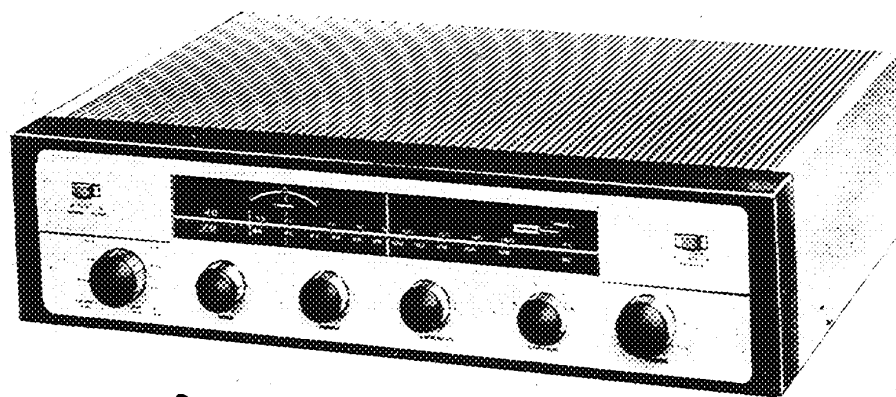


harman kardon



## Festival II

Model TA-1040

CUSTOM HIGH FIDELITY TUNER AMPLIFIER

### OPERATION AND SERVICE INSTRUCTION

#### 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 nontechnical 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 Festival II.

We especially call your attention to UNDER THE CHASSIS CONTROLS, page 7, with special emphasis to the following paragraphs.

- AFC Adjustment Control.
- ANG Adjustment Control.
- Meter Adjustment Controls. (AM & FM)

These controls must be properly adjusted prior to permanent installation of the instrument!

#### UNPACKING

After unpacking the Festival II, inspect it carefully for signs of damage in transit. Your unit was subjected to many inspections and tests prior to packing. If damage is visible, notify your dealer immediately. If

the unit was shipped to you, notify the transportation company at once.

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

- 1 Festival II, model TA-1040.
- 1 Instruction Booklet.
- 1 Antenna Wire. (FM)
- 1 Warranty Card.
- 1 Template and Cabinet Installation Instructions.
- 1 Package Mounting Hardware.

It is strongly urged that the warranty card be completed and mailed without delay, to protect your rights under warranty. If you should require repair service or information on the use of your high fidelity instrument, 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 proper procedure and authorization for shipping.

#### INSTALLATION

Your Festival II receiver 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 Festival 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 Festival 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 and 125 volts. Be sure, however, that you have a 50 or 60 cycle AC power source. The Festival II has several convenience outlets on the rear of the chassis. The proper use of these outlets is described in the section under Electrical Connections.

### **ELECTRICAL CONNECTIONS**

#### **AM Antenna:**

The Harman-Kardon ferrite loopstick built into the Festival II comprises all the antenna required for the finest in noise-free local AM reception.

In locations more removed from metropolitan areas, an outdoor antenna may be required. This should consist of a single wire, as long as is reasonably practical. It should be kept away from large metal objects, power lines or electrical machinery.

Connect one end of the outdoor antenna to the terminal marked "AM" on the antenna terminal strip located at the rear of the chassis.

#### **FM Antenna:**

Due to the extremely high FM sensitivity of the Festival 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 "FM" 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, the non-directional antenna may be used. This non-directional 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.

#### **Phonograph Connections:**

Any type of record player will operate with the Festival II. To derive maximum enjoyment it is suggested that a high quality pickup and a rumble-free turntable be used. Two classes of phonograph pickups are

in use today: Magnetic (GE, Audak, ESL, Fairchild, Pickering and Recoton) and Crystal (including the newly developed ceramics).

All magnetic cartridges should be connected to the jack on the rear of the chassis marked "PHONO." Connect crystal or ceramic cartridges to the jack marked "AUX" also located on the rear of the chassis.

A word of advice: The purchase of a diamond needle is a worthwhile investment. It has extremely long life and will not only protect your records, but will insure maximum tone quality.

It is sometimes advisable to ground the phonograph chassis to the receiver in order to reduce hum and other unwanted noise. Attach a wire to the metal framework of the changer and connect the other end to the "G" terminal of the antenna or speaker terminal strips.

The power cord of the record changer or turntable may be plugged into either AC convenience outlet located on the rear of the Festival II.

#### **Auxiliary Inputs:**

The Festival II incorporates two "AUX" inputs located at the rear of the unit. Plug all high level equipment, such as a tape recorder or television tuner, into either jack. If you are using a ceramic or crystal phono cartridge make certain to connect your phonograph to the "AUX" jack. This position is controlled by the function Selector Switch on the front panel.

#### **Tape Input:**

This jack is located on the rear of the chassis. The Festival II is packed with a shorting plug inserted into this jack which acts as a "muting" switch to reduce hum and switching noise when the selector switch is thrown. This shorting plug should be removed to connect a tape recorder.

Program material from a tape recorder or tape deck may be connected into the Festival II in two different ways. If the tape mechanism has a pre-amplifier or amplifier stage, it should be connected to the "AUX" jack. If the tape mechanism has no preamplifier, or if its amplifier is not of top quality, the tape head may be connected to the "TAPE INPUT" jack. Setting the Function Selector Knob at the position marked with the appropriate speed (3.75 or 7.5) will then provide the equalization recommended by the manufacturers of pre-recorded tape.

#### **Tape Output:**

A receptacle marked "TAPE OUT" is located on the rear of the Festival II chassis. This will provide either AM, FM or phonograph program material to a tape recorder or other auxiliary equipment. In other words, any program material appearing at the speaker terminals also appears at the "TAPE OUT" jack, but unmodified by the volume or tone controls. This makes it possible to record a program with the proper recording equalization as determined by your tape recorder, while simultaneously monitoring the program with the proper tone control, contour and loudness (volume) setting.

#### **Convenience Outlets:**

The Festival II incorporates two AC convenience outlets located at the rear of the unit. Auxiliary high fidelity equipment (tape recorder, television tuner or

phonograph) may be connected to these outlets and will then be controlled by the on/off switch on the Festival II. Never load these AC convenience outlets with more than a total of 2 amps.

### **Speaker Connections:**

A unique method of connecting one or two loudspeakers is incorporated in the Festival II in order that you may derive maximum enjoyment from this superlative instrument with any of today's fine speaker systems.

#### **Connecting one loudspeaker:**

Connect one of the two speaker leads to terminal "G" and the other lead to "A" on the three screw terminal strip at the rear of the chassis marked "SPEAKER." For speakers with an impedance of 12 to 24 ohms place the Impedance Selector Jumper located at the rear of the chassis so that the center terminal is connected to the terminal marked 16. For speakers with an impedance of 4 to 12 ohms place the Impedance Selector Jumper so that the center terminal is connected to the terminal marked 8. The front panel Speaker Selector Switch should then be placed in the "A" position.

#### **CAUTION:**

A jumper is connected between "A" and "B" terminals on the Speaker Terminal Strip on the rear of this instrument. When only one loudspeaker is used, this jumper must be connected at all times. It should be removed only when two separate speakers are connected. This precaution will prevent the set from appearing to be inoperative when only one speaker is connected, and the Speaker Selector Switch is improperly set.

#### **Connecting two loudspeakers:**

If you wish to operate two loudspeakers with the Festival II and use either one or both together, connect the second speaker to terminals "G" and "B" on the Speaker Terminal Strip. For best operation, both speakers should have the same impedance, although a slight mismatch will not disturb the overall response.

To select speaker A, slide the front panel Speaker Selector Switch to position "A." To select speaker B slide the switch to position "B." To activate both speakers simultaneously slide the front panel Speaker Selector Switch to the position marked "AB."

### **OPERATION**

In general, every control on a well designed, honestly considered high fidelity instrument has a specific useful function, related to each of the other controls. Although this cannot be a treatise on the subject, an explanatory note on the relationship of the various front panel controls will doubtless prove useful in organizing and clarifying them for the user.

Your Festival II incorporates the following operating controls located on the front panel. Viewing the instrument from left to right you will find a Function Selector Switch, Bass Control, Treble Control, Loudness Control (on/off switch is incorporated into this control), Contour Control and the AM-FM Tuning Control. In the upper left hand corner there is a Rumble Filter Switch and in the upper right hand corner a Speaker Selector Switch.

To operate, turn the Function Selector Switch to the AM position, or any program source. Set the Bass

and Treble Controls so that the white lines on the knobs point straight up. This will assure a "flat" uncompensated response. Turn the set on by rotating the Loudness Control in a clockwise position; now set this Loudness Control at 1/3 volume. The Contour Control should remain on zero at this time. Tune for an AM station.

Once the desired program is located and tuned in, adjust the volume level so that the music is played at a comfortable level. Now adjust the Bass and Treble tone controls to correct for the electro-mechanical characteristics of the loudspeaker you are using and the acoustic characteristics of the room in which you are listening. Modify each control until settings are chosen which in your total system create the proper sense of aural balance and evenness.

Now reduce the Loudness (Volume) control setting to a level somewhat lower than normal listening level in your room. You will note that the full bodied-lifelike quality you experienced at high listening level has disappeared (this because of the Fletcher-Munson effect described in the paragraph on the H/K Dynamic Loudness Contour). With all other controls unchanged, select the best contour setting for you. Do this by switching quickly through the several positions until you find the one which most nearly duplicates the full bodied sound you enjoyed at high level. Now turn the Loudness control up to the level at which you wish to listen (perhaps the maximum level you can permit in your home) and listen. You'll find that there is automatic compensation of contour where ever you set the Loudness control thereafter. In fact, under normal circumstances you should not find it necessary to re-adjust the tone controls or the contour selector once having chosen the correct settings for you, your room and your system.

### **TECHNICAL EXPLANATION OF THE CONTROLS**

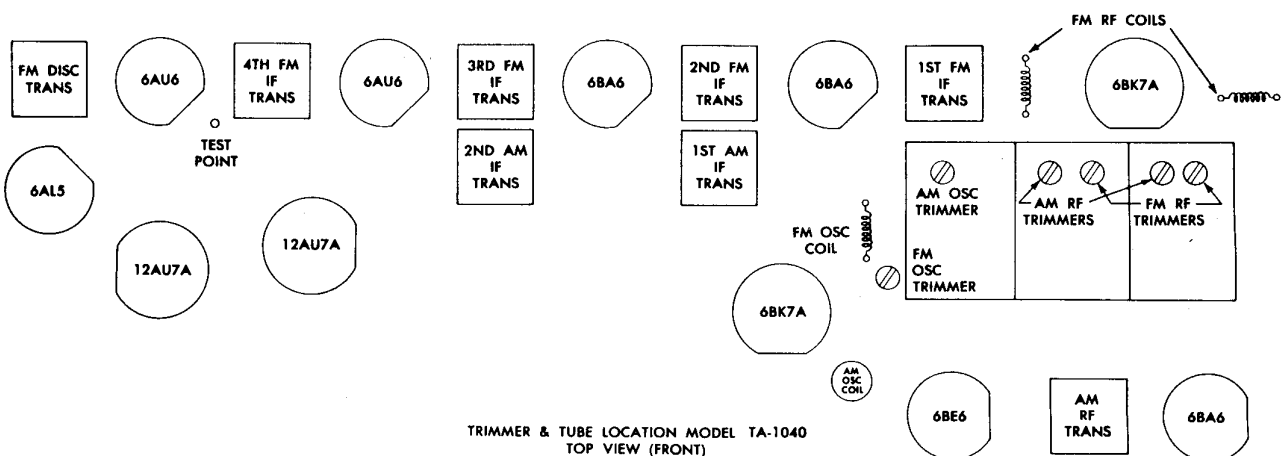
The Function Selector Switch has ten positions: EUR, RIAA, LP, TAPE 7.5, TAPE 3.75, AM, FM-AFC-ANG, FM-AFC, FM and AUX. Its use is to select the desired type of program. Listed below is the explanation of the various functions.

#### **Automatic Frequency Control: (AFC)**

FM broadcasting, by its very nature, eliminates almost all natural and man-made static. However, the characteristics of FM which makes this possible also causes problems in tuning. The Festival II incorporates a special electronic circuit known as Automatic Frequency Control that overcomes these problems and insures proper tuning even if the manual tuning is not accurately done. Therefore AFC always keeps the station in the center of the channel and eliminates distortion caused by inaccurate tuning.

The degree of AFC desired may be adjusted by the AFC Control located on the bottom plate. See Under The Chassis Controls section for complete operating instructions.

In order to take maximum advantage of the benefits of AFC, it is suggested that fine tuning be done with the Function Switch in the FM position. When the switch is then turned to the AFC position the AFC will improve this careful tuning by a factor of 10 to 1.



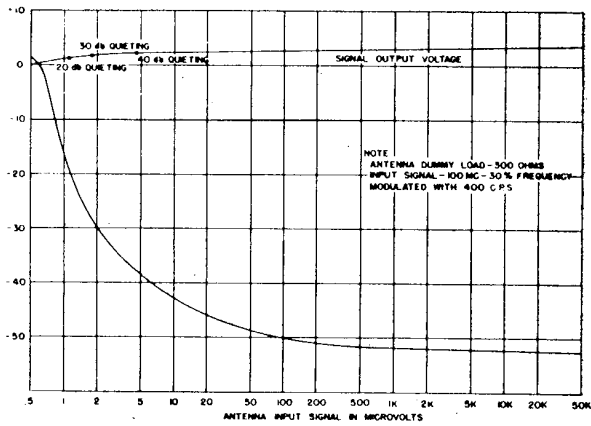
FUNCTION SWITCH SETTING	SIGNAL GENERATOR		SIGNAL INPUT POINT	OUTPUT INDICATOR	CONNECT INDICATOR TO:	DIAL SETTING	ADJUST	OUTPUT INDICATION
	FREQ.	MOD.						
AM	455 KC	30% AM	AM RF GANG	AC-VTVM OR SCOPE	TUNER OUTPUT	1600 KC	2 AM IF TRANS.	MAXIMUM OUTPUT
AM	1400 KC	30% AM	AM ANT. TERM.	AC-VTVM OR SCOPE	TUNER OUTPUT	1400 KC	OSC. ANT & RF TRIMMERS	MAXIMUM OUTPUT
AM	600 KC	30% AM	AM ANT. TERM.	AC-VTVM OR SCOPE	TUNER OUTPUT	600 KC	OSC COIL LOOPSTICK & RF TRANS.	MAXIMUM OUTPUT
AM	1400 KC				REPEAT STEP 2			

### AM ALIGNMENT PROCEDURE

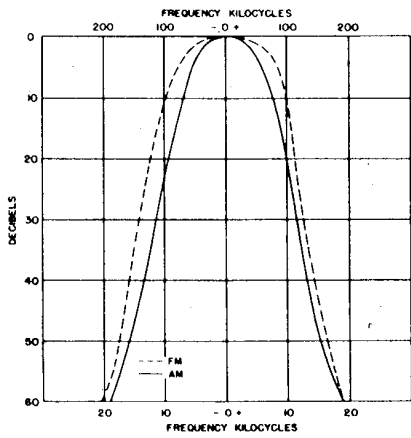
FUNCTION SWITCH SETTING	SIGNAL GENERATOR		SIGNAL INPUT POINT	OUTPUT INDICATOR	CONNECT INDICATOR TO:	DIAL SETTING	ADJUST	OUTPUT INDICATION
	FREQ.	MOD.						
FM	10.7 MC	300KC FM 60 CPS	FM MIXER GANG	AC-VTVM OR SCOPE	TEST POINT	—	4 FM 1F TRANS.	MAX GAIN & SYMMETRY
FM	10.7 MC	300KC FM 60 CPS	FM MIXER GANG	AC-VTVM OR SCOPE	TUNER OUTPUT	—	DISCR. TRANS.	S PATTERN OF MAX GAIN & SYMM.
FM	106 MC	300KC FM 60 CPS	FM ANT. TERMINAL	AC-VTVM OR SCOPE	TEST POINT	106 MC	106 MC OSC RF, MIXER TRIMMERS	MAXIMUM OUTPUT
FM	90 MC	300KC FM 60 CPS	FM ANT. TERMINAL	AC-VTVM OR SCOPE	TEST POINT	90 MC	OSC, RF, MIXER COILS	MAXIMUM OUTPUT

### FM ALIGNMENT PROCEDURE

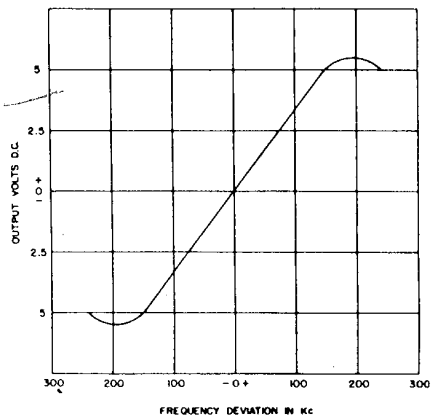
# TUNER CHARACTERISTICS



FM detector output voltage characteristics

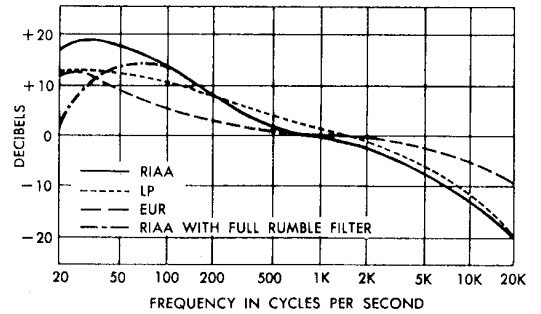


FM & AM selectivity characteristics

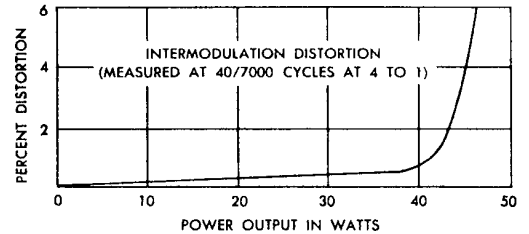


FM discriminator characteristics

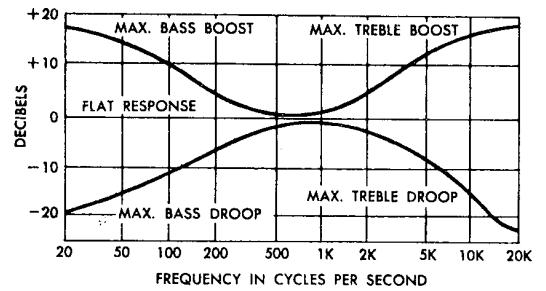
# AMPLIFIER CHARACTERISTICS



Phonograph equalization characteristics

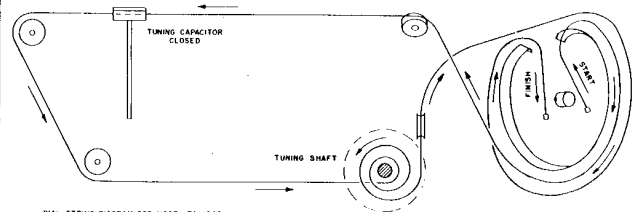


Intermodulation distortion characteristics



Tone control and frequency response characteristics

# DIAL CORD DRIVE



This procedure is especially recommended when a weak station is being tuned on a channel adjacent to a stronger one. This will prevent the AFC from reaching for the more powerful signal and skipping over the weaker one. If the weaker station is tuned in without the AFC, when the AFC is applied it will lock it in permanently.

#### **Automatic Noise Gate Control:**

The ANG Control is preset at the factory for zero Automatic Noise Gate Action before shipment, and must be set to suit the specific installation.

The degree of control is adjusted through a hole in the bottom plate. (See Under The Chassis Controls section for complete operating instructions.)

This feature, marked as "ANG" on the Function Selector Switch, permits tuning between FM stations without the customary FM interstation hiss and adds considerably to the enjoyment of FM reception. In order to utilize this Automatic Noise Gate feature, throw the Function Selector Switch to "FM-AFC-ANG" when tuning.

#### **Record Equalization:**

In order to assure good reproduction of the wide range of frequencies in music and to make necessary adjustments for the limitations of the recording technique, record manufacturers have found it necessary to modify the actual frequency response of the music while it is being recorded. Thus, to avoid overcutting and consequent distortion, a measured and deliberate reduction is effected in low frequency response by selecting a "turnover frequency" and by recording attenuated response below that point. To assure optimum signal-to-noise at the high frequency end when the record is played at home, the highs are deliberately exaggerated during the recording process. A measured and deliberate boost is effected above a certain frequency. This combination of deliberate exaggeration at the low and high ends of the frequency response can be expressed in a "recording curve." When the record is played a mirror image of that curve should be available so that the ideal "flat" response may be achieved. Since several different recording curves have been used in the past (differing with respect to the turnover points and the degree of emphasis or de-emphasis) a choice of playback curves is provided in Harman-Kardon instruments.

The three record equalization positions compensate for the characteristics of over 30 recording labels. LP: Most American long-playing records made before 1954 and some European LP's. Labels include: Columbia, London, Mercury, Oceanic, Remington, Tempo, Urania, Vanguard-Bach Guild, Vox, Westminster, RCA Victor (older), Atlantic, Decca, Polyphonic, Cetra-Soria, Esoteric, Haydn Society, MGM, Angel.

RIAA: Most American records made after 1954, all records cut to standards of Audio Engineering Society, NAB, new RCA Victor Ortho, and newly standardized RIAA. Labels include RCA Victor (newer), Extended Play 45, Blue Note Jazz, Canyon, Capitol, Good Time Jazz, Mercury, some London, Bartok, Caedmon, Capitol-Cetra, Philharmonic, EMS.

EUR: Most European Long-playing, some American LP's and most 78 RPM discs.

The above listed equalization positions are the recommended settings for almost all recordings made, however, it should be noted that it is not compulsory to adhere strictly to the recommendation. For example: Capital records are recommended to be played on the "RIAA" equalization curve, but if for some reason (room acoustics, speaker location, type of program source) the sound is not quite satisfactory, it is permissible to change the equalization control setting to "EUR" or "LP." If the overall sound quality pleases you more, leave it that way. Your hearing should be the final judge as to the exact equalization control setting.

#### **Loudness Control:**

This control is used to adjust the volume level of any program material. Its effect is selectively varied by the Contour Control.

#### **Dynamic Contour Control:**

One of the limitations of human hearing is its tendency to lose sensitivity to the very low and very high pitched sounds, as the sound level is reduced. It is this characteristic (known as the Fletcher-Munson effect) which causes one to play music programs at high level in order to experience the fullness of tone available from fine modern recordings and identified with "live" listening. The Harman-Kardon Dynamic Loudness Contour Control compensates for the Fletcher-Munson effect, eliminating high reproduction level as a requisite for full enjoyment of reproduced music. Six positions of compensation are provided, to allow the selection of the one most suited to your hearing.

Each position (0-5) causes the Loudness (Volume) control to perform with a different degree of compensation, the amount increasing with each clockwise setting. Position 0 is uncompensated. Positions 1 and 2 provide somewhat less compensation than that required to match the Fletcher-Munson curves. Position 3 matches the Fletcher-Munson curves. Positions 4 and 5 provide greater amounts of compensation than the curves suggest. Since hearing characteristics vary from person to person (some require more and others less compensation) the great flexibility provided in these controls can be appreciated.

In operation, the proper choice of contour is easily made, by switching through the several loudness contour positions and selecting the one which sounds best to you.

#### **Bass and Treble Controls:**

Separate Bass and Treble controls are incorporated to provide the full range of tone adjustment required for maximum high fidelity performance. These controls can either boost or cut the Bass and Treble tones of this instrument. The controls should be set in accordance with your hearing preference, speaker characteristics and room acoustics.

#### **Rumble Filter Switch:**

Often, records, record changers and even some turntables produce an objectional low frequency signal that is strong enough to be picked up by the sensitive phonograph cartridge and introduced into the playback system. Known as "Rumble" this undesirable signal can be eliminated by the special Rumble Filter incorporated in the Festival II. Located on the front panel, this

three position slide switch effectively "rolls off" the very low frequencies and eliminates rumble.

In position 0 the Rumble Filter is not connected and the overall frequency response of the instrument is essentially flat to 20 c.p.s. When the switch is placed in position 1 the response is slowly attenuated and at 20 c.p.s. is reduced by 6 db. Frequency response is reduced by 12 db. at 20 c.p.s. when the switch is placed in position 2.

Position 1 will be most useful where a minimum amount of rumble appears in the system while position 2 gives additional low frequency attenuation which will be most helpful in cases of heavy rumble.

#### **Speaker Selector Switch:**

Operation of this switch was previously discussed in Speaker Connections section.

#### **Tuning Meter:**

The Festival II tuning meter operates on both the AM and FM bands to insure accurate tuning. There is a difference in the meter action, however, on AM and FM.

#### **AM**

When the receiver is tuned completely off a station, the tuning meter needle will point to the left side of the indicator scale. As you tune through a station the meter will slowly move to the right showing maximum signal strength and then swing back to the left as you tune away from the station. Proper tuning exists when the meter reaches its maximum point to the right indicating maximum signal strength. On very weak AM stations the meter will hardly move at all while on correspondingly stronger ones the meter excursions may be quite large. The meter is thus acting as a relative field strength indicator helping you evaluate the strength of the signals originating from the different AM stations in your area.

#### **FM**

The precise Harman-Kardon tuning meter operates on FM whether AFC is in the circuit or not. When the Festival II is tuned completely off a station, the tuning meter will point to ZERO. As you tune through a station, the needle will swing to one side, then to zero, and then to the other side. As you tune away from the station the needle will move back to zero again. The tuning is proper only when the needle points to approximately zero.

AM and FM meter adjustments are incorporated into the Festival II so that the meter may be precisely zero set. The controls are located on the bottom plate. See Under The Chassis Controls section for adjustment procedure.

### **UNDER THE CHASSIS CONTROLS**

#### **Hum Bucking Control:**

A hum bucking control is incorporated in the amplifier circuit and is accessible from the underside of the chassis. Adjust this control for minimum hum after setting controls for Phono (RIAA) operation and the volume level slightly above normal.

In some installations where a record-player, tape recorder, or other auxiliary AC operated equipment is used, hum may be encountered due to voltage differences between the various units. This may be eliminated by reversing one or all of the AC power

plugs. Simply reverse one at a time until improvement is experienced.

#### **Bias Adjustment:**

A Bias Adjustment Control is located in the same area as the Hum Bucking Control. It should not be adjusted unless tubes are changed and then only by a competent service technician. An approximate setting may be made by first tuning the Loudness Control to minimum, and then adjusting the Bias Control for minimum hum.

#### **Drive Balance Control:**

This control is located on the end of the printed circuit board accessible through the bottom of the unit only when the bottom plate is removed. (It may also be adjusted through the top of the unit when the cage is removed.)

It should be adjusted for minimum intermodulation distortion as indicated on an IM meter. NOTE: Only a competent service technician should perform this adjustment.

#### **AFC Adjustment Control:**

This control is located on the bottom plate and controls the overall action of the AFC circuit. For maximum AFC turn this screwdriver adjustment to the extreme clockwise position.

#### **ANG Adjustment Control:**

The control is located on the bottom plate and has been preset at the factory for zero Automatic Noise Gate action. Advancing the control clockwise gradually increases the noise gate action and at the extreme clockwise position the ANG had maximum effect. Set this control high enough to cut out all noise between stations, yet not high enough to cut out any wanted weak stations.

#### **Meter Adjustment Controls:**

Individual AM and FM meter adjustment controls are incorporated in the Festival II in order that the meter may be precisely set. Both controls are located on the bottom plate.

#### **AM**

Tune between stations so that no input signal is received. Now adjust the AM meter control so that the meter points to minimum scale indication. (As far left as possible)

#### **FM**

Tune between stations so that no input signal is received. Adjust the FM meter control so that the meter points to the center of the scale. (Zero Mark)

#### **Fuse Replacement:**

The fuse should be replaced, if needed, by the SAME SIZE used. (3 amp. slo-blow)

### **MAINTENANCE AND REPAIR**

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

## WARRANTY

We warrant each Festival II, Model TA-1040 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 90 days from date of delivery to the original purchaser, and agree to replace or repair any part or parts returned to us within said 90 days, 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 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 TA-1040, Festival 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.

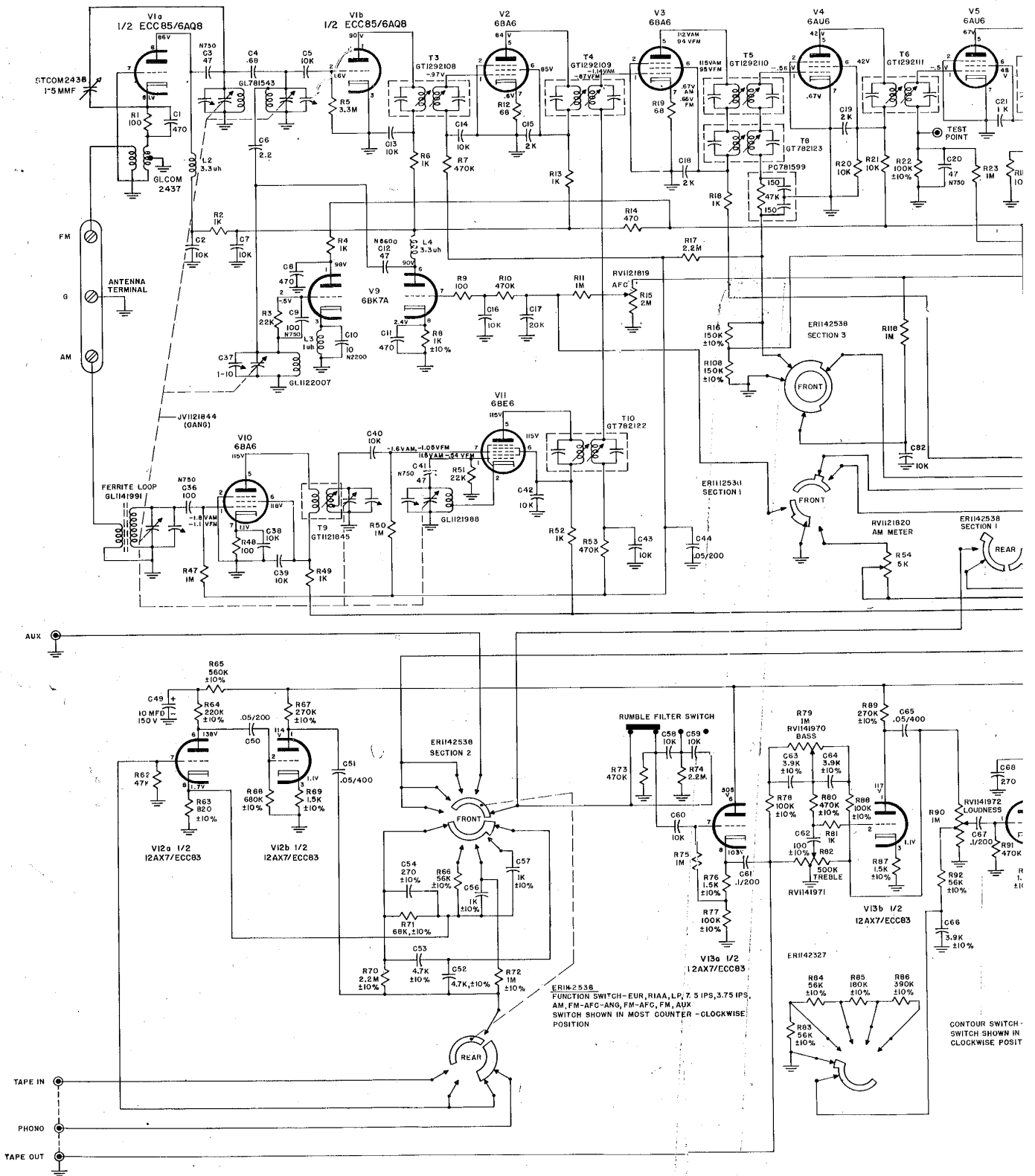
(c) While applying the soldering iron to the connections, "wiggle" the component until it is removed.

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

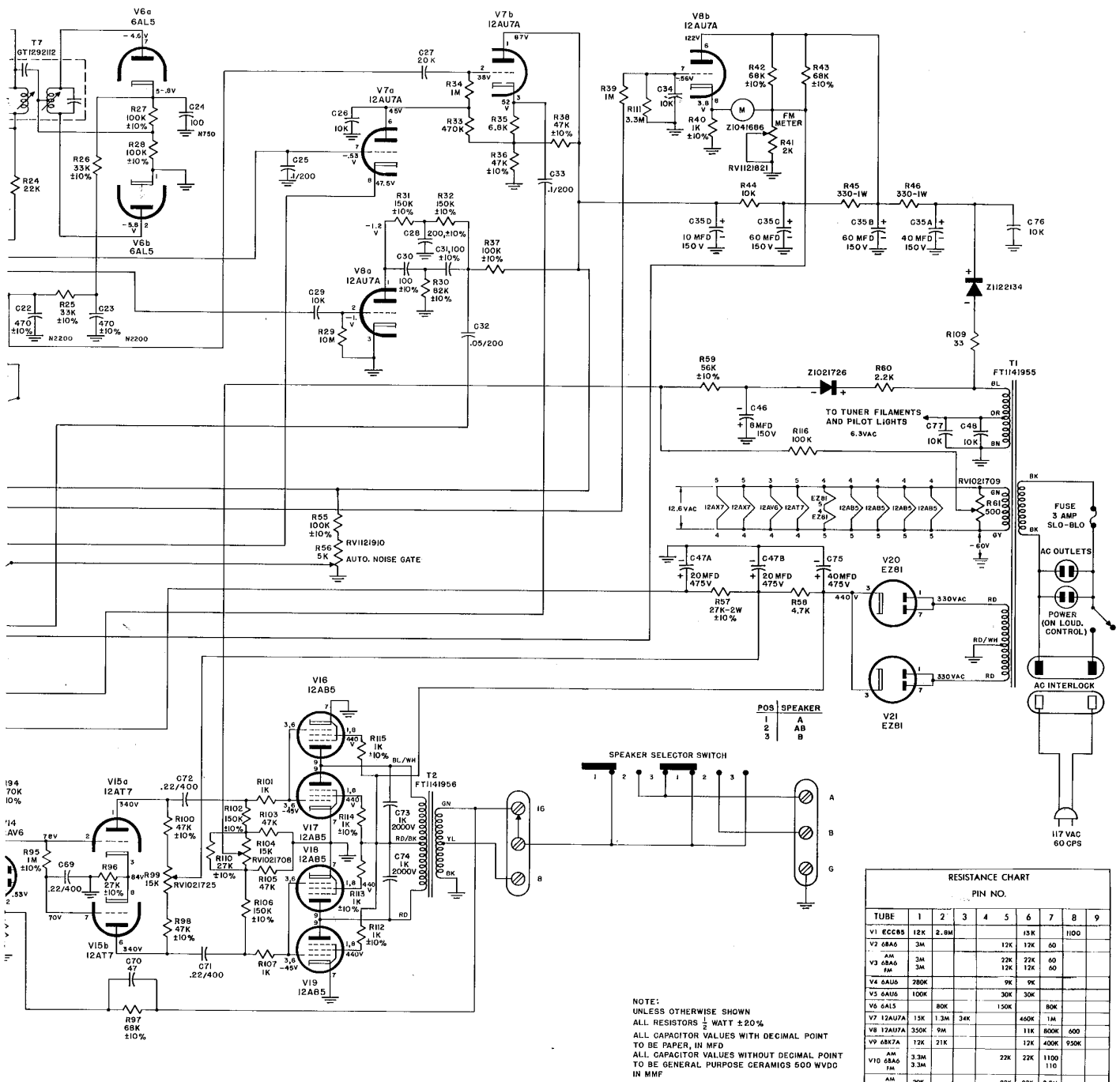
(e) A thin film of solder may remain over the hole through the board after removing the component. Pierce the film with the lead from the new component after heating the solder film with the soldering iron.

(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.





TA 1040



2, 3, 4, 5  
↑ COUNTER-

NOTE:  
UNLESS OTHERWISE SHOWN  
ALL RESISTORS 1/2 WATT ±20%  
ALL CAPACITOR VALUES WITH DECIMAL POINT  
TO BE PAPER, IN MFD  
ALL CAPACITOR VALUES WITHOUT DECIMAL POINT  
TO BE GENERAL PURPOSE CERAMICS 500 WVDC  
IN MMF  
ALL VOLTAGES ARE DC

RESISTANCE CHART		PIN NO.								
TUBE		1	2	3	4	5	6	7	8	9
V1	6CC85	12K	2.9M				15K	12K	60	1100
V2	6BA6	3M				12K	12K	60		
V3	6AA6	3M				22K	22K	60		
V4	6AU6	280K				9K	9K			
V5	6AM5	100K				30K	30K			
V6	6AL5	80K				150K		80K		
V7	12AU7A	15K	1.3M	34K		460K	1M			
V8	12AU7A	350K	9M			11K	800K	600		
V9	6X7A	12K	21K			12K	400K	950K		
V10	6BA6	3.3M				27K	22K	110		
V11	6BE6	3M				27K	22K	3.3M		
V12	12AX7	1.1M	220K	1.5K		1.2M	45K	3200		
V13	12AX7	1.5M	680K	1.5K		1.2M	1M	100K		
V14	12AV6	450K	1100			NC	NC	1.5M		
V15	12AT7	1.4M	27K			2M	27K			
V16	12AB5	750K	180K	180K		180K	0	-750K	-750K	
V17	12AB5	750K	180K	180K		180K	0	-750K	-750K	
V18	12AB5	750K	180K	180K		180K	0	-750K	-750K	
V19	12AB5	750K	180K	180K		180K	0	-750K	-750K	
V20	EZ81	40				2200	40			
V21	EZ81	40					40			

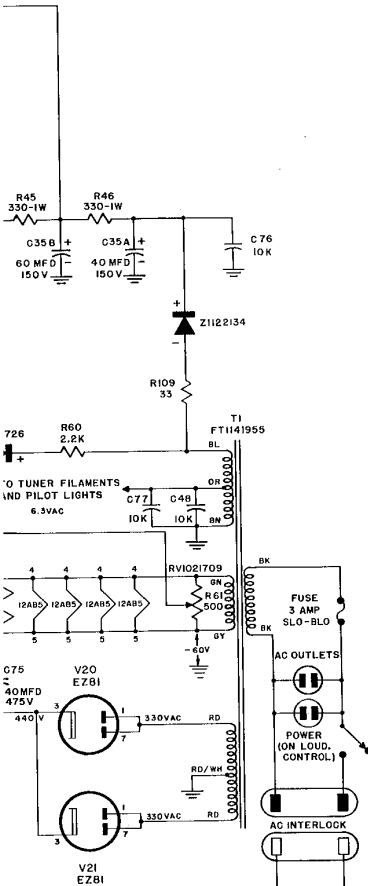
DIAGRAM

TA  
1040



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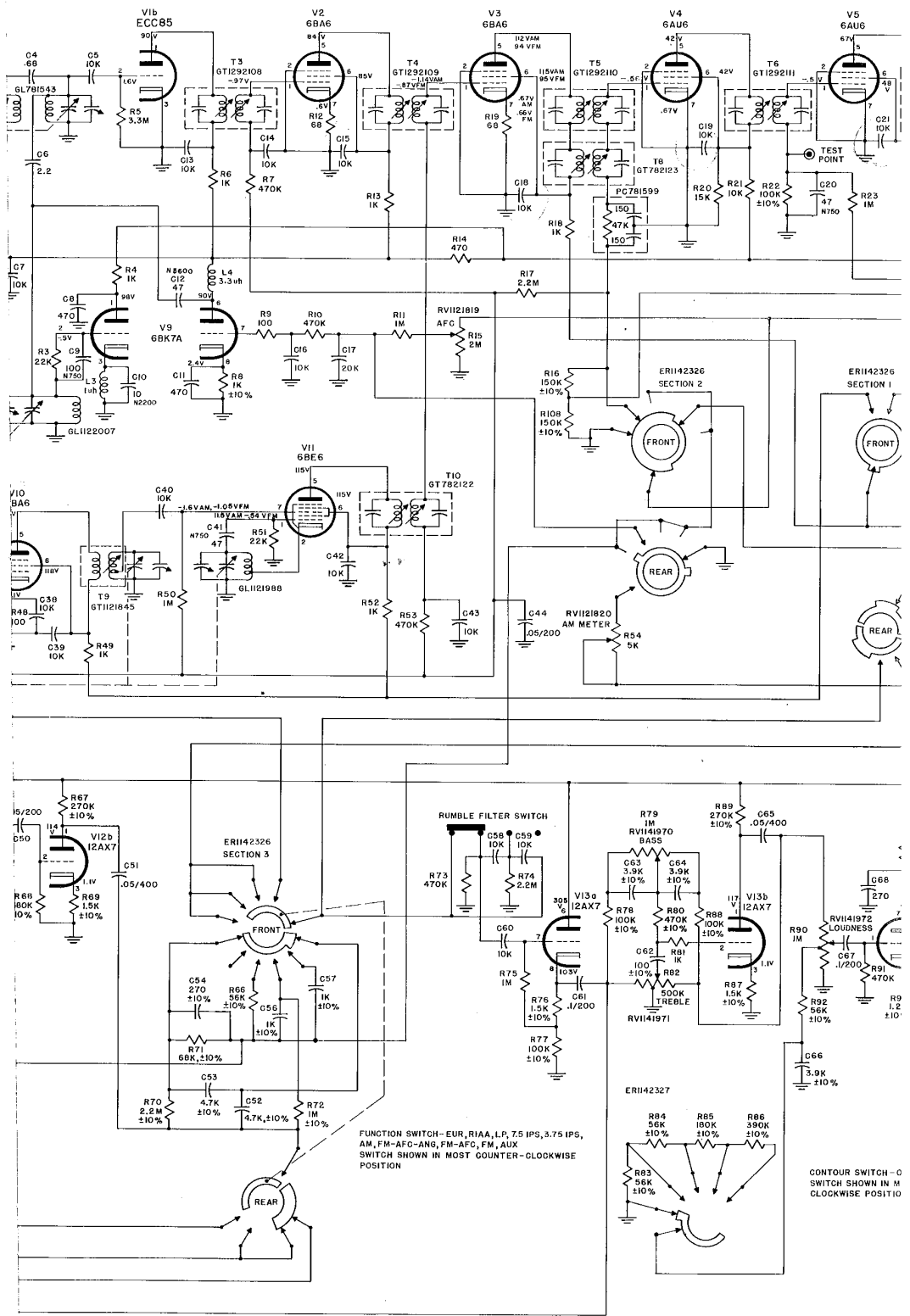
SI62G  
SI420186



A  
B  
G  
NT  
POINT  
VWDC

RESISTANCE CHART		PIN NO.								
TUBE		1	2	3	4	5	6	7	8	9
V1 ECC85	12K	2.0M					12K	12K	60	1100
V2 6BA6	3M						22K	22K	60	
V3 6BA6	3M						12K	12K	60	
V4 6AU6	280K						9K	9K		
V5 6AU6	100K						30K	30K		
V6 6AL5		80K					150K		80K	
V7 12AU7A	1.5K	1.3M	34K				450K	1M		
V8 12AU7A	350K	9M					11K	800K	600	
V9 6BK7A	12K	21K					12K	400K	950K	
V10 6BA6	3.3M	3.3M					22K	22K	1100	110
V11 6BE6	20K	20K					22K	22K	3.3M	3.3M
V12 12AX7	1.1M	220K	1.5K				1.2M	45K	2200	
V13 12AX7	1.5M	680K	1.5K				1.2M	1M	100K	
V14 12AV6	450K	1100		NC	NC		1.5M			
V15 12AT7	1.4M	27K					2M	27K		
V16 12AB5	750K	180K	180K				180K	0	750K	750K
V17 12AB5	750K	180K	180K				180K	0	750K	750K
V18 12AB5	750K	180K	180K				180K	0	750K	750K
V19 12AB5	750K	180K	180K				180K	0	750K	750K
V20 E2B1	40						2200	40		
V21 E2B1	40						40			

SIG 2C  
S1142018G



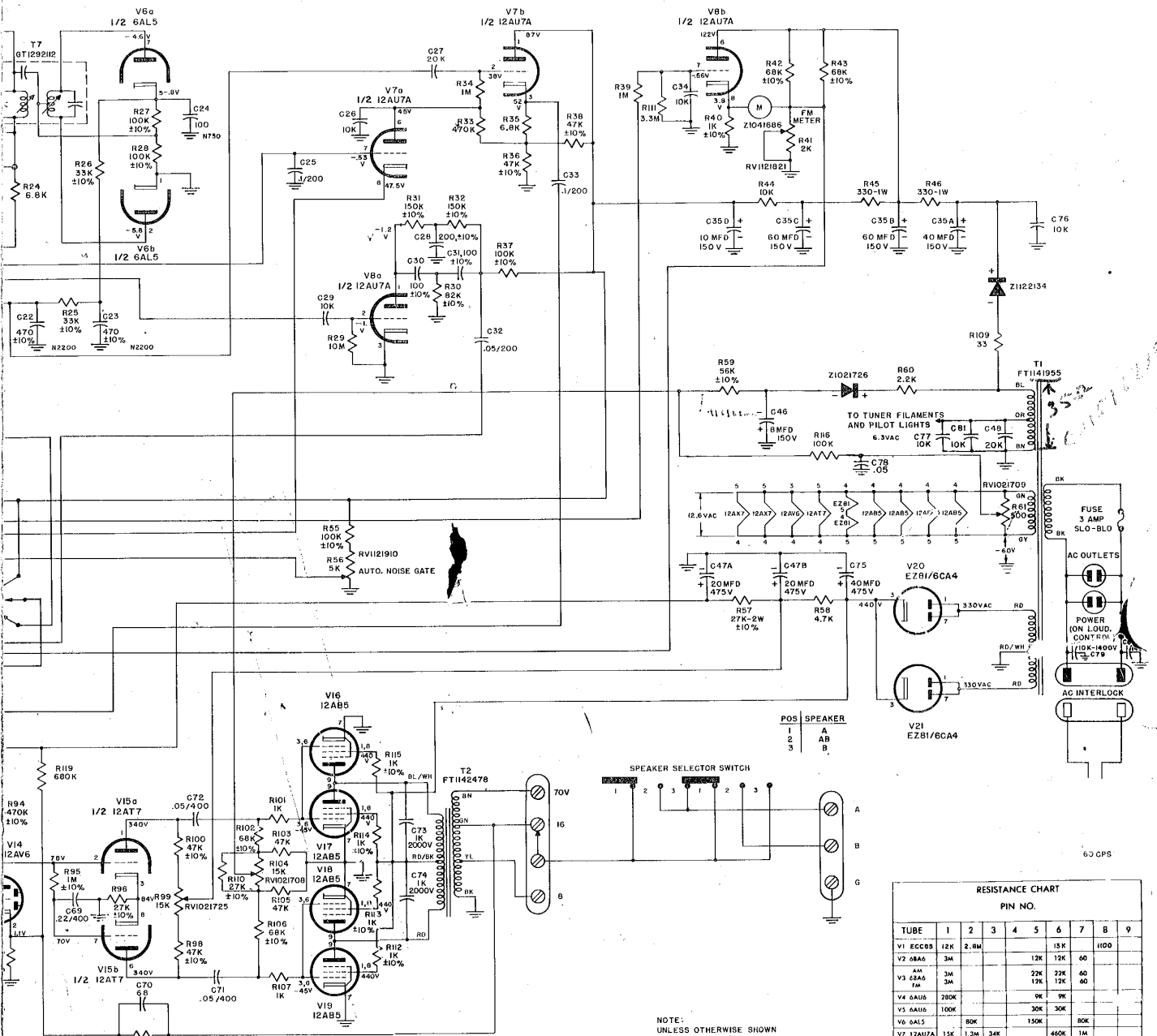
FUNCTION SWITCH - EUR, R1AA, LP, 7.5 IPS, 3.75 IPS, AM, FM-AFC-ANG, FM-AFC, FM, AUX SWITCH SHOWN IN MOST COUNTER-CLOCKWISE POSITION

CONTOUR SWITCH - 0 SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION



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SCHEMATIC



NOTE:  
 UNLESS OTHERWISE SHOWN  
 ALL RESISTORS  $\frac{1}{2}$  WATT ±20%  
 ALL CAPACITOR VALUES WITH DECIMAL POINT  
 TO BE PAPER, IN MFD  
 ALL CAPACITOR VALUES WITHOUT DECIMAL POINT  
 TO BE GENERAL PURPOSE CERAMICS 500 WVDC  
 IN MMF  
 ALL VOLTAGES ARE DC

RESISTANCE CHART

TUBE	1	2	3	4	5	6	7	8	9
V1 ECC85	12K	2.8M				15K		100	
V2 6BA6	3M			12K		12K	60		
V3 6BA6	3M			22K	22K	60	60		
V4 6AU6	280K			9K	9K				
V5 6AU6	100K			30K	30K				
V6 6AL5	80K			150K			80K		
V7 12AU7A	15K	1.3M	34K			460K	1M		
V8 12AU7A	350K	9A				11K	800K	600	
V9 6BK7A	12K	21K				12K	400K	95K	
V10 6BA6	3M				22K	22K	110	110	
V11 6BA6	3M				22K	22K	3.3M	3.3M	
V12 12A7	1.1M	220K	1.5K			1.2M	45K	2200	
V13 12A7	1.5M	680K	1.5K			1.2M	1M	100K	
V14 12AV6	450K	1100				NC	NC	1.5M	
V15 12A7	1.4M	22K				2M	22K		
V16 12AB5	750K	100K	100K			100K	0	750K	750K
V17 12AB5	750K	100K	100K			100K	0	750K	750K
V18 12AB5	750K	100K	100K			100K	0	750K	750K
V19 12AB5	750K	100K	100K			100K	0	750K	750K
V20 E281	40					2200	40		
V21 E281	40					2200	40		

IF PUR. X FORMER  
 HEATS UP OR BURNS OUT - REPL.  
 6CA4 RECT TUBES, WHEN REPL.  
 USE AC VOLT METER TO READ 12V  
 ACROSS FIL WINDING & IF VOLT.  
 DROPS 6CA4 HAS CATHODE FIL. SHORT.

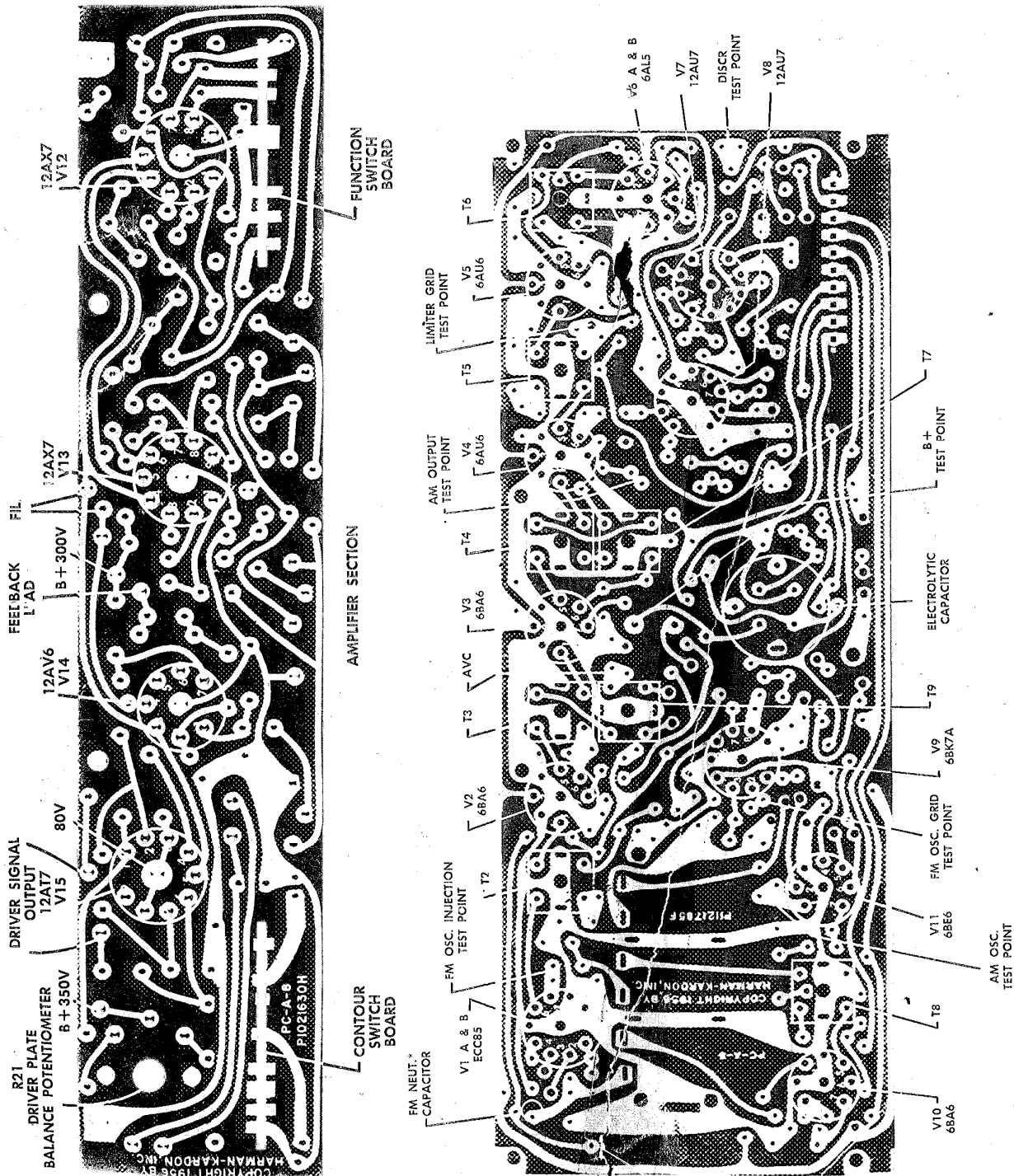
1,2,3,4,5  
 ST. COUNTER  
 100/2K  
 100K/2K  
 200V  
 1/2

DIAGRAM



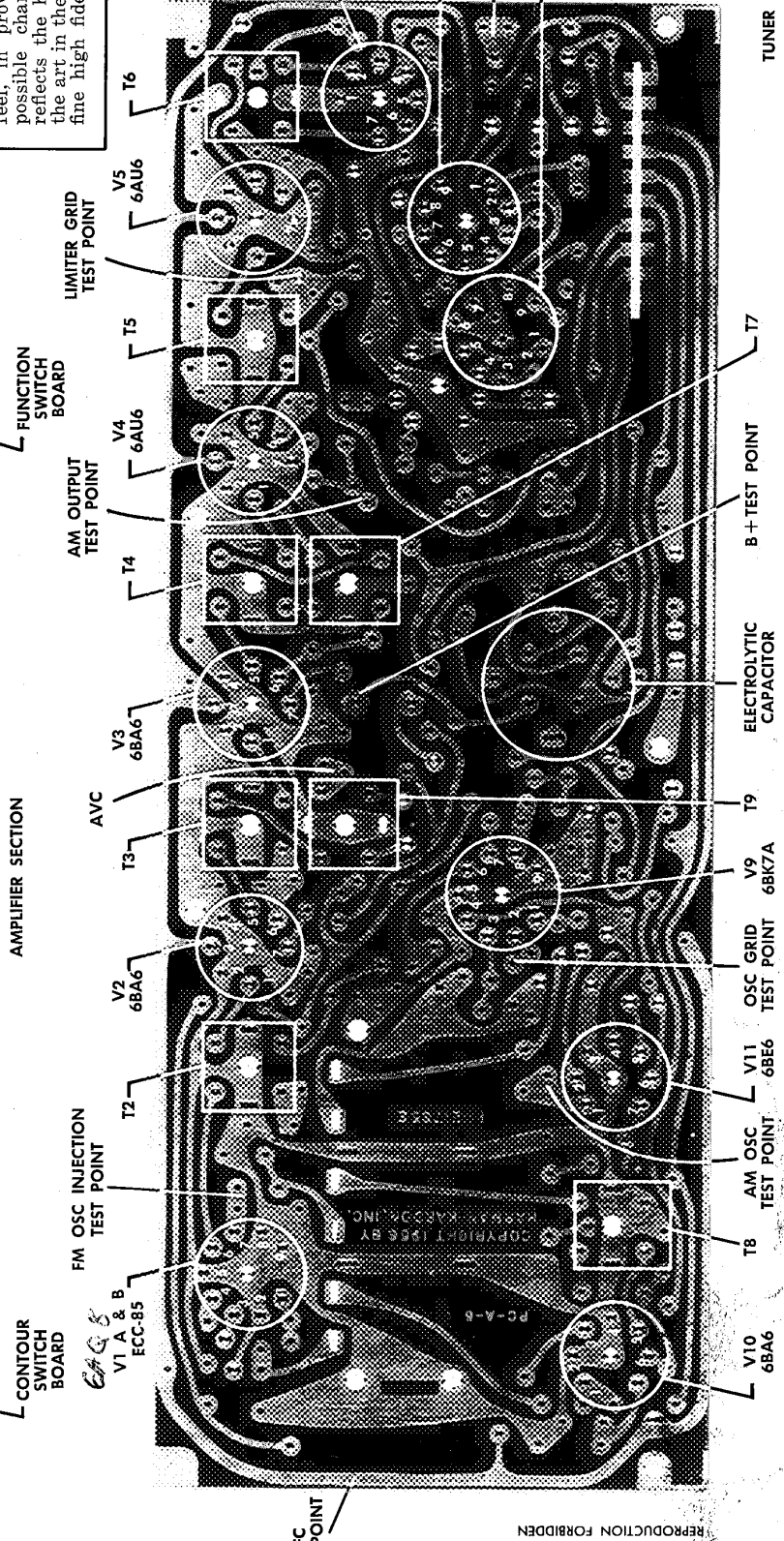
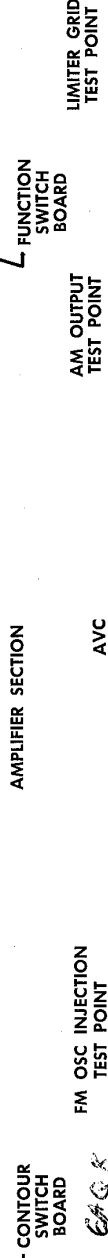
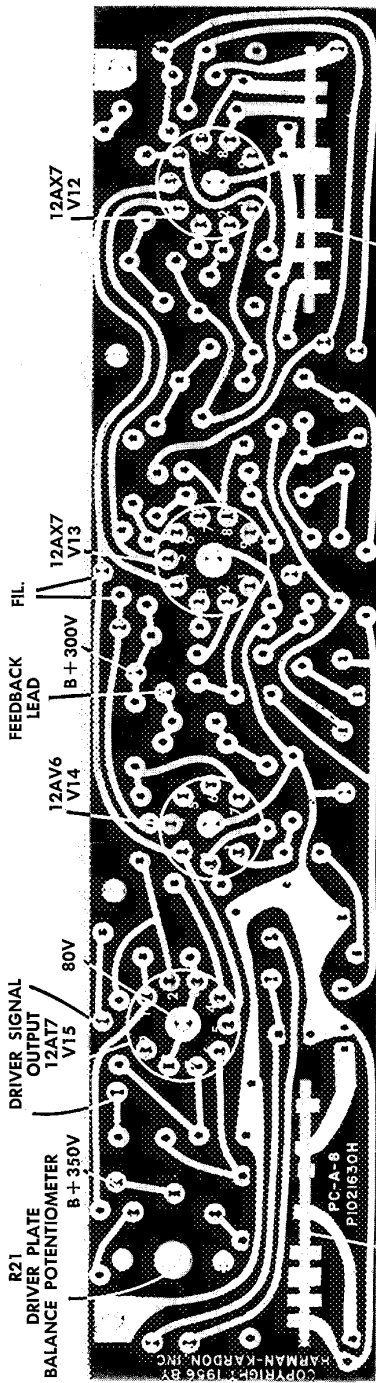
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These photographs show the printed circuit boards used in the Harman-Kardon Festival II and indicate to some degree the complexity of design and painstaking care required in the planning of such a unit. FM frequencies, by their very nature, require careful placement of parts and leads. In conventional point to point wiring, misplacement of a wire, even a slight amount from its correct position will adversely affect operation. The amplifier has been designed to use printed circuits in those areas where each component and each connecting lead must be carefully positioned in order to afford best possible operation. This design form results, we feel, in providing the best possible characteristics and reflects the highest state of the art in the construction of fine high fidelity equipment.



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AFC TEST POINT

REPRODUCTION FORBIDDEN

## SPECIFICATIONS

### RF SECTION

Circuits: FM: Armstrong circuit with dual double tuned Limiters and Foster-Seeley Discriminator.  
 Variable Automatic Frequency Control—Low Noise Front End consisting of Triode Grounded Grid Amplifier and Triode Mixer.  
 AM: Superheterodyne with A.V.C. and Ferrite Antenna.  
 Sensitivity: FM: 2 microvolts for 30 db quieting; 1.5 microvolts for 20 db quieting.  
 AM: Loop sensitivity 30 microvolts/Meter; External antenna sensitivity -5 microvolts.  
 Selectivity: FM: IF Bandwidth: 200 KC at 6 db down.  
 AM: 8 KC Bandwidth at 6 db down.  
 Discriminator: 375 KC; peak to peak separation.  
 Frequency Range: FM: 88-108MC. AM: 530-1650 KC.  
 FM Drift:  $\pm 5$  KC max.  
 Image Rejection: FM: 40 db. AM: 45 db.  
 IF Rejection: FM: 70 db. AM 45 db.  
 Antenna Input: FM: 300 ohms.  
 AM: Built-in low noise ferrite loopstick plus high impedance terminal for external antenna.  
 Distortion: Less than 1% harmonic on FM.  
 Less than 1% harmonic for up to 80% mod. on AM.  
 Frequency Response: FM:  $\pm 1/2$  db 20 to 20,000 c.p.s. including standard 75 microsecond deemphasis.  
 AM: 3 db 20 to 5,000 c.p.s.  
 Hum Level: 65 db below 100% modulation.  
 Tuning Meter: FM: Discriminator Balance.  
 AM: Carrier Level.

### AUDIO SECTION

Circuits: Output circuit employs 4 #12AB5 in new high efficiency low heat generating circuit.  
 Power Output: 40 watts at 1% IM (40 & 7,000 cycles)  
 Peak Power: 60 watts.  
 Frequency Response:  $\pm 1$  db, 20-20,000 c.p.s. at 40 watts.  
 $\pm 1/2$  db, 20-40,000 at 20 watts.  
 Output Impedance: 8 and 16 ohms. 70 volts.  
 Hum: Min. Volume Hum: 80 db below 40 watts.  
 Aux. and Tuner Hum: 70 db below 40 watts.  
 Phono Hum (in RIAA position): 60 db below 40 watts.  
 Tone Control Range:  $\pm 16$  db at 50 and 10,000 c.p.s.  
 Input Levels: aux 0.3 volts; phono 3 mv. tape: 1 mv.  
 Rumble Filter: 6 db per octave cut below 40 cycles or below 100 cycles.  
 Dynamic Loudness Contour: 6 Positions:  
 Position 1. Uncompensated.  
 Position 2. Approximately 10 db less than Fletcher-Munson.  
 Position 3. Approximately 5 db less than Fletcher-Munson.  
 Position 4. Fletcher-Munson Compensation.  
 Position 5. Approximately 5 db more than Fletcher-Munson.  
 Position 6. Approximately 10 db more than Fletcher-Munson.

### SPECIAL NOTES

- Safety Interlock Power Cord disconnects power when cage is removed.
- Printed circuits used throughout, employes dip soldered copper-clad laminated phenolic plastic board.
- Simple mechanical disassembly makes boards easily available for service.
- Hardware and Accessory Material Furnished: Cabinet mounting screws, Template, Instruction booklet, FM antenna wire.

## OVERALL SPECIFICATIONS

Front Panel Controls: (Total: 8) Tuning, Contour, Loudness, Bass, Treble, Function (AM, FM, FM-AFC, FM-AFC-ANG, AUX, LP, RIAA, EUR 7.5, 3.75), Rumble filter (3 position slide switch), Speaker Selector.  
 Rear Panel Controls: (Total: 6) Speaker impedance selector, Automatic Noise Gate control, AM meter control, FM meter control, Hum balance, bias adjustment.  
 Dimensions: 16-1/8" wide x 3-7/8" high (not including runners) x 14" deep (including loopstick, not including knobs).  
 Tube Complement: (Total: 21) 2-12AX7, 1-12AV6, 1-12AT7, 4-12AB5, 2-EZ81, 1-6BK7A, 1-ECC-85, 2-6BA6, 3-6AU6, 1-6BE6, 1-6AL5, 2-12AU7, selenium rectifier.  
 Installation Space Required: 15" wide x 4" high x 13-1/2" deep.  
 Power Consumption: 120 watts at zero output.  
 180 watts at rated output  
 130 watts at average program level.  
 Shipping Weight: 30 lbs.  
 Finish: Escutcheon and Cage: Brushed copper—Display panel for escutcheon and knobs: matte black—Edge lighted dial glass; yellow and white.  
 Functional Features:  
 (a) Counterweighted Tuning Control.  
 (b) Tape Output Receptacle furnished on chassis rear prior to tone controls.  
 (c) Automatic Noise Gate suppresses interstation noise on FM.  
 (d) Speaker selector permits choice of use of either one or both of two speakers.  
 (e) Speaker Impedance Selector switch.

### LIST OF REPLACEABLE PARTS

Descriptor	Harman-Kardon Part No.	List Price
Power Transformer	FT1141955	25.00
Output Transformer	FT1142478	27.50
AFC Control	RV1121819	.60
Control, AM meter	RV1121820	.60
Meter, ANG	RV1121910	.60
Control, FM meter	RV1121821	.60
Control, Balance	RV1021708	.60
Control, Hum-bucking	RV1021709	.55
Electrolytic Cap. 40/475 40/475 V	JE1071739	4.50
Electrolytic Cap. 20-20/475 V	JE1071740	2.90
Tuning Meter	Z1041686	10.25
Dial Glass Assy	P1141962	1.00
Pointer	P1141963	.30
Antenna Coil	GLCOM2437	.50
Antenna Loopstick	GL1121822	2.30
Selenium Rectifier	Z1021726	1.40
Escutcheon Assembly	B1142444	9.50
Cage	P1141948	15.50
Selenium Rectifier	Z1122134	4.50
Variable Condenser	JV1121844	3.75
Trimmer Condenser	STCOM2438	.50
Osc. Trimmer	JV20688	1.60
Transformer, FM IF	GT781491	2.35
Transformer, FM IF	GT1121982	2.00
Transformer, FM-Disc	GT781492	7.50
Transformer, AM IF	GT7781493	2.30
Transformer, AM RF	GT1121845	.80
AM Osc. Coil	GL1121988	2.70
Electrolytic Cap. 40-60-60-10/150 V	JE1121846	1.25
Bass Control	RV1141970	1.35
Treble Control	RV1141971	1.75
Loudness Control	RV1141972	3.25
Function Switch	ER1142538	3.25
Contour Switch	ER1141974	.15
Knob	P20778	.15
Knob	P22783	1.00
Instruction Sheet	L1141968	.75
Mounting Template	L1141969	.50
Schematic		

When ordering parts always list the model number, serial number and complete part number. Prices are subject to change without notice.