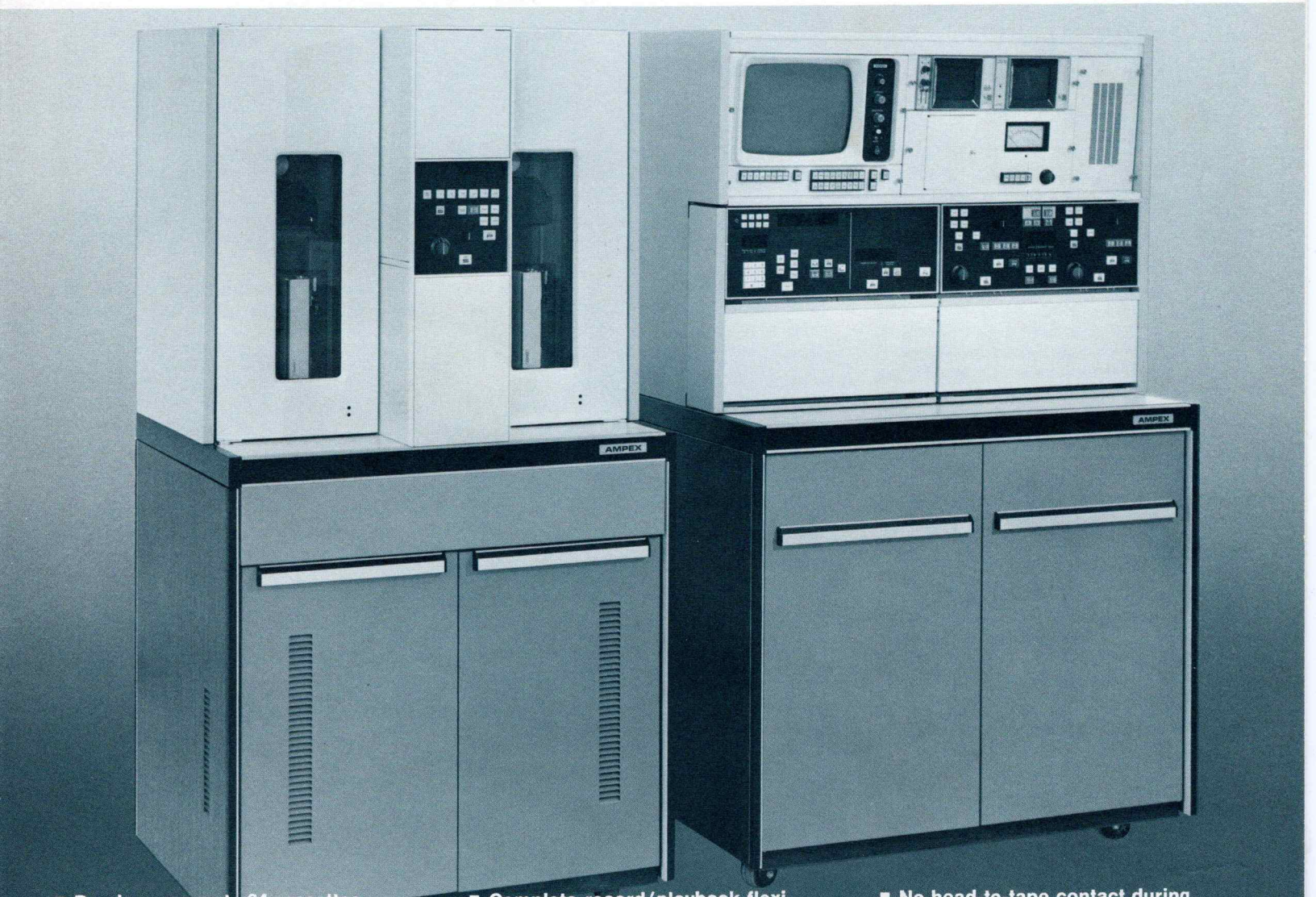
AMPEX

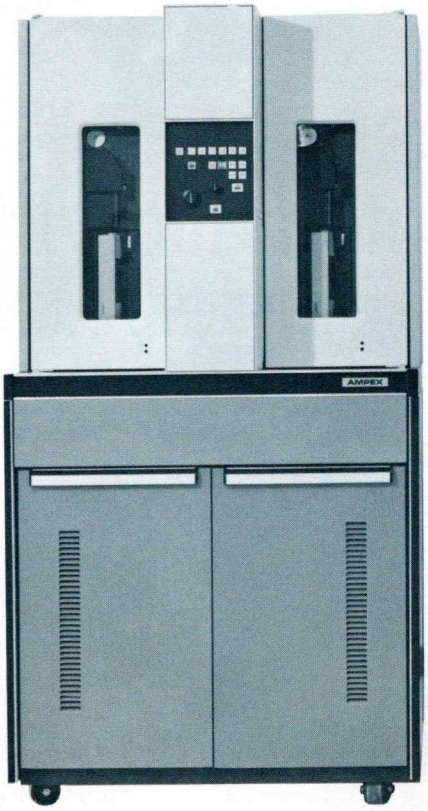
ACR-25 Automatic Video Cassette Recorder/Reproducer

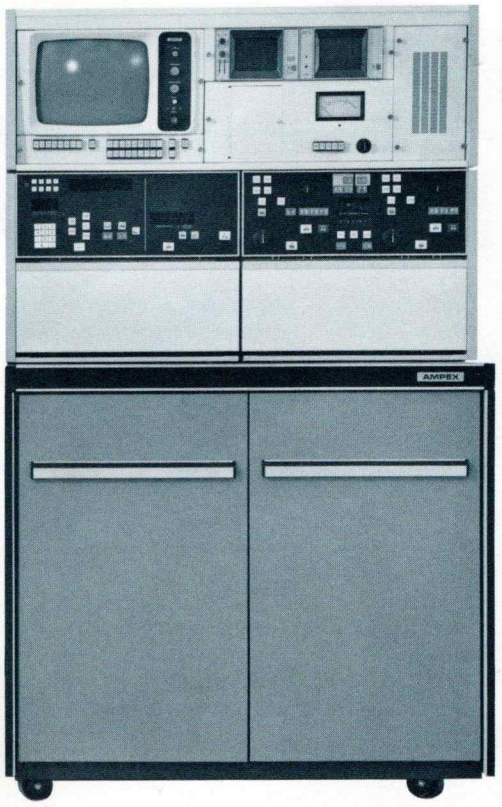
A totally new approach to short-event sequencing for television broadcasters. Combines 3rd generation VTR quality with cassette handling ease in the most flexible random-access system yet.



- Random access to 24 cassettes.
- 6-minute play time per cassette at 15 ips.
- Plays 10-second spots back-to-back. No positional restrictions. Special facility permits back-to-back sequencing of tapes of any length . . . up to 6 minutes. (See OFF-LINE REWIND description.)
- 200 milliseconds start time. (350 milliseconds in 625-line systems.)
- Complete record/playback flexibility. Provides internal record/playback, simultaneous record, automatic or manual playback.
- Available in a configuration permitting time-sharing of AVR-1 electronics.
- Operates at either 7½ ips or 15 ips.
- Cassettes can be loaded by operator with a standard (SMPTE/EBU) pre-recorded or blank tape.
- Vacuum tape handling system—provides rapid, gentle tape handling, with minimum mechanical parts.
- No head-to-tape contact during rewind.
- Complete automatic operation—can be computer controlled with proper interface.
- Compatible with all SMPTE/EBU high/low-band, color/monochrome standards with automatic band selection in playback. (Records high-band only.)
- Fully compatible with Ampex RA-4000 programmer.

ACR-25





Never before has the broadcaster had such versatility and reliability in handling commercial spots, program open and close sequences, news clips, sports features, weather, interviews, promos, public service announcements or other short video with audio segments.

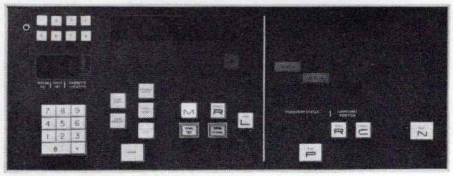
In the ACR-25, advanced technology makes this short-segment recorder/reproducer the outstanding system of its type.

This new ACR-25 offers benefits to every broadcast department: sales, traffic, programming, production and engineering. Improved accuracy in scheduling; the ability to meet client needs for "piggy-back" programming and last minute changes dictated by market conditions; a more professional look to spot or program sequences make the dual transport video cassette recorder/reproducer one of the most valuable investments the broadcaster can make.

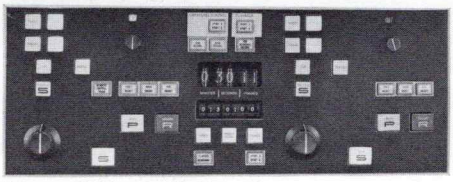
Because it can automatically sequence short events of any length up to six minutes the ACR-25 removes all restrictions to programming forced on the broadcaster by reel to reel equipment limitations. The unusual flexibility of the ACR-25 is provided by the OFFLINE REWIND feature built into the Ampex ACR-25 cassette. Because the 10-second cycle time in the ACR-25 is based on a 1-minute tape, an additional one-second must be allowed for each added minute of tape length, thus a 6 minute spot cannot be followed by a ten-second spot and another spot unless some time is picked up. The ACR-25 provides this time pick-up by allowing the broadcaster to rewind the 6-minute tape after the program sequence is completed. This OFF-LINE rewind feature is standard in the ACR-25. Its use is optional.

A simple programming scheme also makes it possible to lengthen or shorten sequences with minimum effort. This feature provides for scheduling flexibility. Last minute changes are also easy to make.

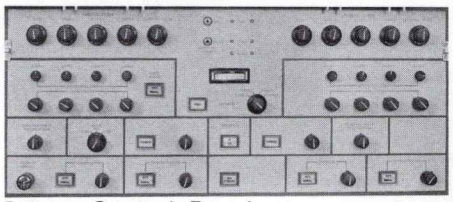
Cassettes are designed so that they may be loaded and unloaded by station personnel, permiting the insertion of new pre-recorded material or blank tape at any time. Investments in cassettes are held to a minimum, for only the loaded cassette spools need be stored—cassettes can remain in active use.



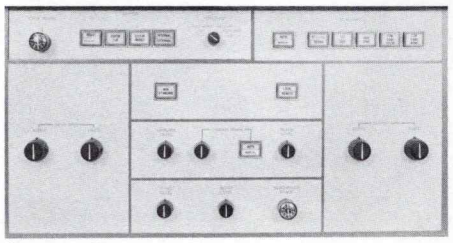
Automatic Control Panel



Manual Control Panel



Set-up Control Panel



Signal Control Panel,

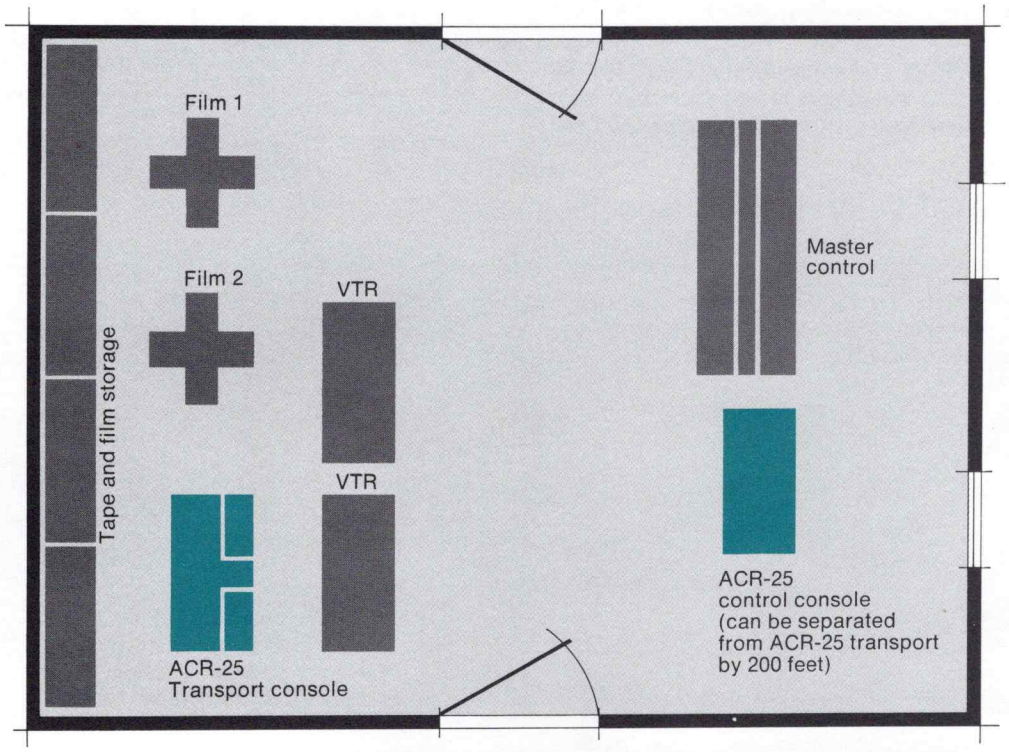
AVR-1 servo systems and electronics are used in the ACR-25, offering computer reliability, simplifying maintenance, and providing third-generation performance standards. Cassette spools, for example, are always under AVR-1 type servo control in PLAY and REWIND modes. Such features as automatic tracking and automatic standard selection are common to both the AVR-1 and ACR-25. The ACR-25 can, in fact, be ordered in a configuration that permits it to time-share video signal processing, time-base stabilization, and velocity compensation with an existing AVR-1.

Customers can thus install an AVR-1 knowing that this time-sharing capability will permit the addition of an ACR-25 in the time-sharing configuration.

For complete flexibility, the time-shared electronics can be added to the ACR-25 at a later date if the customer desires completely independent systems.

In any configuration, the ACR-25 automatically threads tape, cues and plays tapes, automatically rewinding and returning cassettes to the carrousel. An automatic color correction feature (Automatic Chroma Set-up) assures that all color tapes will play back properly color-phased regardless of the relationship between tape phase and system phase. Provision is also made for rewriting a new control track to replace a non-standard control track which may have been recorded on the original "out-of-house" tape.

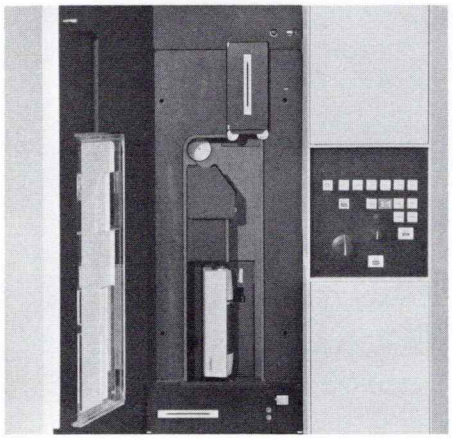
Accessibility to ACR-25 components

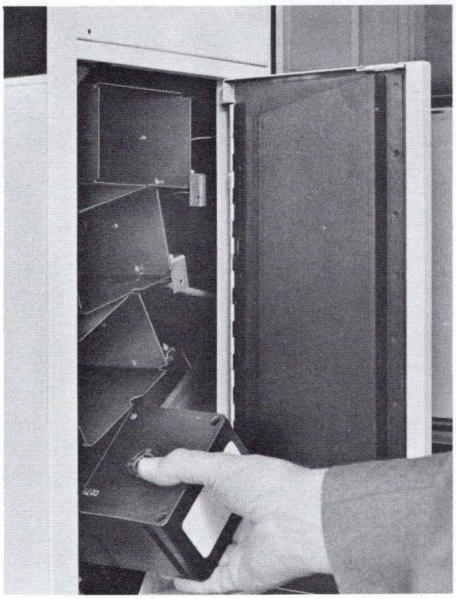


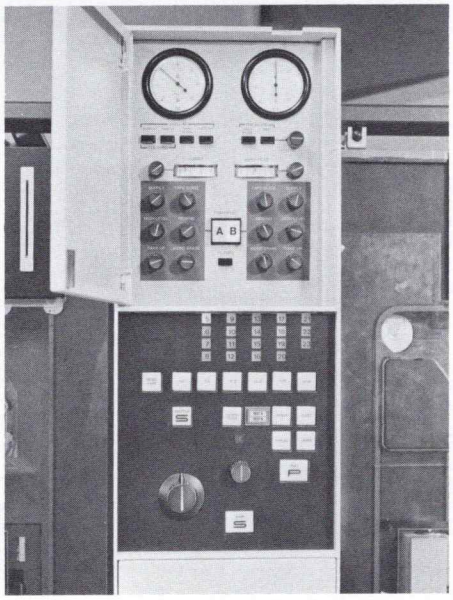
As shown in the illustration, the ACR-25 consists of two modules. Both modules may be located side by side, or separated by as much as 200 feet to provide the most convenient arrangement for the broadcaster.

In the Transport Console, front access is provided to both transports to facilitate cleaning and changing of heads. Mark XX Video Head Assemblies with push-button locking speeds head change.

The 24-bin carrousel is positioned between the two transports. Carrousel loading is simple and straightforward with dynamic balance maintained automatically by the loading sequence. Controls for manually loading cassettes







into the carrousel, record controls, gauges and controls for air and vacuum systems are located on the front panel of the carrousel housing.

All low-level electronics for the ACR-25 are located in the Control Console, along with the Set-up Control Panel, Automatic Control Panel, Manual Control Panel, Signal Control Panel, and system monitoring.

Control panels may be further remoted from this console with engineering controls remoted to one point and programming controls to a separate location. Control techniques are similar to those in the AVR-1 and provide for future computer control.

Maintenance on the ACR-25

Maintenance and service of the ACR-25 is similar to that in the AVR-1.

Extensive monitoring and built-in test systems help to reduce time spent in checking and maintenance procedures. Instrumentation provides clear indications of the need for attention.

Air systems in the ACR-25

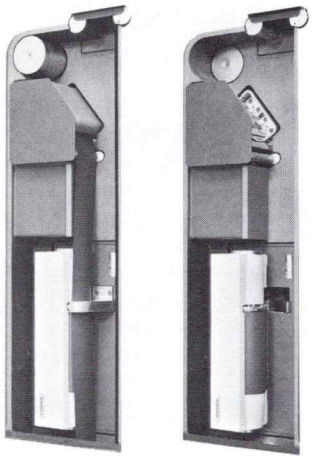
Gentle handling of tape is a prime requisite in any automatic tape recorder operating at fast cycling speeds. In the ACR-25 this gentle tape handling is provided by air and vacuum systems pioneered and proven by Ampex in computer and instrumentation tape transports and in the AVR-1.

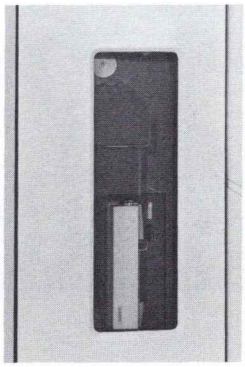
Tape tension, for example, is maintained to extremely close tolerances by using vacuum columns to isolate reels from the capstan. This technique also provides for fast smooth starts and stops and contributes to the 200-millisecond lock-up time in the 525-line version of the ACR-25.

These same vacuum columns also perform the tape threading operation and eliminate entirely any need for mechanical handling of tape.

All guiding is accomplished with airfoil bearings. Tape rides on air instead of hard metal. Even in rewind, extra care is provided for tape as the rewind is made with tape removed from the headwheel transducers and guide block. In the loading/unloading cycles, the vacuum guide, capstan, and audio head shield retract out of the way of tape.

Tape speed inaccuracies caused by slippage at the capstan are eliminated by doing away with pinch-rollers and using a vacuum capstan to provide the essential coupling of tape to capstan.





Vacuum is used to move cassettes from bins to their transport stations and to return them again to the carrousel.

As a final protective step, transports are operated in a sealed environment to seal out dust and dirt, good protection against induced tape drop-outs. Vacuum tension control further protects tape by assuring excellent tape packing on cassette spools. Pneumatic systems in the ACR-25 have been thoroughly proved in computer and instrumentation recorders pioneered by Ampex.

All air support equipment is self-contained in the ACR-25. House air can be used for video head bearing air and air lubricated tape guides, if desired. An automatic sensing system in the ACR-25 will make a change to system-air in the case of house air failure.

Low Cost ACR-25 Cassettes...

provide long play... easy loading... Record Lockout protection.

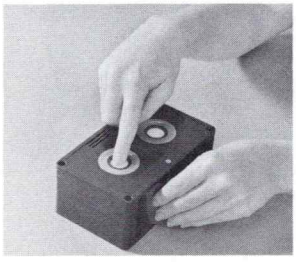
- **Six minutes of program plus leader and trailer (at 15 ips).**
- **Removable tape spools . . . common to both supply & take up.**
- **Moulded high-impact plastic construction with minimum moving parts.**
- **Can be loaded by station personnel.**
- **Tape can be shelf-stored on spools when not in demand.**
- **Low cost mailing and storage containers for spooled tape.**
- **Cassettes are equipped with both RECORD and OFF-LINE REWIND Lockout devices.**

The ACR-25 system provides a universality unique in the field of automatic short segment programming. Both the broadcaster and his customer benefit from the easy-loading cassette scheme. Less storage space is required because the spooled tape can be removed for storage. Cassettes can be reloaded with new material and kept in active use.

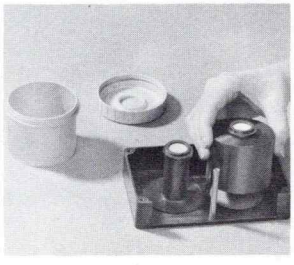
The six-minute (12 minutes at 7½ ips) maximum play time permits the recording and automatic playback of featurette material, as well as short spots.

To facilitate spooling tape, a spooling accessory is available. The Cassette Spooler permits tape on reels to be wound on cassette spools. A precision punch supplied on the spooler makes the essential start of tape and end-of-tape sensor perforations.

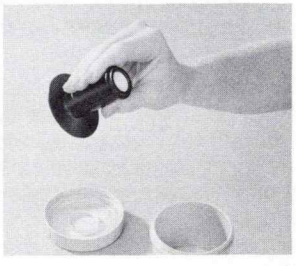
Low cost cassette simplifies tape replacement.



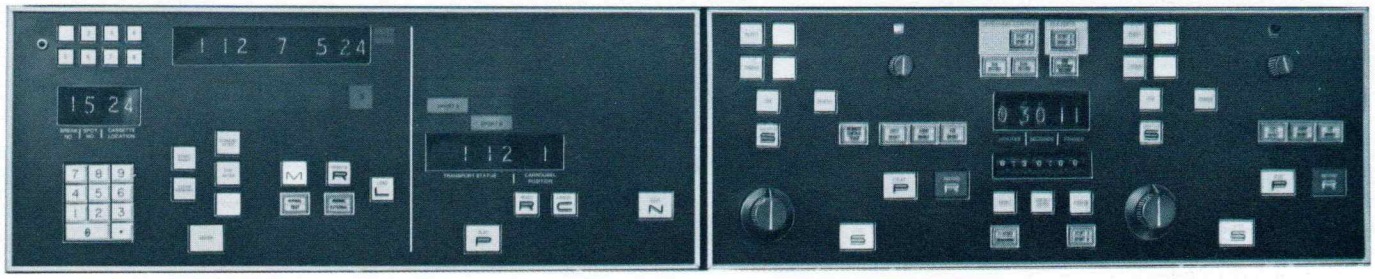
Quick and simple loading of spots, program material, or blank tape.

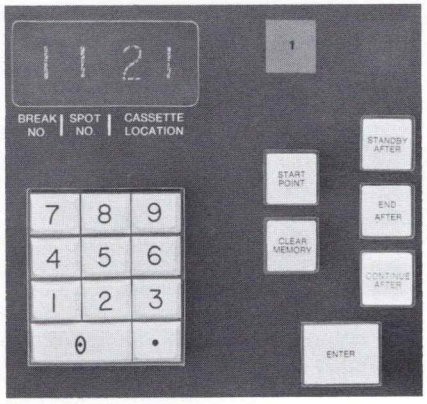


Low cost shipping container also provides protection for shelf storage.



Programming the ACR-25





Sequences of any length are programmed into the ACR-25 by means of the system Automatic Control Panel. As many as 40 events may be sequenced before the memory stores must be reprogrammed. Addition of a suitable interface will enable this information-loading to be brought under computer control.

Events in each sequence are readout in groups of five on the master sequence display on the Automatic Control Panel. All sequence stores may be displayed one after the other to preview the entire play sequence of 40 events.

Each sequence, regardless of length, is terminated by one of two commands. A "STANDBY AFTER" command automatically ends the sequence but causes the next two events to be threaded and cued. An "END AFTER" command ends the sequence and automatically returns all cassettes to the storage carrousel.

If neither command is given, the ACR-25 will automatically "continue" to the next sequence. Changes are easily handled right up to the last minute by changing a number in the stored sequence and making certain the corresponding carrousel storage bin contains any new material required.

Sequences may be lengthened or shortened with minimum effort. Because the ACR-25 can sequence tapes in any order the operator need only re-program changes to the sequence. No tape handling is required if the carrousel contains all cassettes needed.

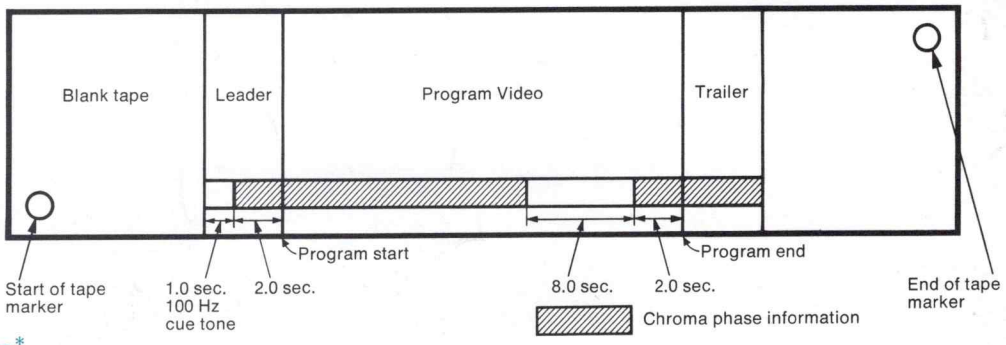
If the schedule calls for a spot to be deleted from a sequence, the operator simply dials a "0" in the sequence where the original event number appears. The ACR-25 will automatically skip the event position marked by the "0," then thread, cue and play the next significant number. The same technique can be used to reserve a place in a sequence for an anticipated new spot.

Cassette tape format

Automated operations under computer control are facilitated by the ACR-25. Shown here is the tape format with start and stop cues.

A Remote Start cue is located near the end of program to initiate an external event — including operation of other equipment.

ACR-25 cue track format also provides space for digital information that identifies the program by index number, sponsor and subject matter. Space is provided for additional data to make automatic adjustments in system electronics to assure proper color set-up levels, providing a means of matching each tape output to standard levels.



ACR-25 preliminary specifications*

Video Response:

MONOCHROME	DOMESTIC		INTERNATIONAL	
	525/60 Low-Band	525/60 High-Band	625/50 Low-Band	625/50 High-Band
Bandwidth:	Flat to 4.1 MHz; −3db at 4.5 MHz; Tolerance ±1 db	Flat to 4.5 MHz; −3db at 5.0 MHz; Tolerance ±0.5 db	Flat to 4.5 MHz; −3db at 5.0 MHz; Tolerance ±1 db	Flat to 5.5 MHz; −3db at 6.0 MHz; Tolerance ±0.5 db
Signal-to-Noise Ratio:	46 db peak-to-peak video to rms noise on interchange basis (monochrome)	46 db peak-to-peak video to rms noise on interchange basis (monochrome and color)	42 db peak-to-peak video to rms noise on interchange basis (monochrome)	43 db min. peak-to-peak video to rms noise on interchange basis (monochrome and color)
Transient Response:	Maximum K-factor 1% (Utilizing 2T sine² Pulse)	Maximum K-factor 1% (Utilizing 2T sine² Pulse)	Maximum K-factor 1% (Utilizing 2T sine² Pulse)	Maximum K-factor 1% (Utilizing 2T sine² Pulse)
Low Frequency Linearity:	2% Blanking to White (max.)	2% Blanking to White (max.)	2% Blanking to White (max.)	2% Blanking to White (max.)

COLOR	DOMESTIC		INTERNATIONAL	
	525/60 Low-Band	525/60 High-Band	625/50 Low-Band	625/50 High-Band
Signal-to-Noise Ratio:	42 db peak-to-peak video to rms noise on interchange basis	46 db peak-to-peak video to rms noise on interchange basis	—	43 db peak-to-peak video to rms noise on interchange basis
Differential Gain:	3% max. Blanking to white	3% max. Blanking to white	—	4% max. Blanking to white
Differential Phase:	3° max. at 3.58 MHz off tape	3° max. at 3.58 MHz off tape	—	4° max. at 4.43 MHz off tape
Transient Response Max. K-factor 2T sine² Pulse	1%	1%		1%
Moire:	−32 db min. (Color bars 75% amplitude, 3.58 MHz Subcarrier)	−40 db min. (Color bars 75% amplitude, 3.58 MHz Subcarrier)	—	−36 db min. (Color bars 75% amplitude, 4.43 MHz Subcarrier)

Physical Dimensions:
Control Console:
Height 78″
Width 48.5″
Depth 32.5″
Transport Console:
Height 78″
Width 40.5″
Depth 32.5″
Cassette:
Height 3.75″
Width 6.25″
Depth 2.5″

Temperature and Humidity:
Temperature 0°C to 45°C
Relative Humidity 10% to 90% (non-condensing)

Power Requirements:
Prime Power Frequency 50/60 Hz
Input Voltage 208/230V single phase 2-50 amp service

Video Signal Input (75 ohms impedance):

Composite Video	0.7 to 1.8V p-p
Sync	1.0V to 8.0V
Blanking	1.0V to 8.0V
H. Drive	1.0V to 8.0V
Vertical Drive	1.0V to 8.0V
Burst Key	1.0V to 8.0V
Subcarrier	1.5V to 2.5V

Video Signal Output (75 ohms impedance):
Composite Video Signal 1.0V p-p
Non-Composite Switches with the scanning standard between 0.7 and 0.714 volts

Audio Input Signal:
Impedance 15000 ohms balanced or unbalanced bridging input
Amplitude −24 dbm to +16 dbm
Source Line, microphone, oscillator

Audio Output Signal:
Output Impedance Less than 30 ohms
Peak Output Level +30 dbm
Nominal Output at 0 VU on level meter +8 dbm
Playback Equalization
ANSI 2000/35 microsec.
CCIR 0/35 microsec.

Operation:
Tape Speed
60 Hz 7½ ips or 15 ips
50 Hz 19.85 cm/s or 39.7 cm/s

Record Time:
Carrousel Capacity 24 cassettes
Record/playback time (per cassette) 6 min. (plus leader & trailer)
Cycle time (1 min. or shorter) 10 sec.
Cycle time (6 min.) 20 sec. (10 sec. with rewind lockout)
Number of stored sequences 8
Number of events with a sequence 5

Starting Time:
From Ready Mode 200 millisec.
From Stop Mode 1.0 sec.

Stopping Time:
0.2 sec. from record or playback mode

Audio Performance:
Frequency Response (400 Hz reference)
15 ips ±2 db 50 to 15,000 Hz
7.5 ips ±2 db 50 to 10,000 Hz
Signal to Noise Down 55 db from peak operating level
Flutter and Wow
15 ips 0.10% rms max.
7.5 ips 0.15% rms max.
Distortion (measured at 1 KHz)
Operating Level less than 1% rms

*Subject to change without notice.

Your investment in Ampex equipment yields maximum returns when operated and maintained by Ampex-trained people. Live and videotape training courses available worldwide. For brochure, write Ampex Technical Institute, 860 Charter St., Redwood City, California 94063, U.S.A.

AMPEX

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