

harman kardon

OPERATING AND INSTALLATION MANUAL

Model MX500 FM Stereo Adapter

**PLUG-IN ADAPTER FOR HARMAN-KARDON TUNERS
MODELS F500, ST350, ST360 and ST360A**

IMPORTANT!

Please read this instruction manual carefully before installing your multiplex adapter. Taking a few minutes now, may save you considerable time and effort later on and will avoid the possibility of an improper installation. Be sure to keep this booklet available at all times. It contains indispensable technical and service information.

INTRODUCTION

FM Multiplexing depends upon the placing of two information channels on one station carrier. The first information channel consists of the sum of the left and right stereo signals and is transmitted on the main carrier in the usual manner. All existing monophonic FM receivers will treat this as a normal monophonic signal. The listener equipped with a standard FM set is not aware that stereo is being broadcast and his position is analogous to that of the black and white TV set owner who continues to receive a black and white compatible picture even when a colorcast is in progress. The decoding element from which stereo is derived consists of the difference of the left and right signals (L-R).

The main carrier is modulated by a supersonic subcarrier which in turn is modulated by the decoding element L-R. The function of the FM stereo adapter is to convert the two signals into left and right channels and produce the full stereophonic effect. The broadcast is solely FM with all of FM's advantages.

Listed below are several questions and answers which should further help explain FM stereo.

Question: Why Was The GE/Zenith System Chosen?

Answer: The GE/Zenith system permits adequate opportunity to provide excellent performance at relatively moderate cost. The frequency response and distortion characteristics are consistent with high fidelity standards. Stereo separation is good throughout the entire range. In short, it offers a minimum degradation of conventional FM monophonic response and a simple and effective method of achieving excellent FM stereo.

Question: What Equipment Is Needed To Receive FM Stereo Broadcasts?

Answer: An FM tuner equipped for multiplex reception, a dual channel amplifier and two speakers.

Question: Are There Any Special Antenna Requirements For Receiving FM Stereo?

Answer: In difficult reception areas, more sensitive and directional antennas, both indoor and outdoor, might be required. The reason for this is that the decoding element of the signal is weaker and more susceptible to noise than regular monophonic programs.

UNPACKING

After unpacking the Model MX500, inspect it carefully for signs of transit damage. The unit was subjected to many inspections and tests prior to final packing, and therefore should be in perfect condition. If damage is visible, notify your dealer at once. If the unit was shipped to you, notify the transportation company without delay.

Check the contents of the carton thoroughly and inspect the folds of the packing material before discarding it. Your package should contain the following items:

- 1 Model MX500 FM Stereo Adapter.
- 1 Instruction Booklet
- 1 Warranty Card
- 1 Package Installation Hardware

WARRANTY POLICY

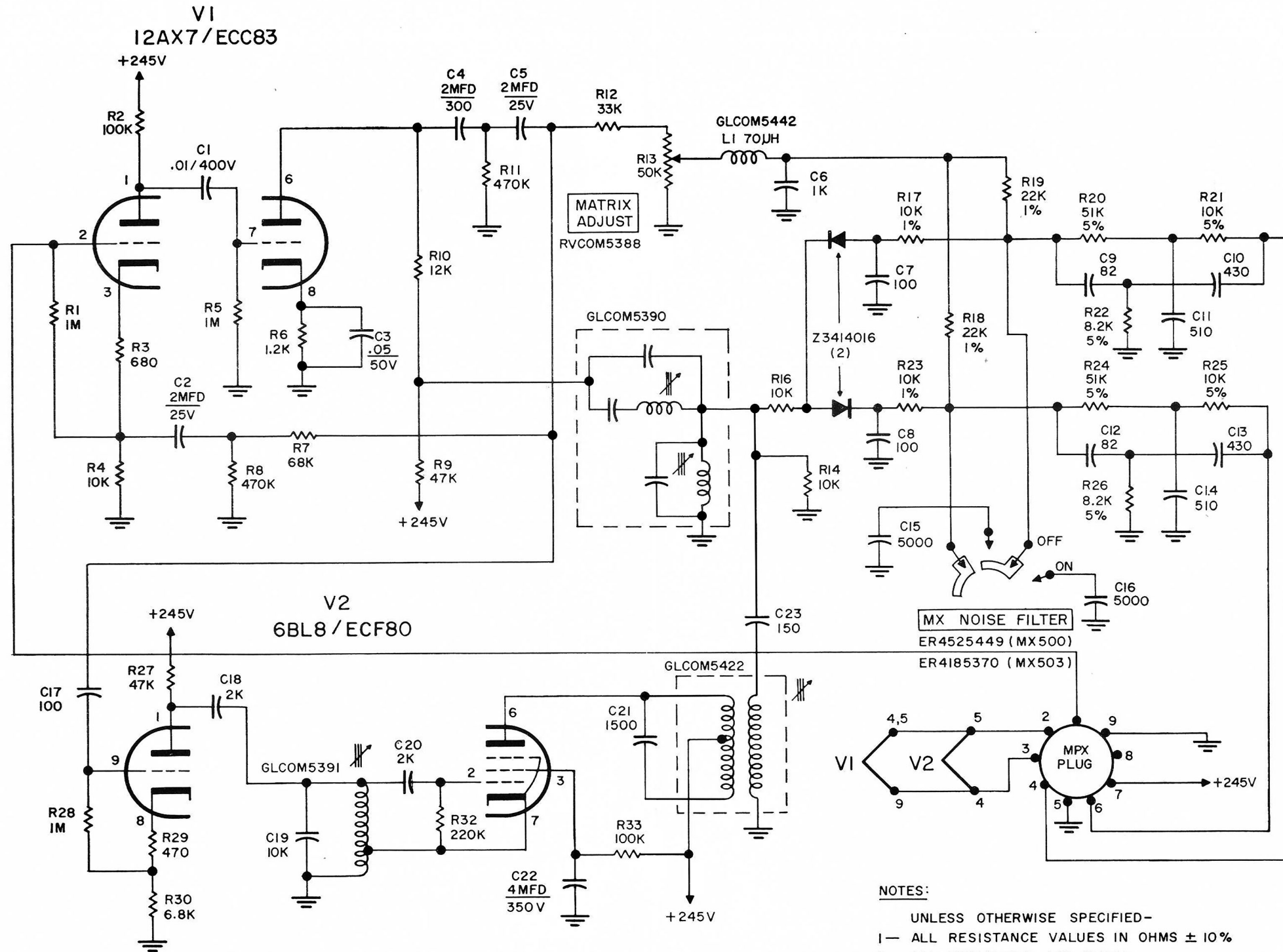
We urge you to fill in your warranty card and mail it to the factory without delay to protect your rights under warranty. The warranty cards are carefully filed for reference and should you require information on the use of this high fidelity unit, or repair service, we will be able to identify your set and reply quickly.

NOTE: It is necessary to receive factory authorization before returning a set for warranty repair to an authorized station. Repairs are to be returned on an Express Prepaid basis. A letter describing the exact difficulty must be enclosed with the unit together with your original sales slip.

WARRANTY

We warrant each Model MX500 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 connected 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.



RESISTANCE READINGS

ITEM	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	12AX7	*100K	1M	10.7K	—	—	*59K	1M	1.2K	—
V2	6BL8	*47K	270K	*100K	—	—	*0	0	7.3K	1M

* RESISTANCE READINGS MARKED WITH ASTERISK ARE MEASURED TO PIN 7 OF MX PLUG.

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%.

FM STEREO ADAPTER

S438
S452
SCOM5457A

INSTALLATION PROCEDURE

Installing The MX500 FM Stereo Adapter Into The F500 Tuner:

1. Remove the F500 Tuner from its enclosure.
2. Remove the tuning knob.
3. Unfasten the front panel by unscrewing the two Phillips head screws.
4. Remove the decorative plug located on the extreme right side of the front panel which covers the hole for the adapter shaft and place the rubber grommet supplied with the MX500 adapter into this hole.
5. Remove the metal cover plate located on the top of the F500 chassis and carefully insert the MX500 adapter into the space provided for it. Keep the control shaft facing forward. The metal cover plate may be discarded.
6. Screw the adapter into place with the four screws provided for this purpose in the adapter package.
7. Insert the plug leading from the FM stereo adapter into the nine-pin socket provided for it on top of the F500 chassis near the power transformer. Disregard the black seven-plug adapter supplied with the MX500 FM stereo adapter for it will not be used in this installation.
8. Replace the front panel.
9. Replace the tuning knob.
10. Insert the long shaft knob supplied with the MX500 adapter through the rubber grommet and fasten it to the FM stereo adapter control shaft. Be sure this knob is installed carefully and is lined up correctly. Disregard the clear plastic control knob supplied with the adapter for it will not be used in this installation.

Connect an additional shielded lead between either the left or right FM Output of your F500 and the Tuner or Aux input of your stereo amplifier. This will enable you to listen to both channels through your stereo system.

Installing The MX500 FM Stereo Adapter Into The ST350, ST360 or ST360A Tuners:

1. Remove the tuner from its enclosure.
2. Remove the two tuning knobs by pulling them out.
3. Unfasten the front panel by removing the two Phillips head screws.
4. Remove the black front end cover which houses the push-button and tuning mechanism by inserting a screwdriver directly under the head of the snap buttons located at either side of the cover and prying off.
5. Remove the metal enclosure over the tuning condensers. The three screws you have just removed which fasten the metal enclosure to the chassis may be discarded.
6. Remove the multiplex metal cover plate located on the top front of the chassis and carefully insert the MX500 FM stereo adapter into place with the long shaft facing forward. Be sure the shaft emerging from the adapter fits properly into the hole provided for it. You may discard the metal cover plate and screws.
7. Screw the adapter into place with the four short screws provided in the adapter hardware package. **Note:** The mounting screw near the adapter cable should not be inserted at this time as this also fastens the cable clamp supplied in the adapter hardware package.

8. It is important to install the cable clamp correctly in order to prevent the adapter wires from being crimped between the metal tuning condenser cover and the adapter chassis. Please perform the following step carefully!
Holding the cable clamp in your left hand between the thumb and forefinger with the bumped rounded surface facing upward and the clamp legs horizontally facing to your right, attach the clamp around the cables making sure that all of the adapter wires are contained within the rounded section of the clamp. Slide the clamp on the cable so that it aligns directly over the unused screw hole which mounts the adapter and cable clamp to the tuner chassis. Insert screw through clamp hole and fasten into place.
9. Replace the metal tuning condenser enclosure over the tuning condensers using the three spacers and special long screws supplied in the adapter hardware package. The spacers fit between the mounting flanges of the condenser enclosure and tuner chassis and are used to raise the condenser enclosure above the tuner chassis to prevent the enclosure from crimping the adapter cables.
10. Insert the special seven-pin adapter plug supplied with the MX500 hardware package into the power take-off socket located on the tuner chassis in front of the tuning condensers. Place the plug from the MX500 FM stereo adapter into the top of this adapter plug.
11. Replace the black front end cover removed in step 4. Be sure the snap buttons are firmly in place.
12. The clear plastic knob which is supplied with your adapter kit is now fitted to the FM stereo adapter control shaft with the shank-arm pointing down. If your tuner is cabinet installed, the clear plastic knob is fitted after the tuner has been reinstalled into the equipment cabinet.
13. Replace the front panel.
14. Replace the tuning knobs.

Note: Disregard the rubber grommet and gold faced long-shaft tuning knob supplied with the MX500 adapter. They are not required for this installation.

Connect an additional shielded lead between the remaining audio output of your tuner and the Tuner or Aux. input of your stereo amplifier. This will enable you to listen to both channels through your stereo system.

OPERATING INSTRUCTIONS

Operating The F500 Tuner With The MX500 FM Stereo Adapter Installed:

All of the operating controls of your F500 tuner can be used for FM stereo reception. To operate your F500 for stereophonic FM set the MODE SELECTOR switch located on the front panel to the "MX" or "FM Stereo" position depending upon the wording at the switch. The purple indicator lamp located beneath the dial glass will now indicate that your tuner is ready to receive an FM stereo broadcast.

Carefully tune to the station broadcasting FM stereo using the tuning meter to locate the exact center of the station channel.

If a hissing noise is present in your FM stereo system, be sure that the LOCAL/DISTANCE switch on the F500 tuner is in the "DISTANT" position. This insures maximum sensitivity.

If noise is still present it may be necessary to use the NOISE FILTER which is part of the FM stereo adapter design. This switch is operated by the long shaft which emerges from the adapter and is located at the extreme right of the F500 front panel. Merely set the switch to the right to activate the noise filter. Setting the switch to the left removes the filter from the circuit. This switch is operative only when the tuner is in the FM stereo function.

If noise is still a problem it may be necessary to use an external FM antenna.

Operating The ST350, ST360 or ST360A With The MX500 Installed:

The MX500 adapter is operative when the STEREO MULTIPLEX push-button on the front panel is depressed. Fine tuning of the FM stereo station can first be done with the function push-button set to "FM", and then switched to STEREO MULTIPLEX once the station has been tuned in.

If a hissing noise is present in your FM stereo system, the NOISE FILTER which is part of the adapter may be used to remove it. Throw the long shank plastic knob to the right to activate the filter. Throwing the switch to the left defeats the NOISE FILTER. This switch is operative only when the tuner is set to the FM stereo function.

Your FM Antenna:

In difficult reception areas the use of the proper FM antenna is essential for noise-free FM stereo reception. If you are presently using a piece of wire or 300 ohm dipole tacked to the rear of your cabinet, it is strongly advised to substitute a high quality outside folded dipole or Yogi antenna. A good antenna will make a big difference in the way your system will sound.

REPLACEMENT PARTS LIST

Part No.	Description	List Price
ER4525449	NOISE FILTER SWITCH	1.00
RVCOM5388	50K POT SCREW DRIVER - KNURL ADJUST LIN TAPER	1.00
Z3414016	CRYSTAL DIODE IN542	1.80
GLCOM5390	5 ELEMENT M DERIVED L-R FILTER	2.85
GLCOM5422	38KC DOUBLER	2.00
GLCOM5391	19KC OSC COIL	2.00
GLCOM5442	L/R FILTER	1.00
JE3283790	2 MFD/25V DC	.55
JECOM5395	2 MFD/300V DC	.75
JE4385449	4 UF/350V DC	.80
P4525460	KNOB, ANODIZED GOLD	2.30
P4525459	KNOB	.30

NOTE: To speed handling of your order be sure to include both the model and serial numbers which appear at the back of the chassis, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a C.O.D. basis except for orders \$1.00 or less, for which remittance should be enclosed. Prices subject to change without notice. Harman-Kardon reserves the right to substitute equivalent parts for those originally installed on this chassis.