

AMPEX

MODEL 600

MAINTENANCE MANUAL

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SECTION I

DESCRIPTION AND SPECIFICATIONS

The AMPEX Model 600 is a lightweight-portable magnetic tape recorder designed to meet the needs of both professional and non-professional users in remote pickups, custom home installations, and studio applications.

The AMPEX 600 is available in various combinations of operating conditions as listed below:

Power Input 117 volts, 50 or 60 cycles.
Tape Speed 7-1/2 or 3-3/4 inches per second.
Head Assembly full-track or half-track.
Electronics Input high or low impedance.

Sections I through VI of this manual are concerned primarily with the basic version of the Model 600; a 7-1/2 ips, full track, high impedance input portable recorder to be used with 117 v, 50 or 60 cps power. Additional notes and information on standard variations of this basic machine are given in the supplement, Section VII, which also covers accessory equipment for machines in this series. It is suggested that service personnel refer to the appropriate parts of Section VII as a preliminary to the operation and servicing of machines other than the basic version.

The complete basic equipment, as shipped from the factory, includes the following:

<u>Item</u>	<u>Ampex Cat. No.</u>
(1) Tape Transport (7-1/2 in/sec, full track)	6200
(1) Electronic Assembly	6350
(1) Carrying Case(with hardware)	9417
(1) Power Cord	CS-2
(1) 7-inch RTMA Plastic Reel	RD-4
(2) Reel Hold-Down Knobs	6319
(1) Microphone Plug	PL-33P
(1) Phone Plug	PL-324P
(1) RTMA Pin Plug	PL-323P
(1) Operator's Guide	

The performance specifications and physical characteristics of the "basic" machine are as follows:

TAPE SPEED

7-1/2 in/sec, full track

REEL SIZE

7 in. RTMA reel maximum

FREQUENCY RESPONSE

40 to 15,000 cycles/sec
 ± 2 db 50 to 10,000 cycles/sec
down no more than 4 db at 15 Kc

SIGNAL TO NOISE RATIO

Over 55 db below Peak Record Level (defined as 3% total rms harmonic distortion when measured on 400 cycle tone; noise includes bias, erase, and playback amplifier noise).

FLUTTER AND WOW

Below 0.25%

STARTING TIME

Instantaneous - (tape accelerates to full play-record speed in less than one second)

STOPPING TIME

Less than one second

PLAYING TIME

32 minutes with 7 in. reel (1200 feet)

FAST FORWARD OR REWIND TIME

90 seconds for full 1200-foot reel

PLAYBACK TIMING ACCURACY

$\pm 0.2\%$ (± 3.6 seconds in a 30-minute recording)

OPERATING MODES

Play-Record: Selector Switch (safety button must be pressed when going from Play to Record)

Fast Forward-Rewind: Selector Switch (interlocked with Play-Record Switch)

LEVEL CONTROLS

Separate Mixing Controls: Microphone Record Level, and Line Record Level

RECORD INPUTS

Microphone: Accommodates any high impedance microphone (may be modified for low impedance microphone by adding accessory transformer).

Line: 0.5 volt required for program level (1% distortion)

PLAYBACK OUTPUT

1.25 Volts into 10,000 ohms at program level

MONITORING

Phone jack and illuminated VU meter. Either program input or playback output may be monitored while recording, depending on position of Monitor Selector switch. (A-B)

HEAD ASSEMBLY

Separate erase, record, and playback heads contained in a single housing.

POWER REQUIREMENTS

117 volts, 50 or 60 cycles; .52 amperes, 61 watts (power line frequency is indicated on serial number plate on side of case).

DIMENSIONS

Tape Transport:	9-5/16" x 12-1/2" x 5"
Electronics:	6-1/8" x 12-1/2" x 5"
Overall Size, Including Case:	16-1/2" x 13-3/4" x 8"

WEIGHT

26 pounds, including case

ACCESSORIES

Low impedance Microphone Transformer Kit: Catalog No. 9359

SECTION II

INSTALLATION AND OPERATION

2.1 General

The Model 600 may be operated in either the horizontal or the vertical position. If the machine is left in its carrying case, "installation" consists only of making up and connecting the required cables, discussed in Section 2.2. For studio installations, an adaptor (Cat. No. 9684) designed to permit mounting of the Model 600 in a standard 19-inch relay rack may be used. Critical dimensions and clearances, and some suggestions for use in planning custom home installation with the Model 600 are given in Section 2.3.

2.2 Input, Output, and Power Cables

A power cable and matching plugs for the MICROPHONE, LINE INPUT, and OUTPUT connectors are supplied with the machine.

Shielded, low-capacity cable is recommended for making up input and output cables. It is considered good practice to make such cables as short as is consistent with convenience in interconnecting units in any audio system. Refer to the schematic diagram, Fig. 6.1, to determine the correct pin connections for all plugs.

IMPORTANT

The Model 600, as shipped from the factory is wired for use with a high impedance microphone. Provision has been made for internal mounting of a microphone transformer to convert the machine for use with low impedance microphones. Installation instructions for this transformer (available in Ampex Kit, Cat. No. 9359) are given in the Supplement at the end of this manual.

2.3 Custom Installation

The playback head cable on the "600" is double-shielded to insure against RF pickup. Cable capacity and length have been

minimized to avoid high frequency loss. It is therefore impossible to mount the electronic assembly and the tape transport more than about a foot apart.

If the playback head cable is lengthened to permit greater separation of the units, the frequency response specification indicated in Section I may not be met. Should an installation absolutely demand lengthening of the cable, it is suggested that a very low-capacity type (e. g. RG/62U) be used, and that an outer shield be added. Under no circumstances should cable length exceed 3 feet if high frequency losses are to be kept to a minimum.

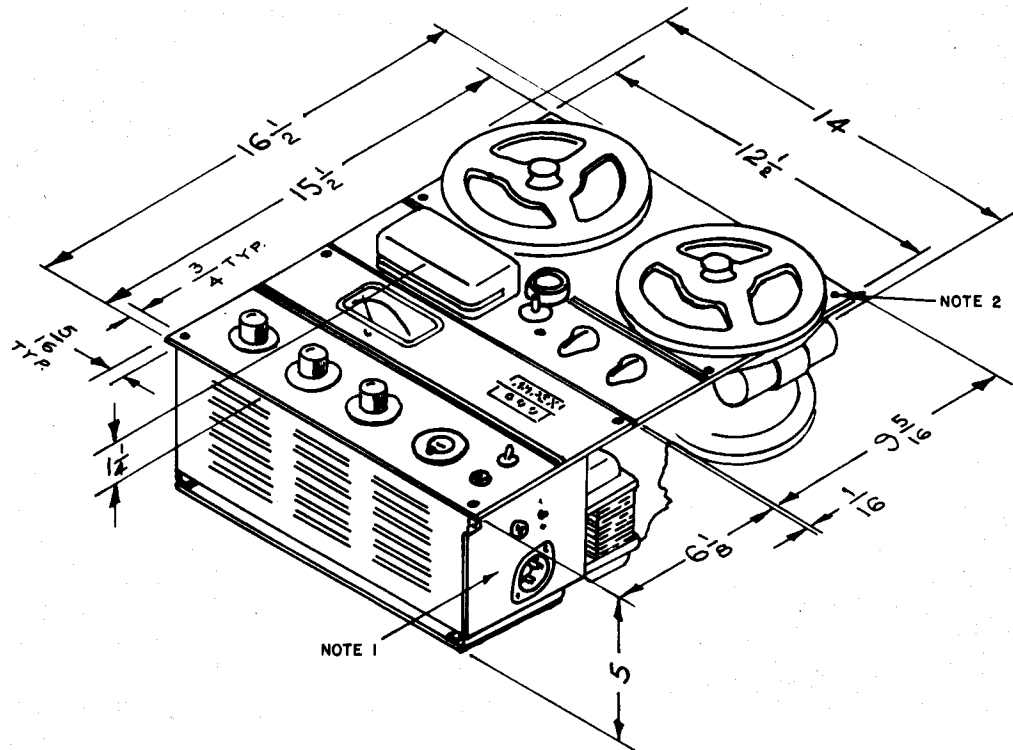
Space requirements and some suggested layouts for custom installation are given in Fig. 2. 1. Be sure to allow sufficient clearance at the right side of the electronics chassis to permit easy access to the LINE INPUT and the OUTPUT connectors. If desired, these connectors may be brought out to a patch panel mounted at some convenient point in the installation so that they will always be readily accessible.

The diversity of home music systems now in use makes it impossible to lay down any hard and fast rules for incorporating a Model 600 in them. In general, however, most of these systems are equipped with a sufficient number and variety of input and output connectors to permit great flexibility in interconnection. Wherever a "600" is inserted in an existing system, the MONITOR SELECTOR should be turned to INPUT, when not recording, in order to permit any units preceding the "600" to play straight through.

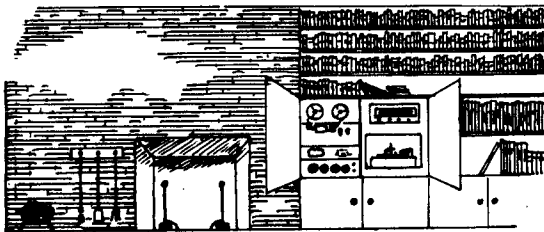
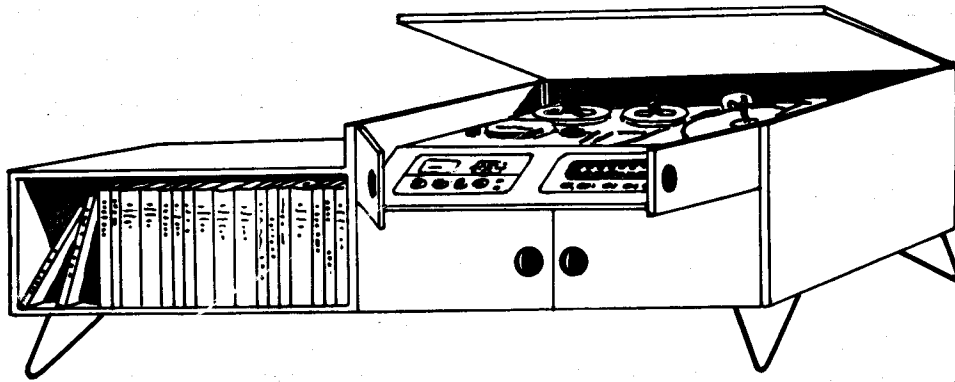
2.4 Impedance Matching, Signal Levels, and Equalization

Regardless of the particular application in which the Model 600 is to be used, the following general requirements and observations should serve as a guide in interconnecting the machine with any other piece of equipment:

- A. The unit to which the 600 is to be connected for playback should have an input impedance of 10,000 ohms or more. If the machine is to work into a 600-ohm studio line, a bridging transformer or some other impedance-matching device will be required.



SPACE AND CLEARANCE REQUIREMENTS



NOTE:

1. ALLOW CLEARANCE FOR ACCESS TO CONNECTORS.
2. INSERT RUBBER SHOCK MOUNTS UNDER MOUNTING HOLES OF MECHANICAL ASSEMBLY

CUSTOM INSTALLATION
 MODEL 600
 AMPEX CORPORATION
 REDWOOD CITY, CALIFORNIA

FIG. 2.1

- B. Any unit to be connected to the LINE INPUT should deliver a signal of at least 0.5 volt. The LINE INPUT is used in recording from tuners, phonographs, or other tape recorders.
- C. Phonographs with crystal pickups may be connected directly to the LINE INPUT when copying disc recordings. For phonographs with variable reluctance or other low-level pickups, the output of the phonograph pre-amplifiers should be used. Regardless of the type of pickup, the phonograph should be properly equalized as recommended by its manufacturer to produce a flat program input to the Model 600.
- D. If a tuner to be used in making recordings has more than one output, use the one marked DETECTOR. This output precedes any tone controls or other frequency compensating circuitry in the tuner, and provides an essentially flat program. If the tuner has only one output, and has integral tone controls, these controls should be set for flat response when making tapes.

2.5 Tape Threading (NOTE: See Supplement B - Special Note)

The tape threading path described below is the same for all modes of operation. See Fig. 2.2.

- A. Place a reel of tape on the left-hand turntable, and an empty reel on the right-hand turntable. Be sure that the pins around the base of each spindle engage the corresponding slots on the reel hubs.
- B. Press a Reel Hold-Down knob in place on each spindle.
- C. Thread the tape as indicated in Fig. 2.2; (a) around the left side of the tape guide; (b) through the head assembly (dull side of the tape facing inward toward the heads); (c)

between the capstan and the capstan idler: (d) in front of the guide post, and; (e) take a full turn counterclockwise around the hub of the empty reel. It is not necessary to anchor the tape in the slot on the reel hub.

2.6 To Record

- A. Thread a reel of tape on the machine. It is not necessary to erase previously recorded tapes before re-using them. Any previous program on the tape will be erased as the new program is recorded.
- B. Turn the POWER switch on.
- C. Turn the MONITOR SELECTOR to INPUT.
- D. Connect microphone, tuner, phonograph or other program source to the appropriate input.
- E. Adjust either the MICROPHONE RECORD LEVEL or the LINE RECORD LEVEL control (depending on whether the MICROPHONE input or the LINE INPUT is being used) so that on the most intense peaks of volume of the program to be recorded, the panel meter swings up to approximately zero (0) on the VU scale. Note that it is unnecessary to put the tape in motion in order to set program level. If only the LINE INPUT is being used, turn the MICROPHONE RECORD LEVEL to zero (0). This will prevent any noise generated in the un-used microphone preamplifier from being recorded on the tape.
- F. Turn the RECORD-PLAYBACK control to RECORD.

IMPORTANT

This control cannot be put in the RECORD position unless the RECORD SAFETY button near its lower left side is held down while the control

