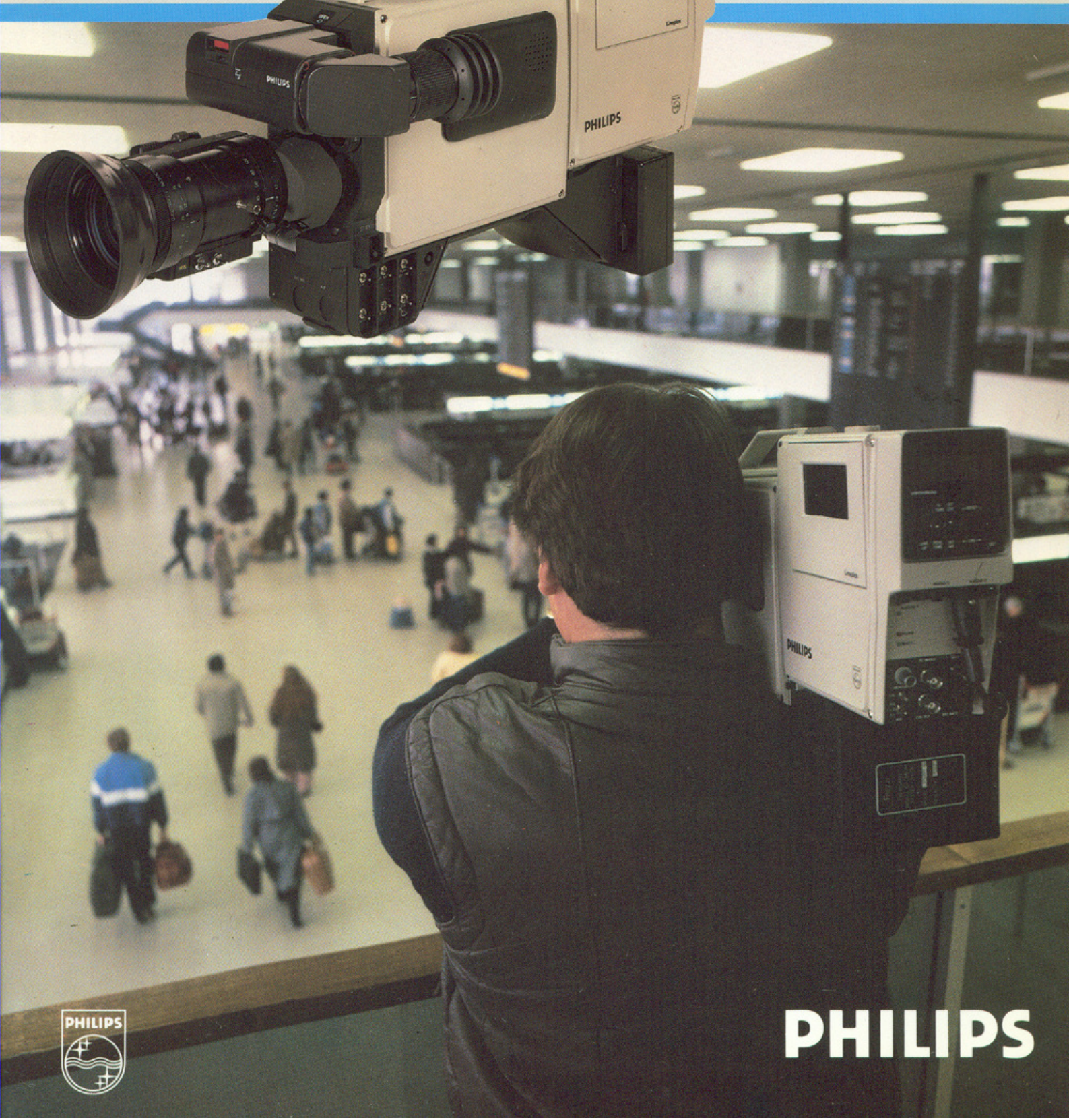
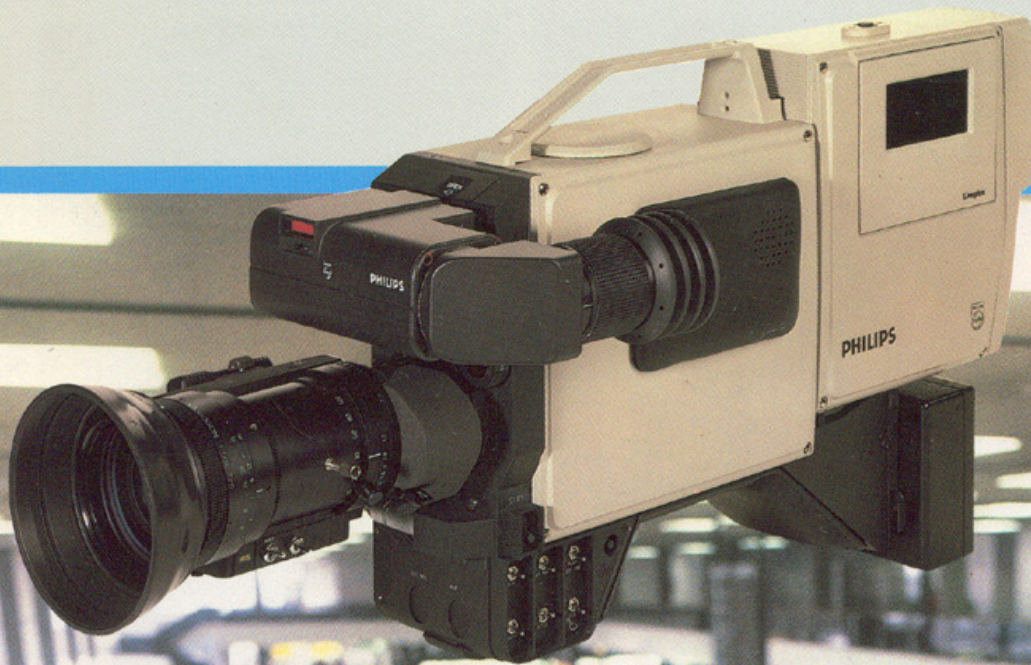


Philips LDK 54

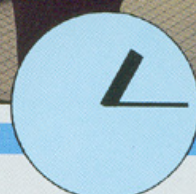
Camera Recorder System



PHILIPS

An unbeatable combination

LDK 54

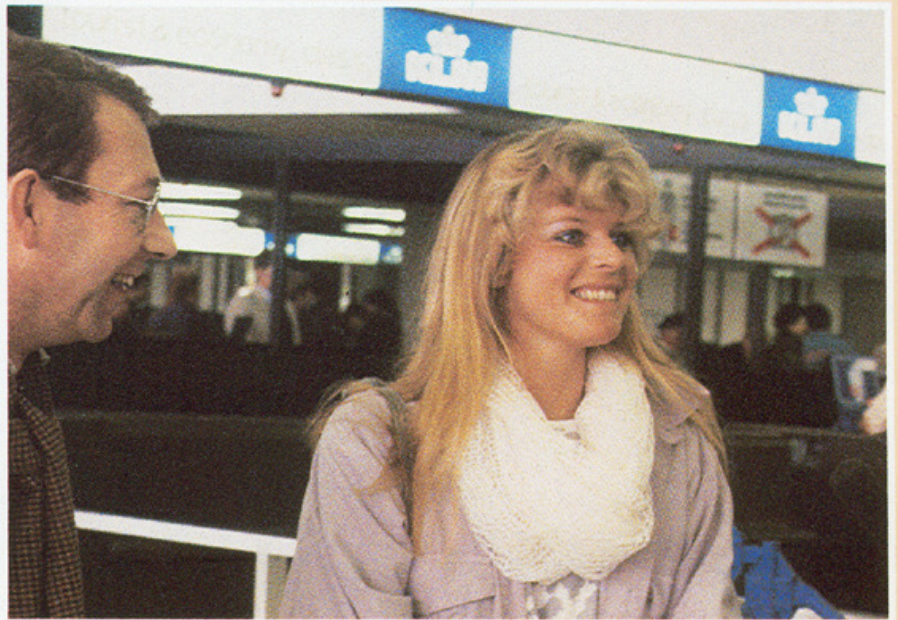


- Top broadcast picture quality
- New HS (high stability) 18 mm diode gun Plumbicon tubes
- Automatic set-up function
- Parallel component video and CVBS camera output signals
- Built-in gen lock facility
- Exceptional ease-of-use
- Revolutionary 1/4" Lineplex tape format
- Playback in camera viewfinder and via monitoring output
- On location in addition to studio editing
- Minimum cost of ownership
- Very versatile system

As the pressures mount upon cameramen and reporters from the world's great news programmes to provide even faster stories with even better pictures, so Philips has risen to meet the need with a new camera and recording system that brings hitherto

unobtainable benefits to news production. The LDK 54.

No other camera recorder system in the world combines such excellent broadcast picture quality with as many extra facilities for ease and speed of use making the LDK 54 the finest



NEWS



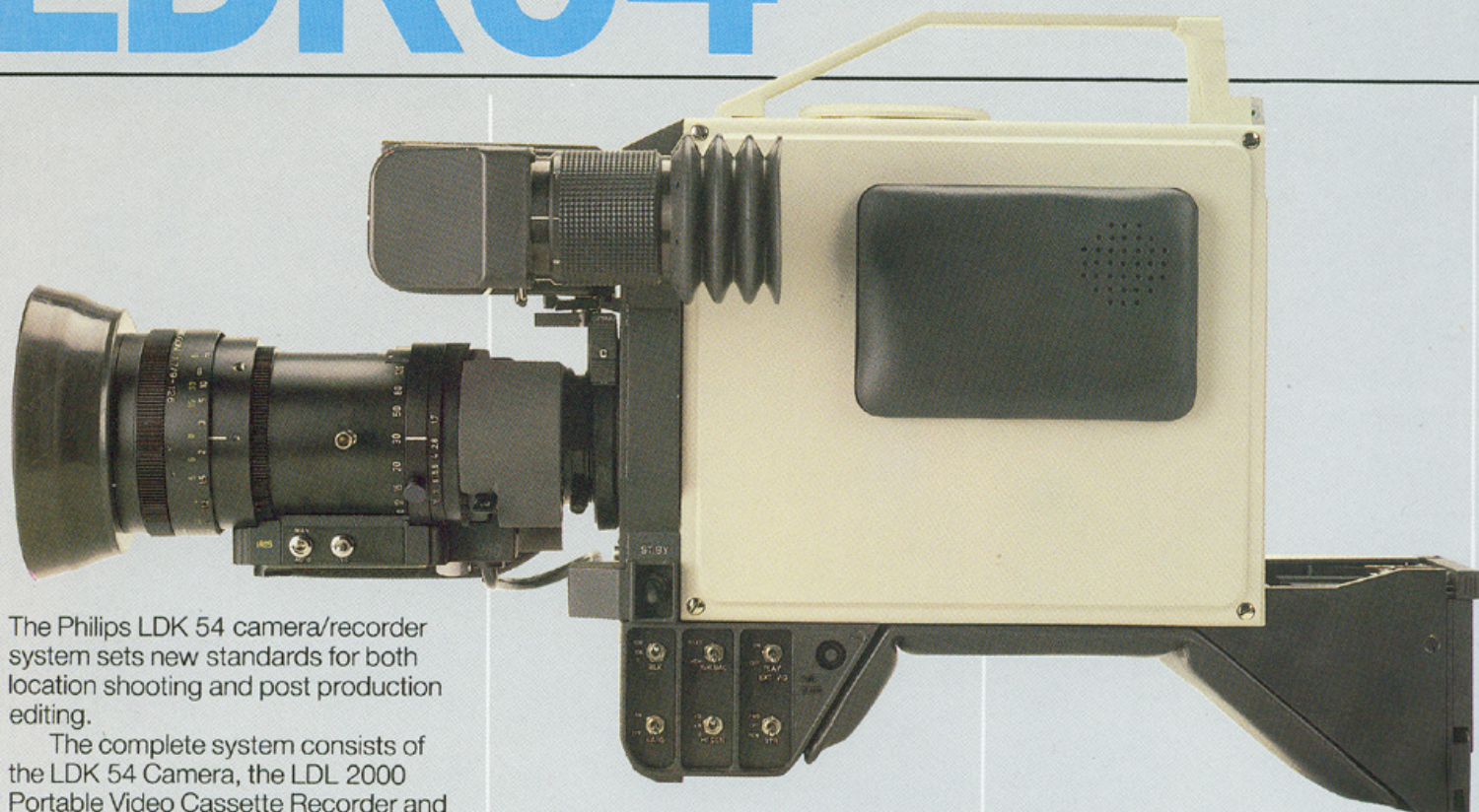
camera for location drama, documentary and sports coverage as well as news gathering.

Consider. The cameraman arrives at the scene. The camera is instantly ready for action – with automatic set-up. The shots are taken. The sound is recorded. Before moving off the cameraman can make a quick check by playing both his video and sound tracks through the viewfinder and built-in monitoring loudspeaker.

Fast editing of vision and sound can be quickly completed on the portable Mobile Production Centre either on site or in a hotel room. Then the programme can be relayed off to the studio for immediate transmission and perhaps another world first for the programme producer.

The LDK 54 System – advanced, adaptable

LDK54



The Philips LDK 54 camera/recorder system sets new standards for both location shooting and post production editing.

The complete system consists of the LDK 54 Camera, the LDL 2000 Portable Video Cassette Recorder and the LDL 2020 Mobile Production Centre. For the studio there is the LDL 2009 Video Cassette Player and the LDL 2010 Video Cassette Recorder/Player.

Camera Recorder

First of all the camera itself leads the way with broadcast quality pictures created by the latest 18 mm ($\frac{2}{3}$ ") HS Plumbicon tubes.

The Recorder uses the revolutionary $\frac{1}{4}$ " tape format cassette which is the world's smallest and most technically advanced. It drastically lessens the size and weight of the camera recorder combination. It includes high quality audio tracks for two programme sound channels. Excellent ergonomics and instant replay through the viewfinder and monitoring loudspeaker are a distinct advantage to the cameraman on location.

Two-piece operation

The LDL 2000 Recorder is detachable from the camera to allow two piece operation.

In this mode the camera and recorder are both provided with adaptors to allow a cable length of up

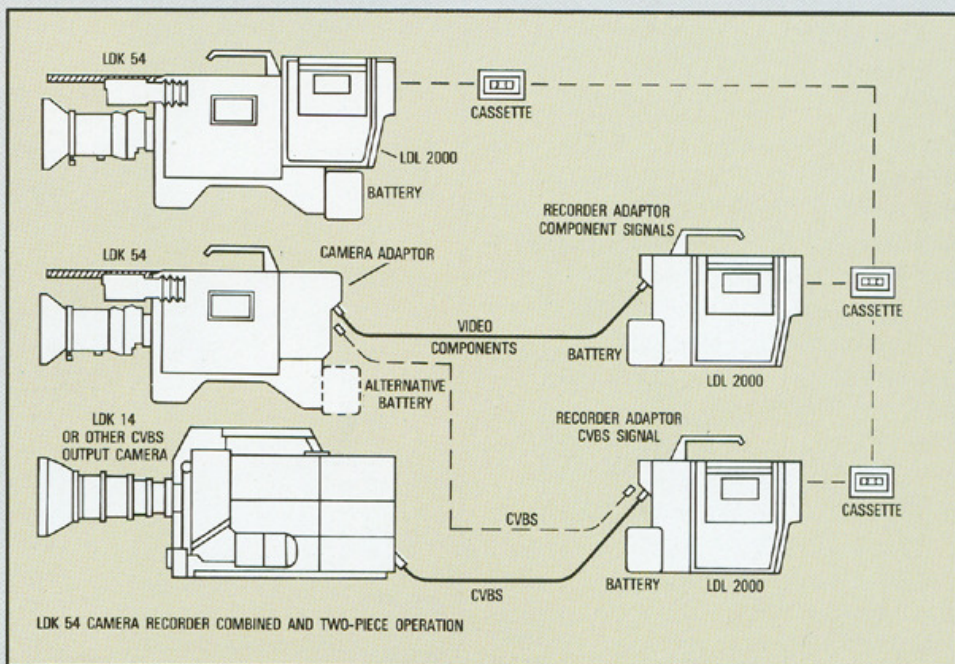
to 10 metres between the units giving even greater flexibility and the mobility to respond to special production requirements.

There is one camera adaptor supplying both component video and CVBS signal to the recorder adaptor.

There are two recorder adaptors – one accepting component video signals, the other CVBS (see diagram).

The second recorder adaptor allows the recorder to interface with any other CVBS (e.g. camera) source.

The LDK 54 Camera Recorder has a provision for an on-board battery which powers both camera and recorder. During two piece production the battery can be located at the camera head or recorder.



... and broadcast quality

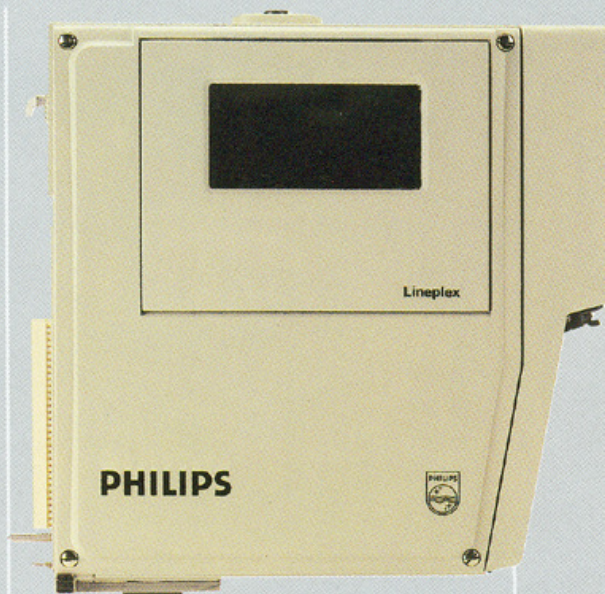
The recorder

The Philips LDL 2000 Video Cassette Recorder matches to perfection the quality of the camera. It is small and lightweight due to the 1/4" video cassette – the world's smallest format. The Recorder uses the Lineplex system with its fully symmetrical twin track layout and the most advanced wavelength expansion and compression techniques which outmatch in performance other existing video tapes. Each cassette gives 20 minutes record/play. Cassette change is fast and easy and any Lineplex video cassette may be used. There are two audio tracks and one time code track which is controlled from the internal time code generator supplying real time or elapsed time code with user bits. To assist in fast post production the recorder features automatic backspace editing during shooting (auto assembly facility). After each take, the recorder rewinds and parks one second before the end of that shot. Battery drain by the recorder between takes is completely prevented. For a new take it requires only one second from 'start' command to achieve a perfect back space edit.

Post production

Cassettes recorded by the camera recorder can alternatively be monitored and processed in any of the three post production units where full broadcast quality replay and editing facilities are available (see diagram).

Although the 1/4" Lineplex format is a new approach in camera recorder systems, care has been taken with both the LDL 2009 and LDL 2010 Video Cassette Player and Recorder/Player to ensure easy interface with existing types of studio recording, playback and editing equipment.



The Mobile Production Centre

For post production on location, the portable LDL 2020 Mobile Production Centre is easy to use and provides broadcast quality editing and playback.

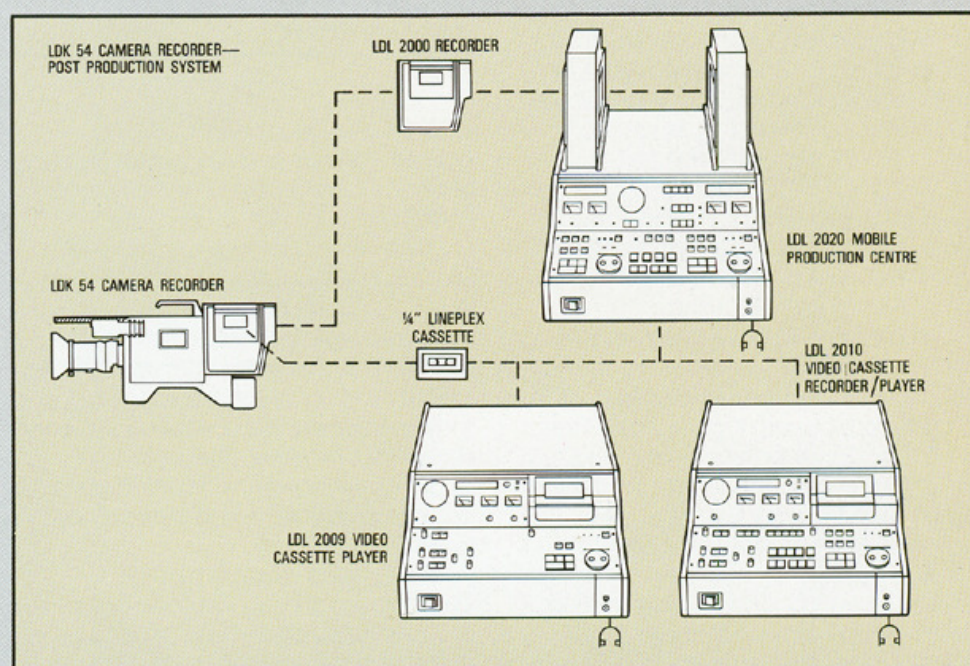
Once the recorder is separated from the camera, the complete recorder unit is placed in direct contact with one of the two contact positions located on top of the Mobile Production Centre.

With one recorder unit in position the Centre can be used for broadcast quality recording and playback.

With two recorder units the Centre provides full time code controlled editing.

During playback and editing the Centre has full control over all the functions of the recorder units.

The Mobile Production Centre's output can be displayed on conventional monitors or it is possible to use a domestic television receiver which may be more easily accessible in hotels or on location for full editing.

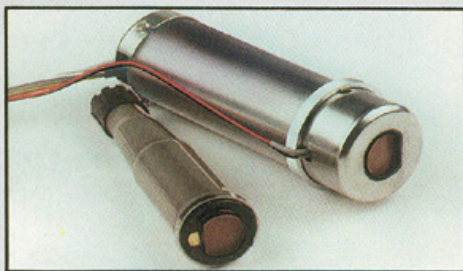


LDK 54 camera – the picture of success

LDK54

All Philips cameras are known for the outstanding broadcast quality pictures they produce. The LDK 54 is no exception. New HS (High Stability) diode gun Plumbicon tubes combine with advanced beam splitting prism optics to help reach for new heights in picture quality. A quartz optical retardation filter and an individual, controllable bias light ensure optimum performance and colour fidelity.

The LDK 54 features the most recently developed 18 mm pick up tube – the HS Plumbicon XQ 4187. This diode gun tube, with static focusing and magnetic deflection, ensures ultimate sensitivity, resolution and very precise registration and geometric performance. The high stability (HS) feature is the result of advanced mechanical construction techniques.



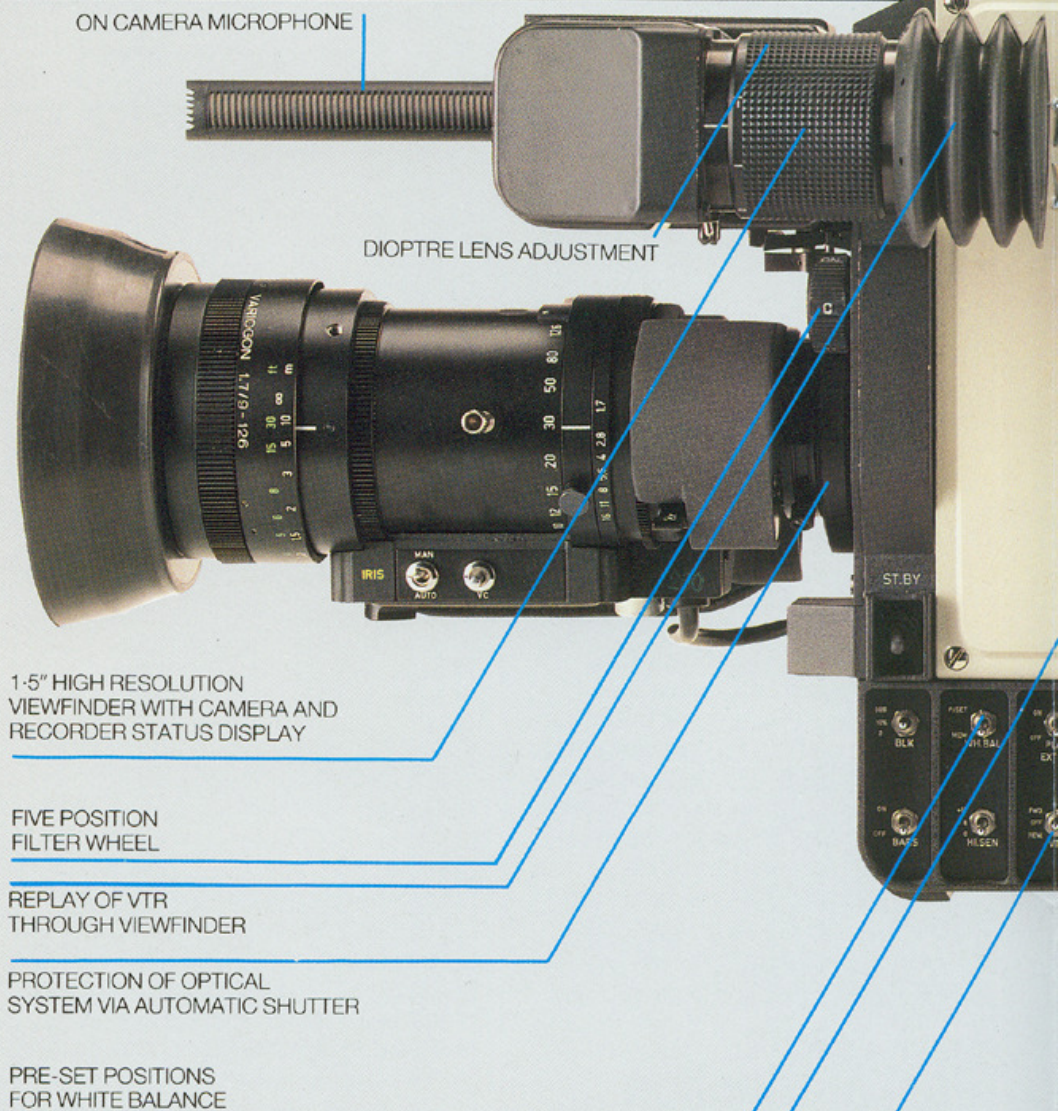
High Stability (HS) Plumbicon XQ 4187 (left) and mounted in a deflection unit (right).

Unusually high signal to noise ratio performance is obtained with the low output capacitance (LOC) construction of the tube, and with the associated FET built into the deflection unit.

There is a large reduction in microphony and RFI immunity. The diode gun construction combined with dynamic beam control (DBC) ensures excellent highlight handling.

Because the LDK 54 has unique automatic set-up it takes only a few seconds for the camera to start producing pictures of perfection. There is no need for registration centering or video black level settings – it is all done automatically. In addition there are automatics for white balance and iris.

The LDK 54 camera uses advanced LSI circuitry throughout with minimum heat – which improves stability and keeps power consumption low. The



LDK 54 also has the light weight, perfect balance and low profile for clear vision that are so important for operator freedom.

The viewfinder has a number of remarkable features. It is compact and has a 1½" high resolution, high brightness CRT. It has a dioptre lens adjustment which the cameraman can use to suit his personal eye sight. Indicators show the amount of tape remaining, recorder status, battery, audio record levels, white balance, auto set-up confirmation and over-exposure warning.

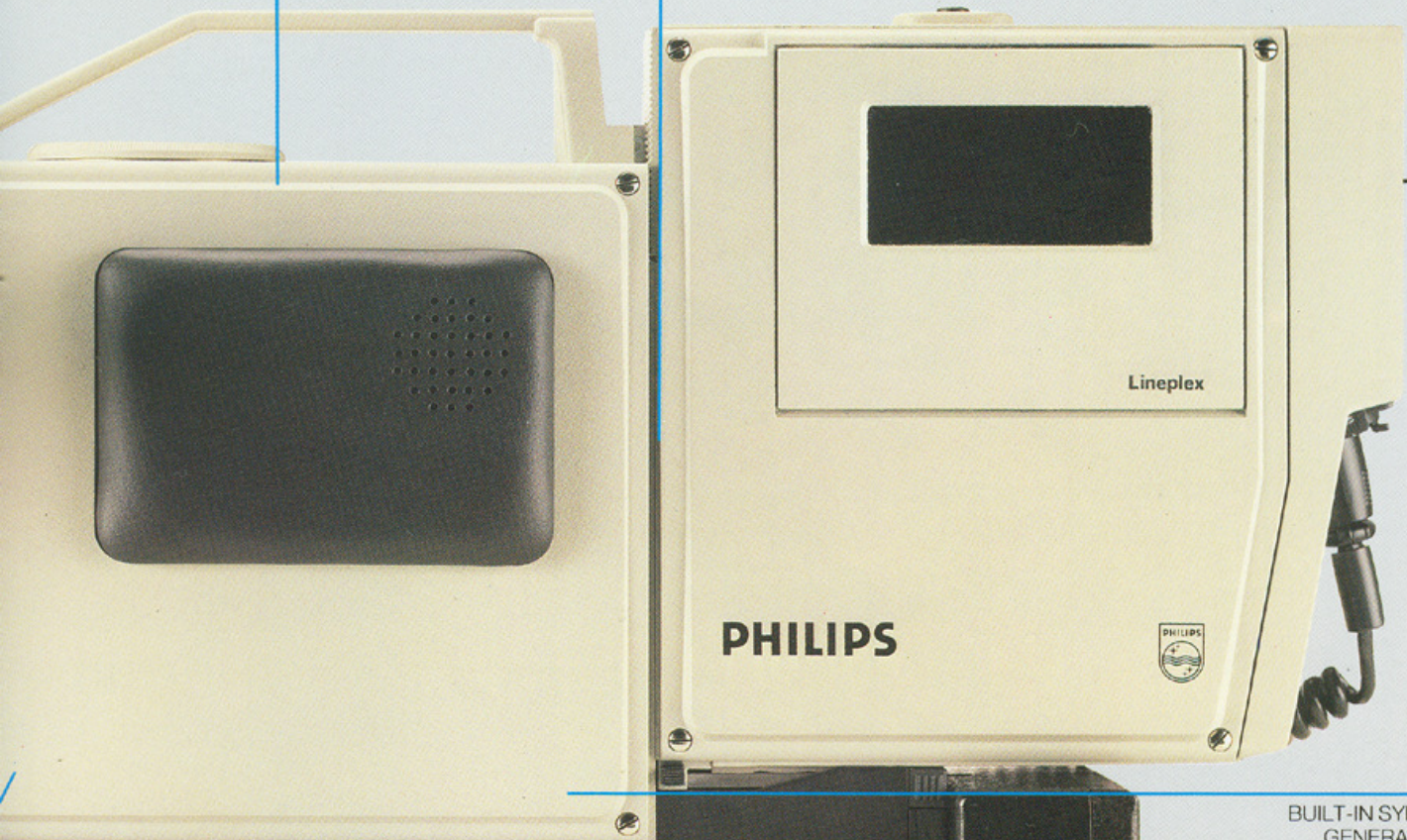
The overall result is that the cameraman can concentrate on getting the best pictures without having to worry about the camera.

HIGH SENSITIVITY AND STABILITY DUE TO PLUMBICON TUBES, QUARTZ FILTER, EFFICIENT BEAM SPLITTER COMBINED WITH +9 AND +18 DB GAIN SELECTION

ON THE SHOULDER CONTROL OF VTR (START, RECORD, REPLAY WIND AND REWIND)

WEATHERPROOF,
RFI PROTECTED

COMPONENT VIDEO
PROVIDED FOR VTR



PERFECT BALANCE

BUILT-IN SYNC PULSE
GENERATOR WITH
GEN LOCK FACILITY
FOR MULTI-CAMERA
OPERATION

LOW POWER
CONSUMPTION

AUTO CAMERA
SET UP
FUNCTIONS

LCD DISPLAY
FOR SMPTE TIMECODE

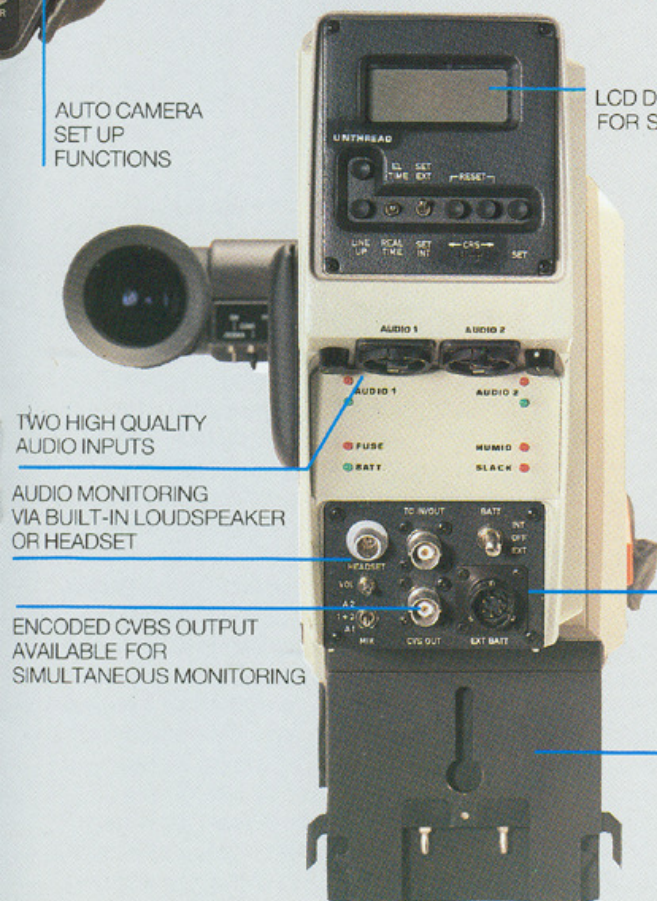
TWO HIGH QUALITY
AUDIO INPUTS

AUDIO MONITORING
VIA BUILT-IN LOUDSPEAKER
OR HEADSET

ENCODED CVBS OUTPUT
AVAILABLE FOR
SIMULTANEOUS MONITORING

ALTERNATIVE POWER SUPPLY
VIA STANDARD BATTERIES,
BATTERY BELT, OR A.C. SUPPLY

SNAPLOCK FOR
BATTERY PACKS



LDK 54 – the complete post-production system

LDK54



LDL 2009 Video Cassette Player

The Philips LDL 2009 Video Cassette Player is ideal in a studio environment for playback of Lineplex cassettes recorded on the Camera Recorder.

The LDL 2009 has a standard interface RS423 so that the player may easily be used with many other existing editing systems like 1", $\frac{3}{4}$ " formats. The unit is very economically priced and is ideal for many other studio applications.

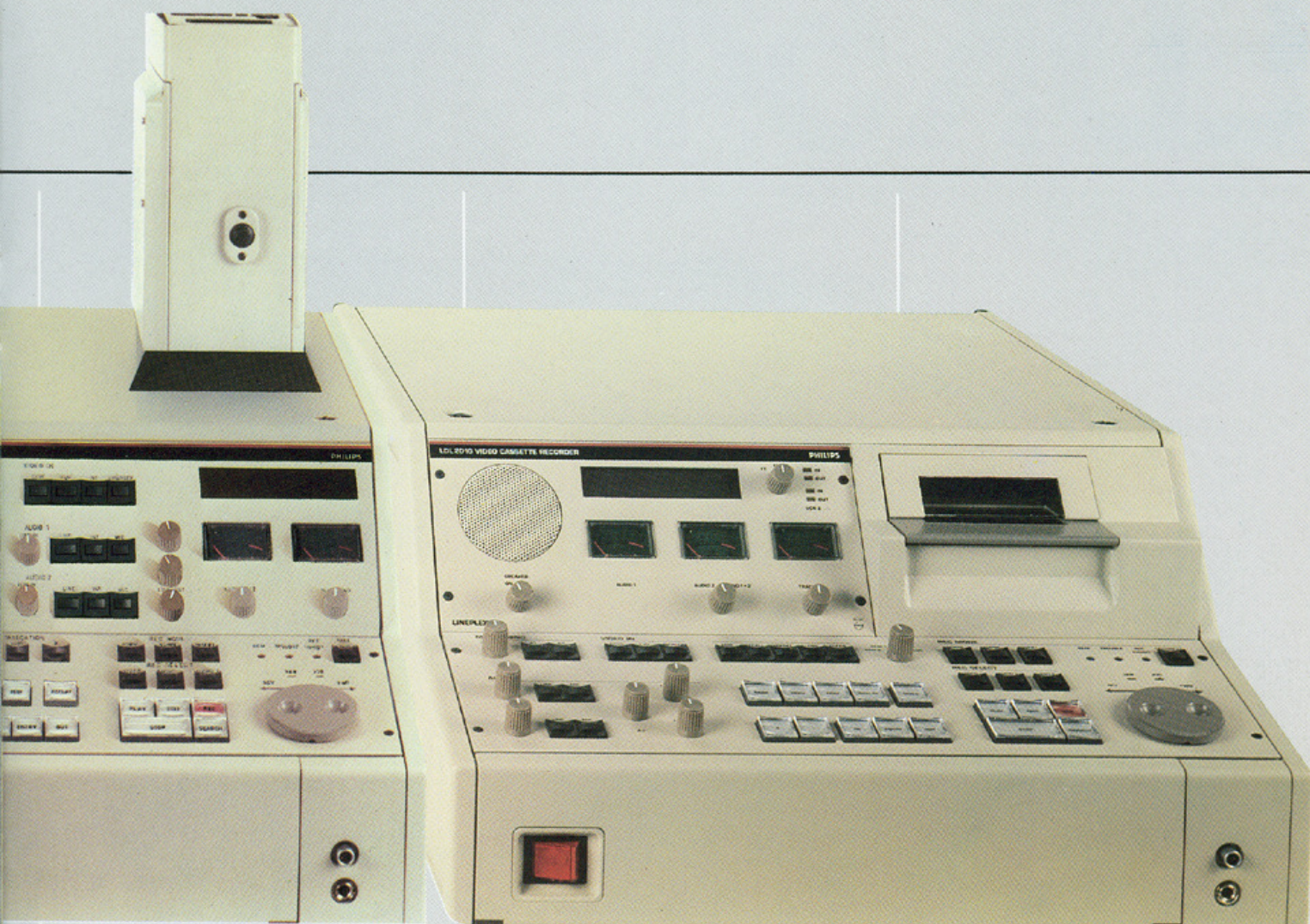
The LDL 2009 has a built-in video processing system enabling direct broadcast transmission. There is no need for an additional time base corrector device. There are outputs for Audio ($\times 2$), encoded CVBS ($\times 3$), component video Y.U.V. and R.G.B. In addition a connection for an RF

domestic television receiver is provided. There are audio post production facilities for recording voice over and cross dubbing using audio and microphone inputs and the internal audio monitoring system. For easy post production the player has facilities for slow motion, variable search (up to 10X) and still frame. In addition there is an integrated time code reader showing SMPTE time code and user bits. There is an internal sync pulse generator with gen lock facility. Outputs for FM modulated Lineplex signals for the LDL 2010 and LDL 2020 help ensure the best possible video editing within the Lineplex tape format system.

LDL 2020 Mobile Production Centre

This lightweight unit is a significant advance for news broadcasters. It allows on location playback and editing – if necessary with a domestic television receiver. The Centre has no recorder facility of its own, but interfaces directly with the recorder unit when it is detached from the camera.

With one recorder unit the LDL 2020 has the same high quality performance and capability as the studio LDL 2010 Video Cassette Recorder. With two recorder units, there is a full editing capability between the two units. The signal is transferred from one recorder to the other with minimal degradation using the FM modulated Lineplex signals, thus bypassing the modulation/demodulation process. The quality of the pictures is



LDL 2010 Video Cassette Recorder/Player

therefore maintained. And the end result is a picture that can be broadcast by the same unit without further processing.

The Centre has facilities for both voice over and cross dubbing. Other facilities for quick and accurate editing include slow motion, visible search and still frame and an integrated time code generator. A standard interface allows use with existing other format editing systems such as 1" and 3/4". Large LCD displays show the status of each recorder unit. Power consumption is low.

In short this Philips Mobile production Centre allows a news team to be fully self-supporting in the field. It helps make the LDK 54 camera a most cost effective and versatile camera recorder system.

The Philips LDL 2010 Video Cassette Recorder/Player is ideal for use in every studio environment for recording and playback. There is a built-in video processing system enabling direct broadcast transmission and eliminating the need for a separate time base corrector. There are full editing capabilities for video and audio using the LDL 2009 Video Cassette Player using the FM modulated Lineplex signals, or other external sources like an input from FM modulated 3/4" VTR formats. There is an internal sync pulse generator with gen lock facility. There are video inputs for encoded CVBS and components (Y, U, V) and outputs for CVBS, components Y.U.V. and RGB as well as an RF connection for a domestic television receiver. There are

slow motion, variable search (up to 10x) and still frame facilities for editing purposes. There are audio and microphone inputs for recording, voice over and cross dubbing.

The LDL 2010 has a standard interface RS423 so that the recorder may easily be used with many existing editing units. It has a built in SMPTE time code generator with user bits.

The Lineplex Format

LDK54



The Lineplex recording system is the first to offer high quality video and audio ENG and EFP recording on 1/4" tape.

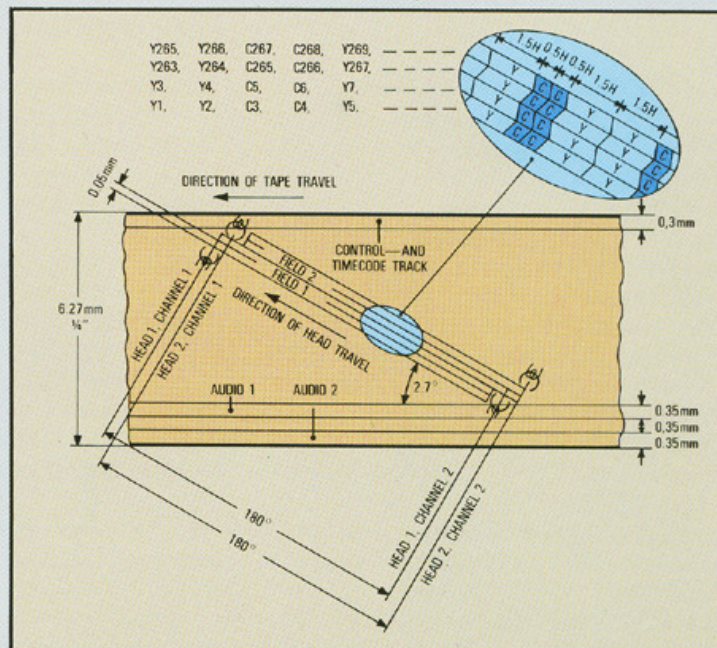
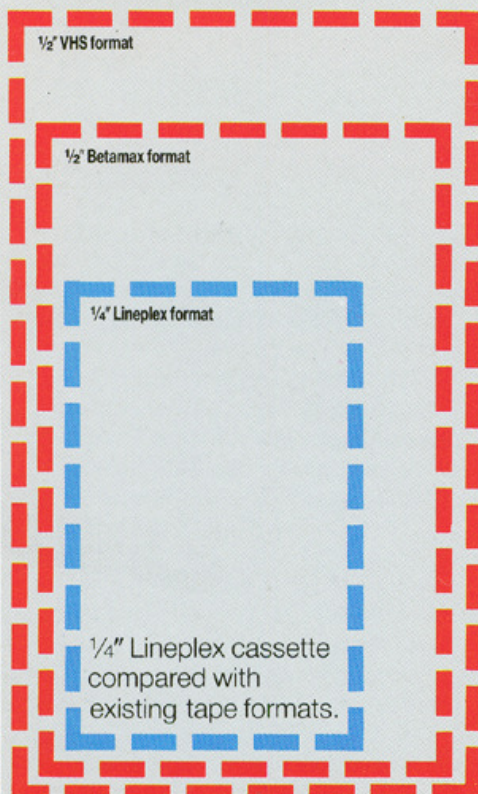
The extremely high information recording density allows 20 minutes recording on a 1/4" cassette.

Lineplex is a component recording technique which utilises time expansion (luminance) and compression (chrominance) followed by time division multiplex of the luminance and chrominance components. A twin channel system records one field for every 180° rotation of the scanner headwheel. CCD line storage arrays are clocked out in such a way as to increase the recorded wavelength of the luminance signal (1.5x). It is this longer effective wavelength at the same head to tape speed which produces such a good signal to noise ratio despite the narrow track width. As similar information is recorded on neighbouring tracks the use of azimuth

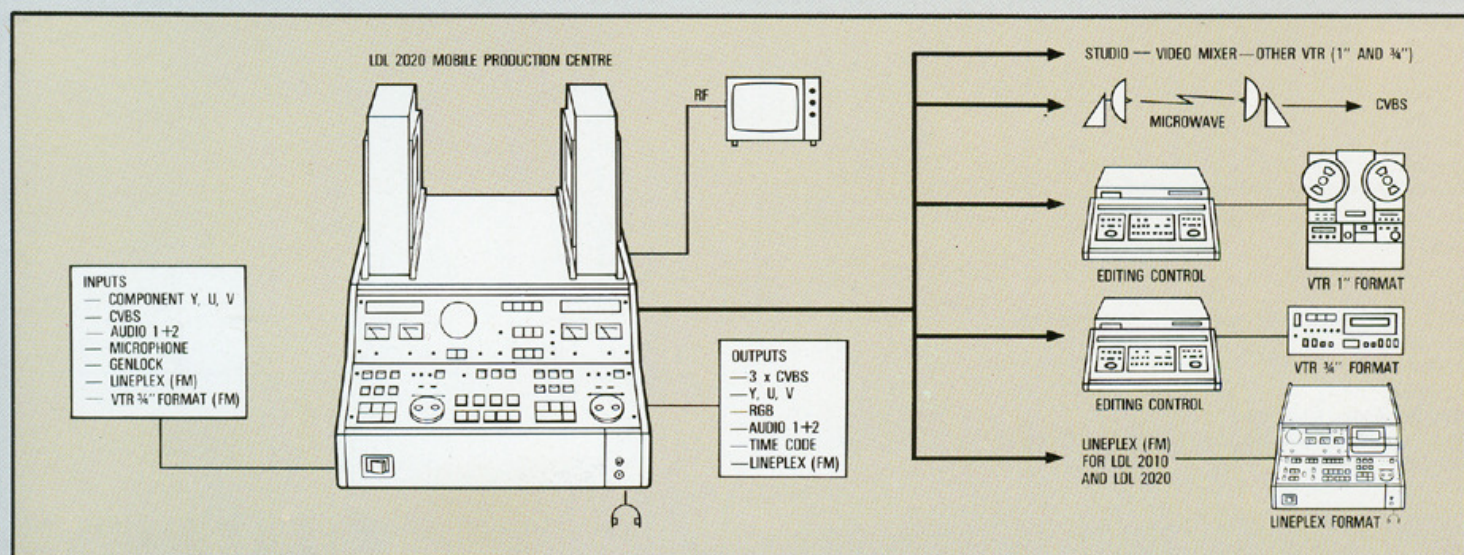
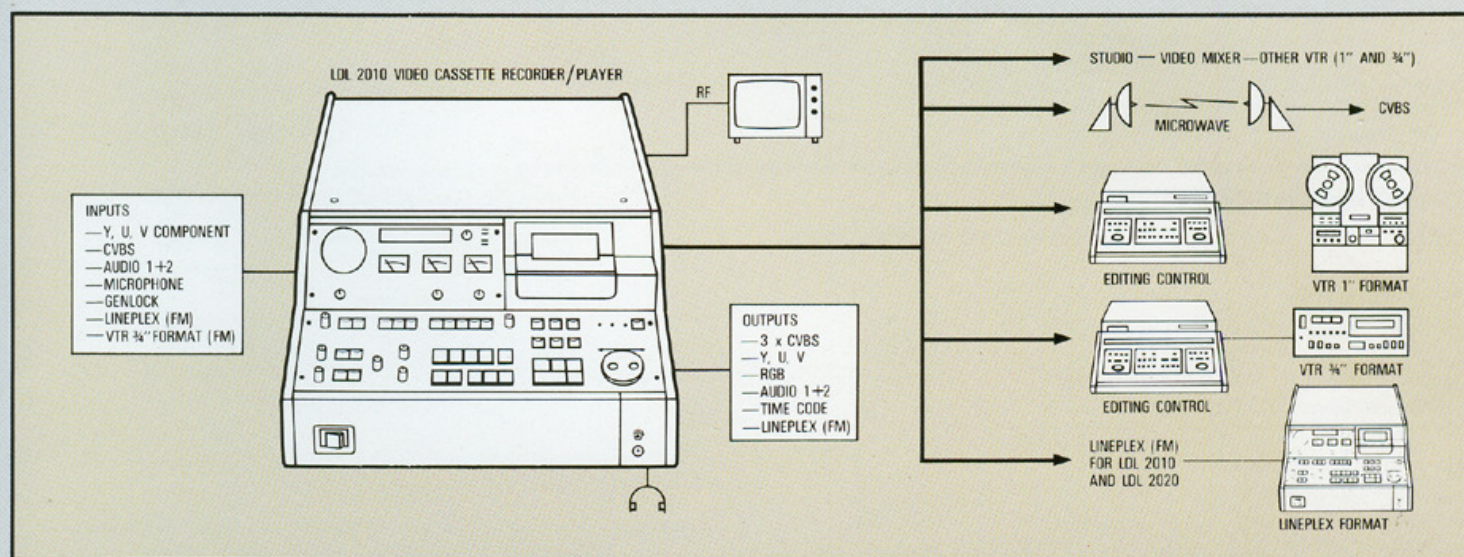
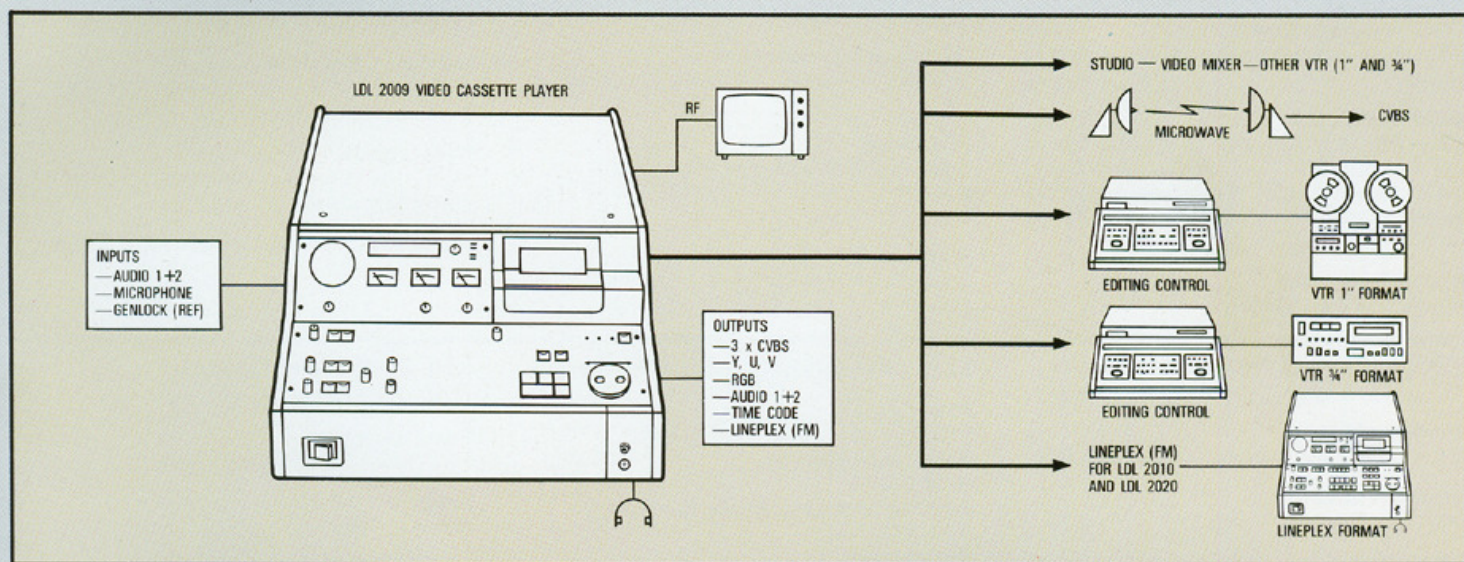
techniques without a guard band prevents crosstalk problems.

Another feature of the Lineplex system is the increased chrominance bandwidth (1.2 Mhz) which is the primary reason for the substantial performance improvement over 3/4" VTR formats.

Apart from the video signal components two high quality audio tracks and a combined SMPTE timecode and control track are located on the 1/4" tape.



LDK 54 – a very versatile system



Technical data

Preliminary Technical Specification LDK 54 Camera Recorder

Systems

PAL, PAL-M, NTSC, SECAM

Pick-up tubes

3 x 18 mm (3/4") HS Plumbicon XQ 4187

Output Signals

CVBS, 1V p-p into 75 ohm

Y/U/V, Video component signal to video cassette recorder

Scene Illumination

900 lux (85ft cd.) for a typical signal noise ratio of 55dB PAL or 57dB NTSC in the Y channel. Lens iris f3.0, reflection factor 90% with linear gamma, matrix in and contours off, encoder notch filter in and colour temp 3000°K and OdB gain.

Limiting Sensitivity

24 lux at f1.4, gain +18dB

Colour Registration

Horizontal and vertical deviations of Red and Blue with respect to Green:

In a circle of 80% of picture height:

30nSec (Zone 1)

In a circle of picture width:

60nSec (Zone 2)

Rest of picture:

100nSec (Zone 3)

Geometric Distortion

Excluding lens errors, less than 1% in the picture area

Resolution

Typical camera performance ignoring lens errors and without contour correction: 45% at 400 TV lines

Gain Control

Master Selector set for 0, +9, and +18dB or on request 0, +6, +12dB

Filter Wheel

Five position filter wheel containing

- clear
- 85B
- 85B+ND 0.9
- ND 0.6
- Special effects

Gamma Correction

Adjustable gamma set for 0.5

Contour Correction

In band and edge of band contour correction separately controlled.

Test Signals

Built in test generators: Sawtooth and colour bar, EBU and split-field

Permissible Ambient Temperature Range

-20°C to +45°C

LDK 54 Camera Recorder with LDL 2000 Video Cassette Recorder

Power supply

10.6-17 VDC internal battery or external source

Power consumption

35W

Dimensions

(without lens and viewfinder)

Height 255 mm (10") (At camera front)

Width 122 mm (4.8") (At cassette recorder)

Length 455 mm (18")

Weight, ready for operation 9.3 kg (20.5 lb)

excluding battery

LDL 2009 Video Cassette Player

Power supply

110/220V AC +10%-20%, 50-60Hz

Power consumption

approx 100W

Ambient operating temperature range

0°-+40°C

Dimensions

Height 220 mm (8.66")

Width 448 mm (17.64")

Depth 540 mm (21.26")

Weight approx 18 kg (39.6 lbs)

LDL 2010 Video Cassette Recorder/Player

Power supply

110/220V AC +10%-20%, 50-60 Hz

Power consumption

approx 110W

Dimensions

Height 220 mm (8.66")

Width 448 mm (17.64")

Depth 540 mm (21.26")

Weight approx 20 kg (44.09lbs)

LDL 2020 Mobile Production Centre

Power supply

110/220V AC +10%-20% 50-60Hz

Power consumption

approx 120W

Dimensions

Height 200 mm (7.87")

Width 448 mm (17.64")

Depth 540 mm (21.26")

Weight approx 18 kg (39.6 lbs)

Lineplex Recording Specifications

General

	PAL/SECAM	NTSC/PAL-M
Tape speed	625	525
Head to tape speed	11.8 cm/s	12.65 cm/s
track angle	4.6 m/s	5.5 m/s
track length	2.7°	2.7°
wrap angle	92 mm	92 mm
Ambient operating temp range	180°	180°
0°C to +40°C		

Video

Frequency response		
Luminance	3.6 MHz	3.6 MHz
Frequency response		
Chrominance	1.2 MHz	1.2 MHz
Signal to Noise Ratio		
(R+S method, unweighted)		
Luminance	46 dB	47 dB
Chrominance	46 dB	47 dB
Diff Gain	≤3%	≤3%
Diff Phase	≤3°	≤3°
Chrom/Lum delay	≤50 ns	≤50 ns
(All values measured at encoded output)		

Audio 1+2

Frequency response	50 Hz - 15 KHz ± 2 dB
Signal to Noise Ratio	
(RMS, unweighted, 200nWB/m)	>60 dB
Distortions	≤3%
Wow and flutter (peak)	0.2%
Crosstalk (1 KHz)	>70dB

Lineplex Video Cassette

Dimensions - Length 106 mm (4.2") Width 12 mm (0.5") Height 68 mm (2.7")
Weight 50g (0.1lb)

In the interest of future development, these preliminary technical specifications are subject to change without notice.



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