



## **STEREOPHONIC HIGH FIDELITY RECEIVER**

- AM
- FM
- FM STEREO
- COMPLETE STEREOPHONIC AMPLIFIER  
AND PRE-AMPLIFIER WITH CONTROL FACILITIES

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### **I N T R O D U C T I O N**

It is essential you read this instruction booklet carefully before operating your stereo receiver. You have invested in a fine high fidelity stereophonic control center into which many important and excellent engineering developments have been incorporated. Each is necessary for the proper operation of your system.

This instruction booklet has been written in simple non-technical language. If you will take time to read it first before doing anything else, you will find it an easy task to install and operate your new stereophonic receiver. **KEEP THIS BOOKLET AVAILABLE AT ALL TIMES FOR IT CONTAINS INDISPENSABLE TECHNICAL AND SERVICE INFORMATION.**

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## WARRANTY

We warrant each stereo receiver to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions herein below set forth, for a period of 1 year from date of delivery to the original purchaser, and agree to replace or repair any part or parts, with the exception of tubes which are under the manufacturer's 90 day warranty, returned to us within said 1 year, with transportation prepaid and which our examination shall disclose to our satisfaction to have been thus defective. This warranty does not include free labor, nor is it applicable to any instrument which shall have been repaired or altered in any way so as in our judgment to affect its stability or reliability nor which has been subject to neglect, misuse, abuse, negligence or accident nor which has had the serial number altered, effaced, or removed. Neither shall this warranty apply to any instrument which has been corrected otherwise than in accordance with instructions furnished by us.

This warranty is expressly in lieu of all other warranties, express or implied, and of all other obligations or liability on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this instrument.

## GENERAL DESCRIPTION

Your stereophonic high fidelity receiver is a versatile instrument capable of exceptionally fine performance. The unit includes an AM and FM section for superb radio reception as well as provision for FM stereo. Two powerful, low distortion amplifiers provide ample power for pure tone quality.

## INSTALLATION PROCEDURE

The following information is for your reference.

### Connecting the Phonograph:

If your phonograph uses a magnetic type pickup connect the two shielded connecting cables to the twin receptacles on the rear of the receiver marked "PHONO LO". If your phonograph uses a ceramic or crystal type phono pickup, connect the two connecting shielded wires to the receptacles labelled "PHONO HI".

### **Connecting the Tape Recorder:**

A tape recorder may be connected to the twin input receptacles labelled "AUX" on the rear panel of the receiver. If you wish to make a recording, connect two shielded leads between the two TAPE OUT receptacles on the inputs of your tape machine. All program material passing through the stereo receiver will now be fed into your tape machine.

### **Connecting the Speaker:**

The speaker manufacturer usually includes the impedance rating of the speaker either on the rear of the magnet structure or on the speaker frame. Connect two wires from the right speaker to the COM and either 8 or 16 ohm terminals (depending on the speaker rating) located on the CHAN. A speaker terminal strip. Similarly connect the left speaker to the COM and either 8 or 16 ohm terminals on the CHAN. B strip. Be sure the wires are cleanly dressed and do not touch the other terminals on the speaker terminal strip.

### **Connecting the FM Antenna:**

A 48" piece of wire is usually sufficient antenna for the stereo receiver. This wire should be connected to the "FM" receptacle on the ANTENNA terminal strip. For best results an outdoor FM or T.V. antenna should be used and should be connected to the "FM" and "GND" terminals on the ANTENNA strip.

### **Connecting the AM Antenna:**

In most installations an outdoor AM antenna is not required. However, if an outdoor antenna is needed attach it to the "AM" terminal on the ANTENNA terminal strip located on the rear panel.

### **Connecting the FM Stereo (Multiplex) Adapter:**

The Model MX601 FM stereo adapter enables you to listen to stereophonic FM broadcasts with your receiver. Instructions for installing the adapter are furnished with the adapter.

## **OPERATING PROCEDURE**

Plug the AC line cord into any outlet furnishing 117 volts, 50 or 60 cycle AC current. The line voltage may vary between 105 and 125 volts.

Your stereophonic receiver incorporates several important operating controls located on the front panel. Each control has a specific useful function which is related to the other controls and a proper understanding of the operation of the various controls will doubtless prove useful in organizing and clarifying them for you.

### **Function Control:**

Viewing the receiver from the front you will find the FUNCTION CONTROL on the extreme left. This control has five positions and selects the desired type of program material.

1. PHONO. This selects your stereo phonograph for operation.
2. AUX. If a television receiver or tape recorder is part of your installation it may be switched in by selecting the "AUX" position.
3. AM. This position selects the AM tuner portion of the receiver for operation.
4. FM. This position selects the FM tuner portion of the receiver for operation.
5. FM STEREO. Stereophonic FM broadcasts may be received when the FUNCTION CONTROL switch is set to "FM STEREO". Reception of FM stereo broadcasts is possible only if your receiver is equipped with the special FM stereo adapter, Model MX601.

You tune for an FM stereo broadcast in the same manner as for conventional FM. Your stereo receiver will automatically transfer the stereo signal through the amplifiers to your speakers.

#### **Loudness Control:**

This control sets the relative volume level of all program material. Rotating the control clockwise raises the listening level of both channels simultaneously.

#### **Balance Control:**

The nature of stereophonic reproduction is such that it requires two identical channels to attain the highest degree of faithfulness and spatial distribution. Any variation in the efficiency of one channel as compared to the other will disturb this relationship. As there may be slight differences between the two speakers, tape heads, cartridge coils, etc., this receiver includes a special control to balance one channel against the other. Sufficient range is covered by this control to permit rebalancing of the overall system even in extreme cases where unbalance exists.

It must be noted that the BALANCE control may be set anywhere within its range of adjustment to attain system balance.

#### **Tone Controls:**

Separate bass and treble tone controls are provided in order to realize the full range of tone adjustment required for maximum high fidelity listening. The controls may either boost or cut the bass and the treble tones of the program source. These controls are activated in all FUNCTION CONTROL positions and should be set in accordance with your own hearing preference, speaker characteristics and room acoustics.

#### **Tuning Control:**

This control selects the desired station when the FUNCTION SELECTOR is in the AM, FM or FM STEREO position.

#### **Power On/Off Switch:**

Moving this slide switch to the right turns the receiver on.

#### **Noise Filter Switch:**

In the event of excessive high frequency phonograph hiss or if excessive noise is introduced while listening to a stereo FM broadcast (when the MX601 FM stereo is installed), turn the NOISE FILTER switch "ON".

For normal listening the filter should be switched off.

### Mode Switch:

The MODE switch selects between stereophonic and monophonic operation. When playing your stereo records, tapes and FM stereo tuner this switch must be in the "STEREO" position. When playing monophonic records or tapes, this switch should be in the "MONO" position.

## MAINTENANCE AND REPAIR

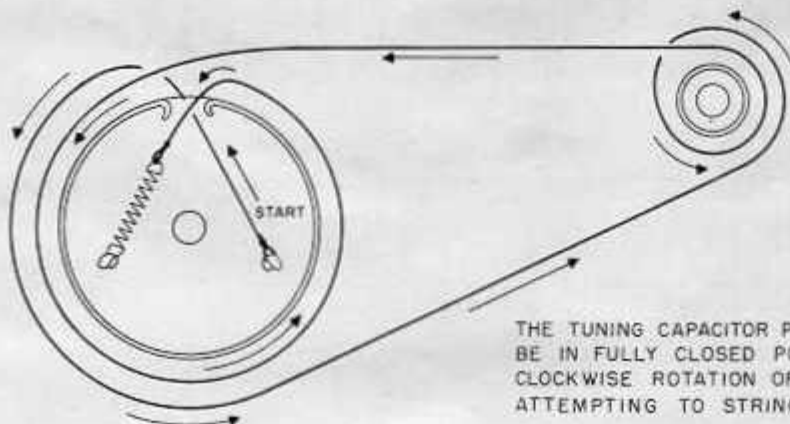
Due to the conservative design and high quality components of this instrument, no routine maintenance other than yearly tube-checking is required. Should trouble develop, however, only the most qualified service technician should be employed, as special equipment and training is required to properly service a high fidelity unit.

### FM ALIGNMENT

STEP	ALIGN	GENERATOR SETTING		FEED SIGNAL	OUTPUT INDICATOR	DIAL SETTING	Adjust	ADJUST FOR
		FREQ	MOD					
1.	IF	10.7 MC	60 CPS	ANT. TERM.	SCOPE AT IF TEST POINT THRU 47K RESISTOR	90 MC	1st, 2nd & 3rd FM IF TRANS.	MAX.
2.	RATIO DETECTOR	90 MC	60 CPS	SAME	SCOPE AT TAPE OUTPUT JACK	90 MC	ADJUST PRIMARY (BOTTOM) FOR MAX. GAIN AND ADJUST SECONDARY (TOP) FOR SYMMETRY	

### AM ALIGNMENT

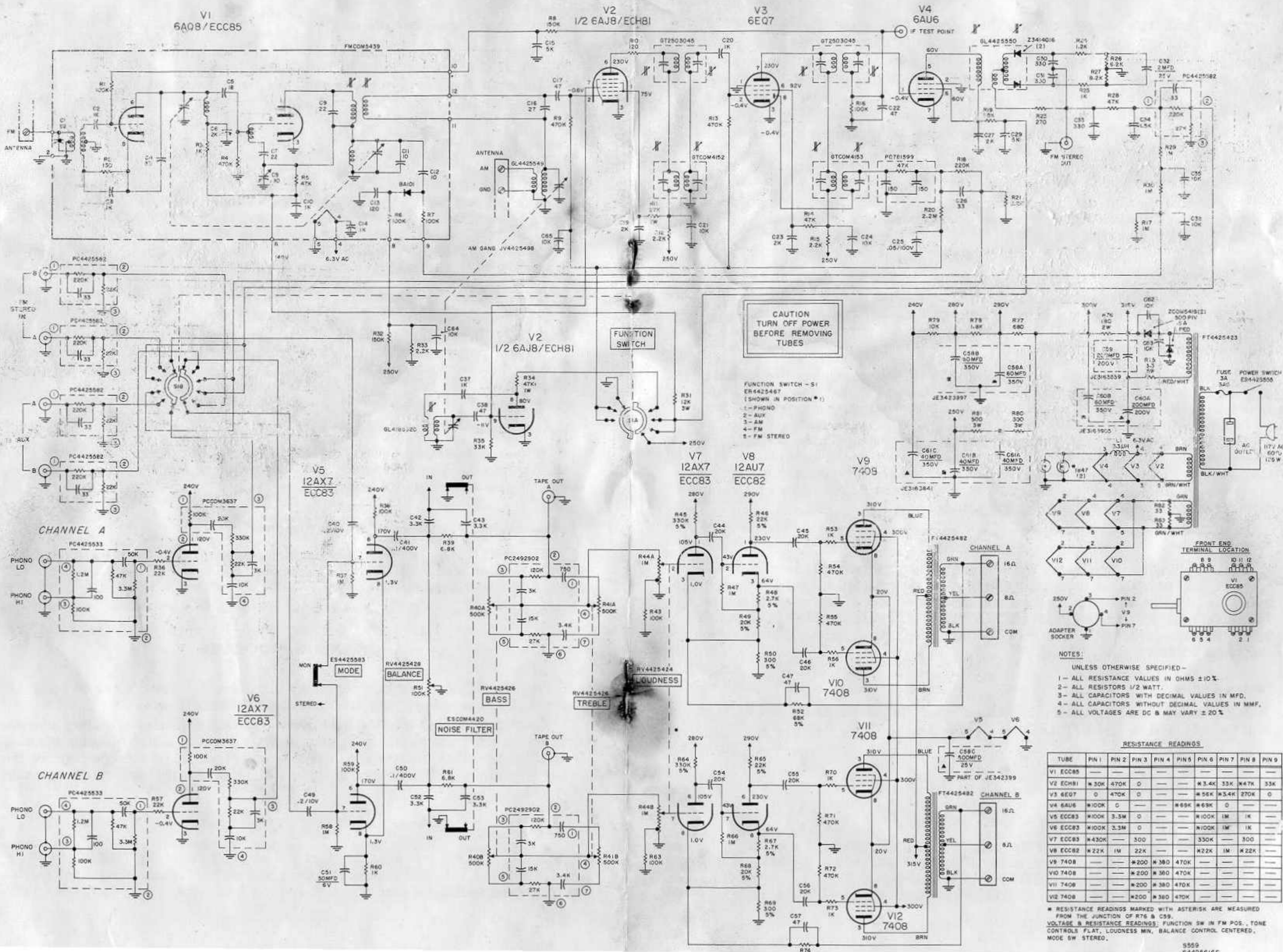
1.	IF	455 KC	400 CPS	COUPLE SIGNAL LOOSELY BY LOOP AROUND LOOPSTICK	AC V-TVM AT TAPE OUTPUT JACK	1600 KC	1st & 2nd AM IF TRANS.	MAX.
2.	OSC	600 KC	400 CPS	SAME	SAME	600 KC	OSC SLUG	MAX.
3.	OSC	1400 KC	400 CPS	SAME	SAME	1400 KC	OSC TRIMMER	MAX.
4.	REPEAT STEPS 2 & 3							
5.	RF	600 KC	400 CPS	SAME	SAME	600 KC	LOOPSTICK RING	MAX.
6.	RF	1400 KC	400 CPS	SAME	SAME	1400 KC	RF TRIMMER	MAX.
7.	REPEAT STEPS 5 & 6							



THE TUNING CAPACITOR PLATES MUST BE IN FULLY CLOSED POSITION (COUNTER CLOCKWISE ROTATION OF SHAFT) BEFORE ATTEMPTING TO STRING DIAL CORD.

## PARTS REPLACEMENT LIST

<i>Part Number</i>	<i>Description</i>	<i>List Price</i>
ES4425583	SLIDE SWITCH SPST SS26 .....	.25
ESCOM4420	SLIDE SWITCH DPDT SS50 .....	.40
HC3654915	PILOT LIGHT SOCKET .....	.40
ES4425555	SLIDE SWITCH SPDT SS36-1 .....	.75
FT4425423	POWER TRANSFORMER .....	13.75
FT4425482	OUTPUT TRANSFORMER .....	4.50
JE3423997	ELECTROLYTIC CONDENSER .....	3.75
JE3163839	ELECTROLYTIC CONDENSER .....	2.50
JE3163905	ELECTROLYTIC CONDENSER .....	3.50
JE3163841	ELECTROLYTIC CONDENSER .....	3.05
STCOM5158	TIPJACK .....	.70
GL4185308	AM OSC. COIL .....	.65
GTCOM4152	1st AM IF TRANS. ....	1.30
GTCOM4153	2nd AM IF TRANS. ....	1.40
GT2503045	FM IF TRANS. ....	1.50
GL4425550	RATIO DETECTOR TRANS. W/DIODES .....	4.85
GL4425549	ANTENNA LOOPSTICK .....	2.40
JV4425498	VARIABLE CONDENSER .....	4.40
P4425500	TUNING DIAL .....	2.50
FMCOM5439	FM FRONT END .....	20.20
ER4425467	FUNCTION SWITCH .....	2.05
RV4425426	BASS AND TREBLE CONTROL - TANDEM .....	1.75
RV4425428	BALANCE CONTROL .....	1.00
RV4425424	LOUDNESS CONTROL - TANDEM .....	2.20
JE3283790	ELECTROLYTIC CONDENSER .....	.50
JE3584255	ELECTROLYTIC CONDENSER .....	.40
PC2492902	PC PLATE, TONE CONTROL .....	.90
PCCOM3637	PC PLATE, RIAA EQUALIZER .....	.50
PC4425533	PC PLATE, PHONO INPUT .....	.50
PC4425582	PC PLATE, VOLTAGE DIVIDER .....	.90
PC781599	PC51 .....	.35
P4425479	ESCUTCHEON .....	7.50
P4425584	KNOB, PLASTIC TUNER .....	.45
P4425585	KNOB, PLASTIC SMALL .....	.40



**CAUTION**  
TURN OFF POWER  
BEFORE REMOVING  
TUBES

FUNCTION SWITCH - S1  
ER4425467  
(SHOWN IN POSITION \* 1)  
1 - PHONO  
2 - AUX  
3 - AM  
4 - FM  
5 - FM STEREO

- NOTES:**  
UNLESS OTHERWISE SPECIFIED -  
1 - ALL RESISTANCE VALUES IN OHMS ±10%  
2 - ALL RESISTORS 1/2 WATT.  
3 - ALL CAPACITORS WITH DECIMAL VALUES IN MFD.  
4 - ALL CAPACITORS WITHOUT DECIMAL VALUES IN MMF.  
5 - ALL VOLTAGES ARE DC & MAY VARY ± 20%

**RESISTANCE READINGS**

TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1 ECC85	—	—	—	—	—	—	—	—	—
V2 ECH81	*30K	470K	0	—	—	*3.4K	33K	*47K	33K
V3 6EQ7	0	470K	0	—	—	*56K	*3.4K	270K	0
V4 6AU6	*100K	0	—	—	—	*69K	*69K	0	—
V5 ECC83	*100K	3.3M	0	—	—	*100K	1M	1K	—
V6 ECC83	*100K	3.3M	0	—	—	*100K	1M	1K	—
V7 ECC83	*430K	—	300	—	—	330K	—	300	—
V8 ECC82	*22K	1M	22K	—	—	*22K	1M	*22K	—
V9 7408	—	—	*200	*380	470K	—	—	—	—
V10 7408	—	—	*200	*380	470K	—	—	—	—
V11 7408	—	—	*200	*380	470K	—	—	—	—
V12 7408	—	—	*200	*380	470K	—	—	—	—

\* RESISTANCE READINGS MARKED WITH ASTERISK ARE MEASURED FROM THE JUNCTION OF R76 & C59.  
VOLTAGE & RESISTANCE READINGS: FUNCTION SW IN FM POS., TONE CONTROLS FLAT, LOUDNESS MIN, BALANCE CONTROL CENTERED, MODE SW STEREO.

# MODEL MX601

## FM STEREO ADAPTER

### INSTALLATION

The MX601 adapter installs easily into your stereophonic receiver without the need for special tools or additional wiring.

1. After removing the MX601 from its carton, insert the adapter into the chassis indentation provided for it. This indentation is located at the left rear of the receiver with the front panel facing you. Proper orientation of the MX601 adapter is to line up the horizontal slot located at one end of the adapter chassis with the protruding metal lock on the receiver chassis. The rear of the adapter (this can be easily identified because all of the adapter cables emerge from this section) includes a small hole for a hex screw to fasten the adapter into place.
2. Once the adapter has been installed, insert the black power take-off plug from the MX601 into the female power socket on the receiver chassis located between the 7408 output tube and the output transformer.
3. Three colored wires emerge from the rear of the MX601 adapter. The green wire connects to the MX OUTPUT receptacle on the rear of the receiver. The white wire connects to the FM STEREO B receptacle and the Blue wire to the FM STEREO A receptacle.

### OPERATION

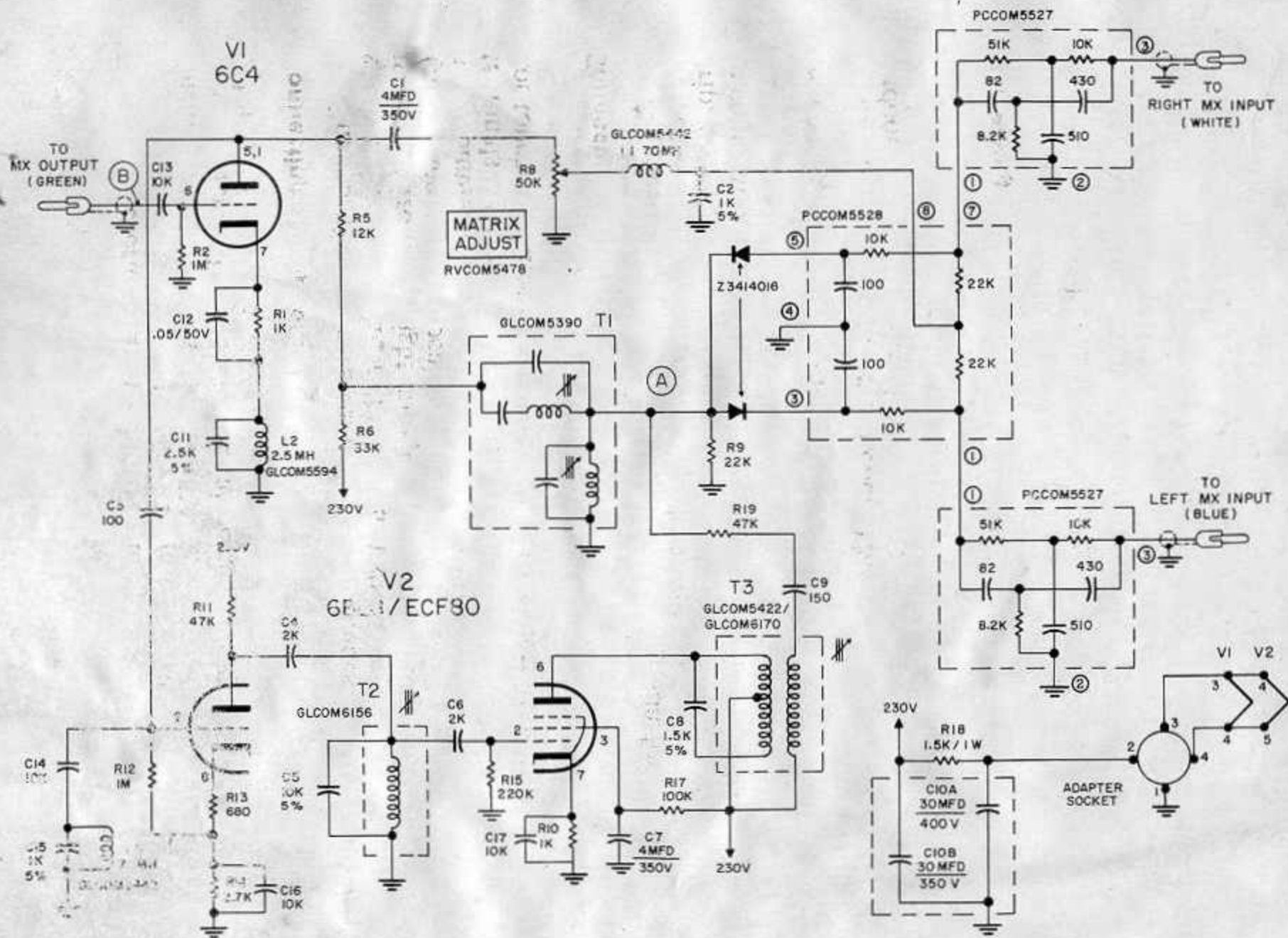
The MX601 is a completely automatic device and is activated when the FUNCTION SELECTOR switch on the front panel of the receiver is in the FM STEREO position. Tune to the desired stereo FM station in the same manner as for conventional FM.

When listening to a conventional FM broadcast, be sure the FUNCTION SELECTOR switch is set to FM rather than to FM STEREO.

### A WORD ABOUT YOUR FM ANTENNA

Since stereo FM requires greater signal strength than ordinary monophonic reception, it is strongly recommended to use an outdoor FM or TV antenna with your stereo receiver in order to obtain optimum results. An outside antenna will also help eliminate multipath interference which can result in whistles and noise in your stereo FM system.





RESISTANCE READINGS

TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	45K	—	—	—	*45K	1M	1K	—	—
V2	*47K	220K	*100K	—	—	*6Ω	1K	3.3K	1M

\* RESISTANCE READINGS MARKED WITH ASTERISK ARE MEASURED FROM THE JUNCTION OF R18 & C10B.

NOTES:

- UNLESS OTHERWISE SPECIFIED—
- 1 — ALL RESISTANCE VALUES IN OHMS ± 10%.
  - 2 — ALL RESISTORS 1/2 WATT.
  - 3 — ALL CAPACITORS WITH DECIMAL VALUES IN MFD.
  - 4 — ALL CAPACITORS WITHOUT DECIMAL VALUES IN MMF.
  - 5 — ALL VOLTAGES ARE DC & MAY VARY ± 20%.

S597  
S4576416B

FM STEREO ADAPTER

MULTIPLEX ALIGNMENT PROCEDURE

DO NOT ATTEMPT ALIGNMENT UNLESS FOLLOWING EQUIPMENT IS AVAILABLE

- 1 — MULTIPLEX STEREO GENERATOR
- 2 — FM SIGNAL GENERATOR
- 3 — OSCILLOSCOPE
- 4 — AC VTVM
- 5 — AUDIO GENERATOR

STEP	ALIGN	GENERATOR	FEED SIGNAL	OUTPUT INDICATOR	ADJUST	ADJUST FOR
1	T1	AUDIO GEN SET TO 67.5KC	(B)	VTVM AT (A)	BOTTOM OF T1	MINIMUM
2	T2	FM SIGNAL GEN MODULATED 30% BY STEREO GEN (CHANNEL A)	ANTENNA TERMINALS. TUNE TO SIGNAL	SAME	TOP OF T2	MAXIMUM
3	T3	38KC DOUBLER	SAME	SAME	TOP & BOTTOM OF T3	MAXIMUM
4	T2	19KC TRANS	SAME	SCOPE AT OUTPUT AT (CHANNEL B)	TOP OF T2 AND MATRIX ADJUST	MINIMUM