THOMSON-CSF

TTV 1623*
TTV 13123

Camera CA 1623 ENG configurations

2

1

Three ENG configurations are possible with the CA 1623 camera. Depending on the equipment with which it is associated (recorder or adaptor), it becomes:

- A "CAMESCOPE**" or camera associated with a built-in video tape recorder (TTV 13123) (1).
- A conventional camera (TTV 1623) with a separate VTR (2).
- A very high performance camera (auto set-up TTV 1623) with a microprocessor-based automatic-control box (3).

3

*available in Plumbicon® or Saticon® L.O.C. version TTV 1624 and 13124

**compatible with BETACAM system

DIVISION VIDÉO ÉQUIPEMENT

I - CAMERA CA 1623

General

The CA 1623 camera represents a new high-quality reference in the field of broadcast cameras. Despite a considerable reduction in size and weight as compared to the MICROCAM range (TTV 1603, 1604, 1605), it makes use of the latest 2/3" pick-up tubes providing an improved picture quality. A new design of all circuits, especially video processing, result in a significant improvement of all performances.
This generation is compatible with any type of composite or component video tape recorder: the camera delivers 7 signals, Y, R-Y, B-Y, R, G, B and the SECAM, PAL or NTSC-encoded signal.

Description

Camera head

The camera head is a one-piece assembly. Its weight is reduced to 4.1 kg approx., owing to the use of magnesium for the camera body, the beam splitter casting and most other parts (viewfinder 1.5" included).
Special care has been taken to "weatherproof" the camera head.

Optical system

- Wide aperture (f/1.4) optical prism block.
- filter wheel with 4 usable positions,
- protective shutter,
- quartz filter providing immunity to colorimetry errors due to reflected polarized light effects,
- full dust-proofing (with sealed window),
- improved bias light uniformity to reduce remanence at low light levels.
- Pick-up tubes
  The use of 2/3" diode gun tubes with low output capacitance allows significant improvements in the resolution and signal-to-noise ratio. New scan circuits with pin cushion correction are used to guarantee very low geometry distortion; the use of dynamic focusing provides excellent resolution not only at the centre of the picture, but also in corners.
  The camera is available in 2 versions:
  1 - standard version CA 1623: SATICON TRIODE H 8399 B tube
  2 - version CA 1624 with L.O.C.* diode gun PLUMBICON tube XQ 3427 or L.O.C. diode gun SATICON tube H 9386 B

*L.O.C. low output capacitance

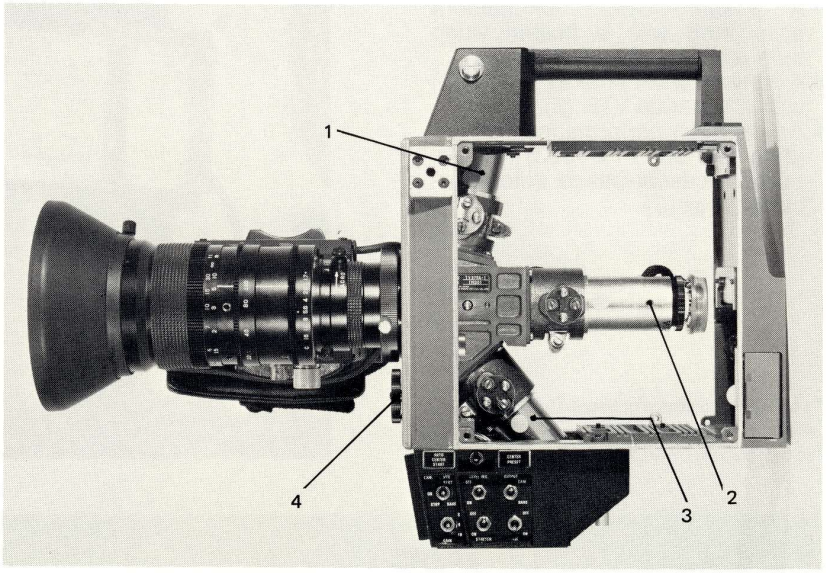
- Lenses
  standard lens:
  FUJINON A 14 x 9 BERM° 28
  or any lens listed below, as desired:
  FUJINON:
  A 3.5 x 6.5 BRM
  A 7 x 7 BRM
  A 10 x 11 BRM
  A 12 x 9 BRM ou BERM°
  A 14 x 10 BRM
  A 17 x 9 BERM

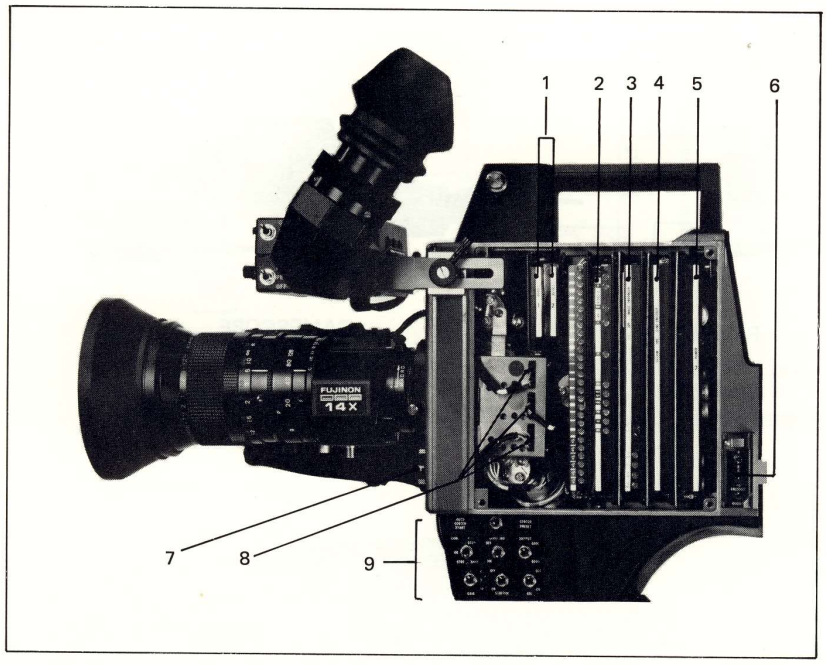
  ° with a x 2 range extender

(1) Red tube.
(2) Green tube.
(3) Blue tube.
(4) Filter control.

Optical system of the camera
— The 3 tubes occupy most of the internal volume.
— The camera has become as short as the lens assembly.

  ANGENIEUX:
  14 x 9 f/1.6 with a x 2 range extender
  15 x 9 f/1.5 with a x 2 range extender
  CANON:
  J 13 x 9 B4 IRS 2 with a focal length doubler
  J 15 x 9.5 B4
  Standard bayonet mount accomodating any lens of the MICROCAM range.
- 1.5" electronic viewfinder
- High-brightness and high-resolution 38 mm tube.
- 10 LED's for camera and VTR status indication.
- For tripod use, can be fitted with a 14 cm viewfinder.





(1) Automatic systems.
(2) Video 1 - video 2.
(3) Contour enhancement.
(4) Sync - encoder.
(5) Power input.
(6) Monitoring - Registrations.
(7) Filter control.
(8) R, G, B preamplifiers.
(9) Operating controls.

High-performance video processing

- Contour enhancement over two lines with separate V and H noise reduction and contour depending on the video level.
- Black and white shading correction with horn corrections.
- Full linear masking enabling very accurate colorimetry correction and accuracy of colours on several cameras.
- Gain: 0, +9, +18 dB with noise reduction variable according to gain.
- Switchable "black stretch" increased contrast (in blacks).
- Built-in encoder (SECAM, PAL, NTSC) with colour bar test pattern.

Automatic control

- Automatic black balance.
- Automatic white balance with a preset position at 3200° K.
- Automatic horizontal and vertical centring registration.
- Switchable automatic black level.
- Automatic permanent or momentary iris control.
- Automatic beam optimization.
- Automatic flare compensation.

(1) Location of connector (not visible) for auto and EPF adaptor.
(2) Mounting system.
(3) Connector for VTR.

Data summary

Electrical

- Power input: 10.8 to 17 V d.c. (battery or mains power supply)
- Power consumption:
  20 W (CA 1623 with standard tubes)
  22 W (CA 1624 with L.O.C. tubes)
- Scanning systems: 625 I/50 Hz SECAM, PAL
  525 I/60 Hz NTSC.

Video frequency

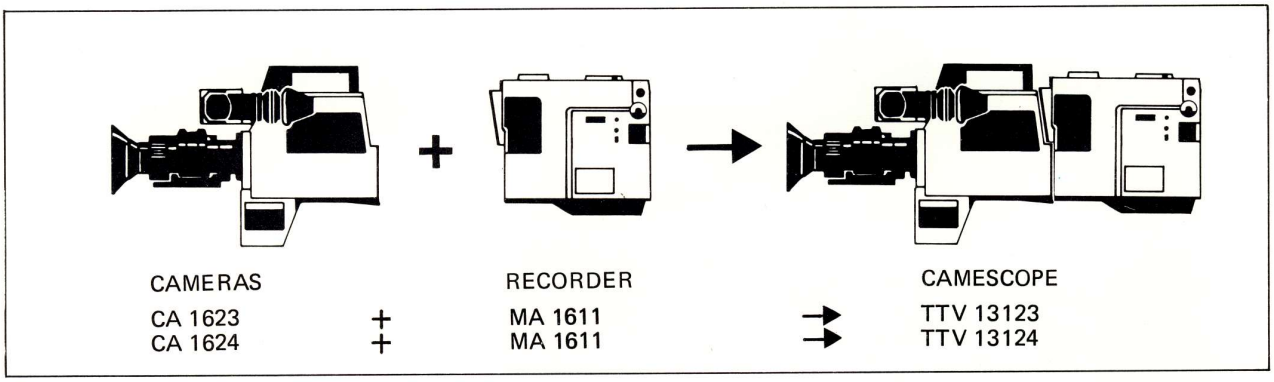
OUTPUT SIGNALS

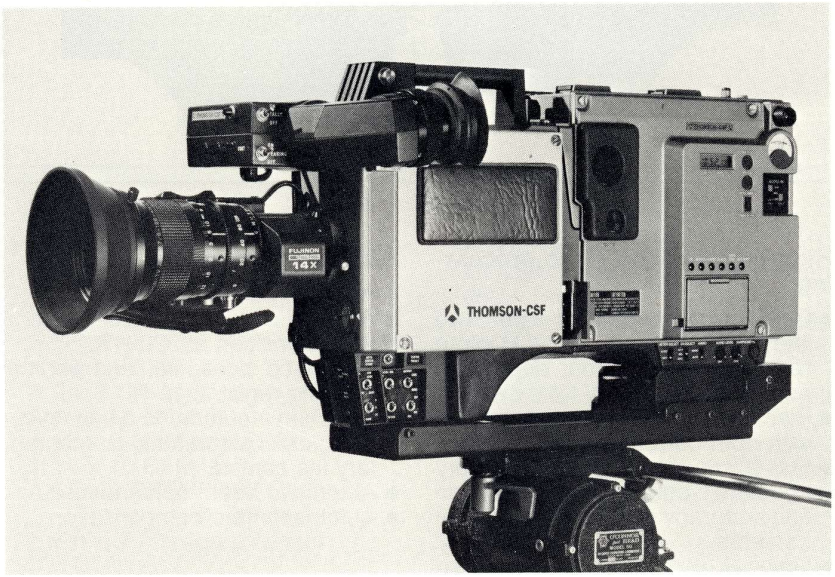
- R, G, B video for testing and EFP application.
- Y, R-Y, B-Y video for component VTR.
- SECAM, PAL or NTSC-encoded video for composite VTR.
- Switchable video for testing R, G, B or encoded R-Y, B-V, Y signal.
- Video bandwidth: 5.5 MHz ± 0.5 dB
- Sensitivity: 2000 lux f/4 (89%, reflectance 3200° K, 0 dB test pattern)
- Maximum sensitivity: 30 lux (18 dB - f/1.4)
- Signal-to-noise ratio:
  Standard tubes: 54 dB (SECAM, PAL)
  56 dB (NTSC)
  L.O.C tubes: 56 dB (SECAM, PAL)
  58 dB (NTSC)
- Horizontal resolution: 650 TV lines at the centre
- Geometry distortion: < 1 % (excluding errors due to the lens assembly)
- Scan registration:
- Area 1: 0.1 %
- Area 2: 0.2 %
- Area 3: 0.4 %
- Operating temperature range:
  — 20° + 40 °C

Physical characteristics

- Dimensions (mm)
  L x W x H: 210 x 110 x 278
- Weight (including 1.5" viewfinder, excluding lens assembly): 4.1 kg

II - THE CAMESCOPE**





The camescope**

A camera with a built-in VTR, the Camescope is a new concept in the ENG field.
It consists in a camera CA 1623 (or 1624, depending on the tubes used) and a video tape recorder MA 1611.

Recording format

The VTR records the three components: luminance (Y) chrominance (R-Y), (B-Y).
The luminance (Y) is recorded alone on a 1st track.
The two chrominance signals are temporarily compressed (in a ratio of 2) and alternately recorder on a separate 2nd track.
This format is therefore independent of the SECAM/PAL or NTSC standards.
The advantages of this new format are as follows:

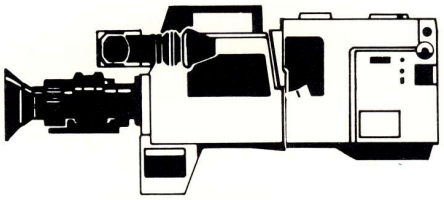
- High picture quality.
- High speed recording owing to the large diameter of the drum.
- Wide bandwidth (for both luminance and chrominance).
- Excellent signal-to-noise ratio.
- No crosstalk between luminance and chrominance.
- Format common to the SECAM or PAL systems.

VTR MA 1611 PS/N

- Recording time with a standard 1/2" cassette HG 20: 24 min.
- Separate EBU time code track.
- Built-in time code generator.
- 6-digit time code readout.
- 2 sound tracks.
- Switchable built-in noise-reduction system (Dolby C).
- Manual or automatic audio recording level control.
- Audio selector: camera microphone/external microphone/line input.
- Built-in monitoring loudspeaker.
- Battery charge/audio level test Vu-meter.
- Back spacing for automatic editing.
- Headset socket.
- Audio monitoring outputs: canal 1, 2 and 1 + 2 mixing.
- Video read test during recording
- Audio read test during recording.
- Battery autonomy (with an NP-1, 1.5 AH): 30 minutes.
- Status display.
- Microphone adaptor.
- Rewinding function.
- Microprocessor-based control.

Technical features

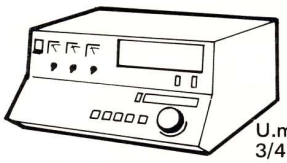
- Transport mechanism: 1/2" cassette Betacam system.
- Linear tape speed:
  10.15 cm/s (SECAM/PAL)
  11.86 cm/s (NTSC).
- Write speed:
  5.7 m/s (SECAM/PAL)
  6.9 m/s (NTSC).
- Wow and flutter: 0.15% rms.
- Recording time:
  24 minutes (SECAM/PAL)
  20 minutes (NTSC).
- Fast rewind time: 150 seconds.



CAMESCOPE**
13 123
13 124

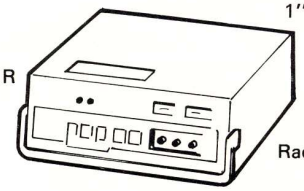
OG

TTV 3615
STUDIO PLAYER



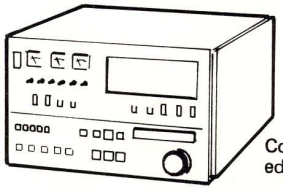
U.matic
3/4" editing
1" B or C

TTV 3625
PORTABLE PLAYER



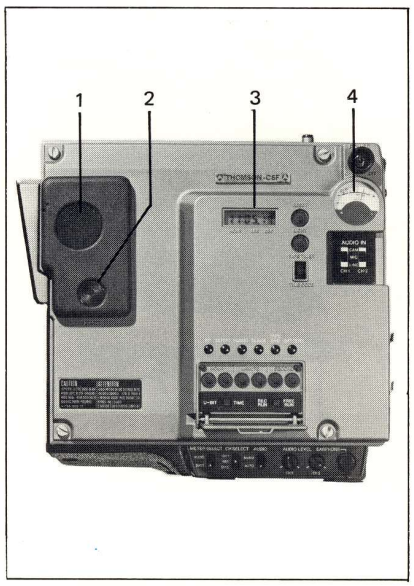
Radio link

TTV 3635
EDITOR



Component
editing

(1) Power input.
(2) Microphone/line audio input.
(3) Test output.
(4) Encoded output.



1) Built-in loudspeaker.
2) Loudspeaker volume control.
3) Digital time readout.
4) Vu-meter.

Video

- Recording system:
- Luminance: FM
- Chrominance: FM (time division and compression multiplexing).
- Bandwidths:
- Luminance: 30 Hz to 4 MHz + 0.5/ — 6 dB
- Chrominance: R-Y, B-Y, 30 Hz to 1.5 MHz + 0.5/— 1 dB
- K factor (2T pulse): 2 %
- Chrominance/Luminance delay: 20 ns.

S/B	SECAM/PAL	NTSC
Luminance	46 dB	47 dB
AM noise	49 dB	50 dB
PM noise	49 dB	50 dB

Audio

- Frequency response: 50 Hz to 15 KHz at ± 3 dB
- Signal-to-noise ratio (3 % of distortion level): 50 dB.
- Distortion at 1 KHz at reference level: 2 %

Audio signals

- Microphone input: — 60 dB, 3 KΩ balanced.
- Line input: + 4 dB, 10 KΩ balanced.
- Monitoring output level: — 20 dB max. into 8 Ω.
- Encoded time generator: internal, with display on liquid crystals and controls.

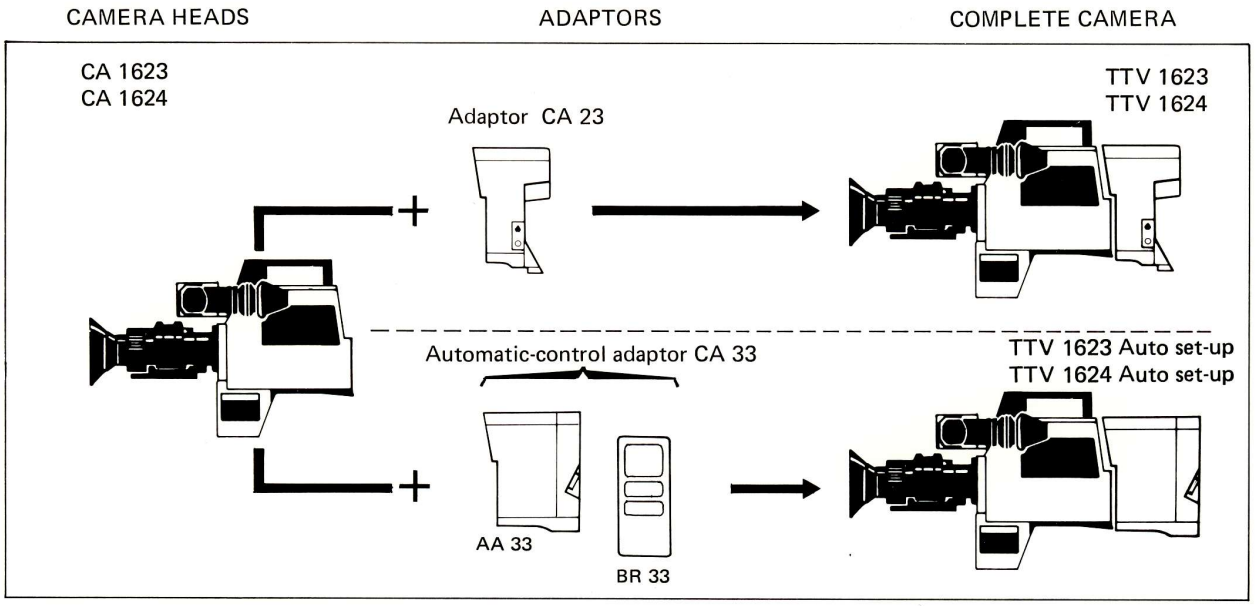
Physical characteristics

- Weight: VTR: 3.3 kg.
- Battery NP-1: 0.68 kg.
- Cassette: 0.2 kg.
- Dimensions (mm):
- Length: 232
- Height: 203
- Width : 122
- Operating temperature range: 0 to + 40 °C.
- Storage temperature range: — 20 to + 60 °C.
- Connectors:
- Camera-VTR: 50 contacts (JAE, DO215-505-FO).
- Microphone, line: 3-pin XLR.
- DC input: 4-pin XLR.
- External battery input: 5-pins.
- Monitoring connector: minijack.

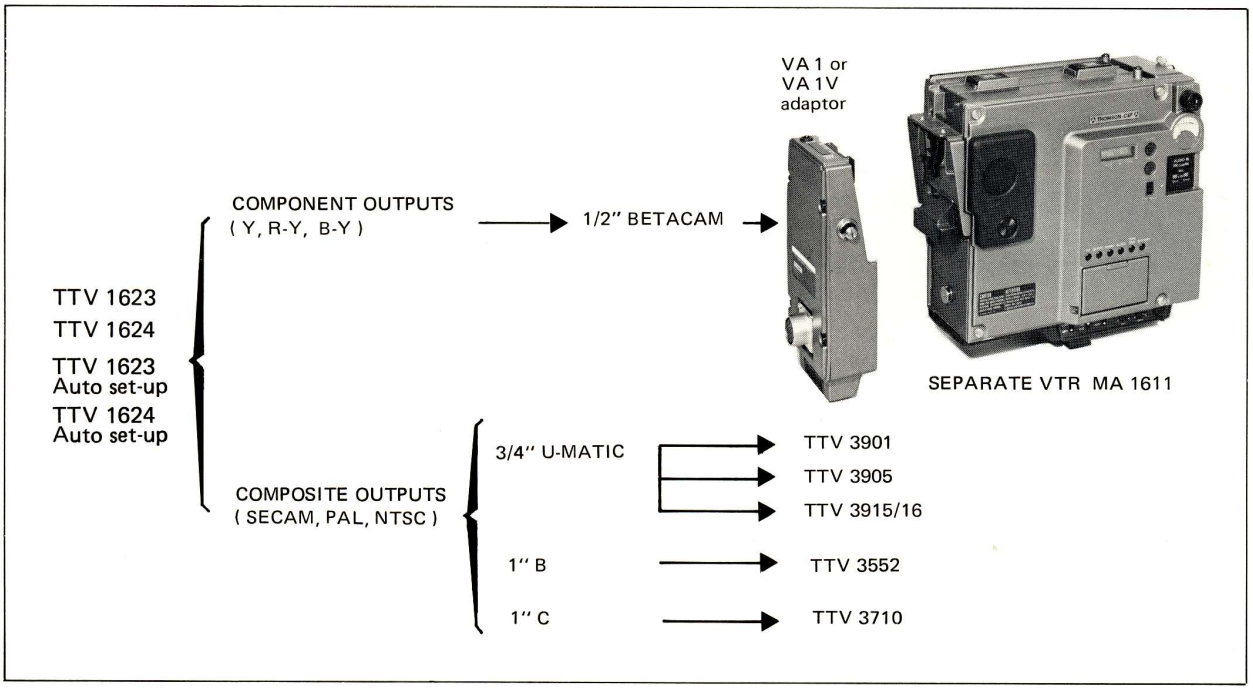
Electrical characteristics

- Power requirements: 12 V d.c. + 2 V/— 0.5 V
- Power consumption: 11 W

III - CAMERA WITH REAR ADAPTOR AND SEPARATE VTR



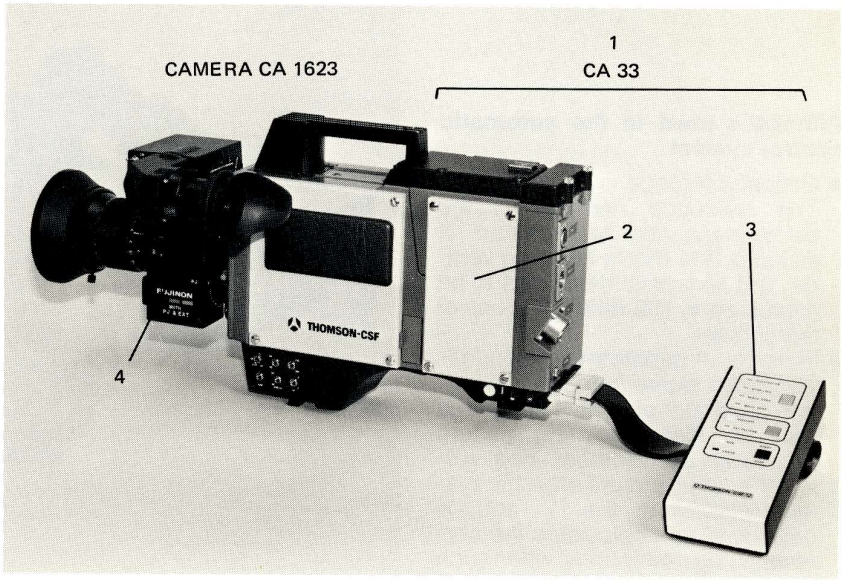
The same camera can be used with a separate VTR.
Depending on the type of adaptor used, CA 23 or CA 33, the camera can be converted into a conventional unit or into a ultra-high performance camera with a microprocessor-based automatic-control system.
In both cases, a cable interconnects the camera + adaptor and the recorder adaptor + separate recorder (Y, R-Y, B-Y component outputs) or + video tape recorders to the U-Matic 3/4" format (TTV 3901, 3905, 3915/16) or to the B or C 1" format (composite SECAM, PAL, NTSC outputs).



A) CONVENTIONAL CAMERA TTV 1623 (or TTV 1624)

This camera includes:
- The camera head CA 1623 (or 1624)
- The rear adaptor CA 23
- The features of this camera are the same those of the camera head CA 1623 or 1624 mentioned above.
- The adaptor box CA 23 enables any type of 1/2", 3/4" or 1" VTR to be used with an interconnection cable.
- The adaptor includes gen-lock function and contains connectors as follows:
- CANNON socket XLR 4 for power input.
- 26-pin connector for VTR.
- Microphone input socket (XLR 3).
- Monitoring earphone output (mini-jack).
- Reference video input for gen-lock (BNC).
- 8-pin connector for R, G, B outputs.
- 4-pin connector for 11 or 14 cm viewfinder.

This adaptor is necessary to be able to separate the VTR from the camera, as well as to carry out maintenance operations.



(1) CA 33.
(2) AA 33 - automatic-control adaptor.
(3) BR 33 - automatic control box.
(4) Diascope lens assembly.

B) CAMERA WITH MICRO-PROCESSOR-BASED AUTOMATIC-CONTROL SYSTEM

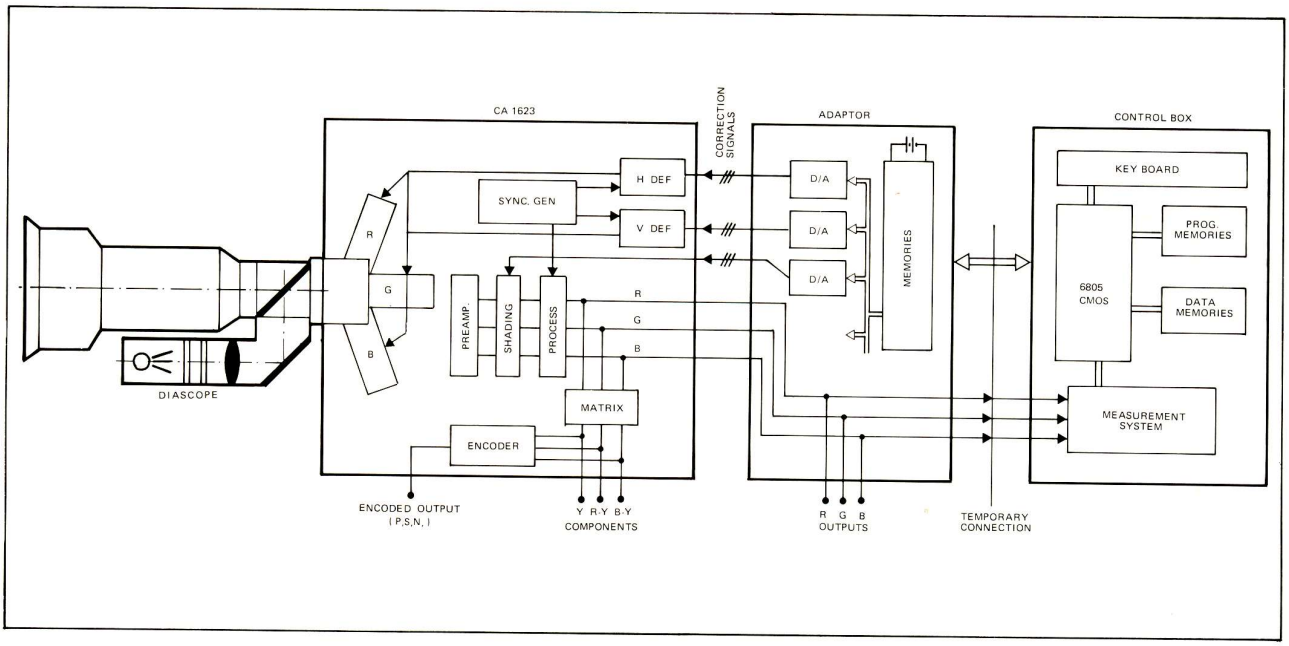
The auto set-up TTV 1623 (or 1624) camera is an automated version equipped with a microprocessor-based control system.
It consists of:

- A camera head (CA 1623 or 1624).
- A rear adaptor containing the gen-lock and automatic control functions.
- A control box.
- A lens with built-in diascope.

An NP-1, 1.5 AH battery can be included in the rear adaptor.

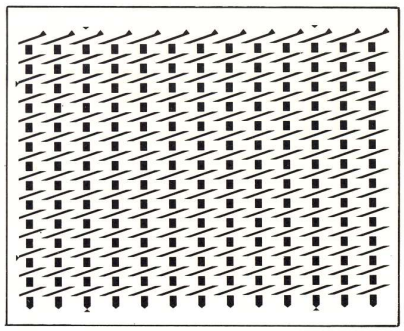
Principle of operation

The automatic-control system adjusts the geometry, registrations, black and white shading.
Such adjustments are carried out by connecting the control box (BR 33) to the rear adaptor (AA 33). Through the keyboard, the desired operations can be selected and all adjustments be performed automatically within a sequence lasting a few minutes. The reference used for adjustments is a special test pattern placed in the diascope of the lens assembly.
An external test pattern may also be used.
Correction data are stored in memories contained in the automatic-control adaptor.
When adjustments are completed, the control box can be disconnected and, if desired, can be used for other cameras.
The camera then recovers the lightness of an ENG camera with the performances of an automated studio camera.

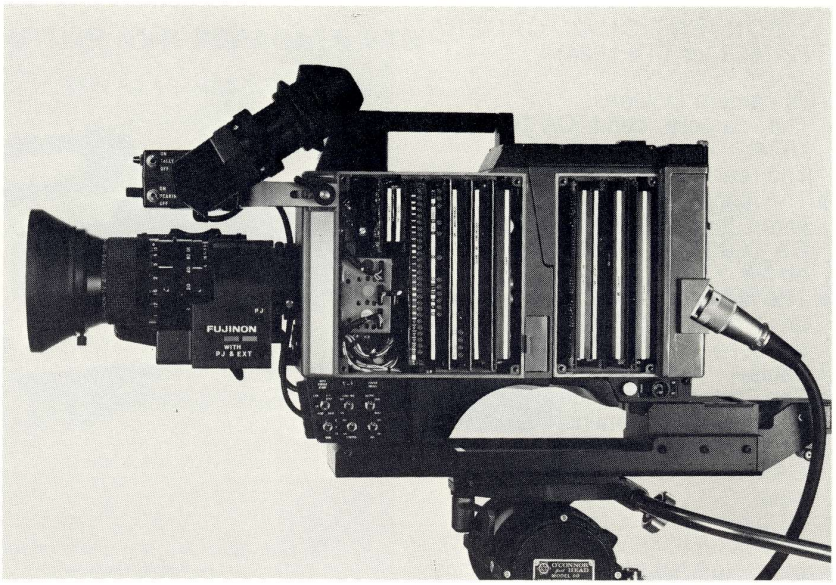


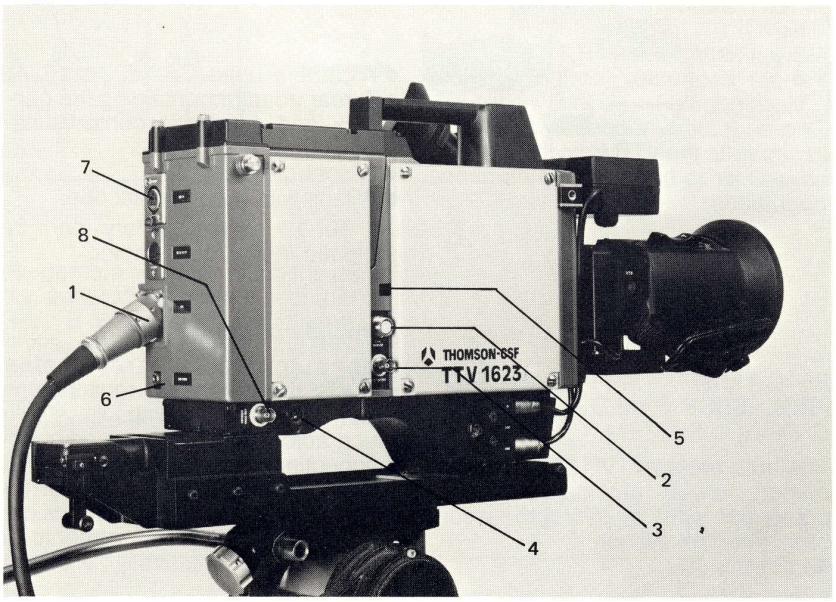
Principles used in the automatic control system

- Optical reference
  The reference normally is the below-mentioned test pattern. It includes 364 motifs enabling vertical and horizontal deviations to be measured in 182 different areas of the picture.
- Principle of geometry correction.
  The video signal from the test pattern generator picture is compared with an electronic test pattern generated by the measuring system. For each picture area, the system measures the V and H deviations and calculates the corresponding corrections; when such corrections have been applied, it repeats measurements and performs corrections iteratively until very small deviations are obtained (< 0.1 %). The system calculates corrections at any point of the picture by interpolating between test points. Final corrections are calculated over 8 bits for horizontal scanning and 12 bits for vertical scanning.
- Similar principles are used for registration corrections, black and white uniformity corrections, etc.



- Organization of the system
  The camera adaptor contains only those memories which store the corrections and D/A converters.
  The control box contains the microprocessor (6805 C-MOS), its peripheral circuits and the video signal measurement functions. This distribution requires but a very low power consumption and the rear adaptor adds only 3 Watt to the camera powerneeds. This additional power requirement (2 W) is only needed while setting-up (few minutes).





- **Specific performances of the auto set-up camera TTV 1623**
- Geometry: errors < 0.1 % over the whole picture (excluding zoom errors).
- Registrations: errors < 0.1 % over the while picture.
- Black and white uniformity: < 1 %
- Power consumption: 23 W. Whilst operating (+ 2 W during adjustment)
- Dimensions:
  L x W x H: 350 x 110 x 278 mm
- Weight: 5.9 kg

Adaptor box inputs-outputs
(1) 26-pin connector for VTR connection to the component, composite, audio, remote-control, power supply, etc, outputs).
(2) On camera, monitoring output.
(3) On camera, composite output (PAL, SECAM, NTSC-encoded).
(4) Video gen-lock input.
(5) On camera, microphone input.
(6) Earphone.
(7) On adaptor, microphone input.
(8) R, G, B, sync output.
(9) Mains power supply or battery input.

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