



# T-Command



# Installation Guide



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# **1. PRE-INSTALLATION CHECKS AND SAFETY PROCEDURES**

## **UNPACKING**

**Check Packaging** - Upon taking delivery of the unit, inspect the packaging for signs of damage. If damage has occurred, advise the carriers and/or the suppliers immediately.

**Check Contents** - Upon taking delivery of the unit, unpack the unit carefully and check that all the items are present and correct. If any items are missing or damaged, contact your equipment dealer.

**Retain Packaging** - The shipping carton is the safest container in which to transport the unit. Retain undamaged packaging for possible future use.

## **IMPORTANT SAFETY PRECAUTIONS**

**Read Instructions** - All relevant safety, installation and operating instructions should be read before attempting to install, connect or operate the unit.

**Retain Instructions** - All safety, installation and operating instructions should be retained for future reference.

**Heed Warnings** - All warnings on the unit and in any relevant safety, installation or operating instructions should be adhered to.

**Cleaning** - Unplug the unit from the power outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

**Attachments** - Do not use attachments not recommended by the product manufacturer as they may cause hazards.

**Water and Moisture** - Do not expose the internal electronics of this unit to water or dampness; for example, in an unprotected outdoor installation, or in any area classified as a wet location.

**Accessories** - Do not attach this unit to an unstable stand, bracket or mount. The unit may fall, causing serious injury to a person and serious damage to the unit.

**Power Sources** - This unit should be operated only from the Plug Top PSU Supplied. Refer to operating instructions.

**Power Connector** - This unit is equipped with coaxial power connector mounted at the edge of the PCB for low voltage power input. Do not attempt to alter this connector in any way.

**Power Cord Protection** - Power supply cords should be routed so that they are not likely to be trapped, pinched or otherwise damaged by items in close proximity to them, Particular attention should be paid to cords at plugs at the rear of the unit.

**Overloading** - Do not overload outlets and extension cords, as this can result in fire or electric shock.

**Object and Liquid Entry** - Never push objects of any kind into the unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on or inside the unit.

**Servicing** - Servicing of the unit should only be undertaken by qualified service personnel, as opening or removing covers may expose you to dangerous voltages or other hazards.

**Damage Requiring Service** - Servicing by qualified personnel should be carried out under the following conditions:

- (a) When the power-supply cord or plug is damaged.
- (b) If liquid has been spilled or objects have fallen into the unit
- (c) If the internal electronics of the unit have been exposed to rain or water
- (d) If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to normal operation.
- (e) If the unit has been dropped or the enclosure is damaged.
- (f) If the unit exhibits a distinct change in performance. This indicates a need for service.

**Replacement Parts** - If replacement parts are required, ensure that only replacement parts recommended by the product manufacturer are used.

**Safety Check** - Upon completion of any service or repairs to the unit, safety checks should be performed to ensure that the unit is in proper operating condition.

**Pre-installation Checks** - It is recommended that the unit be bench-tested prior to installation on the site.

**Safety During Installation or Servicing** - Particular care should be taken to isolate the Matrix or Pick A Point in order to prevent operation while engineering work is being carried out on the T-Command.

**Adhere to Safety Standards** - All normal safety precautions as laid down by British Standards and the Health and Safety at Work Act should be observed.

## **WARNING**

**TO PREVENT DANGER OF FIRE OR SHOCK, DO NOT EXPOSE THE INTERNAL COMPONENTS OF THIS EQUIPMENT TO RAIN OR MOISTURE.**

The "lightning flash with arrowhead" symbol inside an equilateral triangle is used to warn the user of this equipment that there are sufficiently high voltages within the enclosure to constitute a risk of electric shock.

The "exclamation point" symbol inside an equilateral triangle is used to alert the user of this equipment to important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

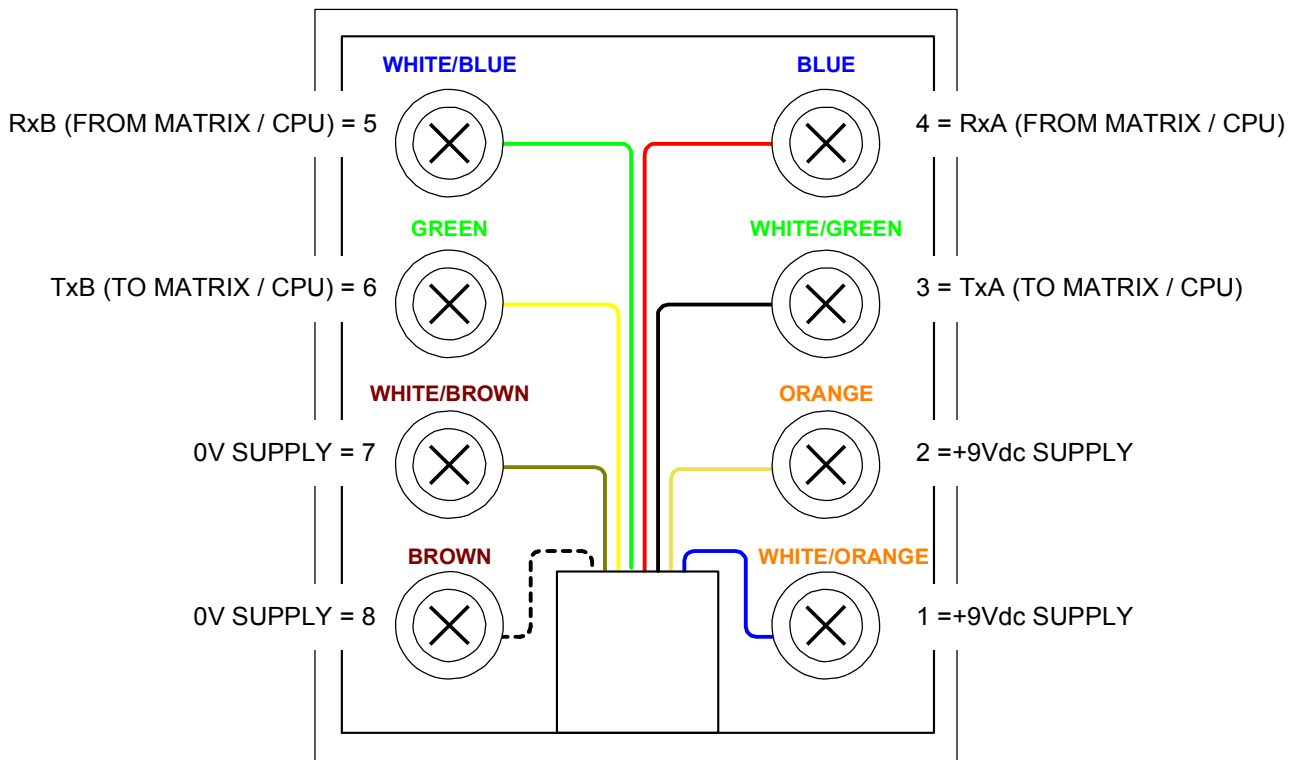


### 3. INSTALLATION

#### OPERATING VOLTAGE

The T-Command requires 9VDC @ 500mA the LCD back light requires the full 9VDC to start. If the unit is supplied with less the keyboard will light and then fail. The T-Command can also be supplied with power by the CAT 5 cable fig 1.

Fig. 1 Note the connections below are at the T-Command & the Tx would be Rx at the MATRIX / CPU end of the cable.



White/Blue, Blue, White/Orange, Orange, White/Green, Green, White Brown, Brown, are the recommended CAT5 & 6 Colours

Fig. 2 Rear view of the T-Command Keypad.



#### 4. DATA CONNECTIONS

The T-Command has two serial data ports both support RS422. The 1<sup>st</sup> port is labelled as **KEYBOARD** this is dedicated for use with BBV equipment. The second is labelled as **AUXILIARY** this port is for further development and not defined in this manual. The T-Command is supplied with one CAT5 Patch Cable and one break out box. The Break out box enables the keypads to be installed over the site without cutting Patch cables.

Fig. 3 Example of RS422 Keypad wiring.

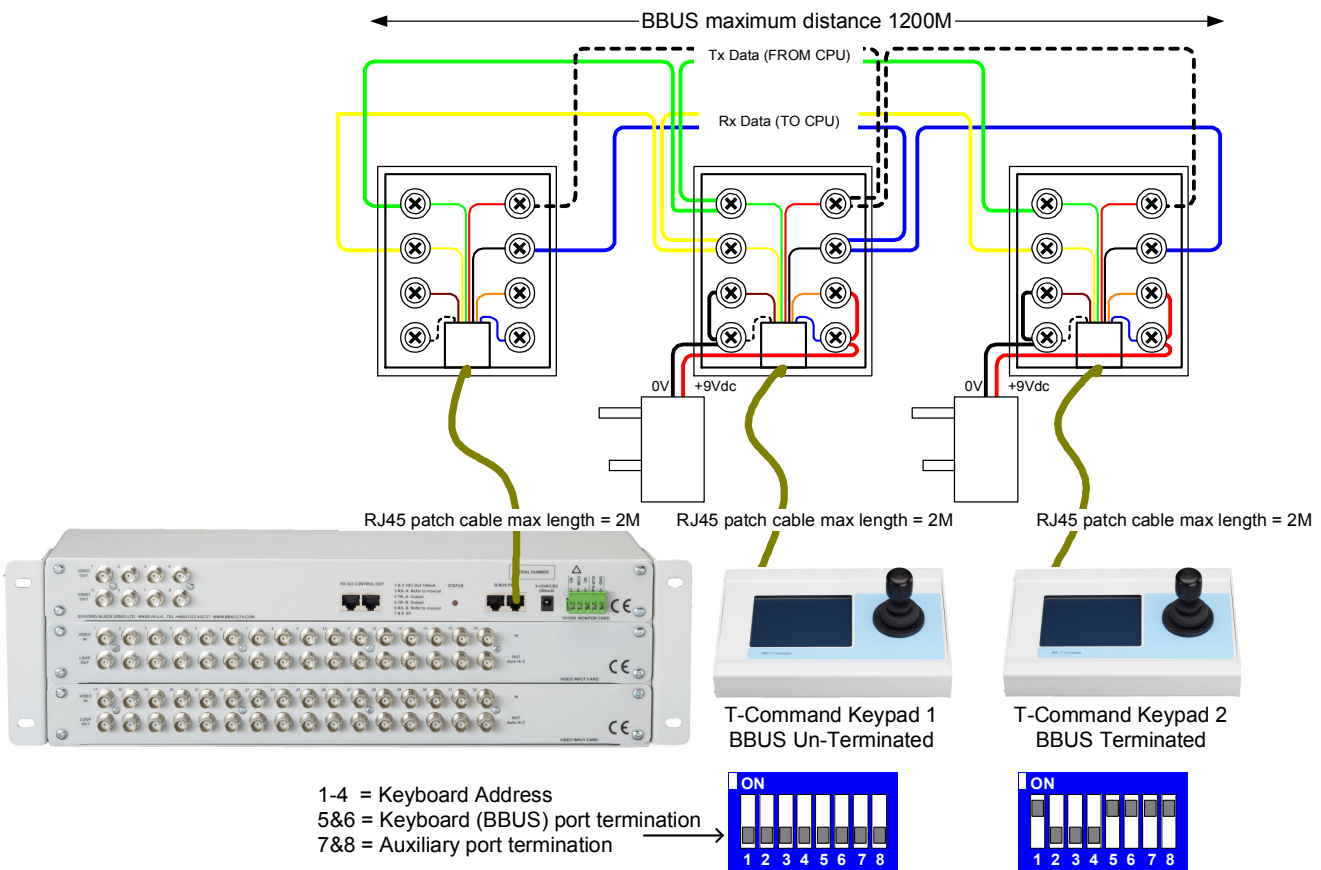


Fig. 4 Internal view of the T-Command keypad.

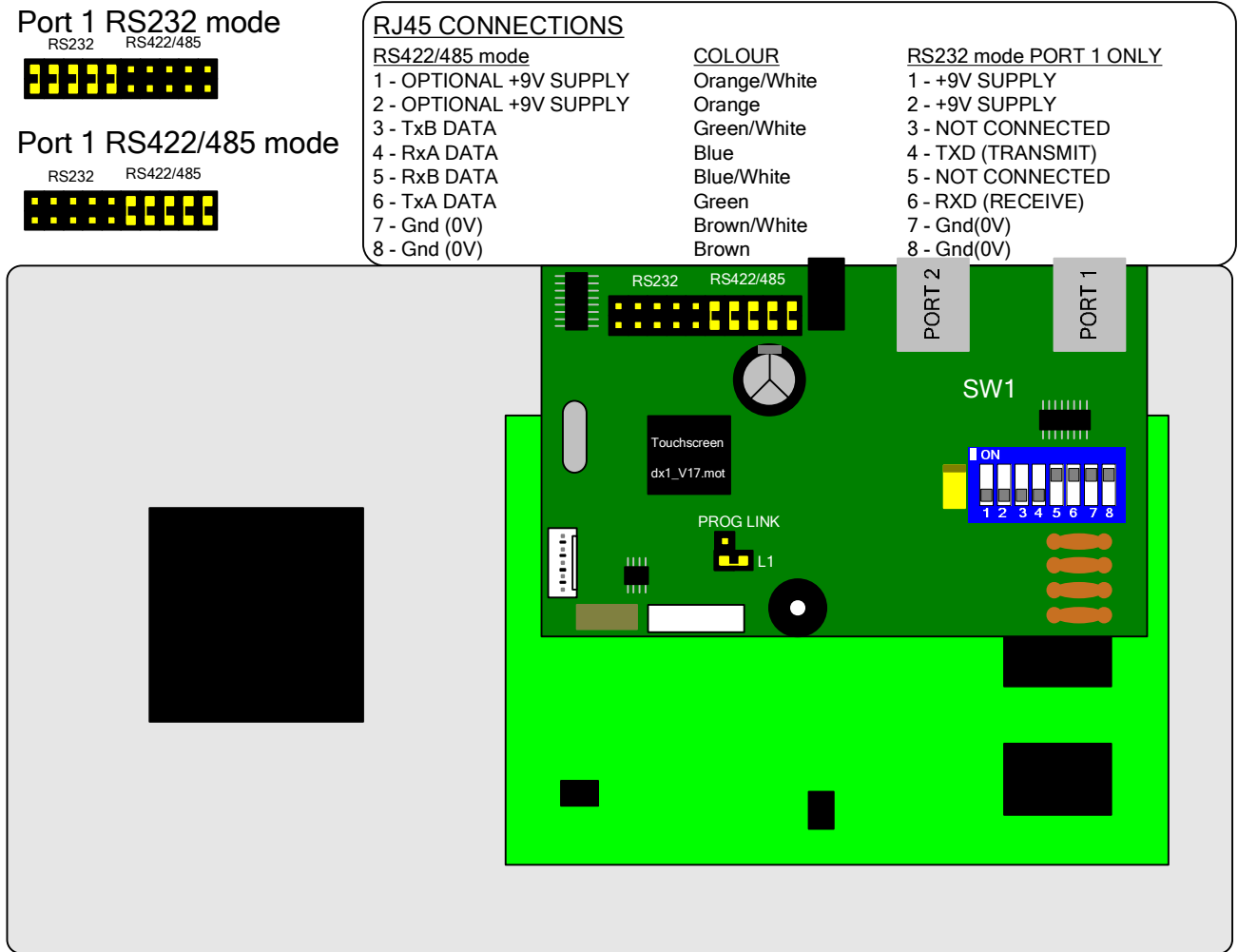
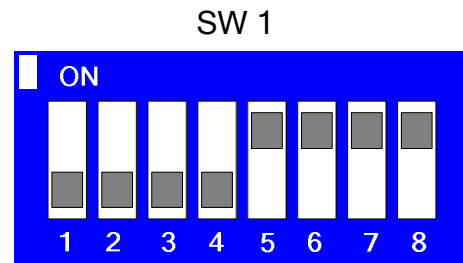


Fig. 5 Address and Termination switch settings.

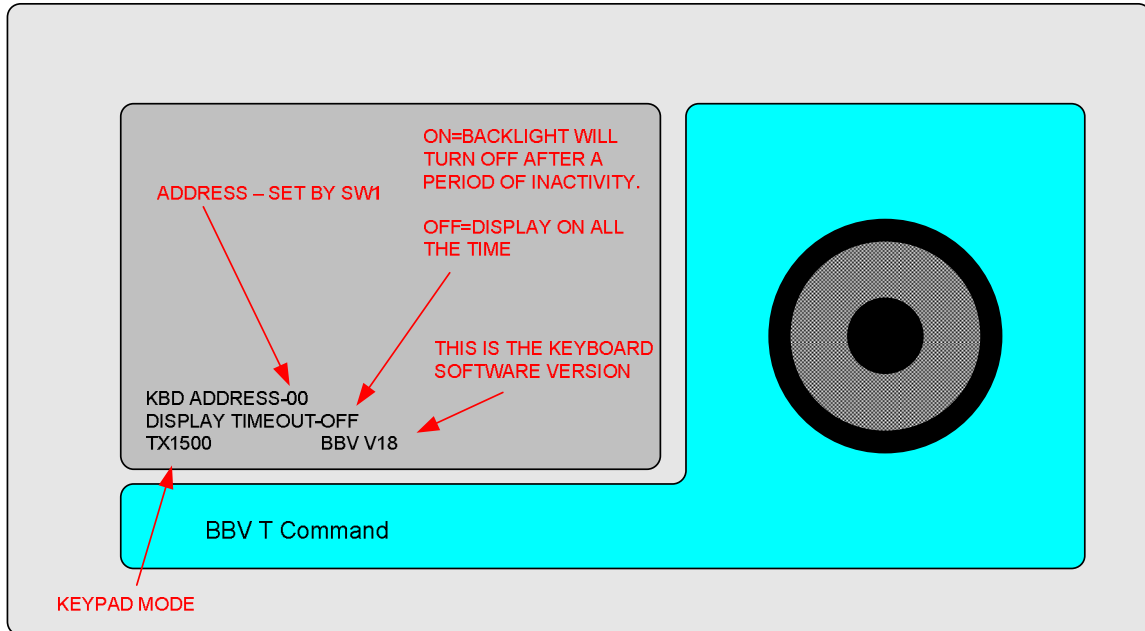
1-4 = Keyboard Address  
 5&6 = Keyboard (BBUS) port termination  
 7&8 = Auxiliary port termination



	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
					PORT 1	PORT 1	PORT 2	PORT 2
					RX	TX	RX	TX
	(1)	(2)	(4)	(8)	120R	120R	120R	120R
1	OFF	OFF	OFF	OFF	ON	ON	ON	ON
2	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
3	OFF	ON	OFF	OFF	ON	ON	ON	ON
4	ON	ON	OFF	OFF	ON	ON	ON	ON
5	OFF	OFF	ON	OFF	ON	ON	ON	ON
6	ON	OFF	ON	OFF	ON	ON	ON	ON
7	OFF	ON	ON	OFF	ON	ON	ON	ON
8	ON	ON	ON	OFF	ON	ON	ON	ON
9	OFF	OFF	OFF	ON	ON	ON	ON	ON
10	ON	OFF	OFF	ON	ON	ON	ON	ON
11	OFF	ON	OFF	ON	ON	ON	ON	ON
12	ON	ON	OFF	ON	ON	ON	ON	ON
13	OFF	OFF	ON	ON	ON	ON	ON	ON
14	ON	OFF	ON	ON	ON	ON	ON	ON
15	OFF	ON	ON	ON	ON	ON	ON	ON
16	ON	ON	ON	ON	ON	ON	ON	ON

## 5. POWER UP SCREEN

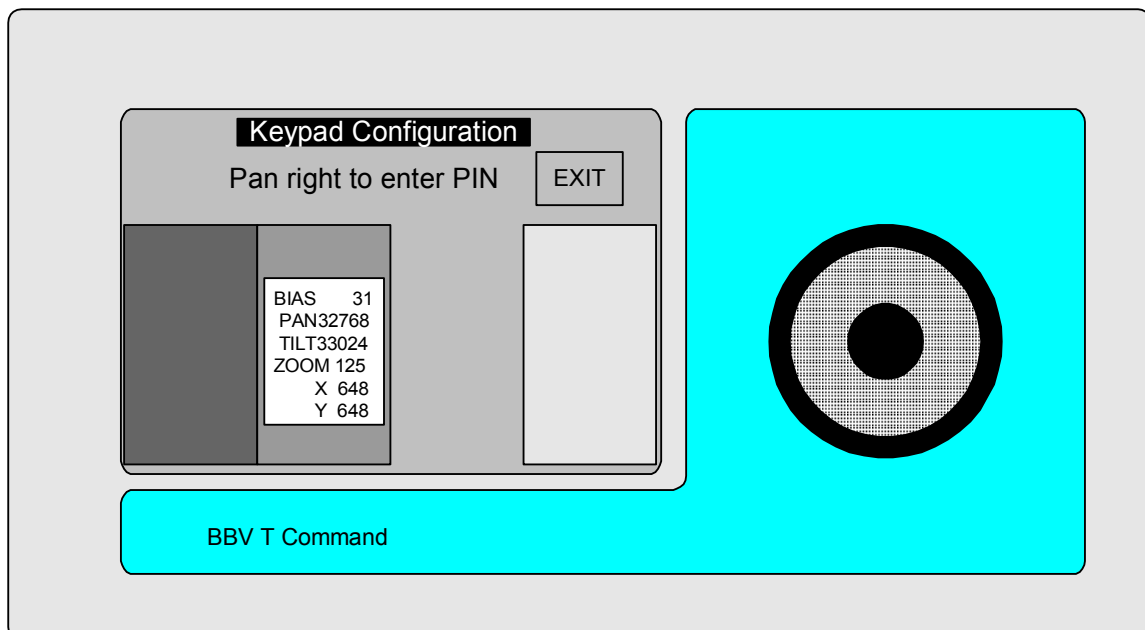
When the T-Command is powered up you will see the Boot up screen. This will give important configuration information. The Software Version will be very important when you call Tech Support +44 (0) 1323 444600. The Keyboard Type will depend on the application you are using the T-Command for. There are a number of options available. Menu access will be necessary to change the Keypad Type.



## 6. SETUP

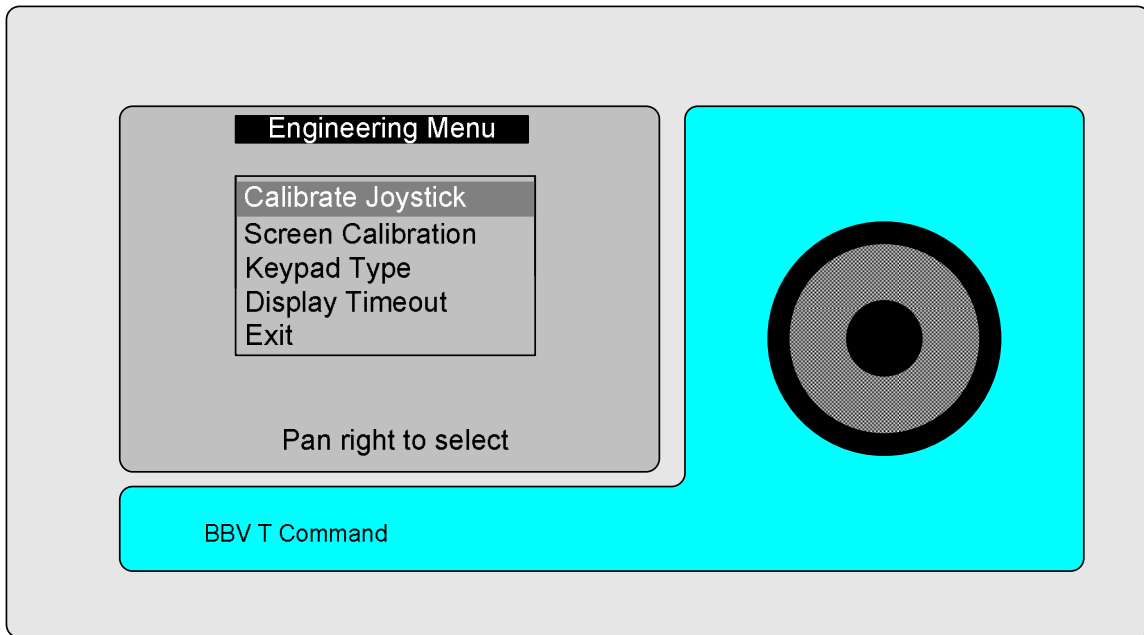
### T-Command Keypad Configuration.

In order to configure the T-Command you will need to power down the T-Command and wait 10 seconds. Twist the joystick fully clockwise then push it to the top right (tilt up and pan right) then plug the power cord back into the T-Command. You will be asked to Pan Right to enter PIN. This will then bring you to the PIN number screen. The Password is **2325**. You will then enter the Engineering Menu. If you are having trouble seeing the screen it is at this point you can adjust the Contrast. This is done by twisting the zoom knob on the joystick.



## 7. ENGINEERING MENU

The Engineering Menu allows you to do a number of key things, Calibrate Joystick, Screen Calibration and select the Keypad Type. To navigate the menu you will need to use the joystick tilt up & down to move up & down then pan right to select.



Calibrate Joystick - this will allow re-calibrating of the Joystick. You will go straight to a **YES NO** screen you will need to press the **YES** key to continue. Then you will need to follow the instructions that come up on the screen. Or pressing **NO** will return you to the Engineering Menu screen.

Screen Calibration - this will allow re-calibrating the Touch Screen part of this keypad. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you will need to follow the instructions that come up on the screen. Or pressing **NO** will return you to the Engineering Menu screen.

Keypad Type – this will allow to select the type of keypad you wish the keypad to be. You will go straight to a **YES NO** screen you will need to press the **YES** key to continue. You will be given four options:

- |            |  |
|------------|--|
| TX1500     | This is to be selected when being used with the BBV Tx1500, FBM Video Matrix & Pick A Point. |
| Dixons DX1 | This is to be selected when being used with the BBV Tx1500 in a retail application.          |
| Ganz DVR   | This is to be selected when being used with the Ganz DVR GANZ ZR-DH1621NP.                   |
| Fast DVR   | This is to be selected when being used with the Fast DVR.                                    |

To navigate the menu you will need to use the joystick tilt up & down to move up & down then pan right to select you will then be shown the **YES NO** screen to confirm your selection. Then the T-Command will re-boot and show the power up screen. Or pressing **NO** will return you to the Engineering Menu screen.

Display Timeout – To reduce electrical power usage, the backlight for the touch screen display can be automatically turned off after a period of no use. This menu option allows the display to timeout or for the display to be on all the time.

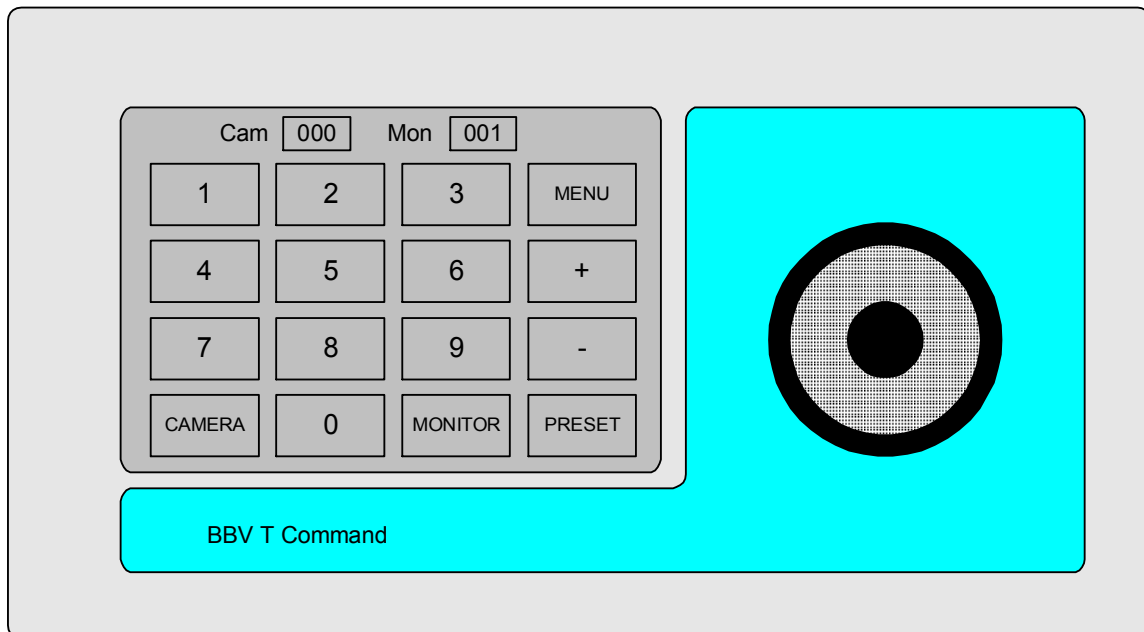
## 8. Tx1500

In this Keypad Type you will be able to control the BBV Tx1500; FBM Video Matrix & Pick A Point below is the main screen. On this screen you can carry out basic matrix functions ie Camera, Monitor, Preset selection & Pan, Tilt, Zoom Functions.

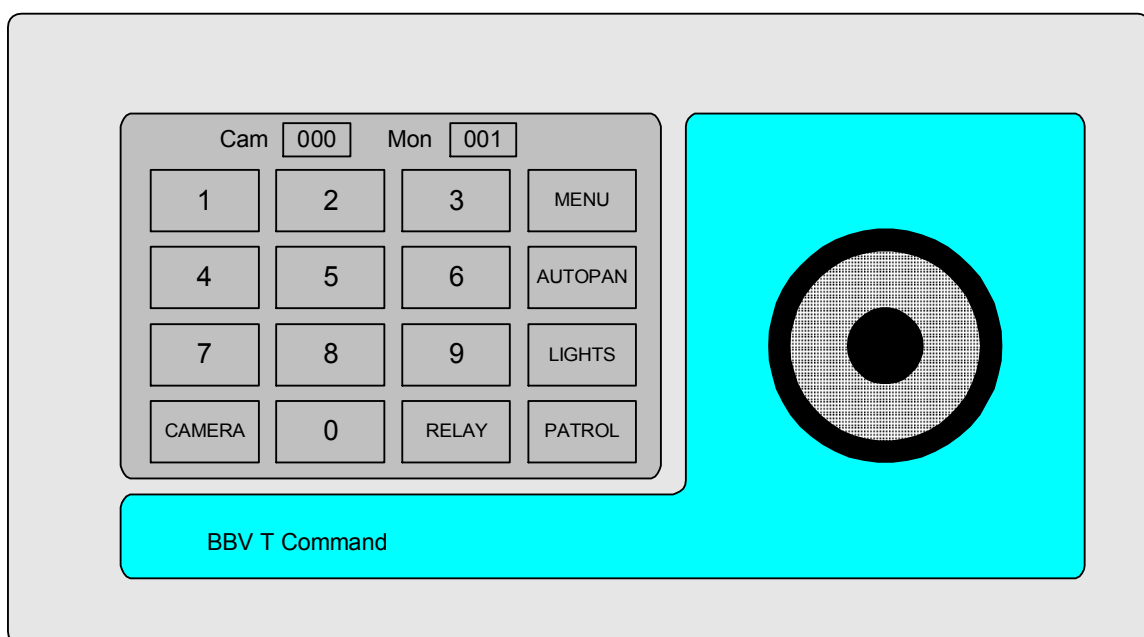
To select a Monitor you will need to press a number pad ie **8** followed by **MONITOR** pad. This will select monitor 8 & it will update the 3 digit display next to the **Mon** legend.

To select a camera you will need to press a number pad ie **6** followed by **CAMERA** pad. This will select camera 6 & it will update the 3 digit display next to the **Cam** legend.

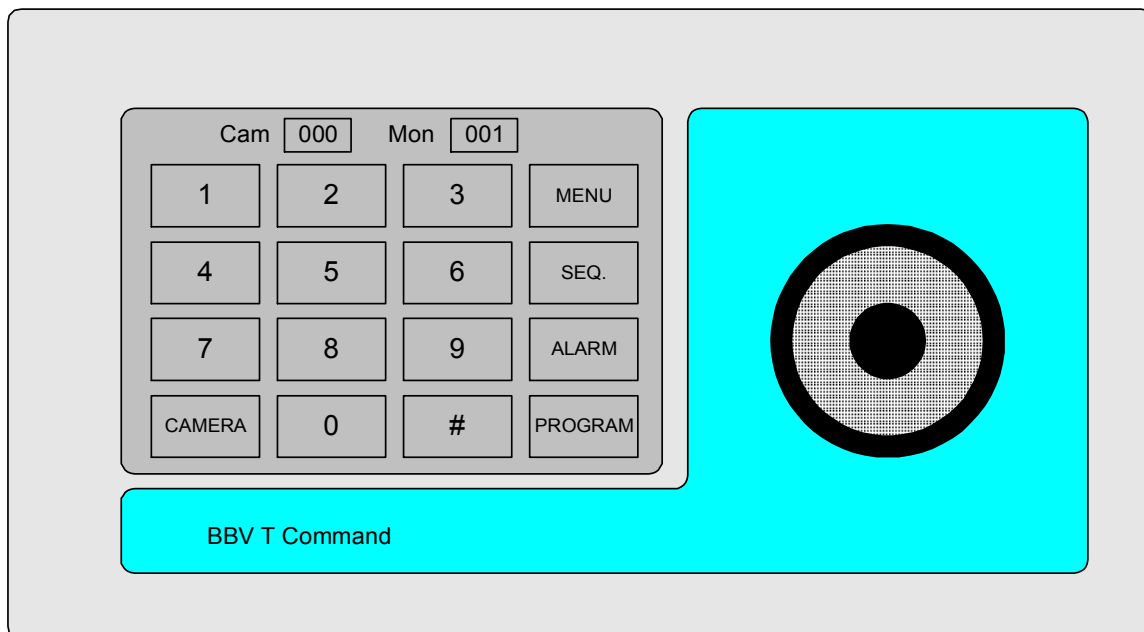
To select a preset you will need to press a number pad ie **4** followed by **PRESET** pad. This will send the camera selected to preset 4.



If you press **MENU** you will move on to the next screen this gives you more PTZ functions. To start a Patrol you will need to press **1** or **2** followed by **PATROL** pad. This will select one of the two patrols. There is also the **RELAY** pad this controls the relay on the front of the Tx1500 Matrix (only) or on the individual Alarm Cards refer to the Tx1500 Manual.



If you press **MENU** you will move on to the next screen this gives more Matrix based controls.  
To start a sequence on the selected monitor you will need to press the **SEQ** pad.  
To acknowledge stacked alarms you will need to press the **ALARM** pad.  
To enter the Tx1500 menu you will need to press AND HOLD the **PROGRAM** pad.  
To enter the Tx1500 COAX menu you will need to press AND HOLD the **#** pad for 2 seconds.



## 9. DX1 DIXONS

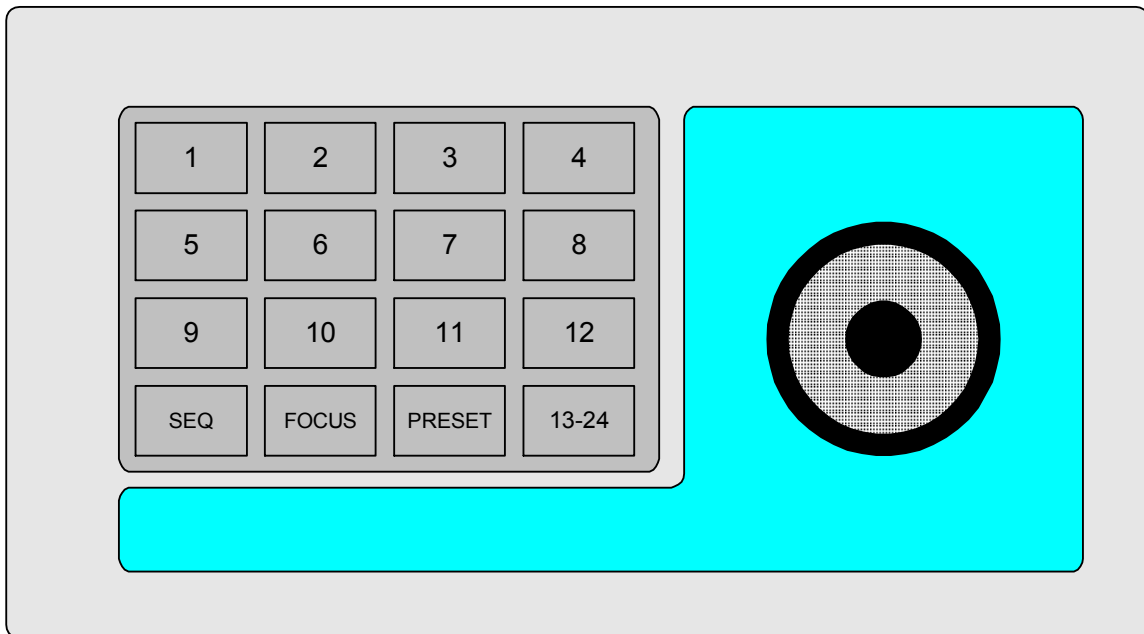
In this Keypad Type you will be able to control the BBV Tx1500, when the matrix is set up in DIXONS MODE Ref, to BBV Tech Support +44 (0) 1323 444600. On this screen you can carry out basic matrix functions ie Camera, & Preset selection including Pan, Tilt, and Zoom Functions.

To select a camera you will simply need to press a number pad ie **6**, this will select camera 6, if you require cameras 13- 24 press the **13-24** pad.

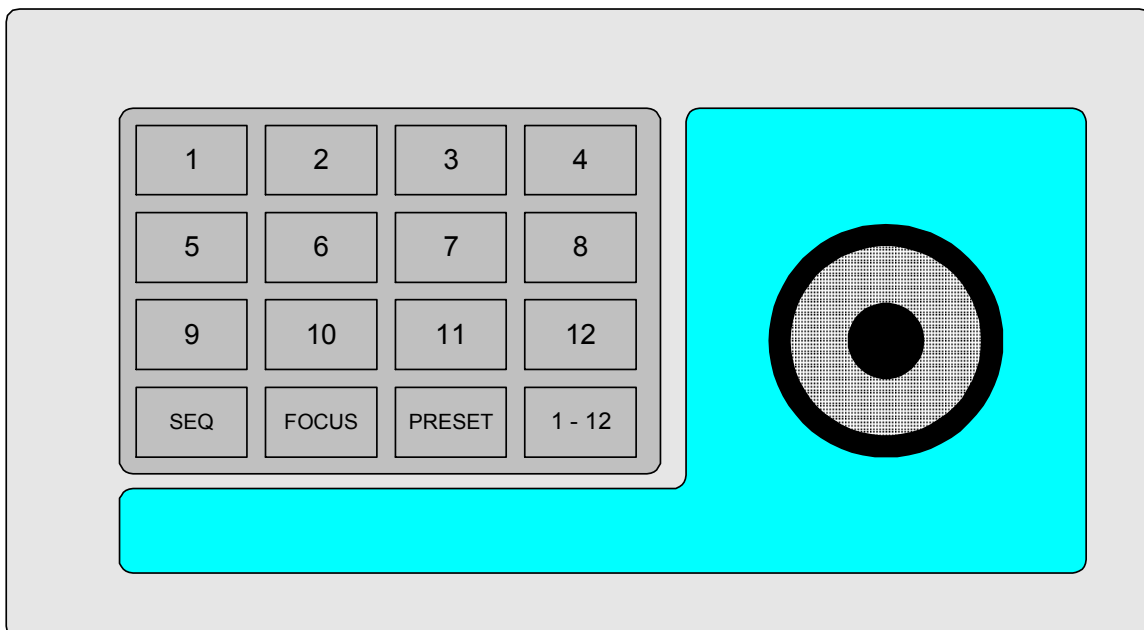
To select a preset you will need to press a number pad ie **4** followed by **PRESET** pad. This will send the camera selected to preset 4.

To save a preset you will need to press AND HOLD the **PRESET** pad; this will then bring you to the PIN number screen. The Password is **6181**. You will then be given 8 pads these correspond to presets 1 through to 8.

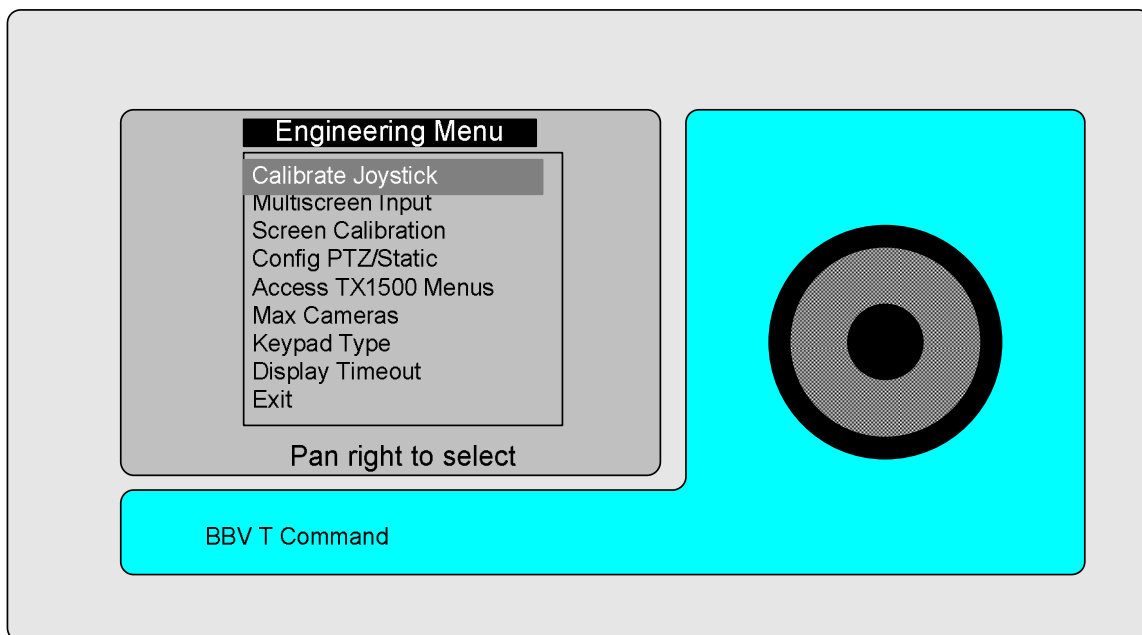
When the Tx1500 is set up in DIXONS MODE the T-Command is locked to the Monitor number that corresponds to the T-Command address. In plain **KBD 1** will only control **Monitor 1** & **KBD 2** will only control **Monitor 2**.



If you press **13-24** you will move on to the next screen this gives more camera numbers.



Within the DX1 there is an Engineering Menu, to access this menu you will need to press AND HOLD the **PRESET** pad, This will then bring you to the PIN number screen. The Password is **2325**.



Calibrate Joystick - this will allow re-calibrating the Joystick. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you will need to follow the instructions that come up on the screen. Or pressing **NO** will return you to the DX1 Engineering Menu screen.

The Multiscreen Input Function allows the on site DVR monitor output to be fed back into a spare camera input of the Matrix. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you will need to press the **+** or **-** pads until you have the correct camera input selected. Or pressing **NO** will return you to the DX1 Engineering Menu screen.

Screen Calibration - this will allow re-calibrating the Touch Screen part of this keypad. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you will need to follow the instructions that come up on the screen. Or pressing or pressing **NO** will return you to the DX1 Engineering Menu screen.

Config PTZ/Static - will allow toggle between **DOME** or **STATIC** you will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you can set up each camera input individual. Or pressing **NO** will return you to the DX1 Engineering Menu screen.

Access TX1500 Menus - will allows full access to the Tx1500 menu without the normal Tx1500 password To navigate the Tx1500 menu you will need to use the joystick tilt up & down to move up & down then pan right & left to move right & left press **+** pad to select within the Tx1500 menu.

Max. Camera - this will allow to select the maximum number of cameras the T-Command can Display on the touch screen. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. Then you are given 3 options 1 – 24, 1 – 36 or 1 - 48. To navigate the menu you will need to use the joystick tilt up & down to move up & down then pan right to select Or pressing **NO** will return you to the DX1 Engineering Menu screen.

Keypad Type – this will allow to select the type of keypad you wish the keypad to be. You will go straight to a **YES NO** screen you will need you press the **YES** key to continue. You will be given four options:

- |            |  |
|------------|--|
| TX1500     | This is to be selected when being used with the BBV Tx1500, FBM Video Matrix & Pick A Point. |
| Dixons DX1 | This is to be selected when being used with the BBV Tx1500 in a retail application.          |
| Ganz DVR   | This is to be selected when being used with the. GANZ ZR-DH1621NP.                           |
| Fast DVR   | This is to be selected when being used with the Fast DVR.                                    |

To navigate the menu you will need to use the joystick tilt up & down to move up & down then pan right to select you will then be shown the **YES NO** screen to confirm your selection. Then the T-Command will re-boot and show the power up screen. Or pressing or pressing **NO** will return you to the DX1 Engineering Menu screen.

Display Timeout – To reduce electrical power usage, the backlight for the touch screen display can be automatically turned off after a period of no use. This menu option allows the display to timeout or for the display to be on all the time.

## **10 Ganz DVR**

Notes on using Touch Screen Keypad (V9 software) with GANZ ZR-DH1621NP

The keypad connects to the DVR via the T-command keyboard port. The keypad only transmits since the DVR protocol at present does not provide any useful feedback data (i.e. status info etc.). Connections are as follows: -

Keypad	DVR
Pin 3(+TX)	Pin 2(+RX)
Pin 6(-TX)	Pin 3(-RX)

The keys that are displayed on the screen mainly mimic DVR front panel controls but some special keys control the keypad screens.

### **Joystick.**

At present the DVR does not support PTZ control. The joystick is only used for DVR OSD menu control (see later).

### **Main Screen.**

This is the primary screen to access all DVR functions and other keypad screens.

The DISPLAY, USER, SPOT, SEARCH, MENU, PTZ, PLAY and AUTO keys mimic the DVR front panel controls. In addition the SPOT, MENU and PLAY keys activate other keypad screens.

The UNIT and CAMERA keys only select other keypad screens, which mimic the 16 DVR front panel keys.

### **Spot Screen.**

This screen is displayed by pressing the SPOT button on the Main screen. The Spot mode toggle command is sent to the DVR.

The 1 to 16 and AUTO keys mimic the DVR front panel keys.

Pressing the Main MON key sends the Spot mode toggle command to the DVR.

EXIT returns to the Main screen.

### **Menu Screen.**

This screen is displayed after pressing the MENU key on the Main screen. The DVR OSD Menu display toggle command is sent to the DVR.

The ^ v > < ENTER keys navigate the DVR OSD menus and mimic FF REW PLAY RPLAY ENTER front panel keys.

In addition, the Joystick can be used to control the menus. Tilt up mimics FF. Tilt down mimics REW. Pan right mimics PLAY. Pan left mimics RPLAY. Twist clockwise mimics ENTER. Twist anticlockwise mimics MENU.

CAMERA selects the Camera Select screen.

MENU toggles the DVR OSD Menu display but does not change the keypad-displayed screen.

EXIT returns to the Main screen.

### **PTZ Screen.**

This screen is displayed after pressing the PTZ key. The PTZ toggle command is sent to the DVR.

TOUR, AUTO, PTZ (toggle PTZ mode), IRIS, FOCUS keys mimic front panel although at present IRIS and FOCUS are not supported in the DVR protocol and do not function.

CAMERA selects the Camera Select screen.

PRESET selects the Preset screen but does not active the DVR OSD Preset menu.

EXIT returns to the Main screen.

### **Play Screen.**

This screen is displayed after pressing the PLAY key from another screen.

RW <<, STOP, FF >>, RPLAY <, PAUSE ||, PLAY > PANORAMA, FULLZOOM, DISPLAY and PIP mimic the DVR front panel keys.

CAM selects the Camera Select screen.

PASSWORD selects the Password screen.

EXIT returns to the Main screen.

### **Camera or Unit Select Screen.**

This screen is displayed after pressing the CAM, CAMERA or UNIT key on another screen.

1 to 16 keys mimic the DVR front panel keys.

When selected from the UNIT key the number key pressed selects the unit number of the DVR to be controlled.

The number key pressed is displayed at the top of the keypad screen in the appropriate window.

EXIT returns to the Main screen.

### **Preset Screen**

This screen is displayed after the PRESET key is pressed on the PTZ screen.

A Preset is selected by pressing the appropriate number keys followed by GOTO i.e. Press 2 then 7 followed by GOTO to select Preset 27.

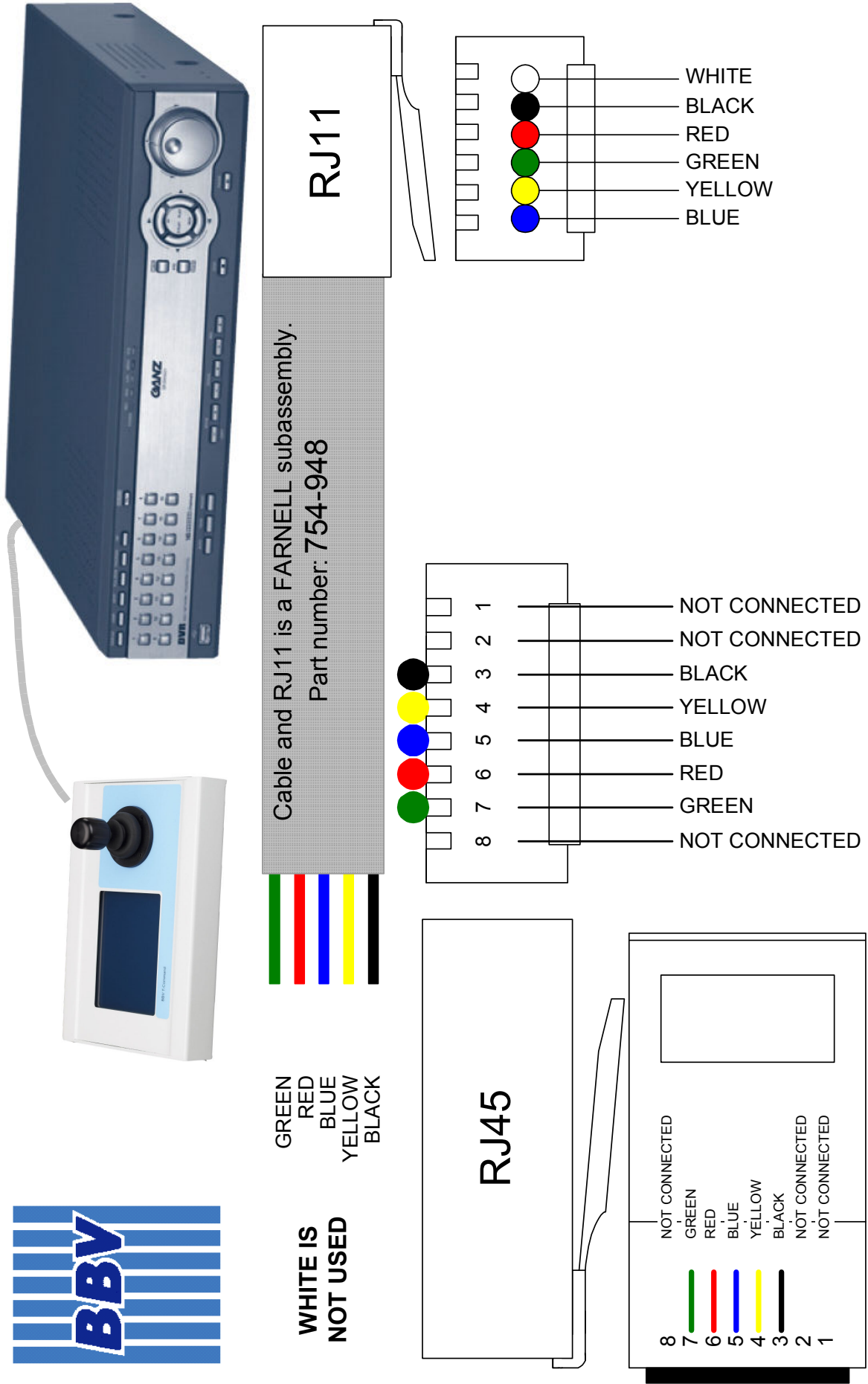
The selected Preset will be displayed at the bottom of the keypad screen before the GOTO key is pressed. If this number is incorrect press CLEAR to clear.

To program/set a Preset first move the camera to the desired position. Then enter the desired numbers followed by SET i.e. Press 3 then 5 followed by SET to program/set Preset 35.

Preset numbers greater than 99 will not be accepted or actioned

## 11 Ganz DVR CONNECTION INFORMATION

Fig. 6 interconnecting cable between T-Command keyboard port and Ganz DVR GANZ ZR-DH1621NP.



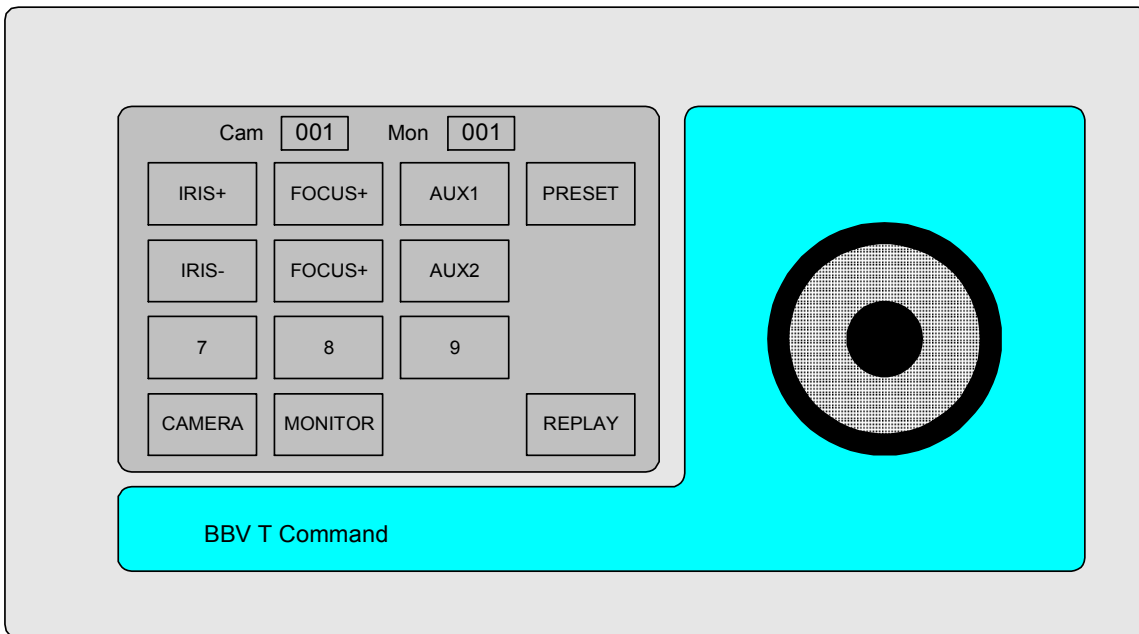
## 12 FAST DVR

Connection between T-Command (keyboard port) and FAST DVR COM port.  
*Note the T-Command port 1 will need to be configured for RS232 refer to fig 4 page 7.*

T-Command RJ45	FAST DB9-F
GREEN (4)	2 (RXD)
BROWN PAIR (7 & 8)	5 (GND)

Internal SW1 switch settings – ALL OFF.

### LIVE - PTZ CONTROL



LIVE MODE – ON POWER UP.

This screen switches the DVR monitor into LIVE mode allowing camera selection and PTZ control using the joystick. Focus and Iris, if supported, can be controlled using **FOCUS +/-** and **IRIS +/-**. **AUX 1** and **AUX 2** are used to toggle PTZ auxiliary outputs.

### GOTO PRESET POSITION

Press the **PRESET** pad followed by the **GOTO** pad.

Using the numeric pads to select the preset number required and then press the **ENTER** pad to recall the camera to the preset. OR press the **EXIT** pad to ignore the preset command.

Example **PRESET, GOTO, 3, ENTER**. This will send the Camera to Preset 3.

### SAVE PRESET POSITION

Press the **PRESET** pad followed by the **SAVE** pad.

Using the numeric pads to select the preset number required and then press the **ENTER** pad to save the current position OR press the **EXIT** pad to ignore the save preset command.

Example **PRESET, SAVE, 4, ENTER**. This will save the new position as Preset 4.

## CHANGING CAMERA

Press the **CAMERA** pad then using the numeric pads to select the camera required and then press the **ENTER** pad to select this new camera OR press the **EXIT** pad to keep with the original camera.

Example **CAMERA, 4, ENTER**. This will select camera 4.

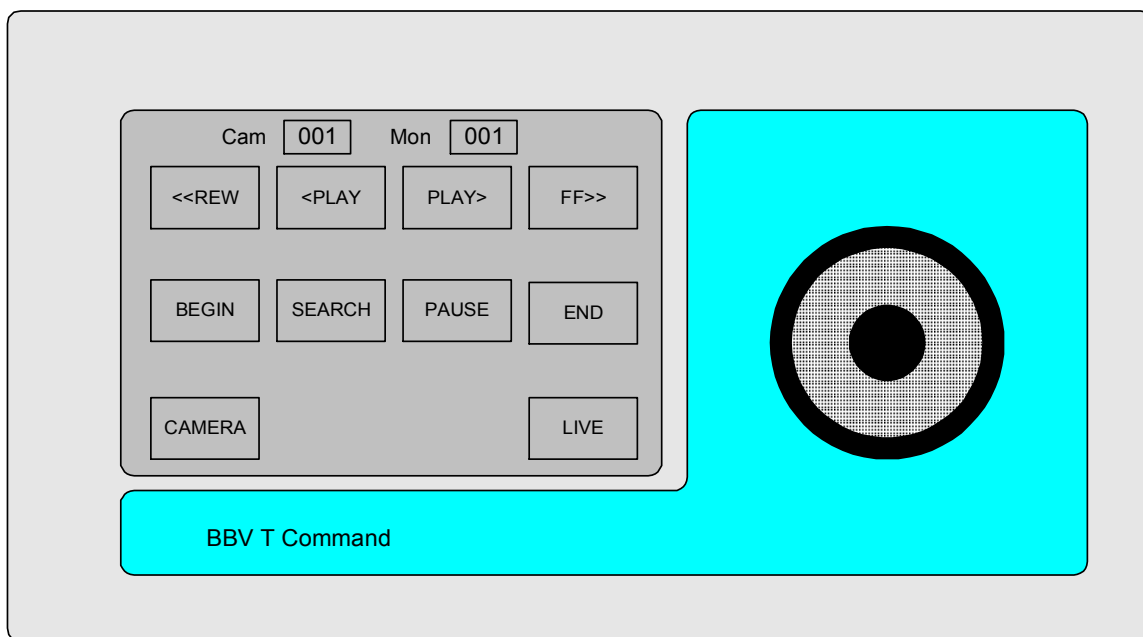
## CHANGING MONITOR

Press the **MONITOR** pad then using the numeric pads to select the monitor required and then press the **ENTER** to select this new monitor or press the **EXIT** to keep with the original monitor.

Example **MONITOR 2, ENTER**. This will select monitor 2.

## REPLAY/PLAYBACK MODE

Pressing the **REPLY** pad will switch the DVR into playback mode and the screen changes to the following layout.



The pads function similarly to a conventional VCR. The joystick is also used to fast forward and rewind by moving the joystick RIGHT or LEFT. When PAUSED the joystick can be moved UP and DOWN to show next and previous frames.

Press the **CAMERA** pad to change the current camera using the same procedure used in live mode.

## TIME AND DATE SEARCH

Press the **SEARCH** pad and then use the numeric keys to select the specific time and date to view followed by the **ENTER** pad.

The time and date must be entered in this format:  
YEAR MONTH DAY HOUR MINUTE SECOND

For example to display time/date of 10 JULY 2005, 10:12.34 press the following keys.

**SEARCH 20050710101234 ENTER**

## SWITCHING BACK TO LIVE

Press the LIVE pad to switch the DVR back into LIVE mode.

## Other BBV products.

Product	Description
<b>TX300</b>	Single camera desktop telemetry transmitter with BBV up-the-coax & 20mA telemetry, Pan/Tilt/Lens & Lights
<b>TX400</b>	As TX300 inc Wash, Wipe, Autopan, 8 presets, preset patrol.
<b>TX400DC</b>	As TX400 including joystick for proportional Pan/Tilt control.
<b>TX1000 MK2</b>	8 or 16 camera, 2 monitor telemetry transmitter. Up to 2 keyboards. BBV up-the-coax and RS422 standard with options for alarm inputs and 20mA telemetry.
<b>TX1500</b>	Mid size matrix 16 – 96 camera, 8 monitor. Up to 4 control positions (keyboard & remote control) options for alarms, remote control, BBV up-the-coax and RS485 telemetry.
<b>FBM range</b>	Large size matrix. Configurable up to 4096 cameras and 64 monitor outputs. Up to 16 control positions (keyboard & remote control) options for alarms, remote control RS485/RS422 telemetry with various options. Please call to discuss requirements.
<b>RX100</b>	Dome Interface with options to drive a large library of dome cameras. BBV up-the-coax and 20mA telemetry.
<b>RX100/BAX</b>	Dome Interface with options to drive a large library of dome cameras. BAXALL up-the-coax telemetry.
<b>RX200</b>	AC receiver for Pan only heads or static cameras, Wash/Wipe/Lights. BBV up-the-coax and 20mA telemetry.
<b>RX300</b>	AC receiver for Pan/Tilt/Zoom/Focus/Iris Override and 1 Auxiliary output. BBV up-the-coax and 20mA telemetry.
<b>RX400P</b>	AC full function receiver. PTZFI 4 Auxiliary outputs, 16 presets. BBV up-the-coax and 20mA telemetry.
<b>RX45X (AC) RX55X (DC)</b>  Multi RS485 protocol and BBV up-the-coax telemetry receivers	Multiple RS485/422 and BBV up-the-coax controllable AC and DC receivers. These receivers are controlled from an expanding range of serial protocols as listed below. 110/230Vac supply. PTZFI, 64 presets, preset patrol, 8 local alarm inputs, 12V 500mA supply output. OSD for remote diagnostics. 3 Aux. outputs RX55X or 4 Aux. outputs RX45X. Optional Privacy board. BBV RS485, COAX & 20mA, BAXALL COAX, DENNARD RS485, MOLYNX PELCO P/D RS485, VCL/HONEYWELL RS485, PHILIPS/BOSCH RS485 (OPTIONAL BI-PHASE INPUT), SENSORMATIC/AD RS422 VICON RS422 CIRRUS AUDIO MONITORING
<b>CTI16</b>	Multi-protocol serial converter that gives up-the-coax control to 16 cameras. BBV RS422, Dennard RS485, Pelco P, Pelco D, Philips/Bosch RS485/232, VCL RS485, Sensormatic RS422, Molyntx, Vicon
<b>STARCARD</b> STARCARD/CONVERTER	8 * RS485 output, 2 wire simplex RS422, 4 wire full-duplex RS422, 2 wire half-duplex RS485. Optional STARCARD/CONVERTER offering protocol conversion to drive an increasing range of 3 <sup>rd</sup> party protocols.
<b>ACCESSORIES</b>	CTI/16 16 camera, RS422 to up-the-coax converter TxLD (bidirectional RS422-RS232 converter) 98005 (bidirectional 20mA-RS232 converter) AD RS422 (American Dynamics) protocol converters