

CAMERA CHANNEL

Type 203

The Camera Channel Type 203, using the 4½-inch Image Orthicon or 3-inch Image Orthicon pick-up tube, produces broadcast quality television signals on 405, 525, or 625 line systems.

FEATURES

- * *Five-position turret including one special position for:*

*Easy withdrawal of pick-up tube through
turret without opening camera sides
and
Mounting diascope or additional lens.*

- * *Lens counterbalance weights are available.*
- * *Smooth lens change and accurate location ensured by a non-linear turret drive and locking pin.*
- * *Accommodates TTH Studio Varotal or Zoomar Zoom lens without modification.*
- * *Operates, by simple change of plug connectors, on any one of the following systems:*
 - 625 lines to CCIR/OIR standards.*
 - 525 lines to IRE/EIA specifications.*
 - 405 lines to BBC/TV80 specification.*
- * *Extensive use of plug-in printed wiring sub-units provides very good accessibility and ease of maintenance.*
- * *Special quality valves and high stability circuits eliminate need for adjustment over long periods of operation.*
- * *Remote control of all lens apertures by easily detachable servo mechanism.*
- * *Camera control unit and power supply can be mounted side by side in standard 19-inch (480 mm) rack and take up only 21 inches (530 mm) in rack height.*
- * *Separate control panel contains no valves.*
- * *Camera can be balanced to suit lens complement, including zoom lens, by means of adjustable wedge.*
- * *Built-in 7-inch (180 mm) electronic viewfinder.*
- * *Variable aperture correction.*
- * *Test saw-tooth generator incorporated to facilitate setting up and checking amplifier circuits.*

- * Built-in quiet cooling fan and thermostatic control system ensure correct pick-up tube temperature.
- * Low weight and compactness achieved by extensive use of magnesium castings and printed wiring sub-units.
- * Pre-set station filter wheel and integral electronic image orbiting device.
- * Periscope viewfinder hood (optional) aids cameraman on high and low angle shots.

CONSTRUCTION

The basic units of the Camera Channel 203 are:

Camera Type 203/6, 203/5, 203/2, or 203/8**
Camera Control Unit Type 213/2
Control Panel Type 215
Power Supply Type 223/2
Viewfinder Hood Type 858

Recommended and optional ancillary units are listed in the Schedule of Equipment on page 13.

Camera (All versions)

Camera Body and Viewfinder

The camera is constructed of lightweight alloy (finished in two tones of green enamel), and is fitted with hinged top covers and detachable side covers. When the top covers are lifted the electronic components are exposed and the viewfinder tube can easily be removed. Removal of the right-hand side-plate enables the yoke and focus mechanism to be serviced or replaced. The left-hand side-plate (colloquially the junction box) carries the camera cable plug, all the associated filtering circuits, the camera scan reversal switches, and access points for test facilities. Sockets on the base of the camera provide video signal and on-air cues for the tracker's monitor. Talk-back outlets and controls, and a main services socket, are on the back of the camera. The camera is mounted on a pan-and-tilt head by means of a standard Vinten wedge. A series of tapped holes (dia. 0.375 in.) can be provided in the wedge to facilitate mounting the camera on U.S.A. - type tripods. The wedge, at the base of the camera, is adjustable to enable correct camera balance to be achieved for different combinations of lenses. Handles are fitted low on each side of the camera body to facilitate lifting onto a tripod; two more carrying handles are provided on the top.

The viewfinder uses a 7-inch (180 mm) rectangular cathode ray tube (Mullard SW17-20) mounted flush with the back of the camera. It provides a large bright picture requiring no optical magnification. A medium-length adjustable Viewfinder Hood Type 858 is normally supplied. It is balanced so that light pressure on the forehead moves it to the required position. An adjustable Periscope Viewfinder Hood Type 859 which facilitates operation of the camera at acute angles of tilt, and a short 'eye-brow' Viewfinder Shade Type 857, are also available. A turret position indicator and an 'on-air' indicator can be seen by the cameraman when these hoods are used. The 'on-air' signal is repeated at the front of the camera, below the taking lens. For iris control the iris gear segments of the lenses are connected and driven together by a remotely-controlled geared servo motor. Manually-operated clutches are provided on the drive gears to permit the lens irises to be set by hand in the event of servo failure. A manually-operated filter wheel carries filters of neutral density 1.0 and 2.0, and a 'minus blue' for improved definition of clouds. Stops are provided between filter stations for 'capping-up'.

** CAMERA TYPE 203/2 IS 3-INCH I.O. 240V 50 c/s VERSION
CAMERA TYPE 203/5 IS 4½-INCH I.O. 115V 50 c/s VERSION
CAMERA TYPE 203/6 IS 4½-INCH I.O. 240V 50 c/s VERSION
CAMERA TYPE 203/8 IS 3-INCH I.O. 115V 50 c/s VERSION

Lens Turret

The turret is a lightweight alloy casting mounted on a tubular shaft which extends from front to back of the camera. One turn of the turret operating crank, located on the right-hand side of the camera, moves the turret from one of five stations to the next. The drive is taken through a special gear arrangement which gives a 60° dead arc at the control handle. Within this arc, positive locking of the turret position is effected by a locking pin. The optical axis alignment in the locked position is within 0.5% of the picture width. An indicator dial at the back end of the turret shaft enables each turret station to be readily identified. Indicator lamps are also visible in the viewfinder hood.

Four of the stations are on the main body of the turret; the fifth is on the removable sector. Alternative removable sectors house either a fifth lens position, a diascope, or a blanking patch. The diascope mounts 2 in. x 2 in. (50 mm x 50 mm) slides and is illuminated when it is brought into the taking position. Control of light level is effected by means of the manual iris control. The turret accommodates all known television lenses fitted with a mount to B.B.C. Specification TV88.

The removable sector of the turret permits the pick-up tube to be inserted without disturbance of the main structure of the camera. This feature reduces unbalanced loads on the panning head whilst installing the pick-up tube and eliminates the risk of misaligning the mechanical and optical axes. The pick-up tube can be changed without opening either of the camera side covers.

Focus Mechanism

The yoke is mounted close to the base of the camera and is supported on P.T.F.E.-lined bearings. The drive mechanism is operated by means of a capstan-type handle located on the right-hand side of the camera and uses a worm gear adjusted to eliminate backlash. It produces an approximation to a cosine law movement so that focusing sensitivity is maintained over the range of wide-angle lenses normally used. Two turns of the handle produce the first inch of yoke movement required to bring an object 10 inches (250 mm) wide into focus with an 8-inch (200 mm) lens at a distance of 6 feet (1800 mm). The total range of travel is 2.35 inches (60 mm) which enables an object 21 inches (530 mm) wide to be brought into focus with a 40-inch (1000 mm) lens at a distance of 60 feet (18 m). The complete yoke can be removed from the camera without disturbance of the turret mounting and drive mechanism, and the particular yoke suitable for the type of tube to be used can easily be fitted. Optical alignment is maintained when the mechanism is re-fitted to the camera.

A mask (normally measuring 42 mm diagonally) is mounted in contact with the pick-up tube face-plate. It defines the size of the patch to be scanned and facilitates the process of setting up. The dimensions of the mask can be changed, on request, to meet requirements.

Camera Control Unit 213/2

The Camera Control Unit 213/2 consists of nine plug-in printed wiring sub-units and a chassis mounted on a frame-work which rests on telescopic runners in a Standard Case Type 197**. The runners allow the unit to be fully withdrawn for ease of servicing. Frames are available to enable two control units, or one control unit and one power supply, to be mounted side by side in a standard 19-inch (480 mm) rack.

** DESCRIBED IN SEPARATE BROCHURE 8/MEM

The framework of the unit comprises front and rear panels connected by a base-plate and upper, central, and lower channel members. The plug-in printed wiring sub-units are mounted vertically on the channel members, all components being immediately accessible. Component identities are clearly marked. Electrical connection from the rear panel of the framework to the rear panel of the case, which carries the camera cable connector and the connectors for power input, pulse input, control panel and communication circuits, is by means of two flexible swan-neck cableforms. An extractor fan on the rear panel ensures that low temperatures are maintained within the unit.

Control Panel 215

All the controls necessary for setting up the camera tube and for the operational control of the channel are mounted on the Control Panel 215. The panel is connected by two multi-way cables to the camera control unit. Only passive circuits are incorporated and the layout is designed for ease of operation. The panel can be used either with or without Remote Control Panel 881.

Power Supply 223/2

The Power Supply 223/2 is mounted on telescopic runners in a Standard Case Type 197 in a similar manner to the Camera Control Unit 213/2. The base-plate carries the transformers, chokes, and condensers, and a chassis above these contains the electronic stabilizers. A detachable servo-amplifier unit which powers the camera iris drive motor is mounted above the main chassis. Semi-conductor rectifiers are used throughout, mounted in such a way that they obtain the maximum possible cooling. The front panel carries switches (including the camera tube pre-heating switch), fuses, indicator lamps, and the pre-set controls for adjustment (with the aid of a built-in meter) of the stabilized h.t. voltages. An extractor fan is incorporated.

Remote Control Panel 881

The Remote Control Panel 881, an optional extra item, carries only those controls necessary for programme operation; up to six panels can be mounted side by side in a vision control desk.

Iris and lift controls are combined in a 'joystick' control. Rotation of the knob operates the iris mechanism. Movement of the knob in a quadrant mode controls black level with gain compensation. A three-position switch for coarse iris settings, used in conjunction with the iris control, enables the lens iris range to be covered from $f/2.8$ to $f/22$. There is also a separate fine gain control, and a pre-set gamma switch with five positions: Law 2, Law 1, Linear, Black Level - 10%, and Set Black Level. The Law 2, Law 1, and Linear positions are remote positions of the Gamma Selector on Control Panel 215. The Black Level - 10% position provides a fixed amount of negative lift (10% of picture amplitude). The Set Black Level position provides a variable amount of negative lift as set by the pre-set potentiometer. The Black Level - 10% and the Set Black Level positions have linear gamma characteristics.

The panel also contains a cue lamp, 'call camera' button, 'control here' lamp and a non-available/available switch.

Camera talk-back is fed from the Control Panel 215 on a separate cable and is looped through the Remote Control Panel 881.

A Talk-back Switch Panel (22407), also available as an optional extra item, can be plugged into the Remote Control Panel 881 to enable one head-set to be switched into up to six camera channels.

CIRCUITS

Camera

Synthetic resin boards with printed wiring are used to the fullest possible extent for the pre-amplifier, output amplifier, blackout mixer, viewfinder amplifier, image orthicon e.h.t. supply and safety circuit, and the camera tube heat control unit. The camera line scan is on a metal chassis.

The iris control servo motor is energised by an amplifier in the Power Supply 223/2 and is controlled by a potentiometer on the Control Panel 215. The system works on a position-position basis.

A pre-heating coil is incorporated in the image orthicon scan yoke to maintain correct tube working temperature. Thermostatic control is provided. The system can function independently of the l.t. or h.t. supplies. A camera tube heater switch and an hour counter are provided.

The viewfinder is fed with either composite or non-composite signals from the camera control unit. The signal amplifier is a printed wiring sub-unit, and the line scan and e.h.t. circuit is on a metal chassis. The field scan is fed from the camera control unit.

A camera overscan switch (giving 5% overscan) is provided for use during setting up and rehearsal.

A transistorized talk-back amplifier (213213) is provided for use when an increased level of communication is required. It consists of three separate amplifiers which provide high-level talk-back for:

- (a) Producer to camera and camera control unit.
- (b) Camera control unit to camera.
- (c) Camera to camera control unit.

It is plugged into the camera control unit; a shorting plug completes the camera channel talk-back circuits when the amplifier is not employed.

Camera Control Unit 213/2

The printed wiring sub-units incorporate the following circuits:

1. Variable aperture corrector, gain control stage, and cable loss correction amplifier.
2. Amplifier and clamp.
3. Gamma corrector and clamp, providing three alternative characteristics of gamma:- linear, 0.7 or 0.5.
4. Blanking and sync amplifiers and black level pulse generator.
5. Output amplifier.
6. Line timing and camera line drive pulse generator.

7. Field scan for camera tube and field scan for viewfinder tube.
8. Line and field shading generator and test sawtooth generator.
9. Field pulse generator.

Pre-set controls are provided for cable length compensation, variable aperture correction, d.c. output level, clamp pulse width, synchronizing pulse amplitude, and peak white limiter.

The output stage supplies either two composite or two non-composite signal outputs at 1.0V or 1.4V standard levels into 75 ohms impedance.

Control Panel 215

Operational controls:

- Iris
- Black Level
- Gain
- Horizontal Shading
- Vertical Shading
- Gamma Selector
- Available/Not Available

Camera tube pre-set controls:

- Target Voltage
- Beam Current (coarse and fine)
- Beam Focus (coarse and fine)
- Alignment 1 and 2
- Multi-focus
- Field Mesh
- Image Focus (coarse and fine)
- Height
- Width
- Horizontal Shift
- Vertical Shift
- Focus Modulation (Type 203/2 only)

Other facilities:-

- Talk-back outlets
- Producer and Camera Volume controls
- Overscan/Normal switch
- Beam Off
- Image Off
- Focus Rock
- Channel test switch
- Viewfinder switch
- Remote/Local switch
- Gamma Law 1 and 2 pre-sets
- Call Camera button
- On-air cue lamp
- Available cue lamp
- Call Control lamp and buzzer

Power Supply 223/2

The Power Supply 223/2 contains the shift supplies, the focus current and voltage stabilizers, and the iris control servo amplifier. It provides the following h.t. supplies for the complete channel:

- + 340V smoothed, 280 mA
- + 230V stabilized, 520 mA
- + 150V stabilized, 125 mA
- 150V stabilized, 260 mA

DATA SUMMARY

Systems

405 lines (B.B.C./T.V.80)	50 fields/second
525 lines (I.R.E./E.I.A.)	60 fields/second
625 lines (C.C.I.R./O.I.R.)	50 fields/second

Power Input

90V to 140V, r.m.s., 50 c/s to 60 c/s, single phase
or
205V to 255V, r.m.s., 50 c/s to 60 c/s, single phase
Permitted variation: $\pm 5\%$
Consumption: 950 VA

Channel Outputs

Two composite outputs at standard level, (0.7V picture, 0.3V sync, or 1.0V picture, 0.4V sync)

or

Two non-composite outputs at the same level.

Pulse Inputs

Mixed sync, mixed blanking, line and field drive at -1.5V to -6.0V. All pulse inputs are high impedance.

Sensitivity

Maximum use is made of the sensitivity performance of the pick-up tube used. Losses in neutral density filters are eliminated by use of remote iris control. Figures for the E.M.I. Electronics and the English Electric $\frac{4}{2}$ in. I.O. and 3 in. I.O. tube sensitivities are applicable.

Frequency Response

Without aperture correction the channel response is flat within ± 1.0 dB to 7 Mc/s. The camera amplifier response is flat within 0.5 dB to 6 Mc/s. Variable phaseless aperture correction is incorporated to counteract variations in pick-up tubes. It is adjustable from 6 dB to 12 dB, peaking at 4.5 Mc/s on 405 lines and at 6.5 Mc/s on 525 and 625 lines.

Resolution

With aperture correction adjusted for optimum performance, the following resolution can be expected with typical tubes, using a square-wave optical pattern. Column A is the response in a central circle, the diameter of which is equal to 0.8 of picture height. Column B is the response in an area outside the central circle, but within a circle the diameter of which is equal to picture width.

	A	B
<i>405 lines (pattern equivalent to 3.0 Mc/s)</i>		
4½-inch I.O.	-1.0 dB	-4.0 dB
3-inch I.O.	-2.0 dB	-6.0 dB
<i>525 lines and 625 lines (pattern equivalent to 5.0 Mc/s)</i>		
4½-inch I.O.	-1.5 dB	-5.0 dB
3-inch I.O.	-3.0 dB	-8.0 dB

In all instances sufficient aperture correction is available to give 0 dB response, at the centre of the picture, at the quoted frequency for average tubes. When the RETMA RESOLUTION CHART (1956) is used it is normally possible to achieve a resolution of better than 600 T.V. lines.

Signal-to-Noise Ratio

Without aperture and gamma correction the signal-to-noise ratio will be no worse than that of the pick-up tube. If correction is used the intrinsic pick-up tube noise will be modified accordingly.

When either E.M.I. Electronics 4½ in. I.O. Tube Type 9565 or the English Electric 4½ in. I.O. Tube Type PB22 is used with a low-pass filter cutting off at 5 Mc/s, the peak-to-peak signal-to-r.m.s. noise ratio is not less than 37 dB. The average figure for this ratio is 39 dB.

When the E.M.I. Electronics 3 in. I.O. Tube Type 9549 is used, the peak-to-peak signal-to-r.m.s. noise ratio is not less than 27 dB. The average figure for this ratio is 30 dB. Similar figures will be obtained when equivalent tubes of other make are employed.

Geometric Distortion

Within the area of a circle the diameter of which is equal to picture width, the displacement of any part of the scan raster from its true position is less than 1% of picture height or width. Actual figures obtained may depend on the image orthicon tube in use. Any distortion occurs gradually and does not introduce visible discontinuities.

Stability

Over a period of six hours gain stability is better than ± 1 dB and black level stability (relative to blanking level) is better than 1% for camera ambient temperatures in the range of 50°F to 100°F and for mains supply variations of $\pm 1\%$.

Warm-up Time

Pictures of transmission quality available within 20 minutes of switching on power.

Output Isolation

Isolation between the two video outputs and the 'viewfinder mix' signal input is better than 40 dB at all frequencies within the channel bandwidth.

Unwanted Signals

Interference from mains supply is imperceptible both as amplitude and positional hum.

Interference from other sources is negligible.

Valve List

Type	Maker	U.S.A. Equivalents	CV No.	Quantity
E88CC	Mullard	6922	2492	40
EF91	Mullard	6AM6	138/4014	9
EL821	Mullard	6CH6	2127/4055	7
6080	Mullard	6080	2984/5008	6
EL36	Mullard	6CM5	2940	2
EL81	Mullard	6CJ6	2721	1
EY51	Mullard	6X2	426	1
EY81	Mullard	6R3	-	1
EY88	Mullard	6AL3	-	1
ECL82	Mullard	6BM8	-	1
85A2	Mullard	5651	449/4048	2
150B2	Mullard	6354	2225/5132	1
EB91	Mullard	6058	140/4025	4
EL84	Mullard	6BQ5	2975	2
150C4	Mullard	0A2	1832/4020	2
U37	G. E. C.	-	-	-
AW17-20(c.r.t.)	Mullard	-	-	-

Overall Dimensions and Weight

	Height	Width	Depth	Weight
** Camera 203/6 203/5	20.5 in. 521 mm	15.5 in. 394 mm	31 in. 788 mm	108 lb 48.6 Kg
** Camera 203/2 203/8	20.5 in. 521 mm	15.5 in. 394 mm	31 in. 788 mm	88 lb 39.6 Kg
Control Unit 213/2	21 in. 533 mm	8.75 in. 227 mm	29.7 in. 654 mm	55 lb 25 Kg
Control Panel 215	7 in. 179 mm	17.5 in. 445 mm	5 in. 127 mm	19 lb 4.5 Kg
Power Supply 223/2	21 in. 533 mm	8.75 in. 227 mm	29.7 in. 654 mm	89 lb 36 Kg
Remote Control Panel 881	12.4 in. 315 mm	5.2 in. 132 mm	6.5 in. 165 mm	6 lb 2.7 Kg

** INCLUDING TURRET, BUT EXCLUDING LENSES, VIEWFINDER HOOD AND DIASCOPE.

Connectors

Camera

Camera Cable B.I.C.C. Mk.IVB plug (quick release)
Up to 1000 ft (300 m) of camera cable may be connected for 405 and 625 lines systems, but maximum of 600 feet (180 m) for 525 lines system.

Camera Unit 213/2

Camera Cable	BICC Nk.IVB socket (quick release)
Power Supply	AN3102-28-15P
Control Panel	(AN3102-28-12P (AN3102-28-12S
Pulse Inputs	AN3102-20-27P
Talk-back and Cueing circuits	AN3102-18-1P
Standard Waveform Aux.Output	SO239
Standard Waveform Main Output	SO239
External Input	SO239

Control Panel 215

Control Unit	(AN3102-28-12P (AN3102-28-12S
Remote Control Panel	AN3102-24-28S
Talk-back Select	AN3102-18-1A

Power Supply 223/2

Maina Input	EP4-14S
Control Unit	AN2102-28-15S

Remote Control Panel 881

Control Panel	AN3102-24-28P
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Lens Data

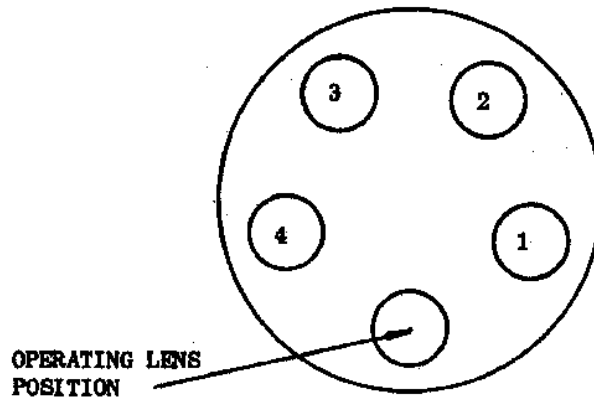
Lenses fitted with a mount to B.B.C. Specification TV88 can be accommodated on the turret as shown on the chart below.

The numbers in the squares indicate the turret position which the lens in Column B - without rayshade if number is bracketed - must take relative to the operating lens.

The black squares indicate which lenses, with rayshades, can be mounted in any position relative to the operating lens without interference.

To arrive at a sequence of lenses the following procedure should be adopted.

- (a) The lens of shortest focal length should first be considered in the operating position and, from the chart, a sequence established.
- (b) The established sequence should be followed whilst each of the other lenses is considered in turn as being in the operating position and, by reference to the chart, a check should be made to ensure that the remaining lenses will cause no interference. In some instances it may be necessary to amend the sequence first established.



B - OTHER LENSES ON TURRET	1.0 in.									
	1.375 in.									
	2 in.									
	3 in.	$\begin{matrix} 2 & 3 \\ (1), (4) \end{matrix}$								
	5 in.	$\begin{matrix} 2 & 3 \\ (1), (4) \end{matrix}$	$\begin{matrix} 2 & 3 \\ (1), (4) \end{matrix}$							
	6 in.	$\begin{matrix} 2 & 3 \\ (1), (4) \end{matrix}$	$\begin{matrix} 2 & 3 \\ (1), (4) \end{matrix}$							
	12.5 in.	2, 3	2, 3	2, 3						
	18 in.	2, 3	2, 3	2, 3	2, 3					
	22 in.	2, 3	2, 3	2, 3	2, 3					
		1.10 in.	1.375 in.	2 in.	3 in.	5 in.	6 in.	12.5 in.	18 in.	22 in.
A - LENS IN OPERATION POSITION										

Any lens, or optical apparatus, not fitted with a mount to this specification but with similar back focus, can be accommodated on the removable sector of the turret.

High-quality Rank Taylor Hobson or Dallmeyer lenses, especially computed for image orthicon cameras, are normally supplied. Details are shown in Table A.

Variable focus lenses can also be accommodated, and include:

- Rank Taylor Hobson Studio Varotal II
- Rank Taylor Hobson Outside Broadcast Varotal II
- Super Universal Zoomar
- Super Studio Zoomar

TABLE 'A'

Fixed Focal Length Lenses

Manufacturer and Type	Focal Length		Maximum Aperture (f)	Horizontal Angle in Degrees
	in.	cm		
Rank Taylor Hobson ORTAL	1.1	2.8	2.0	59.3
	1.375	3.5	2.8	50.0
	2	5.0	2.0	34.6
	3	7.5	2.0	23.6
	5	12.7	2.8	14.2
	8	20.3	4.0	9.0
	12.5	31.8	4.0	5.7
	16	40.6	4.0	4.5
	22	55.9	5.6	3.2
Dallmeyer ORTHIAC	1.375	3.5	3.7	49.2
	2	5.1	1.9	35
	3	7.6	1.9	23.7
	5	12.7	2.8	14.4
	8	20.3	4	9
	12	30.5	4.5	6
	17	43.2	5.6	4.25
Dallmeyer (EMI mount)	25	63.5	6.3	3
	40	101.5	9.5	2

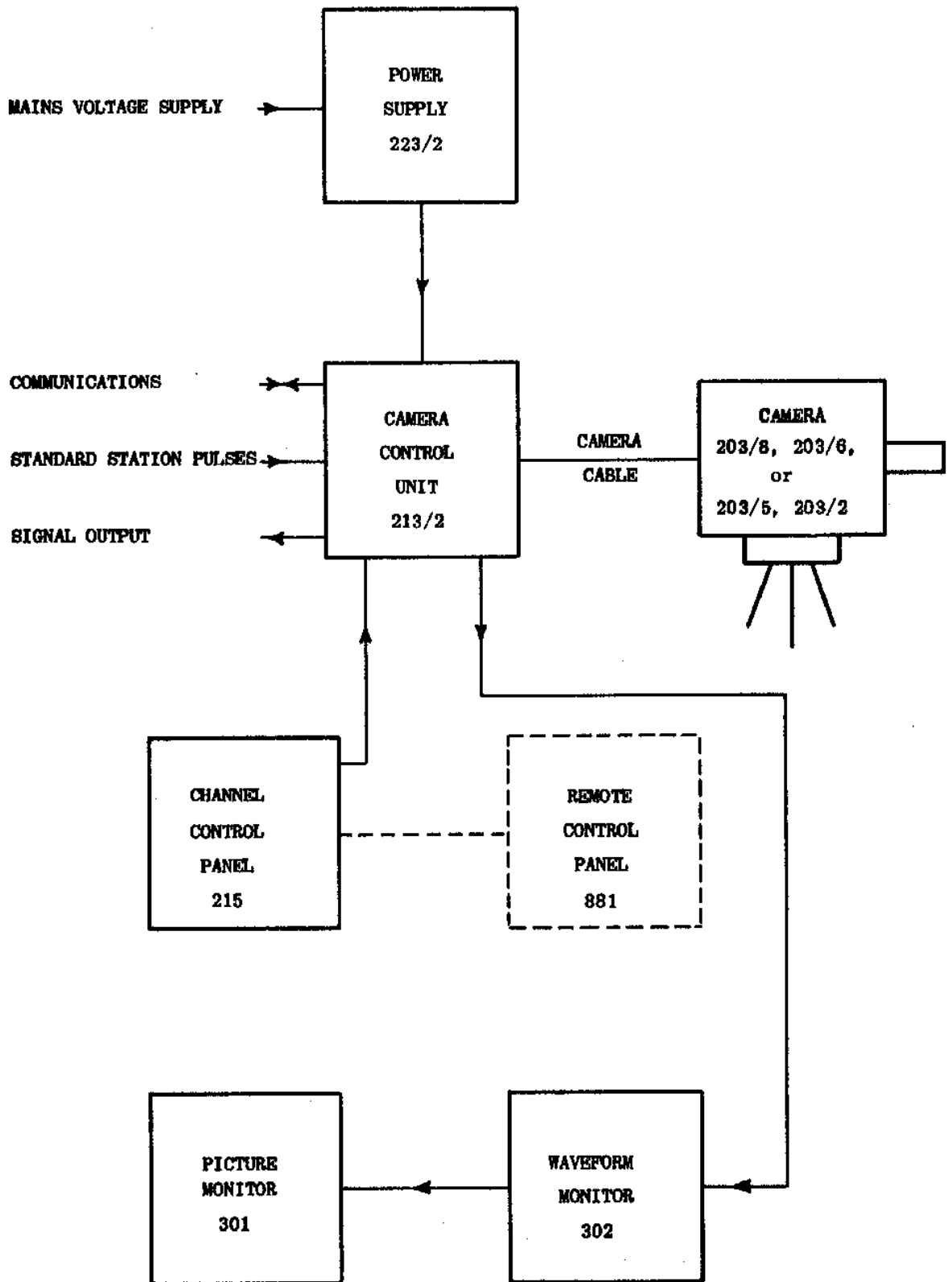
Variable Focal Length Lenses

Manufacturer and Type	Focal Range	Maximum Aperture (f)
Rank Taylor Hobson Studio Varotal II	2.25 in. (57 mm) to 8 (203 mm)	4.5
Rank Taylor Hobson O.B. Varotal III	4 in. (102 mm) to 20 in. (508 mm)	4
	8 in. (203 mm) to 40 in. (1016 mm)	8
Television Zoomar Co. Studio Zoomar	2.25 in. (57 mm) 15 in. (380 mm)	
Television Zoomar Co. Universal Zoomar	2.5 in. (63.5 mm) to 72 in. (1830 mm)	

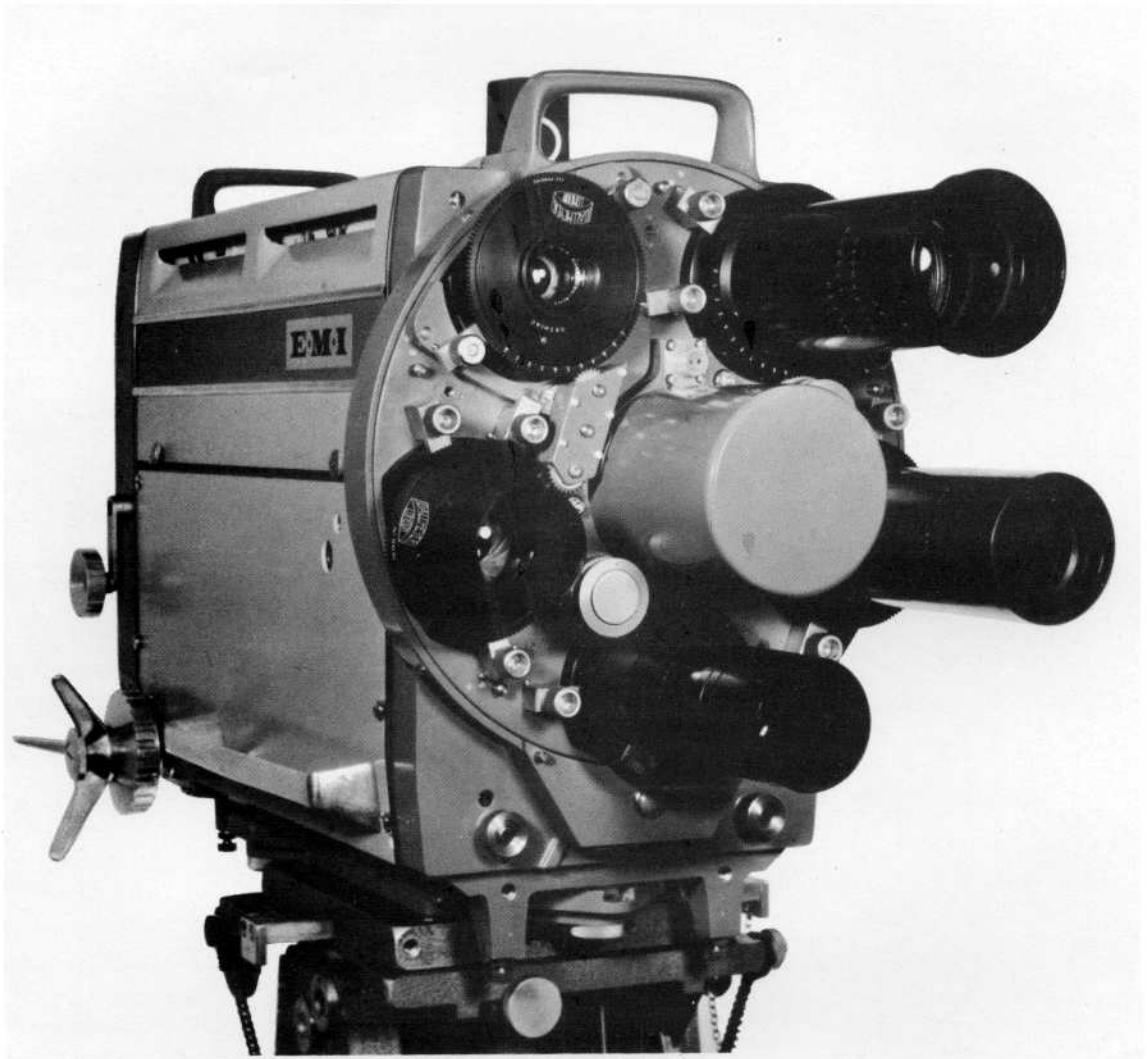
SCHEDULE OF EQUIPMENT

<i>Item</i>	<i>Description</i>	<i>Quantity</i>
1 (i)	Basic Camera Channel Type 203 comprising:	
	(a) Camera Type 203/6 or Camera Type 203/5 or Camera 203/2 or Camera 203/8	1
	(b) Camera Control Unit Type 213/2	1
	(e) Control Panel Type 215	1
	(f) Power Supply Type 223/2	1
	(g) Viewfinder Hood Type 858	1
	(h) BICC Camera Cable Mk. IVB (quick release and right-angle socket)	50 ft (15 m)
	(i) Inter-unit cables	One set
1 (ii)	Ancillary equipment for Camera Channel Type 203:	
	(a) Picture Monitor Type 301**	1
	(b) Waveform Monitor Type 302**	1
	(c) Console Type 194**	1
	(d) Console cables	One set
	(e) Console Connector Strip Type 227	1
	(f) Rank Taylor Hobson Ortol range of lenses to B.B.C. Specification T.V.88, and camera lens box or Dallmeyer Orthiac range of lenses, and camera lens box	One set
	(g) Headsets	3
	(h) Headphones	1
2	Recommended additional items:	
	(a) Heavy Duty Tripod with Skid	1
	(b) Pan and Tilt Head with Wedge Adaptor Plate	1
	(c) Continuously Adjustable Wedge	1
3	Optional extra items:	
	(a) Remote Control Panel Type 881	1
	(b) Diascope Type 854	1
	(c) Test Slides for Diascope	Set of three
	(d) Periscope Viewfinder Hood Type 859	1
	(e) Viewfinder Shade Type 857	1
	(f) Camera Cover	1
	(g) Studio Zoom Lens	1
	(h) Outside Broadcast Zoom Lens	1
	(i) Cubicle Type 198 or Type 199**	1
	(j) Cue-card holder	1
	(k) Talk-back Switch Panel (22407)	1

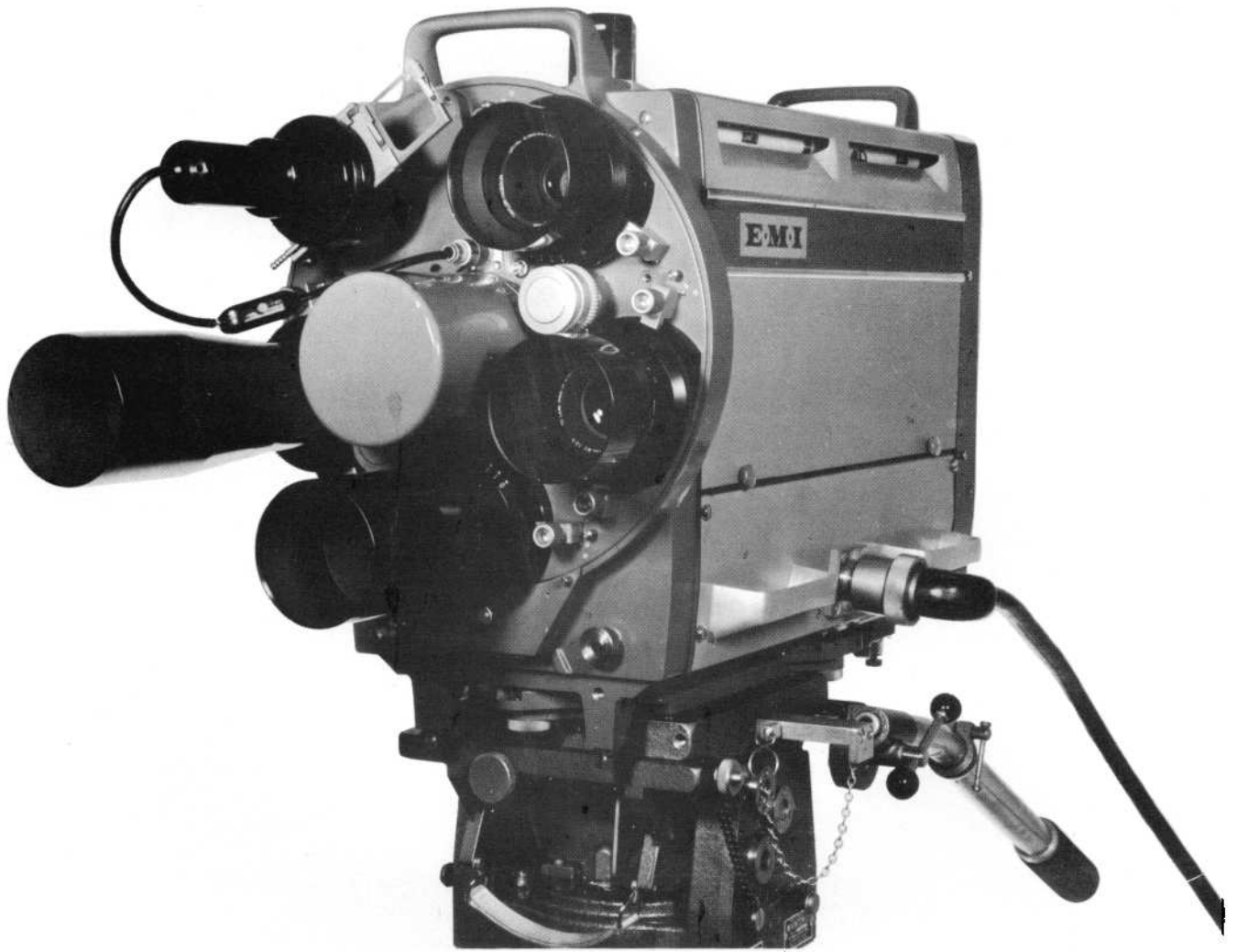
** DESCRIBED IN SEPARATE BROCHURES



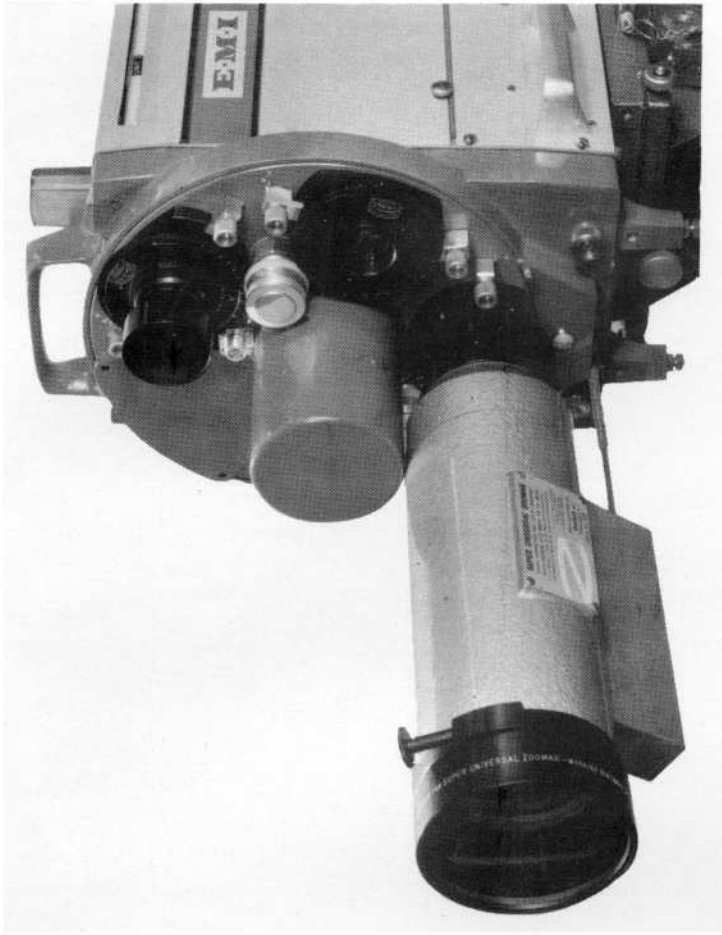
Block Diagram
CAMERA CHANNEL
Type 203



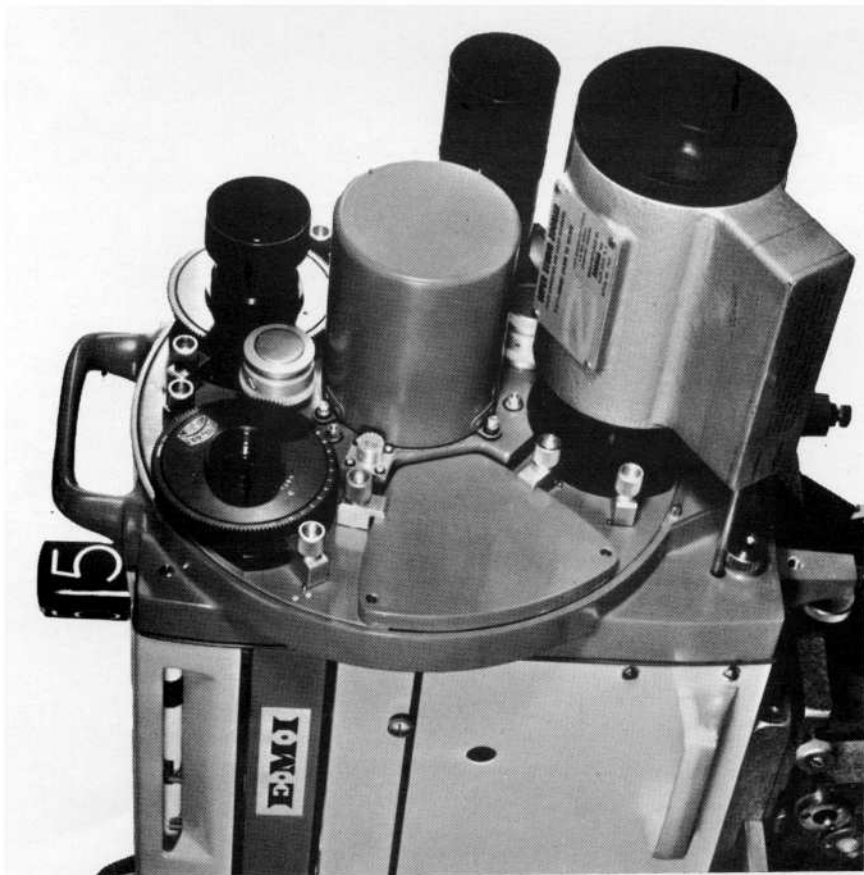
General View of Camera
CAMERA CHANNEL Type 203



General View of Camera
CAMERA CHANNEL Type 203

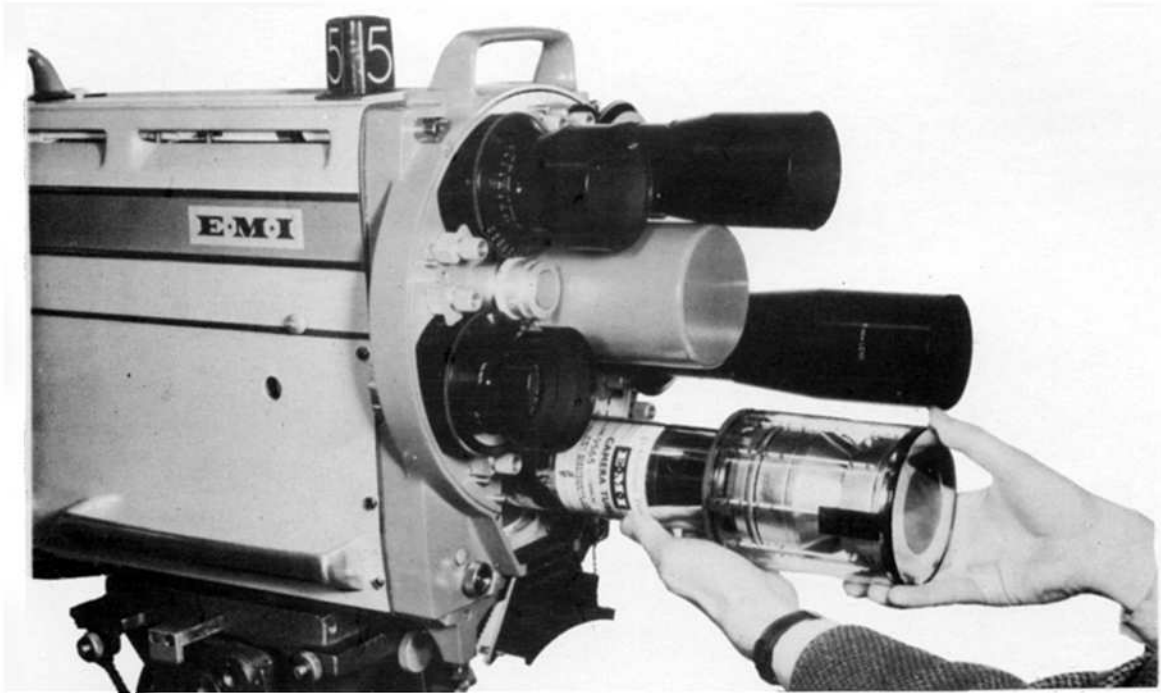


With Super Universal Zoomar Lens and Close-up Adaptor

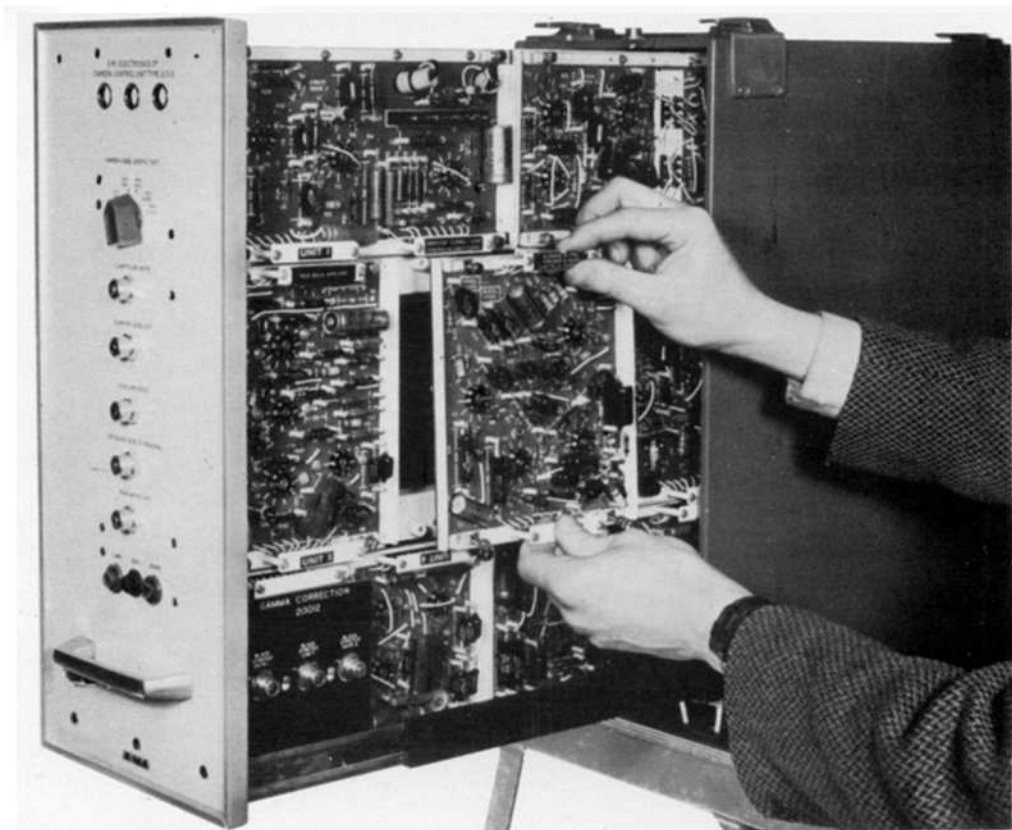


With Super Studio Zoomar Lens

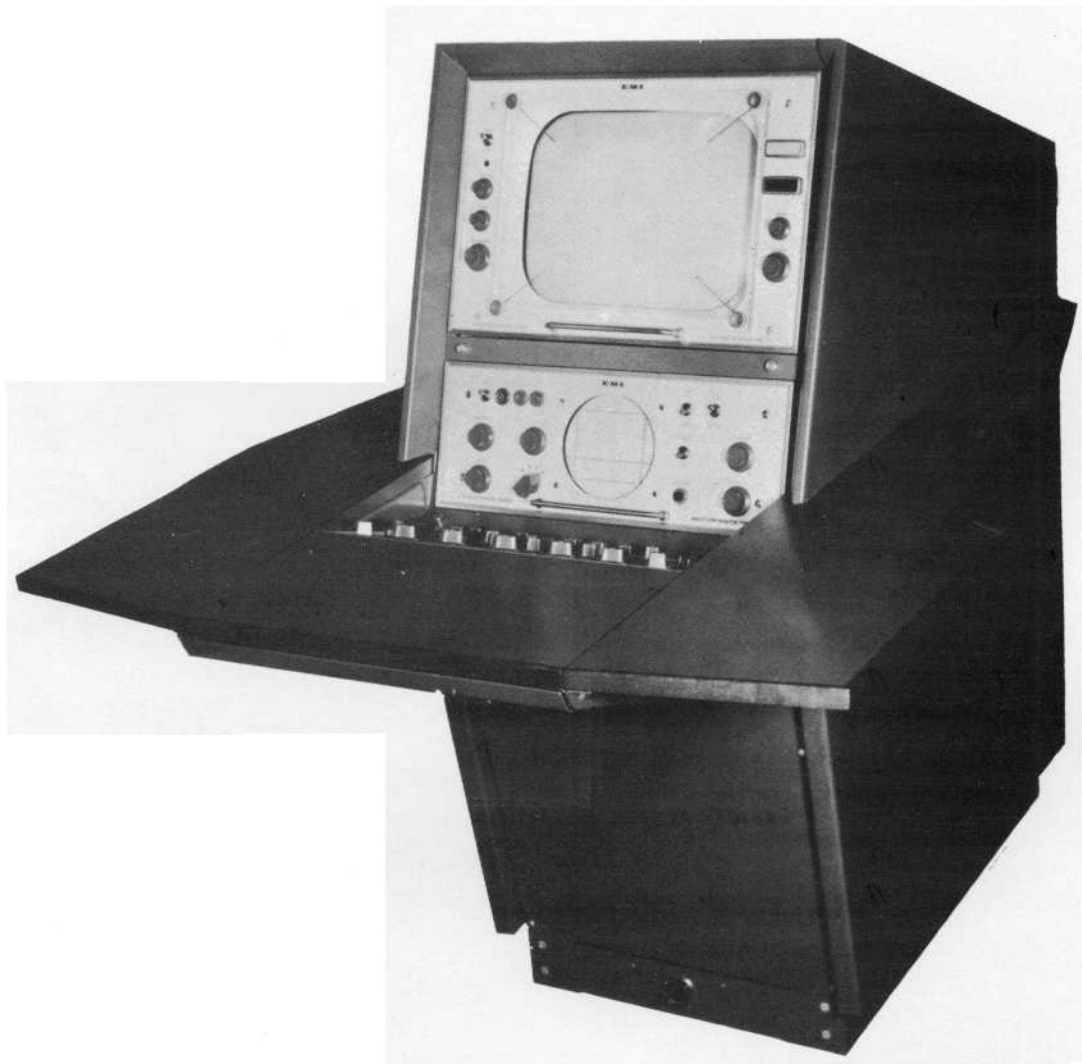
CAMERA CHANNEL Type 203



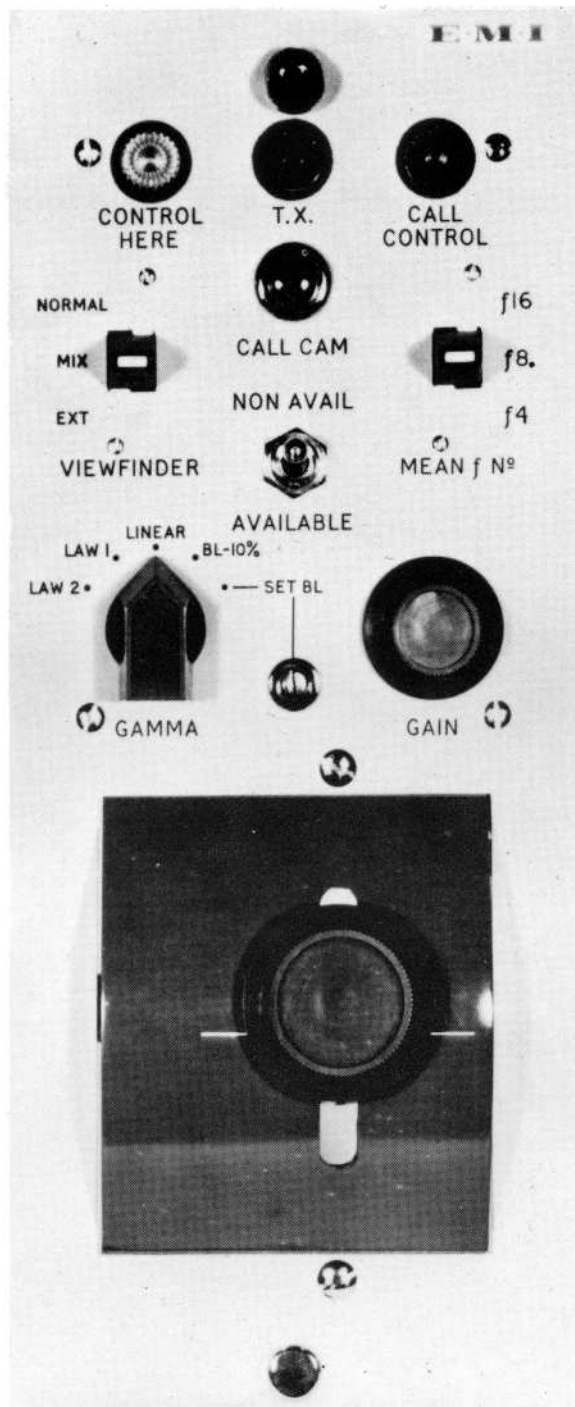
Removal of 4½-inch Image Orthicon Tube
CAMERA Type 203/6



Accessibility for Servicing
CAMERA CONTROL UNIT Type 213/2
CAMERA CHANNEL Type 203



Control Console
CAMERA CHANNEL Type 203



Remote Control Panel Type 881

CAMERA CHANNEL Type 203