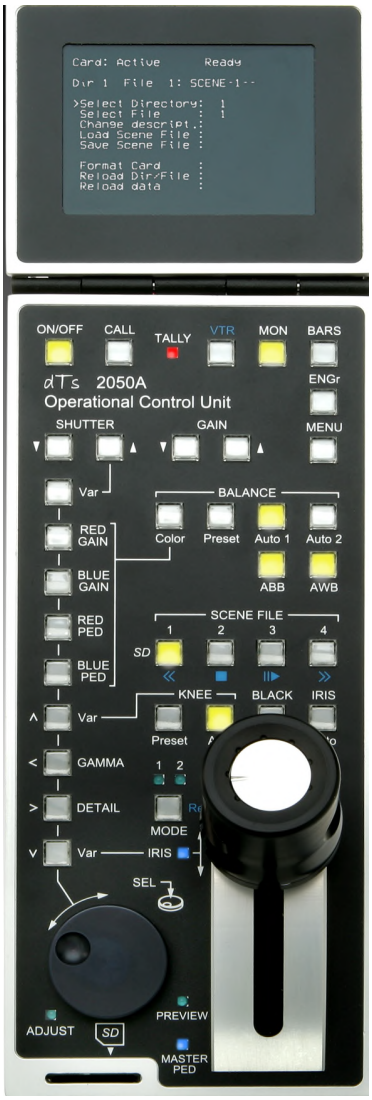
CHRCP-2050A
UNIVERSAL CAMERA REMOTE CONTROL UNIT



USER GUIDE

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Figure 1: CHRCP2050, shown without and with optional TFT/LCD Displays

1. GENERAL DESCRIPTION

The CHRCP-2050A Operational Control Unit provides remote control facilities for a range of broadcast cameras/camcorders from several different manufacturers. It has been designed to emulate control units from Hitachi, Ikegami, JVC, Panasonic and Sony. The 2050A interfaces directly with Telecast Fiber Systems' CopperHead fiber optic extension systems, or can be connected directly to a camera or a camcorder.

The 2050 provides reliable, noise free, non-contact joystick controls of iris, pedestal and preview. Joystick tension is easily adjustable.

The main connector is a DB15 type which is reliable, economical and readily available. This connector carries camera control data, power, as well as red and green tally inputs and preview volt-free contacts. Preview contact closure is also available on a BNC coax connector. Composite video monitor input and video output are available on BNC connectors.

Multiple non-volatile storage and retrieval scene files are available both internally and via ***SD*** card access. The ***SD*** card allows scene file settings to be transported across multi-channel systems as well as off-site backup.

An On Screen Display (OSD) video output provides operational information and ***SD*** scene file access menus. This OSD output can be connected to an external standard definition composite VBS monitor or, optionally, a tiltable 3.5 inch (89mm) TFT-LCD unit is available (Telecast Fiber Systems CHRCP-LCD1) which is ergonomically designed to match and fit the 2050.

The 2050 will function over a large supply voltage range with low power consumption. If the TFT-LCD is fitted this supply voltage range is reduced.

For in-desk fitment the low profile design of only 40mm below desktop surface gives maximum under desk clearance. Panel mounting brackets are available for this purpose.

2. CONFIGURATION

The 2050 Operational Control Unit has been supplied configured to emulate the control panel specified on your order or otherwise agreed. Other emulations can be selected by following the procedure outlined in section 5.1 on page #12.

3. INSTALLATION

3.1. GENERAL

The unit has low power dissipation and does not require any special ventilation requirements. It may be used free standing or with optional brackets, mounted into a desk top. All cables leave the OCU from the rear. Because of the unit's low profile height, the rear connector panel may be tilted downwards to provide easier access as necessary for cabling when mounted in-desk. To do this loosen the screw either side of the connector panel (in the slot) and tilt the panel as required, re-tighten the screws.

3.2. INTERCONNECTIONS

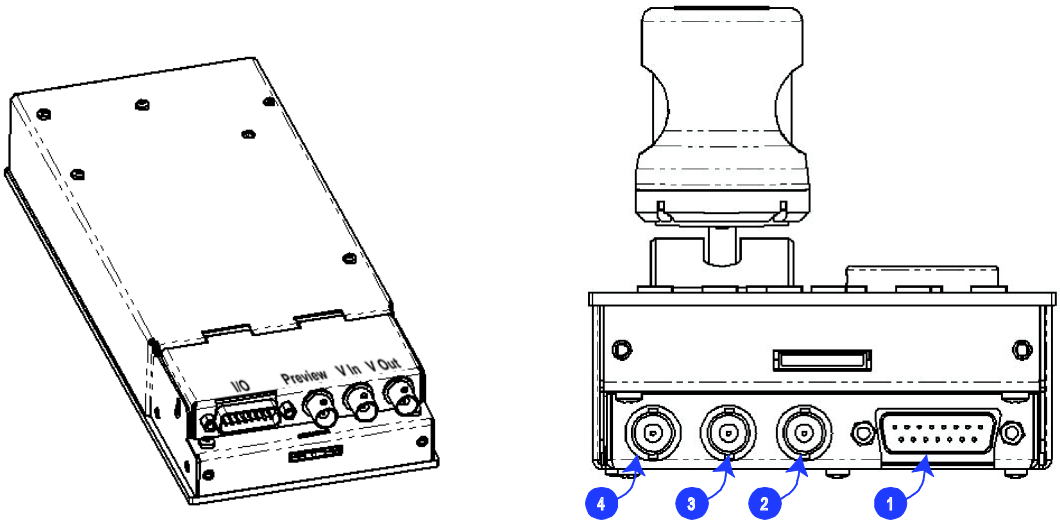


Figure 2: Rear Panel Connectors

The CHRCP2050A has four interconnections:

3.2.1. Main I/O (Connector #1: DB15)

The Main I/O connector is a DB15 female, and carries data, power, and Tally Inputs. Pinouts can be found in Section 10.1.

3.2.1.1. Camera Control Interface

Camera Control is connected via various pins the 'MAIN I/O' connector to your CopperHead Base Station or directly to a camera. The OCU has four electrical control interfaces (RS422, RS232, "Sony bi-di," and "Panasonic bi-di") which are automatically determined when each emulation is selected. However, they can be changed via the "ENGr" menu if necessary for type and sense (see Section 5.1, "ENGINEERING Menu," page #12).

3.2.1.2. Power

The CHRCP2050A runs on DC power, which is supplied from the CopperHead Base Station or directly from the camera, and is supplied via the 'MAIN I/O' connector. If the camera/camcorder does not have enough power to supply the OCU and/or TFT-LCD, an optional connector and AC adaptor are available for powering the units externally.

NOTE: When the 2060 TFT-LCD display is attached, the power supply voltage range is reduced. See specification.

3.2.1.3. Tally Inputs

Tally inputs are found on the 'MAIN I/O' connector (DB15). Both red and green tally inputs are available. These can be configured for either voltage or contact closure. Voltage must be positive reference ground. Contact closure is also reference ground. An open collector bipolar NPN transistor or open drain N channel FET may also drive the inputs. Configuration is via the "ENGr" Menu.

The panel tally LED is a bi-color red/green with the priority red.

3.2.1.4. Preview Output

A volt-free solid state contact closure is available as standard. This is activated when the joystick knob is pushed down. Observe the contact ratings defined in the specifications. The contacts are not polarity conscious. This contact closure is duplicated on the Preview Output BNC.

3.2.2. Preview Output (Connector #2: BNC)

The same Preview output contact closure found on the Main I/O Connector (Preview Output 3.2.1.4, above) is duplicated on this BNC. See section 10.2 for pinout specifications.

3.2.3. Video Input (Connector #3: BNC)

The video BNC input is terminated in 75 ohms and accepts standard definition 1V p-p video - composite sync, Y or VBS.

3.2.4. Video Output (Connector #4: BNC)

A valid video input is switched directly to the video output. When the MON button is activated, the OSD characters are superimposed onto the video in white with a black border to make them easily readable with varying program content. If no video input is applied, then the video output is Composite Sync with black background and OSD superimposed, without color subcarrier. BNC output video is sourced in 75 ohms and gives 1V p-p when correctly terminated in 75 ohms. The output video is also available on the multi-way connector for the optional 3.5 inch TFT-LCD display (2060).

3.3. JOYSTICK TENSION

Joystick tension may be adjusted to personal preference using the adjuster screw, which is accessible through a hole in the under side of the unit directly under the centre of the joystick when centrally positioned.

3.4. ENVIRONMENTAL

As with all electronic equipment, both high and low extremes of temperature should be avoided as well as the ingress of moisture and dust. The units are rugged in construction but sharp shocks and high levels of vibration must also be avoided. Keep the unit within the limits defined in the specification.

4. CONTROLS

PLEASE NOTE:

The following descriptions indicate the full potential control of the CHRCP-2050A but do NOT **imply that all controls are available for any particular control panel emulation. Cameras and controllers differ considerably in the functionality they offer. Refer to**

Figure 13: Table of Emulations and Control Features on Page #17 for available control features. All camera settings and adjustments must be read with reference to the emulated control panel and specific camera manuals.

4.1. VARIABLE ADJUST BUTTONS

In brief:

A **flashing** illuminated variable button means that it's parameter adjustment is active via the rotary encoder. The dual mode 'Gain' display is used to indicate the variable value with an inverted display.
A **steady** illuminated variable button means the parameter value is fixed and operational.

Description:

The variable adjust buttons along the unit's left side allow digital bit increment and decrement of the parameter selected with the rotary encoder. A flashing illuminated variable button means that the rotary encoder is active for this item. The 'adjust' LED should be illuminated. The variable value is shown on the OSD. A steady illuminated variable button means the parameter value previously varied is now fixed and operational.

To adjust a parameter, select by pressing the appropriate button once. The button will flash if the parameter is available. The camera will be updated with the value associated with the parameter and adjustment can be made.

If the button is pushed, again the LED will extinguish and the previous parameter value will be reinstated. To retain the adjusted value, leave the LEDs on.

If another parameter adjustment is required, press the appropriate button. The previous button will go to steady illumination indicating that its particular value has been retained and the new button will flash indicating the new parameter adjustment active.

To switch off a previously fixed parameter, press its button twice. Once will force the parameter adjustment active and the second will turn it off.

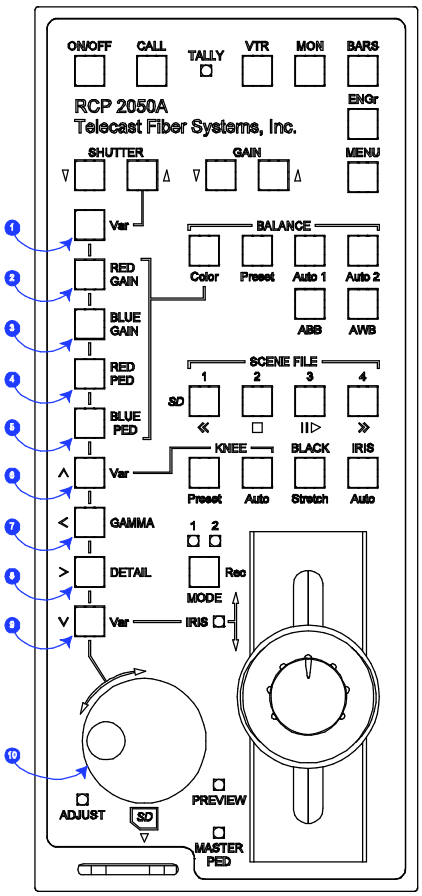


Figure 3: Panel's Variable Adjust Controls

1. SHUTTER	Variable adjustment of shutter value.
2. RED GAIN*	Adjusts red amplitude level
3. BLUE GAIN*	Adjusts blue amplitude level
2&3. GREEN GAIN*	Adjusts green amplitude level. Only available on certain cameras.
4. RED PED*	Adjusts red pedestal (black) level
5. BLUE PED*	Adjusts blue pedestal (black) level
6. KNEE	Adjusts the variable knee camera characteristic.
7. GAMMA	Adjusts the camera gamma characteristic.
8. DETAIL	Adjusts the picture edge detail. Some call it 'Contour' or aperture correction.
9. IRIS	Inhibits the joystick IRIS control. Varies the iris as the joystick. Selecting IRIS AUTO reduces the sensitivity of control, allowing small variation of the auto setting. This is camera dependant. Some cameras do not allow any adjustment in IRIS AUTO mode.

* Note: Color GAIN and PED Adjustments can be adjusted by pushing each individual button, or for quicker access, by pushing down on the ROTERY ENCODER (10) to cycle between RED, BLUE, and GREEN (when available).

ROTARY ENCODER

Rotary Encoder (10)

The encoder allows bit increment and decrement of the selected value.

The encoder also has a push switch. This is used in some emulations to switch between functions. Refer to 'Control Features Chart'.

If either 'RED GAIN' or 'BLUE GAIN' LEDs are active (flashing), pushing the switch will swap control to the other.

If either 'RED PED' or 'BLUE PED' LEDs are active (flashing), pushing the switch will swap control to the other.

4.2. FUNCTION BUTTONS

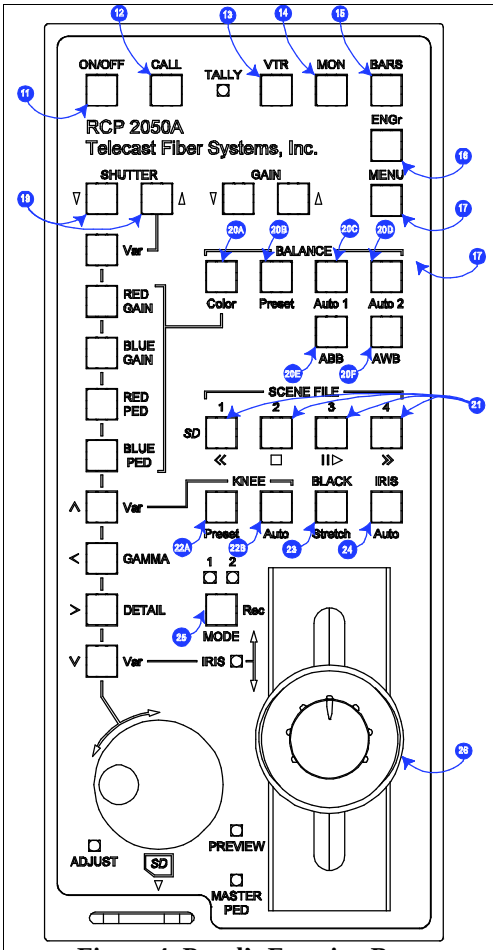
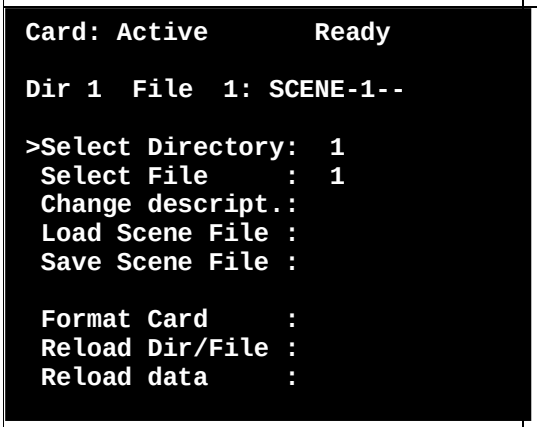


Figure 4: Panel's Function Buttons

11. ON/OFF	OCU on/off Toggles the OCU on/off. On power-up, the LED flashes indicating that the OCU is acquiring comms with the camera. The LED attains steady state when comms are correctly established and the last saved scene file is recalled and applied.
12 CALL	Performs call function with the camera. Usually this means flashing the tally lights on the camera and the viewfinder. This can vary with camera type or camera settings.
13. VTR	Switches the scene file and MODE buttons to VTR mode - on or off as applicable.
14. BARS	Toggles camera color bars on and off.
15. MON	Switches on or off the color monitor On Screen Display characters (OSD)
16. ENGR	Switches on and off the Engineering setup menus.
17. MENU	Switches the camera menu on and off if applicable. When on, the rotary encoder is enabled for item selection and adjustment.
18. GAIN ΛV	Increments or decrements the fixed gain value shown on the OSD.
19. SHUTTER ΛV	Increments or decrements the fixed shutter value shown on the OSD. To turn shutter OFF, hold down the DOWN button for two seconds.
20. BALANCE	
20A.COLOR	Enables variable adjustment of the 4 color balance controls
20B. PRESET	Sets the camera internal preset color balance levels
20C. AUTO1	Applies auto balance 1
20D. AUTO2	Applies auto balance 2
20E ABB	Performs an auto black balance
20F. AWB	performs an auto white balance

	21. SCENE FILE 1 – 4	Saves and recalls 5 complete OCU settings. **On power-up the last saved scene file is recalled.** To **save** a file - press and hold the button to save for approximately 2.5 seconds until all four scene file buttons are illuminated. On release of the button the single stored scene file button then illuminates. To **recall** a file - press a button momentarily for less than 2 seconds. The selected file button then illuminates. De-selecting a scene file (pressing illuminated button - all files off) recalls the user default file which can be a starting point for setting a new scene file. This file is stored by pressing button **1** followed by button **4** within 2.5 seconds. Factory default settings can be recalled by pressing '**CALL**' followed by '**TEST**' buttons.
	ALTERNATE FUNCTIONS	
	<<	VTR mode fast rewind
	■	VTR mode stop
	||▶	VTR mode pause/play
	>>	VTR mode fast forward
 **Figure 5: Typical SD scene file OSD Menu**	**SD**	When an ***SD*** card is inserted, Scene File 1 button enables access to the ***SD*** OSD menu. Previously stored scene files may be retrieved or the currently applied scene file saved to ***SD***. Before using an SD card for the first time please see the specifications section to ensure compatibility. Additionally, the SD card must first be formatted on a PC to create a FAT16 Master Boot Record. The SD card can then be formatted in the unit by selecting the 'Format Card' option. When selecting a scene file to be saved, the filename will change to indicate the one selected. In the example above Scene File 4 has been selected for saving. The filename can be edited using the 'Change Description' option before saving. When retrieving the scene file using the load option, the scene file is loaded into the scene file 1 position. To transfer these settings to another scene file, exit the SD Menu and save to one of the other available locations, e.g. Scene File 2.
	22. KNEE	Adjust the camera knee characteristic.
	22A. Preset	Sets the camera preset knee value.
	22B. Auto	Selects the camera auto knee function.
	23. BLACK STRETCH	Adjusts the picture in the black region allowing more picture content to be seen.

24. IRIS AUTO	Sets camera auto iris mode. Most cameras automatically adjust iris to the correct level and allow small adjustment of this level via the joystick 'IRIS' or variable controls.
25. MODE	When 'MODE' is off, camera iris and pedestal values are updated immediately when switching between variable IRIS, joystick IRIS and when selecting different scene files. When 'MODE' is on, joystick IRIS and PED adjustments pick up control only when the current camera values have been reached with the controls. This prevents potentially large changes occurring after switching and when not desired (e.g. live on air). The 'IRIS' and 'PED' leds only illuminate when the controls are active. Other MODE settings are also reserved for future functions.
ALTERNATE FUNCTION **Rec**	VTR mode "Record" if media is present in camcorder

4.3. JOYSTICK CONTROLS (26)

26a. IRIS	Control of lens iris using non-contact technology for noiseless, smooth and reliable operation. When the IRIS LED is illuminated, the Joystick IRIS is in control. When IRIS Auto is selected, Joystick IRIS has a reduced control. While IRIS Var is selected, Joystick IRIS is turned off. See 'MODE' for additional information.
26b. PEDESTAL	Controls video black level pedestal. When the MASTER PED LED is illuminated the Joystick PED is in control. See 'MODE' for additional information.
26c. PREVIEW	Pushing the joystick downwards enables the preview volt-free contact closure. This electronic circuit uses a non-contact sensor and a solid state output relay for reliability.

5. ENGINEERING SETUP

Note; a camera/camcorder needs to be connected for full access to Engineering menus.

5.1. ENGINEERING Menu

When the ENGr button is pressed, the OSD displays the unit's Engineering Menu. There are four pages of menus. Use the Rotary Encoder to scroll thru the selections. Push the Rotary Encoder to select one of the menu items, or to change to the next page.

5.1.1. .Engineering Menu – Page 1

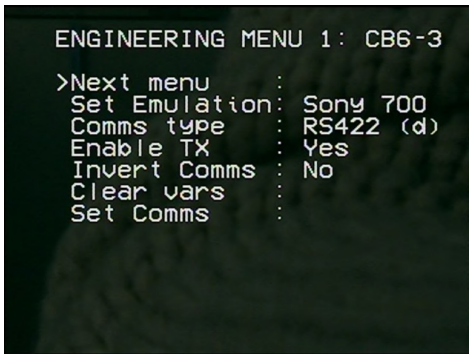


Figure 6: Engineering Menu: Screen Page 1

Control Panel Emulation

Use the Rotary Encoder to select your desired emulation based on

Figure 13: Table of Emulations and Control Features, Page 17. When switching emulations, ensure that rotary encoder is pressed to confirm the selection before exiting the menu.
When switching emulations, it is necessary to calibrate the joystick each time.

Connect the unit to the CopperHead Base Station and turn on the power to the camera head.

If no LCD screen is attached, then connect the Video Output BNC of the unit to an external monitor.

Select MON to turn on the On Screen Display and then ENGR Menu. The first page of the ENGR Menu will be displayed.

Using the rotary control, select 'SET EMULATION' and push down once. The appropriate emulation type can now be selected by scrolling through the available options and pressing down on the rotary control to confirm.

Once the appropriate emulation type is confirmed, scroll down to 'SET COMMS' and select by pressing down on the rotary control. This will automatically set the required I/O parameters.

Exit the ENGR Menu to confirm all of the settings. It may be necessary to switch the camera head OFF/ON for communication to be established.

5.1.2. .Engineering Menu – Page 2

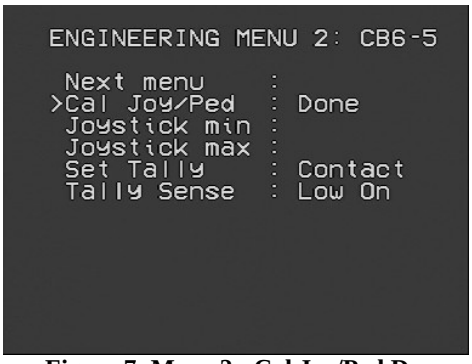


Figure 7: Menu 2 - Cal Joy/Ped Done

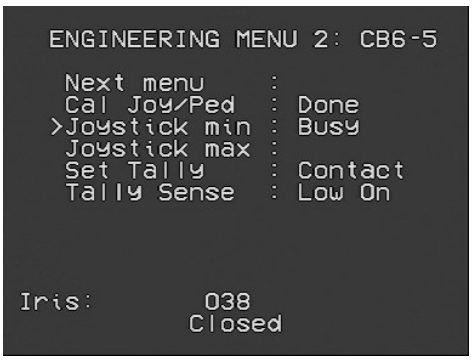


Figure 8: Menu 2 - Joystick Min Busy

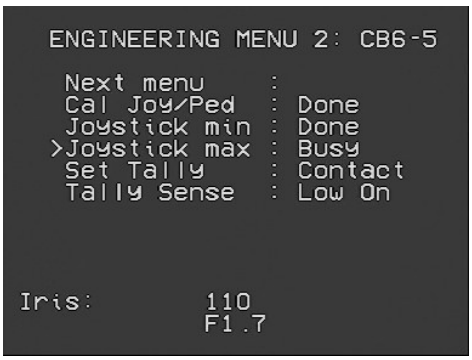


Figure 9: Menu 2 - Joystick Max Busy

The iris range of the joystick can be adjusted to suit individual users or cameras.

Note: a camera/camcorder is required to be connected and operational.

Adjustment Procedure:

1. Turn **AUTO IRIS** off.
2. Pull joystick toward minimum iris position (all the way back towards you) and set MASTER PEDESTAL knob to mid-point.(“12 O’Clock”)
3. Press **ENGR** to enter the **ENGINEERING** screen.
4. Using the rotary control click on **NEXT MENU** until you reach **ENGINEERING MENU 2**.
5. Select **Cal Joy\Ped** with rotary encoder and then push rotary encoder to set. The display will report **Done** (Figure 7)
6. Scroll down to **Joystick min** in menu and press the rotary encoder switch. The OSD will report **Joystick min: Busy** and display the iris value (Figure 8)
7. Use the rotary encoder to set the camera’s iris to the “Closed” position, ideally by viewing the iris ring on the lens of the camera. If this is not possible due to the location of the camera, then set the iris value to the “Closed” position according to the On Screen Display message (see notes below.)
8. Once the iris is set to the “Closed” position, press the rotary encoder to confirm the setting and the display will change from **Busy** to **Done**.
9. Push the joystick all the way forward and select **Joystick Max** and press the rotary encoder switch. The OSD will report **Joystick max: Busy** and display the iris value (Figure 9) .
10. Use the rotary control to set the camera’s iris to the fully open position, ideally by viewing

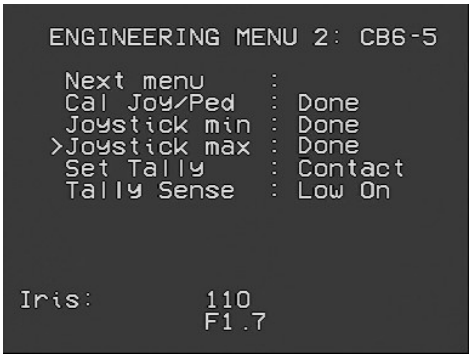


Figure 10: Menu 2 - Joystick Max Done

the iris ring on the lens of the camera. If this is not possible due to the location of the camera, then set the maximum iris value to the **Open** position according to the On Screen Display message (see notes below.)

11. Once the iris is set to the open position, click the rotary control to confirm the setting and the display will change from **Busy** to **Done** (Figure 10).
12. Press ENGR to exit.
13. Check that the iris can be controlled by the joystick across the complete range.

Notes:

Normally the joystick iris control range is set so that it matches the camera iris range, but it is possible to adjust the settings MIN & MAX so that a large movement of the joystick controls a small camera iris movement for fine control. Simply adjust the rotary encoder for lens iris positions that are required relative to the joystick position.

Some Sony camera models allow iris adjustment across a range between approximately 038 minimum and 110

Always adjust the minimum control position first.

5.1.3. .Engineering Menu – Page 3

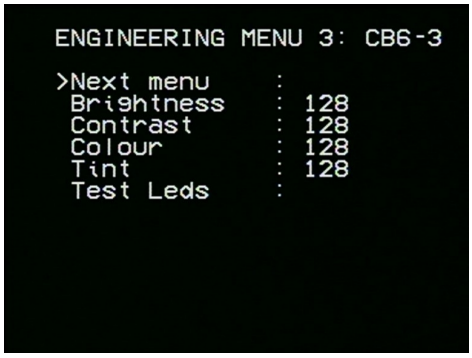


Figure 11: Engineering Menu Screen Page #3

TFT/LCD Screen adjustments

Page 3 of the Engineering menu allows you to control four aspects of the built-in optional LCD/TFT screen. Each has a range of 0 to 255. Default is 128

Brightness: adjust from 0 to 255. Push the Rotary Encoder to select.

Contrast : adjust from 0 to 255. Push the Rotary Encoder to select.

Colour: adjust from 0 to 255. Push the Rotary Encoder to select.

Tint: adjust from 0 to 255. Push the Rotary Encoder to select.

Test LEDs

When selected, the test will start by illuminating tally (red and green), and then illuminate the buttons in groups and end with the blue leds. The OCU will then revert to normal operation.

Note that the SHUTTER ▲▼ and GAIN ▲▼ buttons do not illuminate.

5.1.4. Engineering Menu – Page 4

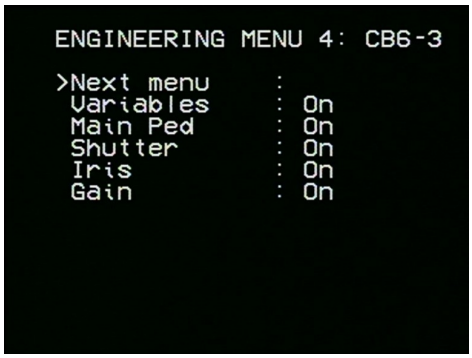


Figure 12: Engineering Menu Screen Page #4

Engineering Page 4

Page 4 of the Engineering menu allows you to enable or disable control of various camera functions, as well as to calibrate the joystick for your particular camera:

Variables: On or Off

Main Ped: On or Off

Shutter: On or Off

Iris: On or Off

Gain: On or Off

5.2. LED Illumination Test

Note that a camera/camcorder does not need to be connected.

Adjustment Procedure:

1. Switch the OCU OFF.
2. Press and hold ENGr button, press the ON/OFF button. Release buttons.

The test will start by illuminating tally and then illuminate the buttons in groups and end with the blue leds. The OCU will then revert to normal operation.

Note that the SHUTTER ▲▼ and GAIN ▲▼ buttons do not illuminate.

5.3. Re-Programming Software/Firmware

The OCU may be field re-programmed with software/firmware updates. Two programming connectors are available underneath the rear connector panel, one for processor software and the other for FPGA firmware. To access these remove the two connector panel adjusting screws (in the slots either side) and raise the panel up. The connectors are marked appropriately.

An optional programming kit is available for this purpose. Software and the re-programming procedure are available from Telecast Fiber Systems Customer Support.

6. EMULATION AND CONTROL FEATURES

Manufacturer:	Panasonic	Sony	Sony	Sony	JVC	Hitachi
Emulation:	RC-10G	RM-M7G	RCP-TX7	700 (RMB)	RM-LP25	RC-Z2
ON/OFF	●	●	●	●	●	●
CALL				●	◄	
VTR - Controls	●			●		
- Stop	●			●		
- Play	●			▼		
- Pause Play	●			▼		
- Fast Forward	●			▼		
- Fast Rewind	●			▼		
- Review Fwd	●			▼		
- Review Rev	●			▼		
- Review Clip				●		
- Record	●			●		
- Record Pause	●			▼		
BARS	●	●	●	●	●	●
ENGr Menu	●	●	●	●	●	●
MENU - Camera	●			●		
SHUTTER - Speeds	●		●	●	●	
- Variable	●		●	●	●	
- Norm	●	┼	●	●	●	
GAIN - Auto						
-Levels	●	┼	●	●	●	●
BALANCE - Color	●	●	●	●	●	●
- Red Gain	●	●	●	●	●	●
- Blue Gain	●	●	●	●	●	●
- Red Ped	●	●	●	●	●	●
- Blue Ped	●	●	●	●	●	●
- Relative to AWB\ABB	●			●		
- Preset	●	●	●	●	●	●
- Auto1	●	●	●	●	●	●
- Auto2	●	●	●	●	●	●
- ABB	●	●	●	●	●	●
- AWB	●	●	●	●	●	●
SCENE FILE 0 - 4	●	+	●	●	●	┼
KNEE - Auto	●	●	●	●	●	●
- Preset	●	●	●	●	●	●
- Variable	●	●	●	●	●	●
BLACK Stretch	●				●	
BLACK Stretch - Variable			●			
IRIS - Auto	●	●	●	●	●	●
- Variable	●	●	●	●	●	●
- Joystick	┼	+	+	+	●	┼
GAMMA - Variable	●	●	●	●	●	●
DETAIL - Variable	●	●	●	●	●	●
PEDESTAL - Joystick	+	┼	┼	┼	●	┼
PREVIEW - Joystick	┼	┼	┼	┼	●	┼
MODE - 1 Iris ctrl latch	●	┼	┼	┼	┼	┼
- 2 M.PED Lock	●		●	●	●	
Rotary Encoder ADJUST	●	●	●	●	●	●
Rotary Encoder Switch	●	●	●	●	●	●
Tally - OCU	●	●	●	●	●	●
- camera					◄	
-DTS2070 Tally Mon. Unit	●			●		
- VIDEO IN\OUT	●	●	●	●	●	●
- DTS2060 TFT Option	●	●	●	●	●	●

Notes:

▼ Camera Model Dependent

┼ Additional feature compared to manufacturers panel

◄ Cam to Studio tally mode

Figure 13: Table of Emulations and Control Features

7. OSD Output

The OSD output provides various on screen camera control information as well as ***SD*** card memory information and control. The characters will be superimposed on a valid video input. If no video input is present, the OSD outputs a black background.

The video output is fed to the rear panel BNC connector and also to the miniature multiway connector for the optional TFT-LCD color display.

Figure 14: Typical on Screen information (simulated)

Figure 15: Typical on Screen information while Red Gain is selected for variable adjustment. (simulated)

8. OPTIONAL LCD/TFT DISPLAY (Model CHRCP-LCD1)

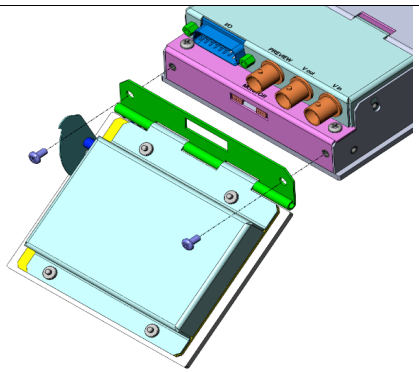
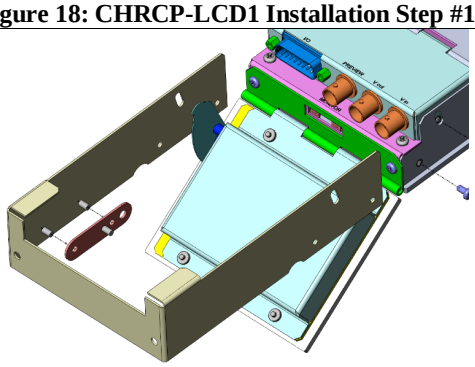
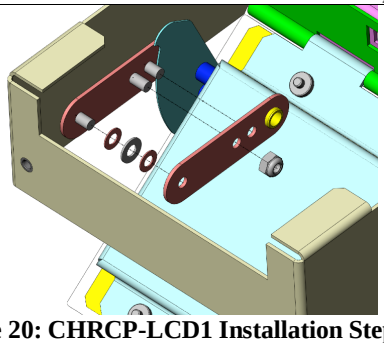
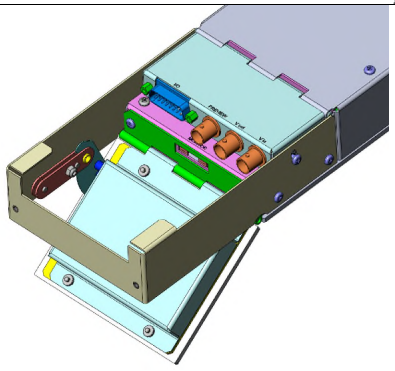
Figure 16: Optional 3.5 Inch LCD Panel

8.1. GENERAL

The optional CHRCP-LCD1 LCD/TFT display mounts to the CHRCP-2050A Control Panel. It displays the input VBS video, as well as superimposed On Screen Display (OSD). The display may be tilted up to 45° for optimum user viewing angle.

Figure 17: CHRCP2050, shown with optional TFT/LCD Display in raised and lowered positions

8.2. INSTALLATION OF CHRCP-LCD1

1) Attach the LCD panel to the rear of the Control Panel using the two supplied screws, as is shown in Figure 18.	 **Figure 18: CHRCP-LCD1 Installation Step #1**
2) Attach the monitor frame to the sides of the Control Panel, using three screws on each side, as is shown in Figure 19.	 **Figure 19: CHRCP-LCD1 Installation Step #2**
3) Attach hinges on each side, as is shown in Figure 20.	 **Figure 20: CHRCP-LCD1 Installation Step #3**
4) Adjust the hinges so that the LCD panel extends to the full 45-degree range, and retracts flat, as is shown in Figure 21.	 **Figure 21: CHRCP-LCD1 Installation Step #4**

9. SPECIFICATIONS

9.1. Power Input

OCU 2050 only

Voltage	8 – 48 VDC
Power (@12V)	1.5W typical
	3.5W maximum

With Display 2060

Voltage	10 > 14 VDC
Power (@12V)	5.5 W combined typical
	7 W combined maximum

9.2. Serial control:

Type	
RS422	Differential I/O (4 wire + gnd) or Single ended i/p
RS232	I/O (2 wire + gnd)
Sony	bi-directional (1 wire + gnd)
Panasonic	bi-directional (1 wire + gnd)

9.3. Tally input (red & green)

Voltage

level off	0V (Gnd)*	CMOS
level on	+5V*	Levels
resistance	10K	
max i/p	+20V	

Contact

level off	open circuit
level on	connect to 0V (Gnd)
resistance	10K to +5V

* Nominal logic sense - levels and sense may vary depending on panel emulation and menu settings.

9.4. REM /EN o/p

level off	+5V	(when ON/OFF LED is off)
level on	0V	(when ON/OFF LED is on or flashing)

9.5. Preview Contacts o/p

Voltage	100V maximum
Current	120mA AC maximum
	250mA DC maximum
On resistance	25ohms maximum
Isolation	5000Vrms maximum

9.6. Video input and output

Composite PAL or NTSC (“VBS”)

9.7. Compatibility

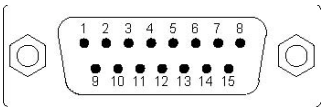
See
Figure 13: Table of Emulations and Control Features, Page 17.

9.8. Size

See Section 11 – Physical Dimension drawing

10. CONNECTORS

10.1. Main I/O



DB 15 Male Plug
(Mating cable connector: DB15 pin female socket)

MAIN I/O	
Pin Number	Function
1	GND
2	RS422 Out+
3	RS422 In-
4	REM /EN
5	+SUPPLY
6	PREVIEW 1
7	PREVIEW 2
8	GND
9	TALLY RED
10	RS422 Out-
11	RS422 In+
12	TALLY GREEN
13	RS232 In
14	RS232 Out
15	Bi-Directional I/O

10.2. Preview

BNC coax Inner Preview1 (volt free contact 1)
Outer Preview2 (volt free contact 2)

10.3. Video In

BNC coax Inner video in 1V p-p 75 ohms
Outer ground

10.4. Video Out

BNC coax Inner video out 1V p-p 75 ohms
Outer ground

11. PHYSICAL DIMENSIONS

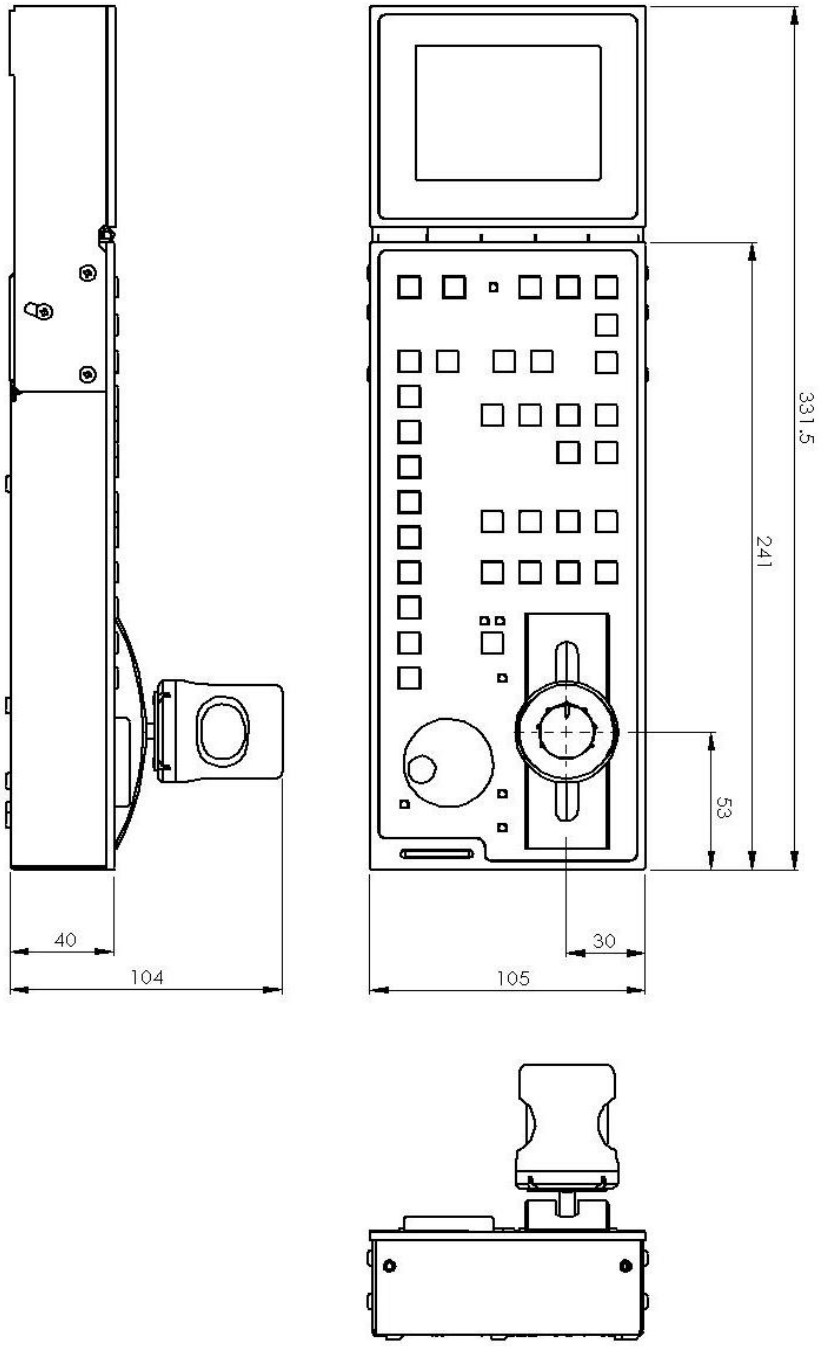
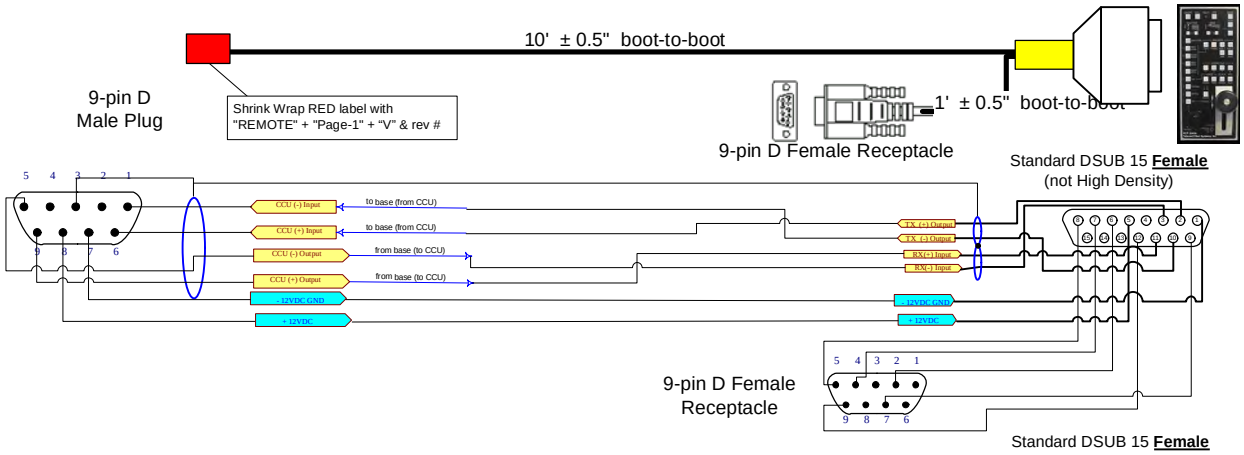


Figure 22: Physical Dimensions

12. APPENDIX

12.1. CopperHead cable for cameras using RS422 Protocol



1	CCU (-) Input	1
2	CCU Format Select	2
3	Ground (CCU shields)	3
4	+12VDC Bias (for CCU Format Select only)	4
5	CCU (-) Output	5
6	CCU (+) Input or Bi-directional CCU I/O	6
7	12VDC CCU Power - Ground	7
8	+12VDC CCU Power	8
9	CCU (+) Output	9

	MAIN I/O
Pin	Function
1	GND
2	RS422 Out+
3	RS422 In (-) / RS232 In
4	REM /EN
5	+SUPPLY
6	PREVIEW 1
7	PREVIEW 2
8	GND
9	TALLY RED
10	RS422 Out (-) / RS232 Out
11	RS422 In+
12	TALLY GREEN
13	Not Used
14	Not Used
15	Bi-Directional I/O

9-pin D Female Receptacle

PREVIEW 1	2
PREVIEW 2	4
GND	5
TALLY RED	7
TALLY GREEN	9

TITLE: Page-1	REVISIONS: NO. 1, DATE 9/20/07, DESCRIPTION Changed DB15 to Female		CopperHead
			All cables5_8b 1CHBR used
DATE ORIGINAL 08/16/07	SCALE N/A		Page 1 of 29
LATEST REV. 9/20/07	Rev # 1	CHECKED	DRAWN Jim Hurwitz

14B

Cable# Page-1
Page 1 of 29

Figure 23: CopperHead Interface cable/RS422

12.2. CopperHead Cable for cameras using RS232 Protocol

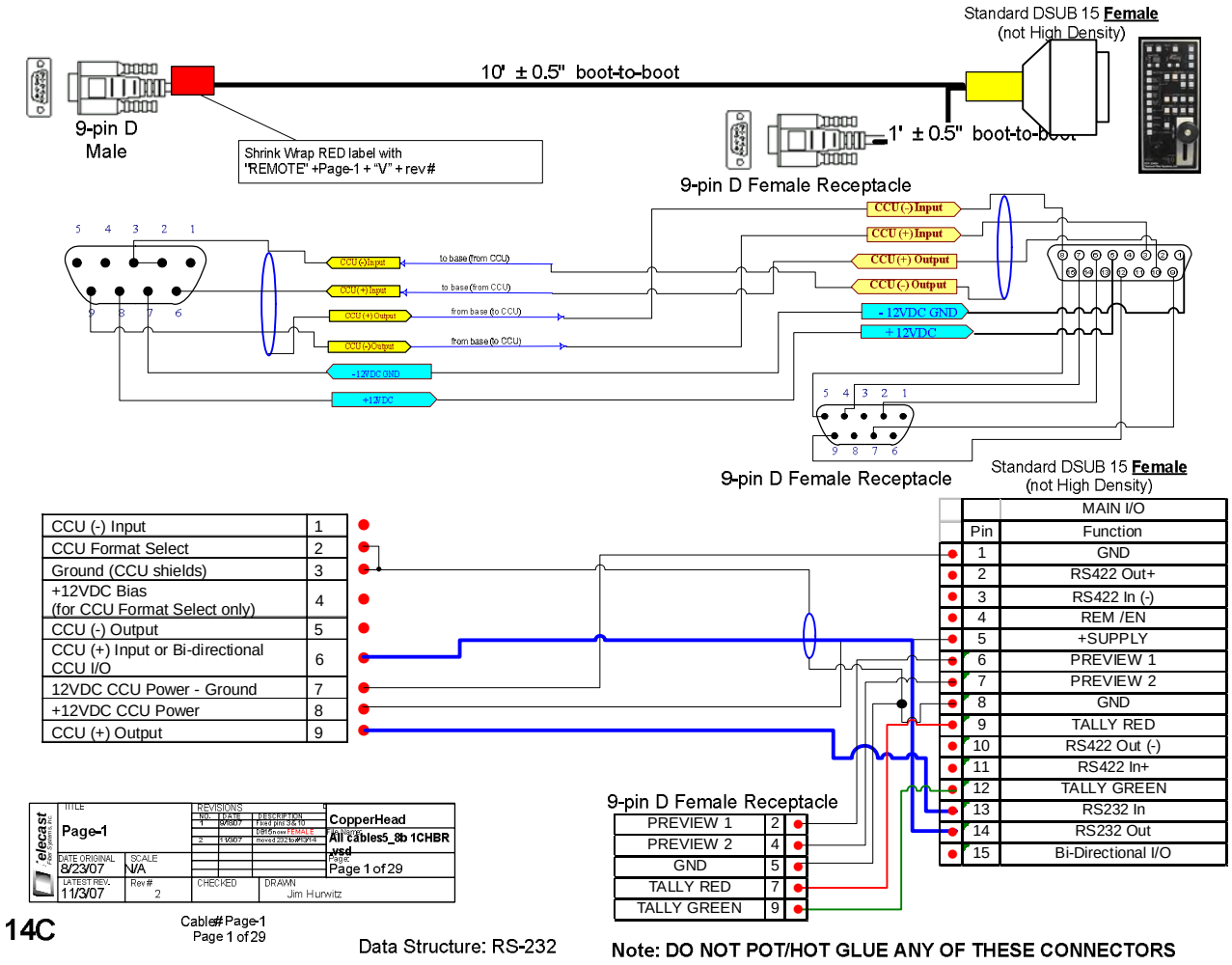


Figure 24: CopperHead Interface cable/RS232

12.3. CopperHead Cable for cameras using Bi-directional TTL Protocol

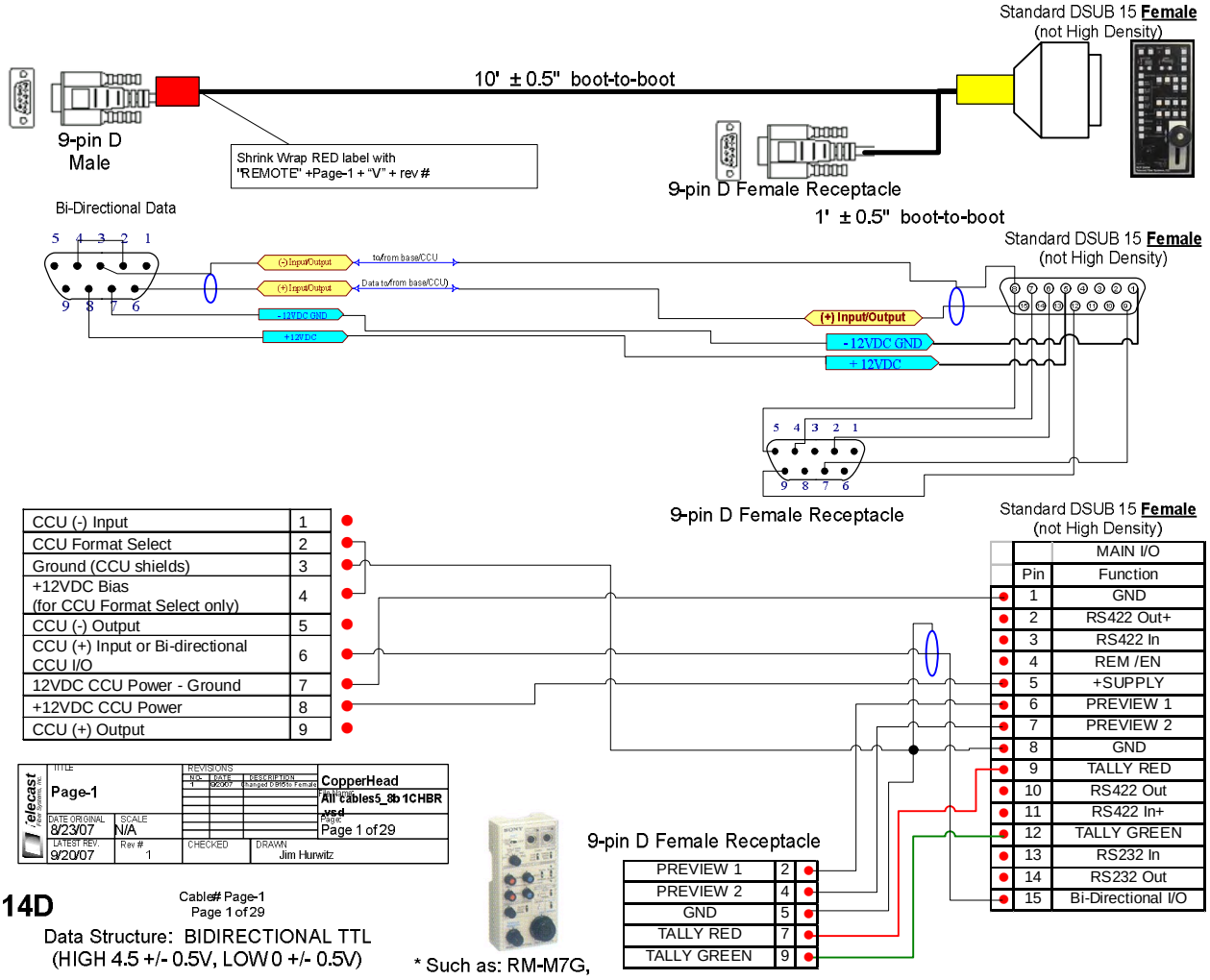


Figure 25: CopperHead Interface Cable/Sony TTL

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