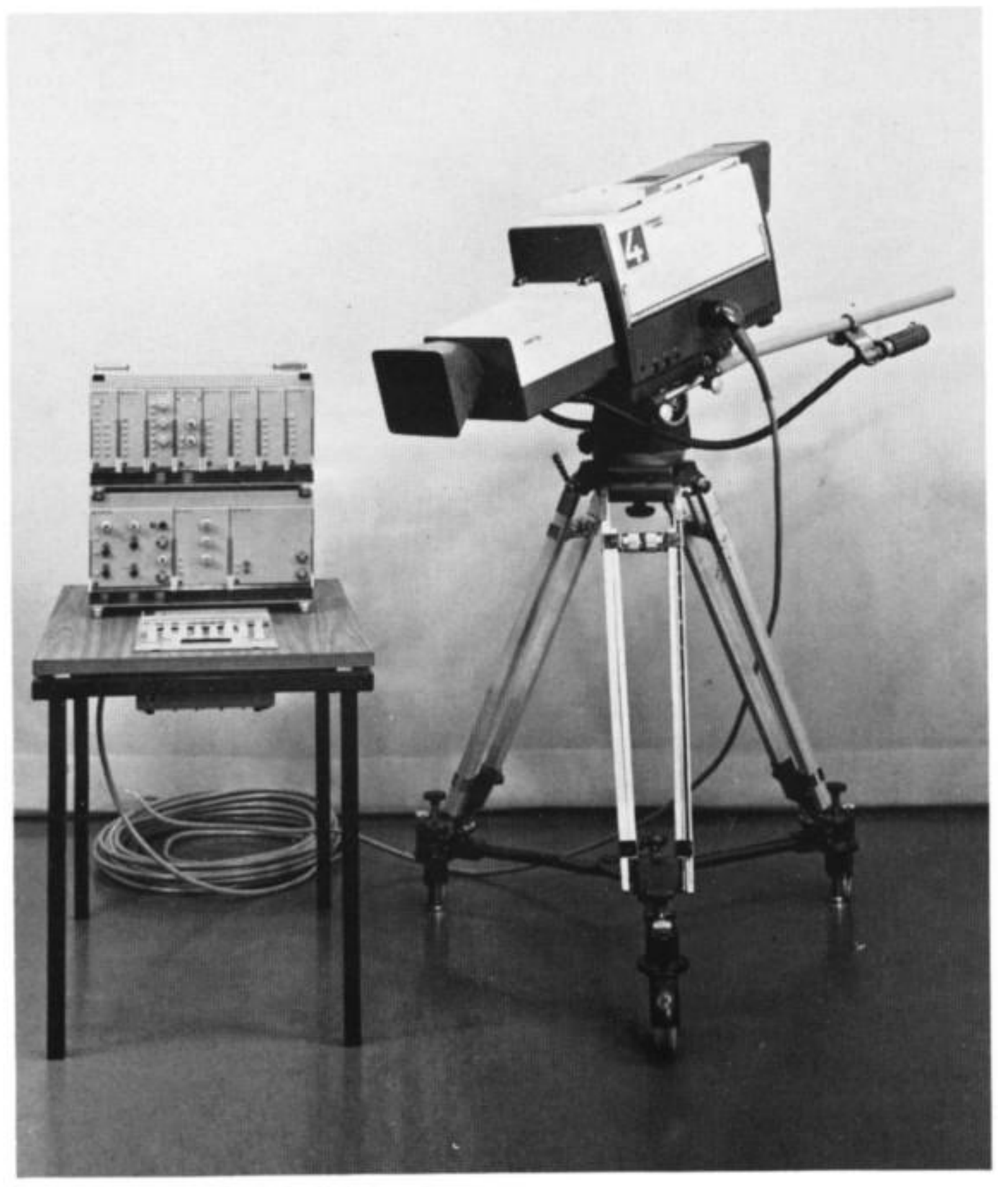
FERNSEH KCU 40 Color TV Camera

KCU 40

KCU – a highly flexible color TV camera of universal application



Since its introduction in the spring of 1969 the universal colour TV camera KCU has won unprecedented acceptance. Hundreds of cameras are operating to the satisfaction of our customers all over the world.

The camera is known worldwide for its perfection and is equally popular with people in the technical and artistic fields. It offers clean and advanced styling (E. Slany DID). Its external features are attractive and operations-oriented.

Some of its most outstanding features are:

Its **high light sensitivity, high S/N ratio, fidelity of reproduction** of color pictures and **extreme stability** under day to day operating conditions.

Additional development work and wide experience have led to substantial improvements and innovations.

The design of the camera based on the universal unit system allows optimum adaptation to the most varied operating conditions and to the latest state of the art. New units and accessories can be added or interchanged. For cameras already in service there are a large number of additional features available. This will also apply to all the future improvements which are under development. Because of these features it can be truly said that the KCU is the most advanced state of the art color camera.

True separate luminance system with only three tubes

In conjunction with a four-channel amplifier the optical system (WRB) chosen offers all the advantages of the three-tube principle, in addition to the operating advantages of a four-tube camera, e.g.

- High sensitivity due to wide spectral response white channel
- Superior definition is achieved through utilization of a white channel
- Gain and gamma control only in the luminance channel during operation, therefore transmission of extreme picture contrast is possible without introducing errors in the color channels
- Visible registration errors reduced to minimum; high-quality compatible black and white picture

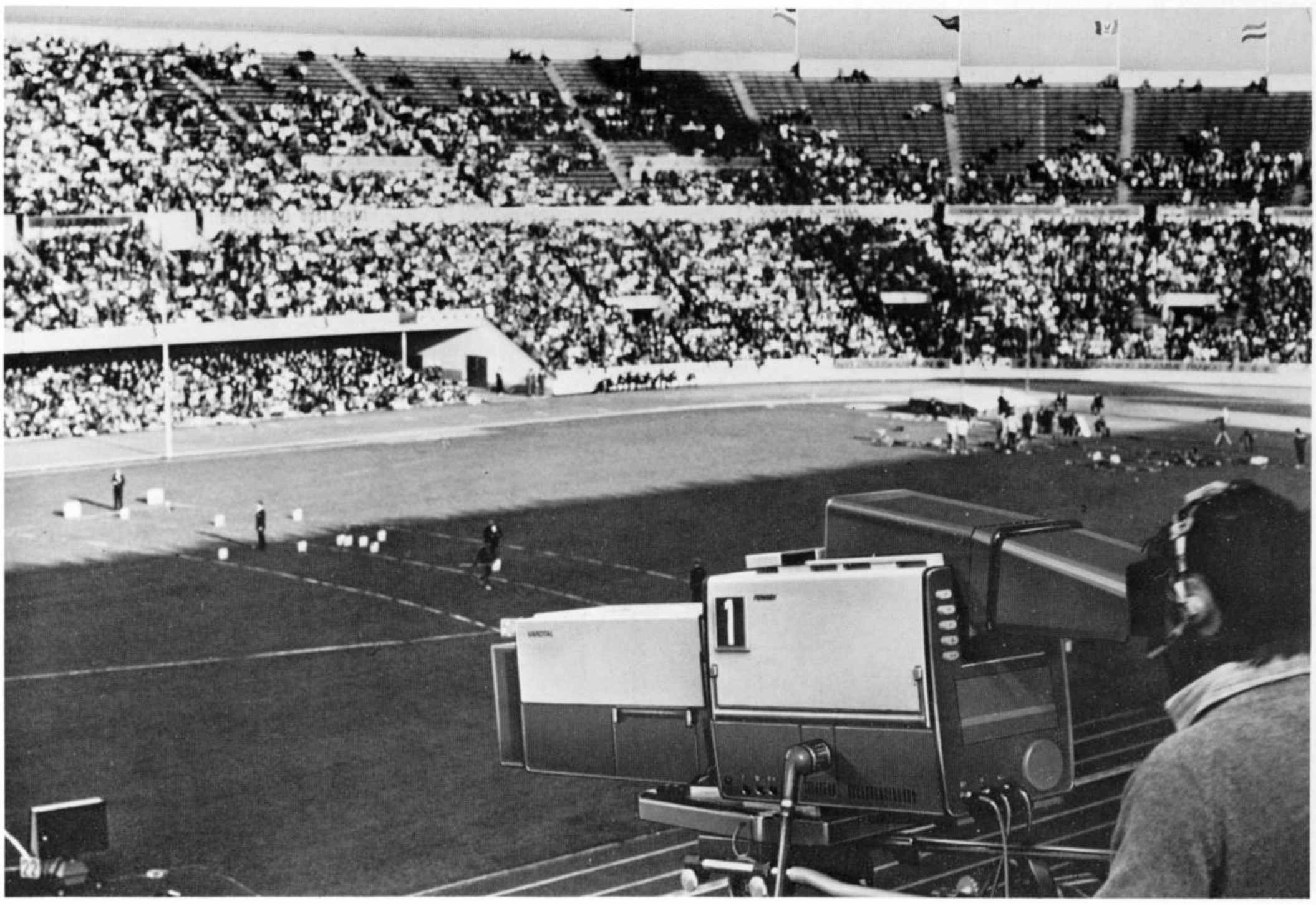
Highly satisfactory picture quality; high S/N ratio

The KCU is characterized by high light sensitivity enabling **perfect picture quality** to be transmitted at light levels down to 5 foot candles.

The pictures of the KCU are distinguished above all by **superior definition and high S/N ratio** due to minimum optical losses and a very low noise amplifier design.

Optimum definition is achieved among other things by an additional horizontal and vertical **aperture corrector with comb filter.**

Smaller image size in the blue channel as well as special design of the deflection assemblies reduce lag, resulting in better picture quality over the entire range of operation.



Proven optical system providing optimum color rendition

For light splitting a **prism beam splitter** with steeply inclined dichroic faces is used. This space-saving prism arrangement results in a minimum of optical errors for the white channel. Optimum color reproduction is achieved by choosing the proper transmission curves in conjunction with close optical tolerances.

The **linear electronic matrixing** of the color components also reproduces the negative components of the colorimetrically required color mixing curves.

As a means of adjustment a **slide projector** is available whose test pattern is projected into the prism. The same test projector is also used for projecting the bias light.

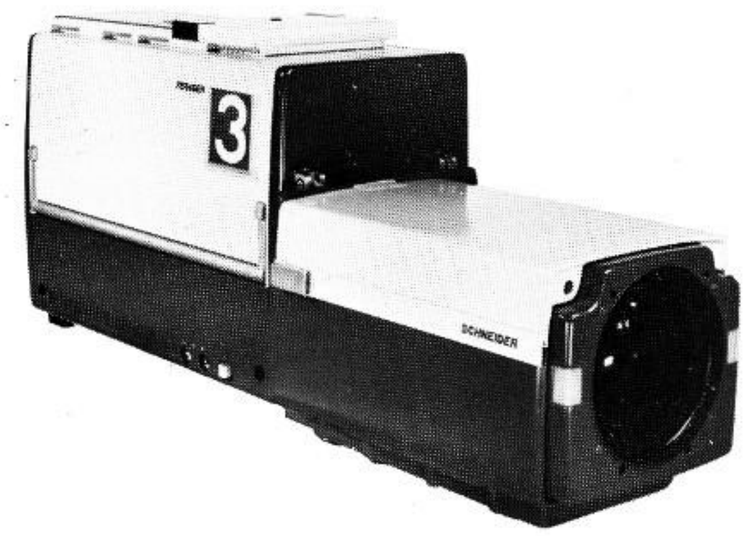
For adapting to outside illumination and changing color temperature a filter wheel equipped with five filters and lenscap is incorporated in the camera head in addition to an **electronic conversion** circuit of 3000 K to 7000 K. The change can be remote-controlled and is indicated digitally at the operating control position (important for automatic studios).

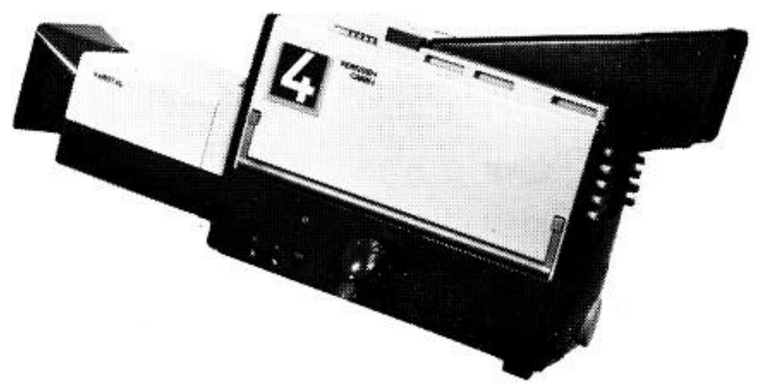
It is possible to choose freely among **a variety of lenses presently available** on the market, since the lens is not an integral part of the camera.

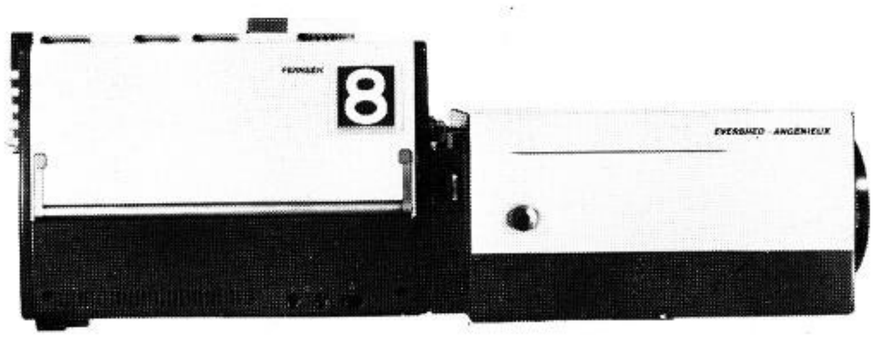
Zoom lenses from all leading manufacturers are available for this camera. The lenses are provided with a quick-change lock permitting convenient and fast interchanging without tools and without re-adjustment.

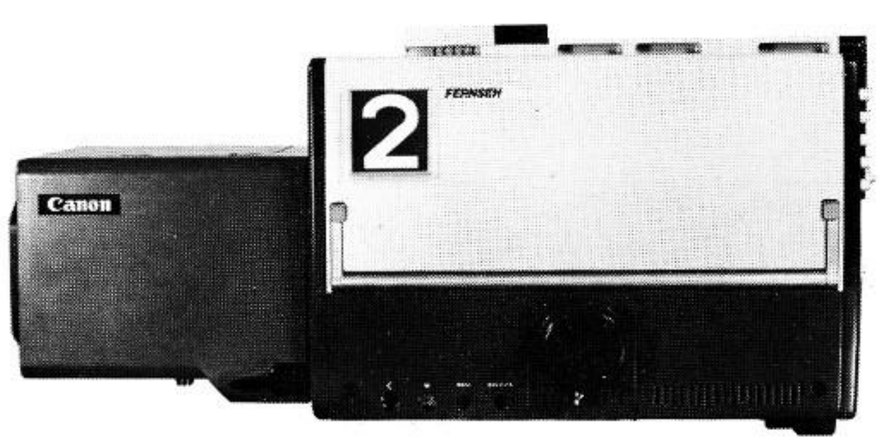
Each lens can be supplied with or without servo facilities. Indication of the taking angle (zoom control) is provided in the viewfinder picture and on the servo operating control unit.

Thanks to the **excellent light sensitivity** of the camera the same performance is assured when using considerably smaller and lighter zoom lenses, such as Varotal XXIIa and Angénieux L 11.









Setting of registration with high long-term stability is no problem

The registration of the three pick-up tubes can be checked and re-adjusted with a novel local or remotely operated set of registration controls on camera head and operating control console which maintain adjustment even with the camera switched off.

Compact, tiltable electronic viewfinder

The viewfinder can be tilted upwards and downwards and easily interchanged as a separate plug-in unit. A high peak light output can be set. High peaking in three steps is available on a switch on the viewfinder.

The viewfinder can be driven by either an internal, an external or a combined video signal.

No cable problems due to a variety of connection facilities

The standard cable for the KCU has a diameter of only approx. 1/2" and is therefore light and very flexible. It can be used up to a length of 2500 ft. A particularly thin and light special cable with a diameter of 1/4" for lengths up to approx. 300 feet can be supplied.

In addition, nearly all commercially available color and black and white camera cables can be connected with the aid of an easily interchangeable adapter. 3/4" cable can be used in lengths up to 3700 feet.

The camera cable plug with practical quick-change lock is small and convenient.

Special features of the KCU increasing its usefulness

Two additional **connections for narrator and background sound microphones** are provided on the camera, in addition to the intercom (either two-wire or four-wire system). The usual cameraman/video operator red/green signalling system with push buttons at each end is also provided between camera and operating control unit with an audible buzzer at the control end. The **power outlet (117 V) on the camera** for service, lighting or heating for cameraman has proved very useful in practical operation. Also an outlet socket is provided for an **announcer monitor** with studio output picture or **on-air signal.** (Required accessories: monitor modulator and demodulator).

The camera has been designed so that it can be included in **automatic broadcast studio operations.**

All the facilities required for connecting an **automatic computerized test system** are provided.

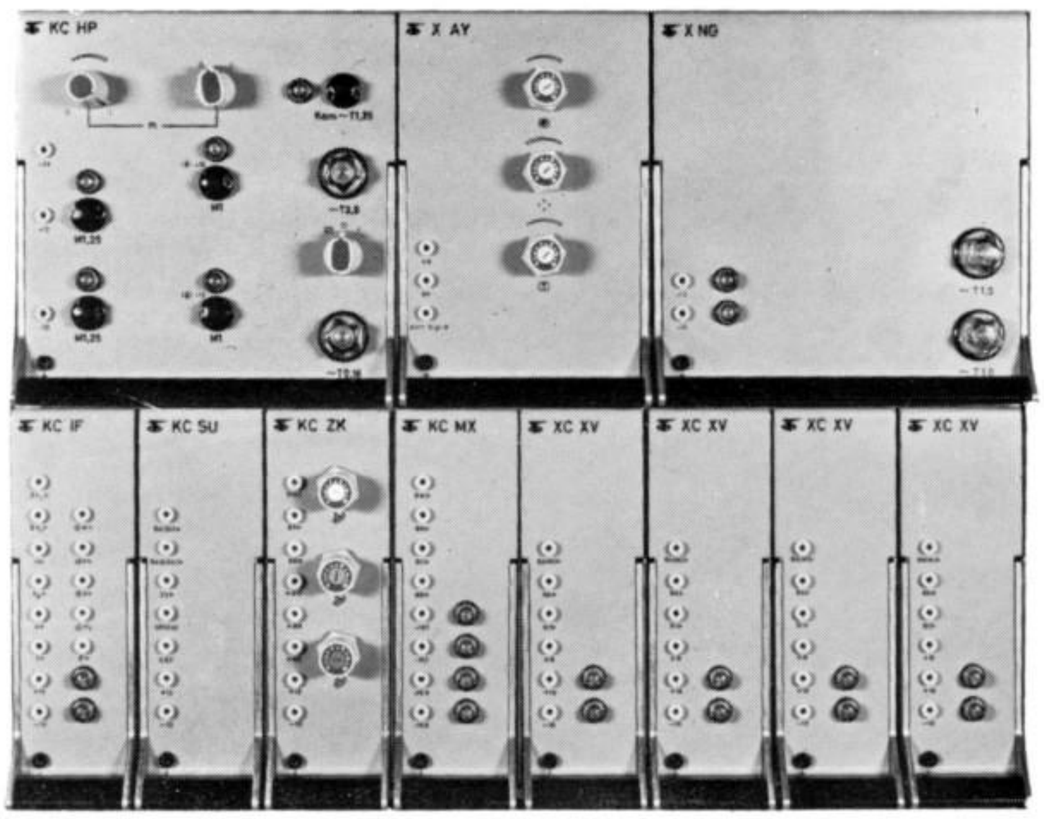
Maximum ease of maintenance due to interchangeable block unit construction

In spite of the **compact and lightweight construction,** maintenance is extremely simplified due to the unit layout.

Special emphasis has been placed on **easy accessibility** of all the components.

The individual circuits in the form of **plug-in cards** are grouped into plug-in units. They are protected against physical shock by use of mounting plates with printed cable harness, so that good contact is assured under all conditions.

The **set of amplifier modules** in the KCU color TV camera is of this same proven plug-in unit construction providing optimum performance.

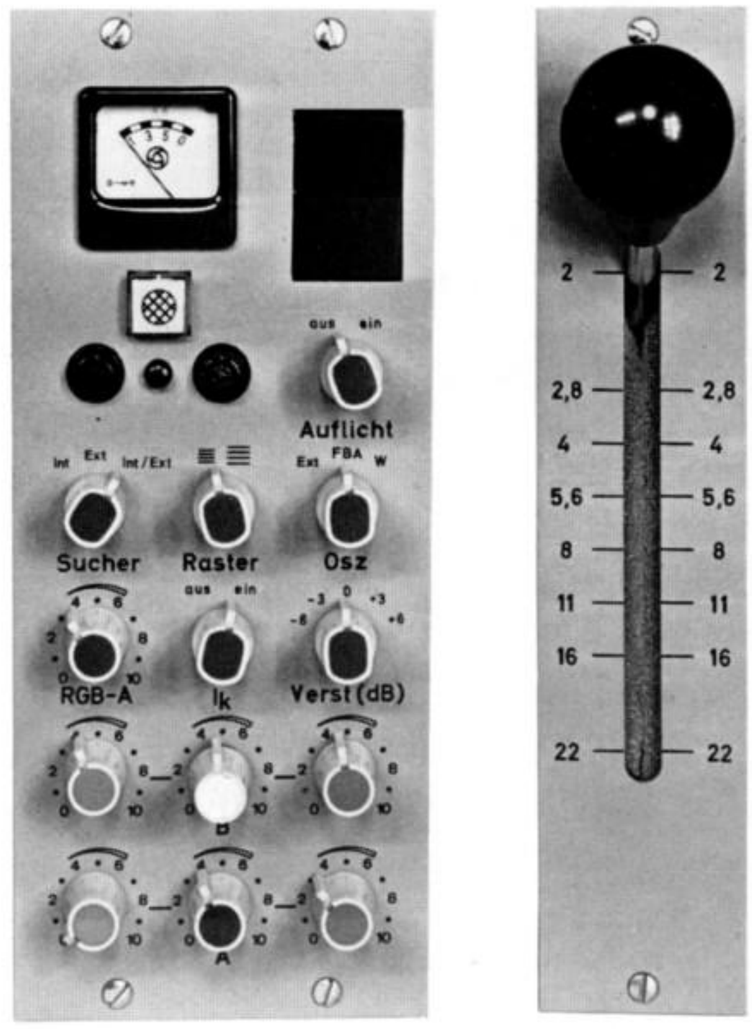


Compact modular design of the operating control units

The KCU controls can be supplied in different versions depending on the particular application of the camera.

In addition to the well-known and proven panel type, a compact type (module) was developed **for use in remote trucks.** It is thus possible to organize the operating control positions as desired. The main and local operating control units can be placed up to 600 feet away from the central camera position.

It is also possible to combine several operating control units into a **central operating console** for controlling several cameras from one location.



Accessories permit a variety of combinations

Depending on the particular use the KCU can be modified to a universal camera by a number of accessories satisfying all operational requirements:

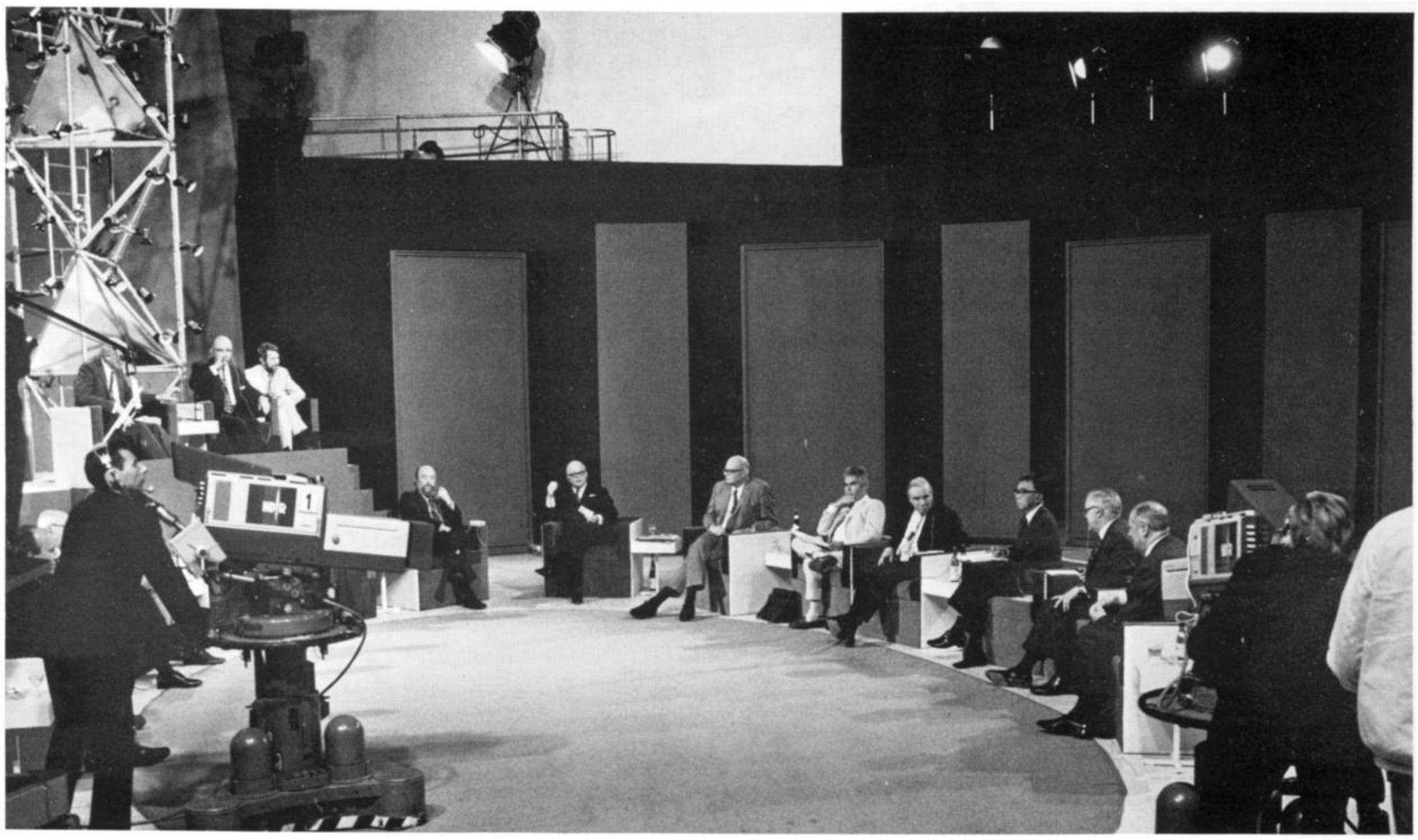
Color Comp Unit
The color comp unit opens new perspectives in the field of color picture designing. This unit is readily interchangeable with the linear matrix and permits the color reproduction of the camera to be influenced within certain defined color areas. Hue and saturation of the colors R, G, B, yellow, cyan, magenta can be changed by means of six controls each. Neutral, white or grey picture areas are not affected.

Dark desaturation
The color saturation in the shadows of the picture to be transmitted can be reduced by means of this accessory unit and minor particularly disturbing black level errors reduced to a minimum; these are further possibilities of picture designing.

Aperture corrector
The correction unit uses the comb filter principle in the horizontal and vertical range. The HVC aperture corrector gives particularly sharp pictures without reducing the S/N ratio appreciably.

B/W balance "Autocolor"
When called off, "Autocolor" enables the automatic black and white balance of the amplifiers to be adjusted and thus guarantees optimum colour reproduction, e.g. in the case of electronic conversion of outside broadcasts.

Registration correction unit "Autoregist"
An automatic registration unit "Autoregist" is also available where extremely long-term stability is called for, particularly for fully automatic studios. With the help of a simple test pattern the unit automatically corrects centring, size, linearity and skew both in horizontal and vertical direction. Dynamic correction of the centring function (autocentring) according to picture content is possible during normal operation of the camera. The most disturbing centring errors are thus corrected continually.



Technical Data

System:	3-Tube Separate Luminance	(Plumbicon® Tubes)
Dimensions:	Camera without lens Height: 375 mm Width: 265 mm Length: 540 mm	Amplifier chain with box Height: 440 mm Width: 440 mm Depth: 444 mm
Weight:	75 lbs approx. (without zoom lens)	55 lbs approx. (with connecting plates)
Power Supply:	117/220 V $^{+5\ \%}_{-10\ \%}$ 60/50 Hz	approx. power consumption 650 VA (without monitor and oscilloscope)
TV-Standard:	525/625 lines	U.S. standard or CCIR
Frequency Response:	Luminance channel Red channel Blue channel	± 0.5 dB up to 5 MHz −1 dB up to 3 MHz −4 dB up to 3 MHz
Pulse Response:	50 Hz 15.6/250 kHz	⩽ 2 % ⩽ 1 %
Differential Gain:		⩾ 0.95
Gain Control:	Fine-tuning control for each channel Coarse-tuning control in 5 steps	± 40 % −6 dB, −3 dB, 0 dB, +3 dB, +6 dB
Black-Level Adjustment:	Separate control for adjustment of each channel (Y, R, G, B) Master control for adjustment of R, G, B	−20 % + 30 % at γ = 1 ± 5 % at γ = 1
Sensitivity:	Reflection coefficient for white = 60 %, at 750 lux, colour-temperature 3000 K	Aperture 4
Resolution:	Depth of modulation when transmitting 400 lines	with aperture correction: adjustable 100 %
Signal to Noise Ratio:	Measured at γ = 1 and 40 % level, sensitivity and resolution as stated above	⩾ 45 dB, unweighted
Registration Accuracy:	Within a circle of 0.9 of the picture height	⩽ 40 nsec deviations
Raster Geometry:	Deviations without faults of lens	⩽ ± 0.5 % (zone 1)
Ambient Temperature:	Permissible ambient temperature	−20° to +45° C
Stability:	No disturbing alteration of the transmission characteristics over the range of ± 10° C anywhere	Colour registration and colour matching are maintained with such accuracy that under normal studio conditions no readjustment is required.

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