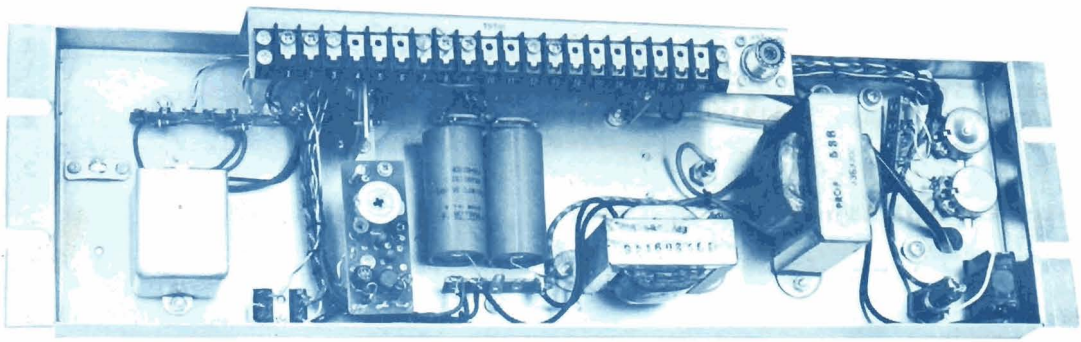
COMMUNICATIONS

MASTR Progress Line

BASE STATION RECEIVER POWER SUPPLY MODEL 4EP39A10



Maintenance Manual LBI-3567D

EP-39-A

SPECIFICATIONS *

Model Number:	4EP39A10
Dimensions (W x H):	19" x 5-1/4"
Input:	117 VAC, ±20%, 50/60 Hz, 2.4 amps
Output:	13.4 volts @750 mA 10 volts @100 mA, ±5%
Transistors:	Four
Rectifiers:	Two
Zener Diodes:	One
Fuses:	1 (F501, 1/4-amp, slow)
Duty Cycle:	Continuous
Ambient Temperature Range:	-30°C (-22°F) to +60°C (+140°F)
Humidity:	95% maximum relative humidity @50°C
Metering:	All voltages measured at terminal strips on wiring side of power supply board with a 20,000 ohms-per-volt multimeter.

*These specifications are intended primarily for the use of the serviceman. Refer to the appropriate Specification Sheet for the complete specifications.

GENERAL ELECTRIC

TABLE OF CONTENTS

ILLUSTRATIONS

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with high voltage; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

The General Electric Transistorized Power Supply Model 4EP39A10 and Antenna Relay, 19A121260-G2 are used with a second receiver when the additional receiver is added to the MASTR station equipment. The power supply is mounted to the chassis frame below the control panel. The antenna relay is mounted on the Transmitter-Receiver Power Supply Model 4EP38A10.

The power supply provides:

- +13.4 volts regulated for the receiver audio
- +10 volts regulated for the receiver RF stages

The receiver is mounted on the front side of the power supply panel. Power supply voltages are connected to the receiver through power cable plug P443. All power supply components are located on the rear side of the power supply chassis.

CIRCUIT ANALYSIS

When power supply ON-OFF switch S501 is on, 117 volts AC is connected across the primary (black leads) of power transformer T501. The secondary of T501 connects to a full-wave rectifier circuit consisting of CR501 and CR502. The output is taken from the transformer center-tap (red-yellow wire), and filtered by C501 and C502. Fuse F501 is in series with switch S501 to protect the power supply from overload.

13.4 Volt Regulator Circuit (A502)

Voltage is applied from the center tap of T501 to the collector of regulator transistor Q503. When the voltage rises, Q503 conducts harder and the output voltage at the emitter of Q503 starts to rise. This increases the base voltage of Q2 (emitter of Q2 is kept constant by VR4) and Q2 conducts more. As Q2 conducts harder, the forward bias at the base of Q1 is decreased and Q1 conducts less. As a result, the forward bias at the base of Q503 is reduced and Q503 conducts less. This increases the voltage drop across Q503, keeping the output voltage constant.

When the voltage at the collector of regulator transistor Q503 drops, the output voltage starts to drop. Q2 conducts less, allowing Q1 to conduct more. This increases the forward bias on Q503 and Q503 conducts more. The reduced voltage drop across Q503 keeps the output voltage constant.

Potentiometer R1 is used to set the emitter-base voltage of Q2 for the desired 13.4 volt output. R2 and R4 limit the maximum current through Q2 and R3 provides bias current for zener diode VR4. The 13.4 volt regulated output is connected to TB501-10, and P443-11 for the receiver audio circuits, and to the input of the +10 volt regulator.

+10 Volt Regulator Supply (A501)

When the supply voltage (or output) starts to increase, the voltage at the base of Q5 also increases. As the emitter voltage of Q5 is kept constant by VR4, the emitter-base voltage increases. This causes Q5 to conduct more which means less base current for Q501. The voltage drop across Q501 becomes larger and the output remains constant.

When the input voltage starts to drop, the output voltage also tends to drop and Q5 will conduct less. This increases the forward bias on Q501 and reduces the voltage drop across Q501 to keep the output constant.

Diode CR2 gives reverse polarity protection to the supply. Potentiometer R11 is used to set the emitter-base voltage of Q5 for the desired 10-volt ±5% output. R8 and R10 limit maximum current through Q5. R9 provides bias current for zener diode VR4, and lamp DS1 provides bias for Q501. C4 and C5 prevent high frequency oscillation. The output voltage is metered at TB501-10 and 12.

Transistor Q502

A 10-volt circuit for controlling receiver muting is connected through Q502. Normally Q502 is conducting and completes the 10-volt circuit required for receiver operation. Keying the transmitter connects 13.4 volts to TB501-11 (from 4EP38A10), reverse biasing CR503, and turning Q502 off. This breaks the 10-volt circuit and mutes the receiver.

If muting is undesirable, disconnect lead to TB501-11. The 10-volt power supply will be connected through Q502 to the receiver at all times.

Matching Transformer

Line matching transformer (T502) is

used to match the receiver output to a 600-ohm telephone line in remotely controlled installations.

The 100-ohm impedance between R-G and BL leads of the secondary is "built out" to 600 ohms by resistors R503 and R504. One watt delivered to the 3.5-ohm primary of T502 will apply +18 dBm to the telephone line pair. The full 600-ohm output between the R and BL leads may be used for connections to long speaker lines or for other special applications.

Two-Frequency Monitoring Control, 19A121629-G7, -G8 (Option)

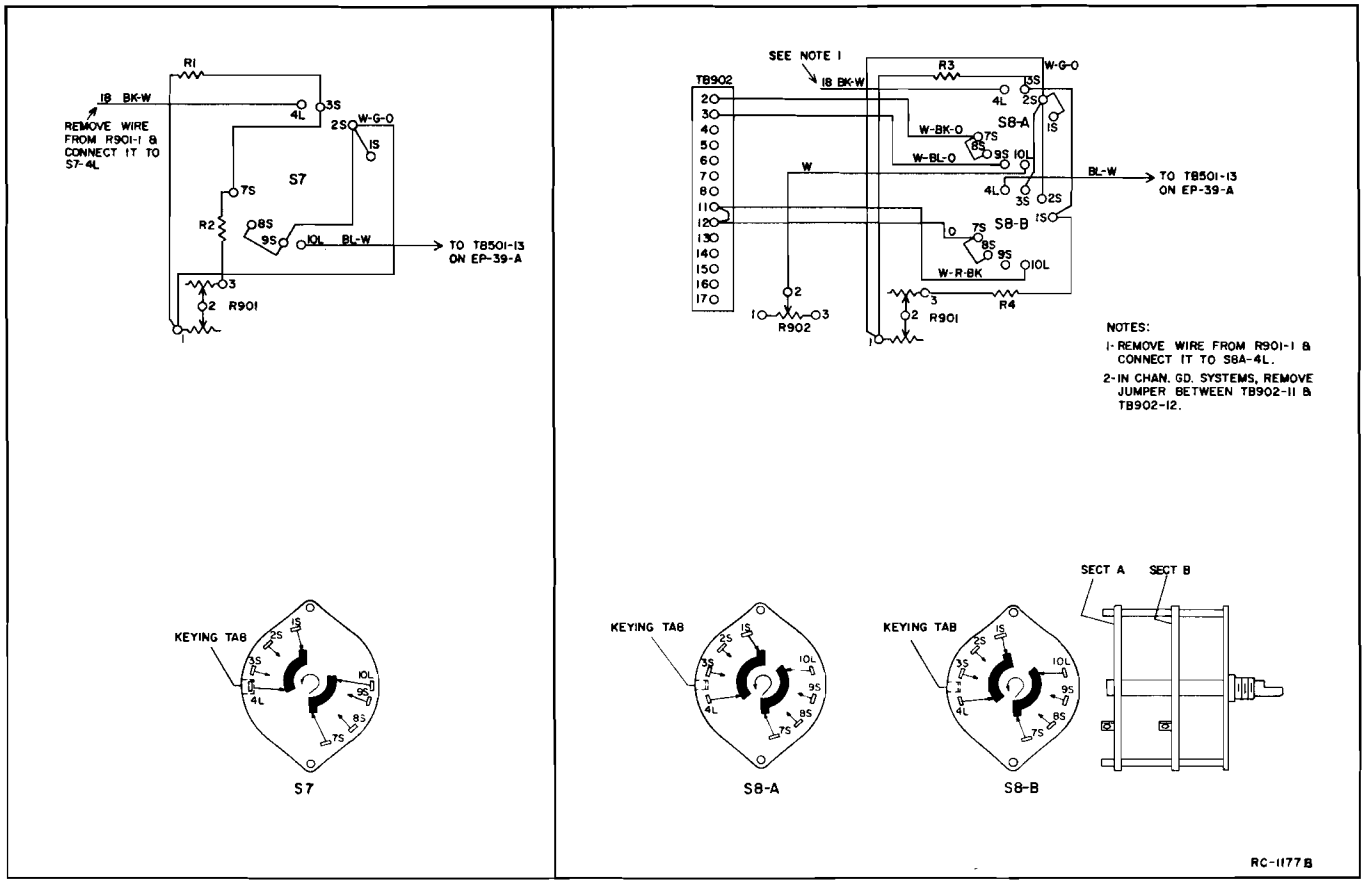
Two-Frequency Monitoring is used in Local Control and Local/Remote Stations to monitor two receivers. Single-Frequency Switch Kit (19A121629-G7) and Two-Frequency Switch Kit (19A121629-G8) are available for Two-Frequency Monitoring Controls.

The Two-Frequency Monitoring switch is mounted on the control panel between the volume control (R901) and the CG-ON switch (S902).

When the monitoring switch is in the "F1-F2" position, receiver 1 and receiver 2 audio will be heard simultaneously and at equal volume levels. The operator must switch to either the "F1" position or "F2" position to interpret one call at a time. When the monitoring switch is in position "F1" for example, receiver 1 will be heard at full volume. If a signal is received by receiver 2, the audio will be heard in the background at a low volume level with the receiver 1 volume remaining constant. When the switch is in the "F2" position, the reverse occurs, "F2" audio will be at full volume and "F1" audio will be low, but audible in the background. This will alert the operator to the presence of a second signal. Refer to the following diagrams for -G7 and -G8 monitor circuit wiring.

Second Receiver Antenna Relay, 19A121260-G2

When a second receiver is used in the station, antenna relay K502 on the Transmitter-Receiver Power Supply, 4EP38A10 (refer to Transmitter-Receiver Power Supply Model 4EP38A10 wiring diagram) is removed and replaced by Relay K504.



Single Frequency Switch Wiring Diagram 19A121629-G7

Two-Frequency Switch Wiring Diagram 19A121629-G8

Figure 1

1. Remove relay K502 as follows:

   A. Disconnect wires from terminals 1 and 2 on K502.
   B. Disconnect plug J503 from chassis mounting bracket.
   C. Disconnect P103 from J103 on transmitter.
   D. Disconnect P441 from J441 on receiver.
   E. Unscrew relay and remove from chassis.

2. Mount Second Receiver Antenna Relay K504 as follows:

   A. Disconnect the R-O wire and the BR-R wire from TB15 and remove TB15.
   B. Connect R-O wire to terminal 1 and BR-R wire to terminal 2 on K504.
   C. Mount J503 into left hole on chassis mounting bracket.
   D. Mount J504 into right hole on mounting bracket.
   E. Plug P103 into J103 on transmitter.

The opposite end of the mounted J504 plug must be connected to the input of each receiver in the station either directly or by means of the appropriate Antenna Matching Unit.

INITIAL ADJUSTMENT

VOLUME and SQUELCH Control Adjustments

VOLUME (R502) and SQUELCH (R501) controls must be adjusted as follows:

1. Attach speaker (3.5 ohm impedance) to TB501-9 and 13.
2. Turn on power to the receiver.
3. Turn VOLUME and SQUELCH controls clockwise.
4. Adjust SQUELCH control counterclockwise until noise just disappears.
5. Adjust VOLUME control to desired listening level.

NOTE

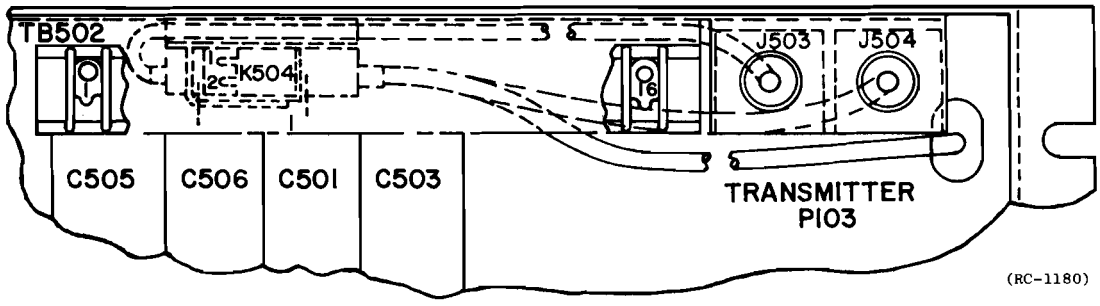
A 3.5 ohm resistor or speaker (3.5 ohm impedance) must always be connected across TB501-9 and 13 for proper loading.

MAINTENANCE

TROUBLESHOOTING HINTS

Refer to the troubleshooting steps listed below and the "Quick-Checks" listed on the power supply troubleshooting procedure sheet:

1. Check fuse F501.
2. Make continuity and voltage checks listed on service outline diagram.
3. Check for shorts and opens in capacitors and resistors.

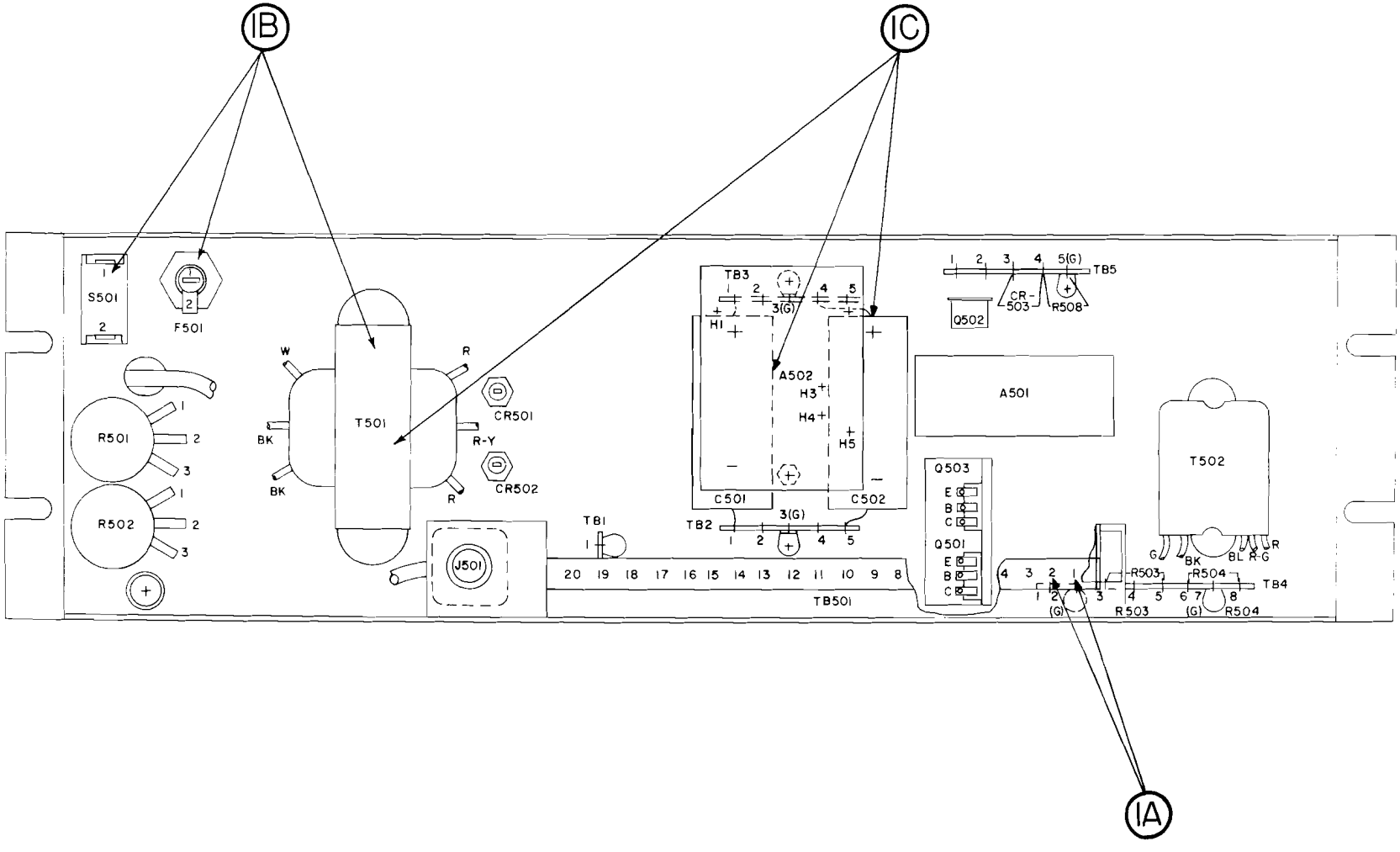


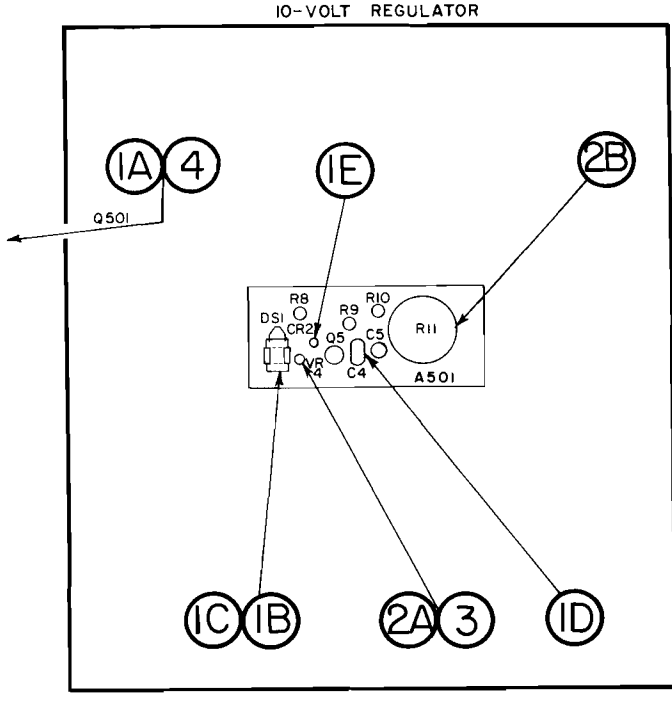
Antenna Relay Wiring
Figure 2

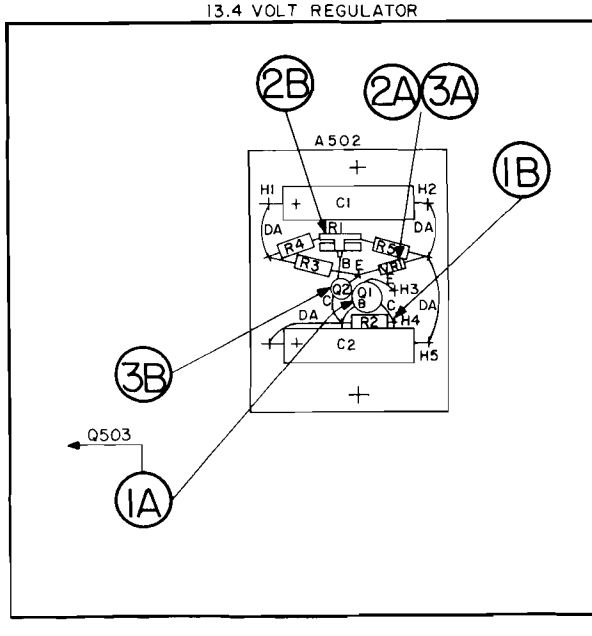
STEP 1 - QUICK CHECKS

RECEIVER POWER SUPPLY
MODEL 4EP39A10

SYMPTOM	PROCEDURE
No output voltages at P443-11-12 and TB501-10-12	1. Check for the following: A. 117 VAC on TB501-1-2. B. Open F501, S501, T501, L501. C. Shorted T501, C501, C502.
13.4 VOLT REGULATOR	
No. 13.4-volt regulator output	1. Check the following A. Open Q503 or Q1. B. 13.4 volts at H4.
Output voltage too high, cannot be adjusted by R1.	2. A. Check for open VR1. B. Check for defective R1.
Very low output voltage	3. A. Check for shorted VR1. B. Check for shorted Q2.
10-VOLT REGULATOR	
No 10-volt regulated output	1. Check for the following: A. Open Q501. B. 13.4 volts. C. Open DS1. D. Shorted C4. E. Open CR2.
Output voltage too high, cannot be adjusted by R6	2. A. Check for open VR4. B. Defective R11.
Very low output voltage	3. Check for shorted VR4.
Output voltage equals input voltage	4. Shorted Q501.


IB
IC
IA
S501
F501
R501
R502
T501
W
BK
BK
R
R-Y
R
CR501
CR502
J501
TB1
TB501
20 19 18 17 16 15 14 13 12 11 10 9 8
TB3
TB2
3(G)
H1
H3
H4
H5
A502
C501
C502
A501
Q502
TB5
CR-503
R508
Q503
Q501
E
B
C
T502
G
BK
BL
R-G
R
R503
R504
TB4
R503
R504
(G)





RC-11628

TROUBLESHOOTING PROCEDURE

BASE STATION RECEIVER POWER SUPPLY
MODEL 4EP39A10

CONTINUITY AND VOLTAGE CHECKS

CONTINUITY CHECKS

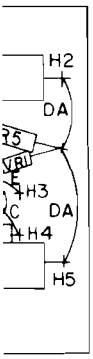
THE FOLLOWING CONTINUITY CHECKS MUST BE MADE WITH SWITCH (S501) IN OFF POSITION AND PLUG P443 DISCONNECTED:

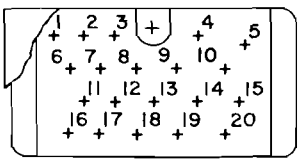
FROM	TO	RESISTANCE
TB501-3	P443-6	0
TB501-4	P443-7	0
TB501-5	P443-8	0
TB501-6	P443-9	0
TB501-7	P443-4	2.5 K SQUELCH POT MAX
TB501-8	GRD.	0
TB501-13	GRD.	.5
TB501-14	TB501-15	500
TB501-16	P443-18	0
P443-5	P443-10	5 K VOL. POT MAX
TB501-13	P443-16	0
P443-1	GRD.	0
P443-13	GRD.	0
P443-14	GRD.	0
P443-17	GRD.	0
TB501-12	P443-12	0
TB501-9	GRD.	0

VOLTAGE CHECKS

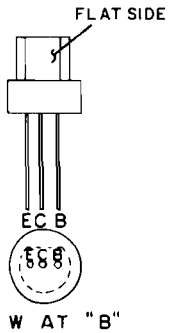
THE FOLLOWING VOLTAGE CHECKS MUST BE MADE WITH RECEIVER AT FULL LOAD CONDITIONS.

TEST POINT	READINGS
TB501-10	13.4 VOLTS DC
TB3-5	13.4 VOLTS DC
TB501-12	10 VOLTS REG. DC
TB501-1 TB501-2	117 VOLTS AC
J1 & J2	10 VOLTS REG. DC

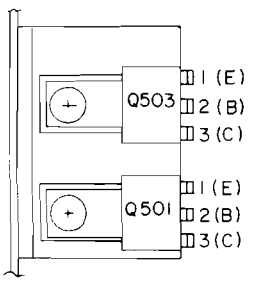




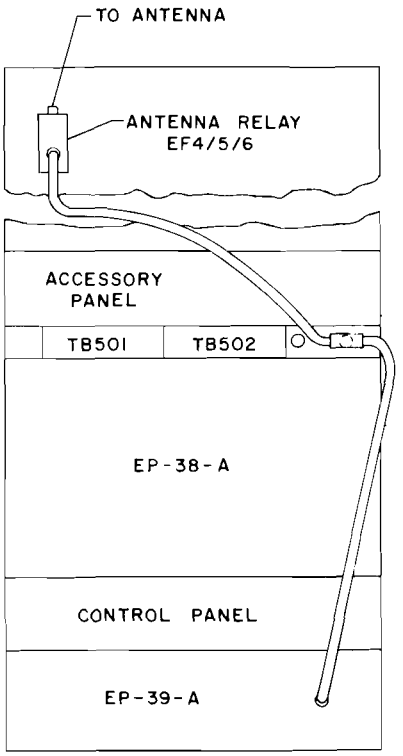
P443



W AT "B"

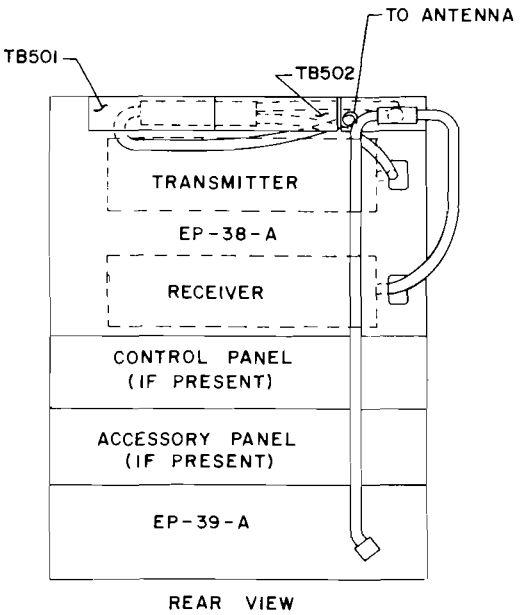


VIEW AT "A"



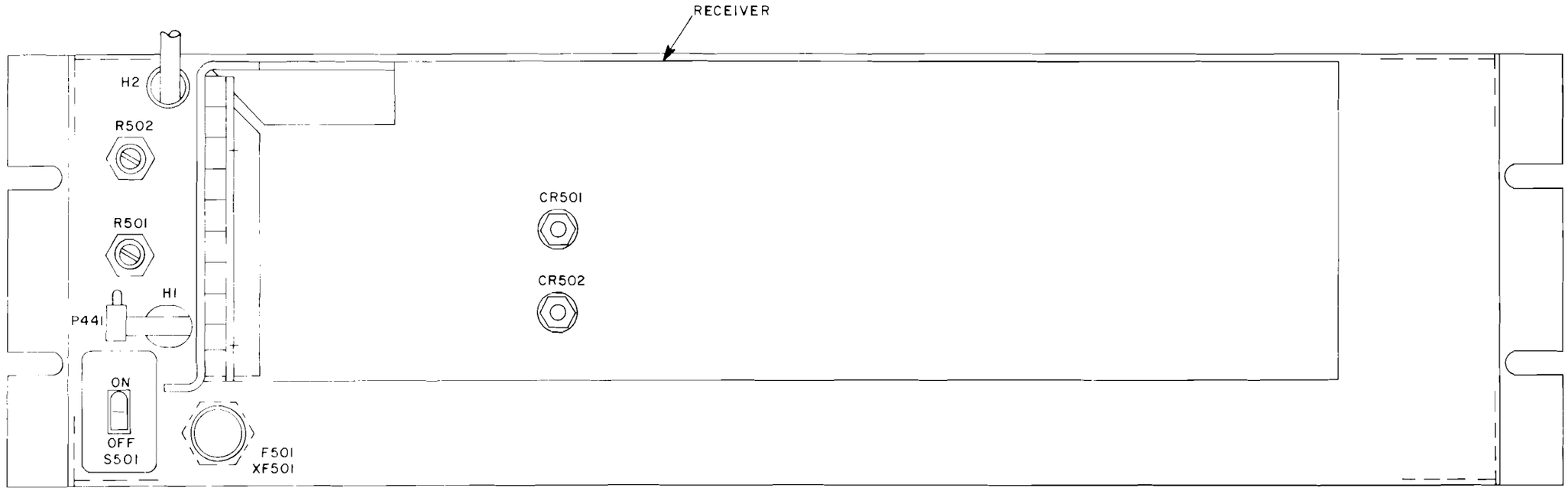
REAR VIEW

ANTENNA WIRING HIGH POWER

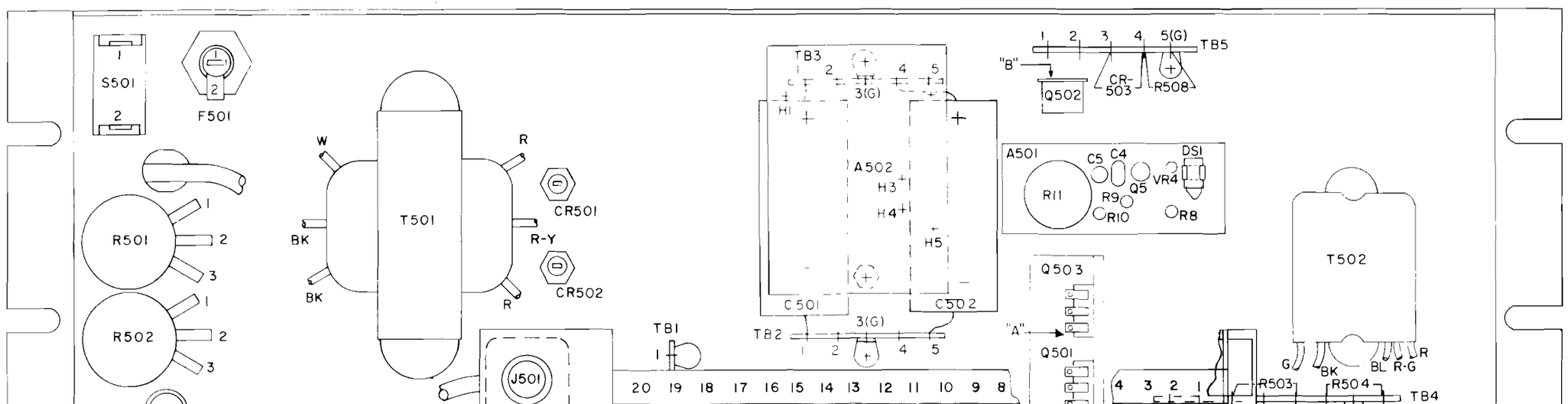


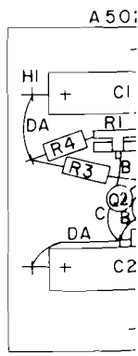
REAR VIEW

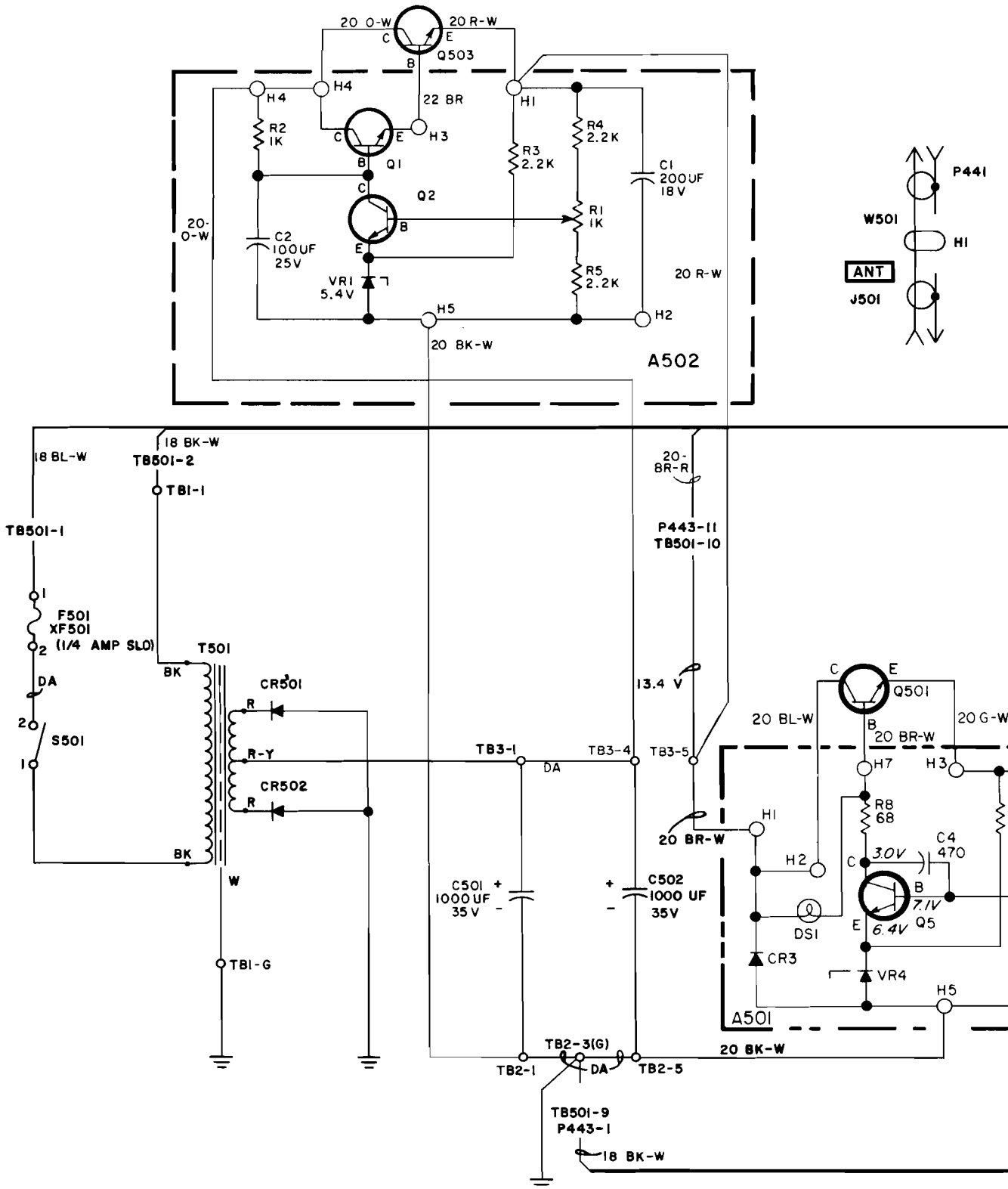
ANTENNA WIRING MEDIUM POWER


RECEIVER
H2
R502
R501
P441
H1
ON
OFF
S501
F501
XF501
CR501
CR502

FRONT VIEW


S501
F501
R501
R502
T501
W
BK
R
R-Y
CR501
CR502
J501
TB1
TB2
TB3
3(G)
A502
H3
H4
H5
C501
C502
TB5
"B"
Q502
CR-503
R508
A501
R11
C5
C4
DSI
VR4
Q5
R9
R10
R8
Q503
"A"
Q501
T502
R503
R504
TB4
G
BK
BL
R-G
R


HI
DA
R4
R3
C2



ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

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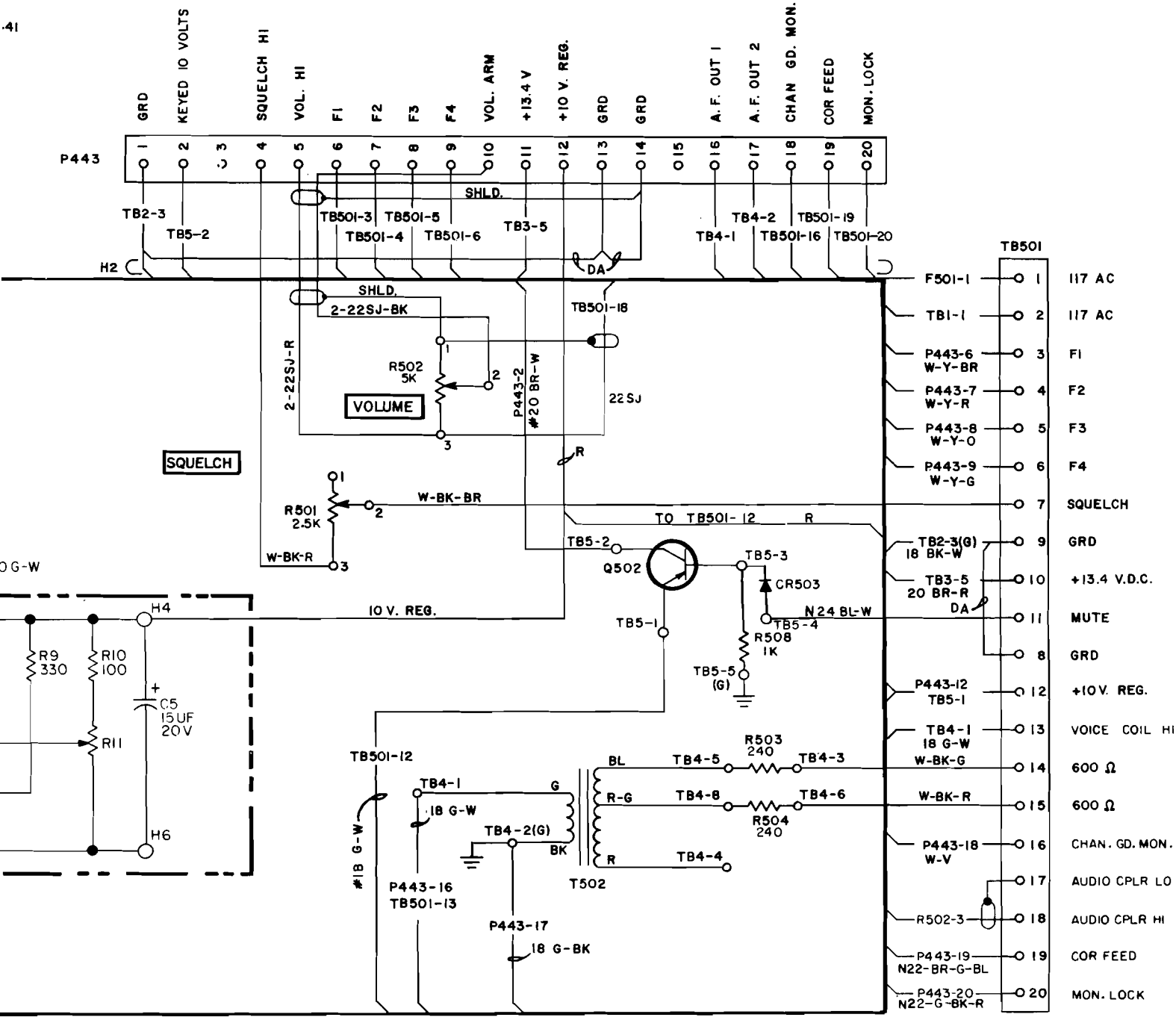

BLE PRODUCTION CHANGE INSTRUCTION BOOK SECTION TH THIS UNIT, FOR DES- F CHANGES UNDER EACH TTER.
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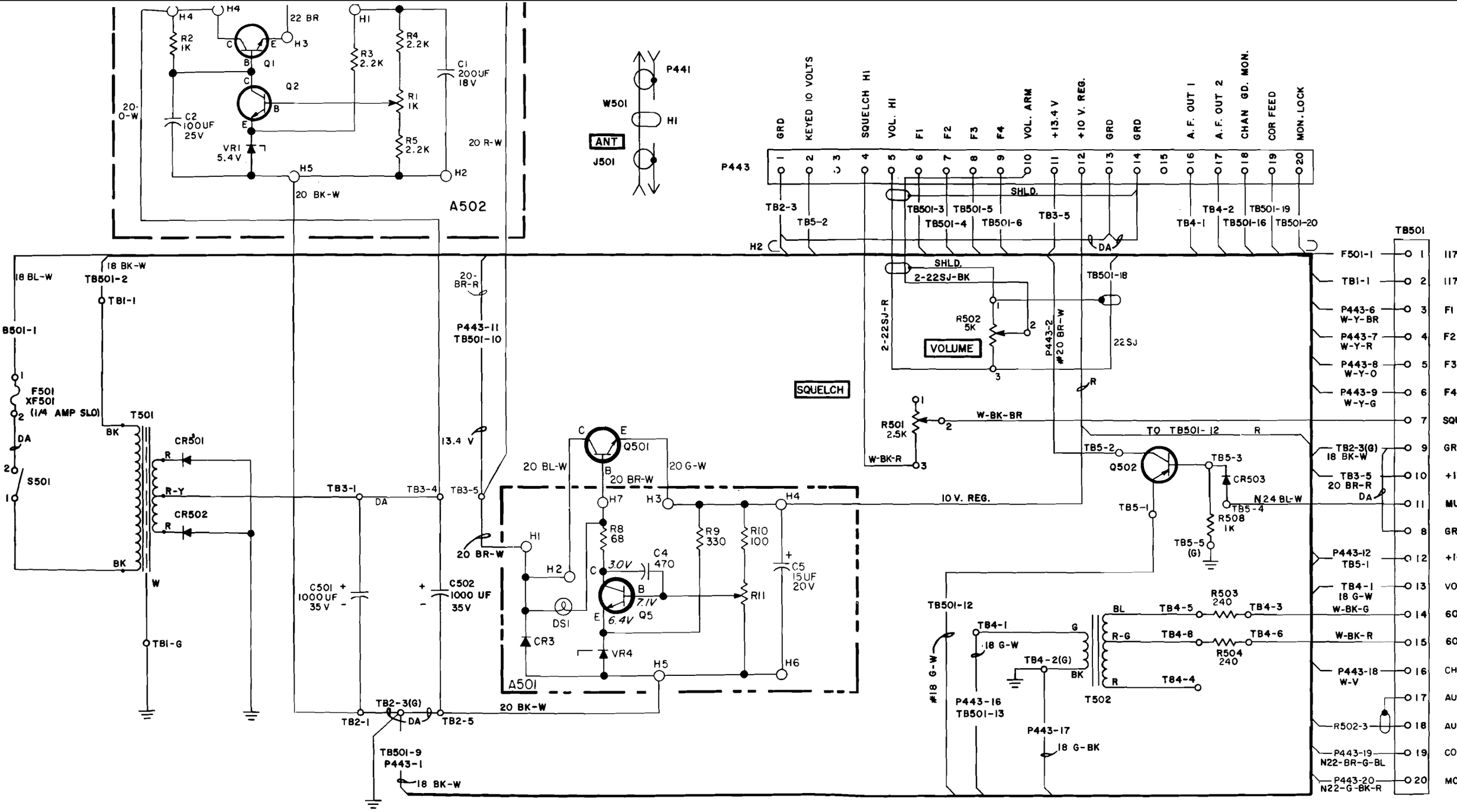
REV LETTER K

NOTE:
ALL WIRES SF24 UNLESS OTHERWISE SPECIFIED.

(19D402347, Rev. 23)

SCHEMATIC DIAGRAM

BASE STATION RECEIVER POWER SUPPLY
MODEL 4EP39A10



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SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH

NOTE:

ALL WIRES SF24 UNLESS OTHERWISE SPECIFIED.

DESCRIPTION

Receiver cable assembly, RF coaxial: includes panel receptacle (J504), 350 VRMS max, approx 27 inches long.

Transmitter cable, RF: 1900 VRMS max, approx 12 inches long; sim to Amphenol 421-055. (Used with P103).

Receptacle, panel, coaxial: mica-filled insert, UHF contact. Signal Corps SO-239; sim to Amphenol 83-1R.

Hood, UHF connector: used with RG-58A/U cables; sim to Amphenol 83-765. (Used with J503 and J504).

Connector: phono type plug.

FREQUENCY MONITORING KIT

19A121629-G7 (1-FREQUENCY TRANSMITTER)
19A121629-G8 (2-FREQUENCY TRANSMITTER)

- - - - - - - - - - RESISTORS - - - - - - - - -

Composition: 18 ohms ±10%, 1/2 w. (Used in 19A121629-G7).

Wirewound, ceramic: 3.5 ohms ±5%, 5 w; sim to Tru-Ohm Type X-60. (Used in 19A121629-G7).

Composition: 18 ohms ±10%, 1/2 w. (Used in 19A121629-G8).

Wirewound, ceramic: 5 ohms ±5%, 5 w; sim to Tru-Ohm Type X-60. (Used in 19A121629-G8).

- - - - - - - - - - SWITCHES - - - - - - - - -

Rotary: 2 poles, 3 positions, non-shorting contacts, 2 amps at 25 VDC or 1 amp at 110 VAC; sim to Oak Type "A" or Centralab Series 100. (Used in 19A121629-G7).

Rotary: 2 sections, 4 poles, 3 positions, non-shorting contacts, 2 amps at 25 VDC or 1 amp at 110 VAC; sim to Oak Type "A" or Centralab Series 100. (Used in 19A121629-G8).

- - - - - - - - - MISCELLANEOUS - - - - - - - -

Nameplate: etched aluminum.

STATION ANTENNA CABLE
LOW AND MED POWER

Cable, RF: approx 19 inches (Complete with connectors).

Cable, RF: approx 40 inches (Complete with connectors).

T-Connector.

STATION ANTENNA CABLE
HIGH POWER

Cable, RF: approx 40 inches (Complete with connectors).

T-Connector.

MECHANICAL PARTS

(SEE RC-1132)

Hinged support. (Used with Receiver).

Support. (Swivel latch for Receiver).

Not Used.

Chassis.

Stud.

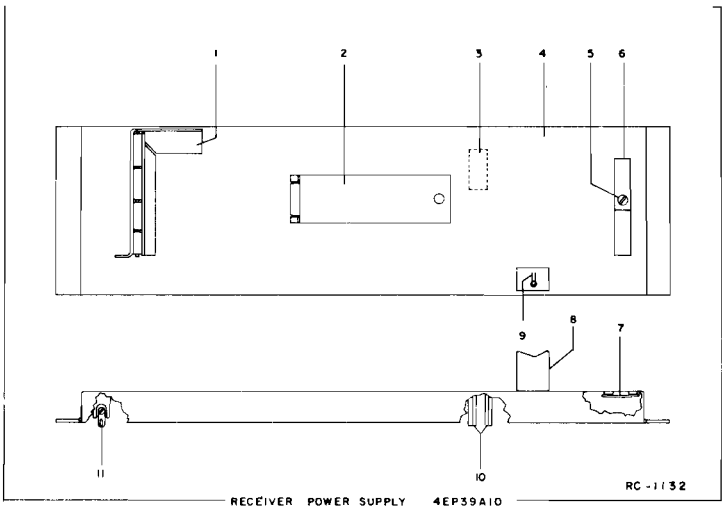
Support. (Used with Receiver).

Not Used.

Not Used.

Hex spacer: No. 4-40. (Used with A501).

Lug terminal. (Used with S501).



RECEIVER POWER SUPPLY 4EP39A10

MBOL	G-E PART NO	DESCRIPTION
*		13.4 VOLT REGULATOR ASSEMBLY 19B216188-G1 Added by Rev H
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
1	19A115680-P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TT.
2	19A115680-P5	Electrolytic: 100 µf +150% -10%, 25 VDCW; sim to Mallory Type TT.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
1	19A115300-P3	Silicon, NPN; sim to Type 2N3053.
2	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
1	19B209358-P103	Variable, carbon film: approx 25 to 1000 ohms ±20%, 0.2 w; sim to CTS Type X-201.
2	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w.
3 thru 5	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
		- - - - - - - - - - VOLTAGE REGULATORS - - - - - - - -
R1	4037887-P5	Silicon, Zener.
		- - - - - - - - - - CAPACITORS - - - - - - - -
	5493132-P1	Tubular: 1000 µf +250% -15%, 35 VDCW; sim to G-E 43F2066AA1.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
1	4037898-P2	Silicon.
2		
3*	19A115250-P1	Silicon. Added by Rev F.
		- - - - - - - - - - FUSES - - - - - - - - - -
	7487942-P1	Cartridge, slow blowing: 1/4 amp at 250 v; sim to Bussman MDL-1/4.
	1R16-P13	In Models of Rev A and earlier: Cartridge, quick blowing: 1/4 amp at 250 v; sim to Littelfuse 312.250 or Bussmann AGC-1/4.
		- - - - - - - - - - RELAYS - - - - - - - - - -
	5491595-P12	Armature: 1.5 w max operating, 520 ohms ±15% coil res, 2 form C contacts rated at 1 amp at 12 VDC; sim to Allied Control T154-186. Deleted by Rev F.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
	19B209146-P1	Reactor: 100 mh ind min at 0.85 amp DC, 25 ohms DC res max, 120 v peak, 14 VDC operating. Deleted by Rev H.
		- - - - - - - - - - PLUGS - - - - - - - - - -
		(Part of W501).
	19C303506-P1	Connector, phen: 20 contacts rated at 5 amps max at 600 VDC.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
	19A115948-P1	Silicon, NPN.
	19A115527-P1	In Models of Rev G and earlier: Germanium, PNP.
	19A115267-P1	In Models of Rev B and earlier: Germanium, PNP.
	19A115768-P1	Silicon, PNP. Added by Rev F.
	19A115948-P1	Silicon, NPN. Added by Rev H.
		- - - - - - - - - RESISTORS - - - - - - - - -
	2R75-P10	Potentiometer: 2500 ohms ±20%, 1/2 w; sim to CTS Series 45.

SYMBOL	G-E PART NO	DESCRIPTION
R502	2R76-P12	Potentiometer: 5000 ohms ±20%, 3/8 w; sim to CTS Series 45.
R503* and R504*	3R77-P241J	Composition: 240 ohms ±5%, 1/2 w.
	3R77-P101K	In Models of REV J and earlier: Composition: 100 ohms ±10%, 1/2 w.
	3R77-P241K	In Models of Rev A and earlier: Composition: 240 ohms ±10%, 1/2 w.
R505*	7141971-G1	Resistor Kit. Includes wirewound, 3.5 ohms ±10%, 4 w resistor with 2 spade tongue terminals. Deleted by Rev D.
R506* and R507*	5493035-P13	Wirewound: 100 ohms ±5%; sim to Tru-Ohm Type X-60. Added by Rev E. Deleted by Rev H.
R508*	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w. Added by Rev F.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S501	7144140-P1	Toggle: SPST, 10 amps at 250 v or 15 amps at 115 v; sim to Hart 164.
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T501	19B209074-P1	Power, step-down: single phase, Pri: 117 v, 50/60 hertz, Sec 1: 850 ma at 13.8 VDC.
T502	7487236-P1	Audio frequency: Pri: 3.5 ohms imp, Sec 1: 600 ohms ±10% imp, Sec 2: 100 ohms ±10% imp.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500-P46	Phen: 1 terminal.
TB2 and TB3	7775500-P11	Phen: 5 terminals.
TB4	7775500-P24	Phen: 8 terminals.
TB5*	7775500-P55	Phen: 5 terminals.
	7775500-P11	In Models of Rev E and earlier: Phen: 5 terminals. Added by Rev F.
TB501	19C301086-P12	Feed-thru, phen: 20 terminals; sim to GE CR151D.
		- - - - - - - - - - CABLES - - - - - - - - - -
W501		CABLE ASSEMBLY 7146725-G4
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J501	2R22-P3	Receptacle, panel: coaxial, UHF small single contact, mica-filled insert. Signal Corps SO-239 or sim to Amphenol 83-1R.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	7488600-P135	Cable assembly, coaxial: includes phono type plug (P441), 350 VRMS max, approx 17-1/2 inches long.
	4029082-P1	Hood, UHF connector: used with RG-58/U cables; sim to Amphenol 83-765.
	7489477-P8	Ring, grounding: orange; sim to Burndy YOC150.
	5490407-P2	Grommet.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XF501	7115179-P1	Fuseholder: 15 amps at 250 v; sim to Bussman Type HKP.
XK501*	5491595-P4	Relay: 10 contacts; sim to Allied Control 30054-1. Deleted by Rev F.
XQ501*	5491888-P1	Transistor, power, phen: sim to Cinch 133-92-10-034. Deleted by Rev C.
		SECOND RECEIVER ANTENNA RELAY KIT 19A121260-G2
K504	19B204628-G2	Relay assembly. Includes:
	19C307103-P1	Relay, armature, coaxial: 12 VDC nominal, 2 w max operating, 100 ohms ±15%, coil res, 1 form C contact rated at 100 w RF at 470 MHz; sim to FXR 300-10977.
	19B209044-P16	Antenna cable, RF: 1900 VRMS max, approx 10 inches long; sim to Amphenol 421-055. (Used with J503).

SYMBOL	G-E
	5491
	19B2
J503 and J504	2R22
	4029
P103	7104
R1	3R77-
R2	5493
R3	3R77-
R4	5493
S7	5495
S8	5495
	NP243
	7474
	7474
	2R22-
	7474
	2R22-
1	19B20
2	19A12
3	19B20
4	19B20
5	5490
6	19A12
7	5491
8	5491
9	7142
10	7878

PARTS LIST

LBI-3553D

RECEIVER POWER SUPPLY
MODEL 4EP39A10

SYMBOL	G-E PART NO.	DESCRIPTION
A501*		10-VOLT REGULATOR 19C303420-G6
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C4	7774750-P1	Ceramic disc: .00047 µf +100% -0%, 500 VDCW.
C5	5496267-P14	Tantalum: 15 µf ±20%, 20 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR2 *	19A115250-P1	Silicon. Deleted by REV J.
CR3 *	4037822-P1	Silicon. Added by REV J.
		- - - - - - - - - INDICATING DEVICES - - - - - - -
DS1	4034664-P1	Lamp.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q5	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R8*	3R77-P680K	Composition: 68 ohms ±10%, 1/2 w.
	3R77-P161J	In Models of Rev F and earlier: Composition: 160 ohms ±5%, 1/2 w.
R9	3R77-P331J	Composition: 330 ohms ±5%, 1/2 w.
R10	3R77-P101J	Composition: 100 ohms ±5%, 1/2 w.
R11	19A115681-P1	Potentiometer: 1000 ohms ±20%, 3 w.
		- - - - - - - - - VOLTAGE REGULATORS - - - - - - -
VR4	4036887-P6	Silicon, Zener.
		In Models of Rev B and earlier:
A501*		REGULATOR BOARD ASSEMBLY 19C303420-G3
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW: sim to Sprague Type 150D.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	4037265-P2	Jack, tip: stake-in, red molded melamine; sim to Component Mfg Service A-1128.
J2	4037265-P1	Jack, tip: stake-in, black molded phen; sim to Component Mfg Service A-1128.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	4037993-P1	Germanium, PNP; sim to Type 2N1303.
Q2	19C300073-P2	Germanium, PNP; sim to Type 2N1414.
Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R77-P680J	Composition: 68 ohms ±5%, 1/2 w.
R3	3R77-P242J	Composition: 2400 ohms ±5%, 1/2 w.
R4	3R77-P331J	Composition: 330 ohms ±5%, 1/2 w.
R5	3R77-P681J	Composition: 680 ohms ±5%, 1/2 w.
R6	19B209113-P1	Potentiometer: 250 ohms ±20%, 2.5 w.
		- - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1	4036887-P9	Silicon, Zener.

SYMBOL	G-E PART NO	DESCRIPTION
A502*		13.4 VOLT REGULATOR ASSEMBLY 19B216188-G1 Added by Rev H
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A115680-P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TT.
C2	19A115680-P5	Electrolytic: 100 µf +150% -10%, 25 VDCW; sim to Mallory Type TT.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115300-P3	Silicon, NPN; sim to Type 2N3053.
Q2	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19B209358-P103	Variable, carbon film: approx 25 to 1000 ohms ±20%, 0.2 w; sim to CTS Type X-201.
R2	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w.
R3 thru R5	3R77-P222J	Composition: 2200 ohms ±5%, 1/2 w.
		- - - - - - - - - VOLTAGE REGULATORS - - - - - - -
VR1	4037887-P5	Silicon, Zener.
		- - - - - - - - - - CAPACITORS - - - - - - - -
C501 and C502	5493132-P1	Tubular: 1000 µf +250% -15%, 35 VDCW; sim to G-E 43F2066AA1.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR501 and CR502	4037898-P2	Silicon.
CR503*	19A115250-P1	Silicon. Added by Rev F.
		- - - - - - - - - - FUSES - - - - - - - - - -
F501*	7487942-P1	Cartridge, slow blowing: 1/4 amp at 250 v; sim to Bussman MDL-1/4.
	1R16-P13	In Models of Rev A and earlier: Cartridge, quick blowing: 1/4 amp at 250 v; sim to Littelfuse 312.250 or Bussmann AGC-1/4.
		- - - - - - - - - - RELAYS - - - - - - - - -
K501*	5491595-P12	Armature: 1.5 w max operating, 520 ohms ±15% coil res, 2 form C contacts rated at 1 amp at 12 VDC; sim to Allied Control T154-186. Deleted by Rev F.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L501*	19B209146-P1	Reactor: 100 mh ind min at 0.85 amp DC, 25 ohms DC res max, 120 v peak, 14 VDC operating. Deleted by Rev H.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P441		(Part of W501).
P443	19C303506-P1	Connector, phen: 20 contacts rated at 5 amps max at 600 VDC.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q501*	19A115948-P1	Silicon, NPN.
	19A115527-P1	In Models of Rev G and earlier: Germanium, PNP.
	19A115267-P1	In Models of Rev B and earlier: Germanium, PNP.
Q502*	19A115768-P1	Silicon, PNP. Added by Rev F.
Q503*	19A115948-P1	Silicon, NPN. Added by Rev H.
		- - - - - - - - - RESISTORS - - - - - - - - -
R501	2R75-P10	Potentiometer: 2500 ohms ±20%, 1/2 w; sim to CTS Series 45.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and GE Part Number.

Service parts may be obtained from Authorized GE Communication Equipment Service Stations or through any GE Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. GE Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

MAINTENANCE MANUAL

LBI-3567

DF-0061

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PRINTED IN U.S.A.