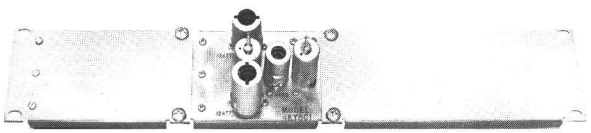
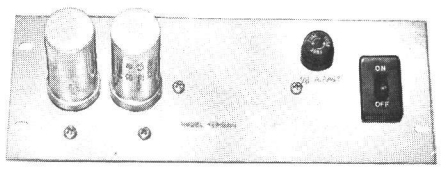
MOBILE RADIO

MASTR Progress Line

ANTENNA MATCHING UNIT MODEL 4KY8C1 with POWER SUPPLY MODEL 4EP41A10



ANTENNA MATCHING UNIT



POWER SUPPLY

SPECIFICATIONS *

ANTENNA MATCHING UNIT

Dimensions	3-1/2 inches x 19 inches (mounts to 19" panel)
Frequency Range	152-174 megahertz
Input Power	0.775 amps at 6.3 volts AC; 25 mA at 200 volts DC B+
Isolation	Sufficient to prevent interaction when receiver antenna transformers are tuned.
Ambient Temperature Range	-30°C to +60° C (-22°F to +140°F)

POWER SUPPLY

Dimensions	Occupies 8" x 3-1/4" of an Option panel (19" x 3-1/2")
Input	.08 amps @ 117 VAC ±20%, 50/60 hertz
Output	180 VDC at 15 mA. 6.3 VAC at 0.775 amps
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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ILLUSTRATION

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 Model 4KY8C1 (152—174 MHz) with Power Supply Model 4EP41A10 is designed to provide the gain necessary to match two or three receivers to a single antenna when frequency separation requirements are 5 megahertz or less. It may be employed with any receiver having an input impedance of approximately 50 ohms and adequate reserve power to supply the unit power requirements. Where required, two Antenna Matching Units can be used if more than three receivers must be operated from a single antenna.

ANTENNA MATCHING UNIT

The Antenna Matching Unit consists of a broadly tuned antenna transformer connected to a 6AK5 RF amplifier tube. The output of the RF amplifier supplies signal voltage to three 12AT7 triode sections which are used as cathode followers to supply the signal voltages to the receiver. The band pass of the RF stage employed in the Antenna Matching Unit is approximately 2.0 megahertz. For frequency separations of more than 2.0 megahertz, it is recommended that the Matching Unit be tuned to the mid-frequency.

The chassis of the Antenna Matching Unit is designed for standard rack mounting. Filament and B-plus connections are terminated at an easily accessible terminal board. Standard 50-ohm cables of 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, J674, 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 J672. All terminal connections are made to TB671. The Automatic Gain Control connected to TB671-3 must be grounded.

Adjustment

The only adjustments of the Antenna Matching Unit is peaking T671 and Z671. Proceed as follows:

1. Measure 2nd IF of one of the receivers with GE Test Set Meter Type EX-3-A or a 20,000 ohms-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.
3. Tune T671 and Z671 for maximum first-limiter current. Keep the signal level low enough so that the limiter does not saturate.

If the frequency separation between the lowest and highest receiver frequencies does not exceed 2.0 megahertz, no additional adjustments are required. For frequency separations of greater than 2.0 megahertz, however, it may be necessary to make a compromise setting of T671 and Z671. This may be done by noting the sensitivity of each receiver through the Matching Unit. Adjust T671 and Z671 to equalize the sensitivity readings of the receivers on the two extreme frequencies; that is, noting the receiver of the poorer sensitivity, adjust T671 and Z671 to improve the sensitivity. Recheck the relative sensitivities and repeat the adjustment until the sensitivities are equalized.

POWER SUPPLY

When the power supply ON-OFF switch S501 is turned ON, 117 volts AC, 50/60 hertz from TB901-1-2 is applied 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, C501, R503, and two 20-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 Antenna Matching Unit filaments is supplied by the 6.3-VAC winding of T501. The green leads connect the T501 6.3-VAC winding to TB901-4-5. R501 must be jumpered when used with the Matching Unit.

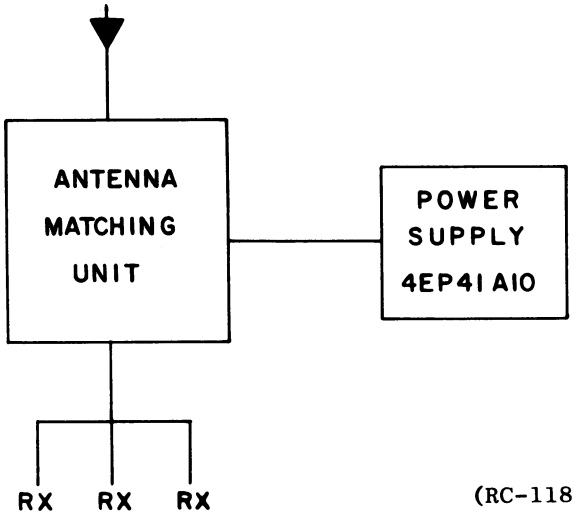


Figure 1 - Antenna Matching Unit/Power Supply Block Diagram

MAINTENANCE

POWER SUPPLY TROUBLESHOOTING HINTS

- No B+ at TB901-3 or 6.3 VAC at TB901-5:

  Check the following:

  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:

  A. For 6.3 VAC at TB1-1.
  B. For 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.

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

PARTS LIST

LBI-3632A

ANTENNA MATCHING UNIT
MODEL 4KY8C1
REV A

SYMBOL	G-E PART NO.	DESCRIPTION
		---------- TERMINAL BOARDS ----------
TB671	19C301086-P22	Feed-thru, phen: 6 terminals rated at 20 amps at 1600 VRMS; sim to GE CR151D25406AB.
		ANTENNA MATCHING PANEL 7488437-G1
		---------- CAPACITORS ----------
C671	7774750-P15	Ceramic disc: .02 µf +100% -0%, 500 VDCW.
C672	7133651-G1	Silver mica: 250 pf ±10%, 500 VDCW; sim to Underwood Type J-1-HF (modified 2 terminals).
C673 and C674	7774750-P5	Ceramic disc: .0015 µf +100% -0%, 500 VDCW.
C675	7133651-G1	Silver mica: 250 pf ±10%, 500 VDCW; sim to Underwood Type J-1-HF (modified 2 terminals).
C676 thru C678	7770468-P4	Ceramic: 4 pf ±0.5 pf, 500 VDCW, temp coef 0 PPM.
C679 thru C682	7774750-P5	Ceramic disc: .0015 µf +100% -0%, 500 VDCW.
C683 thru C685	7133474-G3	Silver mica: 250 pf ±10%, 500 VDCW; sim to Underwood Type J-1-HF (modified 2 terminals).
C686	7774750-P5	Ceramic disc: .0015 µf +100% -0%, 500 VDCW.
C697* thru C698*	7489162-P43	Silver mica: 470 pf ±5%, 300 VDCW; sim to Electro Motive Type DM-15. (Added by Rev A).
		---------- JACKS AND RECEPTACLES ----------
J671 thru J674	2R22-P3	Receptacle, panel, coaxial. Signal Corps SO-239 or sim to Amphenol 83-1R.
		---------- RESISTORS ----------
R671	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R672	3R77-P105K	Composition: 1 megohm ±10%, 1/2 w.
R673	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R674	3R77-P473K	Composition: 47,000 ohms ±10%, 1/2 w.
R675	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R676 and R677	3R77-P121K	Composition: 120 ohms ±10%, 1/2 w.
R678	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R679 and R680	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R681 and R682	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R683	3R77-P104K	Composition: 0.1 megohm ±10%, 1/2 w.
R684	3R77-P121K	Composition: 120 ohms ±10%, 1/2 w.
R685	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R686	3R77-P472K	Composition: 4700 ohms ±10%, 1/2 w.
R687	3R77-P184K	Composition: 0.18 megohm ±10%, 1/2 w.
R701* thru R703*	3R77-P510J	Composition: 51 ohms ±5%, 1/2 w. (Added by Rev A).

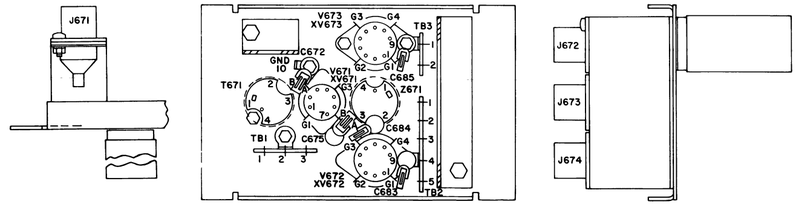
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- TRANSFORMERS ----------
T671		ANTENNA ASSEMBLY 7133210-G2
		---------- CAPACITORS ----------
C687	7770468-P12	Ceramic: 18 pf ±10%, 500 VDCW, temp coef 0 PPM.
C688	7774846-P237	Ceramic disc: 6 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C689	7770468-P234	Ceramic: 3 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		---------- INDUCTORS ----------
L671	7140936-P1	Coil.
		---------- TERMINAL BOARDS ----------
TB1	7775500-P7	Phen: 3 terminals.
TB2	7775500-P12	Phen: 5 terminals.
TB3	7775500-P1	Phen: 2 terminals.
		---------- TUBES ----------
V671		Type 6AK5.
V672 and V673		Type 12AT7.
		---------- SOCKETS ----------
XV671	7768887-P14	Tube, mica-filled phen: 7 pins rated at 1 amp at 500 VRMS; sim to Elco 04-703-24.
XV672 and XV673	7480532-P8	Tube, mica-filled phen: 9 pins rated at 1 amp at 500 VRMS; sim to Elco 04-903-84.
		---------- FILTERS ----------
Z671		RF TANK ASSEMBLY 7138047-G6
		---------- CAPACITORS ----------
C690	7774846-P240	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C691	7770468-P233	Ceramic: 2 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		---------- INDUCTORS ----------
L672	7133209-P2	Coil.
		ANTENNA CABLES MEDIUM POWER STATIONS
	7774980-G28	RF, 13 inches. Includes the following:
	2R22-P1	Plug.
	7105381-P1	Adapter.
	7774980-P32	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.
		MECHANICAL PARTS
1	7128896-P1	Tube shield base: approx 5/8 x 3/4 inches dia; sim to Cinch 1050. (Used with V671).
2	7123269-P1	Tube shield base: approx 5/8 x 1 inches dia; sim to Cinch 60M13979. (Used with V672, 673).
3	7768887-P12	Tube shield: approx 1-3/8 x 7/8 inches dia; sim to Elco 04-791-04. (Used with V671).
4	7480532-P6	Tube shield: approx 2 x 1 inches dia; sim to Elco 04-991-05. (Used with V672, 673).
5	4029082-P1	UHF connector hood: sim to Amphenol 83-765. (Used with J671).

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify 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 reduce possibility of self-oscillations. Added C697, C698, C699, R701, R702, and R703.



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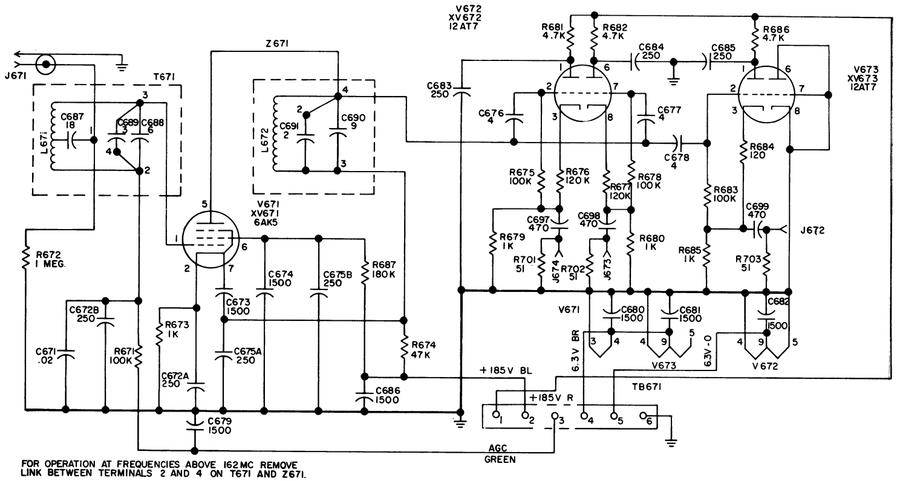
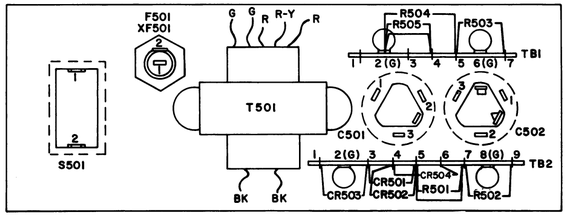


(B-7488438. Rev. 3)

SCHEMATIC & OUTLINE DIAGRAM

ANTENNA MATCHING UNIT
MODEL 4KY8C1

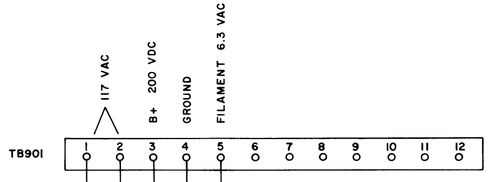


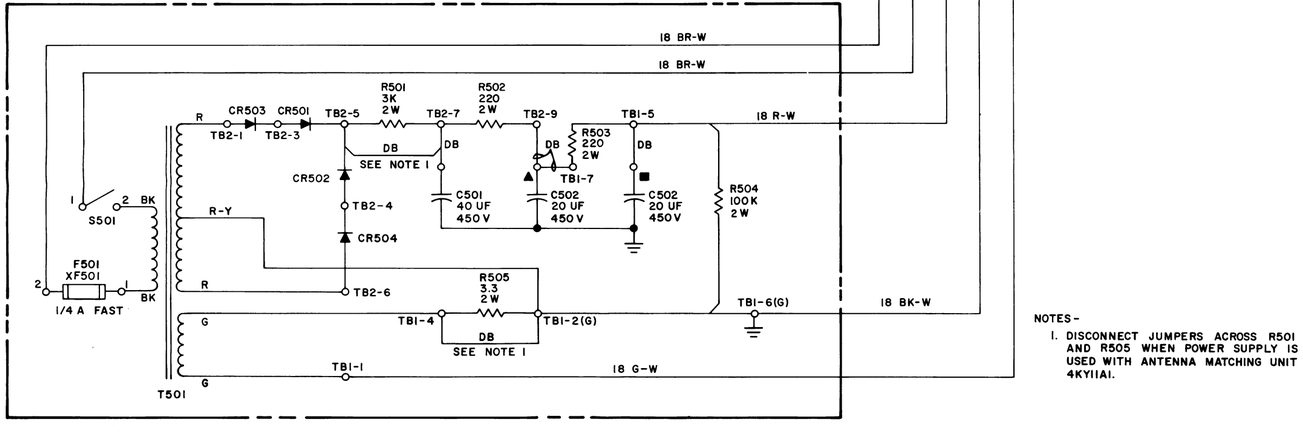
(19B204882, Rev. 0)

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

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.





(19C303517, Rev. 1)

NOTES-

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

SCHEMATIC & OUTLINE DIAGRAM

ANTENNA MATCHING UNIT
POWER SUPPLY MODEL 4EP41A10

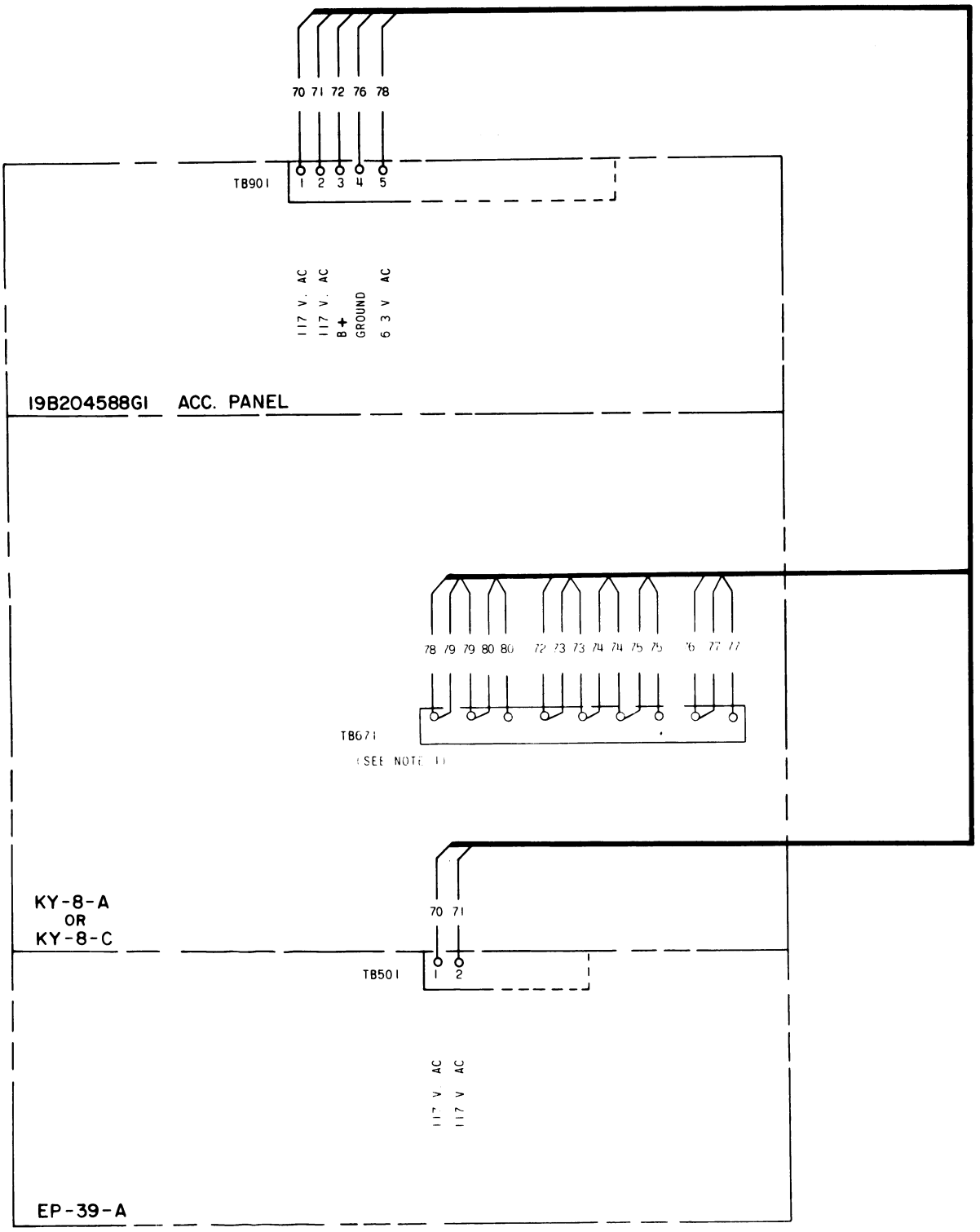
PARTS LIST

LBI-3554

ANTENNA MATCHING POWER SUPPLY
MODEL 4EP41A10
(PL-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-P302K	Fixed composition: 3000 ohms ±10%, 2 w.
R502 and R503	3R79-P221K	Fixed composition: 220 ohms ±10%, 2 w.
R504	3R79-P104K	Fixed 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	7115179-P1	Fuseholder: 15 amps at 250 v; sim to Bussmann Type HKP.
		- - - - - - - - - MISCELLANEOUS - - - - - -
	19B204629-P1	Chassis: approx 8-11/16 x 3-3/16 x 1/16 inches thick.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



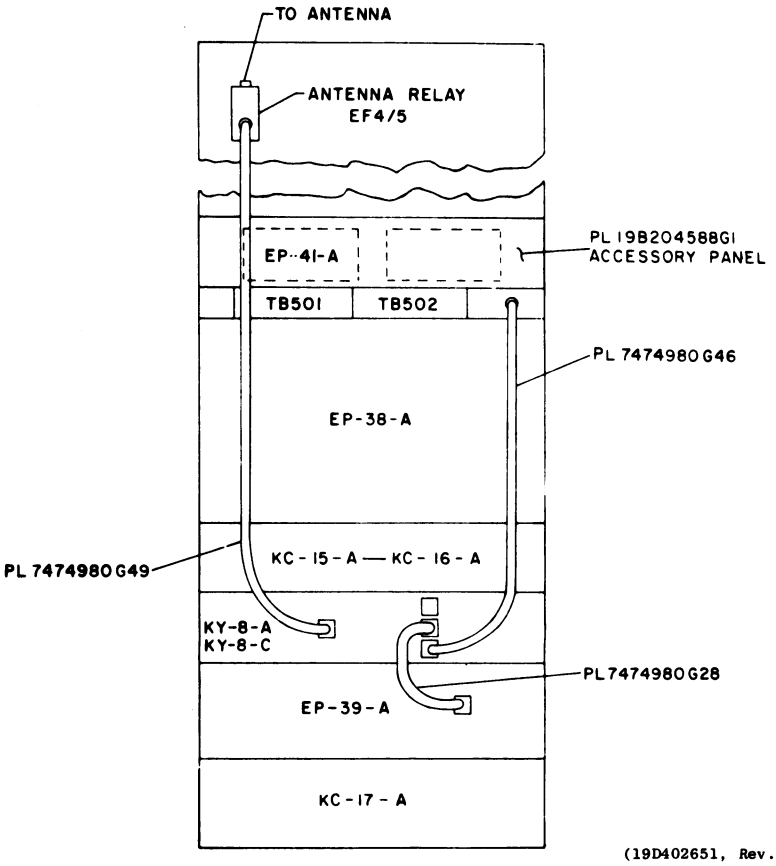
(19D402648, Rev. 1)

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.

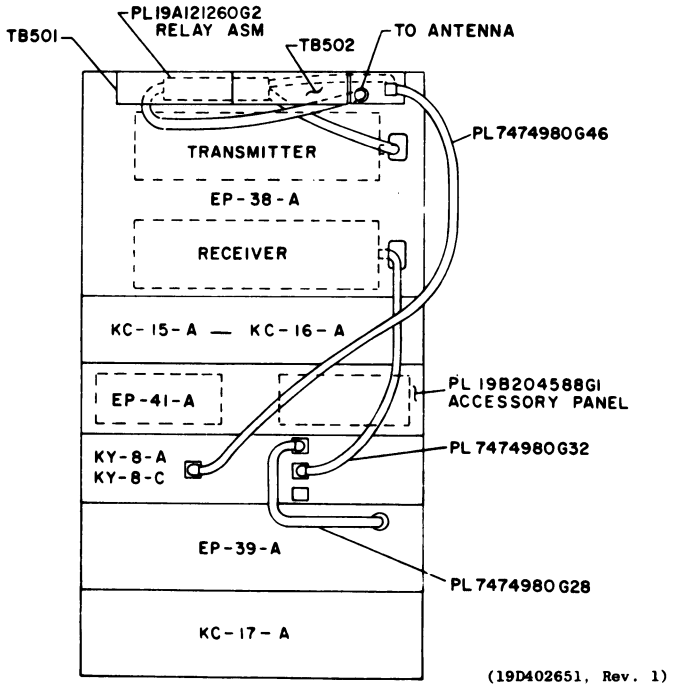
WHEN KY 8 C IS USED, CONNECT WIRES 72 & 73 TO TB671 1, WIRE 73 TO TB671 2, AND REMOVE WIRES 74 & 75 FROM HARNESS; CONNECT WIRES 78 & 79 TO TB671 4, WIRE 79 TO TB671-5, AND REMOVE WIRE 80 FROM HARNESS; CONNECT WIRES 76 & 77 TO TB671-3, WIRE 77 TO TB671-6.

INTERCONNECTION DIAGRAM

ANTENNA MATCHING UNITS
MODELS 4KY8A2, 3 & C1



Antenna Connections
High Power
Rear View



Antenna Connections
Medium Power
Rear View

ANTENNA CONNECTIONS

ANTENNA MATCHING UNIT
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-3572

Progress Is Our Most Important Product

GENERAL ELECTRIC

MOBILE RADIO DEPARTMENT LYNCHBURG, VIRGINIA 24502

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