General Electric Co.

	Model: LB-530	**Chassis:**	**Year:** Pre March 1942
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Riders Volume 13 - GE 13-36
Riders Volume 13 - GE 13-37
Riders Volume 13 - GE 13-38

GENERAL ELECTRIC CO.

To Charge Battery

The battery is charged by merely plugging the receiver power cord in the rated AC power outlet and turning the selector switch to "charge." Frequent check should be taken of the charge indicator and when all indicator balls are visible, the battery is fully charged. Charging the battery after all indicator balls are visible will not harm the battery except that it will evaporate the water faster. A completely discharged battery will be restored usually within 20 to 30 hours.

When operating the receiver from the AC house current, the battery is being charged at a slow rate. Thus if you wish to operate the receiver at the same time that you are charging even a fully discharged battery, plug the power cord in the AC receptacle and turn the power selector switch to the AC position. Prolonged and repeated operation on this position will assure that the battery is always maintained in a nearly fully charged condition.

Battery Operating Instructions

1. Add distilled or tap water in the filter cap at sufficiently frequent intervals to keep liquid level at indicator mark as viewed through opening in a battery case. DO NOT OVERFILL. The battery is available by removing the thumb screw on the left side of the battery case and removing the cover of the case. If any water is spilled in receiver when filling battery, remove with absorbent tissue.

Tap or drinking water is satisfactory as long as it does not contain large quantities of iron or chlorine dissolved in it.

2. If battery is discharged (only one or two indicators showing), water should be added to the level line before starting the recharge.

3. A fully charged battery will operate the radio in "Battery" position about 15 hours before recharging is required. Whenever possible, it is best not to allow the battery to become discharged to the extent that all three indicators disappear.

However, if all three indicators have sunk, the battery should be recharged immediately or within 24 hours.

4. A battery will continually discharge at a slow rate even when not in use. For this reason, monthly checks should be made of the charge condition and the battery placed on charge when necessary. This will prevent damage to the battery such as freezing during cold weather.

BATTERY INSTALLATION

The following instructions should be carefully followed in installing battery:

1. Remove battery from packing carton.

2. If needed, add water to bring liquid level to indicator mark on battery container. Do not overfill.

3. Remove back cover from radio, also battery case cover. The latter is removed by taking out the thumb screw and pulling the left side of the cover away from the battery case.

4. Turn battery with ball indicators faced to left, and then connect the two black leads with spade terminals onto the extreme right or negative (−) terminal of the battery. Note that the leads when connected to the terminal come away from the terminal on the side of battery toward you.

5. Turn battery so that the indicators face the front, then slide the battery part way into the case. Connect the two yellow leads with the spade terminals to the front or positive (+) terminal of the battery. The leads when connected will come away from the terminal on the right-hand side of the battery.

6. Connect the rubber vent tube over the vent located in middle of battery.

7. Slide battery as far as it will go into battery case.

8. Replace battery case cover.

9. Place battery on charge, if necessary, as described in a previous paragraph, until all three indicators are showing in the opening in the case cover.

Charger Characteristics

A ¼-ampere fuse is used in series with the primary of the charger transformer. If the battery, after being placed on charge, does not show any signs of becoming charged after a reasonable length of time, the fuse should be checked. Replace only with a ¼-amp GE Cat. No. 2548 fuse or its equivalent.

If one or more of the copper oxide discs of the rectifier unit are defective, the charger will not operate properly. To test the rectifier unit operation, proceed as follows: Remove the two black leads from the negative terminal of the battery and connect a DC ammeter which will read two amperes, in series with these leads to the negative terminal of the battery. Plug the power cord into an AC supply and turn the power selector switch to the "Charge" position. With the AC line voltage at 117 volts, the average charging current should read about 1.35 amperes at 2.1 volts battery. If line voltage is greater or battery voltage is lower than 2.1 volts the charging current will be greater. If the current is much less than this value at the rated line of 117 volts, one or more of the copper oxide discs may be defective.

To check individual discs, the following tests are suggested. In the conducting direction, the rectifier disc should pass 0.5 ampere or more when ½ volt is impressed across the disc. Note: The copper oxide rectifier disc conducts when the positive potential is applied to the copper oxide surface. The copper oxide is a dark blue coating and is plated with nickel to afford a good surface contact to the oxide. If a DC ammeter is not available for measuring currents as high as 0.5 ampere, the circuit shown in Fig. 2 can be used for this check. This method requires that the resistance of 2.75 ohms be made fairly accurate and is placed in series with the rectifier disc and placed across the two volt storage battery. The voltage should always read 0.5 volt or less; if the voltage exceeds 0.5 volt across the disc in this circuit, it indicates a defective disc.

The reverse current flow is as important as the above test and is made as follows: Reverse the battery polarity in the above test circuit and place a milliammeter that will read 10 milliamps in series with a lead to one of the battery terminals. This reverse current should not exceed 2½ milliamperes at the applied voltage of 2.0 volts. If the current is considerably above this value the disc should be discarded. Precaution—A suitable meter fuse should be used in series with the milliammeter to prevent damage to the meter in case the disc under test is shorted. A rough check, if a milliammeter is not available, is to measure the resistance of the disc in the non-conducting direction on the low-resistance tap (1½ volt) of the ohmmeter. The resistance should measure at least 750 ohms.

BATTERY INFORMATION

The receiver uses a 2-volt Willard Radio Battery No. 20-2 or equivalent. It has a twenty ampere-hour capacity and should be cared for in the same manner as any other storage battery.

Charge Indicator

The degree of charge of the battery can be determined by removing the back cover of the radio and referring to the charge ball indicator visible through the hole in the metal battery case.

If the battery is fully charged, three indicator balls will be visible at the surface of the liquid in the battery. When the battery discharges, these ball indicators will sink and disappear in the following order:

1. Green indicator sinks when approximately 10 per cent of battery capacity has been discharged.

2. White ball sinks when 50 per cent capacity has been discharged.

3. The red ball sinks when battery is 90 per cent discharged.

On charge, the balls rise or float in the reverse order and the charge is complete and may be stopped when all three balls appear in the opening.

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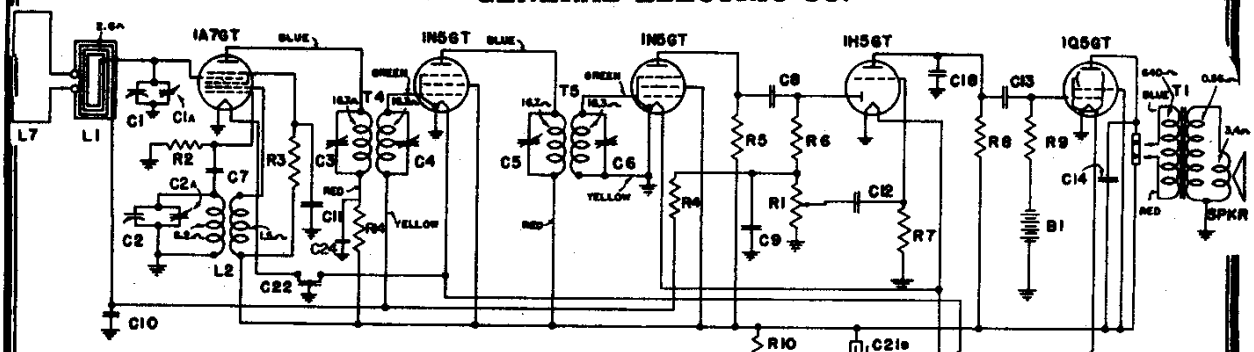


Fig. 5. Schematic Diagram

POWER SELECTOR SWITCH OPERATION

POSITION	CONTACTS CONNECTED
"OFF"	ALL CONTACTS OPEN
"BATTERY"	#1 to #2; #4 to #5; #7* to #8
"AC"	#1 to #2 to #3; #4 to #5; #8 to #9
"CHARGE"	#2 to #3; #8 to #9

* #7 terminal is not connected to circuit

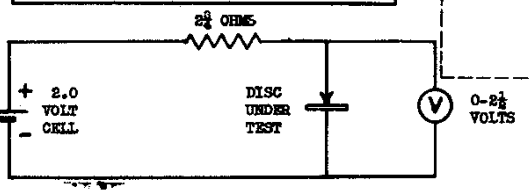
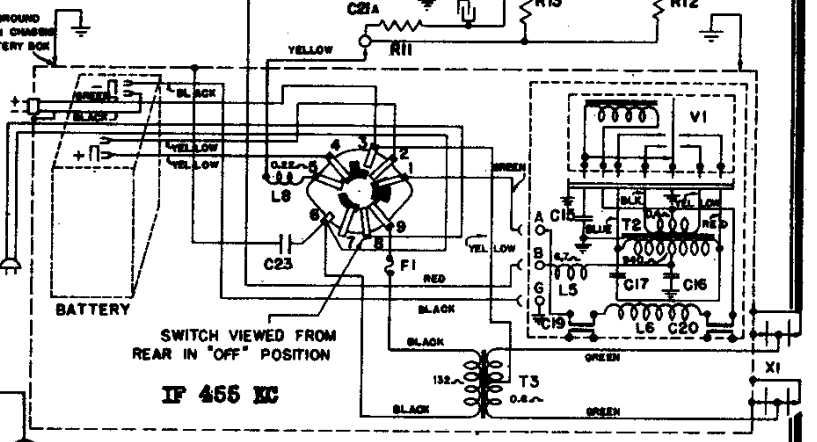


Fig. 2. Charger Disc Test



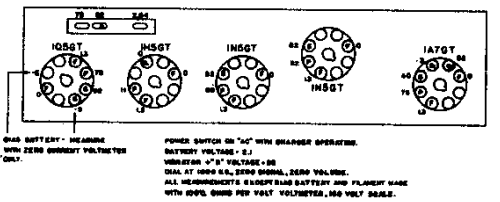


Fig. 1. Socket Voltage Diagram

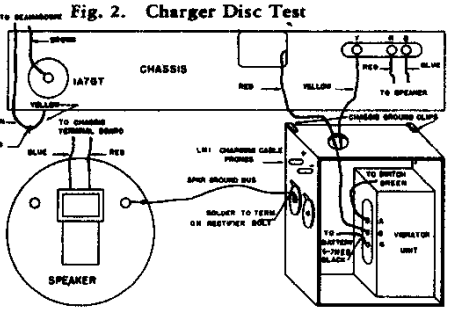


Fig. 3. Assembly Wiring

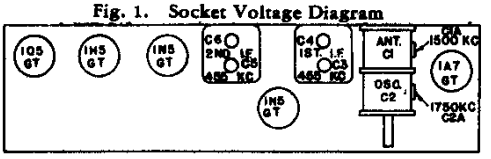


Fig. 4. Trimmer Location

Prices subject to change without notice.

Stock No.	Symbol	Description	List Price
RC-7054	C-1, 2	CONDENSER—Tuning condenser and trimmers	$1.55
*RC-216	C-7	CAPACITOR—47 mmf, mica	.25
*RC-235	C-8, 9	CAPACITOR—100 mmf., mica	.25
*RC-072	C-10	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-096	C-11	CAPACITOR—0.1 Mfd., 200 V. paper	.30
*RC-023	C-12, 13	CAPACITOR—.005 Mfd., 600 V. paper	.25
*RC-039	C-14	CAPACITOR—.01 Mfd., 600 V. paper	.25
*RC-096	C-15	CAPACITOR—0.1 Mfd., 200 V. paper	.30
*RC-072	C-16	CAPACITOR—.05 Mfd., 200 V. paper	.25
*RC-027	C-17	CAPACITOR—.006 Mfd., 100 V. paper	.30
*RC-235	C-18	CAPACITOR—100 mmf., mica	.25
*RC-156A	C-19, 20	CAPACITOR—0.5 Mfd., 120 V.	.45
RC-5189	C-21A, 21B C-21C	CAPACITOR—15 Mfd., 150 V. dry electrolytic CAPACITOR—1200 Mfd., 2 V. dry electrolytic	.75
*RC-156A	C-22	CAPACITOR—0.5 Mfd., 120 V. paper	.45
*RC-092	C-23	CAPACITOR—.05 Mfd., 600 V. paper	.30
RV-125	R-1	VOLUME CONTROL—0.5 megohm volume control	.95
*RQ-1315	R-2	RESISTOR—220,000 ohm, ½ W. carbon	.70—5
*RQ-1299	R-3	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1339	R-4	RESISTOR—2.2 megohm, ½ W. carbon	.70—5
*RQ-1293	R-5	RESISTOR—27,000 ohm, ½ W. carbon	.70—5
*RQ-1299	R-6	RESISTOR—47,000 ohm, ½ W. carbon	.70—5
*RQ-1347	R-7	RESISTOR—4.7 megohm, ½ W. carbon	.70—5
*RQ-1331	R-8	RESISTOR—1.0 megohm, ½ W. carbon	$0.70—5
*RQ-1339	R-9	RESISTOR—2.2 megohm, ½ W. carbon	.70—5
*RQ-1259	R-10	RESISTOR—1,000 ohm, ½ W. carbon	.70—5
RQ-1208	R-11, 12, 13	RESISTOR—8.2 ohm, ½ W. carbon	.70—5
RC-2056	B-1	CELL—5.0 V. bias cell assembly	.55
RL-568	L-1	BEAM-A-SCOPE—Loop antenna assembly (inside cover)	.90
RL-2055	L-2	COIL—Oscillator coil	.30
RL-367	L-5	CHOKE—B choke	.20
RL-366	L-6	CHOKE—Vibrator choke	.55
RL-567	L-7	BEAM-A-SCOPE—External loop antenna	.45
RL-365	L-8	CHOKE—Filament supply choke	.20
RS-3115	SW1	SWITCH—Power selector switch	.70
RT-4010	T-1	TRANSFORMER—Output transformer	.90
RT-0525	T-2	VIBRATOR—Vibrator power transformer	1.80
RT-0524	T-3	TRANSFORMER—50-60 cycle rectifier step-down transformer	1.20
RT-0527	T-3	TRANSFORMER—25 cycle rectifier step-down transformer	.90
RT-393	T-4	TRANSFORMER—1st I.F. transformer	.90
RT-392	T-5	TRANSFORMER—2nd I.F. transformer	.90
RV-204	V-1	VIBRATOR—Power supply synchronous vibrator	3.60
RR-802	X-1	RECTIFIER—Copper oxide rectifier	.25
RS-1066	Spkr	SPEAKER—PM speaker	4.60

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. ..... 455 KC

R.F. ..... 1500 KC

The location of all trimmers is shown in Fig. 4.

I.F. Alignment

Connect an output meter across the voice coil. Turn volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to 1A7GT converter grid through .05 Mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans.

R.F. Alignment

Adjust the signal generator to 1750 KC and loosely couple a wire from the output terminal of the signal generator so that the receiver loop will pick up the signal. Set the gang condenser to minimum capacity and adjust the oscillator trimmer (C2A) to receive the signal. After this has been done set the signal generator to 1500 KC and tune the receiver until this signal is tuned in. Adjust the R.F. trimmer (1A) for maximum output. In case of bent plates in the condenser, set the signal generator and the receiver to 600 KC and bend plates into the position for maximum output.

Tubes

Converter-Oscillator	GE-1A7GT
1st I.F. Amplifier	GE-1N5GT
2nd I.F. Amplifier	GE-1N5GT
Detector & 1st Audio	GE-1H5GT
Power Output	GE-1Q5GT

SPECIFICATIONS

Physical Dimensions

Height	13 inches
Width	13 inches
Depth	4¾ inches
Weight (with Battery)	16 pounds

Special Service Information

The following service information will be very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains

1A7GT grid to 1st IF grid	40 at 1,000 KC
1A7GT grid to 1st IF grid	57 at 455 KC
1st IF grid to 2nd IF grid	95 at 455 KC
2nd IF grid to 1H5GT diode plate	8.5 at 455 KC

(2) Audio Gain

0.08 volts, 400 cycle signal across volume control with control set at maximum, will give approximately 50 milliwatts speaker output.

(3) DC voltage developed across oscillator grid resistor (R2) averages 6.5 volts at 1,000 KC.

Variations of 20 per cent permissible. All readings obtained are with AVC shorted to chassis ground.

Electrical Rating

Charging from AC line:
110–125 volts AC. ..... 50–60 cycles ..... 6 watts
110–125 volts AC. ..... 25–60 cycles ..... 10 watts
Charging from storage battery (using LM-1 Charging Cable):
6.3 volts DC. ..... 1.4 amperes
Receiver power consumption:
2.1 volts DC. ..... 1.3 amperes ..... 2.7 watts
Receiver battery requirement:
Willard 2.0 volts No. 20-2 or equivalent rechargeable battery.
Fuse: G-E No. 2548 ¼-ampere rating.

Tuning Frequency Range

Broadcast Band ..... 550–1750 KC

Electrical Power Output

Maximum ..... 225 milliwatts

Loudspeaker—PM Dynamic

Cone Diameter ..... 5 inches
Voice Coil Impedance ..... 3.5 ohms (400 cycles)

GENERAL INFORMATION

Power Supply

All power necessary for the operation of the receiver is supplied by the 2-volt built-in rechargeable battery. The tube filaments are heated directly by the two volts from the battery while the necessary high voltage for the screen and plates of the tubes is furnished by a synchronous vibrator used in conjunction with a step-up power transformer and its associated filter circuit. The synchronous vibrator operates on the two volts from the battery.

Provision has been made to charge the battery directly from the house current without removing the battery from the receiver circuit. Two charging positions are provided on the four-position power selector switch. The "Charge" position of this switch allows the battery to be charged at the rate of approximately 1.35 amperes from the house current during the period that the receiver is not being operated. The "AC" position of the switch allows the receiver to be operated at the same time that the battery is being charged. Under this condition, however, it takes a considerably longer period for a partially discharged battery to be fully restored due to the fact that current is taken from the battery to operate the receiver.

The battery charging unit consists of a step-down transformer which converts the house current to approximately 5.5 volts on 50–60 cycle models; on 25–60 cycle models the voltage is 6.6 volts. This low voltage is then applied to a copper oxide rectifier in a full wave rectifier circuit which supplies the battery with a DC charging current.

A charging cable, Stock LM-1, is available, which provides a convenient means of charging the radio battery from an automobile or 6-volt storage battery. The cable plug is inserted over the two prongs on the left side of the metal battery case and the plug and socket on the other end of the cable is provided with terminals for connection to a 6-volt supply. Full installation instructions are provided with each cable.

Before the receiver chassis can be removed from the cabinet, it is necessary to first remove the battery-vibrator case. The battery case is held in place by four screws available from the bottom of the cabinet. The radio chassis is held by two Phillips head screws located on the control panel. Fig. 3 shows the various connectors used to interconnect the units.