

AMPEX

By Special Request



AMPEX PRESENTS THE AG-440C
PROFESSIONAL AUDIO RECORDER/REPRODUCER

ANOTHER STEP FORWARD IN A TRADITION OF EXCELLENCE

For a number of years, Ampex AG-440 and AG-440B recorders have enjoyed an enviable reputation in professional recording and broadcasting circles. The basic design of the machine has been proven under all conditions, and it has logged a remarkable record of reliability. In short, the Ampex AG-440 has long been the standard by which other recorders have been measured.

Now, with the AG-440C, Ampex offers a recorder/reproducer in the same tradition of excellence. Enhancing its potential return on investment are many refinements suggested both by discriminating users throughout the world, and by Ampex design engineers. These refinements provide the user with improved performance and better maintainability. New convenience features insure that the AG-440C is even more efficient and satisfying to use.

This is the working professional's workhorse recorder. Its genealogy is first-rate, and its promise is unsurpassed.

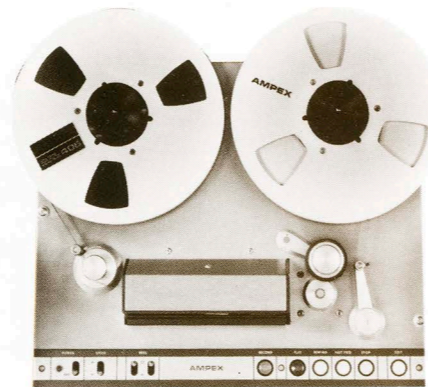
THE TRANSPORT

Motion sensing has been added to transport controls, making it possible to move immediately from Fast Forward or Rewind to Play without first pressing the Stop button. This eliminates the hazards — such as breaking or spilling tape — of changing from one mode to another too suddenly.

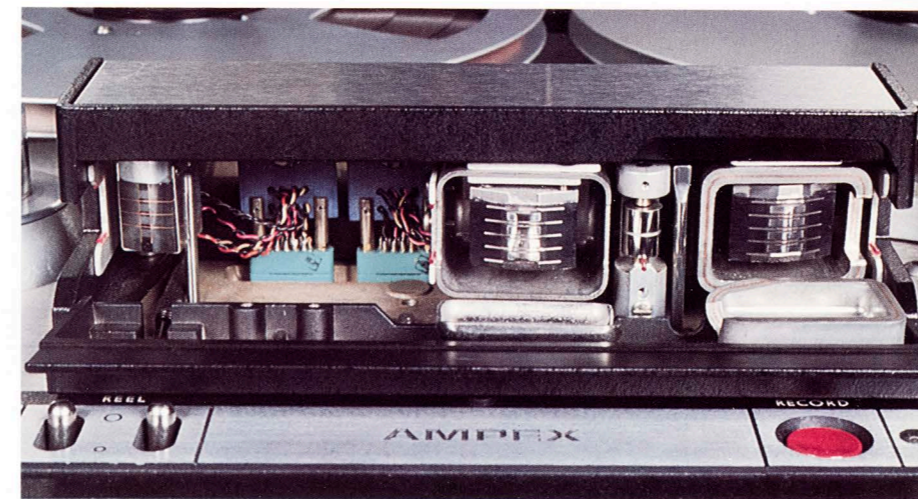
An improved edit control makes it possible to release the brakes without the necessity of holding up the tension arm. When tape is spilled, the take-up reel remains stationary, so that the free end of tape on the take-up reel remains in position for splicing.

An improved tape guidance system featuring sapphire guides and a flutter idler means more accurate tape handling, further reduction of skew to an all-time minimum, and longer life for individual elements. Reduced skew translates into greater phase shift stability as well as high frequency amplitude stability.

Tape safety is assured when the machine is in standby mode by preventing contact of the tape with the capstan until the machine is actually put into Play or Record.



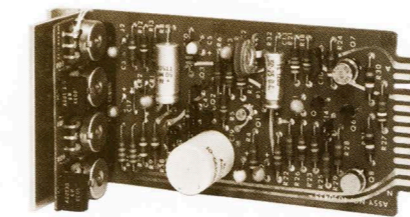
All advantages of the transport for which previous AG-440 models are famous have been retained in the AG-440C. **The rugged top plate** is die cast and precision milled, providing a rigid mounting which will remain flat and preserve accuracy under all operating conditions in any configuration, whether mobile or fixed. **The automatic tape lifters** may be overridden manually, electrically or by remote control for cueing



or editing. **Tape guides** may be easily rotated to accommodate either 1/4" or 1/2" tape.

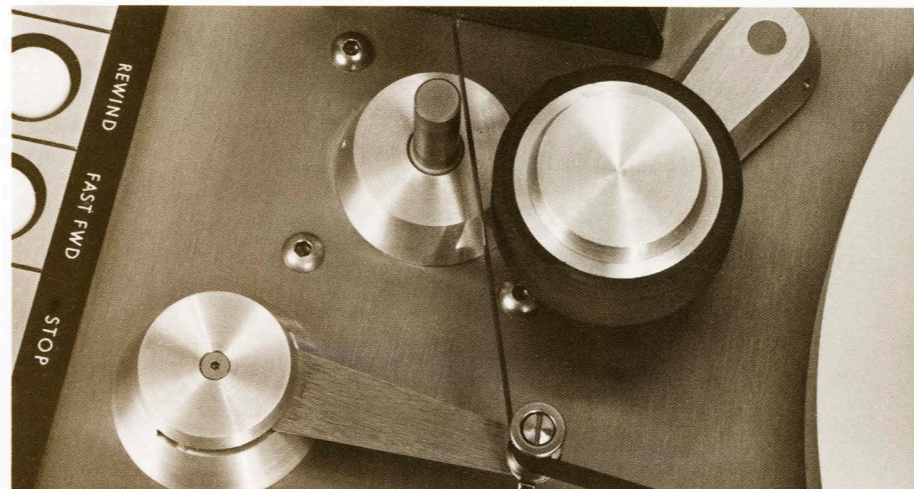
ELECTRONICS

The high-frequency response has been extended with improved flatness — typically +1 -2dB to 15 kHz at 7 1/2 in/s, ±2dB to 20 kHz at 15 in/s when using Ampex 406 tape.



Sel-Sync response has been improved at 15 in/s, typically ±2dB, 30Hz-12 kHz. Sel-Sync signal-to-noise ratio is now equal to the reproduce signal-to-noise ratio.

Automatic switching has been incorporated in the Sel-Sync mode — when a channel being reproduced with the Sel-Sync synchronizer is put into Record, the output switches automatically from monitoring the Sel-Sync output to monitoring input.



A plug-in etched board has been provided for record control circuitry.

Two line output impedances are available, 600 ohm or 150 ohms, selectable by a switch.

Meter sensitivity for either +4 or +8 line is selectable by a switch.

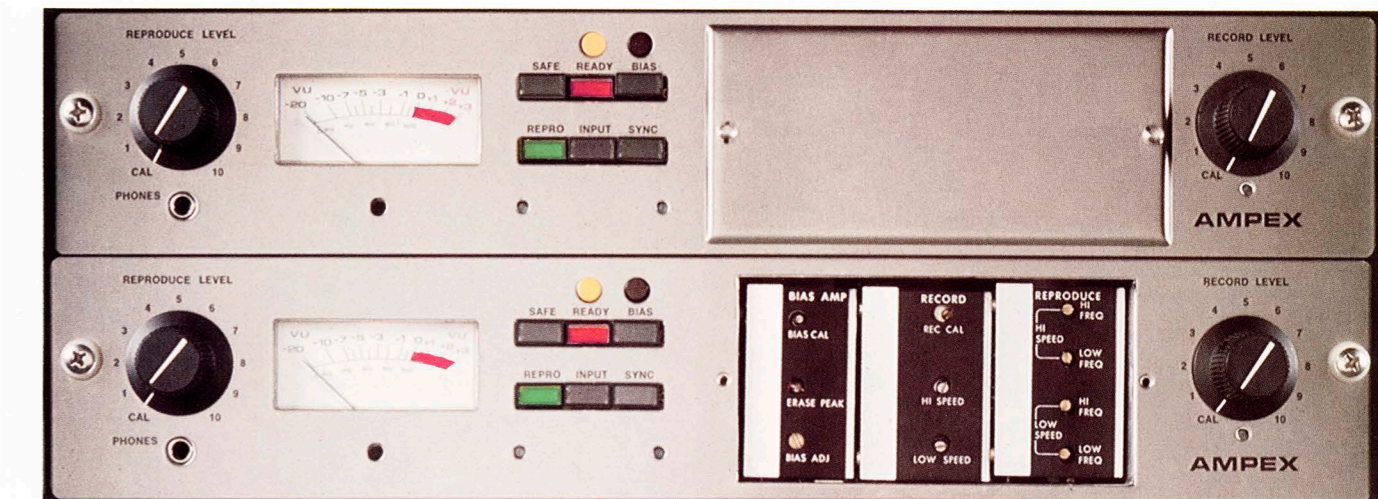
Bias may be metered on the VU meter while output is monitoring reproduce or input.

Gold plated contacts on electronics modules add to long-term reliability.

HEAD ASSEMBLIES

Head assemblies are easily replaced. Head stacks mount with a single screw and plug-in connector to permit individual replacement, or configuration changes. The gate opens fully to allow access to the heads for editing, cleaning, demagnetizing.

Space for a fourth head is provided to permit installation of a four-track stereo head, single track head, or any other head that may be needed for a special purpose.



MANUAL CONTROLS

All manual controls on the AG-440C, as in previous models, are logically arranged for the utmost ease of operation. New improvements make them easier than ever to use.

"Indicator" pushbuttons have been introduced for improved display and easier selection of electronics operating functions.

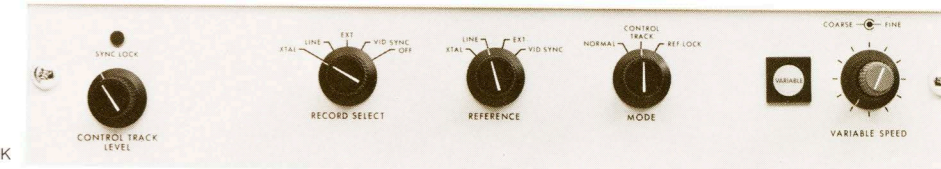
Calibrate positions have been incorporated on reproduce and record level controls — a feature which greatly simplifies adjustment and maintenance.

ADDITIONAL ADVANTAGES

Other improvements of the AG-440C reflect the usual meticulous attention to detail represented by Ampex design. **Record and ready lamps** may be easily

pulled out and replaced from the front. **Knurled coin slot screws** are used to hold panel covers in place. **VU meters** are mounted flush, to minimize breakage hazards. Meter lamps are bayonet-type for easy replacement. **The stainless steel electronics front panel** is easily removed for cleaning.

OPTIONS AND ACCESSORIES



Capstan control options for the AG-440C include either a hysteresis synchronous motor, or a dc motor with servo control.

The hysteresis synchronous motor provides a highly accurate speed which is more than adequate for many professional recording applications. Facilities are provided for external drive of the motor from a power MDA to permit variable speed operation.

The capstan servo provides unique advantages for applications in which timing accuracy is of the highest critical importance, or in which it is necessary to synchronize the AG-440C with film or video equipment, or with another audio recorder. The servo features four standard speeds (3/4, 7 1/2, 15 and 30 in/s). It will accept an external reference signal for variable speed control.

A sync lock accessory is available for servo-equipped machines. It provides constant sync with video equipment. The sync lock may be used with any channel of electronics. The self-contained variable speed control makes it a simple matter to achieve lip sync.

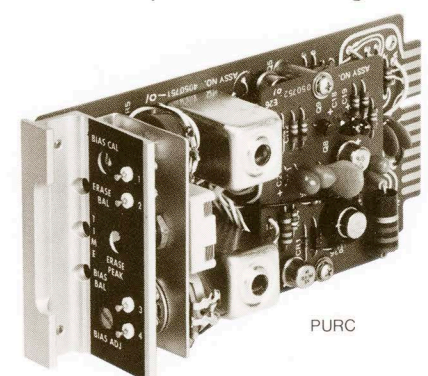
Transport remote control is available to permit operation of all functions from one or more locations.

Extender boards permit servicing or testing electronics boards while in operation.

A portable 15-watt amplifier/speaker system is available (AA-620).

A microphone/line mixer is available for rack mounting, or with meter panel and portable

case. The mixer is a 6-position, 2-channel professional model (AM-10) for two channel stereo and monophonic recording.



Pick-up recording capability (PURC) permits the overdubbing of an insert into previously recorded material without the tell-tale "hole" at the end of the dub, caused by the distance between the erase and recording heads.

By Special Request

Improved manual controls

- "Indicator" push-button electronic controls
- Calibrated record/reproduce controls

Improved tape guidance

- Sapphire guides
- Improved tape tracking

Improved Sel-Sync*

- Improved response at 15 in/s
- Improved signal-to-noise ratio, equal to reproduce
- Automatic monitor switching from Sel-Sync Synchronizer to Input

Improved edit mode

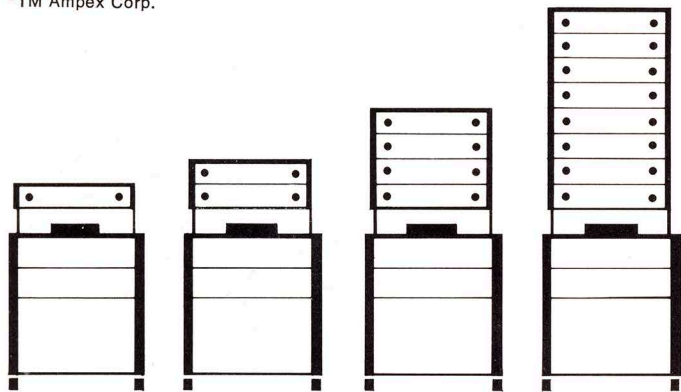
- Simplified control
- Take-up reel remains stationary when tape is spilled

Improved serviceability

- Plug-in etched boards for record control and transport logic circuitry

Plus a number of miscellaneous improvements, all incorporated into the finest audio recorder/reproducer ever produced.

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MODELS

The **AG-440C** is available in full-track, 1/2-track, 2-track and 4-track configurations for 1/4-inch tape, and a 4-track configuration for 1/2-inch tape. Options include portable or console models, or unmounted machines for rack installation.

The **AG-440C-8** is an 8-track servo-only version which shares the basic advantages of the smaller machines, but offers greater production versatility. The machine is especially noteworthy for the ease and accuracy with which it handles 10 1/2-inch reels of 1-inch tape.



SPECIFICATIONS

TAPE WIDTH AND CHANNELS:

1/4" (6.3mm) full track, half track, 2 channel (.075" or 1.9mm track width) and 4 channel (.040" or 1mm track width) 1/2" (12.6mm) 4 channels (.070" or 1.8mm track width)

TAPE SPEEDS:

3 3/4 and 7 1/2 in/s (9.5 and 19 cm/s)
7 1/2 and 15 in/s (19 and 38 cm/s)
15 and 30 in/s (38 and 76 cm/s)

REEL SIZE:

5-inch, 7-inch, 10 1/2-inch, EIA or NAB.

Can accept 29 cm or 11 1/2-inch IEC (CCIR) reel with adapters. (Turntable reel switches provide correct tension for large or small reel hubs.)

LINE INPUT:

100,000 ohms unbalanced; convertible to 20,000 ohms balanced, with supplied bridging transformer. Accepts line levels from -17 dBm, to produce recommended operating level. Record amplifier mid-frequency clip level 28 dB or more above operating level.

LINE OUTPUT:

Balanced or unbalanced.

Nominal impedance: 600 ohm or 150 ohms selected by switch. Internal impedance: 130 ohms or 33 ohm respectively. Clip level: +28 dBm or 10 VRMS respectively.

Output level: Meter sensitivity is selectable by switch for +4 dBm or +8 dBm.

EQUALIZATION:

NAB Standard for 3 3/4, 7 1/2 and 15 in/s, AES standard for 30 in/s. Equalization automatically switched by transport speed selector. IEC (CCIR) available for 3 3/4, 7 1/2 and 15 in/s.

OVERALL FREQUENCY RESPONSE:

Specification referred to a 700 Hz zero reference when recording with Ampex 406 tape or equivalent high output low noise tape. Zero reference is operating level for 15 in/s and 30 in/s, at least 14 dB below operating level for 3 3/4 in/s and 7 1/2 in/s.

3 3/4 in/s NAB +1 -2dB
30 Hz to 7500 Hz
7 1/2 in/s NAB ±1dB
50 Hz to 10,000 Hz
+1, -2dB
30 Hz to 15,000 Hz
15 in/s NAB ±1dB
100 Hz to 15,000 Hz
±2dB
30 Hz to 20,000 Hz
30 in/s AES ±2dB
50 Hz to 20,000 Hz

SIGNAL-TO-NOISE RATIO

Measured with respect to a record level of 520 nWb/m to biased tape noise when using Ampex 406 or equivalent high output low noise tape.

UNWEIGHTED

(Using a 30 Hz to 18 kHz RC filter to attenuate noise outside the audio spectrum)

TAPE SPEED	FULL TRACK	HALF TRACK or 2-TRACK	4 TRACK 1/2-INCH	4 TRACK 1/4-INCH
3 3/4 in/s NAB	67 dB	62 dB	—	59 dB
7 1/2 in/s NAB	69 dB	64 dB	64 dB	61 dB
15 in/s NAB	68 dB	63 dB	63 dB	60 dB
30 in/s AES	70 dB	65 dB	65 dB	—

WEIGHTED

(Using an NAB or ASA "A" weighting filter and a 1000 Hz reference)

TAPE SPEED	FULL TRACK	HALF TRACK or 2-TRACK	4 TRACK 1/2-INCH	4 TRACK 1/4-INCH
3 3/4 in/s NAB	71 dB	66 dB	—	63 dB
7 1/2 in/s NAB	73 dB	68 dB	68 dB	65 dB
15 in/s NAB	71 dB	66 dB	66 dB	63 dB
30 in/s AES	74 dB	69 dB	69 dB	—

SEL-SYNC* RESPONSE:

Specification referred to a 700 Hz zero reference in the Sel-Sync mode of operation where the record head is used for reproducing. The specification does not apply to full track recorders.

15 in/s NAB ±2.5dB
30 to 12,000 Hz
30 in/s AES ±2.5dB
50 to 12,000 Hz

BIAS AND ERASE FREQUENCY

150 kHz

ERASE EFFICIENCY

75 dB or greater at 1 kHz

EVEN-ORDER DISTORTION:

Second harmonic distortion of a 500 Hz signal recorded at 520 nWb/m (6 dB above high output tape operating level) is less than 0.4%.

SPEED ACCURACY:

Speed measured per NAB Standard on Magnetic Tape Recording and Reproduction 1965 Section 2.02.01 with the pulley located between the capstan and the reel idler.

Absolute Speed: (measured in the beginning portion of a reel using a tape whose thickness is .0019" ± .0005")

Servo Motor: Nominal ±0.08%
7 1/2-15 AC Motor: Nominal ±0.20%
3 3/4-7 1/2 AC Motor: Nominal ±0.20%

*TM Ampex Corp.

FLUTTER AND WOW:

Measured per ANSI S 4.3 or DIN 45507 using a pre-recorded flutter tape.

TAPE SPEED	SERVO MOTOR		7 1/2-15 AC Motor		3 3/4-7 1/2 AC Motor	
	Peak Weighted	Peak Unweighted	Peak Weighted	Peak Unweighted	Peak Weighted	Peak Unweighted
3 3/4 in/s	0.10%	0.18%	—	—	0.12%	0.22%
7 1/2 in/s	0.06%	0.12%	0.10%	0.14%	0.10%	0.16%
15 in/s	0.06%	0.10%	0.07%	0.12%	—	—
30 in/s	0.04%	0.08%	—	—	—	—

Speed Variation beginning to end of reel: (using 10 1/2" NAB or 7" EIA)

Servo Motor: Less than 0.08%

7 1/2-15 AC Motor: Less than 0.10%

3 3/4-7 1/2 AC Motor: Less than 0.14%

START TIME:

At 3 3/4, 7 1/2 and 15 in/s the average speed is typically* within ± 1/2 % of the nominal speed in 300 milliseconds throughout a reel of tape. This specification does not apply to 3 3/4-7 1/2 recorders if the supply tape pack is less than 1 inch from the reel hub. At 30 in/s ± 1/2 % of nominal speed is reached in 3 seconds.

With capstan servo motors the flutter components below 20 Hz will be less than ±.3% peak in one second. At 30 in/s, in 3 seconds. With AC capstan motors the flutter components below 20 Hz will be less than ±.3% peak in 3 1/3 seconds.

*Varies with tape. Specification applies to Ampex 631 tape.

STOP TIME:

At 15 in/s the tape moves less than 3 inches after pressing the stop button.

REWIND TIME:

Approximately 1 minute for a 2400 foot NAB reel.

POWER REQUIREMENT:

System	Amps (approximate)
1 Channel	2.3
2 Channel	2.5
3 Channel	2.7
4 Channel	2.9

Recorders with capstan servo motors operate at either 60 Hz or 50 Hz.

Recorders with AC capstan motors are available for 50 Hz operation.

Specifications subject to change without notice.

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