

**Model 1120
Stereo
Console Amplifier**

Handbook of Instructions

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**Model 1120
Stereo
Console Amplifier**

No. 199-1090-100

MARANTZ CO., INC. - P.O. BOX 99 - SUN VALLEY, CALIFORNIA - 91352
A WHOLLY-OWNED SUBSIDIARY OF SUPERSCOPE INC., SUN VALLEY, CALIFORNIA 91352

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PURCHASER'S RECORD

Contents of Carton:

Model 1120 Stereo Console Preamplifier/Amplifier
No. 215-1008-100.

Accessory Kit, No. 249-1029-100

- Containing:
- 1 — 4A Fuse
 - 1 — #8 Hex Key Wrench
 - 2 — #6 Flat Washers
 - 2 — #6-32 x 3/4 Machine Screws
 - 5 — #4 Bronzed Wood Screws

Warranty Registration Card
With prepaid reply envelope

Mounting Template, No. 199-1082-000

Handbook of Instructions, No. 199-1090-000

Schematic Diagram, No. 199-1100-000

(Notices and other enclosures may also be included)

FOREWORD

AFTER UNPACKING

Please inspect this unit carefully for any signs of damage incurred in transit. It has undergone very strict quality control inspections and tests prior to packing. Thus it left the factory unmarred and in perfect operating condition. If the unit was shipped directly to you and if you discover damage, notify the transportation company without delay. Only you, the consignee, may institute a claim with the carrier for damage during shipment. However, the Marantz Company will cooperate fully with you in such an event. Save the carton as evidence of damage for their inspection. If you received the unit directly from a Marantz dealer, return it to him for adjustment.

It will be to your advantage to save all the packing materials — carton, fillers, cushions, etc. They will prove valuable in preventing damage should you ever have occasion to transport or ship the Model 1120. Be careful that you do not inadvertently throw away or lose the Accessory Kit envelope packed with the unit.

WARRANTY

To qualify for the Marantz 3-year Golden Warranty, please fill out the warranty registration card and mail it to the factory. Your dealer has reported the sale of this amplifier and date of delivery, but

WARRANTY REGISTRATION

Model: Marantz Model 1120

Serial No. _____

Purchaser's Name _____

Purchased From (Name) _____

Address _____

Price Paid \$ _____ Date Purchased _____

Date Warranty Reply Card Mailed _____

The above information becomes your permanent record of a valuable purchase. It should be promptly filled in at the same time that you fill in and mail the warranty registration reply card to Marantz. This information provides a valuable insurance record and must also be referred to should you have any correspondence with Marantz.

your warranty protection will not go into effect unless you promptly return the registration card packed in the carton.

HANDBOOK

This handbook of instructions contains complete instructions for the installation and operation of your Model 1120 Stereo Console-Amplifier.

Installing and operating the Model 1120 is not complicated, however the flexibility provided by its numerous operating features can not be fully appreciated until you have become fully familiar with its controls and connections.

For convenience, this handbook is divided into two parts. The first part covers the installation and operation of the Model 1120 in simple, non-technical terms. The second part provides a more detailed description of the circuits and their functions. It was written to answer the question "What goes on inside?", and to help in situations where the Model 1120 is to be used in special applications. Detailed technical specifications are also included in this second part.

To provide a means of readily distinguishing between references to the controls and connection facilities of the Model 1120 and those of the other system components, *italic* type is used for references to the Model 1120. Notice that the spelling and abbreviations of all such markings appear exactly as they appear on the front and rear panels of the instrument.

INTRODUCTION

The Marantz Model 1120 is a completely solid state, dual channel (Stereo) console-amplifier, employing the latest advancements in electronic packaging to ensure long life and high performance. It is designed to operate into load impedances of 4 ohms or higher. The Model 1120 is capable of continuously delivering 60 Watts RMS per channel into 8 ohm loads over the entire audio range from 20 Hz to 20 KHz.

The many features of this console amplifier permit

you to record on three tape recorders simultaneously, to modify tape recordings through the use of the high and low filters or the tone controls, and to use the preamplifier or amplifier sections separately. The ganged volume control varies the level of both audio channels simultaneously while maintaining stereo balance within ± 2 dB.

The power transistors in the Model 1120 are mounted on a large aluminum heatsink to permit full output operation for prolonged periods of time without subjecting the circuits to excessive temperatures. Built-in circuits protect your unit and speakers against damage from accidental overloads and dangerous levels of d-c voltages.

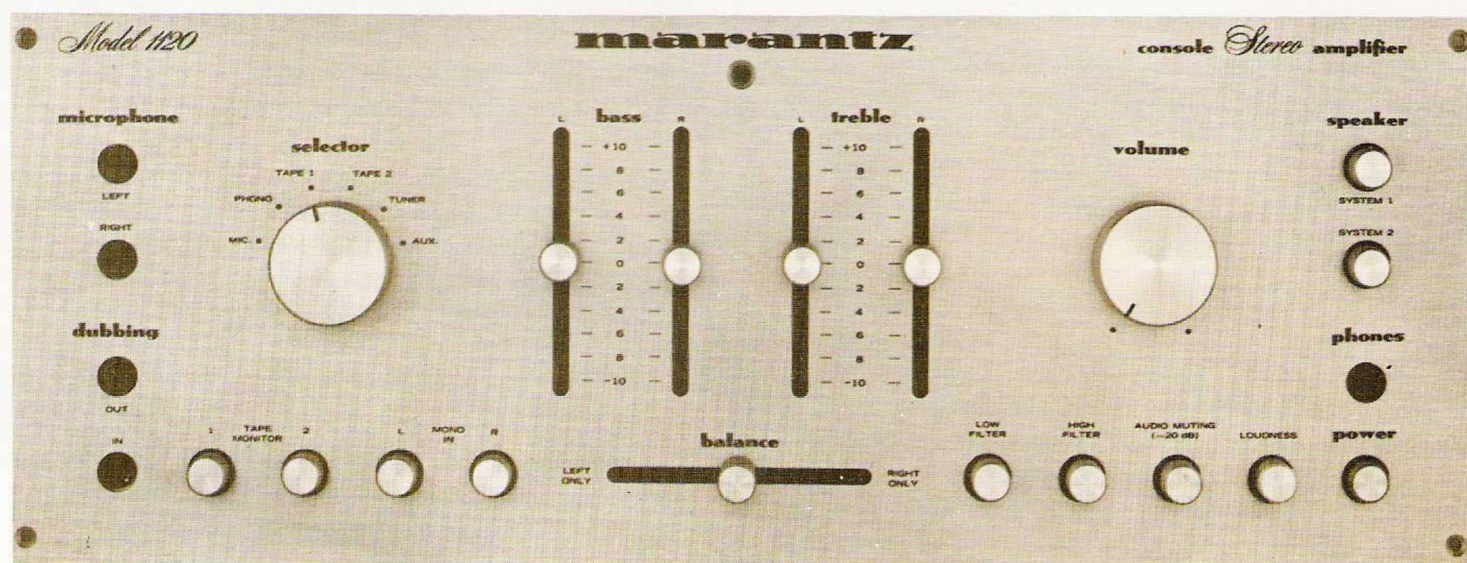


Figure 1. Front Panel Controls and Jacks

OPERATION

When operating the Model 1120 Stereo Console Amplifier for the first time, follow the simple directions outlined below using Figure 1. Later, after you have familiarized yourself with the function of all the controls and jacks (see the Functional Description section) you can take full advantage of the unit's versatility and features.

Step 1. Connect the input and output signals as described in the Preparation for Use section.

Step 2. Turn the *VOLUME* control all the way to the left (fully counter-clockwise), and set the *BALANCE* control to mid-position.

Step 3. Set all push-button switches to *OUT* position.

Step 4. Set both pairs of *TREBLE* and *BASS* controls to the center (*O*) position.

Step 5. Select the speaker system to be used by depressing the appropriate *SPEAKER* switch.

Step 6. Select the desired program source by turning the *SELECTOR* switch to the appropriate position.

Step 7. Depress the *POWER* switch. The pilot light at the top center of the front panel will illuminate.

Step 8. Wait 10 or 15 seconds, until the protection circuit relays energize, before turning up the *VOLUME* control. Adjust the *VOLUME* control for the desired listening level. Once you are familiar with the control setting versus sound level, it will not be necessary to reduce the *VOLUME* control setting before turning on the system.

Should you experience problems in the operation of your system, refer to the Service Notes section of this manual. The Service Notes section is intended to help you isolate the cause of a problem and possibly to correct it.

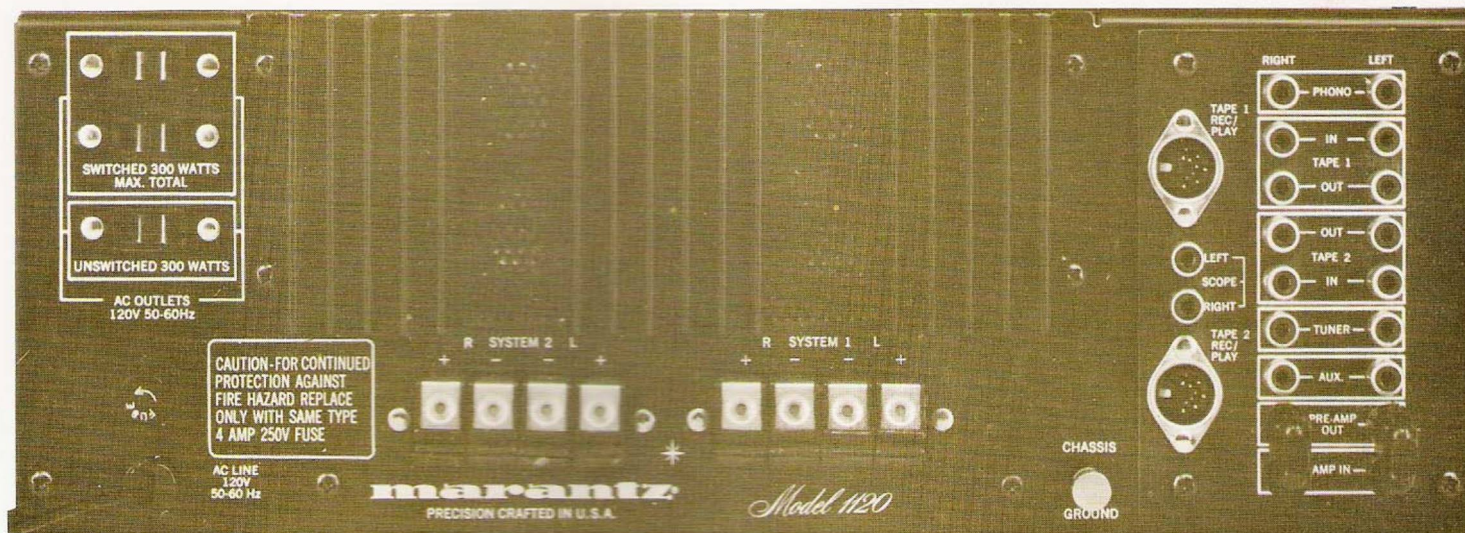


Figure 2. Rear Panel Connection Facilities

PREPARATION FOR USE

CABINET INSTALLATION

The Marantz Model 1120 Stereo Console can be installed in furniture cabinets and custom-built panels, or it may be used on an open shelf or table top. An attractive oiled-walnut cabinet (the Model WC-1U) may be ordered from your dealer. Remove the plastic feet from the bottom of the chassis and slide the unit into the cabinet from the front. Align the rear rail of the cabinet with the rearmost mounting holes of the amplifier and secure the rail in place. Fasten the unit into the cabinet using the hardware supplied in the Accessory Kit. The four bronze wood screws are used to secure the unit to the front of the cabinet. For custom installation, please read the instructions in the section on Custom Installation.

INPUT SIGNAL CONNECTIONS

All input signal connections to the Model 1120 should be made using shielded audio cables with phono plugs. Suitable standard cables are available from your dealer.

To obtain the full 60 Watts of undistorted output power available from the Model 1120, the low-level (*MIC* and *PHONO*) program source must be capable of providing 1.1 millivolts into 47K ohms over the entire audio spectrum (20 Hz to 20 KHz) and the high level program source must be capable of providing 110 millivolts into 25K ohms over the entire audio spectrum. If only the power amplifier section of the Model 1120 is to be used, the signal

source connected to the *AMP-IN* jacks must be capable of providing 1.1 volts into 47K ohms over the audio range.

Figure 2 shows the location of the input and output jacks on the rear panel. These are for "permanent" connections. Use of the front panel controls and jacks will be discussed later. *L* Channel corresponds to the left audio channel; *R* Channel to the right audio channel. To avoid confusion, it is suggested that you connect one cable at a time between the Model 1120 and the other components of your system. This way, improper connections between signal sources and destinations will be avoided.

PHONO Input jacks — These jacks are for use with a turntable or record changer employing a magnetic phono cartridge requiring a 47K ohm resistive load.

If hum is heard when playing records, it can be evidence of inadequate grounding or shielding of your record player or connections. Connect a separate ground wire from the turntable or record changer frame to the **CHASSIS GROUND** binding post on the Model 1120. If the tone-arm is mounted on a wood panel or is otherwise insulated from the frame, connect the arm's mounting base to the grounding wire with a short 'jumper'. If the two pairs of signal wires in the tone-arm have a single overall shield, connect the shield to the grounding wire. Keep the two phono connecting cables and grounding wire close together. In three-wire (common ground) systems, this will minimize "ground loops". If excessive phono hum persists, and if your phono cartridge has a clip connecting the two "common" wires together, remove that clip.

NOTE: If the *PHONO* jacks are to remain unused, leave the shorting plugs installed in the jacks. Because these inputs have very high gain and a high input impedance, you may otherwise hear low-frequency noise when the *SELECTOR* switch is turned momentarily to the unused phono position.

TAPE 1 IN jacks — The jacks are primarily intended to receive the output signals from a tape recorder preamplifier. These jacks may be used to connect any high level signal source to the Model 1120, however, such use does not allow the *TAPE 1 MONITOR* switch to perform its intended function.

TAPE 2 IN jacks — These jacks are identical in function to the *TAPE 1 IN* jacks. They are provided for connection of a second tape recorder.

TUNER jacks — A stereo or mono tuner may be connected to these jacks. These jacks may be used to connect any high-level signal source to the Model 1120.

For stereo (multiplex) FM tuner reception, proceed as follows:

Connect a pair of audio cables between the tuner's A and B or left and right output jacks and the Model 1120 *L* Channel and *R* Channel *TUNER* jacks. Set the front panel *SELECTOR* switch to *TUNER*. Set the *MONO IN* switches for "stereo" operation.

For monophonic FM or AM tuners, proceed as follows:

Connect one cable to either *L* Channel or *R* Channel *TUNER* jack. Set the front panel *SELECTOR* switch to *TUNER*. Set the *MONO IN* switches for "mono" operation.

AUX jacks — These jacks are for connecting miscellaneous high level sources (such as tape players with self-contained playback preamplifiers, phonographs that provide RIAA equalized output from a self-contained preamplifier, additional tuners or receivers, etc.).

AMP-IN jacks — These are the input terminals for the power amplifier section of the Model 1120.

NOTE: The *PRE-AMP OUT* and *AMP-IN* jacks are normally bridged by two rear panel bridging connections (molded RCA type pin plug assemblies) which are provided with each Model 1120. These bridging connections must remain intact for normal operation of the unit. However, should you intend to use such

equipment as a graphic equalizer, compressor/limiter, or expander, you may connect these instruments to your Model 1120 by removing these bridging connections and connecting appropriate shielded audio cables between your Model 1120 and such processing equipment.

TAPE 1 REC/PLAY jack — The rear panel 5-pin DIN jack permits use of European-type 5-wire connectors between the Model 1120 and similarly equipped tape recorders. This jack is connected in parallel with the *TAPE 1 IN* and *TAPE 1 OUT* jacks. The polarizing pin in the connector assures proper phasing.

TAPE 2 REC/PLAY jack — This 5-pin DIN jack serves the same purpose as the *TAPE 1 REC/PLAY* jack, but is connected in parallel with *TAPE 2 IN* and *TAPE 2 OUT*.

CHASSIS GROUND — This binding post provides a convenient ground point for program sources.

OUTPUT SIGNAL CONNECTIONS

All output signal connections from the Model 1120 should be made with shielded audio cables, except the connections to the loudspeakers which are described later under *SYSTEM 1/SYSTEM 2* jacks.

TAPE 1 OUT jacks — The signals available at these jacks are selected by the *SELECTOR* switch, and are intended for routing to your tape recorder for recording.

TAPE 2 OUT jacks — The jacks are connected in parallel with the *TAPE 1 OUT* jacks and provides a signal for recording on a second tape recorder.

PRE-AMP OUT jacks — These jacks make the output of the Model 1120 preamplifier available at the rear panel.

SCOPE jacks — These jacks are for testing phase, separation, and balance of the program source material, using an oscilloscope. Owners of Marantz tuners with a built-in oscilloscope tuning indicator may take advantage of this feature by connecting a pair of audio cables from the *SCOPE* jacks on the Model 1120 to the external scope input jacks on the tuner. When the tuner's "Display" switch is set to "External", the program source signals chosen by the *SELECTOR* switch will be available at the *SCOPE* jacks for evaluation. Signals available at the *SCOPE* jacks are affected only by the *SELECTOR* switch on the front panel.

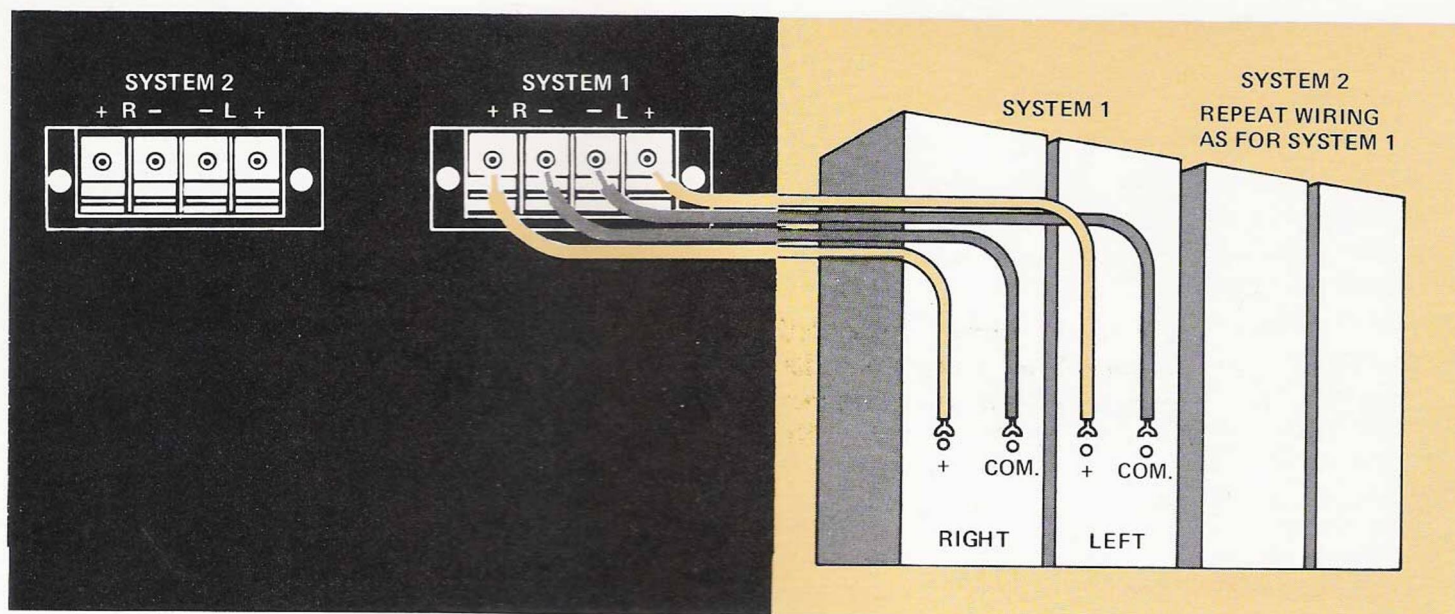


Figure 3. Loudspeaker System Connections

SYSTEM 1/SYSTEM 2 jacks — These jacks, located in the center of the rear panel, will accommodate two loudspeaker systems; each speaker having a rated impedance of 4 ohms or more. If main and remote speakers will be used, do not use 4 ohm speakers. Use 8 or 16 ohm speakers only. When using only one pair of speakers, connect them to the terminals marked **SYSTEM 1**. The terminals marked **SYSTEM 2** are used for connecting a second pair of speakers.

CAUTION: Improper connection of the Model 1120 may result in damage to loudspeakers or other equipment. Such damage is not covered by the warranty. Read all instructions carefully before making connections, or applying power to the unit. Marantz Company, Inc. shall not be liable for any damage resulting from improper connection or operation of this instrument. **NEVER DIRECTLY CONNECT THE OUTPUT TERMINALS OF ONE CHANNEL IN PARALLEL WITH THOSE OF ANY OTHER.**

Use care when connecting the Model 1120 to a loudspeaker which contains a built-in power supply — such as an electrostatic speaker. The “common” speaker-connection terminal of these devices may be capacitively coupled through the power supply. The (—) terminals of the Model 1120 must be connected to the “common”, or (—), terminals of the loudspeaker system.

For normal installation, using 8 ohm impedance loudspeakers, ordinary #18-gauge, two conductor lamp cord may be used for distances of up to 30 feet between amplifier and loudspeakers. For longer distances, use #16-gauge or heavier wire.

Connections to 4 ohm impedance speakers should be made using #16-gauge wire for distances up to 30 feet and correspondingly heavier wire for greater distances.

In connecting two loudspeakers for stereo operation, it is important that speaker phasing (polarity) be correct to get the best stereo effect and bass response. If you are in doubt, listen to the system with both *MONO IN* switches depressed. Then reverse the connections at one speaker. You are properly phased with the connections that give the most bass in the “mono” mode. Correct phasing is best achieved when using identical loudspeakers, by simply coding each wire for identification. Close inspection of standard lamp cord will reveal some form of coding on the insulation (a ridge or a groove on one edge); or one of the wires may be tinned while the other is not. Other means of coding are tying a knot at each end of one wire or using tape to identify both ends of the same wire.

The coded wires can then be used for identical connections in each channel. For example, the coded wire in each pair can be connected to the “common” terminal of each loudspeaker and the (—) terminal of each amplifier channel. The uncoded wire of each pair is then connected to the remaining loudspeaker and amplifier terminal of each channel. This procedure ensures correct polarity or phasing of identical loudspeakers.

Figure 3 shows the correct connections between the output terminals of the Model 1120 and your loudspeakers. As you face your system, the loudspeaker to your left is to be connected to the *L* terminals; the one on your right to the *R* terminals.

POWER CONNECTIONS

LINE CORD — With the *POWER* switch on the front panel turned off, plug the line cord into an electrical outlet providing 108 to 132 volts, 50 to 60 Hz AC only.

CONVENIENCE OUTLETS — Three AC outlets on the rear panel are provided for powering associated components of your system, such as power amplifiers, tuners, tape recorders, record players, etc. The top two of these are controlled by the front panel *POWER* switch. Do not attempt to provide switched power to system components which require more than 300 Watts TOTAL. The power requirements for all Under-

writers' Laboratories listed appliances is marked on the unit. Overloading the *SWITCHED* convenience outlets could result in damage to the Model 1120 which is not covered by the warranty. The *UNSWITCHED* outlet at the bottom is not controlled by the *POWER* switch. This outlet is for powering a turntable or record changer that has its own on-off switch.

POWER REQUIREMENTS — The amount of power consumed by the Model 1120 is determined by the load impedance and the output power supplied to the load. The "rated" input power requirement is representative of the power requirements at 10% of full audio output into an 8 ohm load.

FUNCTIONAL DESCRIPTION

Proper operation and full utilization of the many features of the Model 1120 Stereo Console requires an understanding of the switch and control functions. The location of all front panel controls and jacks is shown in Figure 1. The function of each control and jack is described below, as well as some suggestions for use of tape recorders with the Model 1120.

MICROPHONE jacks — These front panel jacks are intended for use with any low-level (–30 to –60 dBm output) microphone wired for unbalanced operation. Input impedance of the *MIC* circuit is 47,000 ohms. The jack marked *LEFT* is the input to the left audio channel and the *RIGHT* jack is the input to the right audio channel.

DUBBING OUT jack — This front panel jack is internally connected in parallel with all rear panel "Tape Out" jacks and connectors. Thus any signal available at the jacks on the rear panel are simultaneously available at the front panel. You can connect the recording inputs of an "external" tape recorder to this jack using a standard 3 conductor phone plug. (An external tape recorder is one that is not part of your permanent system — i.e., one not normally connected to the rear panel tape jacks.)

DUBBING IN jack — This front panel jack has a built-in switch that automatically disconnects the inputs to the *TAPE 2 IN* jacks and the *TAPE 2 REC/PLAY* connector on the rear panel when you insert a standard 3-conductor phone plug. The signal inserted into this jack is routed to the system

by depressing the *TAPE 2 MONITOR* switch. You can connect the playback outputs of an "external" tape recorder to this jack. Suitable 3-conductor phone plugs are available at your dealer.

TAPE MONITOR 1 and 2 switches — With both switches in the normal (out) position, the program source signal being played through the system is determined by the setting of the *SELECTOR* switch. When either *TAPE MONITOR* switch is depressed, the signal from the appropriate tape recorder is played through the system. However, the program source selected by the *SELECTOR* switch continues to be fed to both *TAPE OUT* jacks and both *REC/PLAY* connectors on the rear panel, and the *DUBBING OUT* jack on the front panel. It is this feature that permits you to feed any program source to your tape recorders while you listen to (monitor) the recording as it is in progress. Of course, the tape recorder must be equipped with separate record and playback heads and preamplifiers.

It is important to note that the *TAPE 2 MONITOR* switch must be in the "out" position to allow the monitoring of *TAPE 1*. When both switches are simultaneously in the depressed position, the signal applied to the *TAPE 2* inputs will be played through the system.

SELECTOR switch — This six position switch selects the program source to be heard and/or recorded. *MIC*, *PHONO*, *TAPE 1*, *TAPE 2*, *TUNER*, or *AUX* may be selected. Each position selects the program source connected to the corresponding jacks on the front or rear panel. When both *TAPE MONITOR* switches are in the normal position, the selected program source will be played through the system and will be available at all recording out jacks.

MONO IN L and R switches — With both switches in the normal (out) position, the Model 1120 is in the "Stereo" mode. This is the normal setting for these switches. When the *L* switch is depressed, the signal available at the left audio channel input, selected by the *SELECTOR* or *TAPE MONITOR* switches, is simultaneously applied to both audio channels of the amplifier. Depressing the *R* switch applies the right audio channel input to both channels of the amplifier. With both switches simultaneously in the depressed position, both input channels are equally mixed and the mixture (a monophonic equivalent of the stereo input signals) is fed to both channels of the amplifier. This position (both switches "in") is particularly useful for playing or taping monophonic records using a stereo cartridge.

BASS and TREBLE controls — These controls alter the tonal balance of the program signals to suit your individual listening preference. Because each control is separate, it is possible to compensate for unbalanced room acoustics or any other tonal imbalance between the channels of stereo program material. The left-hand sliding controls adjust the response of the left audio channel; the right-hand controls adjust the right audio channel. With all controls in the mid-position (mechanically detented) the response of the amplifier is approximately "flat".

BALANCE control — This control alters the level of the output channels. As it is moved away from its center position, it decreases the level in one output channel while maintaining the level in the other output channel.

LOW FILTER switch — This switch may be used to sharply reduce turntable rumble, low frequency noises, or boomy exaggerated bass. With the switch "in" a circuit which attenuates (at a 12 dB/octave slope) all frequencies below 50 Hz is activated. Obviously, use of the filter will reduce desired low frequency sounds as well as unwanted noise, although loss of this bass will go unnoticed with most musical material. In the "out" position, the 50 Hz filter is by-passed.

HIGH FILTER switch — This switch may be used to sharply reduce high frequency noises, such as those encountered on poorly recorded tapes or old worn disc recordings. With the switch "in", a circuit which attenuates (at a 12 dB/octave slope) all frequencies above 9 KHz is activated. This filter will usually prove effective in suppressing tape "hiss" or the "scratchy" sound from poor quality or carelessly handled records. In the "out"

position, the 9 KHz filter is switched out of the circuits.

VOLUME control — This control adjusts the level of both output channels simultaneously, while maintaining stereo balance within ± 2 dB at all normal settings. This control does not affect the signal level available at the recording out jacks.

AUDIO MUTING (-20 dB) switch — This switch is normally set in the "out" position. Should you desire to temporarily reduce the output sound level without disturbing the *VOLUME* control, depressing the switch will reduce the volume 20 dB. The output sound will revert to its original level when the switch is returned to the "out" position.

LOUDNESS switch — In the depressed position, this switch activates an equalization circuit which boosts the bass and treble of the Model 1120 to closely approximate the Fletcher-Munson loudness curves. In this way, the apparent loudness of musical tones is equalized at low listening levels. At higher volume control settings this equalization is not necessary and the circuit is automatically by-passed, even though the switch is "in". With the switch set to "out", only the tone controls affect the frequency response of the amplifier.

POWER switch — This switch applies AC power to the Model 1120 and to the *SWITCHED* convenience outlets when depressed. When depressed again, AC power is turned-off.

PHONES jack — This jack is internally connected to the outputs of both audio channels. The *PHONES* jack is designed for use with low impedance stereo headphones. The design of the headphone circuit is such that use of most 8 ohm impedance phones will give approximately the same apparent output level as using 8 ohm loudspeakers. Two sets of headphones in parallel, may be used with the aid of a 'Y' connector.

SPEAKER SYSTEM 1 and 2 switches — Either the *SYSTEM 1* or the *SYSTEM 2* pair of speakers may be selected individually by depressing the appropriate switch; or both systems may be selected simultaneously by depressing both switches. When both switches are in the "out" position, all loudspeaker terminals are internally disconnected from the Model 1120. The *PHONES* jack, however, is always connected and is not affected by the *SPEAKER* switches.

SOME SUGGESTIONS ON USING TAPE RECORDERS WITH YOUR MODEL 1120

The Model 1120 has five sets of inputs and outputs for tape recorders; *TAPE 1*, *TAPE 2*, *TAPE 1 REC/PLAY*, *TAPE 2 REC/PLAY*, and *DUBBING*. To avoid confusion in the following discussion, references to "tape monitoring" assume the recorder is equipped with separate record and playback heads and separate record and playback pre-amplifiers. To further simplify this discussion, the recorder connected to *TAPE 1* or *TAPE 1 REC/PLAY* will be referred to as the "MAIN" recorder; the recorder connected to *TAPE 2* or *TAPE 2 REC/PLAY* will be referred to as the "SECONDARY" recorder; the recorder connected to the *DUBBING* facilities on the front panel will be referred to as the "EXTERNAL" recorder.

It should be noted that the *REC/PLAY* connectors are internally wired in parallel with the corresponding *TAPE IN* and *TAPE OUT* jacks. Therefore either the *TAPE 1 REC/PLAY* jack or the *TAPE 1 IN* and *OUT* jacks may be used, but both should not be used simultaneously. This also applies to *TAPE 2* connections.

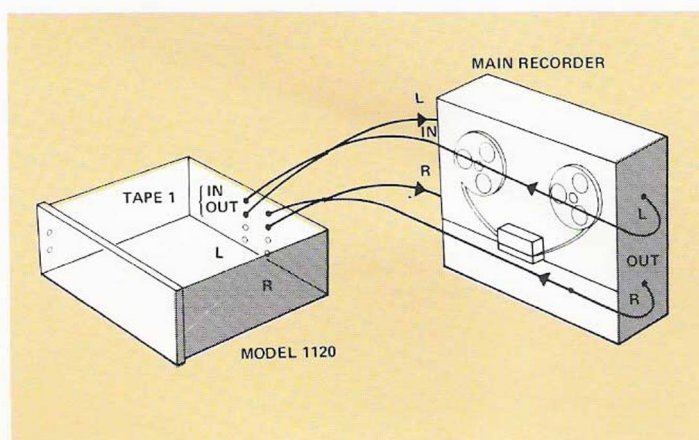


Figure 4. Typical Connection for "Main" Recorder

The simplest system is using only one recorder. If the recorder is to be a "permanent" part of the system, connect it to the *TAPE 1* jacks as shown in Figure 4. If the recorder is only a "temporary" part of the system, connecting it to the *DUBBING* jacks as in Figure 5 may be preferred. In either case, recordings may be made from the program source simply by placing the recorder in the record mode. To monitor the tape as it is being recorded, the proper *TAPE MONITOR* switch must be depressed; *TAPE 1* for a recorder in the *TAPE 1* jacks, and *TAPE 2* for a recorder in the

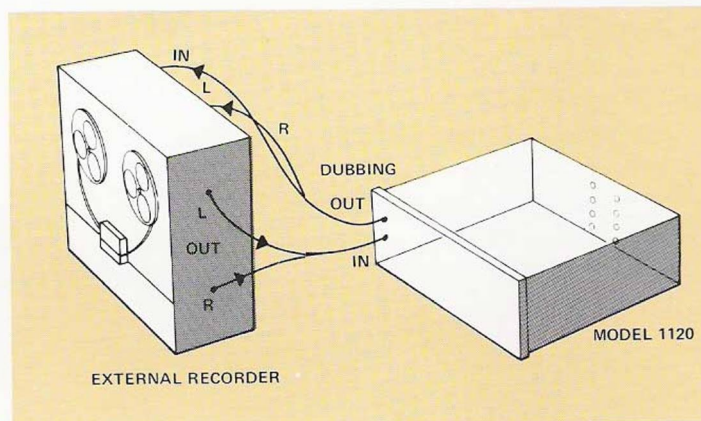


Figure 5. Typical Connection for "External" Recorder

DUBBING jacks. Playback of the recording may be accomplished in the same manner as monitoring (or, for the permanently connected recorder, by setting the *SELECTOR* switch in the *TAPE 1* position) except that the recorder is in the playback mode instead of the record mode.

When two recorders are to be used, connections should be made as in Figure 6 or Figure 7 connecting the "MAIN" recorder to the *TAPE 1* jacks and the "SECONDARY" recorder to the *TAPE 2* jacks or the "EXTERNAL" recorder to the *DUBBING* jacks. The program source may be recorded on either or both recorders simply by placing the appropriate recorder in the record mode of operation.

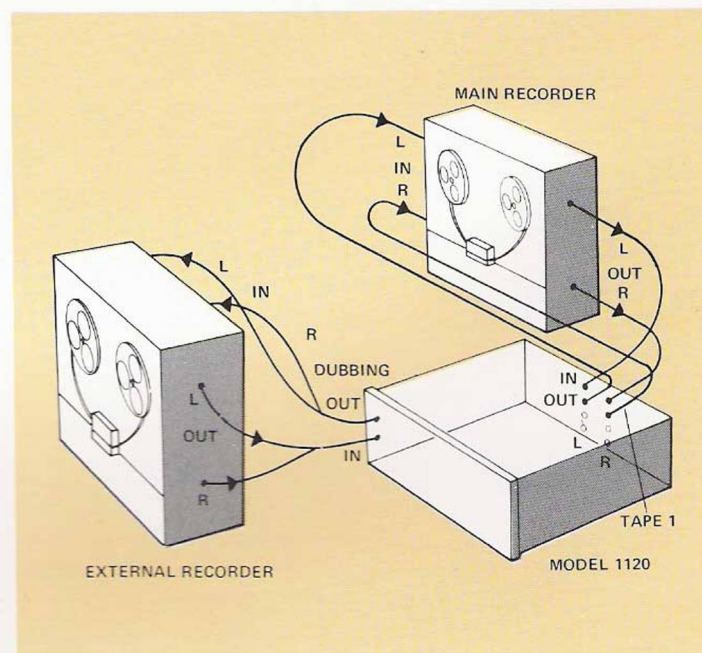


Figure 6. Typical Connection for "Main" and "External" Recorders

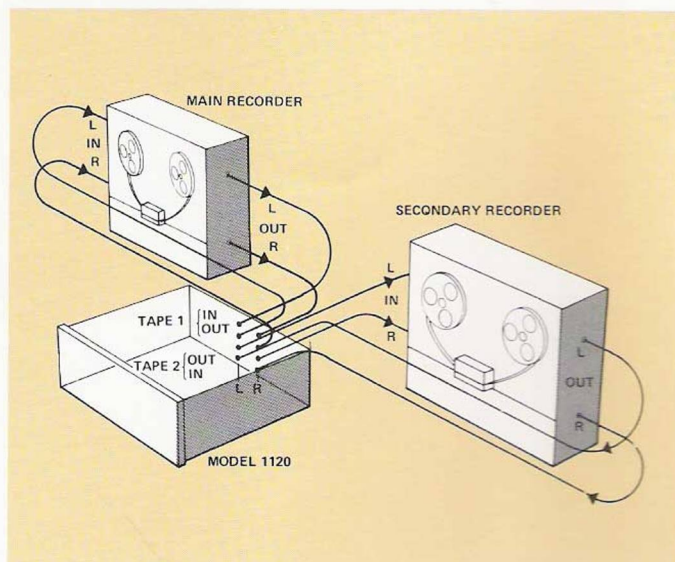


Figure 7. Typical Connection for "Main" and "Secondary" Recorders

The Model 1120 has the capability of using three recorders simultaneously. The hook-up is shown in Figure 8, the "MAIN" recorder is connected to *TAPE 1* jacks, the "SECONDARY" recorder is connected to the *TAPE 2* jacks, and the "EXTERNAL" recorder is connected to the *DUBBING* jacks. Operation is basically the same as for two recorders.

"Tape-to-Tape" copy is possible from the "MAIN" recorder to all other recorders of the system; by setting the *SELECTOR* switch in the *TAPE 1* position, the "MAIN" recorder in the playback mode, and any or all of the other recorders in the record mode. It is also possible to copy "tape-to-tape" from the "SECONDARY" recorder to any other recorder of the system by setting the *SELECTOR* switch in the *TAPE 2* position, the

"SECONDARY" recorder in the playback mode, and any or all of the other recorders in the record mode.

Monitoring of any of the tape recorders may be accomplished as follows:

"MAIN" recorder — Depress the *TAPE 1 MONITOR* switch (*TAPE 2 MONITOR* switch must be in the OUT position).

"SECONDARY" recorder — Depress the *TAPE 2 MONITOR* switch (the "EXTERNAL" recorder must be disconnected from the *DUBBING IN* jack).

"EXTERNAL" recorder — With the "EXTERNAL" recorder output connected to the *DUBBING IN* jack, depress the *TAPE 2 MONITOR* switch.

Care should be taken to prevent the activation of the record mode of the recorder corresponding to the position of the *SELECTOR* switch (e.g., the record head of the "MAIN" recorder while the *SELECTOR* switch is in the *TAPE 1* position). Should this occur, the signal appearing at the playback head would simultaneously be applied to the record head of the same recorder. This would result in the destruction of the program material on the tape being played by the recorder.

RECORDING A LONG DURATION PROGRAM

— With two tape recorders connected to the Model 1120 as shown in Figure 6 or 7, you can make a continuous recording without losing parts of the program during reel changes. You can start the recording on either recorder, then prepare the other recorder to begin recording at a convenient program pause before the main recorder runs out of tape. As soon as the second recorder is started, you will have ample time to reload the main recorder in preparation for further recordings.

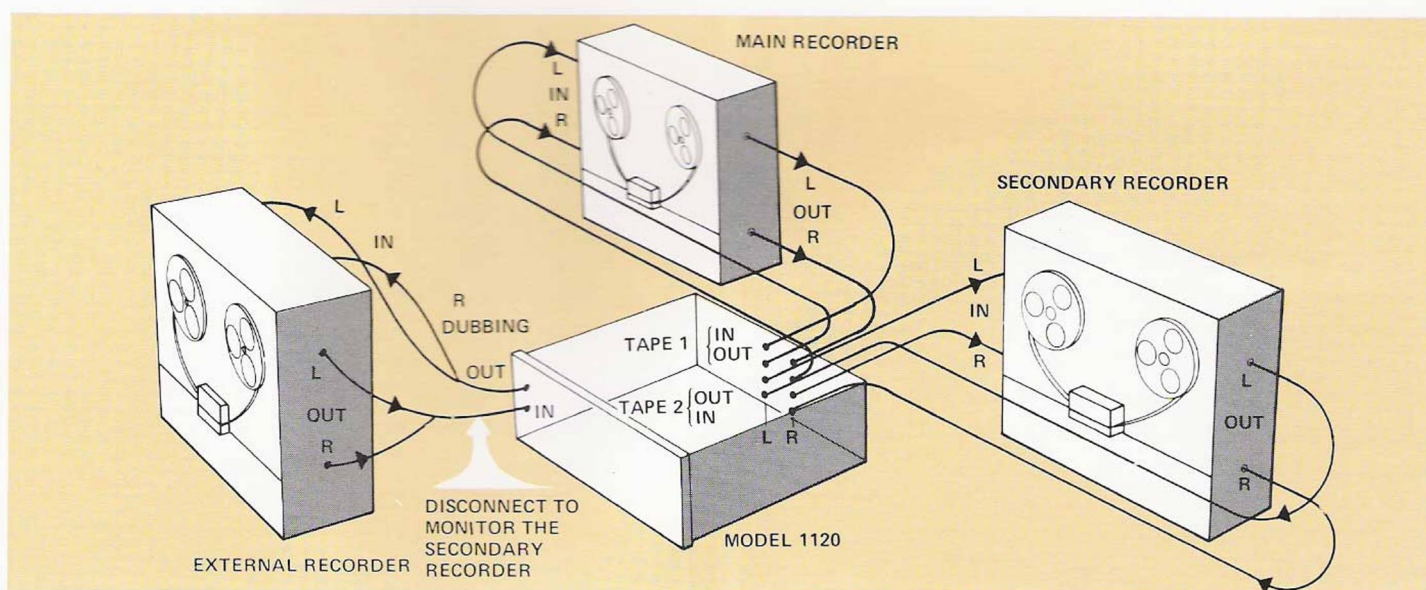


Figure 8. Typical Connection for Three Recorders

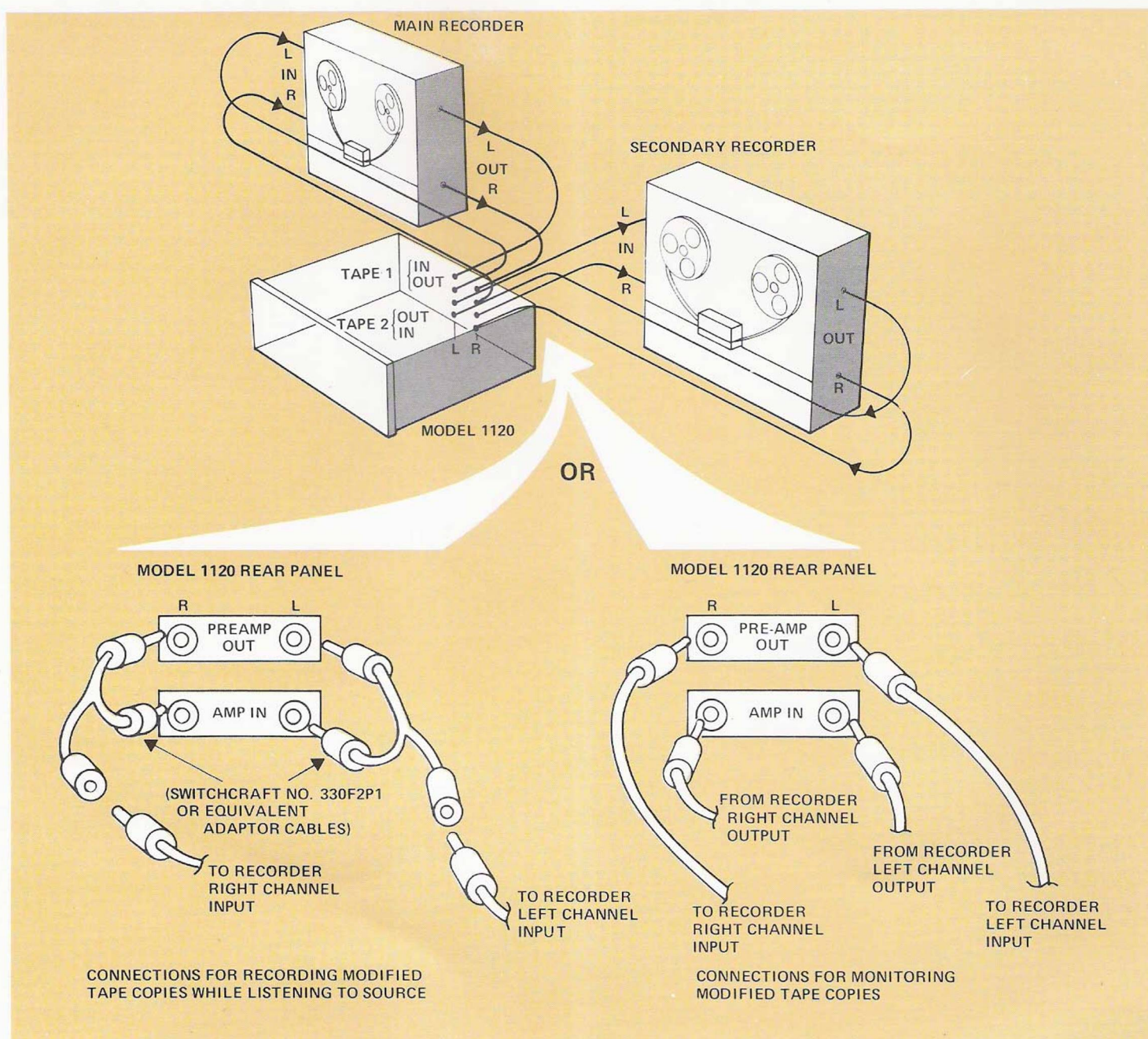


Figure 9. Arrangement for Making Modified Tape Copies

COPYING AND EDITING

Using the input/output and control facilities and two tape recorders, connected as shown in Figure 9, you can copy and edit tapes from the "MAIN" recorder to the "SECONDARY" recorder making modifications in tonal balance, noise level, stereo balance, etc., by using the appropriate front panel controls. For this purpose, the *SELECTOR* switch is to be set in the *TAPE 1* position, and the recording input of the recorder is connected to the *PRE-AMP OUT* jacks. If you want to listen to the program material as it is being recorded, it will be necessary to use 'Y' adapters at the *PRE-AMP*

OUT jacks and to replace the bridging connectors (normally installed between the *PRE-AMP OUT* jacks and the *AMP IN* jacks) with jumper cables.

A standard adapter cable (Switchcraft #330F2P1 or equivalent) may be available at your dealer. These adapter cables will accomplish both requirements for each channel. Since the program source signal is being processed by the Model 1120 control circuits, the *TAPE MONITOR* switches cannot be used to monitor the recorded tape and must be left in the "OUT" position. However, connecting the outputs of the "SECONDARY" recorder to the appropriate *AMP IN* jacks will allow you to monitor the recording.

TECHNICAL SPECIFICATIONS

Preamplifier Only:

Gain — Phono Amplifier	40 dB
— X10/Tone Amplifier	20 dB
Input Impedance — Low Level (Phono)	47K ohms
— Low Level (Microphone)	47K ohms
— High Level (All)	25K ohms
Input Sensitivity — Low Level	1.1 mV to equal 1.1V output at Pre-Amp Out
— High Level	110 mV to equal 1.1V output at Pre-Amp Out
Volume Tracking	Within ± 2 dB

Preamplifier/Amplifier Combined:

Gain — Phono Input to Speaker Terminals	82 dB
Frequency Response (20 Hz to 20 KHz at 1 Watt output, Tone Controls electrically flat)	+0.5 dB -0.5 dB
Damping Factor	Greater than 30 into 8-ohm load
Intermodulation Distortion (See Fig. 13)	Less than 0.2% at rated power output with both channels driven (S.M.P.T.E.)
Total Harmonic Distortion (See Fig. 14)	Less than 0.2% at rated power output 20 Hz - 20 KHz with both channels driven
Equivalent Noise — At phono input	Better than 2 μ V equiv. input.

Power Output — 20 Hz - 20 KHz (each channel with both channels driven)	Load	RMS Power	IHF Power
	4 ohms	70 watts	105 watts
	8 ohms	60 watts	90 watts
	16 ohms	30 watts	45 watts

Operating (Primary) Power Requirements*	Nominal Voltage	Range	Max Power	Frequency	Fuse
	100 vac	90-110 vac	200 watts	50-60 Hz	4.0A
	120 vac	108-132 vac	200 watts	50-60 Hz	4.0A
	220 vac	200-240 vac	200 watts	50-60 Hz	3.0A

Dimensions — Panel	15-3/8 inches Wide x 5-3/4 inches High
— Unit Depth	13-1/4 inches

Weight — Unit alone	27 lbs
— Packed for shipment	33 lbs

*Special primary windings permit conversion to 100 volt or 220 volt operation.

Specifications subject to change without notice.

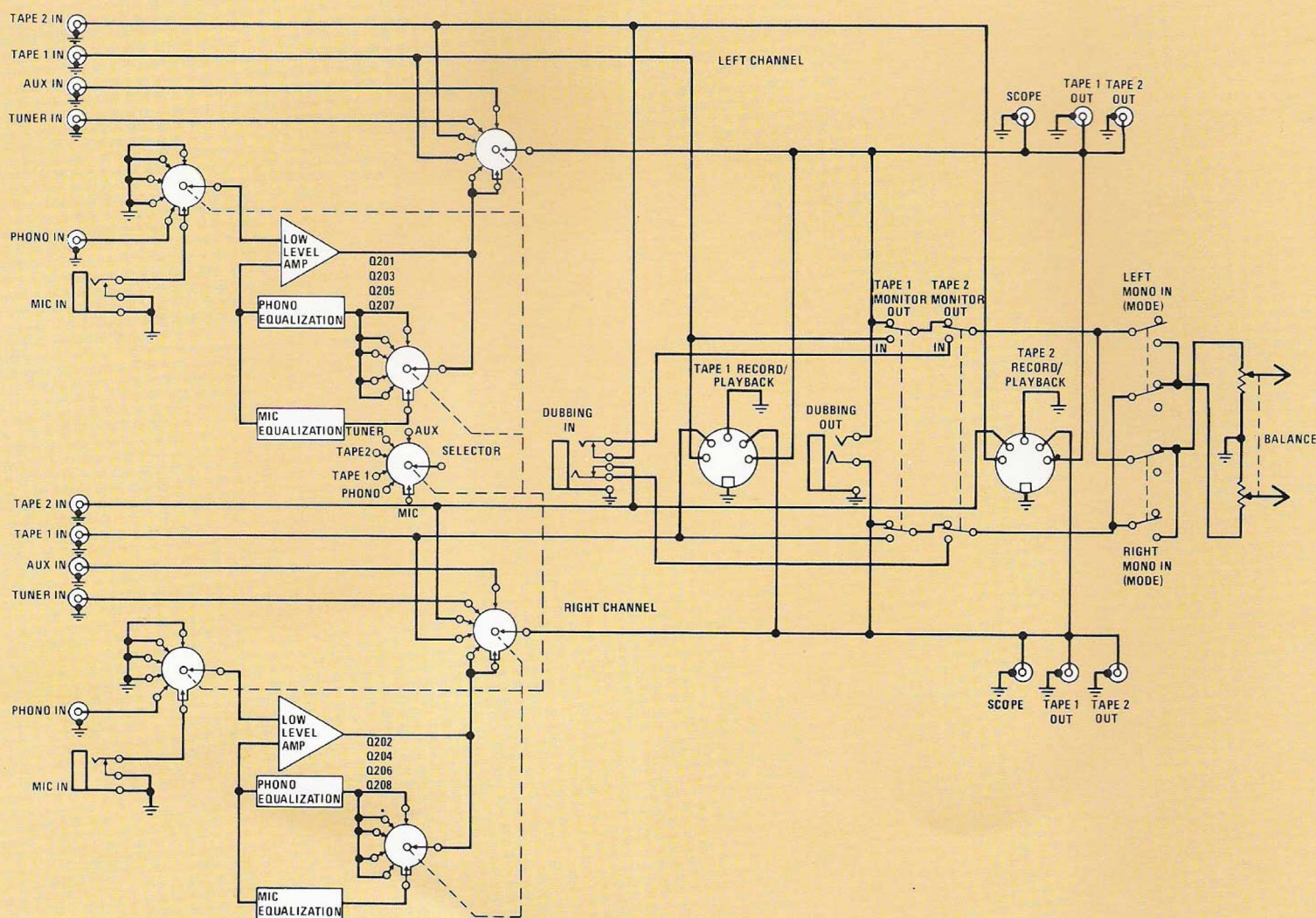


Figure 10. Functional Block Diagram

CIRCUIT DESCRIPTION

GENERAL

Figure 10 is a functional block diagram showing the principal elements and signal routing in the Model 1120 Stereo Console-Amplifier. Both the left and right channels are processed simultaneously by the circuits and controls. The description of the circuits is limited to the left audio channel only; the right channel being identical.

Also included in this section are graphs showing typical tone control characteristics (see Figure 11), typical filter characteristics (see Figure 12) and typical distortion measurements (see Figures 13 and 14). The technical specifications for the Model 1120 are shown on page 11.

PREAMPLIFIER CIRCUITS

High and low level inputs (program sources) are selected by the *SELECTOR* switch and routed in accordance with signal level. Low level inputs (*PHONO* and *MIC*) are routed to the phono

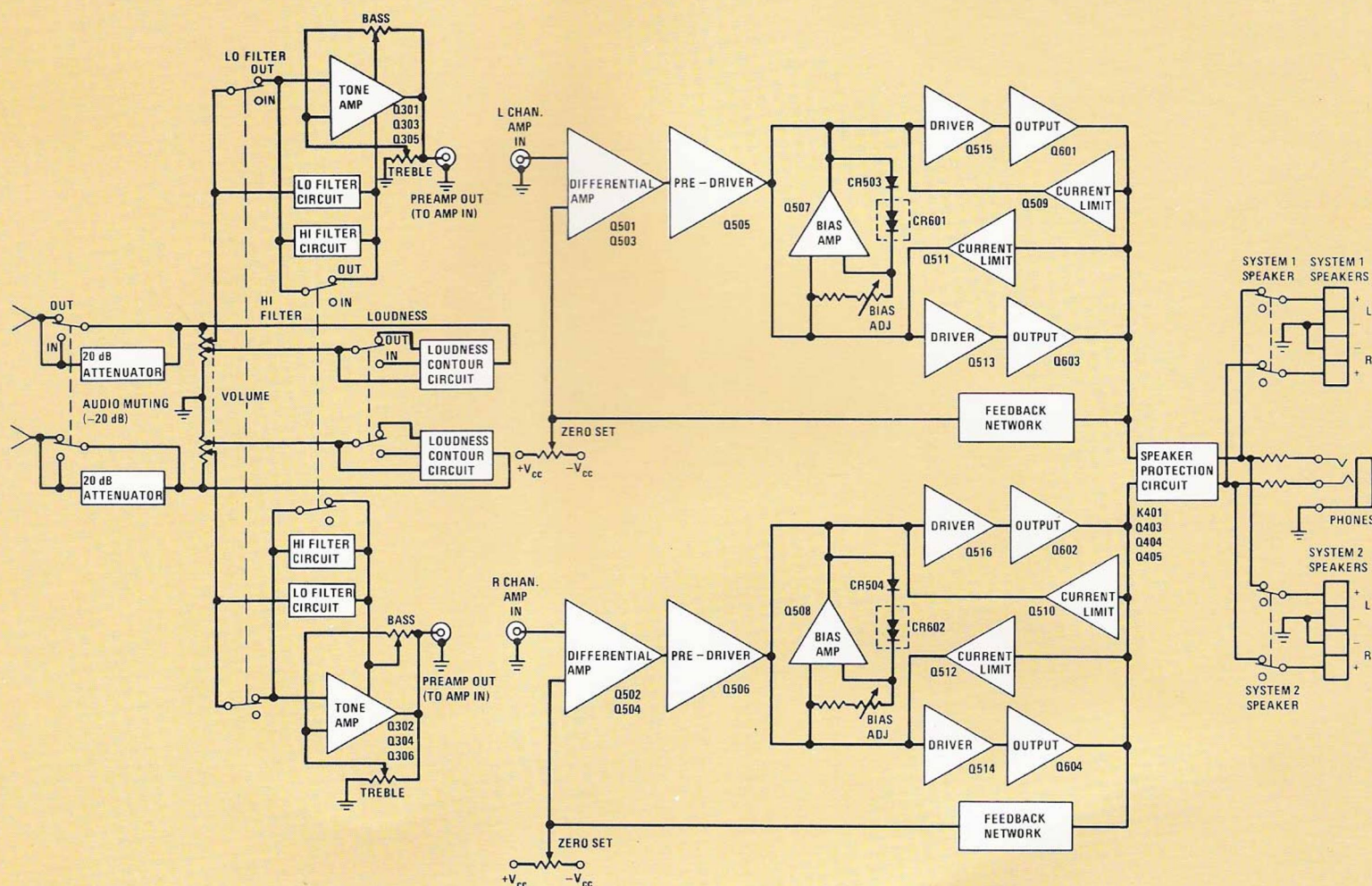


Figure 10. Functional Block Diagram (Cont.)

amplifier circuit where proper equalization (RIAA or Mic) is inserted. The phono amp circuit is an operational amplifier (Q201, Q202, Q205) with a constant current source (Q207) in the output.

A negative feedback network controls the overall gain of the phono amplifier circuit and provides the proper roll-off slope. Additional components in the feedback circuit adjust the gain to provide necessary RIAA or Mic equalization. The output of the phono amplifier circuit is routed to the *SELECTOR* switch, where it is handled as another high level input.

The high level signal, as selected by the *SELECTOR* switch, is applied simultaneously to the *TAPE OUT* jacks, *DUBBING OUT* jack, *SCOPE* jacks, the output pins of both *TAPE REC/PLAY* connectors, and to the *TAPE 1 MONITOR* switch. The *TAPE 1 MONITOR* switch selects between the output of the *SELECTOR* switch and the signal input at the *TAPE 1 IN* jack (and the input pins of the *TAPE 1 REC/PLAY* connector). The *TAPE 2 MONITOR* switch selects between the signal selected by the *TAPE 1 MONITOR* switch and the input applied to the *TAPE 2 IN* jack (and the input pins of the *TAPE 2 REC/PLAY* connector).

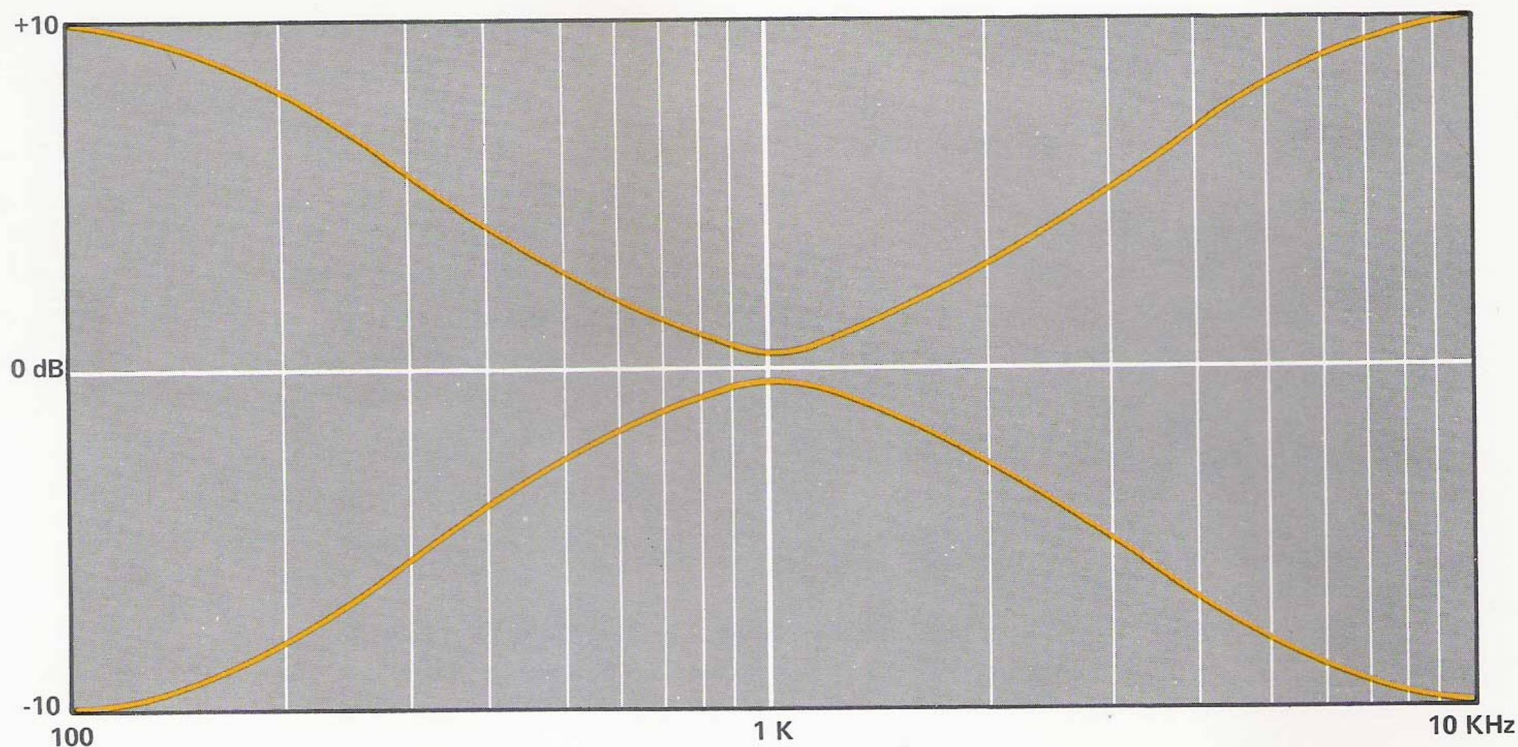


Figure 11. Tone Control Characteristics

or the signal applied to the *DUBBING IN* jack. The signal selected by the *TAPE 2 MONITOR* switch is applied to the *MONO IN* switches.

The *MONO IN* switches select the mode of operation for the Model 1120 — Stereo (*L* and *R* button OUT, Left only (*L* button IN/*R* button OUT), Right only (*L* button OUT/*R* button IN), or Mono (*L* and *R* buttons IN). The signal is then applied to the *BALANCE* control. The *BALANCE* control adjusts the relative level of the signal by attenuating one channel while maintaining the level of the other. From the *BALANCE* control, the signal is applied to the *AUDIO MUTING* (-20 dB) switch which, when activated, feeds the signal to an attenuator circuit. The signal is then applied to the *VOLUME* control, which controls the level of the output signal available at the *PRE-AMP OUT* jacks. The signal is also routed to a loudness circuit which when activated boosts bass and treble to compensate for the fact that at low listening levels the average human ear does not hear low and high frequencies as well as it does mid-range frequencies. The loudness circuit adjusts the frequency response of the circuits to approximate the Fletcher-Munson loudness curve. After being processed, the signal is applied to the input of the X10/tone amplifier circuit.

The X10/tone amplifier is a non-inverting operational amplifier (Q301, Q303, Q305) with

frequency-sensitive feedback circuits. The frequency response of this circuit is controlled by the feedback network. Included in the feedback network are the *BASS* and *TREBLE* tone controls (which are continuously variable over a range of approximately ± 10 dB and are essentially out of the circuit when the controls are in the mid-position) and the switch defeatable *HIGH* and *LOW FILTERS*. The tone controls may also be used to enhance or attenuate the highs and lows while the loudness contour is active. In this way, the tone may be adjusted to your personal preference. The output of the X10/tone amplifier circuit is applied to the *PRE-AMP OUT* jacks.

AMPLIFIER CIRCUIT

The signal at the *PRE-AMP OUT* jacks is direct coupled to the *AMP IN* jacks through an external bridging connector on the rear panel. The signal is then applied to the input of the differential amplifier (Q501, Q503) contained within the amplifier section of the Model 1120. The other input to this differential amplifier is feedback from the output which controls the overall gain and roll-off slope of the amplifier circuit. The output of the differential amplifier is direct coupled to a pre-driver stage (Q505) which also provides the signal for each half of the driver stage (Q513, Q515), which is full-complimentary. The output of the driver stage is direct coupled to the input of

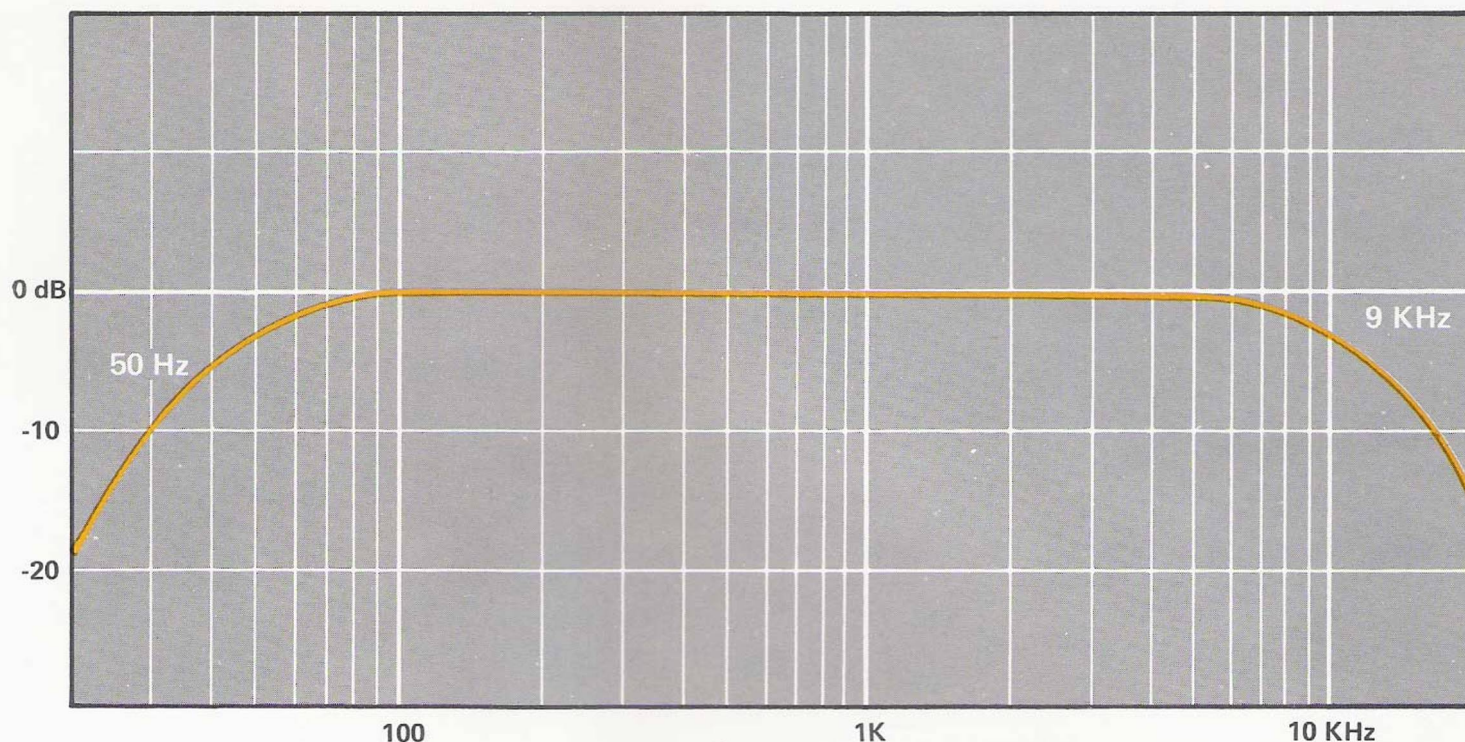


Figure 12. Low and Hi Filter Characteristics

the quasi-complementary power output pair (Q601, Q603). The voltage gain of the entire amplifier section is 26 dB. Bias regulation for the amplifier section is provided by three diode junctions (CR503, CR601) and one transistor (Q507) per channel, which compensates for temperature variations and prevents thermal runaway. The double junction diode (CR601) is mounted in direct contact with the black anodized aluminum heatsink on which the power transistors are installed.

The amplified signal is applied to the *SYSTEM 1/ SYSTEM 2* jacks and *PHONES* jacks, through the speaker protection circuit. The *SYSTEM 1/ SYSTEM 2 SPEAKER* switches, electrically located between the speaker protection circuit and the *SYSTEM 1/ SYSTEM 2* jacks, selects the speaker system to be used.

PROTECTION CIRCUITS

Built into the Model 1120 are circuits which prevent failures as a result of accidental overload of the amplifier. Other circuits protect loudspeakers from damage resulting from transient surges which may occur during the first few seconds after turn-on. Other circuits prevent minor internal failures from having a catastrophic effect. With the exception of the thermally-controlled switches in the output circuit, all protection circuits operate instantly allowing normal operation immediately

after the condition which caused their activation is eliminated.

CURRENT LIMITING CIRCUIT — Contained within the amplifier section is a current limiting circuit which continually monitors the output current level. When excessive output current levels are detected, this complimentary circuit (Q509, Q511) reduces the drive to the driver transistors (Q513, Q515) thus limiting the peak output current to a safe level.

THERMAL SWITCH — A temperature sensing switch is installed in direct contact with the output transistor heatsink. Should the transistors approach an unsafe temperature, the switch will open, disconnecting the A-C power from the unit. The power will remain disconnected until the heatsink temperature has been reduced to a proper operating level.

SPEAKER PROTECTION CIRCUIT — The speaker protection circuit consists of a relay (K401), a time delay circuit and a solid-state sensing network (Q403, Q404, Q405). The function of the speaker protection circuit is to provide a minimum 5-second delay after turn-on to protect the speakers from surges. The circuit also provides instantaneous turn-off when high-amplitude low-frequency (below 10 Hz) surges appear in the audio output. Five seconds after the low-frequency surge is eliminated, normal operation is automatically restored.

TYPICAL DISTORTION MEASUREMENTS

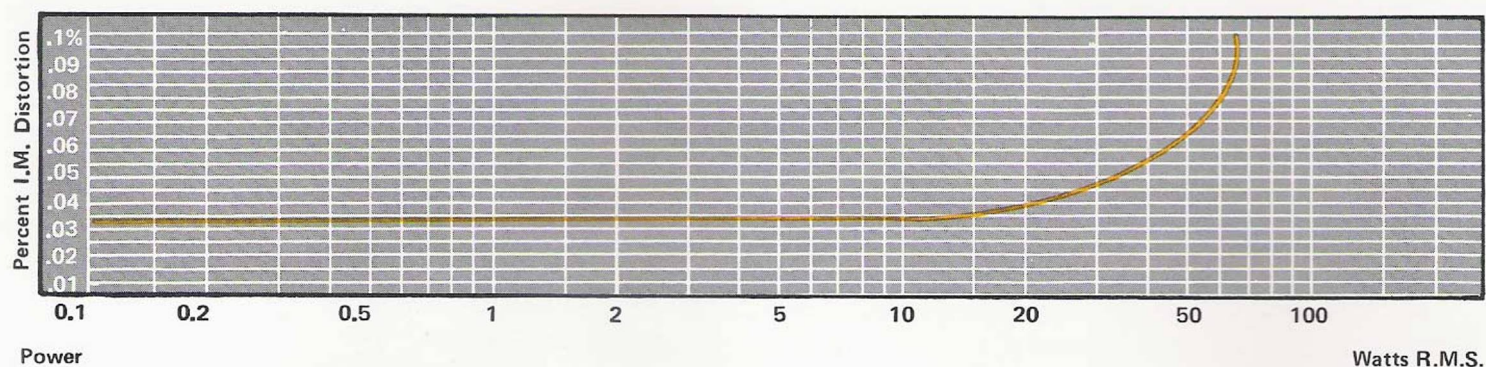


Figure 13. Intermodulation Distortion vs Power Output
 Test frequencies:
 60 Hertz
 7,000 Hertz

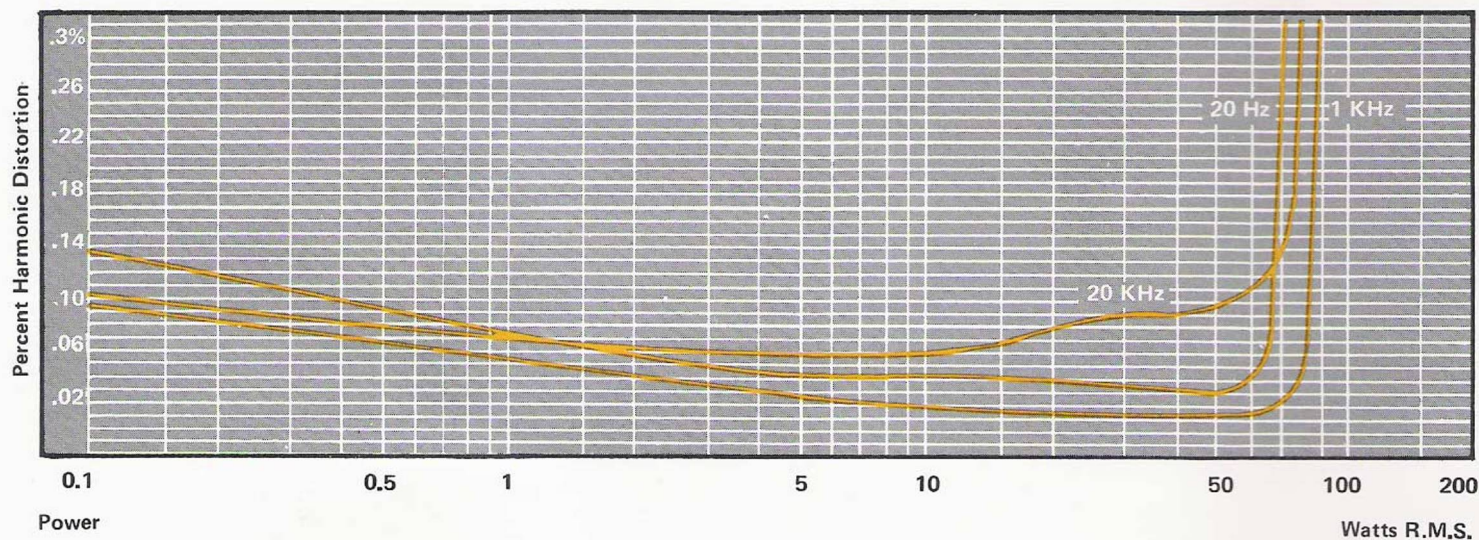


Figure 14. Total Harmonic Distortion vs Power Output
 with 8 Ohm Load

CUSTOM INSTALLATION

A template is supplied to install the Model 1120 Stereo Console-Amplifier in a custom cabinet. An opening 14-1/2 inches wide by 5-1/4 inches high, is required. Since the front panel of the Model 1120 is larger than the cutout, it will neatly hide the edges of the cut. Remove the plastic feet from the bottom of the unit. Slide the Model 1120 through the opening. Adequate bracing across the rear of the cabinet must be located so as to provide support

for the rear of the unit without obstructing the air flow across the heatsink. Fasten the front panel in place with the four #4 oval-head wood screws provided in the Accessory Kit envelope.

NOTE: Do not use the holes in the corners of the front panel as drill guides. A slip can ruin the appearance of the panel.

CAUTION: Allow at least 3 to 6 inch spacing, between the Model 1120 exterior and cabinet surfaces, for ventilation.

SERVICE NOTES

Since the Model 1120 amplifier is completely solid-state, the circuit components will continue to operate indefinitely when properly operated. If the pilot lamp burns out, have your serviceman replace it.

CLEANING — The satin anodized finish of the front aluminum panel will last indefinitely with proper care and cleaning. NEVER use scouring pads, steel wool, scouring powders, or harsh chemical agents, such as lye solution. These will mar the finish. Clean with a soft, lint-free cloth slightly dampened with a mild solution of detergent and water. A little ammonia may also be added. A liquid furniture wax or spray cleaner may also be used if desired.

KNOBS — The large round knobs on the front panel are held to their shafts by hexagonal-key set screws. An appropriate wrench has been included in the Accessory Kit envelope for use in removing or tightening the knobs. Push-button knobs are the press-on type.

FUSE — The Model 1120 is protected by a 4-ampere fuse, located on the rear panel of the unit. In the event the fuse opens, replace it ONLY with one of the same type and rating. (A spare fuse is supplied in the Accessory Kit packed with the unit). Replacement with slower-acting types or higher rated fuses will not protect the instrument and will void the warranty. The power switch should be switched OFF before replacing the fuse. Should the replacement fuse open within a short period, the amplifier should be taken to an authorized service facility.

ABNORMAL OPERATION — If the amplifier does not operate, make sure the power cord is properly connected to a "live" outlet. Also, check the fuse (replace if necessary) and verify that the power switch is in the ON position. If the panel light is illuminated, but one channel is inoperative, check the loudspeaker wiring for shorts, breaks, loose connections, or other faults. If the loudspeaker connections appear satisfactory, check for broken, open, shorted, corroded, or disconnected shielded cables between the Model 1120 and the program source. Look for any other visible fault. If no fault is noted, turn off the amplifier, then reverse the shielded input cables at the program source. If the opposite channel is inoperative when the

amplifier is turned back on, replace the shielded cable for the inoperative channel. Should replacement of the cable fail to correct the problem, the fault is in the program source component of your system. If the same channel remains inoperative, reverse the loudspeaker leads at the amplifier. If there is still no sound from the same speaker system, then the loudspeaker is at fault. Should any system component require repair, refer the problem to your nearest authorized service facility. If your system is playing and both channels suddenly become silent, the thermal switch in the Model 1120 may have been activated. Prolonged overloads or accidental shorting of the output will cause the output transistors to over-heat, which will open the thermal switch and internally disconnect the AC power to the unit. While the unit is cooling, inspect the amplifier and loudspeaker connections for shorts. Should the unit fail to become operative again after 10 minutes or alternate between an "on" and "off" condition, refer the problem to an authorized serviceman.

REPAIRS - Only the most competent and qualified service technicians should be allowed to service the Model 1120. The Marantz Company and its factory trained warranty station personnel have the knowledge and special equipment needed for repair and calibration of this precision instrument.

In the event of difficulty, write directly to the factory for the name and address of the Marantz warranty or authorized service station nearest your home or business. Please include the model and serial number of your unit together with a full description of what you feel is abnormal about its behavior.

SHIPPING - Should you ever have the need to ship your amplifier to a service facility or elsewhere, always use the original packing materials. When shipping the Model 1120 for service, always —

- ★ Remove the unit from its cabinet.
- ★ Ship via a reputable carrier (Do not use Parcel Post) and obtain a receipt from the carrier.
- ★ Insure the parcel for its full value.
- ★ Include your return address on the shipping label.



IMPERIAL