

TTV 1525 C

Colour camera chain

Features

New top-of-the-range camera mainly suited for studio and EFP applications and completing the TTV 1525 camera range.

Essential differences between the TTV 1525 A/B and the TTV 1525 C:

- A new camera head equipped with three 1" pick-up (25 mm) tubes.
- A convergence servo-control using a micro processor and working on 182 picture zones.
- A shading correction servo-control working all over the picture.

- A filter wheel equipped with special effects filters.
- An optical fiber link (option).
- A multistandard colour viewfinder (option).

Have been preserved:

- The reliability.
- The flexibility owing to the incremental mode of operation making use of a micro processor RIM 1525.



Description

The colour camera chain TTV 1525 C comprises:

- The camera head CA 1525 C with its accessories. The camera head consists in a precision cast frame stable, rugged and aesthetic, which houses the optical system, 12 printed circuits and the DC to DC converter.
 - The camera control unit CV 1525 C, which houses the plug-in boards containing the video processing and auxiliary functions such as monitoring, encoding, sync. and so on...
 - The camera CCU interconnection cable (3 alternatives: multicore, triaxial or optical fiber cable).
 - Various control panels according to the operational mode:
 - Normal mode: one operational control panel PRN 1525 and one remote control panel PTN 1525 for each camera.
 - Incremental mode: one centralized operational control panel fitted with a microprocessor RIM 1525 for up to 8 cameras and one remote control panel TIM 1525 for each camera.
- A switching matrix GR 1525 is necessary for the incremental mode of operation.

The camera chain has been developed to ensure a high MTBF and, if necessary, an easy maintenance.

For this purpose:

- Only standard electronic components are used.
- All the integrated circuits are mounted on supports.
- The adjustment and test points are marked on each board and, thus, can be easily located.
- Test softwares have been integrated for the micro processor -based boards.
- Diagnosis.

Camera head

Pick-up tubes

The camera TTV 1525 C makes use of three "diode gun" 1" (25 mm) pick-up tubes of low capacity (LOC):

- XQ 3070 for the green and blue channels,
- XQ 3075 for the red channel for example

These tubes offer high resolution and modulation depth. Equipped with an Automatic Beam Optimizer, they control up to 16 times the normal illumination level of the target without image disturbance.



Optical beam splitter

The light flux from the lens assembly is split in a prism beam splitter which is designed for the 1" (25 mm) format and opens up to f:1.5.

Protection against infra-red radiation is ensured by a special treatment and reflection effects due to the bias lights are inhibited by a quartz plate. Dust tightness ensured by the beam splitter front face.

Filter wheel

Two filter wheels are provided in front of the prism. The first one, which can be remote controlled from the panels, comprises neutral filters of density 0 to 1.2 and a filter acting as a shutter. The second wheel, which can only be controlled by the cameraman, comprises special effects filters: stars with 4 or 8 branches, center focus filter, low contrast filter.

The colour temperature correction is carried out electronically by switching the gains, beam currents and colour masking coefficients.

Lenses

The camera TTV 1525 C can use a very wide range of lenses. The lens must be fitted with a diascope which is used during the automatic operational adjustments and automatically switched on during a set-up sequence. The lens is fixed to the camera front face by a reliable fast attachment system.

● ANGENIEUX:

- 15 x 13
- 12 x 12.5
- 42 X 12.5

● FUJI:

- 14 x 12.5
- 44 x 13.5

Viewfinders

Two types of viewfinder can be used: monochrome or multistandard colour.

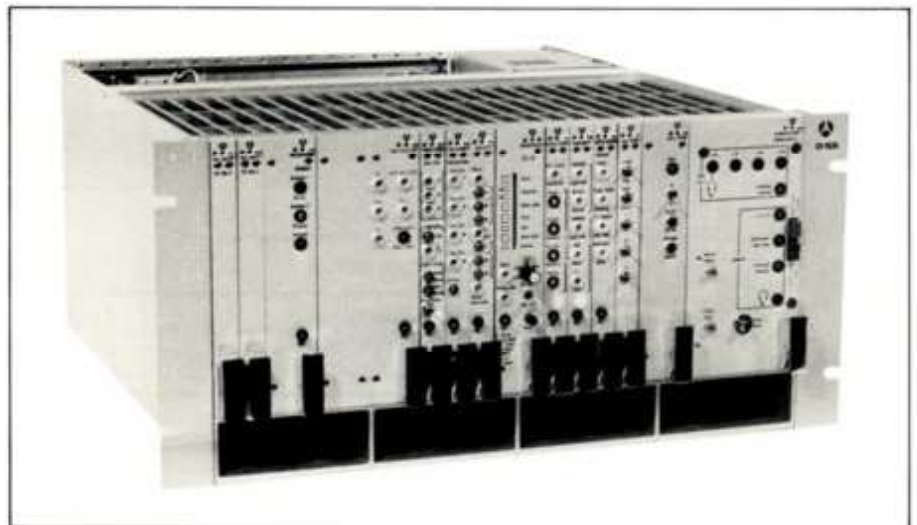
- Steerable in elevation and azimuth.
- Easy attachment allowing for fast replacement, if necessary.
- Luminous indication of the lens focal length.
- R, G, B, R-G, B-G, encoded video or external video can be selected from the keyboard located on the camera operational face (keys with luminous indication).
- Monochrome 17 cm viewfinder with high brightness tube.
- Colour 18 cm viewfinder with high resolution and brightness tube.

Camera control unit

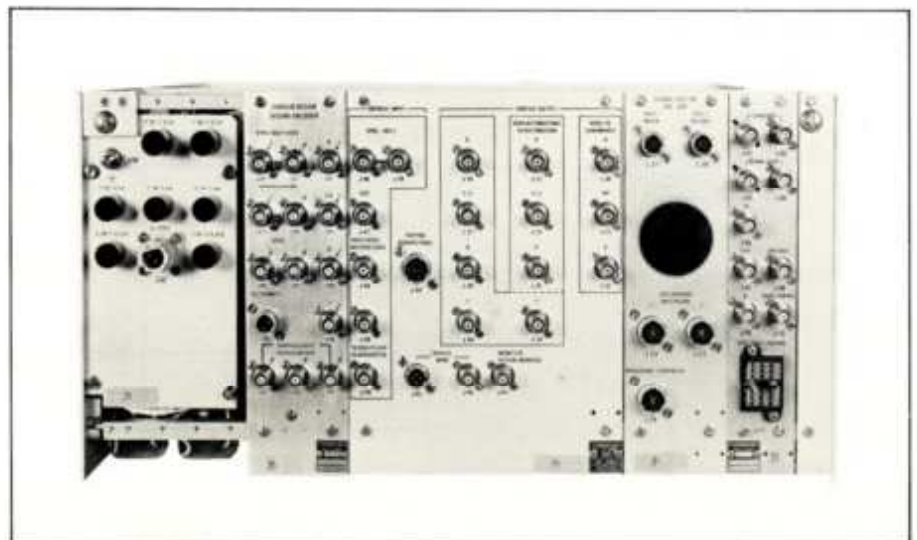
● The CCU consists in a SOMAC frame to the 19" standard and of 5 units height. The three signals from the camera head undergo the following processing operations in the CCU:

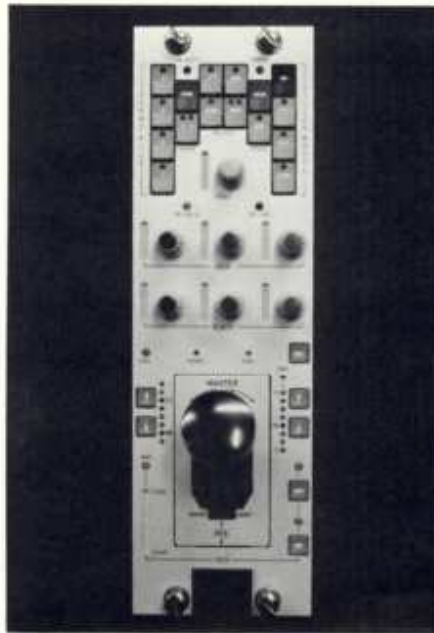
- Omnidirectional contour enhancement with possible control from the panel during operation.
- Gamma correction.
- Additional white shading correction.
- Colour masking through matricing.
- The CCU also houses the plug-in boards ensuring the following functions:
- Monitoring (waveform, monochrome picture monitors).

- Optional SECAM, PAL or NTSC encoder with a built-in bar test pattern and sync. generator with genlock.
- Chroma-key (option).
- Remote control commands encoding.
- Automatic operational adjustments.
- Camera chain power supply comprising safety devices such as detection of shorted cable, open cable or cable under load.



CAMERA CONTROL UNIT





STANDARD REMOTE CONTROL PANEL



Servo control systems

These systems comprise the automatic controls and automatic adjustments.

Automatic adjustments

Two types of automatic adjustments available of different running times and performances.

- Maintenance automatic adjustments

They allow a great accuracy to be reached for the:

- Geometry and convergence adjustments.
- Black and white shading corrections.

They make use of an external specific test-pattern and thus allow the distortions due to the lens to be taken into account: the registration is carried out on 182 picture zones. The shading correction can be performed on up to 8,000 picture dots.

- Operational automatic adjustments

Of rapid running time, they use a diascope test pattern located inside the lens and can be remote controlled from the panels. The following parameters are checked and adjusted:

- Horizontal and vertical centering, amplitudes and linearities of the red and blue channels compared to the green channel.
- Black levels.
- White levels (gain).
- Grey levels (gamma).
- Black pulse amplitude.
- Flare correction.

- Automatic controls

Remote controls are available from the panels:

- Automatic iris control which automatically sets the aperture.
- Automatic black balance which rapidly balances the three video levels in a black area of the filter wheel shutter.
- Automatic white balance which rapidly balances the three video levels in a white area of the scene to be transmitted and automatically sets colour temperature.

Technical data

- Power supply: Single phase mains, 220 V - 240 V \pm 10 %, 50 Hz \pm 2 Hz.
Option: 117 V - 60 Hz.
- Consumption (depending on options selected):
 - Camera: 150 W approx.
 - CCU : 130 W approx.
- Operating temperature range:
 - - 10 °C to + 40 °C (+ 50 °C tubes unguaranteed).
 A heating cover allows the camera head to operate down to - 30 °C.
- TV standards:
 - 625 lines, 50 Hz - SECAM or PAL.
 - 525 lines, 60 Hz - NTSC.
- "Diod gun" LOC lead-oxyd pick-up tubes
 - 1" (25 mm) dia. for the three channels:
 - XQ 3070/02 or P 8442 for the green and blue channel,
 - XQ 3075/02 or P 8443 RF for the red channel.
- Camera cables:
 - multicore cable, 14 mm dia., 600 m max.,
 - triaxial "A" cable, 9 mm dia., 750 m max.,
 - triaxial "B2" cable, 13 mm dia., 1,500 m max.,
 - optical fiber cable CABELTEL, 11.5 mm dia., 2,250 m max.
- Video teleprompter:
 - 2 MHz band with up to 600 m (with triaxial "B" cable).
- Sensitivity:
 - For a colour temperature of 3,200 °K, an illumination level of 1,400 lux (on a reference white area of 60 % reflectance) and a lens iris at f:4, the typical r.m.s signal to noise ratio at the luminance channel output with 5 MHz bandwidth is: \geq 53.5 dB.
- Modulation depth:
 - At 5 MHz without aperture correction: minimum value: 40 %, typical value: 50 %.
- Geometry distortions:
 - within a circle of diameter equal to 0.8 picture height (zone 1): \leq 1 % of picture height'
 - out of this circle: \leq 1.5 % of picture height (typical value with lens).
- Convergence:
 - Convergence error tolerances are identical for R-G and B-G
 - zone 1: 20 ns
 - zone 2: 20 ns typical values
 - zone 3: 40 ns.
- Gamma correction:
 - $\gamma = 0.45$ adjustable at ± 0.05
 - Two transfer laws are provided for use in studio and outdoors

Mechanical specifications

BASIC UNITS	HEIGHT MM	WIDTH MM	DEPTH MM	WEIGHT KG
Camera CA 1525 (excluding lens and viewfinder)	445	270	592	35
Camera with viewfinder hinged down	480			12.3
17 cm viewfinder VE 1525	130	170	300	4.5
Camera control unit CV 1525	225	480	475	10
Operational control panel:				
- Standard PRN 1525	90	205	350	7
- Incremental RIM 1525	140	380	420	1
Remote control panel:				
- Standard PRN 1525	190	115	370	2
- Incremental TIM 1525				
Matrix GR 1525	220	480	500	6