	S	..*	
30A1A3A2A4	Doppler Ampl	1	S	Yes	
30A1A3A2A5	Ferrite Mod Driver Ampl (Unit 2)	1	S	**	
30A1A3A2A6	Kly Tun Cont Ampl (Rcvr)	1	S	Yes	
30A1A3A2A7	Side Lobe Comparator	1	S	Yes	
30A1A3A2A8	Ferrite Mod Driver Ampl (Unit 1)	1	S	**	
30A1A3A2A9	Triple IF Ampl	1	S	No	
30A1A3A2A10	Noise Monitor Pnl	4	---	No	
30A1A3A5	Freq Converter	3	*	Yes	

PLACEMENT INFORMATION

Repair Internally	Reference Designation	TM Nomenclature	Ease of Replacement	Availability to Second Echelon	Repair Internally
Yes	30A1A4A1A1	Power Supply (300, 90, 28 VDC)	1	S	**
**	30A1A4A2A1	Rng & Az Cont Ampl	1	S	Yes
No	30A1A4A2A2	Rng & Az Cmptr	1	S	No
Yes	30A1A4A2A3	Rng Intlk Cmptr	1	S	Yes
Yes	30A1A4A4	-100,100/150,250 VDC PS (Console)	2	S	Yes
Yes	30A1A4A5	Cont-Indicator Pnl	4	---	Yes
Yes	30A1A4A7	6.3 VDC PS (Console)	1	*	**
Yes	30A1A4A8	6.3 VDC PS (Ped)	1	*	**
Yes	30A1A4A9	Main Fuse Pnl	4	---	Yes
Yes	30A1A4A11	-100,100/150,250 VDC PS (Ped)	2	S	Yes
Yes	30A1A4A13A1	Radar Set Cont	1	S	**
No	30A1A4A13A2	Ground Speed Cmptr	1	S	**
Yes	30A1A4A14A1	E1 Cont Ampl	1	S	**
No	30A1A4A14A2	Az Cont Ampl	1	S	**
Yes	30A1A4A15A1	Doppler Tck Unit	1	S	Yes
No	30A1A4A15A2	Rng Unit	1	S	Yes
No	30A1A4A16A1	Comparator & Min E1 Cutout	1	S	Yes
No	30A1A4A16A2	E1 & TOF Cmptr	1	S	No
No	30A1A4A16A3	E1 & TOF Cont Ampl	1	S	Yes
Yes	30A1A4A17	Console Heaters	4	---	No
Yes	30A1A4A18	Armature Relay Assy	3	*	No
No	30A1A5	Motor-Generator Assy	4	---	**
Yes	30A1A6	Main Power Dist Box	4	---	No

EASE OF REPLACEMENT:

1. Easy chassis to replace.
2. More difficult chassis to replace.
3. Most difficult to replace--may require special tools.
4. Cannot be replaced by second echelon.

AVAILABILITY TO SECOND ECHOLON:

- S Spare chassis available
- * May be requisitioned.
- Not available to second echelon.

REPAIR INTERNALLY:

- ** Second echelon could repair if parts were available.