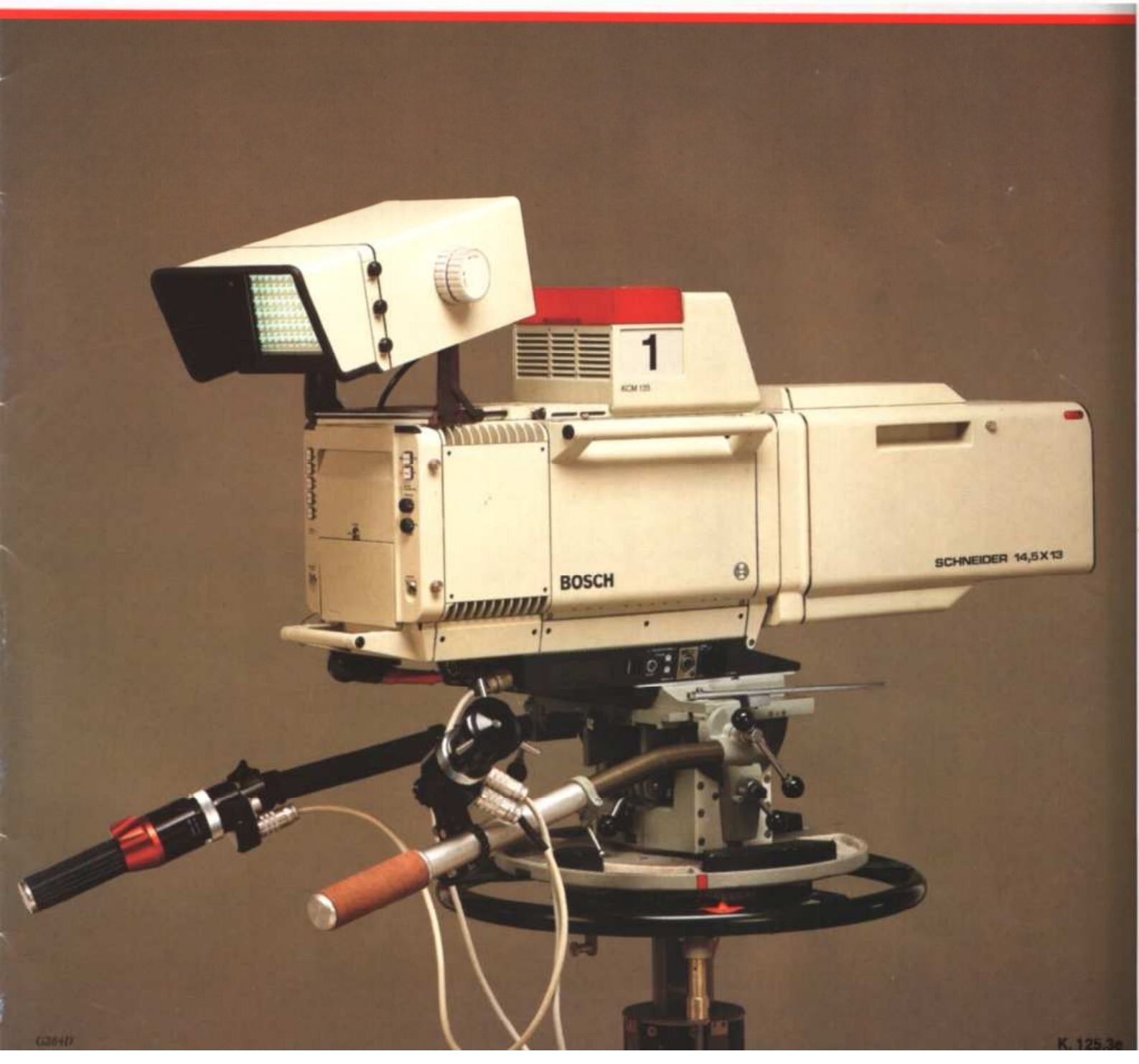
BTS

Broadcast Television Systems GmbH

A joint company of Bosch and Philips

KCM 125
Top Quality
Microcomputer-Controlled Camera



Application

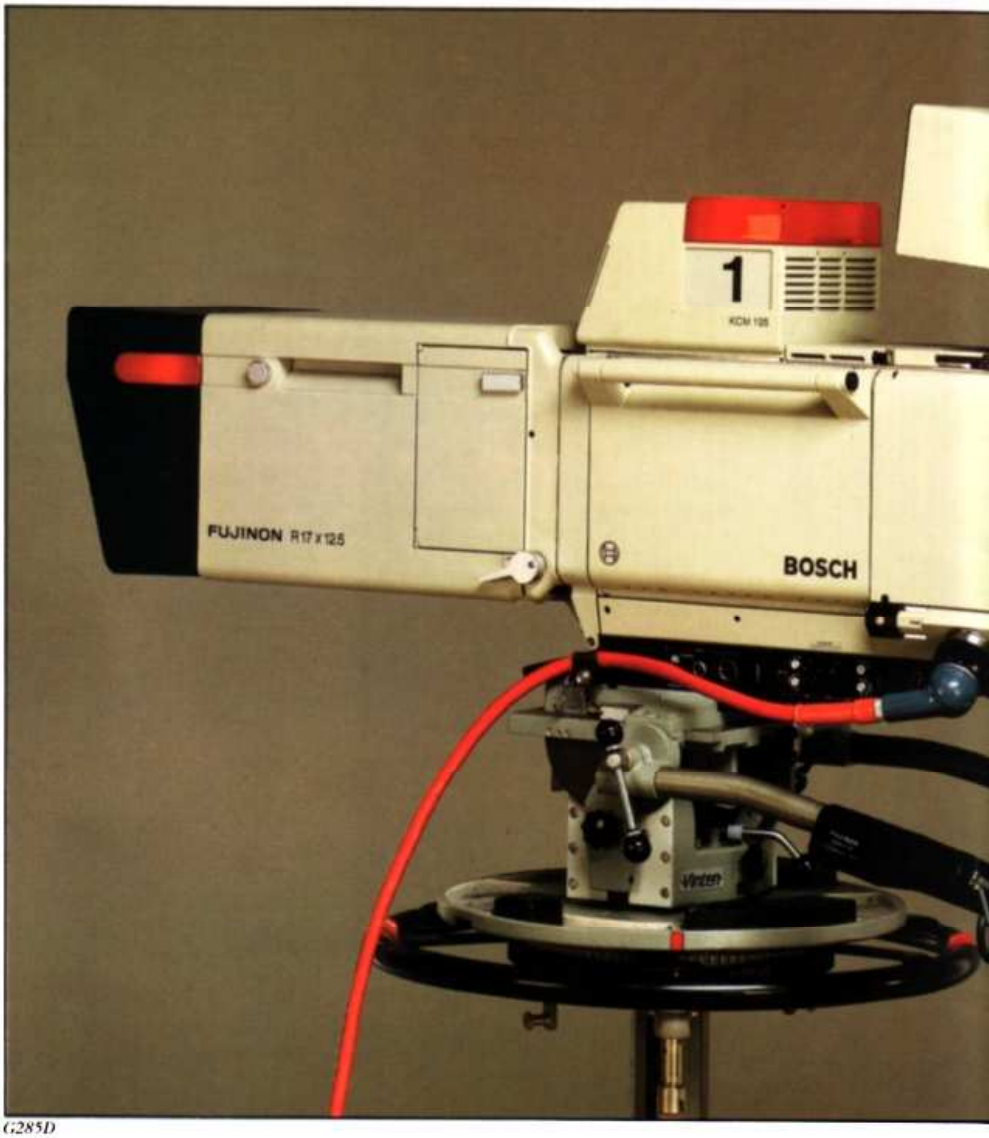
The new colour television camera KCM 125 is designed for use in the studio and field, providing top picture quality in any shooting conditions. The outstanding advantages for the user are good resolution, sensitivity and signal-to-noise ratio, as well as raster geometry and registration, combined with excellent colour reproduction. 25mm (1") pick-up tubes of the latest type with lead oxide targets are one of the major contributing factors.

The KCM 125 can be fitted with an appropriate connector for any existing system using KA 64 camera cable. Alternatively, triax/coax cable can be used.

The KCM 125 camera system has automatic adjustment and operating functions, which are controlled via distributed logic in the camera head, camera control unit and remote control unit.

Service is aided by a two-stage error diagnosis system which extends to PCB and component level.

The outstanding features of this BTS camera system are its unequalled balance between picture quality and system flexibility on the one hand and the low investment, operating and servicing costs on the other.



G285D

- Lenses with integrated test projector from any major manufacturer
- Quick-locking lens mounting
- Mechanical monoblock construction with prism splitter and deflection coils including tubes, attached directly to the lens mounting
- 2 filter wheels with five settings each, including lens cap
- Prism splitter with optimum transmission and axial green channel
- Filter to counteract polarization effects and infra-red sensitivity
- 3×1" pick-up tubes with LOC and diode gun
- Bias light, individually adjustable for R, G and B tube
- Automatic Beam Correction (ABC)
- Low-noise pre-amplifier using the latest field effect technology
- Maximum sensitivity at f 2.8 630 lux, 0 dB gain
- Modulation depth more than 60% at 5MHz
- Signal-to-noise ratio 56 dB (PAL), 58 dB (NTSC)
- Resolution over 700 lines

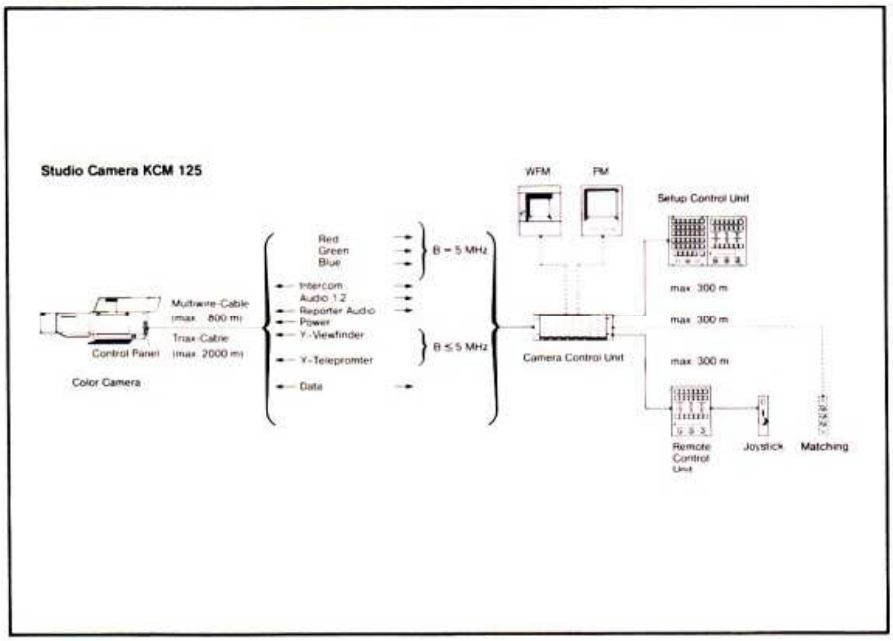
Special Features

- Aperture correction in all channels in the camera head, independent of contour correction in the camera control unit
- Control unit for operation and adjustment in camera head
- Electronic b/w viewfinder, with pan and tilt facility and comprehensive electronic displays
- Int. and 2 Ext. video input signals for electronic viewfinder with mixed image facility Int./Ext.I – Int./Ext.II
- Electronic colour viewfinder (optional)
- Connection for external tripod monitor
- Four-wire intercom for multi-communications systems
- Two microphone inputs for programme sound
- Intercom for maintenance service
- Tally light on lens, at the top side of the camera and in the viewfinder; front facing light can be switched off
- Connection for electro-optical cue machines (e.g. teleprompter, auto-cue)
- Electronics provided in plug-in card form, no cable harnesses
- Light weight camera head – only 33kg, incl. b/w viewfinder and pick-up tubes
- Triax or multi-wire cable up to 2000 m or 800 m length, respectively
- Automatic camera cable compensation (optional)
- Automatic dynamic lens error correction (LEC)
- Automatic geometry adjustment
- Automatic registration
- Automatic scene dependent centring
- Automatic iris control
- Automatic dynamic knee function
- Automatic, level dependent contour correction in H and V, before and after the gamma stage
- Automatic flare correction
- Automatic white balance
- Automatic black balance
- Automatic dynamic shading correction in black and in white
- Automatic beam focusing
- Automatic beam alignment
- Components processor with Y, P_B, P_R and CCVS outputs
- Switchable colour correction matrixes
- Distributed logic for automatic functions in camera head, camera control unit and remote control units
- Operating parameters for up to 9 different shots can be stored and called up at any time
- Permanent digital storage of automatic settings
- Automatic fault diagnosis with text display
- Designed for all TV norms and colour standards 625/50, 525/60, PAL, PAL-M, SECAM and NTSC
- R, G, B before, and R, G, B after the gamma stage outputs

System

The KCM 125 colour camera chain consists of the colour camera, the camera control unit, the remote control unit and the set-up control unit, which is composed of a remote control unit and a set-up add-on unit.

In line with modern TV production techniques the control units are arranged in the clearest way possible and provide the maximum combination posibilities. Important operating functions are automated. In Auto-Set-up all the camera's vital functions can be automatically adjusted "at the push of a button".



Camera head

The entire camera head electronics are divided up in 6 functional groups:

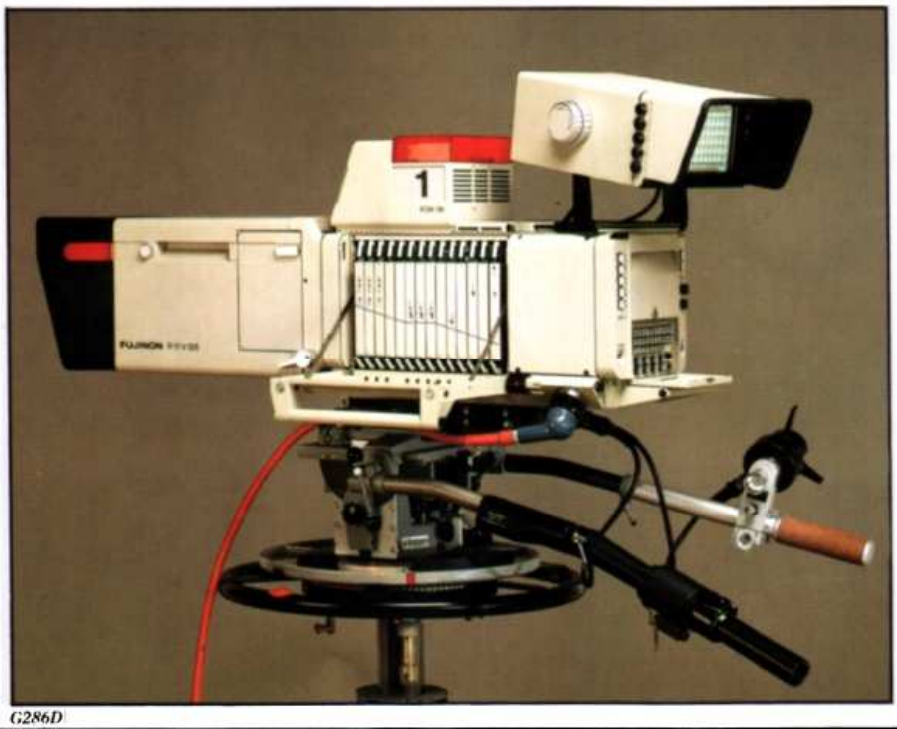
- FET pre-amplifier
- Tube supply and deflection
- Video signal processing (including pulse generator, etc.)
- Power supply
- Computer system
- Audio and intercom circuitry.

The location of the new FET pre-amplifiers directly next to the pick-up tubes ensures an excellent signal/noise ratio.

The processor delegated to the head is housed in a drawer in the base of the camera. Part of this drawer is taken up by the head set-up control unit, which enables the camera chain to be lined up automatically from the head.

Three intercom connectors on the camera head provide the KCM 125 with maximum flexibility. The electronics for the two microphone channels are contained in a trough underneath the casing. This is where the microphone signals are FM modulated for transmission.

The electronic viewfinder is fitted with a 17 cm precision tube of high luminosity and sharpness. It can be tilted through ±50° and rotated through ±100°. If required, it can easily be exchanged as a separate component or even operated externally. Of course, the viewfinder's design also takes account of servicing requirements. In addition to the internal camera signal, two external sources can be selected for the viewfinder, for example, to display a superimposed image. To aid the cameraman, the usual safe area limit, centre position, electronic focal length displays and an optional electronic focus display are included. In addition it is possible to superimpose zones or orientation lines adjustable in size and position.



G286D

Camera Cable Transmission Systems

Type KA 64 multi-wire cables can be used up to 800 m. This means that all existing KA 64 cables for Bosch KCU, KCK, KCP, KCA 100 and KCA 110 camera types can continue to be used.

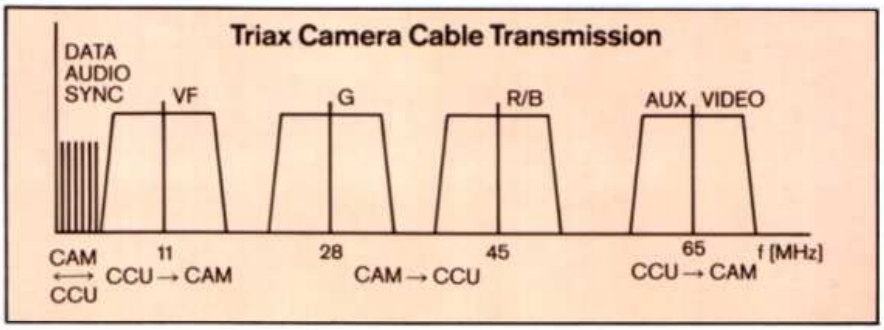
If triax camera cables are used the permissible length depends upon the cable diameter and can be up to 2000 m for 14 mm diameter cable.

With the triax/coax camera cable transmission system chosen by BTS, the video signals of the red, green and blue channel are transmitted with the required full bandwidth of 5 MHz. The advantages of this are as follows:

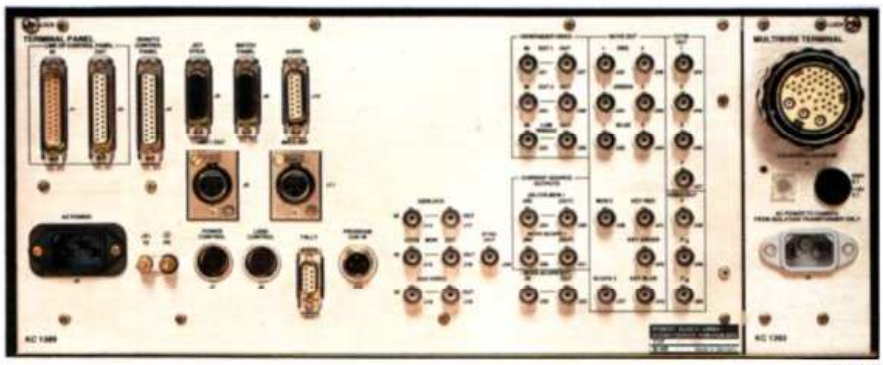
- Full quality chroma-key
- Full bandwidth monitoring signals
- Colour matrixing even in detail
- Contour correction can use R, G and B as reference.

Cable equalization for multi-wire or triax camera cables is carried out automatically for the entire length of the cable without length switch-over.

Any commercially available coax and triax cables can be used. The usable cable length is determined by the cable specifications. The system can be modified to use coax/triax or multi-wire cable, by exchanging 4 printed circuit boards, the cable connector in the camera head and 2 boards and the relevant connector in the camera control unit. All the signals from the head to the control unit and vice versa can be transmitted via triax/coax cable. In the case of triax/coax operation the 220 V utility power output on the camera head is not present.



G287D



G288D

Camera Control Unit

The new KCM 125 camera control unit is of the latest compact design. It is housed in one single plug-in module for installation in cabinets or racks of inch or DIN specifications.

The camera control unit consists of:

- Coax (triax)/multi-wire adaptor with automatic cable equalizer in the latter case
- Input amplifier
- Contour correction
- Output amplifier with gamma stage
- Monitoring unit
- Coder
- Pulse generator
- Operating unit
- Automatic units and computer
- Power supply units

System

The following features are worthy of particular mention:

- Automatic recognition of the cable length used, if multi-wire, without any switch-over, as well as high quality correction of cable influences
- Automatic knee function for scene-related compression of dynamics in very bright areas
- Extremely stable, regulated gamma correction
- Switchable colour correction matrixes
- Coder with proper component outputs for future studios.

Operation and service are made considerably easier by a large number of automatic functions:

- Automatic iris
- Automatic white balance and black balance
- Automatic cable length compensation
- Automatic centring from the scene
- Automatic dynamic correction of
  - convergence
  - white shading
  - black shading

  in 16H × 16 (32) V points.
- Automatic lens error correction
- Automatic adjustment of
  - focus current
  - beam current
  - ABC
  - beam alignment
  - flare compensation
  - gamma
  - level
  - coarse registration
  - all dynamic corrections
- Automatic fault diagnosis

Automatic Beam Correction (ABC)

Highlights up to 1600% level will be stabilized.

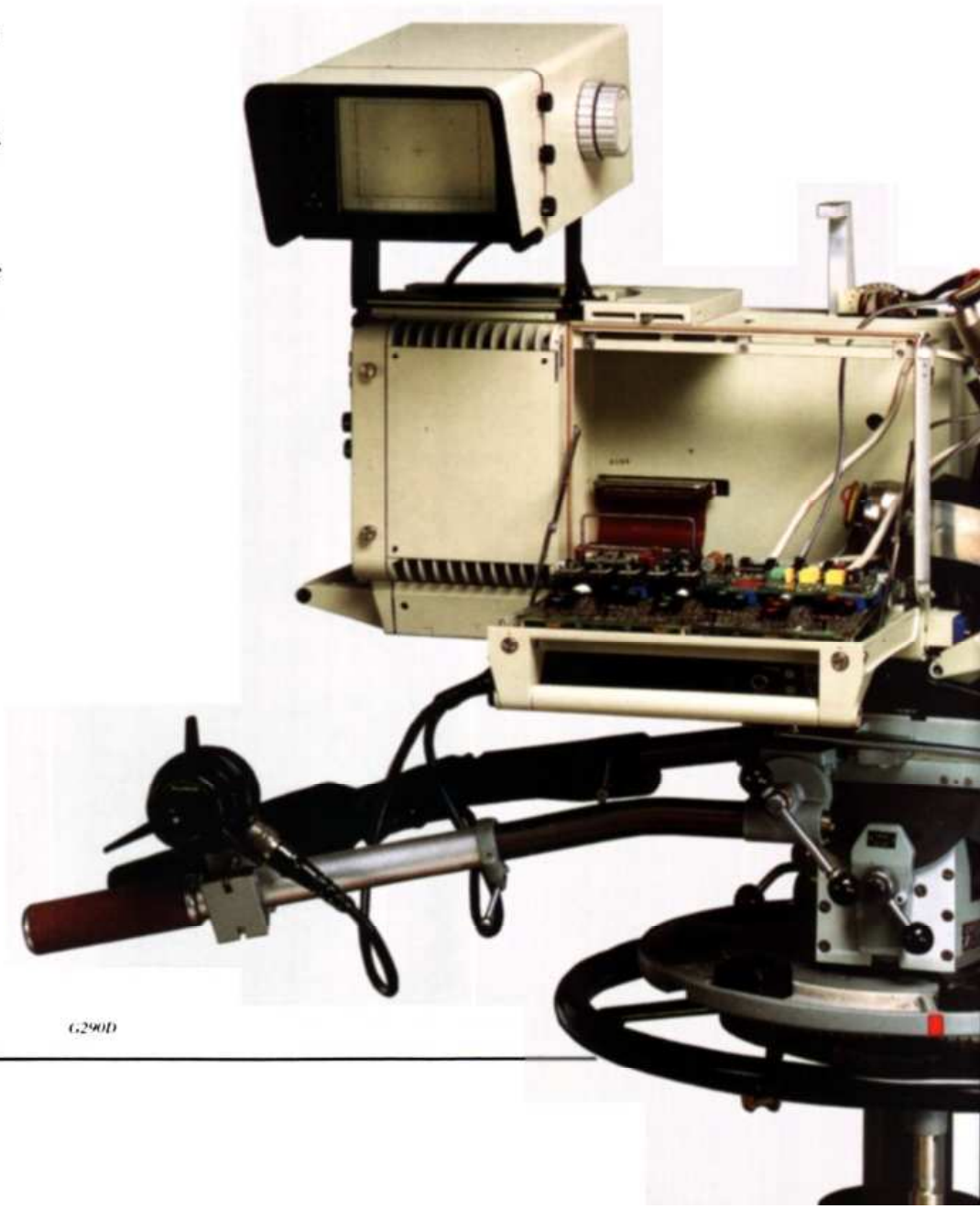
Monitoring

The monitoring unit contains the switching for the picture and waveform monitors. The arrangement of the monitor and oscilloscope next to each other in a single plug-in module or equipment box is especially useful during operation.

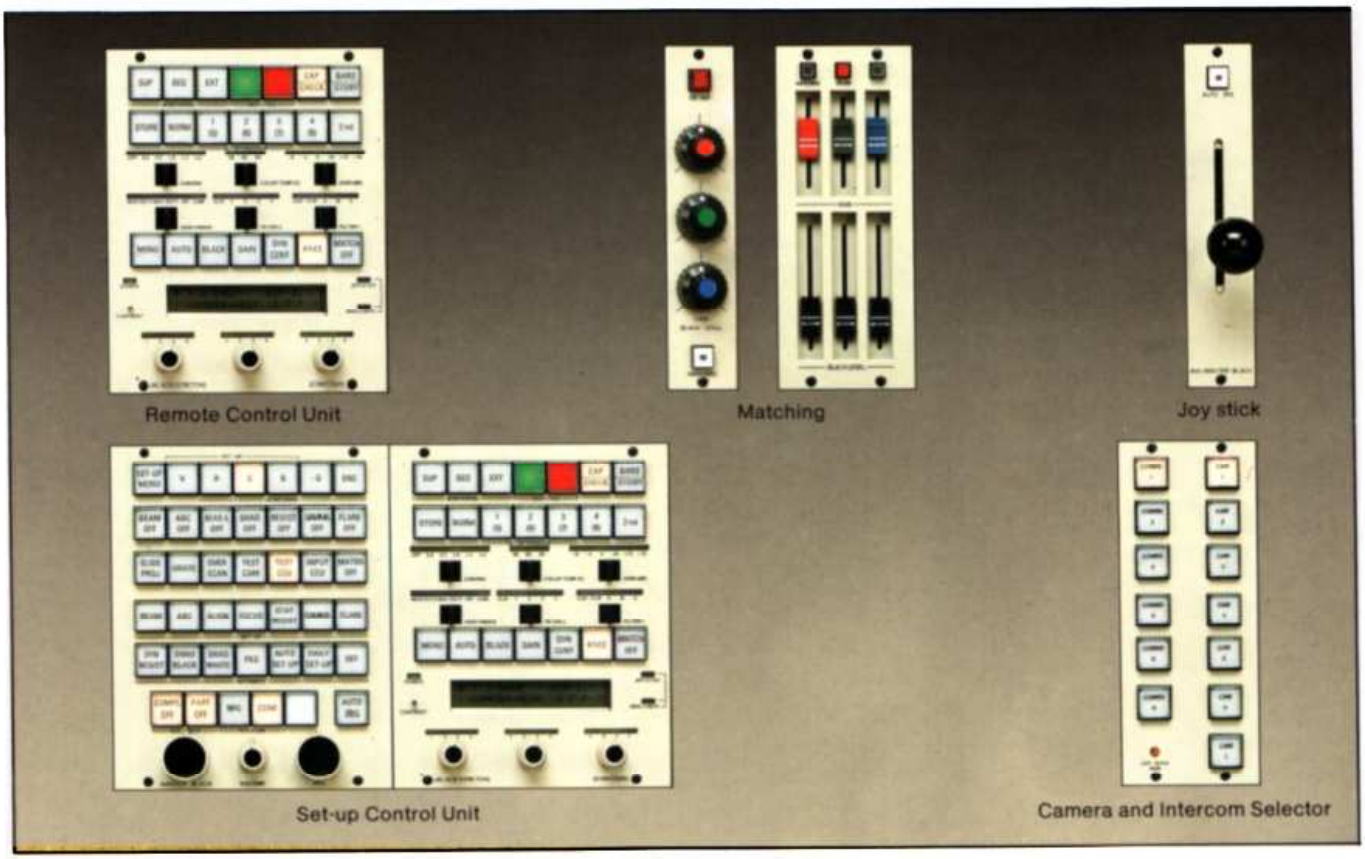
Hinged Optical Block

[illegible] pick-up tubes.

G289D



G290D



Remote Control Unit

The operating control unit can be connected to the camera control unit with one single cable of up to 300 m in length. It carries the intercom signals, as well as purely digital data. The unit contains its own 8 bit processor. All the control elements are "non-storing"; incremental generators are used instead of the more traditional potentiometers. The central element is an LCD panel with a display that can still easily be read even under extreme incidental light. Various installation positions can be taken into account by electronic alteration of the optimum reading angle.

Matching Control Unit

This module provides the controls for manual white balance and black balance with:

- Double Conventional Potentiometer
- Slide Potentiometer
- Double Joysticks

Set-up Control Unit

The set-up control unit is created by combining the remote control unit with set-up add-on unit. The principal task of the set-up control unit is the execution of various automatic test and correction procedures. In addition to full auto set-up, which balances all the functions of the pick-up tube control as well as registration and video signal levelling, it can also carry out a quick check, daily set-up and auto set-up of the most important functions as well as effecting separate automatic line-up of all the individual functions.

With the KCM 125 complete set-up can, however, also be carried out using a camera head internal panel.

Joystick

The joystick enables master black, iris and auto/iris on/off to be set and monitoring to be selected.

Camera and Intercom Selector

The selector delegate the set-up control unit to one of the Cameras 1 to 6 or to all of them simultaneously, separately the Intercom can be selected to the requested camera or to any other.

System

Set-up

Manual set-up facilities:

- Beam current
- ABC
- Beam alignment
- Electr. focus
- Raster geometry
- Raster registration
- Gamma
- Flare compensation

Test signals (switchable):

- Test injection before pre-amplifier
- Test injection into camera control unit

Test point selection:

- Input of camera control unit
- Output at camera control unit

Concealed control panel:

- In camera head for all essential functions

Operation

Shot store:

- 9 operating settings can be stored

Chroma level:

- Adjustment to 0%, 80%, 90%, 100%, 110%, 120%

Gain:

- 6 stages: −6 dB, −3 dB, 0 dB, +6 dB, + 12 dB, + 18 dB

Colour temperature:

- Electronic for clear filter: 3000 K, 6000 K, 9000 K

Filter wheel operation:

- Filter wheel I: Lens cap, 100%, 25%, 6.25%, effects
- Filter wheel II: 3200 K, 4300 K, 5600 K, 8000 K, effects

Viewfinder selection:

- Operational switch-over Camera Remote Internal, external 1, internal/external 1, external 2, internal/external 2

Switching functions:

- Lens cap, colour bar, manual black and white balance, etc.

Automatic Functions

I. Standard

- Auto White
- Auto Black
- Auto Iris
- Auto Shading Black
- Auto Shading White
- Auto Focus
- Auto Beam
- Auto ABC
- Auto Regist
- Lens Error Correction

II. Option with KC 1360

- Auto Flare
- Auto Gamma
- Auto Dyn Cent
- Auto Coarse Geometry
- Auto Coarse Registration
- Auto Beam Align

Monitoring

Oscilloscope Picture monitor

Key

on adjustment accessory

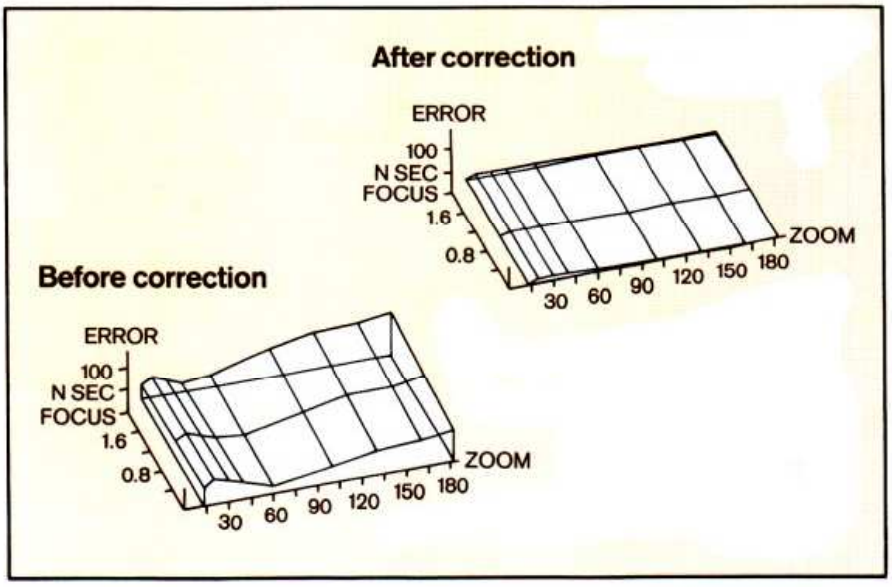
Red signal	R	Red signal
Green signal	G	Green signal
Blue signal	B	Blue signal
Red signal or blue signal	−G	R-G or B-G signal
NCVS	ENC	NCVS
R, G, B, signal superimposed	Sup	NCVS
NCVS, R, G, B signal sequential	Sequ	NCVS
NCVS ext, R, G, B signal sequential	Ext	NCVS

on remote control unit

Lenses, Error Correction (LEC)

Lenses from any leading manufacturer can be supplied for the KCM 125; they have a built-in test projector with a test slide developed by BTS.

The zoom and focus dependent colour alterations of the lenses are stored in the camera's processor system and are evaluated continuously in order to correct convergence errors. This dynamic lens error correction reduces the residual lens error to a third of its actual value.



Filter Wheels

The KCM 125 is equipped with two dust-protected filter wheels, which can be easily changed. A total of 2 × 5 settings is available for transparency, colour temperature, effects and lens cap.

The filter wheels can be remote controlled not only from the camera head but also from the remote control unit. Filter wheel positions which have been selected and stored in the shot stores are called up by push-button.

Prism Splitter, Special Filters

The light is split in a new, high trasmission prism. The maximum aperture of f 1.5 produces unequalled transmission for maximum sensitivity. The chosen RGB trichromatic response guarantees the outstanding colour reproduction for which BTS cameras are renowned.

Unacceptable spectral components in the infra-red range are suppressed with special filters; a λ/4 quartz filter prevents the transmission of polarization effects.

1" Pick-up Tubes, Pre-amplifier

Any commercially available high performance pick-up tubes with lead oxide targets, diode gun system – with LOC can be used.

For each tube a directly effective and individually adjustable bias light is present to ensure achromatic, minimum streaking even in shots with low lighting level.

The tubes chosen by Bosch, namely XQ 3070 for the green and blue channel and XQ 3075 for the red channel, produce superior low-noise images, with their low output capacitance; their diode gun systems ensure optimum transmission of scene-related highlights. The chosen tube format produces a limiting resolution of more than 700 lines per picture height and achieves a modulation depth of ≥60% at 5 MHz.

Sensitivity

Prism, pick-up tubes, pre-amplification and subsequent video signal processing are all so perfectly balanced in their characteristics that the result is superior overall sensitivity of 630 lux with a lens aperture of f 2.8.

Minimum illumination is 30 lux, iris f 1.6 and + 18 dB gain.

Test Signals

A special test signal saw-tooth with pulse identification to distinguish it from other test signals can be inserted into the video paths directly in the pre-amplifiers. A second test signal (saw-tooth), which is generated in the camera control unit, can be inserted there if required.

Shading Correction

Any shading errors, even those of higher order – spatial errors – are compensated for by dynamic, computer controlled correction. The error evaluation and correction occurs in 512 discreet picture areas using a division of 16 H × 16 (32) V.

dB Selection

Amplification of the video signal path can be switched in six stages:

- – 6 dB to adjust the beam current to 200% signal level scanning
- – 3 dB to raise the signal-to-noise ratio by 3 dB if the lighting is sufficient
- 0 dB as the standard setting for adjustment and operation
- + 6 dB to reduce the light requirement to 315 lux at f 2.8
- + 12 dB to reduce the scene brightness to less than 157 lux at f 2.8 and
- + 18 dB where the limiting sensivity of the camera is raised to 78 lux at f 2.8. This is equivalent to a limiting sensitivity of 30 lux for the entire opto-electronic transmission system at f 1.6.

Colour Temperature

To enable fast, precise adaptation to the colour temperature of the scene lighting, basic settings of 3000, 6000 and 9000 K can be selected from the remote control panel.

White Balance

In order to carry out white balance, the amplification of the R, G, B channels can be changed from 50% to 200% – with reference to a nominal level of 100% – by remote control via R, G, B gain from the remote control panel.

Matching

The R, G, B white levels can be altered by +/−40%, the black levels by +/−5%, in order to match differing colour effects from the cameras.

Black Balance

The R, G, B black levels can be modified by +/− 10% by remote control from the remote control panel.

Master Black

Simultaneous alteration of the R, G, B black levels – master black – by +5/ −20% can be achieved by using a common control.

Genlock

The camera chain is synchronized via a CCVS Genlock input, for all standards.

Data Transmission

Data transmission within the system is in line with the standardization proposals of the EBU and SMPTE. resp.

System

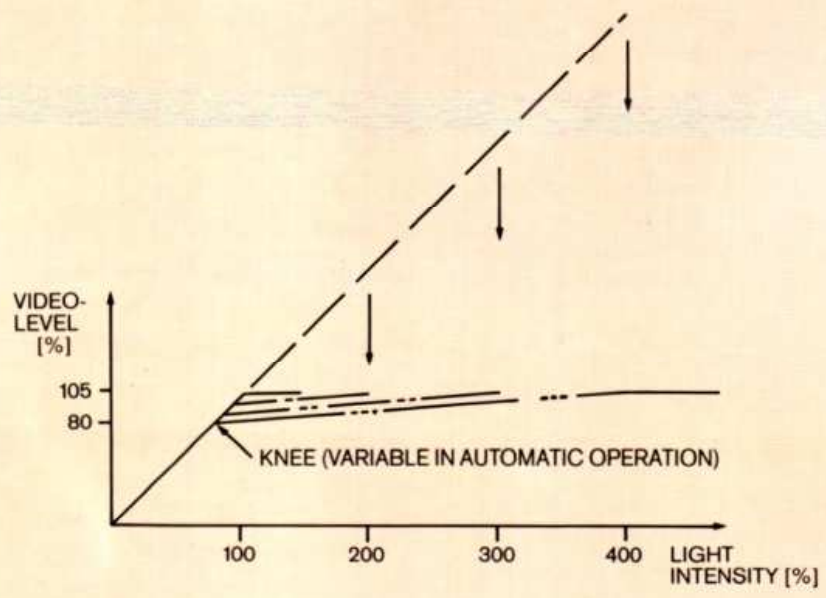
Knee Function (Dynamic Gain)

The transmission of picture content in the white area when there is a high contrast ratio is made possible by a switchable knee function. The knee function is adapted automatically to the scene information, so that everything above the knee threshold is transformed according to a dynamic curve into the region of 105% level. The purpose of this electronic amplifier function is to produce film style picture contrasts.

This function can cope with levels up to a total of 400%. Excess levels are compressed dynamically to 150% in a first stage in the camera head; in a second stage in the camera control unit (CCU) they are brought down to nominal level.

The knee function can be switched to a constant mode or switched off completely.

Operational Principle of the Dynamic Knee Function



Signal-levels are shown before Gamma correction

Iris Control

Manual or automatic iris control is effected via an adjustment potentiometer or, respectively, under computer control in 1024 stages (equivalent to 10 bits) at a time.

Linear Matrix Masking

For precise colour reproduction, the required negative parts of the trichromatic response are realised in a linear matrix. This matrix can be plugged in and two possible settings are permanently available.

In position 1 the matrix parameters for precise colour reproduction are set; position 2 allows differing colour reproduction to be achieved while maintaining white balance.

Aperture Correction

The aperture correction in the camera head enables the R, G, B channels to be individually adjusted to 100% modulation at 5 MHz.

Contour Correction

Contour correction via H+V, which is independent of the aperture correction, derives from the green channel a correction signal. When the green segment is too low or completely missing, H–correction is obtained automatically from red and blue. The contour stages are based on completely new principles and are provided with numerous adaptive functions.

Gamma Correction

Gamma correction for the R, G, B video signals can be adjusted individually for each channel from 0.30 to 0.55.

Almost ideal continuous gamma curves, which are free of temperature drift, are achieved by patented circuitry.

Chroma-Key

The full 5 MHz bandwidth linear R, G, B signals are led out before the gamma stage and become available for conventional R, G, B chroma-key processes.

For more recent key processes, such as matting, equalized R, G, B and luminance and chroma-component signals are also available.

Black Stretch

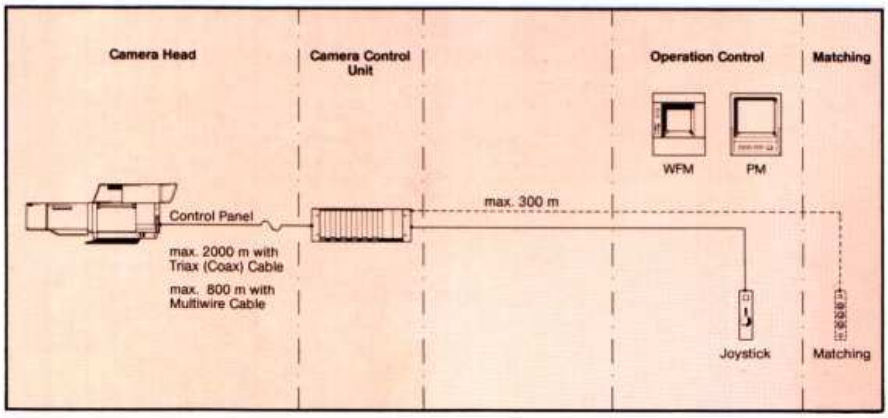
When there is a high contrast ratio, picture information in the black area is boosted by the controllable black stretch function and made recognizable in detail. Black level lift and white level adjustment are not affected by this.

Fault Diagnosis

The KCM 125's automatic fault diagnosis is of particular importance, allowing faults to be recognized at board level. In addition there is service back-up to component level. During operation the supply voltages, pulse voltages and beam and deflection currents of the image converters are monitored; when the test slides in the lens are switched on the video levels at numerous test points are also monitored. Error messages are displayed as clear text in the remote control unit, the control monitor, the camera viewfinder and can be fed to an external printer and a service terminal, if necessary.

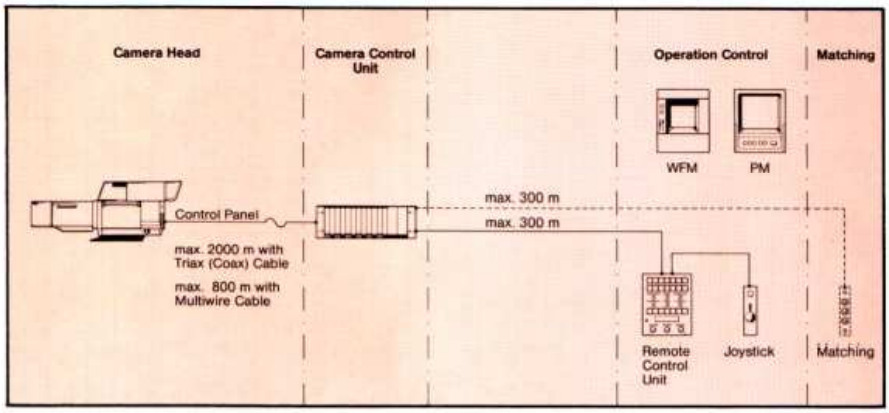
Configuration 1

Set-up:
Control unit in camera head
Operation:
Joystick connected directly to camera control unit
Monitoring:
One monitoring unit consisting of oscilloscope and picture monitor for use in both line-up and operation



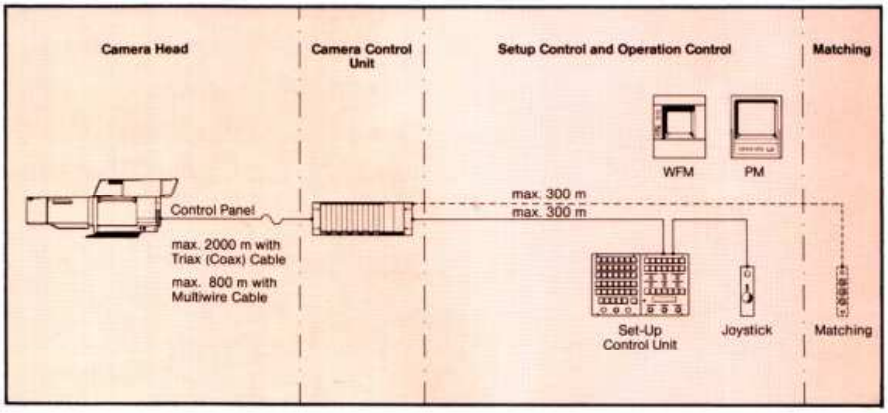
Configuration 2

Set-up:
As for configuration 1
Operation:
Remote control unit and joystick
Monitoring:
As for configuration 1



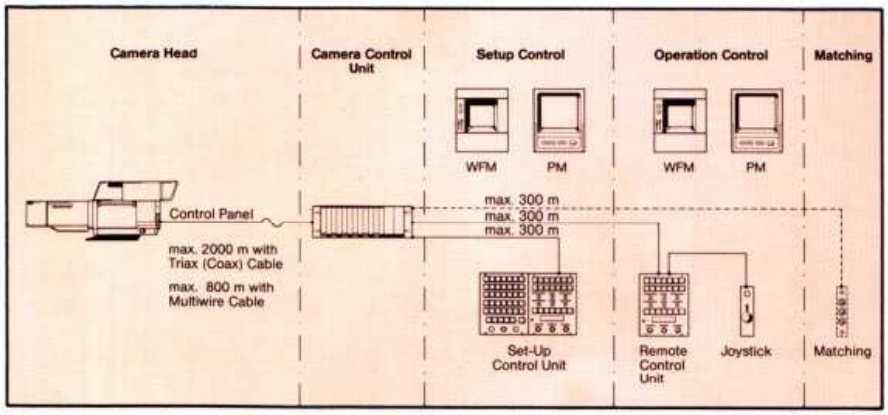
Configuration 3

Set-up:
From camera head or with set-up control unit
Operation:
As for configuration 1
Monitoring:
As for configurations 1 and 2



Configuration 4

Set-up:
Separate workstation with set-up control unit
Operation:
Separate, additional remote control unit and joystick
Monitoring:
One monitoring unit each for set-up and operating workstation



Configuration 5

Economic configuration for up to 4 cameras

Set-up:

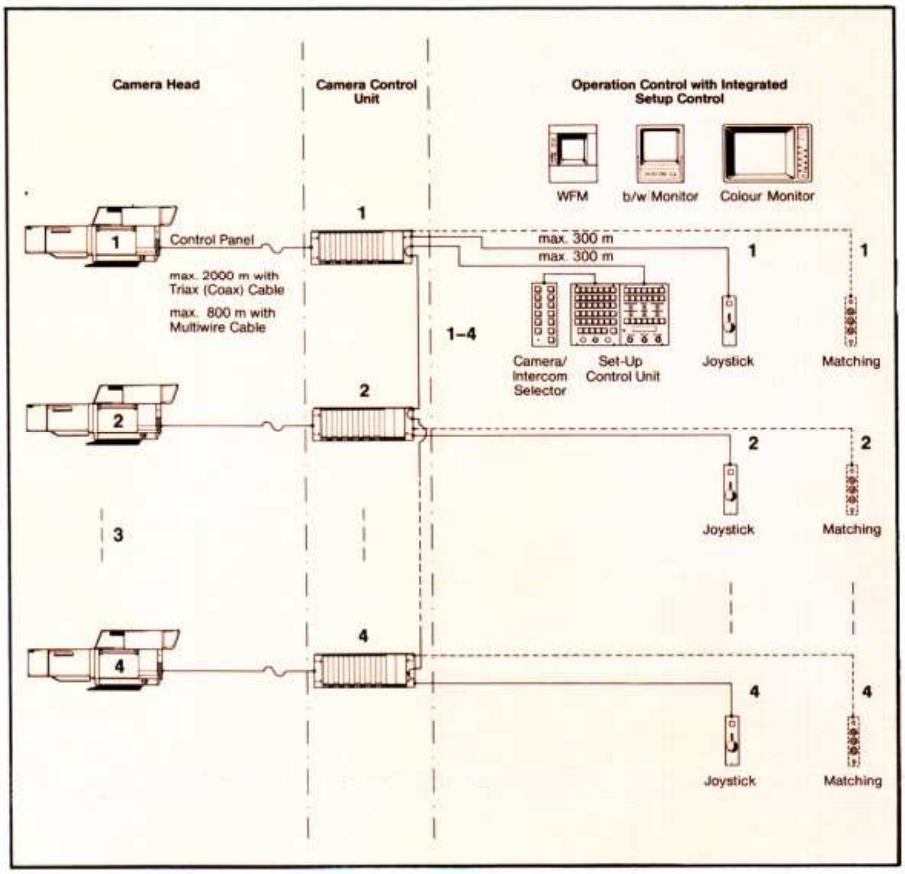
Set-up workstation with adjustment accessory and operating control unit for cameras 1 to 4. Can be delegated via camera/intercom selection

Operation:

Camera 1 to 4 in parallel set-up control unit. Joystick for each camera chain 1 to 4

Monitoring:

Common monitoring unit for set-up and operating workstation



Configuration 6

Comfortable configuration for 1 to 6 cameras

Set-up:

Set-up control unit can be delegated to cameras 1 to 6 via camera/intercom selection

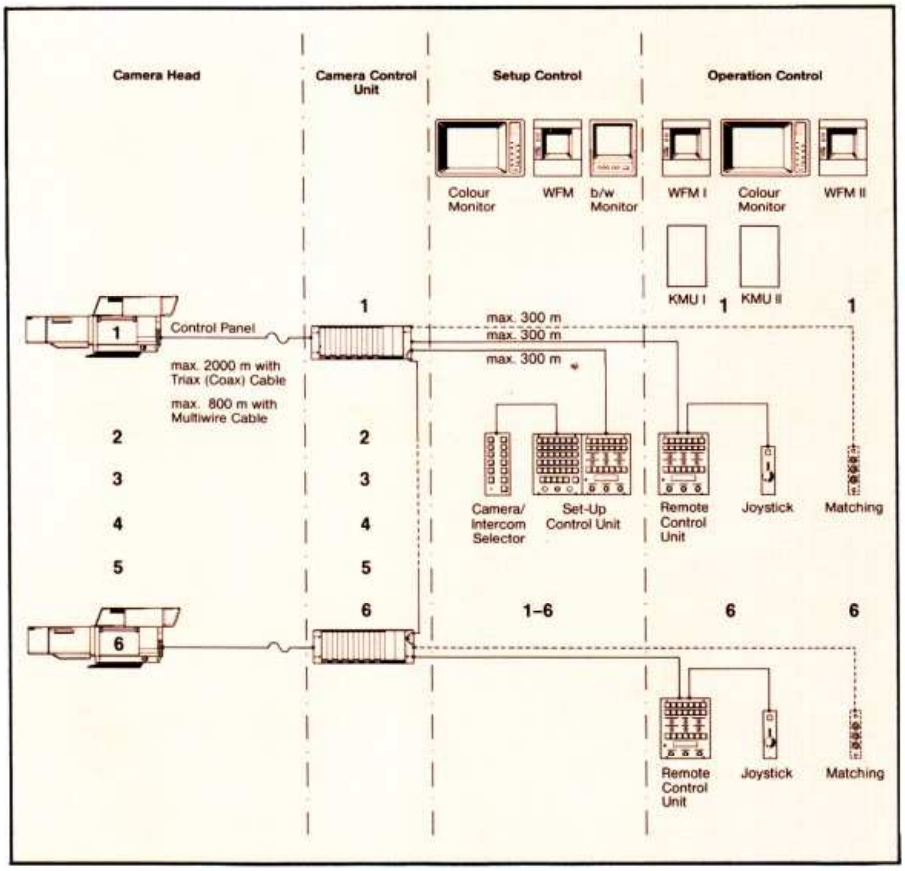
Operation:

One operating control unit and joystick for each camera chain

Monitoring:

One integrated switching of the monitoring unit for cameras 1 to 6 for the set-up workstation, additional switchable monitoring units for cameras 1 to 6 for the operating workstation

Configurations 1 to 6 can be extended with an additional change-over switch to n × 6 units.



Configuration 7

In between Configurations 5 and 6 there are different special configurations dependent upon the needs.

Audio Characteristics

Cameraman

Connection for headset on camera head

Engineering intercom:
CAM ⟷ remote control unit
CAM ⟷ camera control unit
CAM ⟷ production control
CAM ⟷ dolly
Programme sound:
Production control ⟷ CAM

Headset
All inputs −10 dB m
All outputs + 6 dB m
Inputs and outputs from and to production control = + 6 dB m
Input and output at remote control unit −10 dB m

Frequency response (without headset) = 300 Hz up to 3kHz −3 dB
Harmonic distortion factor total ≤ 3%
Signal-to-noise ratio ≥ 40 dB

Dolly

Connection for headset on camera head

Engineering intercom dolly ⟷ CAM
Engineering intercom operation → CAM and Dolly
Engineering intercom production control → Dolly
Programme sound production control → Dolly
Camera Control Unit → Dolly

All inputs −10 dB m
All outputs + 6 dB m

Frequency response without headset 300 Hz up to 3 kHz −3 dB
Harmonic distortion factor total ≤ 3%
Signal-to-noise ratio ≥ 40 dB

Reporter

Connection for headset on camera head

Programme sound production control → reporter
Production intercom reporter ⟷ production control

All inputs −10 dB m
All outputs + 6 dB m
Inputs and outputs from and to production control +6 dB m

Frequency response without headset 300 Hz up to 3 kHz −3 dB
Harmonic distortion factor total ≤ 3%
Signal-to-noise ratio ≥ 40 dB

2 Microphone Channels

Inputs Mic I and Mic II on camera head

Connections for:
a) Dyn. microphone
b) Condenser microphone
Feed b):
T 12 audio signal feed 12 V
P 48 phantom feed 48 V

Level switch-over:
UE = −75 dB m
UE = −65 dB m
UE = −50 dB m
UE = −35 dB m
UE = −20 dB m
UE = − 5 dB m
with overload indication

Switchable dynamic compressor
Frequency response: 20 Hz up to 15 kHz −3 dB
Total harmonic distortion ≤ 1%
Unweighted s/n ratio ≥ 50 dB
Outputs to production control +6 dB m

Service Intercom:

Camera Control Unit ⟷ Remote, Set-Up Control Unit
Camera Control Unit ⟷ Production Control
Production Control ⟷ Remote, Set-Up Control Unit

When the camera chain is switched off, service communication between the camera head, CCU and operating unit is possible with limited data, provided the supply voltage is present at the mains cable of the CCU.

In this case beside the intercom the calling facility is still acting in Multi and in Triax versions.

General

Power supply

220 V $^{+25\%}_{-18\%}$, 50/60 Hz

110 V $^{+25\%}_{-18\%}$, 60 Hz

Total power consumption approx. 300 W

Ambient temperature (head)
Adherence to specifications −20°C to +50°C
Stability:
Constant transmission characteristics for ranges of +/− 10°C within the above temp. range
Relative humidity 93% max.
Air pressure 600 h Pa (4000 m above sea-level)

Dimensions

Camera head (excl. lens)

Height (mm)	Width (mm)	Length (mm)	Weight (kg)
440	310	565	33

Camera Control unit

Height (mm)	Width (mm)	Length (mm)	Weight (kg)
195	518	500	30

19" or DIN cabinet or rack installation

Video-Characteristics

Colour TV standards	PAL, SECAM 625/50 NTSC, PAL-M 525/60
Pick-up tubes (R, G, B)	3×1" Plumbicon (XQ 3070, XQ 3075), LOC, diode gun with bias light and ABC
Signal to noise ratio* γ = 1, unweighted, 40% level R+S method, with colour subcarrier trap, without aperture and without contour correction and without Blackstretch	56 dB (PAL, SECAM), typical 58 dB NTSC, PAL-M), typical
Resolution*	Typical 60% (without aperture and contour correction)
Modulation depth with 5 MHz test picture	100% (with aperture correction)
Limiting resolution	> 700 lines in picture centre
Sensitivity* Re-emission for white = 89,9% Colour temperature 3200 K. Gain 0 dB	630 Lux/f 2,8
Max. sensitivity* Colour temperature 3200 K. Gain + 18 dB	30 Lux/f 1,6
Max. aperture Camera input	f 1,5

Inputs

1 × Genlock CCVS or Black Burst	1 V_{pp}/75Ω
1 × NCVS-ext. Oscilloscope (reference signal)	0,7 V_{pp}/75Ω
1 × (C)CVS-ext. Monitor	1 V_{pp}/75Ω
2 × (N) C(C) VS viewfinder (Ext)	0,7 (1,0) V_{pp}/75Ω
1 × CVS-Aux. AUX Video	1 V_{pp}/75Ω

*depending on tube

Gain	−6, −3, 0, +6, +12, +18 dB
Frequency response G	+/− 0,5 dB up to 5 MHz
Pulses response	50 Hz ≤ 2% 15 kHz ≤ 1% 250 kHz ≤ 1%
Linearity (without aperture and contour correction.)	≥ 0,95
Gain control (R, G, B)	50% to 200%
Black level (R, G, B)	+/− 10%

Outputs

4 × CCVS	1 V_{pp}/75Ω	
2 × NCVS for R, G, B respectively	0,7 V_{pp}/75Ω	
1 × CVS, Y	1 V_{pp}/75Ω	"analogue components"
1 × NCVS, P_B for 100/0/100/0 colour bar achromatic, at 0 V DC	0,7 V_{pp}/75Ω	
1 × NCVS, P_R for 100/0/100/0 colour bar achromatic, at 0 V DC	0,7 V_{pp}/75Ω	
1 × NCVS for R, G, B resp. for Chromakey only	0,7 V_{pp}/75Ω	
2 × NCVS special measurement signal for oscilloscope	0,7 V_{pp}/75Ω	
2 × NCVS special measurement signal for picture monitor	0,7 V_{pp}/75Ω	
Raster geometry without taking into account the residual lens error after lens error correction	Zone 1: 0,2%	
Registration deviation without taking into account the residual lens error after lens error correction	Zone 1: 0,0625% (≤ 25 ns) Residual image: 0,125% (≤50 ns)	

BTS Broadcast
Television Systems GmbH
Robert-Bosch-Straße 7
P.O. Box 110261
D-6100 Darmstadt
Fed. Rep. of Germany
Phone: 0 61 51/808-1
Telefax: 0 61 51/89 44 63
Telex: 419 256

BTS Broadcast
Television Systems Inc.
900 Corporate Drive
P.O. Box 618
Mahwah, New Jersey 07430, USA
Phone: (201) 529 1550
Telefax: (201) 529 5843
Telex: 0233 762 558

BTS Broadcast Television Systems GmbH

A joint company of Bosch and Philips

5.87 – 5 (SD) VFW Printed in the Federal Republic of Germany Sachnummer 0 981 100 013