

marantz®

**Model 5220
Stereo
Cassette Deck**

MARANTZ CO., INC. 20525 NORDHOFF STREET, CHATSWORTH, CALIFORNIA 91311
A WHOLLY-OWNED SUBSIDIARY OF SUPERSCOPE INC., CHATSWORTH, CALIFORNIA 91311

FOREWORD

To obtain maximum performance and enjoyment from the Model 5220 Stereo Cassette Deck, please study these instructions carefully. Installing and operating the Model 5220 is not complicated, but the flexibility provided by its numerous operating features merits your becoming familiar with its controls and connections. Our recommended procedures will assure you of securing the superb performance for which the Model 5220 was designed.

For convenience, this manual is divided into three parts. The first part covers installation. The second part outlines a simplified operating procedure. The third part provides a more detailed description of the features of the Model 5220, and explains some of the finer points of recording techniques. Technical specifications are also included in this part.

For quick identification of the many controls, connection facilities, and adjustments on the Model 5220 all references to them in this manual are printed in **BOLDFACE** type.

AC Line Operation

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

AFTER UNPACKING

It is advisable to retain all original packing material to prevent damage should you wish to transport or ship the Model 5220 (refer to page 16 for repacking and shipping instructions). Be careful that you do not inadvertently throw away or lose the parts packed with the unit.

Please inspect your Model 5220 Stereo Cassette Deck carefully for any signs of shipping damage. Our very strict quality control and professional pride ensure that each Model 5220 left the factory in perfect condition. If the unit is damaged or fails to operate, immediately notify your dealer. If the unit was shipped to you directly, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for shipping damage. Save the carton and all packing material as evidence of damage for their inspection. Should assistance be required, the Marantz Company will cooperate fully in assisting your claim.

Please fill out and mail the Warranty Registration Card within ten days of purchase. The card will remain on file at the Marantz Company for the duration of the warranty period. We also strongly advise that you retain your sales receipt to provide proof of purchase in the event that Warranty service is sought.

QUICK REFERENCE INDEX

Figure 1 shows the location of the main controls and switches on the Model 5220. Listed by each feature is the number of the page where a description about the feature appears.

Before proceeding with connecting your new tape deck, take a few moments to acquaint yourself with some of the features and terminology you will encounter in this book.

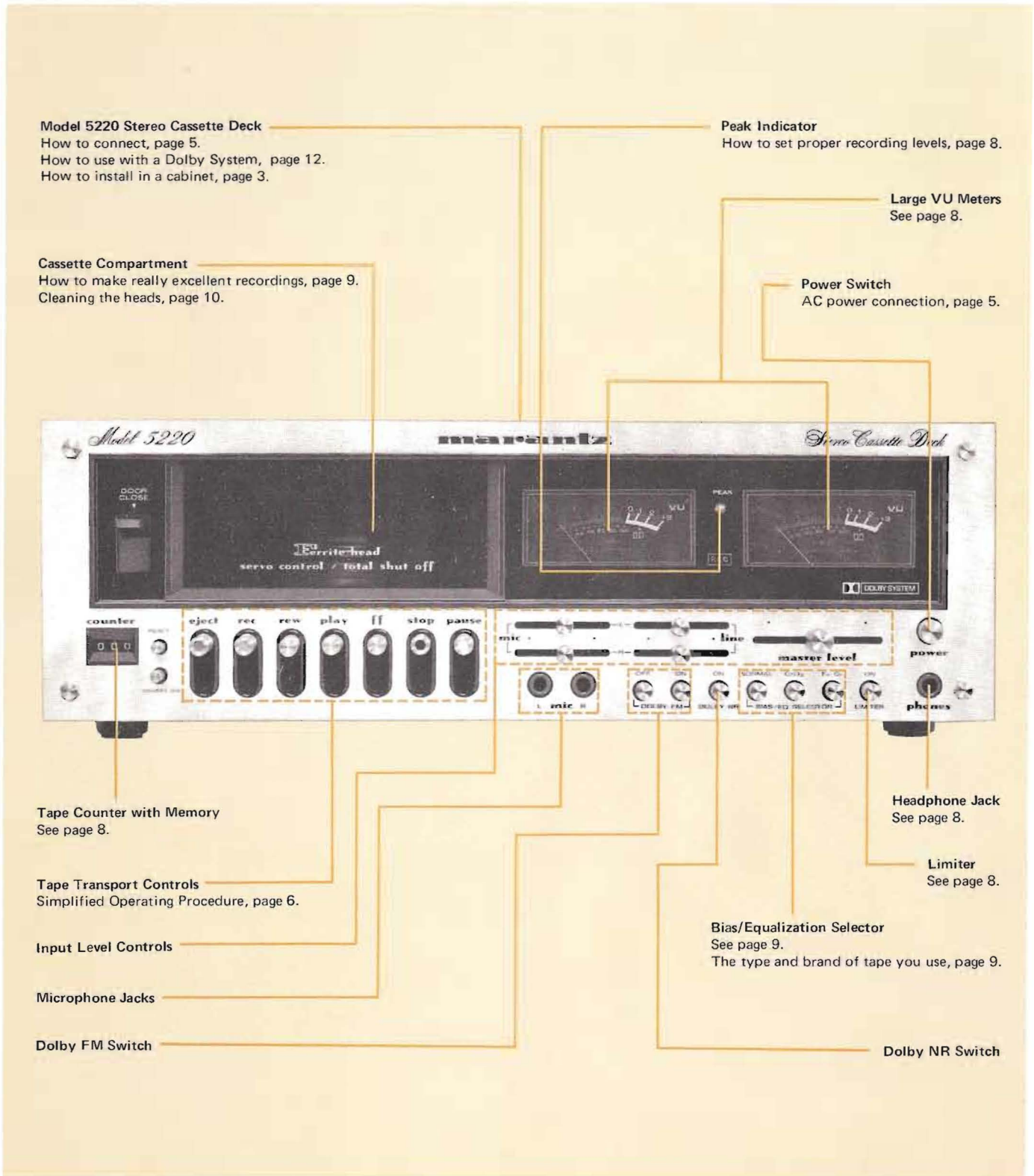


Figure 1. Main Controls and Switches

PREPARATION FOR USE

MECHANICAL INSTALLATION

The Model 5220 Stereo Cassette Deck can be installed in two basic ways: In a beautiful walnut veneer cabinet for placement on a table or shelf, or mounted in your own cabinetry or custom installation.

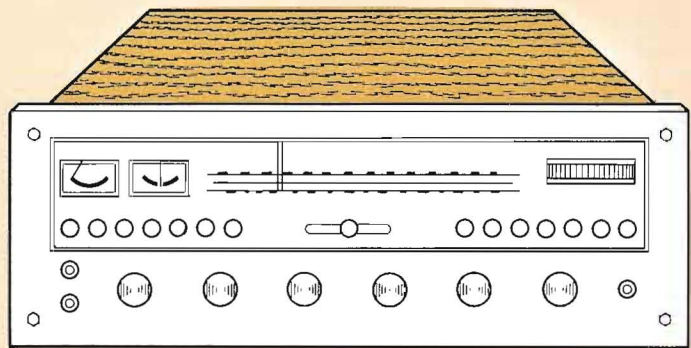
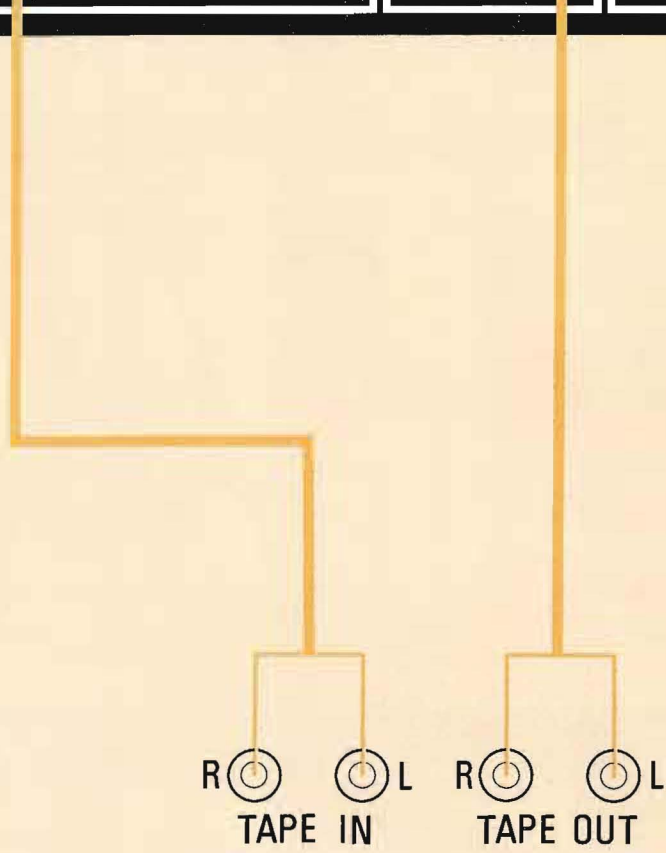
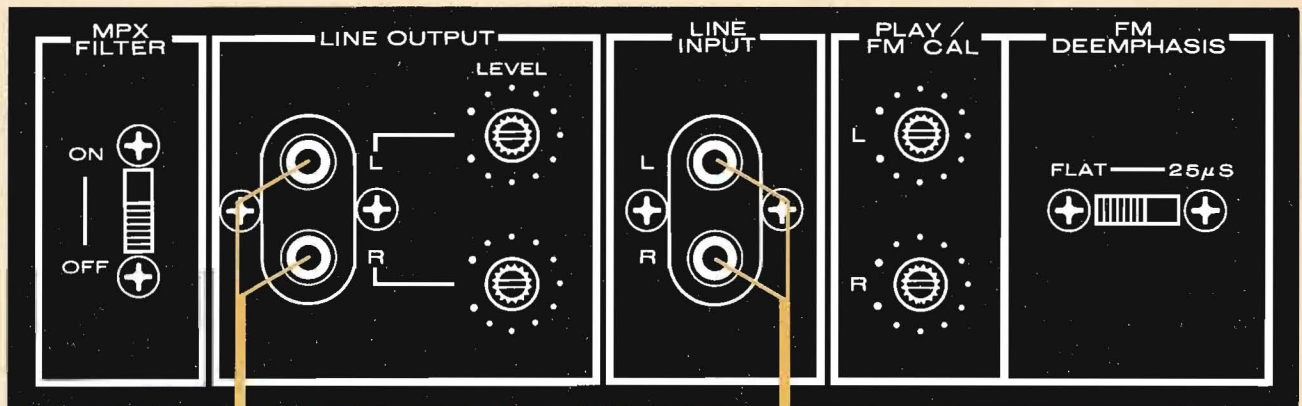
MARANTZ WALNUT CABINET

An attractive walnut veneer cabinet, Model WC-15T, may be obtained from your Marantz dealer. The case provides for proper ventilation, and can be placed on furniture, or on a bookshelf. Complete instructions for installation are provided with the WC-15T.

CUSTOM INSTALLATION

When planning a custom installation, allow adequate spacing between the Model 5220, cabinet surfaces, and other components for adequate ventilation.

To install the Model 5220 Stereo Cassette Deck in a custom cabinet, cut an opening 16-7/8 inches wide by 5-1/8 inches high. Since the front panel of the Model 5220 is larger than the cutout, it will neatly hide the edges of the cut. Remove the plastic feet from the bottom of the unit and slide it through the opening. To support the weight of the Model 5220, adequate bracing across the rear of the cabinet must be located to provide contact with the rear of the unit.



STEREO AMP. OR STEREO RECEIVER

Figure 2. Rear Panel Connection Diagram

CONNECTING THE MODEL 5220

REAR PANEL SIGNAL CONNECTIONS

Figure 2 shows the location of the input and output jacks on the rear panel. These jacks are for "permanent" connections. Front panel jacks and their use will be discussed later.

All connections to the rear panel should be made with the power to the entire system turned off. The rear panel signal connections should be made with shielded audio cables. To avoid confusion, connect one cable at a time between the 5220 and the other components of your system. This is the safest way to avoid cross-connecting channels or confusing signal source outputs with inputs. When connecting audio cables insert the connectors completely into the jacks. Loose connections may cause hum and noise.

LINE INPUTS

These jacks will accept signals from any line level source. They are also the inputs for the DOLBY FM circuitry in the Model 5220. Therefore, these jacks should be connected to the set of tape output jacks on your receiver, which will supply signals from FM and other audio sources. If you own an audio system comprised of separate components, connect the **LINE IN** jacks of the Model 5220 to the tape output jacks of your preamplifier.

LINE OUTPUTS AND OUTPUT LEVEL CONTROLS

Connect the **OUTPUT** to the tape monitor input jacks of your receiver.

The **LEVEL** controls located next to the output jacks determine the volume output of each channel. They operate the same as a volume control, and can be turned with a screwdriver. The purpose of these adjustments is to match the output level of the Model 5220 to the input sensitivity of the tape monitor circuits in your receiver. When the **LEVEL** controls are properly adjusted, the volume through your speakers will remain constant as the tape monitor is switched in and out. Of course, you can't make these adjustments until the system is set up, so for the present time, the **LEVEL** controls should be set approximately one quarter turn above the minimum volume setting.

AC POWER SOURCE CONNECTION

With the **POWER** switch set to the OFF (out) position, plug the AC line cord into an AC outlet providing the proper voltage.

CAUTION: DO NOT PLUG THE MODEL 5220 INTO A DC OUTLET, AS SERIOUS DAMAGE WILL OCCUR.

If your receiver has a switched AC outlet on its rear panel, you may find it convenient to plug the Model 5220 into that outlet.

Now that you have connected your Model 5220 to your receiver and external tape recorder, you are doubtlessly eager to try it out. So, the following section will outline a simplified operating procedure to follow so you can begin recording and listening to your new Stereo Cassette Deck immediately. After becoming familiar with the Stereo Cassette Deck, you may take full advantage of its many features and operating versatility.

OPERATING INSTRUCTIONS

First, set the controls and switches on the Model 5220 as follows:

POWER Switch	OFF (out)
TAPE TRANSPORT Controls	STOPPED
DOLBY NR Switch	OFF (out)
DOLBY FM-OFF Switch	(in)
DOLBY FM-ON Switch	(out)
BIAS/EQ SELECTOR Switches	Depress button that matches kind of tape used.
LIMITER	OFF (out)
ALL LEVEL Controls	Minimum (to left)

After setting the controls and switches, record on a blank cassette as follows:

1. Depress the **POWER** switch. The meters will illuminate, indicating the unit's power is on. If they don't, check to make sure the power cord is plugged in. Turn on the source equipment (receiver, turntable, etc.)
2. Before inserting the cassette, take up the slack of the tape to prevent it from becoming entangled around the capstan. Twist the tape hub inside the cassette with your fingernail or with a pencil. (See Figure 4.)
3. Depress the **EJECT** button fully to open the cassette compartment and raise the cassette holder.

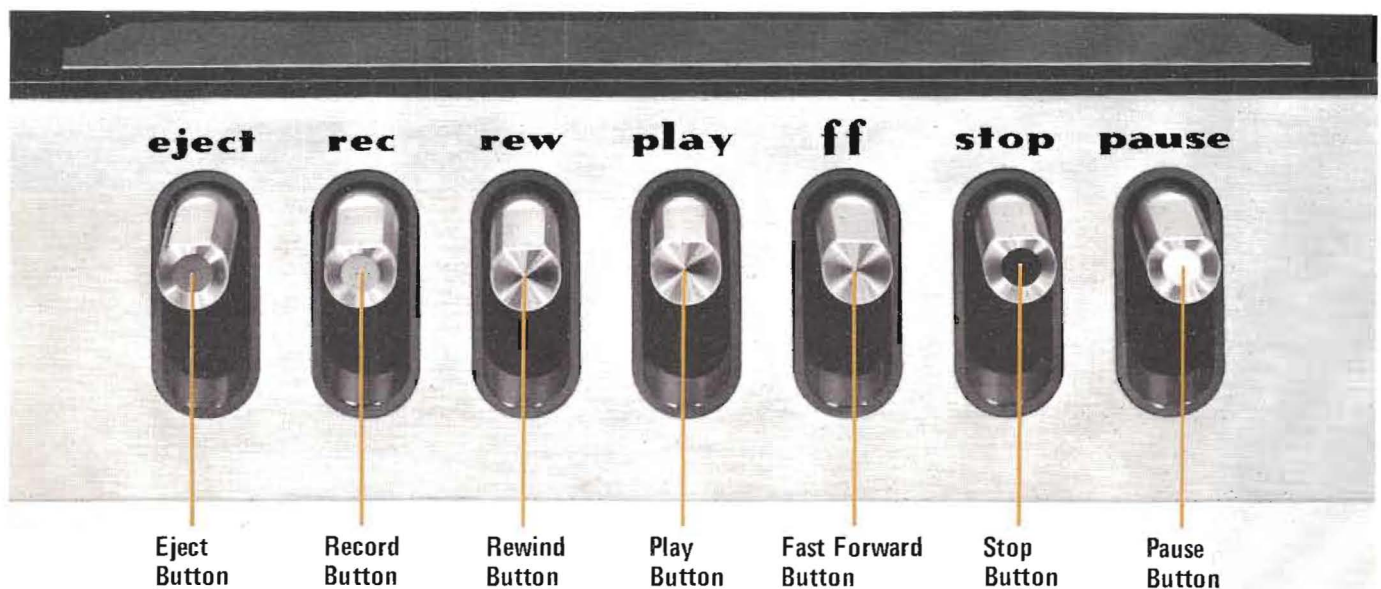


Figure 3. Tape Transport Controls

4. Insert the cassette with the desired side for recording up. Close the lid.

NOTE: The cassette can only be inserted if the cassette holder is up.

5. Play the audio signal source (phono, tuner, etc.) with the tape monitor switch on the receiver in the "source" position.
6. Press the **RESET** button on the tape **COUNTER** to reference the beginning of the recording.
7. Place the Model 5220 in the record mode: Depress the record (**REC**) and **PLAY** buttons simultaneously. The **REC** light between the VU meters will illuminate.

NOTE: The smoothest way to engage the record mode is to depress the REC button first. Then, while holding it down, depress the PLAY button.

8. Slide the **MASTER LEVEL** Control to its maximum setting (to the right). All other controls should be set at minimum.
9. Gradually increase the left and right **LINE** level controls while watching the VU meters. Adjust the level controls so that the loudest passages of the program deflect the pointers of the meters as fully as possible with minimum triggering of the **PEAK** level indicator (light emitting diode).
10. Set the tape monitor switch on the receiver to the "tape" position.

NOTE: If the volume level changes when the tape monitor is switched in, adjust the OUTPUT LEVEL controls on the rear panel of the 5220. The volume level should remain constant as the tape monitor is switched in and out.

11. When finished recording, reduce the **MASTER LEVEL** control to minimum and press the **STOP** button.
12. Rewind the tape by depressing the rewind (**REW**) button. Stop the tape when the **COUNTER** registers zero, or use the **MEMORY** feature (see page 8).
13. Play back the tape by pressing the **PLAY** button.

The Model 5220 is now playing back the tape you just recorded. The following sections will explain the front panel features and some methods of adding more sophistication to your recording technique.

CAUTION: Do not attempt to manually lift the pushbuttons when they are in the depressed position. The pushbuttons are mechanically locked into position and can be released only by depressing the STOP pushbutton. The PAUSE pushbutton can only be released by pressing it a second time.

FRONT PANEL FEATURES

VU METERS AND PEAK INDICATORS

Two large VU meters in the Model 5220 monitor the relative recording and playback level of each channel.

All meters are "time sensitive" devices. In other words, it takes a short amount of time for the meter to respond to a quickly applied signal. Even though the meter needle and other moving parts are very lightweight, they still have some inertia and are relatively sluggish when compared to the instantaneous nature of audio peaks. The meters, then, indicate an average value reading with which to monitor the average level and balance of the two channels.

The Model 5220 is also equipped with a **PEAK** indicator which, when used in conjunction with the VU meters, is a valuable aid to proper recording level adjustment. The **PEAK** indicator, unlike the meters, reacts instantaneously to audio transients during recording. The indicator illuminates if an audio transient strong enough to cause tape saturation (distortion) occurs. If the **PEAK** indicator flashes repeatedly, the recording level should be reduced.

INPUT LEVEL CONTROLS

On the front panel are four independent slide-type input level controls and a stereo **MASTER LEVEL** control. The **MIC** controls receive their inputs from the left and right **MIC** jacks on the front panel. The **LINE** controls receive their signals from the rear panel **LINE INPUT** jacks. The four input controls, or "sliders," combine their audio signals in a stereo mix in the proportions chosen by you, the recordist. They assign the audio inputs to the left and right stereo outputs of the mixer as indicated by the letters **L** and **R** beside each slider slot.

NOTE: When microphone are selected for recording, do not monitor through speakers, as this will cause howling (acoustic feedback) which could damage your audio equipment. Use headphones for monitoring.

MASTER LEVEL CONTROL

The **MASTER LEVEL** slider adjusts the total stereo output level. Its purpose is to control the audio level of the entire mixture of the four input

channels without changing the input slider positions and without affecting their proportionate audio levels. If, for instance, the four input levels are mixed in the exact proportions you want, but the VU meters register too high a reading, reduce the **MASTER LEVEL** accordingly.

The **MASTER LEVEL** slider can be used to "fade out" or "fade in". For example, when making a cassette recording of a phonograph record, you may wish to fade out the music gradually just before the end of the tape is reached. This way, you will avoid the abrupt cut-off of sound that occurs during playback when the cassette runs out of tape. Likewise, the music could be "faded in" at the beginning of the cassette.

PEAK LIMITER

The peak **LIMITER**, when in use, automatically reduces the record level during sudden volume surges. By preventing the peak recording level from exceeding 0 VU, the peak **LIMITER** minimizes distortion.

The **LIMITER** is not the same as an A.L.C. (Automatic Level Control) circuit; it is designed rather as a safeguard against high input signals that you had not anticipated when you adjusted the record levels initially. The **LIMITER** is also advantageous when recording sources such as radio programs or live music whose peak volume levels are sometimes unpredictable.

If the recording levels were set much too high and the **LIMITER** were activated, it would tend to "compress" the dynamic range of the music. In other words, not only the peaks, but all loud passages would be reduced in volume. Therefore, the recording levels should be set before the **LIMITER** is turned on.

PHONES JACK

This jack accepts headphones utilizing a standard three conductor phone plug. It is internally connected to the output circuitry to provide adequate sound level with popular low impedance stereo headphones. Two or more sets of headphones may be used with the aid of "Y" connectors (available at your dealer). However, output level will drop as additional headphones are added.

MEMORY COUNTER

The **MEMORY COUNTER** is used for precise program relocation, whether at the beginning of the side or far into the recorded tape.

The MEMORY feature operates as follows:

1. Locate a desired starting point and depress the **RESET** button to register this starting point. ("000" shown on the Tape Counter).
2. Depress the **MEMORY ON** button.
3. Play (or record) the tape.
4. Depress the rewind (**REW**) button to rewind the tape. The tape motion stops and the rewind button releases automatically when the original starting point is reached. Actually, the tape stops at "999", one count before "000" to avoid missing the starting point of the program.

BIAS/EQ SELECTOR PUSHSWITCHES

These pushswitches select the proper bias and equalization to suit the three most common types of cassette tape:

- NORMAL — for normal Ferric Oxide tape
- CrO₂ — for Chromium Dioxide tape
- Fe-Cr — for Ferri-Chrome tape

See "The Type and Brand of Tape You Use," on this page.

DOLBY FM AND DOLBY NR PUSHSWITCHES

These switches control the DOLBY Noise Reduction circuitry in the Model 5220. Their operation is explained in the "DOLBY SYSTEM" section, Page 12.

TOTAL SHUT OFF

The TOTAL SHUT OFF feature will automatically disengage the tape transport when the end of the tape is reached in any transport mode (play, rewind, etc.). The TOTAL SHUT OFF feature will also activate if the tape should jam.

MAKING OPTIMUM CASSETTE RECORDINGS

The Model 5220 Stereo Cassette Deck, augmented by its built-in Dolby Noise Reduction System, is capable of making really excellent recordings. But the quality of recording can also be negatively influenced by some other very important factors. Inferior tape, poorly maintained heads, and improperly set recording levels can spoil your recordings. So that you can realize the full potential of your investment in the Model 5220, the following section will explain a few techniques of skillful recording.

THE TYPE AND BRAND OF TAPE YOU USE

In cassette recording, the type and brand of cassette you use has the greatest influence on the quality of your recordings. Therefore, buy the best cassettes you can. Your Marantz dealer will assist you in selecting a nationally recognized name brand of low-noise, clean-running tape. For best results, use a 60 or 90 minute cassette.

Chromium Dioxide (CrO₂) and Ferri-Chrome (Fe-Cr) tapes provide better fidelity than normal tape. When using these kinds of tape, depress the appropriate **BIAS/EQ SELECTOR** pushswitch on the 5220 to provide the correct bias and equalization to suit the characteristics of the tape.

PROPER RECORDING LEVEL

One of the beauties of music is its dynamic range, in other words, the contrast of very soft to very loud passages. To capture this contrast on tape requires that the recording levels be set so that the loudest passages you intend to record don't saturate the tape and cause distortion. Yet, the recording levels shouldn't be set too low, because the soft passages would simply disappear in the residual noise. The proper technique is to anticipate the loudest section of the music you want to record and set the recording levels using the VU meters as a guide before any recording actually takes place.

If, for example, you are recording from a phonograph record, you should at the outset find the loudest section of the record. To set the recording levels on the 5220, insert the cassette, depress the **PAUSE** button and then place the Model 5220 in the record mode. This technique allows the recording level to be checked and adjusted with-

out actually recording anything on the tape. Once the levels are set for the loudest portion of the music, leave them where they are. Start the phonograph record over at the beginning and release the **PAUSE** button to commence recording.

NOTE: Most cassette manufacturers splice a few inches of clear leader tape to the beginning and end of the magnetic recording tape. The leader tape cannot be recorded, and it usually takes about six seconds to pass by the heads when the tape is played from the beginning.

When taking up the slack in the cassette before inserting it for recording, advance the tape so that the spliced area of the tape is ready to pass the recording head (see Figure 4). By knowing exactly where the recordable tape begins, you can assured that the beginning of the program will be recorded.

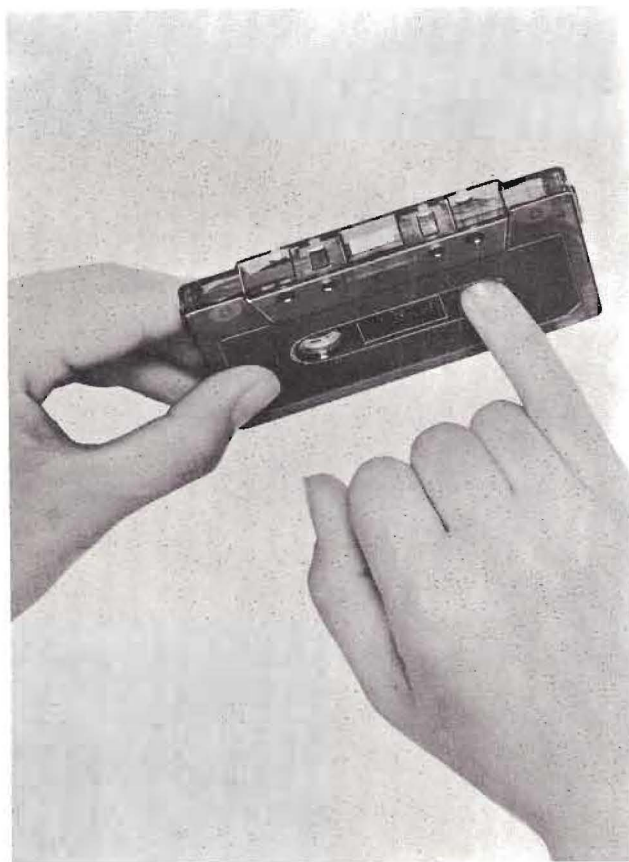


Figure 4. Cassette Preparation

CLEAN AND DEMAGNETIZED HEADS

The RECORD/PLAYBACK and ERASE heads are the most important parts of the stereo cassette deck. After tape rubs against the heads during record and playback, brown oxide deposits from the tape accumulate on the heads, guides, and pinch roller. Even the best cassette tapes will shed some particles of oxide. The accumulation of this oxide will cause loss of high frequency response, loss of sound volume, intermittent sound dropout and unsatisfactory results when recording or erasing tape. If your Model 5220 exhibits any of the preceding symptoms, immediately clean the heads. If the oxide is allowed to build up, it may cause the heads to wear out prematurely, causing permanent damage. Therefore, the heads must be kept clean.

Now, a word about routine preventative maintenance:

Don't put off cleaning the heads simply because the deck is performing well. The experienced audiophile gives the tape path a thorough cleaning at the beginning of every usage as a matter of habit. This is an excellent practice for assuring cleanliness and the best possible recording conditions, and it only requires a minute to do.

To clean the tape path, use cotton swabs and denatured alcohol (available at any pharmacy). Please note that common "rubbing alcohol" should not be used because it has a high water content. Use "DENATURED" alcohol.

Dip the cotton swab in the alcohol and clean the tape heads, capstan, guides, pinch roller — everywhere the tape touches — until no more oxide can be picked up on a fresh cotton swab.

To gain access to the heads for cleaning and demagnetization,

1. Turn off the power.
2. Depress the **EJECT** button and remove the cassette.
3. Reach inside the cassette compartment and push the cassette holder down.
4. Push the **PLAY** button. The heads and pinch roller will protrude into the cassette compartment. The head surfaces may now be inspected.
5. After cleaning and demagnetizing, press the **STOP** button.
6. Depress the **EJECT** button fully to life the cassette holder.

Obviously, the heads and pinch roller of the Model 5220 are more difficult to inspect, clean,

and demagnetize than those of a toploading cassette machine, because access to the rear-facing heads must be made through the front-facing opening. Therefore, you may find it more convenient to obtain a few special tools to aid inspection and cleaning.

On your trip to the pharmacy to buy alcohol and cotton swabs, also buy an inspection mirror (the kind the dentists use) and an inexpensive hemostat. The mirror can be used for inspecting the head surfaces and the rubber pinch roller.

The pinch roller in the cassette mechanism provides a simple, visual indication of when to clean the heads. If you can see a stripe of brown oxide around the perimeter of the pinch roller, it is time to clean the entire tape path.

The hemostat can be used to hold the cotton swab while cleaning. If the swab is made of wood, you may wish to break it in half to provide more room.

Tape heads and guides also become magnetized after a period of use. When this occurs they cause excessive noise and can even partially erase the tape. The tape heads and guides should be demagnetized periodically (about every nine hours of playing time) with a demagnetizer.

The demagnetizer should be of the same design as those used with 8-track tape cartridge players — that is, the type with a long, slender demagnetizing element bent at an angle near the end.

Instructions are enclosed with the demagnetizer.

CAUTION: BEFORE USING THE DEMAGNETIZER, TURN OFF THE POWER TO THE MODEL 5220.

DOLBY SYSTEM

BASIC DOLBY PROCESS

The Dolby system increases the level of low volume mid- and high- frequency signals during recording and reduces the level of these signals by an identical amount during playback. As a result, the playback signal is identical to the original source signal, but the level of background noise generated by the tape recorder is greatly reduced. A Dolbyized FM broadcast is subjected to the first phase of the noise reduction process before being transmitted. When these signals pass through the Dolby playback circuitry, the mid- and high frequency noise is greatly reduced.

The Dolby Noise Reduction System in the Model 5220 can be used for recording, or for playing back Dolbyized cassettes.

The following section will explain how to operate the Dolby Noise Reduction System in the 5220 to process cassettes, FM broadcasts, and external sources.

CASSETTES

The Dolby Noise Reduction circuit in the Model 5220 is designed for maximum convenience when recording or playing back a cassette. The calibration levels have been internally preset at the factory, so the only adjustment to make is that for recording level.

The procedure for Dolby recording and playback is identical to that for non-Dolby except that the **DOLBY NR ON** pushswitch is depressed after the recording levels are set.

DOLBY FM BROADCASTS

Dolbyized FM broadcasts contain Dolbyized audio information to which a special pre-emphasis applied for the purpose of improving the noise reduction process. The pre-emphasis time constant ($25\mu\text{S}$) is different from the used with non-Dolbyized broadcasts. To properly recover the original program material, a complementary time constant at the receiver is required. A 25 micro-second FM de-emphasis circuit is built into the Marantz Model 112, 125, and 150 stereo FM tuners and should be activated when recording or listening to Dolby FM broadcasts through your Model 5220. If your present tuner does not have such a circuit, set the **FM DE-EMPHASIS** switch on the rear panel of the Model 5220 to $25\mu\text{S}$ to activate the corrective network.

NOTE: If you are using the de-emphasis circuit built into the tuner, leave the **FM DE-EMPHASIS** switch on the Model 5220 at "FLAT". Do not use both de-emphasis circuits simultaneously.

To listen to a Dolbyized FM broadcast, proceed as follows:

1. The tuner or receiver should be connected to the **LINE INPUT** jacks.
2. Apply the proper de-emphasis as outlined above.
3. Depress the **DOLBY NR ON** pushswitch.
4. Depress the **DOLBY FM-ON** pushswitch.
5. The Dolby FM calibration levels have been pre-adjusted at the factory and should not normally need to be readjusted when used with the Marantz tuners and receivers equipped with "DOLBY FM" pushswitches. However, when used with receivers or tuners not so equipped, FM calibration will be required. For this purpose, **PLAY/FM CAL** controls are provided on the rear panel. The controls should be adjusted so that the Dolby reference tone transmitted by the FM station at the beginning of a Dolby broadcast registers **D0** on the VU meters. Once the levels are set, they do not need to be readjusted unless a different tuner or receiver is connected.

The decoded Dolby FM program can be monitored through the amplifier system. If you are recording a cassette at the same time, the cassette will be Dolby encoded to obtain the maximum effect from the noise reduction process.

NOTE: When the **DOLBY FM-ON** pushswitch is depressed, the record input level controls (the sliders) are bypassed. The recording level is determined by the **PLAY/ FM CAL** controls. When the controls are set properly using the broadcast reference tone, the levels will be correct for Dolby recording.

EXTERNAL TAPE RECORDER

The Dolby System in the Model 5220 can be used as a Dolby decoder for an external tape deck not equipped with its own Dolby circuits in the same manner as a decoder for Dolby FM broadcasts. Because of the dissimilar playback level characteristics of various tape recorders, **PLAY/FM CAL** controls are provided on the Model 5220. The **PLAY/FM CAL** controls determine the input sensitivity of the Dolby circuit when playing back a Dolbyized program from the external unit.

The external tape recorder should be connected

directly to the rear panel **LINE INPUT**. The outputs of the Model 5220 remain connected to the tape monitoring facilities on the preamplifier or receiver.

It is necessary to adjust the output level controls of the external tape deck and the rear panel **PLAY/FM CAL** controls on the Model 5220 when using the Dolby System. The following section will outline calibration, recording and playback procedures.

CALIBRATION

If you haven't already done so, obtain a reel-to-reel Dolby System Calibration Tape from your Marantz dealer. The calibration tape is also available in cassette format, if your external recorder is another cassette deck. The tape is prerecorded with a 400 Hz tone at the specified Dolby level and is used for setting the output levels of your external tape deck and the **PLAY/FM CAL** levels on your Model 5220. Use and store the calibration tape carefully to avoid accidental erasure. For example, do not store the calibration tape on top of your power amplifier, because the magnetic fields produced by the transformer in the amplifier could partially erase the tape. (The same holds true for any cassette tape!)

When you have obtained a calibration tape, proceed as follows:

1. Set the tape monitor switch on your receiver to "TAPE".
2. Depress the **DOLBY NR ON** pushswitch.
3. Depress the **DOLBY FM-ON** pushswitch.
4. If you are using the 25 μ Sec de-emphasis circuit in the Model 5220, switch it to **FLAT**.
5. Load the Dolby Calibration Tape on your external recorder and play it.
6. Set the monitor switch(es) on the external recorder to "TAPE" and adjust the output level controls so that the VU meters register "0".
7. With the tape still playing, adjust the **PLAY/FM CAL** controls on the rear panel of the Model 5220 so that its VU meters register DC.
8. When the levels are set, rewind the remove the calibration tape.

NOTE: The Model 5220 may be left in the stop position when using the Dolby circuits to decode an external source.

The decoded program from the external tape recorder can be monitored through the amplifier system. To make a cassette copy of the program, insert a cassette and record in the same manner as

a Dolby FM broadcast. Again, the cassette you record will be Dolby-encoded to obtain the maximum effect from the noise reduction process, and no adjustment of the input level controls is necessary.

If you have purchased a Dolby Calibration cassette, you may play the cassette on your Marantz deck to confirm the playback reference level. The meters should register within 1 dB of the "DC" mark.

MULTIPLEX FILTER

The rear panel **MPX FILTER** switch activates a high filter which is specially designed to block the high frequency multiplex pilot and subcarrier signals which are present in stereo FM broadcasts. Although these pilot and subcarrier signals are outside the human hearing range, they can inhibit the action of the noise reduction circuit when making Dolby encoded recordings of standard FM stereo broadcasts.

Normally, it is the job of the tuner or receiver to filter out these undesired signals. Most high quality tuner sections already provide sufficient (40 dB) pilot and subcarrier rejection. In fact, **with all Marantz tuners and receivers, use of the MPX FILTER is unnecessary.** However, to ensure correct operation of the noise reduction circuitry when used with other brands of tuners that may not have sufficient pilot and subcarrier rejection, the **MPX FILTER** is provided.

If you are using a non-Marantz tuner, and if the Dolby circuit seems to have no effect when recording from FM stereo, then activate the **MPX FILTER**. The filter will then block the high frequency interference and allow the Dolby circuitry to operate as designed.

TECHNICAL SPECIFICATIONS

Signal to Noise Ratio	
DOLBY NR OFF	
with FE-Cr or CrO ₂ tape	50 dB
with standard tape	48 dB
DOLBY NR ON improves S/N ratio by	8 dB
Total Harmonic Distortion	3%
Frequency Response	
with Ferri-Chrome tape	35 Hz to 17 kHz ±3 dB
with CrO ₂ tape	35 Hz to 15 Hz ±3 dB
with standard tape	45 Hz to 13 kHz ±3 dB
Wow and Flutter	0.08% W.R.M.S.
Input Impedance	
Mic	10 kΩ
Line	100 kΩ
Line Output Level	900 mV
Line Output Impedance	6 kΩ
Headphones Output Impedance	8Ω

GENERAL

Power Requirements	120 V AC, 60 Hz
Power Consumption	25 W
Dimensions:	
Width	17-3/8 inches
Height	5-3/8 inches
Depth	11-1/2 inches
Weight:	
Model 5220 Only	20 lbs 10 oz
Packed for Shipment	26 lbs 11 oz

MAINTENANCE

CLEANING

The satin gold anodized finish of the aluminum front panel and the smoked plexiglas window 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 or cotton swab slightly dampened with a mild solution of detergent and water.

IN CASE OF DIFFICULTY

If your set is not operating properly, check the following points:

1. Tape not running.
 - Improper connection of power cord.
 - **POWER** switch in OFF position.
 - Defective cassette.
2. Record button will not go down.
 - No cassette inserted.
 - No erasure prevention tab on cassette.
3. Tape runs but no sound.
 - Tape not recorded.
 - Improper or incorrect connection of amplifier or speaker.
 - Volume control of amplifier is in MIN position.
 - Amplifier select switch not in TAPE position.
4. Level meter is dead during recording (no recording).
 - **DOLBY FM-ON** switch is depressed.
5. Distortion in sound.
 - Record level is too high.
6. Wow in sound.
 - Tape head is dirty.
 - Pinch-roller (capstan) is dirty.
 - Defective tape (warped or stretched tape).
 - Tape is not wound neatly or it is wound too tight.
 - Defective cassette with excessive tape drag.
7. Excessive noise.
 - Tape head requires demagnetization.
 - Defective tape.
8. Hum in sound.
 - Improper connection of shielded cable.
 - AC magnetic field from power transformer of external equipment is in close proximity to tape head.

REPAIRS

Only the most competent and qualified service technicians should be allowed to service the Model 5220. 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, refer to the list of Authorized Marantz Service Stations packed with the Model 5220 or write directly to the location listed below for the name and address of the Marantz 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 in its behavior.

Marantz Company, Inc.
Technical Service Dept.
P.O. Box 577
Chatsworth, CA 91311
U.S.A.

REPACKING FOR SHIPMENT

Should it become necessary to repack your Model 5220 for shipment to the factory, to an authorized service station, or elsewhere, please observe the following precautions:

- a. Do not ship your unit to the factory without an Authorized Return Label, which the Marantz Company will supply if the description of difficulties appears to warrant factory service.
- b. Do not ship the unit installed in its accessory walnut cabinet; remove the unit from the cabinet before packing.
- c. Pack the unit carefully, using the original material as shown in Figure 5.

PLEASE NOTE that if you have discarded, lost, or damaged the packing material, new packing material may be obtained by writing to the **Marantz Technical Services Department**. The carton, its fillers, and packing instructions will be returned to you at a nominal charge.

- d. Ship via a reputable carrier (do not use Parcel Post) and obtain a shipping receipt from the carrier.
- e. Insure the unit for its full value.
- f. Be sure to include your return address on the shipping label.

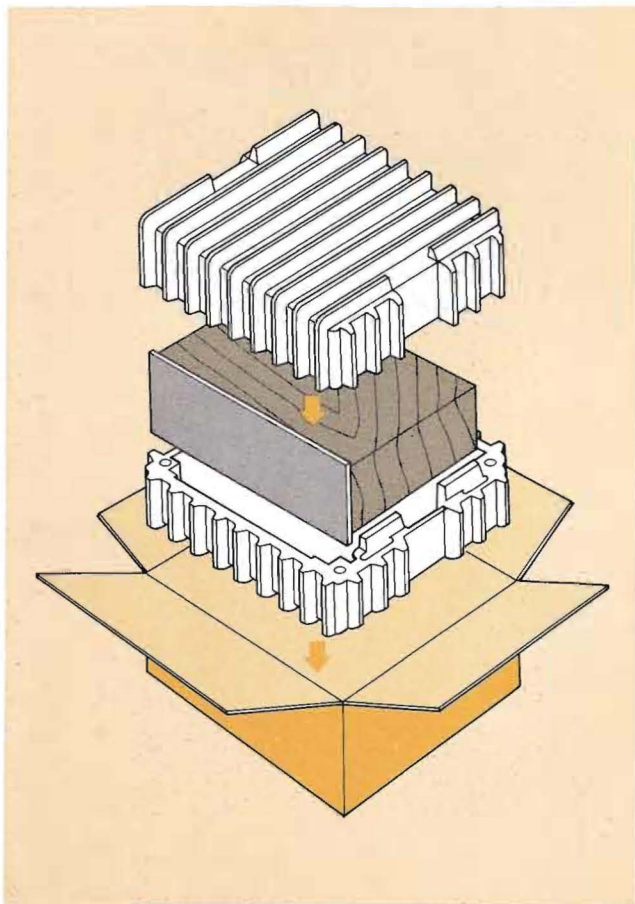


Figure 5. Packing Instructions

NOTES

The Sound of Marantz
is the compelling warmth of a Stradivarius.
It is a dancing flute, a haughty bassoon
and the plaintive call of a lone French horn.
The Sound of Marantz is the sound of beauty,
and Marantz equipment is designed to bring you
the subtle joy of its delight.
Wonderful adventures in sound await you
when you discover that the Sound of Marantz
is the sound of music at its very best.

Noise reduction circuit under license from Dolby Laboratories, Inc.
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