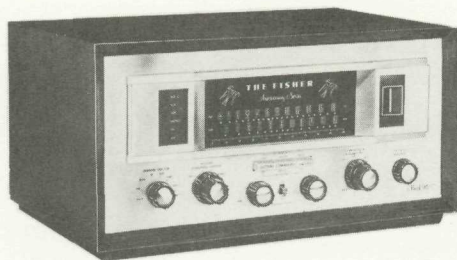




THE FISHER 90-T
SERVICE
MANUAL

MODEL 90-T

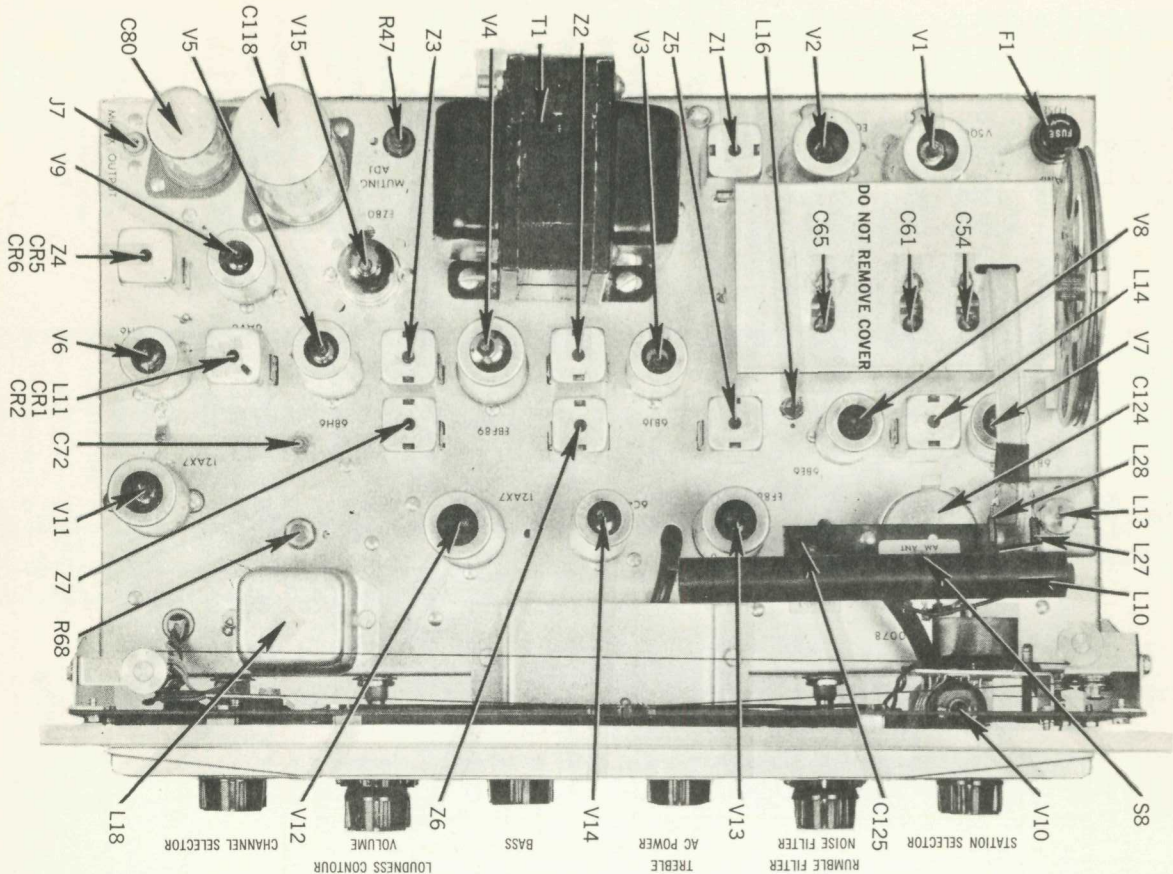


SERIAL NUMBERS
20001 — 29999 INCLUSIVE

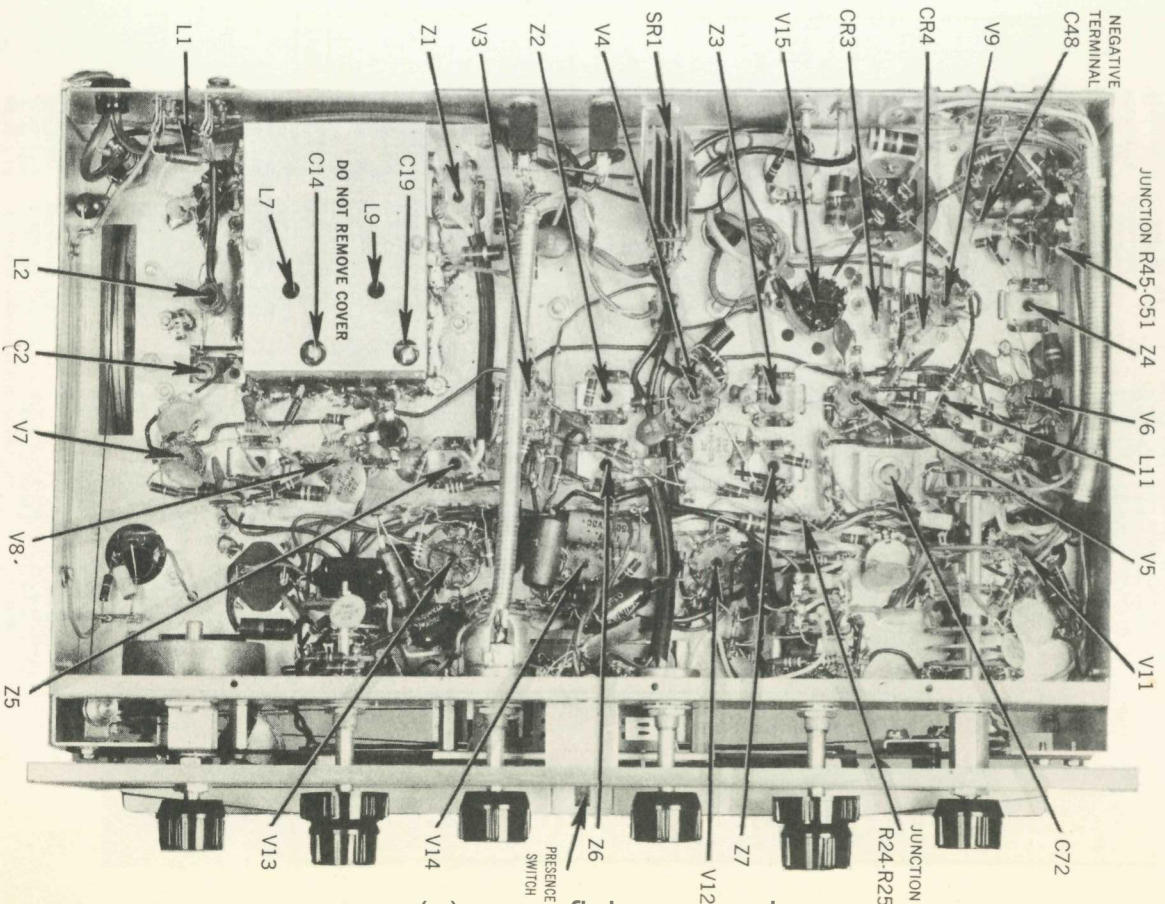
PRICE: \$1.00

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CHASSIS, TOP VIEW



CHASSIS, BOTTOM VIEW



PARTS DESCRIPTION LIST

CAPACITORS

20% tolerance for all fixed capacitors, unless otherwise noted or marked GMV (guaranteed minimum value). Cer = Ceramic.

Symbol	Order No.	Description
C1	C-528-118	Variable, FM-AM
C2	Part of C1	Tuning FM RF
C3	CC20CH050F5	Ceramic, 500 uf
C4, 5	C-50070-5	Ceramic, 100 uf
C6	C-50071-2	Ceramic, 100 uf, GMV, 1000V
C7-10	C-629-172	Ceramic, feed-through, 1000V
C11	C-629-170	Ceramic, 600V
C12	C-50071-2	Ceramic, .005 uf
C13	CC21GP680K5	Ceramic, 100 uf
C14	C-643-153	Trimmer, FM mixer
C15	CC20CH030D5	Ceramic, 300 uf NPO, 500V
C16	CC20CH050F5	Ceramic, 5 uf NPO, 500V
C17	CC21GP240K5	Ceramic, 24 uf, 10%, 500V
C18	CC21GP121K5	Ceramic, 120 uf, 10%, 500V
C19	C-643-153	Trimmer, FM Oscillator
C20	CC20T1150U5	Ceramic, 15 uf N470, 500V
C21, 22	C-577-121	Ceramic, 100 uf, 600V
C23	CC21GP102K5	Ceramic, 100 uf, 10%, 500V
C24	C-629-172	Ceramic, feed-through, 100V, 500V
C25, 26	C-629-170	Ceramic, .005 uf, 500V
C27, 28	C-3334	Mica, 470 uf
C29	C-50071-3	Ceramic, .02 uf, 5%, 250V
C30	CC20CH100G5	Ceramic, 10 uf, 10%, 1000V
C31, 32	C-629-170	Ceramic, .005 uf
C33	C-50070-1	Ceramic, 1 uf P100, 1000V
C34	CC21GP221K5	Ceramic, 220 uf, 10%, 500V
C35, 36	C-629-170	Ceramic, .005 uf
C37	C-50070-5	Ceramic, 100 uf, 1000V
C38	C-629-175	Electrolytic, 4 uf, 50V
C39	CC20CH050F5	Ceramic, 5 uf NPO, 500V
C40	C-50070-5	Ceramic, 100 uf, 1000V
C41	CC20CH050F5	Ceramic, 5 uf
C42	C-629-170	Ceramic, 500 uf
C43	C-50071-2	Ceramic, .001 uf
C44, 45	C-629-170	Ceramic, 100 uf, 10%, 500V
C46, 47	C-50072-1	Ceramic, 330 uf, 10%, 500V
C48	C-629-138	Electrolytic, 8 uf, 50V
C49	C-50072-1	Ceramic, 330 uf, 10%, 500V
C50	C-50071-2	Ceramic, 1000 uf
C51	C-50072-4	Ceramic, 1200 uf, 10%, 1000V
C52	CC21GP240K5	Ceramic, 24 uf, 10%, 500V
C53	CC21GP121K5	Ceramic, 120 uf, 10%, 500V
C54, 55	Part of C1	Trimmer, AM RF
C56	C-50071-3	Ceramic, .02 uf, 50V
C57	C-50070-4	Ceramic, 47 uf, 10%, 1000V
C58	C-629-170	Ceramic, .005 uf, 500V
C59	C-50077-6N	Special, 0.68 uf, 500V
C60	CC20CH100G5	Ceramic, 100 uf
C61	C-50077-6N	Special, 0.68 uf, 500V
C62	Part of C1	Trimmer, AM RF
C63	C-50070-5	Ceramic, 100 uf, 1000V
C64	CC21GP121K5	Ceramic, 120 uf, 10%, 500V
C65	CC20VK100G5	Ceramic, 100 uf
C66	C-50071-3	Ceramic, .02 uf, 50V
C67	C-3334	Mica, 470 uf
C68	C-629-170	Ceramic, .005 uf, 5%, 300V
C69	C-3334	Mica, 470 uf, 5%, 300V
C70	C-50074-27	Molded, .047 uf, 10%, 250V
C71	C-50070-3	Ceramic, 30 uf, 1000V
C72	C-629-151-1	Trimmer, AM 10-KC filter
C73	CC21GP470K5	Ceramic, 47 uf, 10%, 500V
C74	C-50071-3	Ceramic, .02 uf, 50V
C75, 76	C50071-2	Ceramic, .001 uf
C77	C-629-170	Ceramic, .005 uf
C78	C-50071-2	Ceramic, .001 uf
C79	C-50073-2	Ceramic, .05 uf, +80/-20%
C80	C-629-143	Electrolytic, 100V, 500V
C81	C-629-170	Ceramic, .005 uf
C82	C-50074-26	Molded, .022 uf, 10%, 250V
C83	C-639-114	Electrolytic, 25 uf, 1600 uf
C84	C-50072-8	Ceramic, 1000 uf, 10%, 1000V
C85	C-50072-7	Ceramic, 820 uf, 10%, 1000V
C86	C-50072-6	Ceramic, 300 uf, 0%, 1000V
C87	C-50073-2	Ceramic, .05 uf, +80/-20%
C88	C-50073-1	Ceramic, .02 uf, +80/-20%
C89	C-50070-3	Ceramic, 100 uf, 1000V
C90	C-50073-2	Ceramic, .05 uf, +80/-20%
C91	C-639-114	Electrolytic, 25 uf, 6V
C92	C-50074-28	Molded 0.1 uf, 10%, 250V
C93	CC21GP221K5	Ceramic, 220 uf, 10%, 500V
C94	CC21GP121K5	Ceramic, 120 uf, 10%, 500V
C95, 96	C-50074-24	Molded, 4700 uf, 10%, 250V
C97	C-50074-28	Molded, 0.1 uf, 10%, 250V
C98	C-639-114	Electrolytic, 25 uf, 6V
C99	C-50074-16	Molded, .027 uf, 10%, 125V
C100	C-50074-27	Molded, .047 uf, 10%, 250V
C101	C-50074-28	Molded, .9 uf, 10%, 250V
C102	C-639-114	Electrolytic, 25 uf, 6V
C103-5	C-50070-2	Ceramic, 12 uf NPO, 10%, 1000V
C106, 7	C-50072-4	Ceramic, 1000 uf, 10%, 1000V
C108	C-50072-2	Ceramic, 680 uf, 10%, 1000V
C109	C-50074-24	Molded, 4700 uf, 10%, 250V

RESISTORS AND POTENTIOMETERS

In ohms, 10% tolerance, 1/2 watt, unless otherwise noted. K = Kilohm, M = Megohm.

Symbol	Order No.	Description
R1	RC20BF221K	Composition, 220
R2	RC20BF474K	Composition, 470K
R3	RC20BF152K	Composition, 150K
R4, 5	RC20BF134K	Composition, 130K
R6	RC20BF102K	Composition, 1K
R7	RC20BF824K	Composition, 820K
R8	RC20BF474K	Composition, 47K
R9	RC20BF152K	Composition, 1500
R10	RC20BF682K	Composition, 6800, 1W
R11	RC30BF103K	Composition, 10K, 1W
R12	RC20BF101K	Composition, 10K
R13	RC20BF102K	Composition, 12K
R14	RC20BF101K	Composition, 10K
R15	RC20BF101K	Composition, 10K
R16	RC20BF101K	Composition, 10K
R17	RC20BF100K	Composition, 10K
R18	RC20BF824K	Composition, 820K
R19	RC20BF152K	Composition, 2.2M
R20	RC20BF152K	Composition, 2.2M
R21	RC20BF824K	Composition, 82K
R22	RC20BF824K	Composition, 82K
R23	RC20BF563K	Composition, 56K
R24	RC20BF223K	Composition, 22K
R25	RC20BF223K	Composition, 22K
R26	RC20BF223K	Composition, 22K
R27	RC20BF563K	Composition, 56K
R28	RC20BF224K	Composition, 220K
R29	RC20BF224K	Composition, 22K
R30	RC20BF223K	Composition, 22K
R31	RC20BF474K	Composition, 470K
R32	RC20BF724K	Composition, 720K
R33	RC20BF724K	Composition, 720K
R34, 35	RC20BF183K	Composition, 18K
R36	RC20BF183K	Composition, 18K
R37	RC20BF183K	Composition, 18K
R38	RC20BF183K	Composition, 18K, 1W
R39	RC20BF152K	Composition, 1500
R40	RC20BF152K	Composition, 270
R41	RC20BF152K	Composition, 1500
R42, 43	RC20BF824K	Composition, 82K
R44	RC20BF102K	Composition, 1K
R45	RC20BF102K	Composition, 10K
R46	RC20BF103K	Potentiometer, 10K
R47	R-629-141-1	Potentiometer, .50K, 20%
R48	RC20BF224K	Composition, 220K
R49	RC20BF183K	Composition, 18K
R50	RC20BF102K	Composition, 1K
R51	RC20BF102K	Composition, 10K
R52	RC20BF474K	Composition, 4.7

Symbol	Order No.	Description
R53	RC20BF105K	Composition, 1M
R54	RC20BF173K	Composition, 173K
R55	RC20BF473K	Composition, 47K
R56	RC20BF222K	Composition, 220
R57	RC20BF487K	Composition, 4.7
R58	RC20BF824K	Composition, 820K
R59	RC20BF474K	Composition, 47K
R60	RC30BF223K	Composition, 22K, 1W
R61	RC20BF102K	Composition, 1K
R62	RC20BF101K	Composition, 10K
R63	RC20BF101K	Composition, 10K
R64	RC20BF156K	Composition, 156K
R65	RC20BF105K	Composition, 105K
R66	RC20BF334K	Composition, 334K
R67	RC20BF683K	Composition, 683K
R68	R-629-141-2	Potentiometer, 200K, 20%, AM 10-KC filter
R69	RC20BF101K	Composition, 100K
R70	RC20BF104K	Composition, 104K
R71	RC20BF474K	Composition, 470K
R72	RC20BF156K	Composition, 156K
R73	RC20BF105K	Composition, 105K
R74	RC20BF105K	Composition, 105K
R75	RC20BF473K	Composition, 47K
R76	RC20BF102K	Composition, 1K
R77	RC20BF473K	Composition, 47K
R78	RC20BF334K	Composition, 334K
R79	RC30BF224K	Composition, 220K, 1W
R80	RC30BF272K	Composition, 270K, 1W
R81	RC20BF225K	Composition, 22M
R82	RC20BF335K	Composition, 3.3M
R83	RC20BF125K	Composition, 1.2M
R84	RC20BF225K	Composition, 2.2M
R85	RC20BF272K	Composition, 270K
R86	RC20BF393K	Composition, 39K
R87, 88	RC20BF274K	Composition, 270K
R89	RC20BF334K	Composition, 330K
R90	RC20BF184K	Composition, 184K
R91	RC20BF102K	Composition, 1K
R92	RC20BF334K	Composition, 330K
R93	RC20BF104K	Composition, 10K
R94	RC20BF105K	Composition, 10K
R95	RC20BF105K	Potentiometer, 1M
R96	R-629-123	Potentiometer, 1M, with SZ
R97	R-629-117	Potentiometer, 1M, 100K, 20%
R98	R-629-116	Potentiometer, 20%, bass
R99	RC20BF473K	Composition, 47K
R100	RC20BF683K	Composition, 68K
R101, 2	RC20BF473K	Composition, 47K
R103	RC20BF683K	Composition, 68K
R104	RC20BF473K	Composition, 470K
R105	RC20BF152K	Composition, 1500
R106	RC20BF225K	Composition, 2.2M
R107	RC20BF224K	Composition, 220K
R108	RC20BF824K	Composition, 820K
R109	RC20BF824K	Composition, 820K
R110	RC20BF102K	Composition, 10K
R111	RC20BF102K	Composition, 10K
R112	RC20BF394K	Composition, 390K
R113-16	RC20BF106K	Composition, 10M
R117	RC20BF473K	Composition, 47K
R118	RC40BF120J	Composition, 12, 47K, 1W
R119	RC20BF105K	Composition, 1M
R120	RC20BF333K	Composition, 33K
R121	RC20BF104K	Composition, 100K
R122	RC20BF154K	Composition, 150K
R123	RC20BF154K	Composition, 150K
R124	RC20BF154K	Composition, 150K
R125	RC30BF473K	Composition, 47K, 1W
R126	RC20BF122K	Composition, 1200
R127	RC20BF694K	Composition, 690K
R128	RC20BF694K	Composition, 690K
R129	RC40BF331K	Composition, 330, 2W
R130	RC40BF331K	Composition, 270, 2W
R131	RC40BF271K	Composition, 270, 2W
R132	RC30BF241J	Composition, 240, 5%, 1W

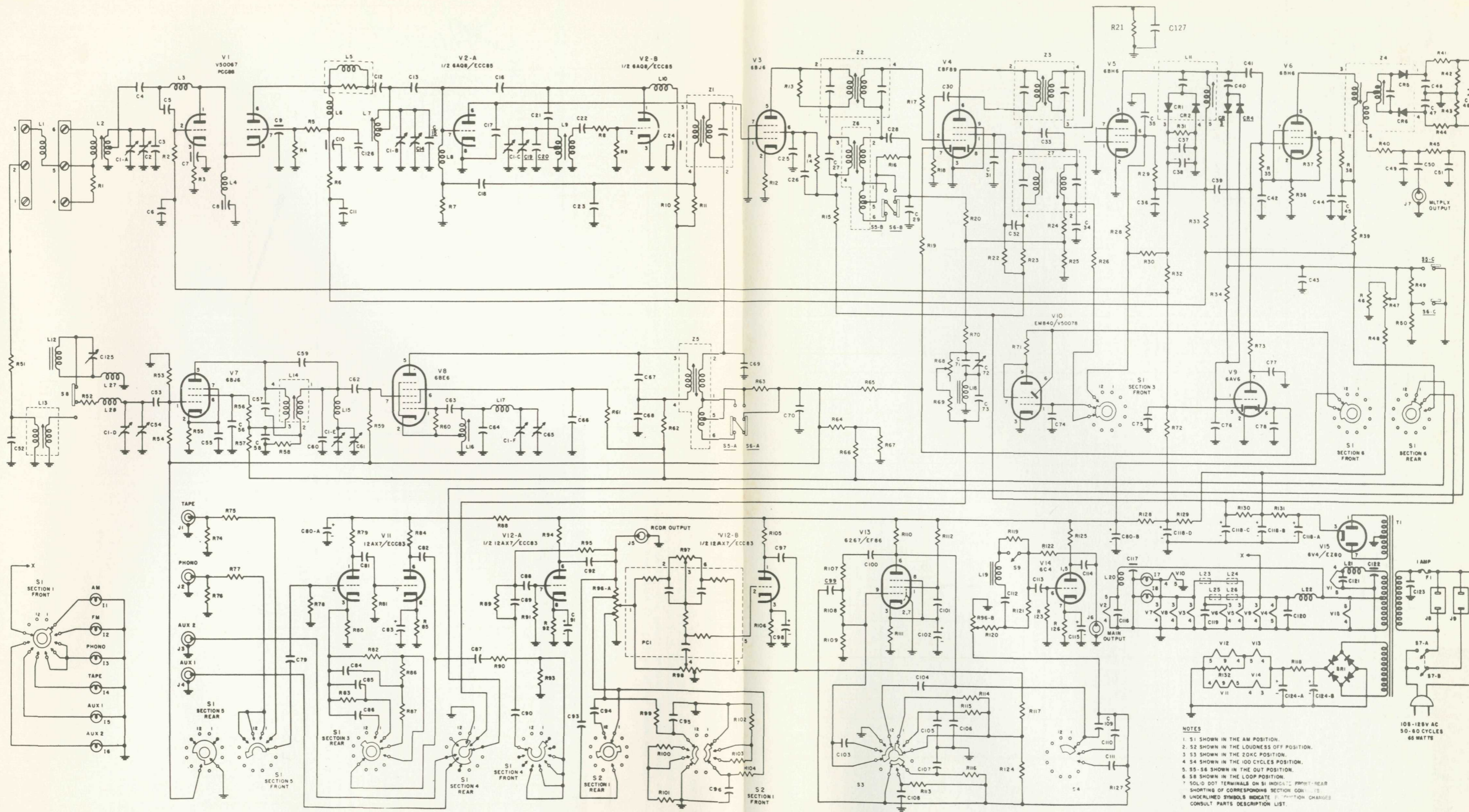
COILS, TRANSFORMERS, CHOKES

Symbol	Order No.	Description
L1	L-50066-8	Choke antenna, 3 uf
L2	L-629-177	Coil, tuned, FM antenna
L3	L-50066-3	Choke, RF, 1.2 uh
L4	L-50066-3	Choke, RF, 1.2 uh
L5	L-629-180	Choke, RF, 0.56 uh

Symbol	Order No.	Description
L6	L-50066-19	Choke, RF, 0.56 uh
L7	L-629-178	Coil, tuned, FM RF
L8	L-50066-7	Coil, tuned, FM oscillator
L9	L-629-179	Coil, tuned, FM oscillator
L10	L-50066-3	Choke, RF, 1.2 uh
L11	L-551-121	Coil, assy, tuned
L12	L-629-176	Coil, tuned, AM antenna
L13	L-629-171	Coil, tuned, AM antenna
L14	L-556-125	Coil, tuned, AM RF
L15	L-50066-3	Choke, RF, 1.2 uh
L16	C-5000-122	Coil, tuned, AM oscillator
L17	L-50066-3	Choke, RF, 1.2 uh
L18	L-629-152	Coil, AM, 10-KC
L19	L-629-153	Coil, AM, 10-KC
L20, 21	L-50066-19	Choke, filament, 0.56 uh
L22	L-629-156	Choke, filament
L23-26	L-592-189	Choke, ferrite bead, 1.2 uh
L27, 28	L-50066-3	Choke, RF, 1.2 uh
L29	L-629-118	Transformer, power
L30	ZZ-630-114	Transformer, power
L31	ZZ-630-114	Transformer, power
L32	ZZ-629-142	Transformer, 1st FM IF
L33	ZZ-629-142	Transformer, assy, FM IF and 3rd IF
L34	ZZ-592-170	Transf. assy, FM det
L35, 6	ZZ-629-135	Transf. assy, 1st and 2nd AM IF
L37	ZZ-2984	Transf. assy, 3rd AM IF

MISCELLANEOUS

Symbol	Description
CR1, 2	Crystal diode
CR3, 4	FM limiter
V-1N541	FM muting
V-1N66	Interchangeable with V-1N541
CR5, 6	Crystal diodes, FM detector
F1	Fuse, 1 ampere
I-588-120	Lamp, channel indicator
I-563-145	Lamp, dial edge
I-50048	Jack input
J-3143	Jack, input
J-546-129	Receptacle, auxiliary AC
AS-50-163-2	Dipole antenna, FM
P-1091	



NOTES

1. S1 SHOWN IN THE AM POSITION.
2. S2 SHOWN IN THE LOUDNESS OFF POSITION.
3. S3 SHOWN IN THE 20KC POSITION.
4. S4 SHOWN IN THE 100 CYCLES POSITION.
5. S5-S6 SHOWN IN THE OUT POSITION.
6. S8 SHOWN IN THE LOOP POSITION.
7. SOLID DOT TERMINALS ON S1 INDICATE FRONT-REAR SHORTING OF CORRESPONDING SECTION COILS.
8. UNDERLINED SYMBOLS INDICATE POSITION CHANGES. CONSULT PARTS DESCRIPTION LIST.

SCHEMATIC DIAGRAM

THE FISHER 90-T

ALIGNMENT INSTRUCTIONS

Read These Instructions With Extreme Care Before Attempting Alignment.

CHASSIS: Turn the Station Selector completely counterclockwise, without forcing. Dial pointer should be at zero index mark on logging scale. If not, re-set the dial pointer as described under Dial Cord Replacement. Disconnect external antennas, antenna link between terminals 1 and 2. Set tone controls to flat. Turn loudness contour control and presence switch off. Switch rumble filter to 20 cycles, and noise filter to 20 KC. When using an oscilloscope for alignment, set volume control for no overload, as shown by proper waveform shape.

SIG. GEN: The signal generator equipment must be able to supply the following: AM RF modulated 30% at 400 cps, FM RF modulated 30% (± 22.5 -KC deviation) at 400 cps, accurately calibrated

10-KC audio output for adjusting 10-KC AM whistle filter, AM IF with 30-KC sweep for AM band-width adjustment.

INDICATOR: DC VTVM and SCOPE for alignment. AC VTVM for 10-KC AM whistle filter adjustment. AC VTVM and SCOPE for FM muting adjustment.

ALIGNMENT: Allow the chassis and test instruments to warm up for at least fifteen minutes. Adjust the line voltage for 117 volts AC, 50-60 cycles. Use fully insulated tools: a small slot-head screwdriver for all capacitors, L13 and L16; a K-tran tool for Z1, Z2, Z3, Z5, Z6, Z7, and L14; a hex tool for Z4, L2, L7 and L11.

STEPS	CHASSIS		SIGNAL GENERATOR		INDICATOR		ALIGNMENT				
	PUSH BUTTONS	LOOP SW	STATION SELECTOR	COUPLING	FREQ.	MOD.		TYPE	CONNECTION	ADJUST	INDICATION
1	AM SHARP (DISTANT)	EXT	Point of no signal and no interference	.01-uf capacitor in series with hot lead to V8, pin 7	455 KC	30% AM at 400 cps	DC VTVM or SCOPE	Z7 pin 2, to main output	Z5, Z6, Z7 top and bottom	Maximum negative voltage	
2	"	"	1400 KC	220-uf capacitor in series with hot lead to antenna terminal 2	1400 KC	"	"	"	C54, C61, C65	"	
3	"	"	600 KC	"	600 KC	"	"	"	L13, L14, L16	"	
4	Repeat steps 2 and 3 at least once for proper dial calibration										
5	AM SHARP (DISTANT)	LOOP	1400 KC	Hot lead loosely coupled to loopstick	1400 KC	"	"	"	C80	"	
6	AM BROAD (LOCAL)	EXT	Point of no signal and no interference	.01-uf capacitor in series with hot lead to V8, pin 7	455 KC	30-KC sweep	SCOPE	Main output	Z7 top	Adjust slightly for symmetrical curve	
7	OFF (DISTANT)	-	"	Ungrounded tube shield of V2	10.7 MC	None	DC VTVM	L11, pin 3	Z1, Z2, Z3 top and bottom, L11 boltom	Maximum negative voltage	
8	"	-	"	"	"	"	"	C48, neg. terminal	Z4 bottom	"	
9	"	-	"	"	"	"	"	R45-C51 junction	Z4 top	Zero reading on zero-center scale	
10	"	-	106 MC	Two 120-ohm carbon resistors in series with leads to antenna terminals 5 and 6	106 MC	30% FM (22.5 KC dev) at 400 cps	DC VTVM and SCOPE	L11, pin 3, to main output	C 19	Check for sine waveform, and adjust for max negative voltage	
11	"	-	* 90 MC	"	90 MC	"	"	"	L9	"	
12	"	-	106 MC	"	106 MC	"	"	"	C2 & C14	"	
13	"	-	90 MC	"	90 MC	"	"	"	L2 & L7	"	
14	Repeat steps 4 through 7 at least once for proper dial calibration and maximum output										

AM ALIGNMENT

Switch channel selector to AM.

FM ALIGNMENT

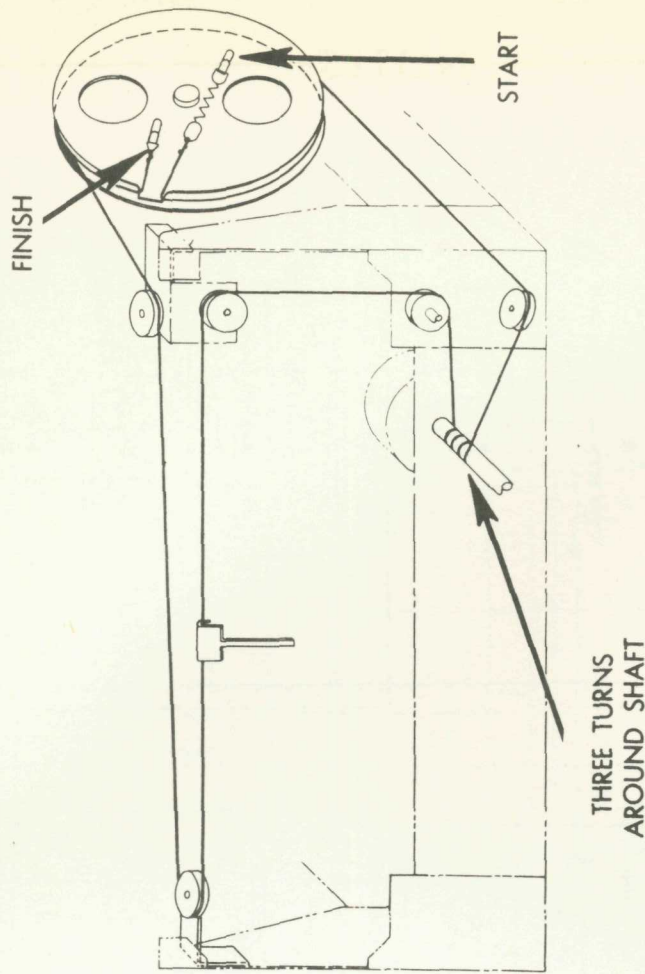
Switch channel selector to FM.

ADJUSTING FM MUTING LEVEL: Connect signal generator as in step 10 of Alignment Instructions. Tune chassis to 98 MC. Set signal generator for 98 MC with 30% FM (22.5 KC deviation) at 400 cps, and 100 uv output. Connect oscilloscope to main output, and check waveform for no overload and no clipping. Connect AC VTVM to main output and observe reading with DISTANT pushbutton depressed. Depress LOCAL pushbutton, and adjust R47 for reading 2 db below reading with DISTANT pushbutton depressed.

ADJUSTING 10-KC AM WHISTLE FILTER: Connect an audio oscillator to the junction of R24 and R25, and set for 10 KC. The oscillator MUST be accurately calibrated, or this adjustment should not be attempted. Connect an AC VTVM to the chassis main output. Make back-and-forth adjustments of R68 and C72 until a minimum reading is obtained on the meter. Use a small slot-head screwdriver for both adjustments.

DIAL CORD REPLACEMENT INSTRUCTIONS

1. Remove chassis from cabinet. Remove all knobs. Carefully remove the hexagonal nuts located behind the channel selector and station selector knobs. Remove the two hexagonal screws holding the brass panel assembly. These are located behind the front panel, near the upper corners. Carefully lift the brass panel away. Remove bottom cover.
2. Remove the defective cord and the dial pointer. String the new dial cord as shown in the diagram at the right. The three turns around the station selector shaft (behind the bracket) are made back-to-front in a clockwise direction.
3. Turn the station selector to its extreme counterclockwise position, without forcing. Slip the dial pointer onto the top edge of the metal front panel and position at the index mark at the low end of the logging scale. Thread the dial cord in the three clips at the back of the dial pointer, after affixing a small piece of tape to the cord at the point it passes under the center clip. Check the position of the dial pointer as at the beginning of this step, then apply household cement to secure the pointer to the dial cord.
4. Replace bottom cover. Replace the brass panel assembly, making sure to use both the hexagonal screws and the nuts removed in step 1.





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