



# AMPEX

## FINE LINE F-44

### OWNER'S REFERENCE MANUAL

# AMPEX

FINE LINE F-44

MODELS F-4450, F-4452, F-4460, & F-4470

*Welcome* to the growing family of music lovers whose discriminating tastes have found expression in the ownership of an AMPEX. Your new AMPEX recorder—a product of the magnetic recording industry's most advanced skills—is designed to provide the highest levels of performance and dependability attainable in any tape equipment made for home or semi-professional use.

This manual has been prepared so that you may realize the full potential of the quality features engineered into your recorder. It is suggested that you first read the manual carefully, operating the controls to become familiar with their functions. When you are ready to perform the various functions, use of the index at right will provide a convenient means of locating the desired section.

**what does it consist of,  
and what it does:**

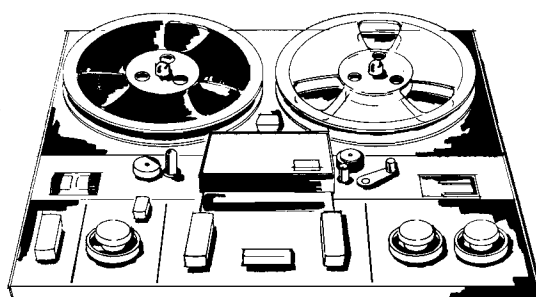
**how to operate:**

**care and maintenance:**

**TO USE THE “QUICK-FIND” INDEX AT RIGHT:**

Hold the index edge between thumb and fore-finger, flip pages until grey panel appears underneath desired index pages.

**GETTING ACQUAINTED WITH THE AMPEX FINE LINE F-44**



GENERAL

F-4450  
and  
F-4460

F-4470

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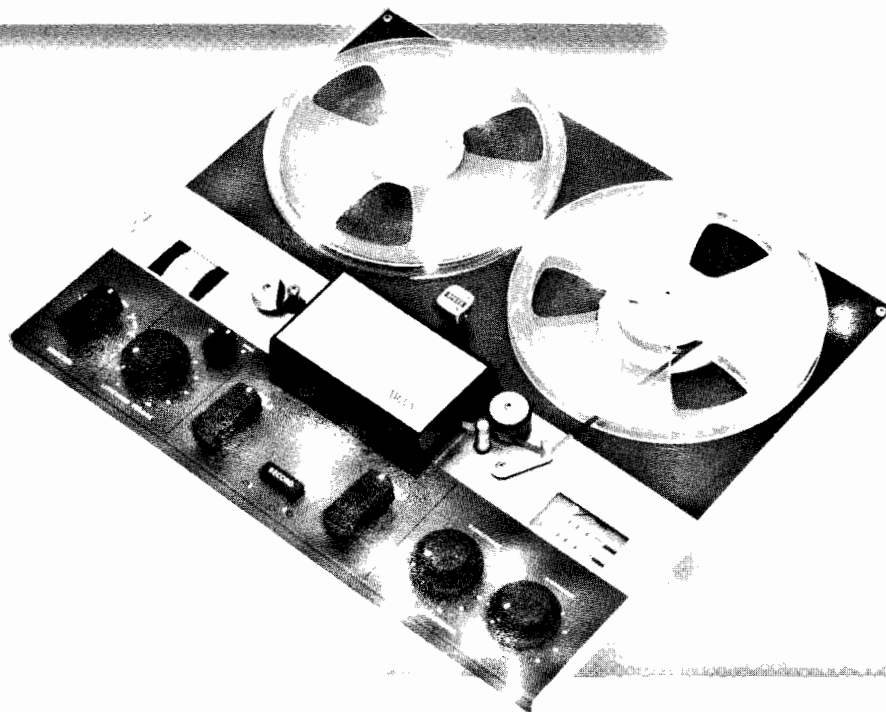
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# GETTING ACQUAINTED WITH THE AMPEX FINE LINE F-44



## FOUR F-44's

The Fine Line F-44 recorders are available in four versions. The F-4450 and F-4452 are unmounted recorders designed for mounting in hi-fi consoles and similar custom installations. The F-4460 is mounted in a durable luggage-type portable carrying case. The F-4470 is mounted in a similar portable carrying case which contains, in addition to the recorder, an integral stereo amplifier and two speakers.

The function of the Fine Line F-44 recorder is to capture and store sound as magnetic impulses on the tape, and to translate the impulses back into sound on demand. The instrument incorporates a wide range of control functions and, with them, is capable of a level of performance normally obtainable only with professional recording equipment.

The F-44 has been engineered to provide optimum operation results at either of two standard operating speeds— $7\frac{1}{2}$  ips and  $3\frac{3}{4}$  ips. The latter is recommended for recording voice and other sounds where long recording time may be more important than high frequency response. The  $7\frac{1}{2}$  ips speed is recommended for music and other sounds requiring the highest degree of fidelity throughout the range of human hearing.

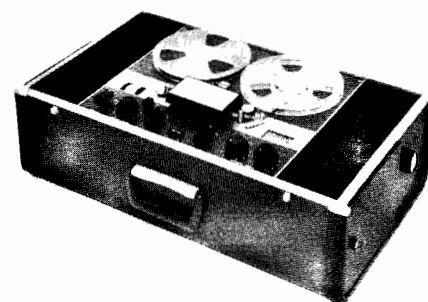
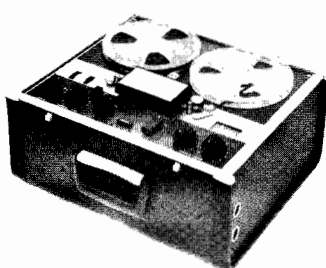
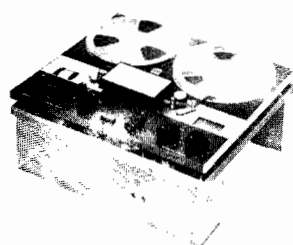
The instrument utilizes three separate precision dual-track stacked heads, for 4-track playback, recording, and erasing operations, each especially engineered for its one specific function.

The function of the head—erasing, recording, or playback—takes place at the “head gap”. In the playback head, the head gap is a minute vertical space much smaller than the diameter of a human hair, where the two halves of the head structure come together.

## COMPONENTS SUPPLIED

|                                    | F-4450 | F-4452 | F-4460 | F-4470 |
|------------------------------------|--------|--------|--------|--------|
| Recorder, unmounted                | 1      | 1      | —      | —      |
| Recorder in portable case          | —      | —      | 1      | —      |
| Recorder in monitor-amplifier case | —      | —      | —      | 1      |
| Empty 7" reel                      | 1      | 1      | 1      | 1      |
| Power cable                        | 1      | 1      | 1      | 1      |
| Signal cable                       | 2      | 2      | 2      | 2      |
| Owner's reference manual           | 1      | 1      | 1      | 1      |
| Mounting template                  | 1      | 1      | —      | —      |
| Warranty card*                     | 1      | 1      | 1      | 1      |

\*To be filled out and returned to AMPEX AUDIO to receive ONE YEAR WARRANTY IDENTIFICATION card.



## PERFORMANCE CHARACTERISTICS

### *Recording Inputs*

High impedance line inputs (500,000 ohms) requiring approximately 0.15 volt rms for maximum normal recording level; high impedance microphone inputs (2.2 megohms) requiring approximately 0.5 millivolt for maximum normal recording level.

### *Overall Frequency Response*

Within  $\pm 2$  db from 50 to 15,000 cps at  $7\frac{1}{2}$  ips with 53 db signal-to-noise ratio; and within  $\pm 2$  db from 50 to 8,000 cps at  $3\frac{3}{4}$  ips with 48 db signal-to-noise ratio.

### *Load Impedance*

Recommended load impedance 250,000 ohms or greater, less than 2500  $\mu\text{f}$ .

### *Flutter and Wow*

Under 0.15% rms at  $7\frac{1}{2}$  ips and under 0.2% rms at  $3\frac{3}{4}$  ips (measured using A.S.A. standard Z57.1-1954).

### *Timing Accuracy*

$\pm 1\%$ .

### *Power Line Supply*

115 volts, 60 cycles AC, 105 watts

### *Playback Outputs*

Approximately 1.0 volt rms from cathode fol-

lower when using tapes recorded at maximum normal recording level.

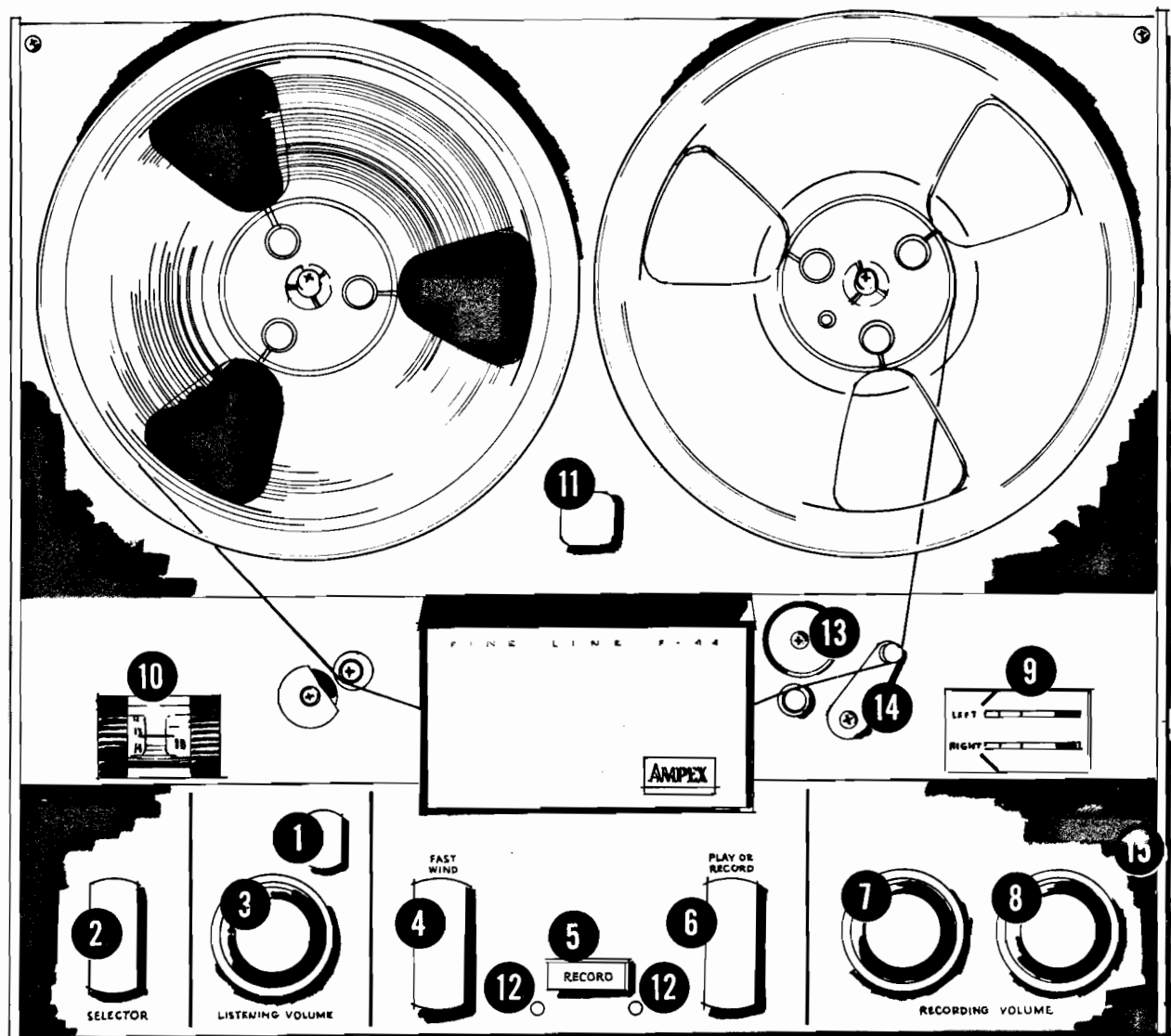
### *Heads*

Manufactured to the same standards of precision that exist in AMPEX broadcast and recording studio equipment. Surfaces are lapped flat within 10 millionths of an inch, resulting in uniform performance characteristics throughout the life of the head. Stereo head gap alignment: the one head gap in the stack with respect to the other is held within 20 seconds of an arc, equivalent to less than 10 millionths of an inch—a degree of precision achieved through use of a unique process involving micro-accurate measurements within a controlled environment. Head gap length is 90 millionths of an inch.

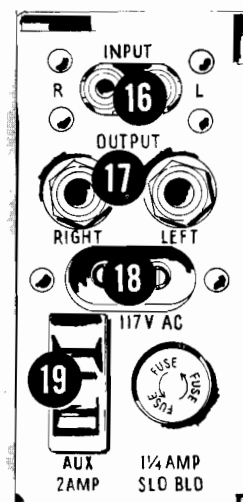
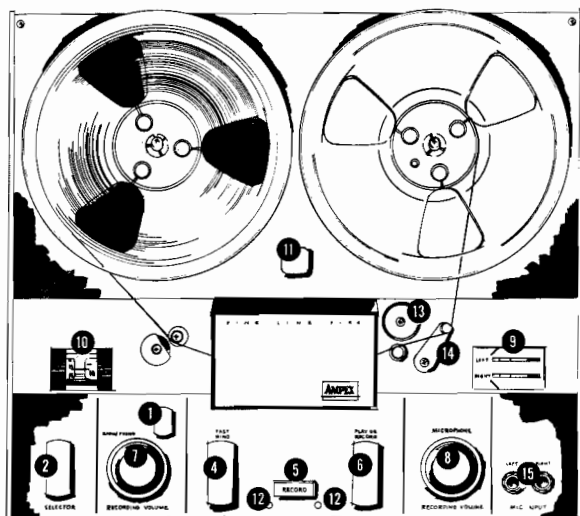
| PLAYING TIMES                  | 4-track<br>stereophonic<br>tapes | 4-track<br>monophonic<br>tapes |
|--------------------------------|----------------------------------|--------------------------------|
| 1200' reel, $7\frac{1}{2}$ ips | 1 hr 4 min                       | 2 hrs 8 min                    |
| $3\frac{3}{4}$ ips             | 2 hrs 8 min                      | 4 hrs 16 min                   |
| 1800' reel, $7\frac{1}{2}$ ips | 1 hr 36 min                      | 3 hrs 12 min                   |
| $3\frac{3}{4}$ ips             | 3 hrs 12 min                     | 6 hrs 24 min                   |
| 2400' reel, $7\frac{1}{2}$ ips | 2 hrs 8 min                      | 4 hrs 16 min                   |
| $3\frac{3}{4}$ ips             | 4 hrs 16 min                     | 8 hrs 32 min                   |

With the objective of a continuing improvement of its products, AMPEX Corporation reserves the right to modify specifications and designs as necessary, without incurring any obligation.

## THE F-4450 AND F-4460



## THE F-4452



The following list outlines the controls, indicators, and other functional parts used in operating the Fine Line F-44 recorder. Numbers correspond with those in the illustration on the opposite page. Note that LISTENING VOLUME and RECORDING VOLUME controls have double knobs; inner knob and surrounding ring are separate controls.

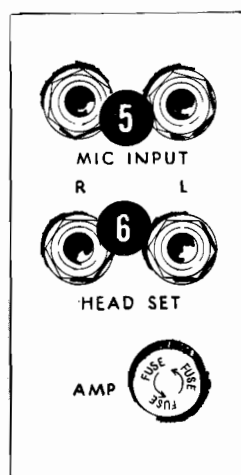
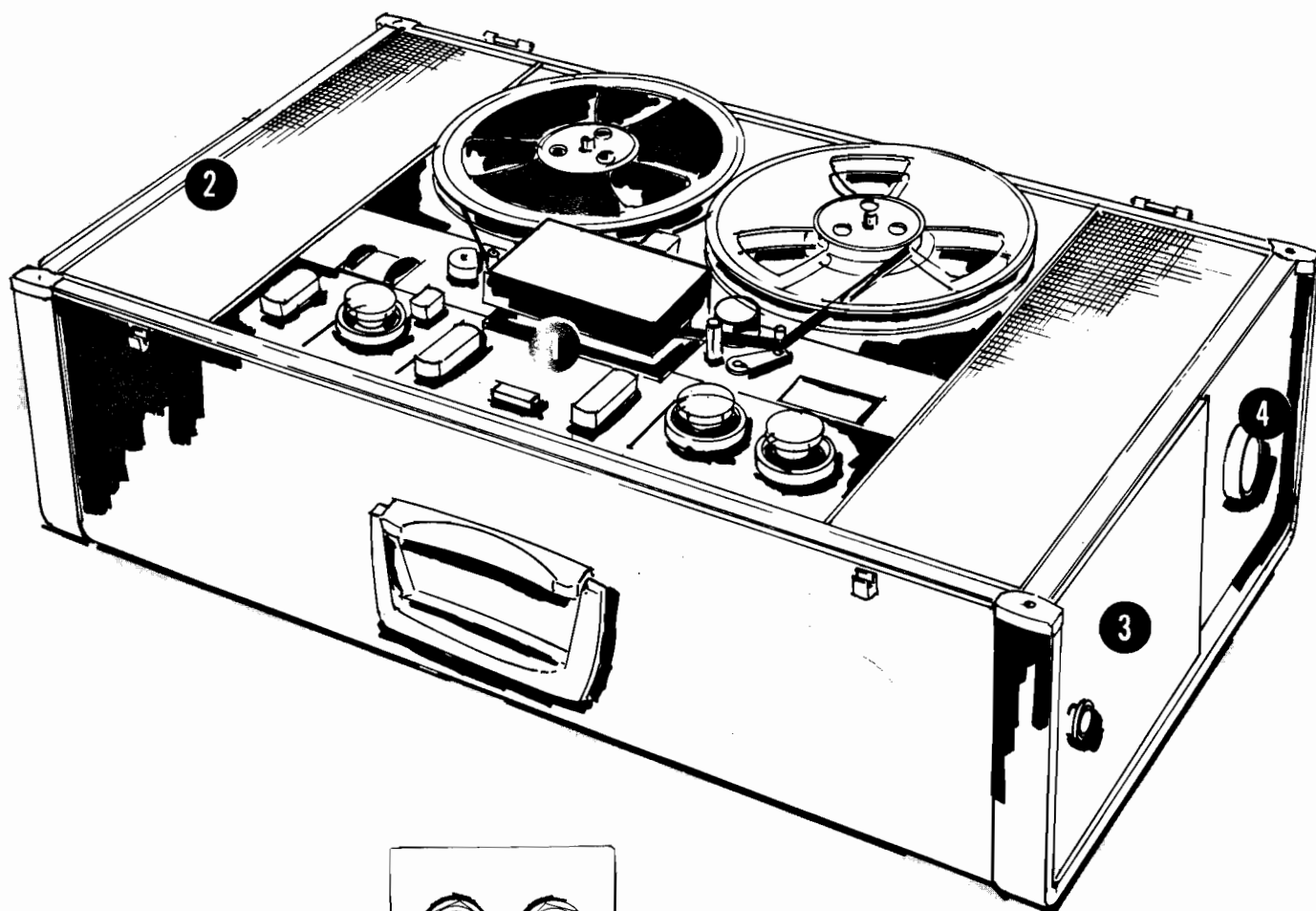
- 1 Power and monitor switch. Switches recorder on and selects monitoring of input or tape. In INPUT position, signals from input of recorder are present at output. In TAPE position, signals from tape are present at output.
- 2 Selector switch. Selects monophonic or stereophonic recording and playback. In MONO 1 position, input to left channel (from microphone, radio, etc.) is recorded on upper track (track 1 or 4). In MONO 2 position, input to left channel is recorded on lower track (track 3 or 2). In STEREO, inputs to both channels are recorded simultaneously (on tracks 1 and 3 or tracks 4 and 2). See page 23 for explanation of two ADD positions. Also see page 10 for explanation of track placement on tape.
- 3 Listening volume control. Inner knob adjusts listening volume for left channel, and outer knob adjusts listening volume for right channel. NOTE: In model F-4452, listening volume is not adjustable and RADIO/PHONO RECORDING VOLUME controls (see #7) occupy this position.
- 4 Fast wind control. Moves tape rapidly in either direction. To operate, turn knob in direction of desired tape motion.
- 5 Record switch. Record switch (pushbutton) is safety-interlocked with PLAY or RECORD control (#6) — both must be actuated simultaneously to record.
- 6 Play or record control. Locks machine in playback or recording mode of operation. Turn clockwise to move tape at normal speed from left to right.
- 7 Radio/phono recording volume. Inner knob adjusts recording volume of external input signal (such as a radio) for left channel and outer knob adjusts recording volume for right channel. NOTE: In model F-4452, RADIO/PHONO RECORDING VOLUME controls occupy position #3 and the MICROPHONE RECORDING VOLUME controls (#8) occupy this position.
- 8 Microphone recording volume. Inner knob adjusts recording volume of microphone input signal for left channel and outer knob

adjusts recording volume for right channel. NOTE: In model F-4452, MICROPHONE RECORDING VOLUME controls occupy position #7 and MICROPHONE INPUT jacks (#15) occupy this position.

- 9 Record level meter. Upper meter indicates recording level of upper track (marked LEFT) and lower meter indicates recording level of lower track (marked RIGHT).
- 10 Tape position indicator. Indicates starting and stopping position of the various selections on the tape, enabling return to any predetermined position.
- 11 Speed selector. Selects tape speed: up position for 7½ ips, down for 3¾ ips. NOTE: *Recorder must be turned on when changing tape speed setting.*
- 12 Record indicators. Indicates which track is actually being recorded; indicator marked L (left) is upper track and indicator marked R (right) is lower track.
- 13 Capstan and capstan idler. Capstan drives tape at proper tape speed in play or record modes. Capstan idler presses tape against capstan and is only actuated in play or record modes.
- 14 Automatic shut-off arm. Shut-off arm automatically stops tape motion at end of reel or if tape breaks. See "Special Features" on page 14.
- 15 Microphone input jacks. On the F-4450 and F-4460, microphone input jacks are located on right side of recorder near front. Upper jack is for left channel and lower jack for right channel. On the F-4452, microphone input jacks are located on top in position normally occupied by MICROPHONE RECORDING VOLUME controls (#8).
- 16 Line input jacks. Line input jacks are located at back of recorder near left side. Line input jacks are used to connect a radio, phonograph or other sound source to recorder.
- 17 Output jacks. Located on same panel as line input jacks, output jacks are used to connect recorder to amplifier-loudspeaker systems.
- 18 Power receptacle. Connected to proper power source, receptacle provides power to recorder. It is located on same panel as line input and output jacks.
- 19 Auxiliary power outlet. Provides power to auxiliary units such as the AMPEX 2044 Speaker-Amplifier and is controlled by recorder power switch (#1). See "Special Features" on page 14.



# THE F-4470





The AMPEX Fine Line F-4470 provides the same operational features as the Models F-4450 and F-4460, with the additional feature of a self-contained 3-watt stereo and amplifier-speaker system (1.5 watts per channel). Though external speaker-amplifiers such as the AMPEX Model 2044 or equivalent are recommended for utilizing the full performance capabilities of the F-4470's recorder/reproducer, the unit's built-in amplifier-speakers provide a high degree of flexibility and utility for their designed purpose of stereo monitoring.

- 1 The control features of the F-4470 recorder are identical to the F-4450 recorder on page 7 with exception of the location of the microphone input jacks (see #5 below).
- 2 Behind this door is the speaker for the left channel. The door is used as a sound director (see below).
- 3 Behind this door is the speaker for the right channel. The door, as with the left channel, is used as a sound director.
- 4 Tone control. Selects the most pleasing (to the user) tonal response in the immediate listening area.
- 5 Microphone input jacks. The microphone input jacks are located at the back of the recorder and are labelled for the right and left channels.
- 6 Head set jacks. The phone jacks are connected to the output of the internal monitor amplifiers and may be used for monitoring through head sets.

#### OPERATIONAL DIFFERENCES

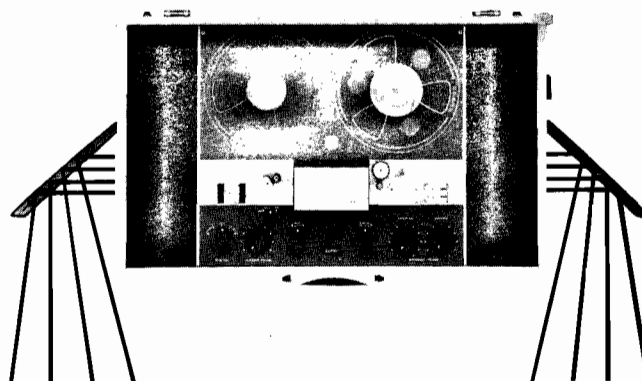
The microphone input jacks, as previously mentioned, are located at the rear of the recorder. Except for location, operation of the microphone inputs is identical to the F-4450 and F-4460.

As with the F-4450 and F-4460, the output jacks are used to connect the recorder to external speaker-amplifiers such as the AMPEX Model 2044. Connecting external speaker-amplifiers to the recorder automatically disconnects the internal monitor amplifier-speakers.

The headset jacks are connected to the output of the internal monitoring amplifiers. With low impedance headsets (16 ohms or less) plugged into these jacks, the monitor speakers are automatically disconnected.

The tone control allows adjustment of the tonal response of the monitor amplifier-speaker system. With the control in the full clockwise position, the frequency response of the amplifier is flat over its specified frequency range. In the extreme counterclockwise position, the treble signals are attenuated and a setting between the full clockwise and full counterclockwise position can be selected to provide the most pleasing monitor response in the immediate listening area.

On both the right and left end panels, toward the front, is a small knob. Rotation of this knob unlatches the sound directors, which may be adjusted to an angle between zero and 80° from the end of the case. The angle at which the directors are set is adjusted as desired to provide the most desirable stereo acoustical pattern in the immediate monitoring area.



# THE RECORDING MEDIUM – MAGNETIC TAPE

Magnetic tape is a plastic film coated with millions of tiny particles of magnetic oxide (which give the tape its brown color). To store a sound on this tape, it is necessary to convert the sound into an electrical current. This current, flowing through the recording head on your tape machine, causes an electromagnetic field to vary in accordance with the fluctuations in the sound. The oxide particles on the tape, as they pass the recording head, are magnetized by the varying electromagnetic field. On playback, the magnetized tape passes the playback head and induces an electrical current corresponding to the sound that the tape "remembers". This current is amplified and transformed back into sound energy.

Magnetic tape's "memory" does not wear out or deteriorate with age. The tape remains magnetized indefinitely, until erased or brought into contact with a strong magnetic field. It can be erased and re-recorded innumerable times with no loss in its ability to capture and play back sound or other information which can be converted into electrical signals.

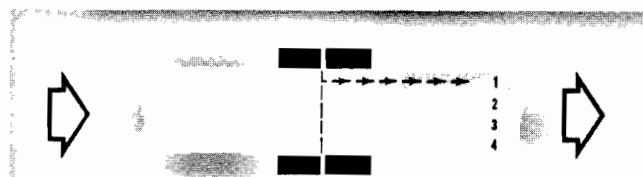
## TYPES OF TAPES

Both monophonic and stereophonic recordings can be recorded on the F-44 series recorders. A monophonic recording is one in which only single-channel sound is recorded on the tape. A monophonic tape is generally recorded its full length and then turned over for recording on its sound track back to the beginning of the reel. In "four track" monophonic recording this process is repeated again so that all four tracks are used for four separate recordings, which provides four times the available recording time.

The 4 track stereo tape is recorded on alternate tracks so that the first recording goes on tracks 1 and 3 for the full length of the tape and is then turned over to record on tracks 2 and 4 back to the beginning of the reel.

## HANDLING MAGNETIC TAPE

Tape is a strong, permanent recording medium, unaffected by ordinary handling or



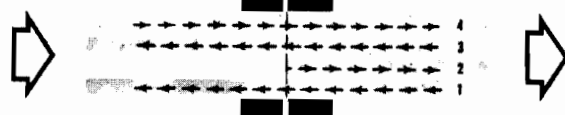
In MONOPHONIC RECORDING, the tape is recorded on one-fourth its width. (MONO 1 position)



When the end of the reel is reached, the tape is turned over, and the second track is recorded in the opposite direction. (MONO 1 pos.)



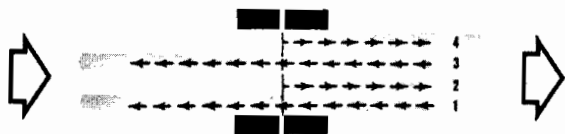
When the end of the second track is reached, the tape is again turned over, and the third track is recorded in the same direction as the original recording. (MONO 2 position)



The reel is again turned over and the final track is recorded. (MONO 2 pos.)



In 4-track STEREO RECORDINGS, the two stereo channels are recorded on non-adjacent tracks in one direction, (tracks 1 and 3 as shown above) from one end of the reel to the other.



At the end of the reel, the tape is turned over and recorded on the alternate tracks (tracks 2 and 4 as shown above).

storage. However, it should be kept away from heat and moisture, and direct contact with other magnetic materials. Avoid stretching tape, or you will distort it and destroy the quality of the recording.

## AMPEX "500" SERIES RECORDING TAPE

The same exacting engineering skills that made AMPEX the leader in the tape recording field have now created the world's finest recording tapes! Only AMPEX could have engineered tapes with so many superior performance characteristics — tapes that truly merit the name AMPEX. Here are some of the reasons: greater dynamic range, 4 to 8 DB wider; lower print-through; superior high frequency overload characteristics.

## HOW TO CHOOSE THE RIGHT RECORDING TAPE

Currently AMPEX Recording Tapes are made on two bases — Dupont's "Mylar" Polyester film and cellulose acetate film.

Cellulose acetate is a highly refined form of cellophane that has always been an excellent base for recording tapes and is even now considered standard for the recordist's use. The use of acetate base tapes guarantees more playing time per dollar, affording more listening enjoyment on a budget basis. It must be understood, however, that acetate will not afford the durability or reliability of "Mylar".

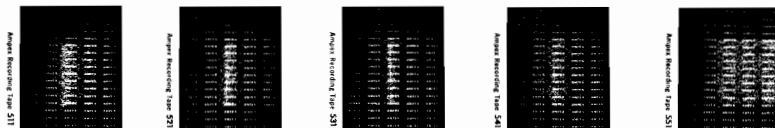
Increased durability and reliability requirements have created a trend toward the toughest . . . strongest . . . most durable base material used for modern recording tape, MYLAR! You'll find that tapes of "Mylar" do a better job. They have a 300% safety margin against stretching and breaking. They give long life and lasting fidelity because they will not crack or dry out with age. You never have to bother with fussy storing either . . . because heat and humidity just cannot affect tapes of "Mylar".

The logical rule to follow when selecting a tape length is, "The thinner the base, the more playing time". Acetate base tapes are not practical in thicknesses less than 1 mil.

Mylar, on the other hand, can be obtained in ½ mil thickness. The tape handling facility of the recorder is critical. Some less expensive recorders are apt to break the thinner based tapes. Experience will be the best teacher in this respect. A 7" reel of ½ mil Mylar will provide one hour of recording at 7½" per second. 1½ mil tape provides thirty minutes on a 7"

reel. Your own recording experience will soon provide you with the knowledge to select the best tape for the job.

AMPEX Recording Tape is a quality AMPEX product. The Ferro-Sheen® process permits intimate tape-to-head contact to capture all the high frequency overtones that are a must for the brilliance of faithful sound reproductions.



### 511 OUTSTANDING VALUE

Improved by AMPEX engineering, this popular priced tape made with the Ferro-Sheen process will give top performance and excellent frequency characteristics. 1.5 mil acetate base.

### 521 INCREASED PERFORMANCE

This tape gives the home recordist maximum playing time per dollar invested, for application where high strength is not critical. 1 mil acetate base.

### 531 VIRTUALLY INDESTRUCTIBLE

A tape that provide the greatest mechanical strength and resistance to change due to extreme dampness or temperature changes. You can store this tape indefinitely without its becoming brittle or drying out. 1.5 mil DuPont Mylar base.

### 541 EXTRA PLAYING TIME

Top results on any recording instrument is assured with this tape. Assured resistance to tearing or breaking is built in this 1 mil DuPont Mylar base tape.

### 551 DOUBLE PLAY

Double length plus double strength with superior frequency characteristics is the chief value of Ampex 551. At normal tape speeds, up to two hours of recording is possible. Specially silicized .5 mil DuPont Mylar base.

# SETTING UP THE SYSTEM

## MOUNTING

For custom installation of the Fine Line F-4450 and F-4452 recorders, a mounting template is provided. This template indicates all the mounting holes and clearances necessary for proper installation and operation.

## CONNECTIONS

The diagrams on the opposite page show the connections necessary for a portable system and a permanent system. The illustrations on this page show close up views of the types of plugs necessary and of connector panels on the recorder and the speaker-amplifier. The pin plugs (A) are used with the line input jacks, and the phone plugs (B) are used with the output jacks and microphone input jacks. Connect power and signal cables to the system as shown in the diagram.

## CHECKING BALANCE

If, upon operating your system, you would like to determine that your speaker system is in balance, go through the following procedure, referring to pages 6 and 7 for identification of controls and indicators:

### Step 1:

Turn on system power, setting control #1 to TAPE. Turn the SELECTOR switch (control #2) to the MONO 1 position. Set both listening volume controls (#3) to the same setting (Approximately 5). Place a pre-recorded tape on the machine and play it back in accordance with the instructions on pages 16 and 17.

### Step 2:

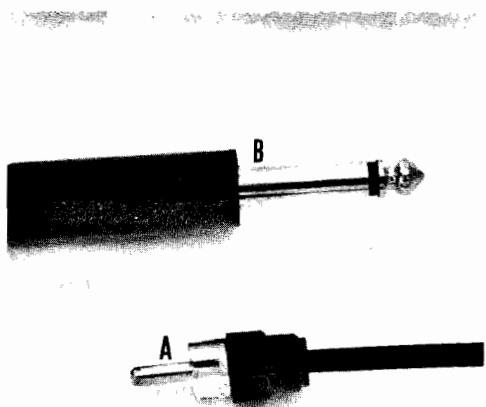
At the speakers, make sure that BASS-TREBLE controls are at identical settings.

### Step 3:

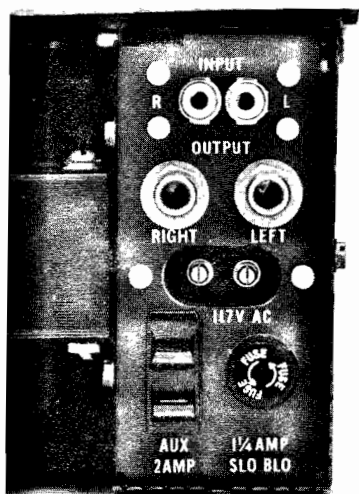
Stand in front of the speakers, at a point equidistant from both. Have someone adjust the volume controls on the speaker amplifiers until the sound appears to originate midway between them.

### Step 4:

Note the settings of speaker-amplifier volume controls; use the same settings and regulate the volume from the LISTENING VOLUME controls (#3) on the tape recorder.



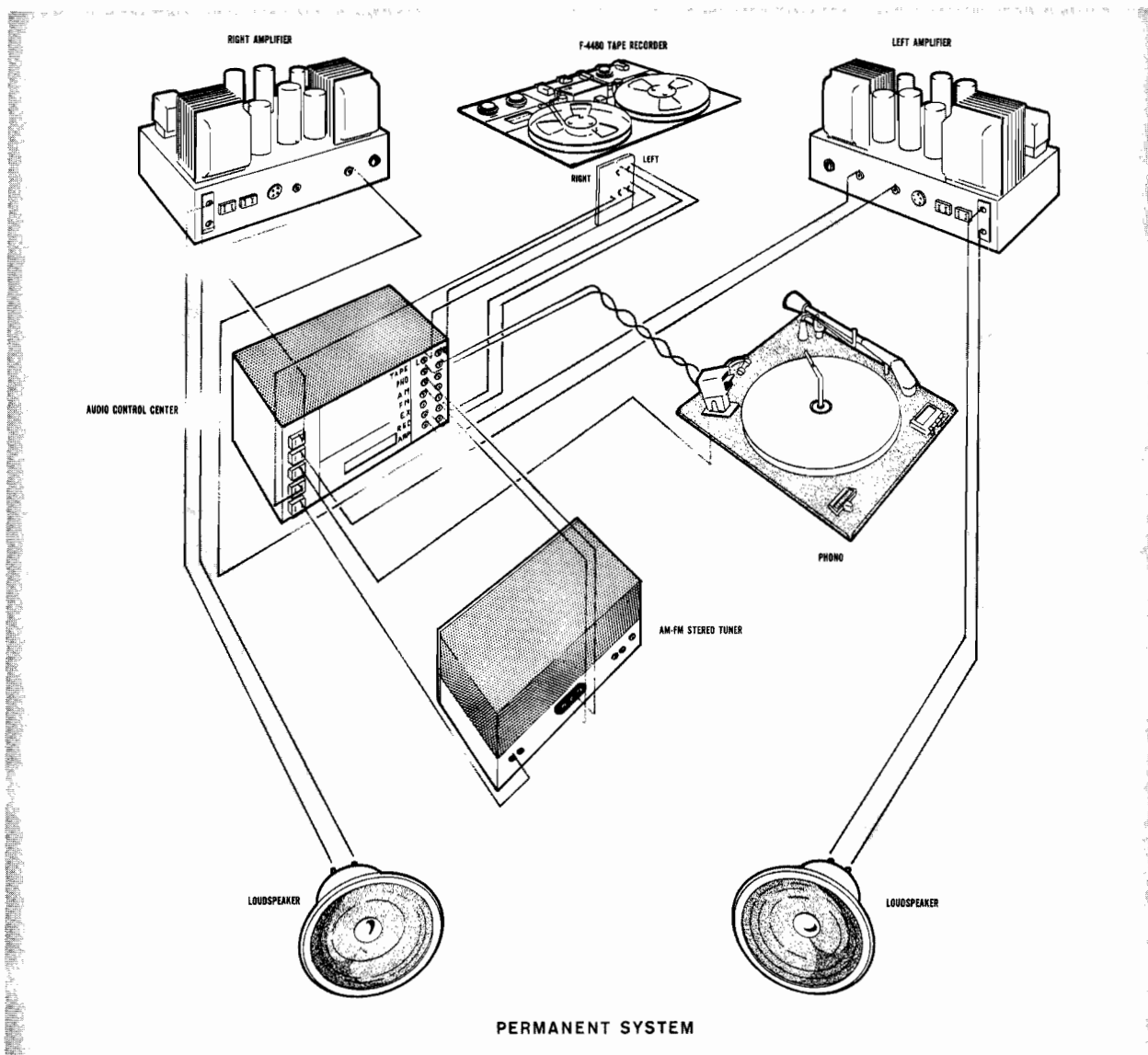
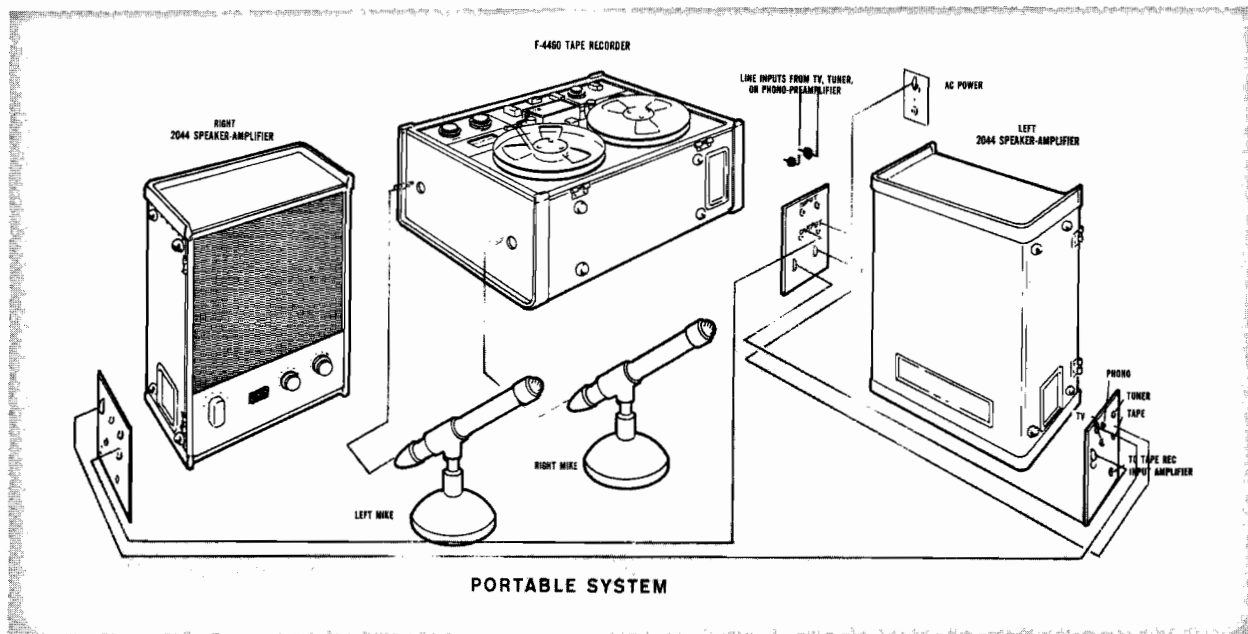
*Signal Plugs Used with the System*



*Connector Panel, F-44*



*Connector Panel, Ampex 2044*



# GETTING READY TO OPERATE THE RECORDER

## FAST WINDING

The purpose of the FAST WIND control is to move the tape rapidly from one reel to the other. Using it, a full reel can be unwound in a little over a minute. To check fast winding operation, turn the pointer of the FAST WIND control toward the empty reel at the right. The tape should start to wind onto the takeup reel and increase rapidly in speed. After a few seconds, stop the tape (see below). Then turn the pointer of the FAST WIND control to the left and allow the tape to unwind off the takeup reel. When the tape has come completely off the reel, the automatic shut-off arm should drop, stopping all rotation of the reels.

## STOPPING TAPE MOTION

To stop the tape from moving, either at standard operating speed or at fast winding speed, merely return the control involved to its neutral position. This automatically stops tape

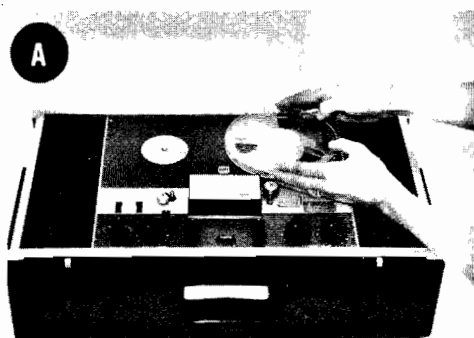
motion (and releases the RECORD pushbutton if it has been pushed in). Always return the appropriate control to its neutral position to stop tape motion. Using the on-off switch will not stop tape motion (see "Special Features" below).

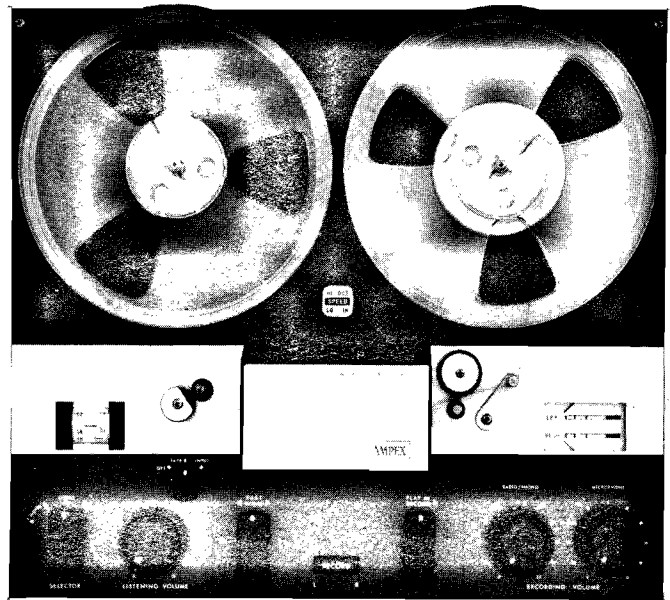
## SPECIAL FEATURES

An automatic shut-off feature has been incorporated that allows the machine to be turned off (control #1 on page 6) with the tape still playing. At the end of the tape, the machine will automatically shut itself completely off. It will also shut off any equipment (such as the 2044 Speaker-Amplifiers) that is plugged into the a-c receptacle (#22 on page 6) on the connector panel.

## THREADING THE TAPE

All new factory wound reels of tape should be unwound and inspected by running them





through the machine in the FAST WIND mode. New tapes may be looped at the hub in such a manner that the tape will not come free at the end of the reel. This will prevent the automatic shut-off arm from disengaging the capstan idler from the capstan, which may result in a flat being worn on the capstan idler wheel. (Any adhesive material accumulation on the reel hub may also keep the tape from coming free at the end of the reel and, therefore, should be removed with solvent.)

To thread the tape on the machine, refer to Figures "A" through "F" below and proceed as follows:

1. Place an empty tape reel on the right-hand turntable, in the position of the takeup reel in Figure A. Make sure the slots in the reel engage the turntable.
2. Put a full reel of tape on the left turntable (Fig. B). Tape must be coming off the left

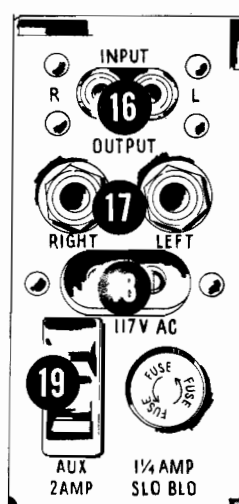
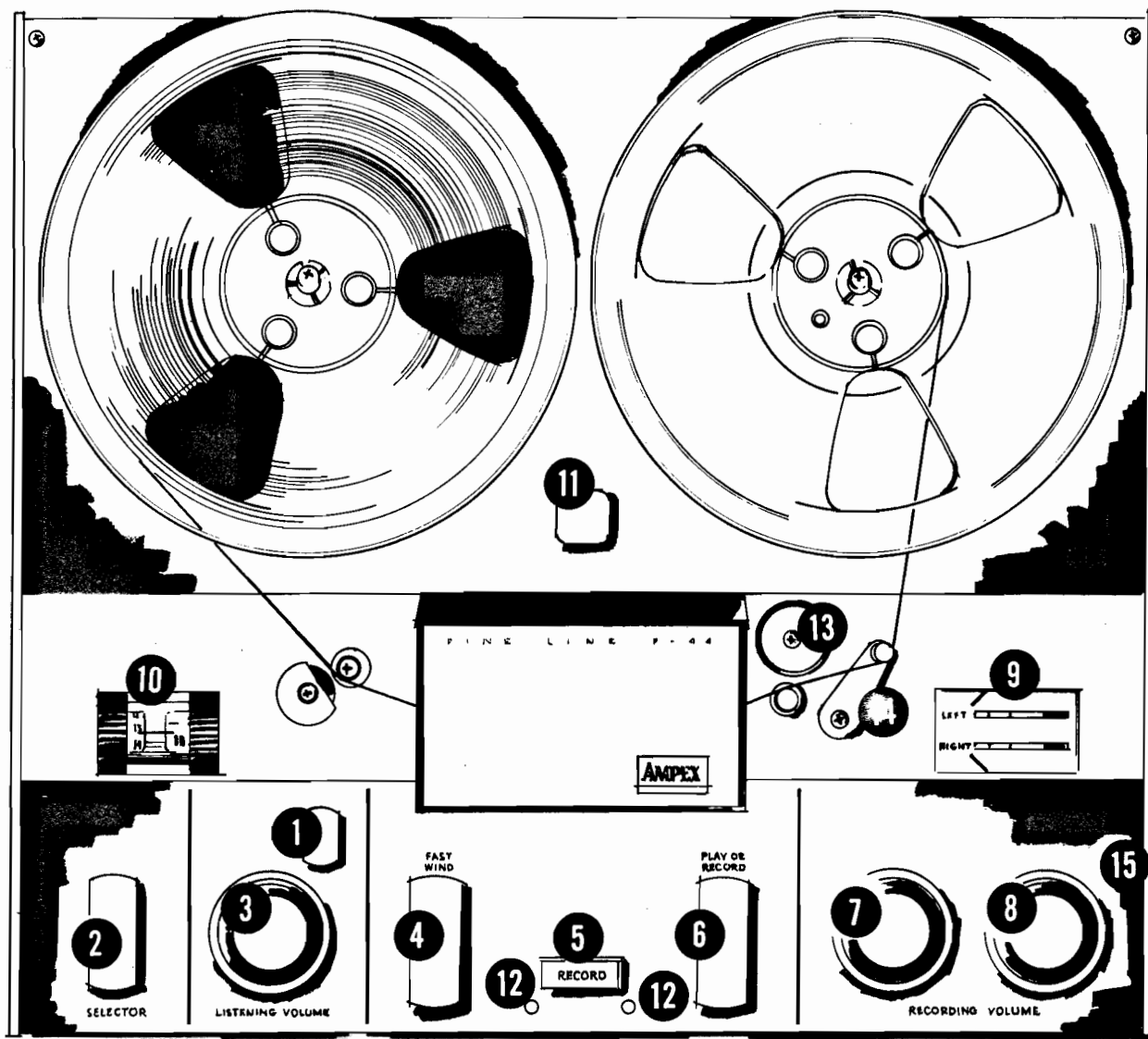
side of the reel. Make sure the slots in the reel engage the turntable.

3. Without twisting the tape, pull it off the reel and place it between the holdback tension regulator and the tape guide (Fig. C). Then slip it under the front lip of the head cover and between the capstan and the idler (Fig. D). Check to be sure that the shiny side of the tape faces toward you.
4. Place the tape on the lower side of the automatic stop arm (Fig. E.). Then pull the tape up between the flanges of the takeup reel (Fig. F).
5. Turn the PLAY OR RECORD control to start tape motion. Tape should start winding onto the reel hub. Return the PLAY OR RECORD control to its neutral position. The tape is now threaded and you are ready to operate the recorder.





# PLAYING MONOPHONIC AND STEREOPHONIC TAPES



## PLAYING MONOPHONIC TAPES

Normally, a 4-track monophonic tape will be played from beginning to end starting with track 1, followed by track 4, then track 3 and finally, track 2. Assuming that the tape is wound on the reel properly, use the procedure below. If, however, the tape is wound on the reel so that track 4 is first, the tape must be fast wound to the other end (see page 15).

### NOTE

*The following procedure assumes that the recorder has been connected to speaker-amplifiers as outlined on pages 12 and 13.*

#### Step 1:

Set the SELECTOR switch (control #2) to the MONO 1 position.

#### Step 2:

Turn the power and monitor switch (control #1) to the TAPE position. (See "Special Features" below.) Set the tape position indicator to zero.

#### Step 3:

Check the tape box or reel to see at what speed the tape is recorded. Then adjust the tape SPEED selector (control #11) for the appropriate speed (Up: 7½ ips. Down: 3¾ ips.).

### CAUTION

*Do not shift the SPEED selector if the motor is not operating as the machine can be damaged.*

#### Step 4:

Thread the tape on the machine as outlined on page 14.

#### Step 5:

Turn the PLAY control (#6) to the right to begin tape motion. The recording should now be heard. Adjust the LISTENING VOLUME controls (#3) for the desired level of sound. (See page 7.)

### NOTE

*Even though a monophonic recording is being played, the sound will be heard from both speaker-amplifiers.*

#### Step 6:

After the tape has been fully played, remove the empty reel from the recorder. Pick up the full reel of tape, turn it over and place

it on the other turntable. Thread the tape as outlined on page 14 and turn the PLAY control to begin tape motion. This will be track 4.

#### Step 7:

After the tape has again been fully played, remove the empty reel, turn the full reel over as in step 6, and turn the SELECTOR switch (control #2) to the MONO 2 position. Thread the tape and place the tape in motion. This will be track 3.

#### Step 8:

To play track 2, repeat step 6 in its entirety.

If a particular selection is desired, determine which track the selection is on and set the SELECTOR switch (control #2) accordingly (MONO 1 for tracks 1 or 4 or MONO 2 for tracks 3 or 2). Using the tape position indicator, fast wind to the desired location on the tape, then turn the PLAY control (#6) to begin tape motion as outlined in step 5 above.

## PLAYING STEREOPHONIC TAPES

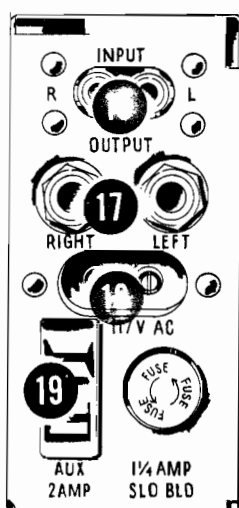
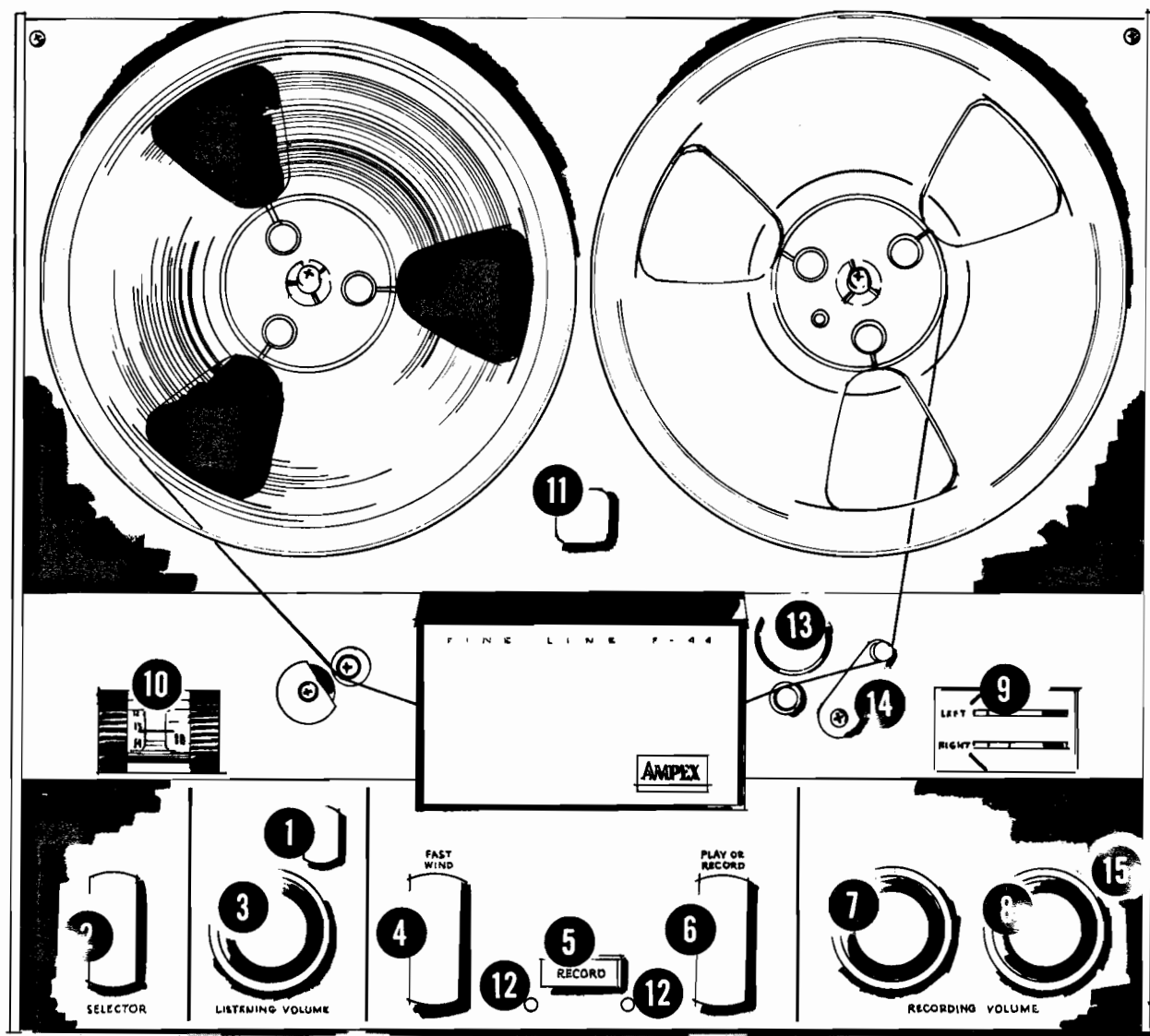
Normally, a 4-track stereophonic tape will be played from beginning to end starting with tracks 1 and 3, followed by tracks 4 and 2. To play the tape, set the SELECTOR switch (control #2) to the STEREO position and perform steps 2 through 6 above (disregarding the note in step 5). Step 6 will be tracks 4 and 2. If a particular selection is desired, fast wind to the desired location on the tape using the tape position indicator, then turn the PLAY control to begin tape motion.

Two-track stereophonic tapes can be played in the same manner as 4-track stereophonic tapes (except that step 6 is omitted and the tape should be rewound). When playing 2-track tapes, the sound level of the left channel will be slightly lower than the right channel. Turning up the volume for the left channel will compensate for this situation. For large libraries of 2-track tapes, the AMPEX 106 head shift kit should be installed. The shift kit is not recommended for users with small 2-track libraries.

## SPECIAL FEATURES

If desired, the power and monitor switch (control #1) can be turned to the OFF position while the tape is playing. The tape will continue to play until it reaches the end, at which time the recorder (and any equipment plugged into the auxiliary power outlet) will automatically shut off.

# RECORDING STEREOPHONIC TAPES



## RECORDING FROM MICROPHONES

To make a 4-track stereophonic recording, proceed as follows:

### Step 1:

Connect the two microphones to the microphone input jacks (#15). If the microphones have built-in on-off switches, make sure the switches are on.

### Step 2:

Set the SELECTOR switch (control #2) to the STEREO position.

### Step 3:

Turn the power and monitor switch (control #1) to the INPUT position and set the tape position indicator to zero.

### Step 4:

Adjust the tape SPEED selector (control #11) for the desired tape speed (Up: 7½ ips. Down: 3¾ ips.).

### CAUTION

*Do not shift the SPEED selector if the motor is not operating.*

### Step 5:

Thread the tape on the machine as outlined on page 14.

### Step 6:

Adjust the left channel (inner) MICROPHONE VOLUME control (#8) for a normal indication on the recording level meter (#9) while speaking into the left channel microphone (the meter needle should go as high as possible, but not in the black area of the meter face). Adjust the right channel (outer) MICROPHONE VOLUME control for a normal indication on the meter while speaking into the right channel microphone.

### NOTE

*If speaker-amplifiers are connected to the recorder, make sure that they are turned down so that the microphones will not pick up the sound from the speakers. If the speakers are too loud, strange noises will be heard and, if loud enough, the speakers could be damaged.*

### Step 7:

Press the RECORD button (#5) at the same time, turn the RECORD control (#6) to

begin the recording. The record indicator lights will be on when the machine is recording. (See illustration below.)

### NOTE

*If desired, the power and monitor switch (control #1) can be switched from the INPUT to the TAPE position, and vice versa, to compare the original with the recording.*

### Step 8:

After the tape has been recorded on tracks 1 and 3, remove the empty reel. Pick up the full reel, turn it over and place it on the other turntable. Then repeat steps 5 and 7.

## MICROPHONE PLACEMENT

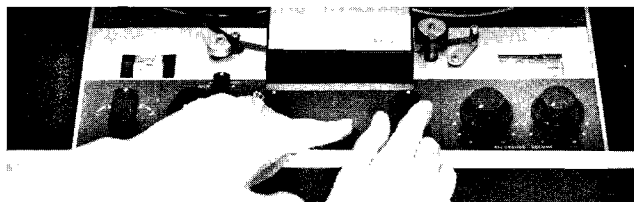
Microphone placement must be determined by the acoustics of the room and the preference of the person making the recording. Experimentation is the best teacher in this. Exact distance between the microphone and the sound can vary upwards from a minimum of a few inches; however, it must be close enough to get a normal indication on the recording level meter. Placing the microphone closer to the sound and reducing the recording level setting will increase the feeling of "presence."

## RECORDING FROM EXTERNAL SOURCES

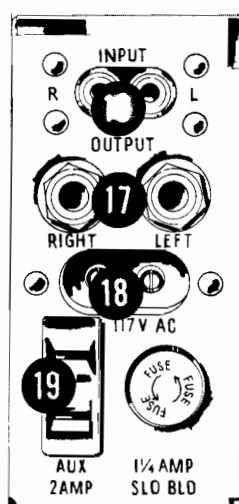
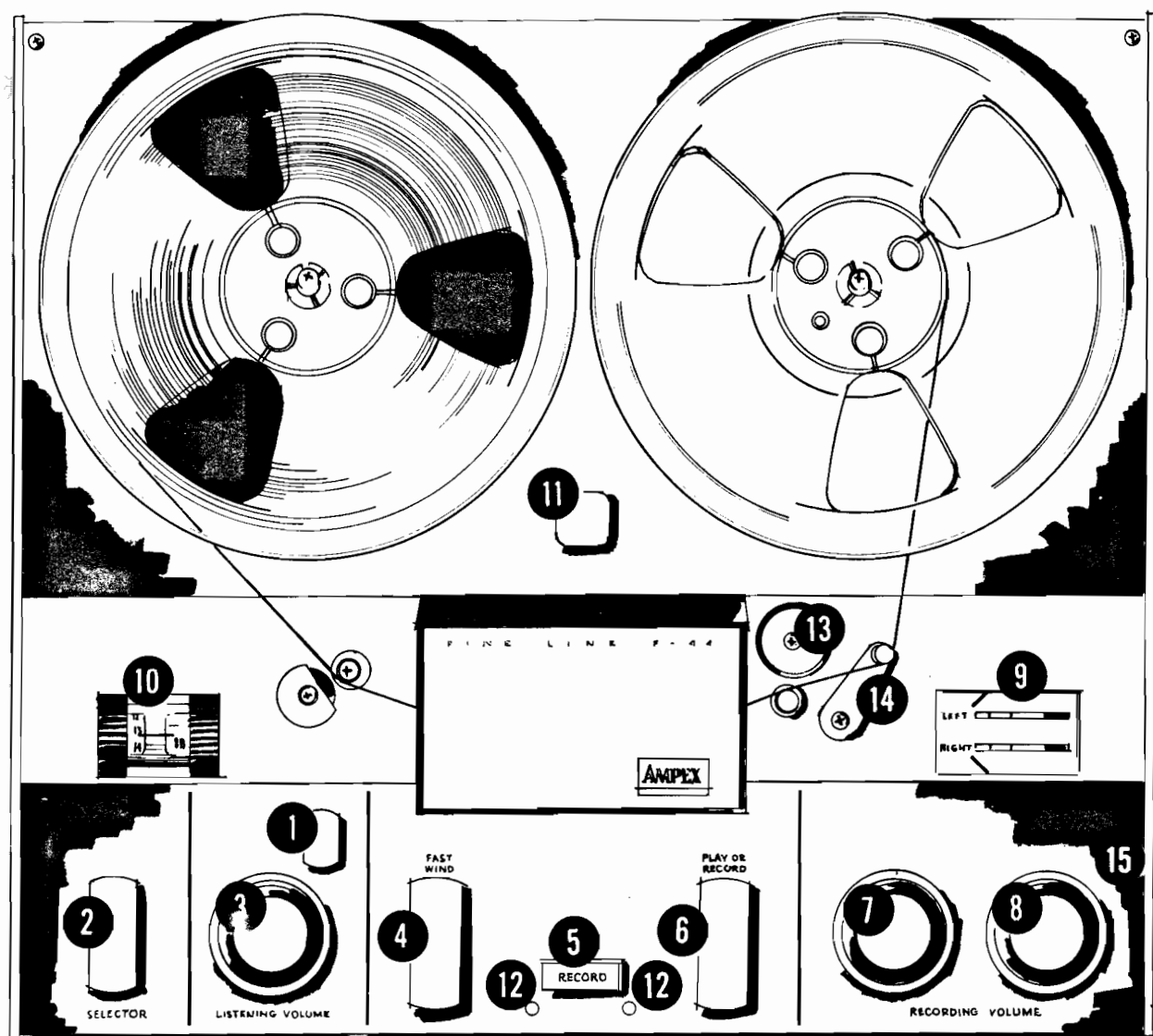
The procedure for this type of recording is the same as that for recording from microphones, except that the recording levels will be adjusted using the RADIO/PHONO VOLUME controls (#7) instead of the MICROPHONE VOLUME controls (#8). Make sure that the MICROPHONE VOLUME controls are turned to zero as noise can be picked up. The sound source (radio, phonograph, etc.) should be connected to the line INPUT jacks (#16) and the microphone input jacks are not used.

### NOTE

*If desired, recordings can be made from both external sources and microphones simultaneously, in which case, both RECORDING VOLUME controls (#7 and #8) would be used as would the line INPUT jacks and the microphone input jacks.*



# RECORDING MONOPHONIC TAPES



## RECORDING FROM A MICROPHONE

To make a 4-track monophonic recording, proceed as follows:

### Step 1:

Connect the microphone to the upper or left microphone input jack (#15). If the microphone has a built-in on-off switch, make sure that the switch is on.

### Step 2:

Set the SELECTOR switch (control #2) to the MONO 1 position.

### Step 3:

Turn the power and monitor switch (control #1) to the INPUT position and set the tape position indicator to zero.

### Step 4:

Adjust the tape SPEED selector (control #11) for the desired tape speed (Up: 7½ ips. Down: 3¾ ips.).

### CAUTION

*Do not shift the SPEED selector if the motor is not operating.*

### Step 5:

Thread the tape on the machine as outlined on page 14.

### Step 6:

Adjust the left channel (inner) MICROPHONE VOLUME control (#8) for a normal indication on the recording level meter (#9) while speaking into the left channel microphone (the meter needle should go as high as possible, but not in the black area of the meter face).

### NOTE

*If speaker-amplifiers are connected to the recorder, make sure that they are turned down so that the microphone will not pick up the sound from the speakers.*

### Step 7:

Press the RECORD button (#5) at the same time, turn the RECORD control (#6) to

begin the recording. The left record indicator light will be on when the machine is recording.

### Step 8:

After the tape has been recorded on track 1, remove the empty reel. Pick up the full reel, turn it over and place it on the other turntable. Then repeat steps 5 and 7. This will be track 4 and the left record indicator light will again be on.

### Step 9:

After the tape has been recorded on track 4, remove the empty reel. Pick up the full reel, turn it over and place it on the other turntable. Turn the SELECTOR switch (control #2) to the MONO 2 position, then repeat steps 5 and 7. This will be track 3 and the right record indicator light will be on.

### Step 10:

After the tape has been recorded on track 3, repeat step 8 in its entirety. This will be track 2 and the right record indicator light will again be on.

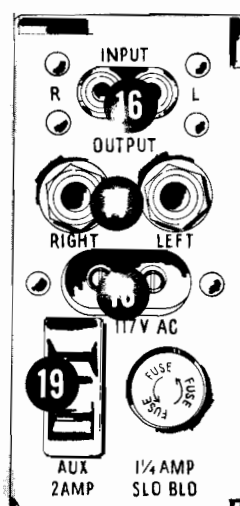
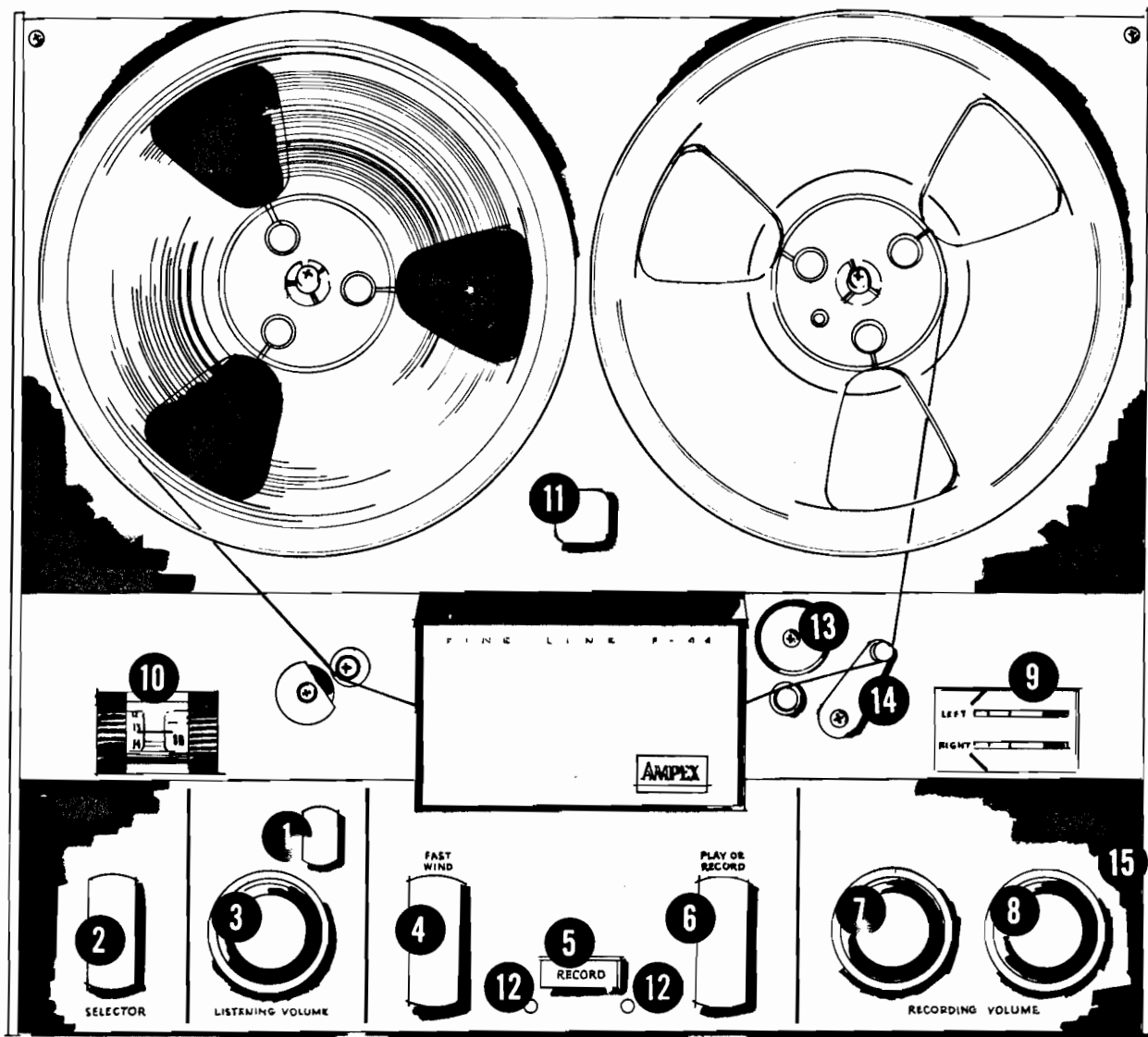
## RECORDING FROM AN EXTERNAL SOURCE

The procedure for this type of recording is the same as that for recording from a microphone, except that the recording level will be adjusted using the left RADIO/PHONO VOLUME control (#7) instead of the left MICROPHONE VOLUME control (#8). Make sure that the MICROPHONE VOLUME controls are turned to zero as noise can be picked up. The sound source (radio, phonograph, etc.) should be connected to the left line INPUT jack (#16) and the microphone input jacks are not used.

### NOTE

*If desired, recordings can be made from both an external source and a microphone simultaneously, in which case, both the left RADIO/PHONO VOLUME control and the left MICROPHONE VOLUME control would be used as would the left line INPUT jack and the left microphone input jack.*

# SPECIAL TECHNIQUES





## SOUND-ON-SOUND

Sound-on-sound is the process by which one performer can become a trio or a quartet. Here's how:

### Step 1:

Connect a microphone to the upper or left microphone input jack (#15). If the microphone has a built-in on-off switch, make sure that the switch is on.

### NOTE

*If desired, the first track can be from an external source (such as a phonograph, electric guitar or electronic organ), instead of or in addition to the microphone. In this case, connect the external source to the left line INPUT jack (#16).*

### Step 2:

Set the SELECTOR switch (control #2) to the MONO 1 position.

### Step 3:

Turn the power and monitor switch (control #1) to the INPUT position and set the tape position indicator to zero.

### Step 4:

Adjust the tape SPEED selector (control #11) for the desired tape speed.

### Step 5:

Thread the tape on the machine as outlined on page 14.

### Step 6:

Adjust the left channel (inner) MICROPHONE VOLUME control (#8) and/or the left channel (inner) RADIO/PHONO VOLUME control (#7) for a normal indication on the recording level meter.

### Step 7:

Press the RECORD button (#5) and at the same time, turn the RECORD control (#6) to begin the recording.

### Step 8:

Rewind the tape to the beginning of the recording and connect a speaker-amplifier to the left OUTPUT jack (#17). Disconnect the external source, if used.

### Step 9:

Turn the SELECTOR switch (control #2) to the ADD 1 2 position and turn the PLAY control (#6) to play back the tape. Adjust the left channel RADIO/PHONO VOLUME control (#7) for a normal indication on the recording level meter. Turn down the volume of the speaker-amplifier until it is barely perceptible.

### Step 10:

Rewind the tape and adjust, if necessary, the left channel MICROPHONE VOLUME control (#8) for a normal indication on the recording level meter.

### Step 11:

Press the RECORD button (#5) and at the same time, turn the RECORD control (#6) to the begin recording the second "voice." The original recording can be heard on the speaker-amplifier.

### Step 12:

To add a third "voice," rewind the tape, turn the SELECTOR switch to the ADD 2 1 position and repeat step 11. For the fourth "voice," return the SELECTOR switch to the ADD 1 2 position and repeat, etc.

## LANGUAGE/MUSIC INSTRUCTION

The technique for recording language/music instruction tapes is essentially the same as for sound-on-sound above. The instructor records the original (steps 1 through 7) and the student records his version along with the original (steps 8 through 11). For comparison, the student connects the speaker-amplifier to the RIGHT OUTPUT jack and hears the combined recording. After comparison, the student repeats steps 8 through 11 as many times as necessary.

# MAINTENANCE NOTES

## CLEANING

Cleanliness of all parts of the tape drive system is required for consistent optimum performance. With average use of the recorder, the heads, capstan, capstan idler and tape guides should be cleaned once a week.

### *Cleaning The Tape Drive System*

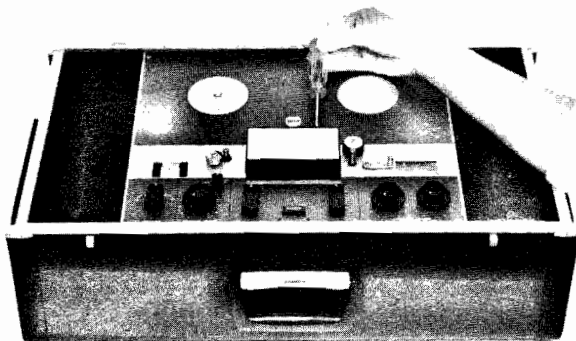
Clean all parts *except the heads* using a lintless cloth moistened with Iso-Propyl alcohol (rubbing alcohol). This cleaning is of utmost importance as most tape manufacturers lubricate their tapes and the lubricant will gradually form a coating on the components in the tape threading path, which will result in a loss of positive drive at the capstan, dropouts, flutter, and wow, or poor high frequency response.

## CAUTION

*It is imperative that only Iso-Propyl alcohol be used for cleaning the capstan idler wheel (rubber). However, under no circumstances should the alcohol be used to clean the heads.*

### *Cleaning The Heads*

The heads should be cleaned using a 'Q-Tips' cotton swab moistened in a solution of Xylene and 0.1% Aerosol (available as a standard AMPEX AUDIO accessory, No. 823). **DO NOT USE ANY OTHER SOLVENTS ON THE HEADS**, or you may damage them. Never use an abrasive or any metallic object which might cause scratches or nicks.



## DEMAGNETIZING THE HEADS

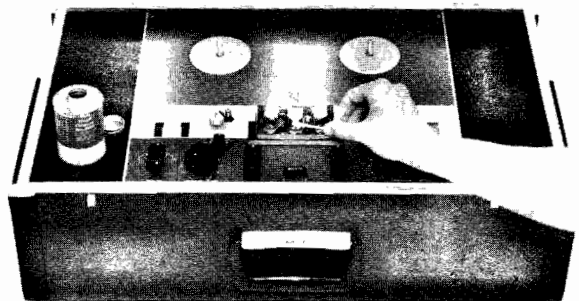
Occasionally the heads may become slightly magnetized through continued use. If this condition is not corrected, you may find the noise level of your tapes increasing, recorded signals becoming distorted and, in extreme cases, the high frequencies on recorded tapes gradually being erased. This condition can be corrected with an AMPEX Model 820 head demagnetizer. To use the demagnetizer:

1. Loosen the Phillips-head screw at the rear of the metal head shield (accessible through the holes in the head cover) and lift off the shield.
2. Plug the head demagnetizer into a wall outlet (117 volts ac).
3. Align the tips of the demagnetizer to the recording (center) head so that they straddle the head gap. Do not touch the surface of the head with the metal tips of the demagnetizer. Run the tips up and down the head several times and slowly withdraw the demagnetizer.
4. Repeat the above for the playback (right) head and the erase (left) head.

## EDITING AND SPLICING TAPES

### *Editing By Erasure*

Extraneous noise or conversation between selections can easily be erased by using the erase head on the tape recorder. Turn all RE-CORDING VOLUME controls (7 and 8) to zero and put playback SELECTOR control (2)



in MONO 1, MONO 2 or STEREO, depending on type of recording. Run the tape in the fast-winding mode to the point to be erased. (The exact place to be edited can be located by rotating the reels manually and listening to the output of the speaker. Be sure to allow for the space between recording and playback heads. Then note the points to start and stop erasing on the tape position indicator.) Press the RECORD pushbutton (5) as you turn the PLAY OR RECORD control (6) to start tape motion. When you reach the point where the next selection starts, return the PLAY OR RECORD control to its neutral position.

#### *Completely Erasing Recorded Tapes*

The tape will be erased during the recording process, so it is not necessary to completely erase before re-recording. However, if there are to be gaps between newly-recorded sections of the tape, and you wish to avoid having previously recorded material in the gaps, leave the RECORD pushbutton in, with recording level at zero, between sections you are recording. Completely erasing the tape before re-recording can lessen your editing problems. If bulk erasing facilities are not available, complete erasure can be accomplished by running the tape in the recording mode at 7½ ips with all RECORDING VOLUME controls at zero.

#### *Editing By Cutting*

The recorded tape can also be edited by determining the portions to be deleted, physically cutting those portions out of the tape, and then

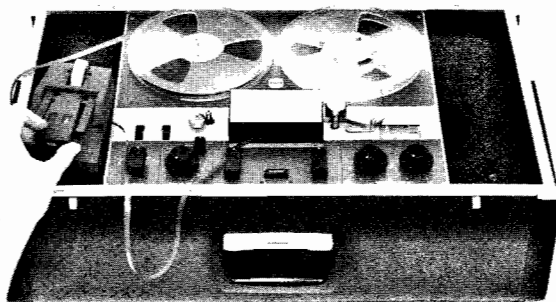
splicing the program tape together. Note that this cannot be accomplished with a tape recorded in both directions unless one side is sacrificed. An inexpensive tape splicer, such as the AMPEX Model 805, will aid you in making the correct splice.

#### **MAINTENANCE AND THE DEALER**

With any precision equipment, lubrication and alignment is necessary from time to time. With average use, lubrication and alignment should be necessary only once a year in order to keep your AMPEX recorder in the best possible operating condition. Your AMPEX dealer or AMPEX AUTHORIZED SERVICE CENTER is best equipped to handle this normal preventive maintenance as well as corrective maintenance should it be needed. If corrective maintenance becomes necessary, your AMPEX service would appreciate as much information as possible regarding symptoms of the malfunction as well as the model and serial number of your equipment.

#### **MAINTENANCE MANUAL AVAILABLE**

The maintenance procedure handbook describes the checkout and alignment procedures (both mechanical and electronic) necessary for proper operation. In addition, it provides complete replacement parts lists. Note that sufficient background in electronics and access to the proper tools and test equipment is necessary for proper alignment. The manual for your recorder is available through your AMPEX dealer. The part number is 89-0201 and the price is \$4.00.



## ACCESSORIES AVAILABLE

### SPECIFICATIONS

#### *Overall Frequency Response (in air)*

70 to better than 13,000 cps essentially flat acoustically. Response curve established with unit radiating into semi-infinite space of  $2\pi$  steradians. Actual use will approximate this condition when placed in good acoustical environment.

#### *Power Output*

10 watts amplifier power with no audible harmonic distortion. Speaker can use full power.

#### *Signal-to-Noise Ratio*

Amplifier noise (including hum) is 70 db below rated output.

#### *Controls*

Volume control, concentric bass and treble controls, and selector switch which selects one of four inputs or turns off power to amplifier.

#### *Input Impedance*

250,000 ohms (20,000 ohms maximum source impedance).

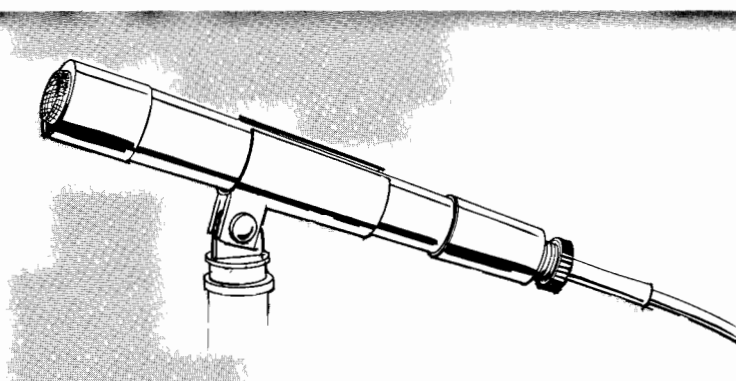
#### *Power Requirements*

117 volts, a-c, 50 or 60 cps, 0.5 amps, 55 watts

### AMPEX MODEL 2044 SPEAKER-AMPLIFIER

The AMPEX Model 2044 speaker-amplifier is an electronically and acoustically integrated system of components designed to present to the ear a completely accurate, undistorted recreation of the original sound. The speaker-amplifier utilizes a powerful push-pull 10-watt (20-watt peak) amplifier, a specially designed 8" high compliance speaker, a horn type tweeter and an l-c crossover network consisting of two inductors, three capacitors, and two resistors. These components are mounted in an acoustically correct enclosure that provides a uni-

form acoustical response that is virtually flat from 70 to better than 13,000 cycles per second. Individual volume and tone controls are located on the front panel, and input jacks are provided for audio signals from any external source. A front-panel selector switch enables you to select sound from tape, phonograph, radio, or TV sound, without the necessity for changing input wires at the connection panel. In addition, there is a jack on the connection panel that connects any input (except tape) selected by the selector switch, to the input of the F-44 recorder.

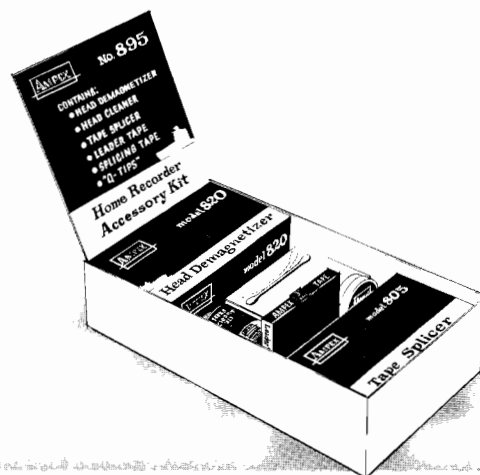


## AMPEX MICROPHONE

The AMPEX 801 Microphone is a high impedance omnidirectional dynamic microphone for recording. Optimum frequency response is provided in the critical range from 50 to 18,000 cps. The microphone has been styled for a slim, tapered appearance, is light in weight and comfortably balanced for hand-held use. Two microphones would be required for stereo recording.

## AMPEX HOME RECORDER ACCESSORY KIT

The AMPEX 895 Home Recorder Accessory Kit contains an AMPEX 805 Tape Splicer, an AMPEX 820 Head Demagnetizer, a can of AMPEX 823 Head Cleaner, a roll of AMPEX Splicing Tape, a roll of AMPEX Leader Tape, and a box of "Q-Tips" cotton swabs. Each of these products (except perhaps the "Q-Tips" cotton swabs) is also available separately at your AMPEX dealer. Their use is described on pages 24 and 25.



## FINE LINE MAGNETIC HEADS

*a story of exacting precision...*

**"RESTRICTED AREA — ONLY AUTHORIZED PERSONNEL MAY ENTER — NO SMOKING".**

This sign is attached to the door of a large room in the Ampex Audio Plant — a room only a few people are allowed to enter. This closed room, strictly "off limits" to all but authorized personnel, is temperature and humidity controlled. The people who work in it must wear special lint-free smocks.

This room is where the world-renowned Ampex Audio Head is built.

Heart of the Ampex Fine Line 1200 is its cluster of magnetic heads... delicate and indispensable parts whose function is both the beginning and end of tape recording and playing. Many of the processes used in manufacture of these heads, and some of the

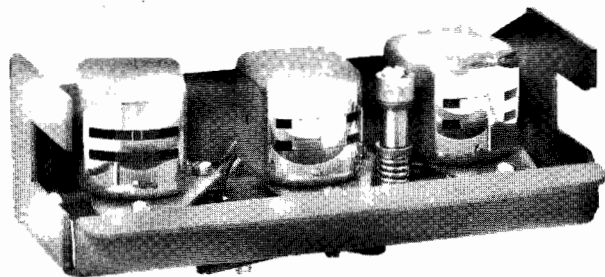
material actually utilized in their construction, are highly classified Ampex secrets. Special precision equipment located in the room was designed and built by Ampex especially for the building of the never-equalled Ampex Magnetic Head.

Ampex, since it first introduced the magnetic tape recorder in the United States over 14 years ago, has produced the finest heads ever used in a magnetic device — whether the device is used for audio, video, scientific or digital recording. Ampex leadership in the technology and engineering "know-how" of magnetic head manufacture has made Ampex the world's most EXPERIENCED and DIVERSIFIED producer of magnetic recording devices.

## Ampex Fine Line Heads — Exceptional Performance and Long Life

Noted for their exceptional long life, Ampex heads have been known to operate for as many as ten thousand running hours without variation from original specifications. You can expect a long life from Ampex heads.

Although a magnetic head is simple in theory, the building of one to meet the quality standards of Ampex is a complicated task requiring experience in hundreds of technologies and a know-how for precise manufacture. Ampex has this, but not content with resting on their world-wide reputation, Ampex engineers constantly strive to develop even better heads. If a better head is possible, it will be designed and manufactured by Ampex, and *it will be* the standard of excellence throughout the industry.





AMPEX

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**1020 KIFER ROAD, SUNNYVALE, CALIFORNIA**  
PRINTED IN U.S.A.