MOBILE RADIO

MASTR® Personal Series

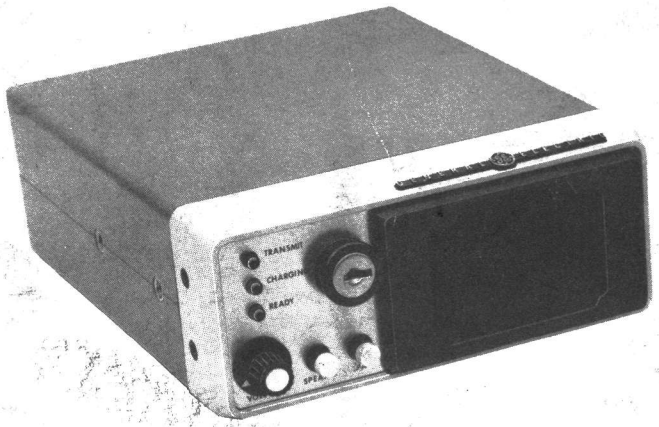
PROGRESS LINE

PE VEHICULAR CHARGERS

Maintenance Manual LBI 30040E

DATAFILE FOLDER - DF 0069

PE VEHICULAR CHARGERS



SPECIFICATIONS *

Used With	PE MODEL Two-Way Radios
Input Voltage	11 VDC - 16.6 VDC
Input Currents (@13.8 VDC)	
Standby	100 mA
2-1/2 Watts Audio-Trickle Charge	430 mA
2-1/2 Watts Audio-Rapid Charge	730 mA
CHARGE CURRENT	
Rapid Charge	400 mA
Trickle Charge	45 mA
CHARGE TIME	3 Hours (100% Capacity)

CHARGE CAPACITY & TIME VS TEMPERATURE

Temperature	Time	Capacity
+5°C (41°F)	3.3 Hours	100%
+25°C (+77°F)	3.0 Hours	100%
+45°C (113°F)	2.7 Hours	80%

INDICATORS	Amber	CHARGING
	Green	READY
		TRANSMIT
RATED AUDIO POWER	2-1/2 Watts	
DISTORTION (@ Rated Audio Power)	10%	
SPEAKER IMPEDANCE	8 ohms	

*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

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!

EQUIPMENT INDEX

EQUIPMENT	PART NUMBER OR MODEL NUMBER
Rear Assembly	19D423343G1
Front Assembly	19D423353G1, 2 & 3
2.5 Watt Audio Amplifier	19B226789G1
Speaker	19C320302G6
Microphone	19C320270G1
Positive Ground Converter	4EP54A10
Cables	19B226198G2 & 3
Antennas: 30-50 MHz Hook Base 138-512 MHz	 7491074P1 19A121577G1 4033101G1 19B209563P1
Key	5491682P4

OPTIONS

15 Watt Audio Amplifier	19B226782G2
External Speaker and Public Address	19C321515G1 & 2

COMBINATION NOMENCLATURE

1st Digit	2nd Digit	3rd Digit	4th Digit	5th Digit	6th Digit	7th Digit	8th Digit
Product Line	Application	Package	Input Voltage	Charge Time	Version	Type	Frequency Range
3 Charger	**6** PE (700 mAh Battery Packs)	**4** Mobile System	**C** -12 VDC Neg Grd	**3** 3 Hour	**A** 1 Charge Socket	**I** Standard	**A** 30-36 MHz
		5 Mobile Charger	**D** ±12 VDC				**B** 36-42 MHz
							C 42-50 MHz
							G 138-150.8 MHz
							H 150.8-174 MHz
							K 406-420 MHz
							M 450-470 MHz
							N 470-494 MHz
							P 494-512 MHz
							X Not Frequency Sensitive

DESCRIPTION

General Electric Vehicular Charger combinations provide a system for using a MASTR® Personal PE Series, FM, two-way radio as a mobile unit while recharging the PE radio's battery pack. The vehicular charger will recharge the nickel-cadmium 700 mAh battery pack 100% in 3 hours.

When a PE radio with battery pack is placed in the charging insert the external antenna, microphone, Push-to-Talk, speaker and charging contacts are automatically connected. Power Switch S801 is turned on by a compression spring in the charging insert. An amber LED indicator labeled CHARGING will light, indicating the battery pack is being charged. When the battery pack is fully charged a green LED indicator labeled READY will light and the charger will automatically switch from a rapid charge rate to a safe trickle charge. A red LED indicator labeled TRANSMIT will light when the transmitter is keyed.

The vehicular charger uses heat sensors to constantly monitor the temperature of both the battery pack and the charging insert. When a cold battery pack is inserted into the charging insert, the charger will wait until the battery pack has warmed up to within approximately 10°C of ambient. The charger will then, automatically, apply the high charging rate. When the battery pack overcharges enough to heat the cells 10°C above ambient, the charger will switch from fast charge to trickle charge. The charger also has a memory, set when the charger switches from the high charging rate to trickle charge and reset by removing the battery pack from the charging insert.

If a hot battery is in the charging insert and the memory has not been reset, the charger will remain at the trickle charge rate. If the memory has been reset the charger will wait until the battery pack has cooled before automatically switching to fast charge. If a fully charged battery pack is removed from the charging insert and then re-inserted, it will charge for approximately 1/2 hour until the cells reheat.

OPERATION

Temperature characteristics of nickel-cadmium batteries, prevent a full charge at temperature extremes. For a maximum charge, recharge the battery pack at temperatures of from 65° to 85° Fahrenheit whenever possible.

WARNING

General Electric Vehicular Charger Combinations are designed for recharging GE 700 mAh battery pack 19D413522G4 only. Attempting to recharge any other battery pack or batteries may result in damage to equipment, leakage or explosion.

To use the vehicular charger, place the radio, with audio adjusted for a normal listening level, into the charging insert with the speaker facing down. Press the radio in against the bottom of the charging insert (see Figure 1). Lock the charger to help protect the radio against theft.

Power is automatically applied to the PE radio when the radio is in the charging insert. The amber LED indicator labeled CHARGING will light when positive contact has been made and the green LED indicator labeled READY will light when the battery pack is fully recharged. The red LED indicator labeled TRANSMIT will light when the transmitter is keyed. Adjust the volume control on the charger for a normal listening level.

The vehicular charger is equipped with an external antenna for sending and receiving messages. The charge rate will permit the radio to be operated on a 5% transmit, 10% receive and 85% standby duty cycle while maintaining the battery charge.

To remove the radio from the charger, unlock the charger, press in on the release button and remove the radio from the charging insert.

CIRCUIT ANALYSIS

Charger

The vehicular charger consists of a charging circuit and a temperature controlled cut-off circuit. Charging current flows through series connected resistor R1, regulator transistor Q1 and diode CR4 to positive charging contact E804 on charging insert A802. A portion of the charging current is routed through resistor R3 and transistor Q4 to light LED indicator CR1 and provide a trickle charge. The series connected charge circuit determines the high charge rate and is controlled by the temperature controlled cut-off circuit. The temperature controlled cut-off circuit is contained in thick film hybrid integrated circuit (IC) U1.

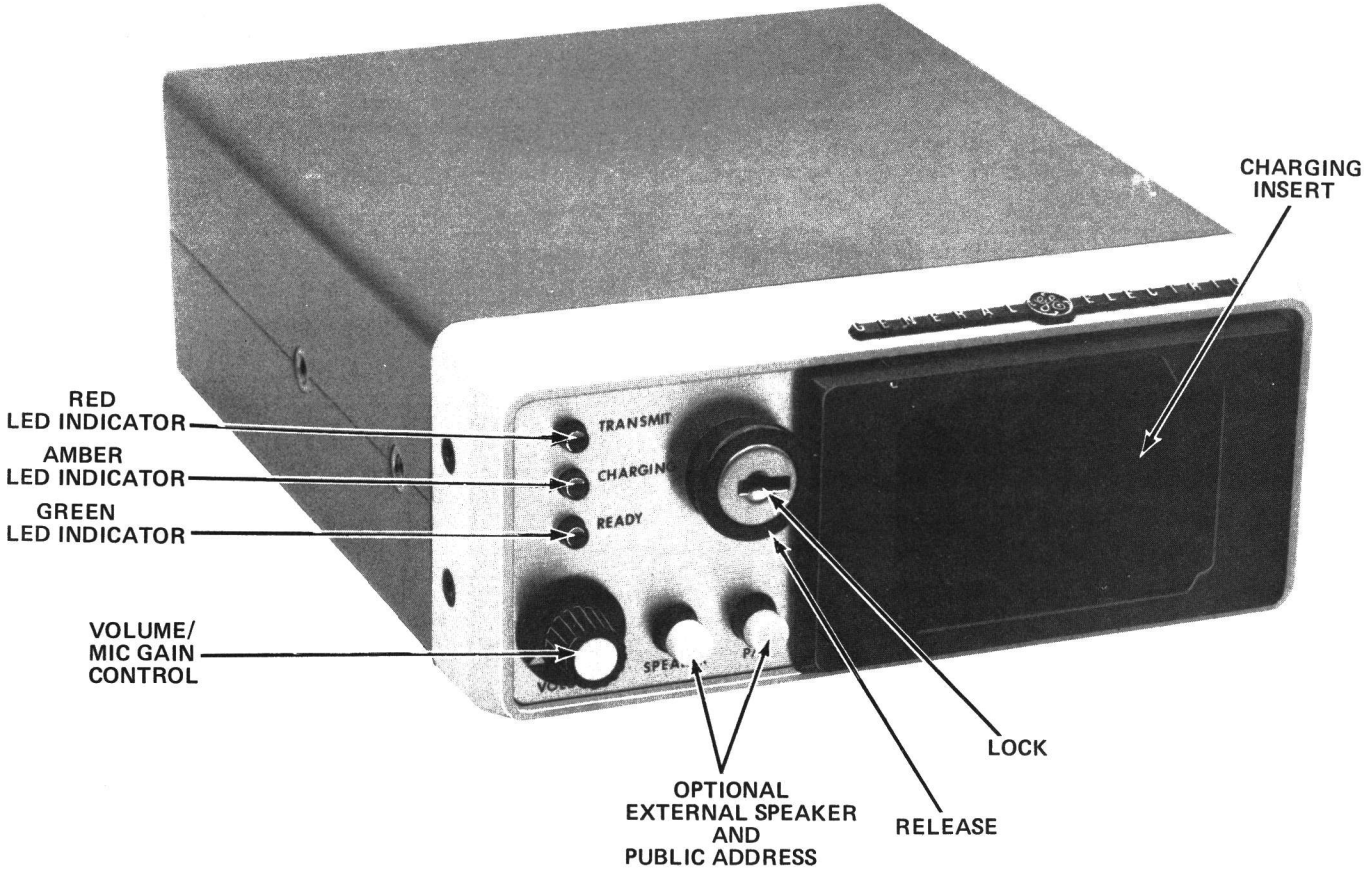


Figure 1 - Vehicular Charger

Temperature cut-off IC U1 monitors the temperature of both the charging insert, through thermistor RT1, and the battery pack through a thermistor inside the battery pack. It also controls transistor Q1, through transistor Q2, turns the "READY" indicator on when the battery pack is fully charged and provides memory to prevent the same battery pack from being recharged at the high rate.

Thermistors RT1 and RT Battery are connected with R7 and R8 to form a bridge circuit (see Figure 2). The outputs of the bridge circuit are connected to terminals 2 and 14 of U1. When a battery pack is in the charging insert and U1 senses the bridge to be in a nearly balanced condition, the high rate of charge is enabled. When the battery pack is removed from the charging insert RT Battery is removed from the bridge circuit causing the bridge to be unbalanced. U1 senses the bridge to be unbalanced, the voltage on U1-14 being much larger than the voltage on U1-2, and the charger memory is reset.

When the battery pack temperature is more than 10°C below ambient, thermistor RT Battery is a high resistance and the voltage on U1-14 is larger than the voltage on U1-2 just as though no battery pack were present. There is no output from U1-6 or U1-5. Transistor Q1 and LED "READY" indicator CR2 remain off. The battery pack charges at a trickle charge rate, determined by series resistance R3 and diode CR4, until the temperature is less than 10°C below ambient. At less than 10°C below ambient, the voltage at U1-14 and U1-2 are nearly equal and the output at U1-6 goes high causing transistor Q2 to conduct turning Q1 on beginning the high charge rate. As the battery pack temperature increases 10°C above ambient during overcharge, the voltage at U1-2 becomes larger than the voltage at U1-14 causing U1-6 to go low. U1-6 going low causes Q2 to stop conducting. Q1 cuts off and the charge rate switches from the high charge rate to the trickle charge rate. The larger voltage on U1-2 also causes U1-5 to go high. The high output on U1-5 causes transistor Q3 to conduct and CR2 to light. A memory circuit inside of U1 is set so that the same battery pack cannot be recharged at the high charge rate unless it is first removed from the charging insert to reset the memory.

2.5 Watt Audio Amplifier

Receiver audio is coupled through con-

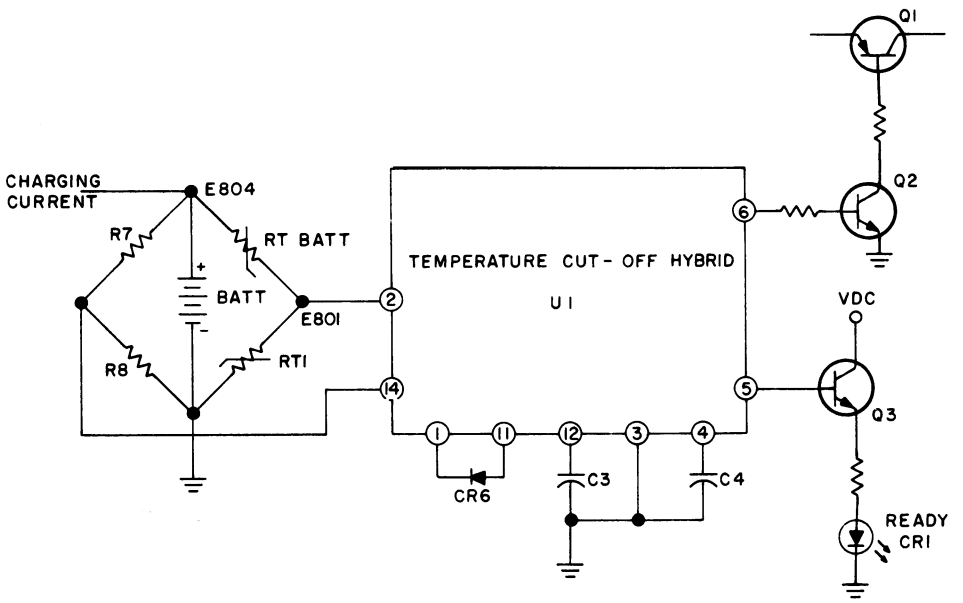


Figure 2 - Simplified Temperature Cut-off Circuit

tact E811 on charging insert A802 and volume control R4 to J3-6 of the charger. J1 of audio amplifier 19B226789G1 plugs into J3, mounting the amplifier inside of the charger.

Receiver audio at J1-6 of the audio amplifier is coupled to Pin 7 of operational amplifier AR1. AR1 produces 2.5 watts of audio at J1-3.

The audio at J1-3 is coupled through J3-3 to J2-4. Audio at J2-4 is connected through P801-1 to J804-2 then to an external speaker.

15 Watt Audio Amplifier (Optional)

J1 of 15 watt audio amplifier 19B226782G2 plugs into J3 mounting inside the charger the same as the 2.5 watt audio amplifier. Receiver audio is connected to J1-6.

The receiver audio at J1-6 is coupled through audio transformer T1 to push-pull, Darlington connected, power amplifier circuit Q3 and Q4. 15 Watts of audio is applied from audio output transformer T2 to J1-3.

External Speaker and Public Address (Optional)

External Speaker and Public Address option board 19C321515G1 adds two push-push switches to front assembly 19D423353G3 of the vehicular charger and an external speaker connection on the rear assembly. Push-push switch S2 labeled "SPEAKER" switches receiver audio to an external speaker. Push-push switch S1 labeled "PA" connects the mobile microphone to the audio amplifier through a pre-amplifier circuit and switches the speaker to external. The volume control on the front assembly of the charger controls microphone gain.

External speaker option board 19C321515G2 adds push-push switch S2, labeled "SPEAKER," to front assembly 19D423353G2 of the vehicular charger and an external speaker connection on the rear assembly. Switch S2 switches receiver audio to an external speaker.

System

The vehicular charger is used in a negative ground system only. To use the charger in a positive ground system, positive ground converter 4EP54A10 must be used. Refer to the Table of Contents.

INSTALLATION

CHARGER

When installing the charger, speaker and microphone in a vehicle, select mounting locations that will prevent injury to the occupants in case of an accident.

Install the charger where it will be within convenient reach of the operator, and where it will not interfere with the safe operation of the vehicle. The charger

is normally mounted on the underside of the instrument panel.

To mount the charger:

1. Use the mounting bracket as a template and drill the two pilot holes with a #29 (9/64-inch) drill.

2. Attach the bracket to the mounting surface with the #10 x 5/8-inch self-tapping screws and lockwashers provided.

3. Mount the charger in the mounting bracket with the four machine screws and lockwashers provided.

4. Connect the Red fused lead to battery plus, and the Black lead to battery negative. Leave sufficient slack so that the charger may be pulled out of its case for servicing with the power applied.

SPEAKER

Mount the speaker where it will direct sound to the operator but not interfere with his vision, and the safe operation of the vehicle. In exposed locations or areas of high humidity, mount the speaker so that moisture will not accumulate in the speaker cone.

The universal mounting bracket enables the speaker to be mounted on the top or bottom of the instrument panel, on the firewall above the windshield in trucks, or behind the speaker grille in some vehicles.

To mount the speaker:

1. Use the mounting bracket as a template and drill three mounting holes with a #29 (9/64-inch) drill.

2. Attach the bracket to the mounting surface with the #10 x 5/8-inch self-tapping screws supplied with the unit.

3. Attach the speaker to the mounting bracket and connect the speaker plug to the speaker jack on the back of the charger.

MICROPHONE

Mount the microphone where it will be within easy reach of the operator but will not interfere with the safe operation of the vehicle.

To mount the microphone:

1. Use the microphone bracket as a template and drill two mounting holes with a #32 (1/8-inch) drill.

2. Attach the bracket to the mounting surface with the two #8 x 1/2" screws provided.

3. Connect the microphone plug to the jack on the bottom of the charger.

ANTENNA

Installation instructions for the antenna are packaged with the antenna. The antenna must be installed in accordance with good engineering practice for optimum results.

MAINTENANCE

Disassembly

To gain access to the charger circuitry for servicing, remove the four Phillips-head screws in the rear of the housing and slide the charger from the housing.

The 2.5 watt audio amplifier board A807 or the optional 15 watt audio amplifier board A806 may be removed for servicing by removing two screws and unplugging the boards from J3 of printed circuit board A801.

To remove printed circuit board A801 for servicing, remove the six Phillips-head screws holding A801 and carefully lift A801 out, disconnecting from LED indicator board A803, speaker connector P801 or external speaker and public address option board A804/A805.

To remove LED indicator board A803 without first removing A801, remove the two screws in each side of the front assembly and remove the assembly unplugging A801 from A803. Remove the two Phillips-head screws holding A803 in the front assembly and lift A803 out.

Troubleshooting

Should a difficult service problem arise, the Troubleshooting Procedure listed in the Table of Contents is provided to assist the service technician.

IGNITION SWITCH CONTROL

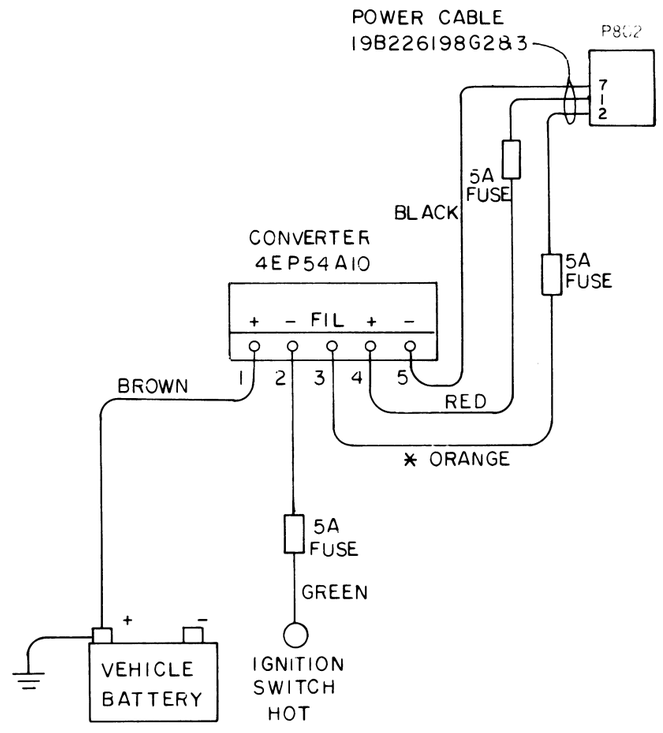


FIG. 1

IGNITION SWITCH BY-PASS

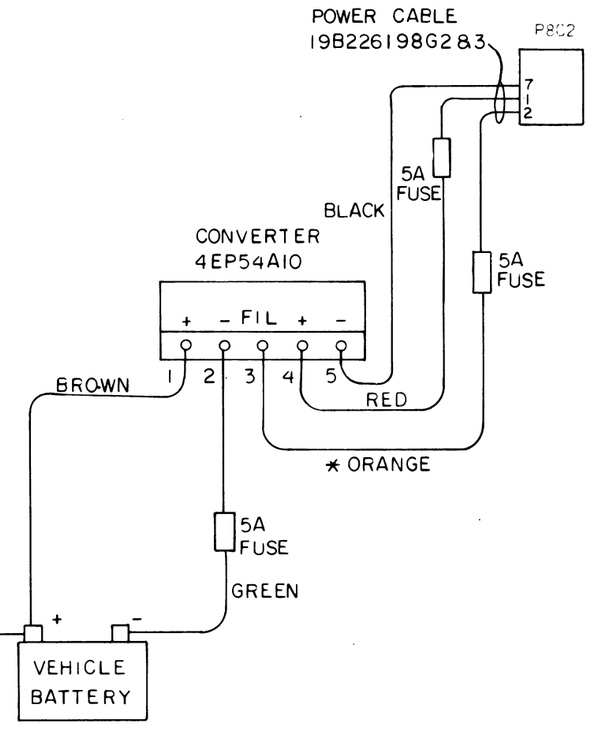


FIG. 2

USED WITH OPTION 4633 ONLY
(15 WATT AUDIO AMP)

MODIFICATION INSTRUCTIONS

NOTE: This modification kit to be used only when Option 4633 (15 W audio P.A.) is present and where the mobile system operates with POSITIVE ground.

1. **On A801 remove jumper from H7 to H8 and H9 to H10.**
2. **Connect Jumper from H9 to H8 on A801.**
3. **Insert Jumper PL19A130730G1 into H7 and solder. Insert terminal end of wire into J802-2.**

(19A130731, Rev. 2)

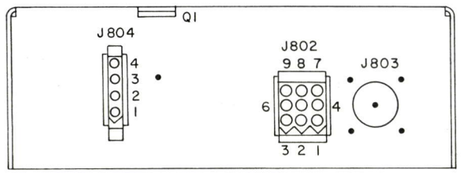
INSTRUCTIONS:

1. MOUNT CONVERTER TO INSIDE WALL OR IN ENGINE COMPARTMENT, WITH 3 SCREWS FURNISHED.
2. MAKE IGNITION SWITCH CABLES AND CONVERTER CONNECTIONS PER APPLICABLE FIG. 1 OR 2 (TERMINALS FURNISHED WITH CONVERTER TO MAKE CONVERTER CONNECTIONS.)

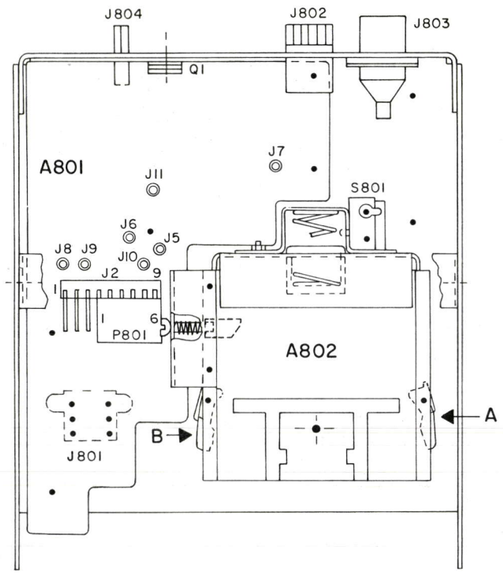
(19C321771, Rev. 1)

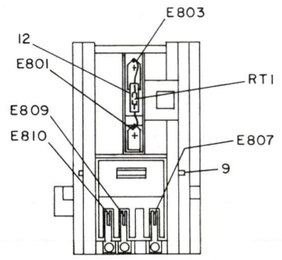
POSITIVE GROUND INSTALLATION INSTRUCTIONS

REAR ASSEMBLY
REAR VIEW

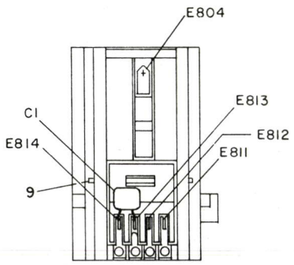


TOP VIEW



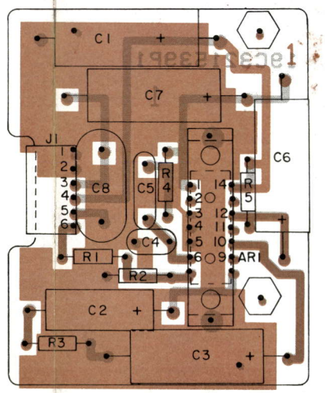


VIEW AT "B"



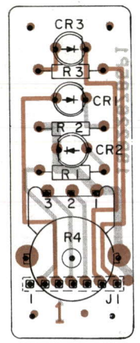
VIEW AT "A"

A807



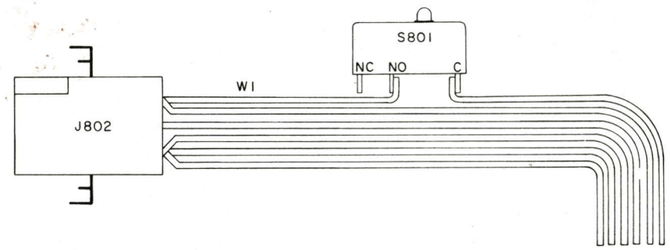
(19B226787, Sh. 2, Rev. 1)
(19B226787, Sh. 3, Rev. 1)

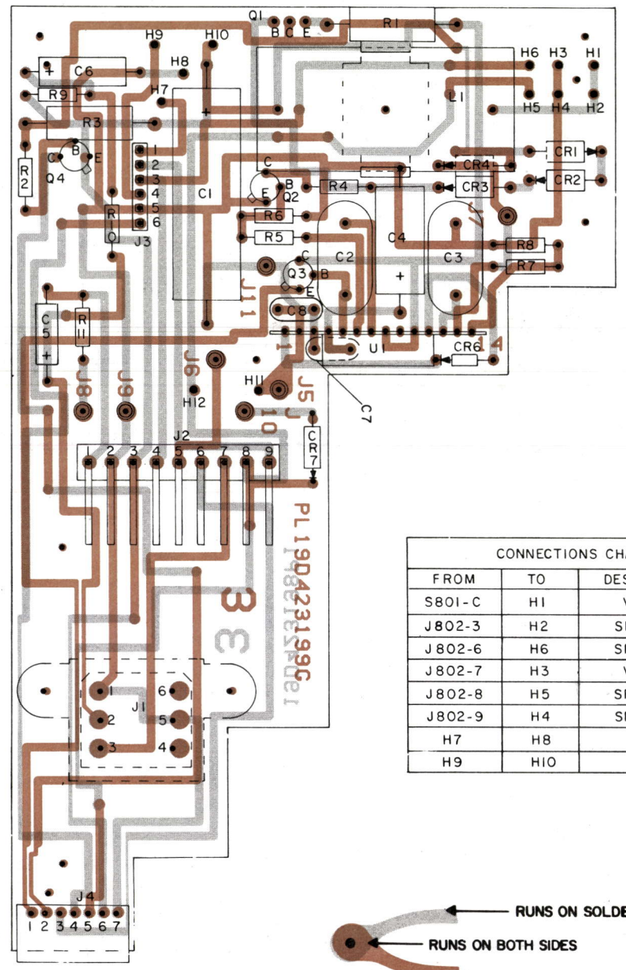
A803



(19B226784, Sh. 2, Rev. 1)
(19B226784, Sh. 3, Rev. 1)

A801



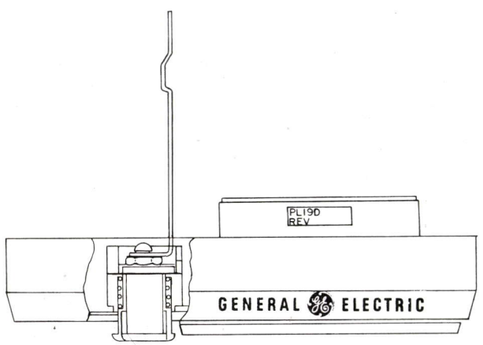


CONNECTIONS CHART		
FROM	TO	DESCRIPTION
S801-C	H1	V20-R
J802-3	H2	SF24-R
J802-6	H6	SF24-W-G
J802-7	H3	V20-BK
J802-8	H5	SF24-W-BL
J802-9	H4	SF24-BK
H7	H8	DA
H9	H10	DA

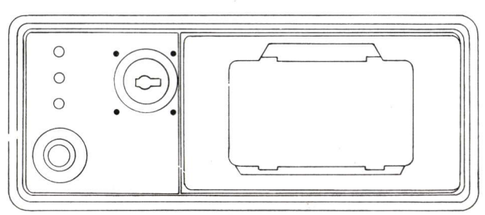
RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

(19C321512, Sh. 2, Rev. 3)
(19C321512, Sh. 3, Rev. 3)

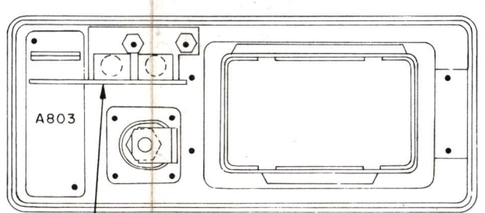
TOP VIEW



FRONT ASSEMBLY
FRONT VIEW



REAR VIEW

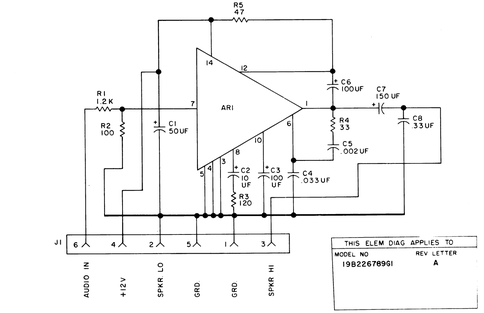


A804 (GROUP 2 ONLY)
A805 (GROUP 3 ONLY)

(19D423862, Rev. 4)

OUTLINE DIAGRAM

VEHICULAR CHARGER



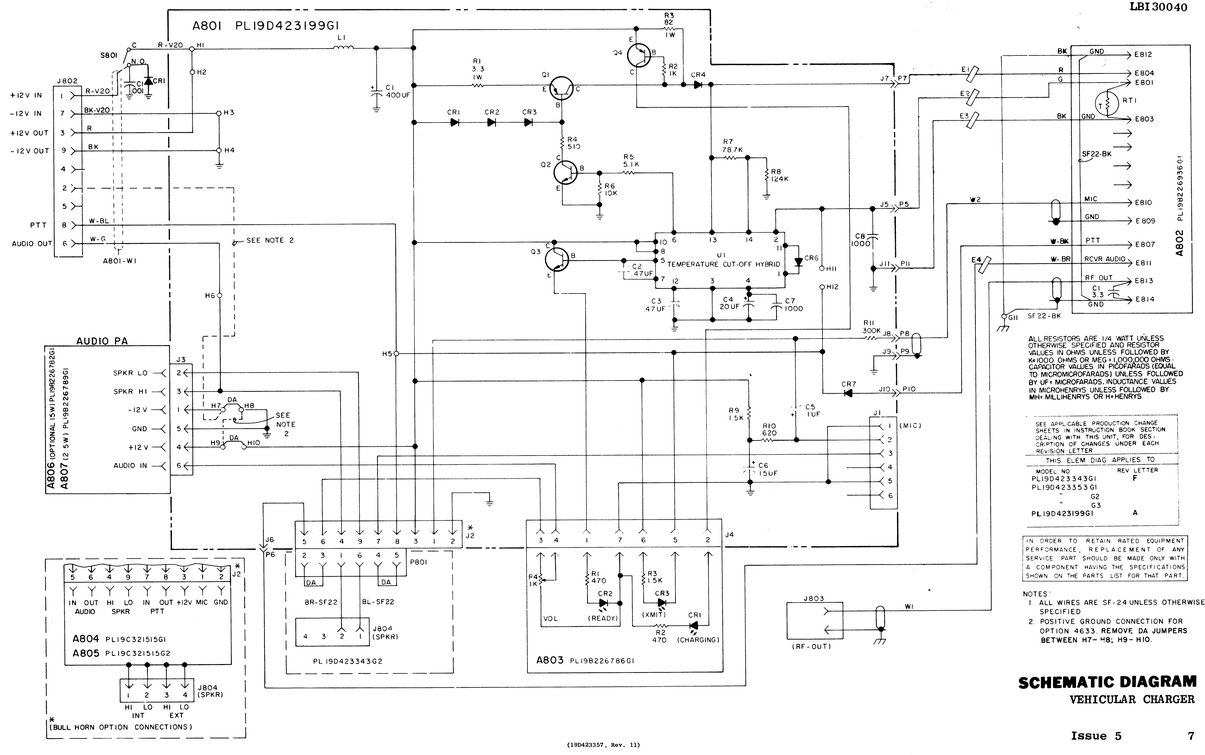
ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN MICROFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS, INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR 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.

(19B226919, Rev. 3)

SCHEMATIC DIAGRAM

2.5 WATT AMPLIFIER
19B226789G1 (A807)



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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
PL19D423343G1	F
PL19D423353G1	
" G2	
" G3	
PL19D423199G1	A

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.

NOTES:
1. ALL WIRES ARE SF-24 UNLESS OTHERWISE SPECIFIED
2. POSITIVE GROUND CONNECTION FOR OPTION 4633. REMOVE DA JUMPERS BETWEEN H7-H8; H9-H10.

(19D423357, Rev. 11)

SCHEMATIC DIAGRAM

VEHICULAR CHARGER

PARTS LIST

LBI30041E

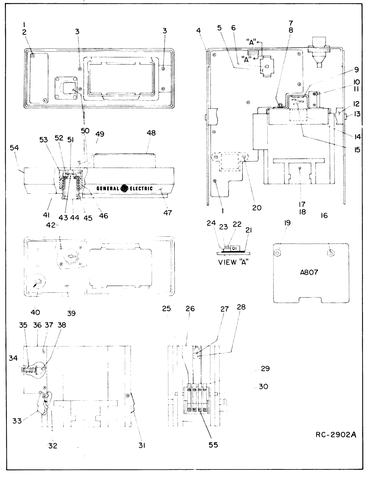
VEHICULAR CHARGER
AND
ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
		FRONT ASSEMBLY 19D423353G1 (STANDARD) 19D423353G2 (OPTIONAL EXT. SPEAKER) 19D423353G3 (OPTIONAL EXT. SPEAKER AND PUBLIC ADDRESS)
A803		COMPONENT BOARD 19B226788G1
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	19A134407P2	Diode, optoelectronic: yellow; sim to Monsanto MV5355.
CR2	19A134407P3	Diode, optoelectronic: green; sim to Monsanto MV5354.
CR3	19A134146P4	Diode, optoelectronic: red; sim to Opcoa LSR-6L.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1	19A134152P25	Connector, printed wiring; sim to Molex 22-03-2071.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3B1529471J	Composition: 470 ohms ±5%, 1/4 w.
R3	3B1529152J	Composition: 1.5K ohms ±5%, 1/4 w.
R4	19B209296P13	Variable, carbon film: 1K ohms ±20%, 0.1 w; sim to CTS Type 295-250 BZ.
A804	19C32151SG1	External Speaker and Public Address. (See Table Of Contents).
A805	19C32151SG2	External Speaker. (See Table Of Contents).
		REAR ASSEMBLY 19D423343G1
A801		COMPONENT BOARD 19D423199G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A115680P24	Electrolytic: 400 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C2 and C3	19A116080P11	Polyester: 0.47 µf ±10%, 50 VDCW.
C4	19A115680P3	Electrolytic: 20 µf +150% -10%, 25 VDCW; sim to Mallory Type TT4.
C5	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C6	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C7	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C8*	5494481P21	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV A.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR4	4037822P1	Silicon, 1000 mA, 400 PIV.
CR5	19A115100P1	Silicon; sim to Type 1N458A.
CR6 and CR7		
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1	19B219627G4	Connector: 6 contacts.
J2	19A116859P31	Connector, printed wiring: 9 contacts; sim to Molex 2373-9A.
J3	19A134152P24	Connector, printed wiring; sim to Molex 22-03-2061.

SYMBOL	GE PART NO.	DESCRIPTION
J4	19A134152P34	Connector, printed wiring; sim to Molex 22-02-1031.
J5 thru J11	4033151P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19A115894P1	Audio freq: 1.0 mh ind., 0.35 ohms DC res.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A114375P1	Silicon, PNP.
Q2 and Q3	19A115910P1	Silicon, NPN; sim to Type 2N3904.
Q4	19A116525P1	Silicon, PNP; sim to Type 2N3906.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	5490205P4	Composition: 3.3 ohms ±5%, 1 w.
R2	3B1529102J	Composition: 1K ohms ±5%, 1/4 w.
R3	3B7898Z0J	Composition: 82 ohms ±5%, 1 w.
R4	3B1529511J	Composition: 510 ohms ±5%, 1/4 w.
R5	3B1529512J	Composition: 5.1K ohms ±5%, 1/4 w.
R6	3B1529103J	Composition: 10K ohms ±5%, 1/4 w.
R7	19C314256P27R72	Metal film: 78.70K ohms ±1%, 1/4 w.
R8	19C314256P21243	Metal film: 124K ohms ±1%, 1/4 w.
R9	3B1529J52J	Composition: 1.5K ohms ±5%, 1/4 w.
R10	3B1529621J	Composition: 620 ohms ±5%, 1/4 w.
R11	3B1529306J	Composition: 300K ohms ±5%, 1/4 w.
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1	19D423164G1	Temp Cut Off Hybrid.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1		CABLE ASSEMBLY 19B226889G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5494481P1.	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1*	4037822P1	Silicon. Added by REV D.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J802	19B209288P3	Receptacle: sim to Molex 12928.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S801	19A116076P1	Sensitive: SPDT, 5 amp at 24 VDC or 5 amp at 250 VRMS; sim to Microswitch 111SM-T2.
	19B209288P29	Shell.
	4033714P14	Solderless terminal.
A802*		SLEEVE ASSEMBLY 19B226893G2 (Added by REV E)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116146P3	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1* thru E34*	19A126140P3	Core, toroidal; sim to Stackpole 88-31959. Added to 19D423343G1 by REV A.
E4*	19A126140P3	Core, toroidal; sim to Stackpole 88-31959. Added to 19D423343G1 by REV C.
E801	19B216916P1	Contact.
E803 and E804	19B2.6916P1	Contact.
E807	19B226199G1	Contact, strap.
E809 thru E814	19B226199G1	Contact, strap.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J803		(Part of W1).
		- - - - - - - - - - PLUGS - - - - - - - - - -
P5 thru P8	402984OP2	Contact, electrical: sim to Amp 42827-2.
P9	402984OP1	Contact, electrical: sim to AMP 41854.
P10 and P11	402984OP2	Contact, electrical: sim to Amp 42827-2.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	19C30004B96	Disc: 50K ohms ±10%; sim to NL Ind. 4D103.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1*	19A127521G7	RF: approx 1 foot long. (Includes J803). Is REV D and earlier:
	19A127521G6	RF: approx 5-1/2 inches long. (Includes J803).
W2	19B209044A9.9	RF: approx 12 inches long.
A802*		SLEEVE ASSEMBLY 19B226893G1 (Deleted by REV E)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116146P12	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM.
		- - - - - - - - - - TERMINALS - - - - - - - - - -
E1* thru E34*	19A126140P3	Core, toroidal; sim to Stackpole 88-31959. Added to 19D423343G1 by REV A.
E4*	19A.26140P3	Core, toroidal; sim to Stackpole 88-31959. Added to 19D423343G1 by REV C.
E801	19B216916P1	Contact.
E803 and E804	19B2.6916P1	Contact.
E807	19B226199G1	Contact, strap.
E809 thru E814	19B226199G1	Contact, strap.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J803		(Part of W1).
		- - - - - - - - - - PLUGS - - - - - - - - - -
P5 thru P8	402984OP2	Contact, electrical: sim to Amp 42827-2.
P9	402984OP1	Contact, electrical: sim to AMP 41854.
P10 and P11	402984OP2	Contact, electrical: sim to Amp 42827-2.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	19C30004B96	Disc: 50K ohms ±10%; sim to NL Ind. 4D103.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1*	19A127521G7	RF: approx 1 foot long. (Includes J803). Is REV D & earlier:
	19A127521G6	RF: approx 5-1/2 inches long. (Includes J803).
W2	19B209044A9.9	RF: approx 12 inches long.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J804	19B209288P17	Connector: sim to Molex Products 14908.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P801	19A116659P19	Connector, printed wiring; sim to Molex 09-50-3061.

SYMBOL	GE PART NO.	DESCRIPTION
		ASSOCIATED ASSEMBLIES
A807		2-1/2 WATT AUDIO AMPLIFIER 19B226789G1
A81	19A134064P1	Integrated Circuit, Digital: sim to Fairchild µT06 SG5-T9A 9413.
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A115680P4	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
C2	19A115680P8	Electrolytic: 10 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
C3	5496267P16	Tantalum: 100 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C4	19A116080P104	Polyester: 0.033 µf ±10%, 50 VDCW.
C5	5494481P14	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C6	5496267P16	Tantalum: 100 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C7	5496267P12	Tantalum: 150 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C8	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1	19A134152P33	Connector, printed wiring; sim to Molex 22-02-1061.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1*	3B1529122J	Composition: 1.2K ohms ±5%, 1/4 w. Earlier than REV A:
	3B1529152J	Composition: 1.5K ohms ±5%, 1/4 w.
R2	3B1529101J	Composition: 100 ohms ±5%, 1/4 w.
R3	3B1529121J	Composition: 120 ohms ±5%, 1/4 w.
R4	3B1529330J	Composition: 33 ohms ±5%, 1/4 w.
R5	3B1529470J	Composition: 47 ohms ±5%, 1/4 w.
		SPEAKER 19C32030G6
		- - - - - - - - LOUDSPEAKERS - - - - - - - -
LS1	19A116994P1	Permanent magnet: 5 inch, 8 ohms ±10% imp; 20 w max operating; sim to Oaktron5EU2189-2.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1		(Part of W4).
		- - - - - - - - - - CABLES - - - - - - - - - -
W4	19A130648G1	Power Cable. (Includes P1).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	19B219692G1	Grille.
	19B227593G1	Housing.
	19C320016P1	Mounting Bracket.
	19A116986P108	Screw, thread forming, assembled washer; Phillips Pozidriv®, HI-LO® thread: No. 7-19 x 1/2. (Secures LS1).
	19A116986P112	Screw, thread forming, assembled washer; Phillips Pozidriv®, HI-LO® thread: No. 7-19 x 3/4. (Secures cover to housing).
	N187P1601OC6	Machine screw: No. 10-32 x 5/8. (Secures mounting bracket to housing).
		CHARGING CABLE 19B226189G2
		- - - - - - - - - - FUSES - - - - - - - - - -
F1	1B16P8	Quick blowing: 5 amps at 250 v; sim to Littelfuse 312025 or Bussmann MTH-5.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1	19B209288P4	Plug: sim to Molex Products Co. 12929-.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XF1		FUSE LEAD 19A122111G1
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	19A115776P2	Fuseholder, phenolic: sim to Bussmann Type HHJ.
		MISCELLANEOUS
	19A.2189IG7	Cover. (CHARGER).
	NP2T9990	Combination Nameplate.
	19A121902G1	Mounting Bracket. (CHARGER).
	5491468Z94	Key.
	7141414G2	Nike Bracket.
		MECHANICAL PARTS (SEE RC2902)
1	N809P0040C6	Machine screw, Phillips head: No. 4-40 x 1/4.
2	7142162P65	Spacer.
3	N134A9P05C6	Tap screw, Phillips POZIDRIV®: No. 4-24 x 5/16.
4	19B226933G1	Support.
5	7118718P10	Clip, spring tension: sim to Prestole E-50019-003. (Used with L1 on A801).
6	19B200525P153	Rivet, tubular. (Secures L1 clip on A801).
7	7141225P2	Hex nut: No. 4-40.
8	N404P1C6	Lockwasher, internal tooth: No. 4.
9	19B226870G1	Rear cap.
10	N845007C6	Machine screw, Phillips head: No. 2-56 x 7/16.
11	7135118P2	Terminal, solderless. (Not Used).
12	19A130733G1	Support.
13	19B209209P304	Tap screw, Philips Pozidriv: No. 6-32 x 1/4.
14	19B226873P1	Ejector.
15	19A130623P1	Spring.
16	NHOP0306C6	Machine screw, philips head: No. 6-32 x 3/8.
17	19A116773P105	Tap screw, Phillips POZIDRIV®: No. 7-19 x 5/16.
18	N404P13C6	Lockwasher, internal tooth: No. 6.
19	5491541P207	Spacer, threaded: 6-32 x 1-1/8.
20	N300P1906F22	Metallic eyelet. (Used with J801 on A801).
21	19A116023P3	Insulator, plate. (Used with Q1 on Rear Assembly).
22	NHOP0306C6	Machine screw, Philips head: No. 4-40 x 3/8.
23	4029846P1	Hex nut, self-locking: No. 4-40.
24	19A134016P1	Insulator, bushing. (Used with Q1 on Rear Assembly).
25	19B226936G2	Sleeve.
26	N134A9P03C	Tap screw, Phillips POZIDRIV®: No. 2-32 x 3/16.
27	19C327044P1	Contact.
28	19D423939P2	Lever Assembly. (E811-E814 side).
29	19C327032P1	Contact.
30	19B227847P1	Spring.
31	N136A9P03C	Tap screw, Phillips POZIDRIV®: No. 2-32 x 3/16.
32	19A.2784991	Pin.
33	19D423939P1	Lever Assembly. (E807, E809, E810 side).
34	19B226891P1	Screw, nut head: No. 4-40 x 7/8.
35	19A115062SP1	Spring.
36	19B226885P1	Guide.
37	N136A9P04C6	Tap screw, Phillips POZIDRIV®: No. 4-24 x 1/4.
38	19A137319P1	Latch.
39	NP2T9986	Nameplate, aluminum. (STANDARD).
	NP2T9985	Nameplate, aluminum. (OPTIONAL EXTERNAL SPEAKER).
	NP2T9984	Nameplate, aluminum. (OPTIONAL EXTERNAL SPEAKER AND PUBLIC ADDRESS).
40	19B209527P1	Knob. (R4- VOLUME CONTROL).
41	19A130622P1	Spring.
42	19A134424P1	Tap screw, Phillips Posidriv: No. 5-20 x 3/4.
43	19B226889P8	Screw, hex head: No. 1/4-28 x 1/4 with 6-32 tap center tap.
44	5491682P25	Rim lock.
45	19C321643P1	Pushbutton.
46	19B226880P1	Sleeve.
47	19B209527P1	Identification Plate. (GENERAL ELECTRIC).
48	19D413783P1	Sleeve.
49	19B226911P1	Cam.
50	19B226846P1	Cam.
51	N910P1BC6	Retaining ring.
52	5493636P5	Washer, spring tension.
53	19B226886P1	Cap.
54	19A130627G1	Casting.



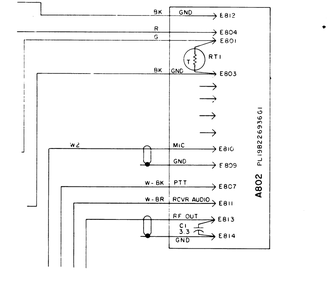
PRODUCTION CHANGES

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 those revisions.

REV. A - Rear Assembly 19D423343G1

To improve performance. Added Ferrite bead, green wire, terminal and hole.

Schematic Diagram Was:



REV. B - To improve power output. Added black wire between P812 and P814.

REV. A - 2.5 Watt Amplifier 19B226788

To improve audio sensitivity. Changed R1.

REV. B - Rear Assembly 19D423343G1

To improve power output. Added 68 Ω black wire between E812 and E814.

REV. C - To improve RF performance. Added E4.

REV. D - To provide reverse polarity protection. Added CR1.

REV. E - To change interface contacts. Changed A802.

REV. A - Component Board 19D423199G1

To prevent RF interference. Added CR.

REV. F - Rear Assembly 19D423343G1

To increase accessory current travel preventing intermittent operation during worse case conditions. Added material to contact actuating levers at area where levels apply pressure to contacts. New parts will be marked with "F" added above the existing part number.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

TROUBLESHOOTING PROCEDURE

test circuit shown can be used to simulate battery itions and determine if the charger is working Switch S1 simulates battery pack temperature n temperature, closed-hot battery pack). Switch charger logic, the same as removing the battery the charging insert.

ect the test circuit as shown on the diagram. In- ttery pack into the charging insert. Use the logic voltage readings on the diagram to determine the ondition of the charger.

he charger works properly with the test circuit, ith the battery pack, check thermistors RT1 and RT Each should measure approximately 50 K ohms at erature (25°C).

ure the battery pack is fully inserted into the ging insert and all contacts are made before ubleshooting.

ecks:

Amber LED does not light, check fuse, Q4 and CR1.

Red LED does not light when PTT is pushed, check CR3.

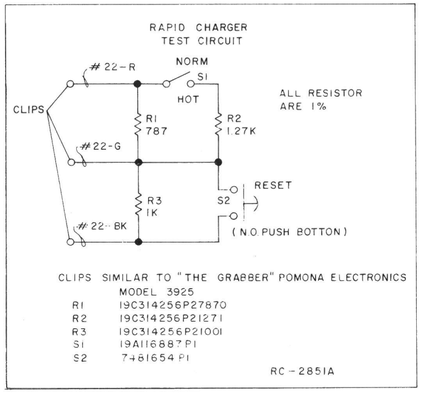
If a known good battery pack has been charging and the charger fails to shut-off (READY light does not come on) at the end of the charge time, check Q1, Q2, Q3 and CR2.

U1-11 always high, logic will not reset, check C2.

U1-6 always low, no high rate of charge, check C3.

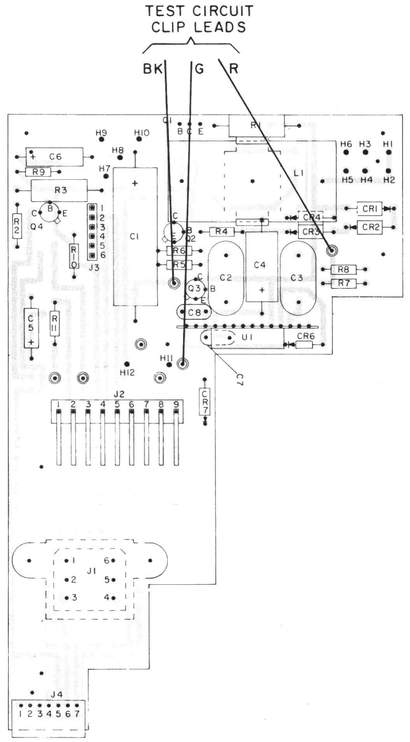
U1-5 always low, logic will not reset, check C4.

No high rate of charge, check for open CR4.

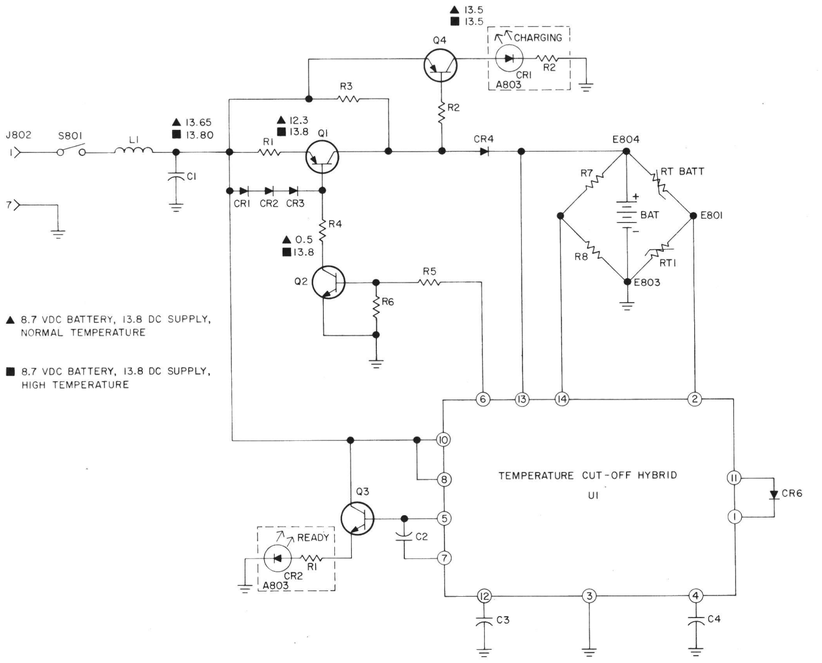


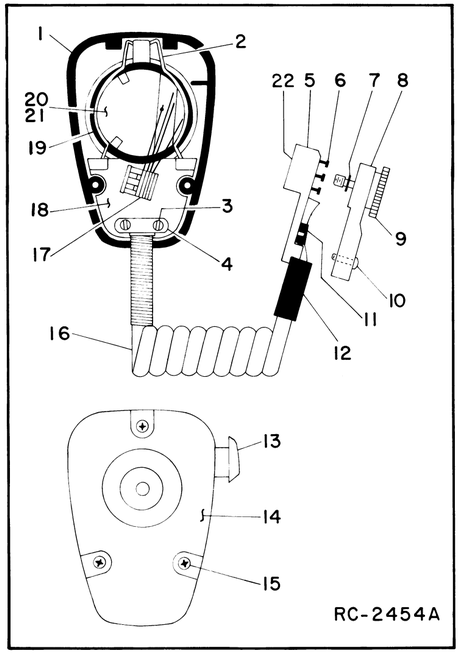
TEST BATTERY CONDITION	U1 PIN				TEST CKT SWITCH POSITION	
	11	4	6	5	S1	S2
No Battery	High	Low	Low	Low	Norm	Closed
Cold Battery	High	Low	Low	Low	Norm	Closed
Normal Battery Charging	Low	High	High	Low	Norm	Open
Charged Battery	Low	Low	Low	High	Hot	Open
Hot Battery Just Inserted	Low	Low	Low	Low	Hot	Open

LOW = PIN VOLTAGE <1.0 VOLTS
HIGH = PIN VOLTAGE >3.0 VOLTS



(RC2918)
(19D423862, Rev. 4)
(19C321512, Sh. 2, Rev. 3)





PARTS LIST

LBI-4481B

TRANSISTORIZED DYNAMIC MICROPHONE
19C320270G1, G2
(SEE RC-2454)

SYMBOL	GE PART NO.	DESCRIPTION
1		Front Case Assembly. RP127. (includes items 14, 15).
2		Retaining spring. (Part of item 18).
3		Tap screw, phillips. (Part of item 16).
4		Retaining bar. (Part of item 16).
5	19D416766P1	Connector base.
6	19A129435P1	Contact.
7	7109043P1	Retaining ring.
8	19D416767P1	Connector cover.
9	19B219723G1	Screw.
10	N136AP905C	Tap screw, phillips: No. 4 x 5/16.
11	19A116937P1	Cable clip.
12	19B219749P1	Strain relief.
13		Switch button kit. RP126.
14		Rear Case Assembly. (Part of item 1).
15		Tap screw, phillips. (Part of item 1).
16	19C321016G1	Cable assembly: Includes items 3-12 and cable RP129.
17		Switch Assembly. RP128.
18		Grille Assembly. RP130. (includes items 2, 19, 21).
19		"O" Ring. (Part of item 18).
20		Transistorized Cartridge. RP117.
21		Washer. (Located under cartridge- part of item 18).
22	19C321016G3	Connector assembly: Includes items 5-12.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

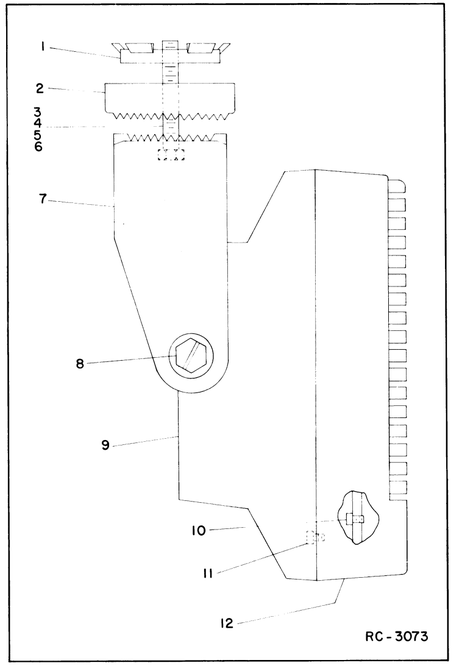
PARTS LIST

LBI-30291

SPEAKER
19C320302G6

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - LOUDSPEAKERS - - - - - - - - -
LS1	19A116694P1	Permanent magnet: 5 inch, 8 ohms ±10% imp, 20 w max operating; sim to Oaktron 5EU2189-2.
		- - - - - - - - - - - CABLES - - - - - - - - - -
W4		CABLE ASSEMBLY 19A130648G1
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P1		Connector. Includes:
	19B209288P16	Shell.
	5496809P18	Connector: male contact: sim to Molex Products 1380-T. (Quantity 2).
		MECHANICAL PARTS (SEE RC-3073)
1	19B219578G1	Safety release disc.
2	19C320022P1	Retaining bracket.
3	N187P16010C6	Screw, hexhead, slotted: No. 10-32 x 5/8. (Quantity 1, used with safety release disc and retaining bracket).
4	N130P16012C6	Tap screw, hexhead, slotted: No. 10-16 x 3/4. (Quantity 3, used without safety release disc and retaining bracket).
5	N130P16024C6	Tap screw, hexhead, slotted: No. 10-16 x 1-1/2. (Quantity 3- Used with thick carpet mounting).
6	N402AP9C6	Flatwasher: No. 10. (Used with item 5).
7	19C320016P1	Mounting bracket.
8	N189P16010C6	Machine screw: No. 10-32 x 5/8.
9	19B227593G1	Housing.
10	19A116986P108	Tap screw, with lockwasher: No. 7-19 x 1/2. (Secures speaker LS1 to housing).
11	19A116986P112	Tap screw, with lockwasher: No. 7-19 x 3/4. (Secures grille to housing).
12	19B219692G1	Grille.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



SERVICE SHEET

MICROPHONE 19C320270G1 & G2

PARTS LIST

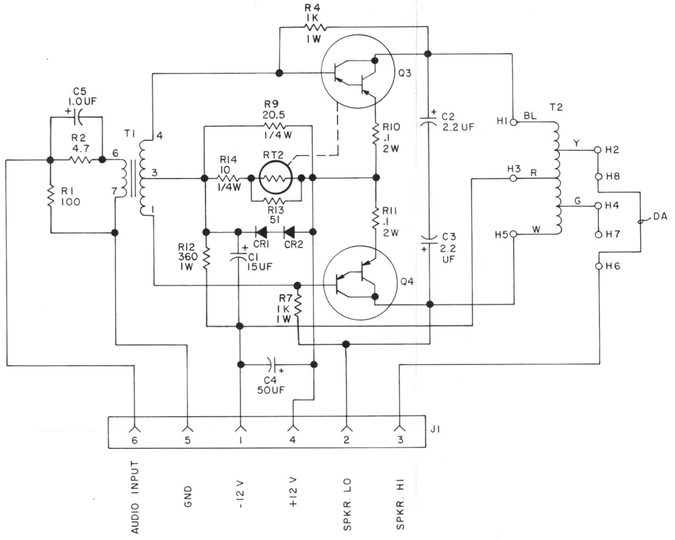
A806

15 WATT AMPLIFIER
19B226782G2

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C2 and C3	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C4	19A115680P4	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
C5	19A134202P14	Tantalum: 1 µf ±20%, 35 VDCW.
		- - - - - - - - - - DIODES AND RECTIFIERS - - - - -
CR1 and CR2	4037822P1	Silicon, 1000 mA, 400 PIV.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1	19A134152P33	Connector, printed wiring: 6 contacts; sim to Molex 22-15-2061.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q3	19A13032G4	Transistor, silicon, PNP. (Includes RT2- 5490828-P54).
Q4	19A134612P1	Silicon, PNP; sim to TIP-125.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P101J	Composition: 100 ohms ±5%, 1/2 w.
R2	7147161P13	Composition: 4.7 ohms ±5%, 1/2 w.
R4	3R78P102J	Composition: 1K ohms ±5%, 1 w.
R7	3R78P102J	Composition: 1K ohms ±5%, 1 w.
R9	19C314256P22059	Metal film: 20.5 ohms ±1%, 1/4 w.
R10 and R11	19B209022P89	Wirewound: 0.1 ohms ±5%, 2 w; sim to IRC Type BWH.
R12	3R78P361J	Composition: 360 ohms ±5%, 1 w.
R13	3R77P510J	Composition: 51 ohms ±5%, 1/2 w.
R14	3R152P100J	Composition: 10 ohms ±5%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT2	5490828P54	Thermistor: 50 ohms ±10%, color code blue; sim to Carborundum Type B08075-16.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19A134159P1	Audio freq: 300-4000 Hz, +1.0 dB max., Pri: 40 ohms ±10%, Sec: 60 ohms, 2.5 MADC.
T2	19A134167P1	Audio freq: 300-4000 Hz, +1 dB, 8.0 ohms, 50 MADC at 1000 Hz.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19A116023P3	Insulator, plate. (Used with Q3 & Q4).
	19A134016P1	Insulator, bushing. (Used with Q3 & Q4).
	4029846P1	Nut, self-locking, Hex: thd. 4-40NC-3B. (Used with Q3 & Q4).
	7160861P6	Nut, sheet spring: sim to Tinnerman C9028-4Z-157. (Secures T2).
	N136P965C6	Tap screw, phillips head: No. 4-24 x 5/16. (Secures T2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SCHEMATIC DIAGRAM

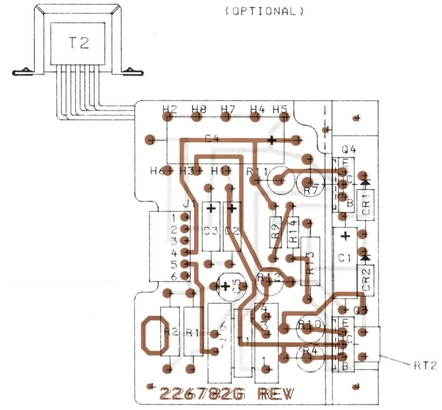


(19C328671, Rev. 0)

MODEL NO	REV LETTER
PL19B226782G2	

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.

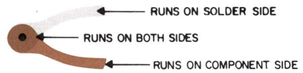
OUTLINE DIAGRAM



(19C328653, Rev. 0)
(19B232935, Sh. 1, Rev. 0)
(19B232935, Sh. 2, Rev. 0)

CONNECTION CHART			
FROM	TO	LENGTH	REMARKS
T2-BL	H1	6.75	♦STRIP&TIN .125±.03
T2-R	H3	6.50	♦STRIP&TIN .125±.03
T2-W	H5	6.00	♦STRIP&TIN .125±.03
T2-Y	H2	6.75	♦STRIP&TIN .125±.03
T2-G	H4	6.00	♦STRIP&TIN .125±.03
H8	H6		DA JUMPER

♦ ALL CONNECTIONS TO BE MADE ON SOLDER SIDE

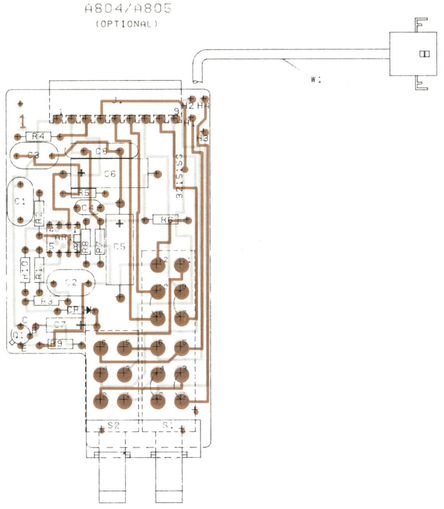


SERVICE SHEET

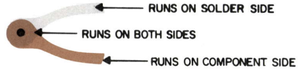
15 WATT AMPLIFIER
19B226782G2

Issue 1 11

OUTLINE DIAGRAM

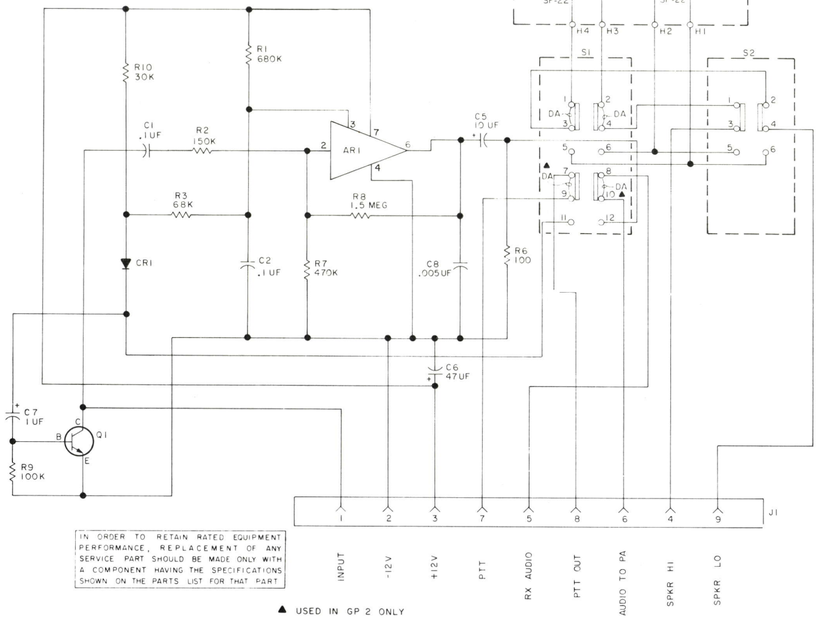


(19C327069, Rev. 0)
(19C321513, Sh. 2, Rev. 2)
(19C321513, Sh. 3, Rev. 1)



SCHEMATIC DIAGRAM

ALL RESISTORS ARE 1/4 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.

▲ USED IN GP 2 ONLY

(19D423314, Rev. 2)

PARTS LIST

LBI30067C

OPTIONAL EXTERNAL SPEAKER AND PUBLIC ADDRESS
A804 19C321515G1 (Part of Front End Assembly 19D423353G3)
A805 19C321515G2 (Part of Front End Assembly 19D423353G2)

SYMBOL	GE PART NO.	DESCRIPTION
AR1*	19A134659P1	Integrated circuit, linear: Power OP AMP; sim to Fairchild µA859H.
		Earlier than REV A:
	19A134247P2	Integrated circuit, linear: audio amplifier.
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C3*	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW. Deleted by REV A.
C4*	5494481P8	Ceramic disc: 470 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. Deleted by REV A.
C5	19A115680P8	Electrolytic: 10 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
C6	5496267P15	Tantalum: 47 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C7	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C8	19A116655P26	Ceramic disc: 5000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	19A116659P76	Connector, printed wiring: 9 contacts; sim to Molex 09-52-3091.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115910P1	Silicon, NPN; sim to Type 2N3904.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P684J	Composition: 680K ohms ±5%, 1/4 w.
R2	3R152P154J	Composition: 150K ohms ±5%, 1/4 w.
R3	3R152P683J	Composition: 68K ohms ±5%, 1/4 w.
R4* and R5*	3R152P682J	Composition: 6.8K ohms ±5%, 1/4 w. Deleted by REV A.
R6	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R7	3R152P474J	Composition: 470K ohms ±5%, 1/4 w.
R8	3R152P155J	Composition: 1.5 megohm ±5%, 1/4 w.
R9	3R152P104J	Composition: 100K ohms ±5%, 1/4 w.
R10	3R152P303J	Composition: 30K ohms ±5%, 1/4 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209575P1	Push: 4PDT, alternate action, 1.1 amp at 14 VDC; sim to Switchcraft 14S-7101.
S2	19B209575P2	Push: DPDT, alternate action, 1.1 amp at 14 VDC; sim to Switchcraft 14S-7099.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1		CABLE ASSEMBLY 19B226904G1
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J804	19B209288P17	Receptacle: 4 contacts; sim to Molex 03-09-1041. Includes:
	5496809P17	Contacts. (Quantity 4).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19B209575P102	Cap, push button. (Used with S1).
	19B209575P101	Cap, push button. (Used with S2).
	NP279985	Nameplate, faceplate. (Used with A805).
	NP279984	Nameplate, faceplate. (Used with A804).

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 - Component Board 19C321515G1

To incorporate a new operational Amplifier. Changed AR1 and deleted R4, R5, C3 and C4.

SERVICE SHEET

OPTIONAL EXTERNAL SPEAKER
AND PUBLIC ADDRESS
19C321515G1 & G2

PARTS LIST

LBI30068B

15 WATT AMPLIFIER A806
19B226782G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C2 and C3	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C4	19A115680P4	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TTX.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1	4037822P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	19A134152P33	Connector, printed wiring: sim to Molex 22-02-1061.
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q1	19A130324G1	Silicon, PNP. (Includes RT1).
Q2	19A116942P1	Silicon, PNP.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R77P101J	Composition: 100 ohms ±5%, 1/2 w.
R2	7147161P13	Composition: 4.7 ohms ±5%, 1/2 w.
R3*	19C314256P21589	Metal film: 15.5 ohms ±1%, 1/4 w. In REV A and earlier:
	19C3142562P1219	Metal film: 12.1 ohms ±1%, 1/4 w.
R4*	3R78P102J	Composition: 1K ohms ±5%, 1 w. In REV A:
	3R78P301J	Composition: 300 ohms ±5%, 1 w. Earlier than REV A:
	3R79P151J	Composition: 150 ohms ±5%, 2 w.
R5 and R6	19B209022P101	Wirewound: 0.27 ohms ±10%, 2 w; sim to IRC Type BWH.
R7*	3R78P102J	Composition: 1K ohms ±5%, 1 w. In REV A:
	3R78P301J	Composition: 300 ohms ±5%, 1 w. Added by REV A.
R8*	3R78P391J	Composition: 390 ohms ±5%, 1 w. Added by REV B.
		- - - - - - - - - - THERMISTORS - - - - - - - -
RT1	5490828P54	Thermistor: 50 ohms ±10%, color code blue; sim to Carborundum B0807J-16. (Part of Q1).
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T1	19A134159P1	Audio freq: 300-4000 Hz.
T2	19A134167P1	Audio freq: 300-4000 Hz.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19A116023P3	Insulator, plate. (Used with Q1 and Q2 on A806).
	19A134016P1	Insulator, bushing. (Used with Q1 and Q2 on A806).
	4029846P1	Nut, hex: No. 4-40. (Used with Q1 and Q2 on A806).
	7160861P6	Nut, sheet spring: sim to Tinnerman C9028-4Z-157. (Used with T2).
	N136P905C6	Tap screw, phillips head: No. 4-24 x 5/16. (Secures T2).

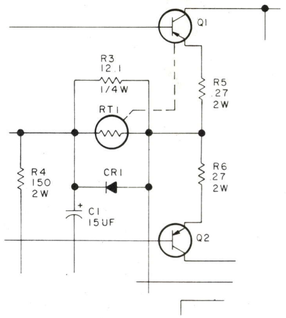
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PRODUCTION CHANGES

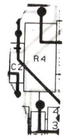
Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

REV. A - To improve audio.
Changed R4 and added R7

Schematic Diagram was:

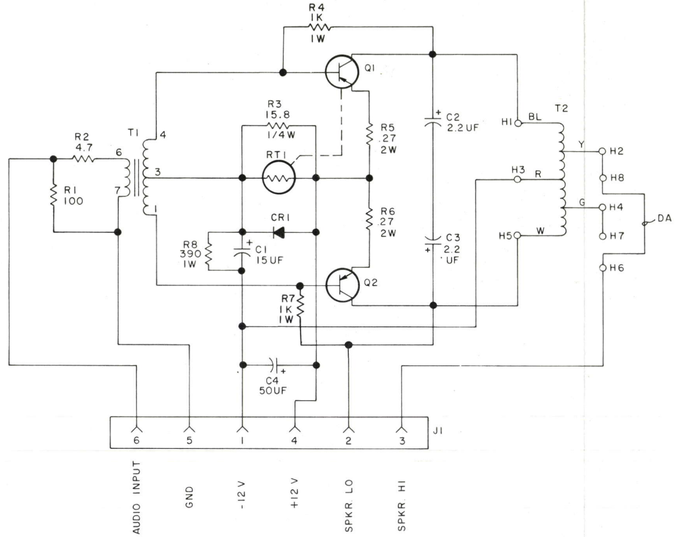


Outline Diagram was:



REV. B - To improve operation.
Changed R3, R4, and R7.
Added R8.

SCHEMATIC 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 PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

(19C321669, Rev. 4)

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

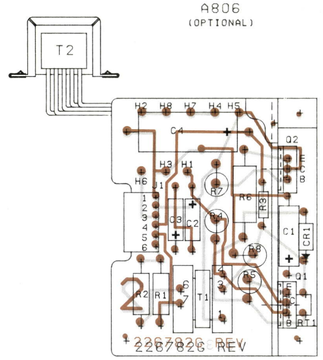
THIS ELEM DIAG APPLIES TO

MODEL NO	REV LETTER
PLI9B226782G1	B

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.

OUTLINE DIAGRAM

A806
(OPTIONAL)



CONNECTION CHART			
FROM	TO	LENGTH	REMARKS
T2-BL	H1	6.75	*STRIP&TIN .125±.03
T2-R	H3	6.50	*STRIP&TIN .125±.03
T2-W	H5	6.00	*STRIP&TIN .125±.03
T2-Y	H2	6.75	*STRIP&TIN .125±.03
T2-G	H4	6.00	*STRIP&TIN .125±.03
H8	H6		DA JUMPER

* ALL CONNECTIONS TO BE MADE ON SOLDER SIDE

(19C327070, Rev. 2)
(19B226783, Sh. 2, Rev. 2)
(19B226783, Sh. 3, Rev. 2)

RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

SERVICE SHEET
15 WATT AMPLIFIER
19B226782G1

Issue 3