

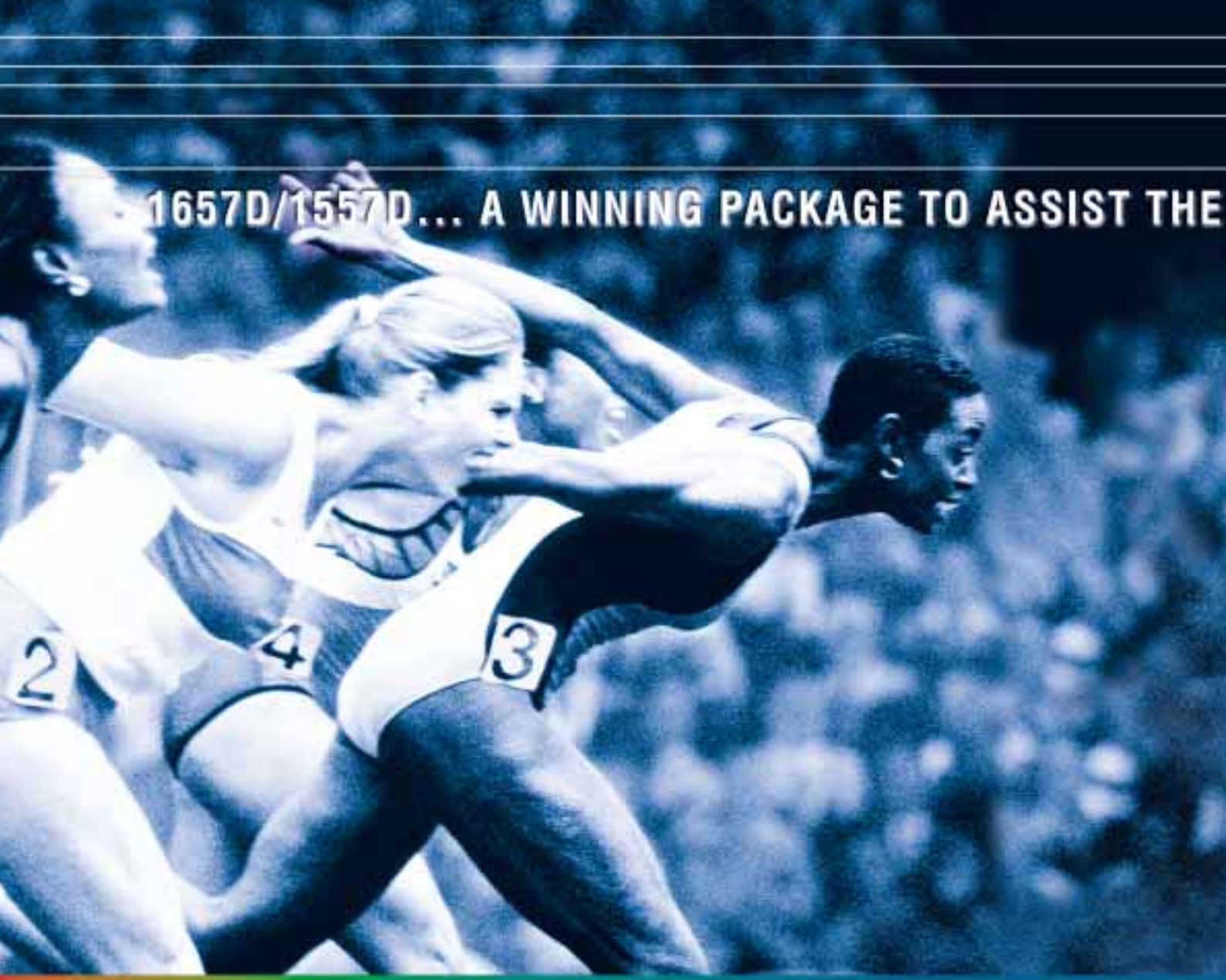
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1557D/1657D DIGITAL CAMERAS

DESIGNED TO OFFER
YOU THE ULTIMATE IN
PERFORMANCE
AND FLEXIBILITY



THOMSON MULTI
MEDIA
BROADCAST SOLUTIONS



1657D/1557D... A WINNING PACKAGE TO ASSIST THE

THOMSON unveils its vision of the digital cameras in offering a range of 12-bit digital processing cameras, the 1657D/1557D camera family. This camera family is a complete creative system designed as a production tool to assist the craft of the cameraman. With the 1657D portable digital camera and its derivative products like the unique Microcam™ and the Sportcam™, as well as the 1557D the conventional studio version, this camera family is the most complete digital camera family ever.

The 1657D/1557D Family

Each camera has been designed to offer you the ultimate in performance and flexibility for each specific requirement. The 1657D/1557D don't use just any digital processing, they use "the" digital processing 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 performed with 12-bit quantization 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.

1657D Microcam

The Microcam is the ultra-compact split-head option for the 1657D. It 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 new shooting angles that would be impossible with a conventional camera. At the same time, the picture quality of the 1657D is maintained, providing a perfect match 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.

CRAFT OF THE CREATIVE CAMERAMAN



1657D Sportcam and 1557D

Both the Sportcam™ and the 1557D offer the same performance and features. The Sportcam™ is perfectly suited for those who face the difficulty of planning shooting schedules and not knowing in advance whether to use a portable or a studio camera. The 1557D has been designed for those who prefer the look of a conventional studio camera, and for whom the flexibility is less important. The versatility of the Sportcam™ 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 both the Sportcam™ and the 1557D, 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, a control panel enables the cameraman to select which video he wants to see in the viewfinder, as well as activating the various markers he may want to use. Furthermore on the 1557D, a picture-in-picture facility allows the cameraman to view one of the return videos within the main camera viewfinder picture.

THE STARTING BLOCK FOR PERFECT DIGITAL

12-bit Quantization

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

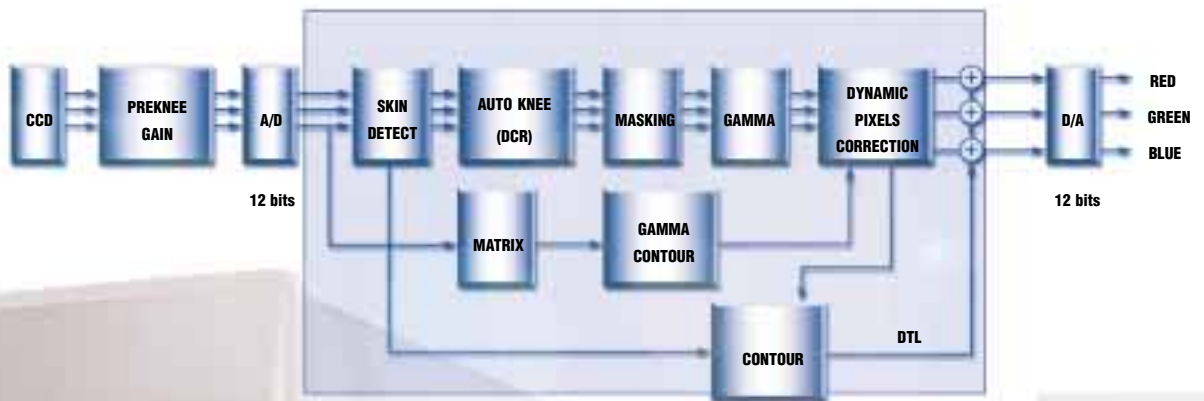
Technology

Due to the complexity of the image processing algorithms implemented with more than 22 bit internal processing,

Thomson 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 results in a highly compact image processor with very low power consumption.

Stability and Reproducibility

The advantage of 12-bit analog-to-digital converters over 10-bit based cameras enables the digital processing power to be maximized and thus reduces the analog 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/1557D cameras offer a wide choice of sensors, enabling each operator to choose the sensor best suited to his requirements, with regard to technology and price. Among the sensors available, the 1657D/1557D may be fitted with the very latest generation of FIT and IT sensors. At the top of the range, the new FIT 1250 pixels sensor offers an unprecedented level of resolution. In the IT range, the new switchable 16/9-4/3 sensor benefits from recent improvements that mean "smear", frequently associated with such sensors is virtually imperceptible.

BROADCAST TECHNOLOGY



Dynamic pixel correction

As pioneer in the field of pixel correction in broadcast cameras, Thomson has taken a new step forward in building an automatic compensation system for defective pixels into the 1657D/1557D.

This dynamic system analyses the image continuously and corrects defective pixels in real time, without any maintenance being required.

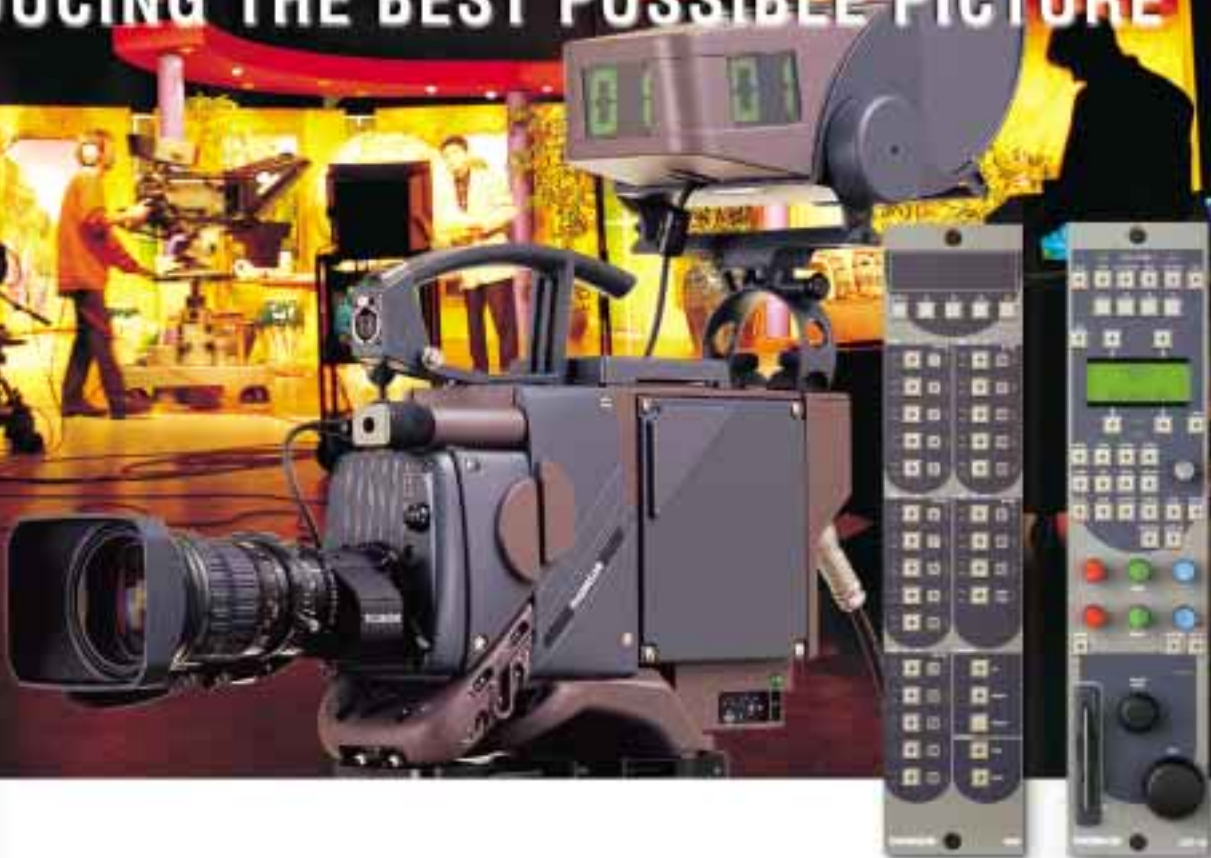
Switchable 4/3-16/9: "The wider view"

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 switchable sensors have the same sensitivity in both 4/3 and 16/9 formats.



1657D/1557D... DIRECTING THE OPERATOR IN PRODUCING THE BEST POSSIBLE PICTURE



OCP 42

Thomson camera control panels are designed to aid the operator in producing the best possible picture. The OCP 42 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 42 allows the camera status to be seen at a glance and modified for perfect matching in a 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 OCP 42 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.

Its memory card can be used to store operating settings for several cameras (up to 24) or to store the technical values and operating settings for a single camera. In this case, the card could be used to restore all the original settings for a camera on its return from hire.

MCP

In multi-camera operations, the MCP allows centralization of all adjustment functions. It facilitates operation where there is a large number of cameras and also enables hierarchies of operator responsibilities to be set up.

In its standard version, the new MCP consists of an OCP similar to the OCP42, but with the Iris and Master Ped controls operated by flat-mounted digipots (OCP50), with an associated selection keypad (MSP). The MCP can control up to 24 cameras and provides:

- access to all the camera's Operational parameters,
- access to Technical parameters, in conjunction with the OCP50,
- transfer of Operational and Technical parameters from one camera to one or more others,
- storage on Smart Card of the Operational parameters for one studio, or all the parameters for one camera,
- access to single functions in group mode.



Dual Skin Contour

This correction allows detail level to be varied as a function of color. 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 color spectrum.

Contour

Contour correction is used to enhance picture sharpness. The contour signal in the 1657D / 1557D is calculated from the three primary colours ensuring very sharp reproduction of pictures even in highly colored 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.

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-color reduction

The 1657D/1557D incorporates a new form of picture processing which considerably reduces the phenomenon of cross-color. It removes all disturbing frequencies from the picture, so encoded pictures from the 1657D/1557D are of unprecedented quality.

Gamma

In the 1657D/1557D, gamma correction is carried out totally digitally. The 1657D/1557D have several presets, corresponding to different gamma laws. From each preset 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 color reproduction

A patented compression system is used to reduce dynamic range in those brightly lit parts of a picture that exceed nominal level. This process, unique to Thomson, restores luminance and chrominance, as well as the details 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 analog-to-digital conversion in the 1657D/1557D.



Direct access to colour temperature

The 1657D/1557D cameras have an exclusive system that enables camera color 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 color 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.



Continuous white balance

The 1657D/1557D cameras have a continuous white balancing system. In this mode, the camera continuously adjusts white balance correction as a function of picture content. For example, the color temperature modifications are automatically tracked by the camera during tracking shots from indoor to outdoor lighting conditions.

Saturation

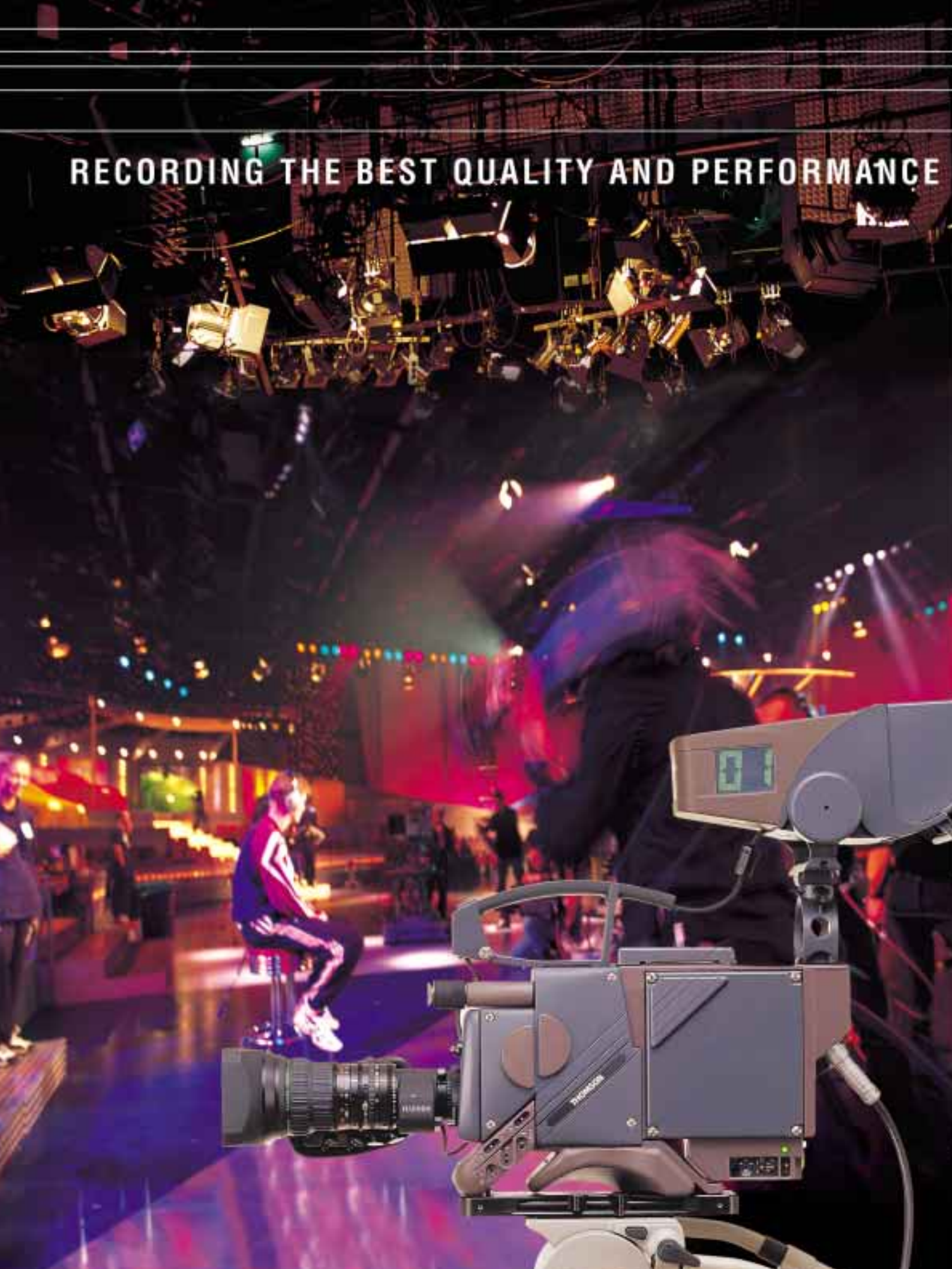
This feature allows color saturation in the picture to be adjusted, from black and white to over-saturation (200%)



Masking

The 1657D/1557D 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.

RECORDING THE BEST QUALITY AND PERFORMANCE



IN THE BROADCASTING INDUSTRY

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 analog 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 4:2:2 studio profile format, together with 60 minutes recording time on BCT-60SX cassettes. The TTV 4005 also allows full color picture and sound playback, without a special adapter.

Triax: Mobility

The triax system has been designed to operate with cameras from the 1657D/1557D family. The design of the triax link allows full picture quality to be maintained over long distances. Both the CCU 1686 and the CCU 1685 provide all the facilities required for ideal integration into a high-end production environment, whether in an Outside Broadcast van or studio.

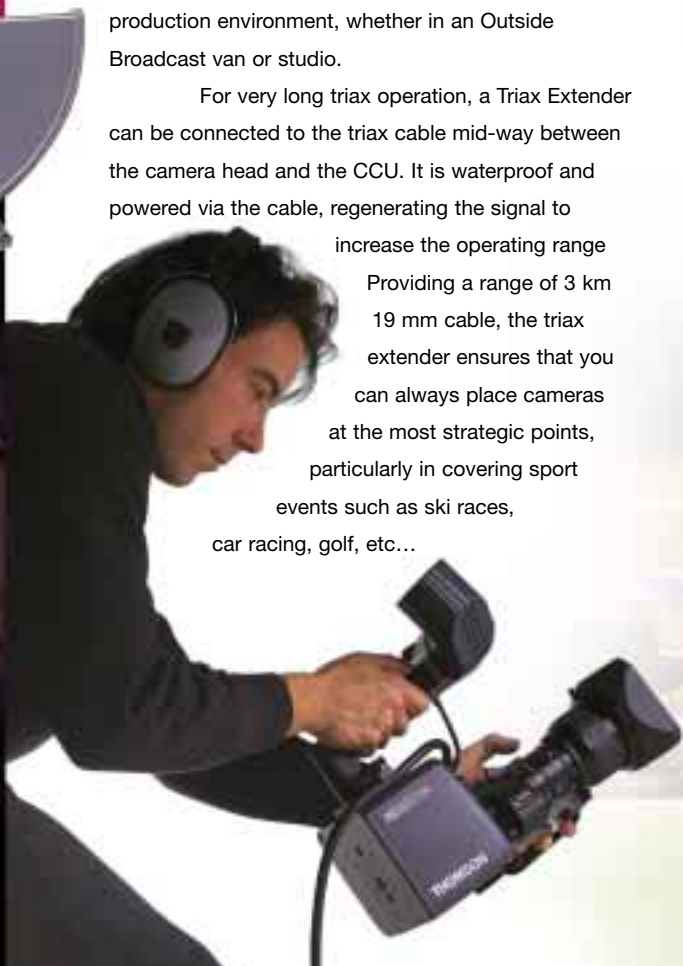
For very long triax operation, a Triax Extender can be connected to the triax cable mid-way between the camera head and the CCU. It is waterproof and powered via the cable, regenerating the signal to

increase the operating range

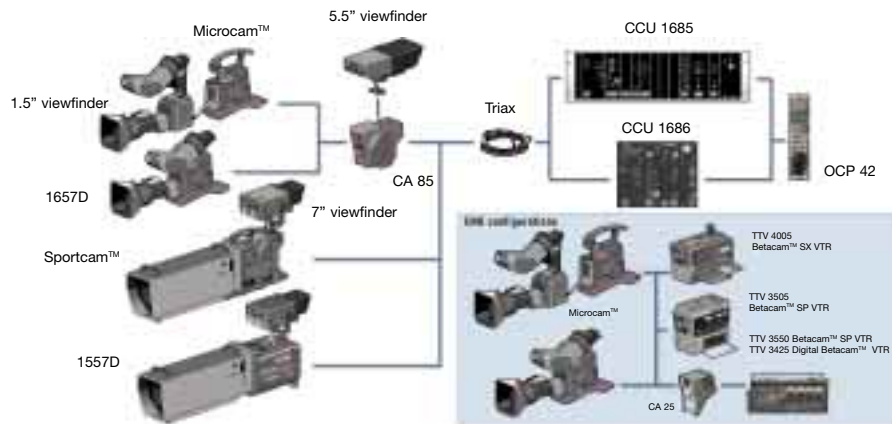
Providing a range of 3 km 19 mm cable, the triax extender ensures that you can always place cameras at the most strategic points, particularly in covering sport events such as ski races, car racing, golf, etc...



- 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. Microphone input sensitivity can be controlled remotely from the CCU.
- 4 analog "viewfinder return" video channels, 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.



1657D / 1557D PRODUCTION SYSTEM



TECHNICAL SPECIFICATIONS

1657D

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 Ohm
video out	BNC, 1 Vp-p, 75 Ohm (composite video, Y, R, G, B, R-G, B-G)
mic	XLR 3 (with 12V phantom powering)
vf	Chuomusen 21-pin (B/W, component or RGB, composite video, video return)
lens	Hirose 12-pin

1557D

Weight	approx. 26 kg with 7" viewfinder, excluding lens
Camera head connectors:	
Cameraman headset	Tuchel or XLR5, talkback headset connector
Cameraman assistant headset	Tuchel or XLR5, talkback headset connector
vf out	BNC, 1 Vp-p, 75 Ω
genlock	BNC, 1 Vp-p, 75 Ω
encoded out	BNC, 1 Vp-p, 75 Ω
mic 1&2 in	2 XLR3 female (with individual +12V/+48 V phantom powering)
tracker	Hirose 12-pin (talkback: prod, eng, cameraman)
ext on air	Lemo 2-pin
prompter out	BNC, VBS 1 Vpp, 75 Ω
remote	Hirose 10-pin (for OCP40 control panel connection)
CCU out	BNC, VBS 1 Vpp, 75 Ω
utility power DC out	XLR4 female, 12 V DC, 70 W utility power output for prompter
utility power AC out	XLR2 female, 110 V AC or 220 V AC, 50 W optional output for prompter
lens	24 pin connector for studio lens
DC in	XLR4 male, 12 V DC input for standalone operation
triax	Lemo 75 W, Lemo 50 W, Fischer, King

Microcam

Multicore cable	CCZA type cable, 26-pin
Microcam/camera body distance	0 to 100m
Dimensions	138 x 155 x 105 mm (excluding grip and viewfinder)
Fixing	2 3/8" bolts for tripod mount 4 M4 screws and 3 M3 screws for "mini-wedge"
Weight	2.5 kg with viewfinder, excluding lens
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, composite video, video return)
lens	Hirose 12-pin

Sportcam

Weight	10.7 kg without viewfinder
Sportcam connectors:	
cam (vf)	Hirose 10-pin (for camera head connection)
prompter out	BNC, 1 Vp-p, 75 Ω (available up to 300 m)
power utility	XLR4 female, 12 V DC, 70 W for 17 cm (7") viewfinder connection
vf	2-pin
ext on air	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

CA85

Weight	2,8 kg
CA 85 connectors:	
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 option"

TECHNICAL SPECIFICATIONS

CCU triax Tracker	Lemo 75 Ω, Lemo 50 Ω, Fischer, King Hirose 12-pin female (12V-3W, on-air indicator: 100 Ω grounded contact; talkback: prod, eng, cameraman)
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CCU 1685 / CCU 1686

Bandwidth	R: 6 MHz, G: 6 MHz, B: 6 MHz
Maximum triax distances (without / with triax extender)	Triax A (ext. Ø 9 mm: cable attenuation 7,8 dB/100 m à 60Mhz): 600 m / 1,100 m. Triax B (ext. Ø 13 mm: cable attenuation 3,9 dB/100 m à 60Mhz): 1200 m / 2400 m. Triax C (ext. Ø 19 mm: cable attenuation 2,9 dB/100 m à 60Mhz): 2100 m / 3000 m.
CCU/panel distance	max. 500m (RS422 SMPTE protocol)
Mains supply	100-120V/220-240V AC, 50-60 Hz
Consumption	Max 100 W
Weight	approx 15 kg
Dimensions	CCU 1685: 3U 19" ; CCU 1686: 4U 1/2 19"
CCU connectors:	
RCP	sub-D 9-pin female
MCP	sub-D 9-pin female
RCP power +12V out	XLR 4-pin female (CCU 1685 only)
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 - (4wire: 0dBm-600 Ω, adjustable from -6 to +12dBm)
intercom eng	sub-D 9-pin female, 4-wire (2-wire) or RTS - (4wire: 0dBm-600 Ω, adjustable from -6 to +12dBm)
aux port	sub-D 9-pin female, auxiliary connector (call,...) (CCU 1685 only)
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 1557D and Sportcam only and up to 300 m)
ret 1-4	4 BNC with loop-through, 1 Vp-p, 75 Ω, analog viewfinder returns
video out	CCU 1685: 2 x 3 BNC CCU 1686: 1 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	CCU 1685: 3 BNC CCU 1686: 2 BNC 1 Vp-p, 75 Ω, composite video outputs

pix	BNC, 1 Vp-p, 75 W, video monitoring outputs
mic 1-2 out	2 XLR 3-pin male, camera and CA 85 microphone outputs

Triax extender

Dimensions (h x w x d)	110 x 200 x 350 mm
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OCP 42

Consumption	3 W
Weight	1,2 kg
Dimensions h x w x d	354 x 80 x 110 mm

OCP 42 connectors:

Preview	sub-D 9-pin
CCU	sub-D 9-pin
LOOP	sub-D 9-pin (for connection to additional control panel)
DC in	XLR 4-pin 12 V DC

MCP

OCP 50

Dimensions h x w x d	115 x 80 x 354 mm
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OCP 50 connectors:

Preview	sub-D 9-pin
CCU	sub-D 9-pin
LOOP	sub-D 9-pin (for connection to additional control panel)
DC in	XLR 4-pin 12 V DC

MSP

Mains supply	100-120V / 220-240V AC, 50 or 60Hz
Dimensions h x w x d	115 x 80 x 354 mm

MSP connectors:

OCP50	sub-D 9-pin
CCU 1 / CAP to CCU	8 sub-D 9-pin
Video Matrix (RS422)	sub-D 9-pin
Video Matrix (BCD)	sub-D 9-pin
OCP Matrix	sub-D 9-pin
GPI in	sub-D 25-pin
AUX	sub-D 9-pin
Extend	sub-D 9-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

TECHNICAL SPECIFICATIONS

Environmental conditions

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

Temperature	-20° 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 OCP42 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)

1657D/1557D camera heads

Standards	PAL, NTSC
Sensors	1657D/1557D TX: 3 CCD 2/3" IT "low smear" (Interline Transfer) 813 H x 503 V pixels in NTSC, 4/3 format 813 H x 585 V pixels in PAL, 4/3 format 1657D/1557D WIDE LS: 3 CCD 2/3" IT "low smear" (Interline Transfer) 1020 H x 505 V pixels in NTSC, 16/9-4/3 format 1008 H x 591 V pixels in PAL, 16/9-4/3 format 1657D/1557D WIDE FX: 3 CCD 2/3" FIT (Frame Interline Transfer) 1020 H x 491 V pixels in NTSC, 16/9-4/3 format 1008 H x 585 V pixels in PAL, 16/9-4/3 format 1657D/1557D WIDE FX 1250: 3 CCD 2/3" FIT (Frame Interline Transfer) 1270 H x 503 V pixels in NTSC, 16/9-4/3 format 1255 H x 587 V pixels in PAL, 16/9-4/3 format
Modulation depth	1657D/1557D WIDE FX 1250: 85% typ. at 5 MHz 1657D/1557D WIDE LS and WIDE FX: 75% typ. at 5 MHz 1657D/1557D TX : 65 % typ. at 5 MHz
Horizontal resolution	950 TV lines in 16/9 750 TV lines in 4/3

Vertical resolution	Standard or extended (PAL: 530 lines in extended mode)
Registration	Zones 1,2,3: less than 0,05% (excluding lens faults)
Optical system	f/1,4 RGB beam splitter with infra-red and low-pass filters
Sensitivity	2000 Lux at f/8 (89,9% reflectance, color temperature 3,200°K)
Minimum illumination	Approx. 5,5 Lux (lens at f/1.4, gain 21 dB)
Signal/noise ratio	61 dB typical (PAL), 63 dB typical (NTSC)
Filter wheel	1657D standard: 1 manual filter wheel (wheel 1). optional: 2 motorised filter wheels (wheel 1 & 2) 1557D standard : 2 motorised filter wheels Wheel 1: neutral density filters: clear, 1/4, 1/16, 1/64, cap. Wheel 2: special effects filters: clear, 4 point star, dense fog, light fog.
Gain	-3, 0, 3, 6, 9, 12, 15, 18, 21 dB
Shutter	1/60, 1/120, 1/250, 1/500 et 1/1000s
Clear scan	50 Hz à 200 Hz in Pal 60 Hz à 200 Hz in NTSC

Operating features and parameters:

12-bit analog/digital conversion and > 22-bit internal digital processing, depending on processing stage.
Gamma: master gamma, fine gamma, gamma R, gamma B
Black stretch level
Contour: detail level, coring level, level dependant, 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
Color temperature: progressive electronic correction from 2,200°K to 9,900°K
Lens correction: the 1657D/1557D hold two lens correction files

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