



AMPEX

AG-440

The new generation in professional Audio Recorders.



Two decades of serving...

The broadcast industry, recording industry, and professional equipment user in government, education, industry and medicine have preceded and contributed to a new generation of professional audio recorders.

Starting in 1947 with the model 200 and continuing through the series 300, 400, 3200, 600, PR-10, and 350, a chain of development and progress has evolved that almost chronicles the growth of recorded sound itself. The quantity of each Ampex series in use throughout the world today (including most of the original 200's) is testimony to the accomplishment of the original design objective of each.

Now Ampex introduces the AG-440 series—a new generation of professional audio recorders. New with tape transport rigidity previously limited to higher cost Ampex mastering recorders and Ampex instrumentation and video recorders. New versatility—with rapid convertibility to accommodate either 1/2 or 1/4 inch tape. New flexibility—with ability to “build up” from one-channel to two, three, or four channel. New with improved solid-state plug-in modular electronics. New with superior head assemblies. The newest of the new generation.

All new features from AMPEX'S new generation

RIGID DIE CAST FRAME provides absolutely flat, rigid mounting of all mechanical components. It assures stability for precise alignment for both 1/2 and 1/4 inch tapes. No flexing or distortion will occur in any configuration in any mobile or fixed application.

MAINTAINABILITY The AG-440 is designed for easy-rapid maintenance, and minimum down-time. Modular design **FRONT OF PANEL PLUG-IN BOARDS** provide fast replacement or servicing. (Reserve boards permit the user to have full back-up should split second maintenance be required.) Individual head stacks can be replaced with a single screw and plug-in connector. Transport motors, guides and major components can be quickly removed and replaced in exact alignment because of the precision milled transport casting. All relays are plug-in, and interchangeable. Console models permit rotating transport for rapid accessibility.

CONVERTIBILITY between 1/4 and 1/2 inch tapes is accomplished with ease. Tape transport guides rotate for either 1/4 or 1/2 inch tapes. One quarter inch head assemblies are standard on all one and two channel recorders. One-half inch assemblies are standard on all three and four channel recorders. Assemblies are quickly removed with three screws and new assemblies installed with registration dowel pins for quick alignment.

FLEXIBILITY allows you to add three channel capability to a monophonic machine by installing two additional panels of electronics, changing heads and head cabling. The AG-440 console over-bridge modular mount accepts from 1 to 4 (or more) 3 1/2 inch electronics panels. For the first time, you can build a single channel full track Ampex up to a four channel, four track recorder.

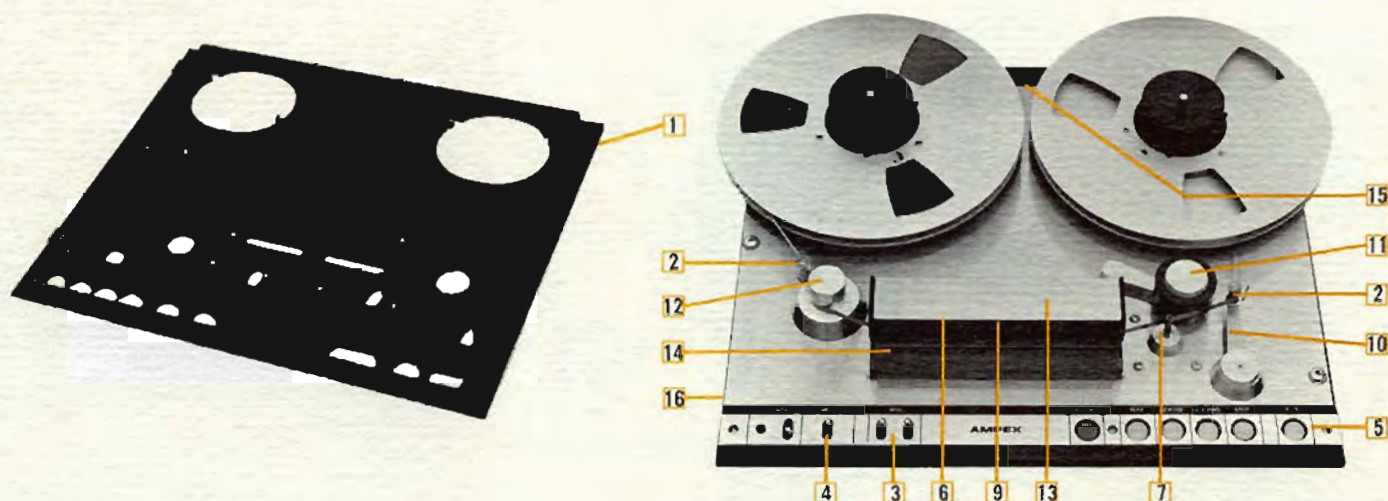
OBSOLETE PROOF The Ampex AG-440 allows you to expand without replacement. You can keep pace with the changing requirements of the industry, by using the building block increments of Ampex's new generation in professional audio recorders.

JEWEL BEARING SCRAPE FLUTTER IDLERS minimizes scrape flutter (especially important to production of master tapes).

AUTOMATIC TAPE LIFTERS with electrical and mechanical override ease the tape away from the heads during rewind and fast forward modes.

FAST HEAD CHANGES You can remove a 1/4 inch head assembly and replace with a 1/2 inch head assembly or change from four track to three track operation in a few minutes.

AMPEX ONE YEAR WARRANTY ON ALL PARTS.



The new generation in TRANSPORTS

For the first time in a medium-priced professional recorder, a precision milled die-cast frame that eliminates flexing problems and their related side effects. This precision frame has been standard on all expensive Ampex Video, Instrumentation and Master Audio Recorders for seventeen years. These years of experience in manufacturing and production now allow Ampex to incorporate this type of frame in medium priced professional recorders. Now you can operate a recorder all day in the most demanding studio or mobile applications without risking the flexing and misalignment problems that can occur with aluminum plate or sheet steel. Strong, rugged and durable, this new Ampex die-cast frame will withstand the weight of heavy-duty motors and fully dampens motor resonance that affects flutter characteristics.

The most advanced tape transport ever offered on a professional audio recorder. Transport guides rotate for either $\frac{1}{4}$ or $\frac{1}{2}$ inch tape. Tension controls can be adjusted to accommodate any standard reel size up to $11\frac{1}{2}$ inch European versions.

Human engineered for quick easy operation. Unique new editing features.

Transport features

- 1 Unique new precision ground die-cast frame provides absolutely flat, rigid mounting of all mechanical components.
- 2 Standard transport tape guides rotate for either $\frac{1}{2}$ or $\frac{1}{4}$ inch tape.
- 3 Individual torque motor tension controls provide compensated switching for large or small hub reels. Slide resistors under transport provide fine adjustments.
- 4 Tape speed switch selects the fast or slow speed of the recorder and automatically switches electronics for proper equalization.
- 5 Record, play, rewind, fast forward, stop and edit push buttons are logically and sequentially placed on transport and accessory remote for positive relay solenoid operation. Controls operate 24 volt DC enclosed plug-in relays, interlocked for fast editing and cueing and to prevent damage or jamming.
- 6 Automatic tape lifters ease the tape away from the heads during rewind and fast forward. For editing or cueing, this can be overridden manually, electrically, or by remote control.
- 7 Direct drive capstan is plated with "Hard Chrome" to give several times the wear life of standard capstans.
- 8 Time tested and proven braking system provides smooth, fast, posi-

tive action. Individual solenoid actuated brakes on each motor for STOP and EDIT are adjustable to operators' preferred tensions.

9 Jewel bearing scrape flutter idler reduces scrape flutter by 75%. An accessory idler is available for mounting between the erase and record heads to reduce flutter another approximate 25%.

10 Take-up tension arm eliminates "slack" in fast starts and gives even smooth tape wrap on the take-up reel.

11 Capstan idler maintains accurate traction pressure through quiet, yet positive solenoid control.

12 Reel idler pulley has heavy-mass flywheel to provide essential filtering. This, plus precision capstan assembly and hysteresis synchronous motor, holds flutter and wow at a minimum.

13 Flat head cover permits mounting of commercial edit block.

14 Head assemblies can be removed with three screws and replaced in less than four minutes. The gate opens fully to allow access to the heads for edit marking, head cleaning or demagnetizing.

15 Transport houses regulated power supply and plug-in master bias oscillator to feed up to four electronics channels. (More details on page 4.)

16 AC power cord has ground connection to reduce shock hazard.



New 100% solid state plug-in modules provide the electronic sophistication to match the mechanical perfection of the new AG-440 — slim and compact. Ampex's engineering capability on the design of solid state circuitry for Digital, Instrumentation, Videofile* and professional Videotape Recorders is reflected in the design of the AG-440 electronics.



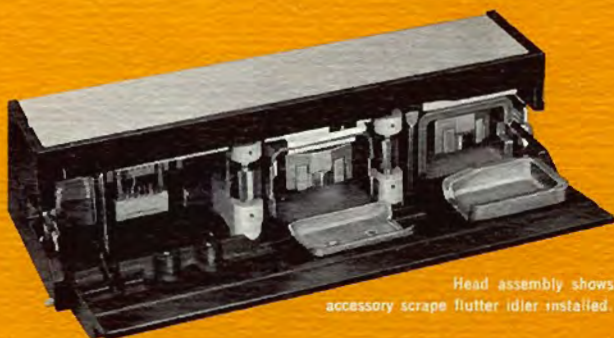
The new generation in ELECTRONICS

Electronics features

- 1 New slim style electronics require only 3½ inches of vertical space, and because the power is supplied from the transport, the chassis is less crowded, permitting easier access to all circuits.
- 2 The tape transport also contains plug-in master bias oscillator module which feeds up to four electronics channels. This method eliminates interchannel beat and assures stable performance by providing only one bias frequency source. Modulation noise is reduced by using a higher (150 kHz) bias and erase frequency.
- 3 Electronics have built-in SEL-SYNC* (selective synchronization) that allows the temporary conversion of record heads to playback functions for synchronized sound-on-sound or track revising on two or more channel recordings.

- 4 All electronics are so designed that modules plug into the front of the chassis for easy rapid accessibility. Playback, record and bias amplifier boards have all necessary adjustments accessible from the front of the recorder.
- 5 Equalizers plug into record and playback boards to match transport speeds, and the adjustments are accessible from the front.
- 6 Large illuminated easy-to-read VU meter can be switched to read recorder input, reproducer output, and bias current.
- 7 Safe/Record/SEL-SYNC switch prevents accidental erasure and switches record head to play amplifier for tight record cueing on all models, or sound-on-sound synchronized recording of two or more tracks of music or voice.

The new generation in HEAD ASSEMBLIES



Head assembly shows accessory scrape flutter idler installed.

You can convert a recorder from ½ to ¼ inch operation or change track configuration in less than four minutes by removing three screws and inserting a new assembly. Registration dowel pins assure quick alignment. These are the finest, newest assemblies in Ampex's twenty year history of the manufacture of quality heads.

Head Assembly features

- 1 One and two channel recorders are supplied with ¼ inch assemblies. Three and four channel recorders are supplied with ½ inch assemblies. Conversion from one width to another is easily accomplished. The assembly can be removed by unscrewing three screws and a new one installed and aligned with the aid of dowel pins.
- 2 A new head assembly with an overhead bridge headmount provides adequate space for a fourth head and four individual plug-in head stack replacements.
- 3 Head gate opens fully for easy access to heads for edit marking, head cleaning or demagnetizing.
- 4 All heads are low impedance which reduces microphonics and permits longer head cables without high frequency loss.
- 5 Head stacks mount with a single screw and plug-in pigtail permitting individual replacement or configuration changes.
- 6 Playback heads have triple shields with lapped housing and covers for absolute minimum noise.

The new generation in FLEXIBILITY



Console

New low profile design and slim overbridge electronics panels combine to form the most compact console in the industry. New "risers" allow the stacking of up to four panels in the overbridge mount. Improved heavy-duty 3 inch casters allow free rolling mobility of the light weight console. The transport pivots up or down to any convenient angle for operation, maintenance or editing — when cables are removed, the transport can be rotated a full 360 degrees. A rugged handsome vinyl finish provides an attractive, mar-proof, easy to clean exterior.




Portable



All models of the AG-440 recorders are available in portable cases. These are supplied in two cases; one case for the transport, and one case for the electronics. Electronics cases have 7 inch opening for one and two channel models and 14 inch opening for three and four channel models. Blank stainless panels are used to fill openings on 1 and 3 channel models. All cases permit full access to equipment.










Unmounted

Transport, electronics panels, mixers and accessories are available in unmounted modular units for studio rack mounting or special mobile van installation. All units fit easily into standard electronics racks for convenience.

AG-440-1  Recorder/Reproducer 1/4 inch mono, full or half track available in console, portable and unmounted. For broadcast, education, industry and medical.

AG-440-2   Recorder/Reproducer 1/4 inch, two channels, half track, stereo (models also supplied with half track stereo plus quarter track playback), available in console, portable and unmounted. For stereo broadcast, language lab masters, industry training and medical.

AG-440-3    Recorder/Reproducer, 1/2 inch, three channels. Available in console, portable and unmounted. For recording studios, industry quality control vibration testing, and specialized, unique government/defense multichannel applications.

AG-440-4     Recorder/Reproducer, 1/2 inch, four channels. Available in console, portable and unmounted. For recording studios, master music tapes and critical industrial and laboratory multichannel applications.

AG-445

Playback only. Available in 1/4 inch 1 and 2 channel (also 2 and 4 track stereo with selector switch) versions and 1/2 inch 3 and 4 channel versions. One single 3 1/2 inch chassis accommodates from one to four channels of playback electronics modules.

Custom versions of AG-440 can be supplied on special order or field converted to meet various requirements.

Specifications

Tape Speeds 7½ and 15 ips, or 3¾ and 7½ ips.

Metric Conversion Table

ips	CM/sec
3¾	9.52
7½	19.05
15	38.10

Frequency Response Overall

15 ips	±2 dB	30–18,000 Hz
7½ ips	±2 dB	40–10,000 Hz
3¾ ips	+2 –4 dB	50–7,500 Hz

Signal-to-Noise Ratio

Speed	Full Track	2 Track	3 Track	4 Track
15 ips	68 dB	60 dB	62 dB	60 dB
7½ ips	68 dB	60 dB	62 dB	60 dB
3¾ ips	63 dB	56 dB	57 dB	56 dB

Peak record level to unweighted noise (30 to 18,000 Hz). Includes bias, erase and playback amplifier noise using 3M (201) tape or equivalent.

Flutter

Speed	Percentage
15 ips	below 0.08% rms
7½ ips	below 0.1% rms
3¾ ips	below 0.15% rms

Percentage of total flutter is measured by the methods of American Standard Association 257.1 — 1954, in a band 0.5 to 200 cps, while reproducing an Ampex Flutter Test Tape (flutter on test tape less than 0.03%).

Playback Output +8 dBm into 600 ohms — retraceable for +4 dBm output, balanced or unbalanced. Maximum of +29 dBm before clipping.

Record Input 100K unbalanced bridging with dummy plug supplied or 20K balanced bridging with plug-in transformer supplied with each electronics. — 17 dBm to produce recommended operating level.

Electronic Adjustments Accessible from front-equalization; reproduce level; record level; reproduce calibration; record calibration; bias adjustment; bias calibration; erase adjust. SEL-SYNC level and bias trap adjustment on rear of chassis.

Start/Stop START: tape at full speed in less than ½ second.

STOP: at 15 ips, tape moves less than 2 inches after pressing stop button.

Playback Timing Accuracy ± 0.2% (±3.6 seconds in 30 minutes recording time).

Mounting Configurations Portable, unmounted, console (electronics above transport).

Tape Width Standard ¼" or ½" tape.

Reel Size Standard up to 10½ inch reels, adjustable up to 11½ inch reels.

Equalization All standard models supplied with NAB equalization. CCIR curves available on special order.

Edit Control Edit button stops take-up reel permitting tape to move in play mode without winding on reel. Button also releases brakes in stop mode for easier threading.

Rewind Time Approximately 1 minute for 2400 foot NAB reel; 30 seconds for 1200 foot EIA reel.

Power Requirements Standard models are 117 volts, 50 or 60 cycle. Units with multiple tapped power input transformers are available on special order. Single channel requires 2.3 amps; two channel requires 2.5 amps; three channel requires 2.7 amps; four channel requires 2.9 amps. All machines are supplied with 3 wire grounding power cord.

Dimensions Standard 19" wide panels with commercial notching for rack mounting. Tape Transport: Uses 15¾ inches of rack space (10½" NAB reels overhang 1½ inches from side edges, and 2¾ inches above transport). Electronics: 3½ inches of rack space. One 3½ inch electronics required for each record/reproduce channel. Reproduce only electronics handles 1 to 4 channels in one 3½" panel. Console: Single channel record/reproduce or up to 4 channel reproduce only — 40½" high (to top of electronics housing), 24¼" wide, 27½" deep. For more than one record/reproduce channel, add 3½" height per additional channel.

Warranty Ampex one year warranty.

All units are fully approved by Underwriters Laboratories.

AMPEX

AMPEX CORPORATION

401 Broadway • Redwood City • California • 94063

North Sydney, Australia • Rio de Janeiro, Brazil • Toronto, Canada • Bogota, Colombia
• Reading, England • Paris, France • Frankfurt/Main, Germany • Hong Kong, B.C.C.
• Tokyo, Japan • Mexico City, Mexico • Stockholm, Sweden • Lugano, Switzerland

Accessories

REMOTE CONTROL

Allows operation from one or more locations. Duplicates all functions of record, play, fast forward, rewind, stop and tape lifter override. Three color-coded indicator lights are mounted on the remote control desk top box.

READY indicates machine is ON and tape threaded.

PLAY indicates machine is operating in play mode.

RECORD indicates the machine is operating in the record mode.

PLUG-IN INPUT UNITS

Interchangeable units match various inputs such as zero loss transformer for balanced bridging, 600 ohm line matching, or preamplifiers for both low and high output microphones.

PLUG-IN EQUALIZERS

Interchangeable units provide NAB or CCIR curves appropriate to each tape speed.

MICROPHONE/LINE MIXER

4-position, 2-channel compact professional mixer for two-channel stereo and monophonic recording. Four mixing positions accept up to four low impedance microphone inputs or two low-Z microphone inputs and two line inputs. Switching control for each input permits feeding input either to the left or right, or split to feed equally into both channels. Two-channel facilities are excellent for monophonic applications, two or more mixers can be coupled, which provides overall master gain controlled by the last unit in the coupling.

EXTENDER BOARDS

These permit servicing or testing electronics boards while in operation. Four types are available:

- master power supply/bias oscillator,
- playback
- record
- bias amplifier

RECORD SCRAPE FLUTTER IDLER

Ready for installation between the erase and record heads. A second optional scrape flutter idler/reduces flutter another 25% (a standard scrape flutter idler is factory installed between the record and reproduce head which removes about 75% of recorder modulation noise).

CONSOLE REAR COVER PANELS

Used where all console cables are to be concealed. Sets are available to cover the cabinet base and one to four electronics panels.

CONSOLE ELECTRONICS MOUNTING CASTING (RISERS)

Casting sets are available to add 3½ inch electronics multiples to existing console.



World-wide sales and service
Write for the name of your nearest distributor