

# Appendix G: Rear-Panel Connectors

This appendix describes the connectors located on the rear panel of the CTS850.

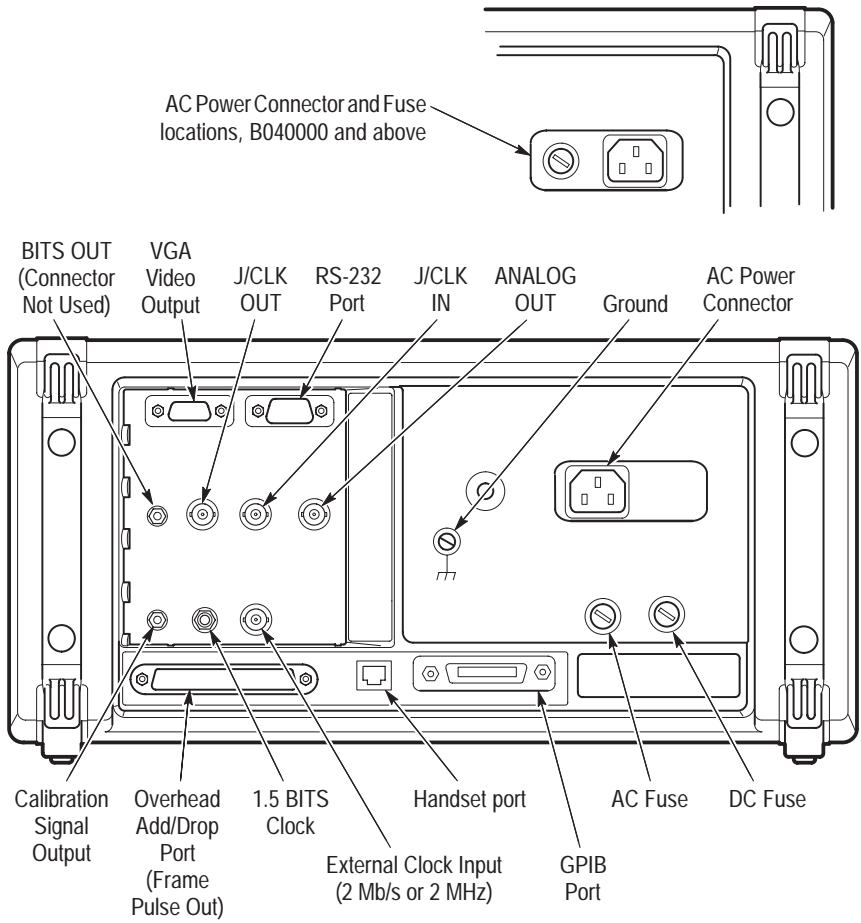


Figure G-1: CTS850 Rear Panel Connectors

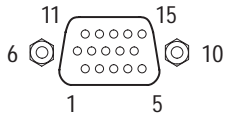
**Table G-1: Voltage Range, Input Frequency, and Fuses**

| Voltage Range | Input Frequency | Fuse (250V)<br>3AG UL198G | Fuse (250V)<br>IEC127, SH1 | Max Input |
|---------------|-----------------|---------------------------|----------------------------|-----------|
| 100-132V      | 50/60 Hz        | 8A Fast                   | 6.3A Fast                  | 6A        |
| 180-250V      |                 |                           |                            |           |

Voltage Range automatically selected.

## VGA Video Output

The CTS850 can drive an external IBM-compatible VGA monitor. There are no parameters to set in order to drive an external monitor. The output is monochrome (green only); the resolution is 640 pixels × 480 pixels. Figure G-2 shows how the pins are numbered on the VGA (female) connector. Table G-2 lists the pin assignment for the rear-panel VGA connector.



**Figure G-2: The VGA Video Output Connector**

**Table G-2: VGA Video Output Connector Pin Assignment**

| Pin Number | Description          |
|------------|----------------------|
| 1          | Ground               |
| 2          | Video Signal (Green) |
| 3          | Ground               |
| 4          | –                    |
| 5          | –                    |
| 6          | Ground               |
| 7          | Ground               |
| 8          | Ground               |



Table G-2: VGA Video Output Connector Pin Assignment (Cont.)

| Pin Number | Description     |
|------------|-----------------|
| 9          | –               |
| 10         | Ground          |
| 11         | Ground          |
| 12         | –               |
| 13         | Horizontal Sync |
| 14         | Vertical Sync   |
| 15         | –               |

## GPIB Port

The GPIB (General Purpose Interface Bus) port is used for remote control of the CTS850. For detailed information on remote control of the CTS850, see the CTS850 SDH Test Set *Programmer Manual* (Tektronix part number 070-8925-XX)

## RS-232 Port

The rear panel RS-232 (male) connector is used to connect to printers and instrument controllers. Set the RS-232 parameters for printers on the PRINTER SETUP page of the UTILITY menu. Set the RS-232 parameters for instrument controllers on the REMOTE CONTROL page of the UTILITY menu. You can find more detailed information on remote control of the CTS850 in the CTS850 SDH Test Set *Programmer Manual*. Figure G-3 shows how the pins are numbered on the RS-232 port. Table G-3 lists the pin assignment for the RS-232 port on the CTS850 rear panel.



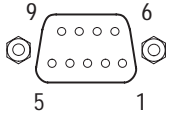


Figure G-3: The RS-232 Port

Table G-3: RS-232 Rear Panel Connector Pin Assignment

| Pin Number | Name | Description         |
|------------|------|---------------------|
| 1          | DCD  | Data Carrier Detect |
| 2          | RxD  | Receive Data        |
| 3          | TxD  | Transmit Data       |
| 4          | DTR  | Data Terminal Ready |
| 5          | GND  | Signal Ground       |
| 6          | DSR  | Data Set Ready      |
| 7          | RTS  | Request To Send     |
| 8          | CTS  | Clear To Send       |
| 9          | RI   | Ring Indicator      |

## Calibration Signal Output

You use the calibration signal output for servicing the CTS850. Information on servicing the CTS850 is located in the *CTS850 SDH/PDH Test Set Service Manual*, Tektronix part number 070-9991-XX.

## Overhead Add/Drop Port

You use the Overhead Add/Drop (female) connector to add/drop the section and line data communication channels (DCC), and the section and line user channels. The DCC and user channel add/drop



functions are independent; for example, you can add a DCC while dropping a user channel. Only one DCC or user channel can be added or dropped at a time. The parameters for adding a DCC or a user channel are located on the SECTION OVERHEAD and PATH OVERHEAD pages of the TRANSMIT menu. The parameters for dropping a DCC or a user channel are located on the SECTION OVERHEAD and PATH OVERHEAD pages of the RECEIVE menu.

TX and RX Frame Pulse outputs are made available on the Add/Drop Connector. The TX Frame Pulse Connection is RS449, Add/Drop connector pin 15. The RX Frame Pulse Connection is RS449, Add/Drop connector pin 36.

The Overhead Add/Drop port uses a gapped clock. Figure G-4 shows how the pins are numbered on the Overhead Add/Drop port. Tables G-4 and G-5 summarize the different communication channels.

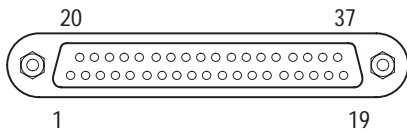


Figure G-4: The Overhead Add/Drop Port

Table G-4: Overhead Channels Added

| Added Channel | Bytes Added                           | Data Rate | Clock Rate            |
|---------------|---------------------------------------|-----------|-----------------------|
| DCC           | D1, D2, D3                            | 192 kbps  | 216 kHz               |
| DCC           | D4, D5, D6, D7, D8, D9, D10, D11, D12 | 576 kbps  | 2.16 MHz <sup>1</sup> |
| User Channel  | F1                                    | 64 kbps   | 72 kHz                |
| User Channel  | F2                                    | 64 kbps   | 72 kHz                |

<sup>1</sup> The DCC signal has a 1/3–2/3 duty ratio.



**Table G-5: Overhead Channels Dropped**

| Dropped Channel      | Bytes Dropped                            | Data Rate | Clock Rate |
|----------------------|--|-----------|------------|
| Section DCC          | D1, D2, D3                               | 192 kbps  | 216 kHz    |
| Line DCC             | D4, D5, D6, D7, D8,<br>D9, D10, D11, D12 | 576 kbps  | 2.16 MHz   |
| Section User Channel | F1                                       | 64 kbps   | 72 kHz     |
| Path User Channel    | F2                                       | 64 kbps   | 72 kHz     |

Table G-6 summarizes the data signal pin assignments on the Overhead Add/Drop port. Table G-7 summarizes the additional pin assignments on the Overhead Add/Drop port. The signal lines listed in Table G-6 can drive 100  $\Omega$ , differential TTL lines. The signal lines are terminated with a 100  $\Omega$  impedance and can drive 100  $\Omega$  lines.

**Table G-6: Overhead Add/Drop Port Data Signal Pin Assignments**

| Signal  | +Pin | -Pin |
|---|------|------|
| Added Tx Data (input)                           | 4    | 22   |
| Added Tx Clock (output) –<br>Error Pulse Output | 5    | 23   |
| Tx Common (ground)                              | 37   | –    |
| Dropped Rx Data (output)                        | 6    | 24   |
| Dropped Rx Clock (output)                       | 8    | 26   |
| Rx Common (ground)                              | 20   | –    |



**Table G-7: Overhead Add/Drop Port Additional Pin Assignments**

| Signal                               | Pin |
|--------------------------------------|-----|
| Shield (ground)                      | 1   |
| Signal Ground (ground)               | 19  |
| Reserved                             | 33  |
| Tx Frame Pulse (output) <sup>1</sup> | 15  |
| Rx Frame Pulse (output) <sup>1</sup> | 36  |

<sup>1</sup> The Frame Pulse signals are nominal 8 kHz, TTL, single-ended signals.

## External Clock Input (2 Mb/s or 2 MHz)

To synchronize the CTS850 transmit clock with a 2 Mb/s or 2 MHz reference, connect a 2 Mb/s or 2 MHz reference to the External Clock Input connector.

The 1.5 BITS clock can also be used to time the transmitter. The 1.5 BITS clock has its own input connector on the rear panel.

| Press Menu Button | Select Menu Page  | Highlight Parameter | Select Choice   |
|-------------------|-------------------|---------------------|-----------------|
| TRANSMIT          | TRANSMIT SETTINGS | Transmit Clock      | External 2 Mb/s |

## Handset Interface

The following handset interface specifications are compatible with an Audiosears handset, 2600–A–00–JAFC–AAJ–05. This Audiosears handset uses a 2212 speaker (receiver) and a 2251 Amplified Electret microphone (transmitter). Other handsets with similar specifications will also work. Handsets with non–amplified Electret (Standard) microphones may also be used.

**Table G–8: Handset Interface Specifications**

|                                      |   |
|--------------------------------------|---|
| Handset microphone voltage           | 3.0 V $\pm$ 10% (standard mic selected)<br>1.25 V $\pm$ 10% (Electret mic selected) |
| Handset microphone impedance         | 130 Ohms (standard mic selected)<br>1k Ohm (Electret mic selected)                  |
| Handset microphone operating current | 15 mA (standard mic selected)<br>350 uA (Electret mic selected)                     |
| Handset Speaker Impedance            | 150 Ohms  |
| Handset Speaker Volume               | Speaker volume will depend upon the speaker sensitivity                             |
| Handset Audio Mixing                 | Sidetone Gain: – 20 dB  |
| Handset CODEC Coding                 | A–Law for CTS850  |
| Handset Interface Noise              | < 3 mV RMS at handset speaker output  |





## Jitter Inputs and Outputs

If the CTS850 SDH Test Set has the Jitter Test Option (Option 14) installed, four additional connectors are located on the rear panel in the JITTER/WANDER group. The connections in order from left to right in the listing below. If measuring Jitter and/or Wander at line rates, use the regular connections on the front panel of the CTS850 Test Set.

### **BITS OUT (Connector – Not Used)**

The BITS OUT connector is not used by the CTS850 SDH Test Set.

### **J/CLK OUT**

J/CLK OUT (jittered clock output) provides a clock line rate signal modulated by generated jitter. You can choose any SDH or PDH rate. In addition, the J/CLK OUT connector can provide a 2.048 MHz G.703 synchronization signal. Refer to *Setting Jitter or Wander Generation* in Chapter 3 – **Reference** for information about controlling the signal type, rate, jitter, and frequency offset.

The J/CLK OUT connector is a 75  $\Omega$  BNC. The output is ECL compatible when terminated by 75  $\Omega$ .

### **J/CLK IN**

J/CLK IN (jitter clock input) is an input you can use to measure the jitter on a MHz clock signal. The signal must be NRZ coded and at an SDH or PDH rate. Refer to *Setting Jitter Receive Parameters* in Chapter 3 – **Reference** for information about setting the jitter measurement source and rate.

The J/CLK IN connector is a 75  $\Omega$  BNC. The input is AC coupled. Typical sensitivity is 0.4 V<sub>p-p</sub>.



## ANALOG OUT

The ANALOG OUT connector provides the demodulated jitter from the receiver as an analog waveform. You can use an oscilloscope or spectrum analyzer to analyze this waveform, as long as you realize the limitations of an oscilloscope or spectrum analyzer at looking at this type of telecommunications information.

The ANALOG OUT signal is not calibrated; the amplitude has low accuracy, but the spectral content is valid. The spectral content is dependent on the measurement filter you select. Refer to *Setting Jitter Receive Parameters* in Chapter 3 – **Reference** for information about controlling the measurement range and filter.

The ANALOG OUT connector is a 75  $\Omega$  BNC. The signal level is typically  $\pm 1V$  or less and is centered at 0 V. Typical sensitivity is 125 mV/UI in normal mode and 3.5 mV/UI in extended mode.

