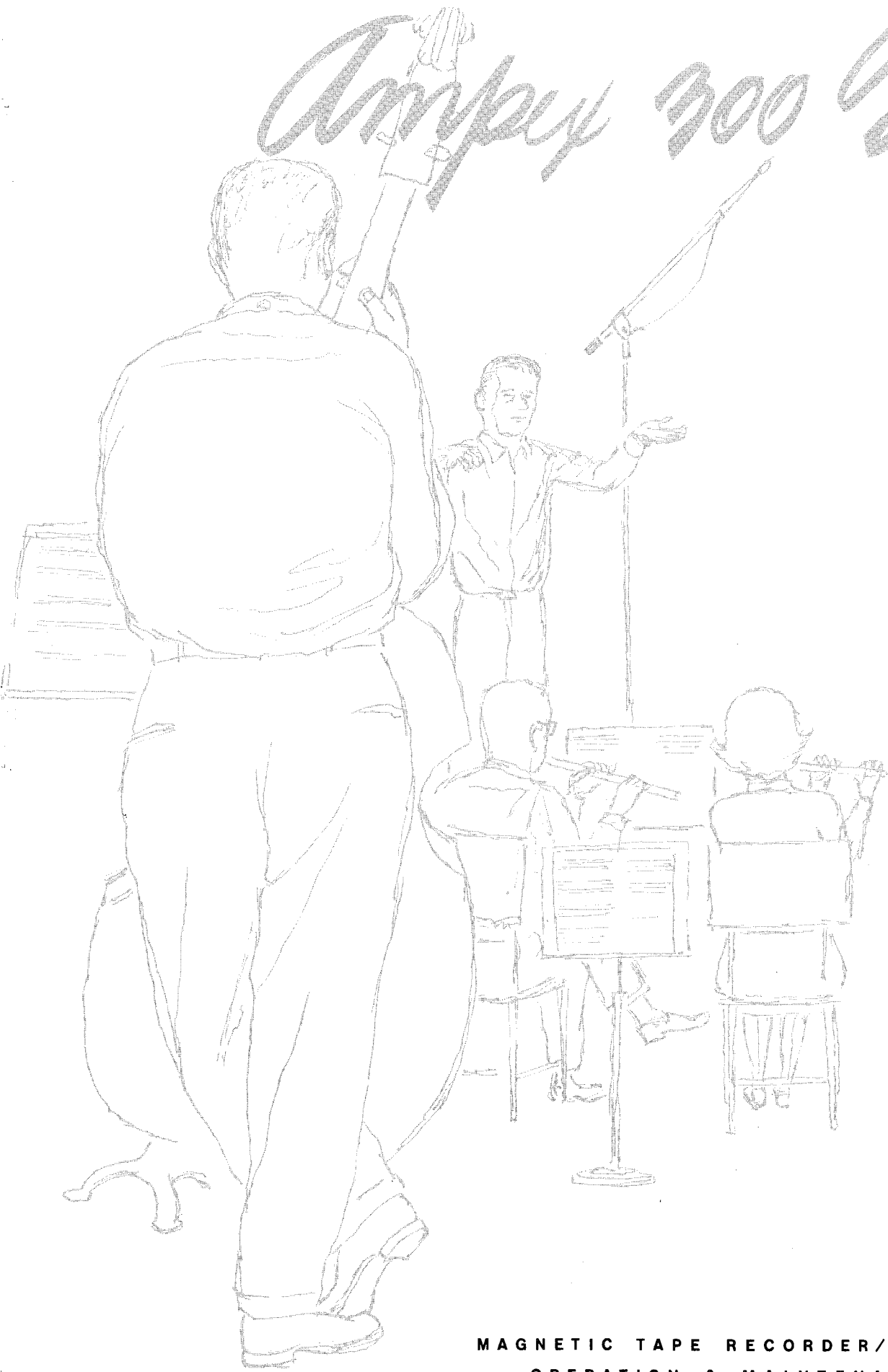
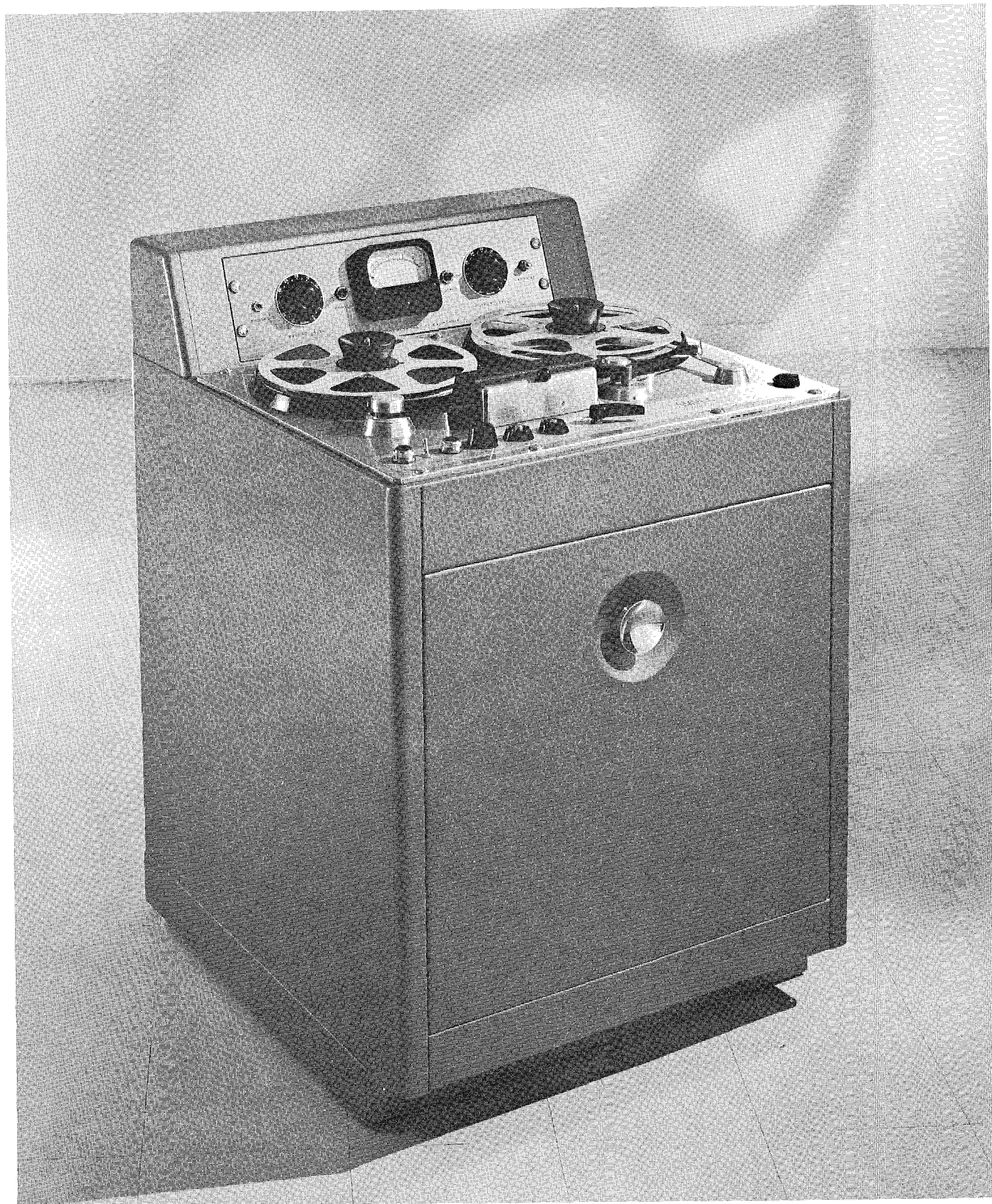


AmpeX 900 Series



MAGNETIC TAPE RECORDER/REPRODUCER
OPERATION & MAINTENANCE MANUAL

August 1959



AMPEX MODEL 300 RECORDER/REPRODUCER

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DESCRIPTION AND PERFORMANCE CHARACTERISTICS

GENERAL

Ampex Series 300 Magnetic Tape Recorder/Reproducers are high quality precision instruments designed for the professional user who requires the finest, most faithful recording and reproduction.

Recorder/reproducer equipment in the 300 series consists of a tape transport, a head assembly, electronic assemblies, and accessory units such as the Sel-Sync panel.

The tape transport mechanism, capable of handling up to 10½-inch reels, is available for operation at tape speed pairs* of 3¾-7½ inches per second (ips) or 7½-15 ips, using ¼, ½ or 1-inch magnetic tape width, depending on the version of the equipment desired. By arrangement with Ampex Professional Products Contract Engineering, a tape transport mechanism handling 14 inch reels, may be obtained. Equalization switching is available for 3¾ ips NAB, 7½ ips NAB, 15 ips NAB and 15 ips Ampex Master Equalization (AME). (See AME discussion at the back of this section.) The accessory Sel-Sync panel provides a head switching arrangement which makes any selected record head perform the function of a reproduce head

so that any one, two, or more tracks can be monitored while recording on another track.

A variety of head assemblies are offered—two, three, and four track—with the configuration depending on the demands of the user. The Ampex Model 300-2M equipment, for instance, is designed for making special ½-inch wide master tapes on which two dual track stereophonic programs are recorded in opposite directions on the tape. The section in this manual dealing with head assemblies covers the subject thoroughly.

The electronic assemblies, featuring etched board construction, are mounted in a single chassis. Three etched boards contain the major portion of the electronic components; the record amplifier and the bias and erase oscillator are located on one board, the reproduce amplifier on a second board, and the power supply on the third board.

CCIR equalization for operation to European standards can be obtained when ordering equipment.

Console and rack mounting arrangements are available.

*30 ips can be achieved by means of a capstan adaptor, but equalization must be changed.

PERFORMANCE CHARACTERISTICS

Tape Widths 1/4, 1/2 and 1-inch

Tape Speed Pairs 3 3/4-7 1/2 ips
7 1/2-15 ips
30 ips (by arrangement with Ampex Professional Products Contract Engineering)

<i>Frequency Response</i>	Speed (ips)	Response (cycles per second)
	3 3/4	±2 db 50 to 7,500 cycles
	7 1/2	±2 db 40 to 10,000 cycles
		±4 db 30 to 15,000 cycles
	15 (NAB or AME)	±2 db 30 to 15,000 cycles
	30	±2 db 50 to 15,000 cycles

<i>Signal-to-Noise Ratio</i>	Speed (ips)	Peak Record Level to Unweighted Noise (db)
	3 3/4	50 db
	7 1/2	55 db
	15	55 db
	30	55 db

The peak record level is defined as that level at which the overall (input to output) total rms harmonic distortion does not exceed 3% when measured on a 400 cycle tone. Noise is measured when erasing a signal of peak recording level in the absence of new signal. Thus, bias and erase noise are included as well as playback amplifier noise. All frequencies between 50 and 15,000 cycles are measured.

<i>Flutter and Wow</i>	Speed (ips)	Flutter and Wow (percentage rms)
	3 3/4	.25
	7 1/2	.2
	15	.1
	30	.1

The flutter and wow measurements include all components between 0 to 300 cycles using an rms meter calibrated to read the rms value of constant amplitude sine wave flutter.

<i>Reproducing Time</i> (NAB 10 1/2-inch Diameter Reels, 2400 feet of tape)	Speed (ips)	Half Track		Full Track	
		(hrs)	(min)	(hrs)	(min)
	3 3/4	4	16	2	8
	7 1/2	2	8	1	4
	15	1	4		32
	30		32		16

Starting Time The tape is accelerated to full speed in less than 1/10 of a second (1/4 inch tape). Acceleration for 1/2-inch tape is approximately 1/2 of a second.

Stopping Time When operating at 15 ips, the tape moves less than two inches after the STOP button is pressed, at 7 1/2 ips less than one inch.

<i>Reproduce Timing Accuracy</i>	Accuracy	Accuracy	Length of Recording
	(percentage)	(sec)	(min)
	±.2	±3.6	30

Rewind Time Approximately 1 minute for a full 2,400 foot NAB reel.

PERFORMANCE CHARACTERISTICS (Contd.)

Controls

- Tape Motion** All tape motion is controlled by two pushbuttons and a mode selector switch.
- The two pushbuttons control START and STOP functions, and the switch provides a means for selecting FAST FWD, REWIND and PLAY.
- Record Control** A separate RECORD button on the face of the electronic assembly, when pressed, energizes the record relay for that channel only. The relay drops out when the STOP button is pressed.
- When the RECORD button on the tape transport is pressed all channels are placed in the record mode.
- Equalization** An EQUALIZATION SWITCH on the face of the electronic assembly provides a means for selecting 7.5 NAB, 15 NAB or 15 AME equalization.*
- Record Inputs** The INPUT TRANSFER SWITCH provides a means for selecting three different types of inputs:

<i>Input</i>	Input Impedance	Minimum Input Signal that will produce Operating Level (1% tape characteristic distortion)
MICROPHONE	150 to 250 ohms nominal (transformer can be strapped for 30-50 ohms nominal)	200 microvolts
BAL BRIDGE	200 K ohms	-10 dbm
UNBAL BRIDGE	100 K ohms	-10 dbm

- Reproduce Output** Zero indication on the v-u meter corresponds to +8 dbm \pm 1 db. Sufficient gain and power handling capabilities exist to feed a +14 vu line output into 600 ohms balanced or unbalanced. The center tap of the output transformer can be strapped to ground for balanced output. Plus 4 vu also can be obtained by strapping. (See INSTALLATION.)
- Head Housing** The erase, record, and reproduce heads are contained in a single head housing.
- Power Requirements** Two track equipment requires approximately 3.5 amperes peak at 117 volts, 300 watts nominal, 50 and 60 cycles per second (cps).
- In general, the addition of each amplifier increases the power requirement by .5 ampere and 50 watts.

*See AME discussion at back of this section.

AMPEX MASTER EQUALIZATION

Because hearing sensitivity has been determined to be more generally acute between 2,000 and 5,000 cycles, Ampex engineering designers have introduced greater pre-emphasis in the record circuitry and more de-emphasis in the reproduce circuitry in this frequency range. This results in a reduction of subjective noise—the noise heard rather than the noise measured on a VTVM—of about 7 db.

Appropriate curves used for AME operation are shown in back of SECTION 7.

AMPEX MULTICHANNEL SERIES 300-2-3 and 4 COMPLETE EQUIPMENT

<i>Model</i>	<i>Channel</i>	<i>Mounting</i>	<i>Inch Per Second (ips)</i>	<i>Track</i>	<i>Cycle</i>	<i>Tape Width</i>	<i>Ampex Cat. No.</i>
300-2	2 Full	Rack	7½-15	Two	60	¼ inch	30902-01
300-2	2 Track	Rack	7½-15	Track	50	¼ inch	30902-02
300-2	2 "	Console	7½-15	in-line	60	¼ inch	30902-03
300-2	2 "	Console	7½-15	Stereo only	50	¼ inch	30902-04
300-2 M	2 No	Rack	7½-15	(2 Track	60	½ inch	30902-05
300-2 M	2 Erase	Rack	7½-15	4 track	50	½ inch	30902-06
300-2 M	2 "	Console	7½-15	configur-	60	½ inch	30902-07
300-2 M	2 "	Console	7½-15	ation.)	50	½ inch	30902-08
300-3	3 (Indi-	Rack	7½-15	3 in-line	60	½ inch	30903-01
300-3	3 vidual	Rack	7½-15	3 in-line	50	½ inch	30903-02
300-3	3 erase)	Console	7½-15	3 in-line	60	½ inch	30903-03
300-3	3 "	Console	7½-15	3 in-line	50	½ inch	30903-04
300-3 SS	3 "	Rack	7½-15	3 in-line	60	½ inch	30903-05
(Sel Sync)							
300-3 SS	3 "	Rack	7½-15	3 in-line	50	½ inch	30903-06
300-3 SS	3 "	Console	7½-15	3 in-line	60	½ inch	30903-07
300-3 SS	3 "	Console	7½-15	3 in-line	50	½ inch	30903-08
300-4 SS	4 "	Rack	7½-15	4 in-line	60	½ inch	30904-01
(Sel Sync)							
300-4 SS	4 "	Rack	7½-15	4 in-line	50	½ inch	30904-02
300-4 SS	4 "	Console	7½-15	4 in-line	60	½ inch	30904-03
300-4 SS	4 "	Console	7½-15	4 in-line	50	½ inch	30904-04