

# Appendix A: Menu Maps

CTS 850 SDH/PDH Test Set

## What is a Menu?

A menu groups related functions together. For example, all settings that affect the signal transmitted by the CTS 850 are located in the TRANSMIT menu. Each menu is made up of pages. A page is identified by a page tab located at the bottom of the display (see Figure A 1).

If the choice is not available, it is not displayed or it is not highlighted.

The CTS 850 always displays a menu. The name of the current menu is shown near the top of the display. To change to another menu, press a menu button on the front panel.

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***NOTE.** The only time pressing a menu button does not change menus is when a dialog box is displayed or when you are entering a value for a parameter. You must first exit the dialog box or finish entering the value before you can change menus.*

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<b>TEST SETUPS</b>						
Test Control	Recall Instrument Settings	Recall Pass/Fail Tests	Save Instrument Setups	Save Pass/Fail Tests	Jitter Tests	
<b>TRANSMIT</b>						
Transmit Settings	64k Tx Settings	Defects & Anomalies	Pointers & Timing	Jitter & Wander	APS Commands	More 1 of 2
Transmit Settings	Section Overhead	Path Overhead	Trace Settings	Signal Labels	Overhead PRBS Test	More 2 of 2
<b>RECEIVE</b>						
Receive Settings	64k Rx Settings	Signal Status	Analysis Config	Jitter & Wander		More 1 of 2
Receive Settings	64k Rx Settings	Section Overhead	Path Overhead	RX CAS & Voice		More 2 of 2
<b>RESULTS</b>						
Test Summary	SDH Results	PDH Results	Jitter & Wander	Error Analysis	Perf Analysis	More 1 of 2
Test Summary	SDH Results	PDH Results	History Graphs	Save Results	Recall Results	More 2 of 2
<b>UTILITY</b>						
Misc. Settings	Printer Setup	Remote Control	Instr Config	Self Test	Jitter Cal	

Figure A 1: CTS 850 Menus and Pages

## TRANSMIT

### Transmit Settings

Function	Choices
Transmit Rate	STM 0, STM 0E, STM 1, STM 1E, STM 4, 2 Mb/s, 8 Mb/s, 34 Mb/s, 45 Mb/s (option), 140 Mb/s
Transmit Line Code (PDH)	8, 34 Mb/s: HDB3, AMI 2 Mb/s: HDB3 Balanced, Unbalanced; AMI Balanced, Unbalanced 140 Mb/s: CMI only
Transmit Clock	Internal, Recovered, External 2 Mb/s 2 MHz, External 1.5 Mb/s BITS
Line Clock Offset	Max: +100 ppm; Stress: +20 ppm; Stress: -20 ppm; Default 0 ppm; User defined
Transmit Level	0 dB, -6 dB
AU Under Test	1, 2, 3, 4
SDH Structure	STM 4: VC4 4cBulk, AU 4Bulk, AU 4 140 Mb/s, TU 3 Async 34 Mb/s, TU 12 Async 2 Mb/s
	STM 1: AU 4Bulk, AU 4 140 Mb/s, TU 3 Async 34 Mb/s, TU 12 Async 2 Mb/s
	STM 0: AU 3Bulk
TU Under Test	TU 12: TUG3: TUG3:1, TUG3:2, TUG3:3 TUG2: 1,2,3,4,5,6,7 TU 12: 1,2,3
	TU 3: TU 3:1,2,3 TU3:1, TUG3:2, TU3:3
TU Background Fill	TU 12: PRBS 2 <sup>15</sup> -1 or IDLE TU 3: IDLE
SDH Output	STM 4 (Optical only), STM 1 (Optical or Electrical), STM 0 (Optical or Electrical), Disabled.

Function	Choices
Payload Structure	Payload sets the signal generation base rate. Because of the number of selection available, the rate and framing parameters are split. See the specific section in the SDH Transmit Parameters for all choices available.
Test Pattern	PRBS 2 <sup>9</sup> 1, PRBS 2 <sup>11</sup> 1, PRBS 2 <sup>15</sup> 1, PRBS 2 <sup>20</sup> 1, PRBS 2 <sup>23</sup> 1, All Ones, All Zeros, TS Idle, 01010101, 1 in 8, 8 bitfixed, 16 bitfixed, 24 bitfixed, 1020 Hz 0 dBm, User defined. See the specific section in the SDH Transmit Parameters for all choices available.
Background Pattern	PRBS 2 <sup>15</sup> 1, PRBS 2 <sup>20</sup> 1, PRBS 2 <sup>23</sup> 1, All Ones, All Zeros, 10101010. See the specific section in the SDH Transmit Parameters for all choices available.
Active Channel	If payload selection forces demultiplexing, active channel selections will be displayed.
Tx/Rx Setup	Independent, Coupled, Thorough Mode

The following menus are available from **MORE 1 of 2**.

#### 64k TX Settings

Function	Choices
2 Mb/s Framing	PCM30 CAS/CRC, PCM31 CRC, PCM30 CAS, PCM31
Configuration	1x64k, Nx64k Contiguous
Number of Timeslots	If configuration is Nx64k, this selects the number of contiguous channels (N) that make up the signal. This choice will not display for 1 x 64k configuration.
Starting Timeslot	This selects the starting (or only) timeslot.
Test Pattern	This selection is a duplicate of the Test Pattern selection choice from the TRANSMIT SETTING menu.

## Defects &amp; Anomalies TX

Function	Choices
Error Type set to	None, RS B1 BIP, MS B2 BIP, Path B3 BIP, HP REI, TU BIP, TU Path BIP, LP REI, Pattern Bit, PDH FAS Error, PDH FAS Burst, Code, PDH CRC
Error Rate set to	None, 1e 3, 1e 4, 1e 5, 1e 6, 1e 7, 1e 8, User defined
Transmit Alarm to	None, MS AIS, MS RDI, AU AIS, HP RDI, TU AIS, LP RDI, PDH RAI, PDH AIS
Transmit Failure to	None, LOS, LOP, AU LOP, TU LOP TU LOM

## Pointers &amp; Timing TX

Function	Choices
Pointer/Timing Mode	Pointer Movements, Frequency Offset, Pointer Sequences (see section on Setting Pointers and Changing Timing for long list of Pointer Sequences) Pointer Sequences (Tributary Offset) (TX rate must be SDH; SDH structure must be TU 3 or TU 12 in order to access the Trib Offset choices.)
Pointer Type	AU Pointer, TU Pointer
Pointer Control	Single, Burst, Set Value, Continuous
Sequence Type (G.783)	See section on Setting Pointers and Changing Timing for long list of Sequence Types
Pointer Value set to	Min 0, Max 782, Default 522, Illegal (Max + 1), User defined
Set with New Data Flag	Yes, No
Pointer S Bits	00, 01, 10, 11

**Jitter & Wander TX**

Function	Choices
Jitter/Wander Generation	Off, On
Jitter Output	Line, Clock 0.8 V, 2 MHz G.703
Jitter Frequency	10.0 Hz, 500 Hz, 6.50 kHz, 65.0 kHz, 1.30 MHz, User defined
Jitter Amplitude	1.00UI, 300.00UI (Max), 150.00UI (Max/2), 0.0UI, User defined

**APS Commands TX**

Function	Choices
APS Mode	Span, Ring
K1 Full Byte	Set to 00000000, Set to 11111111, Default 10101010, Edit Byte
	Set bit pattern for Bits 1 - 4 of K1: Switch Request Set bit pattern for Bits 5 - 8 of K1: Channel Requesting
K2 Full Byte	Set to 00000000, Set to 11111111, Default 10101010, Edit Byte
	Set bit pattern for Bits 1 - 4 of K2: Bridged Channel Set bit pattern for Bit 5 of K2: Architecture Set bit pattern for Bits 6 - 8 of K2: Status
Transmit Setup	Transmit User Setup, Transmit Default, Transmit Illegal

The following menus are available from **MORE 2 of 2**.

#### Section Overhead TX

Function	Choices
Showing Overhead for	Depends on transmit Rate
External Add	None, D1 D3,D4 D12, F1, E1, E2, E1 from Handset, E2 from Handset
J0 RS Trace	TEK CTS850, Disable Trace, Enable Trace, Null Trace, Default Trace, Edit Trace
S1 Sync Status Message	Quality Unknown, G.811, G.812 Transit, G.812 Local, G.813 SETS, Do not use

#### Path Overhead TX

Function	Choices
Overhead View	VC4 Overhead, VC3 Overhead, VC12 Overhead
External Add	None, F1 (or F2)
J1 Path Trace Byte	Reset Overhead, 64 byteFormat, 16 byteFormat, Edit Trace, Default Trace
C2 Signal Label	Unequipped, Equipped (Non specific), TUG, TU n Locked, 34 Mb/s Asynch, 140 Mb/s Asynch, ATM, MAN (DQDB), FDDI, 0.181 Test Signal, VC AIS

## Trace Settings TX

Function	Choices
Trace Select	RS Trace (J0) HP Trace (J1) LP Trace (J2)
Expected	Clear Trace; Copy Transmit; Copy Receive; Edit Trace

## Signal Labels TX

Function	Choices
C2 HP Signal Label	Expected, RX, TX See the Signal Labels TX section in the SDH Transmit Parameters for a listing of dependent menu choices to enable this information.
C2 LP Signal Label	Expected, RX, TX See the Signal Labels TX section in the SDH Transmit Parameters for a listing of dependent menu choices to enable this information.
V5 LP Signal Label	Expected, RX, TX See the Signal Labels TX section in the SDH Transmit Parameters for a listing of dependent menu choices to enable this information.

## Overhead PRBS Test TX

Function	Choices
Tx Overhead PRBS Test	Byte selections: None, D1 D3,D4 D12,E1, E2, F1, F2 Patterns: PRBS15, PRBS20, PRBS23 Inversion: Standard, Inverted
Rx Overhead Test	Byte selections: None, D1 D3,D4 D12,E1, E2, F1, F2 Patterns: PRBS15, PRBS20, PRBS23 Inversion: Standard, Inverted



## RECEIVE

## Receive Settings

Function	Choices
Receive Rate	STM 0, STM 0E, STM 1, STM 1E, STM 4, 2 Mb/s, 8 Mb/s, 34 Mb/s, 140 Mb/s
Receive Level	Normal, Monitor 20dB, Monitor 30dB
AU Under Test	1, 2, 3, 4
SDH Structure	STM 4: VC4 4cBulk, AU 4Bulk, AU 4, TU 3Async, TU 12Async
	STM 1: AU 4Bulk, AU 4 140 Mb/s, TU 3Aync, TU 12 Async
	STM 0: AU 3Bulk
TU Under Test	TU 12: TUG3: TUG3:1, TUG3:2, TUG3:3 TUG2: 1,2,3,4,5,6,7 TU 12: 1,2,3
	TU 3: TU 3:1,2,3 TU3:1, TUG3:2, TU3:3
TU Background Fill	TU 12: PRBS 2 <sup>15</sup> 1 or IDLE TU 3: IDLE
Payload Structure	Payload sets the final analysis rate. Because of the number of selection available, the rate and framing parameters are split. See the specific section in the SDH Transmit Parameters for all choices available.
Test Pattern	PRBS 2 <sup>9</sup> 1, PRBS 2 <sup>11</sup> 1, PRBS 2 <sup>15</sup> 1, PRBS 2 <sup>20</sup> 1, PRBS 2 <sup>23</sup> 1, All Ones, All Zeros, TS Idle, 01010101, 1 in 8, 8 bitfixed, 16 bitfixed, 24 bitfixed, Live. See the specific section in the SDH Transmit Parameters for all choices available.
Active Channel	If payload selection forces demultiplexing, active channel selections will be displayed.
Payload Drop	Off, On Balanced, Off Balanced
Tx/Rx Setup	Independent, Coupled, Thorough Mode

### 64k RX Settings

Function	Choices
2 Mb/s Framing	PCM30 CAS/CRC, PCM31 CRC, PCM30 CAS, PCM31
Configuration	1x64k, Nx64k Contiguous
Number of Timeslots	If configuration is Nx64k, this selects the number of contiguous channels (N) that make up the signal. This choice will not display for 1 x 64k configuration.
Starting Timeslot	This selects the starting (or only) timeslot.
Test Pattern	This selection is a duplicate of the Test Pattern selection choice from the RECEIVE SETTING menu.

### Signal Status RX

Function	Choices
PDH Payload Frequency	Displays direct measurement
Round Trip Delay Offset	Displays measurement of how long PRBS signal takes to travel through a DUT.
Received Optical Power	Displays received optical power or received peak voltage (electrical signal)

**Analysis Config RX**

<b>Function</b>	<b>Choices</b>
FAS Error Threshold	valid range: 1 - 7
Pointer ss Bit Mismatch Action	Loss of Pointer or Ignore
Trace Mismatch Detection	Comparison of Received J0 Trace value vs. expected value. Measurement in error seconds. HP Unequipped Detection Choices: Disabled, Enabled LP Unequipped Detection Choices: Disabled, Enabled HP Signal Label Mismatch Detection Choices: Disabled, Enabled
2 Mb/s CRC SES Threshold	2 Mb/s rate: 300 (for G.826) or 805 (for G.821) 45 Mb/s rate (option): 2444 (for G.826) or 45 (form G.821)
Rx Error Trigger Output	None, B1, B2, B3, Pattern

**Jitter & Wander RX**

<b>Function</b>	<b>Choices</b>
Jitter Mode	Peak Peak, RMS
Jitter Input Source	Line, Clock
Jitter Range	Normal (6.0UI), Extended
Jitter Measurement Filter	Wideband, Highband, Fullband (Range changes per signal rate)
Jitter Hit Threshold	0.10 UI, 0.50 UI, 1.00 UI, 1.50 UI, User defined
Pointer Hit Threshold	Min 0 ppm/sec, Max 10 ppm/sec, 0.023 ppm/sec

**Section Overhead RX**

<b>Function</b>	<b>Choices</b>
Showing Overhead for	Depends on transmit Rate
External Drop	None, D1 D3,D4 D12, F1, E1, E2, E1 from Handset, E2 from Handset
Pause Control	Pause, Continue, Update Active
J0 RS Trace	Constant 0x01, Enable Trace, Disable Trace
S1 Sync Status Message	Quality Unknown, G.811, G.812 Transit, G.812 Local, G.813 SETS, Do not use

**Path Overhead RX**

<b>Function</b>	<b>Choices</b>
Overhead View	VC4 Overhead, VC3 Overhead, VC12 Overhead
External Drop	None, D1 D3,D4 D12, E1, E2, E1 from Handset, E2 from Handset, F1
Pause Control	Pause, Continue, Update Active
C2 Signal Label	Unequipped, Equipped (Non specific), TUG, TU n Locked, 34 Mb/s Asynch, 140 Mb/s Asynch, ATM, MAN (DQDB), FDDI, 0.181 Test Signal, VC AIS
J1 HP Trace Format	64 Bytes, 16 Bytes

**RX CAS & Voice**

<b>Function</b>	<b>Choices</b>
CAS Display Mode	Single, Scan
Selected Timeslot	In Single display mode, this permits selection of the timeslot of interest. This selection is not displayed in scan mode.
Speaker	Off, Low, Medium, Loud
CAS Bit Values	Displays Time Slot and bit values

## TEST SETUPS

### Test Control

Function	Choices
Test Duration	5 min, 15 min, 1 hour, Continuous, User defined
History Resolution	High (1 sec), Normal (1 min), Low (15 min)

### Recall Instrument Setups

Function	Choices
Memory	0.Default, 1-5 Recall Setups
Disk	Choices depend on disk content Recall Setup, Delete File

### Recall Pass/Fail Tests

Function	Choices
Disk	Choices depend on disk content Recall & Run Test, Delete File

### Save Instrument Setups

Function	Choices
Name	SETUP_XX, Clear, EDIT NAME
Description	None, Clear, EDIT TEXT
Save to Memory	Memory 1-5
Save to Disk	Save File

**Save Pass/Fail Tests Test Setups**

<b>Function</b>	<b>Choices</b>
Name	TEST_XX, Clear, EDIT NAME
Description	None, Clear, EDIT TEXT
Operator Start Prompt	Default, Clear, Preview, EDIT TEXT
Test Duration	5 min, 15 min, 1 hour, Continuous, User Defined
Fail If	<i>Up to four fail if conditions can be specified</i>
Operator End Prompt	Default, Clear, Preview, EDIT TEXT
On Test Completion	Do Nothing, Print Summary, Save to Disk
Save to Disk	Save File

**Jitter Tests Test Setups**

<b>Function</b>	<b>Choices</b>
Test Type	Output Jitter, Jitter Tolerance, Jitter Transfer, Pointer Jitter
Test Control	Edit Setup, View Graph, Save Results, Recall Results
Test Duration	(per filter) 15 sec, 30 sec, 1 min, 15 min, User defined
Mask Type	Dependent on Rate
Start Frequency	Set start frequency for jitter generator
End Frequency	Set end frequency for jitter generator
Number Freq Samples	Dependent on Test chosen
Tolerance Criteria	Onset of Errors, BER Penalty
Record Error Threshold	Select Action, Measure BER, Record BER

## RESULTS

### Test Summary Results

Function	Choices
Results Source	<i>Displayed information is taken form last test run</i>
Results	
Results Structure	
Results Payload	
Test Started	
Elapsed Time	
Trouble Scan	

### SDH Results

Function	Choices
SDH Network Defects	Loss of Signal, Loss of Frame, Loss of Synchronization Seconds (LSS), CTS Loss of Power
SDH Section Defects	Out of Frame (SEFS), MS AIS, MS RDI, RS TIM
SDH Path Defects	AU AIS, AU LOP, AU LOM, TU AIS, TU LOP, TU LOM, HP RDI, HP RFI, LP RDI, LP RFI, HP TIM, HP PLM, HP UNEQ, LP TIM, LP PLM, LP UNEQ
SDH Anomalies	STM FAS, RS B1 BIP, MS B2 BIP, Path B3 BIP, TU Path BIP, Pattern Bit, MS REI, HP REI, LP REI
Pointers	Loss of Pointer Seconds, New Data Flag Seconds, Illegal Pointer Seconds, Positive Justifications, Negative Justifications, Illegal Pointer Count, New Data Flag Count, Pointer Value



**PDH Results**

<b>Function</b>	<b>Choices</b>
PDH Network Defects	Loss of Signal, Loss of Frame, Loss of Synchronization Seconds (LSS), CTS Loss of Power
PDH Defects	Loss of CRC, Loss of Multiframe, FEMFAS, 2 Mb/s LOF, AIS, RDI, 64k TS 16 AIS
PDH Anomalies	Frame Bits (140 Mb/s, 34, 8, 2) Error Counts, Error Ratios, Errored Seconds; Code Violation, Pattern Bit; CRC4; E Bit
PDH Slips	Slip Seconds (Leading, Lagging), 64k Commanded Slips

The following menus are available from **MORE 2 of 2**.

**Jitter & Wander Results**

<b>Function</b>	<b>Choices</b>
Jitter	Peak Peak Jitter, Positive Peak Jitter, Negative Peak Jitter, Jitter Hit Seconds, Jitter Unlocked Seconds
Timing Quality	Current Frequency Drift Rate, Maximum Frequency Drift Rate
Wander	Peak Peak Wander, TIE, Estimated Bit Slips (2 Mb/s rate only), Estimated Frame Slips (2 Mb/s rate only)
Line Frequency	Current Frequency, Maximum Frequency, Minimum Frequency

### Error Analysis Results

Function	Choices
SDH G.826	<b>Near End or Far End</b> Error Blocks, Errored Seconds, Background Block Errors, Severely Errored Seconds, Consecutive SES Periods, Unavailable Seconds
PDH G.826	<b>Near End or Far End</b> Error Blocks, Errored Seconds, Background Block Errors, Severely Errored Seconds, Consecutive SES Periods, Unavailable Seconds
SDH M.2101.1	<b>Near End or Far End</b> Error Blocks, Errored Seconds, Background Block Errors, Severely Errored Seconds, Consecutive SES Periods, Unavailable Seconds
PDH M.2100	<b>In Service or Out of Service</b> Error Blocks, Errored Seconds, Background Block Errors, Severely Errored Seconds, Consecutive SES Periods, Unavailable Seconds
Pattern Bit G.821	Error Counts, Errored Seconds, Degraded Minutes, Severely Errored Seconds, Unavailable Seconds, Error Free Seconds

### Performance Analysis Results

Function	Choices
G.826	Analysis Type, SDH Allocation, PDH Allocation, Include UAS
M.2101.1	Test Type: Bring into Service (BIS); Performance After Repair; Maintenance; Custom
	Allocation
	Include UAS
	APO (Allocation Performance Objective) Multiplier Section ES; Path ES

The following menus are available from **MORE 2 of 2**.

#### History Graphs Results

Function	Choices
Bar graphs	<i>See section on Viewing Results for specific measurements displayed</i>
Line graphs	
On/Off graphs	

#### Save Results

Function	Choices
Name	RESLT_XX, Clear, Edit Name
Description	Edit Text, None, Clear
Save to Disk	Save Current

#### Recall Results

Function	Choices
Memory	Recall Result
Disk	Recall Result, Delete File

**UTILITY****Misc Settings Utility**

<b>Function</b>	<b>Choices</b>
Display Brightness	Low, Medium, High
Beeper	On, Off
Setting the Date	Set Date
Setting the Time	Set time
Front Panel Controls	Enabled, Locked When Test Running, Locked
Menu Selection Knob	Direction Clockwise Down, Clockwise Up Action at Top/Bottom Wrap Around, Stop

**Printer Setup Utility**

<b>Function</b>	<b>Choices</b>
Printer Type	Tek DPU 411, Epson, Thinkjet, ASCII test, To Disk BMP Format, To Disk Ileaf Format, To Disk EPS Format, To Disk ASCII
RS 232	Baud Rate, Stop Bits, Parity, Flow Control
Printer User & Company	User Name, Company Name

**Remote Control Utility**

<b>Function</b>	<b>Choices</b>
GPIB Primary Address	Default 4, Inc, Dec. Offline
RS 232	Baud, Stop Bits, Parity, Hardware Handshake, Software Handshake, Data Carrier Detect, Tx Delay (Seconds), Tx Terminator

**Instr Config Utility**

<b>Function</b>	<b>Choices</b>
Model	Displays model number of instrument
Serial Number	Displays serial number of instrument
Hardware Revision	Displays version of hardware
Firmware Revision	Displays version of firmware
Options	Displays list of options and number of options in instrument

**Self Test Utility**

<b>Function</b>	<b>Choices</b>
Self Test Control	Ready, Run
Self Test Group	Power up Self Test, Self Test, SYS. Int., SYS. Ext.
Self Test Loop	Once, Ten, Thousand, Until Error, Forever

**Jitter Cal Utility**

<b>Function</b>	<b>Choices</b>
Calibration Control	Ready, Run
Calibration System	Jitter Measurement, Jitter Generation
Calibration Routine	All or select a particular rate All, STM 0, STM 1, STM 4, Analog Output, 2 Mb/s, 34 Mb/s, 140 Mb/s