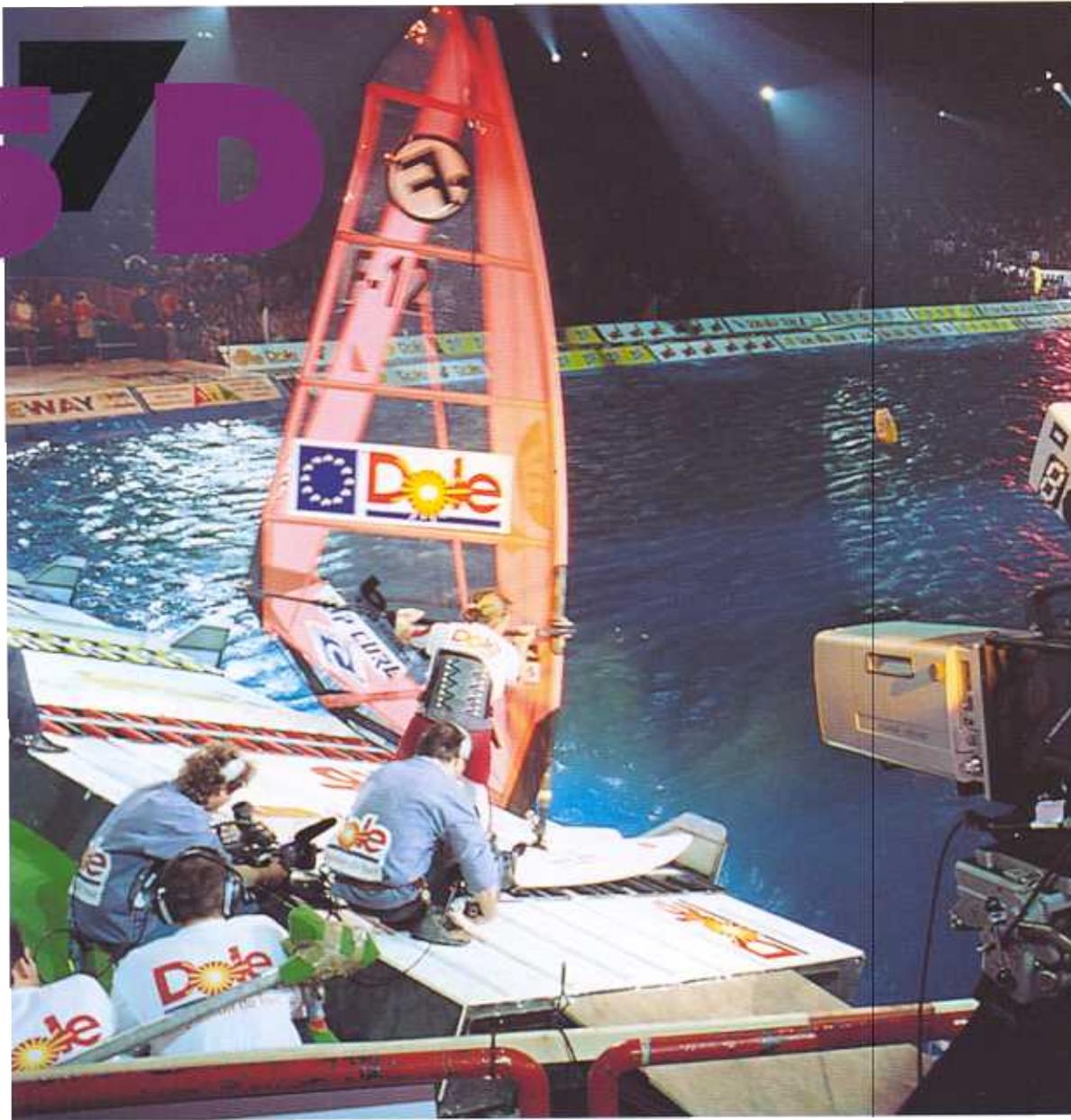
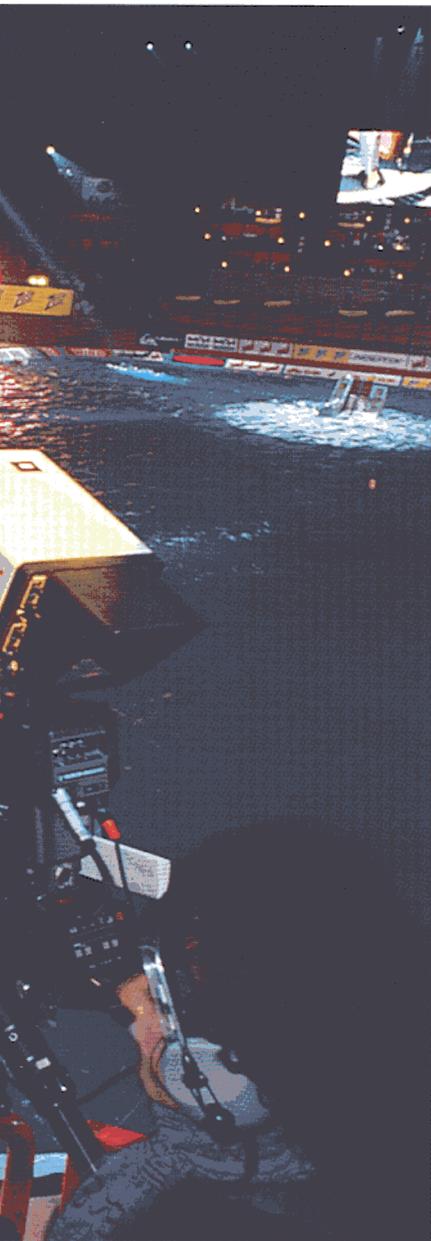


# 1657D



The 1657D is more than just a camera, it is a complete creative system designed as a production tool to assist the craft of the cameraman. Based around the portable 1657D, Thomson Broadcast Systems designed a total camera system, providing many different configurations, such as Microcam™ and Sportcam™, each designed to offer you the ultimate in performance and flexibility for your specific requirements.

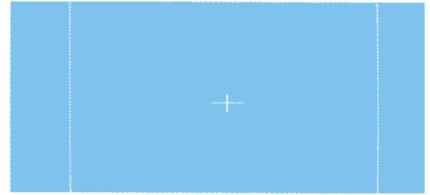
Not just any digital camera, the 1657D is “the digital camera”, capable of giving you the sort of images you want, even in the toughest conditions encountered when shooting in the broadcast world. The front end sampling of the video signal is carried out with 12-Bit quantisation depth. This, combined with intermediate processing stages of up to 20-Bit depth, gives you the sort of contrast ratio handling only previously available to film.



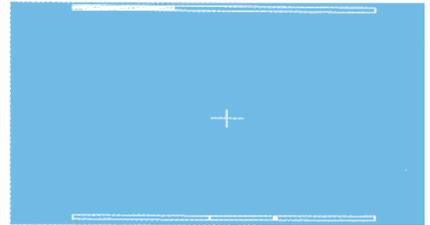
With users the world over facing the difficulty of planning shooting schedules and not knowing in advance whether to use a portable or studio camera, Thomson Broadcast Systems created Sportcam™. As the pioneer in this field, Thomson Broadcast Systems reinforced its leading position in introducing the 1657D Sportcam™.



exposure level monitoring profile



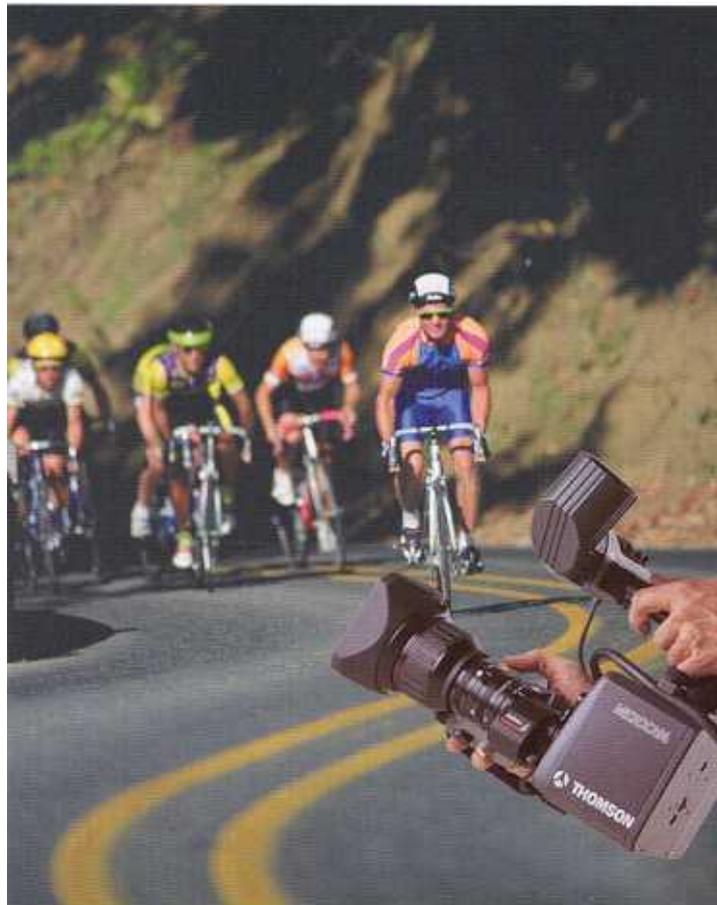
centre cross and 4/3 framing markers

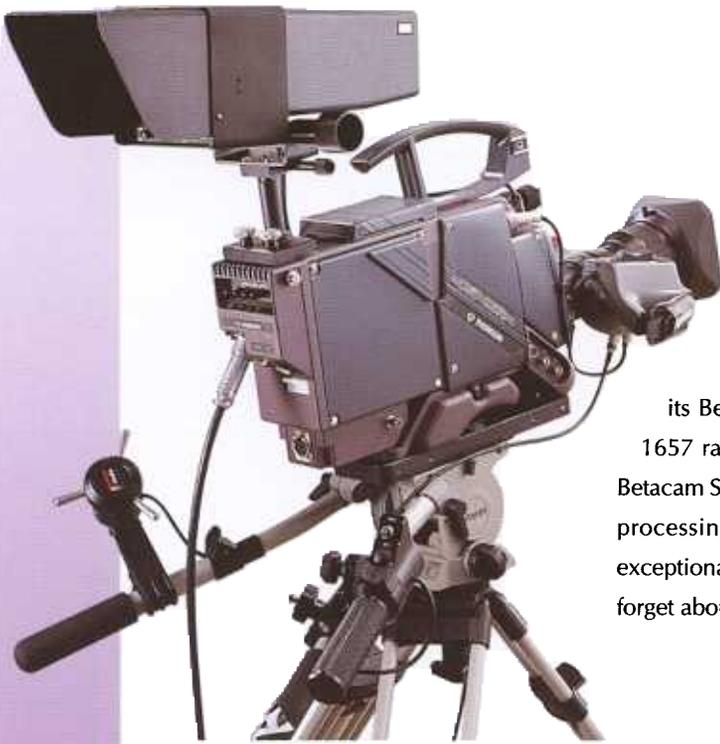


battery and audio level indicators

The Microcam™, an ultra-compact split-head option for the 1657D, provides the easy handling and mobility that no conventional portable camera can match. It enables you to explore new shooting angles, and gives the cameraman new freedom and expression, all with the benefit of switchable widescreen capability.

Where highest quality, yet discreet size is of importance, such as remote or robotic installations, the 1657D Microcam™ is the ideal solution.





## THE SYSTEM

Thomson Broadcast Systems unveils its vision of the digital camera in introducing its new portable 12-bit camera, the 1657D. This is, indeed, the heart of a production system: with its Betacam™ interface, the 1657D accepts all accessories from the 1657 range, including triax and multicore adapters, Betacam SP™ and Betacam SX™ recorders. The latest technology, bringing sophisticated video processing and carefully conceived ergonomics, make the 1657D an exceptional camera. A camera that frees your creativity, yet allows you to forget about technology, is truly a better camera.



## 1657D FILM

Since the digital processing used by the 1657D gives you the freedom to get the picture quality you want, the 1657D provides an alternative to the production tools traditionally used for shooting commercials, documentaries or drama. In the past, electronic cameras have not been able to reproduce the wide range of signals produced by film lighting. Now, with the introduction of the 12-Bit 1657D the creative limitations are removed to provide all the advantages of electronic shooting.

## 1657D MICROCAM™

The Microcam™ comprises a 1657D camera body, with the CCD block mounted remotely. The camera body and block are linked by a standard 26-pin multicore cable of up to 100 metres length, with automatic cable compensation. This system produces a very compact camera head, enabling shots that would be impossible with a conventional camera; at the same time the picture quality of the 1657D is maintained, providing perfect matching with other 1657D cameras being used. Moreover, the CCD block can be quickly refitted to the camera body to produce a conventional portable camera once again.





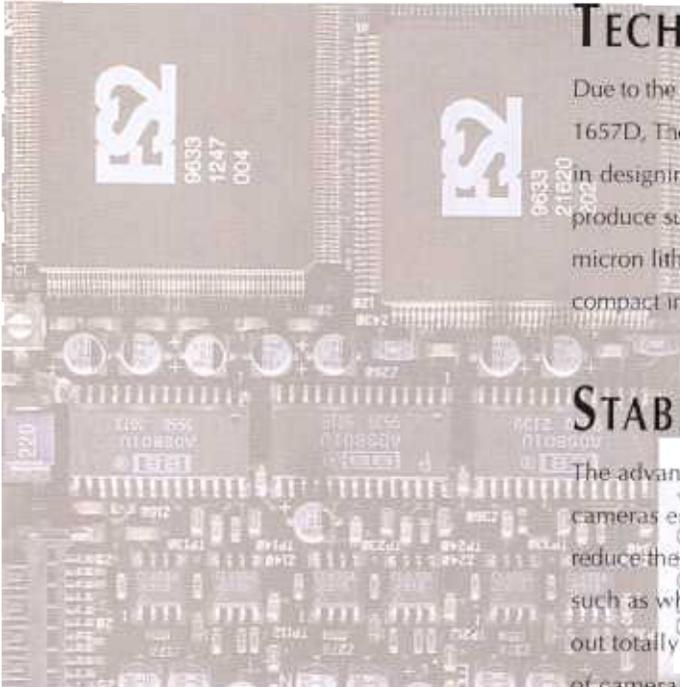
## 1657D SPORTCAM™

The Sportcam™ configuration offers the same performance and features as a conventional studio camera and offers even greater flexibility, specifically in its ability to change rapidly from portable to studio configuration. This versatility is increased further by the capacity to accept large lenses with different mounting systems, simply by changing the Sportcam™ adapter front plate. This allows the customer to rent lenses with less need to check cross compatibility.

In the 1657D Sportcam™, everything has been designed to make life easier for the cameraman. The 17 cm (7") viewfinder offers excellent resolution and its very bright output makes this viewfinder particularly suitable for outdoor shooting. In addition, the Sportcam™ control panel enables the cameraman to select which video signal he wants to see in the viewfinder, as well as activating the various markers he may want to use.

# 12-BIT QUANTISATION

The 12-Bit 1657D brings with it new power and a picture quality hitherto unattainable in 10-Bit digital cameras. These 2 bits make all the difference in increasing the dynamic range, providing excellent colour accuracy in the crucial over-exposed areas, and providing exceptionally clean, noise free blacks.



## TECHNOLOGY

Due to the complexity of the image processing algorithms implemented in the 1657D, Thomson Broadcast Systems has used the most advanced technologies in designing the ASICs (application specific integrated circuits) needed to produce such a high quality camera head. This level of technology (0.65 micron lithography, 200,000 gates and 3.3 V powering) results in a highly compact image processor, with very low power consumption.

## STABILITY AND REPRODUCIBILITY

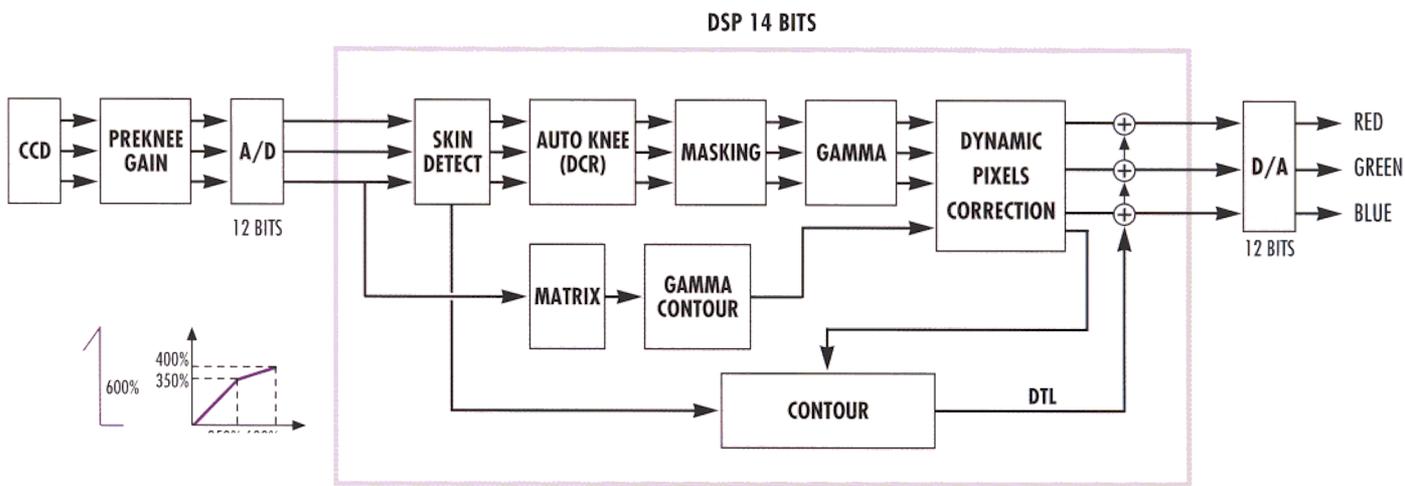
The advantage of 12-bit analogue to digital converters over 10-bit based cameras enables the digital processing power to be maximised and thus reduce the analogue pre-processing required. Certain non-linear processes, such as white compression and gamma correction, are therefore carried out totally in the digital domain. This new architecture ensures stability of camera adjustments together with excellent reproducibility between cameras.

## SENSORS

The 1657D may be fitted with two types of sensor: IT (Interline Transfer) or FIT (Frame Interline Transfer). These sensors use 'microlens' technology, which increases the intrinsic sensitivity of the sensor by a factor of two. IT technology has made considerable progress over the last few years, to the extent that the phenomenon of smear once associated with these sensors has become virtually imperceptible.

## SHUTTER AND CLEAR SCAN

Using CCD technology, it is possible to vary the exposure time for each frame. This allows the capture of sharp pictures during rapid movement (in Shutter mode), or shooting of computer screens without flicker or horizontal bars (in Clear Scan mode).



## EXTENDED VERTICAL RESOLUTION

IT and FIT sensors may be scanned in two modes: 'field integration' mode, the normal mode, or 'frame integration' mode, an extended vertical resolution mode, where vertical resolution reaches 530 TV lines.

## SWITCHABLE 4/3 - 16/9: "THE WIDER VIEW"

The 16/9-4/3 switchable sensor offers an extended horizontal field of view for a "wider view" in 16/9, allowing you to take full advantage of the artistic possibilities offered by the 16/9 format. The FIT sensor has the same sensitivity in both 4/3 and 16/9 formats.

## DYNAMIC PIXEL CORRECTION

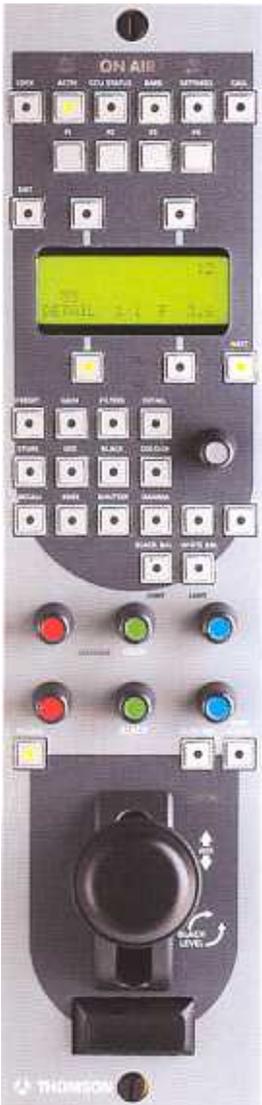
As pioneer in the field of pixel correction in broadcast cameras, Thomson Broadcast Systems has taken a new step forward in building an automatic compensation system for defective pixels into the 1657D. This dynamic system continuously analyses the image and corrects defective pixels in real time, without any maintenance being required.

## VIDEO NOISE SLICER

The 1657D includes noise coring circuitry that enables the visibility of noise to be considerably reduced. This feature is particularly effective when there is insufficient light and camera gain must be increased.

# OCP 40 (OPERATIONAL CONTROL PANEL)

Thomson Broadcast Systems camera control panels are designed to aid the operator in producing the best possible picture. The OCP 40 provides access to the camera's operational and technical functions, including innovative features such as Detail Follow Zoom and Skin Detail. With its LCD screen, the OCP 40 allows camera status to be seen at a glance and modified for perfect matching in multi-camera operation. For ease of use, the operator always has available a reference set-up and four scene files, which can be recalled at any time. The compactness of the OCP40 allows a large number of control panels to be mounted in a very limited space, with up to 6 control panels fitting into a 19" rack width.



## CONTOUR

Contour correction is used to enhance picture sharpness. The contour signal in the 1657D is calculated from the three primary colours ensuring very sharp reproduction of pictures even in highly coloured scenes. The sophistication of the algorithms used to calculate the contour signal allows enormous creative control over the type of 'look' you want to achieve.



## DUAL SKIN DETAIL

This correction allows detail level to be varied as a function of colour. For example, in facial close-ups, the degree of skin detail could be reduced relative to the rest of the picture. For increased flexibility, two different hues may be selected from the full colour spectrum.



## DETAIL FOLLOW ZOOM

This dynamic function allows the detail level to be varied with the zoom position of the lens. For example, to have greater detail at the wide position of a lens and less at the tight end.

## CROSS-COLOUR REDUCTION

The 1657D incorporates a new form of picture processing which considerably reduces the phenomenon of cross-colour. It removes all disturbing frequencies from the picture, so encoded pictures from the 1657D are of unprecedented quality.

# GAMMA

In the 1657D, gamma correction is carried out totally digitally. The 1657D has several pre-sets, corresponding to different gamma laws. From each pre-set law, it is possible to modify gamma correction individually for each primary RGB signal.

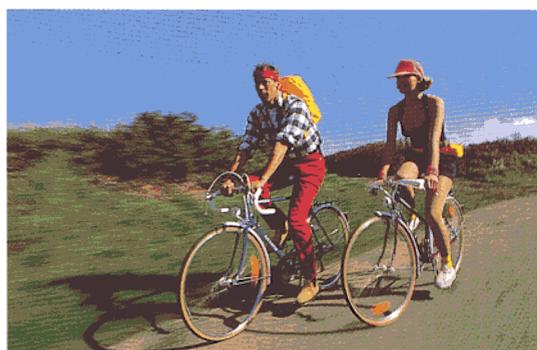
# BLACK STRETCH

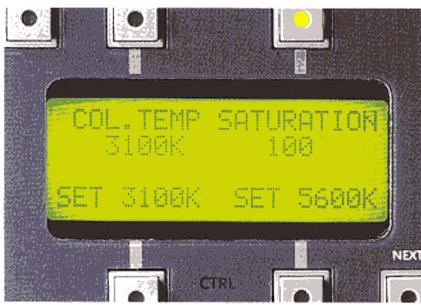


This feature allows blacks either to be expanded or compressed, without affecting the rest of the picture. It is particularly useful in recovering detail from large areas of shadow, for example wide shots of a sports arena where part is in sunshine and part in shadow. Conversely, it is possible to restore contrast to shots such as those in fog, where the overall contrast range has been reduced.

# CONTRAST COMPRESSION WITH COLOUR REPRODUCTION

A patented compression system is used to reduce dynamic range in those brightly lit parts of a picture which exceed nominal level. This process, unique to Thomson Broadcast Systems, restores luminance and chrominance, as well as the detail of over-exposed areas. The system allows fullest use to be made of the whole contrast range reproduced by the high sensitivity sensors and 12-bit analogue to digital conversion in the 1657D.





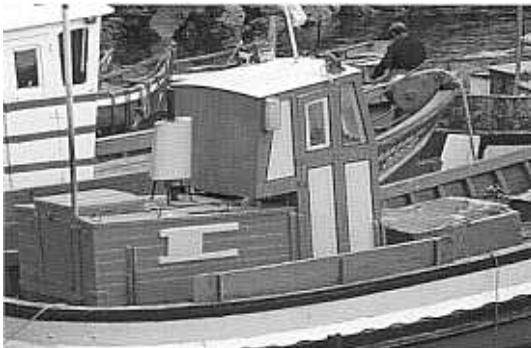
## DIRECT ACCESS TO COLOUR TEMPERATURE

The 1657D has an exclusive system that enables camera colour temperature to be varied by the operator between 2,200°K and 9,900°K. This function opens up new creative opportunities, making it possible to modify the colour temperature of the pictures simply by adjusting this single control. Perfectly reproducible 'moods' can quickly be achieved in shooting situations where the style of picture aids dramatic effect.



## SATURATION

This feature allows colour saturation in the picture to be adjusted, from black and white to over-saturation (200%).



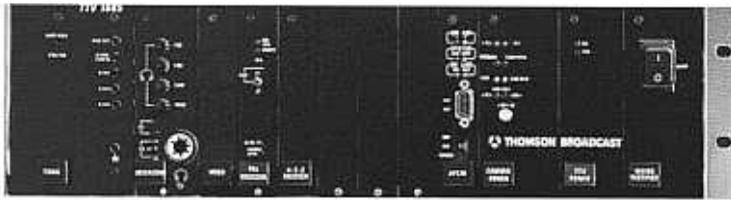
## CONTINUOUS WHITE BALANCE

The 1657D has a continuous white balancing system. In this mode, the camera continuously adjusts white balance correction as a function of picture content. For example, in tracking shots from indoor to outdoor lighting conditions, this change of colour temperature can be automatically tracked by the camera.

## MASKING

The 1657D has several masking options. The reference setting corresponds to the EBU standard, while other settings may be used either for special effects, or to match existing cameras.

# TRIAX: MOBILITY



The EFP triax system (CA 85 and CCU 1685) is designed to operate with cameras from the 1657D family.

The design of the triax link allows full picture quality to be maintained over long distances. In a compact 3U 19" rack unit, the CCU 1685 provides all the facilities required for ideal integration into a high-end production environment, whether in an outside broadcast van or studio.

- wide-band RGB triax link, allowing excellent keying in the studio.
- long transmission distance for great flexibility when used in an outside broadcast van: 1,500 m using 13 mm cable and up to 3,000 m using a repeater and

19 mm cable.

- remote camera powering, with electrical safety
- 2 talkback channels, to separate engineering talkback from production talkback.
- 2 wide-band audio channels to carry two clean audio feeds from the camera to the CCU: one microphone input on the camera (12 V phantom powered) and one microphone input on the CA 85 (0/12/48 V phantom powering). Microphone input sensitivity can be controlled remotely from the CCU.
- 4 analogue "viewfinder return" video channels, selectable from the CA 85, with the ability to mix the selected video with the camera video in the viewfinder (MIX mode).
- 4 serial digital outputs, for ease of integration into a digital production environment (option).
- picture monitoring (PIX) video output with camera status information for the operator displayed in the video.



## TRIAX EXTENDER

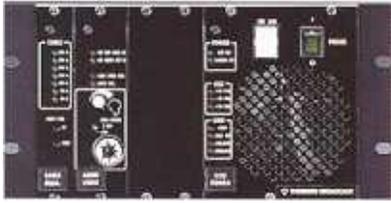
This equipment is connected to the triax cable mid-way between the camera head and CCU. It is waterproof and powered via the cable, regenerating the signal to increase the operating range considerably. Providing a range of 3 km with 19 mm cable, the triax extender ensures that you can always place cameras at the most strategic points, particularly in covering sports events such as ski races, car racing, golf, etc.

## MULTICORE: AFFORDABLE BROADCAST QUALITY

The EFP multicore system offers a low-cost , broadcast quality solution for small studios and similar applications.

The CCU 1625 control unit is light and compact (half a 3U 19" rack unit) and provides multicore operation over distances up to 300 m. It supplies all the necessary facilities for integration into a studio:

- RGB or component and composite outputs
- 26-pin CCZA multicore cable
- Automatic compensation for length of multicore cable
- Full control system capability.



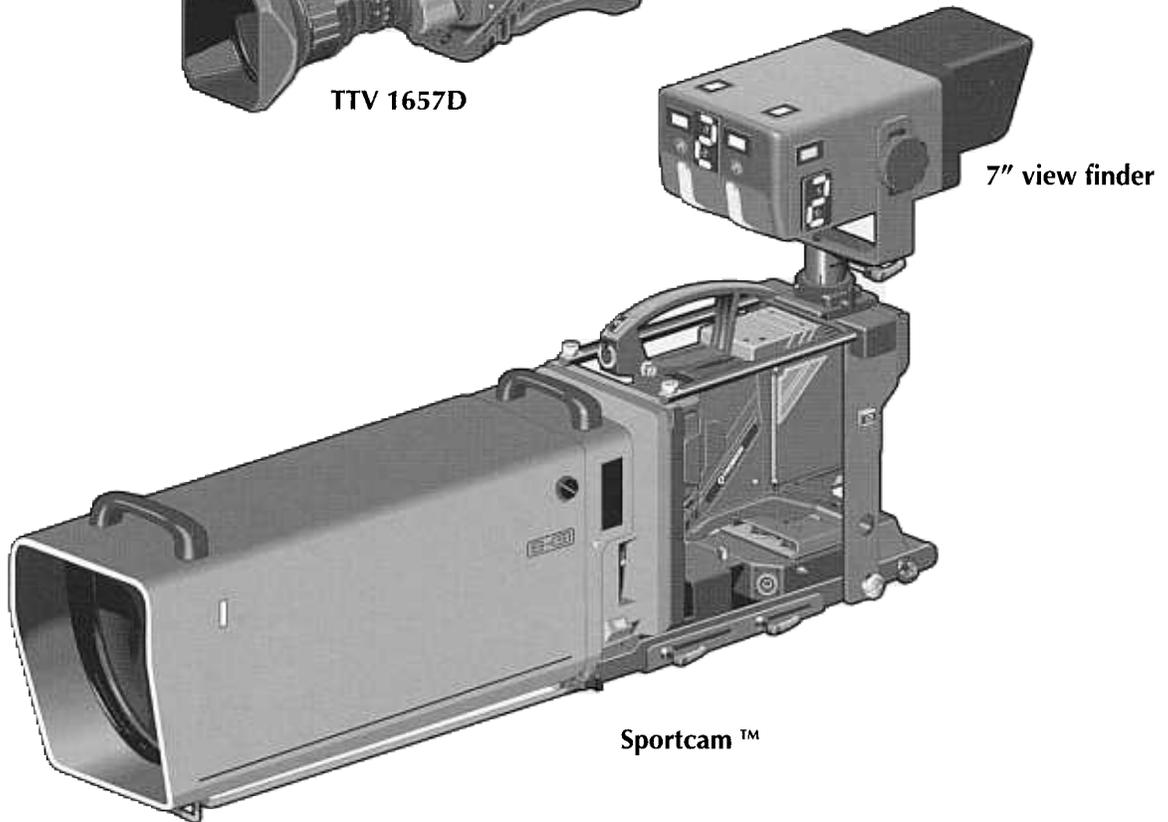
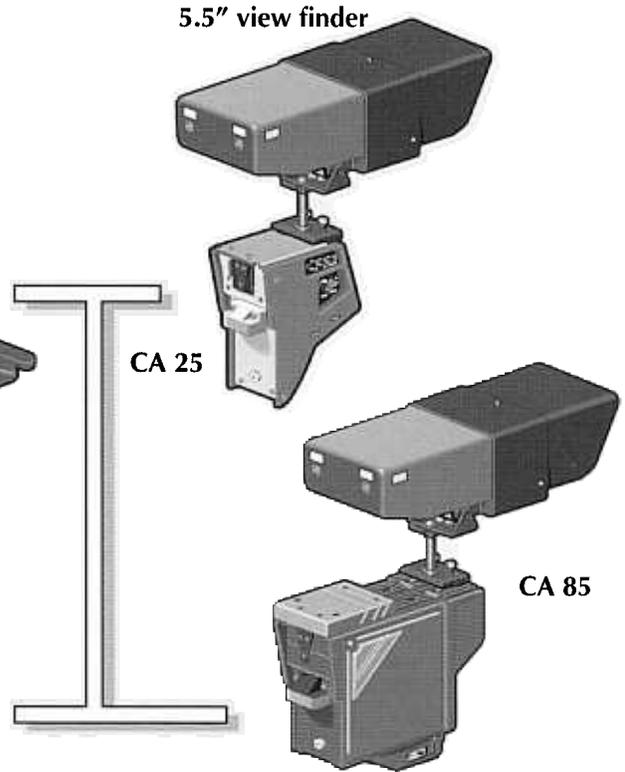
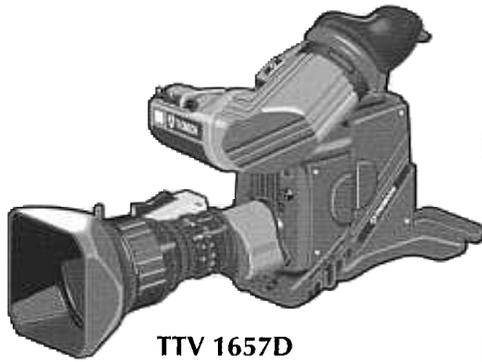
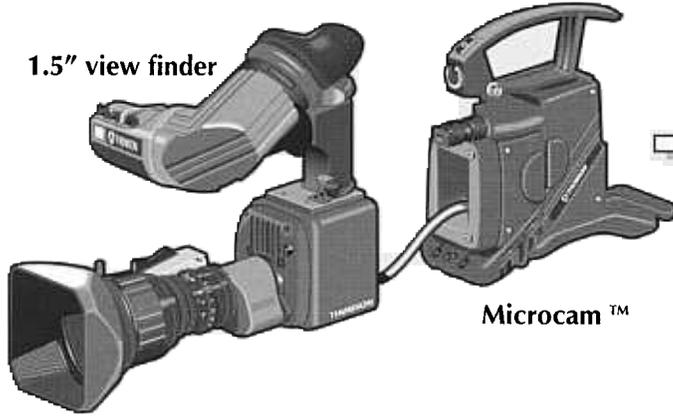
## BETACAM SP™ AND BETACAM SX™ CAMCORDERS

Using TTV 3505 Betacam SP™ video recorders or TTV 4005 Betacam SX™ recorders, the 1657D may be converted to a camcorder. The TTV 3505 recorder provides the familiar Betacam SP™ format facilities with analogue component recording and a 30-minute recording time using BCT-30 cassettes. The TTV 4005 recorder is a new digital Betacam SX™ format recorder. The TTV 4005 provides digital recording quality in 4:2:2 studio profile format, together with 60 minute recording time on BCT-60SX cassettes. The TTV 4005 also allows full colour picture and sound playback,



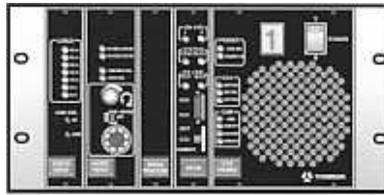
# 1657D PRODUCTION SYSTEM

## EFP CONFIGURATIONS





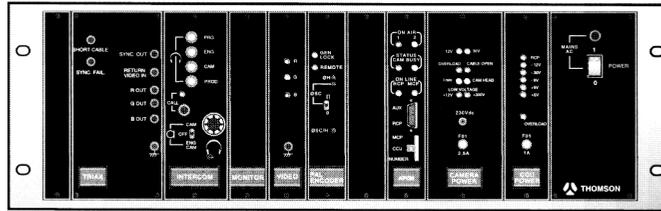
Multicore



CCU 1625



Triax

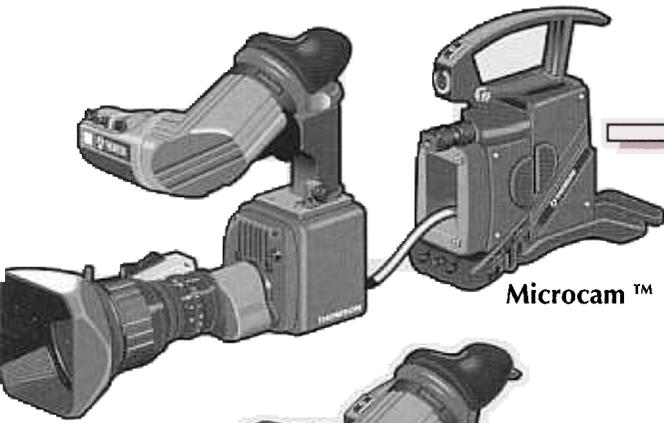


CCU 1685

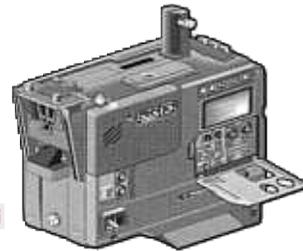


OCP 40

### ENG CONFIGURATIONS



Microcam™



TTV 4005  
Betacam™ SX VTR



TTV 3505  
Betacam™ SP VTR



TTV 1657D



CA 25



TTV 3550 Betacam™ SP VTR  
TTV 3425 Digital Betacam™ VTR

# SPECIFICATIONS



## 1657D CAMERA HEAD:

- **Standards** PAL, NTSC
- **Sensors** TTV 1657D WIDE FX: 3 CCD 2/3" FIT ML (Frame Interline Transfer) 600,000 pixels, 16/9 & 4/3 formats  
TTV 1657D FX: 3 CCD 2/3" FIT ML (Frame Interline Transfer) 490,000 pixels, 4/3 format  
TTV 1657D TX: 3 CCD 2/3" IT ML (Interline Transfer) 490,000 pixels, 4/3 format  
TTV 1657D WIDE FX: >70% @ 5 MHz  
TTV 1657D FX or TX: >50% @ 5 MHz
- **Modulation depth** 950 TV lines in 16/9  
750 TV lines in 4/3
- **Horizontal resolution** Standard or extended (530 lines in extended mode)
- **Vertical resolution** Zones 1,2,3: less than 0.05% (excluding lens faults)
- **Registration** f/1.4 RGB beam splitter with infra-red and low-pass filters
- **Optical system** 2,000 Lux at f/8 (89.9% reflectance, colour temperature 3,200°K)
- **Sensitivity** Approx. 5.5 Lux (lens at f/1.4, gain 21 dB)
- **Minimum illumination** 61 dB typical (PAL), 63 dB typical (NTSC)
- **Signal/noise ratio** (optional second wheel and motors)
- **Filter wheel** Wheel 1: neutral density filters: clear, 50%, 25%, 6.3%  
Wheel 2: special effects filters: clear, 4 point star, centre focus, fog
- **Gain** -3, 0, +3, 6, 9, 12, 15, 18, 21 dB
- **Shutter** 1/60, 1/120, 1/250, 1/500 and 1/1,000s
- **Clear scan** 50 Hz to 200 Hz in PAL  
60 Hz to 200 Hz in NTSC

### ■ **Operating features and parameters:**

12-bit analogue/digital conversion and 14 to 20-bit digital processing, depending on processing stage.

Gamma: master gamma, fine gamma, gamma R, gamma B

Black stretch level

Contour: detail level, coring level, level dependent, peak frequency, diagonal detail, soft detail

Detail follow zoom: DFZ wide, DFZ tele

Dual skin detail: skin 1 level, skin 2 level

Masking: masking law (EBU, custom 1&2)

Contrast compression: knee level, knee slope, auto knee

### ■ **Automation:**

Black shading: automatic black shading correction system (12,000 measurement points)

Dynamic pixel correction

Colour temperature: progressive electronic correction from 2,200°K to 9,900°K

Lens correction: the 1657D holds two lens correction files.

### ■ **Weight**

approx. 3.5 kg (including viewfinder)

### ■ **Consumption**

18 W with 1.5" viewfinder

### ■ **Camera head connectors:**

« remote »

Hirose 10-pin (for OCP control panel connection)

« genlock »

BNC, 1 Vp-p, 75 Ω

« video out »

BNC, 1 Vp-p, 75 Ω (composite video, Y, R, G, B, R-G, B-G)

« mic »

XLR 3 (with 12V phantom powering)

Chuomusen 21-pin (B/W, component or RGB, composite video, video return)

Hirose 12-pin

« lens »

## MICROCAM™:

- **Multicore cable connector**
- **Microcam / camera body**
- **Microcam/camera body distance**
- **Dimensions**
- **Fixing**

CCZA type cable, 26-pin

0 to 100m

138 x 155 x 105 mm (excluding grip and viewfinder)

2 3/8" bolts for tripod mount

4 M4 screws and 3 M3 screws for "mini-wedge"

2.5 kg with viewfinder, excluding lens

### ■ **Weight**

### ■ **Microcam connectors:**

« camera body »

26-pin

« video out »

BNC, 1 Vp-p, 75 Ω (viewfinder video)

« mic in »

XLR 3 (with 12V phantom powering)

« viewfinder »

Chuomusen 21-pin (B/W, component or RGB video, composite video, video return)

« lens »

Hirose 12-pin





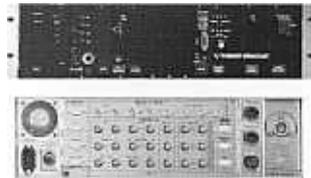
## SPORTCAM™:

■ <b>Weight</b>	10.7 kg without viewfinder
■ <b>Sportcam connectors:</b>	
« cam (vf) »	Hirose 10-pin (for camera head connection)
« prompter out »	BNC, 1 Vp-p, 75 Ω (available up to 300 m)
« power utility »	XLR 4 female, 12V DC, 70 W
« vf »	for 17 cm (7") viewfinder connection
« ext on air »	2-pin
« lens »	Hirose 12-pin (electronic converter side)
« lens »	24-pin on Sportcam front panel, for lens with Thomson mount (others on request)
light »	6-pin lighting supply for script support

## CA 85:

■ <b>Weight</b>	2.8 kg
■ <b>CA85 connectors:</b>	
« CCU out »	BNC, 1 Vp-p, 75 Ω
« mic in »	XLR 3 female (with 12V - 48 V phantom powering)
« Incom »	Tuchel or XLR 5 female as options
« CCU triax »	Lemo 75 Ω, Lemo 50 Ω, Fischer, King, Damar & Hagen
« Tracker »	Hirose 12-pin female (12V-3W, on-air indicator: 100 Ω grounded contact; talkback: prod, eng, cameraman)

## CCU 1685:



■ <b>Bandwidth</b>	R: 6 MHz, G: 6 MHz, B: 6 MHz
■ <b>Maximum triax distances</b> (without/with triax extender)	
Triax A (ext. dia. 9 mm: cable attenuation 7.8 dB/100 m at 60 MHz):	600m / 1,100m.
Triax B (ext. dia. 13 mm: cable attenuation 3.9 dB/100 m at 60 MHz):	1,200m / 2,400m.
Triax C (ext. dia. 19 mm: cable attenuation 2.9 dB/100 m at 60 MHz):	2,100m / 3,000m.
■ <b>CCU/panel distance</b>	max. 500m (RS422, SMPTE protocol)
■ <b>Mains supply</b>	100-120V/220-240V AC, 50-60 Hz
■ <b>Consumption</b>	max. 100 W
■ <b>Weight</b>	approx. 15 kg
■ <b>Dimensions</b>	3U 19"
■ <b>CCU connectors:</b>	
« RCP »	sub-D 9-pin female
« MCP »	sub-D 9-pin female
« RCP power +12V out »	XLR 4-pin female
« mic remote »	sub-D 9-pin female, remote sensitivity control for camera and CA85 microphone inputs
intercom prod »	sub-D 9-pin female, 4-wire (2-wire) producer talkback channel or RTS - (4-wire: 0 dBm-600 Ω, adjustable from -6 to +12 dBm)
intercom eng »	sub-D 9-pin female, 4-wire (2-wire) or RTS - (4-wire: 0 dBm-600 Ω, adjustable from -6 to +12 dBm)
« aux port »	sub-D 9-pin female, auxiliary connector (call,...)
« on air »	sub-D 9-pin female, On-air indicators 1 & 2
« genlock »	BNC with loop-through, 1 Vp-p, 75 Ω
« prompter »	BNC with loop-through, 1 Vp-p, 75 Ω (on Sportcam only and up to 300 m)
« ret 1-4 »	4 BNC with loop-through, 1 Vp-p, 75 Ω, analogue viewfinder returns
« video out »	2 x 3 BNC, 1 Vp-p, 75 Ω, video outputs RGB or Y(R-Y)(B-Y), separately configurable, with variable saturation
« serial output 1-4»	4 BNC, 270 Mb/s serial digital outputs (with optional 4:2:2 10-bit encoder board)
« prgm in »	XLR 3-pin female, with programme sound return
« enc out »	3 BNC, 1 Vp-p, 75 Ω, composite video outputs
« pix »	BNC, 1 Vp-p, 75 Ω, video monitoring outputs
« mic 1-2 out »	2 XLR 3-pin male, camera and CA85 microphone outputs

## TRIAx EXTENDER:

■ <b>Dimensions</b> (h.w.d)	110x200x350 mm
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## CA 25:

- **Weight**
- **Consumption**
- **CA25 connectors:**
  - « mic in »
  - « incom »
  - « CCU/ VTR »
  - « DC in 11-17.5 »

approx. 1 kg  
1 W

XLR 3-pin female (with 12 V phantom powering)  
Tuchel female  
26-pin female  
XLR 4-pin male

## CCU 1625:

- **Maximum cable length**
- **Automatic cable correction**
- **Mains supply**
- **Consumption**
- **Dimensions**
- **Weight**
- **CCU connectors:**

« RCP »  
« MCP »  
« RCP power out »  
« intercom »

« aux port »  
« on air in »  
« Staircase »  
« genlock »  
« return »  
« video out 1-2 »

« enc out 1-2 »

« pix »  
output;

« wfm »

« mic out »

300 m (cable type: CCZ A)  
RGB/YCrCb, composite video, return and genlock channels  
100-120 V / 220-240 V AC, 50 or 60 Hz  
max. 90 W  
half 3U 19" rack-mounting  
approx. 7 kg

sub-D 9-pin female  
sub-D 9-pin female (only works with APCM option)  
XLR 4-pin female, 12 V DC  
XLR 5-pin (4-wire: 0 dBm 600 Ω, adjustable from -6 to +12 dBm).  
sub-D 9-pin female  
3-pin male  
3-pin female, only with APCM option  
BNC with loop-through, 1 Vp-p, 75 Ω  
BNC with loop-through, 1 Vp-p, 75 Ω, viewfinder return  
2 x 3 BNC, 1 Vp-p, 75 Ω, with APCM option:  
2 RGB video outputs or 2 Y(R-Y)(B-Y) outputs with variable saturation, individually configurable; without APCM option:  
2 RGB or Y(R-Y)(B-Y) video outputs with fixed saturation  
2 BNC, 1 Vp-p, 75 Ω, composite video outputs with fixed saturation  
BNC, 1 Vp-p, 75 Ω, with APCM option: video monitoring  
without APCM output: composite video output with fixed saturation  
BNC, 1 Vp-p 75 Ω, signal output to oscilloscope (only with APCM option)  
XLR 3-pin male, camera microphone output

## OCP40:

- **Consumption**
- **Weight**
- **Dimensions h.w.d**
- **OCP40 connectors:**
  - « Preview »
  - « CCU »
  - « LOOP »
  - « DC in »

3 W  
1.2 kg  
90x80x354 mm

sub-D 9-pin  
sub-D 9-pin  
sub-D 9-pin for connection to additional control panel  
XLR 4-pin 12 V DC

## TTV 3505 BETACAM SP™ RECORDER:

The video recorder specifications are common to those of the BETACAM SP™ range apart from the chrominance bandwidth with metal cassettes: 25 Hz to 1.5 MHz (+0.5 dB, -3 dB).

- **Recording time**

30 mn (with BCT-30M cassette)

- **Weight**

3.4 kg

- **Consumption**

14 W

- **TTV 3505 connectors:**

« Audio in CH1/CH2/CH3/CH4 »

XLR 3-pin female  
MIC - 60 dB, 3.6 kΩ balanced  
48 V phantom powering, switchable on CH1  
LINE + 4 dB, 14 kΩ balanced (nominal level)  
CAMERA - 60 dB, 3 kΩ, via camera input connector



« Genlock Video in »	BNC 1 Vp-p, 75 Ω
« Time Code in »	BNC 0.5 Vp-p to 5 Vp-p, 10 kΩ
« Encoded Video out »	BNC 1 Vp-p, 75 Ω
« Time code out »	BNC 1 Vp-p, 75 Ω
Headphones	Mini-jack 8 Ω, - ∞ to - 20 dB
« PB adaptor »	20-pin (for VA500 P)

## TTV4005 BETACAM SX™ RECORDER:

■ Recording time	60 minutes (with BCT-60SX cassette)
■ Weight	2.9 kg
■ Consumption	19 W
■ TTV 4005 connectors:	
« Audio IN CH1/CH2 »	XLR 3-pin
	MIC - 60 dB, 3.6 kΩ balanced
	LINE + 4 dB, 14 kΩ balanced (nominal level)
« Genlock in »	BNC 1 Vp-p, 75 Ω
« Time Code in »	BNC 0.5 Vp-p to 18 Vp-p, 10 kΩ
« Video out »	BNC 1 Vp-p, 75 Ω
« Video test out »	BNC 1 Vp-p, 75 Ω
« Time code out »	BNC 1 Vp-p, 75 Ω
«Headphones »	Mini-jack 8Ω, - ∞ to - 20 dB
« Audio out »	XLR 5-pin

## 1.5" (4 CM) VIEWFINDER:

■ Tube	4 cm (1.5") black and white
■ High resolution	700 TV lines
■ Rotation	+ 135°/-90°
■ Adjustment	70 mm lateral, 30 mm longitudinal
■ Weight	0.72 kg

## 5.5" (14 CM) VIEWFINDER:

■ Tube	14 cm (5.5") black and white
■ High resolution	600 TV lines
■ High brightness	600 Nits
■ Consumption	1 A (video and indicators on)
■ Weight	3 kg

## 7" (17 CM) VIEWFINDER:

■ Tube	17 cm (7") black and white, flat
■ High resolution	750 TV lines
■ High brightness	600 Nits
■ Rotation ± 90°	Tilt ± 50°
■ Weight	7 kg

### Environmental conditions for camera head, Microcam™, Sportcam™, adapters, viewfinders and triax extender:

■ Temperature	-20°C to +45°C
■ Electromagnetic compatibility	EN 50081-1, EN 50082-1
■ Relative humidity	(non-condensing) for 48 hours 93% RH at 40°C, IEC standard 68-2-3 (NFC 20703)

### Environmental conditions for CCU and OCP40 control panel:

■ Electrical safety	conforms to EN 60950
■ Temperature	0° to +40°C
■ Electromagnetic compatibility	EN 55022 Class A standard
■ Relative humidity	(non-condensing) for 48 hours 93% RH at 40°C, IEC standard 68-2-3 (NFC 20703)

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Picture comparisons are computer simulated


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