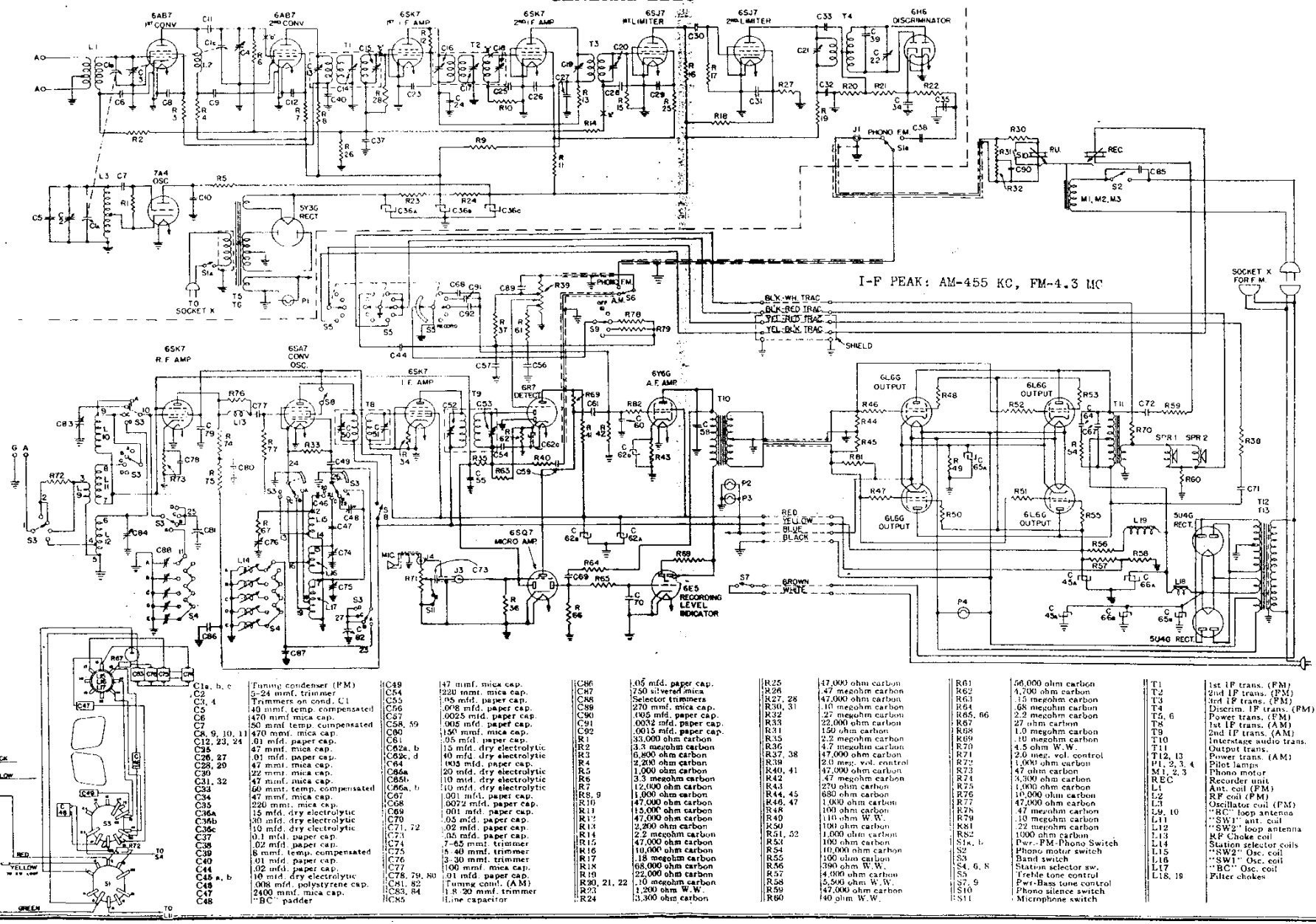
General Electric Co.

	Model: 80	Chassis:	Year: Pre 1945
	Power:	Circuit:	IF:
	Tubes:		
	Bands:		

Resources
Riders Volume 14 - GE 14-17, 18
Riders Volume 14 - GE 14-19
Riders Volume 14 - GE 14-20
Riders Volume 14 - GE 14-21
Riders Volume 14 - GE 14-22
Riders Volume 14 - GE 14-23
Riders Volume 14 - GE 14-24
Riders Volume 14 - GE 14-25
Riders Volume 14 - GE 14-26
Riders Volume 14 - GE 14-27

GENERAL ELECTRIC CO.



C1a, b, c	Tuning condenser (FM)	C49	47 mmf. mica cap.	C86	.05 mfd. paper cap.	R25	47,000 ohm carbon	R61	56,000 ohm carbon	T1	1st IF trans. (FM)
C2	5-24 mmf. trimmer	C54	220 mmf. mica cap.	C87	750 silvered mica	R26	.47 megohm carbon	R62	4,700 ohm carbon	T2	2nd IF trans. (FM)
C3, 4	Trimmers on cond. C1	C55	.05 mfd. paper cap.	C88	Selector trimmers	R27, 28	47,000 ohm carbon	R63	.15 megohm carbon	T3	3rd IF trans. (FM)
C5	40 mmf. temp. compensated	C56	.008 mfd. paper cap.	C89	270 mmf. mica cap.	R30, 31	.10 megohm carbon	R64	.68 megohm carbon	T4	Discrim. IF trans. (FM)
C6	470 mmf mica cap.	C57	.0025 mfd. paper cap.	C90	.005 mfd. paper cap.	R32	.27 megohm carbon	R65, 66	2.2 megohm carbon	T5, 6	Power trans. (FM)
C7	50 mmf. temp. compensated	C58, 59	.005 mfd. paper cap.	C91	.0032 mfd. paper cap.	R33	22,000 ohm carbon	R67	27 ohm carbon	T8	1st IF trans. (AM)
C8, 9, 10, 11	470 mmf. mica cap.	C60	150 mmf. mica cap.	C92	.0015 mfd. paper cap.	R34	150 ohm carbon	R68	1.0 megohm carbon	T9	2nd IF trans. (AM)
C12, 23, 24	.01 mfd. paper cap.	C61	.05 mfd. paper cap.	R1	33,000 ohm carbon	R35	2.2 megohm carbon	R69	.10 megohm carbon	T10	Interstage audio trans.
C25	47 mmf. mica cap.	C62a, b	15 mfd. dry electrolytic	R2	3.3 megohm carbon	R36	4.7 megohm carbon	R70	4.5 ohm W.W.	T11	Output trans.
C26, 27	.01 mfd. paper cap.	C62c, d	40 mfd. dry electrolytic	R3	6,800 ohm carbon	R37, 38	47,000 ohm carbon	R71	2.0 meg. vol. control	T12, 13	Power trans. (AM)
C28, 29	47 mmf. mica cap.	C64	.005 mfd. paper cap.	R4	2,200 ohm carbon	R39	2.0 meg. vol. control	R72	1,000 ohm carbon	P1, 2, 3, 4	Pilot lamps
C30	22 mmf. mica cap.	C65a	20 mfd. dry electrolytic	R5	1,000 ohm carbon	R40, 41	47,000 ohm carbon	R73	47 ohm carbon	M1, 2, 3	Phono motor
C31, 32	47 mmf. mica cap.	C65b	10 mfd. dry electrolytic	R6	3.3 megohm carbon	R42	.47 megohm carbon	R74	3,300 ohm carbon	REC	Recorder unit
C33	150 mmf. temp. compensated	C66a, b	10 mfd. dry electrolytic	R7	12,000 ohm carbon	R43	270 ohm carbon	R75	1,000 ohm carbon	L1	Ant. coil (FM)
C34	47 mmf. mica cap.	C67	.001 mfd. paper cap.	R8, 9	1,000 ohm carbon	R44, 45	680 ohm carbon	R76	10,000 ohm carbon	L2	RF coil (FM)
C35	220 mmf. mica cap.	C68	.0072 mfd. paper cap.	R10	47,000 ohm carbon	R46, 47	1,000 ohm carbon	R77	47,000 ohm carbon	L3	Oscillator coil (FM)
C36a	15 mfd. dry electrolytic	C69	.001 mfd. paper cap.	R11	15,000 ohm carbon	R48	100 ohm carbon	R78	.47 megohm carbon	L9, 10	"BC" loop antenna
C36b	30 mfd. dry electrolytic	C70	.05 mfd. paper cap.	R12	47,000 ohm carbon	R49	110 ohm W.W.	R79	.10 megohm carbon	L11	"SW1" ant. coil
C36c	10 mfd. dry electrolytic	C71, 72	.02 mfd. paper cap.	R13	2,200 ohm carbon	R50	100 ohm carbon	R81	.22 megohm carbon	L12	"SW2" loop antenna
C37	0.1 mfd. paper cap.	C73	.05 mfd. paper cap.	R14	2.2 megohm carbon	R51, 52	1,000 ohm carbon	R82	1000 ohm carbon	L13	RF Choke coil
C38	.02 mfd. paper cap.	C74	7-65 mmf. trimmer	R15	47,000 ohm carbon	R53	100 ohm carbon	S1a, b	Pwr.-FM-Phono Switch	L14	Station selector coils
C39	6 mmf. temp. compensated	C75	5-40 mmf. trimmer	R16	10,000 ohm carbon	R54	10,000 ohm carbon	S2	Phono motor switch	L15	"SW2" Osc. coil
C40	.01 mfd. paper cap.	C76	3-30 mmf. trimmer	R17	.18 megohm carbon	R55	100 ohm carbon	S3	Band switch	L16	"SW1" Osc. coil
C44	.02 mfd. paper cap.	C77	100 mmf. mica cap.	R18	68,000 ohm carbon	R56	390 ohm W.W.	S4, 6, 8	Station selector sw.	L17	"BC" Osc. coil
C45 a, b	10 mfd. dry electrolytic	C78, 79, 80	.01 mfd. paper cap.	R19	22,000 ohm carbon	R57	4,000 ohm carbon	S5	Treble tone control	L18, 19	Filter chokes
C46	.008 mfd. polystyrene cap.	C81, 82	Tuning cond. (AM)	R20, 21, 22	.10 megohm carbon	R58	5,500 ohm W.W.	S7, 9	Pwr-Bass tone control		
C47	2400 mmf. mica cap.	C83, 84	1.8-20 mmf. trimmer	R23	1,200 ohm W.W.	R59	47,000 ohm carbon	S10	Phono silence switch		
C48	"BC" padder	C85	Line capacitor	R24	3,300 ohm carbon	R60	140 ohm W.W.	S11	Microphone switch		

GENERAL ELECTRIC CO.

ALIGNMENT CHART

Step	Test-Osc. Connect to	Test-Osc. Setting	Pointer Setting	Tune Trimmer for Max. Output
1	6SK7 IF Grid in Series with .05 mfd.	455 KC	"BC" Band 550 KC	C52 and C53
2	6SA7 Conv. Grid in Series with .05 mfd.	455 KC	"BC" Band 550 KC	C50 and C51
3	Use Capacity Coupling	580 KC	"BC" Band 580 KC	C48 **
4	Use Capacity Coupling	1500 KC	"BC" Band 1500 KC	C75 and C83
5	Use Capacity Coupling	580 KC	"BC" Band 580 KC	C48 **
6	Use Capacity Coupling	6.0 MC	"SW1" Band 6.0 MC	C74
7	Use Capacity Coupling	21.0 MC	"SW2" Band 21.0 MC	C76 *
8	Use Capacity Coupling	21.0 MC	"SW2" Band 21.0 MC	C84 **

* Use minimum capacity peak.
** Rock gang tuning condenser for optimum peak.

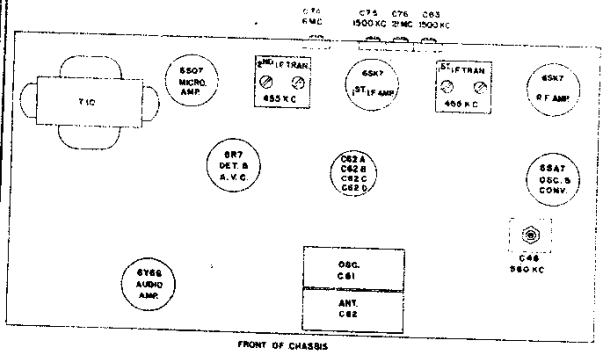


Fig. 3. SW-BC Trimmer Location

Alignment—BC and Short-wave Chassis

The alignment procedure, shown in table form, should be made with the chassis bolted in the cabinet. All RF alignment can be performed by capacity-coupling the test-oscillator signal to the respective built-in loop antenna of the band being aligned. Use a three-foot piece of wire connected as an antenna to the high side of the test-oscillator output. Bring this wire to within three feet of the proper loop antenna of the band in use. Metal objects such as meters, tools, etc., should not be brought in close proximity to the built-in loop antenna.

Before making the RF alignment make sure the pointer is set to the line at the low frequency end of the dial scale when the gang condenser plates are closed. Output meter alignment is preferable and the meter may be connected across the voice coil leads, then turn volume control partially up. Keep the signal input as low as possible to avoid AVC action.

Alignment—FM Receiver

Equipment

In order to perform the necessary alignment operations on this Translator the following equipment is recommended:

(1) A good signal generator capable of giving a 46 MC signal with adjustable output voltage.
(2) A wide band signal generator covering 4.3 MC with a sweep circuit of plus or minus 200 KC.
(3) A cathode ray oscilloscope.
(4) A 0–100 microammeter.

I.F. Alignment

Alignment of the I.F. transformers must be performed stage by stage and no over-all adjustments should be made after completing the stage by stage adjustments.

Connect the high side of the oscilloscope input through a 470,000 ohm carbon resistor to point "A" on the 1st limiter 6SJ7 load circuit. The ground side of the oscilloscope input connects to the chassis. Progressively apply a wide band signal generator output of 4.3 MC to points "B," "C" and "D" of the 2nd I.F., 1st I.F. and 2nd converter grids. Use a .05 mfd. capacitor between the generator output and points "B" and "C." Use a 22 mmf. capacitor between the generator output and point "D." Connect the ground lead of the wide band signal generator output to the chassis at the same point to which the oscilloscope ground is connected. Align the primary and secondary I.F. transformer trimmers for maximum vertical deflection of the oscilloscope curve. The third circuit trimmers (C14 and C17) of the 1st and 2nd I.F. transformers should be adjusted to give maximum broadness to the peak of the oscilloscope curve consistent with maximum vertical deflection. The I.F. curve should not be broadened beyond that point where the vertical deflection of the oscilloscope curve is reduced.

Discriminator Alignment

Remove the oscilloscope input connections from the limiter load and connect the high lead directly to the audio output. Connect the ground lead to the chassis using the same point to which the generator ground is connected. Apply the wide band generator signal of 4.3 MC through a 22 mmf. capacitor to point "D" on the 2nd converter grid. Adjust the discriminator transformer (T4) primary trimmer (C21) for maximum vertical deflection on the oscilloscope. Align the secondary trimmer (C22) for center crossover of the two curves. Retrim the primary trimmer (C21) for straight crossover lines if necessary.

R.F. Alignment

Connect a 0–100 microammeter in series with a 470,000 ohm resistor between chassis and point "A" on the load circuit of the 1st limiter tube, 6SJ7. The resistor should be between the meter and point "A." Apply a 46 MC generator signal to the antenna input terminals of the Translator. Set dial pointer to 46 MC and align oscillator trimmer (C2). The image signal should be below 46 MC when the oscillator is properly set. Peak the converter trimmers (C3 and C4) for maximum output.

NOTE. If oscillations develop in the I.F. circuits during alignment it is probably due to the generator and oscilloscope ground connections. Be sure these ground connections are made to the same point on the chassis. Changing ground points will generally assist in eliminating instability.

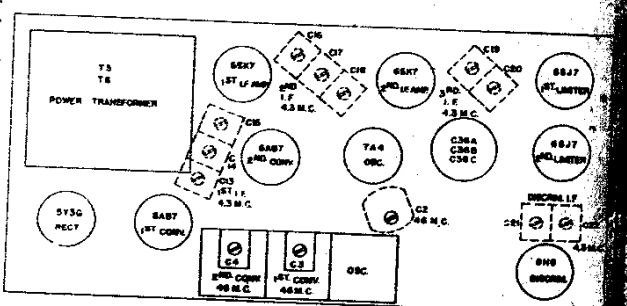


Fig. 4. FM Trimmer Location

MODELS 60, 80

GENERAL ELECTRIC CO.

Special Service Information

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

(1) Stage Gains†

(a) Antenna Post to R.F. Grid at
1000 KC.....5.0
4000 KC.....2.5
18,000 KC.....2.5

(b) R.F. Grid to Converter Grid at
1000 KC.....5.0
4000 KC.....3.0
18,000 KC.....2.0

(c) R.F. on Converter Grid to I.F. on 1st I.F. Grid at
1000 KC.....47
4000 KC.....47
18,000 KC.....45

(d) I.F. on Converter Grid to I.F. on 1st I.F. Grid at
455 KC.....55

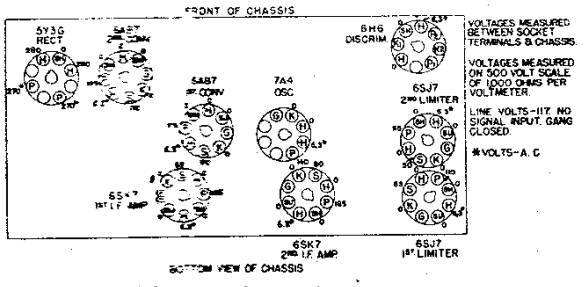
(e) I.F. Amplifier Grid to Detector Plate at
455 KC.....70

(2) Voltage across Volume Control to Give ½-watt Speaker Output‡ at 400 cycles.....05 volts

(3) DC Voltage Developed across Oscillator Grid Resistor R-83 at
1000 KC.....7.5
4000 KC.....7.5
18,000 KC.....5.0

†Variations of ±20% permissible. All readings obtained with enough input signal to give ½-watt speaker output.

‡½-watt speaker output at 400 cycles is equivalent to a reading of 1.41 volts as measured by a high resistance AC voltmeter across the voice coil leads of the two speakers connected in parallel.



Phono-FM-Television Connection

If a television picture receiver with sound converter, a separate record player, or a frequency modulation translator (Model 60) is desired to be used with either of these models proceed as follows. On Model 80, remove the black shielded plug connection to the rear of the broadcast short-wave receiver rear chassis deck; on Model 60, remove the shielded lead to left of broadcast short-wave receiver rear chassis deck; then make the plug connection to the auxiliary unit. General Electric plug, Stock No. RP-145, fits the pin jack. To switch the receiver from radio to auxiliary unit operation, merely depress the Phono-FM push button selector key.

Service Hints

1. Audio howl is traceable usually to the 6Y6G audio driver tube. In making new tube replacements, it may be necessary to try several before a quiet tube is found.

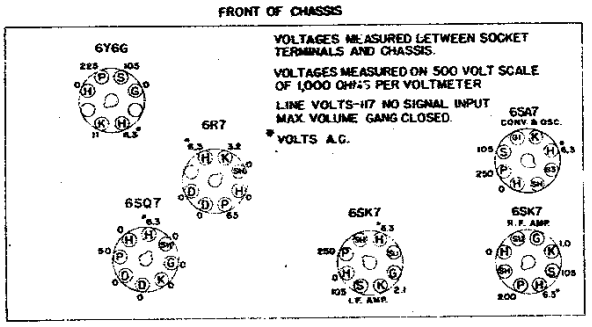
2. A method of setting up broadcast automatic station selector buttons which will assure drift-proof adjustment is to screw the iron core all the way out and then turn slowly inward until the desired station is tuned in.

3. The black speaker lead should be connected to the 10-inch speaker terminal which is grounded to the speaker frames. When replacing a speaker, make sure of the proper phasing. With the speaker terminal boards facing each other, the interconnecting leads should be crossed.

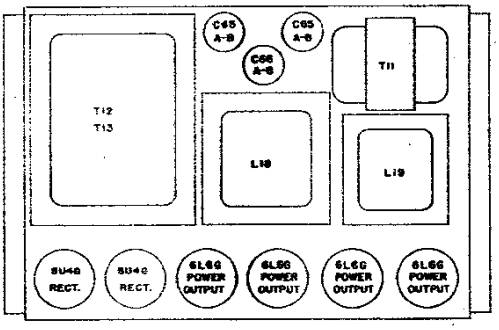
Reproducers

The voice coil is accurately centered at the factory and should seldom give trouble. In case the voice coil needs recentering, loosen the three hex head clamping screws which hold the voice coil spider assembly; remove the voice coil dust cap, and insert four centering shims in the air gap. Tighten the clamping set screws; remove the shims and replace dust cover.

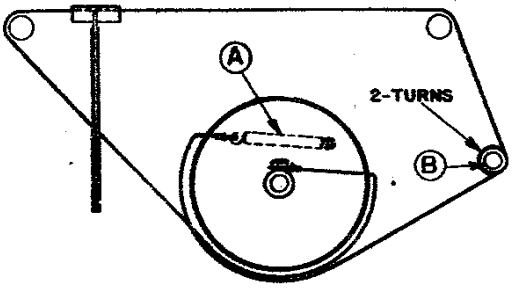
NOTE—In no case should the magnet be loosened or removed from the assembled position.



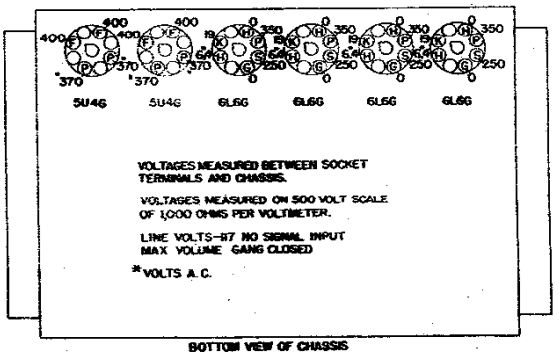
Socket Voltages—AM Chassis



Power Unit Component Layout



Dial Cord Stringing Diagram



Socket Voltages—Power Unit

MODELS 60, 80
MODEL JM-1C

GENERAL ELECTRIC CO.

DELUXE AUTOMATIC RECORD CHANGER
and
RECORDING UNIT
USED IN *Musaphonic* MODELS 60 AND 80

RECORD CHANGER MODEL JM-1C

This deluxe automatic record changer and home recording unit is standard equipment in the above model receivers and is designed for operation on a 110-volt alternating-current source. The record changer will play up to fifteen 10-inch and 12-inch records intermixed, while the recording mechanism is designed to record on record blanks which have not been pre-grooved.

OPERATING CONTROLS

Power Controls

To turn power "on," press the red push button (AK) in Fig. 1 until the power switch clicks. To turn power "off" press down on tone arm rest (AH).

Index and Record-reject Control

This control consists of the switch knob (AI) pointer (AJ) and push button (AK). The selector knob provides for either manual or automatic operation of the mechanism. Turn pointer and knob assembly to "A" for automatic operation. Turn pointer and knob assembly to "M" for manual operation.

To reject a record being played, or to start the record changing cycle, push down on the red push button (AK) as far as it will go.

Record Holder Shelf Plates

These three assemblies consist of the selector plate (BA), center plate (BB) and shelf plate (BC). These plates are hinged so that they may be raised to a vertical position for clear access to the turntable.

GENERAL DESCRIPTION OF PHONO CHANGE CYCLE

An automatic record player for records of two sizes has three principal duties to perform. These duties are here performed by three mechanisms inter-connected and built together, but largely separate in their operation. The motion for each is originated in one central cam gear which has three different and individual cam surfaces. The cam gear (FK) is normally at rest while a record is being played, but is put into operation by contact of a latch lever (AD) (located in the cam gear) with the teeth of an intermediate drive gear (CI). This motion takes place only when the unit is put into a change cycle. The cam gear then turns one full revolution to complete the change cycle and stops in a neutral position.

1. THE RECORD CHANGING MECHANISM is brought into operation by a segment (CH) (or lever) with a roller (EJ) at one end which runs in a cam groove in the cam gear (FK) as it turns, which drives with an oscillating motion the three pulleys (FG) by means of a metal tape (DD). The pulleys are fastened to the lower ends of the changer shafts (DL), which in turn transmit their motion to the changer plates (BC) which are fastened with setscrews to the upper ends of the shafts. When the changer plate assembly is revolved, the record resting on the shelf plates (BC) is released to the turntable.

2. THE PICK-UP OPERATING MECHANISM is likewise brought into operation originally by a cam surface on the cam gear (FK) which operates a raising lever (CA) that receives a rocking motion from the cam gear (FK) through a roller (CD) which is part of the raising lever assembly. The flat spring on the opposite end of this lever (CA) is carried upward against a lifter pin (FW) which raises the pick-up (AG), thus lifting the needle from the record. This motion also moves the hollow pick-up shaft (FX) upward, pressing together the locating plate (ES), the cork friction disc, (EV) and swing bracket (FY). While the needle is raised from the record, the swing bracket (FY) receives an angular or swinging motion from the cam gear (FK) to a lever and link assembly (EK) and carries with it the locating plate (ES) which is directly connected to the pick-up. The pick-up (AG) is thus carried out beyond the turntable while the changer plates (BC) drop a record, and is then brought back to the proper position to start playing. If there is no record resting on changer plates (BC) when the cycle starts, the pick-up arm (AG) will then remain out beyond the turntable and descend on the pick-up rest (AH) automatically shutting off the motor after the last record has been played.

3. MECHANISM FOR BRINGING NEEDLE INTO CORRECT STARTING POSITION ON THE RECORD. This mechanism must operate fairly accurately for both 10-inch and 12-inch records. Partly due to this requirement, the starting position is not determined by the cam action, as this cam surface on the cam gear (FK) is so designed that the movement of the lever and link assembly (EK) would normally carry the pick-up arm (AG) farther toward the turntable shaft (BF) than would ever be desirable as a starting adjustment. Therefore, the travel of the pick-up arm (AG) toward the turntable shaft (BF) is stopped at the proper point for lowering onto the record by two eccentric adjusting studs on the locating plate (ES) which comes into contact with the stop arm (EQ) which is automatically pre-set by the record which is about to be released from the changer plates (BC) to the turntable. If a 12-inch record is about to be played, it rests on the center changer plate (BB) of the master changer post (which is located directly behind the pick-up arm (AG), causing same to push downward on center pin (EA) which in turn pushes downward on the center plate lifter lever (DF) which is pivoted on a hinge pin (DH) in the pulley (FG). This brings the upper end of center plate lifter lever (EB) toward the pulley hub. When the pulley is oscillated or driven by the tape (DD), the upper end of this lever (EB) will travel on the inside of the crescent shaped cam (EC). This will move the setting lever (EQ) (which is fastened to the same hub as the stop lever) in such a position that stop lever will contact the 12-inch eccentric adjusting stud on the locating plate which accurately measures the starting point of the needle on a 12-inch record. A 10-inch record which is about to be played will not rest on the center plate (BB), therefore the center plate and center pin (EA) and lever (DF) will be held upward by a spring (DI) on the pulley. The upper end of the center plate lifter lever (EB) will therefore be further away from the pulley hub and will travel on the outside of the crescent shaped cam (EC) moving the setting lever and stop lever (EQ) in such a position that stop lever will touch the 10-inch eccentric adjusting stud (ES) also on the locating plate which accordingly measures the starting point of the needle on a 10-inch record. After the last record has been dropped from the changer plates and played, the lower changer plate (BC) is pushed upward by the no-record control pin. The no-record selecting lever (EP) is also carried up so that when pulley is oscillated the no-record lever sweeps the setting lever and stop lever (EQ) to the position where the stop lever engages with a heel on the locating lever (ES) and holds pick-up (AG) out beyond the turntable. Then when the pick-up (AG) descends, it depresses the pick-up rest (AH), thereby tripping switch (CG) and shutting off the motor.

RECORDING MECHANISM DESCRIPTION

The recording unit which mounts on the main phono motor board by the hex nut (11) and the mounting screw (12), is shown in Fig. 4. This unit is not shown mounted in Figs. 1, 2 and 3 for purposes of clarity.

The gear (10) of the recording unit enmeshes with the main drive pinion gear (CJ). This pinion gear drives the recording arm through a friction clutch drive principle. Since this gearing mechanism is in operation continuously while the turntable is operating, it is important to place the recording arm on its rest when not in use.

MODELS 60, 80
MODEL JM-1C

GENERAL ELECTRIC CO.

SERVICE NOTES AND ADJUSTMENTS

Oiling

The recorder and record changer mechanism should be lubricated once a year with a few drops of good light machine oil at each of the following points:

1. Three oil holes in motor gear housing.
2. Turntable spindle bearings.
3. Recorder pivot arm spindle.
4. All other bearing points.

Caution: Never oil the friction clutch at any time as it will cause slippage.

If squeaks are heard, compare the squeak with and without a load of records, as any stack of records in motion is apt to squeak with a pin through their centers.

This can be corrected by rubbing a little wax on the turntable shaft. See that all three ¼-inch round wicks in the motor frame are in position and are thoroughly saturated with oil (as it may not be if insufficient oil or too heavy oil has been used). Lift out all three motor wicks with tweezers. See if old oil has become "gummy" (commonly due to use of low-grade oil or low viscosity oil). If necessary, clean gummed-up wicks with kerosene. See that each is saturated with a fine oil, then before replacing them, drop a little fine oil into the holes. The gear box of the motor is packed with a semi-fluid grease at the factory, and it should never be necessary to take it apart for lubrication purposes.

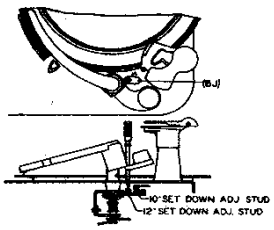
RECORD CHANGER AND RECORDING UNIT ADJUSTMENTS

Adjustments Nos. 1, 2, 3, 15 and 16 can be made from the top of the record player. All adjustments are correctly made at the factory and ordinarily need never be altered. However, should it become necessary to re-adjust due to tampering or accident, proceed as indicated in the following chart.

1

ADJUSTING LANDING POSITION OF NEEDLE ON RECORD

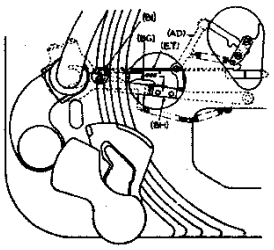
The position at which the needle lowers to the record can be adjusted by inserting a screw driver through hole (BJ) just in back of tone arm. For adjusting the 10-inch set-down, insert screw driver into the inside eccentric adjusting stud. For adjusting the 12-inch set-down, insert screw driver into the outside slotted stud Turn very slightly clockwise or counterclockwise to move needle landing in or out. The proper adjustment for the needle landing is ⅛ inch in from the outer edge of the record.



2

ADJUSTING TRIP CAM FOR CORRECT CLEARANCE BETWEEN TRIP LEVER AND TRIP ARM

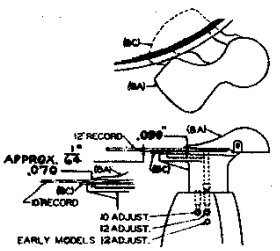
Insert screw driver through hole (BI) in main plate and locate it into slotted stud. Adjust eccentric cam so that the distance between the trip lever (BG) and trip arm (BH) is approximately .005 in. This can best be done by first adjusting the trip eccentric cam at (BI) so that there is no clearance or gap, then back off very slightly until trip lever (BG) is free to pulsate with the clutch motion or action of the release lever (ET). If the clearance is not sufficient between the trip lever (BG) and trip arm (BH) the pulsating motion of the clutch release lever (ET) will gradually cause the trip lever to move the trip arm enough to trip the trigger (AD) and start a change cycle. If gap is too great the trip lever will not move far enough to start a change cycle at the end of a record.



3

ADJUSTMENT FOR CHANGER PLATES

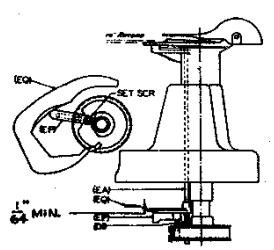
To adjust the distance between the selector plate (BA) and the shelf plate (BC) for 10-inch records, first select a 10-inch record that is approximately .070 in. thick. Then position it on changer and start a change cycle to revolve changer plates. Stop the turntable by hand just as the selector plate (BA) is about to touch the record, and shut off the motor. Then slowly turn the turntable by hand, allowing selector plates to contact edge of record so that it just slides over record, touching the surface lightly. Check all three selector plates and if any adjustment is necessary, it can be done by inserting a No. 10 Allen wrench in the setscrew holes located in the sides of the changer posts. Turn setscrew slightly clockwise to raise the selector plate and counterclockwise to lower it. The setscrew for adjusting the 10-inch record setting, and the one for 12-inch record setting is shown in the adjacent drawing. To adjust for 12-inch records, select a 12-inch record that is approximately .090 in. thick, then follow same procedure as for adjusting 10-inch records.



4

NO-RECORD SELECTING LEVER ADJUSTMENT

First be sure that spring tension on spring (DI) is strong enough to lift the center blade raising pin (EA) properly and fully, but not so strong that one 10-inch record will not fully depress pin and lever. Then with setscrew loose in no-record selecting lever (EP) and pin held down by weight of one 10-inch record. slide no-record selecting lever (EP) into position so that it will just clear under lower edge of the lower cam setting lever (EQ) by approximately 1/64 in. clearance. Then tighten setscrew and check adjustment with and without a record, also be sure that without a record, the fin on no-record selecting lever (EP) swings above cam setting lever (EQ) and portion of lever (EP), indicated by arrow, sweeps stop lever (EQ) on cam setting lever into position shown in upper illustration of adjustments 12 and 13.



GENERAL ELECTRIC CO.

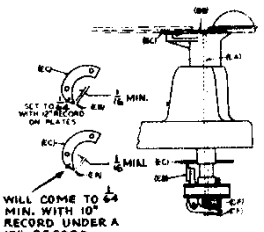
MODELS 60, 80
MODEL JM-1C

ADJUSTMENTS

5

LIFTER LEVER DIFFERENTIAL ADJUSTMENT

Place a 12-inch record over the turntable spindle so that the record rests on the shelf plates. Then check the center plate lifter lever (EB) and see that point of this lever will just slide inside of center arm lifter cam (EC). Then place a 10-inch record under the 12-inch record so that the 10-inch record will rest on shelf plate (BC) and the 12-inch record will then touch center plate (BB) which presses down center pin (EA) and accordingly moves lifter plate (EB) closer to outside face of lifter cam (EC) than it would without the 12-inch record on top of the 10-inch record. The lever (EB) should then follow the outside of the center arm lifter cam (EC). If it is necessary to re-adjust, this can be done by means of adjusting screw (CE) and lock nut (CF) to balance out the contact of lever (EB) on both sides of cam (EC) in relation to starting point of cam.



6

LIFTER LEVER CLEARANCE ADJUSTMENT

Check the distance between the leading edges of the center plate lifter lever (EB) and center arm lifter cam (EC) with a 12-inch record resting on the shelf plates. It should be a minimum of 1/64 in. It should not be necessary to check this adjustment unless the tape clamp screws on the pulley (FG) have been loosened. To re-adjust after screws have been loosened, first set pulley so that when the slack in the tape line is taken up in the direction of forward motion of the tape segment (CH), there will be the necessary 1/64 in. clearance as mentioned above.

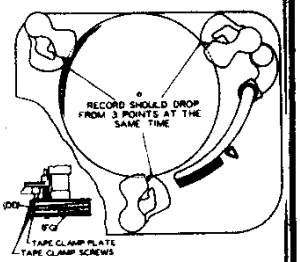
Note: If this adjustment is "OFF" most likely changer plate synchronization will also be off. Check adjustment No. 7.

7

CHANGER PLATE SYNCHRONIZATION

The synchronization of changer plates can be checked by placing one 10-inch record on the shelf plates. Then start a change cycle allowing it to continue until plates are just about ready to release the record. It can then be determined which plate is either slow or fast. This plate can then be adjusted by loosening the screws on the tape clamp which hold the tape (DD) from slipping in the pulley (FG). Then slightly move changer plate whatever is necessary to synchronize it with the other two plates so that record will drop evenly. Then tighten tape clamp screws securely. (Also check adjustment No. 6.)

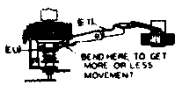
Note: Tape line should have a very slight amount of slack. Check by grasping tape line with thumb and index finger and moving it in and out approximately 5/8 in. with a moderate pressure.



8

CLUTCH RELEASE LEVER ADJUSTMENT

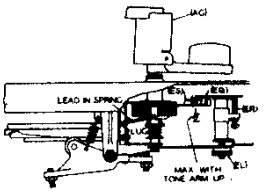
The fork on clutch release lever (ET) should be adjusted so that it only slightly moves the friction clutch with a sharp kick rather than a wavy movement. To get more or less movement of the clutch, bend the release lever (as shown in upper illustration). Also be sure that both prongs of fork on release lever (ET) contact the pressure release sleeve (EU) simultaneously. At no time should fork ride the pressure release sleeve between impulses, as the clutch would then be held open and changer would not trip.



9

SETTING CAM ADJUSTMENT

By means of the adjusting screw (ER) set stop lever (EQ) so that there will be 1/32 in. maximum overlap on eccentric studs (ES). If there is not enough overlap, the stop lever (EQ) will slide off instead of holding on eccentric studs (ES) on stop lug, while measuring set-down of tone arm (AG).



10

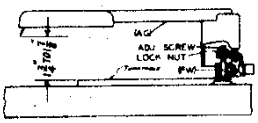
SLIDE-IN ADJUSTMENT

To adjust the power of the tone arm lead-in, bend the lug on lead-in spring to give it more or less tension; too much tension may cause needle to slide in on record. The knurled nut (EL) adjusts the distance tone arm will swing in, before clutch is disengaged. If clutch is still engaged after needle lands on record it may cause slide-in. Turning nut (EL) clockwise should correct slide-in if lead-in spring tension is correct.

11

TONE ARM HEIGHT ADJUSTMENT

This can be adjusted by means of an adjusting screw in the tone arm assembly (AG). The tone arm elevating pin (FW) presses against this screw which should be adjusted so that the distance between the point of needle (in tone arm) and the turntable is 1¾ in. to 1⅞ in., which is the equivalent of approximately seventeen 10-inch records. When correct height adjustment is made, tighten lock nut on adjusting screw securely.



MODELS 60, 80
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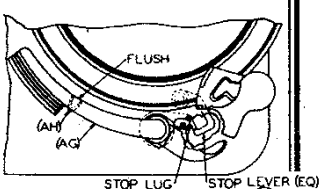
RECORD CHANGER AND RECORDING UNIT ADJUSTMENTS (Cont'd)

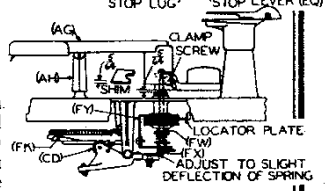
12
TONE ARM SWING ADJUSTMENT

First raise tone arm (AG) by hand and slightly loosen clamp screw on tone arm shaft head. Then start a change cycle and shut off power supply to motor when tone arm (AG) is being held in stop position above the tone arm rest (AH), and stop lever (EQ) (on setting cam assembly) is contacting stop lug on locator plate (which is part of the tone arm shaft assembly). Then insert a $\frac{5}{64}$-in. shim between tone arm shaft head and bearing race to set vertical clearance (which must be approximately $\frac{3}{64}$ in.) so that clutch will be engaged for moving trip lever when tone arm is down on record and align tone arm (AG) flush with tone arm rest (AH) as shown in upper illustration. Tighten clamp screw securely and remove $\frac{5}{64}$ in. shim, then check action of tone arm and adjust needle landing as in adjustment No. 1, if necessary.



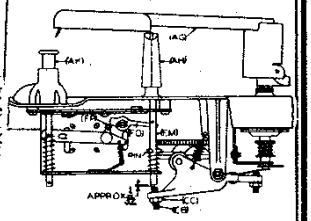
13
RAISING LEVER PRESSURE ADJUSTMENT

To make this adjustment first put unit into change cycle, then stop it when roller (CD) is at the highest point on the cam (FK), then loosen lock nut and turn screw under flat lifter spring clockwise until tone arm elevating pin (FW) and shaft (FX) are completely raised and flat spring contacts the tone arm shaft (FX) holding clutch assembly firmly in the high position against tone arm swing bracket (FY) and only slightly deflecting the flat spring. Then tighten lock nut securely.



14
SWITCH SHUT-OFF ADJUSTMENT

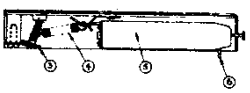
Start a change cycle by pressing push button (AK) so that roller (FP) holds switch latch (FQ) in a loaded position. Then stop turntable by hand when cam gear is in position (shown in illustration) and pin on rest shaft is sliding down decline from shoulder on cam gear, allow the rest shaft (FM) to come down gradually and when switch latch (FQ) trips, hold rest shaft in that position and adjust screw (CB) to within approximately $\frac{1}{32}$ in. from end of shaft (FM), tighten lock nut (CC) securely and check operation.



15
ADJUSTING DEPTH OF RECORDING NEEDLE CUT

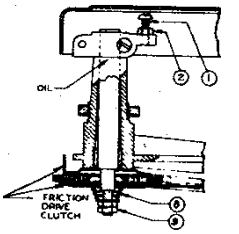
The adjustment for cut of needle pressure is thumbscrew (3) shown in illustration. This adjustment regulates the spring tension of pressure spring (4) on the pivoted cutting head (5), and by turning the thumbscrew to the left or right will increase or decrease the pressure on the needle.

The correct setting is determined by inspecting a cut record under a magnifying glass. The width of the groove should be approximately the same as the width of the uncut record surface between the grooves.



16
ADJUSTING HEIGHT OF RECORDING ARM

The adjusting height screw (1) and lock nut (2) are for adjusting the height of the recording arm above the turntable. The height of the tip of the needle is approximately $\frac{1}{8}$ in. from the record surface when the cartridge (5) is held by the screw (7) in the "UP" position. If it is necessary to adjust the height of arm to provide a final adjustment of the cutting needle pressure, loosen lock nut (2) and with screw driver, turn adjusting screw (1) counterclockwise to raise the arm or clockwise to lower the arm. Then tighten the lock nut.



TROUBLE SHOOTING

Cases of failure to operate satisfactorily will generally be found due to either neglect of proper lubrication, to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition, there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage), even though the utmost factory precautions are taken against it—or that setscrews may work loose due to external vibration. For tightening setscrews, an Allen (hexagon) wrench is required. Be sure that setscrews are properly seated on the holes or flats provided. Damage from tampering is likely to take the form of bent parts. Never bend any part during examination.

GENERAL ELECTRIC CO.

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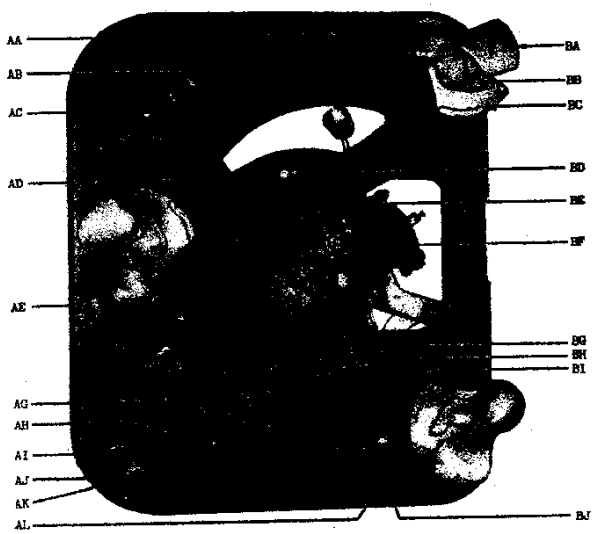
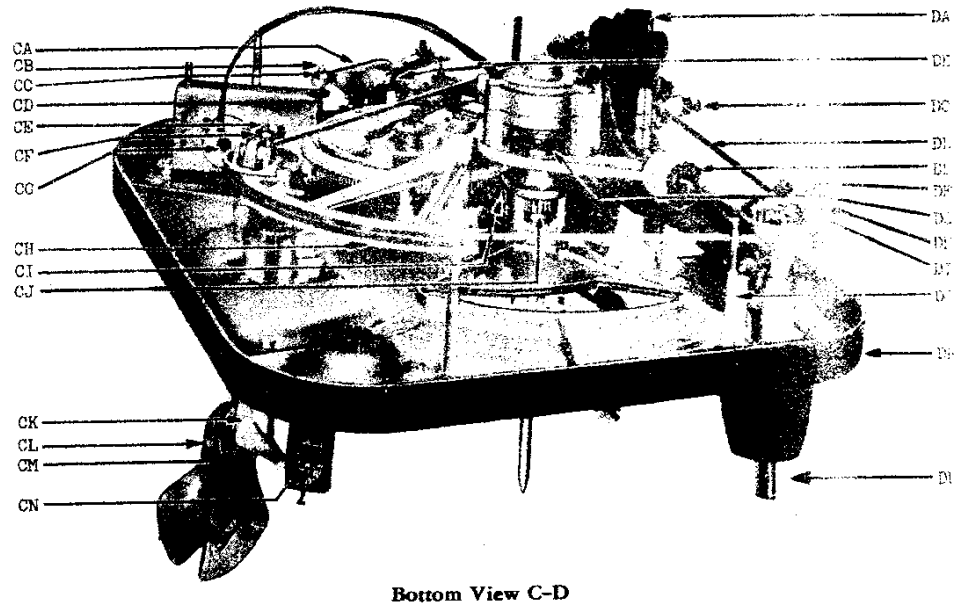


Top View A-B
Fig. 1



Bottom View C-D
Fig. 2

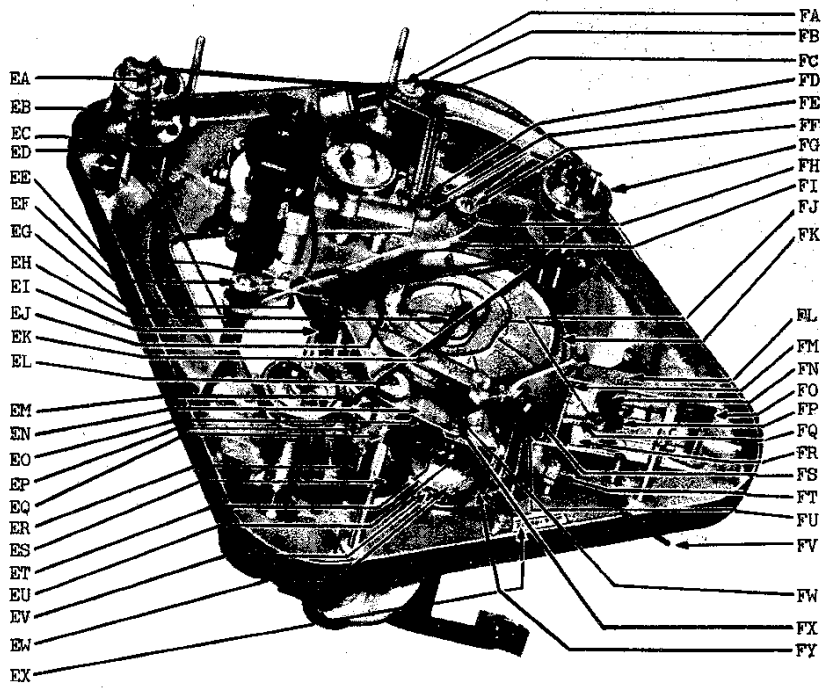
REPLACEMENT PARTS LIST—MODEL JM-1C RECORD PLAYER AND RECORDER

Symbol	Stock No.	Description
		RECORD PLAYER ASSEMBLY
AD	RL-967	LATCH—Cam latch and trigger assembly
AH	RR-854	REST—Phono tone arm rest support
AI	RK-1025	KNOB—Manual-automatic selector knob
AK	RB-643	BUTTON—Reject control button
BA	RP-2012	PLATE—Selector plate
BA, BB, BC	RX-092	ASSEMBLY—Changer plate assembly
BC	RP-2010	PLATE—Shelf plate
BB	RP-2011	PLATE—Center plate
BF	RS-960	SPINDLE—Turntable spindle and housing
BG	RL-968	LEVER—Trip-lever assembly
BH	RA-426	ARM—Trip arm assembly
CA	RX-093	ASSEMBLY—Raising lever assembly
CB, CE	RS-8020	SCREW—Adjusting screw
CD	RR-946	ROLLER—Raising lever arm roller
CG	RS-3106	SWITCH—Phono power switch
CH	RX-094	ASSEMBLY—Tape control segment assembly
CI	RG-718	GEAR—Intermediate gear assembly

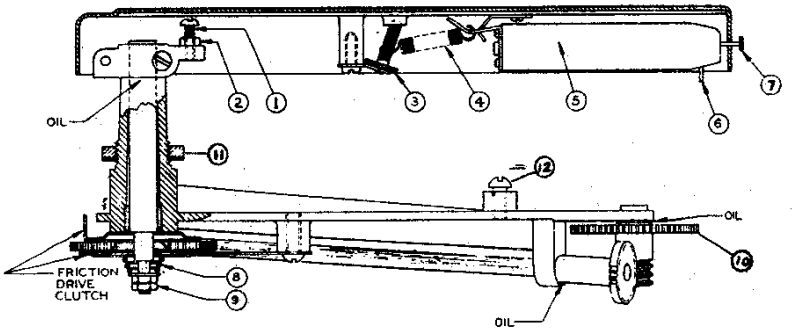
Symbol	Stock No.	Description
CJ	RG-717	GEAR—Drive pulley gear
CK	RB-1127	BRACKET—Changer plate bracket
CL	RP-413	PIN—Plate hinge pin
CM	RP-414	PIN—Plate lifting pin
CN	RC-5010	CRYSTAL—Phono crystal pick-up
DA	RM-150	MOTOR—60 cycle phono motor
DA	RM-151	MOTOR—50 cycle phono motor
DB	RS-8021	SCREW—Raising lever trunion screw
DD	RT-938	TAPE—Cycling control tape
DF	RX-095	ASSEMBLY—Centerplate lifter assembly
DG	RC-2041	COUPLING—Motor coupling assembly
DH	RP-415	PIN—Plate lifter pin
DI	RS-4036	SPRING—Plate lifter spring
DL	RP-416	PIN—Plate post pin
EA	RP-417	PIN—Centerplate raising pin
EC	RC-2042	CAM—Center arm lifter cam
ED	RS-8022	SCREW—Arm lifter cam mounting screw
EG	RC-8211	CONNECTOR—Motor grounding
EH	RS-4035	SPRING—Swing lever spring
EI	RS-4034	SPRING—Trip arm spring

MODELS 60, 80
Model JM-1C

GENERAL ELECTRIC CO.



Bottom View E-F
Fig. 3



Recorder Unit
Fig. 4

REPLACEMENT PARTS LIST—MODEL JM-1C RECORD PLAYER AND RECORDER (Cont'd)

Symbol	Stock No.	Description	List Price
EJ	RR-947	ROLLER—Roller for tape control segment	$0.10
EK	RL-969	LEVER—Swing lever and bracket assembly	1.20
EL	RN-015	NUT—Setting lever thumbnut	.20
EM	RS-4033	SPRING—Trip lever spring	.05
EN	RS-638	SUPPORT—Swing bracket support	.45
EO	RS-4032	SPRING—Clutch brake spring	.05
EP	RL-970	LEVER—No-record selecting lever	.30
EQ	RC-2043	CAM—Setting cam assembly	1.20
ES	RS-9026	SHAFT—Phono tone arm shaft assembly	2.10
ET	RL-971	LEVER—Clutch release lever assembly	.50
EU	RS-959	SLEEVE—Pressure release sleeve	.20
EV	RW-130	WASHER—Cork friction washer	.05—3
EW	RC-2044	CUP—Tone arm bottom friction cup	.10
FA	RW-131	WASHER—Retainer washer	.05—3
FC	RS-8023	SCREW—Binder head screw	.05—4
FG	RP-332	PULLEY—Post pulley	1.05
FH	RG-308	GROMMET—Motor plate mounting grommet	.05
FI	RP-2013	PLATE—Motor mounting plate	.60
FK	RC-2045	CAM—Main cam and gear assembly	
FL	RX-096	ASSEMBLY—Phono motor switch plate assembly	
FM	RS-9025	SHAFT—Phono tone arm rest shaft	
FN	RS-4031	SPRING—Switch latch spring	
FO	RS-9024	SHAFT—Push button control shaft	
FQ	RL-972	LATCH—Switch latch gear	
FU	RS-4030	SPRING—Phono tone arm raising lever spring	
FW	RP-418	PIN—Phono tone arm elevating pin	
FX	RS-9023	SHAFT—Phono tone arm shaft	
	RS-3105	SWITCH—Crystal shorting switch	
	RS-8019	SCREW—Spindle housing mtg. screws	
	RT-939	TURNTABLE—Turntable assembly	
		RECORDER UNIT ASSEMBLY	
	RA-425	ARM—Cutter arm complete	
(5)	RC-5009	CRYSTAL—Crystal cutter head	
	RG-716	GEAR—Recorder assembly less cutting arm and cartridge	
(7)	RS-876	SCREW—Crystal needle screw	
(4)	RS-4029	SPRING—Crystal tension spring	

GENERAL ELECTRIC CO.

MODELS 60, 80
MODEL JM-1C

TROUBLE SHOOTING REFERENCE CHART

SYMPTOM	CHECK
1. Mechanism is slow in starting, or motor overheats	a. Lubrication b. For too high or low line voltage c. For motor winding damage
2. Motor is slow starting	a. Lubrication. Old or gummy oil b. Changer may be in too cold place. Give chance to warm before trying other checks
3. Changer is noisy when in cycle	a. Lubrication. Check if any part is loose or bent and is rubbing against moving part
4. Changer fails to trip after playing record while set on "A" automatic	a. Adjustments Nos. 2, 8
5. Changer fails to trip when push button is pressed (pointer set on "A")	a. Adjustment No. 2 b. Switch assembly (FL) for obstruction or a bent or loose part
6. Trips too soon or before record has finished playing	a. Adjustment No. 2 b. For not enough clutch action. Bend forked release lever (ET) slightly to increase
7. Tone arm lifts immediately without playing record or continues cycling	a. Adjustment No. 2 b. For proper operation cam latch and trigger assembly (AD)
8. Tone arm lifts but does not swing out properly	a. Adjustment No. 13
9. Tone arm falls off record or misses record completely	a. Adjustments Nos. 1, 12 b. For too much clearance between cork clutch disc and tone arm switch bracket (FY). Adjust by means of the thumb nut (EL), turn counterclockwise
10. Tone arm slides in several grooves on record	a. Adjustments Nos. 9, 10
11. Tone arm fails to pull in first groove on record properly	a. Adjustment No. 9
12. Tone arm lands too far in or out on record	a. Adjustment No. 1 b. For loose or bent parts
13. Tone arm lands in middle of record	a. Adjustment No. 9
14. Tone arm fails to clear stack of sixteen 10-inch records	a. Adjustment No. 11
15. Tone arm lands for 10-inch record when playing a 12-inch record	a. Adjustments Nos. 5, 6
16. Changer cycles with pointer set on "M" for manual operation	a. Adjustment No. 2 b. For loose setscrew in knob (AI) c. That manual latch (FR) holds trip link rod (FS) from moving
17. Changer jams and stops	a. Adjustments Nos. 7, 14
18. Record jams	a. For off-size record or defective edge b. Adjustment No. 3
19. 12-inch record is not dropped by one of shelves	a. Adjustment No. 5
20. One or more shelves drop 2 records at a time	a. Adjustment No. 3
21. Changer fails to turn off automatically after last record is played	a. Adjustments Nos. 4, 9, 14
22. Records drop unevenly from shelf plates to turntable	a. Adjustment No. 7
23. Tone arm varies when set down on record	a. For loose tone arm shaft head on shaft (FX) b. Adjustment No. 9
24. "WOW" in record reproduction	a. For warped or defective records b. For bent motor mounting plate (FI) c. For motor shaft out of alignment with turntable shaft
25. Record is driven but not heard or not heard with proper volume	a. That pickup cord is plugged in b. Amplifier and speaker connections c. For open pickup crystal
26. Noisy or intermittent noise from speaker during change. cycle	For dust particles or grease on silencing switch contacts. This switch is mounted on the power switch assembly (FL)