BTS

SERIES 9000

Universal Camera Control SYSTEM

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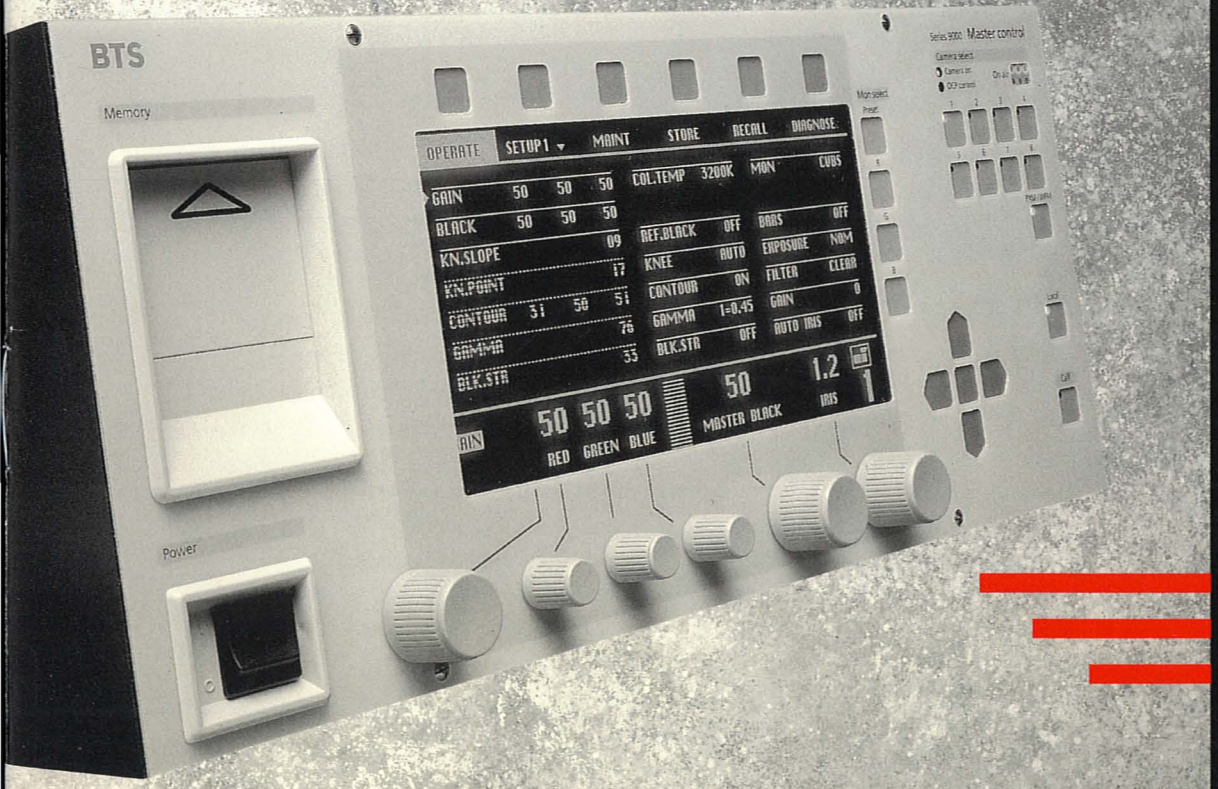


BTS

From a simple set-up with a single camera to the most complete multi-camera operation, the BTS Series 9000 Universal Camera Control System ensures optimum control with maximum flexibility in a concept that is ready for a digital future. Developed for use with the complete family of BTS Frame Transfer CCD cameras, Series 9000 brings the latest control technology to television production, allowing unparalleled artistic freedom in any situation.

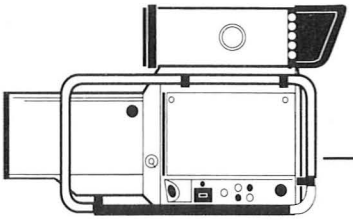
Extensive production control, engineering control and maintenance facilities are provided, with features such as comprehensive scene file memories and scene file RAM cards simplifying set-up of complex scenes. In addition, an optional Serial Digital Video Interface card offering serial digital standard 4:2:2 component 270 Mb/s (10-bit) operation means that Series 9000 is fully digital-ready.

These features make the BTS Series 9000 the most extensive, flexible and efficient solution for TV production in and out of the studio.

Series 9000 - the world's most extensive professional remote control system

- ☐ Flexible universal remote control system for all BTS CCD cameras
- ☐ Wide range of Series 9000 control options to suit every TV production requirement
- ☐ Self-explanatory Master Control Panel (MCP) with clear, sharp, wide angle electroluminescent display
- ☐ Remote camera select function on MCP
- ☐ Four scene files per camera and a customer or factory defined standard file
- ☐ Personal back-up memory scene file card for convenient storage and retrieval of complex scene set-ups
- ☐ Remote lens control via MCP
- ☐ Data transmission over triax for customer applications, i.e. RS 232 or other low bandwidth data signals for transmission
- ☐ Assignable Operational Control Panels (OCP) with full control for remote operation of the camera channel. Joystick or rotary control versions available
- ☐ Optional analog Mono Knob and Color Control Panels via Remote Control Interface (RCI) unit
- ☐ RCI can be used with most standard and custom-designed analog remote controls
- ☐ Serial digital RCI for RS 232/422 interface and with selectable baud rate for robotics control applications
- ☐ Digital-ready with optional Serial Digital Video Interface (SDVI) offering serial digital standard 4:2:2 component - 270Mb/s (10-bit)
- ☐ Prepared for HDTV CCD camera control
- ☐ Diagnostic menu for on-line fast, effective fault tracing and elimination
- ☐ Simple two-wire data connection between system units up to 350 meters/1,150 feet enables assignment of OCP's and ensures fast system change without cable rewiring
- ☐ Easy-to-clean, dust-free, flat-foil switches
- ☐ Full range of service items and BTS support worldwide

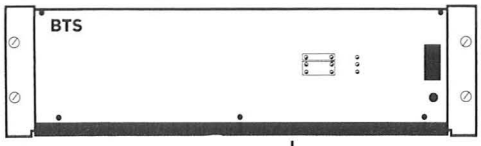
Series 9000 System Overview



LDK 9 or
LDK 91 or
LDK 910 or
LDK 9000 (via CPU)

Triax Cable
LDK 8107/xx
LDK 8108/xx
LDK 8112/xx

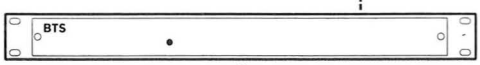
Optional Serial Digital Video output



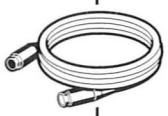
Base Station
LDK 4053/xx

Headset
LDK 8111/35
LDK 8111/37

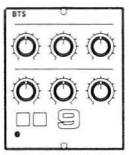
Control Cable 4 p
LDK 8113/01
LDK 8113/05
LDK 8113/10
LDK 8113/...



Remote Control Interface
LDK 4608/01 analog
LDK 4608/10 Serial

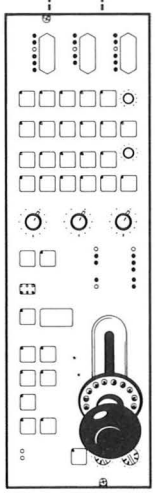


Control Cable 25 p
LDK 8192/01
LDK 8192/10
LDK 8192/...

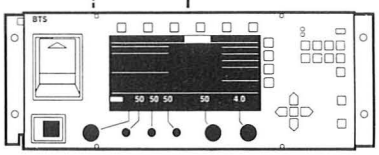


Color Control
LDK 4626/01

Mono Knob Control
LDK 4625/01



Operational Control Panel
LDK 4624/01 (shown)
LDK 4628/00 (Rotary control)



Master Control Panel
LDK 4607/01

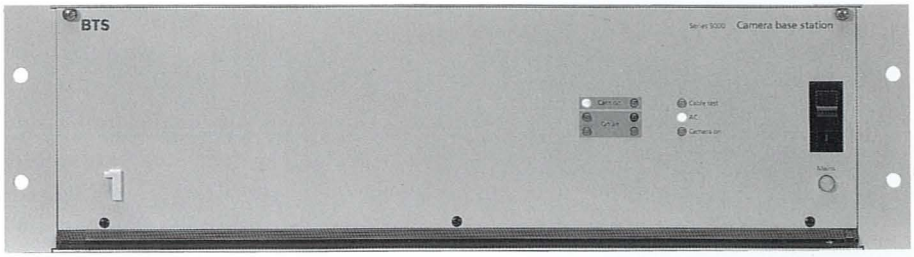
Memory Card
LDK 8561/00

Version Numbers for Camera Head and Triax Base Station		
Version	Connectors	
	Triax	Headset
/01 50Hz	Fischer	Tuchel
/06 50Hz	ARD	Tuchel
/11 50Hz	Lemo	Tuchel
/51 60Hz	Tri-Lock	XLR5

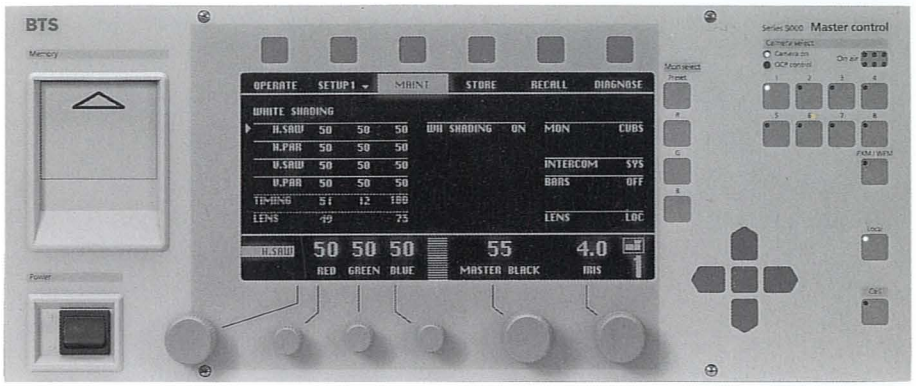
Controls and options for unparalleled creative freedom

The BTS Series 9000 Universal Camera Control System offers the most extensive professional remote control facilities for every type of production. In its complete configuration, Series 9000 consists of a Base Station, Master Control Panel (MCP) and either joystick or rotary controlled Operational Control Panels (OCP). Optional analog Mono Knob (iris/master black) and Color (paint) Control Panels can also be linked to the system using the analog Remote Control Interface option. This allows most standard and customized Mono Knob and Color controls to be used. An additional serial digital RCI with a selectable baud rate between 2.4 K and 9.6 K provides interfacing for robotics and other remote camera applications.

Series 9000 remote controls are universal within the BTS family of Frame Transfer CCD cameras. They can be used with triax versions of the LDK 91, LDK 910 and LDK 9, as well as in the latest BTS CCD HDTV camera, and the dedicated portable camera for the LDK 9. This enables users to standardize on remote control facilities whatever combination of BTS CCD cameras have already been installed or are planned for the future.



Base Station



Master Control Panel

Base station

The Base Station is the interface center for the camera head signals and signals from the outside world. It provides an interface to the remote control system with an in-built digital command system for the MCP and OCP, and has rear mounted connectors for all system inputs and outputs. Using a BTS Triax cable interconnection, the Base Station can be sited up to 2,400 meters/ 7,875 feet from the camera head. An optional Serial Digital Video Interface card with standard 4:2:2 components operating at 270 Mb/s (10-bit) provides full facilities for digital operation. This unique integrated solution will save weight, space, and power consumption.

Master Control Panel

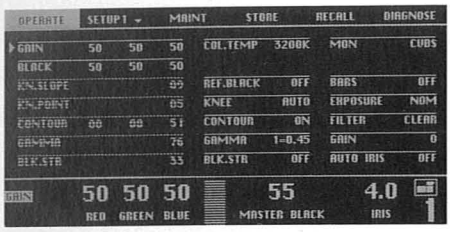
The MCP is the control center in multi-camera configurations and can control an unlimited number of cameras in groups of eight. Its menu-oriented electroluminescent display provides operational, maintenance and diagnostic set-up information. Complete control and status of camera parameters are provided by the menu system. A built-in read/ write capability allows personal scene or RAM set-up file cards to be used for back-up.

Personal Scene File Card

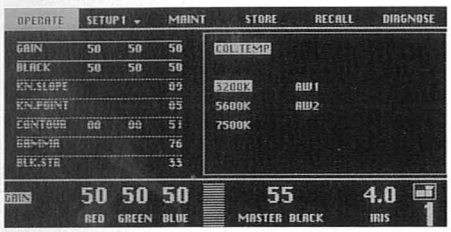
To aid complex production set-ups, the MCP has a memory card system. Each memory card (as small as a credit card) can store production and scene file reference information for up to eight cameras. Television productions shooting over a long period, at differing locations, or even on a day-to-day basis, can use this scene file card to ensure perfect matching of camera parameters and specific setups.

Two-wire data bus for simple and flexible system interconnection

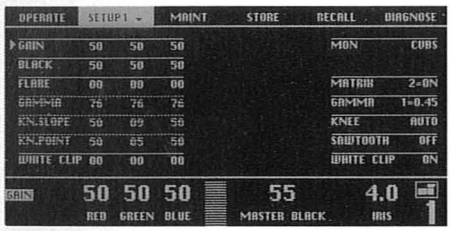
Connection between the MCP and the control system as a whole is a simple two-wire data bus system. Two MCPs can be used on the two-wire data bus and up to eight assignable control panels can be used with each MCP. Up to 350 meters/1,150 feet of two-wire control cable can be used, sufficient for the longest cable runs in major installations. Assignment of OCP's is very fast and flexible without the need to rewire the system.



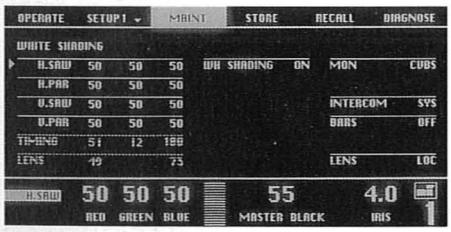
Operate menu showing OCP function "GAIN" being adjusted



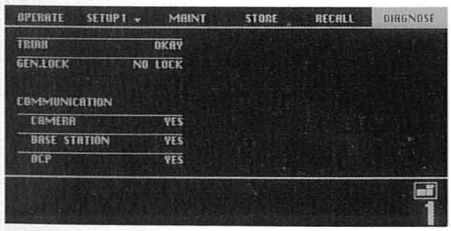
Operate menu showing specification of "COL.TEMP" value 3200K



Set-up menu



Maintenance menu



Diagnostic menu

MCP Menu Functions

The MCP menu system provides a complete overview of parameter status for up to eight cameras. Three main user group menus are available for adjusting parameters: operate, set-up and maintenance. Two menus can be used to store and recall scene files. Menu selection is done via pushbutton switches above the display screen. Direct accessible monitoring functions are also available, together with an additional menu for diagnostics.

■ *Operate Menu*

With this menu selected, the left part of the screen shows analog functions from the Operational Control Panel. Each of these can be assigned, using the cursor, to the three analog controls under the left hand side of the screen. The associated values are displayed both above the controls and next to the on-screen parameters. Iris and Master Black settings are at the bottom right of the screen, just above their associated analog controls.

The right section of the menu screen shows parameters which can be cursor selected for adjustment. After selection of a parameter, in this case color temperature, a pop-up sub-menu shows the selectable values. The cursor can then be used to specify the required value after which the main menu returns to the screen.

■ *Set-up Menu*

The set-up menu displays all other camera set-up functions and allows them to be adjusted. This makes it possible, for example, for a vision engineer to optimize more complex picture situations, and for matching cameras.

■ *Maintenance Menu*

All important engineering functions are displayed in the maintenance menu. It allows engineering staff to maintain and monitor the camera systems.

■ *Diagnostic menu*

Should a system fault occur, the top right hand bar on whichever MCP menu is in use will flash. The selection of a diagnostic menu will enable the fault to be rapidly pinpointed and eliminated.

■ *Store/Recall Menus*

The store and recall menus provide access to the MCP's read/write capability. All scene files, with or without the aid of a personal memory card, can be stored, previewed or recalled using these two menus.

Operational Control Panels

The two assignable Series 9000 OCP's have all the controls for remote operation of the camera channel, logically grouped for clear, recognizable selection of different camera functions.

The joystick version OCP is comprehensively specified with, in the top section, picture and waveform monitoring selectors with LED indicators, together with selectors and indicators for color temperature, lighting control and exposure control.

Below them, pushbuttons for Gain, Black Stretch and Filter wheel each select a predetermined state. Variable Black Stretch and Knee and the Contour control are also pushbutton selectable.

Black and White painting controls are logically grouped together with the status indicators for Knee and Gamma, Color Matrix, Chroma On/Off, and the two-level On-Air tally light.

At the bottom of the panel, a Mono Knob lever is provided. This is to set Iris level. It rotates to adjust Master Black. In addition, Scene File selection buttons allow scene files - one factory preset and four which can be built up for specific camera settings - to be recalled instantly.

The BTS Series 9000 alternative version OCP with rotary control is

even more highly specified. In addition to separate rotatable knobs independently controlling Master Black and Iris, additional controls include Variable Gamma Red Channel, Variable Master Gamma, Variable Blue Gamma, RGB Flare, Variable White Clip, Knee Slope and Knee Point and Variable Contour Control of vertical level and Contour Level Dependency. A unique Camera Select switch allows the selection of any one of up to 16 cameras, and a Camera Power button at the top left of the OCP provides an additional system safety feature. Again, all controls and indicators are logically grouped for high efficiency in operation and diagnostic indicators are provided.

Remote Control Interface (analog/parallel)

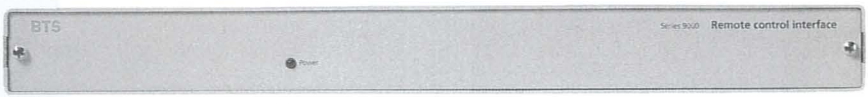
The analog RCI allows the use of Mono and Color Control Panels in systems where these functions are operated separately. It also allows the use of most standard of custom-designed controls in television stations where existing remotes are preferred. A maximum of four sets MC/CC can be connected to a single RCI unit.

Remote Control Interface (serial/digital)

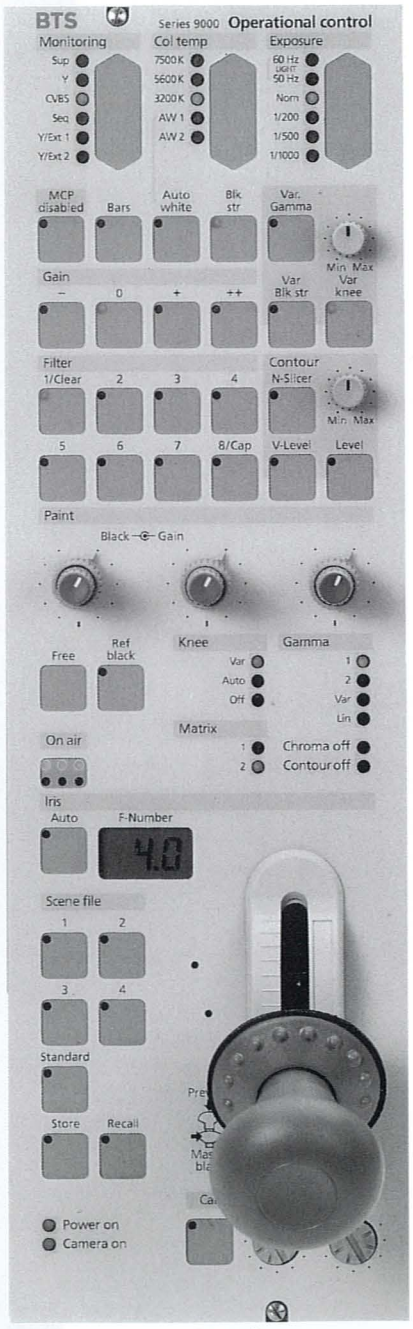
For use in robotics applications, a serial digital RCI with a baud rate selectable between 2.4 K and 9.6 K is available.

Mono Knob Control Panel

The Mono Knob Control Panel is an optional item that allows separate control of the main operational functions. It provides mono knob control for Iris and Master Black, similar to the OCP control, and has the same Iris Range and Center controls. It also has Auto Iris, Local Control and Camera Call selectors, and a two-level On-Air indicator.

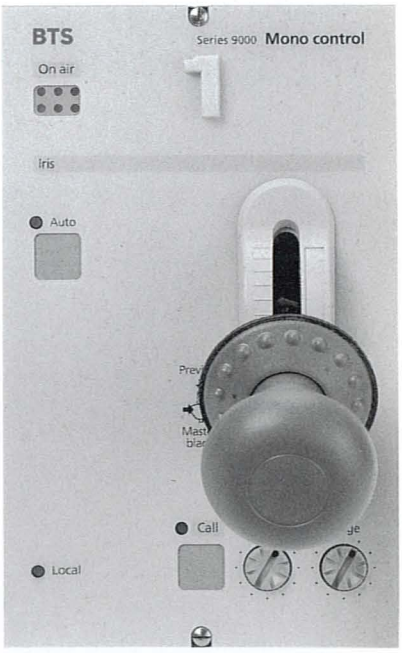


Remote Control Interface



Operational Control Panel

Color Control Panel



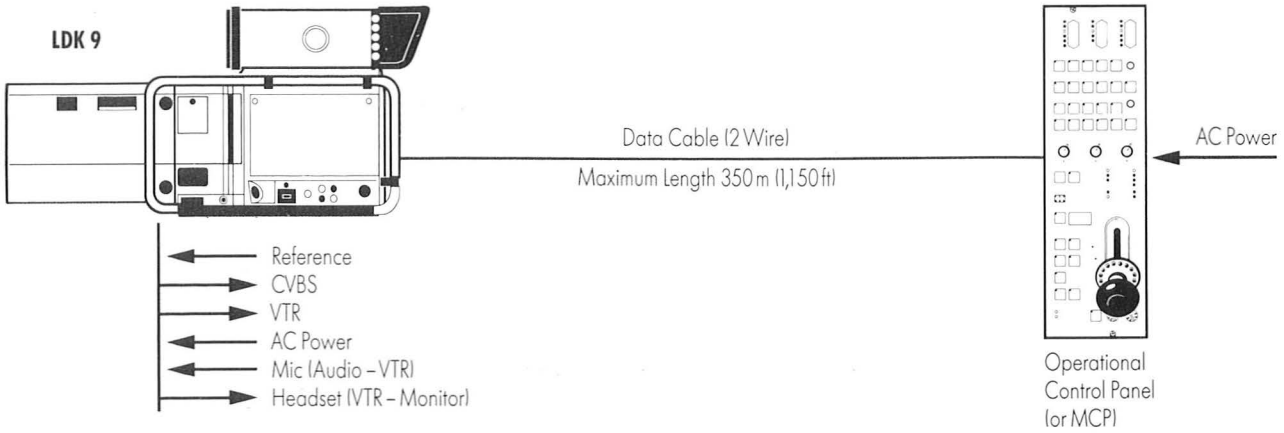
Mono Knob Control Panel

Color Control Panel

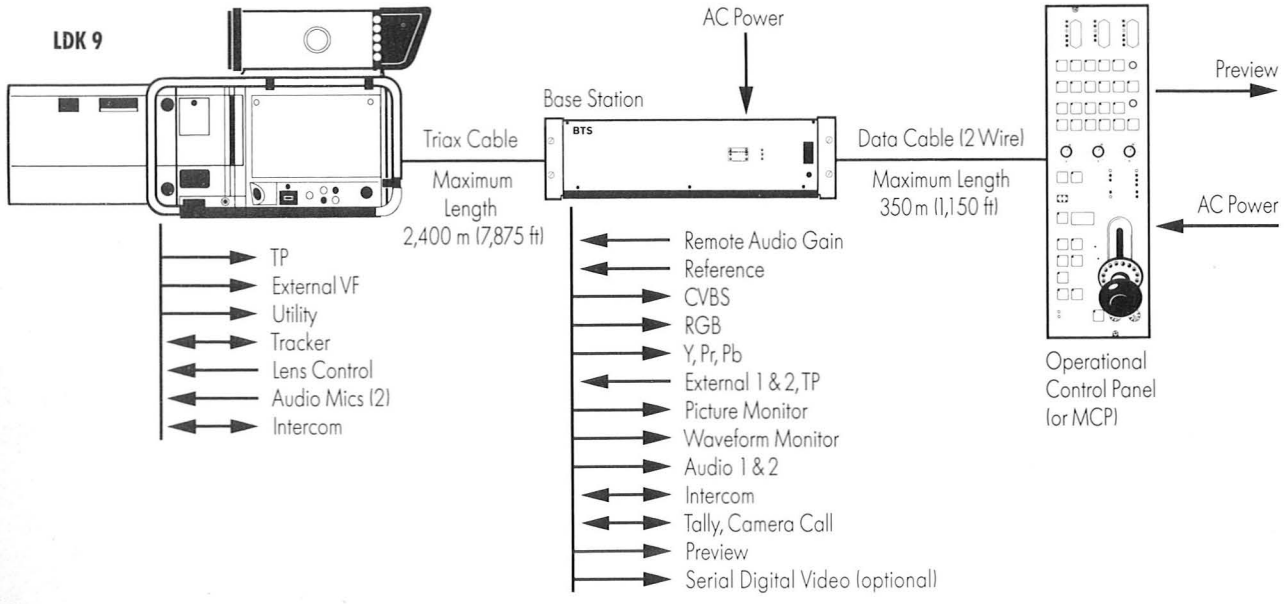
The compact Color Control Panel is designed to match the Mono Knob Control Panel. It has controls for red, green and blue gain and black level, for painting, plus a free button for mechanical range corrections.

Extensive application possibilities

Single Camera Stand Alone Mode

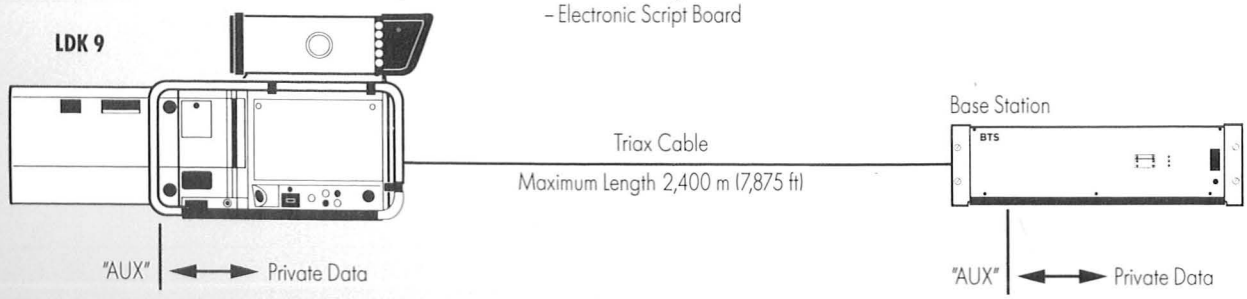


Single Camera Triax Mode

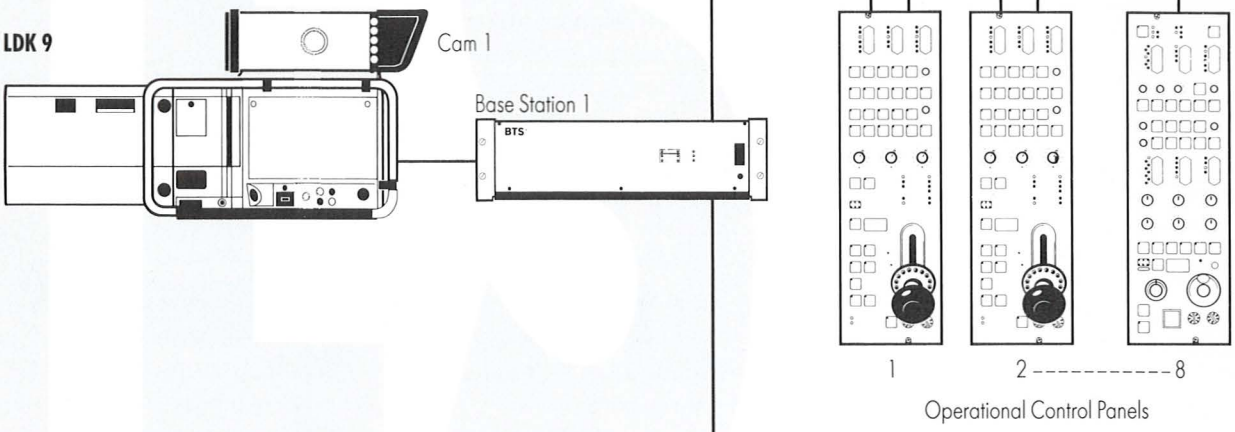


Special Applications

- Remote Control P/T Heads
- Remote Routing Switcher
- Electronic Script Board

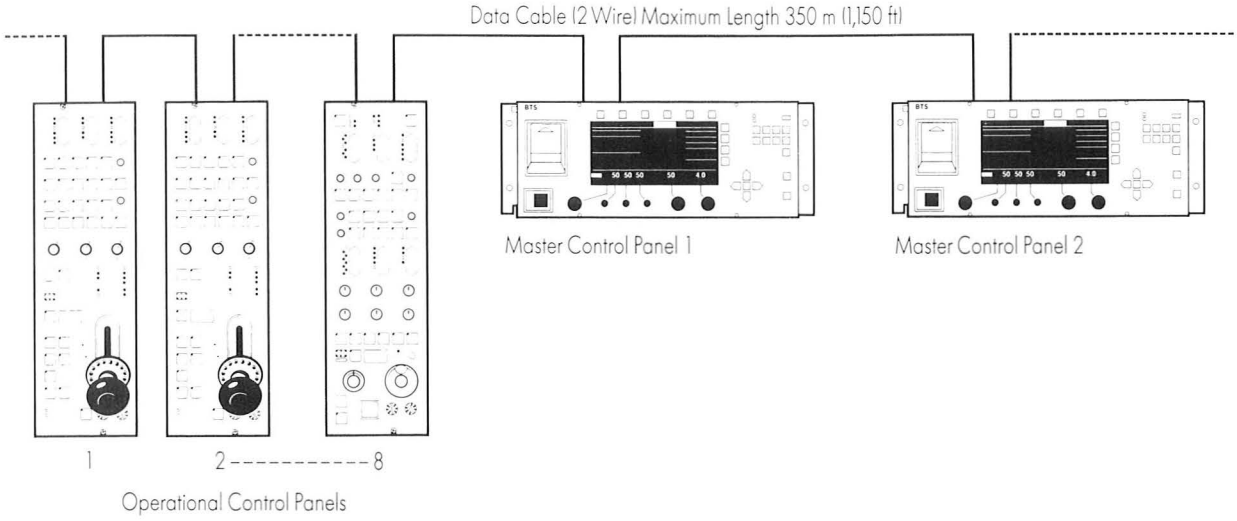


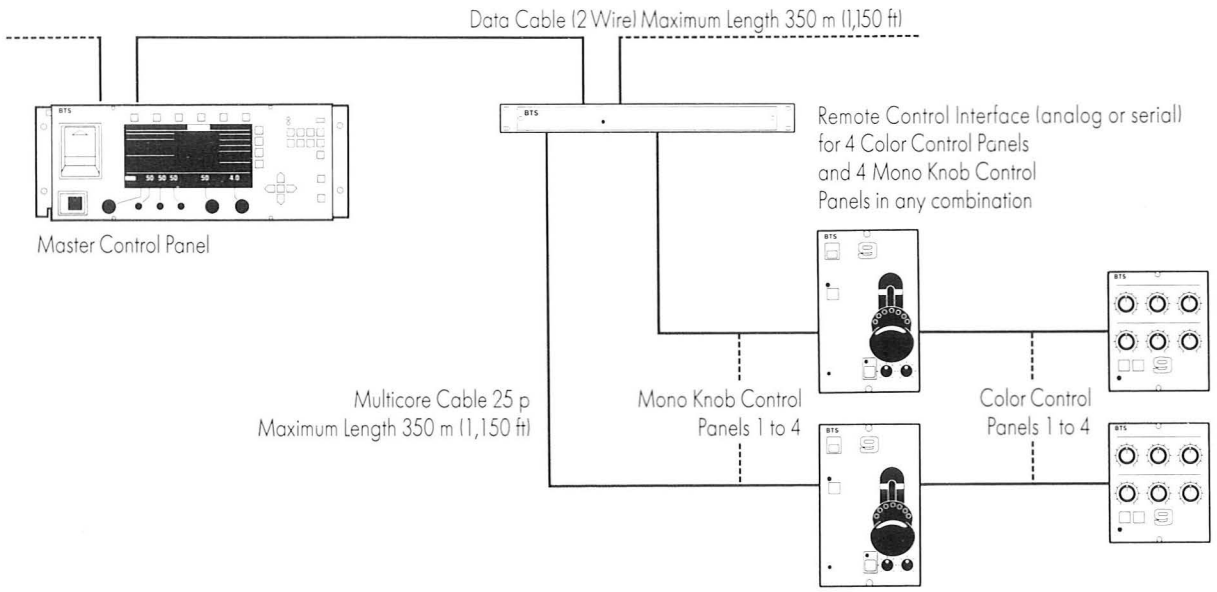
Multiple Camera Mode

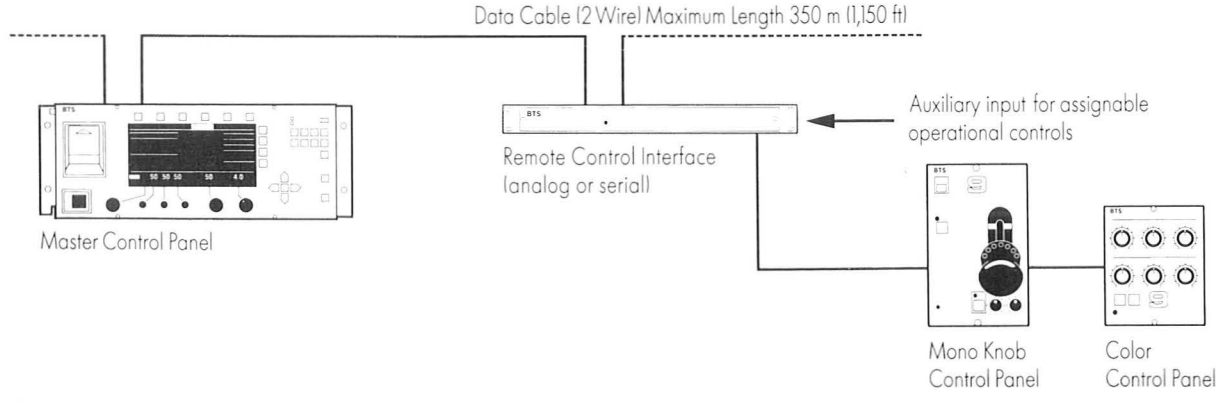


Remote Control for Broadcasters

The range of control panel options allows the user to select control options to suit particular broadcast applications. In simple, one camera stand alone mode, only the OCP is needed to provide full, comprehensive control of operational functions. In a multiple camera studio, the Mono Knob and Color Control Panels can be used in a more conventional, studio remote control setup. This is also true of the larger outside broadcast units which normally have separate camera operation areas.







specifications

Base Station

Video

Outputs	*Inputs*
Composite CVBS(3)	Reference
RGB	Ext. 1, Ext. 2
Y, P_r, P_b	Teleprompter
Picture Monitor	
Waveform Monitor	

Optional Serial Digital Video Interface (SVDI) card acc. 4:2:2 component 270 Mb/s (10-bit)

Audio

Camera to Base Station

Two high-quality audio channels with remote gain control

Intercom 2-wire or 4-wire

Base Station to camera head

3 channels:
Engineering
Production
Program

Camera head to Base Station

2 channels:
Cameraman
Floor manager

Power Supply

115-230V ± 15%, 47-63 Hz

Power Consumption

Base Station	250 watts*
OCP	5.5 watts
MCP	23 watts
RCI	9 watts

* Includes LDK 9 camera head, VF, 70 VA utility, 700 meters (2,300 feet) triax and lens.

Approximate Weights

Base Station	28 kg (62 lb)
OCP	3.5 kg (8 lb)
MCP	6 kg (13 lb)
RCI	5 kg (11 lb)

Operating Ambient Temperature

Series 9000 units 0 to +45°C

Maximum Cable Lengths

Camera head to Base Station

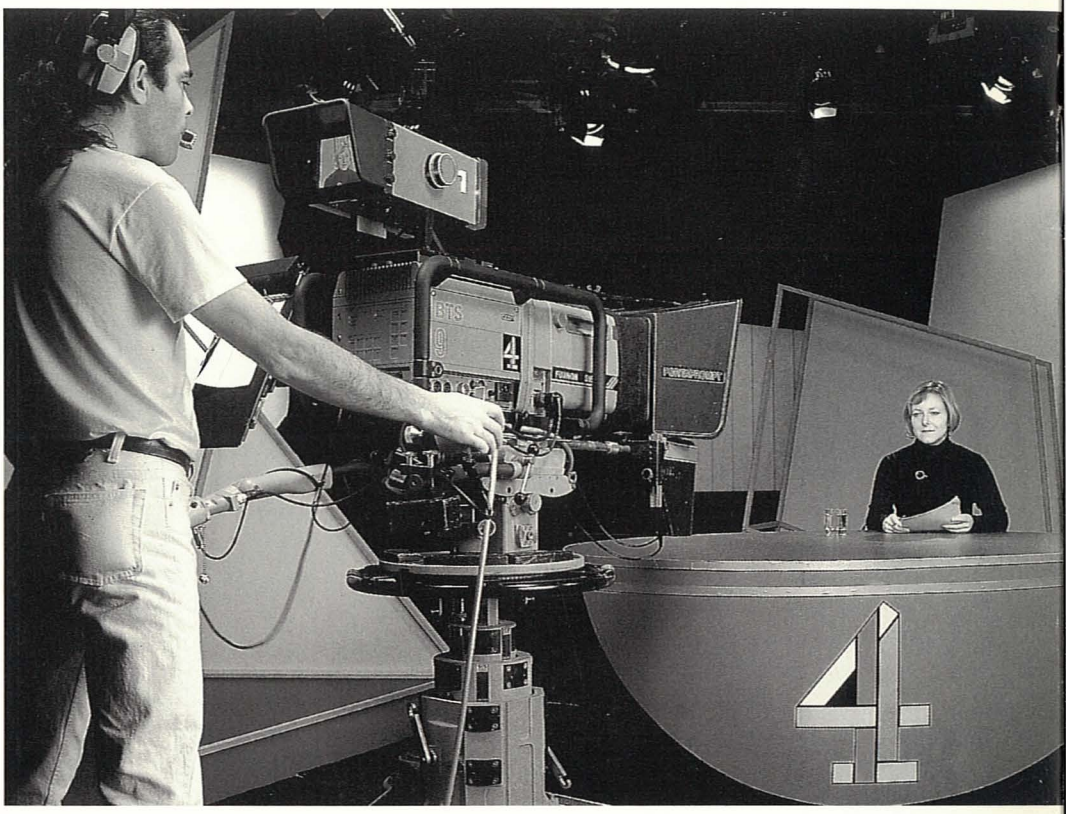
8 mm Triax	675 m (2,215 ft)
11 mm Triax	1,200 m (3,937 ft)
14 mm Triax	2,000 m (6,562 ft)
16 mm Triax	2,400 m (7,875 ft)
Data Control Cable (4p and 25p)	350 m (1,150 ft)

Dimensions

Width, Height, Depth in mm (inches)

Base Station	482 (19)	132 (5.2)	482 (19)
OCP	105 (4.2)	351 (13.8)	119 (4.7)
MCP	482 (19)	177 (7.0)	120 (4.7)
RCI	482 (19)	44 (1.7)	275 (10.8)
Mono Knob Control	106 (4.2)	173 (6.8)	97 (3.8)
Color Control	106 (4.2)	128 (5.0)	30 (1.2)

These typical specification details are subject to change without notice.



BTS Broadcast Television Systems, a Philips and Bosch company, combines an unrivalled 60 years of experience in every aspect of broadcast technology with a record of leadership in technical advancement second to none. First to develop CCD technology 20 years ago, BTS still leads the field with the only Frame Transfer sensor technology which totally eliminates the basic problem of smear, and which combines this achievement with outstanding dynamic resolution.

BTS products are distributed in more than 120 countries, and backed by a comprehensive network of sales and service agencies to assist and advise customers throughout the world.

BTS supplies a range of products from individual cameras to complete studio systems and comprehensive installations for major international events. BTS has five decades of experience in managing complete "turnkey" projects and constructing mobile outside broadcast vehicles.

BTS products, used throughout the broadcast television and production fields, include cameras, video tape recorders, telecines, production switchers, master control switchers, routing switchers, studio automation systems, computer graphics, and multi-signal processing and distribution systems.

In addition, major research and development resources are committed to the development of products for the coming age of high definition television (HDTV) systems.

Is it any wonder more people are getting behind us?

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