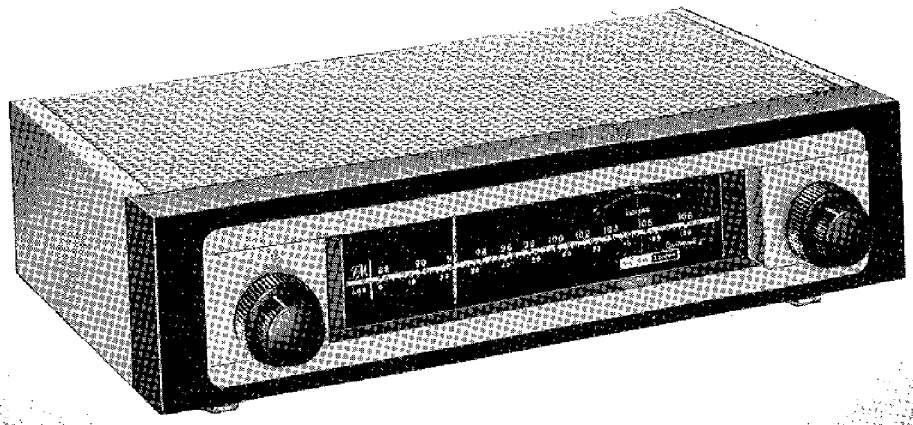
harman kardon



Counterpoint II

MODEL FM 100

DELUXE FM TUNER

OPERATION AND SERVICE INSTRUCTIONS

IMPORTANT

It is essential you read this instruction book carefully before setting up your Harman-Kardon system. You have invested in a fine instrument into which many excellent engineering developments have been incorporated. Each is important for the proper operation of your system. This book has been written in simple non-technical language and if you will take the time to read it first before doing anything else you will find it simple to obtain optimum performance from your Counterpoint II.

We especially call your attention to the paragraphs describing the operation of the Variable Automatic Frequency Control and Variable Automatic Noise Gate Control.

UNPACKING

After unpacking the Counterpoint II, inspect it carefully for any signs of damage in transit. Your unit was subjected to many inspections and tests, and then carefully packed. If damage is visible notify the transportation company at once.

Check the contents of the package carefully. Be sure to inspect the folds of the packing material before discarding it. Your package should contain:

1 Counterpoint II, Model FM-100 tuner.
1 Instruction Booklet
1 Antenna Wire (FM)
1 Warranty Card
1 Package Hardware
1 Template and Cabinet Installation Instructions.

It is strongly urged that the warranty card be completed and mailed without delay to protect your rights under the warranty. If you should require repair service or information on the use of the Counterpoint II, we will be able to identify your unit immediately, and respond quickly. NOTE: To expedite service, when necessary, please contact Harman-Kardon first. We will suggest a warranty station in your area and give you the procedure and authorization for shipping.

INSTALLATION

Your Counterpoint II FM tuner may be installed on an open shelf, table, bookcase or high fidelity equipment cabinet. For cabinet mounting, refer to the template supplied with this instruction book.

VENTILATION

All electrical equipment generates heat which must be allowed to escape. Although the Counterpoint II is well-ventilated in itself, sufficient space should be allowed around it to permit free air flow. If it is placed in a bookcase, it should be located well toward the front, to provide as much clearance as possible at the rear. DO NOT place books or other objects on top of the Counterpoint II. Covering the perforated metal cage will prevent proper air flow and will result in sharply reduced component and tube life.

POWER REQUIREMENTS

Plug the AC power cord into any outlet furnishing 117 volts, 50 or 60 cycles house current. The exact voltage is relatively unimportant and may vary between 105 to 125 volts. Be sure, however, that you have a 50 or 60 cycle AC power source.

ELECTRICAL CONNECTIONS

FM Antenna:

Due to the extremely high FM sensitivity of the Counterpoint II, the 48" piece of wire furnished with the set will be sufficient antenna for all but the most difficult locations. One end of this wire should be fastened to the "A" terminal of the Antenna Terminal Strip, the other end left free and extended as may be convenient. It may be tacked or stapled to the rear of the bookcase or equipment cabinet if necessary.

If, for some reason, it is necessary to utilize other FM antenna types, we have listed for your convenience the following suggestions:

1. Special outdoor FM antennas may be used. These come in various types. For extremely difficult locations an in-line Yagi cut for the FM band or equivalent may be necessary. For reception of FM stations scattered in many directions, a nondirectional antenna may be used. This nondirectional type is known as a double dipole and consists of two folded dipoles placed at right angles to each other.

2. Your present TV antenna may be used to obtain a maximum FM signal. A special antenna coupler or knife switch should be used when joining the FM line to the television antenna.

If using a 300-ohm TV wire it should be connected to the "G" and "A" terminal on the Antenna Terminal Strip.

Output

Two receptacles will be found at the rear of the chassis marked "Output" and "Multiplex." For your convenience in connecting the tuner to the amplifier you will find a 36" shielded cable packed with the Counterpoint II. Plug one end of this cable into the "Output" receptacle and the other end into the appropriate input receptacle of the amplifier.

Since the output circuit of the tuner uses a cathode follower this cable may be extended to any reasonable length without deterioration of tone quality.

The "Multiplex" jack is taken directly from the detector output and is to be connected to multiplex equipment only. The Multiplex output jack bypasses the deemphasis network and will give a 13.8 db rise at 10,000 cycles.

OPERATION

The Harman-Kardon Counterpoint II has only three operating controls. The Tuning Knob to the right selects the desired FM station. The Concentric Control at the left is two controls in one. The inner knob turns the power on and off and adjusts the Automatic Noise Gate action. The outer knob controls the Automatic Frequency Control (AFC) action. Maximum AFC and ANG action is obtained in the extreme clockwise position.

TECHNICAL EXPLANATION OF THE CONTROLS

Automatic Noise Gate Control:

Automatic Noise Gate action (ANG) permits tuning between stations without the customary FM interstation hiss and adds considerably to the enjoyment of FM reception.

The ANG control may be set for minimum interstation noise as required in your location. Advancing the control clockwise gradually increases this action and at the extreme clockwise position the ANG has maximum effect. The continuously variable feature of this control enables you to select the degree of ANG action without cancelling out wanted stations.

Proper adjustment of the ANG control is made by first turning the control completely counterclockwise and then advancing clockwise to the point where interstation background noise cuts out. At this point even the weakest station will operate the noise gate. Turning the control further clockwise will require an increasingly stronger signal to operate the noise gate.

Tuning Meter:

The precise Harman-Kardon tuning meter operates whether AFC is in the circuit or not. When the Counterpoint II is tuned completely off any station, the tuning meter will point to zero. As you tune through a station, the needle will swing to one side, then to zero, then to the other side, and as you tune away from the station, back to zero. The tuning is proper only when the needle points to approximately zero. For precise meter adjustment see Behind The Chassis Controls section for adjustment procedure.

Automatic Frequency Control (AFC):

FM Broadcasting, by its very nature, eliminates almost all natural and man-made static. However, the characteristics of FM which make this possible also make for problems in tuning. The Harman-Kardon Counterpoint II incorporates an effective Automatic Frequency Control (AFC) circuit that overcomes these problems and insures proper tuning even if the manual tuning is not accurately done. The following experiment will lead to an understanding of AFC, and the fuller enjoyment of the Counterpoint II. First, rotate the "AFC" control to the extreme clockwise position. Now tune across the scale. Note how the stations "pop" into place, one after the other. Now tune to any station, preferably one with a musical program. Turn the "AFC" control counterclockwise as far as possible. This defeats the AFC. Tune slowly through the station from left

to right. Notice that there are three points where the station sounds clean, interspersed with points of distorted sound. The middle clean-sounding point is the proper tuning position for the best tone quality with minimum noise and interference. At this point the tuning meter will indicate proper tuning. Tune slightly away from the proper tuning position, until the sound is distorted. Note that the tuning meter will indicate improper tuning. Now reactivate the AFC by turning the "AFC" knob to the right. You will notice that the sound clears up and the proper tuning indication is restored, as if the receiver had been manually retuned.

Actually, the tuning has been electrically readjusted by the operation of the AFC circuit, which automatically retunes the electronic circuits to the center of the station channel.

In order to take maximum advantage of the benefits of AFC, it is suggested that tuning be done with AFC off, to render a more precise indication of the tuning meter. When AFC is then turned on, the tuning will be improved by a ratio of 10 to 1.

This procedure is especially recommended in those areas where a weak station is found close to a strong station. Under this condition, the AFC may tend to reach for the strong station and completely skip over the weak one. If the weak station is tuned in without AFC, it will be locked in when the AFC is turned on.

Another procedure might be to find that setting of the AFC control which provides the exact amount of AFC action for most convenient tuning in your location.

To do this, tune to a portion of the dial where a strong station is found immediately adjacent to a weak station. (If this situation cannot be found in your location, leave the AFC control at maximum.) Now tune slowly through both stations, from the direction of the strong station. If the AFC control is set too high, the stronger station may be held until the tuning is past the weak station. Adjust the AFC so that when the stronger station pops out, the weaker station appears.

The professional feature of variable AFC enables the user to select the amount of AFC desired at any time according to location and personal preference.

BEHIND THE CHASSIS CONTROLS

Output Level Control:

The output level of the Counterpoint II may be adjusted to suit the input requirements of the amplifier or to balance the volume of another program source (such as a record player). The Output Level Control located to the right of the AC connection should be set at maximum if it is not desired to balance volume levels.

FM Rumble Filter:

Many broadcast stations transmit a certain amount of low frequency rumble that may be produced by the records or turntables used at the station. This low frequency signal is often disturbing in a high quality system and the Counterpoint II incorporates a rumble filter which eliminates this unwanted signal by reducing response below 50 cycles. This filter is controlled by a slide switch on the rear of the chassis.

Meter Adjustment Control:

A meter balancing control is incorporated in the Counterpoint II so that the meter may be precisely set. This control is located on the back panel slightly to the left and above the Output Jack. To adjust, tune between stations and turn the control until the needle points to the center of the scale (Zero Mark).

MAINTENANCE AND REPAIR

In some installations, hum may be encountered due to a voltage difference between the amplifier, tuner and record changer chassis. This may be eliminated by reversing one or all of the AC power plugs. Simply reverse one at a time until improvement is experienced.

Due to the conservative design and high quality components of the Counterpoint II, no routine maintenance other than yearly tube-testing is required. Should trouble develop, however, only the most qualified serviceman should be employed, as special equipment and training is required to properly service high fidelity equipment.

This instruction booklet contains diagrams and other information needed by your repairman. It should be kept available for his use.

CHANGING PILOT LIGHTS AND TUBES:

In order to change tubes or pilot lights in this unit remove the 7 screws holding the cage and slide cage off. Tubes are then exposed and can be removed. Make certain that excessive pressure is not applied to the printed circuit board or components.

To change the right hand pilot light turn the tuning condenser until it is completely closed. The pointer will then be at the extreme left of the dial. The screw holding the light assembly at the right side can now be loosened and the assembly pushed straight back thus making the pilot lamp accessible.

To remove the left pilot light remove the screw holding the assembly and push the assembly straight back while turning to the right. To reinsert the pilot light assemblies merely reverse the above procedure.

STACKING THE COUNTERPOINT II

Rubber pads are included in the event that it is desired to stack the tuner on top of the Harman-Kardon Rondo amplifier with a minimum of space between. Their correct use is as follows:

1. Remove cage.
2. Remove bottom plate.
3. Remove both runners from the bottom plate.
4. Now replace bottom plate and cage.
5. Remove safety paper from each pad and press firmly into place on bottom plate in 4 corners, approximately evenly spaced.

WARRANTY

We warrant each Counterpoint II, Model FM-100 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, except tubes which are under 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 judgement 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 the instruction furnished by us.

This warranty is expressly in lieu of all other warranties, express or implied, and of all other obligations or liabilities 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 the Model FM-100, Counterpoint II.

SERVICE NOTES

Servicing printed circuits is a simple matter and is no more complicated than servicing conventionally wired circuits.

Printed circuit receivers, can be more easily repaired, if certain precautions are observed. Standard components are used throughout and can be removed and replaced by any serviceman. No special tools or skills are necessary. However, some parts which have special mounting and connection lugs should be replaced with exact duplicate parts.

Avoid Damage to Copper Foil

Be careful when removing components from the board. However, if the copper foil wiring is damaged a piece of wire can be used to replace the damaged foil. Small breaks can be "jumped" with molten solder. Larger breaks can be repaired with ordinary hook up wire. It is unnecessary to replace the entire board because of foil breakage.

Avoid Damage to Printed Circuit Board

Do not apply excessive pressure to the printed circuit board or components. This is especially important to note when changing tubes. Although the board is sturdy in construction and mounting, it may crack or break if proper care is not taken when servicing. In case the board is to be removed from the chassis, remove the mounting screws around the edges and unsolder the few leads that connect between the board and the chassis. If this is done, a vise with protected jaws should be used to hold the board while servicing and care should be taken not to exert excessive pressure against the board.

Avoid Excessive Deposits of Solder

In some areas on the printed circuit board, the wiring is very closely spaced. When resoldering a new component avoid excessive deposits of solder. Excessive solder may cause a short or an intermittent trouble to occur later which may be difficult to locate.

Avoid Overheating

When using the soldering iron (35 watts or less), do not overheat the component terminals or the copper foil. Excessive heat (applying soldering iron longer than necessary, using a higher wattage soldering iron than recommended, or using a solder gun) may cause the bond between the board and foil to break. This will necessitate replacement or repair of the foil connection.

Tools and Materials Required

(1) Low wattage soldering iron with a small point or wedge (rating should not exceed 35 watts).
(2) Small wire brush.
(3) 60% tin, 40% lead, low temperature rosin core solder.
(4) Thin bladed knife.
(5) Small wire pick, or soldering aid.

REPLACING COMPONENTS

Soldering Replacement Component to Old Leads

Cut the leads where they enter the defective component. Clean off the ends of the leads, leaving as much of the leads as possible. Make a small loop in each lead of the replacement component and slide the loops over the remaining leads of the old component. Caution should be taken not to overheat the connection since the copper foil may peel or the original component lead may fall out of the board. This is possible due to heat transfer through the leads. The lead length of the replacement part should be kept reasonably short to provide some mechanical rigidity.

Unsoldering and Resoldering Components

To test a component or if the component is mounted in such a manner that the above method can not be used (such as vertically mounted capacitors, etc.) the component can be replaced by unsoldering it. This procedure should be used whenever it is necessary to unsolder any connections to replace defective components.

(a) Heat the connection on the wiring side of the board with a small soldering iron. When the solder melts, brush away the solder. Do not overheat the connection. In the process of removing the solder, caution must be taken to prevent excessive heating. Therefore, do not leave the iron on the connection while brushing away the solder. Melt the solder, remove the iron and quickly brush away the solder. It may require more than one heating and brushing process to completely remove the solder.

(b) Insert a knife blade between the wiring foil and the "bent-over" component lead and bend the lead perpendicular to the board. (It may be necessary to apply the soldering iron to the connection while performing this step as it is sometimes difficult to completely break the connection by brushing.) Do not overheat the connection.

(c) While applying the soldering iron to the connections, "wiggle" the component until it is removed.

(d) Remove any small particles of solder using a clean cloth dipped in solvent.

(e) A thin film of solder may remain over the hole through the board after removing the component. Pierce the film with the lead from the new component after heating the solder film with the soldering iron.

(f) Insert the leads of the new component through the holes provided. Cut to desired length and bend over the ends against the copper foil. Resolder the connection with 60/40 low temperature solder.