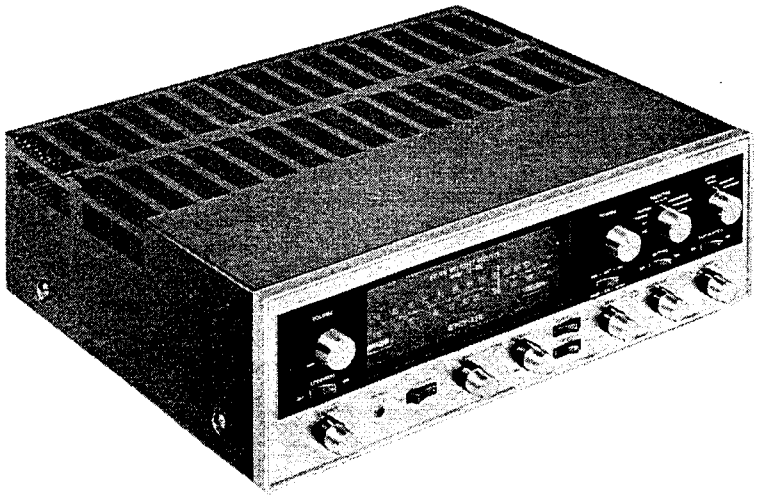
PIONEER®

SERVICE MANUAL

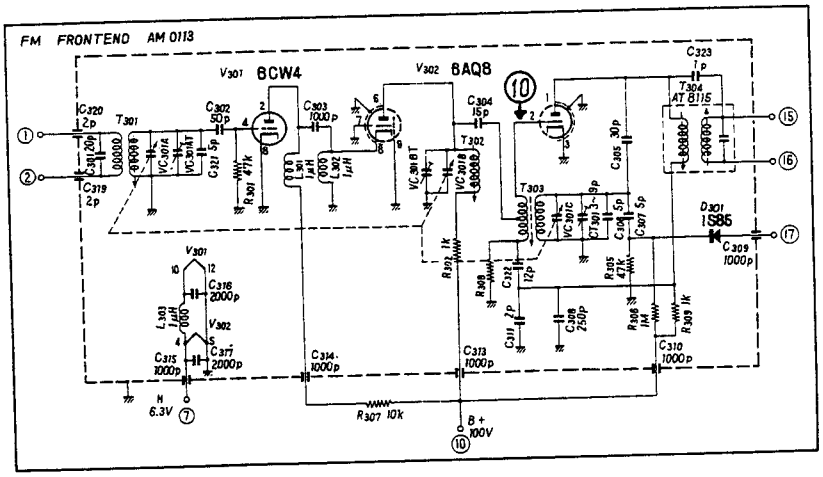


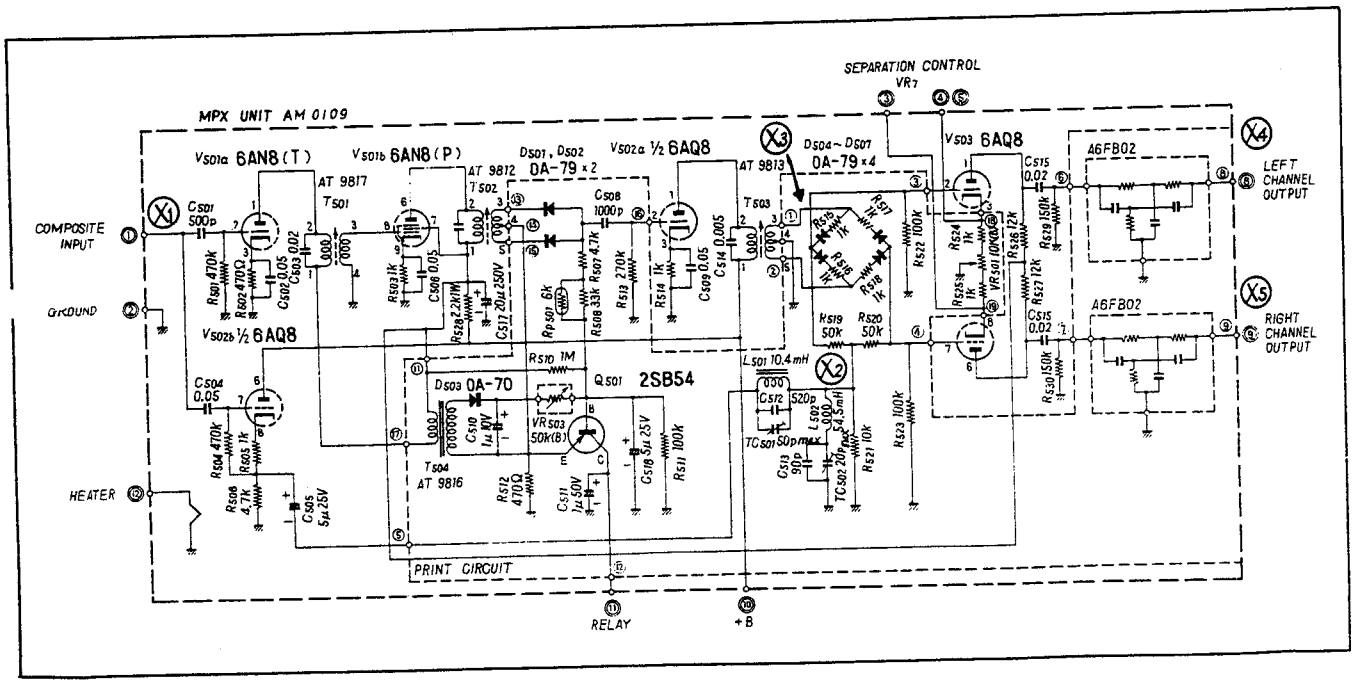
AM/FM MULTIPLEX RECEIVER

SX-800

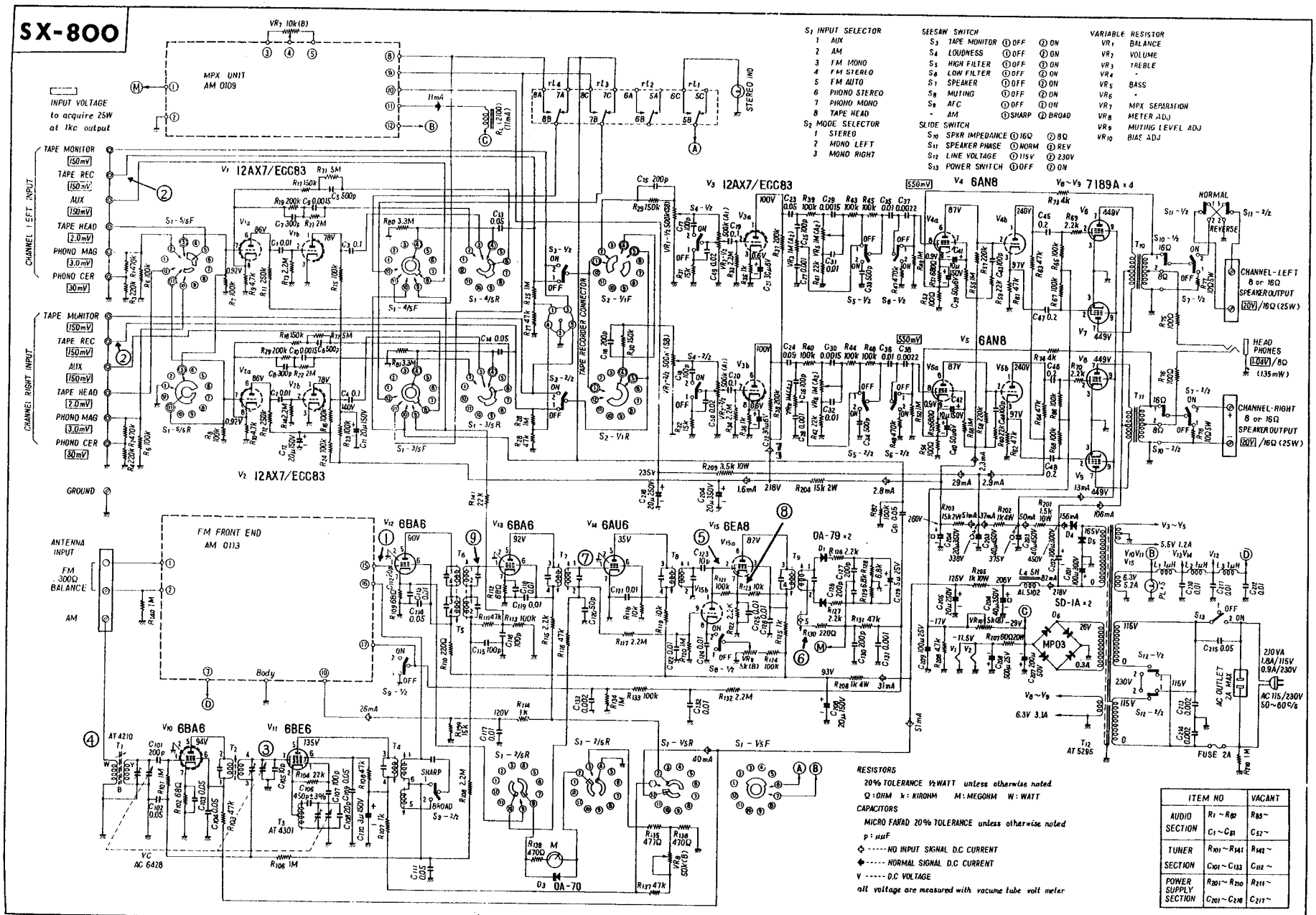
PIONEER ELECTRONIC CORPORATION
TOKYO JAPAN

45R5


FM FRONTEND AM 0113
V301 6CW4
V302 6AQ8
D301 1S85
H 6.3V
B+ 100V

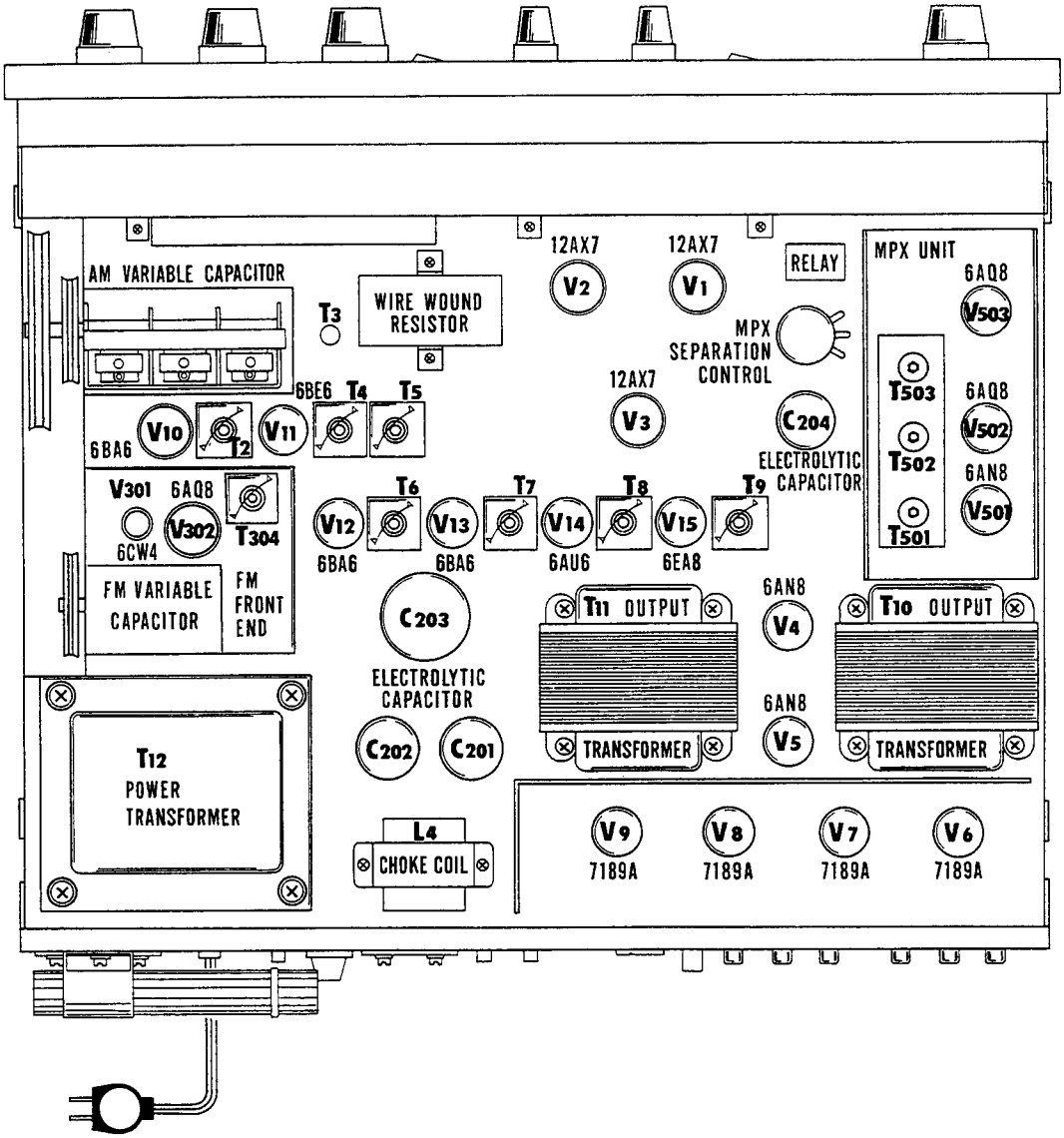

MPX UNIT AM 0109
SEPARATION CONTROL VR7
V501a 6AN8(T)
V501b 6AN8(P)
V502a ½ 6AQ8
V502b ½ 6AQ8
V503 6AQ8
D501, D502 0A-79 x2
D504~D507 0A-79 x4
D503 0A-70
Q501 2SB54
A6FB02
COMPOSITE INPUT
GROUND
HEATER
LEFT CHANNEL OUTPUT
RIGHT CHANNEL OUTPUT
PRINT CIRCUIT
RELAY
+B

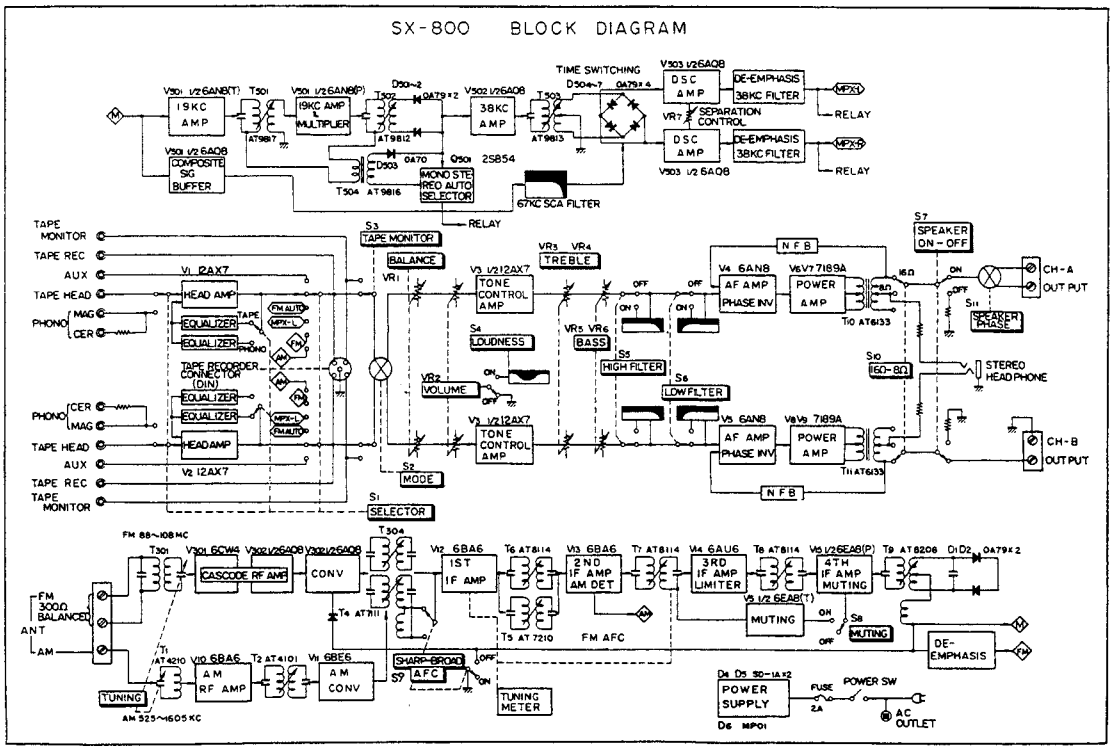
SX-800



ITEM NO		VACANT
AUDIO SECTION	R_1 ~ R_{82}	R_{83} ~
	C_1 ~ C_{81}	C_{82} ~
TUNER SECTION	R_{101} ~ R_{141}	R_{142} ~
	C_{101} ~ C_{133}	C_{132} ~
POWER SUPPLY SECTION	R_{201} ~ R_{210}	R_{211} ~
	C_{201} ~ C_{216}	C_{217} ~

SX-800 LAYOUT





ALIGNMENT INSTRUCTION

Please read these Instructions with extreme care before attempting alignment.

+ Test Equipment
  1) Standard Signal Generator 2) VTVM. DC, AC
  3) Oscilloscope

+ Attention on Alignment
  1) Signal Generator Input: in every case, use the minimum generator input that will obtain a satisfactory output indication.
  2) When connecting the test equipment to the input, use the shielded wire as short as possible.

+ VTVM and Oscilloscope should be connected in parallel at the output.

+ Alignment of AM Section

+ Note: Position of Switch: SELECTOR - AM
MODE - STEREO NORMAL
Position of Volume Control: MINIMUM

STEPS	Signal Generator Input			Dial Setting	Connect VTVM	Alignment	
	Coupling	Freq.	Modu.			Adjust	Remarks
1	Pin 1 of V_{12} (6BA6) (1)	455 kc	1 kc 30%	Point of no interference as near as 535 kc	AC VTVM to audio output (2)	T_5 top and bottom	Adjust to get MAX deflection
2	On Step 3, at first set the band width selector switch (S9) to SHARP, after that set the (S9) to BROAD. From step 4, (S9) should be set at SHARP position.						
3	Pin 7 of V_{11} (6BE6) (3)	455 kc	1 kc 30%	"	"	T_4 top and bottom	"
4	Antenna terminal through dummy (0.1 uF) (4)	600 kc	"	600 kc	"	T_1, T_2 and T_3	"
5	"	1400 kc	"	1400 kc	"	CT_1, CT_2 and CT_3	
6	Repeat STEPS 4 and 5 until no further improvement is possible.						

Alignment of FM Section

Note: 1) Position of Switch: SELECTOR-FM
AFC-OFF
2) Position of Volume Control: MINIMUM
3) Connect VTVM and Oscilloscope in parallel at STEPS 10, 11.

STEPS	Signal Generator Input			Dial	Connect VTVM	Alignment	
	Coupling	Frequency	Modu.	Setting		Adjust	Remarks
1	Pin 2 of V_{15} (6EA8) (5)	10.7 mc 100 db	None	Point of no interference as near as 82 mc	DC VTVM to Pin 5 of T_9 (6)	Top of T_9	Adjust to get zero volts (between pos. and neg. reading)
2	"	10.4 mc 100 db	"	"	"	Bottom of T_9	Adjust to get Maximum deflection
3	"	11 mc 100 db	"	"	"	"	Adjust to get Maximum deflection (Neg. reading)
4	Repeat STEPS 1, 2 and 3 several times to get a similar curve as fig.						
5	Pin 1 of V_{14} (6AU6) (7)	10.7 mc 100 db	"	"	DC VTVM to Pin 7 of V_{15} (8)	Top and bottom of T_8	"
6	Pin 1 of V_{13} (6BA6) (9)	10.7 mc 70 db	"	"	"	Top and bottom of T_7	"
7	Pin 1 of V_{12} (6BA6) (1)	10.7 mc 60 db	"	"	"	Top and bottom of T_6	"
8	Pin 2 of V_{302} (6AQ8) (10)	10.7 mc 50 db	"	"	"	Top and bottom of T_{304}	"
9	Repeat STEPS 5,6,7 and 8 several, times to get a similar curve as fig.						
10	FM antenna terminal	90 mc 18 db	1 kc 30%	90 mc	AC VTVM to audio output (2)	T_{301}, T_{302}, & T_{303}	Adjust to get Maximum deflection
11	"	105 mc 18 db	"	105 mc	"	VC_{301AT} VC_{301BT} CT_{301}	"
12	Repeat STEPS 10 and 11 until no further improvement is possible.						

Alignment of MPX Section

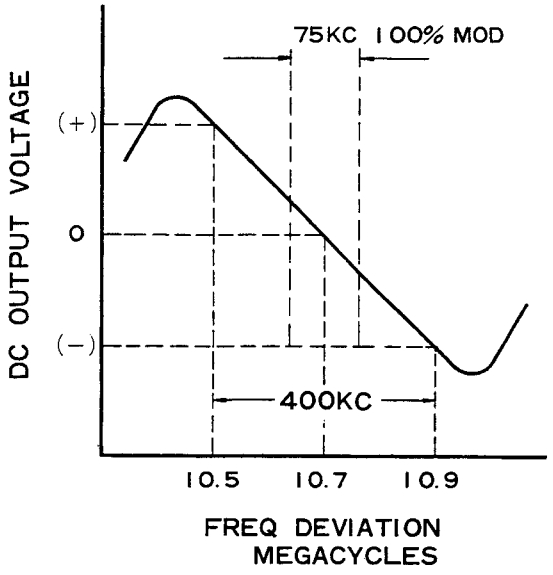
+ Note: 1) Position of Switch: SELECTOR-FM MPX
2) " AFC - OFF
3) Position of Main Volume Control: MINIMUM

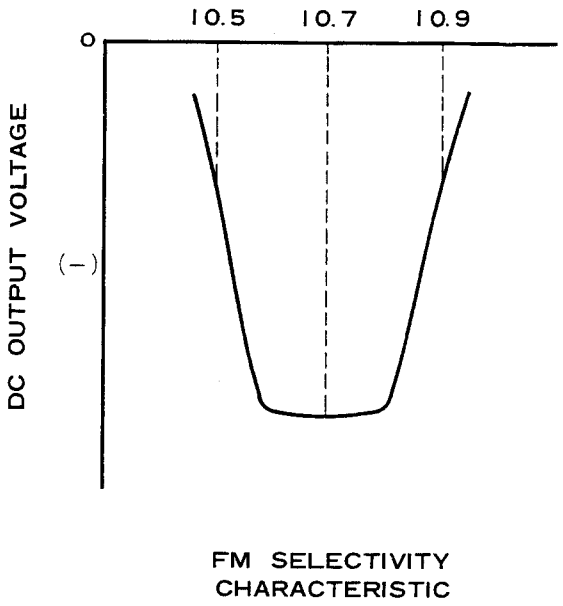
STEPS	Circuit to be adjusted	Signal Generator Input			Connect VTVM	Alignment	
		Coupling	Input Signal	Modu.		Adjust	Remarks
1	67 kc Reject Filter	Audio Oscillator to (X1)	65.5 kc 68.5 kc 300 mv (rms)	None	R521 (X2)	65.5 kc TC_{501} 68.5 kc TC_{502}	Adjust to get Minimum deflection
2	Sub Carrier Circuit	Multiplex Generator to FM Antenna terminal	60 db of 19 kc Pilot Signal	10%	T503 (X3)	T_{501} T_{502} T_{503}	Adjust to get Maximum deflection from T_{503} to T_{502} and T_{501} reversely, repeating several times
3	Pilot phase	"	60 db Composite Signal each channel	19 kc Pilot 10% & Sub & Main 1 kc 30%	(X4) or (X5)	T_{501} T_{502} T_{503}	Adjust to get Maxumum output and Minimum distortion, confirm each channel
4	Audio Gain Balance	"	"	"	"	VR_{501}	Adjust to get same output to each channel
5	Separation Control	"	"	"	"	VR_7	Adjust to get Minimum output of reverse channel, confirm each channel
6	Repeat STEPS 3, 4 and 5 several times						
7	Stereo Indicator light	"	20 db 19 kc pilot signal	19 kc 10%	-	VR_{503}	Adjust to glow STEREO indicator when 19 kc pilot signal is applied,

Note: 1) Couple VTVM and Oscilloscope in parallel so as to observe ripples simultaneously.

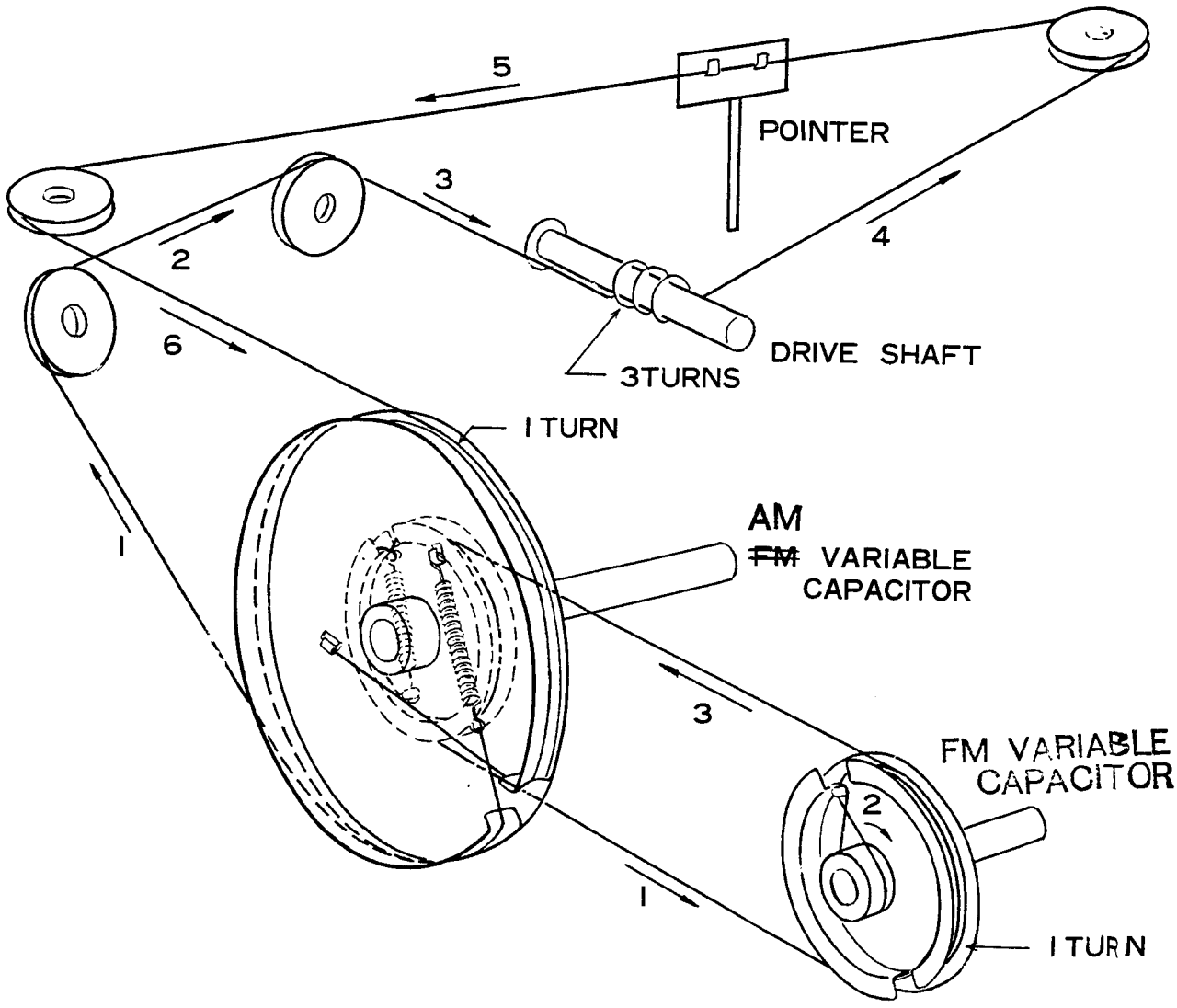
2) At step 2, 1 megohm is indispensable in coupling VTVM to pin 3 of T_{503} in series.

3) At steps 3, 4 and 5, apply the Composite signal to FM antenna terminal and measurement must be made on each right and left channel separately.





SX-800 DIAL CORD STRINGING



PARTS LIST SX-800

CAPACITORS

In uF, 20% tolerance for all fixed capacitors unless otherwise noted. P = uuF

Symbol	Description				Part No.
C1	Oil paper	0.01		400v	
C2	Oil paper	0.01		400v	
C3	Mylar	0.1		400v	
C4	Mylar	0.1		400v	
C5	Mica	500p	10%	400v	
C6	Mica	500p	10%	400v	
C7	Mica	300p	10%	400v	
C8	Mica	300p	10%	400v	
C9	Ceramic	0.0015	10%	400v	
C10	Ceramic	0.0015	10%	400v	
C11	Electrolytic	20		150v	
C12	Electrolytic	20		150v	
C13	Mylar	0.05		50v	
C14	Mylar	0.05		50v	
C15	Mica	200p	10%	400v	
C16	Mica	200p	10%	400v	
C17	Mica	100p	10%	400v	
C18	Mica	100p	10%	400v	
C19	Mylar	0.1		50v	
C20	Mylar	0.1		50v	
C21	Electrolytic	30		6v	
C22	Electrolytic	30		6v	
C23	Oil paper	0.05		400v	
C24	Oil paper	0.05		400v	
C25	Mica	100p	10%	400v	
C26	Mica	100p	10%	400v	
C27	Ceramic	0.001	10%	400v	
C28	Ceramic	0.001	10%	400v	
C29	Ceramic	0.0015	10%	400v	
C30	Ceramic	0.0015	10%	400v	
C31	Ceramic	0.01	10%	400v	
C32	Ceramic	0.01	10%	400v	
C33	Mica	500p	10%	400v	
C34	Mica	500p	10%	400v	
C35	Ceramic	0.01	10%	400v	
C36	Ceramic	0.01	10%	400v	
C37	Ceramic	0.0022	10%	400v	
C38	Ceramic	0.0022	10%	400v	
C39	Electrolytic	50		6v	
C40	Electrolytic	50		6v	
C41	Electrolytic	10		150v	
C42	Electrolytic	10		150v	
C43	Mica	100p	10%	400v	
C44	Mica	100p	10%	400v	
C45	Mylar	0.2		400v	
C46	Mylar	0.2		400v	

Symbol	Description				Part No.
C47	Mylar	0.2		400v	
C48	Mylar	0.2		400v	
C49	Oil paper	0.02		400v	
C50	Oil paper	0.02		400v	
C51	Mylar	0.05		50v	
C101	Mica	200p	10%	400v	
C102	Oil paper	0.05		400v	
C103	Oil paper	0.05		400v	
C104	Oil paper	0.05		400v	
C105	Ceramic	10p	10%	400v	
C106	Mica	450p	±3%	400v	
C107	Mica	100p	10%	400v	
C108	Ceramic	20p	10%	400v	
C109	Oil paper	0.05		400v	
C110	Electrolytic	3		150v	
C111	Oil paper	0.05		400v	
C113	Ceramic	0.01		400v	
C114	Ceramic	0.01		400v	
C115	Mica	100p	10%	400v	
C116	Mica	100p	10%	400v	
C118	Ceramic	0.01		400v	
C119	Ceramic	0.01		400v	
C120	Ceramic	50p	10%	400v	
C121	Ceramic	0.01		400v	
C122	Ceramic	0.01		400v	
C123	Ceramic	10p	10%	400v	
C124	Ceramic	0.01		400v	
C125	Ceramic	0.01		400v	
C126	Ceramic	0.01		400v	
C127	Mica	200p	10%	400v	
C128	Mica	200p	10%	400v	
C129	Electrolytic	5		25v	
C130	Mica	200p	10%	400v	
C131	Ceramic	0.001	10%	400v	
C132	Ceramic	0.01		400v	
C133	Ceramic	0.002	10%	400v	
C201	Electrolytic	100		300v	
C202	Electrolytic	100		300v	
C203	Electrolytic	40+40		450v	
C204	Electrolytic	40+20+20		350v	
C205	Electrolytic	20		250v	
C206	Electrolytic	20		150v	
C207	Electrolytic	200		50v	
C208	Electrolytic	500		25v	
C209	Electrolytic	100		25v	
C210	Ceramic	0.01	10%	400v	
C211	Ceramic	0.01	10%	400v	
C212	Ceramic	0.01	10%	400v	
C213	Ceramic	0.002	10%	1400v	UL Approved
C214	Ceramic	0.002	10%	1400v	UL Approved

Symbol	Description			Part No.
C215	Oil paper	0.05	400v	
C216	Electrolytic	20	250v	
VC	Variable Capacitor (AM)			AC6428

RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise marked or noted. K=Kilohm, M=Megohm.

Symbol	Description			Part No.
R1	Composition	470k		
R2	Composition	470k		
R3	Composition	220k		
R4	Composition	220k		
R5	Composition	100k		
R6	Composition	100k		
R7	Composition	100k	20%	
R8	Composition	100k	20%	
R9	Carbon	4.7k		
R10	Carbon	4.7k		
R11	Carbon	250k		
R12	Carbon	250k		
R13	Composition	2.2m	20%	
R14	Composition	2.2m	20%	
R15	Carbon	100k		
R16	Carbon	100k		
R17	Composition	150k		
R18	Composition	150k		
R19	Carbon	200k		
R20	Carbon	200k		
R21	Carbon	2m		
R22	Carbon	2m		
R23	Composition	100k	20%	
R24	Composition	100k	20%	
R25	Composition	1m		
R26	Composition	1m		
R27	Composition	47k		
R28	Composition	47k		
R29	Composition	150k		
R30	Composition	150k		
R31	Composition	15k		
R32	Composition	15k		
R33	Composition	2.2m	20%	
R34	Composition	2.2m	20%	
R35	Composition	1k		

Symbol	Description			Part No.
R36	Composition	1k		
R37	Carbon	200k		
R38	Carbon	200k		
R39	Composition	100k		
R40	Composition	100k		
R41	Composition	22k		
R42	Composition	22k		
R43	Composition	100k		
R44	Composition	100k		
R45	Composition	100k		
R46	Composition	100k		
R47	Composition	470k		
R48	Composition	470k		
R49	Composition	1m	20%	
R50	Composition	1m	20%	
R51	Composition	680		
R52	Composition	680		
R53	Carbon	100		
R54	Carbon	100		
R55	Composition	1m	20%	
R56	Composition	1m	20%	
R57	Composition	220k		
R58	Composition	220k		
R59	Composition	22k		
R60	Composition	22k		
R61	Composition	47k		
R62	Composition	47k		
R63	Composition	47k		
R64	Composition	47k		
R65	Composition	100k		
R66	Composition	100k		
R67	Composition	100k		
R68	Composition	100k		
R69	Composition	2.2k		
R70	Composition	2.2k		
R71	Carbon	5m		
R72	Carbon	5m		
R73	Carbon	4k		
R74	Carbon	4k		
R75	Composition	100		
R76	Composition	100		
R77	Wire wound	10		5w
R78	Wire wound	10		5w
R80	Composition	3.3m	20%	
R81	Composition	3.3m	20%	
R82	Composition	100k	20%	
R101	Composition	1m	20%	
R102	Composition	68	20%	
R103	Composition	4.7k		
R104	Composition	22k		
R105	Composition	1m	20%	
R106	Composition	4.7k		
R107	Composition	1k	20%	

Symbol	Description				Part No.
R108	Composition	2.2m	20%		
R109	Composition	68	20%		
R110	Composition	220			
R111	Composition	47k			
R112	Composition	68	20%		
R113	Composition	100k			
R114	Carbon	1k		2w	
R115	Composition	2.2k			
R116	Composition	47k			
R117	Composition	2.2m	20%		
R118	Composition	10k			
R119	Composition	10k			
R120	Composition	1m	20%		
R121	Composition	100k			
R122	Composition	2.2k			
R123	Composition	8.2k			
R124	Composition	100k			
R125	Composition	1k	20%		
R126	Composition	2.2k			
R127	Composition	2.2k			
R128	Composition	6.8k			
R129	Composition	6.8k			
R130	Composition	220	20%		
R131	Composition	47k			
R132	Composition	2.2m	20%		
R133	Composition	100k			
R134	Composition	1m			
R135	Composition	470	20%		
R136	Composition	470	20%		
R137	Composition	47k	20%		
R138	Composition	470			
R139	Carbon	15k		2w	
R140	Composition	1m	20%		
R141	Composition	22k			
R201	Wire wound	1.5k		10w	
R202	Wire wound	1k		4w	
R203	Wire wound	15k		2w	
R204	Wire wound	15k		2w	
R205	Wire wound	1k		10w	
R206	Wire wound	1k		4w	
R207	Wire wound	60		20w	
R208	Composition	4.7k	20%		
R209	Wire wound	3.5k		10w	
R210	Composition	1m	20%		

POTENTIOMETERS

Symbol	Description	Part No.
VR1	BALANCE 500 kilohm dual tandem	AR8541
VR2	VOLUME 500 kilohm dual tandem	AR8542
VR3	TREBLE 1 megohm	AR8227
VR4	TREBLE 1 megohm	AR8227
VR5	BASS 1 megohm	AR8227
VR6	BASS 1 megohm	AR8227
VR7	MPX Separation 10 kilohm (Semifixed)	AR0014
VR8	AM Tuning Meter Sens, 50 kilohm (Semifixed)	AR0015
VR9	Muting Level Adj., 5 kilohm (Semifixed)	AR0016
VR10	Bias Level Adj., 5 kilohm (Semifixed)	AR0016

TRANSFORMERS & COILS

Symbol	Description	Part No.
T1	Ferrite Stick Antenna	AT4210
T2	AM RF Coil	AT4101
T3	MW OSC, Coil	AT4301
T4	AM IFT	AT7111A
T5	AM IFT (Det)	AT7210A
T6	FM IFT	AT8114
T7	FM IFT	AT8114
T8	FM IFT	AT8114
T9	FM IFT (DET)	AT8208
T10	Output Transformer	AT6133
T11	Output Transformer	AT6133
T12	Power Transformer	AT5295
L1	Heater Choke Coil 1uH	AL0502
L2	Heater Choke Coil 1uH	AL0502
L3	Heater Choke Coil 1uH	AL0502
L4	Choke Coil 5H	AL5102

TUBES & DIODES

Symbol	Description	Part No.
V1	12AX7 Audio Amp	
V2	12AX7 Audio Amp	
V3	12AX7 Audio Amp	
V4	6AN8 Audio Amp	
V5	6AN8 Audio Amp	

Symbol	Description	Part No.
V6	7189A Power Amp	
V7	7189A Power Amp	
V8	7189A Power Amp	
V9	7189A Power Amp	
V10	6BA6 IF Amp	
V11	6BE6 AM-RF, OSC, MIX	
V12	6BA6 IF Amp	
V13	6BA6 IF Amp	
V14	6AU6 FM IF Amp	
V15	6EA8 FM IF Amp, MUTING	
D1	OA79 FM-Det, Germanium Diode	
D2	OA79 FM-Det, Germanium Diode	
D3	OA70 Tuning Meter, Germanium Diode	
D4	SD-1A Power Rectifier Silicon Diode	
D5	SD-1A Power Rectifier Silicon Diode	
D6	MP01 Power Rectifier Silicon Diode	

MISCELLANEOUS

Symbol	Description	Part No.
S1	INPUT SELECTOR	AS1624
S2	MODE SELECTOR	AS1625
S3	TAPE MONITOR (OFF-ON)	AS0210
S4	LOUDNESS (OFF-ON)	AS0210
S5	HIGH FILTER (OFF-ON)	AS0210
S6	LOW FILTER (OFF-ON)	AS0210
S7	SPEAKER (OFF-ON)	AS0210
S8	MUTING (OFF-ON)	AS0210
S9	FM AFC (OFF-ON)	AS0210
	AM SELECT (SHART-BROAD)	AS0210
S10	SPKR, IMPEDANCE (16 ohm - 8 ohm)	AS6216
S11	SPKR, PHASE (NORM-REV)	AS6216
S12	LINE VOLTAGE (115V-230V)	AS6216
S13	POWER SWITCH	AS0213
RL	Relay	AS8402
	Pilot Lamp 8V	AV7206
	Fuse 2A	
	Phone Jack	AK7204
	Fuse Holder	AK9603
	Tape Recorder Connector	AK5803
	Tuning Pully	AM4104
	Tuning Pully	AM4185

Description	Part No.
Tuning Meter	AA1182
Dial Pointer	AA3166
Dial Scale	AA3284C
KNOB INPUT SELECTOR	AA1190
MODE SELECTOR	AA1190
VOLUME	AA1188
TUNING	AA1185
BALANCE	AA1182
TONE BASS	AA1182
POWER	AA1182
Terminal Audio Input	AP2113
Terminal Antenna Input	AP3111
Terminal Speaker Output	AP3113
Attenuator (FM Antenna)	AM0126

MULTIPLEX SECTION (AM0109)

CAPACITORS

In uF, 20% tolerance for all fixed capacitors unless otherwise noted. P=uuF

Symbol	Description				Part No.
C501	Mica	500p	10%	50v	
C502	Mylar	0.05		50v	
C503	Mica	0.02	10%	50v	
C504	Mylar	0.05		50v	
C505	Electrolytic	5		25v	
C506	Mylar	0.05		50v	
C507	Mica	0.01	10%	50v	
C508	Stilor	1000p		50v	
C509	Mylar	0.05		50v	
C510	Electrolytic	1		10v	
C511	Electrolytic	1		50v	
C512	Polyethylene	520p	5%	50v	
C513	Polyethylene	90p	5%	50v	
C514	Mica	0.005	10%	50v	
C515	Mylar	0.02		250v	
C516	Mylar	0.02		250v	
C517	Electrolytic	20		250v	
C518	Electrolytic	5		25v	
CT501	Trimmer Capacitor				AC3312
CT502	Trimmer Capacitor				AC3311
Packaged Component	Twin-T Filter				AC9606

TUBES & DIODES

Symbol	Description	Part No.
V501	6AN8	
V502	6AQ8	
V503	6AQ8	
D501	0A79	
D502	0A79	
D503	0A70	
D504	0A79	
D505	0A79	
D506	0A79	
D507	0A79	
Q501	2SB54	
RP501	Positive Thermistor	

RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise Marked or noted. K=Kilohm, M=Megohm.

Symbol	Description			Part No.
R501	Composition	470k		
R502	Composition	470		
R503	Composition	1k		
R504	Composition	470k		
R505	Composition	1k		
R506	Composition	4.7k		
R507	Composition	4.7k		
R508	Composition	33k		
R510	Composition	1m		
R511	Composition	100k		
R512	Composition	470		
R513	Composition	270k		
R514	Composition	1k		
R515	Carbon	1k		
R516	Carbon	1k		
R517	Carbon	1k		
R518	Carbon	1k		
R519	Carbon	50k	5%	
R520	Carbon	50k	5%	
R521	Carbon	10k	5%	

Symbol	Description			Part No.
R522	Composition	100k		
R523	Composition	100k		
R524	Composition	1k		
R525	Composition	1k		
R526	Composition	12k		
R527	Composition	12k		
R528	Composition	2.2k	1w	
R529	Composition	150k		
R530	Composition	150k		

POTENTIOMETERS

Symbol	Description	Part No.
VR501	Variable Resistor Semifixed 2 kilohm	AR0013
VR503	Variable Resistor Semifixed 50 kilohm	AR0015

TRANSFORMERS & COILS

Symbol	Description	Part No.
T501	19KC	AT9817
T502	19KC	AT9812
T503	38KC	AT9813
T504	Noise Pick-up Coil	AT9816
L501	49mH	AL9814
L502	10mH	AL9815

FRONT-END SECTION AM0120(U)

CAPACITORS

In uF, 10% tolerance for all fixed capacitors unless otherwise noted. P=uuF

Symbol	Description			Part No.
C301	Ceramic	20p	400v	
C302	Ceramic	50p	400v	
C303	Ceramic	0.001	400v	
C304	Ceramic	15p	400v	
C305	Ceramic	30p	400v	

Symbol	Description		Part No.
C306	Ceramic	5p	400v
C307	Ceramic	5p	400v
C308	Ceramic	250p	400v
C309	Feed-thru type Ceramic	1000p	
C310	Feed-thru type Ceramic	1000p	
C311	Feed-thru type Ceramic	2p	
C312	Feed-thru type Ceramic	1000p	
C313	Feed-thru type Ceramic	1000p	
C314	Feed-thru type Ceramic	1000p	
C315	Feed-thru type Ceramic	1000p	
C316	Ceramic	0.002	400v
C317	Ceramic	0.002	400v
C319	Feed-thru type Ceramic	2p	
C320	Feed-thru type Ceramic	2p	
C321	Ceramic	5p	400v
C322	Ceramic	12p	400v
C323	Ceramic	1p	400v
C324	Ceramic	0.001	400v
CT301	Ceramic Trimmer		AC0302
VC301	Variable Capacitor (FM)		AC6429

RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise Marked or noted. K=Kilohm, M=Megohm.

Symbol	Description		Part No.
R301	Composition	47k	1/4w
R302	Composition	1k	
R303	Composition	47k	1/4w
R304	Composition	1k	
R305	Composition	47k	
R306	Composition	1m	
R307	Com;osition	10k	1w
R308	Composition	33k	1/4w
R309	Composition	100	

TRANSFORMERS & COILS

Symbol	Description	Part No.
T301	FM Antenna Coil	AL0207
T302	FM RF Coil	AL0421
T303	FM OSC Coil	AL0323
T304	FM IFT	AT8115
L301	Heater Choke Coil 1uH	
L302	Heater Choke Coil 1uH	
L303	Heater Choke Coil 1uH	

TUBES & DIODES

Symbol	Description	Part No.
V301	6CW4	
V302	6AQ8	
D301	Variable Capacitor Diode 1S85	

TROUBLE SHOOTING

POWER CIRCUIT

SYMPTOMS	POSSIBLE CAUSE	TO BE CHECKED
Does not light up or function at all.	1) No power supplied.	
	a. Severed power cable.	Check where cable enters plug.
	b. Defective power switch.	Check contact point.
	c. Fuse blown or no fuse inserted.	Replace or insert new fuse.
	2) Fuse blows	
	a. Power transformer heat up.	Short between transformer windings layer.
	b. Defective insulation in OPT between primary and secondary.	Replace OPT.
	c. Short between electrodes in tubes or diodes.	Maily in rectifier or in power tube.
	d. Defective electrolytic capacitor.	Mainly in ripple filter circuit.
	3) Emits smoke.	
	a. Short in filament wiring.	Check wiring by removing tubes.
	b. Defective tube socket.	Mainly poor insulation of wafer-type socket.
Light up, but does not function.	1) Insufficient plate voltage.	
	a. Rectifier tube diode burned out.	Replace tube or diode.
	b. Resistor in ripple filter circuit burned out.	Replace resistor.
	c. No rectifier.	
	2) No voltage at plate circuit.	
	a. Primary windings of OPT burned out.	

AUDIO CIRCUIT

SYMPTOMS	POSSIBLE CAUSE
Does not function	1) Power amplifier section a. Severed output transformer(s) windings (primary and secondary). b. Power output tubes damaged or heaters burned out. c. Plate load resistors between each stages burned out. d. Bias resistor in cathode circuit burned out. 2) Preamplifier section a. Plate load resistors between each stages burned out. b. Poor contact(s) in input selector switch or mode switch. c. Defective cathode resistor. d. Defective de-coupling resistors between each stages. e. Defective tubes.
Noises	1) Tubes a. Defective tubes. 2) Resistors a. Defective plate resistors, negative feed back resistors, or cathode resistors. 3) Capacitors a. Defective capacitor, coupling phase compensation circuit. 4) Potentiometers a. Noise emanating from defective volume control or other variable resistors.
Hum	1) Tubes a. Defective tubes, particularly short between electrodes. 2) Resistors a. Defective load resistor in phase inverter circuit on cathode end. 3) Capacitors a. Defective electrolytic capacitors in filter circuit or in de-coupling circuit.
Distortion	1) Transformer a. Defective output transformer, output tubes or rectifier (tube or diode). b. Short between primary and secondary. 2) Capacitor a. Defective capacitor in output tube bias circuit. 3) Resistor a. Defective grid leak resistor. 4) Rectifier a. Defective rectifier in bias circuit when fixed bias circuit employed.

AM TUNER CIRCUIT

SYMPTOMS	POSSIBLE CAUSE	NOTE
Does not function	a. Defective tubes	
	b. Poor contact or defective insulation in input selector or mode switch.	
	c. Burnt out resistor in power supply.	
	d. Severed winding(s) in IF transformer.	
	e. Severed oscillator coil winding.	
	f. Short of variable capacitor (tuning) inside mechanism.	
	g. Germanium diode in detector circuit is defective.	
Poor sensitivity	a. Severed winding in RF coil.	
	b. Out of alignment in IF transformer.	
	c. Out of tracking alignment.	
	d. Defective tubes.	
	e. Poor insulation of trimming capacitors.	
Distortion	a. Defective germanium diode.	
	b. Defective tubes.	
	c. Defective tuning indicator tube.	
	d. Defect in AVC circuit.	
Noise	a. Noise emanating from defective tube.	
	b. Occasional short between fixed plate and rotor plate of variable capacitor.	
	c. Poor soldering or short between parts.	

FM TUNER CIRCUIT

SYMPTOMS	POSSIBLE CAUSE	NOTE
Does not function	a. Defective tubes.	
	b. Severed winding(s) in IF Transformers.	
	c. Poor contact or defective insulation in rotary switch.	
	d. Burnt out resistor(s) in power supply.	
	e. Loose oscillation coil connection, or poor soldering.	
	f. Poor contact between sockets and tube pins.	
	g. Defective germanium diode(s).	
Poor sensitivity	a. IF transformers out of alignment.	
	b. Tracking out of alignment.	
	c. Defective tubes.	
Distortion	a. Discriminator IF transformer out of alignment.	
	b. Defective tubes.	
	c. Defective germanium diode(s).	
Noises including Microphonic	a. In most cases, due to defective tubes in RF amplifier or local oscillator tube(s).	
	b. Poor contact between sockets and tube pins.	
	c. Antenna input is not enough.	
	d. Inproper mounting variable capacitor.	
	e. Poor soldering or short between parts.	
	f. Excessive long leads or resistors in RF or IF circuits.	

MULTIPLEXE TROUBLE SHOOTING AND REPAIRS

SYMPTOMS	PROBABLE CAUSE	REPAIRS NECESSARY
Poor separation	1. Pilot amplifying circuit (drift in 19 kc transformer, or other faulty components) 2. Composite circuit (drift in separation control; or other faulty components)	1. Readjustment (T501, T502, T503); replacement of components 2. Readjustment of separation control; replacement of components
Excessive distortion in stereo reception	1. Pilot amplifier circuit 2. Composite circuit (6AQ8, etc.) 3. Drop in line power voltage	1. Readjustment or replacement of components 2. Vicinity of 6AQ8 3. Provide supply of proper voltage
Distortion prevalent at points of high	1. Inadequate pilot level 2. Drop in line power voltage	1. Readjustment; replacement of faulty components 2. Check power supply section
Extreme drop in volume in stereo reception	1. Composite amplifying circuit (Faulty 6AQ8 or components in its vicinity)	1. Replace 6AQ8 or other faulty components in vicinity of 6AQ8
Separation control completely ineffective (No. change even when separation control adjusted.)	1. Faulty separation control variable resistor (burntout)	1. Replace component
Poor separation on one channel only	1. Faulty 38 kc filter (one channel only) 2. One of secondary windings of 38 kc transformer severed	1. Replace component 2. Replace component
Stereo indicator fails to function	1. Faulty pilot lamp 2. Improper working point	1. Replace component 2. Readjust auto level control (VR503)

+ Other malfunctions should be dealt with in the same way as for other amplifiers.