

DESCRIPTION**1.1 GENERAL**

Ampex Models AG-500 and AL-500 Magnetic Tape Recorders and Reproducers (See Figure 1-1) provide high quality performance for professional audio applications. Both models are housed in a compact configuration which makes them especially suitable for use as portable units; they can also be mounted directly in standard 19-inch racks.

Both the AG-500 and AL-500 consist of a two-speed tape transport assembly, a head assembly (installed on the transport), and one all solid state electronic assembly for each record/reproduce operating channel. The equipment can be provided either mounted in a specially-designed carrying case, or unmounted for installation in a custom console or in a rack.

The basic difference between the AG-500 and AL-500 equipment is in tape speed. The Model AG-500 is intended for use as a general purpose, audio recorder/reproducer; as such, optional tape speed pairs available are 3-3/4 and 7-1/2 ips (inches per second) or 7-1/2 and 15 ips. The Model AL-500 is designed for long term operation in communication logging applications; a single tape speed pair of 15/16 and 1-7/8 ips is available for this model.

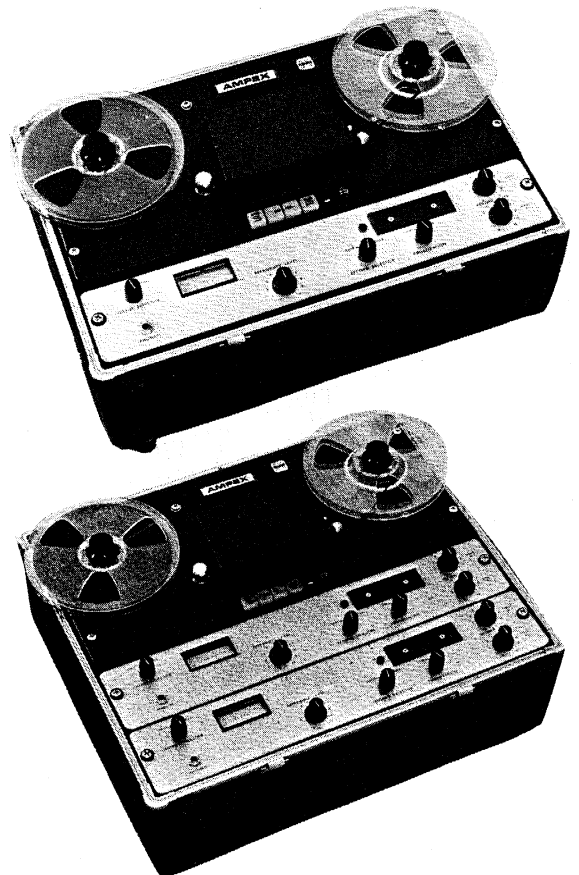


Fig. 1-1. Ampex Model AG-500 Recorder/Reproducers, Portable Cases

Model AG-500 equipment is available either as a one channel or two channel equipment. The head assembly for the one channel version may provide either full track or half track recording and reproducing; for the two channel version, it may provide either conventional two track or quarter track operation.

Either two channel or four channel record/reproduce capability is available for the Model AL-500. Heads for this equipment are all of the quarter track variety.

Both models come in two basic versions, designated as Domestic and International. Domestic equipment requires a 105 to 125 volt ac power line. International equipment is provided with a switch which allows the selection of either 105 to 125 volt or 210 to 250 volt operation. Either version can be ordered for use with power line frequencies of 60 Hz or 50 Hz.

1.2 TAPE TRANSPORT ASSEMBLY

Two tape speeds are provided by the tape transport, shown on Fig. 1-2. Standard speed pairs available are 15/16 and 1-7/8 ips, 3-3/4 and 7-1/2 ips, and 7-1/2 and 15 ips. The transport accommodates 1/4-inch wide magnetic tape on reels up to 7 inches in diameter.

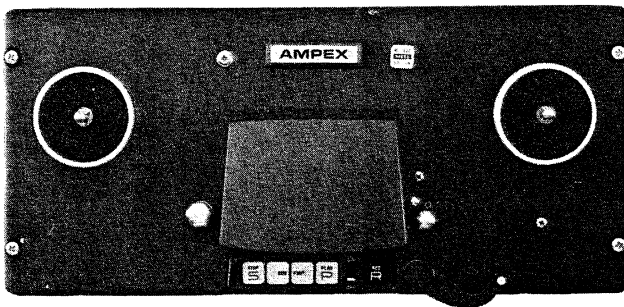


Fig. 1-2. Tape Transport

Controls on the tape transport include a speed selector lever; five pushbutton switches used to initiate the record, play, fast forward, rewind, and stop functions; and a power toggle switch.

1.3 HEAD ASSEMBLY

Individual head stacks (erase, record, or reproduce) may contain either one head (full

track) or two heads (two track or quarter track). Typical head assemblies are shown in Figure 1-3.

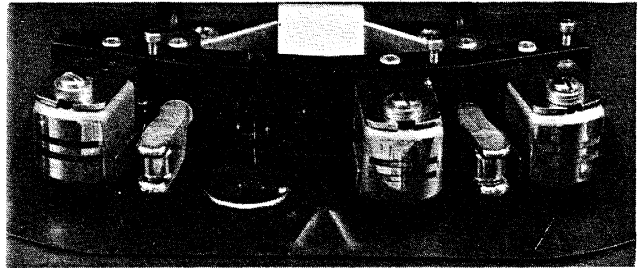


Fig. 1-3. Typical Head Assembly

NOTE

Single channel equipment ordered for half track operation, will be supplied with a complete two track head assembly.

Single channel AG-500 equipment uses a three stack head configuration, consisting of erase, record, and reproduce head stacks in that order. Two channel equipment may utilize either three or four head stacks. In the three stack version, the erase, record, and reproduce stacks are all of the same configuration (either two track or quarter track). The four stack assembly contains a two track erase, two track record, quarter track reproduce, and two track reproduce head stack; two track or quarter track reproduce operation is selected by positioning a switch on the head assembly.

All head stacks for AL-500 equipment are of the quarter track variety. No erase head is provided with the standard assembly. For two channel record/reproduce operation one record and one reproduce stack are required. A four channel equipment requires two record and two reproduce head stacks.

1.4 ELECTRONIC ASSEMBLY

Each electronic assembly (See Fig. 1-4) contains record, reproduce, and monitoring circuitry for one channel. An all solid state design is employed.

Two record inputs, with separate level controls, are provided for each channel; when both are used, the signals are mixed and recorded on one track on the tape. Adjustable equalization for both record and reproduce is provided for AG-500 recorders. On the Model AL-500, reproduce equalization is fixed (record equalization is adjustable on this equipment).

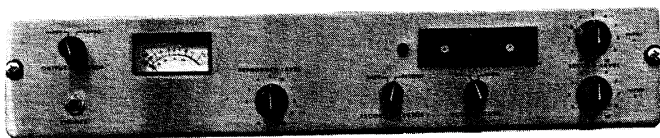


Fig. 1-4. Electronic Assembly

A vu meter, which indicates record and reproduce levels, is furnished on each electronic assembly. Operating controls include an output selector switch, a reproduce level control, an equalization switch, a record selector switch, and two record level controls.

1.5 ACCESSORIES

1.5.1 Input Transformers

Two plug-in transformers are available to allow operation with a balanced line input. One of these optional accessories (Catalog No. 4580200-01) is a balanced bridging transformer with unity gain. The other (Catalog No. 4580200-02) is a balanced matching transformer providing a gain of 14 db.

1.5.2 Microphone Preamplifier

A plug-in microphone preamplifier, Catalog No. 4010066, will allow recordings to be made from a microphone. This is a two stage preamplifier, wired so that the record level control on the electronic assembly is connected between the two stages; the preamplifier is thus used as a variable gain device which will accommodate a wide variety of microphones.

1.5.3 Remote Control Unit

Two types of remote control units are available. One, Catalog No. 01-96510, is a desk top model supplied with a 30-foot interconnecting cable. The other, Catalog No. 01-96520, is mounted on a flat panel suitable for installation in a studio console; no interconnecting cable is furnished.

1.5.4 Microphones

Two professional quality microphones are available for use with this equipment. The Ampex Model 802 has an omnidirectional pickup pattern, with a frequency response of ± 3 db from 70 to 10,000 Hz, down no more than 7 db at 50 and 20,000 Hz.

The Model 803 has a cardioid pickup pattern, with an average front-to-back discrimination of 20 db. Frequency response is approximately ± 3 db from 45 to 15,000 Hz.

Both microphones provide an output level of -55 dbm, and can be strapped for 30-50, 150-250, or 20,000 ohms impedance.

1.5.5 Head Demagnetizer

Demagnetization of the erase, record, and reproduce heads can be accomplished easily and efficiently by using the Ampex Model 820 head demagnetizer.

1.5.6 Standard Tapes

Ampex manufactures standard tapes for use in aligning the equipment and in measuring flutter. Each standard tape is individually recorded on precision equipment which is specially maintained under laboratory-controlled conditions. Catalog numbers of standard tapes are included in Sections 4 and 5, under Test Equipment Required.

1.6 SPECIFICATIONS

1.6.1 Tape Transport

Tape Width

1/4-inch

Tape Speeds

Two Speeds: 7-1/2 - 15 ips or
3-3/4 - 7-1/2 ips or
15/16 - 1-7/8 ips

Maximum Reel Size

7-inch EIA

Fast-Winding Time

60 Hz equipment: 110 seconds

(1200 foot reel)

50 Hz equipment: 128 seconds

Speed Accuracy

15 ips: $\pm 0.25\%$

7-1/2 ips: $\pm 0.25\%$

3-3/4 ips: $\pm 0.4\%$

1-7/8 ips: $\pm 0.6\%$

15/16 ips: $\pm 1.0\%$

Flutter and Wow (using flutter test tape)

15 ips: 0.1% rms

Measured according to ASA
Standard Z57.1-1954, including
all components between 0.5 and
200 Hz.

7-1/2 ips: 0.13%

3-3/4 ips: 0.175% rms

1-7/8 ips: 0.4% rms

15/16 ips: 0.5% rms

1.6.2 Electronic

Input

100,000 ohms, unbalanced.
Will accept input signal levels as
low as -18 dbm for normal
operating level.

Output

Will feed a 600 ohm line, balanced
or unbalanced, at a nominal +4 dbm
output level. Maximum reproduce
output level before clipping is +24 dbm.

Overall Frequency Response (500 Hz reference)

15 ips: ± 2 db, 30 to 18,000 Hz
7-1/2 ips: ± 2 db, 60 to 10,000 Hz
+2-4 db, 30 to 15,000 Hz
3-3/4 ips: ± 2 db, 50 to 7,500 Hz
1-7/8 ips: ± 3 db, 100 to 6,000 Hz
15/16 ips: ± 3 db, 100 to 3,000 Hz

Overall Signal-to-Noise Ratio

Tape Speed	Equalization	HEAD		
		Full Track	Half Track	Quarter Track
15 ips	NAB	60 db	55 db	55 db
15 ips	CCIR	57 db	52 db	52 db
7-1/2 ips	NAB	60 db	55 db	55 db
7-1/2 ips	CCIR	57 db	52 db	52 db
3-3/4 ips	120 u secs	55 db	50 db	50 db
1-7/8 ips	---	---	40 db	40 db
15/16 ips	---	---	40 db	40 db

Signal-to-Noise is measured from peak record level (6 db above normal operating level) to unweighted noise. Noise is measured while erasing a 500 Hz tone which was recorded at peak level, using a filter to attenuate noise outside of audio spectrum. Signal-to-noise quoted for 3-3/4 ips is for 120 microsecond equalization, for 7-1/2 and 15 ips it is for NAB equalization. Noise is 3 db higher with CCIR equalization.

Even-Order Distortion

The second harmonic distortion of a 500 Hz signal recorded at normal operating level is less than 0.4%.

1.6.3 General

Power Line Frequency

Both Domestic and International equipment is available for use with one of two power line frequencies, either 60 Hz or 50 Hz.

Power Line Voltage

Domestic: 105-125 volts ac
International: Switch on electronic assembly can be positioned to select either 105-125 volts ac or 210-250 volts ac.

Power Consumption

At 117 volts (Domestic)
Tape Transport: Approximately 1.5 amperes
Each Electronic Assembly: Approximately 0.1 ampere
At 117 volts ac (International)
Tape Transport: Approximately 1.5 amperes
Each Electronic Assembly: Approximately 0.12 ampere
At 230 volts ac (International)
Tape Transport: Approximately 0.75 ampere
Each Electronic Assembly: Approximately .06 ampere

Magnetic Tape

Specifications are based on the use of professional quality magnetic tape, such as Ampex No. 631 or equivalent.