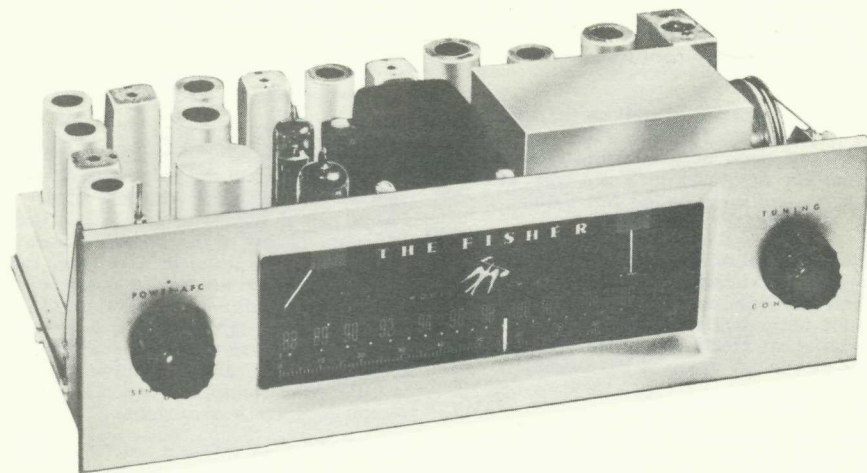




THE
FISHER[®]

FM TUNER

INSTALLATION AND
OPERATING INSTRUCTIONS



MODEL FM-80

PRICE: \$1.00

FISHER RADIO CORPORATION • NEW YORK



THE FISHER

FM TUNER • Model FM-80

GENERAL INFORMATION

THE FISHER FM Tuner, Model FM-80, is one of the finest instruments of its type ever produced in the laboratories of the Fisher Radio Corporation. The original specifications, which called for a tuner capable of meeting exacting professional standards, have not only been met but in some instances exceeded. It is one of the most compact high-quality FM tuners ever produced, yet its circuitry is so advanced and some of its features so new that it will *out-perform* any FM tuner now known to us, including several many times its size.

The circuit comprises a dual triode, cascode-type, tuned RF stage (for maximum signal-to-noise ratio) and two IF stages, followed by two cascaded limiters. The latter are combined with a Foster-Seeley Discriminator to produce a genuine Armstrong System, universally recognized as the ultimate in FM receivers. The continuously variable AUTOMATIC FREQUENCY CONTROL (AFC,) located on the front panel, assures accurate tuning and freedom from the annoyance of drift. The range of AFC lock-in can be adjusted according to the needs of the particular and exact location of the receiver, being continuously adjustable. The AFC feature can also be rendered inoperative, if desired.

THE FISHER Model FM-80 features two meters. The first is a signal strength meter, which shows the relative intensity of the incoming signal. The sensitivity of the receiver to the prevailing signal intensity can be adjusted with the SENSITIVITY Control. The second meter is a center-of-channel indicator that shows when the receiver has been accurately tuned to the desired frequency.

The cathode-follower output assures low distortion as well as the ability to use output leads of any desired length up to 200 feet. There are two output receptacles, one for use with the main or monitoring amplifier and one for use with any desired auxiliary equipment such as a tape, wire or disc recorder, a second amplifier, a commercial sound installation, or multiple distribution amplifiers.

A carefully designed flywheel tuning mechanism, equipped with an anti-backlash gear, makes selection of stations extremely simple and smooth. The edge-lighted glass slide-rule scale has large, easy-to-read numerals, as well as a 0 to 100 Logging Scale for convenient spotting of the stations most frequently used. The front panel of the Model FM-80 is a handsome brushed-brass fascia that adds distinction to any group of equipment.

INSTALLATION INSTRUCTIONS

THE FISHER Model FM-80 is supplied with the following:
1 — FM Folded Dipole, with plug attached. 1 — Shielded Cable.
4 — Mounting Screws and Flat Washers. 2 — Mounting Templates.

MECHANICAL INSTALLATION: THE FISHER Model FM-80 is constructed with a completely self-contained front panel, housing the dial mechanism. It can thus be placed on a shelf or it can be mounted in the conventional manner, behind a ¼" to ⅜" plywood panel. The necessary cut-out should be made in accordance with TEMPLATE No. 1. The mounting holes should be drilled in accordance with TEMPLATE No. 2. To remove the front panel:

1. Remove the control knobs by pulling forward.
2. Remove the two ⅜" nuts on the control shafts. The front panel will come free. When reassembling the ⅜" nuts on the control shafts, have the smooth, washer-faced surface *toward* the panel. Finally, press the knobs back on the control shafts.

PROPER VENTILATION: In any of the installations described above, it is imperative that adequate ventilation be provided. The tuner should never be mounted in a totally enclosed cabinet of small dimensions. In cases where a completely enclosed cabinet cannot be avoided, cut air slots at the rear edge of the shelf on which the tuner rests, as well as at the top rear of this compartment (either in the rear wall, or the shelf above.) This is especially necessary where an amplifier or other heat-producing equipment will be placed in the same compartment with the tuner.

ELECTRICAL INSTALLATION: ANTENNA REQUIREMENTS: The FM antenna connection is made with a four-prong plug (attached to the antenna furnished.) A folded dipole is supplied and is generally adequate, except in extreme fringe areas, or where there is a high noise level. The folded dipole can be affixed to the rear surface of the tuner compartment or placed under an adjacent carpet. Check for the best positioning of the dipole, for maximum signal, before laying it under the carpet. The lead-in portion of the dipole antenna can be extended if necessary, by adding 300-ohm, twin-lead. Should an external FM antenna be desired, it will be found that the FM antenna inputs have been designed to accommodate either a 300-ohm balanced system or a 72-ohm unbalanced, coaxial system. Connections for both types are shown on the antenna transformer shield.

POWER REQUIREMENTS: THE FISHER Model FM-80 is designed to operate on 105 to 125 volts, 50 to 60 cycles AC. It consumes approximately 50 watts.

CONNECTIONS TO ASSOCIATED EQUIPMENT: THE FISHER Model FM-80 supplies sufficient audio output voltage to operate into any control chassis and conventional amplifiers.

OPERATING INSTRUCTIONS

THE FISHER FM-80 controls were specifically designed to avoid duplication within a given sound system. For this reason, you will discover that there is no selector switch, volume control, or any other device that would exist on a well-designed control unit, such as THE FISHER Master Audio Control, Series 50-C.

INITIAL SET-UP: Turn the OUTPUT LEVEL Control, located on the rear apron of the chassis, fully counterclockwise, the minimum position. Turn the ON-OFF Switch, located on the AFC Control, clockwise until it clicks. Advance the SENSITIVITY Control to approximately the half-way position. Tune in the desired station. The center of the channel will be shown by the pointer of the TUNING Meter (the pointer resting on the center of the horizontal bar between — and +.) The OUTPUT LEVEL Control should be set as follows:

1. If the Model FM-80 output is connected to an instrument that has an input level control, adjust the tuner's OUTPUT LEVEL Control to maximum, fully clockwise.
2. If there is no input level control provided, set the OUTPUT LEVEL Control to the point where it will not overload the associated equipment, or to a point that matches the level of other equipment, such as a record player, TV sound, etc. This will insure the same relative listening level when switching from one to the other.

Tune the instrument to the strongest signal in your area. Adjust the SENSITIVITY Control to the point where the SIGNAL Meter reads between 3 and 4. The signal level of all other stations reading at least 1 will give full limiting. The SENSITIVITY Control should be advanced only in the event that the signal reading is less than 1.

NOTE: During the tuning process, the meters cannot be damaged, even by extreme deflections of the pointer.

SETTING OF AFC CONTROL: Turn the AFC Control to maximum, clockwise. In this position, it will be found that the station will automatically lock in and remain correctly tuned when the dial pointer is moved in the vicinity of the desired channel. Under ordinary conditions, the Model FM-80 can be used with the AFC in the maximum position at all times. When the pointer of the TUNING Meter rests on *any portion* of the horizontal bar, the instrument is correctly tuned. The amount of dial pointer travel over which the lock-in feature operates for a given channel can be adjusted by means of the AFC Control. In some locations, however, when a weak station is separated from a strong station by only one or two channels, the latter will tend to operate the control unit, and make it difficult to bring in the weaker of the two stations. When this condition prevails, turn the AFC Control counterclockwise to the degree necessary for normal reception of the weaker station.

ADJUSTMENT OF METERS: After the instrument has been in operation for ten or fifteen minutes, note the positions of the pointers on each meter. The SIGNAL Meter pointer should be at 0 with the SENSITIVITY Control *almost* at minimum (*not* at absolute minimum;) the TUNING Meter pointer should be at the center of the horizontal bar. If one or both of these conditions does not occur, adjustments must be made as follows: The adjustment point, marked TUNING METER ADJUSTMENT or SIGNAL METER ADJUSTMENT will be found on the top surface of the chassis, behind each meter. Insert a screw driver in the corresponding slot, and turn the slot until the pointer on the SIGNAL Meter reads "0". Adjust the TUNING Meter pointer to fall on the center of the horizontal bar.

LOGGING SCALE: THE FISHER Model FM-80 dial glass carries a logging scale consisting of linear divisions from 0 to 100. With this, location of your favorite and frequently used stations is reduced to its simplest form.

COMPLETE HOME MUSIC SYSTEM

Careful selection of associated equipment for use with THE FISHER FM Tuner, Model FM-80, will result in a perfectly matched, high fidelity home music system. Those seeking the ultimate in associated equipment will find it in THE FISHER Master Audio Control, Series 50-C, THE FISHER High Quality Amplifiers, Model 50-A or Model 70-A, and THE FISHER Hi-Lo Filter System, Model 50-F. Complete specifications on request.

GENERAL SPECIFICATIONS

FREQUENCY MODULATION: Cascode RF stage, two IF stages, dual limiters, Armstrong System, automatic frequency control (AFC).

ANTENNA INPUTS: Dual inputs; choice of 72 ohms, or 300 ohms balanced.

SENSITIVITY: Full limiting on signals as low as 1 microvolt.
 On 72-ohm antenna input: 1½ microvolts for 20 db of quieting;
 2½ microvolts for 30 db of quieting.
 On 300-ohm antenna input: 3 microvolts for 20 db of quieting;
 5 microvolts for 30 db of quieting. (Refer to Figures 1, 2, 3, and 4.)

FREQUENCY RESPONSE: Uniform from 20 to 20,000 cycles, ±1 db.

METERS: Two meters, indicating signal and center-of-channel.

OUTPUTS: Two bridged outputs, low impedance cathode-follower type.
 Output cables can be made any length up to 200 feet.

CONTROLS: Total of three. 1: VARIABLE AFC Control and line switch.
 2: SENSITIVITY Control. 3: STATION SELECTOR. Adjustable OUTPUT LEVEE Control on rear apron of chassis.

GENERAL FEATURES: 11 tubes. Self-powered. Completely shielded and shock mounted chassis. Full shielding of variable capacitor, with copper

rotor and stator plates, using solder construction to minimize possibility of microphonics. Attractive brushed-brass front panel. FM dipole antenna supplied. Tube complement: 2-6BQ7A, 1-6CB6, 2-6BH6, 2-6AU6, 1-6AL5, 2-12AU7, 1-6X4.

PHYSICAL DATA: Over-all dimensions: 12¾" wide, 7⅜" deep, 4" high.
 Allow an additional 1" depth for control knobs. Shipping weight: approximately 15 pounds.

AT YOUR SERVICE

It is the constant desire of Fisher Radio Corporation to have your FISHER equipment give you its best possible performance. Toward that objective, we solicit your correspondence on any special problems that may arise. After you have had an opportunity to familiarize yourself with THE FISHER equipment you purchased, *we would appreciate your letting us know how it is meeting your requirements.*

SPECIAL NOTE: To maintain your equipment at peak performance, may we suggest that you avail yourself of the facilities and factory trained personnel at our Service Department.

FISHER RADIO CORPORATION
 21-21 Forty-fourth Drive
 Long Island City 1, N. Y.

ALIGNMENT INSTRUCTIONS: READ WITH EXTREME CARE BEFORE ATTEMPTING ALIGNMENT. To set pointer, turn the tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Set SENSITIVITY Control to maximum clockwise, AFC Control to minimum, counterclockwise. Use an insulated screwdriver for alignment adjustment.

STEPS	DUMMY ANTENNA	COUPLING	FREQUENCY	MODULATION	DIAL POINTER SETTING	INDICATING METER	ADJUST	REMARKS
1	—	To shield of V-2 (6CB6) Unground shield	10.7 MC	None	Point of no interference.	DC VTVM to pin 7 of V-10-A	Z-1, Z-2, Z-3, Top and bottom.	Adjust for maximum deflection.
2	—	"	"	"	"	DC VTVM, 1 Meg. to pin 1 of V-6	L-8	"
3	—	"	"	"	"	DC VTVM to junction of R-26 and C-28	Detune Z-4 top slightly. Adjust Z-4 bottom.	"
4	—	"	"	"	"	"	Z-4 Top.	Adjust for zero between positive and negative reading.
5	Two 120 ohm carbon resistors	Connect for 300 ohms	106 MC	400 CPS FM (22.5 KC deviation)	106 MC	DC VTVM to pin 7 of V-10-A	C-29	Adjust for maximum deflection.
6	"	"	90 MC	"	90 MC	"	L-10	"
7	Repeat Steps 5 and 6							
8	Two 120 ohm carbon resistors	Connect for 300 ohms	106 MC	400 CPS FM (22.5 KC deviation)	106 MC	DC VTVM to pin 7 of V-10-A	C-3, C-6	Adjust for maximum deflection.
9	"	"	90 MC	"	90 MC	"	L-3, L-4	"
10	Repeat Steps 8 and 9							
11	Adjustment of meters: refer to text.							

RESISTANCE REFERENCE CHART

SOCKET PINS

TUBE	1	2	3	4	5	6	7	8	9
V-1, 6BQ7A	13K	300K	0	.2	.2	13K	1.3 MEG	0	0
V-2, 6CB6	1.3 MEG	0	0	0	13K	13K	0	—	—
V-3, 6BH6	700K	100	0	0	14K	14K	0	—	—
V-4, 6BH6	.6	100	0	0	14K	14K	0	—	—
V-5, 6AU6	40K	0	0	0	11K	11K	0	—	—
V-6, 6AU6	10K	0	0	0	30K	30K	0	—	—
V-7, 6AL5	100K	85K	0	0	0	0	85K	—	—
V-8, 6BQ7A	13K	4.7K	0	0	0	13K	1 MEG	1K	0
V-9, 12AU7	12K	1 MEG	49K	0	0	100K	100K	17K	0
V-10, 12AU7	12K	800K	600	0	0	12K	500K	600	0
V-11, 6X4	75	INF	0	0	18K	75	13K	—	—

CAUTION: Be certain to disconnect AC line cord when making these measurements.

NOTES: Sensitivity control maximum clockwise. Power Switch off. Level control maximum clockwise. All resistance in ohms unless otherwise specified. M equals megohms. K equals kilohms.

Measurements taken with respect to chassis.

VOLTAGE REFERENCE CHART

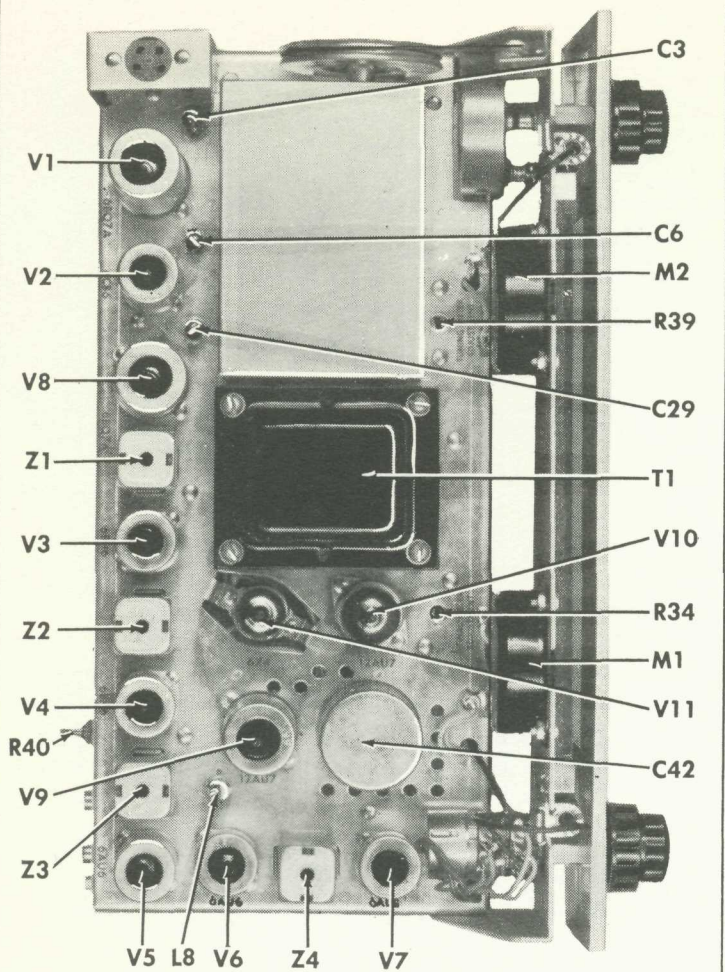
SOCKET PINS

TUBE	1	2	3	4	5	6	7	8	9
V1, 6BQ7A	105	-0.7	0	6.3AC	0	110	-0.9	0	0
V2, 6CB6	-2.4	0	0	6.3AC	105	105	0	—	—
V3, 6BH6	-0.8	0	0	6.3AC	105	105	0	—	—
V4, 6BH6	0	1	6.3AC	0	100	100	0	—	—
V5, 6AU6	-0.5	0	6.3AC	0	30	30	0	—	—
V6, 6AU6	-0.5	0	6.3AC	0	49	50	0	—	—
V7, 6AL5	1	-3	6.3AC	0	0	0	3.5	—	—
V8, 6BQ7A	110	-1	0	0	6.3AC	110	0	3	0
V9, 12AU7	110	46	53	0	0	-26	-26	4	6.3AC
V10, 12AU7	140	0	0.5	6.3AC	6.3AC	140	-0.5	5.2	0
V11, 6X4	190AC	—	0	6.3AC	—	190AC	170	—	—

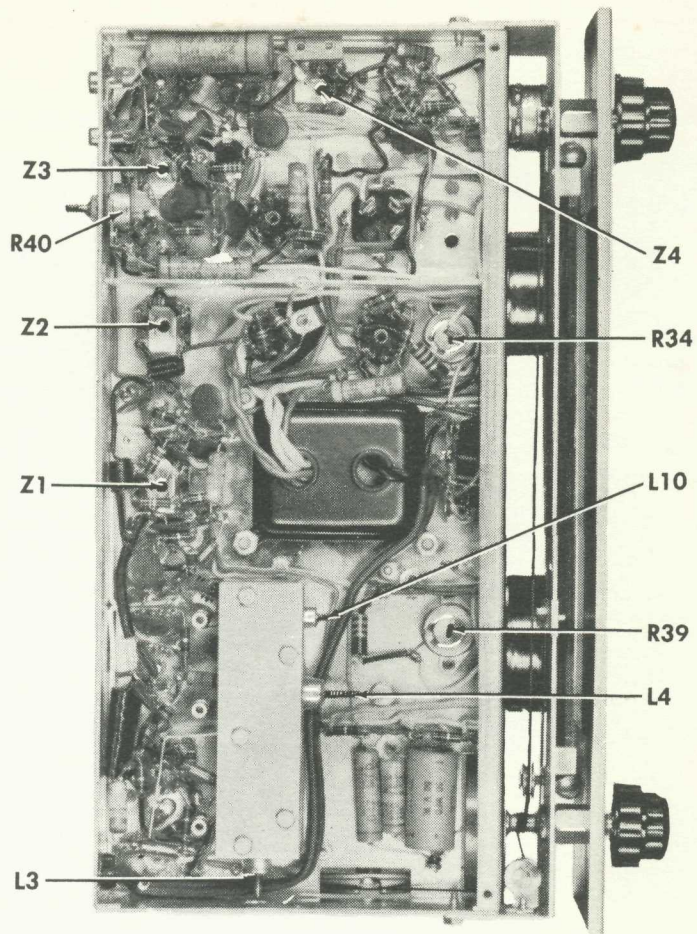
NOTES: Line voltage set at 117V, 60 cycles. Voltage readings may vary 10% under normal operating conditions.

All voltages read with Vacuum Tube Voltmeter, under no-signal conditions. Sensitivity control at maximum clockwise, AFC control at maximum counterclockwise.

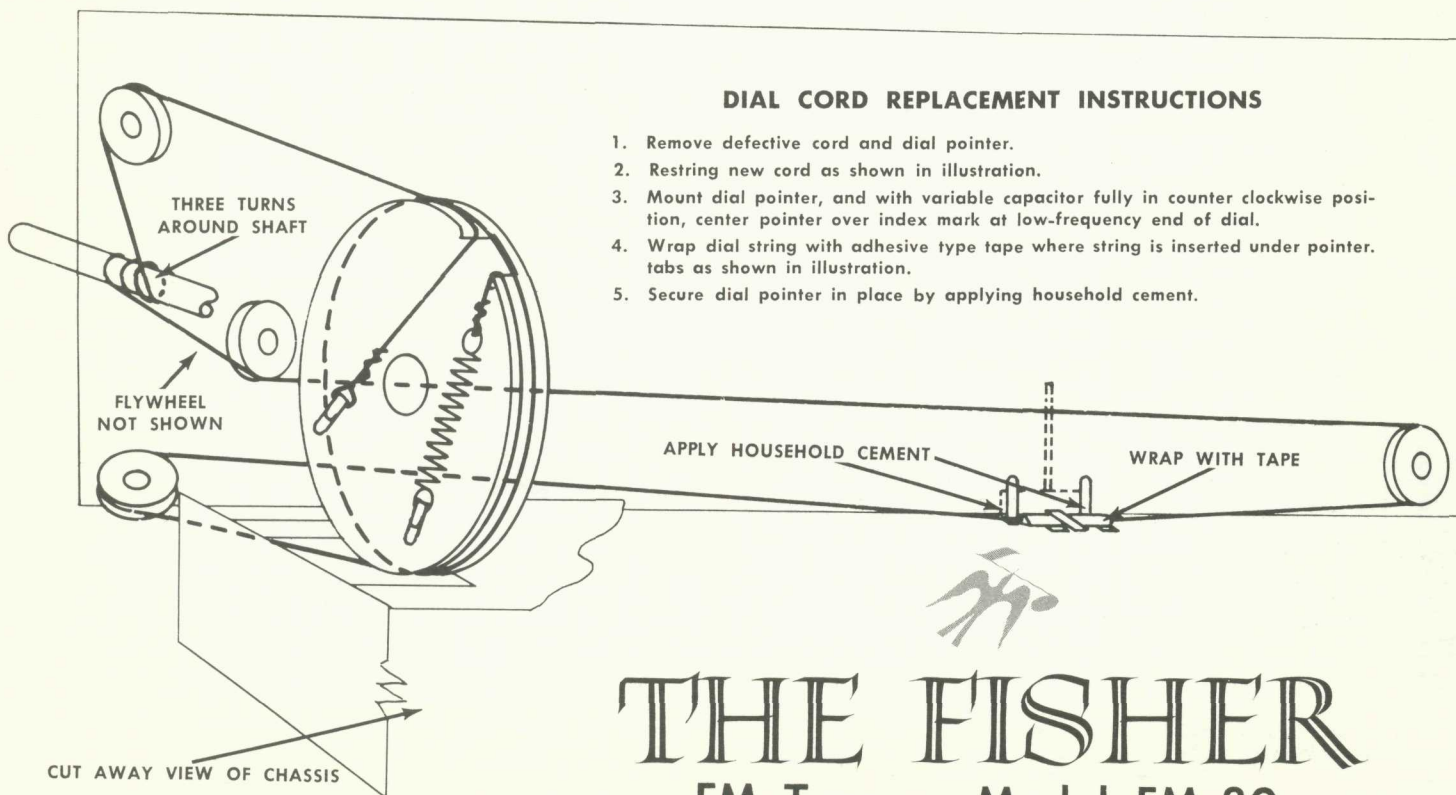
All voltages read with respect to chassis. Readings are in positive volts DC unless otherwise specified.



TOP VIEW OF CHASSIS SHOWING LOCATION OF MAJOR COMPONENTS AND ADJUSTMENTS



BOTTOM VIEW OF CHASSIS SHOWING LOCATION OF MAJOR COMPONENTS AND ADJUSTMENTS



DIAL CORD REPLACEMENT INSTRUCTIONS

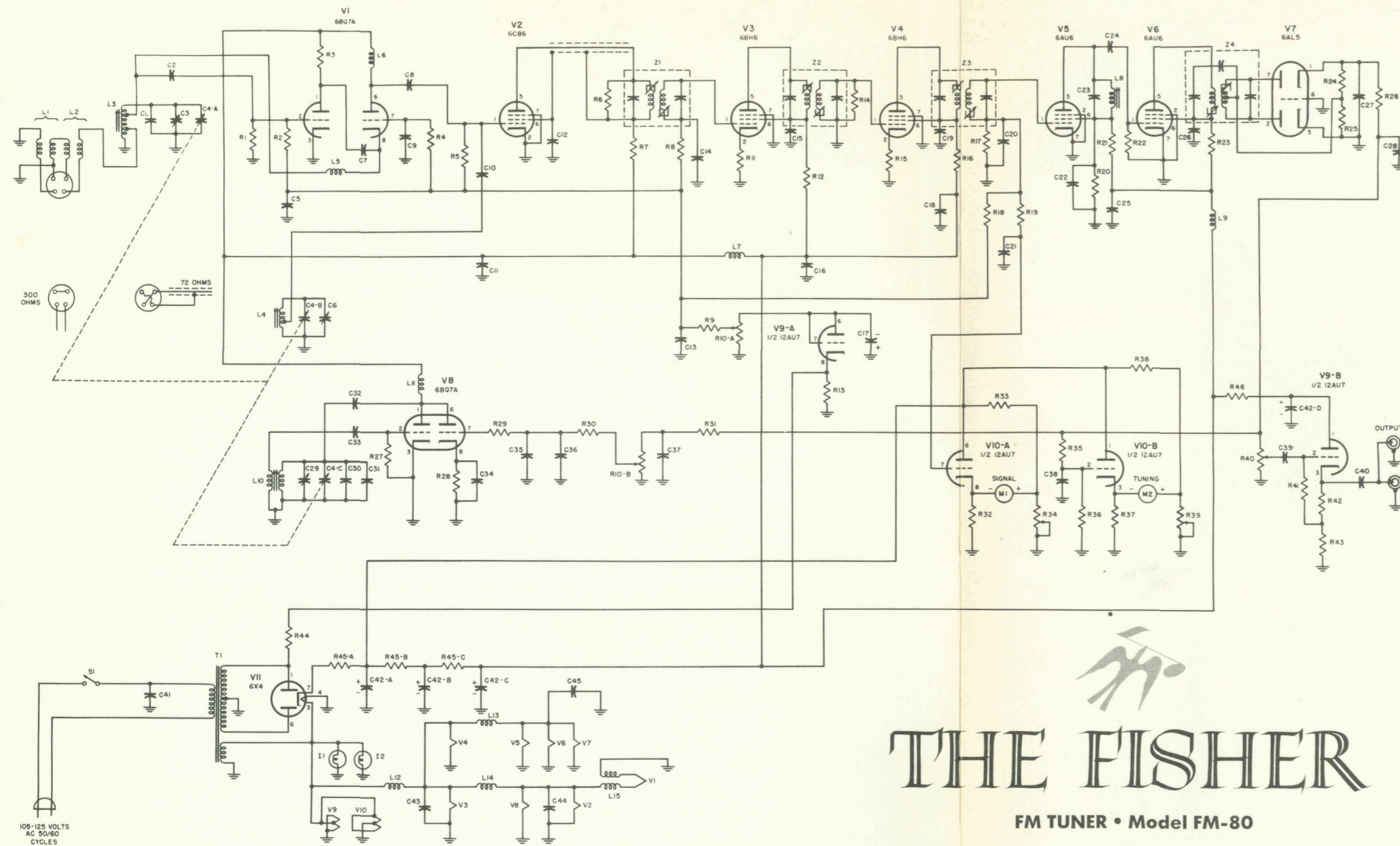
1. Remove defective cord and dial pointer.
2. Restring new cord as shown in illustration.
3. Mount dial pointer, and with variable capacitor fully in counter clockwise position, center pointer over index mark at low-frequency end of dial.
4. Wrap dial string with adhesive type tape where string is inserted under pointer.
5. Secure dial pointer in place by applying household cement.

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PARTS DESCRIPTION LIST

Symbol	DESCRIPTION	Part No.
C-1	Capacitor, Ceramic: 10 mmfd; 500 V	C-1317
C-2	Capacitor, Ceramic: 470 mmfd; 600 V	C-520-143
C-3	Capacitor, Trimmer: 1.5 — 10 mmfd, N-220	C-520-158
C-4-A, -B, -C	Capacitor, FM Variable	C-520-118
C-5	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-6	Capacitor, Trimmer: 1.5 — 10 mmfd, N-220	C-520-158
C-7	Capacitor, Ceramic: 500 mmfd; 500 V	C-1315
C-8	Capacitor, Ceramic: 33 mmfd; 500 V	C-3337
C-9	Capacitor, Ceramic: 5000 mmfd; 500 V	C-1315
C-10	Capacitor, Ceramic: 5000 mmfd; 500 V	C-3338
C-11, C-12	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-13	Capacitor: .022 mfd; 200 V	C-68P223M2
C-14, C-15, C-16	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-17	Capacitor, Electrolytic: 50 mfd; 50 V	C-508-115
C-18, C-19	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-20	Capacitor, Ceramic: 47 mmfd; 500 V	C-3350
C-21, C-22	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-23	Capacitor, Ceramic: 47 mmfd; 500 V	C-3350
C-24	Capacitor, Ceramic: 220 mmfd; 500 V	C-3306
C-25, C-26	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-27	Capacitor, Ceramic: 100 mmfd; 500 V	C-3339
C-28	Capacitor, Ceramic: 720 mmfd, 10%; 500 V	C-3422
C-29	Capacitor, Trimmer: 1-6 mmfd; NPO	C-520-159
C-30	Capacitor, Ceramic: 10 mmfd; N220; 500 V	C-2005
C-31	Capacitor, Ceramic: 5 mmfd; N750; 500 V	C-520-181
C-32	Capacitor, Ceramic: 500 mmfd; 500 V	C-1315
C-33	Capacitor, Ceramic: 47 mmfd; 500 V	C-3350
C-34, C-35	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-36	Capacitor: .047 mfd; 200 V	C-68P473M2
C-37	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
C-38	Capacitor: .01 mfd; 200 V	C-68P103M2
C-39	Capacitor: .047 mfd; 200 V	C-68P473M2
C-40	Capacitor: .22 mfd; 200 V	C-68P224V2
C-41	Capacitor, Molded Tubular: .01 mfd; 600 V	C-2747
C-42-A, -B, -C, -D	Capacitor, Electrolytic: Each Section 40 mfd; 200 V	C-520-180
C-43, C-44, C-45	Capacitor, Ceramic: 5000 mmfd; 500 V	C-2146
I-1, I-2	Lamp: Panel	I-2148
L-1, L-2	Coil: Elevator Transformer	L-509-139
L-3	Coil: Antenna Assembly	AS-520-177
L-4	Coil: RF Assembly	AS-520-176
L-5	Coil: Neutralization	L-520-178
L-6, L-7	Choke, RF: 2.2 microhenrys	L-3352
L-8	Coil: FM Limiter	L-520-145
L-9	Choke, RF: 2.2 microhenrys	L-3352
L-10	Coil: Oscillator Assembly	AS-520-174
L-11	Choke, RF	L-509-147
L-12, L-13, L-14	Choke, Filament	L-520-156
L-15	Choke, RF: Bi-Filar Winding	L-509-140
M-1	Meter, Signal	M-520-130-1
M-2	Meter, Tuning	M-520-130-2
R-1	Resistor, Composition: 470,000 ohms, 10%; 1/2 W	RC20BF474K
R-2	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
R-3	Resistor, Composition: 470 ohms, 10%; 1/2 W	RC20BF471K
R-4, R-5	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
R-6	Resistor, Composition: 68,000 ohms, 10%; 1/2 W	RC20BF683K
R-7	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-8	Resistor, Composition: 470,000 ohms, 10%; 1/2 W	RC20BF474K
R-9	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
R-10A, -B	Potentiometer, Composition: Dual Section; 100,000 ohms, 2 megohms	R-50000-7
R-11	Resistor, Composition: 100 ohms, 10%; 1/2 W	RC20BF101K
R-12	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-13	Resistor, Composition: 22,000 ohms, 10%; 1/2 W	RC20BF223K
R-14	Resistor, Composition: 68,000 ohms, 10%; 1/2 W	RC20BF683K
R-15	Resistor, Composition: 100 ohms, 10%; 1/2 W	RC20BF101K
R-16	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-17	Resistor, Composition: 47,000 ohms, 10%; 1/2 W	RC20BF473K
R-18, R-19	Resistor, Composition: 470,000 ohms, 10%; 1/2 W	RC20BF474K
R-20	Resistor, Composition: 15,000 ohms, 10%; 1/2 W	RC20BF153K
R-21	Resistor, Composition: 33,000 ohms, 10%; 1/2 W	RC20BF333K
R-22	Resistor, Composition: 10,000 ohms, 10%; 1/2 W	RC20BF103K
R-23	Resistor, Composition: 22,000 ohms, 10%; 1/2 W	RC20BF223K
R-24, R-25	Resistor, Composition: 100,000 ohms, 10%; 1/2 W	RC20BF104K
R-26	Resistor, Composition: 150,000 ohms, 10%; 1/2 W	RC20BF154K
R-27	Resistor, Composition: 4700 ohms, 10%; 1/2 W	RC20BF472K
R-28	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-29	Resistor, Composition: 100 ohms, 10%; 1/2 W	RC20BF101K
R-30	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
R-31	Resistor, Composition: 470,000 ohms, 10%; 1/2 W	RC20BF474K
R-32	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-33	Resistor, Composition: 33,000 ohms, 10%; 1/2 W	RC30BF333K
R-34	Rheostat, Wirewound: 1500 ohms	R-520-149
R-35	Resistor, Composition: 3.3 megohms, 10%; 1/2 W	RC20BF335K
R-36	Resistor, Composition: 820,000 ohms, 10%; 1/2 W	RC20BF824K
R-37	Resistor, Composition: 1000 ohms, 10%; 1/2 W	RC20BF102K
R-38	Resistor, Composition: 33,000 ohms, 10%; 1 W	RC30BF333K
R-39	Rheostat, Wirewound: 1500 ohms	R-520-149
R-40	Potentiometer, Composition: 500,000 ohms	R-520-139
R-41	Resistor, Composition: 1 megohm, 10%; 1/2 W	RC20BF105K
R-42	Resistor, Composition: 2200 ohms, 10%; 1/2 W	RC20BF222K
R-43	Resistor, Composition: 47,000 ohms, 10%; 1/2 W	RC20BF473K
R-44	Resistor, Composition: 100,000 ohms, 10%; 1/2 W	RC20BF104K
R-45A, -B, -C	Resistor, Wirewound: 880 ohms; tapped at 220 ohms and 500 ohms	R-520-179
R-46	Resistor, Composition: 2200 ohms, 10%; 1/2 W	RC20BF222K
S-1	Switch SPST Part of R-10	R-50000-7
T-1	Transformer, Power	T-520-112
Z-1, Z-2	Transformer, FM IF	ZZ-2987
Z-3	Transformer, FM IF	ZZ-509-130
Z-4	Transformer, FM Discriminator	ZZ-509-131



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