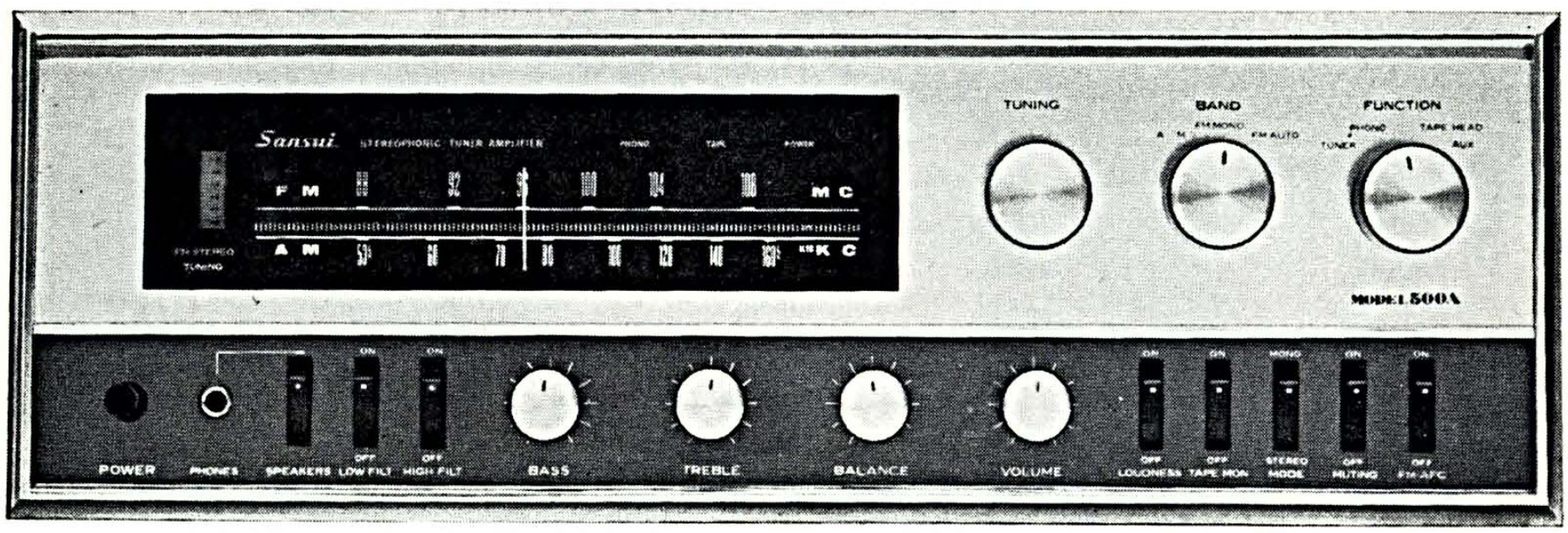
SERVICE MANUAL

AM/FM MULTIPLEX STEREO TUNER AMPLIFIER

SANSUI MODEL 500A



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SANSUI ELECTRIC COMPANY LIMITED

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MODEL 500A

HOW TO USE THIS SERVICE MANUAL

Step 1 What type or nature of the trouble you are confronted with? Look it up in the trouble-shooting charts in this service manual.

Step 2 Isolate the trouble to a particular unit or part by referring to the charts.

Step 3 Pinpoint the position of the part by means of the circuit diagram and the co-ordinates listed in the parts list.

Step 4 In the same way, by referring to the chassis diagram and the co-ordinates listed in the parts list, you can easily find out in what part of chassis the part is located.

TROUBLESHOOTING AUDIO SYSTEM

If the amplifier is operating satisfactorily, the trouble may be attributed to the following :

1. Incorrect connections or loose terminal contact. Check the speakers, record player, tape recorder or tape deck, antenna and line cord.
2. Incorrect or improper operation. Before operating the audio equipments, be sure to look up the manufacturer's instructions.
3. Improper location of audio equipments. The proper positioning of the audio equipments, such as speakers and record player, is vital to stereo.
4. Defective audio equipment or equipments.
5. The next step to do is listed below :

Program	Symptom	Probable Cause	What to Do
AM, FM or MPX reception	A. Constant or intermittent noise heard at times or in a certain area	* Discharge or oscillation caused by electrical appliances, such as fluorescent lamp, TV set, D.C. motor, rectifier and oscillator * Natural phenomena, such as atmospherics, statics, strays and thunderbolt * Insufficient antenna input due to thick reinforced concrete wall of a building or long distance from the station * Wave interference from other electrical appliances	* Attach a noise limiter to the electrical appliance that causes the noise, or attach it to the power source of the amplifier. * Install an outdoor antenna and ground the amplifier to raise the signal-to-noise ratio. * Reverse the power cord plug-receptacle connections. * If the noise occurs at a certain frequency, attach a wave trap to the ANT. input. * Keep the set in proper distance from other electrical appliances.
	B. The needle of the tuning meter does not move well.	The movement of the needle is one thing, the sensitivity of the amplifier is another.	Tune the set for maximum signal strength.
	C. The zero point of the meter diverges much.	Regional difference in field intensity	The unit is not at fault.
AM reception	A. Noise heard at a particular time of a day, in a certain area or over part of dial	This results from the nature of AM broadcast.	* Install the antenna for maximum antenna efficiency. See "ANTENNA" in the operating instructions. * In some cases, the noise can be eliminated by grounding the amplifier or reversing the power cord plug-receptacle connections.
	B. High-frequency noise	1. Adjacent-channel interference or beat interference 2. TV set too close to the audio system	* Although such noise cannot be eliminated by the amplifier, it is advisable to turn the TREBLE control properly from midpoint to left and switch on the HIGH FILTER. * Keep the TV set in proper distance from the audio system.
FM reception	A. Noisy	1. Poor noise limiter effect or too low S/N ratio due to insufficient antenna input Note: FM reception is affected considerably by the conditions of transmission by stations: power and antenna efficiency. As a result, you may receive one station quite well while having difficulty in receiving another station.	* Install the antenna (attached) for maximum signal strength. * If this does not prove effective, use an outdoor antenna designed exclusively for FM. When you use a TV antenna for both TV and FM with the help of a divider, make sure the TV reception is not affected. * Excessive long antenna may rather cause a noise.

Program	Symptom	Probable Cause	What to Do
(Continued)	B. Noise heard like "scratch noise"	1. Ignition noise caused by the starting of an automobile engine	* Install the antenna and its lead-in wire in proper distance from the road or raise the antenna input as described above.
	C. Distortion or no sound during the reception	1. Drift of tuning resulted from the nature of FM	* Turn on the FM AFC switch.
	D. Tuning noise between stations	This noise results from the nature of the FM reception. As the station signal becomes weak, the noise limiter effect is also decreased. The amplification of the limiter, in turn, is enlarged and thus a big noise is generated.	If the amplifier is equipped with a muting switch, turn it on. Inasmuch as it also reduces the sensitivity, it should be used sparingly.
FM-MPX reception	A. Noise heard during FM-MPX reception while not heard during FM mono reception	1. The service area of the FM-MPX broadcast is only half as much as that of the FM mono broadcast.	* Install the antenna for maximum antenna input. * Switch on the noise filter and/or turn the TREBLE control properly from midpoint to left.
	B. Clearness of channel separation is decreased during the reception.	1. Excess heat	* Circulation of air is important to the amplifier. Make sure that air can flow underneath.
	C. The stereo indicator goes on and off.	1. Interference	* The indicator is not at fault.
	D. The stereo indicator goes on and off even though a stereo station is not received.	1. Interference	* The indicator is not at fault.
Record playing or tape playback	A. Hum or howling	* Record player placed directly on the speaker box * Use of wire other than shielded wire * Loose terminal contact. * Shielded wire too close to the line cord, fluorescent lamp or other electrical appliances * Nearby amateur radio station or TV transmission antenna	* The connecting cord should be as short as possible. * Put a cushion between the player and the speaker box or place them separately from each other. * Switch on the LOW FILTER and turn the BASS control properly from midpoint to left. * Consult the nearest Radio Regulatory Bureau.
	B. Distortion	* Worn or old record * Worn pick-up needle * Needle covered with dust * Improper needle pressure	* Turn the TREBLE control properly from midpoint to left. * Switch on the HIGH FILTER.
Over all stereo programs	The BALANCE control is not at the midpoint when equal sound comes from left and right channels.	It is important to adjust the control for equal sound from both channels. It should not be always set to the midpoint.	Set the control to the position where the equal sound comes from both channels.

AMPLIFIER TROUBLESHOOTING CHART

OVER ALL PROGRAM SOURCES

Symptom	Probable Cause		Check Point
No sound over all program sources	A. Defective speaker	1. Broken speaker cord, 1. Broken or short-circuited voice coil	Check continuity of speaker and cord. Repair broken cord or replace speaker.
	B. No power	1. No power comes to the power source.	
		2. Defective on-off switch	PS-1
		3. Defective line cord	
		4. Loose plug contact	PU-2
		5. Blown fuse	FU-1
		If the fuse should be burnt out as soon as it is replaced, the trouble may be attributed to:	
		a. Shorted power transformer;	T_{001}
		b. Shorted capacitor;	C_{003}, C_{004}, C_{005}, C_{021}
		c. B circuit open.	Check continuity of B circuit.
		6. Broken primary winding of power transformer	T_{001}
	C. Defective power circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in power circuit and replace defective element. Check R_{001}, R_{002} and R_{003} for disconnection.
	D. Defective low-frequency circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in low-frequency circuit and replace defective element.
		2. Blown heater of tube	V_{12}, V_{14}, V_{16}, V_{17} or V_{13}, V_{15}, V_{18}, V_{19}
		3. Capacitor, open or short-circuited	C_{703}, C_{704}, C_{707}, C_{804}, C_{805} or C_{712} C_{713}, C_{716}, C_{809}, C_{810}
Weak sound over all program sources	A. Defective speaker circuit	1. Shorted voice coil	Check voice coil for short circuit.
	B. Defective power circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in power circuit and replace defective element.
	C. Defective low-frequency circuit	1. Divergence of voltage	Measure voltage in low-frequency circuit and replace defective element.
		2. Shorted output transformer	T_{801}, T_{802}
		3. Insufficient capacity or short circuit of capacitor	C_{703}, C_{704}, C_{707}, C_{804}, C_{805} or C_{712} C_{713}, C_{716}, C_{809}, C_{810}, C_{706}, C_{709} or C_{715}, C_{718}
		4. Weak tube	V_{12}, V_{14}, V_{16}, V_{17} or V_{13}, V_{15}, V_{18}, V_{19}
Distortion over all program sources	A. Defective speaker	1. Defective voice coil	Check and replace.
		2. Defective cone or damper	
	B. Defective power circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in power circuit and replace defective element.

Symptom	Probable Cause		Check Point
(Continued)	C. Defective low-frequency circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in low-frequency circuit and replace defective element.
		2. Aging or weak tube	V_{14} or V_{15}
		3. Shorted output transformer	T_{801} or T_{802}
Hum over all program sources	A. Defective power circuit	1. Defective hum balancer	VR_{003}, VR_{004}
		2. Insufficient capacity of capacitor	C_{003}, C_{004}, C_{005}, C_{020}, C_{018}, C_{019}
	B. Defective low-frequency circuit	1. Inner contact or poor insulation of tube	V_{12}, V_{14}, V_{16}, V_{17} or V_{13}, V_{15}, V_{18}, V_{19}
		2. Insufficient capacity of capacitor	C_{006}, C_{007}, C_{008}, C_{009}
		3. Fixed resistor blown	R_{812}, R_{824}
Noisy over all program sources	A. Defective speaker	1. Defective voice coil	
		2. Inner contact of speaker components	
		3. Defective cone or damper	
	B. Defective power circuit	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in power circuit and replace defective element.
	C. Defective low-frequency circuit	1. Fixed resistor defective	R_{704}, R_{706}, R_{803}, R_{804}, R_{806}, R_{807} or R_{711}, R_{713}, R_{815}, R_{816}, R_{818}, R_{819}
		2. Capacitor, shorted or poor insulation	C_{802}, C_{803} or C_{807}, C_{808}; C_{020}
		3. Shorted primary winding of output transformer	T_{801} or T_{802}
		4. Inner contact of tube	V_{12}, V_{14}, V_{16} or V_{13}, V_{15}, V_{18}, V_{19}
		5. Defective master volume	VR_{701} or VR_{702}
SPEAKER switch does not work at all.	A. Defective headphone		Check headphone.
	B. Defective headphone circuit		R_{825}, R_{826} or R_{830}, R_{831}; JAC-1ab
HIGH FILTER switch does not work at all.	A. Defective filter circuit		C_{705} or C_{714}; SS_{709}, SS_{710}
LOW FILTER switch does not work at all.	A. Defective filter circuit		C_{708} or C_{717}; SS_{709}, SS_{710}
LOUDNESS switch does not work at all.	A. Defective filter circuit		C_{701}, C_{702}, R_{701} or C_{710}, C_{711}, R_{708}; VR_{701}, VR_{702}, SS_{701}, SS_{702}
TONE CONTROL does not work at all.	A. Defective tone control circuit		C_{705}, C_{706}, C_{708}, C_{709}, R_{707} or C_{714}, C_{715}, C_{714}, C_{715}, C_{717}, C_{718}, R_{714}; VR_{703}, VR_{705}, VR_{706}

AMPLIFIER TROUBLESHOOTING CHART

FM RECEPTION

Symptom	Probable Cause		Check Point
No sound	A. Defective overall section		See "No sound over all program sources".
	B. Defective FM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in FM section and and replace defective element.
		2. Blown heater of tube	$V_1 \sim V_8$
		3. Aging capacitor	Check C_{214} for insufficient capacity and C_{212}, C_{213}, C_{210}, C_{211} for short.
		4. Aging I.F.T.	T_{101}, $T_{201} \sim T_{204}$
		5. Defective oscillating circuit	C_{113}, C_{114}, R_{108}, L_3, V_{3b}
Weak sound	A. Weak station signal		See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	B. Defective overall section		See "Weak sound over all program sources"
	C. Defective FM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in FM section and replace defective element.
		2. Poor Q of coil	T_{101}, $T_{202} \sim T_{204}$ and $L_1 \sim L_3$
		3. Insufficient capacity of capacitor	C_{109}, CR_{201}, CR_{202}, C_{214}, C_{215}, C_{107}
		4. Improper contact of rotary switch	S_{2a}, S_{2b}
		5. Poor emission of tube	$V_1 \sim V_8$
		6. Voltage drop in local oscillator	C_{113}, C_{114}, L_3, V_{3b}
		7. Divergence in adjustment of:	Optimum adjustment often needs to use measuring instruments.
		a. Tracking.	$TC_1 \sim TC_3$, $L_1 \sim L_3$
		b. I.F.T.	T_{101}, $T_{201} \sim T_{204}$/IF curve & S curve.
		c. Variable resistor.	VR_{201}
Distortion	A. Defective overall section		See "Distortion over all program sources".
	B. Defective FM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in FM section and replace defective element.
		2. Defective diode.	D_{202}, D_{203}
		3. Insufficient capacity of capacitor.	C_{110}, C_{201}, C_{204}, C_{206}, C_{207}
		4. Divergence in adjustment of:	Optimum adjustment often needs to use measuring instruments.
		a. Tracking.	$TC_1 \sim TC_3$, $L_1 \sim L_3$
		b. I.F.T.	T_{101}, $T_{201} \sim T_{204}$/IF curve & S curve.
Hum	A. Defective overall section		See "Hum over all program sources".

Symptom	Probable Cause		Check Point
(Continued)	B. Defective FM section	1. Inner contact or poor insulation of tube	$V_1 \sim V_8$
		2. Insufficient capacity of capacitor	C_{110}, C_{201}, C_{204}, C_{206}, C_{209}, C_{011}, C_{013}, C_{104}, C_{119}
Noisy	A. Amplifier is O.K.		See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	B. Defective overall section		See "Noisy over all program sources".
	C. Defective FM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in FM section and replace defective element.
		2. Aging tube	$V_1 \sim V_3$
		3. Resistor, rubbing or blown	R_{103}, F_{105}, R_{202}, R_{203}, R_{205}, R_{206}, R_{216}
		4. Insufficient capacity or short circuit of capacitor	C_{211}, C_{218}, CR_{203}, C_{206}, C_{104}, C_{119}, C_{110}, C_{201}, C_{109}, CR_{201}, CR_{202}, C_{209}, C_{208}
Tuning meter does not work normally.	A. Defective FM tuner		
	B. Defective tuning indicator circuit.		(M), R_{204}, CR_{203}, S_{2e}, S_{2f}
FM-AFC switch does not work at all.	A. Defective AFC circuit.		D_{101}, C_{111}, C_{120}, C_{217}, R_{210}, SS_{101}
MUTING switch does not work at all.	A. Defective muting circuit.		R_{212}, R_{209}, R_{208}, R_{211}, VR_{201}, C_{216}, C_{215}, V_8

FM-MPX RECEPTION

Symptom	Probable Cause		Check Point
No sound	A. Defective FM section		See "FM RECEPTION: No sound"
	B. Defective overall section		See "No sound over all program sources".
	C. Defective MPX section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in MPX section and replace defective element.
		2. Blown heater of tube	$V_9 \sim V_{11}$
		3. Defective resistor	R_{421}, R_{423}, R_{424}, R_{425}, R_{422}
		4. Insufficient capacity or short circuit of capacitor	C_{401}, C_{403}, C_{416}, C_{417}, C_{418}, C_{419}, C_{420}, C_{422}, C_{423}, C_{424} C_{425}, C_{426}
		5. MPX coil aging	L_{402}
Weak sound	A. Defective FM section		See "FM RECEPTION: Weak sound".
	B. Defective overall section		See "Weak sound over all program sources".

FM-MPX RECEPTION (Continued)

Symptom	Probable Cause		Check Point
(Continued)	C. Defective MPX section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in MPX section and replace defective element.
		2. Insufficient capacity of capacitor	C_{401}, C_{416}, C_{417}, C_{420}, C_{422}, C_{423}, C_{424}, C_{404}, C_{406}, C_{410}, C_{410}, C_{412}, C_{415}, C_{414}
		3. Aging diode	D_{401}~D_{408}
		4. Divergence in adjustment of MPX coil.	Optimum adjustment often needs to use measuring instruments. L_{401}~L_{404}
Distortion	A. Defective FM section		See "FM RECEPTION: Distortion".
	B. Defective overall section		See "Distortion over all program sources".
	C. Defective MPX section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in MPX section and replace defective element.
		2. Aging diode	D_{401}~D_{404}
		3. Insufficient capacity of capacitor	C_{420}, C_{424}
		4. Fixed resistor defective	R_{401}, R_{402}, R_{403}, R_{409}, R_{411}, R_{426}, R_{431}
		5. Divergence in adjustment of MPX coil	L_{401}~L_{404} Optimum adjustment aften needs to use measuring instruments.
Hum	A. Defective FM section		See "FM RECEPTION: Hum"
	B. Defective overall section		See "Hum over all program sources".
	C. Defective MPX section	1. Inner contact or poor insulation of tube	V_9~V_{11}
		2. Insufficient capacity of capacitor	C_{014}, C_{015}, C_{011}
Noisy	A. Defective FM section		See "FM RECEPTION: Noisy".
	B. Defective overall section		See "Noisy over all program sources"
	C. Defective MPX section	1. Defective MPX coil	L_{402}~L_{404}
		2. Defective fixed resistor	R_{405}, R_{406}, R_{427}, R_{428}, R_{429}, R_{430}
		3. Aging capacitor	C_{401}, C_{409}, C_{416}, C_{417}, C_{420}, C_{422}, C_{423}, C_{424}
		4. Aging tube	V_9~V_{11}
		5. Loose contact of rotary switch	S_{2a}, S_{2b}
No MPX stereo sound	A. Subcarrier amplifying circuit defective	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage at pins of V_9 and V_{10} in subcarrier amplifying circuit and replace defective element.
		2. Insufficient capacity or short circuit of capacitor	C_{405}, C_{402}, C_{404}, C_{405}, C_{410}, C_{412}, C_{411}, C_{416}, C_{417}
		3. 38-kc oscillating circuit defective	R_{409}, R_{410}, R_{411}, C_{413}, L_{404}, C_{415}
		4. Aging tube (poor emission)	V_9, V_{10}
		5. Aging coil (too low Q)	L_{402}, L_{403}
Poor separation	A. Defective MPX section	1. Same as above.	Same as above.
		2. Divergence of properties of circuit elements (MPX coil and diode) due to temperature change	Readjust VR_{401}. Taking account of the temperature change, our company has adjusted the circuit elements for the optimum conditions.

Symptom	Probable Cause	Check Point
Stereo indicator does not glow white when FM MPX station is received.	A. Defective MPX circuit	Same as above.
	B. Defective stereo indicator circuit a. Pilot lamp off b. Aging or defective transistor or diode c. Variable or fixed resistor defective d. Insufficient capacity or short circuit of capacitor	 PL_7 $TR_1 \sim TR_3$, D_{501}, D_{502} VR_{501}, R_{501}, R_{502}, R_{503}, R_{504}, R_{408} C_{501}, C_{502}, C_{503}, C_{504}, C_{505}
Stereo indicator changes repeatedly from white to green or from green to white even though a station is not received.	A. Amplifier is O.K.	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD"
	B. Defective stereo indicator circuit	Check VR_{501} for divergence in adjustment. Check R_{207} and D_{202}.
Tuning meter does not work normally.	A. Defective MPX section	Check the preceding items.
	B. Defective tuning indicator circuit	See "FM RECEPTION: Tuning meter does not work normally".

AM RECEPTION

Symptom	Probable Cause		Check Point
No sound	A. Defective overall section		See "No sound over all program sources".
	B. Defective AM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in FM section and replace defective element.
		2. Aging or defective tube	V_4, V_6
		3. Aging or defective I.F.T.	T_{301}, T_{302}
		4. Detector diode defective	D_{301}
		5. Aging or defective capacitor.	Check C_{307} and D_{308} for short circuit and C_{309} for insufficient capacity.
Weak sound	A. Weak station signal		See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	B. Defective overall section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM"	Measure voltage in AM section and replace defective element.
		2. Voltage drop in local oscillator	V_9, C_{302}, C_{304}, R_{302}, R_{303}, L_5
		3. Detector diode, aging or weak	D_{301}
		4. Too low Q of coil	L_4, T_{301}, T_{302}
		5. Insufficient capacity of capacitor	C_{304}, CR_{202}, C_{309}
		6. Aging or weak tube (poor emission)	V_4, V_6

Symptom	Probable Cause		Check Point
(Continued)		7. Divergence in adjustment of: a. Tracking. b. I.F.T.	Optimum adjustment often needs to use measuring instruments. TC_4, TC_5 T_{301}, T_{302}
Distortion	A. Defective overall section		See "Distortion over all program sources".
	B. Defective AM section	1. Divergence of voltage specified in "CIRCUIT DIAGRAM" 2. Detector diode, aging or weak 3. Insufficient capacity of capacitor 4. Divergence in adjustment	Measure voltage in AM section and replace defective element. D_{301} C_{305}, C_{306} See "Weak sound".
Hum	A. Defective overall section		See "Hum over all program sources"
	B. Defective AM section	1. Inner contact or poor insulation of tube. 2. Insufficient capacity of capacitor.	V_4, V_6 C_{305}, C_{011}
Noisy	A. Amplifier is O.K.		See "TROUBLESHOOUING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	B. Defective overall section		See "Noisy over all program sources".
	C. Defective AM section	1. Aging or defective tube. 2. Loose contact of rotary switch.	V_4 S_{2a}, S_{2b}
Tuning meter does not work normally.	A. Defective AM tuner		Check as described above.
	B. Defective tuning indicator circuit		See "FM RECEPTION: Tuning meter does not work normally".

USE OF RECORD PLAYER (MAGNETIC), TAPE DECK

Symptom	Probable Cause		Check Point
No sound	A. Program source defective		Check and repair or replace.
	B. Defective overall section		See "No sound over all program sources".
	C. Divergence of voltage	1. Divergence of voltage specified in "CIRCUIT DIAGRAM" 2. Defective capacitor or resistor.	Measure voltage in head amplifier section and replace defective element. C_{607}, C_{617}, R_{610}, R_{624}, C_{605}, C_{615}

Symptom	Probable Cause		Check Point
(Continued)		3. Loose contact of rotary switch. 4. Loose contact of input terminal or pin jack.	S_{1a}, S_{1e}, S_{1g} or S_{1b}, S_{1f}, S_{1h}
Weak sound	A. Program source defective		Check and repair or replace.
	B. Defective overall section		See "Weak sound over all program sources".
	C. Defective head amplifier	1. Divergence of voltage specified in "CIRCUIT DIAGRAM" 2. Insufficient capacity of capacitor 3. Divergence of capacity of capacitor 4. Loose contact of rotary switch 5. Loose contact of input terminal or pin jack	Measure voltage in head amplifier section and replace defective element C_{601}, C_{605}, C_{607} or C_{611}, C_{615}, C_{617} C_{602}, C_{606}, C_{612}, C_{616} S_{1a}, S_{1e}, S_{1g} or S_{1b}, S_{1f}, S_{1h}
Distortion	A. Program source defective		Check and repair or replace.
	B. Defective overall section		See "Distortion over all program sources".
	C. Defective head amplifier	1. Divergence of voltage specified in "CIRCUIT DIAGRAM" 2. Capacitor, shorted or blown	Measure voltage in head amplifier section and replace defective element C_{601}, C_{611}, C_{602}, C_{605}
Hum	A. Program source defective		Check and repair or replace.
	B. Amplifier is O.K.	1. Improper connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	C. Defective overall section		See "Hum over all program sources".
	D. Defective head amplifier	1. Insufficient capacity of capacitor	C_{012}
Noisy	A. Program source defective		Check and repair or replace.
	B. Amplifier is O.K.		See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	C. Defective overall section		See "Noisy over all program sources".
	D. Defective head amplifier	1. Fixed resistor defective 2. Defective capacitor	R_{601}~R_{614} or R_{615}~R_{628} C_{601}~C_{610} or C_{611}~C_{620}

OTHER PROGRAM SOURCES

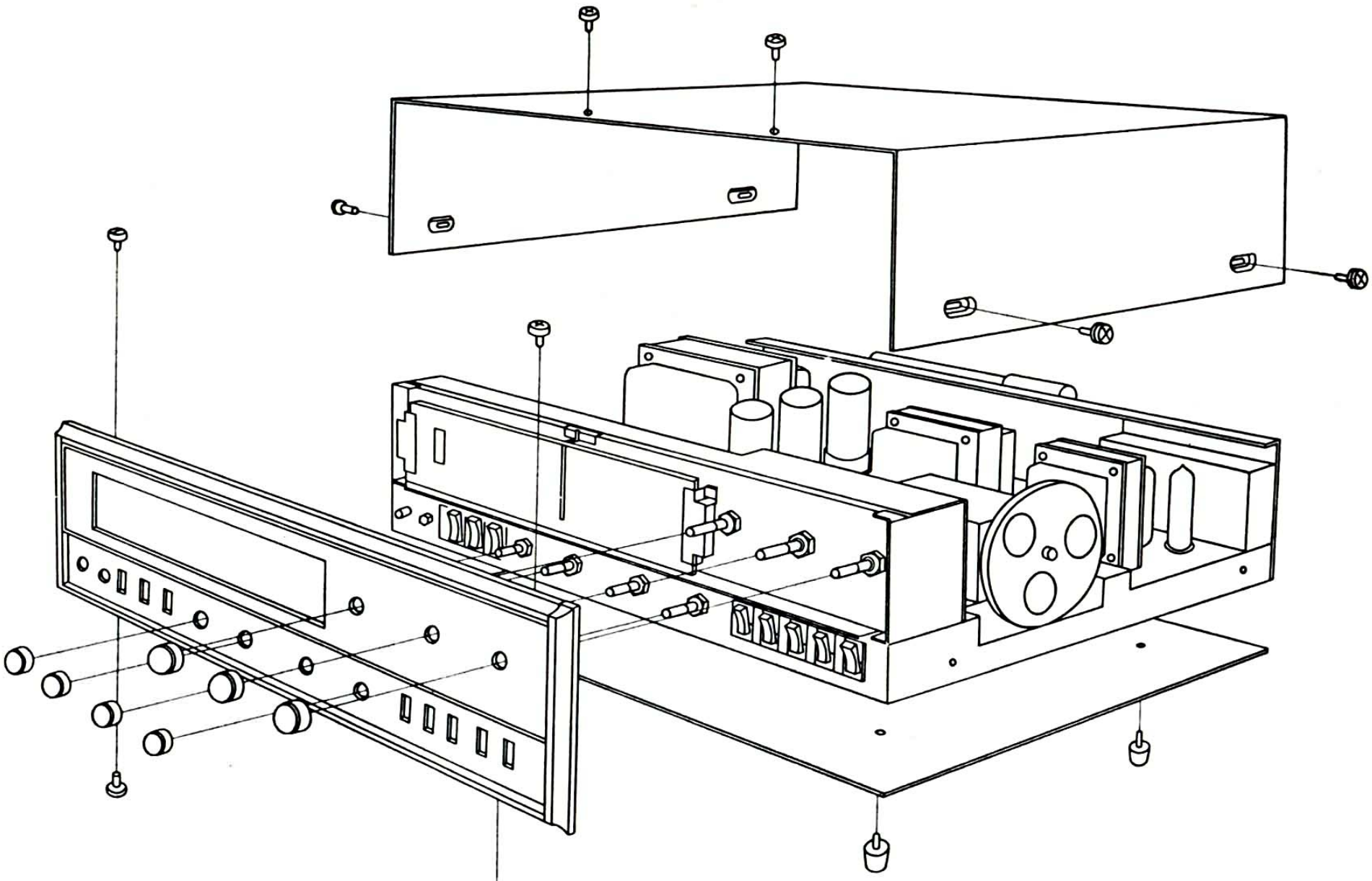
Symptom	Probable Cause	Check point
Record player with crystal cartridge does not operate properly.	1. Program source defective	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. Defective overall section	See "OVER ALL PROGRAM SOURCES"
Sound input from TV, additional tuner or others is not reproduced properly.	1. Program source defective	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. Defective overall section	See "OVER ALL PROGRAM SOURCES"
Pin-jack tape recorder does not operate properly.	1. Program source defective	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. Defective overall section	See "OVER ALL PROGRAM SOURCES"
One-connection tape recorder (DIN standard) does not operate properly.	1. Program source defective	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. Defective overall section	See "OVER ALL PROGRAM SOURCES".
	4. Defective input circuit	JAC-2, R_{013}~R_{016}

RECORDING ON TAPE

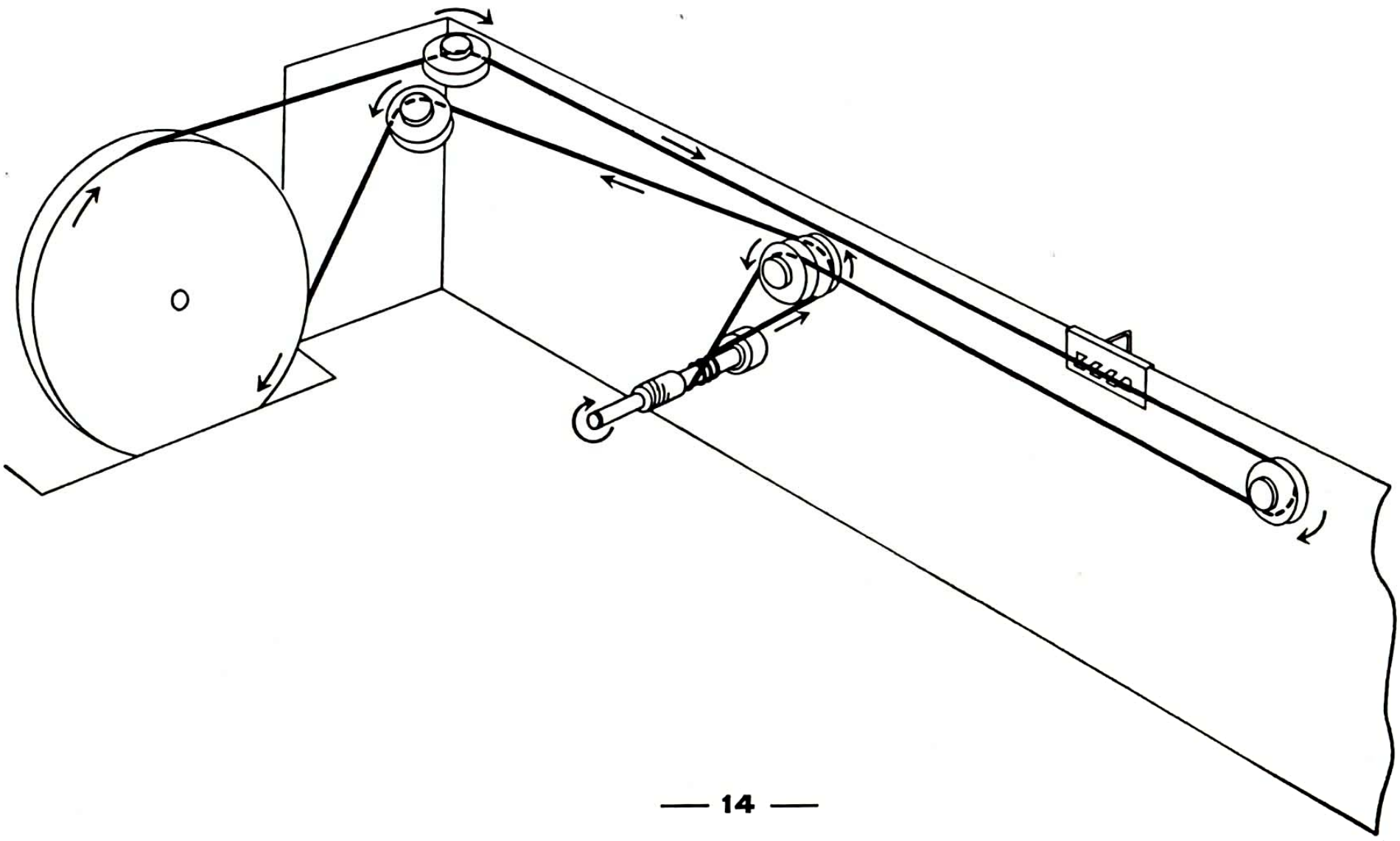
Symptom	Probable Cause	Check point
Broadcast is not recorded well.	1. Defective tape or tape recorder	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. FM, FM-MPX or AM section defective	See "AM", "FM" or "FM-MPX RECEPTION".
Record is not recorded well.	1. Defective tape or tape recorder	Check and repair or replace.
	2. Improper or incorrect connections	See "TROUBLESHOOTING AUDIO SYSTEM WHEN THE AMPLIFIER IS GOOD".
	3. Record, or record player defective	Check and repair or replace.
	4. Defective head amplifier	See "Defective head amplifier".

REMOVING THE FRONT PANEL, BONNET & BOTTOM PANEL/DIAL MECHANISM

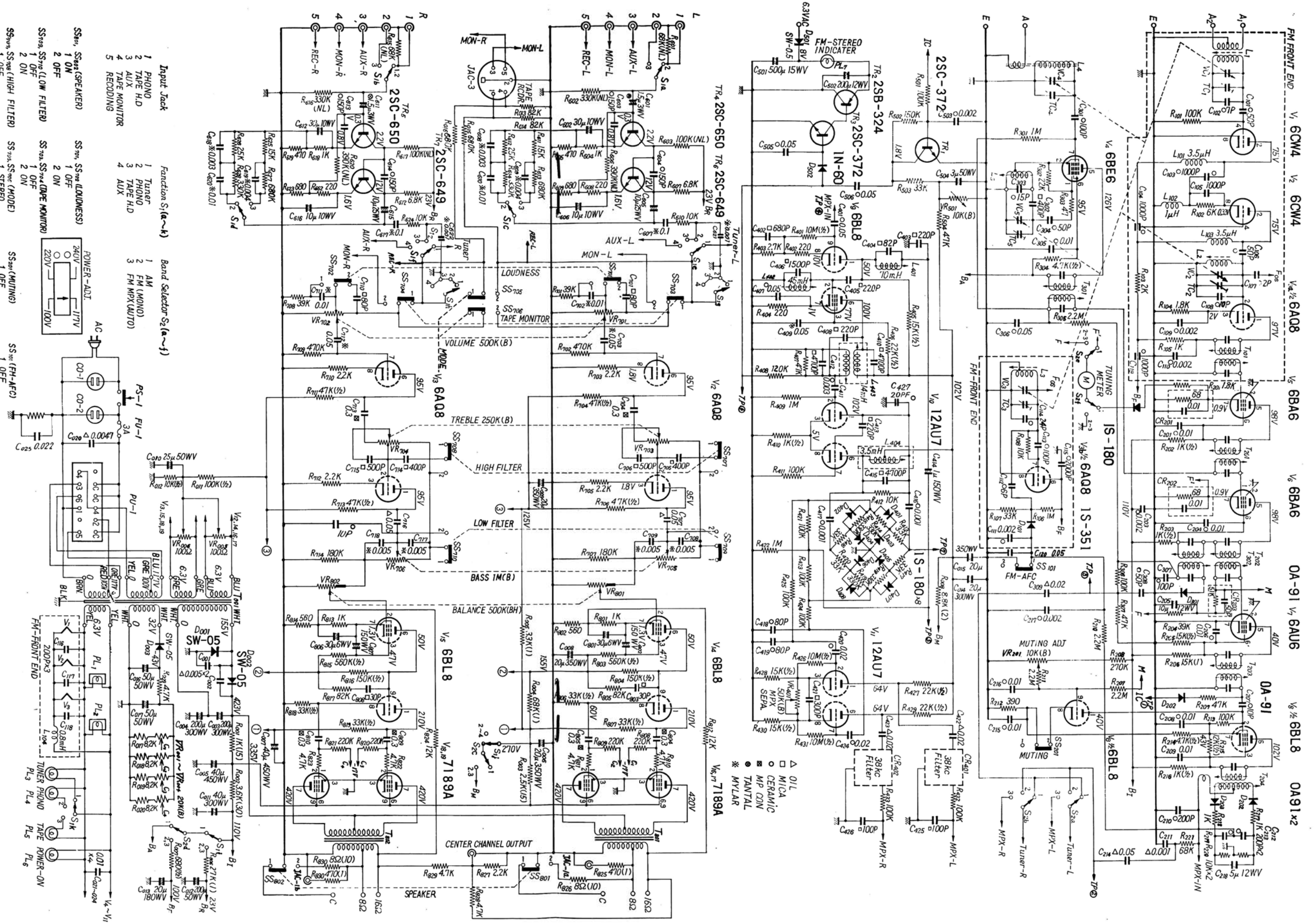
REMOVING THE FRONT PANEL, BONNET & BOTTOM PLATE



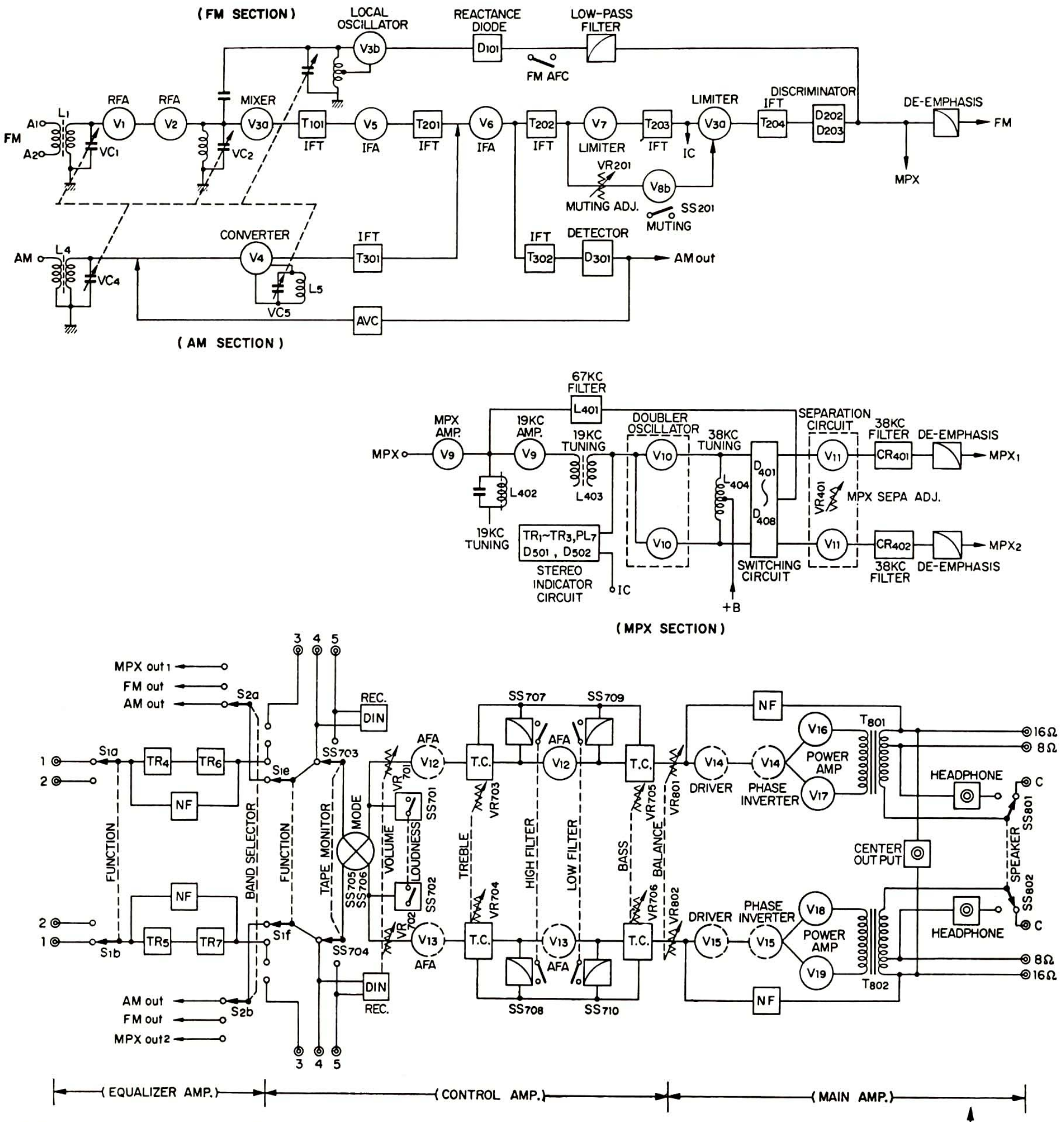
DIAL MECHANISM



SCHEMATIC DIAGRAM



BLOCK DIAGRAM



Input Jack
1. PHONO
2. TAPE HD.
3. AUX
4. TAPE MONITOR
5. RECORDING

S1(a~k) Function
1. TUNER
2. PHONO
3. TAPE HD.
4. AUX

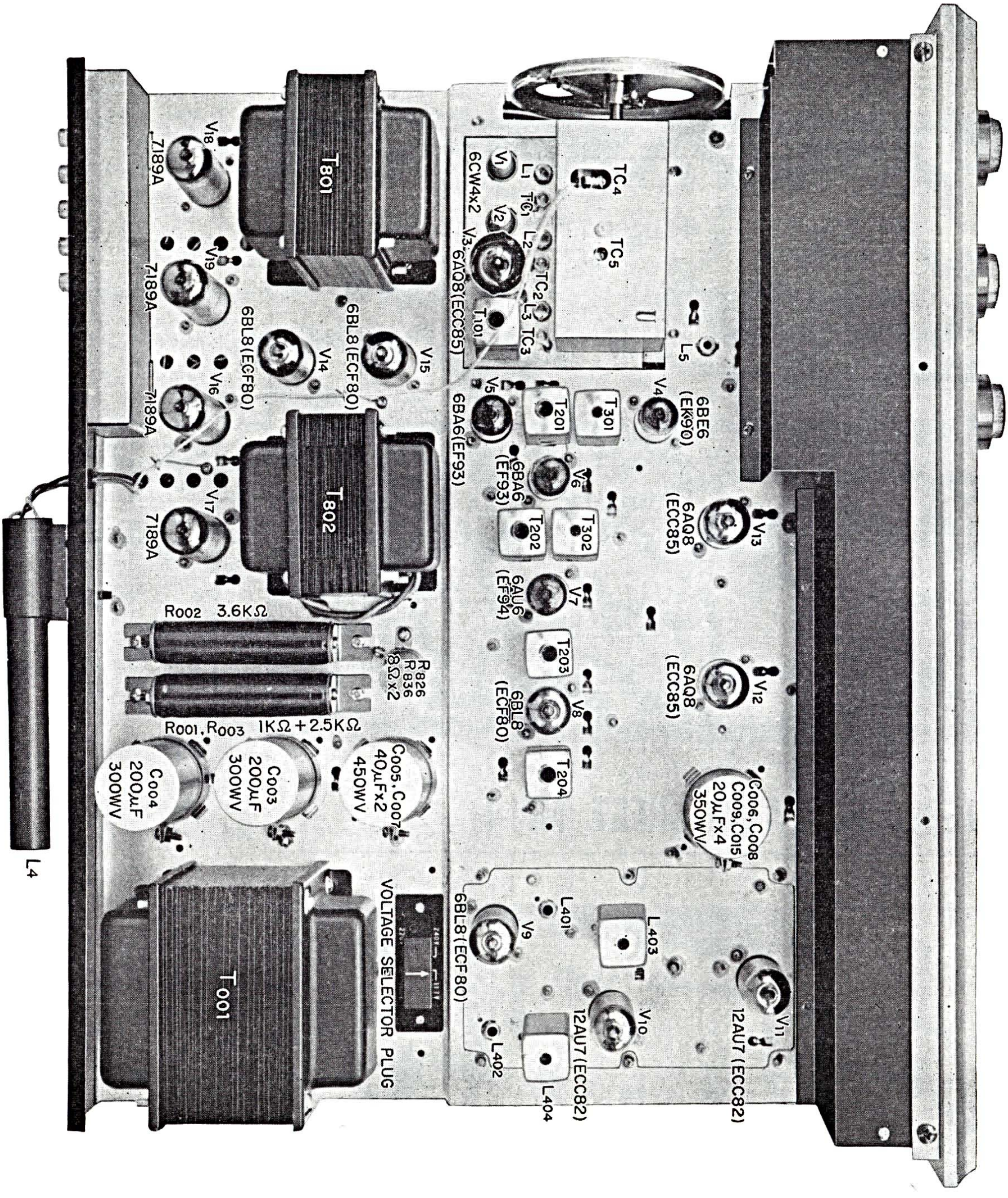
S2(a~f) Band Selector
1. AM
2. FM (MONO)
3. FM MPX (AUTO)

SS101 FM AFC
SS201 MUTING
SS701, SS702 LOUDNESS
SS703, SS704 TAPE MONITOR
SS705, SS706 MODE (STEREO-MONO)
SS707, SS708 HIGH FILTER
SS709, SS710 LOW FILTER
SS801, SS802 SPEAKER

POWER CIRCUIT

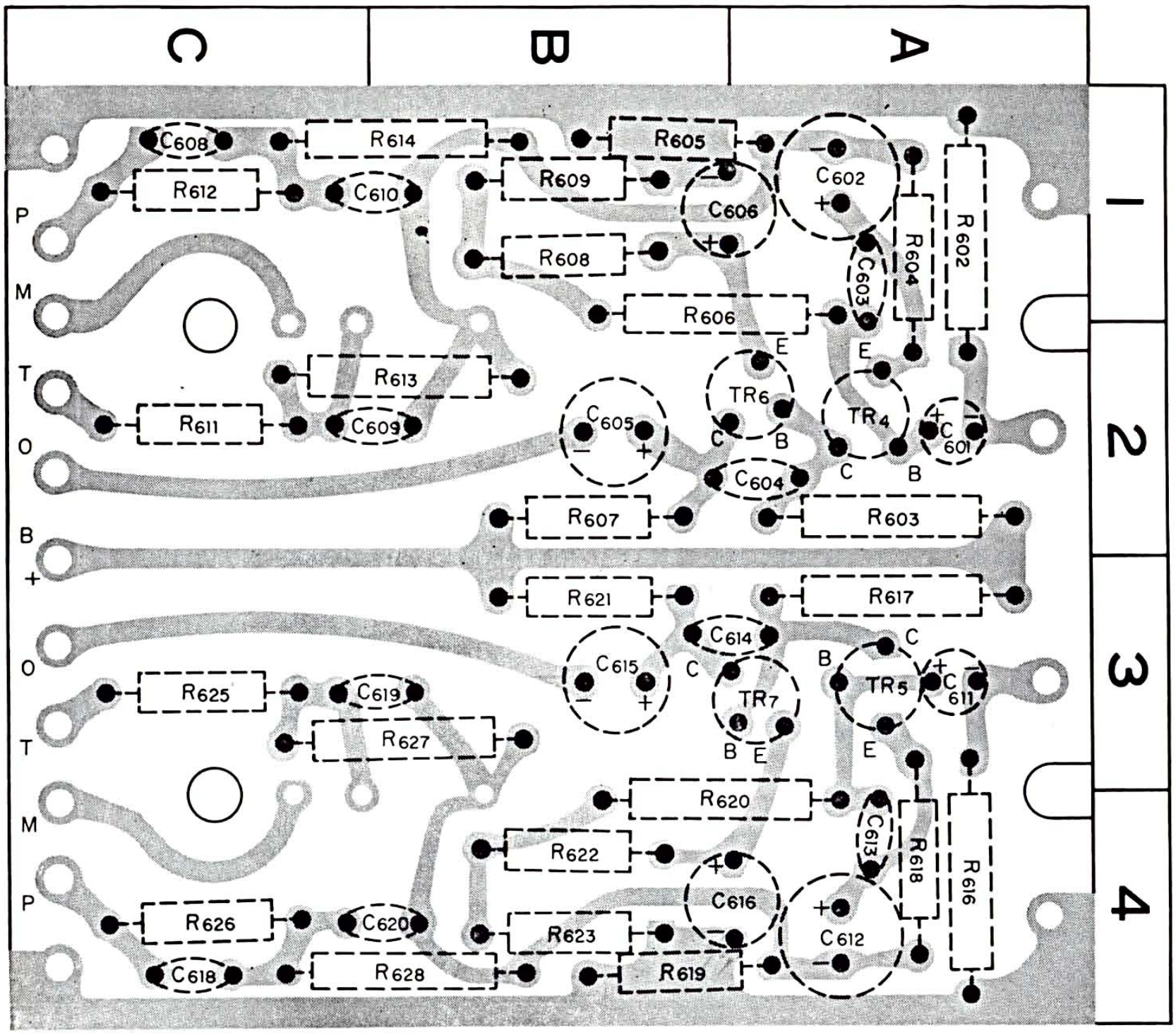
VR201 MUTING ADJ.
VR401 MPX SEPARATION ADJ.
VR701, VR702 VOLUME
VR703, VR704 TREBLE
VR705, VR706 BASS
VR801, VR802 BALANCE

PARTS LAYOUT



PRINTED CIRCUIT SHEETS

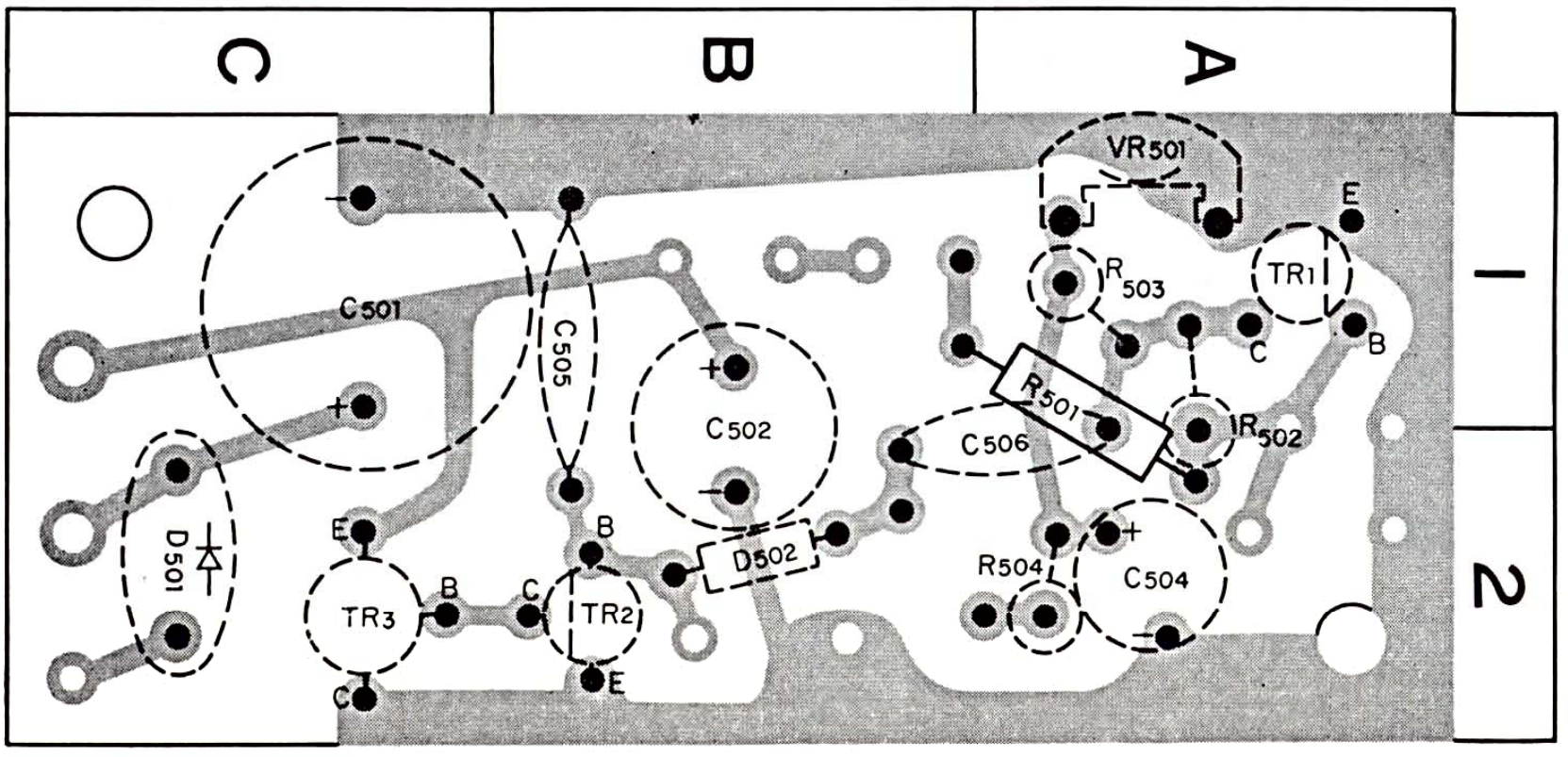
EQUALIZER AMP. SHEET (TRHA-6A)



Co-ordinates of Parts Used

R602....1 A	R628....4 B
R603....2 A	C601....2 A
R604....1 A	C602....1 A
R605....1 B	C603....1 A
R606....1 B	C604....2 A
R607....2 B	C605....2 B
R608....1 B	C606....1 B
R609....1 B	C608....1 C
R611....2 C	C609....2 B
R612....1 C	C610....1 B
R613....2 B	C611....3 A
R614....1 B	C612....4 A
R616....4 A	C613....4 A
R617....3 A	C614....3 B
R618....4 A	C615....3 B
R619....4 B	C616....4 B
R620....4 B	C618....4 C
R621....3 B	C619....3 B
R622....4 B	C620....4 B
R623....4 B	TR4 ....2 A
R625....3 C	TR5 ....3 A
R626....4 C	TR6 ....2 A
R627....3 B	TR7 ....3 A

STEREO INDICATOR SHEET (MPI-1)



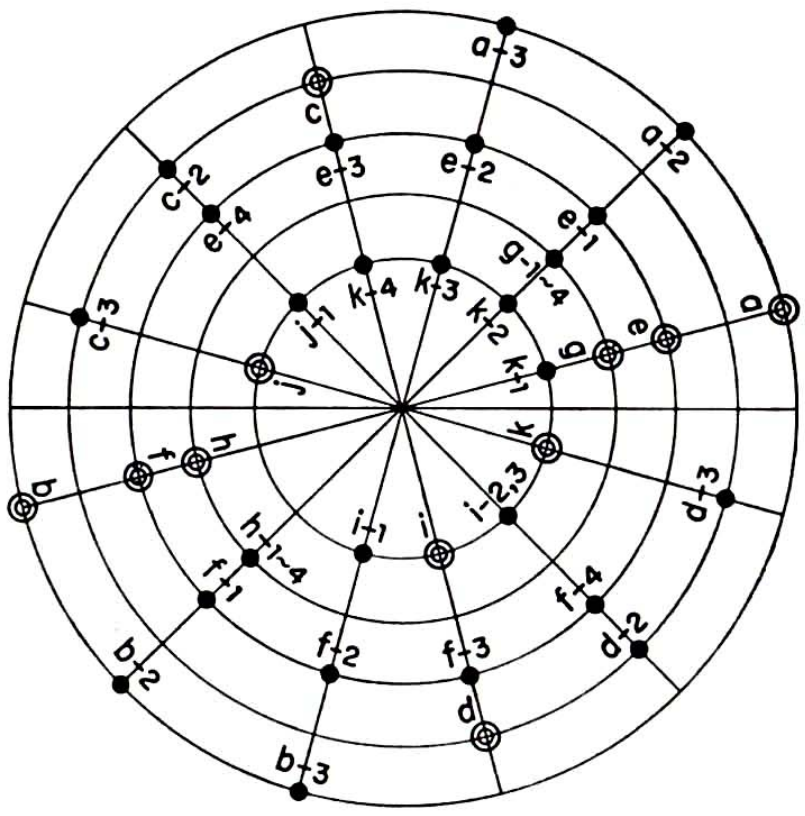
Co-ordinates of Parts Used

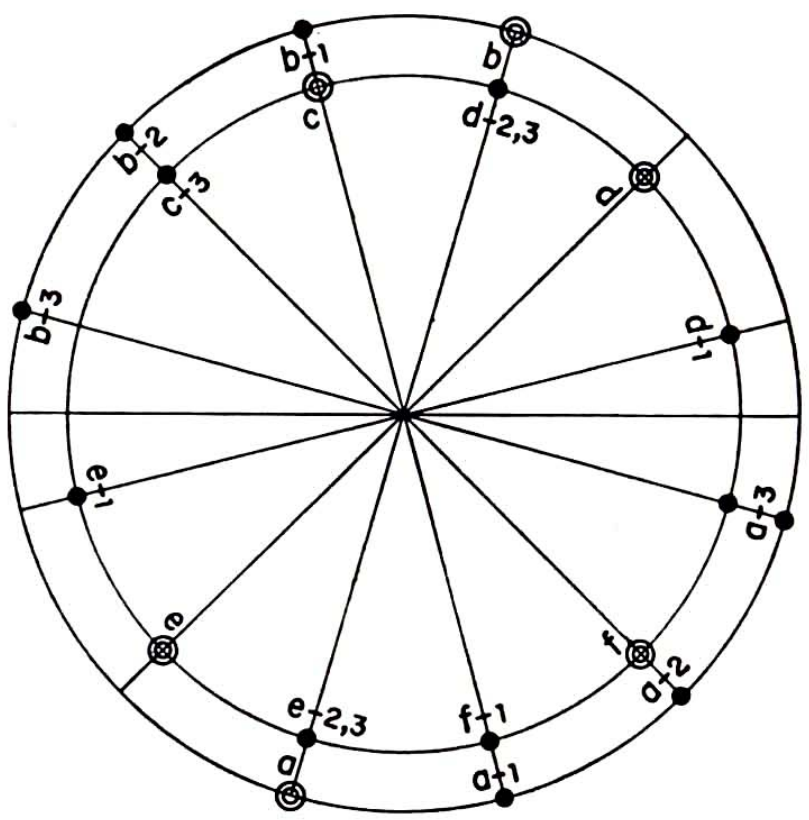
R501....1 A	C506....2 A
R502....1 A	VR501 ..2 C
R503....1 A	D501....2 C
R504....2 A	D502....2 B
C501....1 C	TR1 ....1 A
C502....1 B	TR2 ....2 B
C504....2 A	TR3 ....2 C
C505....1 B	

SELECTOR CHART

Remove the bonnet and look at the switches from the back side of the amplifier. This chart tells you the location of their contact and supporting points. The smaller the circle, the nearer the points locate to the back of the amplifier.

●: contact point
◎: supporting point





(Ex.) 3 o o 2 ═══ Contact Point
S1a ═══ Supporting Point

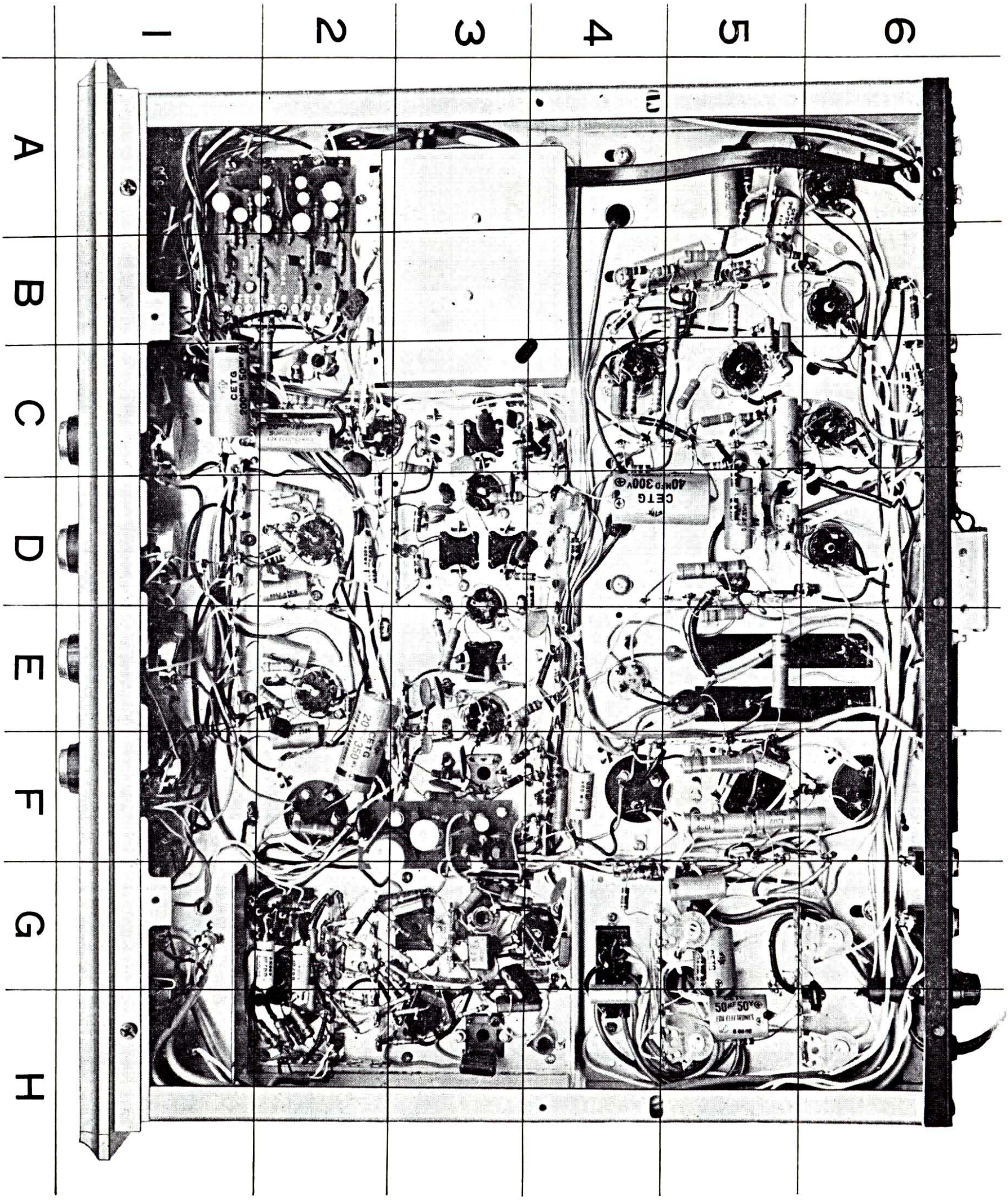
FUNCTION
S1 (a~k)

	Co-ordinates in Circuit Diagram			
1. TUNER	S1a	1D	S1g	4D
2. PHONO	S1b	1E	S1h	4E
3. TAPE H.D.	S1c	3E	S1i	9F
4. AUX	S1d	3F	S1j	8E
	S1e	3D	S1k	9F
	S1f	3E		

BAND SELECTOR
S2 (a~f)

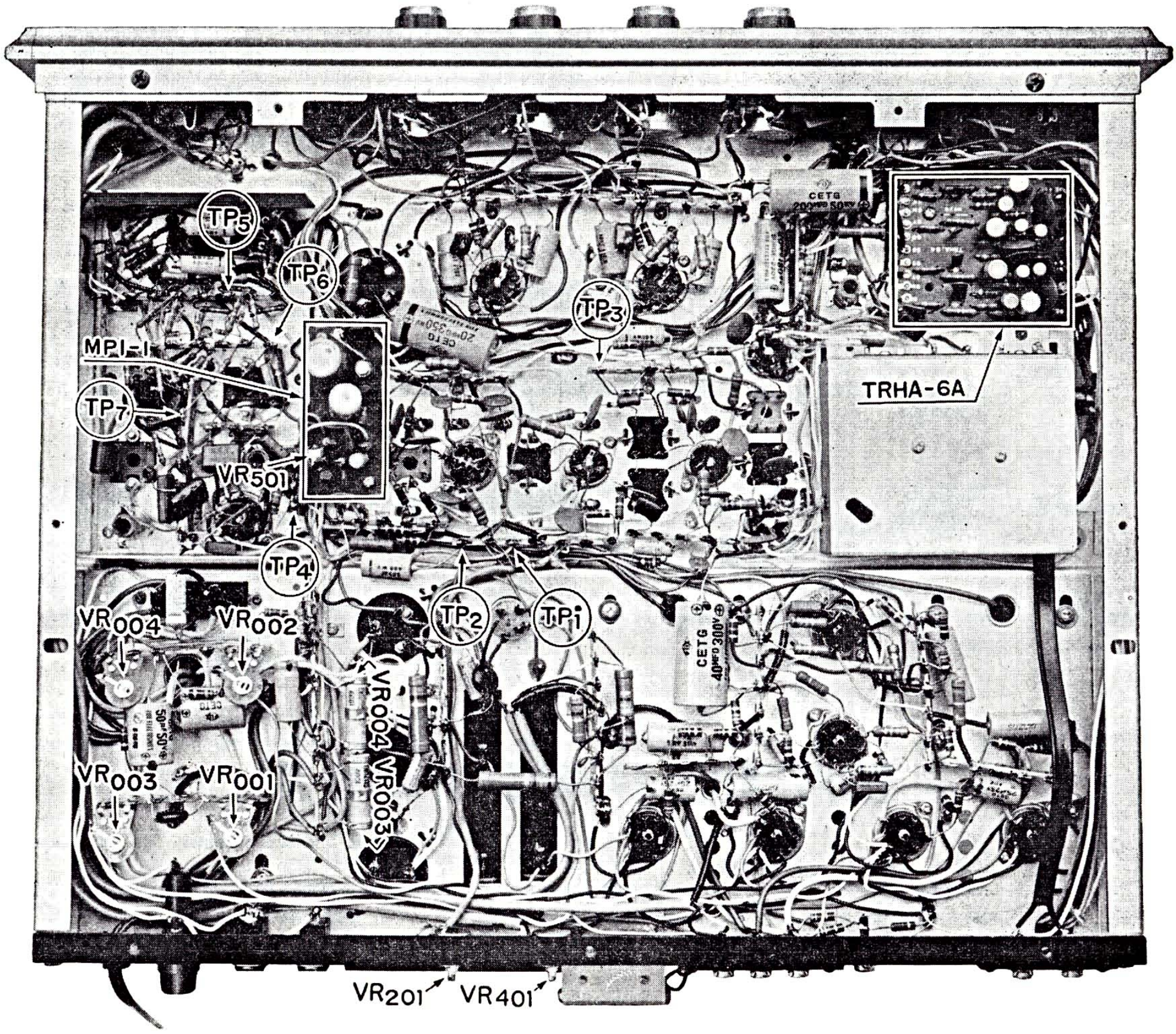
	Co-ordinates in Circuit Diagram	
1. AM	S2a	9B
2. FM (MONO)	S2b	9B
3. FM MPX (AUTO)	S2c	9E
	S2d	9F
	S2e	4B
	S2f	5B

CHASSIS DIAGRAM

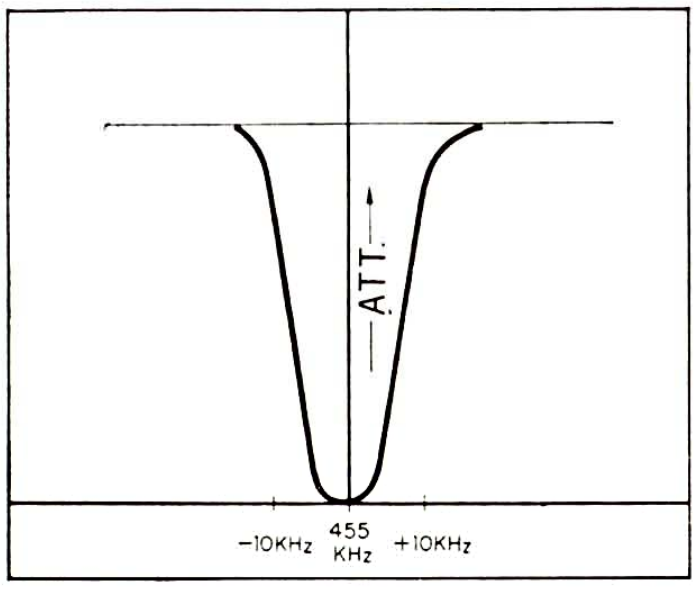


ALIGNMENT

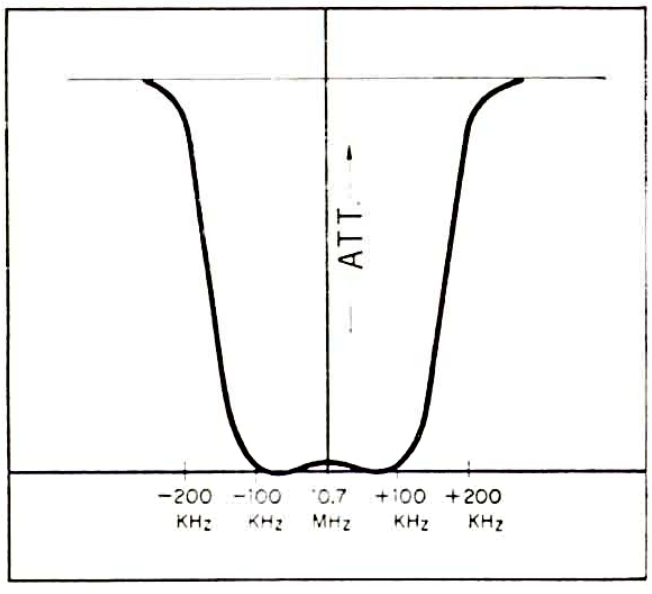
CO-ORDINATES OF TEST POINTS



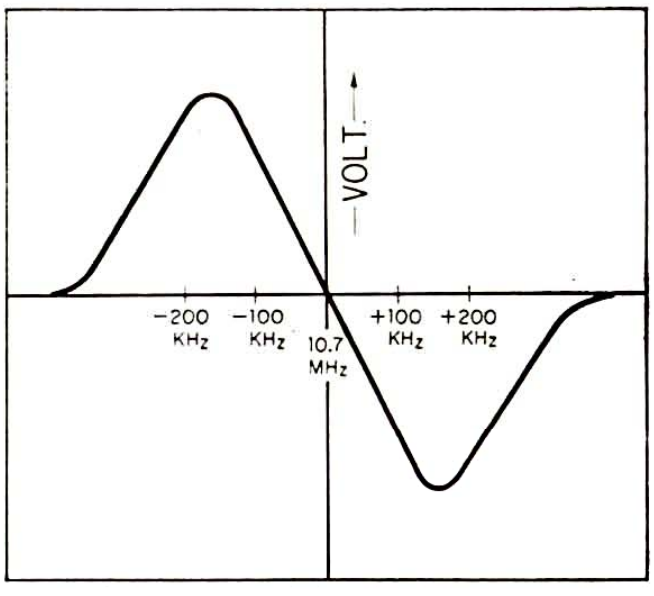
AM IF Wave form



FM IF Wave form



FM Discriminator Wave form



ALIGNMENT

FM ALIGNMENT PROCEDURE

1. AFC-OFF 2. Turn tuning gang fully. Center carrier wave. Set pointer at reference mark.

STEP	ALIGN	GENERATOR	FEED SIGNAL	OUTPUT INDICATOR	DIAL SETTING	ADJUST	ADJUST FOR
1.	IF Transformer	10.7 MHz ±400 KHz	V_7 Pin 1 6AU6	oscilloscope at T.P ①		4th IFT (T_{203}) Primary & secondary	Best IFT Wave form
		10.7 MHz ±400 KHz	V_6 Pin 1 6BA6	oscilloscope at T.P ①		3rd IFT (T_{202}) Primary & secondary	Best IFT Wave form
		10.7 MHz ±400 KHz	V_5 Pin 1 6BA6	oscilloscope at T.P ①		2nd IFT (T_{201}) Primary & secondary	Best IFT Wave form
		10.7 MHz ±400 KHz	Couple Sweep Signal by a round tube V_3 6AQ8	oscilloscope at T.P ①		1st IFT (T_{101}) Primary & secondary	※Best IFT Wave form
2.	Discriminator	10.7 MHz ±400 KHz	Couple Sweep Signal by a round tube V_3 6AQ8	oscilloscope at T.P ②		5th IFT (T_{204}) Discriminator Transformer	※S Curve
3.	OSC.	88 MHz 400 Hz 100% Modulation	Antenna Terminals	oscilloscope & V.T, V.M. at oscillo load	88 MHz	OSC. coil L_3	Maximum
4.	OSC.	108 MHz 400 Hz 100% Modulation	Antenna Terminals	oscilloscope & V.T, V.M, at oscillo load	108 MHz	OSC. Trimmer TC_3	Maximum
5.		Reiterate 3. 4					
6.	RF Amp.	88 MHz 400 Hz 100% Modulation	Antenna Terminals	oscilloscope & V.T, V.M. at oscillo load	88 MHz	RF Amp. coil L_2	Maximum
7.	Antenna circuit	88 MHz 400 Hz 100% Modulation	Antenna Terminals	oscilloscope & V.T, V.M. at oscillo load	88 MHz	Antenna coil L_1	Maximum
8.	RF Amp	108 MHz 400 Hz 100% Modulation	Antenna Terminals	oscilloscope & V.T, V.M. at oscillo load	108 MHz	RF. Amp Trimmer TC_2	Maximum
9.	Antenna circuit	108 MHz 400 Hz 100% Modnlation	Antenna Terminals	oscilloscope & V.T. V.M. at oscillo load	108 MHz	Antenna circuit Trimmer TC_1	Maximum
10.		Reiterate 6, 7, 8, 9					

AM ALIGNMENT PROCEDURE

STEP	ALIGN	GENERATOR	FEED SIGNAL	OUTPUT INDICATOR	DIAL SETTING	ADJUST	ADJUST FOR
1.	IF Transformer	455 KHz ±30 KHz sweep-generator	V_4 pin 7 6BE6	Sweep input at T.P ③		1st I.F.T...(T_{301}) Primary & seconpaty 2nd I.F.T...(T_{302}) Primary & secondary	Best I.F.T Wave form
2.	OSC.	AM-OSCILLATOR 535 KHz 400 Hz 30% Modulation	Antenna Terminals	oscilloscope & V.T, V.M, at output load	535 KHz	OSC. coil L_5	Maximum
3.	OSC.	1605 KHz 400 Hz 30% Modulation	Antenna Terminals	oscilloscope & V.T, V.M, at output load	1605 KHz	OSC. Trimmer TC_5	Maximum
4.		Reiterate 2, 3.					
5.	Antenna circuit	600 KHz 400 Hz 30% Modulation	Antenna Terminals	oscilloscope & V.T, V.M, at output load	600 KHz	Ferrite Loop Antenna at coil L_4	Maximum
6.	Antenna	1400 KHz 400 Hz 30% Modulation		oscilloscope & V.T, V.M, at output load	1400 KHz	Antenna circuit at Trimmer TC-4	Maximum
7.		Reiterate 8, 9.					

FM MPX ALIGNMENT PROCEDURE

1. Do not attempt to align the Multiplex Circuit unless the following equipment is available :

a. Multiplex Stereo Generator b. FM Signal Generator c. Oscilloscope
d. Sweep Generator e. AC V.T, V.M. f. Audio oscillator

STEP	ALIGN	GENERATOR	FEED SIGNAL	OUTPUT INDICATOR	ADJUST	ADJUST FOR
1.	67 KHz Trap	67 KHz Audio Signal	Connect to T.P ④	V.T, V.M at T.P ⑤	L_{401}	Minimum
2.	19 KHz coil	FM Signal Gen. Modulated 30% by Stereo Gen. sub-Channel	Antenna Terminals Tune to signal	V.T, V.M. & Oscilloscope at T.P ⑥	L_{402}	Maximum
3.	19 KHz coil	Same	Same	Same	L_{403}	Maximum
4.	38 KHz Doubler	Same	Same	V.T, V.M. & Oscilloscope at T.P ⑦	L_{404}	Maximum
5.	Separation VR	FM Signal Gen. Modulated 30% by Stereo Signal Gen. Channel-L	Same	V.T, V.M. & Oscilloscope at output load Channel-R	Separation VR_{401}	Channel-R Minimum

PARTS LIST

A: Part No.
B: Part name
C: Co-ordinates in Schematic Diagram
D: Co-ordinates in Chassis Diagram

MPI-1: Stereo Indicator Sheet; TRHA: Equalizer Amp. Sheets; Part located on the top surface are parentheiized.

A	B	C	D
R001	1KΩ 15Watt Wire Wound Resistor	8F	6E
R002	3.6KΩ 30Watt Wire Wound Resistor	9F	5E
R003	2.5KΩ 15Watt Wire Wound Resistor	9E	5E
R004	68KΩ 1Watt 10% Carbon Fixed Resistor	8E	5B
R005	33KΩ 1Watt 10% Carbon Fixed Resistor	7E	2F
R006	27KΩ 1Watt 10% Carbon Fixed Resistor	10F	2C
R007	680Ω ½Watt 10% Carbon Fixed Resistor	10F	2C
R008	8.8KΩ (3.3KΩ + 3.3KΩ + 2.2KΩ) 3Watt 10% Carbon Fixed Resistor	7C	5E
R009	4.7KΩ ½Watt 10% Solid Resistor	8F	5G
R011	100KΩ ½Watt 10% Carbon Fixed Resistor	6F	4G
R012	10KΩ ½Watt 10% Carbon Fixed Resistor	6F	4G
R013	100KΩ ¼Watt 10% Carbon Fixed Resistor	1E	(6B)
R014	100KΩ ¼Watt 10% Carbon Fixed Resistor	1E	(6B)
R015	470KΩ ½Watt 10% Solid Resistor	2E	(6B)
R016	470KΩ ½Watt 10% Solid Resistor	2E	(6B)
R017	8.2KΩ ½Watt 10% Solid Resistor	8F	5G
R018	8.2KΩ ½Watt 10% Solid Resistor	8F	6G
R019	8.2KΩ ½Watt 10% Solid Resistor	8F	5H
R020	8.2KΩ ½Watt 10% Solid Resistor	8F	6H
R021	470KΩ ½Watt 10% Carbon Fixed Resistor	5F	6G
R101	100KΩ ¼Watt 10% Solid Resistor	2A	3A
R102	6KΩ ¼Watt 10% Solid Resistor	3A	4A
R103	2KΩ ¼Watt 10% Solid Resistor	4B	3B
R104	1.8KΩ ¼Watt 10% Solid Resistor	4A	4B
R105	1KΩ ¼Watt 10% Solid Resistor	4A	4B
R106	33KΩ ¼Watt 10% Solid Resistor	6B	3B
R107	33KΩ ¼Watt 10% Solid Resistor	6B	3B
R108	10KΩ ¼Watt 10% Solid Resistor	5B	3B
R201	1.8KΩ ¼Watt 10% Solid Resistor	5A	4C
R202	1KΩ ½Watt 10% Carbon Fixed Resistor	6A	3C
R203	1KΩ ½Watt 10% Carbon Fixed Resistor	6A	3D
R204	39KΩ ¼Watt 10% Solid Resistor	7A	4D
R205	15KΩ ½Watt 10% Carbon Fixed Resistor	7A	3E
R206	15KΩ 1Watt 10% Carbon Fixed Resistor	7A	3E
R207	47KΩ ¼Watt 10% Solid Resistor	8A	3E
R208	270KΩ ¼Watt 10% Solid Resistor	8B	4E
R209	2.2MΩ ¼Watt 10% Solid Resistor	8B	4E
R210	2.2MΩ ¼Watt 10% Solid Resistor	7B	3F
R211	2.2MΩ ¼Watt 10% Solid Resistor	8B	4D
R212	390Ω ¼Watt 10% Solid Resistor	8B	3E
R213	100KΩ ¼Watt 10% Solid Resistor	8A	3E
R214	4.7KΩ ½Watt 10% Carbon Fixed Resistor	8A	2F
R215	12KΩ ½Watt 10% Carbon Fixed Resistor	8A	3F
R216	1KΩ ½Watt 10% Carbon Fixed Resistor	9A	3E
R217	1KΩ ¼Watt 10% Solid Resistor	9A	3F
R218	1KΩ ¼Watt 10% Solid Resistor	9A	3F
R219	10KΩ ¼Watt 10% Solid Resistor	10A	4F
R220	10KΩ ¼Watt 10% Solid Resistor	10A	4F
R221	68KΩ ¼Watt 10% Solid Resistor	9A	4F
R301	1MΩ ¼Watt 10% Solid Resistor	2B	2D
R302	22KΩ ¼Watt 10% Solid Resistor	2B	2C

A	B	C	D
R303	47Ω ¼Watt 10% Solid Resistor	3B	2C
R304	4.7KΩ ¼Watt 10% Solid Resistor	3B	3C
R305	2.2MΩ ¼Watt 10% Solid Resistor	4B	3D
R306	100KΩ ¼Watt 10% Solid Resistor	7B	3D
R307	47KΩ ¼Watt 10% Solid Resistor	7B	2D
R401	10MΩ ½Watt 10% Carbon Fixed Resistor	3C	3G
R402	220Ω ¼Watt 10% Carbon Fixed Resistor	3C	3G
R403	2.7KΩ ¼Watt 10% Carbon Fixed Resistor	3C	3G
R404	220Ω ¼Watt 10% Carbon Fixed Resistor	4C	4G
R405	15KΩ ½Watt 10% Carbon Fixed Resistor	4C	3G
R406	22KΩ ½Watt 10% Carbon Fixed Resistor	4C	3G
R407	47KΩ ¼Watt 10% Carbon Fixed Resistor	4C	3G
R408	120KΩ ¼Watt 10% Carbon Fixed Resistor	5C	3G
R409	1MΩ ¼Watt 10% Carbon Fixed Resistor	5C	3H
R410	1KΩ ½Watt 10% Carbon Fixed Resistor	5C	2H
R411	100KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2H
R412	10KΩ ¼Watt 10% Carbon Fixed Resistor	6C	3H
R413	33KΩ ¼Watt 10% Carbon Fixed Resistor	6C	3G
R414	330KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2G
R415	330KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2G
R416	33KΩ ¼Watt 10% Carbon Fixed Resistor	6C	3G
R417	33KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2H
R418	330KΩ ¼Watt 10% Carbon Fixed Resistor	7C	2H
R419	330KΩ ¼Watt 10% Carbon Fixed Resistor	7C	2H
R420	33KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2G
R421	100KΩ ¼Watt 10% Carbon Fixed Resistor	6C	2G
R422	1MΩ ¼Watt 10% Carbon Fixed Resistor	6C	2G
R423	100KΩ ¼Watt 10% Carbon Fixed Resistor	7C	2G
R424	100KΩ ¼Watt 10% Carbon Fixed Resistor	7C	2H
R425	100KΩ ¼Watt 10% Carbon Fixed Resistor	7C	2G
R426	10MΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R427	22KΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R428	15KΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R429	22KΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R430	15KΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R431	10MΩ ½Watt 10% Carbon Fixed Resistor	8C	2H
R432	100KΩ ¼Watt 10% Carbon Fixed Resistor	9C	2G
R433	100KΩ ¼Watt 10% Carbon Fixed Resistor	9C	1G
R501	100KΩ ¼Watt 10% Solid Resistor	2C	MP1-1
R502	150KΩ ¼Watt 10% Solid Resistor	2C	MP1-1
R503	33KΩ ¼Watt 10% Solid Resistor	2C	MP1-1
R504	47KΩ ¼Watt 10% Solid Resistor	3C	MP1-1
R601	68KΩ ¼Watt 10% Noise Less Resistor	1D	(6A)
R602	330KΩ ¼Watt 10% Noise Less Resistor	2D	TRHA
R603	100KΩ ¼Watt 10% Noise Less Resistor	2D	TRHA
R604	1KΩ ¼Watt 10% Carbon Fixed Resistor	2D	TRHA
R605	470Ω ¼Watt 10% Carbon Fixed Resistor	2D	TRHA
R606	390KΩ ¼Watt 10% Noise Less Resistor	2D	TRHA
R607	6.8KΩ ¼Watt 10% Carbon Fixed Resistor	3D	TRHA
R608	220Ω ¼Watt 10% Carbon Fixed Resistor	3D	TRHA
R609	680Ω ¼Watt 10% Carbon Fixed Resistor	3D	TRHA

A	B	C	D
R610	10KΩ ¼Watt 10% Carbon Fixed Resistor	3D	(1A)
R611	15KΩ ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R612	25KΩ ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R613	680KΩ ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R614	330KΩ ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R615	68KΩ ¼Watt 10% Noise Less Resistor	1E	(6A)
R616	330KΩ ¼Watt 10% Noise Less Resistor	2E	TRHA
R617	100KΩ ¼Watt 10% Noise Less Lesistor	2E	TRHA
R618	1KΩ ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R619	470Ω ¼Watt 10% Carbon Fixed Resistor	2E	TRHA
R620	390KΩ ¼Watt 10% Noise Less Resistor	2E	TRHA
R621	6.8KΩ ¼Watt 10% Carbon Fixed Resistor	3E	TRHA
R622	220Ω ¼Watt 10% Carbon Fixed Resistor	3E	TRHA
R623	680Ω ¼Watt 10% Carbon Fixed Resistor	3E	TRHA
R624	10KΩ ¼Watt 10% Carbon Fixed Resistor	3E	(1A)
R625	15KΩ ¼Watt 10% Carbon Fixed Resistor	2F	TRHA
R626	25KΩ ¼Watt 10% Carbon Fixed Resistor	2F	TRHA
R627	680KΩ ¼Watt 10% Carbon Fixed Resistor	2F	TRHA
R628	330KΩ ¼Watt 10% Carbon Fixed Resistor	2F	TRHA
R701	39KΩ ¼Watt 10% Solid Resistor	4D	1C
R702	470KΩ ¼Watt 10% Solid Resistor	4D	2E
R703	2.2KΩ ¼Watt 10% Solid Resistor	4D	1E
R704	47KΩ ½Watt 10% Carbon Fixed Resistor	5D	2E
R705	2.2KΩ ¼Watt 10% Solid Resistor	6D	2E
R706	47KΩ ½Watt 10% Carbon Fixed Resistor	6D	2E
R707	180KΩ ¼Watt 10% Solid Resistor	6D	1F
R708	39KΩ ¼Watt 10% Solid Resistor	4E	1B
R709	470KΩ ¼Watt 10% Solid Resistor	4E	2D
R710	2.2KΩ ¼Watt 10% Solid Resistor	4E	1D
R711	47KΩ ½Watt 10% Carbon Fixed Resistor	5E	2D
R712	2.2KΩ ¼Watt 10% Solid Resistor	6E	2D
R713	47KΩ ½Watt 10% Carbon Fixed Resistor	6E	2D
R714	180KΩ ¼Watt 10% Solid Resistor	6E	1F
R801	1KΩ ¼Watt 10% Solid Resistor	7D	5C
R802	560Ω ¼Watt 10% Solid Resistor	7D	5C
R803	560KΩ ½Watt 10% Carbon Fixed Resistor	7D	5B
R804	150KΩ ½Watt 10% Carbon Fixed Resistor	8D	5B
R805	82KΩ ¼Watt 10% Solid Resistor	8D	5B
R806	33KΩ ½Watt 10% Carbon Fixed Resistor	8D	5C
R807	33KΩ ½Watt 10% Carbon Fixed Resistor	8D	5C
R808	220KΩ ¼Watt 10% Solid Resistor	8D	5D
R809	220KΩ ¼Watt 10% Solid Resistor	8D	5D
R810	4.7KΩ ¼Watt 10% Solid Resistor	9D	5D
R811	4.7KΩ ¼Watt 10% Solid Resistor	9D	5C
R812	12KΩ ¼Watt 10% Solid Resistor	9D	5C
R813	1KΩ ¼Watt 10% Solid Resistor	7E	4B
R814	560Ω ¼Watt 10% Solid Resistor	7E	5B
R815	560KΩ ½Watt 10% Carbon Fixed Resistor	7E	4C
R816	150KΩ ½Watt 10% Carbon Fixed Resistor	8E	4C
R817	82KΩ ¼Watt 10% Solid Resistor	8E	4C
R818	33KΩ ½Watt 10% Carbon Fixed Resistor	8E	4B

A	B	C	D
R819	33KΩ ½Watt 10% Carbon Fixed Resistor	8E	5C
R820	220KΩ ¼Watt 10% Solid Resistor	8E	5A
R821	220KΩ ¼Watt 10% Solid Resistor	8E	5A
R822	4.7KΩ ¼Watt 10% Solid Resistor	9E	5A
R823	4.7KΩ ¼Watt 10% Solid Resistor	9E	5B
R824	12KΩ ¼Watt 10% Solid Resistor	8E	4B
R825	470Ω 1Watt 10% Carbon Fixed Resistor	10D	5E
R827	2.2KΩ ¼Watt 10% Solid Resistor	10E	6B
R828	4.7KΩ ¼Watt 10% Solid Resistor	10E	6C
R829	4.7KΩ ¼Watt 10% Solid Resistor	10E	6C
R826	8Ω ×2 10Watt Wire Wound Resistor	10D	4E
R830		10E	4E
R831	470Ω 1Watt 10% Carbon Fixed Resistor	10E	5D
C001	0.005μF 600WV 10% Oil tubular	8F	5F
C002	0.005μF 600WV 10% Oil tubular	8F	5E
C003	200μF 300WV electrolytic Lug turminal	8F	5F
C004	200μF 300WV electrolytic Lug turminal	8F	6F
C005	40μF 450WV electrolytic Lug turminal	9F	4F
C006	20μF 350WV electrolytic Lug turminal	8E	2F
C007	40μF 450WV electrolytic Lug turminal	8F	4F
C008	20μF 350WV electrolytic Lug turminal	7D	2F
C009	20μF 350WV electrolytic Lug turminal	6E	2F
C010	25μF 50WV electrolytic tubular	5F	5G
C011	40μF 300WV electrolytic tubular	9F	4D
C012	200μF 50WV electrolytic tubular	10F	1C
C013	20μF 180WV electrolytic tubular	10F	2C
C014	20μF 300WV electrolytic tubular	7C	2E
C015	20μF 350WV electrolytic Lug turminal	6C	2F
C016	50μF 50WV electrolytic tubular	8F	5H
C017	50μF 50WV electrolytic tubular	8F	5G
C018	25μF 25WV electrolytic tubular	8F	5B
C019	25μF 25WV electrolytic tubular	9F	5D
C020	0.0047μF 600WV 10% Oil tubular	5F	4H
C021	0.01μF 250WV $^{+100}_{-0}$% Ceramic tubular	10F	4C
C022	0.01μF 250WV $^{+100}_{-0}$% Ceramic tubular	10F	3D
C023	0.01μF 250WV $^{+100}_{-0}$% Ceramic tubular	10F	3E
C024	0.01μF 250WV $^{+100}_{-0}$% Ceramic tubular	10F	4F
C025	0.022μF 600WV ±10% Oil(UL)	5F	6G
C101	50pF 250WV 10% Ceramic tubular	2A	3A
C102	7pF 250WV ±0.5pF Ceramic tubular	2A	3A
C103	1000pF 250WV $^{+100}_{-0}$% Ceramic tubular	2A	4A
C104	1000pF 250WV 10% Ceramic feedthru	3B	3B
C105	1000pF 250WV $^{+100}_{-0}$% Ceramic tubular	3A	4A
C106	50pF 250WV 10% Ceramic tubular	3A	4B
C107	2pF 250WV ±0.5pF Ceramic tubular	3A	
C108	7pF 250WV ±0.5pF Ceramic tubular	4A	3B
C109	0.002μF 250WV $^{+100}_{-0}$% Ceramic tubular	4A	4B
C110	0.002μF 250WV $^{+100}_{-0}$% Ceramic tubular	4A	3C
C111	0.002μF 250WV $^{+100}_{-0}$% Ceramic tubular	6B	3B
C112	6pF 250WV ±0.5pF Ceramic tubular	6B	3B

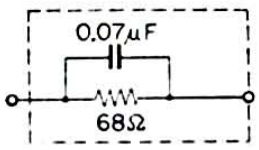
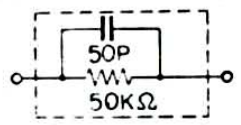
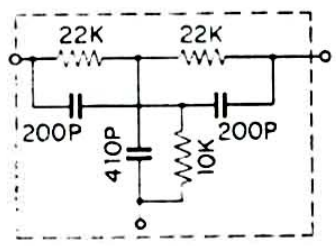
PARTS LIST

A: Part No.
B: Part Name
C: Co-ordinates in Schematic Diagram
D: Co-ordinates in Chassis Diagram

MPI-1: Stereo Indicator Sheet; TRHA: Equalizer Amp. Sheet; Parts located on the top surface are parenthesized.

A	B				C	D
C113	100pF	250WV	10%	Ceramic tubular	5B	3B
C114	20pF	250WV	10%	Ceramic tubular	5B	3B
C115	2000pF	250WV	$^{+100}_{-0}$%	Ceramic tubular	5B	4B
C116	200pF	250WV	10%	Ceramic tubular	7F	4A
C117	200pF	250WV	10%	Ceramic tubular	8F	4B
C118	200pF	250WV	10%	Ceramic tubular	8F	4B
C119	1000pF	250WV	10%	Ceramic feedthru	4B	3B
C120	0.05μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	6B	1A
C201	0.01μF	50WV	$^{+100}_{-0}$%	Ceramic tubular	5A	3C
C202	2pF	250WV	$^{+100}_{-0}$%	Ceramic tubular	5A	3C
C203	0.002μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	6B	4D
C204	0.01μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	6A	3D
C205	10μF	12WV		electrolytic tubular	7A	4D
C206	0.01μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	7A	3E
C207	10pF	250WV	±1pF	Ceramic tubular	8A	3E
C208	0.01μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	8A	3F
C209	0.01μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	9A	3F
C210	200pF	250WV	10%	Ceramic tubular	9A	4F
C211	0.01μF	400WV	10%	Oil tubular	9A	4F
C212	200pF	250WV	10%	Ceramic tubular	9A	4F
C213	200pF	250WV	10%	Ceramic tubular	9A	4F
C214	0.05μF	400WV	10%	Oil tubular	10B	4F
C215	0.01μF	250WV	10%	Ceramic tubular	8B	3E
C216	0.01μF	250WV	10%	Ceramic tubular	8B	3E
C217	0.002μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	7B	3F
C218	5μF	12WV		electrolytic tubular	10A	4F
C301	10pF	250WV	10%	Ceramic tubular	2B	2C
C302	400pF	500WV	10%	Mica tubular	3B	2B
C303	15pF	250WV	10%	Ceramic tubular	3B	2C
C304	50pF	250WV	10%	Ceramic tubular	3B	2B
C305	0.01μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	3B	2C
C306	0.05μF	50WV	10%	Ceramic tubular	4B	3C
C307	100pF	250WV	10%	Ceramic tubular	7A	3D
C308	50pF	250WV	10%	Ceramic tubular	7B	3D
C309	0.02μF	400WV	10%	Oil tubular	7B	2D
C401	0.05μF	50WV	$^{+100}_{-0}$%	Ceramic tubular	3C	4G
C402	680pF	500WV	10%	Mica tubular	3C	3G
C403	220pF	500WV	10%	Mica tubular	3C	3G
C404	82pF	250WV	5%	Mica tubular	3C	3G
C405	220pF	500WV	10%	Mica tubular	4C	4G
C406	1500pF	500WV	5%	Mica tubular	3C	3H
C407	0.05μF	50WV	10%	Ceramic tubular	4C	4G
C408	220pF	500WV	10%	Mica tubular	4C	3G
C409	0.05μF	250WV	10%	mylar tubular	4C	4G
C410	4700pF	50WV	5%	Mica tubular	4C	3G
C411	0.003μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	5C	3G
C412	4700pF	50WV	5%	Mica tubular	4C	3G
C413	220pF	500WV	10%	Mica tubular	5C	3H
C414	1μF	12WV		electrolytic tubular	6C	3G
C415	4700pF	50WV	5%	Mica tubular	6C	3H
C416	0.001μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	6C	3H
C417	0.001μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	6C	3H
C418	80pF	250WV	10%	Ceramic tubular	7C	2H
C419	80μF	250WV	10%	Ceramic tubular	7C	2G
C420	0.02μF	50WV	10%	Ceramic tubular	7C	2G
C421	300μF	500WV	10%	Mica tubular	8C	2H
C422	0.02μF	400WV	10%	Oil tubular	8C	1G
C423	0.02μF	400WV	10%	Oil tubular	8C	2G
C424	0.02μF	400WV	10%	Ceramic tubular	8C	2G
C425	100pF	500WV	10%	Mica tubular	8C	2H
C426	100pF	500WV	10%	Mica tubular	9C	2G
C501	500μF	15WV		electrolytic tubular	9C	2G
C502	200μF	12WV		electrolytic tubular	1C	MP1-1
C503	0.002μF	250WV	$^{+100}_{-0}$%	Ceramic tubular	1C	MP1-1
C504	3μF	50WV		electrolytic tubular	2C	MP1-1
C505	0.05μF	50WV	10%	Ceramic tubular	2C	MP1-1
C506	0.05μF	50WV	10%	Ceramic tubular	2C	MP1-1
C601	1.5μF	3WV		Tantal tubular	3C	MP1-1
C602	30μF	10WV		electrolytic tubular	2D	TRHA
C603	150pF	250WV	10%	Ceramic tubular	2D	TRHA
C604	150pF	250WV	10%	Ceramic tubular	2D	TRHA
C605	10μF	25WV		electrolytic tubular	3D	TRHA
C606	10μF	10WV		electrolytic tubular	3D	TRHA
C607	0.1μF	50WV	10%	mylar tubular	3D	(1A)
C608	0.003μF	50WV	10%	mylar tubular	2E	TRHA
C609	0.004μF	50WV	10%	mylar tubular	2E	TRHA
C610	0.01μF	50WV	10%	mylar tubular	2E	TRHA
C611	1.5μF	3WV		Tantal tubular	2E	TRHA
C612	30μF	10WV		electrolytic tubular	2E	TRHA
C613	150pF	250WV	10%	Ceramic tubular	2E	TRHA
C614	150pF	250WV	10%	Ceramic tubular	2E	TRHA
C615	10μF	25WV		electrolytic tubular	3E	TRHA
C616	10μF	10WV		electrolytic tubular	3E	TRHA
C617	0.1μF	50WV	10%	mylar tubular	3E	(1A)
C618	0.003μF	50WV	10%	mylar tubular	2F	TRHA
C619	0.004μF	50WV	10%	mylar tubular	2F	TRHA
C620	0.001μF	50WV	10%	mylar tubular	2F	TRHA
C701	80pF	500WV	10%	Mica tubular	4D	1C
C702	0.01μF	50WV	10%	mylar tubular	4D	1C
C703	0.05μF	50WV	10%	mylar tubular	4D	2E
C704	0.3μF	250WV	10%	M.P Condenser	5D	2E
C705	400pF	500WV	10%	Mica tubular	5D	1G
C706	500pF	500WV	10%	Mica tubular	5D	1E
C707	0.05μF	400WV	10%	Oil tubular	6D	2E
C708	0.005μF	50WV	10%	mylar tubular	6D	1F
C709	0.005μF	50WV	10%	mylar tubular	6D	1F
C710	80pF	500WV	10%	Mica tubular	4E	1C
C711	0.01μF	50WV	10%	mylar tubular	4E	1B

A	B				C	D
C712	0.05μF	50WV	10%	mylar tubular	4E	2D
C713	0.3μF	250WV	10%	M.P Condenser	5E	2D
C714	400pF	500WV	10%	Mica tubular	5E	1G
C715	500pF	500WV	10%	Mica tubular	5E	1E
C716	0.05μF	400WV	10%	Oil tubular	6E	2D
C717	0.005μF	50WV	10%	mylar tubular	6E	1F
C718	0.005μF	50WV	10%	mylar tubular	6E	1F
C801	30μF	6WV		electrolytic tubular	7D	5C
C802	1μF	150WV		electrolytic tubular	7D	5C
C803	30PF	500WV	10%	Mica tubular	8D	5C
C804	0.3μF	350WV	10%	M.P Condenser	8D	5D
C805	0.3μF	350WV	10%	M.P Condenser	8D	5C
C806	30μF	6WV		electrolytic tubular	7E	4B
C807	1μF	150WV		electrolytic tubular	7E	4C
C808	30PF	500WV	10%	Mica tubular	8E	4C
C809	0.3μF	350WV	10%	M.P Condenser	8E	5A
C810	0.3μF	350WV	10%	M.P Condenser	8E	5B
VR001	20KΩ(B)	Variable Resistor Driver type			8F	6G
VR002	20KΩ(B)	Variable Resistor Driver type			8F	5G
VR003	20KΩ(B)	Variable Resistor Driver type			6F	6H
VR004	20KΩ(B)	Variable Resistor Driver type			6F	5H
VR005	100Ω	Hum Balancer			6F	5F
VR006	100Ω	Hum Balancer			6F	5F
VR201	10KΩ(B)	Variable Resistor 16φ type			8B	6F
VR401	50KΩ(B)	Variable Resistor 16φ type			8C	6E
VR701	500KΩ(B)	Variable Resistor 24φ type (Center-tap)			4D	1C
VR702					4E	1C
VR703	250KΩ(B)	Variable Resistor 24φ type (Center-tap)			5D	1E
VR704					5E	1E
VR705	1MΩ(B)	Variable Resistor 24φ type (Center-tap)			6D	1F
VR706					6E	1F
VR801	500KΩ(BH)	Variable Resistor 24φ tape			7D	1D
VR802					7E	1D
VC1	6～18PF	Variable Capacitor (FM. RF Tuning)			1A	3A
VC2	6～18PF	Variable Capacitor (FM.RF Tunning)			3A	3B
VC3	6～18PF	Variable Capacitor (FM. oscillator)			5B	3B
VC4	8.8～328PF	Variable Capacitor (AM. RF Tuning)			1B	3A
VC5	8.8～328PF	Variable Capacitor (AM. oscillator)			3B	3B
TC1	15PF	Trimer condenser			2A	3A
TC2	15PF	Trimer condenser			4A	3B
TC3	10PF	Trimer condenser			5A	3B
TC4	15PF	Trimer condenser			2B	3A
TC5	15PF	Trimer condenser			3B	3B
L1	FM. Antenna coil				1A	3A
L2	FM. RF Tuning				3A	3B

A	B	C	D
L3	FM. Oscillator coil	5B	3B
L4	AM. Loop stick Antenna coil	1B	
L5	AM. Oscillator coil	2B	2C
L101	FM. RF coil 3.5μH	2A	3A
L102	FM. RF coil 1μH	3A	4A
L103	FM. RF coil 3.5μH	3A	3B
L104	Heater Chark coil 0.8μH	8F	3A
L401	MPX. coil MFC-8B 70mH ±15%	3C	3G
L402	MPX. coil MFC-8A 45mH ±15%	4C	4H
L403	MPX. coil MFC-8C 14mH ±15%	4C	3G
L404	MPX. coil MFC-8D 35mH ±15%	5C	3H
T001	Power transformer	7F	(5G)
T101	1st FM. I.F.T 10.7Mc/s	4A	4B
T201	2nd FM. I.F.T 10.7Mc/s	5A	3C
T202	3rd FM. I.F.T 10.7Mc/s	6A	3D
T203	4th FM. I.F.T 10.7Mc/s	8A	3E
T204	FM. Discriminator transformer	9A	3F
T301	1st AM. I.F.T 455Kc/s	4B	3C
T301	2nd AM. I.F.T 455Kc/s	6A	3D
T801	Output transformer (Primary 7KΩ) (Secondary 8Ω, 16Ω)	9D	(5D)
T802	Output transformer (Primary 7KΩ) (Secondary 8Ω, 16Ω)	9E	(5A)
CR201	0.01μF-68Ω CRS03 	5A	3C
CR202	0.01μF-68Ω CRS03	6A	3D
CR203	50P-50K CRS04 	7A	4D
CR401	38KC Filter FP-38 	9C	2G
CR402	38KC Filter FP-38	9C	2G
JAC-1a	Head phone jack	10D	1H
JAC-1b		10E	1H
JAC-3	D.I.N. Jack (tape recorder connector)	1E	(5C)
PU-1	Voltage selector plug (for 100V/117V/220V/240V)	6F	4G
PL1, 2	Pilot Lamp (Fuse type) 6.3V 0.3A	8F	
PL3~6	Pilot Lamp 8V 0.15A	0.10F	
PL7	Pilot Lamp 8V 0.15A	1C	(1H)
FU-1	Fuse 3A	5F	6G
M	Tuning Meter 200μA	5B	(1G)
S1(a~k)	Function Y-5-11-4		(1A)
S2(a~f)	Band Selector Y-2-6-3		(1B)

PARTS LIST

A: Part No.
B: Part name
C: Co-ordinates in Schematic Diagram
D: Co-ordinates in Chassis Diagram

MPI-1: Stereo Indicator Sheet; TRHA: Equalizer Amp. Sheets; Part located on the top surface are parentheiized.

A	B		C	D
SS101	FM. AFC Switch		7B	1A
SS201	Muting Switch		8B	1A
SS701	Loudness Switch		4D	1C
SS702			4E	1C
SS703	Tape Monitor		4D	1B
SS704			4E	1B
SS705	Mode (Stereo-Mono)		4E	1B
SS706			4E	1B
SS707	High Filter		5D	1F
SS708			5E	1F
SS709	Low Filter		6D	1G
SS710			6E	1G
SS801	Speaker Switch		10E	1G
SS802			10F	1G
PS-1	Power Switch		5F	1H
CO-1, 2	AC. Receptacles		5F	6G
V_1	6CW4	FM. RF. Amp	2A	4A
V_2	6CW4	FM. RF. Amp	3A	4B
V_3	6AQ8(ECC85)	FM. Oscillator & Mixer	4A6B	4B
V_4	6BE6(EK90)	AM. Convertor	2B	2C
V_5	6BA6(EF93)	FM. 1st. IF. Amp.	5A	4C
V_6	6BA6(EF93)	AM. FM. 2nd. IF. Amp.	6A	3D
V_7	6AU6(EF94)	1st Limitor	7A	3E
V_8	6BL8(ECF80)	2nd Limitor & Muting	8A,B	3E
V_9	6BL8(ECF80)	MPX Amp & 19KC Amp.	3,4C	4G
V_{10}	12AU7(ECC82)	Doubler (38Kc Oscillator)	5C	3H
V_{11}	12AU7(ECC82)	Differential Amp.	8C	2H
V_{12}	6AQ8(ECC85)	Control Amp.	6,6D	2E
V_{13}	6AQ8(ECC85)	Control Amp.	5, 6E	2D
V_{14}	6BL8(ECF80)	Audio Amp. Phose inverter	7,8D	5C
V_{15}	6BL8(ECF80)	Audio Amp. Phose inverter	7, 8E	4C
V_{16}	7189A	Power Amp.	9D	6D
V_{17}	7189A	Power Amp.	9D	6C
V_{18}	7189A	Power Amp.	9E	6A
V_{19}	7189A	Power Amp.	9E	6B
TR_1	2SC-372	D.C Amp.	2C	MP1-1
TR_2	2SC-324	Indicator Amp.	2C	MP1--
TR_3	2SC-372	Indicator Amp.	2C	MP1-1
TR_4	2SC-650	Equalizer Amp.	2D	TRHA
TR_5	2SC-650	Equalizer Amp.	2E	TRHA
TR_6	2SC-649	Equalizer Amp.	2D	TRHA
TR_7	2SC-649	Equalizer Amp.	2E	TRHA
D_{001}	SW-05c Si diode AC(RMS) V_D=240V			
D_{002}	I_D=500mA −65°C～100°C		7F	5F
D_{003}	SW-05-02 Si diode V_D=90V		8F	5F
	I_D=500mA −65°C～100°C		7F	5G
D_{101}	MA-351 Riatance diode (FM, AFC)		6B	3B

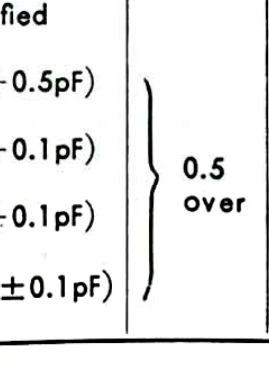
A	B	C	D
D_{201}	OA-91 Ge diode V_D=90V I_D=50mA −55°C～75°C	8A	3E
D_{202}		9A	3F
D_{301}		9A	3F
D_{501}	SW-05-02 Si diode V_D=90V I_D=500mA −65°C～100°C	7A	3D
		1C	MP1-1
D_{502}	IN-60 Ge diode V_D=40V I_D=50mA −65°C～90°C	2C	MP1-1
D_{401}	IS-180 Si diode V_D=50V I_D=100mA −55～150°C	6C	2G
D_{402}		6C	2G
D_{403}		6C	2G
D_{404}		6C	2G
D_{405}		6C	2H
D_{406}		6C	2G
D_{407}		7C	2H
D_{408}		7C	2H

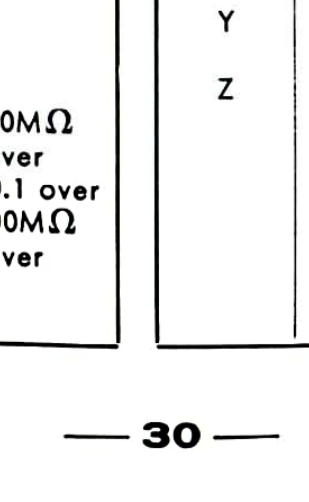
COLOR CODE

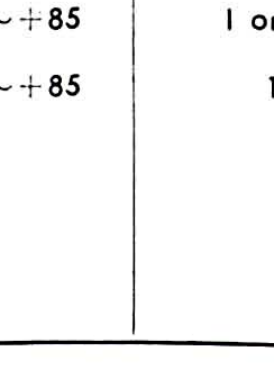
The color code indicates 10 different colors by using figures of 1 to 9. This code agrees with IEC and JIS.

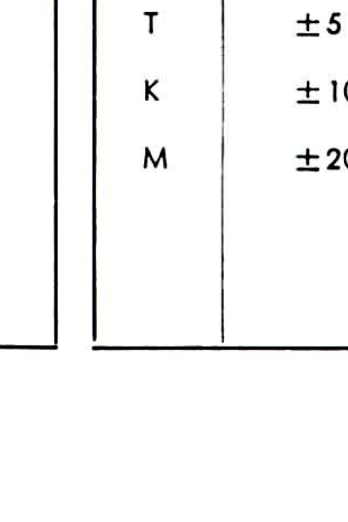
	Common to All Parts			Fixed Resistor	Mica Capacitor				Paper Capacitor		Ceramic Capacity			
Color	1st Figure	2nd Figure	Multiplier	Allowance (%)	Grade	Property	Allowance (%)	Rated Voltage (V)	Allowance (%)	Rated Voltage (V)	Grade	Property	Allowance (%)	Rated Voltage (V)
black	0	0	1		X	A	±20(M)		±20(M)	100	X		±20	
brown	1	1	10^1(10)			B			±5(J)	200				
red	2	2	10^2(K)	±2	Y	C	±2(G)		±2(G)	250	Z			250
orange	3	3	10^3			D		300						
yellow	4	4	10^4			E			±15(L)	400				
green	5	5	10^5(M)			F	±5(J)	500	$^{+20}_{-15}$(V)					500
blue	6	6	10^6						$^{+40}_{-15}$(X)	600			$^{+100}_{-\ 1}$	
purple	7	7	10^7											
grey	8	8	10^8		Z				$^{+10}_{-15}$(Y)		(Y)			
white	9	9	10^9						±10(K)	1000				
golden			10^{-1}(0.1)	±5				1000						
silver			10^{-2}(0.01)	±10								YY YZ		
non-colored				±20										

Note









Property	Temperature Coefficient	Divergence of Capacity	Q tanδ	Insulation Resistance
A	Not specified	Not specified	0.5 under	3000MΩ under
B	Not specified	Not specified		
C	−20～+200	±(0.5%+0.5pF)	0.5 over	7500MΩ over but 0.1 over 3000MΩ over
D	−100～+100	±(0.3%+0.1pF)		
E	−20～+100	±(0.1%+0.1pF)		
F	0～+70	±(0.05%±0.1pF)		

Grade	Usable Temperature Range	Test Classfication
X	−55～+85	I or II
Y	−30～+85	I or II
Z	−30～+85	1

Letter	Allowance
G	±2
T	±5
K	±10
M	±20

Sansui

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