

AMPEX



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ESS.2 ESS.2 ESS.2

DIGITAL VIDEO PRODUCTION SYSTEM

The next step in the union of computer and video by Ampex

Since the infancy of video recording, television professionals have searched for ever-increasing operational convenience, time savings and creative control over the video medium. The ESS-2 Digital Video Production System from Ampex contains more creative potential and mastery of time than ever offered before. The ESS-2 is a new kind of system which expands the automated creative possibilities for the world of teleproduction. As the first commercially available digital video recorder with an unmatched array of capabilities, the ESS-2 has no equal.

The use of computer type disk recording techniques, rather than analog on-tape methods, offers important new choices and advantages to television producers:

- It offers control over both recording and playback speeds, from still frame to real time to playback faster than real time.
- It makes available exciting, unique possibilities in the production of animation, graphics and other special effects—possibilities found in no other single product or system.
- It maintains picture quality as only a digital system can, with virtually no degradation of quality through generation after generation, and with no limit on the time a still image can be played back.
- It eliminates the need for cumbersome and inefficient files of 35mm slides and graphic art.

New creative possibilities. Control of video action in forward or reverse is another feature of the ESS-2. While many possibilities in production, special effects and the like are already apparent, many others have yet to be discovered. Undoubtedly new production techniques will arise. The ESS-2 encourages them.

The introduction of computer-type disk recorders to video production has greatly expanded the potential for still picture usage. Color or monochrome stills for every purpose may be filed for virtually instant access, without the problem of physical deterioration. This recording technique allows instantly available images to be assembled in an unlimited combination of sequences or complete programs... assembled in minutes at a keyboard. Now, this new version of the ESS brings digital disk reliability to real-time and non-real-time video as well. *

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Look inside the ESS-2.... look into the future

This latest creative production tool from Ampex is a combination of a video signal system with one, two or three Ampex computer disk drives, and a system control with a microcomputer and monitoring facility. The producer manipulates the system through local keyboard controls or at up to seven remote locations. Each control panel consists of a keyboard and an alphanumeric readout. A video monitor for each access station is

optional. Access time from any station is less than 70 milliseconds, worst case.

Expandable capacity

The ESS-2 provides varying amounts of memory for any combination of still or action video material. Total storage capacity is determined by the number of disk drives and on-line and off-line disk packs utilized. Within the given capacity, the operator may allocate the material entirely to suit his particular needs.

A single drive system allows on-line storage of up to 814 stills, or up to 27 seconds of real time recording, or a combination of the two. Addition of a second or third disk drive increases on-line storage accordingly. A three-drive installation holds up to 2442 on-line still images, or real time action video totalling 81 seconds, or any combination of the two. Total on and off-line still image capacity, using up to 98 disk packs, is 79,772 stills!

Controls designed for user convenience

The ESS-2 puts time on your side whether it's gathering, storing, editing, creating or combining video images and sequences. Operation of any of the access terminals is a

simple process that is easily learned. Action sequences and still image addresses are stored in the system memories.

There are 815 tracks on each disk pack. Under some conditions, 66 of these tracks are reserved for storage of sequence lists and internal functions.

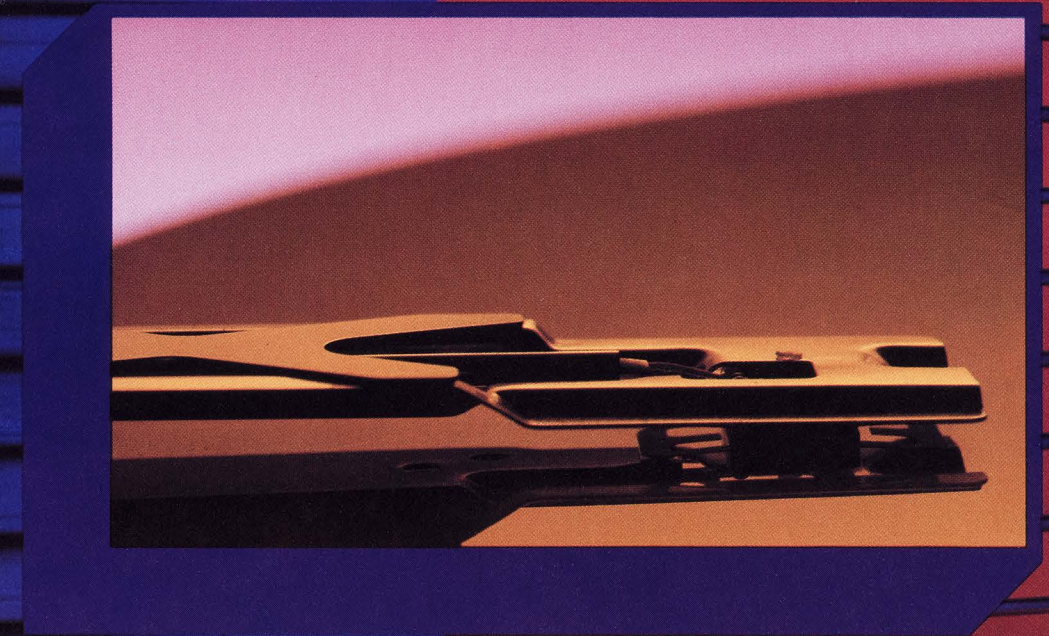
Action sequences or stills are called up from memory by keying the correct address or cue point. Within 1/10 of a second, the image or sequence is on the monitor. This allows rapid review and update of the stored files at any time.

Programming with stills

To assemble a complete program of stills, images are called up from memory and copied to a sequence list. Material may come from either on or off-line disk packs. The material listed may then be played on command, either manually, or by the station's computer at a later time. Once assembled in sequence, stills are switched during the vertical interval so that access time is virtually instantaneous.

An optional feature allows selection of full frame playback, or single field play when used for "frame-grabbing."

The program remains as a list that can be played once or as



many times as needed, edited or modified and then erased. The original material from which the sequence or program was assembled remains in memory for as long as desired. Picture quality remains constant because of the digital techniques employed.

While it is unlikely that all access terminals will be in use simultaneously, there is adequate provision for access control. Access priorities can be assigned in any manner desired, depending on the number and location of terminals and the operating requirements of the facility.

A key-activated lockout feature provides file protection by preventing inadvertent or unauthorized erasure of any stored material.

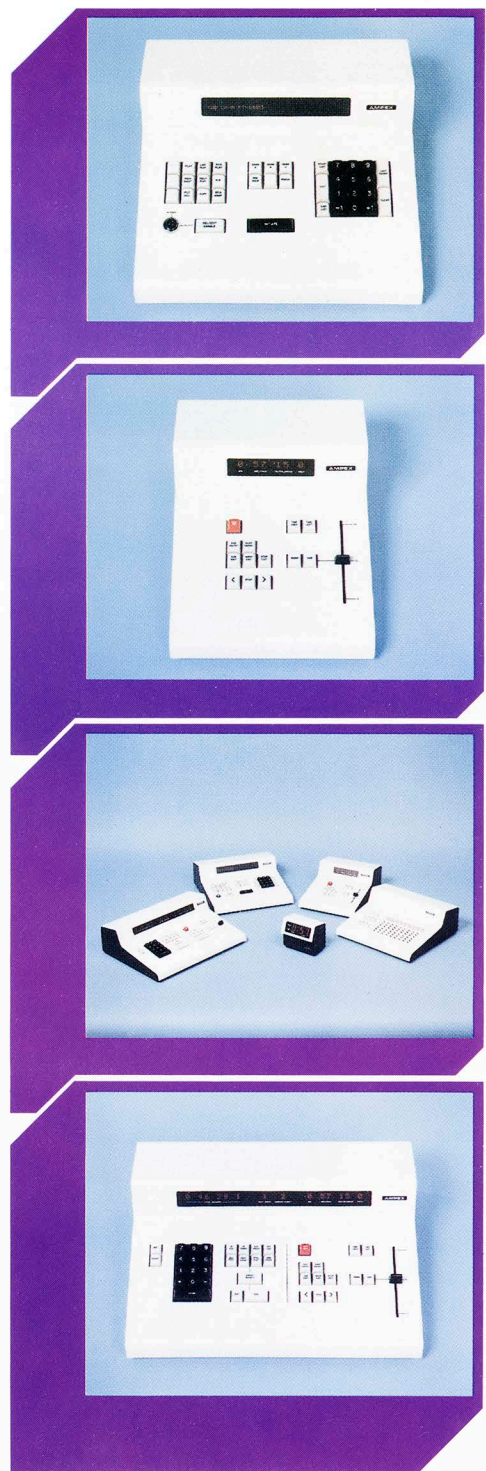
ESS-2: A new combination of proven video and computer components

The ESS-2 Digital Video Production System combines reliable digital storage techniques and proven video electronics with some new innovations in a unique system. The Ampex computer disk drives utilized are of standard



design, modified only for the special requirements of ESS-2 while retaining the precision head-to-disk interface. These drives, which utilize non-contact flying head techniques developed through years of experience in the computer industry, offer virtually unlimited head and disk life.

Similarly, the digital video signal system owes much to work done at Ampex in recent years on digital time base correctors, including a highly accurate, high-speed analog-to-digital converter, and an equally accurate, transient-free digital-to-analog converter.



Miller-Square* code and more

Of even greater importance is the incorporation of a new Ampex-patented innovation in digital recording techniques which Ampex calls Miller-Square code. This coding technique is finding rapid acceptance in several forms of digital recording, and makes possible some of the unique capabilities of the ESS-2.

Finally, but equally important, the latest microcomputer technology has been designed into the ESS-2 control system to insure the best possible functional flexibility reliability.

In total, the ESS-2 Digital Video Production System offers more than just an innovative blend of technology, it gives video production professionals unprecedented and unmatched creative potential.

SIZE

MAIN RACK 69" high X 43-1/2" wide
X 25-1/2" deep

DISK DRIVE 38" high X 19-1/4" wide
X 34" deep

WEIGHT

MAIN RACK One video channel-900 lbs.

Two video channels-1000 lbs.

Three video channels-1100 lbs.

DISK DRIVE-525 lbs.

POWER

The power requirements are: 3 phase with
neutral and ground (5 wire) wye 208V \pm 10%
each phase (120V phase to neutral) 60
Hz \pm 0.5 Hz.

	AMPS		
	PHASE A	PHASE B	PHASE C
Main rack (include full monitoring)—			
One playback channel	9.2	2.8	3.3
Two playback channels	9.2	2.8	6.9
Three playback channels	9.2	6.4	6.9
Disk drive (each)—			
Start mode (7 seconds)	23.5	27	27
Running mode (rotating phase on multiple drive installations to preserve phase-to-phase balance)	2.3	4.4	4.1

STILL STORAGE

EACH DISK PACK-815 tracks including
an assembled 64 item sequence

The System can identify 98 separate disk
packs for a total storage of 79,772 individually
addressable color frames.

ON-LINE STILLs-

One drive system-814 frames

Two drive system-1628 frames

Three drive system-2442 frames

Worst case access time to any on-line still-less
than 70 milliseconds.

Full frame or single field playback of any
recorded still. (option)

Play list (option)-Program play list sequences
to a maximum of 999 items can be composed,
edited and played directly without prior
transfer recording to an assembled sequence
list. The length at each list and the number of
separate lists is fully programmable to the
999 item maximum. Any block of up to 64
items can be transfer-recorded as an
assembled sequence (which can encompass
off-line material).

REAL TIME/SLOW MOTION STORAGE (OPTION)

EACH ON-LINE DISK DRIVE-27 seconds
real-time record/playback



ESS-2

system specifications

(NTSC Only)

Record/playback field rate variable from zero
to 60 fields/second in a forward or reverse
direction from a selected starting point.

Worst case access time to any cue point-less
than 70 milliseconds.

10 event storage for programmed sequences,
including combinations of real time/slow
motion and stills.

System can be formatted to allocate available
recording space between real time and stills.

VIDEO

INPUT VIDEO-Composite video 1 volt p-p
 \pm 3dB at 75 ohms impedance.

Reference Input-Selectable between input
video or a reference input of composite video
or color black, 1 volt p-p \pm 3dB at 75 ohms
impedance.

Output video-one, two, or three
independent output video channels
(2 outputs each channel). 1 volt p-p,
adjustable \pm 3dB, composite video at 75
ohms impedance.

Band width-flat to 4.2 MHz; -3dB at 5.0
MHz; tolerance \pm 0.5dB.

K Factor-1% using 2T sin² pulse and bar.

Chrominance/luminance delay-less than 20
nano-seconds using 12.5T pulse.

DIFFERENTIAL GAIN-Less than 3% for 10%
to 90% APL

DIFFERENTIAL PHASE-Less than 3° for 10%
to 90% APL

NOTE: D.P. and D.G. are measured with 40 IRE units of
subcarrier which has random phase during the
ramp.

NOISE (Random and Quantizing)-Greater
than 50dB p-p video to RMS noise at mid
grey level, unweighted to 4.2 MHz

SYNCHRONIZATION-VERTICAL-Correct line
and field

HORIZONTAL-Adjustable within \pm 10 μ s

SUBCARRIER-Adjustable over 360° range

Note: Each output channel has independent subcarrier
and horizontal position controls.

INTERNAL MONITORING (option) Picture
Monitor

Video Waveform Monitor

Vectorscope

Note: All monitor inputs follow monitor front panel switch
controls.

DISK DRIVE-5 seconds maximum is required
to slew the disk servo between two
reference sources.

-Lock-up time from stationary disk to
rotational synchronism is 30 sec maximum.

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