

AMPEX

4890163-01

AG-300 and AG-305 Recorder/Reproducer

Operation and Maintenance Manual

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DESCRIPTION**1.1 GENERAL**

Ampex Models AG-300 and AG-305 Magnetic Tape Recorders and Reproducers are derived from the Ampex Series 300 equipment. Basically, the transport is the same as the famous Ampex Model 300, long recognized as a standard in the professional recording field. Added to this transport are new, all solid-state, electronic assemblies which combine high quality performance and long, dependable, operating life.

The Model AG-300 (see Fig. 1-1) is a recorder and reproducer. The Model AG-305 is a reproduce-only equipment. Both models are available for use with 1/4-inch tape (one or two channels) or with 1/2-inch tape (three or four channels).

Two mounting arrangements are available. The equipment may be ordered mounted in an Ampex console as shown in Fig. 1-1, or unmounted for installation in racks or in custom consoles.

1.2 TAPE TRANSPORT

The tape transport (see Fig. 1-2) handles reels 10-1/2 inches in diameter. Tape width can be either 1/4-inch or 1/2-inch, as specified by the customer.



*Fig. 1-1 Ampex Model AG-300,
Console Mounted*

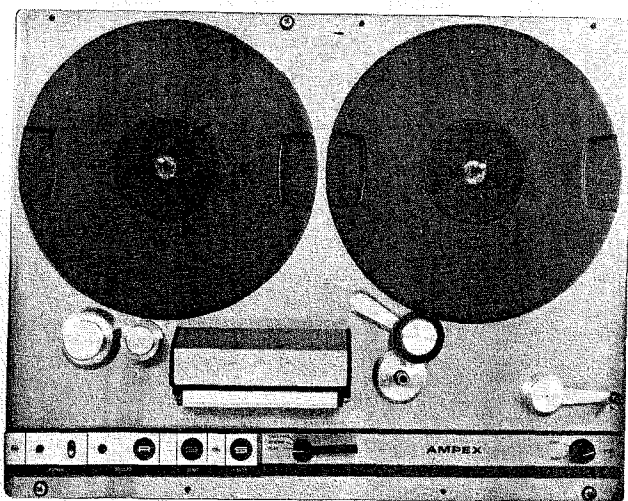


Fig. 1-2 Tape Transport, 1/2-inch

Two tape speeds are available on each tape transport. Standard speed pairs are 3-3/4 - 7-1/2 inches per second (ips), 7-1/2 - 15 ips, and 15 - 30 ips.

Tape motion, and mode of operation is controlled by a rotary selector switch and three pushbuttons (RECORD, START, STOP) on the transport. Tape speed is selected by another rotary switch and power application to the entire system is controlled by a toggle switch. Equalization in the electronic assemblies is automatically changed in accordance with the tape speed selected.

Manually operated tape lifters, actuated when the head gate is opened, remove the tape from contact with the heads during fastwinding operations.

1.3 ELECTRONIC ASSEMBLIES

On record/reproduce equipment, one electronic assembly (see Fig. 1-3) is provided for each channel. This assembly contains all circuitry for recording and reproducing one channel of program material. Plug-in equalizer modules are inserted in receptacles beneath a cover on the front panel; equalization is switched automatically when tape speed is selected at the tape transport. A record selector switch allows recording on any or all channels, or places the electronics in a "safe" condition where no recording is possible. A vu meter on each assembly provides visual monitoring of record, reproduce, and bias levels on that channel. Power for the electronics is provided by a power supply which is an integral part of the assembly.

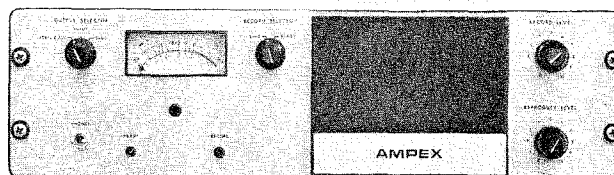


Fig. 1-3 Record/Reproduce Electronic Assembly

The electronic circuitry for reproduce-only equipment is divided into individual audio and power supply modules. Each power supply module will accommodate either one or two audio modules. One power supply and two audio modules mount on a chassis which is the same size as the record/reproduce module described in the previous paragraph (see Fig. 1-4).

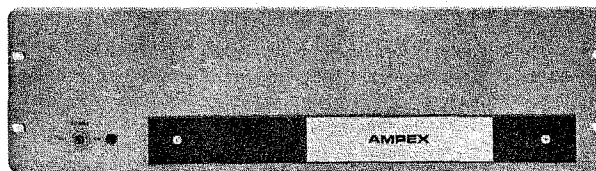


Fig. 1-4 Reproduce-only Electronic Assembly

All assemblies can be strapped to provide either a +8 dbm or a +4 dbm operating level output into a 600 ohm line.

1.4 HEAD ASSEMBLIES

Standard head assemblies for record/reproduce equipment contain three head stacks -- erase, record, and reproduce. Each stack may contain one or more heads, depending on the number of channels which will be recorded or reproduced.

Heads for use with 1/4-inch tape can be for either single channel (full track or half track) or two channel operation. Heads for 1/2-inch tape can be for either three channel or four channel operation.

Heads for reproduce-only equipment contain one (reproduce) head stack. As described previously, there can be one, two, three, or four reproduce heads in this stack, depending upon track configuration and tape width.

1.5 ACCESSORY EQUIPMENT

1.5.1 Input

On record/reproduce equipment, an accessory receptacle and input selector switch are mounted on the back panel of the electronic assembly for optional plug-in units. No accessory unit is required if the equipment is to be fed from an unbalanced line; the input selector switch is simply placed in the UNBAL BRIDGE position.

If a balanced line input is used, either of two input transformers must be plugged into the receptacle. One of these optional transformers (Catalog No. 4580116-01) is a balanced bridging unit with unity gain; the other (Catalog No. 4580116-02) is a balanced matching unit with 14 db gain. Using either of these accessories requires that the input selector switch be placed in the ACCESSORY position.

A microphone preamplifier (Catalog No. 4010040-01) can also be inserted in the accessory receptacle to allow recording directly from a microphone. A switch on the preamplifier selects either 60 or 40 db gain for this unit. The input selector switch is placed in the ACCESSORY position when the preamplifier is used.

1.5.2 Remote Control

The starting and stopping of play and record modes can be controlled from a remote location. Ampex does not supply a remote control unit as an accessory, but it can be easily constructed as explained in Section 2.

If the remote control function is not used, the dummy plug (supplied) must be inserted in receptacle J804S or the transport will not operate.

1.5.3 Motor Drive Amplifier

A motor drive amplifier can be plugged into receptacle J805 at the back of the transport to provide a precise a-c drive for the capstan drive motor. Power to the amplifier is taken at pins 1 and 4 (neutral) of J805, and the precision drive frequency is returned at pins 5 (neutral) and 8. The dummy plug (provided) can be used as a mating connector by removing the jumper.

If a motor drive amplifier is not used, the dummy plug (as supplied) must be inserted in receptacle J805 or the capstan motor will not operate.

1.5.4 Sel-Sync* Assembly

Use of this optional accessory with three or four channel equipment allows the recording of sound on sound, where different tracks on the tape may be recorded at different times while maintaining perfect synchronization. Speaking generally, this is accomplished by recording the first track (or tracks) in the normal manner, then defeating the record function on that track. The record head which recorded the first track is switched to the playback electronic circuit, where it acts temporarily as a playback head. A subsequent record run can then be made on another channel, monitoring the first recording. Since the record heads are precisely aligned in one stack, there will be no time lag between the head through which the first recording is monitored and the head that is making the second recording. The two recordings can therefore be made in perfect synchronization. The procedure can be used to record all tracks on the tape at different times.

*TM, Ampex Corporation

1.6 SPECIFICATIONS

1.6.1 Tape Transport

Tape Width	1/4-inch or 1/2-inch, as ordered
Tape Speeds	Two Speeds: 3-3/4 and 7-1/2 ips or 7-1/2 and 15 ips or 15 and 30 ips.
Maximum Reel Size	10-1/2-inch NAB, will operate with 7-inch EIA reels if tape tension is reduced (refer to Section 4).
Start Time (Using Fast Start)	1/4-inch tape: 0.1 second 1/2-inch tape: 0.5 second
Flutter and Wow Measured According to ASA Z57.1 - 1954, measuring all flutter components from 0.5 to 200 Hz	30 ips: Not more than 0.05% rms 15 ips: Not more than 0.07% rms 7-1/2 ips: Not more than 0.14% rms 3-3/4 ips: Not more than 0.21% rms
Speed Accuracy	±0.2%, which corresponds to 3.6 seconds in a 30 minute recording.

1.6.2 Electronics

Input	100,000 ohms unbalanced. Will accept input signal levels as low as -18 dbm for normal recording level.
Output	Will feed a 600 ohm line, balanced or unbalanced, with a nominal output level of +8 dbm or +4 dbm (depending on internal strapping.) Maximum playback output level before clipping is at least +28 dbm.
Overall Frequency Response (500 Hz reference)	30 ips: ±2 db 50 to 20,000 Hz 15 ips: ±2 db 30 to 18,000 Hz 7-1/2 ips: ±2 db 40 to 10,000 Hz +2 - 4 db 30 to 15,000 Hz 3-3/4 ips: ±2 db 50 to 7,500 Hz

Overall Signal-to-Noise Ratio

<u>Head</u>	<u>Tape Width</u>	<u>30 ips</u>	<u>15 ips</u>	<u>7-1/2 ips</u>	<u>3-3/4 ips</u>
Full Track	1/4 inch	60 db	60 db	60 db	55 db
Half Track	1/4 inch	57 db	57 db	57 db	50 db
Two Track	1/4 inch	57 db	57 db	57 db	50 db
Three Track	1/2 inch	60 db	60 db	60 db	-
Four Track	1/2 inch	57 db	57 db	57 db	-

Signal-to-noise is measured from peak record level (which is 6 db above normal operating level) to unweighted noise. Noise is measured while erasing a 500 Hz tone which is recorded at peak record level, using a filter (refer to Section 5) to attenuate noise outside of the audio spectrum.

Even-Order Distortion

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

1.6.3 General

Power Requirements

105 - 125 volts a-c, 60 Hz, single phase
(Equipment available for 50 Hz operation).

Power Consumption

Tape Transport: Approximately 2.5 amperes
at 117 volts.

Electronic Assembly: Approximately 0.15
ampere at 117 volts, for each assembly.

Magnetic Tape

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