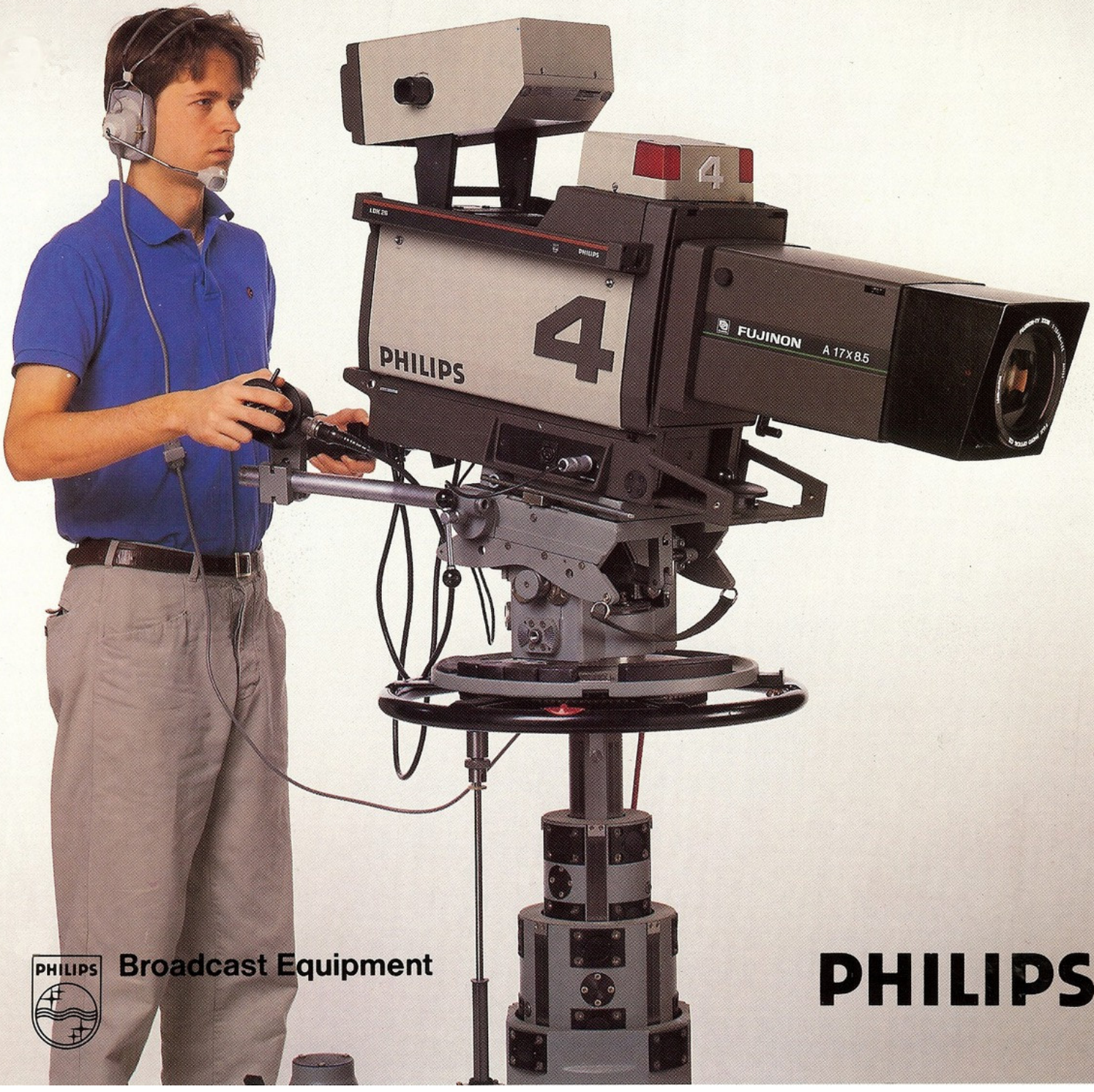
Philips LDK 26A

The intelligent camera system
with 18 mm tubes
and total computer control



PHILIPS Broadcast Equipment

PHILIPS

LDK26A

LDK 26A television camera system – one of the world's greats

The Philips LDK 26A is one of the new generation of Philips fully automatic television cameras.

A ⅔" tube mid-studio computer camera, the LDK 26A has the intelligent features of the Philips LDK 6A which has been acclaimed by the broadcast industry throughout the world.

Never before has advanced microprocessor technology been applied to a range of television cameras to give such power for perfection, such wide ranging capability, so simply and so quickly.

Never before have cameras so completely satisfied all the conflicting demands of producer and engineer, cameraman and operator.

The LDK 26A sets new standards for the mid-studio camera class and takes its place alongside the LDK 6A as one of the world's truly great television cameras.

ROLLED SETTINGS FOR EASE OF USE AND A CONSISTENT PERFECT PICTURE

The benefits

- **Excellent picture quality**
  Through 18 mm Plumbicon tubes and optimised digital scan, shading and dynamic focus correction.
- **Operational flexibility**
  Maximum flexibility for a wide range of broadcast applications under varied weather and light conditions. The interactive computer system with operational and set-up memories allows quick set-up and smooth operation for single or multi-camera systems.
- **Reliable and ready for operation**
  Assured by digital control components, self-diagnostics and easy interchangeability of main units without the need for further adjustments. And COACH, the Philips remote control and monitoring system, gives double assurance of perfect performance.
- **Safety for the future**
  A camera that is built to last, having a transparent computer controlled system with distributed intelligence that can also accommodate future developments.
- **Minimum cost of ownership**
  With triax for minimum handling and maintenance costs. With automatic set-up for a quickly obtainable and consistent high quality picture. With – as an option – instant recall of operational memories for efficient production. With diagnostics for surveillance as standard to ensure minimum downtime. Optional extended diagnostics for fault location.

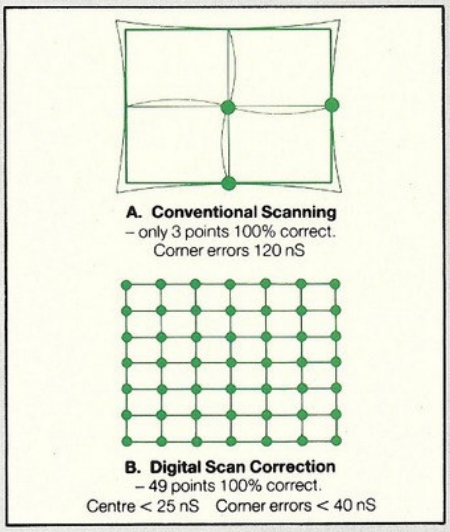
The qualities that come from total computer control

LDK26A

The excellence of the picture

The LDK 26A provides excellent picture quality. That is because the best quality 18 mm Plumbicon tubes with dynamic beam control for highlight handling are used.

A further aid to picture quality is the provision of digital scan correction. This enables exceptional standards of picture registration. Instead of the usual 100% correction at 3 points, 49 points are individually corrected under the control of the automatic set-up facility. The result is a threefold reduction in registration error (see diagrams A and B).



A. Conventional Scanning
– only 3 points 100% correct.
Corner errors 120 nS

B. Digital Scan Correction
– 49 points 100% correct.
Centre < 25 nS Corner errors < 40 nS

This optimum 49 area automatic correction is also applied for black shading, white shading and focus correction for further enhancement of the picture quality.

Amongst the comprehensive video processing features are black stretch, white compression, highlight handling, gamma correction selection, in-band and edge-of-band contours and a full 3×3 linear matrix.

This linear matrix circuit gives spectral curves that are closest to the ideal including the negative lobes required for producing natural colours. The result is a perfect match between Philips cameras.

Computer control– for perfect performance

The LDK 26A system has 3 microcomputers – in the Camera Head, the Camera Processing Unit and the Master Control Panel. Each unit can converse with the others in the chain enabling constant check on status of camera performance. Each camera has its own set-up computer. Because of this 'distributed intelligence' system it is possible to set up independently, simultaneously and automatically any number of camera chains. And system units can be interchanged, without the need for re-setting, checking or adjusting.

The control system is fully digital, and digital/analogue converters with

'pulse-pot' technology permit manual and automatic adjustment over the whole control range. Because of this system no manual pre-set is required for automatic set-up.

The extensive automatic control of parameters makes the LDK 26A a total automatic 18 mm camera with perfect, consistent performance.

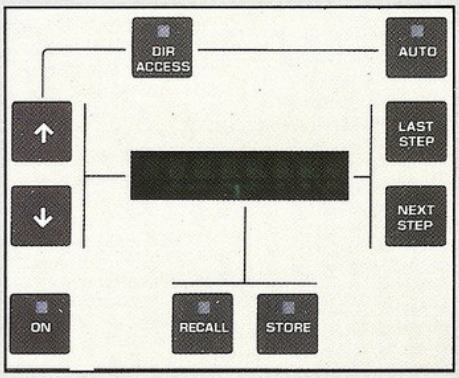
Memories – an aid for production

Every LDK 26A camera has 2 set-up and 2 lens memories as standard. Optionally there are 6 operational memories available.

The set-up memories may be used for special creative and technical applications. Each memory can store over 700 parameters.

The lens file can store colour temperature, flare, shading and registration.

Each of the operational memories stores gains, RGB, blacks, filter wheel position, colour temperature, black stretch, gamma and contours.

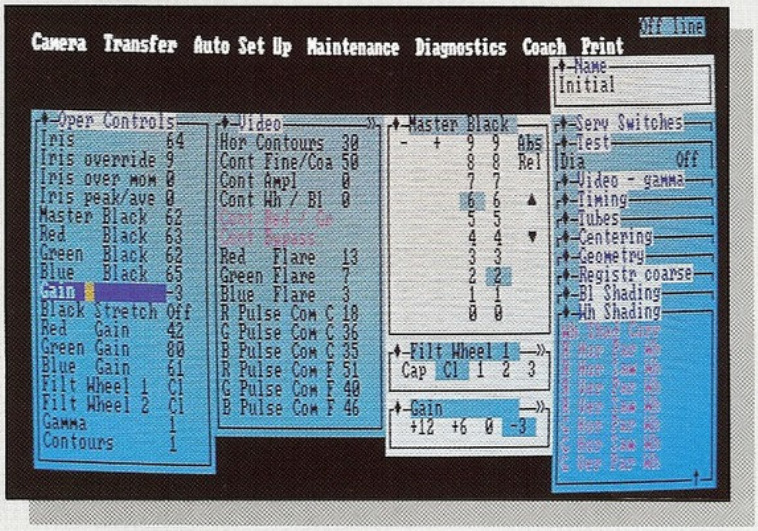


Status feedback

The unique status feedback system is another important advantage of the LDK 26A.

The data transparency of the design enables access to, and retrieval from, any unit on the bus. All setting-up and operational control parameters are available for displays on the Master Control panel. All settings in the Camera Processing Unit and Camera Head are generated by the digi-pots on the Master Control Panel and are fed back to the alpha-numeric displays and are shown by an exact percentage readout. This permits settings to be checked, at a glance, without physically measuring them.

COACH – double assurance



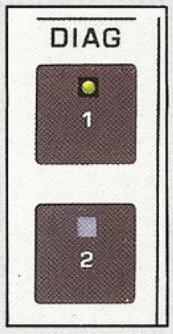
COACH is a tool for centralised maintenance and monitoring of the LDK 6 family of cameras. It consists of 2 components – an interface and an IBM-compatible personal computer. Simple to use, COACH provides:

- Remote control and monitoring of LDK 6 family camera systems
- Flexible retrieval, storage and control of camera data
- In depth diagnostic monitoring
- Remote access via standard modems over telephone lines

It therefore helps make more cost-effective use of engineering staff and allows contact and control at the local Philips Service Centre.

See the COACH brochure for full description.

Diagnostics



There is one standard diagnostic system (Diagnostics 1) and one optional system (Diagnostics 2) available for the LDK 26A.

Diagnostics –1 operates on-line, and is active whenever a camera is "on". It makes no decisions which will interfere with normal "on-air" operation. However, where important characteristics deviate from normal, it warns the operator a decision is needed, and provides a readout on request.

Diagnostics –2 is a very valuable optional extra. It operates off-line, and on demand, by using signal injection techniques throughout the camera system. Messages are displayed on the picture monitor indicating probable fault location.

Automatic programs

The following selectable automatic programs are available in the LDK 26A.

- Full auto set-up
- Auto daily check
- Auto white balance
- Auto black balance
- Auto lens registration calibration
- Auto lens shading, flare and colour temperature calibration.

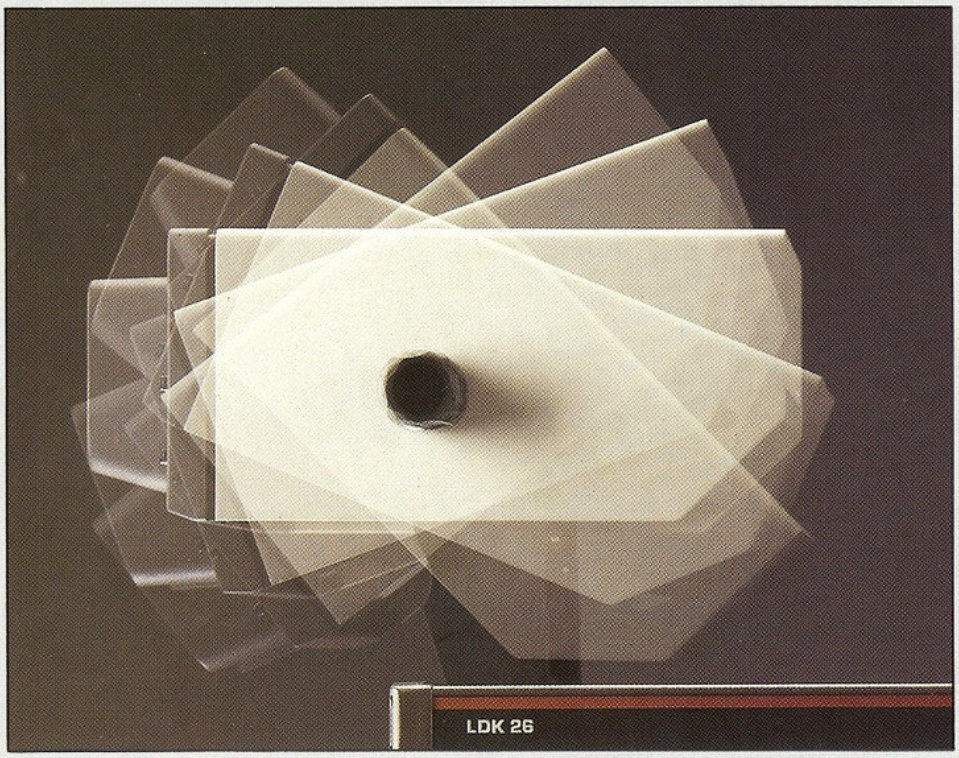
These auto programs provide full automatic control not only to give ease of use, but also to produce the best results in the shortest time.

The Auto lens programs can be used when the zoom lens is equipped with a built-in diascope.

After setting the back focus, it is possible to set up the camera fully automatically after tube replacement without any manual pre-setting. This is made possible because of the full range of computer controlled tube parameters.

Performance – helped by ease of use

LDK26A



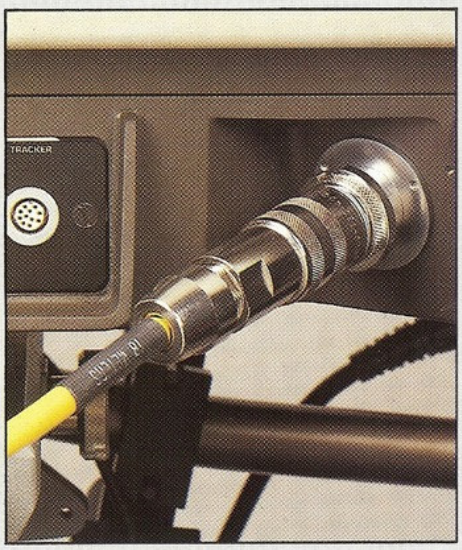
Ahead of its time

The LDK 26A camera head is smaller in size with high brightness, high resolution 5 inch viewfinder which makes it one of the most versatile 18 mm camera in the studio or on location. It has a number of outstanding features.

- Integrated lens support
- Quick lens change
- Optical axis of the lens and viewfinder in one vertical plane
- A 5 position filter wheel
- A separate (controllable) auto cap
- Rotatable, tiltable and easily removable viewfinder (tilt range ±60°)
- Extensive indicators and markers in the viewfinder
- Handgrips on all sides
- Provision for remote facility for intercom and external viewfinder switches (e.g. on pan bars)
- Utility power e.g. for teleprompter
- Provision for script board
- Rainproof housing
- One audio channel
- Extensive intercom facilities
- R, G and B and external video on VF display
- Unparalleled service accessibility.

A future safeguard

The Philips LDK 26A is one of the most advanced computer controlled 18 mm camera systems. But it is also designed to meet tomorrow's changing programming needs, and to anticipate new technical developments. Easy adaptation and extension are simplified by the digital transparency of the system.



The complex made simple

The LDK 26A camera system uses all the latest technology but it has been designed very much with people in mind.

For the cameraman, handling is so easy. The LDK 26A has an integrated camera lens support which ensures correct balance of the combined camera head and lens – whatever the size of the lens being used – light or heavyweight. Then there is the flexible viewfinder for extremes of pan and tilt movement. Finally there is a wide range of indicators and signal selectors together with full communication facilities.

For the engineer and video operator, the Master Control Panel acts as the surveillance centre for the whole system – a sort of electronic screwdriver for maintenance and diagnostics. It monitors and controls hundreds of functions. Used with the individual Operational Control Panels the video operator has control over the whole system.

Immediate reading of lens f-stop numbers, pre-programmed contours, etc. is possible after selection of the relevant camera by means of the MATCH knob on the Operational Control Panel.

Triax – reliable, flexible

The name of Philips and the reliability of triax operation in broadcast cameras are synonymous. The triax system is used because of its great reliability, its flexibility – and above all becausae of the extremely positive reaction from the many Philips users of triax camera in studio and field locations all over the world.

The triax system is an integral part of the camera chain – not an accessory. With the appropriate cable, the camera head can be sited up to 2 km from the processing unit.

Minimum cost of ownership

When it comes to value for money, the LDK 26A is unbeatable. Its basic purchase price is certainly more than competitive with any other computer camera in the world.

Running costs too are equally important. Cost-cutting aids such as:

- The 'distributed intelligence' system with its operational set-up and lens memories helps to minimise operation and maintenance costs, by the considerable reduction in set-up and production times.
- The use of triax cables, with their low investment, also means reductions in handling, labour and repair costs.
- Savings are also made because the system units are independent and easily adaptable to different configurations. So investments in multi-studio configurations can be reduced.
- The diagnostic system reduces the time involved in fault-finding (in the unlikely event of faults occurring).

Equally at home on location

Rugged, reliable, rainproof and able to work over a wide range of temperature, the LDK 26A performs to perfection on location. The compact size and modular design of the control panels (the MCP and CPU being only half 19″ rack size) make them easier to locate in the confined space of an OB van.

In addition, full bandwidth RGB outputs for Chroma Key over long cable lengths are available, thanks to the quadrature modulation of the Red and Blue signals, and separate modulation of the Green.

Both in the studio and on location the highest quality performance is maintained for up to 2 km.

And simply everyone appreciates how light and easy triax cable is to handle.

Compatible companion

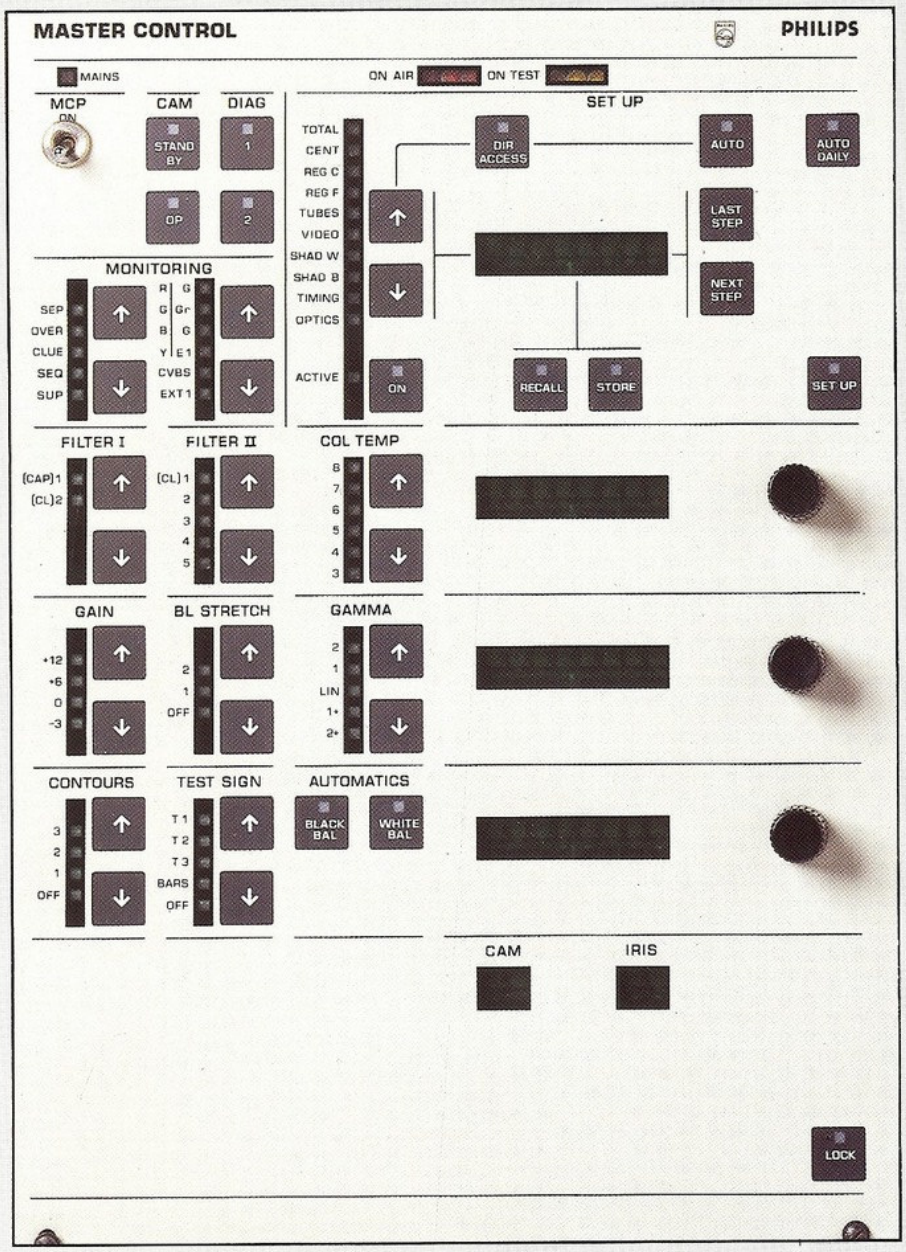
The LDK 26A will work perfectly together with the Philips LDK 6A camera – either in the studio or on location.

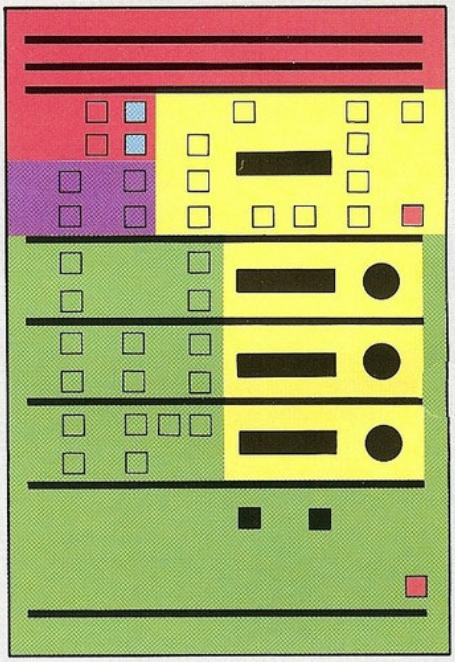
There is also a plug compatible portable companion – the LDK 54A.

This multi-role lightweight triax camera can operate independently or via the standard LDK 26A control system. All three camera systems have, of course, Philips famous matching colorimetry.

Automatic control, easy surveillance

LDK26A





- Select status
- Diagnostics
- Monitor
- Operation
- Set-up

1. Status selection of operational controls. This area governs camera mode, system control, operation and setting up.
2. Diagnostics with selector buttons for both standard and optional diagnostic facilities.
3. Monitoring area. This enables switching of separate, overlayed, CLUE, sequential and superimposed video signals to waveform and picture monitors.
4. Operational control area, which provides the video operator with access to the secondary operational functions with LEDs indicating status of the function at the selected camera.
   These functions are: cap, filter wheel, colour temperature, gains, black stretch, gamma and white compression selector, contour selector, automatic black and white balance, colour bar and test signal selector. Three assignable digi-pots and readouts (via the status feedback system) enable RGB gain and black level adjustments. There are separate signal displays of iris settings and selected camera number.
5. Setting-up and memory access functions are carried out from this area. Access is possible to all the system's required switch and analogue operations. These can be automatic with full auto and daily auto switches or manual via a direct access switch.

LDK 6A control panels can also be used with the LDK 26A.

Master Control Panel

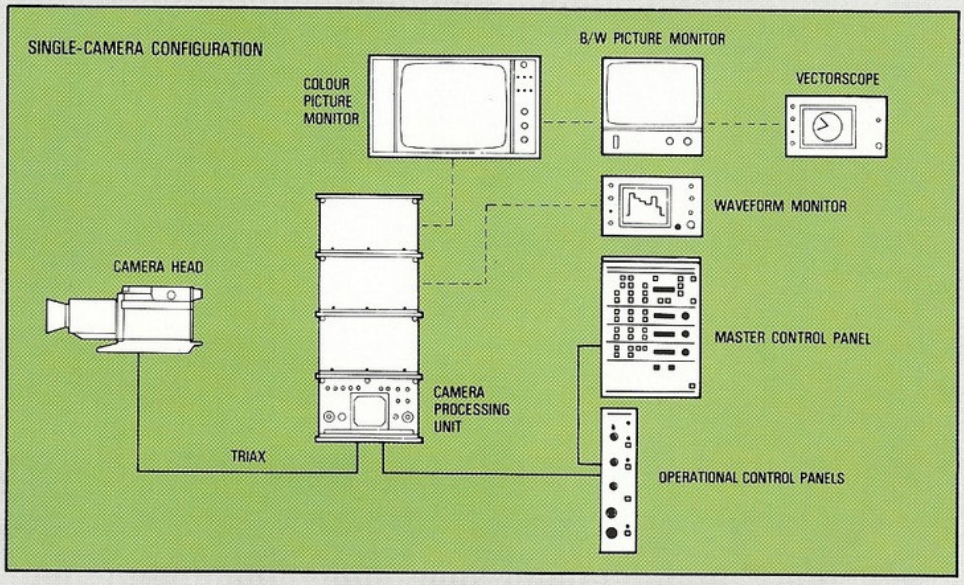
The Master Control Panel (MCP) is designed for both the video operator and engineer and gives full access to functions such as operational memories and monitoring. The MCP is assignable to any specific camera by means of the MATCH knob on the adjacent Operational Control Panel. An electronic LOCK freezes all panel settings to avoid accidental parameter changes.

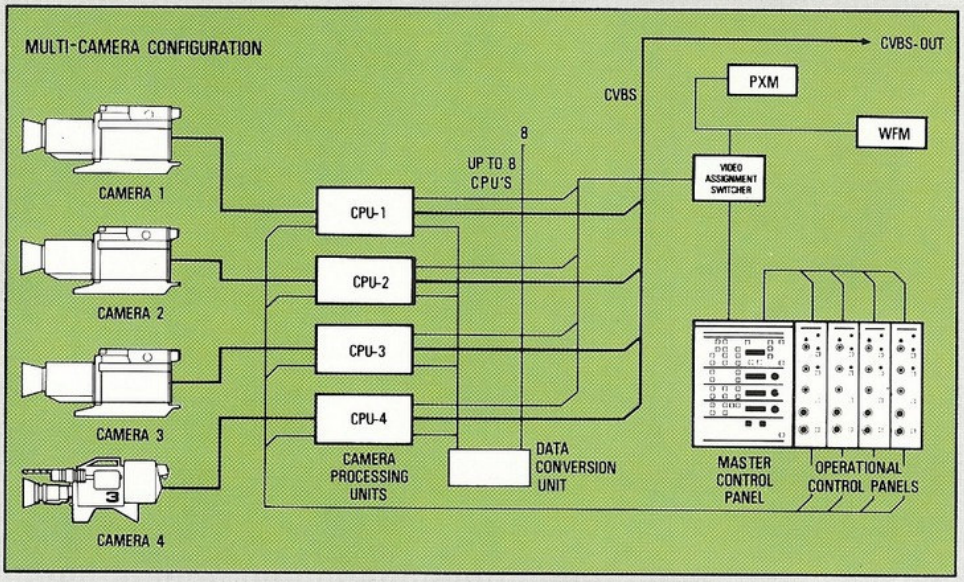
The MCP is also intended for engineering maintenance. In this capacity it acts as the "surveillance and technical control centre" of the system. Functions such as setting up and fault location can also be initiated and monitored.

The MCP is conveniently divided into several discrete areas according to functional requirement (see diagram), providing an unparalleled degree of compactness and user friendliness.

Operational Control Panel

Primary operational controls are located on the Operational Control Panel (OCP). Iris-, master black-, and iris range-RGB individual gains and black level controls are all located on this OCP. Moreover call, preview, match and auto iris switches are provided. The design permits the panels to be co-sited, for example, next to the Master Control Panel.

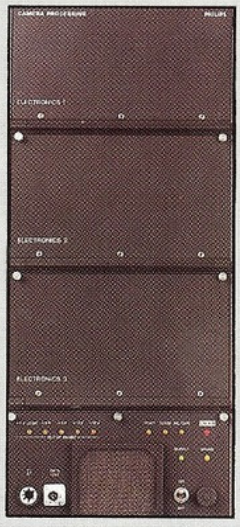




Camera Processing Unit

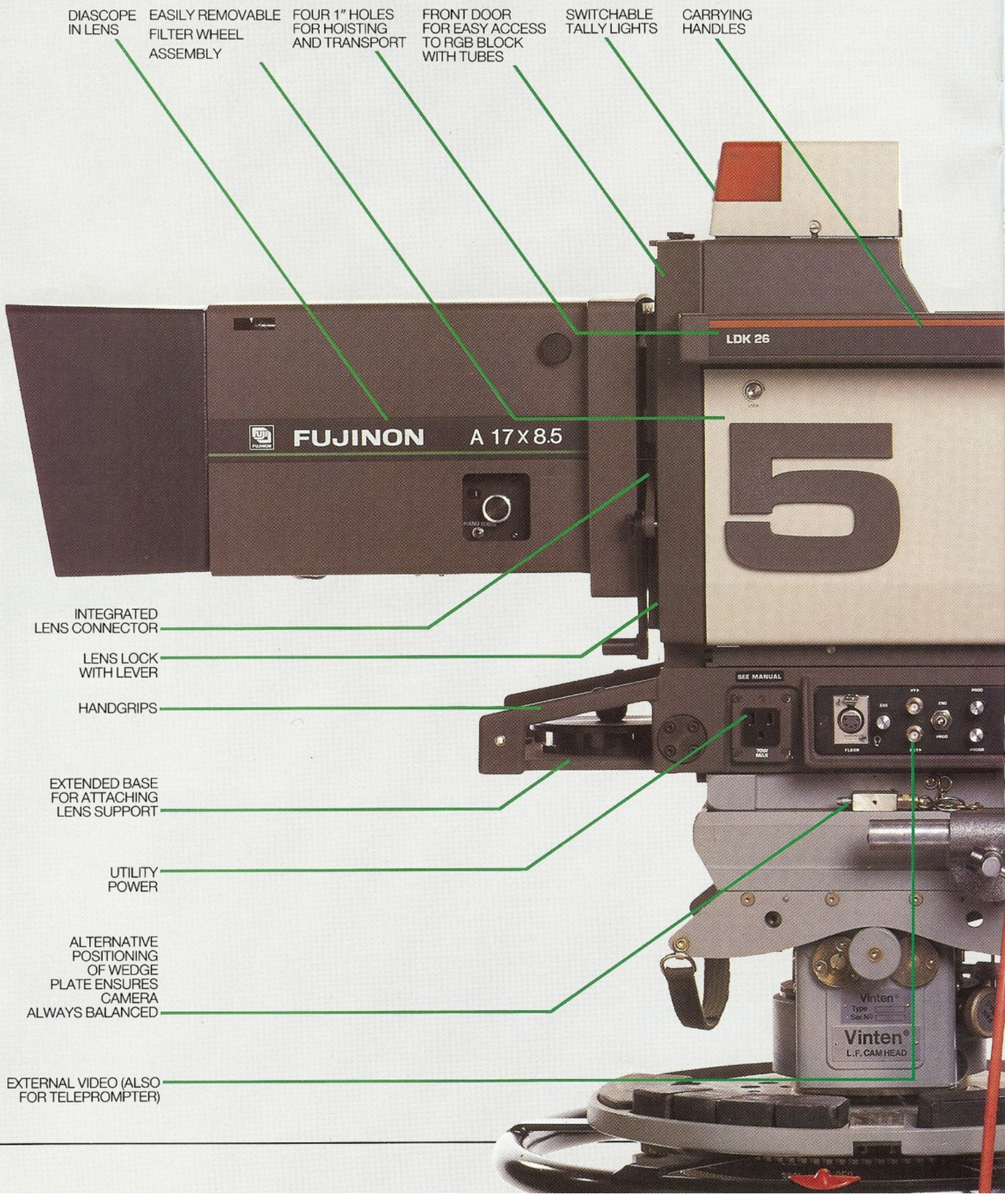
The Camera Processing Unit (CPU), with its incorporated triax circuitry, is the 'black box' of the system. Its compact size (just half the width of a 19" rack), enables a logical left to right system layout, making it ideal for situations such as OB vans, where space is at a premium.

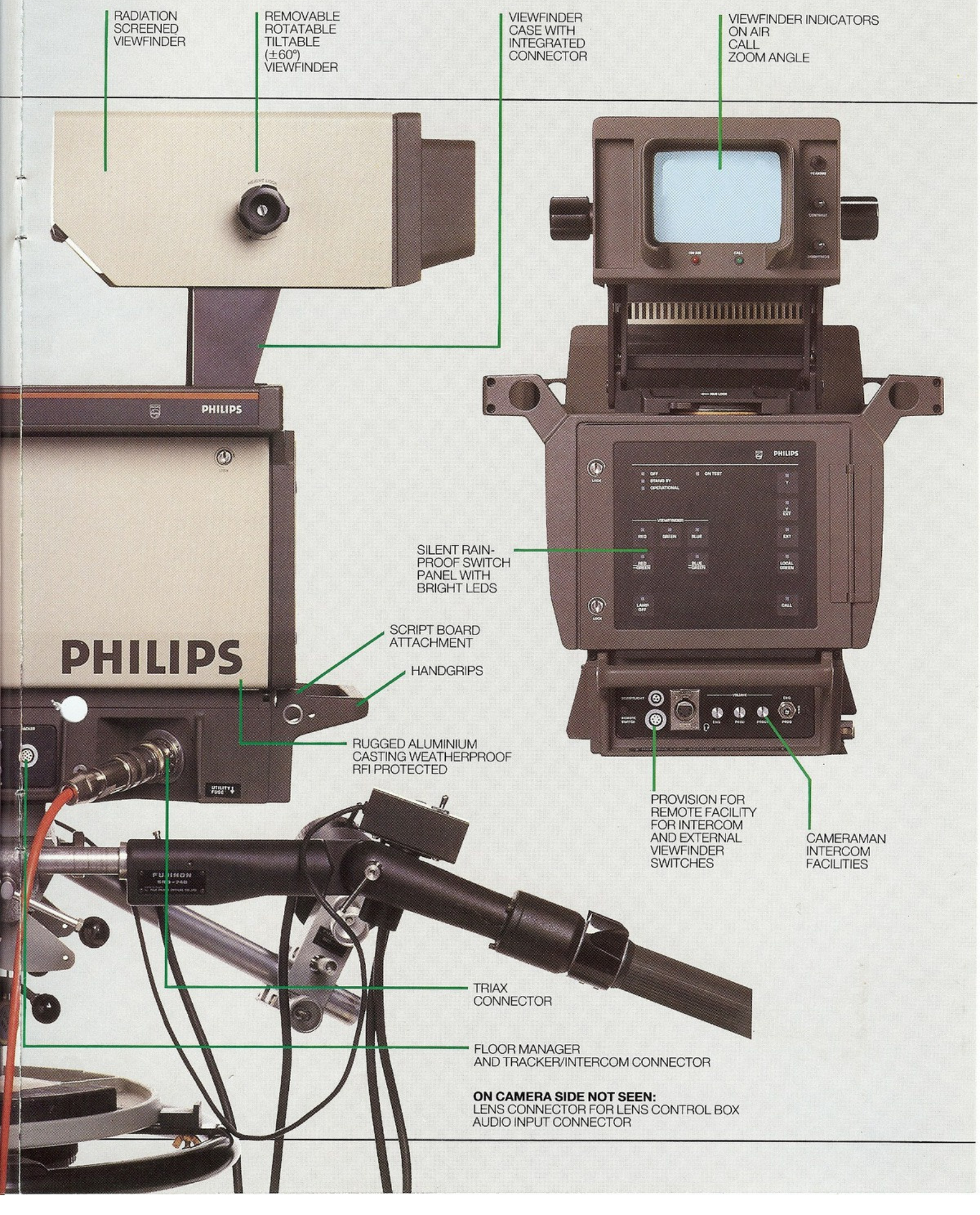
The integrated power unit is provided with indicators, an intercom connection and there is a connector to the control data system for maintenance and diagnostics.



LDK 26A television camera system–one of the world's greats

LDK26A




RADIATION SCREENED VIEWFINDER
REMOVABLE ROTATABLE TILTABLE (±60°) VIEWFINDER
VIEWFINDER CASE WITH INTEGRATED CONNECTOR
VIEWFINDER INDICATORS ON AIR CALL ZOOM ANGLE
PHILIPS
SILENT RAIN-PROOF SWITCH PANEL WITH BRIGHT LEDS
SCRIPT BOARD ATTACHMENT
HANDGRIPS
RUGGED ALUMINIUM CASTING WEATHERPROOF RFI PROTECTED
PROVISION FOR REMOTE FACILITY FOR INTERCOM AND EXTERNAL VIEWFINDER SWITCHES
CAMERAMAN INTERCOM FACILITIES
TRIAX CONNECTOR
FLOOR MANAGER AND TRACKER/INTERCOM CONNECTOR
ON CAMERA SIDE NOT SEEN:
LENS CONNECTOR FOR LENS CONTROL BOX
AUDIO INPUT CONNECTOR

Technical Data

Transmission system
PAL, PAL-M, NTSC and SECAM.

Power supply
AC 47–63Hz. 90–132V and 189–264V.

Power consumption
375W without utility power

Input signals
CVBS or Blackburst
Ext. 1 (C) VBS (above input is looped-through): Return loss: ≥ 46dB at 1MHz
Green reference: VB

Output signals

1 × Red 2 × Green 1 × Blue	(with contours, colour matrixed, no sync, narrow blanking and gamma corrected) 0.7V p–p across 75 Ohm
2 × WFM 2 × PYM 3 × CVBS	1V p–p across 75 Ohm

Separation between outputs ≥ 50 dB at 1MHz.

Scene illumination
1400 lux (130 ft.cd) for a typical signal-to-noise ratio of 56dB (PAL) or 58dB (NTSC) in the Y-channel, lens iris f/2.8 reflection factor 60%, without linear matrix; without contour correction; encoder notch filter on; colour temp. 3200K.

Measurements performed at 35% of peak white.

Contour correction
The contours out of green principle is applied (out of red: optional). Horizontal contour correction is both in-band as well as edge-of-band. The amplitudes of the negative and positive combined horizontal and vertical contours can be independently controlled.

The response can be adjusted to provide a modulation depth of 100% at 400 TV lines.

Level dependency of horizontal contours, noise coring and comb filtering are incorporated in the contour processing circuitry.

Colour registration
Deviations of Red or Blue in any direction with respect to Green. In a circle of 0.8 of picture height, deviations will be no more than the distance equal to a horizontal scanning time of 25 ns. in horizontal as well as in vertical direction. Outside this area deviations will be no more than 40 ns.

Geometry error
Maximum 1% of the picture height.
Skew 0.3% of the picture height (excluding lens distortions).

Gain control
Master selector for: −3dB, 0dB, +6dB and +12dB. Individual controls for +3dB to −3dB in Red and Blue video amplifiers.

Colour temperature control
The colour temperature can be set with a six-step selector covering a range from about 3000K to 8000K.

Optical filter wheel
A five-position filter wheel contains:
Clear, ND 0.6, ND1.2, 85B and a spare.
A controllable cap – closing automatically at camera power off and standby.

Gamma correction
Selector for linear, gamma I and gamma II.
Gamma I and II can be preset.

Black level adjustment
Master control for adjustment between −65% and +35% of the nominal white level.
Individual control for adjustment between −20% and +20% of the nominal white level.

Lenses
A wide range of manual and servo controlled lenses is available.

Amplification characteristics
Frequence response 0 to 5.5MHz ± 0.5dB, and at 7MHz + 0dB/−3dB.

Viewfinder
High resolution picture tube. Screen diagonal 12.5 cm, high brightness 200 ft Lamberts, X-ray radiation conforming to DHEW Rules 21 CFR278 (USA performance standard)

Permissible ambient operating temperature range
Camera Head and Viewfinder – 20°C to +45°C.
Camera Processing Unit and Control Panels 0°C to +45°C.

Intercom
From camera head to CPU: 2 channels.
From CPU to camera head: 3 channels 2 or 4 wire.

Audio
One channel from camera head to CPU.

Cable lengths
with ⌀ 8 mm triax cable 675 m (2215′)
with ⌀11 mm triax cable 1200 m (3940′)
with ⌀14 mm triax cable 2000 m (6560′)

Dimensions

Camera (incl. VF and handgrips)

length	661 mm (26.0″)
width	402 mm (15.8″)
height	460 mm (18.1″)
weight	36 kg (79 lb approx.)

Camera Processing Unit (CPU)

width	213 mm (8.4″)
depth	460 mm (18.0″)
height	533 mm (21.0″)
weight	35 kg (77 lb approx.)

Master Control Panel

width	213 mm (8.4″)
depth	128 mm (5.0″)
height	311 mm (12.2″)
weight	6 kg (13.2 lb approx.)

Operational Control Panel

width	77 mm (3.0″)
depth	128 mm (5.0″)
height	311 mm (12.2″)
weight	0.75 kg (1.7 lb approx.)

These typical specification details are subject to change without notice.

Separate colour brochures are also available for the LDK 6A and LDK 54A cameras and COACH.

PHILIPS **Broadcast Equipment**

PHILIPS

Printed in England by The White Dove Press Ltd., LDK26A.E1.2.86