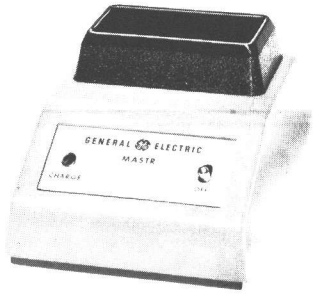
MOBILE RADIO

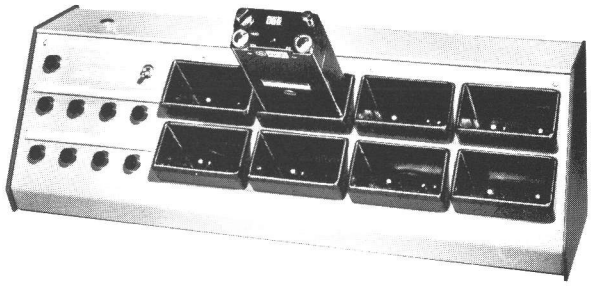
MAINTENANCE MANUAL

BATTERY CHARGERS MODELS 4EP61A10 & 4EP62A10

(Options 4345, 4346, 4347 & 4348)



Desk Charger



Multi-Charger

SPECIFICATIONS *

Model Numbers		
Desk Charger	Model 4EP61A10	
Multi-Charger	Model 4EP62A10	
Used With	PR Model Two-Way Radios	
Input Voltage	120 VAC ±10%, 50/60 Hz	
Input Power	Desk Charger	Multi-Charger
Charging	5 Watts	85 Watts
Not Charging	1 Watt	20 Watts
Charging Current (per battery)	200 milliamperes	
Trickle-Charge current (per battery)	75 milliamperes	
Maximum Charging Time		
100% Charge	16 hours	
70% Charge	5 to 6 hours	
Temperature Range	+5°C to +45°C (+41°F to 113°F)	

OPTIONS

Description	Option Number
Desk Charger	4345
Antenna Connector	4346
Multi-Charger	4347
Slave Multi-Charger	4348

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

GENERAL ELECTRIC

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WARNING

Under no circumstances should any person be permitted to handle any portion of 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

General Electric Desk Charger Model 4EP61A10 and Multi-Charger Model 4EP62A10 will fully recharge the nickel-cadmium battery pack used with MASTR PR Series Two-Way FM radios in 16 hours or less.

The desk charger will recharge one battery pack in or out of the radio, while the multi-charger will recharge up to eight battery packs or radios. One or two additional slave chargers can be connected to the multi-charger for recharging up to 24 radios or separate battery packs.

Both of the chargers are equipped with a circuit that prevents the battery pack from overcharging. When the battery pack is charged to approximately 70% of capacity, the charger switches to trickle charge for the remainder of the charging time. The battery pack may be left on trickle charge indefinitely without damage.

INSTALLATION

DESK CHARGER

The desk charger can be located on a desk or table top, or other flat surface. The location should be close to a 120-Volt AC, 50/60 Hz source. If the radio is to be used while charging, the charger should be located so that it is convenient to the operator.

MULTI-UNIT CHARGER

The multi-charger may be mounted on a table top or shelf, or may be mounted on a wall or other vertical surface. Two mounting holes approximately 16 inches apart are provided in the back of the charger for wall mounting. The mounting location should be close to a 120-Volt AC, 50/60 Hz source. To mount the multi-charger on a wall:

1. Make sure that the power cable is disconnected. Then remove the four Phillips-head screws along the top of the front panel and swing down the panel.
2. Use the charger as a template and mark the mounting holes.
3. Mount the charger using two 1/4-inch lag screws or #14 wood screws as required.
4. Replace the front cover and plug in the power cable.

SLAVE CHARGER

The slave charger is shipped from the factory with the following accessories:

- Three 40-inch wires and two rubber grommets for power connections.
- A spacer frame and mounting screws for mounting the slave unit on the top of the multi-charger, if desired.

To mount the slave charger on the top of the multi-charger:

1. Make sure that the multi-charger power cable is disconnected.
2. Place the spacer frame on the top of the multi-charger. Next, line up the screw holes in the spacer-mounting tabs with the three holes drilled in the back of the multi-charger and secure the spacer with the three screws provided.
3. Remove the plug button in the top of the multi-charger and install one of the rubber grommets in the hole. Install the second rubber grommet in the hole in the bottom of the slave charger.
4. Place the slave charger in the spacer frame on the top of the multi-charger. Then remove the four screws in the front panel of the two chargers and swing open both panels.
5. Make the power and ground connections as shown in the chart in Figure 1.

CONNECTIONS CHART

Wire Color	Connect From Multi-Charger (or Slave Unit)	Connect To Slave Unit
Red (+)	TB501-2	TB501-2
Black (-)	TB501-1	TB501-1
Green (GND)	G10	G10
NOTE: The connections shown in this chart also apply for interconnecting two slave chargers.		

6. If the multi-charger is wall-mounted, secure the slave charger to the wall using two 1/4-inch lag screws or #14 wood screws as required.

If the slave unit is not mounted on the top of the multi-charger, install the unit as follows:

1. Make sure that the multi-charger power cable is disconnected. Then remove the four phillips-head screws along the top of the front panel and swing open the panel.
2. Place the rubber grommets in the appropriate holes.

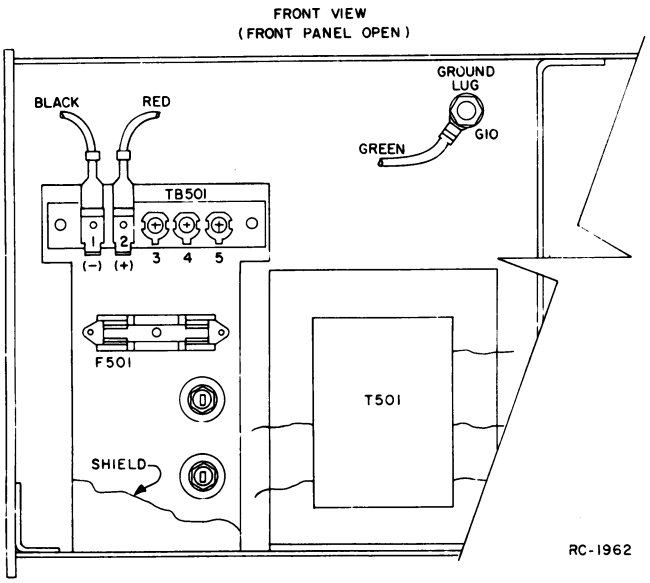


Figure 1 - Power & Ground Connections

3. Make the power and ground connections from the multi-charger to the slave unit as shown in Figure 1.

OPERATION

Due to the temperature characteristics of nickel-cadmium batteries, they will not take a full charge at temperature extremes. For a maximum charge, recharge the battery pack at room temperatures of from 65° to 85° Fahrenheit whenever possible.

DESK CHARGER

To use the desk charger, plug the power cable into a 120-Volt AC, 50/60 Hz source (see Figure 2). Next, place the radio into the charging insert with the speaker facing the front of the charger, or place the battery pack into the insert with the flat side towards the front of the charger. Turn the OFF-ON switch to the ON position. The red CHARGE light will glow when the battery is charging. Let the battery charge for 16 hours.

The radio may be used to send and receive messages while charging, although it may take a little longer to fully recharge the battery.

CAUTION

Using the radio with the Charger continuously on trickle charge can result in an excessively discharged battery. To prevent this, remove and replace the radio in the Charger several times a day. This activates the high-rate Charging Circuit, keeping the battery charged to a safe level for normal operation.

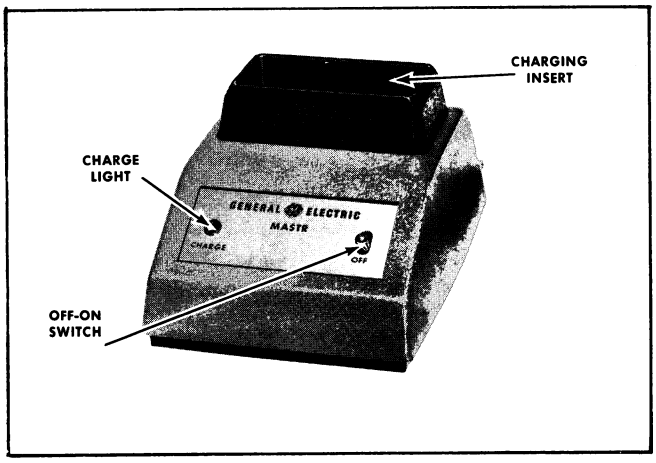


Figure 2 - Desk Charger

An optional antenna connector is available for connecting the charger to an external antenna. When this option is used, placing the radio in the charging insert automatically connects the radio to the external antenna.

MULTI-CHARGER

To use the multi-charger, plug the power cable into a 120-Volt AC, 50/60 Hz source (see Figure 3). Next, place the radio(s) into the charging insert(s) with the speaker facing upwards, or place the battery pack(s) into the insert with the flat side upwards. Then turn the OFF-ON switch to the ON position. The green CHARGE light will glow when the batteries are charging. Let the batteries charge for 16 hours.

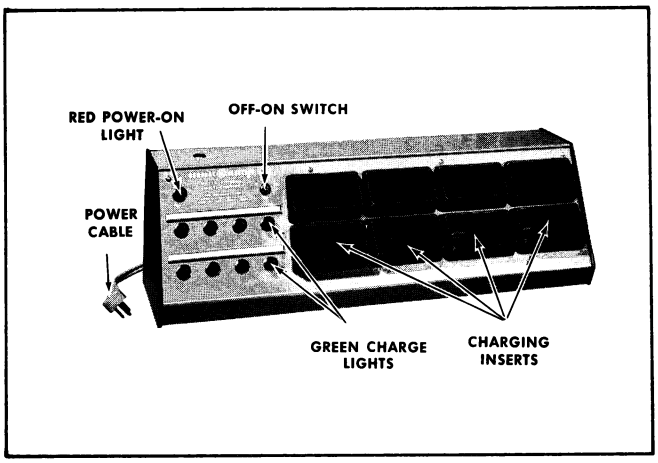


Figure 3 - Multi-Charger

The slave multi-charger operates exactly the way as the master multi-charger except that the slave unit has no power supply, power-on light or ON-OFF switch.

The desk charger contains a power supply and one charging circuit. The multi-charger contains a power supply and eight charging circuits. The charging circuits in both chargers are identical except for the value of the trickle charge current-limiting resistor and diode CR7 to prevent battery discharge when AC power is removed in multi-charger. References to symbol numbers mentioned in the following text can be found on the applicable Schematic Diagram, Outline Diagram or Parts List (see Table of Contents).

POWER SUPPLY

Placing the OFF-ON switch in the ON position applies 120-Volts to the primary of step-down transformer T501. The transformer primary is protected by fuse F501.

In the desk charger, the AC voltage developed across the secondary of T501 is rectified by full-wave bridge rectifiers CR1 through CR4. The rectified output is partially filtered by C1 and applied to the charging circuit.

In the multi-charger, the AC voltage in the secondary of T501 is rectified by full-wave rectifiers CR501 and CR502. The rectified, unfiltered output is applied directly to the charging circuit.

CHARGING CIRCUIT

Placing a battery pack (or radio) into the charger causes Q1 to conduct, applying a 200 milliampere charging current to the battery. The charging current is limited by CHARGE light DS501.

When Q1 is conducting, Q2 and Q3 are turned off. Whenever the battery charges up to approximately 70% of capacity, the voltage developed across the voltage reference circuitry (VR1, CR5, CR6, R5, R1 and R4) causes Q2 to start conducting. This causes Q1 to begin to turn off. As Q1 starts turning off, its collector voltage begins to rise. When the voltage rises to over 11 Volts, Zener diode VR2 conducts and turns on Q2. Turning on Q2 turns off Q1 and CHARGE light DS501. The switching action is assisted by this positive feedback through VR2.

When Q1 is turned off, the circuit is "latched" in the trickle-charge mode. The trickle-charge current is limited by current limiting resistor R10 (R11 in multi-chargers). The charger will remain on trickle-charge until the battery is removed from the charger.

The setting of potentiometer R1 determines the voltage level that causes the charger to switch to the trickle-charge mode. Complete instructions for setting R1 are contained in the Adjustment section (see Table of Contents).

Removing the battery from the charger causes the voltage at the positive charging terminal to rise to approximately 14 Volts. The voltage at the junction of R5 and R7 rises to approximately 5 Volts, which turns on Q3. Turning on Q3 turns off Q2 and keeps C3 discharged, resetting the charging circuit.

Placing a battery (or radio) into the charger instantly turns off Q3. Capacitor C3 keeps Q2 turned off so that Q1 starts conducting, re-starting the charging cycle.

MAINTENANCE

DISASSEMBLY

To gain access to the desk charger circuitry for servicing, remove the three Phillips-head screws in the bottom of the charger and carefully lift off the housing. The charger must be disassembled to replace the CHARGE light.

To gain access to the multi-charger circuitry, remove the four Phillips-head screws along the top of the front panel, and swing open the panel. It is not necessary to open the front panel to change the indicator lights. To change the bayonet-type lamps, first unscrew the colored lens. Then push in on the lamp bulb, turn it 1/4-turns to the left and lift the lamp out.

TROUBLESHOOTING

Should a difficult service problem arise, the Troubleshooting Procedure listed in the Table of Contents is provided to assist the serviceman. The procedure includes servicing both the desk charger and the multi-charger.

ADJUSTMENT

PREFERRED METHOD

Potentiometer R1 is adjusted at the factory. However, if either CR5, CR6, VR1 or Q2 is replaced, it is recommended that R1 be readjusted.

Calibrator Model 4EX10A10 is designed for use with the desk charger and multi-charger for properly setting R1. When using the calibrator, set R1 as follows:

1. Remove the desk charger housing or open the front panel of the multi-charger, as directed in the Disassembly Procedure.

2. Connect a clip lead from the red jack on the calibrator to the positive charger terminal (i.e., E501). Then connect a clip lead from the black jack on the calibrator to the negative charger terminal (i.e., E502).

3. Place the calibrator switch in Position B.

4. Rotate R1 until the CHARGE light turns on. Then carefully adjust R1 until the CHARGE light just turns off.

ALTERNATE METHOD

This alternate method of adjusting R1 may be used if Calibrator Model 4EX10A10 is not available. This procedure requires a DC-VTVM that is accurate to .02 Volts, and a fully charged battery pack.

CAUTION

Failure to adjust potentiometer R1 to within .02-Volt may result in an insufficient charge or damage to the battery.

Set R1 as follows:

1. Connect the positive meter lead to the positive charging terminal (i.e., E501) and the negative meter lead to the negative charging terminal (i.e., E502).

2. Place the battery into the charger. If necessary, rotate R1 until the CHARGE light turns on. Then turn R1 until the light just turns off.

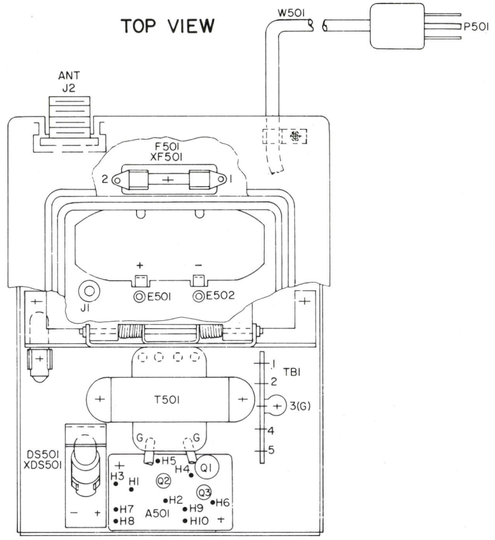
3. Remove and then replace the battery pack in the charger. Note the meter reading when the CHARGE light turns off. If reading is not 8.35 Volts, adjust R1 slightly.

4. Repeat Step 3 until the CHARGE light turns off when the meter reads 8.35 Volts.

220-VOLT MODIFICATION

The desk charger may be modified for 220-Volt AC, 50/60 Hz operation by changing the input taps to stepdown transformer T501. Refer to the note on the Schematic Diagram for the modification instructions.

OUTLINE DIAGRAM



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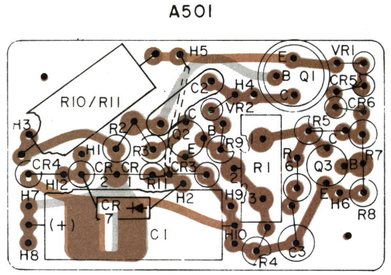
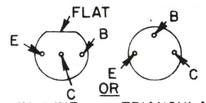
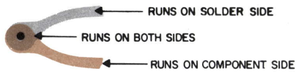


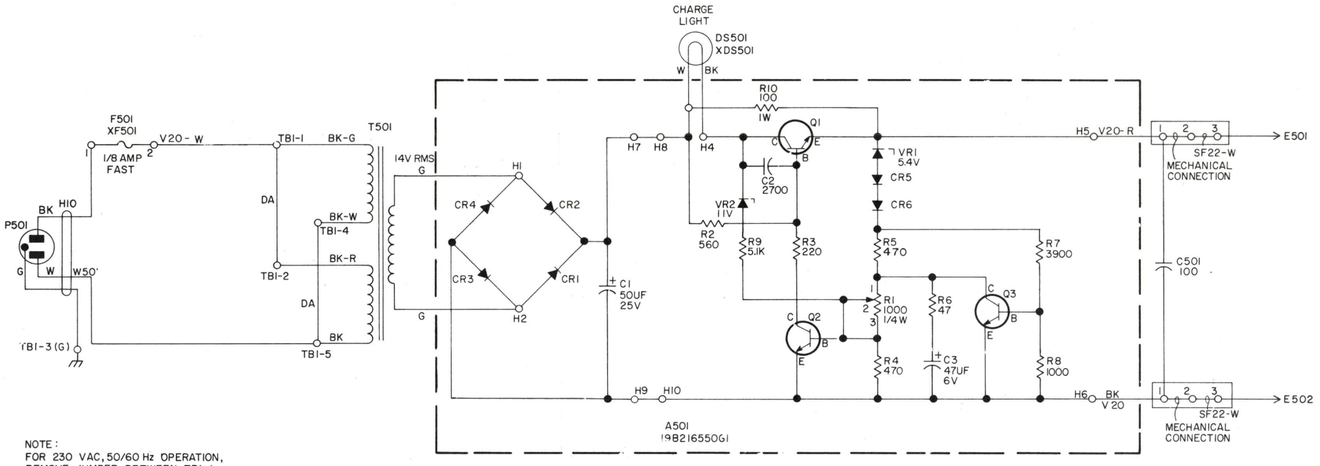
TRANSISTOR
LEAD IDENTIFICATION



NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION



WIRING DIAGRAM

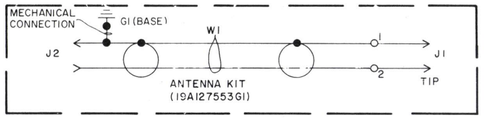


NOTE:
FOR 230 VAC, 50/60 Hz OPERATION, REMOVE JUMPER BETWEEN TBI-1 AND TBI-2. NEXT, MOVE BK-W LEAD FROM TBI-4 TO TBI-2. THEN REPLACE P501 WITH A 230 VOLT PLUG.

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.	
THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
4EP61A10	H

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.



(19D413529, Rev. 14)

SCHEMATIC & OUTLINE DIAGRAM

DESK CHARGER MODEL 4EP61A10

PARTS LIST

LBI-4078D

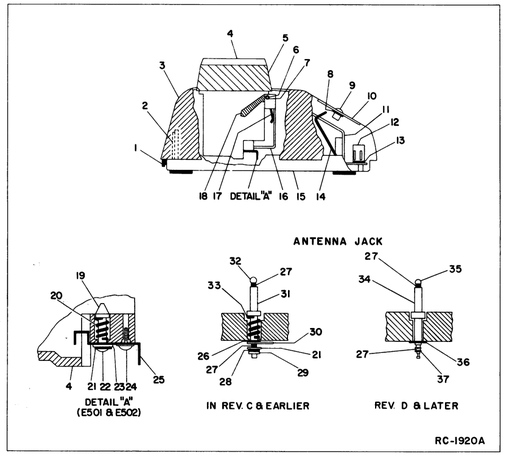
DESK CHARGER
4EP61A10

SYMBOL	GE PART NO.	DESCRIPTION
A501		DESK CHARGER BOARD 19B216550G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A115680P4	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TT.
C2	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C3	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 thru CR4	4037822P1	Silicon.
CR5 and CR6	19A115250P1	Silicon.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1*	19A115300P4	Silicon, NPN; sim to Type 2N3053.
		In REV G and earlier:
	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q2*	19A116774P1	Silicon, NPN; sim to Type 2N5210.
		In REV E and earlier:
	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q3*	19A115910P1	Silicon, NPN; sim to Type 2N3904.
		In REV E and earlier:
	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1*	19B209358P103	Variable, carbon film: approx 25 to 1000 ohms ±10%, 0.2 w; sim to CTS Type X-201.
		In REV B and earlier:
	19B209358P102	Variable, carbon film: approx 25 to 500 ohms ±10%, 0.2 w; sim to CTS Type X-201.
R2	3R77P561K	Composition: 560 ohms ±10%, 1/2 w.
R3	3R77P221K	Composition: 220 ohms ±10%, 1/2 w.
R4*	3R77P471J	Composition: 470 ohms ±5%, 1/2 w.
		In REV A and B:
	3R77P391J	Composition: 390 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P361J	Composition: 360 ohms ±5%, 1/2 w.
R5*	3R77P681J	Composition: 680 ohms ±5%, 1/2 w.
		In REV A and earlier:
	3R77P511J	Composition: 510 ohms ±5%, 1/2 w.
R6	3R77P470K	Composition: 47 ohms ±10%, 1/2 w.
R7	3R77P392K	Composition: 3900 ohms ±10%, 1/2 w.
R8	3R77P102K	Composition: 1000 ohms ±10%, 1/2 w.
R9	3R77P512J	Composition: 5100 ohms ±5%, 1/2 w.
R10	3R78P101J	Composition: 100 ohms ±5%, 1 w.
		- - - - - - - - - VOLTAGE REGULATORS - - - - - -
VR1	4036887P5	Silicon, Zener.
VR2	4036887P8	Silicon, Zener.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - CAPACITORS - - - - - - - - -
C501*	7489162P27	Silver mica: 100 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15. Added by REV A.
		- - - - - - - - INDICATING DEVICES - - - - - - - -
DS501	19C307037P29	Lamp, incandescent: 6.3 v; sim to GE 44.
		- - - - - - - - - TERMINALS - - - - - - - - -
E501 and E502		(See RC-1920, items 19-25).
		- - - - - - - - - - - FUSES - - - - - - - - - - -
F501	1R16P12	Quick blowing: 1/8 amp at 250 v; sim to Littelfuse 312.125 or Bussmann AGC-1/8.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S501*	7478623P1	Toggle: SPST, 3 amps at 250 VDC; sim to Arrow-Hart and Hegeman 20994-BJC. Deleted by REV G.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T501	19B209431P1	Power, step-down: Pri: 117 VRMS, 50/60 Hz (Parallel connected), 234 VRMS, 50/60 Hz (Series connected), Sec: 14 VDC.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7775500P11	Phen: 5 terminals.
		- - - - - - - - - - CABLES - - - - - - - - - -
W501*	19A116740P2	Power: approx 8 ft long, with 3 contact plug.
		In REV D and earlier:
	4036441P7	Power: approx 7 ft long, with 3 contact plug (P501).
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS501	4032220P1	Lampholder, miniature: sim to Drake N517.
XF501	7141008P1	Fuseholder: 5 amps at 125 v; sim to Littelfuse E-357001.
		ANTENNA JACK ASSEMBLY 19A127553G1
J1		(See RC-1920 items 21, 26-37).
J2		(Part of W1).
J503-1	19B219248P1	Collar. (See RC-1920 item 34).
J503-2	19B219247P1	Contact. (See RC-1920 item 35).
W1	19A127521G1	Cable: approx 5 inches long. (Includes J2).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19A127878P1	Ground spring. (Used at J2).
		MECHANICAL PARTS (RC-1920)
1	4029851P5	Bushing, strain relief.
2	19C317175P1	Plug. (ANTENNA OPTION).
3	19B216568G1	Housing.
4	19E500893P1	Holder. (BATTERY/RADIO).
5	19C317116P1	Sleeve.
6	19A127511P1	Pin.
7	19C307038P7	Nut, push on; sim to Palnut PS094032.
8	19C307038P6	Nut, push on; sim to Tinnerman C15227SS-010.
9	19B204949P1	Jewel, red.
10	NP257921	Nameplate.
11	19B216534P1	(Not Used).
12	19A121252P1	Heat sink. (Q1 on A501).

SYMBOL	GE PART NO.	DESCRIPTION
13	4036555P1	Insulator, disc. (Q1 on A501).
14	19A127517G1	Support. (DS501).
15	19C317108G1	Base.
16	19B216542G1	Support.
17	19A127510P1	Spring.
18	19C317096P1	Lever.
19	19A127497P1	Contact, electrical.
20	19A127498P1	Spring.
21	4036835P8	Terminal, solder: sim to Shakeproof 2106-02-02.
22	N80P5003C	Screw, phillips head: No. 2-56 x 3/16.
23	N402P33C13	Flat washer, No. 2.
24	19B201074P205	Tap screw: No. 4-40 x 5/16.
25	19B216531P1	Contact.
26	N402P4C13	Flat washer, No. 3.
27	19A127502P1	Insulator.
28	N402P2C13	Washer, No. 1.
29	N207P3C13	Nut: brass, No. 1.
30	4033714P3	Terminal, solder; sim to Zierick 75.
31	19B216536P1	Collar.
32	19B216533P1	Contact.
33	19A127500P1	Spring.
34	19B219248P1	Collar. (J503-1).
35	19B219247P1	Contact. (J503-2).
36	4036143P2	Retainer ring.
37	4036143P5	Retainer ring.



4EP61A10 DESK CHARGER

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 description of parts affected by these revisions.

Rev. A - To shift the adjustment range of R1. Changed R4. - To filter out the R. F. getting into the charger. Added C501.

Rev. B - To provide proper setting of charger cut-off point. Changed R5.

Rev. C - To provide adjustment of the cut-off circuit with a wide range of diode tolerances. Changed R1 and R4.

Rev. D - To improve antenna contact reliability. Changed J1 on Antenna Kit.

Rev. E - To incorporate a new power cable. Changed W501.

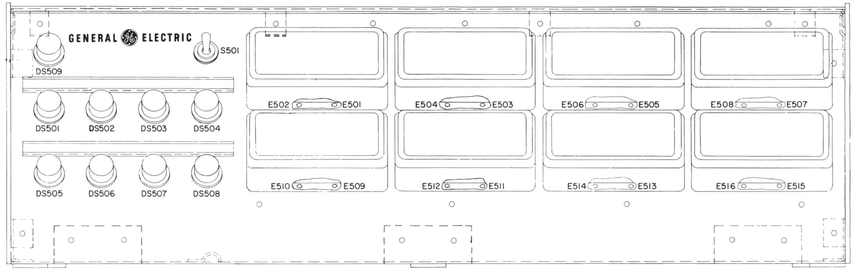
Rev. F - To incorporate new transistors. Changed Q2 and Q3.

Rev. G - To delete unnecessary parts. Deleted S501.

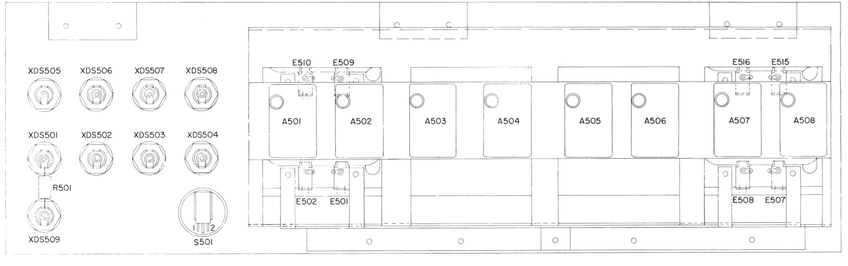
Rev. H - To incorporate new transistor. Changed Q1 and R5.

OUTLINE DIAGRAM

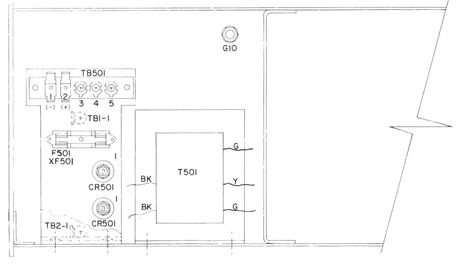
FRONT VIEW



FRONT PANEL
(SHOWN SWUNG OPEN)



FRONT VIEW
(INSIDE CHASSIS)

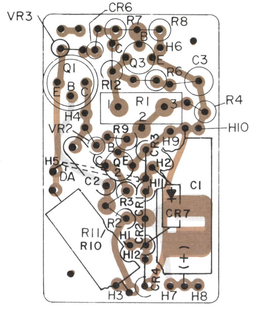


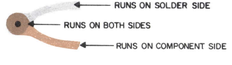
TRANSISTOR
LEAD IDENTIFICATION
FOR

VIEW FROM LEAD END

NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

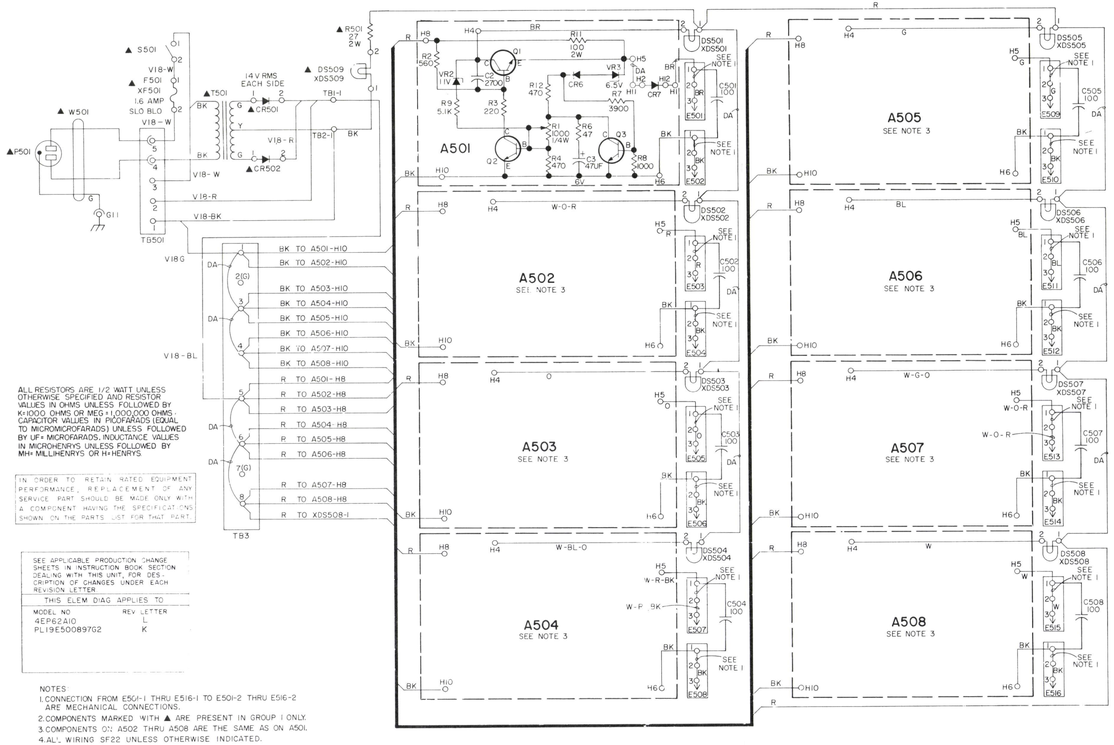
COMPONENT BOARD
A501 / A508





(19E500919, Rev. 4)
(19D216874, Sh. 1, Rev. 1)
(19D216874, Sh. 2, Rev. 1)

WIRING DIAGRAM



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 MICROFARADS (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.

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

THIS ELEM DIAG APPLIES TO

MODEL NO.	REV LETTER
4EP62A10	L
PL19E500897G2	K

NOTES:
1. CONNECTION FROM E501-1 THRU E516-1 TO E501-2 THRU E516-2 ARE MECHANICAL CONNECTIONS.
2. COMPONENTS MARKED WITH ▲ ARE PRESENT IN GROUP I ONLY.
3. COMPONENTS ON A502 THRU A508 ARE THE SAME AS ON A501.
4. ALL WIRING SF22 UNLESS OTHERWISE INDICATED.

(19D413335, Rev. 18)

SCHEMATIC & OUTLINE DIAGRAM

MULTI-CHARGER MODEL 4EP62A10

(DF-0068)

PARTS LIST

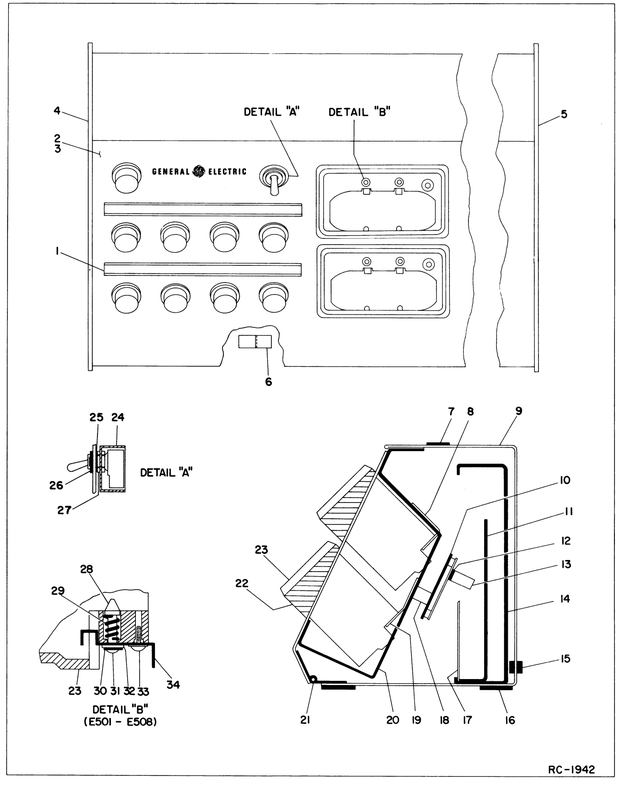
LBI-4076D

MULTI-CHARGER 4EP62A10
SLAVE CHARGER 19E500897G2

SYMBOL	GE PART NO.	DESCRIPTION
A501 thru A508		COMPONENT BOARD 19B216550G2
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW: sim to RMC Type JF Discap.
C3	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW: sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR5*	19A115250P1	Silicon. Deleted in 4EP62A10 by REV G. Deleted in 19E500897G2 by REV F.
CR6	19A115250P1	Silicon.
CR7*	4037822P1	Silicon. Added to 4EP62A10 by REV F. Added to 19E500897G2 by REV E.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1*	19A115300P4	Silicon, NPN.
		In 4EP62A10 of REV K and earlier: In 19E500897G2 of REV J and earlier:
	19A115300P2	Silicon, NPN: sim to Type 2N3053.
Q2*	19A116774P1	Silicon, NPN: sim to Type 2N5210.
		In 4EP62A10 of REV H and earlier: In 19E500897G2 of REV G and earlier:
	19A115362P1	Silicon, NPN: sim to Type 2N2925.
Q3*	19A115910P1	Silicon, NPN: sim to Type 2N3904.
		In 4EP62A10 of REV H and earlier: In 19E500897G2 of REV G and earlier:
	19A115123P1	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1*	19B209358P103	Variable, carbon film: approx 25 to 1000 ohms ±10%, 0.2 w: sim to CTS Type X-201.
		In Model 4EP62A10 of REV C and earlier: In 19E500897G2 of REV C and earlier:
	19B209358P102	Variable, carbon film: approx 25 to 500 ohms ±10%, 0.2 w: sim to CTS Type X-201.
R2	3R77P561K	Composition: 560 ohms ±10%, 1/2 w.
R3	3R77P221K	Composition: 220 ohms ±10%, 1/2 w.
R4*	3R77P471J	Composition: 470 ohms ±5%, 1/2 w.
		In Model 4EP62A10 of REV C and earlier: In 19E500897G2 of REV C and earlier:
	3R77P391J	Composition: 390 ohms ±5%, 1/2 w.
		In Model 4EP62A10 earlier than REV A: In 19E500897G2 earlier than REV A:
	3R77P361J	Composition: 360 ohms ±5%, 1/2 w.
R5*	3R77P681J	Composition: 680 ohms ±5%, 1/2 w. Deleted in 4EP62A10 by REV G. Deleted in 19E500897G2 by REV F.
		In Model 4EP62A10 of REV B and earlier: In 19E500897G2 of REV B and earlier:
	3R77P511J	Composition: 510 ohms ±5%, 1/2 w.
R6	3R77P470K	Composition: 47 ohms ±10%, 1/2 w.
R7	3R77P392K	Composition: 3900 ohms ±10%, 1/2 w.
R8	3R77P102K	Composition: 1000 ohms ±10%, 1/2 w.
R9	3R77P512J	Composition: 5100 ohms ±5%, 1/2 w.

SYMBOL	GE PART NO.	DESCRIPTION
R11*	3R79P101K	Composition: 100 ohms ±10%, 2 w.
		In Model 4EP62A10 of REV A and earlier: In 19E500897G2 of REV A and earlier:
	3R78P680J	Composition: 68 ohms ±5%, 1 w.
R12*	3R77P471J	Composition: 470 ohms ±5%, 1/2 w.
		In 4EP62A10 REV H-J: In 19E500897G2 REV G-H:
	3R77P561J	Composition: 560 ohms ±5%, 1/2 w. Added to 4EP62A10 by REV H. Added to 19E500897G2 by REV G.
		- - - - - - - - VOLTAGE REGULATORS - - - - - -
VR1*	4036887P5	Silicon, Zener. Deleted in 4EP62A10 by REV G. Deleted in 19E500897G2 by REV F.
VR2	4036887P8	Silicon, Zener.
VR3*	4036887P6	Silicon, Zener. Added in 4EP62A10 by REV G. Added in 19E500897G2 by REV F.
		- - - - - - - - - CAPACITORS - - - - - - - - -
C501* thru C508*	7489162P27	Silver mica: 100 pf ±5%, 500 VDCW: sim to Electro Motive Type EM-15. Added to Model 4EP62A10 by REV A. Added to 19E500897G2 by REV A.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR501 thru CR502	19A115202P1	Silicon.
		- - - - - - - - INDICATING DEVICES - - - - - - -
DS501 thru DS509	19C307037P28	Lamp, incandescent: 14.0 v; sim to GE 1891.
		- - - - - - - - - TERMINALS - - - - - - - - -
E501 thru E516		(See RC-1942, items 28 thru 34).
		- - - - - - - - - - FUSES - - - - - - - - - -
F501*	7487942P26	Slow blowing: 1.6 amp at 125 v: sim to Bussmann MDL-1.6.
		In REV D and earlier:
	1R16P4	Quick blowing: 1-1/2 amp at 250 v: sim to Littelfuse 31201.5 or Bussmann Mfg AGC-1-1/2.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R501	3R79P270K	Composition: 27 ohms ±10%, 2 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S501	5491899P3	Toggle: SPST, 6 amps at 125 VAC/VDC: sim to Cutler-Hammer 8383K3.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T501	19A116218P1	Power, step-down: Pri: 117 VRMS, 50/60 Hz. Sec: 16 VDC.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1 and TB2	7775500P44	Phen: 2 terminals.
TB3	7775500P24	Phen: 8 terminals.
TB501	7117710P5	Phen: 5 terminals; sim to Cinch 1775.
		- - - - - - - - - - CABLES - - - - - - - - - -
W501	7491206P3	Cord and plug: 3 conductor, 10 amps at 125 VRMS max, approx 7 feet long. Includes (P501).
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XDS501 thru XDS508	7141855P13	Light, indicator: incandescent (for low voltage lamps), miniature bayonet base, light translucent green plastic lens, without lamp: sim to Dialight Corp 135-0410-1432-102.

SYMBOL	GE PART NO.	DESCRIPTION
XDS509	7141855P12	Light, indicator: incandescent (for low voltage lamps), miniature bayonet base, light translucent red plastic lens, without lamp: sim to Dialight Corp 135-0410-1431-102.
XF501	7141008P1	Fuseholder: 5 amps at 125 v: sim to Littelfuse E-357001.
		HARNESS ASSEMBLY 19E500897G3 MULTI-CHARGER 19E500897G4 SLAVE CHARGER (Includes TB3)
		MECHANICAL PARTS (SEE RC-1942)
1	19A127565P1	Guide.
2	19D413314G1	Front plate. (Used in 19E500897G1).
3	19D413314G2	Front plate. (Used in 19E500897G2).
4	19C317192G1	End plate.
5	19C317192G2	End plate.
6	7763541P6	Clip, spring tension. (Used with W501).
7	R529P16C	Button, plug.
8	19C317205G1	Angle.
9	19D413322G1	Support.
10	19B216890G1	Plate. (Mounts A501-A508).
11	19B216621G1	Support. (Mounts parts of Power Supply).
12	4036555P1	Insulator, washer: nylon. (Used with Q1 in A501-A508).
13	19A121252P1	Heat sink. (Used with Q1 in A501-A508).
14	19C317287P1	Support. (Mounts protective insulator on Power Supply).
15	19A115725P2	Bushing, strain relief. (Used with W501).
16	19A115990P1	Bumper, rubber.
17	19B216754P1	Insulator. (Protects Power Supply from Indicators DS501-DS509 and S501).
18	5491541P101	Spacer, Hex.
19	19C317204G1	Angle.
20	19D413319G1	Support.
21	19B216619G1	Hinge.
22	19C317114P1	Sleeve.
23	19E500893P2	Insert.
24	19A127616P1	Shield, plastic. (Used with S501).
25	7115130P11	Lock washer. (Used with S501).
26	4033394P1	Nut, knurled. (Used with S501).
27	7415195P2	Hex nut. (Used with S501).
28	19A127497P1	Contact, electrical.
29	19A127498P1	Spring.
30	4036835P8	Terminal, solder: sim to Shakeproof 2106-02-02.
31	N80P5003C	Screw, phillips head: No. 2-56 x 3/16.
32	N402P33C13	Flat washer, No. 2.
33	19B201074P205	Tap screw, Phillips POZIDRIV®: No. 4-40 x 5/16.
34	19B216531P1	Contact.



MULTI CHARGER 4EP62A10

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 description of parts affected by these revisions.

MULTI Charger Model 4EP62A10
Slave Charger 19E500897G2

REV. A - To shift the adjustment range of R1. Changed R4 on each board. To filter out the R, F, getting into each charger. Added C501 through C508.

REV. B - To reduce the trickle charge current and increase reliability. Changed R11.

REV. C - To attain proper setting of charger cut-off point. Changed R5.

REV. D - To provide adjustment of the cut-off circuit with a wide range of diode tolerances. Changed R1 and R4.

REV. E - MULTI Charger Model 4EP62A10
To provide protection from input power surges. Changed F501.

REV. F - MULTI Charger Model 4EP62A10
REV. E - Slave Charger 19E500897G2
To prevent battery discharge when the AC power is interrupted. Added CR7.

REV. G - MULTI Charger 4EP62A10
REV. F - Slave Charger 19E500897G2
To give more positive charge indication when the battery under charge is low. Deleted CR5 and VR1. Added JR3.

REV. H - MULTI Charger 4EP62A10
REV. G - Slave Charger 19E500897G2
To increase range of R1. Replaced R5 with R12.

REV. J - MULTI Charger 4EP62A10
REV. H - Slave Charger 19E500897G2
To incorporate new transistors. Changed Q2 and Q3.

REV. K - MULTI Charger 4EP62A10
REV. J - Slave Charger 19E500897G2
To improve adjustment of R1. Changed R12.

REV. L - MULTI Charger 4EP62A10
REV. K - Slave Charger 19E500897G2
To incorporate a new transistor. Changed Q1 and R12.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

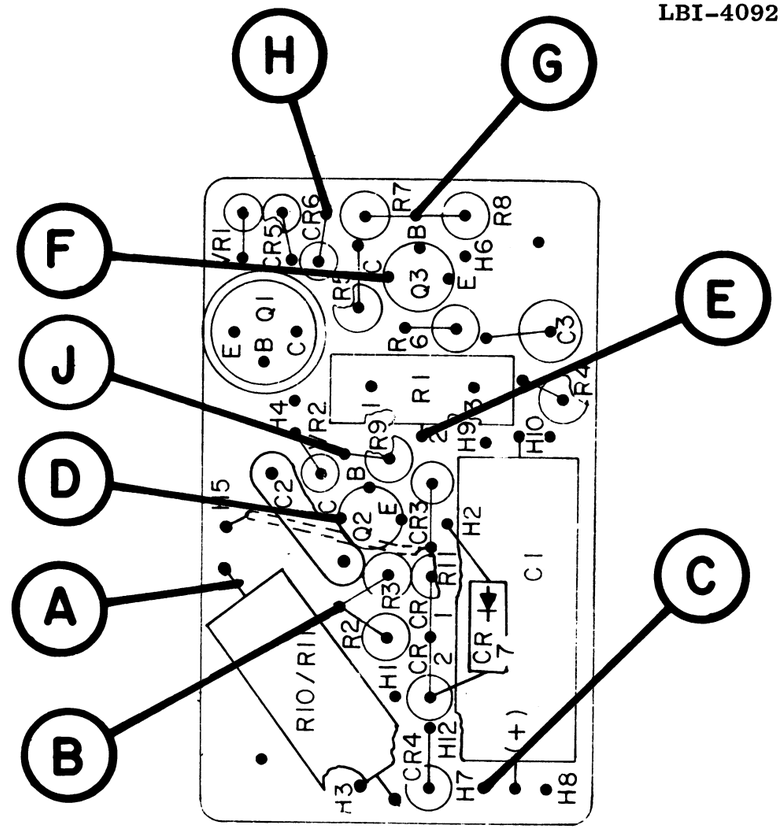
QUICK CHECKS

Symptom	Check For:
Battery will not charge at the high rate (CHARGE light won't come on)	1. Open DS501 or F501 2. Defective Q1 3. Q3 not re-setting charging circuit 4. Open C3, or battery contact damaged
CHARGE light goes off slowly (doesn't switch off quickly)	Open VR2
Battery pack will not charge at high rate	1. Defective or excessively discharged battery 2. Defective VR2, R1, VR1 or R1 improperly adjusted
Charger switches to trickle charge too soon	Improper adjustment of R1
Charger remains on high charge rate (CHARGE light remains on)	1. Improper adjustment of R1, or R1 defective 2. Shorted Q1 or open Q2 3. Shorted Q3 or C3

VOLTAGE READINGS

These voltage readings are DC readings measured with GE Test Set 4EX3A10, 4EX8K11 or equivalent 20,000 ohms-per-volt meter, and measured from the metering point shown to component board ground.

Metering Point	With No Battery	High Charge Rate (charge light on)	Trickle Charge (charge light off)
(A) - Q1 emitter	17 V	7.5-8.3 V	8.1-8.5 V
(B) - Q1 base	17.5 V	8.1-8.9 V	4.5 V
(C) - Rectifier output	17.6 V	11.5 V	15 V
(D) - Q2 collector	17.5 V	8.1-8.9 V	
(E) - Q2 base	0.25 V	0.6 V	0.6 V
(F) - Q3 collector	.08 V		1.5 V
(G) - Q3 base	0.65 V	0.18-0.35 V	
(H) - Junction of R5 and R7	10.8 V	0.9-1.7 V	1.5-1.9 V
(J) - Junction of R9 and VR2	6.6 V		4 V



(RC-1963)
(19C317431, Rev. 3)

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-4092

DF-0068

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

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