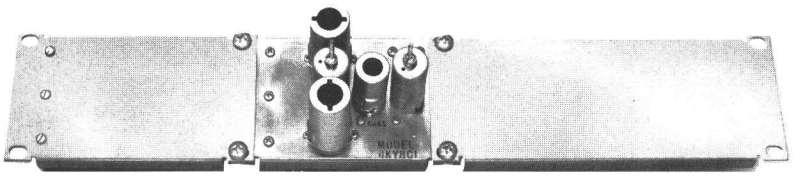
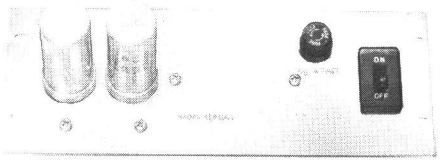
MOBILE RADIO

MASTR Progress Line

ANTENNA MATCHING UNITS-MODELS 4KY8A2&3 with POWER SUPPLY MODEL 4EP41A10



ANTENNA MATCHING UNIT



POWER SUPPLY

SPECIFICATIONS *

ANTENNA MATCHING UNITS 4KY8A2 and 4KY8A3

Dimensions	3-1/2" x 7" x 17-3/8" (19" rack mounting)
Frequency Ranges	Model 4KY8A2: 30-40 Megahertz Model 4KY8A3: 40-50 Megahertz
Input Power	0.75 amps at 6.3 volts AC; 20 mA at 200 volts DC
Isolation Accomplished Between Receivers	Better than 27 dB
Tube Complement	
RF Amplifier	6BH6
First and Second Cathode Follower	12AU7
Third Cathode Follower	12AU7

POWER SUPPLY 4EP41A10

Dimensions	Occupies 8" x 3-1/4" of an Option Panel (19" x 3-1/2")
Input	.08 amps @ 117 VAC ±20%, 50/60 Hz
Output	200 VDC 6.3 VAC
Duty Cycle	Continuous
Ambient Temperature Range	-30°C to +60°C (-22°F to +140°F)

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

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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 Antenna Matching Unit Models 4KY8A2 (30-40 MHZ) and 4KY8A3 (40-50 MHZ) with Power Supply Model 4EP41A10 are designed to provide the gain necessary to match two or three receivers to a single antenna when frequency separation requirements are 1.0 megahertz or less. The Antenna Matching Unit may be operated with any receiver having an input impedance of approximately 50 ohms. No DC path through the antenna input terminal of the receiver is required. The Power Supply is designed to provide the 200 VDC B-plus and the 6.3 VAC filament voltage for the antenna matching unit. The power supply is mounted on the Meter Switching Panel with all connections made to the power supply terminal board TB901. The antenna matching unit chassis is designed for standard rack mounting.

ANTENNA MATCHING UNITS

The unit consists of a highly-selective, dual-tuned pre-selector circuit with individual cathode follower outputs to properly match the receiver inputs. The bank pass of the preselector is ±0.5 megahertz. For frequencies separated as much as 1.0 megahertz, it is recommended that the matching unit be tuned to the mid-frequency.

The matching unit chassis is designed for standard rack mounting. Standard UHF connectors are provided for antenna concections. Filament and B-plus connections are terminated at an easily accessible terminal board. Standard 50 ohm cable to proper length can be used for connecting the associated receivers.

The antenna cable connects to J671 on the antenna matching unit. The first receiver antenna receptacle is connected to output connector, J672, with a short RF cable. The length of this cable is not critical, as long as the input impedance is approximately 50 ohms. When a second receiver is used, the antenna receptacle of the second receiver is connected to the output connector J673. A third receiver (if used) is connected to output connector J674. All terminal connections are made to TB671.

Adjustment

The only adjustment required is that of tuning C671, C674 and C679. Proceed as follows:

1. Meter the second IF of one of the associated receivers, using the GE test set 4EX3A10 or a 20,000 ohm-per-volt multimeter.
2. Connect a signal generator to the input of the matching unit (J671) and tune the generator to discriminator zero of the receiver. A strong signal may be required, since C671, C674 and C679 tune highly selective circuits.
3. Tune C671, C674 and C679 for maximum first-limiter current. Keep the signal level low enough so that the limiter does not saturate.

If the frequency separation does not exceed 250 kilohertz, no additional adjustments are required. However, if a frequency separation of greater than 250 kilohertz between receivers, it may be necessary to make a compromise setting of C671 and C674, between the two receiver frequencies. This may be done as follows.

1. Connect a vacuum tube voltmeter to the plate of V671 (XV671-5) through a 5-mmFd capacitor.
2. With the signal generator connected as in step 2 above, adjust the generator frequency to a point midway between the two receiver frequencies. Turn up the signal generator output until a reading is obtained on the voltmeter.
3. Adjust C671 and C674 for maximum reading on the voltmeter.

If no vacuum tube voltmeter is available, the compromise setting may be made by noting the sensitivity of each receiver through the matching unit. Then adjust C671 and C674 to equalize the sensitivity readings of the two receivers. That is, using the receiver of the poorer sensitivity, adjust C671 and C674 to improve the sensitivity. Recheck the relative sensitivities and repeat the adjustments until the sensitivities are equalized.

POWER SUPPLY

When the power supply ON-OFF switch S501 is turned ON, 117 volts AC, 50/60 Hz from TB901-1 and 2 is applies across the primary (black leads) of power transformer T501. Fuse F501 in the primary circuit of T501 protects the power supply from overload.

The power transformer secondary includes a 200-volt AC winding for the B-plus and a 6.3-volt AC winding for the Antenna Matching Unit filament voltage.

The 200-volt B-plus supply for the Antenna Matching Unit is derived from a full-wave center-tap winding on T501. The AC output from T501 is rectified by a full-

wave rectifier circuit consisting of silicon rectifiers CR501, CR502, CR503 and CR504. The rectified output is filtered through the R/C filter circuit of R502, V501, R503, and two μf sections of C502. R504 is a bleeder resistor and is connected across the B-plus output to ground. The 200-volt DC output from the power supply is connected to TB901-3. The 6.3 VAC for the filaments in the Antenna Matching Unit is supplied by the 6.3 VAC winding of T501. The green leads connect the T501 6.3 VAC winding to TB901-4 and -5. R501 must be jumpered when the Antenna Matching Unit KY-8-A is used.

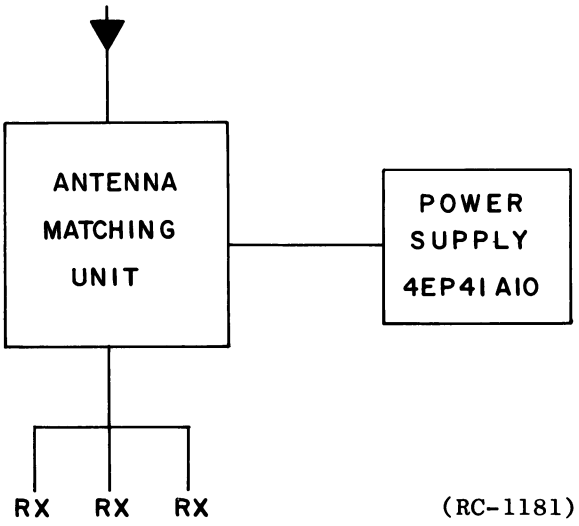


Figure 1 - Block Diagram

Refer to Schematic Diagram for circuitry and Outline Diagram for location of components.

MAINTENANCE

Power Supply Troubleshooting Hints

- No B+ at TB901-3 or 6.3 VAC at TB901-5, check for:
  - A. 117 VAC at TB901-1-2.
  - B. Open fuse F501.
  - C. Defective switch S501.
  - D. Shorted capacitors C501 or C502 (2 parts).
- No 6.3 VAC at TB901-5, check for:
  - A. 6.3 VAC at TB1-1.
  - B. 6.3 VAC at TB1-4.
- No B+ at TB901-5, check for:
  - A. B+ at TB1-5.
  - B. Shorted capacitors C501 and C502.
  - C. Defective silicon rectifiers.

PARTS LIST

EBI-4500F

ANTENNA MATCHING UNIT
MODELS 4KY8A2 AND 3, REV B

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C671	7139837-P1	Variable, ceramic: 4.75 to 45 pf, temp coef -500 PPM, 500 VDCW. Included in T672 and T673.
C672	7770468-P45	Ceramic: 18 pf ±5%, 500 VDCW. Included in T672.
C673	7130348-P3	Phen: 1.0 pf ±0.05 pf, 500 VDCW; sim to Jeffers JM 5/32. Included in T672.
C674	7139837-P1	Variable, ceramic: 4.75 to 45 pf, temp coef -500 PPM, 500 VDCW. Included in T672 and T673.
C675	7770468-P45	Ceramic: 18 pf ±5%, 500 VDCW. Included in T672.
C676	3R122-P18	Silver mica: 100 pf ±10%, 500 VDCW; sim to Electro motive Type CM-15.
C677 and C678	7774750-P13	Ceramic, disc: 0.01 µf +100% -0%, 500 VDCW.
C679	7484389-P7	Variable, ceramic: 4.75 to 45 pf, 500 VDCW.
C680	7476441-P6	Ceramic: 3.3 pf ±0.25 pf, 500 VDCW; sim to Erie Type NPOK.
C681 and C682	7774750-P13	Ceramic, disc: 0.01 µf +100% -0%, 500 VDCW.
C683	3R122-P14	Silver mica: 47 pf ±10%, 500 VDCW; sim to Electro Motive Type CM-15.
C684	7774750-P13	Ceramic, disc: 0.01 µf +100% -0%, 500 VDCW.
C685	3R122-P14	Silver mica: 47 pf ±10%, 500 VDCW; sim to Electro Motive CM-15.
C686	7774750-P13	Ceramic, disc: 0.01 µf +100% -0%, 500 VDCW.
C687	3R122-P14	Silver mica: 47 pf ±10%, 500 VDCW; sim to Electro Motive Type CM-15.
C688	7774750-P13	Ceramic, disc: 0.01 µf +100% -0%, 500 VDCW.
C689	7770468-P249	Ceramic: 27 pf ±5%, 500 VDCW, temp coef -80 PPM. Included in T673.
C690	7130348-P3	Phen: 1.0 pf ±0.05 pf, 500 VDCW; sim to Jeffers JM 5/32. Included in T673.
C691	7770468-P147	Ceramic: 22 pf ±5%, 500 VDCW, temp coef -0 PPM. Included in T673.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J671 thru J674	2R22-P3	Receptacle, chassis: sim to Amphenol 83-1R. Signal Corps SO-239.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L672	7136600-P2	RF Amplifier plate coil. (30-40 MHz).
L673	7136600-P1	RF Amplifier plate coil. (40-50 MHz).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R671	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R672	3R77-P331K	Composition: 330 ohms ±10%, 1/2 w.
R673	473K	Composition: 47,000 ohms ±10%, 1/2 w.
R674	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R675	3R77-P222K	Composition: 2200 ohms ±10%, 1/2 w.
R676	3R77-P121K	Composition: 120 ohms ±10%, 1/2 w.
R677	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R678 and R679	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R680	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R681 and R682	3R77-P121K	Composition: 120 ohms ±10%, 1/2 w.
R683	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R684	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R685* thru R687*	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w. Added by Rev A.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T672	7772711-G2	Antenna transformer. (30-40 MHz) Includes C671 thru C675.
T673	7772711-G3	Antenna transformer. (40-50 MHz) Includes C671, C674, C689 thu C691.
		- - - - - - - - - - TERMINAL BOARDS - - - - - - - - - -
TB1	7775500-P1	Phen: 2 terminals.
TB2	7775500-P24	Phen: 8 terminals.
TB671	19C301087-P13	Phen: 8 terminals; sim to GE CR151D.
		- - - - - - - - - - TUBES - - - - - - - - - -
V671		Type 6BH6.
V672* and V673*		Type 12AU7. Earlier than REV B: Type 12AT7.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XV671	7768887-P9	Tube socket and shield: mica filled phenolic, 7 pin miniature, top mount, flat top.
XV672 and XV673	7480532-P8	Tube socket and shield: mica filled phenolic, 9 pin miniature, 4 ground ears.
		ANTENNA CABLES MEDIUM POWER STATIONS
	7774980-G28	RF, 13 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
	7774980-G32	RF, 30 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
	7488600-P34	Cable, RF. Includes 7104941-P6 plug.
	7774980-G46	RF, 40 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
		ANTENNA CABLES HIGH POWER STATIONS
	7774980-G28	RF, 13 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
	7774980-G46	RF, 40 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
	7774980-G49	RF, 55 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.

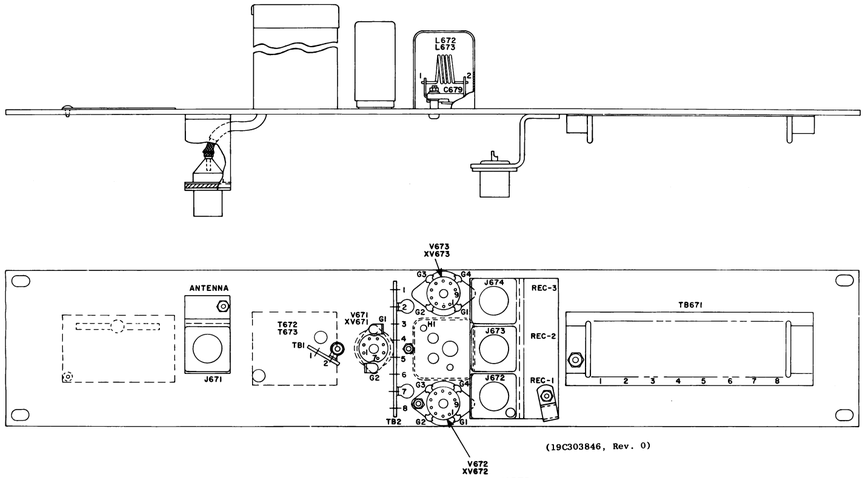
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PRODUCTION CHANGES

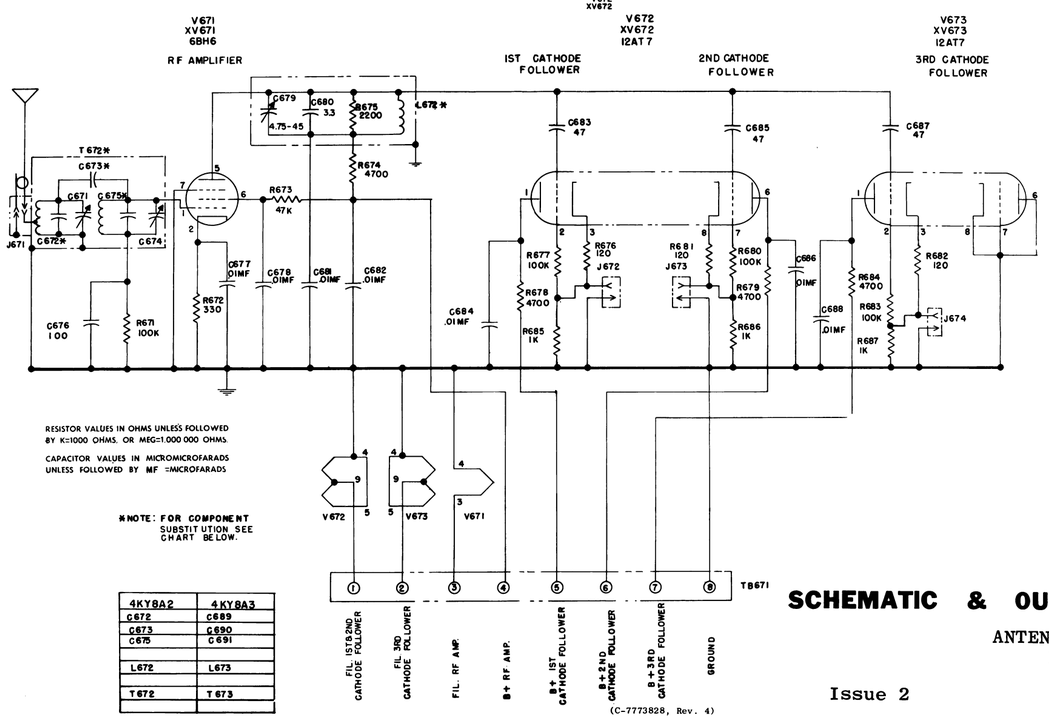
Changes in the equipment to improve performance or to simplity circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - To limit cathode-heater voltage when output load is removed. Added R685, R686 and R687.

REV. B - To improve stability. Changed V672 and V673.



(19C303846, Rev. 0)



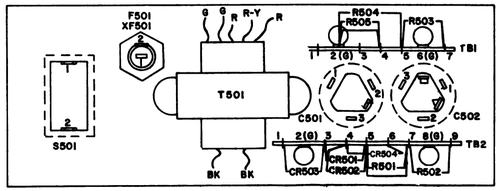
4KY8A2	4KY8A3
C672	C689
C673	C690
C675	C691
L672	L673
T672	T673

(C-7773828, Rev. 4)

SCHEMATIC & OUTLINE DIAGRAM

ANTENNA MATCHING UNITS
MODELS 4KY8A2 & 3

Issue 2

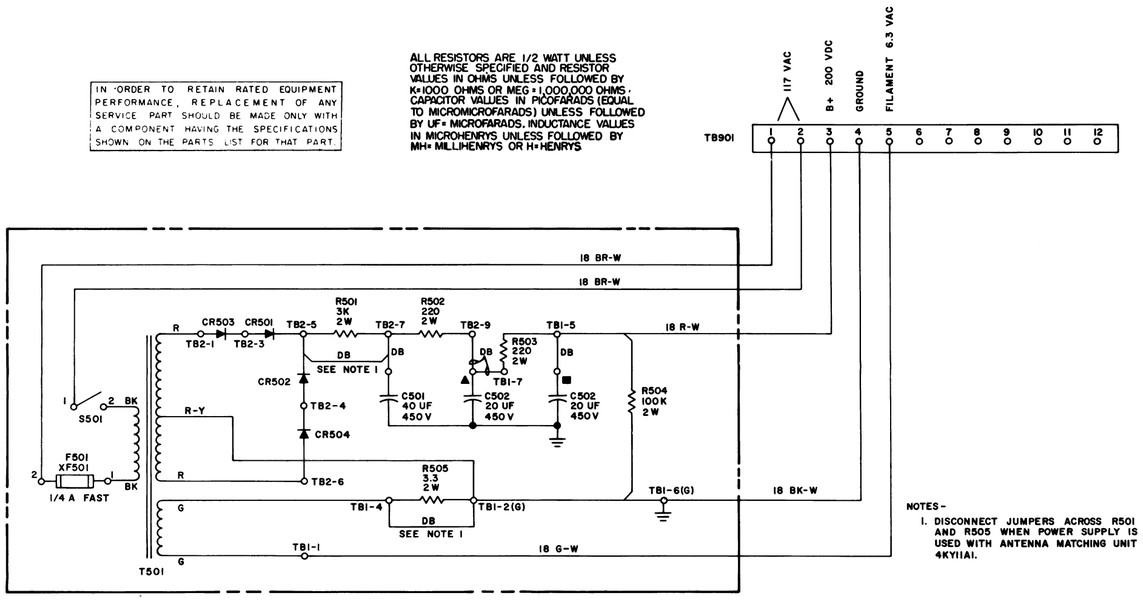


NOTE: REMOVE JUMPERS ACROSS R505 AND R501 WHEN 4KY11A IS USED.

(19B204882, Rev. 0)

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.

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



NOTES-
1. DISCONNECT JUMPERS ACROSS R501 AND R505 WHEN POWER SUPPLY IS USED WITH ANTENNA MATCHING UNIT 4KY11A1.

(19C303517, Rev. 1)

SCHEMATIC & OUTLINE DIAGRAM

ANTENNA MATCHING UNIT
POWER SUPPLY MODEL 4EP41A10

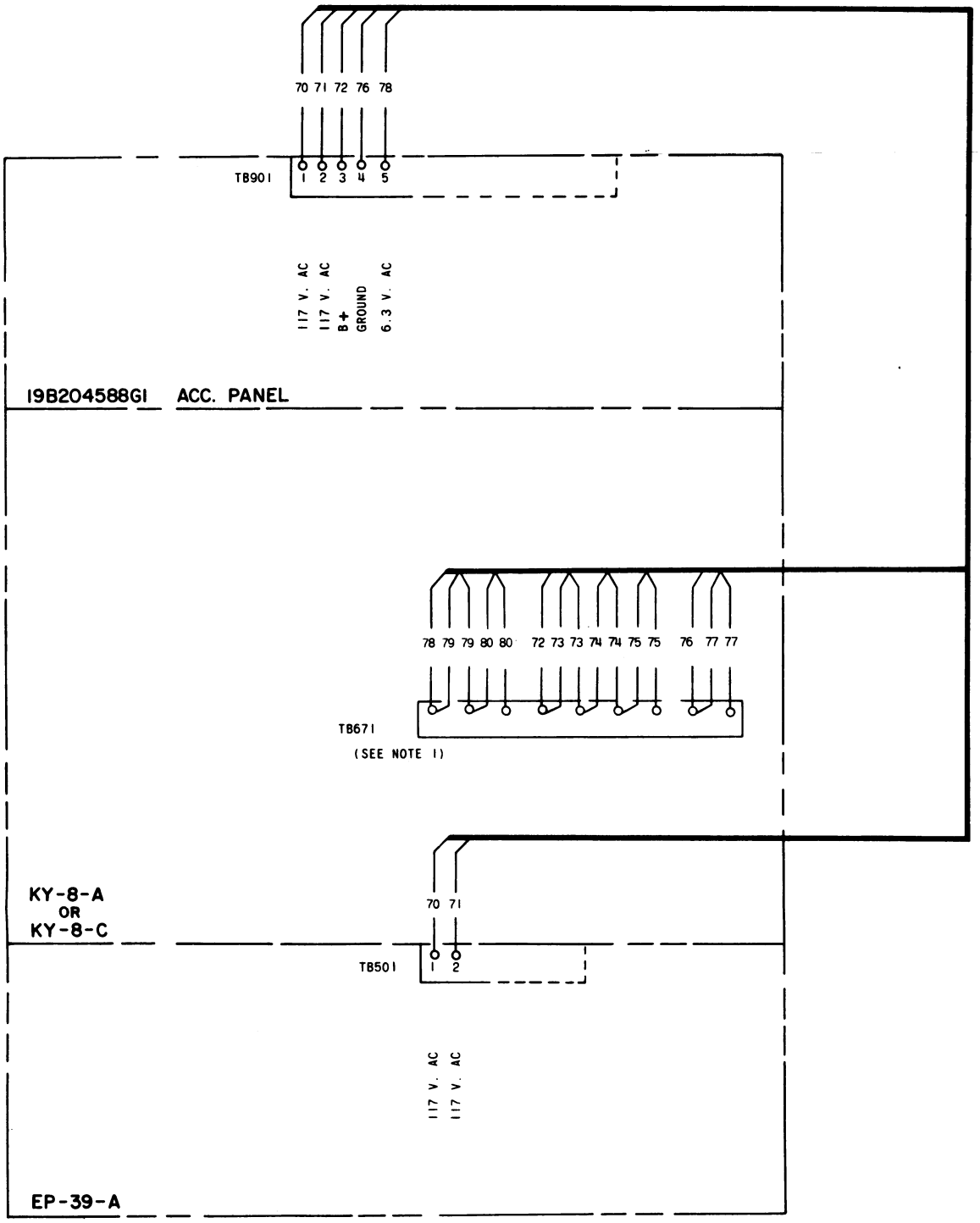
PARTS LIST

LBI-3554A

ANTENNA MATCHING POWER SUPPLY
MODEL 4EP41A10
(19B204627-G1)

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C501	7770994-P9	Tubular, twist-prong, dry electrolytic: polarized, 40 µf +50% -10%, 450 VDCW; sim to Mallory Type FP.
C502	7770994-P24	Tubular, twist-prong, dry electrolytic: polarized, 20-20 µf +50% -10%, 450-450 VDCW; sim to Mallory Type FP234.
		- - - - - - - - DIODES AND RECTIFIERS - - - - -
CR501 thru CR504	4037822-P1	Silicon.
		- - - - - - - - - - - FUSES - - - - - - - - - -
F501	1R16-P13	Cartridge, quick blowing: 1/4 amp at 250 v; sim to Littelfuse 312.250 or Bussmann AGC-1/4.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R501	3R79-P302J	Composition: 3000 ohms ±5%, 2 w.
R502 and R503	3R79-P221K	Composition: 220 ohms ±10%, 2 w.
R504	3R79-P104K	Composition: 0.1 megohm ±10%, 2 w.
R505	19B209022-P127	Wirewound, phen: 3.3 ohms ±10%, 2 w; sim to IRC Type BWH.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S501	7144140-P1	Toggle: SPST, 10 amps at 250 v or 15 amps at 115 v; sim to Hart 164.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T501	19B209168-P1	Power, step-down and step-up: single phase, Pri: 117 v, 50/60 cycles, Sec 1: 188 VRMS ±3%, 200 VDC ref, Sec 2: 6.3 VRMS.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500-P23	Phen: 7 terminals.
TB2	7775500-P25	Phen: 9 terminals.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XF501	19B209005-P1	Fuseholder, post type, phen: 15 amps at 250 v; sim to Littelfuse 342012.
		- - - - - - - - - MISCELLANEOUS - - - - - -
	19B204629-P1	Chassis.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



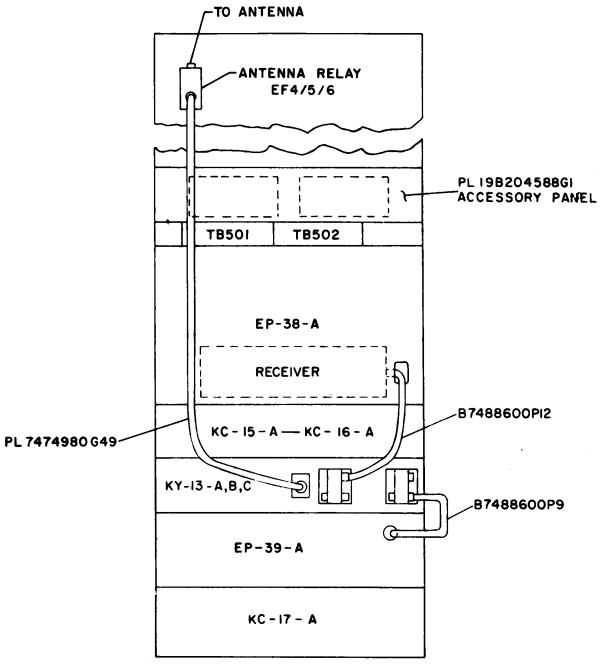
NOTE 1. WHEN KY-8-A IS USED, CONNECT WIRES 72 & 73 TO TB671-4, WIRES 73 & 74 TO TB671-5, WIRES 74 & 75 TO TB671-6, WIRE 75 TO TB671-7, WIRES 78 & 79 TO TB671-1, WIRES 79 & 80 TO TB671-2, WIRE 80 TO TB671-3, AND WIRE 76 TO TB671-8. REMOVE WIRE 77 FROM HARNESS.

WHEN KY-8-C IS USED, CONNECT WIRES 72 & 73 TO TB671-1, WIRE 73 TO TB671-2, AND REMOVE WIRES 74 & 75 FROM HARNESS; CONNECT WIRES 78 & 79 TO TB671-4, WIRE 79 TO TB671-5, AND REMOVE WIRE 80 FROM HARNESS; CONNECT WIRES 76 & 77 TO TB671-3, WIRE 77 TO TB671-6.

(19D402648, Rev. 1)

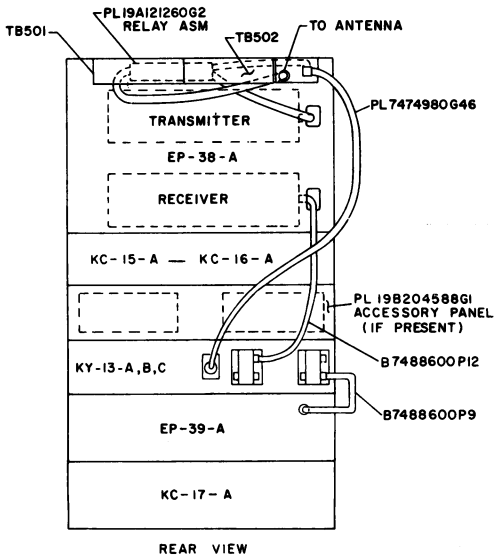
INTERCONNECTION DIAGRAM

ANTENNA MATCHING UNITS MODELS 4KY8A2, 3 & C1



REAR VIEW

SECOND RECEIVER OPTION 'HIGH POWER, WITH ANTENNA MATCHING UNIT. (LOCATE KC-17-A AS SHOWN.)



REAR VIEW

SECOND RECEIVER OPTION MED. POWER, WITH ANTENNA MATCHING UNIT. (LOCATE KC-17-A AS SHOWN.)

(19D402651, Rev. 2)

ANTENNA CONNECTIONS

ANTENNA MATCHING UNITS MODELS 4KY8A2, 3 & C1

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-3571

Progress Is Our Most Important Product

GENERAL ELECTRIC

MOBILE RADIO DEPARTMENT LYNCHBURG, VIRGINIA 24502 CABLE GECOMPROD
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