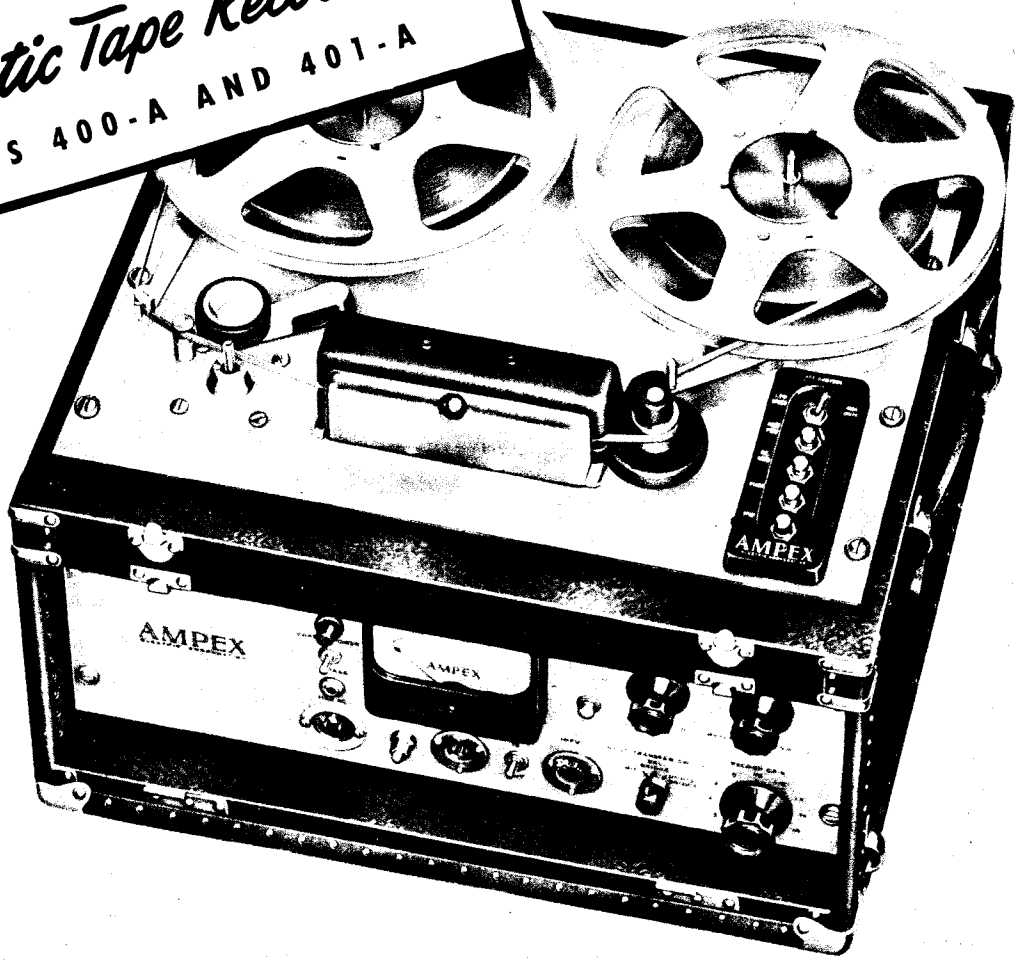
BULLETIN
A-211

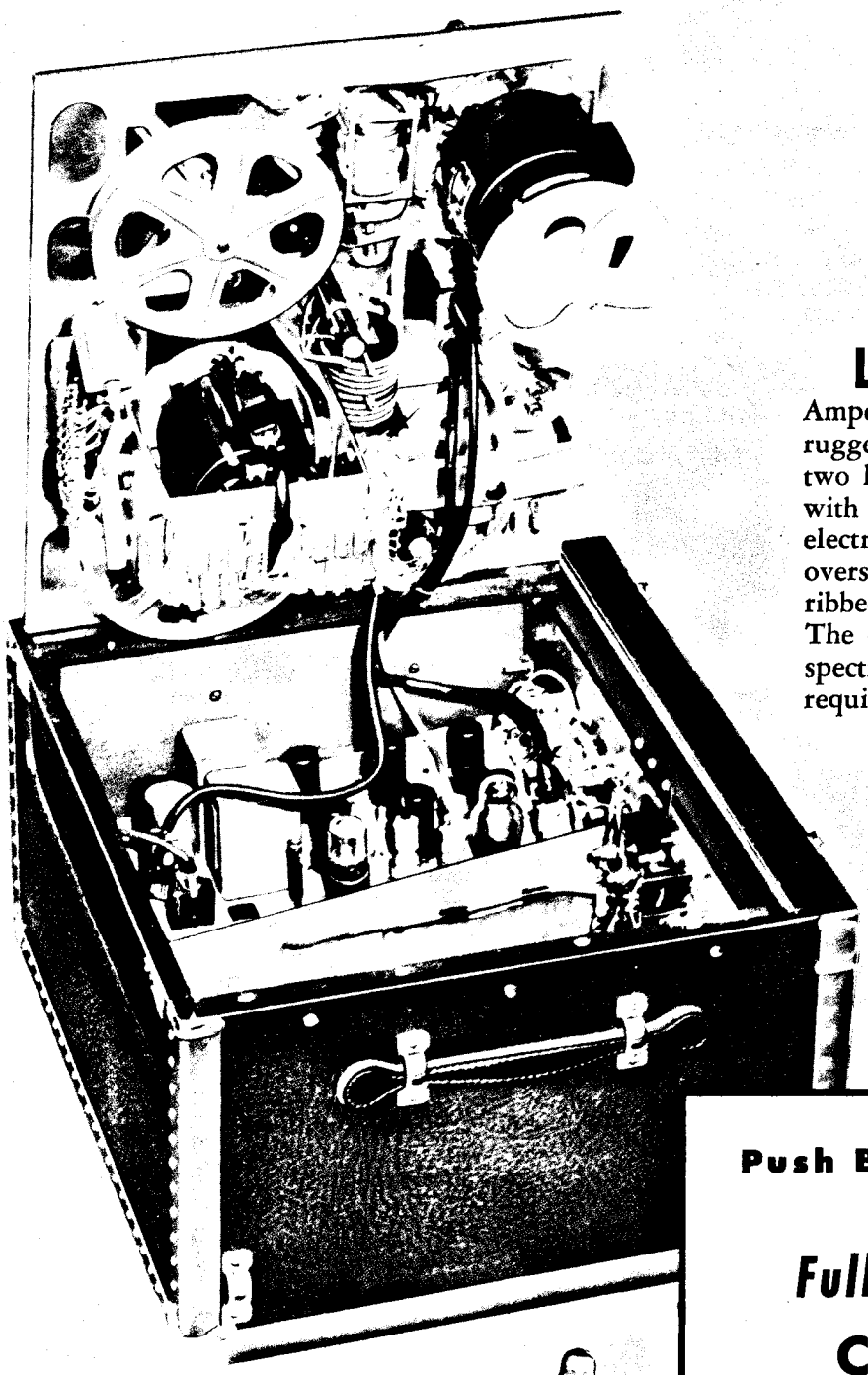
AMPEX
SERIES 400-A

Magnetic Tape Recorders
MODELS 400-A AND 401-A



CONSOLE PERFORMANCE IN A PORTABLE CASE

PERFORMANCE · DEPENDABILITY · LONG-LIFE



Long trouble-free life in the Ampex recorder is assured by the rugged construction, by the use of two high quality motors — each with ample reserve power, by the electrically-operated, quick-acting, oversize brakes, and by the heavily ribbed cast aluminum top-plate. The design also permits easy inspection and maintenance when required.

PORTABLE IN SINGLE, RUGGED, FULLY ENCLOSED CASE

Push Button Operation

and

Full REMOTE CONTROL

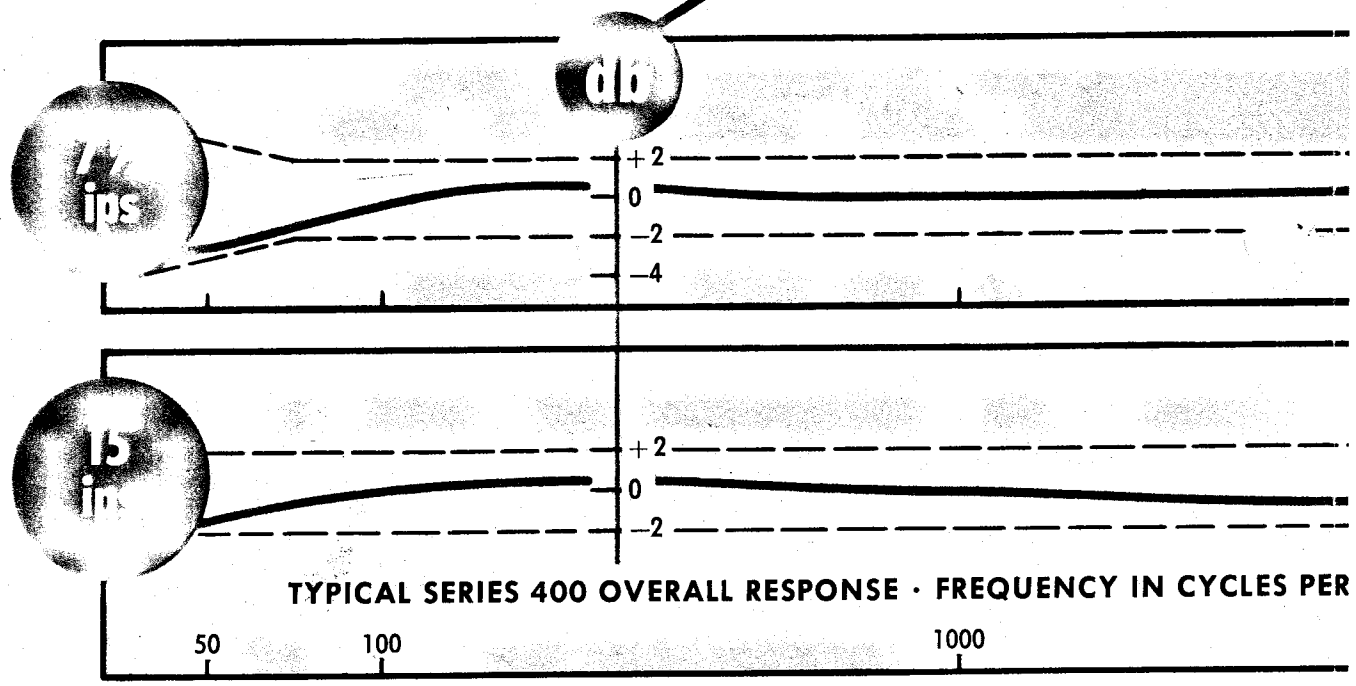
All modes of operation are push-button controlled. Start, Stop, Fast Forward, Fast Rewind, and Speed Change Switches are all banked at the right side of the top plate. The Record Push-Button and its indicating Pilot Light are located, however, on the front panel where it is not apt to be accidentally operated. Brakes and all mechanical functions are solenoid operated to permit use of remote-control when so desired. A separate remote control panel is available, as an accessory, at slight additional cost; this permits full remote control of all functions.

ACHIEVES NEW STANDARDS OF PERFORMANCE

Here again, Ampex takes the lead in advanced design, reasonably priced magnetic tape equipment with the new Series 400-A. Like its big brothers who have earned their way to the top brackets in professional installations, the 400-A is a precision tool which brings the advantages of magnetic recording, formerly available only to commercial recording companies and AM, FM and TV stations concerned with complying with the NARTB standards of performance, within the reach of professional musicians, educational institutions for language, music, and speech studies, business organizations for administrative study and sales promotion programs.

Though compact in size, Series 400-A is a giant in performance, retaining all the features which are requisite for professional applications. It enables the full recording and playback of the audio spectrum without in any way impairing the esthetic values and emotional appeals of the original sounds. Electronically and mechanically it surpasses all competition.

We ask you to carefully read and analyze the specifications which are given in this brochure and then compare them with those of other magnetic tape recorders. Moreover, be assured that any recorder bearing the Ampex trade name will *equal* or *better* its advertised specifications.



Featuring...

PUSH BUTTON OPERATION

All modes of operation, including Record, Playback, Fast Forward, Rewind, Start and Stop are easily actuated by clearly-labeled push-buttons. All mechanical functions are relay and solenoid operated. This feature permits control of all modes of operation from remote points. Further, it minimizes mechanical interlocking and thereby simplifies mechanical adjustment.

TAKES BOTH NARTB AND RMA REELS

This feature allows the use of the two popularly used standard reels on the supply turntable without prior rewinding from one size to the other. "Tension" adjustment is automatic. Either size reel can be played on the same recorder — a unique feature which follows the well known Ampex characteristic of simplified operation.

DUAL-SPEED WITH ONE MACHINE

The Series 400-A operates at both 7½" and 15" per second. The change-over from one speed to the other is accomplished at the flick of a toggle switch. Although the frequency response is flat to 15,000 cps. at the 7½" speed, the 15" speed is especially useful in commercial installations where tape quality must be above question and flattest and widest possible response are essential. The 15" per second speed makes editing easier by spreading the recording out over more tape.

The Series 400-A recorders will provide the highest possible recorded quality at both speeds and are second only to Ampex Series 300 recorders, which are built to the most exacting tolerances possible.

CONSTANT PERFORMANCE THROUGHOUT ENTIRE REEL

The automatic tension adjustment maintains uniform program quality throughout the reel by reducing the tension at the innermost reel diameter. This exclusive feature prevents variation in performance regardless of the size or type of reel used on the supply turntable. Wow due to uneven winding is minimized by accurate tension control within a single revolution of the reel.

HALF-TRACK
LL-TRACK
form Response

to 15,000 cycles per sec. at
7½ ins. per sec.

WIDE DYNAMIC RANGE

The high signal-to-noise ratio of this equipment makes it possible to retain all the thrilling qualities of the original. Fortissimo movements can be recorded in their crashing brilliances, yet pianissimo passages will not be lost in a muddle of noise. This is essential to professional musicians, recording studios, and to anyone who wants to enjoy the realism of live performances.

STANTANEOUS MONITORING FACILITIES

A monitor-jack is provided to which can be connected headsets or bridging amplifiers. An A-B switch allows this monitor-jack as well as the output line to be transferred from the recorder input to the output of the playback amplifier for instantaneous comparison of the original with the recorded music. This same switch simultaneously transfers the VU meter for level comparisons.

INSTANTANEOUS CIRCUIT CHECKING

A switch on the front panel transfers the 4 inch VU meter so that reference readings of the bias and erase currents as well as input and output levels can be made while recording. This provides an instantaneous testing facility indispensable to field operation without the use of external equipment.

UNIVERSAL INPUT

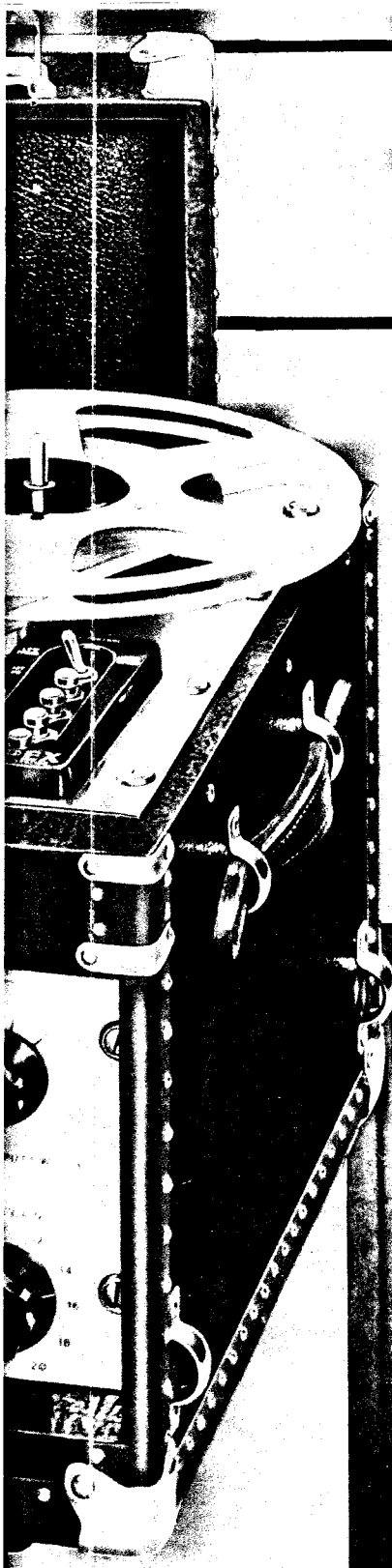
The electronic circuitry includes a built-in microphone preamplifier and line bridging facilities. An input transfer switch provides proper internal connections for a low impedance broadcast microphone and balanced or unbalanced bridging of lines. Radio tuners, too, can be connected to the unbalanced bridging input.

LINE OUTPUT

Line output terminals provide +4 VU to balanced or unbalanced lines. This is capable of driving all high and low impedance amplifiers requiring approximately a 1 volt input.

MODELS 400-A | 400-B

Simultaneous ERASE · RECORD · PLAYBACK



EXCLUSIVE INTERCHANGEABLE TAPE *FEATURE*

Quality control of production gives equal performance from machine to machine. Tapes recorded on any Ampex 400-A in any part of the world can be played back on any other Ampex with identical quality, frequency response, and dynamic range. This is especially important for users with several recorders who may want to play back in the studio tapes made on a portable recorder. For network operation, this feature means that all stations throughout the system can play the originally Ampex recorded tape or a copy of it with complete confidence that all of the original quality will be reproduced.

4 to 1 Tape SAVING

Because of the unique Ampex feature of 15,000 cps. response at 7½ inches per second, only half the tape footage is required, as compared with 15 inch per second recording. Further, half-track recording can be used to redouble the recording time. Effectively, the Series 400-A magnetic tape recorder will give four times as much recording as obtained from a 15 inch per second full-track recorder. What this means in tape economy and tape storage space is clearly shown in the picture. The young lady holds four 7½ inch per second half-track reels which contain the identical program formerly requirng the use of the sixteen 15 inch per second full-track reels seen stacked on the table.

SPECIFICATIONS SERIES 400-A

TAPE SPEED

15 inches per second and 7.5 inches per second with motor speed change and equalization switches conveniently located. No capstan adaptor is required.

FREQUENCY RESPONSE

15 inches: ±2 db.—50-15,000 cycles.
7.5 inches: ±4 db.—30-15,000 cycles.
±2 db.—70-10,000 cycles.

SIGNAL-TO-NOISE RATIO

Over 55 db. at both 7.5 and 15 inches per second as defined by NARTB standards. (By definition, the signal-to-noise ratio is the ratio of peak recording level to the total unweighted playback noise when erasing a signal of peak level and in the absence of a new signal. Thus, bias and erase noise are included as well as playback amplifier noise. All frequencies between 30 and 15,000 cycles are measured. The peak record level is defined as that level at which the overall (input to output) total r.m.s. harmonic distortion does not exceed 3% when measured on a 400 cycle tone.)
This low noise level is achieved by using direct current for the heater in the first amplifier tube and by the use of precision logged, hi-mu metal and copper shields around the heads.

STARTING TIME

Practically instantaneous; the tape accelerates to full speed in less than 1/10 second because capstan is always at full speed whenever power is on.

STOPPING TIME

When playing at 15 inches per second the tape moves less than 2 inches after stop switch is operated. This is accomplished by the positive action of large, quick operating brakes.

FLUTTER and WOW

15 ips: Well under 0.2% r.m.s. measuring all flutter components from 0 to 300 cycles using a 3,000 cycle tone.
7.5 ips: Under 0.25%.

PLAYBACK TIMING ACCURACY

±3.6 seconds in 30 minute program. 0.2%.

PLAYING TIME

Using standard NARTB 10½" reel, 32 minutes at 15 ips; or 64 minutes on each track at 7.5 ips. The standard RMA 7" reel will play for 15 minutes at 15 ips or, 30 minutes at 7.5 ips when used as the supply reel. The Model 400-A is designed to record on one-half the standard ¼" wide tape in accordance with RMA standards. By turning the reel over, the second half-track can be recorded, thus bringing the total program time per 10½" reel to 128 minutes at 7.5 ips. Model 401-A is designed to erase and record the full tape width; its recordings are completely interchangeable with those produced on Model 300 (or other full-track recorders).

REWIND TIME

1½ minutes for full 2400' NARTB reel.

OPERATION SELECTOR

The four operating modes — Fast Forward, Play, Stop and Rewind — are controlled by conveniently located push-buttons. A separate Record button energizes the record relay (button releases when machine is stopped). Swift back-and-forth shuttling for editing and cueing of tape is controlled by Rewind and Fast Forward push-buttons.

COMPLETE PLUG-IN HEAD HOUSING

A single plug-in head housing contains the Erase, Record and Playback Heads. This assembly is interchangeable and easily replaced in the field in the event of difficulty.

SIMULTANEOUS MONITORING

Separate record and playback amplifiers and heads permit program monitoring during recording.

INPUT

A switch allows the recorder to accommodate either microphone level low impedance input or to bridge a 600 ohm +4 VU line, balanced or unbalanced output to achieve 100% modulation level on the tape.

OUTPUT

+4 VU into 600 ohms balanced or unbalanced. Capable of driving all high and low impedance amplifiers requiring approximately 1 volt input.

METERING

A 4-inch VU meter, mounted on the front panel, provides for: (a) Direct monitor of record input signal before or during recording; (b) Monitor of recorded output signal from playback head while recording or during playback; (c) Reading bias current; (d) Reading erase current.

PHONE MONITORING

A phone monitor-jack provides for direct monitor of record input signal before or during recording and monitoring of recorded output signal from playback head while recording or during playback. An A-B switch permits direct comparison of original and recorded programs during recording; this switch simultaneously transfers the VU meter for level comparison and monitoring.

MOUNTINGS

Portable case or 19-inch standard rack.

DIMENSIONS

Portable case 20" wide by 17½" deep by 15" high contains the mechanical and electronic units and power supply. Standard 19-inch rack mounting includes a panel 15¾" high for the mechanical unit, a panel 7" high for the electronic unit and a panel 5¼" high for power supply.

WEIGHT

Complete unit in portable case weighs approximately 80 pounds.

MODEL NUMBER	CATALOG NUMBER 115V- 60 Cycle A.C.	115V- 50 Cycle A.C.
400-A HALF-TRACK . . . . . Portable	1048	3377
400-A HALF-TRACK . . *for* Rack Mount	1047	3378
401-A FULL-TRACK . . . . . Portable	1996	3379
401-A FULL-TRACK . . *for* Rack Mount	1997	3442

AMPEX
MAGNETIC RECORDERS
AMPEX ELECTRIC CORPORATION • REDWOOD CITY • CALIFORNIA

AMPEX RECORDERS
lead in telemetering, too

The scope of Ampex developments in the fields of telemetering and data recording are without parallel in the history of recording. Shown here is Model S-3041, but one of the numerous Ampex units used by industrial, scientific, and military research. Ampex magnetic tape recorders and playbacks are available for recording and analysis of spectra from 0 to 100,000 cycles per second. Data in the form of FM/FM or PWM signals can also be recorded with special Ampex recorders. Ask for bulletin on data recorders.

STANDARD OF THE GREAT RADIO SHOWS

AX-59 (12-10-51)

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