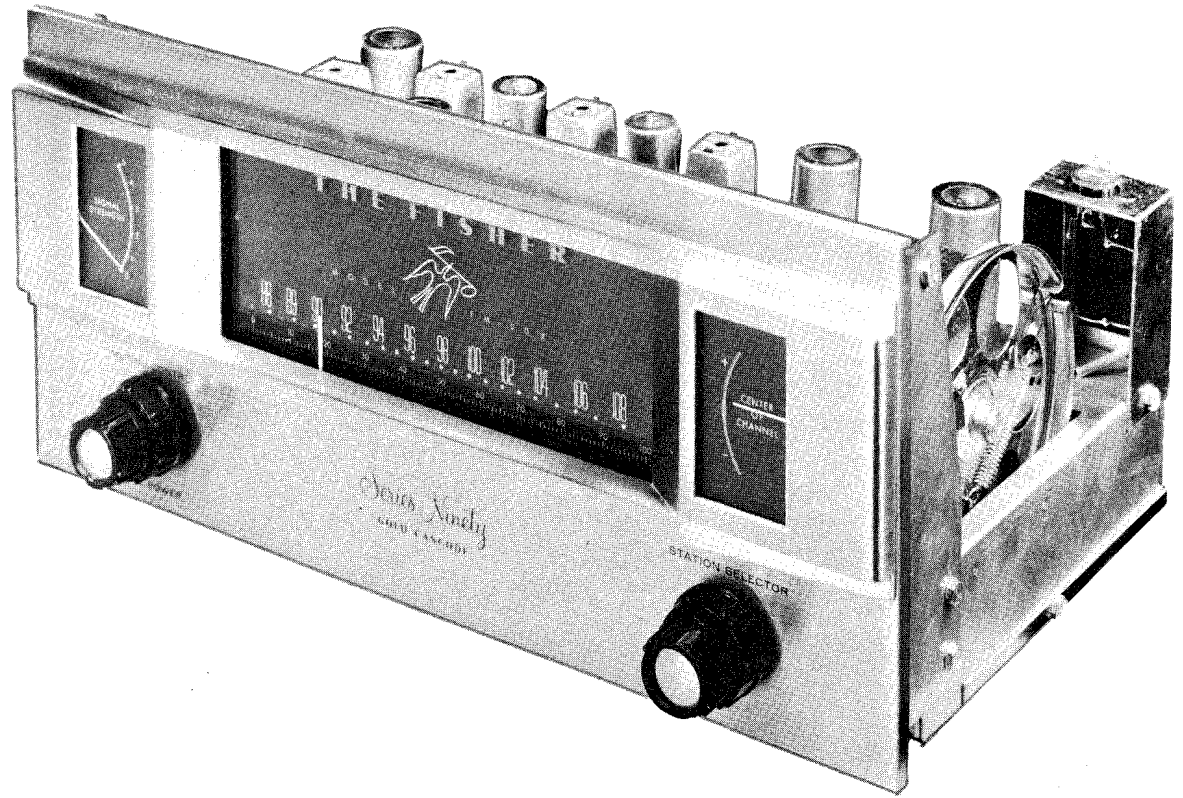


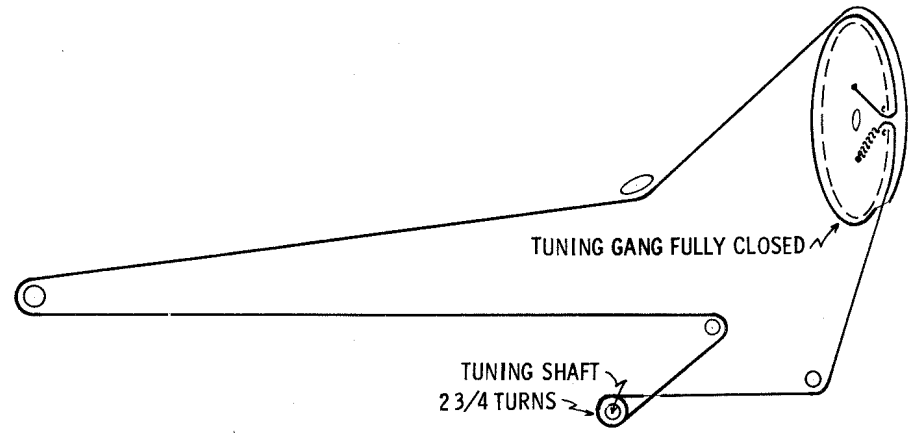


FISHER
MODEL FM-90X



FISHER
MODEL FM-90X

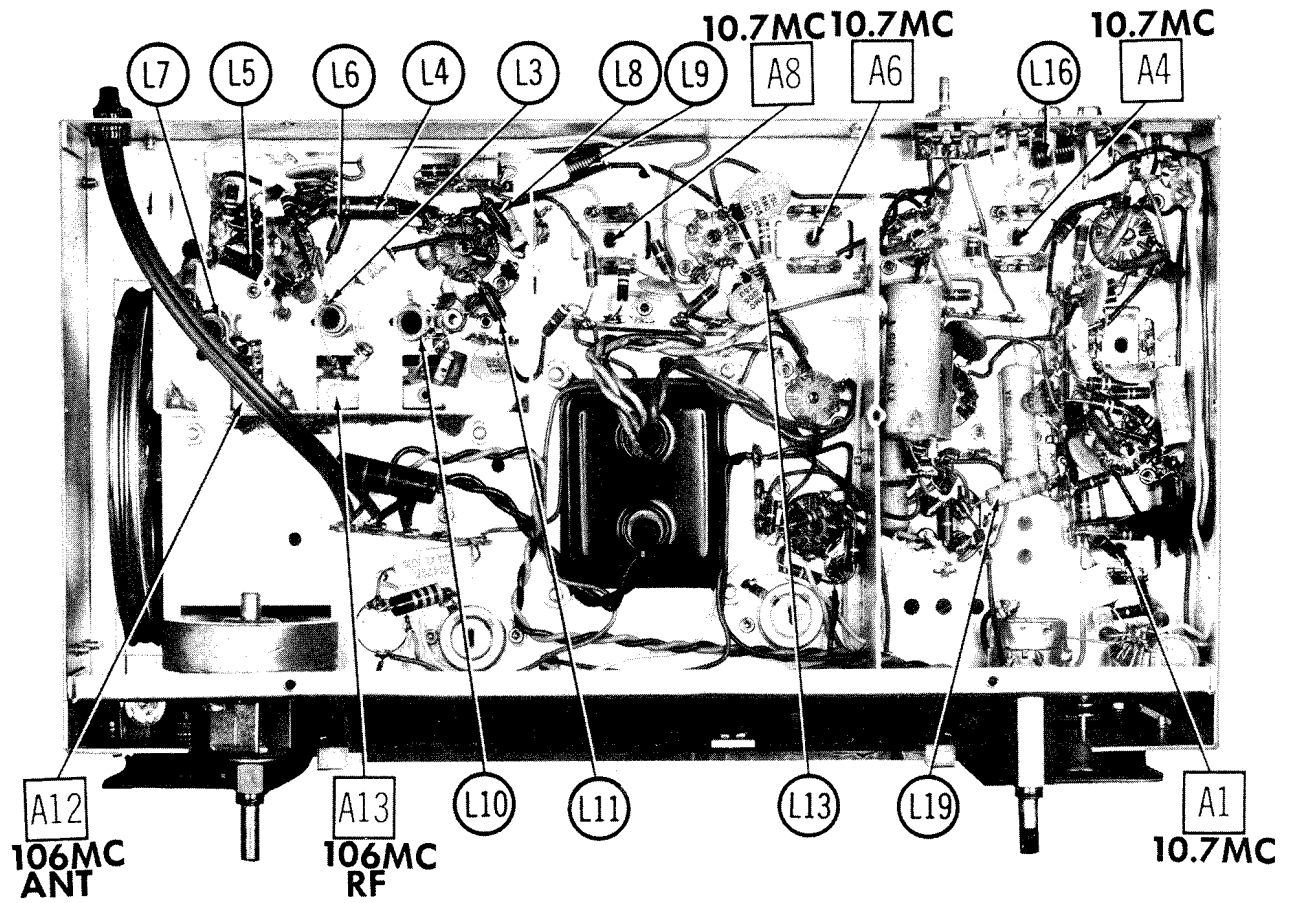
TRADE NAME	Fisher Model FM-90X	
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.	
TYPE SET	AC Operated FM Tuner	
TUBES (Nine)	Types V50064, RF Amplifier, 6BK7A Mixer-Osc., 6BH6 1st IF Amplifier, 6BH6 2nd IF Amplifier, 6AM8 3rd IF Amp.-Squelch Diode, 12AX7 Squelch Amp.-AF Amp., 6BH6 Limiter, 12AU7 AF Amp. - Meter Amp., 6X4 Rectifier	
POWER SUPPLY	105-125 Volts AC - 50/60 Cycles	RATING .46 Amp. @ 117 Volts AC (46 Watts)
TUNING RANGE—FREQ.MOD.	88 - 108MC	



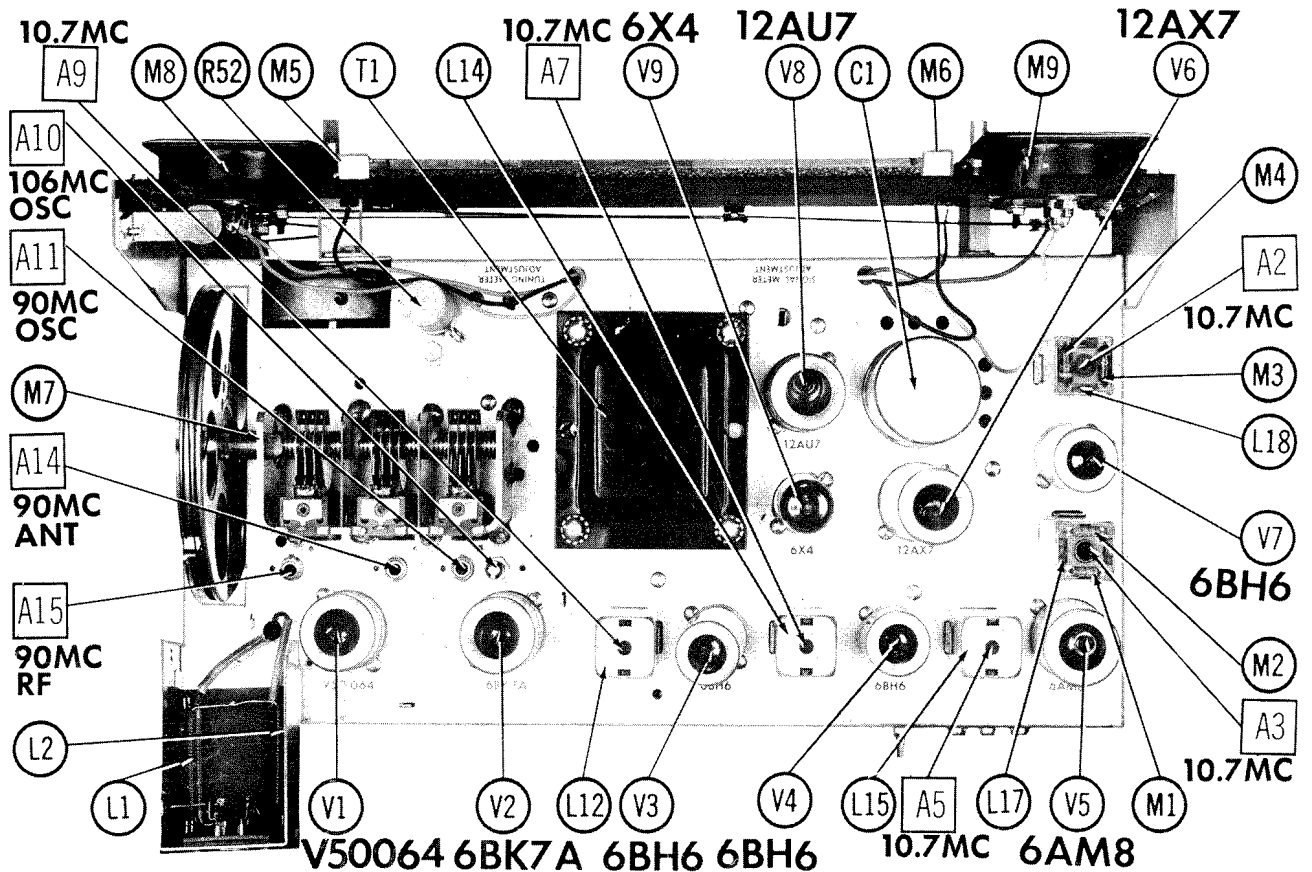
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of H382

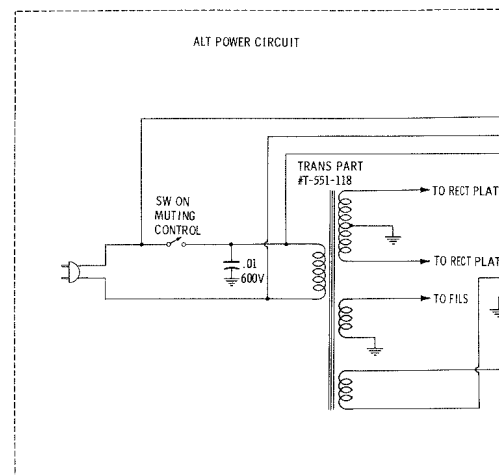
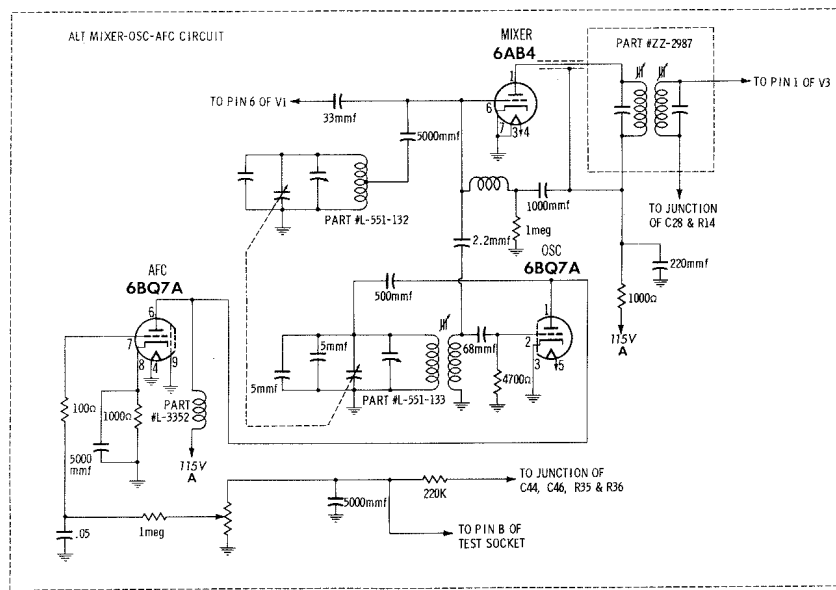
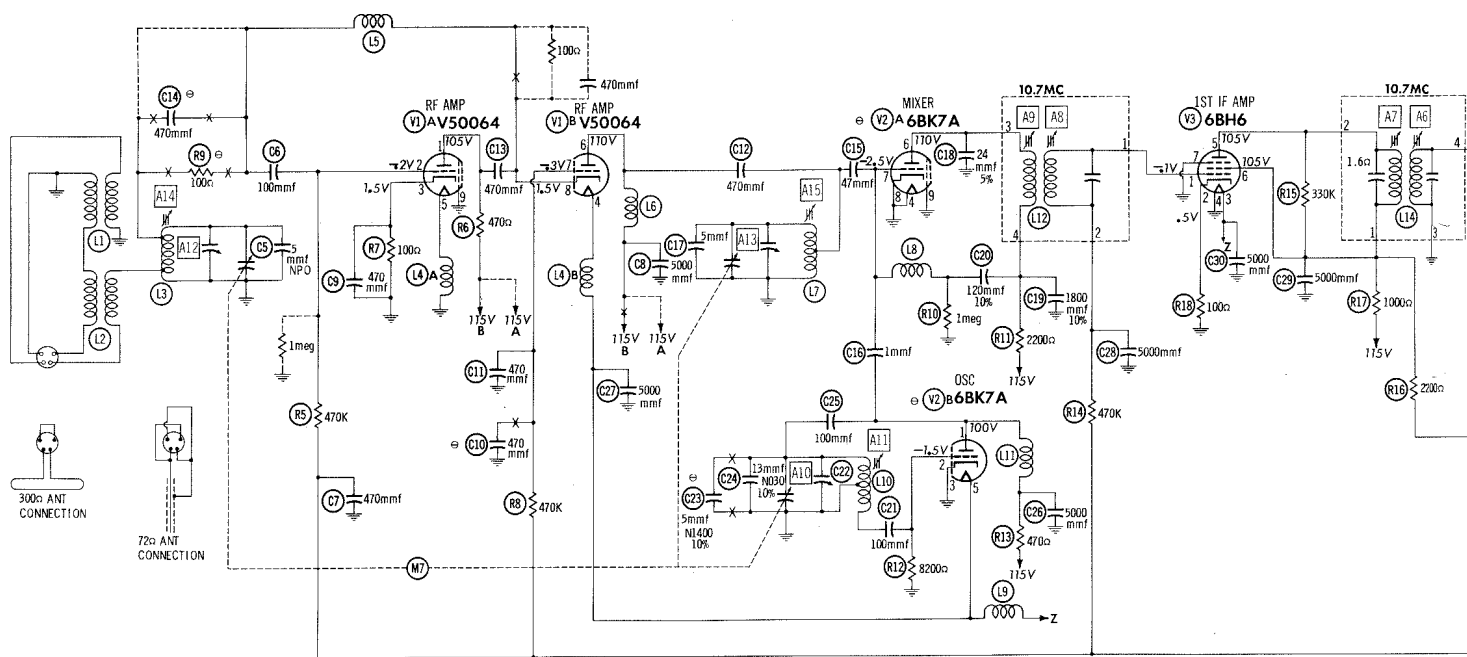
the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



CHASSIS BOTTOM VIEW- INDUCTOR AND ALIGNMENT IDENTIFICATION



CHASSIS TOP VIEW

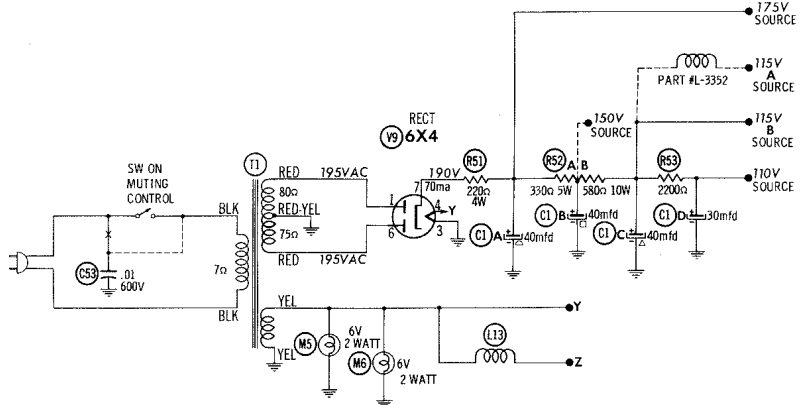
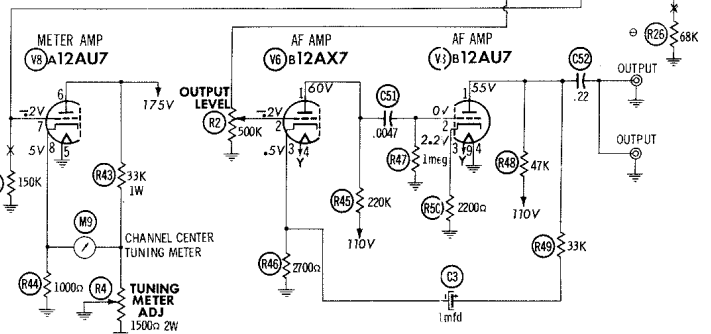
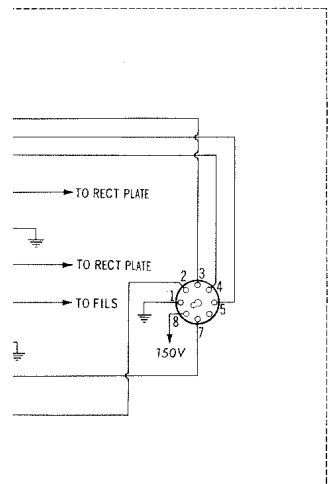
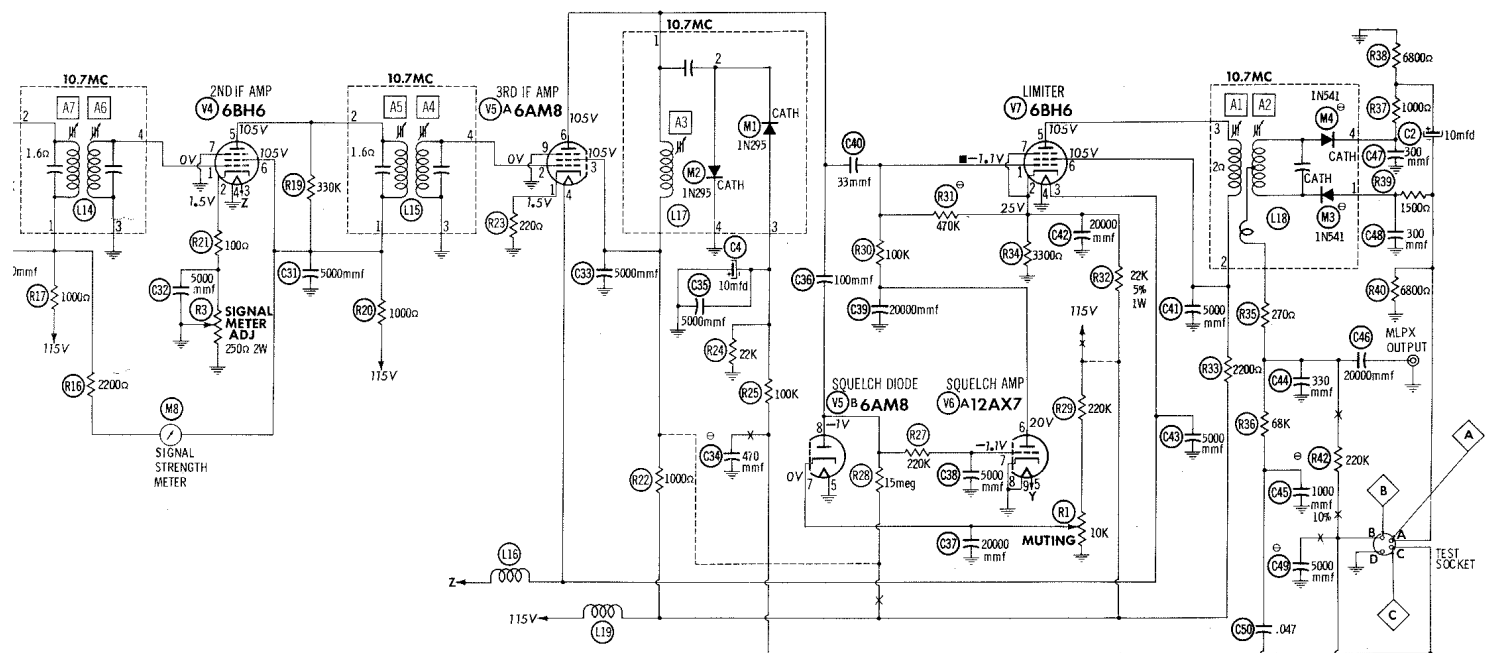


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊗ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
 DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

TUBE	TUBE	Pin 1	Pin
V1	V50064	$\dagger 1700\Omega$	530K
V2	6BK7A	$\dagger 1700\Omega$	8200 Ω
V3	6BH6	530K	100 Ω
V4	6BH6	.4 Ω	370 Ω
V5	6AM8	220 Ω	.4 Ω
V6	12AX7	$\dagger 220K$	240K
V7	6BH6	470K	3300 Ω
V8	12AU7	$\dagger 51K$	1meg
V9	6X4	80 Ω	NC

\dagger MEASURED FROM P
 Ω MEASURED FROM P
 NC NO CONNECTION



RESISTANCE READINGS

TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
50064	+1700Ω	530K	100Ω	.1Ω	.1Ω	+1200Ω	530K	100Ω	0Ω
BK7A	+1700Ω	820Ω	0Ω	.1Ω	.1Ω	+3300Ω	1meg	0Ω	0Ω
BH6	530K	100Ω	.1Ω	0Ω	+2100Ω	+2100Ω	0Ω		
BH6	.4Ω	370Ω	.1Ω	0Ω	+2100Ω	+2100Ω	0Ω		
AM8	220Ω	.4Ω	+2100Ω	.1Ω	0Ω	+2100Ω	0Ω	15meg	0Ω
2AX7	+220K	240K	2700Ω	.1Ω	.1Ω	570K	15meg	0Ω	0Ω
BH6	470K	3300Ω	.1Ω	0Ω	+3300Ω	+3300Ω	3300Ω		
2AU7	+151K	1meg	2200Ω	0Ω	0Ω	+220Ω	90K	600Ω	.1Ω
X4	80Ω	NC	0Ω	.1Ω	NC	75Ω	20K(Min)		

† MEASURED FROM PIN 7 OF V9
 ■ MEASURED FROM PIN 2 OF V7
 NC NO CONNECTION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
 Set muting control to MINIMUM.
 With tuning capacitor fully closed, set dial pointer to zero mark on logging scale.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1. .01mfd	High side to pin 1 (grid) of 6BH6 (V7). Low side to chassis.	10.7MC (Unmod)	Point of non-interference	DC probe to point (A) . Common to chassis.	A1	Adjust for maximum deflection.
2. "	"	"	"	DC probe to point (B) . Common to chassis.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	High side to ungrounded tube shield on 6BK7A (V2). Low side to chassis.	"	"	DC probe to point (C) . Common to chassis.	A3, A4, A5, A6, A7, A8, A9	Adjust for maximum deflection.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120v sawtooth voltage in scope for horizontal deflection.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1. .01mfd	High side to pin 1 (grid) of 6BH6 (V7). Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference	Vert. Amp. to point (A) . Low side to chassis.	A1	Disconnect stabilizing capacitor (C2). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2. "	"	"	"	Vert. Amp. to point (B) . Low side to chassis.	A2	Reconnect C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.
3.	High side to ungrounded shield (V2). Low side to chassis.	"	"	Vert. Amp. to point (C) . Low side to chassis.	A3, A4, A5, A6, A7, A8, A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

RF ALIGNMENT

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4. Two 120Ω Carbon Resistors	To antenna leads with 120Ω in each side.	106MC (Unmod)	106MC	DC probe to point (C) . Common to chassis.	A10	Adjust for maximum deflection.
5. "	"	90MC	90MC	"	All	"
6. "	"	106MC	106MC	"	A12, A13	"
7. "	"	90MC	90MC	"	A14, A15	Adjust for maximum deflection. Repeat steps 4 thru 7.

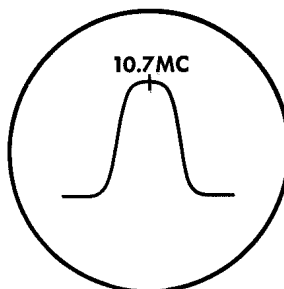


FIG. 1

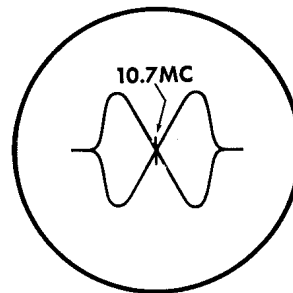
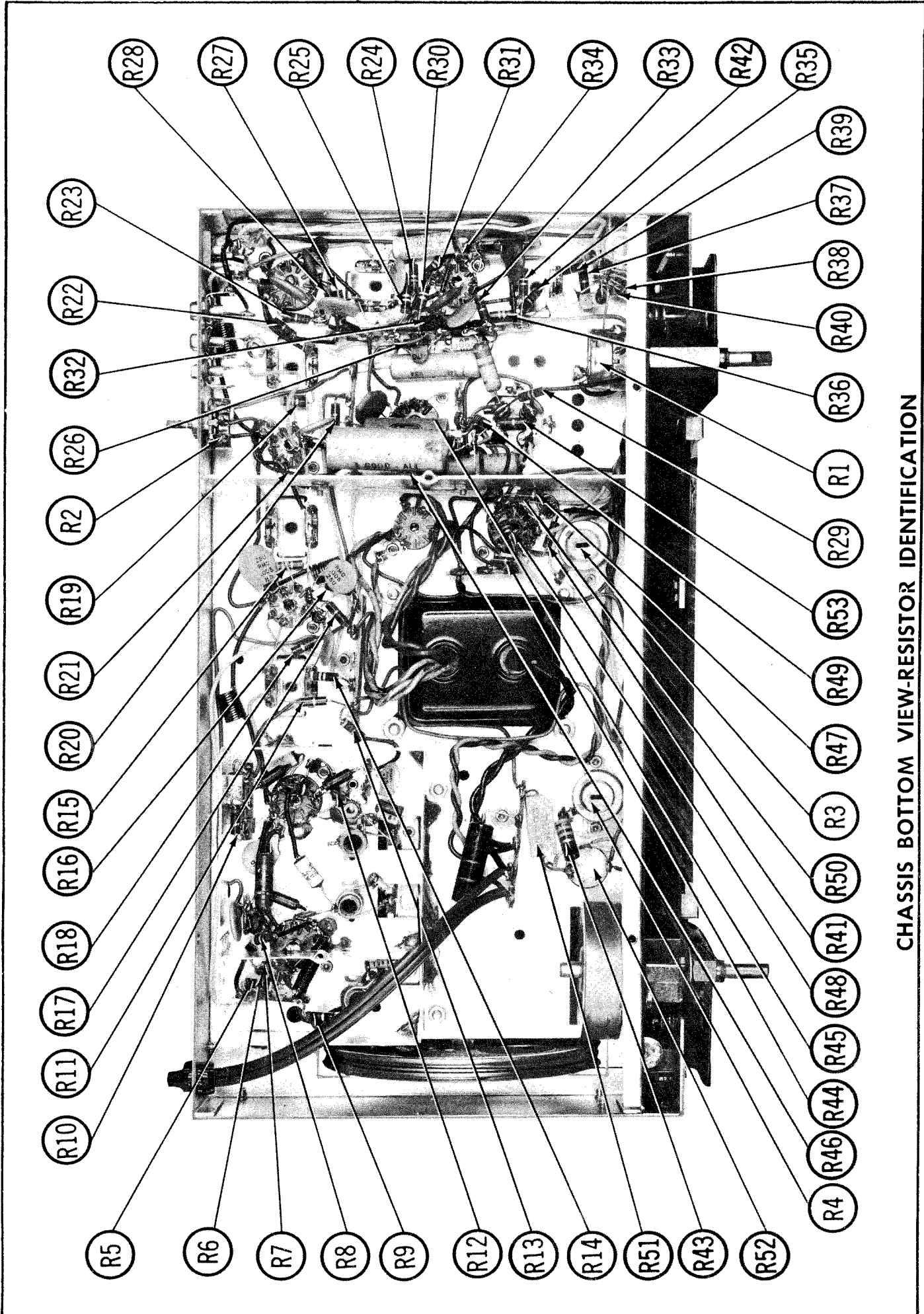


FIG. 2

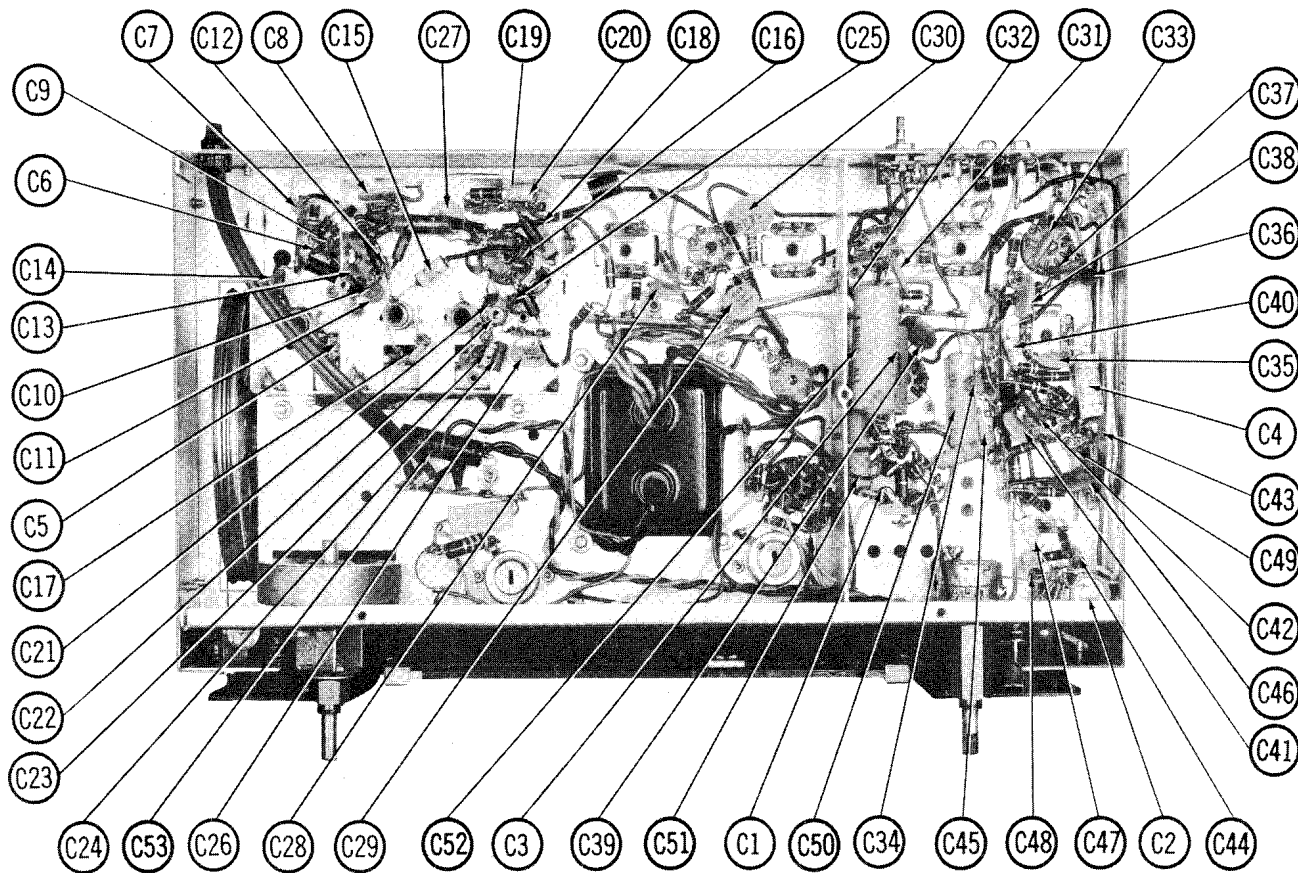
FISHER
MODEL FM-90X

FOLDER 8



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CHASSIS BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, PENNSYLVANIA)

ITEM No.	USE	TYPE	NOTES	ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	V50064		V6	Squelch Amp.-AF Amp.	12AX7	
V2	Mixer-Oscillator	6BK7A	Note 1	V7	Limiter	6BH6	
V3	1st IF Amplifier	6BH6		V8	AF Amp. - Meter Amp.	12AU7	
V4	2nd IF Amplifier	6BH6		V9	Rectifier	6X4	
V5	3rd IF Amp.-Squelch Diode	6AM8					

Note 1. In some versions, the mixer is a 6AB4. A 6BQ7A is used for the oscillator-AFC tube.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLTS.	REPLACEMENT DATA				SPRAGUE PART No.			
			FISHER PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MAILORY PART No.		PYRAMID PART No.	SAN CAMO PART No.	
C1A	40	250	C550-130	AFH4-04-50	D00034	FP420-38	TMQ-120	Q-012		TVL-4635.3
C	40	200								
C2	10	250	C551-128	PRS50V10	BBR10-50	TC32	TD-10-50	MT-0510		TVA-1804
C3	1	50	C546-126	PRS450V1	BRL45	TT250X1	ML10-50	MMT-4501		R2622 *
C4	10	50	C531-146	PWE50010	NL10-50	TT50X10	ML10-50	MMT-0510		TE-1904

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLTS.	REPLACEMENT DATA						NOTES
			FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	MAILORY PART No.	SPRAGUE PART No.	
C5	5	500	CC20CH050F5	NPO-SI 5	TCZ-4R7	CTA8V47C	ZT-555	5TCCB-V47	NPO
C6	100	800	C-577-121	BPD-0001	DD-101	LI0T1	UC-531	5GA-T1	
C7	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C8	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C9	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C10	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C11	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C12	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C13	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C14	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C15	47	500	CC21GP470M5	NPO-SI 1	TCZ-1	CTA8V47C	ZT-555	5TCCB-V1	
C16	1	500	CC21GP470M5	NPO-SI 1	TCZ-1	CTA8V47C	ZT-555	5TCCB-V1	
C17	5	500	CC20HG130K5	NPO-SI 5	TCZ-4R7	CTA8V47C	ZT-555	5TCCB-V47	
C18	24	500	CC24GP240K5	NPO-SI 20	D6-121	CTA8T12C	UC-531	5TCC-T12	
C19	1800	500	CC24GP180K5	BPD-0001	DD-101	LI0T1		5GA-T1	
C20	120	500	CC21GP120K5						
C21	100	800	C-577-121						
C22									
C23	5	500	CC20VK050F5	BPD-0001	DD-101	LI0T1	UC-531	5GA-T1	
C24	13	500	CC20HG130K5	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C25	100	800	C-577-121	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C26	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C27	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C28	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C29	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C30	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C31	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C32	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C33	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C34	470	500	C-520-143	BPD-00047	DD-471	LI0T47	UC-5347	5GA-T47	
C35	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C36	100	800	C-577-121	BPD-001	DD-101	LI0T1	UC-531	5GA-T1	
C37	20000	800	C-556-122	BPD-02	DD-203	BYA10S2	DC525	5HK-S2	
C38	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C39	20000	800	C-556-122	BPD-02	DD-203	BYA10S2	DC525	5HK-S2	
C40	33	500	CC21GP330M5	SI 33	D6-330	LT6Q33	UC-5433	5GA-Q33	
C41	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C42	20000	800	C-556-122	BPD-02	DD-203	BYA10S2	DC525	5HK-S2	
C43	5000	800	CK62GP502V6	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C44	300	500	CC21GP300M5	SI 300	D6-301	LT6T13	UC-533	5GA-T3	
C45	1000	500	CC21GP102K5						
C46	20000	800	C-556-122	BPD-02	DD-203	BYA10S2	DC525	5HK-S2	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	REPLACEMENT DATA				NOTES		
	RATING CAP. VOLT	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.		CORNELL-DUBILIER PART No.	MALLORY PART No.
C47	300	CC21GP301M5	SI 300	D6-301	L76T3	UC-533	5GA-T3
C48	300	CC21GP301M5	SI 300	D6-301	L76T3	UC-533	5GA-T3
C49	5000	CK62GP02V6	BP-D-005	DD-502	BYA10D5	DC525	5HK-D5
C50	.047	C68P473M2	P288N-047	DF-503	CUB2847	GEM-4147	2TM-547
C51	.0047	C68P473M2	P288N-0047	D6-472	CUB6D47	GEM-4247	6TM-D47
C52	.22	C58P224V2	P288N-22	D6-472	CUB22P22	GEM-2022	2TM-P22
C53	.01	C-2747	P688N-01	D6-103	CUB681	GEM-611	6TM-S1

① Not used in some versions.
 ② Chassis with serial numbers 10001-19999 use three 5mmf capacitors in parallel: N1400 (Part #CC20VK050F5), N330 (Part #CC20SK050F5), NPO (CC20C4050F5).
 Chassis with serial numbers 30001-39999 use 5mmf N750 (Part #CC20U050F5) and 15mmf N030 (Part #CC20HG130K5) in parallel.

CONTROLS

ITEM No.	REPLACEMENT DATA				INSTALLATION NOTES			
	RATING RESIST. ANCE	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.		IRC PART No.	MALLORY PART No.	
R1A	10K	Share	R551-182	B-14	A47-10K-S	Q11-116	U20	Muting
R2	500K	Switch	R520-139	Not Req.	FS-3	76-1	US-26	Power On-Off Output Level
R3	250K	2(W/W)	R550-135-2	KB-1 or KR-1*	SWE-12		FL-250	Signal Meter Adj.
R4	1500Ω	2(W/W)	R520-149	JP-504	39-300	39-1500	FL-1.5K	Tuning Meter Adj.

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		FISHER PART No.	NOTES	FISHER PART No.	NOTES
	OHMS	WATT				
R5	470K		RC20BF474K		RC20BF044K	
R6	470K		RC20BF474K		RC20BF474K	Note 2
R7	100K		RC20BF101K		RC30BF223K	
R8	470K		RC20BF474K		RC20BF223K	
R9	100K		RC20BF101K	Note 1	RC20BF322K	
R10	1meg		RC20BF102K		RC20BF271K	
R11	2200Ω		RC20BF222K		RC20BF663K	
R12	8200Ω		RC20BF822K		RC20BF102K	
R13	470K		RC20BF474K		RC20BF152K	
R14	470K		RC20BF474K		RC20BF152K	
R15	330K		RC20BF334K		RC20BF682K	
R16	2200Ω		RC20BF222K		RC20BF154K	
R17	1000Ω		RC20BF102K		RC20BF224K	Note 1
R18	100K		RC20BF101K		RC30BF333K	Note 1
R19	330K		RC20BF334K		RC20BF102K	
R20	1000Ω		RC20BF102K		RC20BF224K	
R21	100K		RC20BF101K		RC20BF272K	
R22	220Ω		RC20BF221K		RC20BF105K	
R23	22K		RC20BF223K		RC20BF473K	
R24	100K		RC20BF101K		RC20BF333K	
R25	68K		RC20BF683K		RC20BF222K	
R26	220K		RC20BF224K	Note 1	4(W/W) R-551-137	
R27	1meg		RC20BF156K		3(W/W) R-551-138	
R28	220K		RC20BF224K		10(W/W) R-551-138	
R29	220K		RC20BF224K		RC20BF222K	

Note 1. Not used in some versions.

Note 2. Some versions may use 560K in this application (Part #RC20BF564K).

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA					
	PRI.	SEC. 1	FISHER PART No.	Holliderson PART No.	Meritt PART No.	Stencor PART No.	Thorndson PART No.	Triad PART No.
T1	117V	375VCT	T-630-113					
	② .48A	③ .070A						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FISHER PART No.	Meissner PART No.	Meritt PART No.	Miller PART No.	
L1	Ant. Matching Coil	L-509-139	15-1082	TV-172	6202	BC-501
L2	Ant. Matching Coil	L-509-139	15-1082	TV-172	6202	BC-501
L3	Antenna Coil	L-551-131				
L4	Fil. Choke	L-509-140	19-1002 *	BC-563 *	4606 *	
L5	Neutr. Coil	L-520-178	19-1002	BC-563	4606	* Use two. 2 Microhenries 2.2 Microhenries
L6	RF Choke	L-50066-6	19-1002	BC-563	4606	
L7	RF Coil	L-551-187				
L8	RF Choke	L-50066-6	19-1002	BC-563	4606	2.2 Microhenries L. 25 Microhenries
L9	Fil. Choke	L-520-156	19-1000	BC-561	4602	
L10	Osc. Coil	L-551-191				
L11	RF Choke	L-50066-6	19-1002	BC-563	4606	2.2 Microhenries
L12	1st FM IF	ZZ-630-114	16-3487			
L13	Fil. Choke	L-520-156	19-1000	BC-561	4602	L. 25 Microhenries
L14	2nd FM IF	ZZ-509-130	16-3487	FM-254	1463	
L15	3rd FM IF	ZZ-509-130	16-3487	FM-254	1463	
L16	Fil. Choke	L-520-156	19-1000	BC-561	4602	L. 25 Microhenries
L17	FM Limiter Ass'y	L-551-121				
L18	Ratio Det. Ass'y	ZZ-592-170				
L19	RF Choke	L-3352	19-1002	BC-563	4606	2.2 Microhenries; IRC Part #CLA

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		FISHER PART No.	CBS PART No.	SYLVANIA PART No.	
M1	1N295		IN60	IN295	Limiter Rect. (Pigtall)
M2	1N295		IN60	IN295	Limiter Rect. (Pigtall)
M3	1N541		IN67	IN295	Ratio Det. (Pigtall) Note 1
M4	1N541		IN67	IN295	Ratio Det. (Pigtall) Note 1

Note 1. Some versions may use 1N542 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M5	Lamp	J-520-137	6 Volt, 2 Watt
M6	Lamp	J-520-137	6 Volt, 2 Watt
M7	Tuning Cap.	C-551-119	FM, 3 Gang
M8	Meter	M-551-134	Signal Strength
M9	Meter	M-551-169	Tuning, Channel Center

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	E-50049-5	Tuning
Knob	E-50049-3	On-Off, Muting
Panel	AS-630-104	Includes Escutcheon
Panel	AS-630-109	Less Escutcheon
Dial Pointer	A-551-125	
Dial Glass	N-551-117	
Meter Glass	N-551-193	Signal Strength
Meter Glass	N-551-194	Center Channel, Tuning

WIRING DATA

General-use Unshielded Hook-up Wire Use BELDEN No. 8530 (Solid) Available in Ten Colors
 Power Cord Use BELDEN No. 1765-B (6 Ft. Length)
 Low-Loss Shielded Lead (Interconnecting) Use BELDEN No. 1725-K (7 1/2 Ft. Length)
 Photo Pick-up Arm Cable Use BELDEN No. 8400
 Use BELDEN No. 8430 (Two Conductor - Twisted)