

A3-4.

Reconnect line cord and turn unit on. Wait 5 minutes for amplifier to fully warm up. Press red pushbutton marked Ch A Bias. Adjust P2 pot until meter indicator points to the line. Repeat for Ch. B bias with P3. Meter will vary slightly in the future due to variations in your household voltage. Slight deviations can be safely ignored. There should be no need to readjust until output tubes are changed, or perhaps after a year of steady use.

## In Case of Difficulty

No matter how careful you are, a mistake is possible. Don't panic! First, make sure each tube is in the proper location. Then go back to the assembly notes and check off each step with the written instructions and the pictorials. Or if possible, have someone else do this for you. Often a fresh approach may disclose mistakes that you might be consistently overlooking. While checking for errors, carefully probe each and every wire, lead, component, and part to make sure there are no short circuits or poor solder joints.

In case the fuse has blown (the tubes will not light up) it is very likely that there is a short circuit. Before replacing the fuse search for the cause.

In case the tubes light up but the unit does not operate properly voltage readings are supplied on the schematic. If you can obtain a good vacuum tube voltmeter (VTVM) use the voltage readings for locating the portion of the circuit that is malfunctioning.

Any sign of arcing or overheating under the chassis is a sure sign of a poorly soldered joint or a near short. It is important to recognize that this amplifier draws a considerable amount of electricity. All paths for the current must be smooth or else trouble will result. **GO OVER YOUR SOLDERING CAREFULLY!** 99% of all troubles will be solved that way.

If none of the above suggestions help in curing the problem you should write to our Laboratory Kit Service Dept. for prompt assistance. There is no charge for this help. The engineers in this department are thoroughly familiar with all aspects of the kit, and can probably localize the cause of your difficulty. However, you must be very explicit in describing your problem. Mention all the approaches you have undertaken to cure it. Describe all the symptoms and signs that may be involved. With complete information supplied, the possibilities of a cure through the mail are greatly increased.

## Congratulations!

Now . . . sign your personal label "This kit was built by ——" . . . connect your amplifier into the rest of your system (see next few pages) . . . relax . . . with one of the finest amplifiers ever made.

## Installation

The LK-150 can be placed on a table or bookshelf. It can be hidden in a closet or in any out-of-the-way location. If the amplifier is to be in view, you can obtain a very handsome accessory cover from your dealer.

Wherever the LK-150 is placed, adequate provision should be made for ventilation. If this is not done, the life of the internal components will be appreciably shortened. By adequate ventilation we mean some space above and behind the unit where air may circulate freely, or, if it is installed in a cabinet, an open back. Remember that this model draws about 300 watts of electricity, and if you placed a 300 watt bulb in a cabinet, you would need a fair amount of moving air to keep it from getting too warm.

## Instructions for Using the Model LK-150 130 Watt Complete Stereophonic Power Amplifier

At the front of this instruction booklet is a description of the amplifier's circuit in very non-technical terms. Read this through so you will be able to obtain maximum understanding and satisfaction from the amplifier.

### CONNECTIONS

#### Power

The power cord should be plugged into any 105 to 125 volt, 50 to 60 cycle AC source. **DO NOT** attempt to use with DC. The amplifier can be connected to an auxiliary AC outlet on the preamplifier. Thus, the on-off switch of the preamplifier will control the LK-150 as well. If used in this manner, leave the on-off switch of the LK-150 in the on position at all times.

## Speakers

Terminal strips for making speaker connections are located on the back. . . . The one marked Channel A Speaker is for connecting the left speaker (as you face them). The one marked Channel B Speaker is for the right. Below each strip are the numbers 4, 8, 16, 0 and 0. This permits you to match the amplifier output to the impedance of the speaker. Each speaker is rated by its manufacturer at a certain impedance. This information is either marked on the speaker or can be supplied by the dealer.

To make the connections use standard twin lead lamp wire. Simply connect one end of the twin lead wire to the two terminals on the speaker or speaker enclosure, as the case may be. At the other end connect one lead to either "0" terminal and the other lead to the terminal whose number is closest to the value of the loudspeaker impedance. When making the connections, be extremely careful to prevent any strands of wire from one screw accidentally touching the other screw, as the speaker will not perform properly.

After the speakers are connected, they should be properly phased to give a good stereo effect with full bass. Phasing instructions are to be found later in this manual.

## How to Connect Your Preamplifier Control Center

Take a shielded audio cable. Connect one end to the Channel A audio output of your preamplifier and the other end to the Channel A input of the LK-150. Repeat for Channel B.

If you are using an H. H. Scott preamplifier (like the LC-21, 130, or 122) or any preamplifier with high output (2.5 volts), set the *Input Level Switch* to the 2.5 position. If you are using a low output preamplifier (1.5 volts), set the switch to 1.5.

## Accessory Outlet

Two accessory switched 117 volt outputs are available on the back panel to supply current for a phonograph or tape recorder motor. The outlet is rated at 5 amperes so the total current drain of all the devices connected should not exceed this amount. When the LK-150 is turned off, all items plugged into these outlets will also be turned off.

## DESCRIPTION AND USE OF CONTROLS

### On-Off Switch

The LK-150 is turned on by rotating the switch clockwise.

### Subsonic Rolloff

A complete description of the operation of these controls is to be found in the introduction. For normal home music listening, set both switches to the *normal* position. This will reduce all frequencies below 20 cycles and limit the possibility of the speaker being overloaded by subsonic noises. For critical applications, such as laboratory measurement, where response down to below 5 cycles is desired, place the switches in the *lab* position.

### Bias Adjustments

After a long period of use, it may be desirable to check the bias adjustments. If the output tubes are changed, this should definitely be done. Always use matched output tubes with the LK-150. The method of making adjustments is described in step A-3-4. The meter indication will vary slightly about the indicator line due to normal variations in house line voltage. This can be ignored.

## PHASING THE LOUDSPEAKERS

A loudspeaker cone produces sound by moving back and forth, pushing the air in such a manner that our ears detect sound. When two loudspeakers are in operation in a stereo system, it is essential that the speaker cones move back and forth at the same time. If the right speaker is moving forward at the same instant that the left speaker is moving backward, there will be a noticeable reduction in bass response as well as a poor stereophonic effect.

To insure that the system is in phase at all times, the following method is suggested:

Tune in a monophonic broadcast with a male voice speaking, or else, play a monophonic record with a male singing voice. Turn the volume to full room level. Stand in front of the two speaker systems and midway between them. Have someone quickly reverse the leads to one speaker. In one position, the voice will sound full and appear to be coming from directly between the two speakers. In the other position, the voice will lose some of its bass response, and will appear to be coming from both speakers. The first is the correct position, the second is the incorrect one.



## Service

When all else fails the facilities of the H. H. Scott Laboratory Kit Service Department and the vast network of Authorized Warranty Service Stations are available to you. You will be charged a fixed fee of \$10.00 for each unit that is submitted either to the factory or to a Warranty Station within the warranty period. This fee will be in addition to any parts that

have to be replaced. If the unit is still within the 90 day warranty period (see description of the Warranty Policy below), then the charge for parts will be governed by this policy. A list of warranty service stations is included with this kit.

Many H. H. Scott dealers have service facilities and are fully competent to repair this kit. These dealers are not governed by our price policy and can charge any fee they wish. This fee should be ascertained before service is begun.

The service policies described above only apply to completely assembled instruments constructed according to the instructions supplied. Any unit that is not complete, or has been modified in any way will not be accepted. Instruments showing the use of fluxes and acid core solder will also not be accepted.

## Warranty

To protect your investment, H. H. Scott, Inc. warrants that for a period of three months from the date of purchase, all parts shall be free of defects in materials and workmanship under normal use and service. H. H. Scott, Inc. will replace any defective parts upon the return of same to the factory, either by the customer, the dealer, or a warranty service station. There will be no charge for this replacement.

This warranty does not apply to any parts damaged during the course of handling and assembling the kit. No other warranty, either expressed or implied, shall apply to this unit.

## Packing For Shipping

If it becomes necessary to return the instrument to the factory, obtain a sturdy carton, large enough to hold the amplifier and place protective material around it. Crumpled newspapers, Kimsul, or similar packing material can be used. Make sure the amplifier is in tight so that it does not shake around. Mark: FRAGILE DELICATE ELECTRONIC EQUIPMENT on the outside of the carton. Insure for its full value and ship, prepaid, by Railway Express to:

## Laboratory Kit Service Dept.

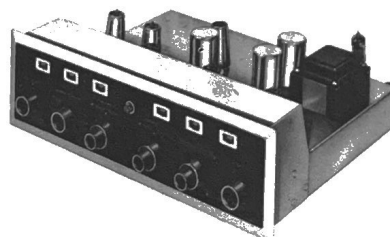
H. H. Scott, Inc.

111 Powder Mill Road

Maynard, Mass.

## Choosing Your Preamplifier Control Center

If you are not using an H. H. Scott preamplifier, you are not getting the full potential of your music system. In particular, the LC-21 stereo control center kit would be an ideal match. The LC-21 incorporates every meaningful control and feature, combined with matchless performance and low distortion. The LC-21 is easy to build and will bring you years of superb listening.



## Choosing Your Tuner

Your new LK-150 is the finest power amplifier kit available. It is designed with the precision that has made the name H. H. Scott a synonym for quality in the component field.

But a fine high fidelity system is only as good as its weakest link. Therefore we suggest that you invest in an H. H. Scott tuner when you are ready to expand your present system.

All H. H. Scott tuners are a perfect match to your new LK-150 in performance. An ideal tuner would be the H. H. Scott LT-10 FM tuner kit. It is a perfect match to your LK-150, and is even easier to build.



# H·H·Scott . . .

## a history of leadership in the Acoustic field

To insure that every H. H. Scott component meets the highest standards of quality, H. H. Scott maintains this ultra modern plant for the design and manufacture of all its components.

This new plant, located in Maynard, Massachusetts, includes a machine shop, sheet metal facilities, coil and transformer department, electrical assembly department and fully equipped laboratories for design and research.

The engineering department is staffed by 12 graduate engineers who are primarily concerned with developing new and better components for high fidelity sound.

Every high fidelity component receives over 50 electrical and mechanical tests before it leaves the factory. Special electrically shielded "screen rooms" are used for aligning FM tuners. There are life test facilities where components are run for thousands of hours under strict controls to test their durability.

These extensive investments in facilities back up H. H. Scott's philosophy that there will never be any compromise with quality.



SERVICE BULLETIN for LK-150 STEREO POWER AMPLIFIER

SPECIFICATIONS

The following data was obtained from a group of 50 home-built units. They represent conservative performance specifications of what the average kit builder can expect if he follows all instructions precisely. It is the opinion of H. H. Scott engineers that most kits will exceed these specifications.

Power Output:                    65 watts per channel ..... IHFM Music Power Rating  
    60 watts per channel ..... Steady State (RMS)

Distortion & Noise Measurements

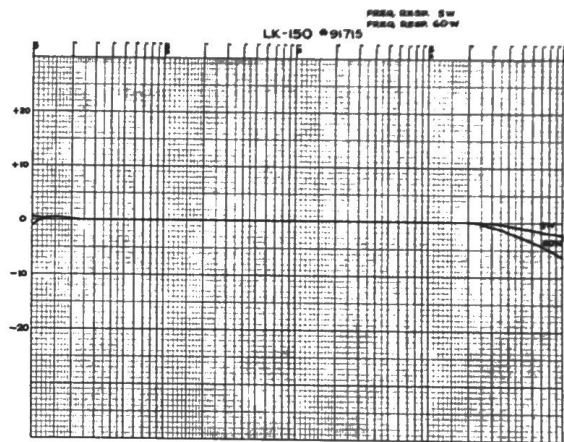
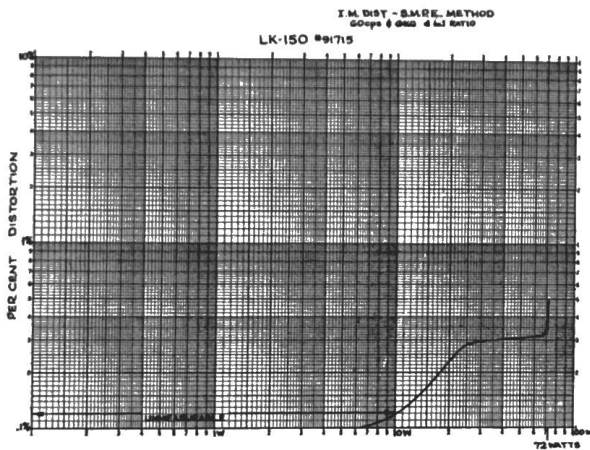
The distortion and noise in the LK-150 is so low that it is of the same magnitude as the top quality laboratory test equipment used for the measurements. As a result, it is not possible to obtain guaranteed data. Suffice to say, once distortion and noise have become too low to measure accurately, they are much too low to hear, also. All measurements made with Subsonic rolloff switches in Lab position and Input Level set for 2.5 v.

Test Equipment

- Hewlett-Packard 200CD, Wide Range Audio Oscillator (residual distortion 0.05%).
- Hewlett-Packard 400D, Vacuum Tube Voltmeter.
- Hewlett-Packard 330B, Distortion Analyser (distortion 0.1%).
- Square Wave Generator (designed and built by H. H. Scott Engineering Dept).
- Sola 5005, Constant Voltage Regulator.
- Tektronix Type 561, Oscilloscope.

Total Harmonic Distortion:    Under 0.5% at rated output. Unmeasurable at normal listening levels.

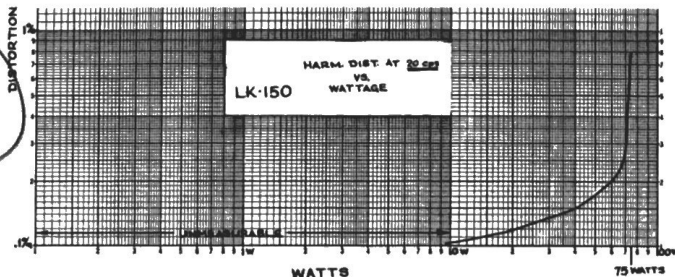
Intermodulation Distortion:   Under 0.5% at 72 watts (RMS)



Power Band (IHFM Method):    Under 19 cycles to over 25 kHz. (Limit of test equipment).

Low Frequency Power & Distortion

At 20 cycles, the LK-150 will produce 75 watts per channel with less than 2% total distortion. It is at the low frequencies that power is really needed.

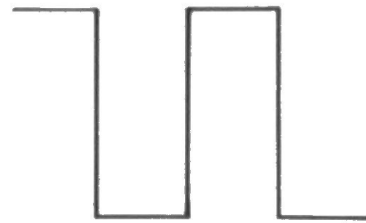




## Square Wave Response



10cps



1KC

Hum & Noise: - Better than -85 db below rated output. (Limit of test equipment).  
Crosstalk: - Over 75 db of separation.  
Feedback: - In excess of 21 db.

Damping Factor: Over 16 to 1 in 2.5 v. position of Input Level. Over 8 to 1 in 1.5 v. position of Input Level (for use with certain low efficiency air suspension speakers).

Sensitivity: 2.5 v. (for use with H. H. Scott and other high output preamplifiers).  
1.5 v. (for low output preamplifiers).

Controls: Input Level Switch; Channel A & B subsonic rolloffs; On-Off; Channel A and B bias potentiometers.

AC Convenience Outlets: - Two

Fuse: - 3.2 amps, externally accessible.

Impedances: - 4, 8, and 16.

Tube Complement: - 2-7199; 2 pairs of matched 6550; 2-GZ34/5AR4; plus 1 selenium rectifier.

Chassis Construction: Electrolytic aluminum for lowest hum, better conductivity, and best heat dissipation.

### GENERAL SERVICE NOTES

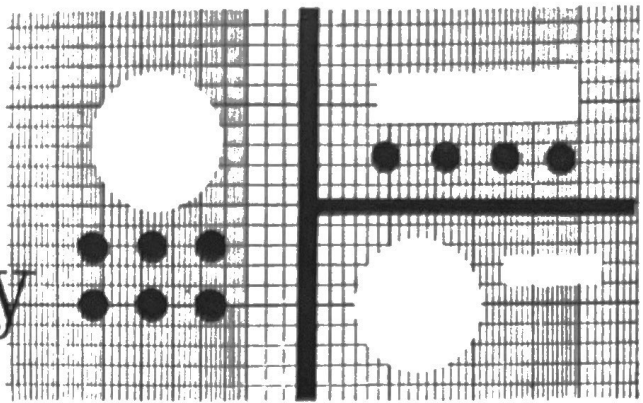
1. Check the tubes, particularly those in the power output stage and the rectifier every year. If the tubes are outside the manufacturer's ratings or show gas, they should be replaced. Gassy tubes may damage other components of the circuit. Output tubes should always be a matched pair.
2. When the amplifier is being checked yearly, clean the tubes of dust so that they may radiate their heat more effectively.
3. If at any time the hum or noise increases noticeably, check the power output tubes. This symptom is often an indication of gassy tubes.
4. If the amplifier blows fuses frequently, check the line voltage. If it rises above 125 volts, drop the line voltage by means of an auto-transformer or place a voltage regulator transformer between the amplifier and the line. If the line voltage is correct, check the amplifier itself. Do not use fuse sizes other than the fuse size specified.
5. Other routine tests can be performed to insure that the unit meets or exceeds the specifications outlined previously. Only use parts and tubes specified by H. H. Scott, Inc. The use of non-standard parts or tubes will preclude obtaining the performance stated in the specifications.

If you have any further questions, write to:

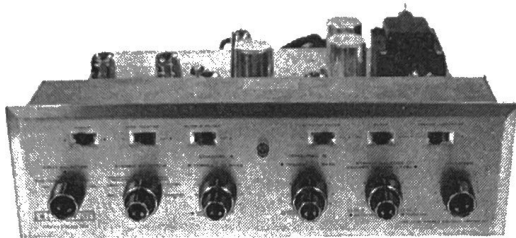
Technical Services Dept.  
H. H. Scott, Inc.  
111 Powder Mill Road  
Maynard, Mass.

The consumer's guide  
to new and important  
high fidelity equipment

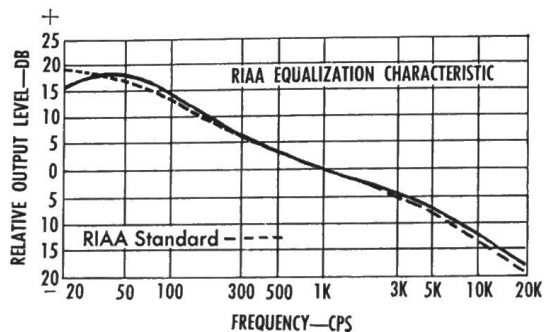
high fidelity



## EQUIPMENT REPORTS



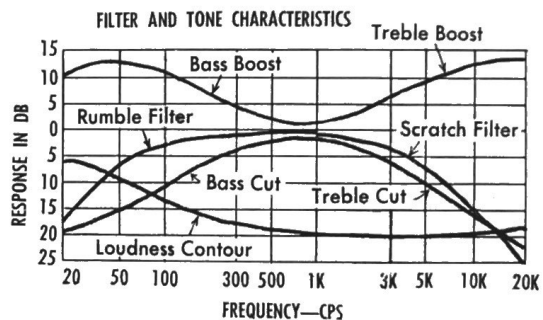
**AT A GLANCE:** The Scott LC-21 is a high quality stereo preamplifier-control unit available in kit form. Tests of the kit-built version, conducted by the United States Testing Company, Inc., indicate that the unit either meets or exceeds its specifications. Harmonic distortion, for instance, was so low as to be unmeasurable. The unit is a trouble-free, satisfying project for the do-it-yourselfer as well as a first-rate audio component when finished. Dimensions are 5¼ inches high by 15½ inches wide by 13¼ inches deep.



Price: \$99.95. Manufacturer: H. H. Scott, Inc., 111 Powder Mill Rd., Maynard, Mass.

**IN DETAIL:** Six knobs (four of them dual concentric types) and six switches, plus a pilot lamp, occupy the neatly styled and logically arranged front panel of the LC-21. The knobs, from left to right, are: a five-position input selector (microphone, tape head, magnetic phono, tuner, and extra or auxiliary input); a seven-position stereo mode selector (balance A, balance

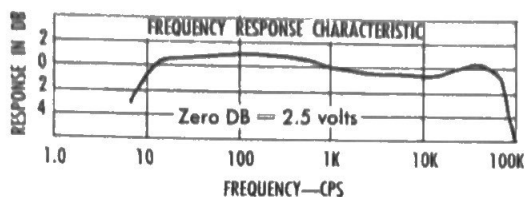
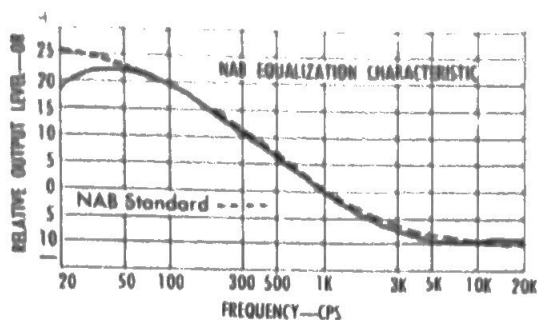
### H. H. Scott Model LC-21 Preamplifier



B, monophonic records or "A+B," stereo, reverse stereo, channel A, channel B); dual concentric bass and treble controls for each channel; concentric stereo balance and center channel level controls; and a loudness control that incorporates a push-pull AC power switch. The slide switches above the knobs include: a pickup selector (either high or low impedance magnetic input); tape monitor; rumble filter; scratch filter; phase reversal; and loudness contour.

The LC-21 has two high-gain inputs per channel, one with a 47K-ohm input impedance (magnetic 1), and the other with a 150K-ohm input impedance (magnetic 2). These jacks can be used for a magnetic phono cartridge as well as a tape playback head. No separate input is provided for a crystal phono cartridge but the "extra" input can be used for this purpose. Output jacks are provided for connecting to power amplifiers as well as to a stereo or mono tape recorder. A derived center channel output also is provided; its level is controlled from the front panel. The rear of the chassis also contains two AC convenience outlets.

The circuit of the LC-21 uses 12AX7 tubes, all operating with 100V filament voltage for minimum hum. The power supply is built around a 6X4 rectifier tube for the B+ voltage, and a full wave semiconductor bridge rectifier for the filament voltage. The use of



the same tube type (12AX7) for the amplifying stages is an obvious advantage in that only the tube need be kept on hand for replacement in any stage that may require it.

In measurements made at USTC, the LC-21 easily met or exceeded its specifications. Frequency response was found to be flat within  $\pm 1$  db from 10 cps to 70 kc. It was down 3 db at 7 cps and at 82 kc. At the preamp's rated signal output of 2.5 volts, its total harmonic distortion was too low to be measured on the test instruments, and was estimated to be considerably less than 0.1% in magnitude. The preamp's intermodulation distortion was measurable, but extremely low, being 0.15% at 1 volt output, and 0.37% at 2.5 volts output. The RIAA phono equalization characteristic agreed with the RIAA standard within  $\pm 2$  db from 25 cps to 20 kc, and the NAB tape equalization was found to be correct within  $\pm 2$  db from 37 cps to 20 kc.

The preamplifier's square-wave response at 10 kc was quite good, showing a relatively small amount of overshoot and generally good waveform. At 50 cps, the flat portion of the square-wave response had a moderate tilt, indicating some phase distortion.

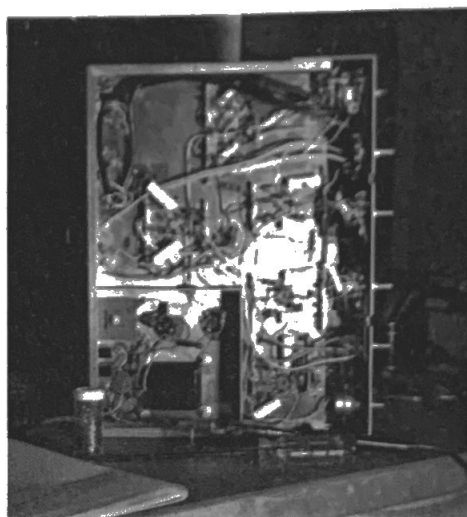
Sensitivity of the LC-21 for 2.5 volts output was 0.5 volt at the high-level inputs, 2.95 mv at the magnetic 1 input, and 8.2 mv at the magnetic 2 input. The magnetic input sensitivity figures given by USTC are for RIAA equalization, and the preamp would have about 4 db less sensitivity for NAB equalization.

The signal-to-noise ratio of the LC-21 was better than 81 db in the high-level positions, 62 db in the magnetic 1 position, and 60 db in the magnetic 2 position. Needless to say, these are very good figures and indicate that no hum or extraneous noise will be introduced into the signals by the LC-21.

The tone controls are feedback types, providing about 13 db of boost and cut at 100 cps and at 10 kc. The loudness curve, measured with the volume control in the "9 o'clock" position, has a very desirable

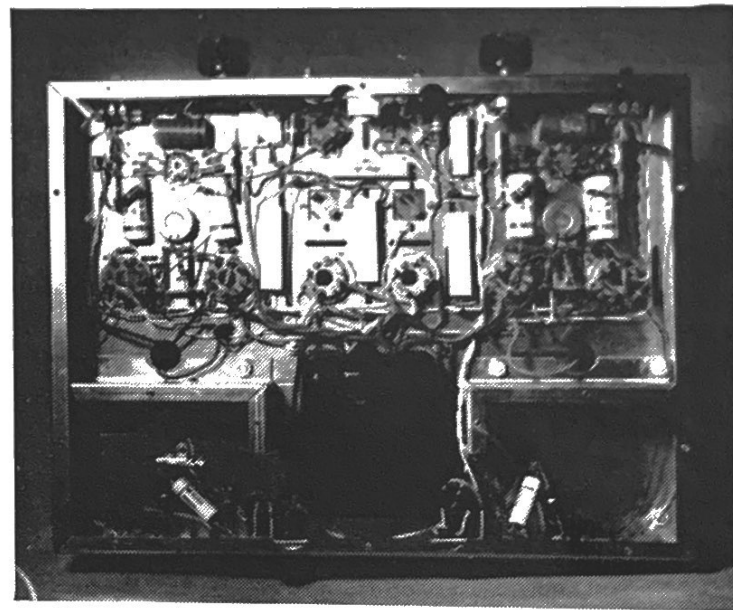
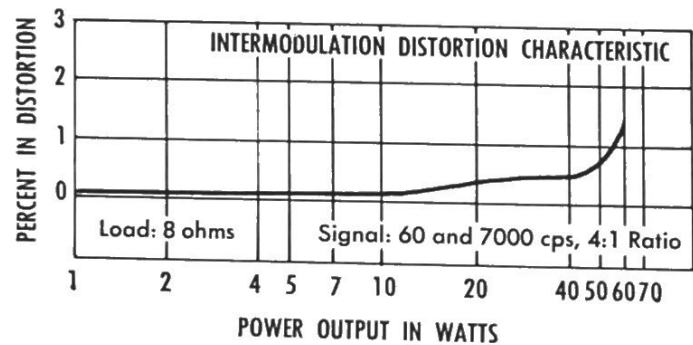
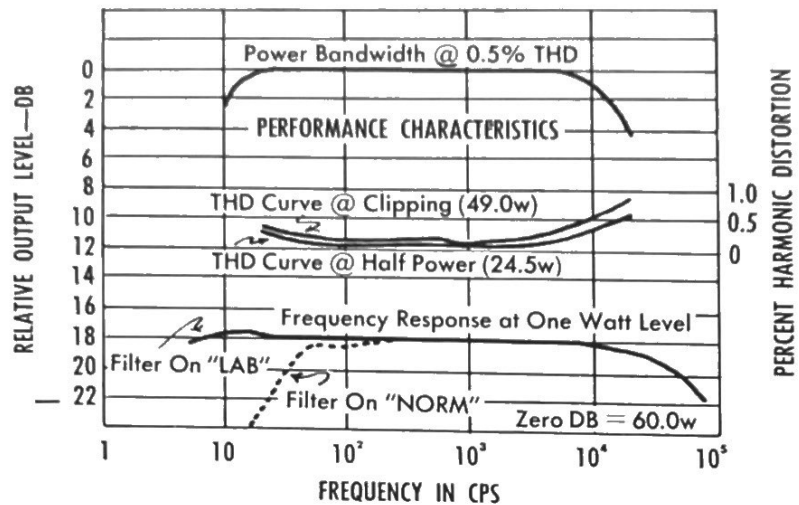
contrast from a musical standpoint. The scratch filter was found to be quite effective, cutting at the rate of about 6 db per octave above 1000 cps. The rumble filter was less effective, dropping the bass response at 10 cps by 6 db. The derived center channel feature enables connecting a monophonic power amplifier and speaker to provide a third sound source in the same room with the regular stereo pair of speakers, or to send a monophonic version of a stereo program to another room.

Used in conjunction with high quality power amplifiers and speakers, the Scott LC-21 proved to be a clean-sounding and convenient stereo control center. It is, in sum, one of the better audio "front ends" available today.



### How It Went Together

Like other audio kits from H. H. Scott, Inc., the LC-21 is a most carefully prepared project that should be successfully completed by even the novice kit builder. The manual is a model of clarity. Each series of working steps is accompanied by a life-size drawing, in color, that shows where the parts go. These drawings are part of the instruction book, and do not require tacking on the wall to be studied. The parts themselves are grouped on coded cards in the exact sequence in which they are to be added to the chassis, and there is a separate card for each group of instructions. Even a color-blind person can pick out the resistors; not only are the electrical values printed next to each resistor but the colored bands themselves are identified in print. As in most preamplifier-control units, the under-chassis wiring at one point must be done in tight quarters, but the instructions guide you safely through these narrows and advise you when the squeeze is over. Much of the hardware (connecting lugs, tube sockets, terminal strips) is preinstalled on the chassis, and most of the wires are precut to proper lengths. A small screwdriver and a generous supply of solder come with the kit. Total assembly time was about eighteen hours, all of them trouble-free.



### How It Went Together

The LK-150 is another carefully prepared audio kit from H. H. Scott with "suitcase" packaging and foolproof instructions. It is supplied with most of the mechanical parts already mounted. The kit builder adds such components as the bias meter and its switches, the input level switch, and the filter capacitors. The wiring comes next. The last parts to be mounted are the power and output transformers. Assembly is aided by a carefully planned sequence of instructions as well as by the clearly drawn and colored pictorials. When finished, the amplifier is adjusted by the kit builder for correct bias on the output tubes—a simple chore that is done in jig time with the aid of the built-in meter. Total construction time was nine hours.

10 kc. The damping factor improved when the input level was switched to 2.5 volts, being measured as 10 at 1,000 cps and at 100 cps, and 8 at 10 kc. With the input level switch in the 2.5-volt position, the amplifier clipped at 49 watts with an input of 2.6 volts, and in the 1.5-volt position the amplifier clipped at 48 watts with an input of 1.7 volts. The amplifier's signal-to-noise ratio was excellent at 94 db. In listening tests, the LK-150 "sounded" as fine as it measured. Its low distortion, ample power reserves, and freedom from noise seem well suited for the finest music-reproducing systems.

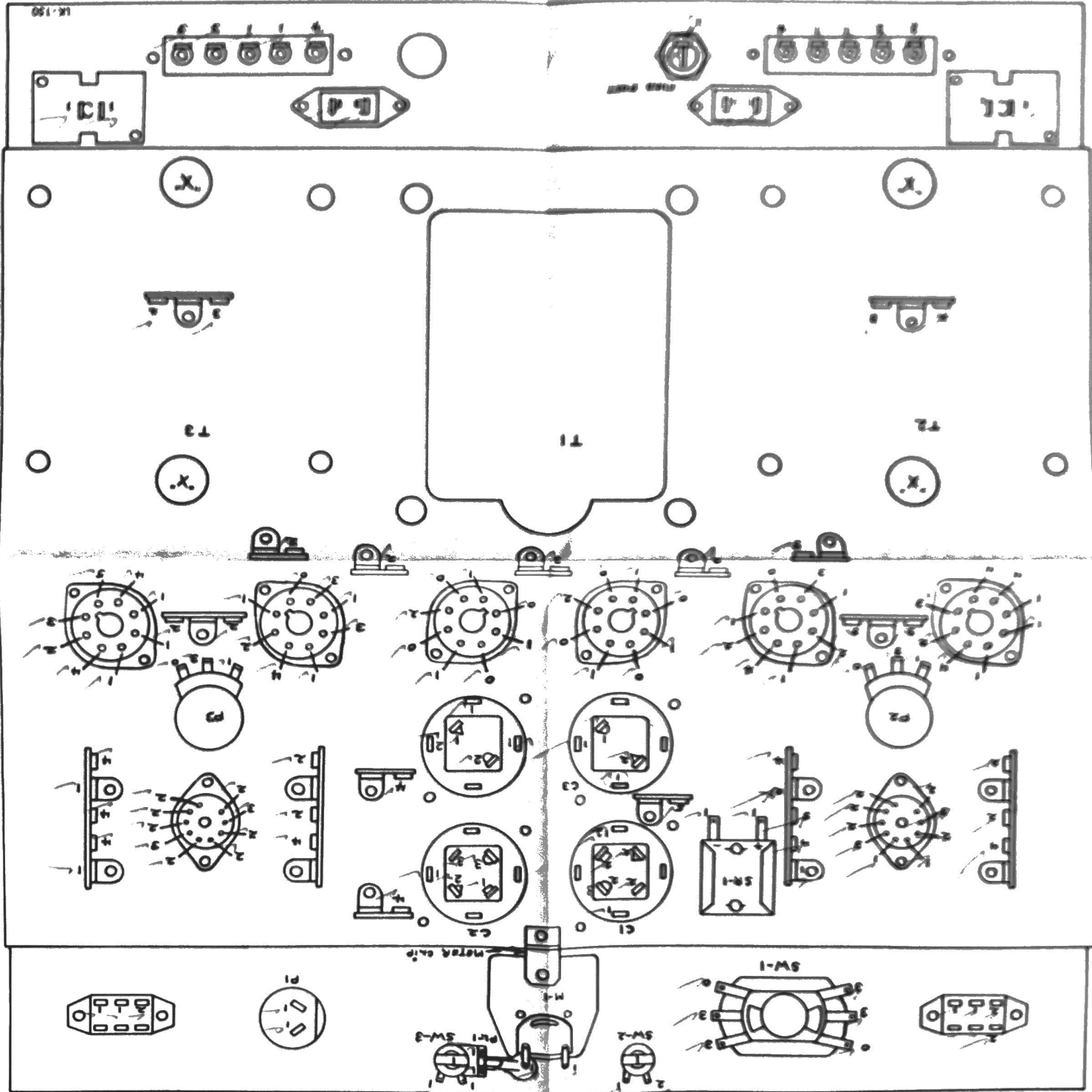


CHART AM-1 (Revised)

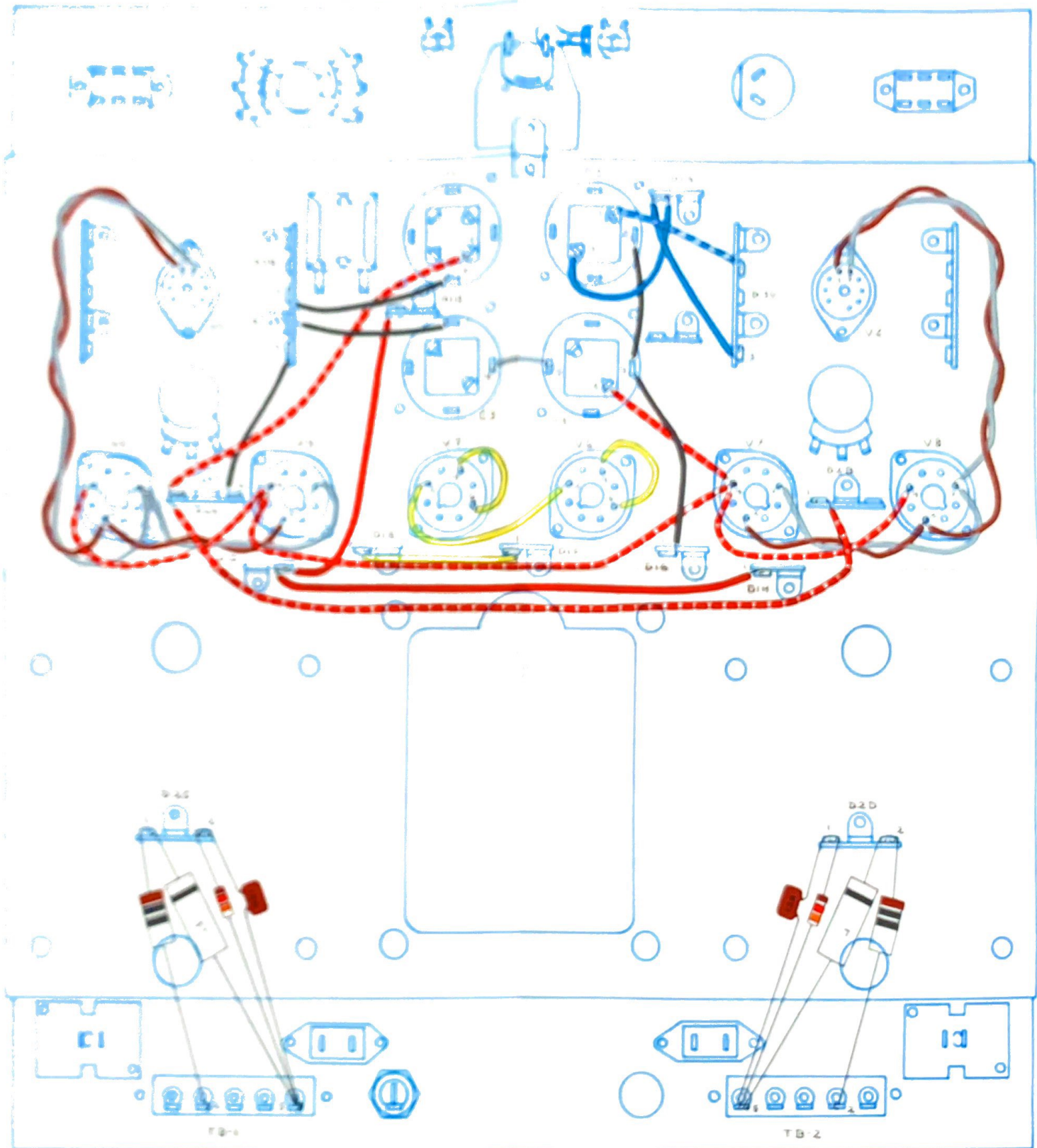
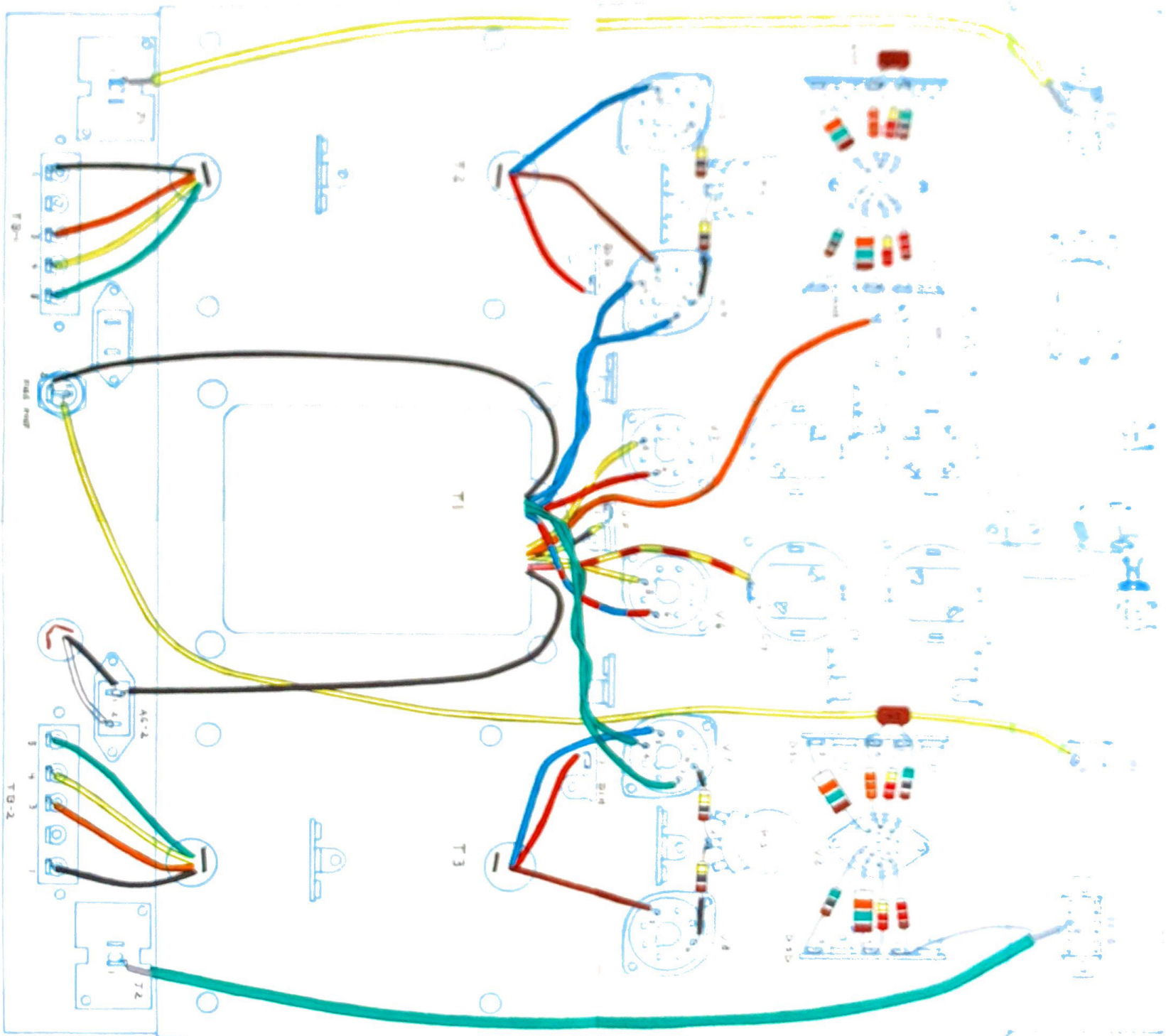
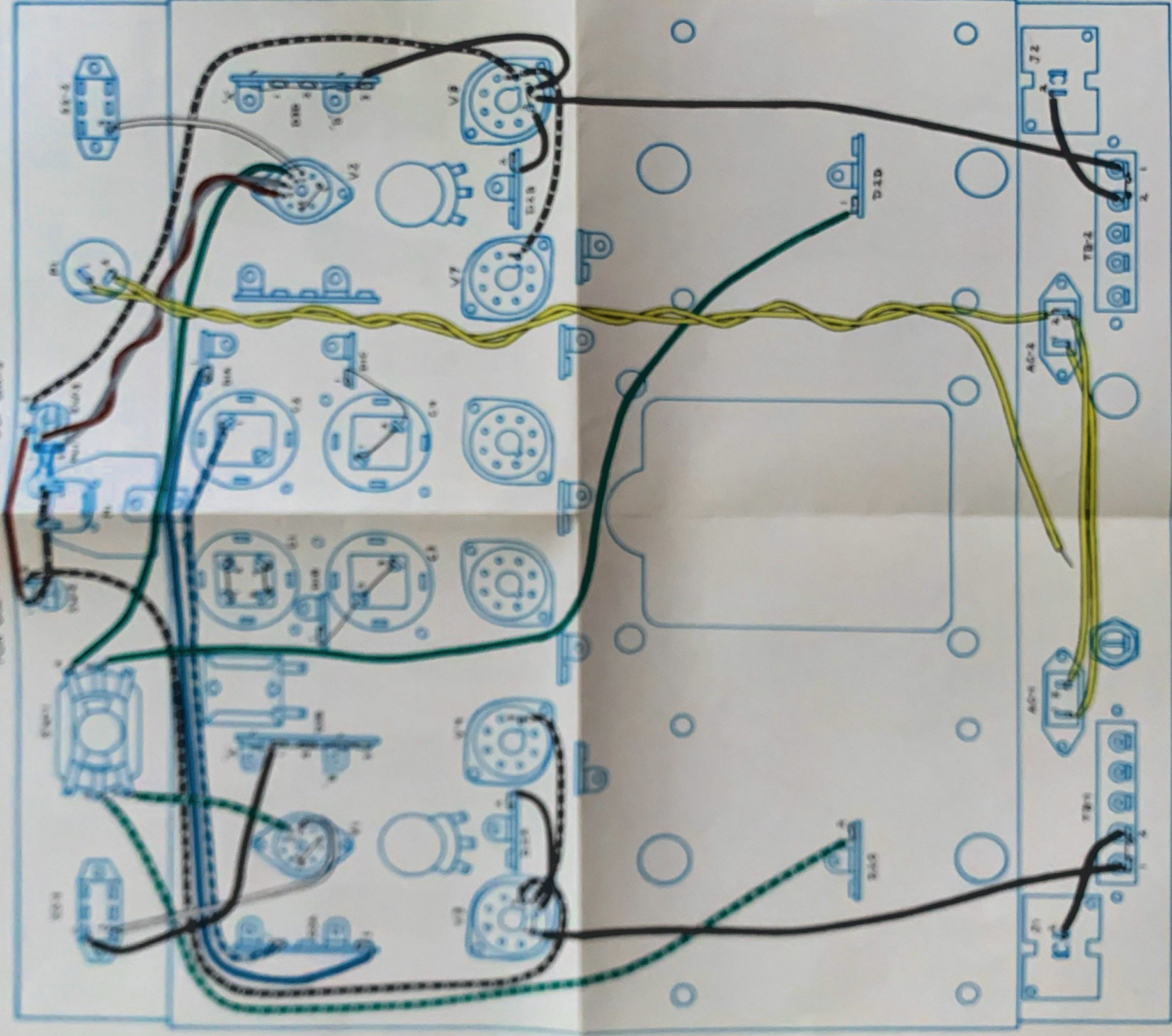


FIG-1

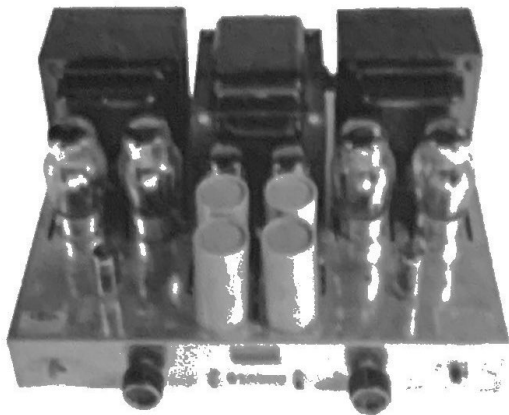
FIG-2



FOR USE WITH ASSEMBLY GROUP BW-2







## H. H. Scott Model LK-150

### Stereo Basic Amplifier Kit

**AT A GLANCE:** The Model LK-150 is a high-powered stereo basic amplifier available in kit form. Tests of a kit-built version, conducted at United States Testing Company, Inc., indicate that the LK-150 is a reliable performer capable of delivering 60 clean watts per channel. Dimensions are 15¼ inches wide, 11¼ inches deep, and 7¼ inches high. Weight is 52 pounds. Price is \$169.95; an optional case costs \$19.95. Manufacturer: H. H. Scott, Inc., 111 Powder Mill Rd., Maynard, Mass.

**IN DETAIL:** The LK-150 is a worthy entry in the class of high-powered basic amplifiers, as well as a smooth, trouble-free project for the do-it-yourselfer. Its power supply is built around a pair of GZ34 rectifier tubes and a selenium rectifier that supplies the bias. The amplifying circuitry, in each channel, consists of a 7199 triode-pentode tube that serves as a voltage amplifier, driver, and phase inverter feeding a pair of 6550s in the push-pull output stage. Feedback is used from the secondary of the output transformer to the cathode of the pentode section of the 7199. A switch on the front panel is used to short out part of the feedback circuit, thereby increasing the feedback and lowering the amplifier's gain. This action has the effect, of course, of changing the amplifier's input sensitivity: with more feedback (less gain), the sensitivity is rated at 2.5 volts; with less feedback (more gain), at 1.5 volts. This feature is intended to permit the use of preamplifiers which themselves have different amounts of signal output. Also contained on the front panel is the on/off switch, a subsonic roll-off switch for each channel, and a bias adjustment meter with a press-to-read switch for each channel. Mounted on the rear of the chassis are two 117-volt AC outlets (unswitched), two input jacks, two terminal strips with taps for 4-, 8-, and 16-ohm speakers, and a power-line fuse holder.

With the subsonic roll-off switch in the NORM position, the signal is fed to the amplifier through a 0.047-microfarad capacitor which attenuates the frequency response of the amplifier below 20 cps. The capacitor is bypassed when the switch is in the LAB position, and then the signal is fed directly to the amplifier with no attenuation of the low frequency response. Potentiometers, mounted on top of the chassis, together with the front panel meter and its switches, enable the user to adjust the bias for each channel quite readily.

USTC's performance tests were run with the input level switch and subsonic roll-off switch set in various positions. With sensitivity set to 2.5 volts and rolloff in the LAB position, the amplifier provided 49 watts of audio output per channel at clipping with only 0.1% harmonic distortion in each channel. At the amplifier's rated distortion figure of 0.5% both channels delivered 60.5 watts of audio power. With both channels operating together the left channel put out 51 watts at 0.5% distortion. Switching the subsonic filter to the NORM position caused the left channel output to drop to 48 watts at 0.5% distortion. The left channel output measured 58.8 watts at 0.5% distortion with the sensitivity set to 1.5 volts and the subsonic rolloff to LAB and dropped still further to 42.7 watts with the subsonic rolloff switched to the NORM position. These fine figures were all measured with a 1-kc input signal.

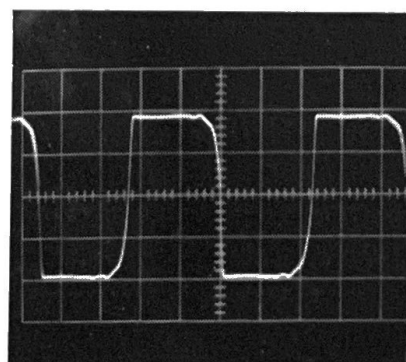
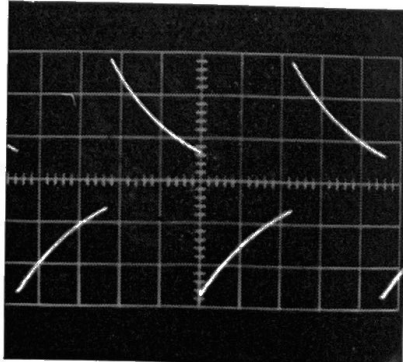
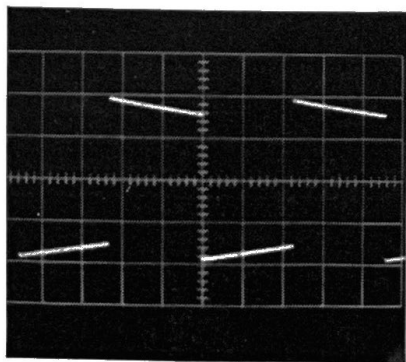
The amplifier's power bandwidth was measured at 0.5% harmonic distortion, and extended from about 10 cps to 15 kc. The distortion at clipping (49 watts) remained under 0.3% from 20 cps to 3 kc, rising to 0.85% at 20 kc. At half power (24.5 watts), the harmonic distortion remained under 0.2% from 35 cps to 5 kc, rising to 0.28% at 20 cps and 0.55% at 20 kc. Intermodulation distortion was very low up to 40 watts, where it measured 0.5%. Under 15 watts, the IM distortion measured below 0.3%. Above 40 watts, the IM distortion rose rapidly to 1.5% at 60 watts.

The frequency response of the LK-150—with the subsonic roll-off switch in the LAB position—was flat within  $\pm 0.3$  db from 5 cps to 15 kc and rolled off to -1 db at 32 kc and -3 db at 66 kc. In the NORM position, the low frequency response of the amplifier fell off, as expected, to -1 db at 38 cps and to more than -6 db at 15 cps.

The low frequency square-wave response of the Scott LK-150 was very good when the subsonic roll-off switch was in the LAB position. However, as expected, a higher amount of phase distortion and 50-cycle attenuation was present when the subsonic roll-off switch was in the NORM position. The 10-kc square-wave response was good in either position (the high frequency response is not affected by the subsonic rolloff) with only slight evidence of ringing.

The damping factor, with the input level switched to 1.5 volts, was 6.6 at 1,000 cps and 100 cps, and 5.7 at

*Square-wave response to 50 cps without rolloff (left), with rolloff, and to 10 kc.*



frequencies, falling off to -5.2 db at 20 cps, but remaining flat within +0.3 and -1 db from 80 cps to 20 kc. The tone control and loudness characteristics, shown on the accompanying graph, were satisfactory from a musical standpoint. The rumble filter boosted the 20-kc response (relative to 1,000 cps) to +2 db, and cut the 100-cps response to -3.5 db, and the 30-cps response to -10 db. This action introduces into the over-all response a gradual slope that is unusual in an amplifier, but its net effect does reduce rumble.

Measured at the 8-16-ohm tap, the amplifier's damping factor was 4.4 at 1 kc and 100 cps, dropping to 3.8 at 10 kc. On the 4-ohm tap, the damping factor was 3.3 at 1 kc. The sensitivity of the amplifier for 18 watts output at 8 ohms, and with the gain switch in the "normal" position, was 1.27 volts at the tape input, 6.3 millivolts at the tape head input, 12.2 mv on magnetic phono, and 520 mv on ceramic phono. The amplifier's signal-to-noise ratio for 18 watts output was 87 db through the tape input and 58 db through the low level inputs—both satisfactory figures. The amplifier had good stability even with capacitive loading—although the amount of ringing did increase noticeably when a square wave was passed through the amplifier.

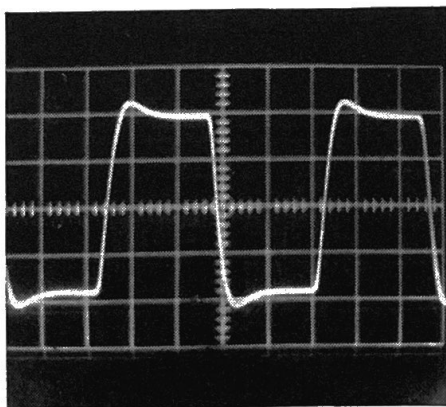
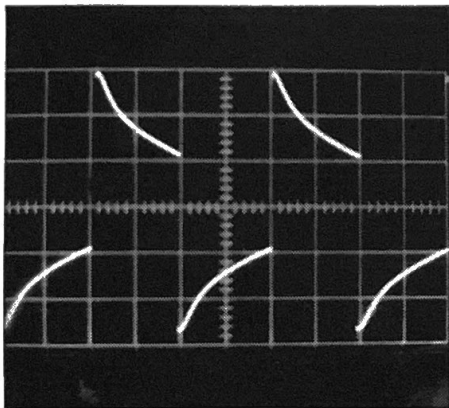
The FM tuner section—after alignment by USTC—had an IHF sensitivity of 2.2 microvolts at 98 megacycles, 2.75 microvolts at 90 mc, and 3.0 microvolts at 106 mc, indicating high sensitivity across the FM band. Harmonic distortion at 400 cps was 0.5%. The 1,000-cps distortion was 0.58%, while at 40 cps the tuner had 1.25% THD. The IHF IM distortion was a very low 0.05%, the signal-to-noise ratio was 62 db, the capture ratio of the tuner was 4.5 db. The point of maximum closure of the tuning eye was not always the point of

minimum distortion, and the user would be advised to tune by listening as well as by visual indication.

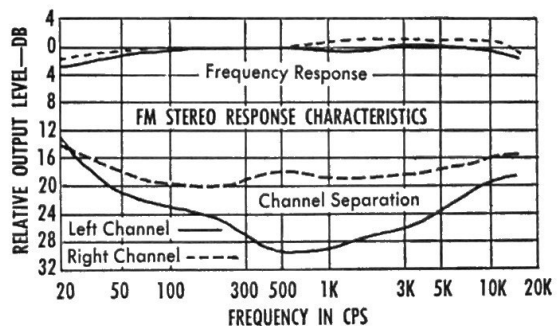
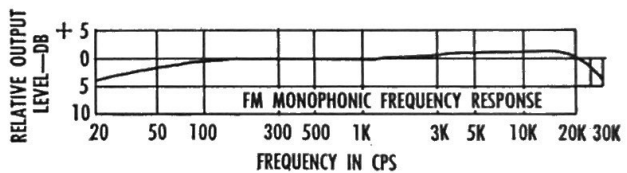
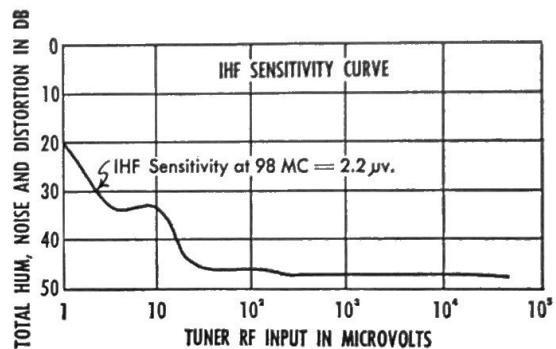
The monophonic frequency response of the tuner was flat within  $\pm 1$  db from 75 cps to 24 kc, and rolled off to -3 db at 25 cps and at 28 kc. In stereo operation, the response on the left channel remained flat within  $\pm 2$  db from 30 cps to 15 kc, and on the right channel within  $\pm 1.5$  db from 20 cps to 15 kc. The channel separation to the left channel was 29 db at 1 kc and remained above 20 db from 50 cps to 9 kc, dropping to 18 db at 15 kc. The separation to the right channel was 18.5 db at 1 kc, but held above 15.8 db from 28 cps to 15 kc.

The harmonic distortion on FM-stereo was higher, as expected, than on mono FM. Measured amounts were 4.9% at 400 cps, 6% at 40 cps, and 1% at 1,000 cps on the left channel, and 1.8% at 400 cps, 4% at 40 cps, and 1.9% at 1,000 cps on the right channel. The 19-kc pilot signal and the 38-kc subcarrier signal were suppressed 37 db and 35 db respectively below the 400-cps output level, when measured at the tape output jack. This is low enough to prevent interference with the bias signal on tape recorders during off-the-air tape recording.

In listening and use tests, the "Astro" proved to be a convenient and generally clean-sounding instrument, with ample power to drive medium- to high-efficiency speakers to enormous volumes of sound in a fairly large room. Its FM receiving ability, in a difficult reception area, proved to be among the best, and FM-stereo signals from stations more than fifty miles distant were pulled in and held with no difficulty. The AM section, fed from an external long-wire antenna, received signals from distances greater than 125 miles, and with—for AM—remarkable fidelity.



Astro's square-wave response to 50 cps (above) and to 10-kc signals.





111 Powdermill Road, Maynard, Mass

### OPEN, CASE OR CUSTOM MOUNTING H. H. SCOTT COMPONENTS

Due to changes in the required mounting hardware on the various units, the hardware shown on the Mounting Template may be incorrect for your particular set. Be sure to check your set against the pictures on the back of this sheet before ordering hardware.

#### Open Mounting (No Case) for units such as:

- (1) 99 A.B.C.D., 122, 209, 222 A.B.C., 333, 130, 370, 350, 350-B, 272, 299 A.B.C., 310 A.B.C.D., 314, 330 A.B.C.D., 335, 399, all of the kits except the 1K-150.
- (2) If the amplifier or tuner does not come with the rubber feet already attached, use the Z-P-1, Z-P-5 or Z-P-9 hardware (whichever is supplied). Put the 5/8" sheet metal screws through the feet and screw into the four corners of the set. If the holes have screws already in them, remove the short 1/4" screws and install the 5/8" screws and feet.

#### Case Mounting the Above Units (Wood & Metal):

- (3) Remove the rubber feet if they are attached to the set. Support the case on its rear edge between two books. Slide the component down into the case by holding the back of the component with your left hand and the front with your right. While inserting the instrument, be very careful not to dislodge any tubes. Position the unit so that the four holes in the bottom line up with the four holes in the case. The component is always inserted in the opening away from the grille.
- (4) Using the Z-P-10, 12 or 13 hardware which is supplied with the case, install the longer 1" sheet metal screws in the feet in place of the 5/8" screws. Start the screws into the holes (See Note) DO NOT TIGHTEN. Correctly position the unit in the case and install the rubber spacers between the unit and the case near the screws, where needed, to hold the set in position. Tighten the feet and screws so that they are SNUG, do not overtighten.

NOTE: Units having spacers with a hole in the middle should be installed between the unit and the case before the screws are started into the holes in the set.

#### SEE REVERSE SIDE FOR MOUNTING DETAILS

#### Custom Mounting the Above Units:

- (5) Remove the rubber feet. If the chassis has a hole near each side through both the top and bottom plates, use the Z-P-5 hardware and mount as shown on the Custom Mounting Diagram.
- (6) Remove the rubber feet. If the bottom cover has a hole near each edge, with an internally-mounted threaded fastener, use the Z-P-9 or Z-P-15 hardware (whichever is supplied or required) and mount as shown on the Custom Mounting Diagram.
- (7) Remove the rubber feet. If the bottom cover has a square hole punched out near each edge, use the Z-P-16 or Z-P-17 hardware (whichever is supplied or required) and mount as shown on the Custom Mounting Diagram.

#### Wooden Case Mounting for the:

296, 208, 340, 355, 4310, 4100, etc.

- (8) If the bottom cover has a hole near each edge, install as described in Paragraphs 3 & 6.
- (9) If the bottom cover has a square hole punched out near each edge, install as described in Paragraphs 3 & 7.

#### Metal Case Mounting the Above Units:

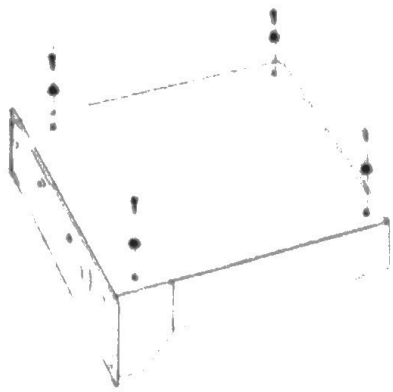
- (10) Mount the unit as described in Paragraphs 3 & 4.

#### Custom Mounting the Above Units:

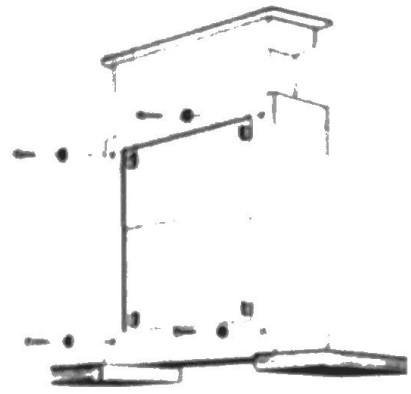
- (11) Mount as described in Paragraphs 6 or 7.

H. H. SCOTT, INC.

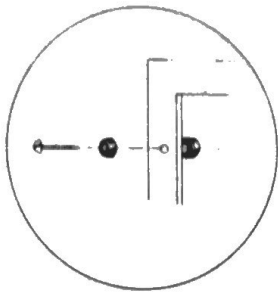
For more information or replacement of misplaced hardware, contact: 111 Powder Mill Road  
Maynard, Massachusetts



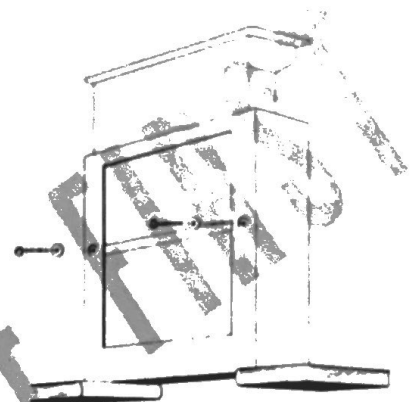
Z-P-1  
(2)



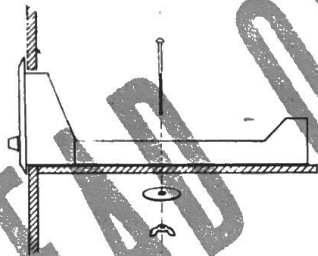
Z-P-10  
(4) & (6)



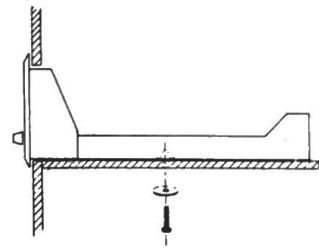
Z-P-13 -NOTE-  
(4) & (10)



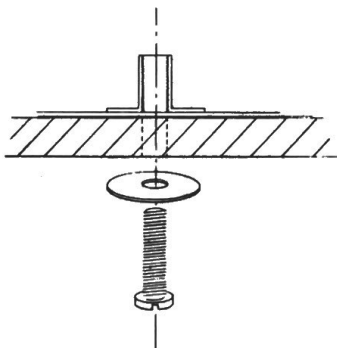
Z-P-15  
(3) & (8)



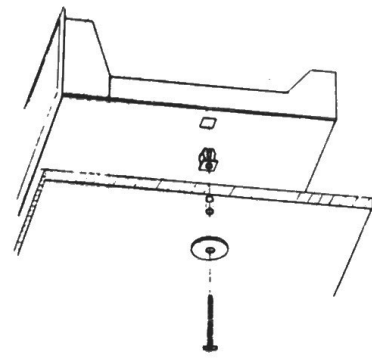
Z-P-5  
(5)



Z-P-9 & 15  
(6) & (8)



Z-P-9 & 15 Detail



Z-P-16 & 17  
(7), (9), & (11)

(SEE OVER ALSO)

# IMPORTANT NOTICE

Since the original introduction of the LK-150, the H. H. Scott Engineering Dept. has developed a new power supply circuit which, with certain wiring changes, will noticeably increase the power output of the LK-150. In addition, distortion is further reduced so as to be virtually unmeasurable at all power levels right up to maximum. Rather than wait for the next printing of the Instruction Booklet to make this change, we have decided to offer the modification immediately.

These new instructions are given on the inside of this sheet. You will also find a picture of the new wiring arrangement plus the list of changes called for in the assembly instructions. These changes primarily involve the electrolytics which are identified as C1, C2, C3, and C4 in your Instruction Booklet. A different C2 is being supplied than originally called for.

Except for the changes indicated, the book and color charts are completely accurate and can be followed faithfully. The enclosed Chart AM-1, which you use for installing the mechanical parts and for the concluding double-check, includes all the revisions.

## IMPORTANT

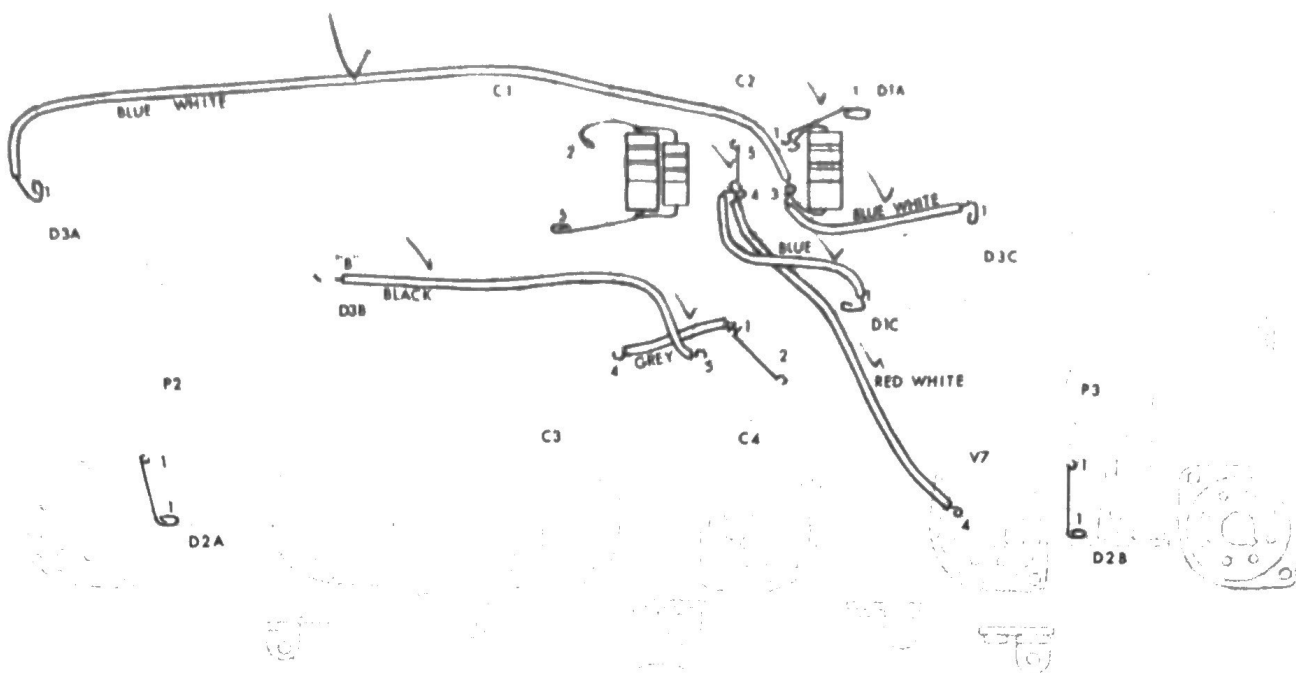
Before beginning the assembly, GO THROUGH THE INSTRUCTION BOOK AND MAKE A LITTLE CHECK IN FRONT OF ALL THE ASSEMBLY STEPS AFFECTED BY THE SUPPLEMENTARY INSTRUCTIONS. Thus, when you reach these steps during the assembly, your attention will be drawn to the Supplementary sheet.

## Supplementary Assembly Sheet

Page 11 A1-7 The can C2 supplied is now a 4x20/450. In positioning this can, refer to the chart on the reverse side.

### REPLACE THE INSTRUCTIONS IN THE BOOKLET WITH THE FOLLOWING

- Page 12 BM1-8 Connect a 5-3/4" red/white wire from pin 4, V7 (S3) to Pin 4, C2.
- BM1-20 Connect a 3-3/4" blue wire from pin 4, C2 to pin 1, D1C.
- BM1-22 Connect a 3 1/2" blue/white wire from pin 3, C2 to pin 1, D3C.
- Page 13 BM1-23 Connect a 2 1/2" heavy grey wire from pin 4, C3 (S1) to pin 1, C4.
- BM1-24 Omit soldering Pin 5, C1.
- BM1-25 Connect a 5" heavy black wire from Ground Lug "B" (ground lug "B" refers to the small hole in the side of the terminal strip which is on the strip riveted to the chassis), D3B to pin 5, C4 (S1).



Add these two steps:

- ~~BM1-26~~ Connect a buss wire from pin 2, D1A to pin 1, C2.
- ~~BM1-27~~ Connect a buss wire from pin 4, C2 (~~S3~~) to pin 5, C2 (~~S1~~).

REPLACE THE INSTRUCTIONS IN THE BOOKLET WITH THE FOLLOWING

- Page 13 ~~BM2-8~~ Connect a 10½" blue/white wire from Pin 1, D3A to Pin 3, C2.
- Page 14 ~~BM2-30~~ Connect a 1-3/4" buss wire from pin 1, C4 (~~S2~~) to pin 2, C4 (~~S1~~).
- Page 15 ~~BM3-7~~ Omit soldering Pin 2, C1.
- ~~BM3-7A~~ Connect the combined 22K 1 watt resistor (red/red/orange) and 10K 2 watt resistor (brown/black/orange) from pin 2, C1 (~~S3~~) to pin 5, C1 (~~S2~~).
- ~~BM3-9~~ Connect a large 10K resistor (brown/black/orange) from pin 1, C2 (~~S2~~) to pin 3, C2 (~~S3~~).
- Page 16 ~~BM6-6~~ Connect a buss wire (omit 22K resistor red/red/orange) from pin 1, P2 (~~S1~~) to pin 1, D2A (~~S3~~).
- ~~BM6-8~~ Connect a buss wire (omit 22K resistor red/red/orange) from pin 1, P3 (~~S1~~) to pin 1, D2B (~~S2~~).

Parts Required for the Above Changes

2 Resistors: 1 22K 1 watt; 1 10K 2 watt

H. H. Scott, Inc.  
111 Powder Mill Road  
Maynard, Mass.

**AUTHORIZED WARRANTY SERVICE STATIONS**

\*\*\* These stations which have triple asterisks beside them are fully equipped for doing multiplex service.

**ALABAMA**

Electronics Associates  
1925-11th Ave., South  
Birmingham, Alabama

Hi Fi Associates  
3180 Biscayne Blvd.  
Miami 37, Florida

**ARIZONA**

\*\*\* Emmett Research Labs  
1309 East MacDowell  
Phoenix, Arizona

Hi Fi Service Center  
201-203 West 11th St.  
Jacksonville 6, Florida

United TV  
1025 Grand Ave.  
Phoenix, Arizona

Southern Authorized Factory Serv.  
62 N. W. 27th Avenue  
Miami 35, Florida

**CALIFORNIA**

\*\*\* Bill's House of Natural Sound  
5303 South Hoover  
Los Angeles, California

**GEORGIA**

Baker Audio Service Dept.  
1361 Spring St.  
Atlanta 9, Georgia

\*\*\* Young's Electronics Co.  
2825 West Pico Blvd.  
Los Angeles, California

**ILLINOIS**

\*\*\* Electronic Engineers  
5615 W. Division St.  
Chicago, Illinois

Photo Electronics  
1027 University Avenue  
San Diego 3, California

Expert Electronics  
7110 S. Rockwell  
Chicago, Illinois

\*\*\* HiFi Equipment Service Co.  
595 Potrero Street  
San Francisco, California

**MASSACHUSETTS**

\*\*\* High Fidelity Service Co., Inc.  
127 Brighton Avenue  
Allston, Massachusetts

**COLORADO**

Central Television Ser., Inc.  
1305 West 38th Avenue  
Denver, Colorado

**MICHIGAN**

Chase Television Service  
16311 Grand River  
Detroit 35, Michigan

**CONNECTICUT**

\*\*\* Burbank Laboratories  
180 S. Whitney St.  
Hartford, Connecticut

\*\*\* The Audio Clinic  
17125 W. McNichols  
Detroit 35, Michigan

**DISTRICT OF COLUMBIA**

National Radio and TV Co.  
6902 Fourth St., N. W.  
Washington, D. C.

**MINNESOTA**

Anderson Audio Lab  
3230 East 42nd St.  
Minneapolis 6, Minnesota

**FLORIDA**

Hi Fi Associates  
3396 Coral Way  
Miami, Florida

**MISSOURI**

Glen Echo Electronics  
1061 South Brentwood  
St. Louis 17, Missouri

Hi Fi Associates  
1620 N. Federal Hwy.  
Fort Lauderdale, Florida

**NEBRASKA**

\*\*\* HI-Plx Service  
7001 Dodge Street  
Omaha, Nebraska

Mishlanie's Electronics  
801 Sunset Avenue  
Utica 4, New York

**NEW JERSEY**

\*\*\* BoHo Electronic Labs  
286 McLean Place  
Hillside, New Jersey

\*\*\* Suffolk Sound Repair  
1845 New York Avenue  
Huntington Station, New York

Approved TV Service Co.  
421 Boyden Avenue  
Maplewood, New Jersey

**OHIO**

Dealer TV and Radio Service, Inc.  
16108 Kirsman Road  
Cleveland, Ohio

**NEW MEXICO**

\*\*\* The Audio Center  
2119 San Mateo Blvd.  
Albuquerque, New Mexico

Magnetic Service Corp.  
1670 West First Avenue  
Columbus 12, Ohio

Ed's TV and Hi-Fi  
301 Maple, N. E.  
Albuquerque, New Mexico

\*\*\* Thomas Audio Service  
4849 Kemp Road  
Dayton 31, Ohio

**NEW YORK CITY (Metropolitan Area)**

\*\*\* Audio Workshop  
732 Broadway  
New York, New York

**PENNSYLVANIA**

\*\*\* Electronic Service Center  
5354 Germantown Avenue  
Philadelphia 44, Pennsylvania

Authorized Factory Service  
97 Reade Street  
New York, New York

\*\*\* Ray's Electric  
11748 Frankstown Road  
Pittsburgh 35, Pennsylvania

Authorized Phono-Tape Service  
1896 Jerome Avenue  
Bronx, New York

**RHODE ISLAND**

Electronic Engineering Service Co.  
790 N. Main Street  
Providence, Rhode Island

\*\*\* Component-Service, Inc.  
250 West 49th Street  
New York, New York

**TENNESSEE**

Nicholson's Hi-Fi Center  
115 19th Avenue  
Nashville, Tennessee

\*\*\* Hi-Phonics Company  
1949 Coney Island Avenue  
Brooklyn, New York

**TEXAS**

Calanco Electronics  
3025 Monticello Avenue  
Dallas 5, Texas

\*\*\* Marveltone Recording Service  
1168 Flatbush Avenue  
Brooklyn, New York

**UTAH**

Clyde W. Anderton  
129 E. Shamrock Drive  
Bountiful, Utah

Sigma Electric  
11 East 16th Street  
New York, New York

**WASHINGTON**

Phototronics, Inc.  
223 Westlake, North  
Seattle, Washington

Sono-Vision Services, Inc.  
167-03 Hillside Avenue  
Jamaica, New York

Sono-Vision Services, Inc.  
156 Hempstead Turnpike  
W. Hempstead, New York

Darrell A. Forsberg Co.  
12209 First Avenue, N. W.  
Seattle, Washington

Electronic Servicer of N. Y.  
Division of Strager Electronics Corp.  
65-37 Queens Blvd.  
Woodside 77, New York