Understanding Diagnostic Screens for the Explorer DHCTs

A Reference Guide

Please Read

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

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About This Guide

Introduction

Providing customer support for any product or technology can be stressful. Customers want answers NOW! We understand the need for providing quick and accurate responses to network users, and we strive to provide tools to make this task easier. The diagnostic screens for the Explorer Digital Home Communications Terminals (DHCTs) are a quick way that you can monitor and diagnose performance relative to the system, as well as the DHCTs.

This guide describes the diagnostics screens included with the Explorer DHCT software. You can access the diagnostic screens using any one of the following methods:

- The keys on the front panel of the DHCT
- The keys on the remote control
- The Web browser on your Digital Network Control System (DNCS)

Purpose

After reading this guide, you will be able to use the diagnostic screens to help identify and evaluate status information for individual Explorer DHCTs in your cable system. The following list includes some of the tasks you can perform using the diagnostic screens:

- Determine the software versions of the SARA and the PowerTV® Operating System (OS)
- Confirm two-way operation and the success of the power-on self test (POST)
- Confirm the tuning mode
- Verify encrypted and unencrypted modes
- Determine the status of the Bootloader upgrade
- Monitor digital video recorder (DVR) performance
- Determine when the latest interactive program guide (IPG) data was received by the DHCT
- Examine the software components installed on the DHCT
- Verify the current copy protection authorization

Audience

This guide is written for cable system operators, service providers, and Cisco personnel who have experience with accessing the SARA-based diagnostic screens for Explorer DHCTs.

Note: The diagnostic screens and other information described in this document are based on SARA. Systems using a resident application from another vendor should contact that vendor for instructions to display diagnostic data.

Supported Software

The diagnostic screens in this guide are accurate for systems running the following software:

- SARA 1.60 or later
- SARA 1.89 or later
- HD 1.60 or later
- SARA DVR 1.5.2 or later

Supported DHCTs

You can access the diagnostic screens described in this guide from the following DHCTs:

- Explorer 1850 Interactive DHCT
- Explorer 2000, 2000 Rev 3, 2100, 3000, and 3100HD DHCTs
- Explorer 2200, 3200, 3250, and 3250HD Digital Interactive DHCTs
- Explorer 4200SD and 4200HD Home Gateway DHCTs
- Explorer 4250SD and 4250HD Home Gateway DHCTs
- Explorer 8000, 8000HD, 8300, and 8300HD Home Entertainment Server DHCTs

Related Publications

You may find the following publications useful as resources when you implement the procedures in this document.

- *Explorer Digital Home Communications Terminal Staging Guide* (part number 734375)
- *Explorer® Digital Home Communications Terminal Troubleshooting Guide* (part number 717867)

Document Version

This is the sixth release of this guide. In addition to minor text and graphic changes, the following table provides the technical changes to this guide.

Description	See Topic
Added diagnostic screens related to DOCSIS Set-Top Gateway (DSG)	***DOCSIS-Specific Diagnostic Screens*** (on page 115)
Added diagnostic screens related to the Enhanced Display Channel Table (SAM EDCT) feature	***SAM EDCT Information Diagnostic Screen*** (on page 85)

1

Understanding Diagnostic Screens

Introduction

SARA captures system data from the DHCTs and then the application reports the data in the appropriate diagnostic screens. The diagnostic screens allow you to quickly confirm the current SARA and PowerTV OS version, check upgrade status by viewing Bootloader information, examine DOCSIS* information, and view details about the video-on-demand (VOD) and DVR services. For example, if customers call in with macroblocking questions, you can use the diagnostic screens to view the data transmission error rate and the signal levels.

To successfully view the information within the diagnostic screens, you must know how to access them. This chapter provides instructions to help you access, navigate, and exit the diagnostic screens and also includes instructions for displaying a blended image. For more information on blended images, go to ***Troubleshoot With a Blended Image*** (on page 9).

** Data-Over-Cable Service Interface Specification*

In This Chapter

Access the Diagnostic Screens

Accessing Diagnostic Screens Using Explorer Front Panel Buttons

This section provides information to help you use the DHCTs to access and navigate the diagnostic screens, to display a blended image, and to exit the diagnostic screens.

You can access the diagnostic screens by pressing a combination of buttons on the front panel of each DHCT. The buttons that you press differ among the various models of DHCTs. The following table indicates the buttons on the front panel of the DHCT that you use to access the diagnostic screens.

Note: After pressing the buttons on the front panel, the Message light emitting diode (LED) will flash. This indicates that diagnostic screens are ready to access.

DHCT Types	Front Panel Buttons
Explorer 2000, 2000 Rev 3, and 3000 DHCTs	■ Center button until Message LED flashes ■ Diamond button
Explorer 2100 and 3100 DHCTs	■ Center button until Message LED flashes ■ Info button
Explorer 1850, 2200, 3200, 3250HD, 4200, and 4200HD Series DHCTs	■ Center button until Message LED flashes ■ Info button
Explorer 8000 and 8000HD Series Home Entertainment Servers	■ Center button until Message LED flashes ■ Info button
Explorer 8300 and 8300HD Series Home Entertainment Servers	■ Center button until Message LED flashes ■ Select button

Accessing Screens Using Front Panel Buttons

This section provides procedures to help you use the Explorer DHCTs to access and navigate the diagnostic screens, to display a blended image, and to exit the diagnostic screens.

You can access the diagnostic screens by pressing a combination of buttons on the front panel of the Explorer DHCT. The buttons that you press differ among the various models of Explorer DHCTs.

Note: After pressing the buttons on the front panel, the Message LED will flash. This indicates that diagnostic screens are ready to access.

1. Press and hold the center or **Select** button until the Message LED on the front panel blinks, and then release the button.
2. While the Message LED blinks, press the diamond or the **INFO** button.
3. To navigate the diagnostic screens, press either the **Vol+** or the **Vol-** button.
4. To display a blended image for troubleshooting purposes, press the **Center** or **Select** button to scroll through the following three blending levels:
   - Dark
   - Light
   - None

   Note: For more information on using blended images, see ***Troubleshoot with a Blended Image*** (on page 9).
5. To exit the diagnostic screens, press the **Diamond** or the **EXIT** button.

Accessing the Diagnostic Screens Using the Remote Control

This section provides procedures to help you use our remote controls to access and navigate through the diagnostic screen sequence, to display a blended image, and to exit the diagnostic screens.

You can access the diagnostic screens using one of the following remote controls:

Model ER1 Remote Control	Model AT8400 AllTouch Remote Control
Model AT2000 AllTouch® Remote Control	Model AT8430 AllTouch Remote Control
Model AT2300 AllTouch Remote Control	Model AT8450 AllTouch Remote Control
Model AT2400 AllTouch Remote Control	Model AT8550 AllTouch Remote Control

1 Is your remote control an ER1 model?

- If **yes**, set its VCR/VOD switch to the VOD mode and then go to step 2.
- If **no**, go to step 2.

2 Press and hold the  (Pause) button until the message LED blinks and then release.

Note: If you are accessing diagnostic screens on an 8000, 8000HD, 8300, or 8300HD Home Entertainment Server, the program that you are currently viewing will pause.

3 Is your remote control an AT2000 or AT2400?

- If **yes**, press the + **NEXT** button to display the Status Summary diagnostic screen.
- If **no**, press + on the **PAGE** button to display the Status Summary diagnostic screen..

4 Is your remote control an AT2000 or AT2400?

- If **yes**, press the **+ NEXT** or the **- PREV** key to navigate through the diagnostic screens.
- If **no**, press the **+** or **-** on the **PAGE** key to navigate through the diagnostic screens

5 To display a blended image, press the  key to scroll through the light and none blending level options.

Note: For more details about blended images, go to ***Troubleshoot with a Blended Image*** (on page 9).

6 To exit the diagnostic screens, press the **EXIT** or button on the remote control.

Notes:

- If you are accessing diagnostic screens on an 8000, 8000HD, 8300, or 8300HD Home Entertainment Server, press the button to resume the program from its current position.
- If you are accessing diagnostic screens on an 8000, 8000HD, 8300, or 8300HD Home Entertainment Server and want to resume the program in to real time, tune away from the current channel and then tune back.

  Note: If you are using an AT8450 or an AT8550 remote control, press the **LIVE** key to resume the program in real time

Accessing the Diagnostic Screens Using the DNCS Web Browser

Use the Web browser on the DNCS to view the diagnostics screens of any DHCT that is booted "two-way" (information can travel to and from the headend) and accessible from that DNCS.

Follow these steps to access the diagnostic screens from the DNCS.

1 Launch a Web browser that is installed on the DNCS.

2 From the **Address** field located at the top of your Web browser, type **http://<the.dhct.ip.address>:5030/1.html** and then press **Enter**. Your Web browser displays the first diagnostic screen (Status Summary) of the DHCT you are using.

  Note: In this command, <the.dhct.ip.address> represents the actual IP address of the DHCT you are using.

3 Follow the on-screen instructions and the links to view the other diagnostic screens.

Identify Information Within Diagnostic Screens

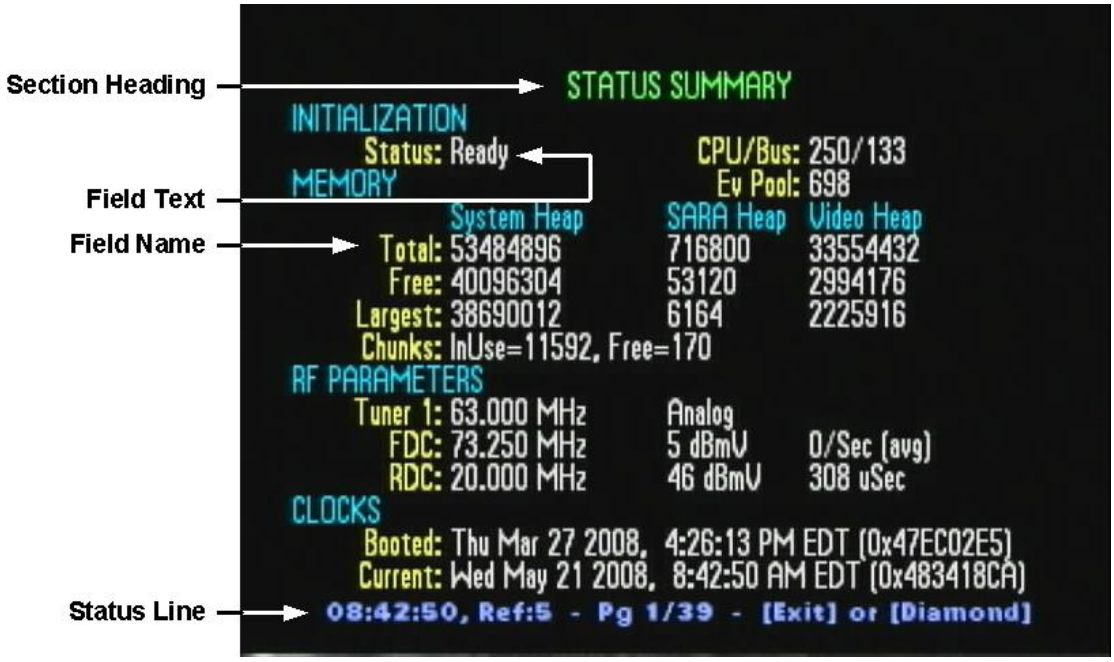
Overview

This section helps you to locate information within diagnostic screens and provides the following information:

- An example of a diagnostic screen with its key elements
- Descriptions of the color-coded text
- Descriptions of the status line content

Diagnostic Screen Layout

The following example of a diagnostic screen shows the section heading, the field name, the field text, and the status line that will appear on various sections of each diagnostic screen.



Locating Page Numbers on Diagnostic Screens

The page number for each diagnostic screen is located at the bottom of each screen in the Status Line. The page number is displayed in the following format:

Page<page number> of <total pages for DHCT>

Note: The page number for some diagnostic screens will vary depending on the version of software that is loaded on the DHCT.

Color-Coded Field Text

The color of the field text within the diagnostic screens varies depending on the condition of the specific component. The following table lists the conditions that the color represents.

Field Text Color	Condition
Green	Indicates a passed condition for a one-time test or self-test
White	Indicates a normal or and expected condition
Amber	Indicates an unusual condition
Red	Indicates an error, an unexpected condition, or an inability to obtain status information for that particular field

Status Line Descriptions

The status line appears at the bottom of all diagnostic screens. The following table describes the field information contained in the status line.

Field Information	Description
Time	Provides the time of day at which the screen was last displayed or refreshed
Ref	Provides the number of seconds between screen refreshes for the current page (example, Ref:5) **Note:** If the current page displays **Play**, it means that the information on the screen does not automatically refresh. To refresh the information on a screen that displays **Play**, press the  (Play) button on the remote control.
Pg	Provides the current page number and the total number of diagnostic screen pages (current/total)
[Exit] or [Diamond]	Indicates the method to exit the diagnostic screens ■ For Explorer 2000, 2000 Rev 3, or 3000 DHCTs, press the **[Diamond]** on the front panel of the DHCT ■ For all other Explorer DHCTs, press **[Exit]** on the front panel of the DHCT. ■ For all Explorer DHCTs, press the **EXIT** button on the remote control.

Troubleshoot with a Blended Image

To help you troubleshoot the DHCT, you can view a blended image. A blended image displays the current channel program in combination with the diagnostic screen. You can display a blended image to diagnose macroblocking issues, to check the signal levels, and to capture a live problem on videotape. You can view a blended image of the diagnostic screen using the dark and light blending levels. This section provides an example of a blended image.

Note: The instructions for displaying a blended image are presented in ***Accessing Diagnostic Screens Using Explorer Front Panel Buttons*** (on page 2).

The following example of a blended image (with light blended level selected) shows the current channel program in the background and the diagnostic screen in the foreground.

Note: You can only blend an analog or a digital channel. When you are tuned to a pay-per-view (PPV) channel with no event playing or tuned to a Music Channel, you cannot display a blended image.

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Network Status Diagnostic Screens for all Explorer DHCTs

This chapter provides diagnostic screens common to the network status of all Explorer DHCTs. These screens accumulate data about your entire network such as software version, serial numbers, boot status, service availability, frequencies, and PPV purchases.

In This Chapter

Status Summary Diagnostic Screen

Information

This section provides a sample of the Host Status Summary diagnostic screen along with field descriptions. You can view this screen to obtain information concerning the status of the system initialization, memory, boot status, and clocks.

Performing Tasks

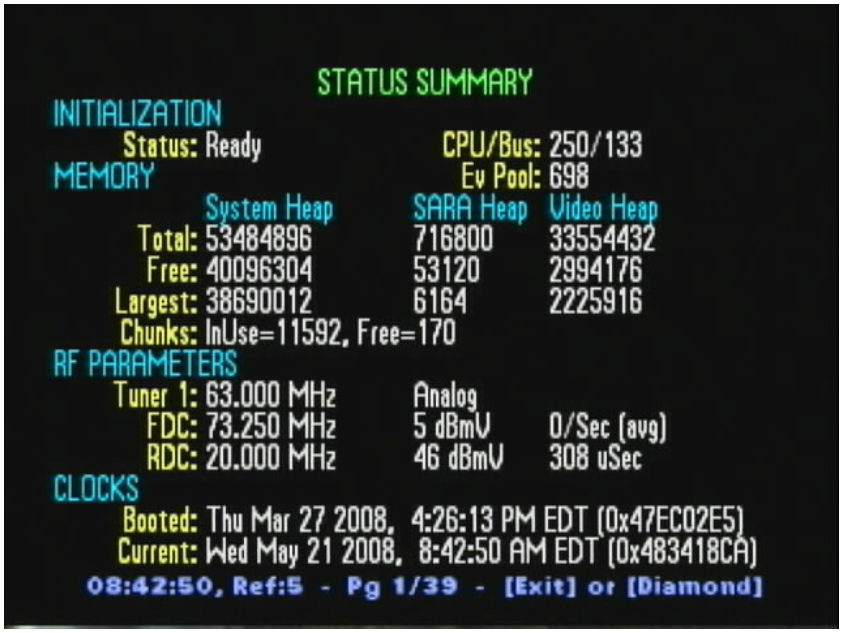
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the current status of the boot process
- Check the amount of available memory
- View the power levels and frequencies of the tuner
- Check when the DHCT was last booted and if it is receiving the correct time of day

Screen Components

- Initialization
- Memory
- RF Parameters
- Clocks

Example:


STATUS SUMMARY
INITIALIZATION
Status: Ready
CPU/Bus: 250/133
MEMORY
Ev Pool: 698
System Heap
SARA Heap
Video Heap
Total: 53484896
716800
33554432
Free: 40096304
53120
2994176
Largest: 38690012
6164
2225916
Chunks: InUse=11592, Free=170
RF PARAMETERS
Tuner 1: 63.000 MHz
Analog
FDC: 73.250 MHz
5 dBmV
0/Sec (avg)
RDC: 20.000 MHz
46 dBmV
308 uSec
CLOCKS
Booted: Thu Mar 27 2008, 4:26:13 PM EDT (0x47EC02E5)
Current: Wed May 21 2008, 8:42:50 AM EDT (0x483418CA)
08:42:50, Ref:5 - Pg 1/39 - [Exit] or [Diamond]

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Initialization

Field Name	Description	Possible Values
Status	The status of the overall boot process	■ **In Progress—**The DHCT is in the process of initializing. If In Progress displays more than 10 minutes, the boot process is incomplete and the DHCT is not properly booting. ■ **Ready—**The DHCT has completed the boot process and is in two-way mode. ■ **Ready-B'cast Only—**The DHCT booted in one-way mode and has not received an individual UN-Config message. This is the final state in a one-way system. **Important:** • Once the status displays Ready, it will not revert back to Ready-B'cast Only if the reverse path is lost. • Once the status displays Ready, it will not revert back to In Progress if the forward signal is lost. • If either signal is lost, contact Cisco Services
CPU/Bus	The speed, in megahertz (MHz), at which the microprocessor and data bus are running	■ **Hardware-dependent value** **Note:** This value is displayed as **n/a** for Explorer 2000 DHCTs.
Ev Pool (Event Pool)	The number events available in the event pool of the OS	■ **[Integer > 0]**

Memory

Field Name	Description	Possible Values
Total	The total amount of memory assigned to the DHCT, SARA, and the video	■ **[Integer ≥ 0]**
Free	The amount of free memory available for the DHCT, SARA, and the video	■ **[Integer ≥ 0]**
Largest	The largest contiguous, free block of memory for the DHCT, SARA, and video	■ **[Integer ≥ 0]**
Chunks	The number of in use and free chunks of available memory	■ **[Integer ≥ 0], [Integer ≥0]**

RF Parameters

Field Name	Description	Possible Values
Tuner or Tuner 1	Describes the following frequency data at the center of the channel of the inband tuner ■ If tuned to a *digital* channel, this field displays the frequency, the current *approximate* signal level, and the average errors per second ■ If tuned to an *analog* channel, this field displays the frequency and the analog channel	■ **Frequency**—Dependent upon setting (MHz) ■ **Signal Level** • **Acceptable Range**[1]: -16 dBmV – +15 dBmV • **Recommended Range:** -8 dBmV – +8 dBmV ■ **Average Errors per Second—** Integer close to 0 that is not changing
FDC	Provides information about the forward data channel (FDC)	■ **Frequency**—Dependent upon the setting in which out-of-band receiver is tuned (MHz) ■ **Signal Level** (approximate) • **Acceptable Range**[1]**:** -16 dBmV – +15 dBmV • **Recommended Range:** -10 dBmV – +10 dBmV ■ **Average Errors per Second**— Integer close to 0 that is not changing

[1] If the dBmV falls outside of the specified ranges, the system and DHCTs may continue to operate, but plant or system maintenance may be required. Perform an analysis using a spectrum analyzer on the incoming signal.

Field Name	Description	Possible Values
RDC	The information about the reverse data channel (RDC)	■ **Frequency**—Dependent upon the setting to which RDC transmitter is broadcasting (MHz) ■ **Signal Level of Transmitter** • **Acceptable Range[2]:** +25 – +55 dBmV • **Recommended Range:** +27 – +53 dBmV ■ **Round Trip Delay**—delay between the DHCT and quadrature phase shift keying (QPSK) modem at the headend or hub (µsec)

Clocks

Field Name	Description	Possible Values
Booted	The date and time that the Explorer DHCT last booted **Note:** The hexadecimal format for the date and time is shown in parenthesis.	■ **[Date, Time]**
Current	The current date and time **Note:** The hexadecimal format for the date and time is shown in parenthesis.	■ **[Date, Time]**

Additional Feature: Displaying the Memory Heap Map

CAUTION:

Accessing the Memory Heap Map may adversely affect performance. Do not attempt to access the memory Heap Map diagnostic screen unless requested to do so by Cisco Services personnel or a support team member.

If you have Explorer DHCTs running SARA 1.44 or later, one of our engineers or support team members may ask you to press the A button on the remote control while viewing this diagnostic screen. Pressing this button displays a new Memory Heap Map diagnostic screen.

[2] A setting greater than +55 dBmV may indicate a problem. If the dBmV falls outside of the specified ranges, perform an analysis using a spectrum analyzer on the incoming signal.

Post and Boot Results Diagnostic Screen

Information

This section provides an overview of the POST and Boot Status diagnostic screen. The POST Results section includes the results of the self-test performed on each hardware component within the Explorer DHCT at the beginning of the boot process. You can view the POST Results section to confirm that all hardware components have a status of "passed."

The Boot Status section includes the results of the boot process performed by the Explorer DHCT. You can view the Boot Status section to confirm whether or not the Explorer DHCT is ready to receive data.

Performing Tasks

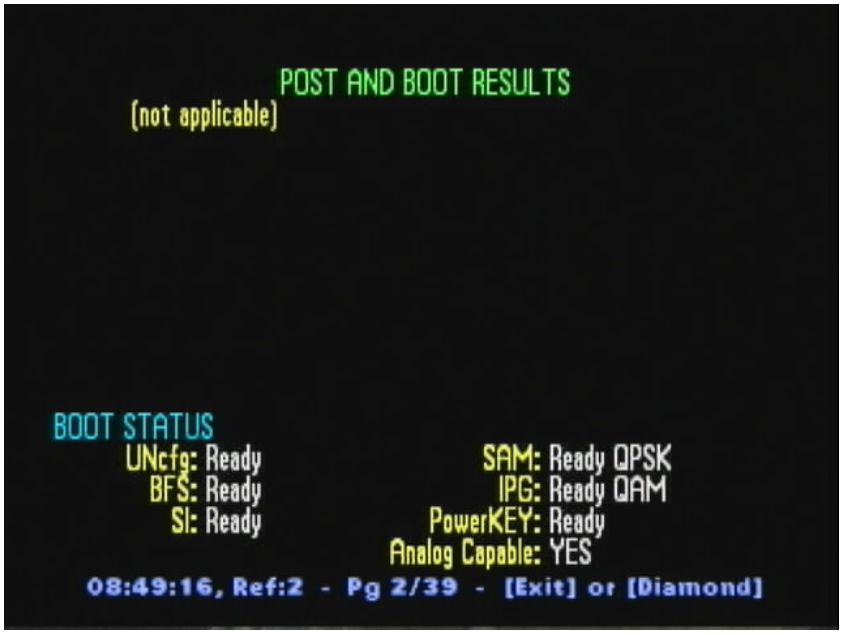
By accessing this diagnostic screen, you can perform the following tasks:

- Ensure that all hardware is present on the system
- Ensure that all hardware components are functioning properly
- Check the boot status of the Explorer DHCT
- Determine if the Explorer DHCT is ready to receive data

Screen Components

- Post Results
- Boot Status

Example:



Notes:

- The POST Results section only displays data for the Explorer 2000, 2000 Rev 3, and 3000 DHCTs.
- The Boot Status section appears for all DHCTs.

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Post Results Parameters

Note: All entries listed in the post results section are applicable to all Explorer 2000s except the 2000 Rev 3.0. The 2000 Rev 3.0 and Rev 3.1, along with the 3000 Rev 1.0, will display post results for most but not all of the components listed. This is expected behavior and is not an indication of a problem with the DHCT.

When a subscriber plugs the DHCT into an AC power outlet, the DHCT performs a self-test on each component within the DHCT. The POST results are not updated automatically. You must reboot the DHCT to run another self-test.

Note: Go to ***Component Acronyms or Descriptions*** (on page 20) for a description of each component.

Field Name	Description	Possible Values
All fields in Post Results section (for example, AC3, RAM, SCSI)	The working status of each component within the DHCT	■ **Failed**—Self-test failed and the DHCT may be defective. For assistance, contact your system administrator. You may need a new DHCT ■ **n/a**—DHCT does not use the module tested in this field ■ **Passed**—Component is installed and functioning correctly ■ **Unavailable**—Component is not installed (optional components) or is not functioning correctly

The following list provides the acronym definition or a description for a component within the POST Results section.

Acronym	Description
AC3	Digital Audio Compression-3 Decoder
BCM	Application Specific Integrated Circuit (ASIC) for demodulating the quadrature amplitude modulation (QAM) signal
MAC	Media Access Control
RAM	Dynamic Random Access Memory
ROM Cksm	Read-Only Memory Checksum
Ethernet	Ethernet connection
VCXO	Voltage Controlled Crystal Oscillator
Spi	Serial Peripheral Interface (communication among ASICs)
BTSC	BTSC stereo decoder for analog audio
DDS	Analog descrambling ASIC
BGATE	QPSK transceiver (encoding and decoding)
TVP	Test Verification Program
Front Panel	Front panel keys and LEDs
Eagle DRAM	Video memory
FLASH Cksm	Validation that the flash ROM contents are not corrupted
UAST	Universal Asynchronous Receiver Transmitter
NVM	Non-Volatile Memory
I2C	Serial bus for communicating with ASICs
SCSI	Small Computer System Interface
RFModem	Transmitter and receiver for QPSKs

Boot Status

The Explorer DHCT must access information from various sources in order to boot. The Boot Status section includes the results of the DHCT's attempt to access the sources that the DHCT must receive in order to boot. These results are updated in the order shown as the DHCT boots up. The indicators within this screen are updated as the DHCT moves through the possible states; however, they are never updated in reverse because this information only indicates the status during boot up.

Field Name	Description	Possible Values
UNcfg	The boot process for the User-to-Network configuration (UNcfg)	■ **Broadcast**—Global broadcast message received ■ **Ready**—An individually addressed configuration message received ■ **Searching**—No UNCfg message received
BFS	The boot process for the Broadcast File System (BFS)	■ **Ready**—BFS directory has been found and loaded ■ **Searching**—Looking for the BFS directory
SI	The boot process for the System Information (SI)	■ **Ready**—SI tables are loaded ■ **Searching**—SI tables are not loaded
SAM	The boot process for the Service Application Manager (SAM)	■ **Ready QAM**—SAM has completed loading inband data ■ **Ready QPSK**—SAM has completed loading out-of-band data ■ **Trying QAM**—SAM is attempting to load data inband ■ **Trying QPSK**—SAM is attempting to load data out-of-band ■ **Waiting**—SAM is waiting for other required boot operations to finish before attempting to load its tables

Field Name	Description	Possible Values
IPG	The boot process for the IPG and indicates if the IPG title data for the current and next day is loaded	■ **Ready QPSK**—IPG has completed loading out-of-band data ■ **Trying QPSK**—IPG is attempting to load data out-of-band ■ **Waiting**—IPG is waiting for other required boot operations to complete before attempting to load data ■ **N/A**
PowerKEY	The boot process for a PowerKEY CableCARD	■ **Ready**—PowerKEY components are ready ■ **Waiting EMM**—Waiting for Entitlement Management Messages (EMMs) to load ■ **Waiting EUT**—Waiting for the Entitlement Unit Table (EUT) to load ■ **Waiting Time**—Waiting for the Time global broadcast authentication message (GBAM) (message sending the time of day to the PowerKEY components)
Analog Capable	Indicates whether or not the DHCT is capable of streaming analog programs	■ **YES** ■ **NO**

Software Versions and Serial Numbers Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Software Versions and Serial Numbers diagnostic screen. You can view this screen to verify the version numbers and serial numbers for all applicable hardware and software modules.

Performing Tasks

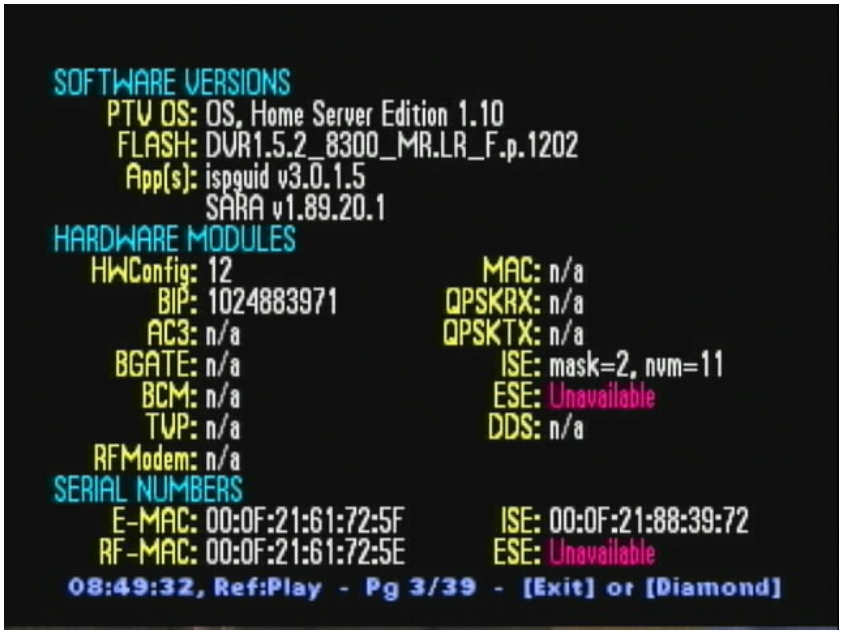
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the software version
- Confirm the hardware modules
- Verify that the RF-MAC matches the MAC address on the DNCS

Screen Components

- Software Versions
- Hardware Modules
- Serial Numbers

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Software Versions

The Software Versions section includes the current firmware versions of the software in Read Only Memory (ROM).

Field Name	Description	Possible Values
PTV OS	The version for the PowerTV OS	■ **[Software-dependent]**
FLASH	The version for the resident application	■ **[Software-dependent]**
App(s)	The names and version numbers of the applications available for execution	■ **[Software-dependent]**

Hardware Modules

The Hardware Modules section includes the version numbers of all applicable hardware modules.

Field Name	Description	Possible Values
HWConfig	The version of the hardware configuration (HWConfig) module	■ **[Hardware module-dependent]** **Note**: This value should match the revision number (without decimals, for example 5.9 will appear as 59) printed on the bottom of the DHCT
BIP	The version of the broadband interface processor (BIP) modules	■ **[BIP module-dependent]** ■ **n/a**—not a standalone part
AC3	The version of the digital AC-3 module	■ **[AC3 module-dependent]** ■ **n/a—**not a standalone part
BGATE	The version of the QPSK transceiver (encoding and decoding) module	■ **[QPSK transceiver module-dependent]** ■ **n/a**—not a standalone part
BCM	The version of the ASIC for demodulating the QAM signal module	■ **[ASIC-dependent]** ■ **n/a—**not a standalone part
TVP	The state of the TV tuner resource in the resident application according to the TV Program Manager (TVP) component of the PowerTV OS	■ **[Hardware-dependent]** ■ **n/a—**not a standalone part
RFModem	The version of the transmitter and receiver for QPSK	■ **[Hardware-dependent]** ■ **n/a—**not a standalone part
MAC	The ASIC version that includes: ■ Moving Pictures Experts Group (MPEG) decoding ■ Graphics ■ AC-3 decoding ■ NTSC encoding	■ **[Hardware-dependent]** ■ **n/a—**not a standalone part
QPSKRX	The QPSK Receiver (QPSKRX) version	■ **[Hardware-dependent]** ■ **n/a—**not a standalone part
QPSKTX	The QPSK Transmitter (QPSKTX) version	■ **[Hardware-dependent]** ■ **n/a—**not a standalone part
ISE	The Internal Secure Element (ISE) and PowerKEY component serial number	■ **[Hardware-dependent]**

Field Name	Description	Possible Values
ESE	The External Security Element (ESE) smart card (optional component) serial number	■ **[Hardware-dependent]** ■ **Unavailable**—smart card is not currently in use
DDS	The analog descrambling ASIC module version	■ **[Hardware-dependent]** ■ **n/a—**ASIC module is not available

Serial Numbers

The Serial Numbers section includes the MAC addresses for specific hardware modules.

Note: If the MAC address is not available, the field displays Unavailable.

Field Name	Description	Possible Values
E-MAC	The Ethernet media access control (E-MAC) adapter MAC address, if installed	■ **[Unique per DHCT]** **Example**: 00:18:68:BF:46:32
RF-MAC	The RF network adapter MAC address that is used by the DNCS	■ **[Hardware-dependent]** **Example**: 00:26:A4:BF:64:2F
ISE	The ISE and PowerKEY component serial number	■ **[Unique per DHCT]** **Example**: 00:40:7B:BF:46:3D
ESE	The serial number of the ESE smart card (optional component)	■ **[Unique per DHCT]** **Example**: smart card is not currently in use

Status and Network Parameters Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Statuses and Network Parameters diagnostic screen. You can view this screen to identify real-time status information and network parameters.

Performing Tasks

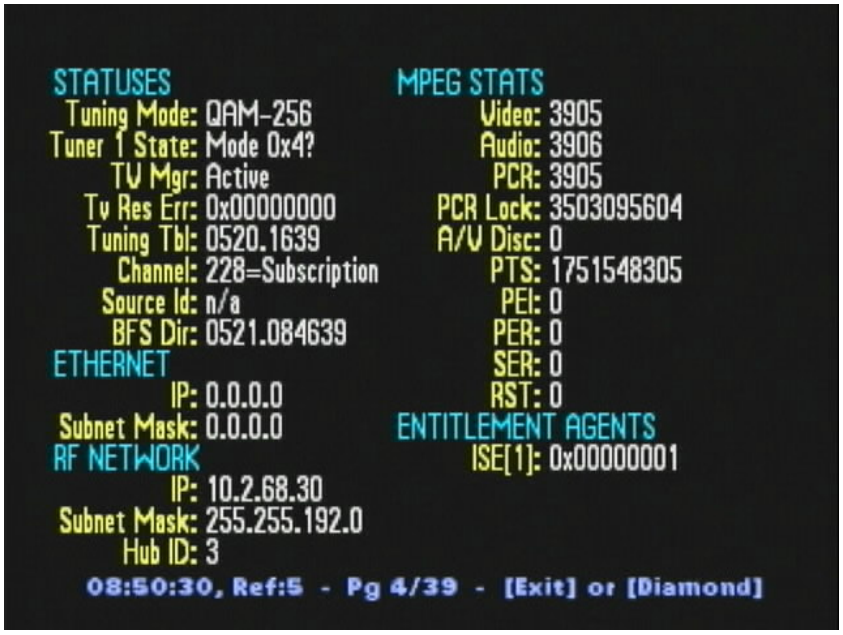
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the tuning mode
- Verify MPEG information for the current stream
- Confirm that the DHCT displays an RF network Internet protocol (IP) address, a subnet mask, and a hub ID

Screen Components

- Statuses
- Ethernet
- RF Network
- MPEG Stats
- Entitlement Agents

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Statuses

The Statuses section includes the status information related to the channel that the subscriber is viewing.

Field Name	Description	Possible Values
Tuning Mode	The current mode of the inband tuner	■ **Analog**—if sap or stereo are detected on the current analog channel, one of the following modes appear: • **Analog (sap)** • **Analog (sap, stereo)** • **Analog (stereo)** ■ **QAM-64** ■ **QAM-128** ■ **QAM-256**

Field Name	Description	Possible Values
Tuner State or Tuner 1 State	The state of the tuner according to the TV manager component of the PowerTV OS	■ **Found QAM**—Tuner successfully tuned to a digital channel ■ **Found Sync**—Tuner successfully tuned to an analog channel ■ **Idle/Available**—Tuner is not in use by an application; tuner is available for use ■ **Waiting QAM**—TV Manager is waiting for the tuner to tune to the desired QAM frequency and lock onto valid data ■ **Waiting Sync**—TV Manager is waiting for the tuner to find the signal on an analog channel
TV Mgr	The state of the TV tuner resource in the resident application according to the TV Manager component of the PowerTV OS **Note:** If the resident application is not using the tuner, the TV Manager displays the state of the active resource using the tuner (if any).	■ **Active**—the resource of the resident application is currently active (in use/tuned) ■ **Denied**—the tuning request for the resource was denied ■ **Inactive**—TV Manager is not in use and is available to process requests ■ **Notified**—TV Manager has instructed the resident application to release the resource not the tuner so the TV Manager can use the tuner for a different request ■ **Suspended**—the tuner resource for the resident application is suspended ■ **Suspending**—TV Manager has notified the owner of the currently active resource to suspend so that it can use the tuner for another request ■ **Unknown**—TV Manager received an unknown state ■ **Waiting PAT**—TV Manager is waiting for the Program Association Table (PAT) to arrive on a QAM channel before the tuning request can complete ■ **Waiting PMT**—TV Manager is waiting for the program Map Table (PMT) to arrive on a QAM channel before the tuning request can complete

Field Name	Description	Possible Values
TV Res Err	The last resource denied error code received by the ResApp from the TV manager when trying to tune (if any)	■ **0x00000000**—no resource errors ■ **0x[non-zero hexagonal number]**—indicates an error was received
Tuning Tbl	The most recent tuning table activation date and time (MMDD.hhmm) received by the DHCT	■ **[Time]** **Example**: 0507.1500
Channel	The channel number and the status for the tuned channel	■ **Clear to Air** (unencrypted) ■ **Free Preview** ■ **Purchased** (for pay-per-view) ■ **Subscription** ■ **Unauthorized** **Note:** An unauthorized channel may display **unauthorized** for a few seconds and then it changes to n/a when the unauthorized barker appears.
Source ID	The source identification number for the tuned channel	■ **[Channel-dependent]** (hexadecimal format)
BFS Dir	The date and time (MMDD.hhmmss) that the BFS directory was last read	■ **[Time]** **Example**: 0507.150027

Ethernet

Note: The values are only valid if the DHCT has an Ethernet adapter installed.

Field Name	Description	Possible Values
IP	The IP address assigned to the Ethernet adapter	■ **[Network-dependent]** **Example:** 10.1.0.1
Subnet Mask	The IP subnet mask assigned to the Ethernet adapter	■ **[Network-dependent]** **Example:** 255.255.255.0

RF Network

The RF Network section includes a description of the RF network adapter.

Field Name	Description	Possible Values
IP	The IP address that the DNCS assigned to the RF network	■ **[Network/DHCT configuration-dependent]** ■ **Unavailable**—DHCT is not authorized for two-way communications or is unable to establish a two-way connection with the DBDS
Subnet Mask	The IP subnet mask that is assigned to the RF network adapter by the DNCS	■ **[Network-dependent]**
Hub ID	The hub number to which the DHCT is connected when booted	■ **[Network-dependent]**

MPEG Stats

The MPEG Stats section includes information about the DHCT when it is tuned to a digital channel and when an MPEG stream is being decoded. This information changes each time the DHCT changes channels on the TV.

Important: The MPEG Stats information applies to the main display and does *not* apply to picture-in-picture (PIP) channels.

Some errors, such as PER (number of Pipeline Errors reported by the MPEG decoder chip) and SER (number of Severe Errors reported by the MPEG decoder chip) are expected to occur.

Note: If the channel is tuned to an unauthorized channel, then **n/a** appears as the field text within the field name.

Field Name	Description	Possible Values
Video	The program identifier (PID) number within the MPEG stream that contains the video information being decoded	■ **[Channel-dependent]** ■ **n/a**—tuned to an analog channel
Audio	The PID number within the MPEG stream that contains the audio information being decoded	■ **[Channel-dependent]** ■ **n/a**—tuned to an analog channel
PCR	The PID number that is used to decode the program clock reference (PCR) information **Note:** The PCR PID is typically the same as the video PID.	■ **[Channel-dependent]** ■ **n/a**—tuned to an analog channel

Field Name	Description	Possible Values
PCR Lock	The time stamp of the last PCR synchronization lock	■ **[Integer > 0]**—number should change each time the screen refreshes; otherwise video may be lost ■ **n/a**—tuned to an analog channel
A/V Disc	The sum of the discontinuity errors encountered on either the audio or video streams (A/V Disc) that have occurred since the current stream was tuned **Note:** Discontinuity errors indicate that packets were transmitted out of order or with a gap between them, which indicates data loss.	■ **0**—no discontinuity errors ■ **[Integer > 0]**—could indicate a problem **Note:** If A/V Disc is high, an issue such as macroblocking may be present. ■ **n/a**—tuned to an analog channel
PTS	A presentation time stamp (PTS) that changes each time the screen refreshes	■ **UNIX format**—number should change each time the screen refreshes; otherwise video may be lost **Important:** If this number does *not* change each time the screen refreshes, then video may have been lost. ■ **n/a**—tuned to an analog channel
PEI	The number of errors (packet error indication [PEI]) in the MPEG stream before reaching the broadband interface processor (BIP)	■ **0**—no errors in MPEG stream ■ **[Integer > 0]**—errors exist and may cause an issue ■ **n/a**—tuned to an analog channel
PER	The PERs reported by the MPEG decoder chip	■ **0**—no errors in pipeline stream ■ **[Integer > 0]**—errors exist and may cause an issue **Note:** Some errors may be normal depending on the MPEG stream being decoded. ■ **n/a**—tuned to an analog channel
SER	Displays the number of SERs reported by the MPEG decoder chip	■ **0**—no server errors ■ **[Integer > 0]**—errors exist and may cause an issue **Note:** Some errors may be normal depending on the MPEG stream being decoded. ■ **n/a**—tuned to an analog channel

Field Name	Description	Possible Values
RST	Displays the number of times the software driver has restarted (RST) the MPEG decoding process	■ **0**—no errors in MPEG stream ■ **[Integer > 0]**—errors exist and may cause an issue ■ **n/a**—tuned to an analog channel

Entitlement Agents

Field Name	Description	Possible Values
ISE or ESE	The entitlement agent ID (EAID) that was installed on the ISE or ESE (also known as a smart card) and inserted in to the DHCT	■ **0x00000001** **Note:** The number within the brackets is an index number. The hexadecimal number that follows the index number displays the EAID. ■ **ESE[1]** ■ **ISE[1]**

RF Status Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the RF Status diagnostic screen. You can view this screen to obtain statistical information about the three RF channels on your system in real-time.

Important: On the Explorer 8000, 8000HD, 8300, or 8300HD Home Entertainment Servers, the descriptions in the Current QAM section of the RF Status diagnostic screen always refer to the first tuner. Also, the information displayed in the Current QAM section field descriptions is not necessarily related to what is displayed on the main TV screen or the PIP. To view the status of the Second Tuner, go to the ***Second Tuner Status Diagnostic Screen*** (on page 133).

Performing Tasks

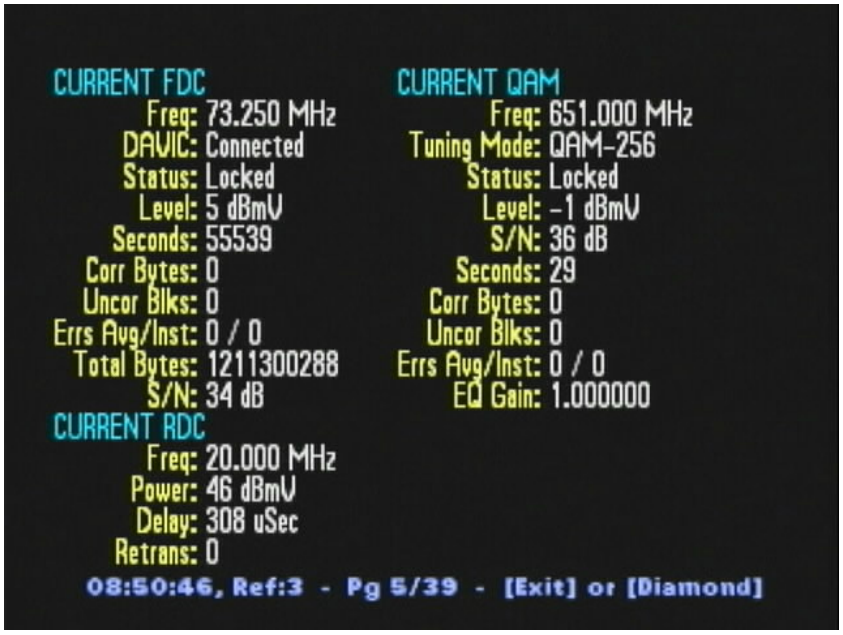
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the power levels and frequencies of the FDC and the RDC
- Confirm the power levels and frequencies of the QAM modulator
- Monitor the average and instantaneous errors of the FDC and the QAM

Screen Components

- Current FDC
- Current RDC
- Current QAM

Example:


CURRENT FDC
Freq: 73.250 MHz
DAVIC: Connected
Status: Locked
Level: 5 dBmV
Seconds: 55539
Corr Bytes: 0
Uncor Blks: 0
Errs Avg/Inst: 0 / 0
Total Bytes: 1211300288
S/N: 34 dB
CURRENT RDC
Freq: 20.000 MHz
Power: 46 dBmV
Delay: 308 uSec
Retrans: 0
CURRENT QAM
Freq: 651.000 MHz
Tuning Mode: QAM-256
Status: Locked
Level: -1 dBmV
S/N: 36 dB
Seconds: 29
Corr Bytes: 0
Uncor Blks: 0
Errs Avg/Inst: 0 / 0
EQ Gain: 1.000000
08:50:46, Ref:3 - Pg 5/39 - [Exit] or [Diamond]

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Current FDC

Field Name	Description	Possible Values
Freq	The frequency (Freq) of the tuned QPSK receiver	■ **[Network-dependent]** **Range:** 70 MHz–130 MHz
DAVIC	The status of the current Digital Audio Visual Council (DAVIC) connection	■ **Booting**—DHCT is attempting to initiate a DAVIC connection ■ **Calib Power**—DHCT is calibrating the power level of the QPSK transmitter for optimal performance ■ **Completion**—DHCT received sign on request; waiting for DAVIC initialization to complete or for DAVIC ranging/ power calibration message ■ **Conn Confirm**—DHCT received a DAVIC connect message for a connection set up by an active session, sent a DAVIC connect response message, and is waiting for a DAVIC connect confirm message to acknowledge the session connection is ready to use ■ **Connected**—connection exists; typically two-way ■ **Data Lock Lost**—DHCT stopped receiving valid data; must re-establish a DAVIC connection when it finds valid data ■ **Dflt Cfg**—DHCT is waiting for DAVIC default configuration message ■ **DNCS Conn**—DHCT adjusted its power, received initialization completion message, and is waiting for DNCS to send a DAVIC connect message to establish default DNCS connection

Field Name	Description	Possible Values
		■ **DNCS Conf**—DHCT received DAVIC connect message from DNCS, responded with a DAVIC connect response message, and is waiting for a connect confirm message ■ **Provisioning**—DHCT is waiting for a DAVIC provision message ■ **Ready-B'cast Only**—DHCT failed to sign on and is operating in one-way mode. A background timer continues attempting to sign on periodically ■ **Resp**—DHCT received sign-on request and is waiting for randomized timeout before sending the DAVIC sign-on response to the DNCS ■ **Searching Chnls**—DHCT is searching for QPSK frequency for valid DAVIC data ■ **Sign-On**—DHCT is waiting for the DAVIC sign on message from DNCS ■ **Slow-Boot Wait**—DHCT is waiting for the slow boot timeout period ■ **Unauthorized**—DHCT is not authorized to sign on with DNCS ■ **Unknown**—DHCT in an unknown state
Status	The status of the receiver in regards to receiving valid data	■ **Locked-**—Receiver is locked onto a frequency with valid QPSK data ■ **Unlocked**—Receiver is not locked onto a frequency with valid QPSK data
Level	The approximate received signal level	■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is marginally too high or too low • **value displayed in red**—signal level is unacceptably too high or too low

Field Name	Description	Possible Values
Seconds	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]**
Corr Bytes	The number of bytes received in error that have been successfully corrected by the forward error correction (FEC) code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present.
Uncor Blks	The number of data blocks received in error that were not successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present
Errs Avg/Inst	Two unique numbers that describe data errors ■ **First Number**—the average number of errors during the time the frequency was locked ■ **Second Number**—the number of errors since the last time the screen was refreshed	■ **[Integer ≥ 0 / Integer ≥ 0]**
Total Bytes	The total number of data bytes successfully read since the frequency was locked	■ **[Integer ≥ 0]**
S/N	The signal-to-noise ratio **Note:** The S/N ration is not applicable for Explorer 2000 DHCTs.	■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is marginally too high or too low • **value displayed in red**—signal level is unacceptably too high or too low ■ **n/a**—not applicable for this DHCT

Current RDC

Field Name	Description	Possible Values
Freq	The frequency, in MHz, to which the QPSK transmitter is tuned	■ **[Dependent upon setting]** **Range:** 8–26.5 MHz
Power	The output level of the QPSK transmitter	■ **Refer to specific hardware specifications** • **value displayed in white**—signal level is nominal • **value displayed in amber**—signal level is marginally too high or too low • **value displayed in red**—signal level is unacceptably too high or too low
Delay	The round-trip delay, in microseconds, between the DHCT and the modem at the headend or hub that is used to determine when to transmit the slotted-aloha packets **Note:** Slotted-aloha packets are used to assign periods of time or slots when the DHCT can transmit without interfering with other DHCTs on the same hub	■ **[Integer ≥ 0]**
Retrans	The number of retransmissions (likely due to noise or collisions) of the same data since the DHCT was last booted	■ **0**—desired value ■ **non-0**—indicates a potential issue with a reserve plant

Current QAM

Important: On the Explorer 8000, 8000HD, 8300, or 8300HD Home Entertainment Servers, the descriptions in the Current QAM section of the RF Status diagnostic screen always refer to the first tuner. Also, the information displayed in the Current QAM descriptions is not necessarily related to what is displayed on the main TV screen or the PIP. The only way to verify which tuner is tied to an output is to change channels on that output (main or PIP) and observe the frequency and modulation changes that occur in the RF Status diagnostic screen and the Second Tuner Status diagnostic screen. To view the status of the Second Tuner, go to ***Second Tuner Status Diagnostic Screen*** (on page 133).

Field Name	Description	Possible Values
Freq	The frequency (Freq) of the tuned QPSK receiver (MHz)	■ **[Dependent upon setting]**
Tuning Mode	The current mode of the inband tuner	■ **QAM-64** ■ **QAM-128** ■ **QAM-256** ■ **Analog** The following is a list of conditions for the possible modes that are placed after the specific tuner mode: • **A**: inband tuner is in the A mode • **B**: inband tuner is in the B mode • **s**: inband tuner is scrambled **Example: QAM-256Bs**
Status	The status of the receiver in regards to receiving valid data	■ **Locked-**—tuner is locked ■ **Unlocked**—tuner is not locked
Level[3]	The approximate received signal level	■ **-8 – +8 dBmV (value displayed in white)**—signal level is nominal ■ **>+8 or <-8 dBmV (value displayed in amber)**—signal level is marginally too high or too low ■ **<Range or >Range (value displayed in red)**—signal level is unacceptably too high or too low

[3] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.

Field Name	Description	Possible Values
S/N[4]	The approximate signal noise ratio (dB) **Note:** The S/N ratio only applies for QAM data channels.	■ **QAM-64**-28 dB – 34 dB (minimum: 25 dB) ■ **QAM-256**—32 dB – 34 dB (minimum: 30 dB) ■ **n/a**-not applicable on this DHCT
Seconds[5]	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]**
Corr Bytes[5]	The number of bytes received in error that have been successfully corrected by the forward error correction (FEC) code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present.
Uncor Blks[5]	The number of data blocks received in error that were not successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Important:** If incrementing rapidly, picture freezing or macroblocking may be present
Errs Avg/Inst[5]	Two unique numbers that describe data errors **First Number**—the average number of errors during the time the frequency was locked **Second Number**—the number of errors since the last time the screen was refreshed	■ **[Integer ≥ 0 / Integer ≥ 0]**
EQ Gain	The QAM equalizer gain (EQ Gain) on QAM data channel **Note:** The EQ Gain parameter is only applicable on QAM data channels.	■ **0.9 – 1.0 (value displayed in white)**—signal level is nominal ■ **0.8 and 1.1 (value displayed in amber)**—signal level is marginally too high or too low and required you to correct the signal problem ■ **<0.8 or >1.1 (value displayed in red)**—serious signal problem that needs immediate attention

[4] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.

[5] This field applies to QAM Data Channels only. It does not apply to analog channels.

PowerKEY Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the PowerKEY Information diagnostic screen. You can view this screen to obtain information about the PowerKEY encryption.

Performing Tasks

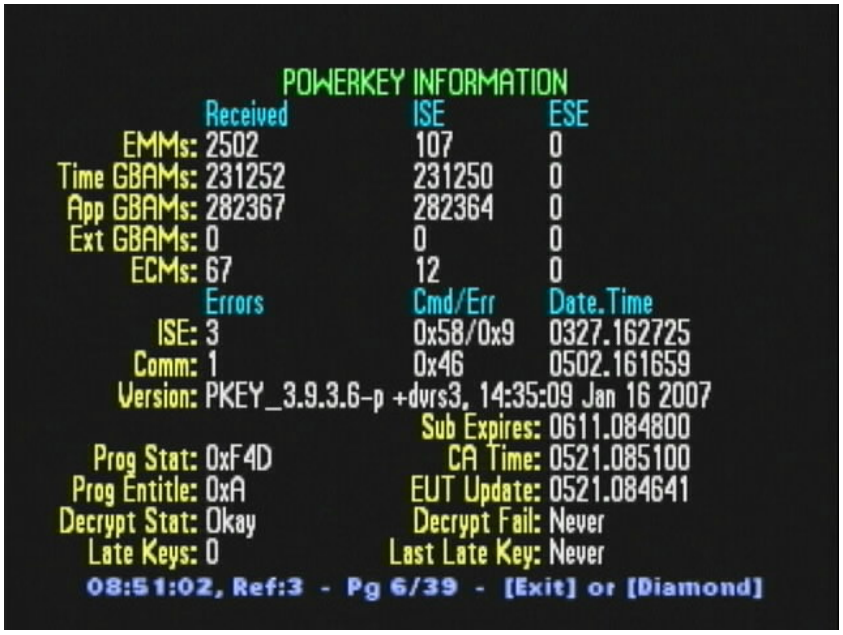
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the total number of messages and type of messages received by the DHCT
- View the number of messages validated by the ISE and the ESE components
- Verify if the Sub Expires date is at least 30 days ahead of the current date
- Determine the encryption status for a program

Screen Components

- Received, ISE, and ESE
- Errors, Cmd/Err, and Date.Time
- Miscellaneous Fields

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Received, ISE, and ESE Parameters

This section contains statistics for the various message types that can be received. Messages are accumulated and displayed for the following categories:

- **Received**—the total number of messages for each message type received by the DHCT
- **ISE**—the number of messages for each message type that is validated by the ISE
- **ESE**—the number of messages for each message type that is validated by the ESE (smart card)

Field Name	Description	Possible Values
EMMs	Counters for EMMs	■ **[Integer ≥ 0]** **Note:** Increments when authorization is sent to DHCT.
Time GBAMs	Counters for time GBAMs	■ **[Integer ≥ 0]** **Note:** Increments over a period of time as provisioned on the DNCS.
App GBAMs	Counters for application GBAM messages	■ **[Integer ≥ 0]** **Note:** Increments over a period of time as provisioned on the DNCS.
Ext GBAMs	Counters for extend event GBAM messages	■ **[Integer ≥ 0]** **Note:** Changes when an event (PPV/IPPV [interactive PPV]) is extended.
ECMs	Counters for entitlement control messages (ECMs) (smart cards)	■ **[Integer ≥ 0]** **Note:** Increments when ECMs are received.

Errors, CMD/Err, and Date.Time

This section contains error statistics for the secure microprocessor. Error statistics are accumulated and displayed for the following categories:

- **Errors**—the number of errors that have occurred with the ISE (secure micro), Comm (Communication with the secure microprocessor), or the version
- **CMD/Err**—the last error that occurred with the ISE, Communication with the secure microprocessor, or the version. If no errors have occurred, then these values are zero
- **Date.Time**—the date and time when the last error occurred for the ISE, Comm, or the version. Never appears if there are no errors

Field Name	Description	Possible Values
ISE	Statistics for the ISE	■ **0**—no errors present ■ **[non-0]**—indicates EMMs have expired
Comm	Statistics for the communications with the secure microprocessor	■ **0**—no errors present ■ **[non-0]**—indicates secure element detected on error

Miscellaneous Fields

Field Name	Description	Possible Values
Version	PowerKEY software version	■ **[Software-dependent]** **Example:** PKEY_3.9.3.6-p +dvrs3, 09:29:29 Nov 20 2007
Prog Stat	Digital PID on which ECMs associated with the current program are received (hexadecimal number)	■ **0**—program is not encrypted or scrambled (in the clear) ■ **[non-0]**—encryption issue has occurred
Prog Entitle	Current entitlement ID for which the current program is authorized (hexadecimal number)	■ **0**—program is not encrypted or scrambled (in the clear) ■ **[non-0]**—encryption issue has occurred

Field Name	Description	Possible Values
Decrypt Stat	Status of the decryption	■ **Blacked Out**—DHCT is authorized to receive program, but program is blacked out in geographical area ■ **ECM Strm Err**—Internal error condition occurred within the QAM broadcasting the current program ■ **No Longer Auth**—DHCT is no longer authorized for program ■ **Okay**—current decryption status is okay (decrypting) or program is in the clear (see Prog Stat above)
Late Keys	Number of times that a program key decryption operation occurred after the DHCT received the program data **Note:** MPEG decoding artifacts (macroblocks) seen concurrent with these errors may be attributed to this condition.	■ **0**—encryption is OK ■ **[non-0]**—encryption issue has occurred
Sub Expires	Date and time that the subscription authorizations expire (MMDD.hhmmss)	■ **[Time]** **Notes:** • Subscription authorizations generally expire 20 to 30 days from the previous renewal date. • A date less than 20 days into the future indicates a problem. ■ **Expired**—subscription is expired
CA Time	Current authenticated time received through the GBAM (MMDD.hhmmss)	■ **[Time]** **Note:** This value matches the current time to the nearest minute.
EUT Update	Last time the DHCT received an update to the entitlement unit table (EUT Update) from the DNCS (MMDD.hhmmss)	■ **[Time]** **Notes:** • Time is updated according to system activity (typically a few times a day). • All DHCTs should reflect the same time.
Decrypt Fail	Time of the last program decryption failure (MMDD.hhmmss)	■ **[Time]** ■ **Never**—no decryption failures

Field Name	Description	Possible Values
Last Late Key	Time that the last late key occurred (MMDD.hhmmss)	■ **[Time]** ■ **Never**—no late keys

IPPV Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the IPPV Information diagnostic screen. You can view this screen to obtain information about IPPV purchases.

Performing Tasks

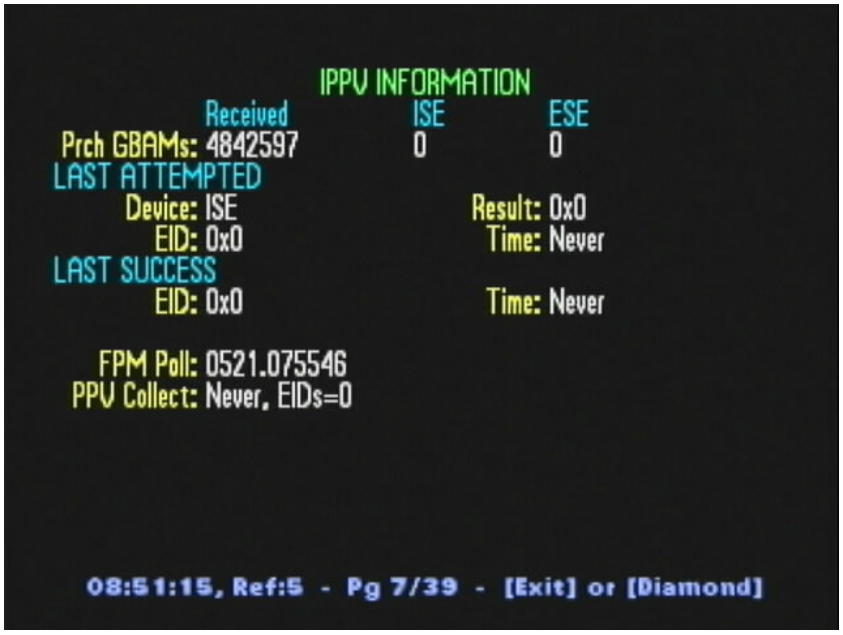
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the total number of Purchase GBAMs received and accepted by the DHCT
- Verify status information about the IPPV purchases
- Confirm the last *attempted* and *successful* IPPV purchase
- Verify if the DHCT has been polled

Screen Components

- Received, ISE, ESE
- Last Attempted
- Last Success

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Received, ISE, ESE

Field Name	Description	Possible Values
Received	The total number of purchase GBAMs received by the DHCT	■ **0**—issue with GBAMs ■ **[Integer > 0]**
ISE	The number of purchase GBAMs accepted by the ISE	■ **0**—issue with GBAMs ■ **[Integer > 0]**
ESE	The number of purchase GBAMs accepted by the ESE (smart card)	■ **0**—unless using a secure card

Last Attempted

The Last Attempted section includes a description of the last attempt to purchase an IPPV event. The last attempt to purchase can include an accepted or an unaccepted purchase.

Field Name	Description	Possible Values
Device	The purchase device used for last purchase attempt	■ **ESE** ■ **ISE**
EID	The entitlement identification of the attempted purchase	■ **[Hexadecimal number]**
Result	The result code for the purchase attempt	■ **[Hexadecimal number]**
Time	The date and time of attempted purchase (MMDD.hhmmss)	■ **[Time]** ■ **Never**—no attempted purchase

Last Success

The Last Success section includes data about the last successful IPPV event purchase.

Field Name	Description	Possible Values
EID	The EID value for the last successful purchased event	■ **[Hexadecimal number]**
Time	Date and time of purchase (MMDD.hhmmss) **Note: Never** will appear in the Time field if there are no purchases	■ **[Time]** ■ **Never**—no purchases
FPM Poll	The date and time of the last forward purchase message poll (FPM Poll) request (MMDD.hhmmss)	■ **[Time]** ■ **Never**—no request sent
PPV Collect	The status of the PPV event collection (Indicates the time for the last and next FPM poll, as well as the number of EIDs)	■ **[Timestamp, Reply@, EIDs=x]** • **Timestamp**—last time DHCT was polled to collect PPV purchases; displays either: • **[MMDD.hhmmss]**—date and time of collection • **Never**—no collection made • **Reply@**—time the DHCT replied to the poll • **[MMDD.hhmmss]**—date and time of reply • **[Empty Field]**—no reply • **EIDs=x**—number of EIDs (x) for uncollected purchase events • **[EIDs=0]**—all purchase events collected • **EIDs=[Integer > 0]**—only lists up to 20 EID values for events **Note:** If the EID value is greater than 20, additional purchased events are stored and not displayed

QPSK SIL Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the QPSK SIL (Signaling Interface Layer) Information diagnostic screen. You can view this screen to verify various forward and reverse path statistics for the QPSK receiver of the DHCT.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify the number of individual data packets received
- Determine if transport packets were aborted
- Verify if there is a packet present in the receive buffer
- Determine if a channel is enabled

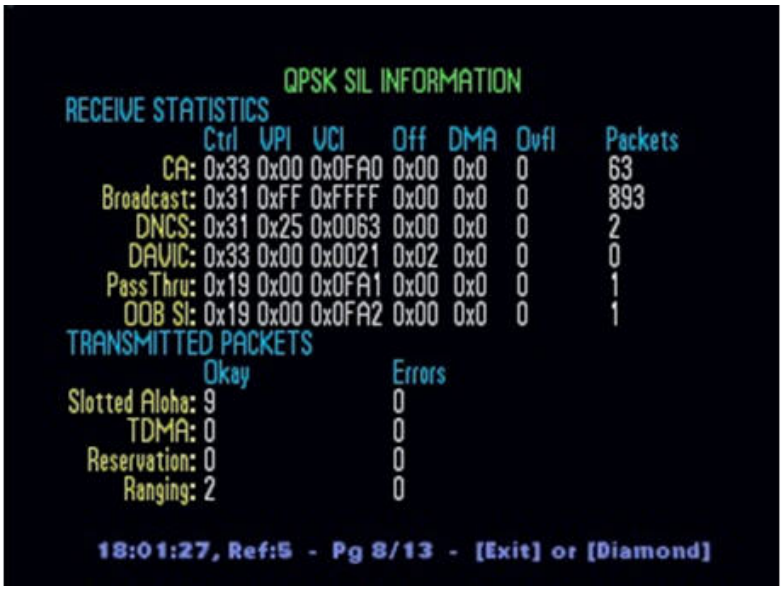
Screen Components

Note: The QPSK SIL Information diagnostic screen differs for Explorer 2000 DHCTs and all other Explorer DHCTs. The screen components for all QPSK SIL Information screens are the same. Only the fields with the Receive Statistics and the Transmitted Packets tables differ for Explorer 2000 DHCTs.

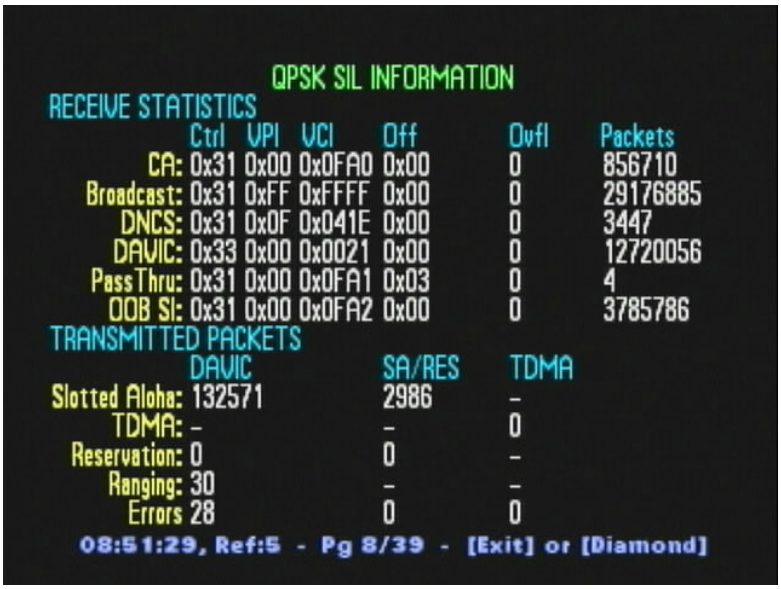
- Receive Statistics
- Transmitted Packets

Examples:

- Screen for an Explorer 2000 DHCT



- Screen for all Explorer DHCTs *except* Explorer 2000 DHCTs



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Receive Statistics

The Receive Statistics section displays the QPSK forward path data statistics for the following data channels that are included within the screen.

- **CA**—the channel containing conditional access data
- **Broadcast**— the channel containing data that is broadcast to multiple DHCTs
- **DNCS**—the channel that the DNCS uses to communicate with the DHCT
- **DAVIC**—the channel used for the DAVIC connection
- **Pass Thru**—the channel on which the DHCT receives one-way pass-through messages
- **OOB SI**—the channel containing out-of-band (OOB) SI

Field Name	Description	Possible Values
Ctrl	The value of the "channel" control register	■ **[Bit 0 set]**—indicates channel is enabled (hexadecimal value)
VPI	The value of the "channel" asynchronous transfer mode (ATM) hardware filter	■ **[Hexadecimal number]**
VCI	The value of the "channel" ATM hardware filter	■ **[Hexadecimal number]**
Off	The channel "hardware filter" offset into the data stream	■ **[Hexadecimal number]**
DMA **Note:** *Only* appears on Explorer 2000 DHCTs.	The value of the "channel" direct memory access (DMA) status register	A hexadecimal number with bits defined as follows: ■ **0x4:** READ PEND—PTV stream read pending flag—PowerTV is trying to read data from DMA channel ■ **0x2:** PKT AVAIL—Hardware data available flag—DMA layer indicates the presence of a packet in the receive buffer ■ **0x1:** OVERFLOW (or initially, channel DISABLED)—DMA driver detected a buffer overflow and has temporarily stopped the channel

Field Name	Description	Possible Values
Ovfl	The number of DMA overflows that occurred on the channel	■ **0** ■ **[Very low number]** **Note:** A higher number indicates a problem.
Packets	The number of individual data packets received; typically represents a single Ethernet frame	■ **[Integer ≥ 0]**

Transmitted Packets

The Transmitted Packets section displays the QPSK reverse path data statistics for the following transmission types that are included in the diagnostic screen:

- **Slotted Aloha**—slotted-aloha style transmission values and are typically DAVIC command and control messages or small reservations App messages
- **TDMA** (Time Division Multiple Access)—TDMA values that are used by a constant bandwidth connection
- **Reservation**—reserved slot transmissions; most applications and some DAVIC messages are sent this way
- **Ranging**—number of calibration transmissions between the QPSK modem and the DHCT performed during DAVIC sign-on that achieves the RDC power level
- **Errors**—number of transmit packets aborted with a hardware error or time out error

The following table describes the field names and values within the Transmitted Packets section.

Note: When the status of the transmitted packets field is not available, a dash (-) appears.

Field Name	Description	Possible Values
Okay **Note:** *Only* appears on Explorer 2000 DHCTs.	The number of packets transmitted for the type sent without error	■ **[Integer ≥ 0]** ■ **(dash)**—status is unavailable
Errors **Note:** *Only* appears on Explorer 2000 DHCTs.	The number of transmit packets aborted with a hardware error or time out error	■ **[Integer ≥ 0]** ■ **(dash)**—status is unavailable
DAVIC **Note:** This field does *not* appear on Explorer 2000 DHCTs.	The number of transmit packets across a DAVIC connection	■ **[Integer ≥ 0]** ■ **(dash)**—status is unavailable
SA/RES **Note:** This field does *not* appear on Explorer 2000 DHCTs.	The number of transmit packets for slotted-aloha style transmissions	■ **[Integer ≥ 0]** ■ **(dash)**—status is unavailable
TDMA **Note:** This field does *not* appear on Explorer 2000 DHCTs.	The number of transmit packets for TDMA transmissions	■ **[Integer ≥ 0]** ■ **(dash)**—status is unavailable

PPV Service Summary Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the PPV Service Summary diagnostic screen. You can view this screen to verify the status of the PPV service and the PPV event for the currently tuned channel.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

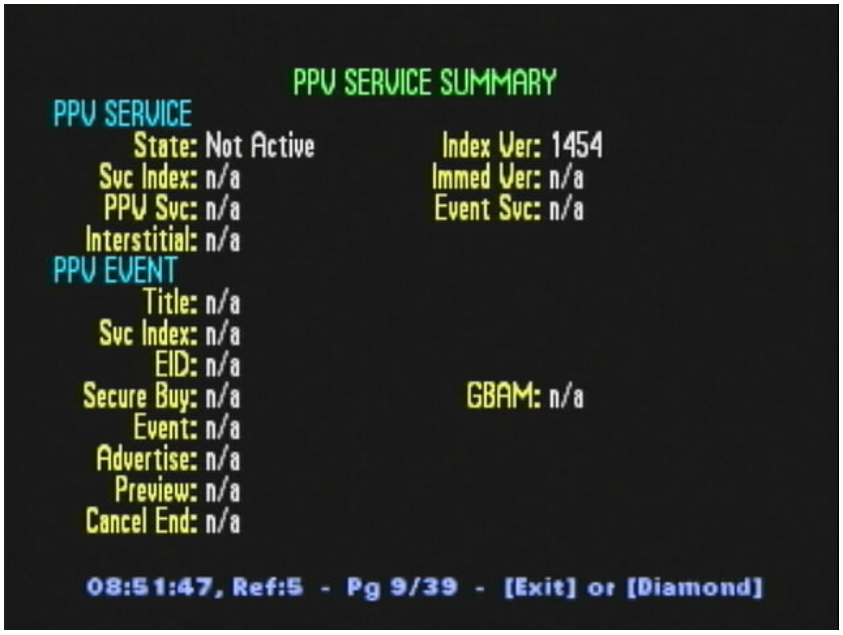
- Identify if a PPV has been purchased
- Determine if a PPV event is expired
- Identify the status of a barker
- Verify the purchase attempt for a PPV event

Screen Components

- PPV Service
- PPV Event

Example:

Note: The DHCT must be tuned to a PPV channel for information to display on this diagnostic screen.



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

PPV Service

The PPV Service section displays information about the PPV service on the currently tuned PPV channel.

Note: If the status of the State field is **Not Active**, then **n/a** appears in all of the fields within the PPV Service Summary diagnostic screen.

Field Name	Description	Possible Values
State	The present state of the PPV service on the tuned channel	■ **Countdown**—an event has been purchased and is about to start, and countdown barker is displayed ■ **Expired Event**—event purchase window has closed ■ **Interstitial**—no advertised event and interstitial event is displaying ■ **Invalid Event**—current event definition is invalid (for example, DNCS DHCT error) ■ **No Event Barker**—no event advertised, no interstitial service defined, and no barker displayed ■ **Not Active**—inactive PPV service ■ **Preview Barker**—event has not been purchased and the free preview period is in effect ■ **Preview Ended**—no event purchased; free preview period has ended ■ **Problem Barker**—problem with the PPV service (problem number displayed on the barker) ■ **Purchase Barker**—event can be purchased and barker for that event is displayed ■ **Subscription**—program is a subscription PPV service ■ **Thank You**—event has been purchased and the Thank You for Purchasing barker appears ■ **Waiting for Data**—DHCT is waiting for data about the PPV service to arrive from DNCS ■ **Watching Event**—current event is purchased and active

Field Name	Description	Possible Values
Svc Index	A representation of the service internally as an index number **Note:** This field should match the Svc Index in the PPV Event section.	■ **[Hexadecimal value]** ■ **n/a**—PPV event not showing **Note:** This value is used for Cisco troubleshooting purposes.
PPV Service	The service associated with the PPV channel	■ **[Channel-dependent]** ■ **n/a**
Interstitial	The service that is shown when no event can be advertised	■ **None** ■ **n/a**—not applicable
Index Ver[6]	The version of the PPV index file that the DHCT has in memory	■ **[Dependent on index version]** **Note:** All DHCTs should display the same version of the PPV index file.
Immed Ver[6]	The version of the PPV immediate file that the DHCT has in memory	■ **[Dependent on PPV immediate file]** **Note:** All DHCTs should display the same version of the PPV index file.
FECM Ver[7]	A description of the forward error correction method (FECM) that is in use	■ **[Dependent on FECM file]** ■ **n/a**—FECM file is not applicable
Event Svc	The service associated with the PPV event	■ **[Dependent on PPV channel]** ■ **n/a**—not tuned to PPV event

[6] There may be a short period of time (only a few seconds) when the Index Ver and the Immed Ver fields do not match as new versions are loaded. However, both versions must match or PPV will not operate properly.

[7] The FECM Ver field only appears on diagnostic pages for Explorer 1850, 4200, and 4200HD set-tops.

PPV Event

The PPV Event section includes information about the PPV event on the currently tuned PPV channel.

Field Name	Description	Possible Values
Title	The title of the PPV event	■ **[Dependent on PPV channel]** ■ **n/a**—PPV event not showing
Svc Index	A representation of the service internally as an index number **Note:** This field should match the Svc Index in the PPV Service section.	■ **[Hexadecimal value]** ■ **n/a**—PPV event not showing
EID	The EID associated with the purchase of an event	■ **[Hexadecimal value]** ■ **n/a**—PPV event not showing
Secure Buy	The purchase state for the PPV event	■ **n/a**—PPV event not showing ■ **Pending**—purchase is not allowed because buy window is not yet opened ■ **Problem PPV#**—problem occurred when attempting to purchase event; # is the error number associated with the error ■ **Processing**—purchase attempt is being processed ■ **Ready**—purchase is accepted and event is viewable
Event	The window of time the PPV event is shown (hh:mm-hh:mm am/pm)	■ **[Time]** **Example:** (1:00-3:30pm) ■ **n/a**—PPV event not showing
Advertise	The window of time the PPV event is advertised to those who have not yet purchased the event (hh:mm-hh:mm)	■ **[Time]** **Example:** 1:00-3:30pm ■ **n/a**—PPV event not showing
Preview	The window of time the PPV event is appearing free (hh:mm-hh:mm	■ **[Time]** **Example:** 1:00-3:30pm ■ **n/a**—PPV event not showing
Cancel End	The time after which PPV event cancellations are no longer accepted (hh:mm am/pm)	■ **[Time]** (12-hour time format) ■ **n/a**—PPV event not showing

Field Name	Description	Possible Values
GBAM	The time that GBAMs for the PPV event appear on the network (hh:mm am/pm)	■ **[Time]** (12-hour time format) ■ **n/a—**PPV event not showing

Digital Video Status Diagnostic Screen

Information

This section provides an overview of the Digital Video Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains all of the status information applicable to decoding digital video on a single screen.

Performing Tasks

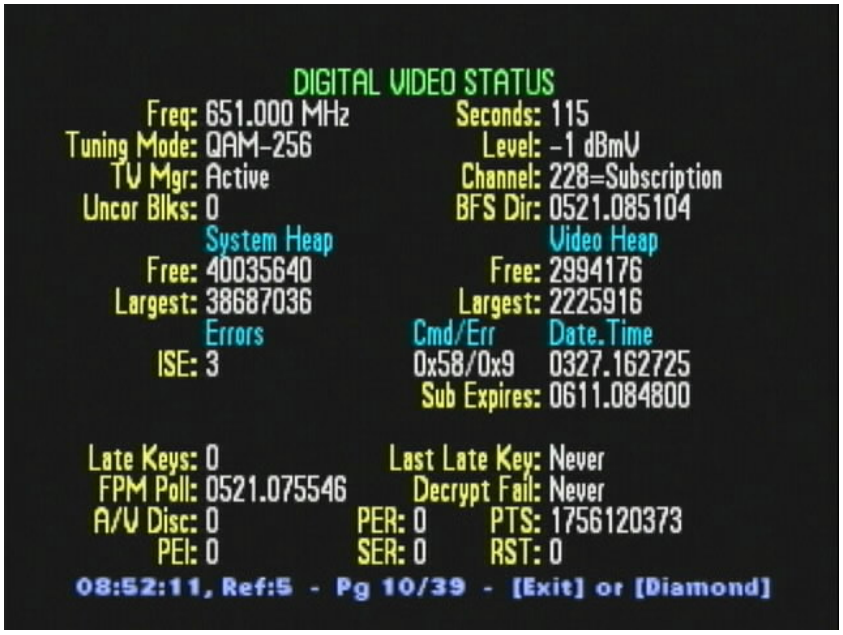
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the decoding of digital video on a single screen
- Videotape this screen and then replay the tape later to determine the cause of any decoding issues

Screen Components

- Statuses
- System Heap and Video Heap
- Errors, Cmd/Err, and Date.Time

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Statuses

Field Name	Description	Possible Values
Freq	The frequency to which the QAM is tuned (MHz)	■ **[Integer > 0]**
Tuning Mode	The tuning mode of the inband tuner	■ **Analog** **Note:** If "sap" or "stereo" is detected, one of the following displays in the Tuning Mode field of the diagnostic screen: • **Analog (sap)** • **Analog (stereo)** • **Analog (sap,stereo)** ■ **QAM-64** ■ **QAM-128** ■ **QAM-256**

Field Name	Description	Possible Values
TV Mgr	The state of the resident application's TV tuner resource according to the TV Manager component of the PTV OS. If the resident application is not using the tuner, the TV Mgr refers to the state of the active resource using the tuner (if any).	■ **Active**—resident application's resource is currently active (in use/tuned) ■ **Denied**—tuning request for the resource was denied ■ **Inactive**—TV Mgr is *not* is use; TV Mgr is available to process requests ■ **Notified**—TV Mgr has instructed the resident application to release the resource on the tuner so that the TV Mgr can use the tuner for a different request ■ **Suspended**—resident application's tuner resource has been suspended ■ **Suspending**—TV Mgr has notified the owner of the currently active resource to suspend so that it can use the tuner for another request ■ **Unknown**—received an unknown state from the TV Manager ■ **Waiting PAT**—TV Mgr is waiting for the PAT to arrive on a QAM channel before tuning request can complete ■ **Waiting PMT**—TV Mgr is waiting for the PMT to arrive on a QAM channel before tuning request can complete
Uncor Blks	The number of data blocks received in error that were not successfully corrected by the FEC code	■ **[Integer ≥ 0]** **Note:** This value should increment slowly. **Important:** If incrementing rapidly, the picture is freezing or macroblocking may be present. ■ **n/a**—tuned to an analog channel
Seconds	The number of seconds that the frequency has been locked	■ **[Integer ≥ 0]** ■ **n/a**—tuned to an analog channel

Field Name	Description	Possible Values
Level	The approximate received signal level (dBmV)	■ **-8 to +8 (value displayed in white)**—signal level is nominal ■ **>+8 or <-8 (value displayed in amber)**—signal level is marginally too high or too low; you should correct the signal problem ■ **<Range or >Range (value displayed in red)**—signal level is too high or too low ■ **n/a**—tuned to an analog channel
Channel	The channel number and, optionally, a status for the tuned channel	■ **[Channel]=Clear to Air-Unencrypted** ■ **[Channel]=Free Preview** ■ **[Channel]=n/a** (if tuned to a PPV channel) ■ **[Channel]=Purchased-Pay-per-view** ■ **[Channel]=Subscription** ■ **[Channel]=Unauthorized**
BFS Dir	The date and time that the BFS directory was last read (MMDD.hhmmss)	■ **[Time]**

System Heap and Video Heap

Field Name	Description	Possible Values
Free	The amount of free memory (memory not in use)	■ **[Integer ≥ 0]**—based on the applications and data on the DHCT
Largest	The size of the largest contiguous free block of memory	■ **[Ideally an integer ≥ 200]** **Note:** This value varies based on the applications and data on the DHCT.

Errors, Cmd/Err, and Date.Time

Field Name	Description	Possible Values
ISE	The number of PowerKEY errors that have occurred	■ **0**—expected value ■ **[Integer > 0]**—issue with encryption on channel
Cmd/Err	The last error that occurred	■ **[Hexadecimal number = 0]**—no errors occurred ■ **[Hexadecimal number > 0]**—errors have occurred
Date.Time	The time when the last error occurred (MMDD.hhmmss)	■ **[Date.Time]** ■ **Never**—no errors occurred
Sub Expires	The date and time that the subscription authorizations expire (MMDD.hhmmss)	■ **Expired**—subscription has already expired ■ **[Time]** **Notes:** • Time less than 20 to 30 days into the future indicates a problem. • Subscription authorizations generally expire 30 days from the last time they were renewed.
Late Keys[8]	The number of times that a program key decryption operation occurred after the DHCT received the program data	■ **0**—desired value ■ **[Integer > 0]**—issue with decryption
FPM Poll	The date and time of the last FPM request (MMDD.hhmmss)	■ **[Date.Time]** ■ **Never**—no request was sent
A/V Disc[8]	The sum of the discontinuity errors encountered on either the audio or video streams that have occurred since the current stream was tuned **Note:** Discontinuity errors indicate that packets were transmitted out of order or with a gap between them, and indicate data loss.	■ **0**—desired value ■ **[Integer > 0]**—indicates an issue ■ **n/a**—tuned to an analog channel
PEI[8]	The number of errors in the MPEG stream before reaching the BIP	■ **0**—desired value ■ **[Integer > 0]**—indicates an issue ■ **n/a**—tuned to an analog channel

[8] Occasional changes in these values are normal. If this value is updated with each screen update or in large steps (greater than 10) per screen update, contact Cisco Services.

Field Name	Description	Possible Values
Last Late Key	The time that the last late key occurred (MMDD.hhmmss)	■ **[Date.Time]** ■ **Never**—no late key
Decrypt Fail	The time of the last program decryption failure (MMDD.hhmmss)	■ **[Date.Time]** ■ **Never**—no decryption failure
PER[8]	The number of PERs reported by the MPEG decoder chip (MMDD.hhmmss)	■ **0**—desired value ■ **[Integer > 0]** ■ **n/a**—tuned to an analog channel
SER[8]	The number of SERs reported by the MPEG decoder chip	■ **Digital**—0 ■ **n/a**—tuned to an analog channel
PTS	A presentation time stamp that changes each time the screen refreshes	■ **[UNIX format**—number should change each time the screen refreshes **Important:** If this number does not change each time the screen refreshes, then video may have been lost. ■ **n/a**—tuned to an analog channel
RST[8]	The number of times the software driver has restarted the MPEG decoding process	■ **0**—desired value ■ **[Integer > 0]** **Note:** If the RST value is incrementing, then a possible source issue may exist. Please contact Cisco Services for assistance. ■ **n/a**—tuned to an analog channel

[8] Occasional changes in these values are normal. If this value is updated with each screen update or in large steps (greater than 10) per screen update, contact Cisco Services.

VOD Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the VOD Information diagnostic screen. You can view this screen to verify status information applicable to VOD services and sessions.

Performing Tasks

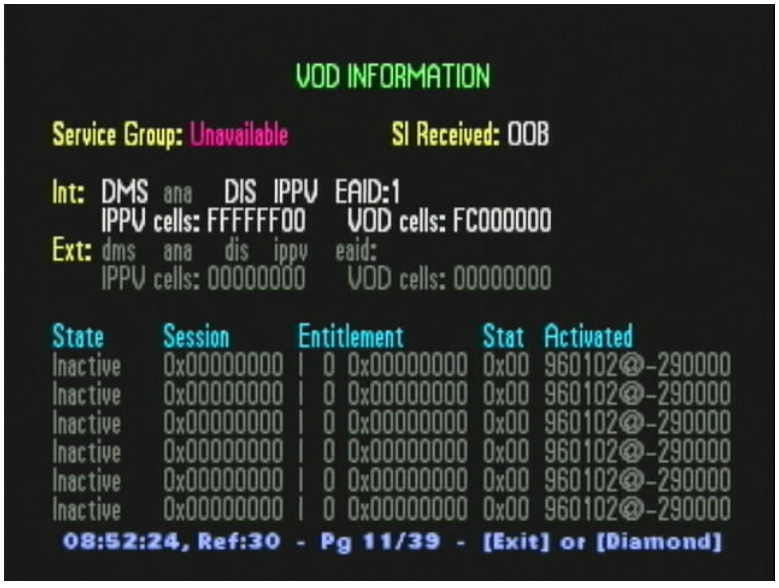
By accessing this diagnostic screen, you can perform the following tasks:

- Confirm the status of the internal and external VOD services
- Verify the status of the VOD sessions
- Determine if SI data is inband or out-of-band
- Verify that there is an EID associated with the VOD session

Screen Components

- Service Group
- SI Received
- Internal and External Secure Micro-configuration
- VOD Statistics

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Service Group and SI Received

This section displays the service group information and the status of the SI received. The service group and SI received are detected by the DHCT.

Field Name	Description	Possible Values
Service Group	The service group and mapfile version from the BFS	■ **Unavailable**—service group ID is not available **Note:** The OS is not responsible for reporting service group data.
SI Received	The indicator that describes how SI data is received	■ **OOB**—out-of-band (QPSK)

Internal and External Secure Micro Configuration

This section displays the service group information and the status of the SI received. The service group and SI received are detected by the DHCT.

Field Name	Description	Possible Values
DMS	The status of the digital multicast services (DMS) enabled flag from the DNCS	■ **DMS**—enabled ■ **dms**—not enabled **Note:** Enable "dms" to view secure digital services.
ANA	The status of the analog service (ANA) enabled flag	■ **ANA**—enabled ■ **ana**—not enabled **Note:** Enable "ana" to descramble analog services on DHCTs with a descrambler.
DIS	The status of the digital interactive services (DIS) enabled flag (VOD)	■ **DIS**—enabled ■ **dis**—not enabled **Note:** Enable "dis" for VOD and xOD to function.
IPPV	The status of the IPPV purchase enabled flag	■ **IPPV**—enabled ■ **ippv**—not enabled
EAID	The EAIDs that have been installed for the ISE or ESE into the DHCT	■ **EAID <ID number of agent>**—EAID received ■ **eaid**—EAID not received

Field Name	Description	Possible Values
IPPV cells	A bit map representation of the number of non-volatile storage cells available for PPV events	■ **FFFFFF00**—desired value **Note:** If FFFFFF00 does not appear, restage the DHCT.
VOD cells	The bit map representation of the number of non-volatile storage cells available for VOD events	■ **FC000000**—has type 8 EMMs needed for encryption ■ **00000000**—does not have type 8 EMMs needed for encryption

VOD Statistics

Field Name	Description	Possible Values
State	The status of the VOD session	■ **Active** ■ **Failed** ■ **Inactive** ■ **Terminated**
Session	The OS session ID number	■ **[Session ID]** (hexadecimal format)
Entitlement	The corresponding EAID and EID pair for the active VOD session	■ **[Entitlement ID]** (hexadecimal format)
Stat	The response code from the secure micro when it processes the authorization	■ **0x45**—active VOD session (hexadecimal format) ■ **0x00**—inactive VOD session (hexadecimal format)
Activated	The date and time when the session became active (YYMMDD@hhmmss or yymmdd@50000)	■ **[Time]** **Example:** 211230@190000 ■ **[Time, Inactive]** **Example:** 960101@-50000

Bootloader Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Host Bootloader Information diagnostic screen. Bootloader is a factory program loaded into the DHCTs to ensure reliable upgrades. You can view this screen to confirm the status of the Bootloader.

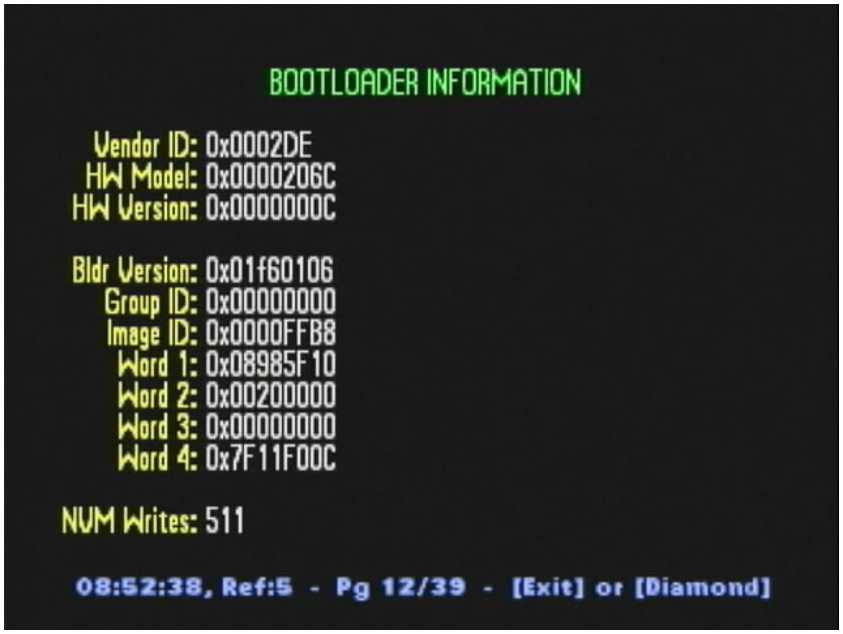
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Determine the version number of the PowerTV Bootloader
- Verify the vendor ID for the manufacturer of the DHCT
- Determine the identification number of the FLASH ROM image
- Determine the code version table (CVT) download group for the DHCT

Screen Components

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Notes:

- If **na** appears in all of the fields, then the Bootloader application has not been loaded on that DHCT.
- The Bldr Version Group ID, Image ID, Word, and NVM Writes fields are CVT-only fields.
- In the Word fields, resource descriptors are used to validate that new software can be used by the DHCT and, therefore, help prevent bad code from being loaded onto the DHCT.

Field Name	Description	Possible Values
Vendor ID	The vendor number defined by the manufacturer for the DHCT (hexadecimal format)	■ **[Manufacturer-dependent]—**last 6 digits are first 6 digits of MAC address for DHCT ■ **na—**Bootloader not loaded
HW Model	The hardware model for the DHCT (hexadecimal format)	■ **[Hardware model-dependent]** ■ **na—**Bootloader not loaded
HW Version	The version number of the hardware model	■ **[Hardware model-dependent]—**in hexadecimal format ■ **na—**Bootloader not loaded
Bldr Version	The software version for the PowerTV Bootloader (hexadecimal format)	■ **[Software-dependent]** ■ **na—**Bootloader not loaded
Group ID	The logical group that the DHCT has been assigned to	■ **0x00000000—**default group ID ■ **0x000000xx—**"xx" are two numeric values ■ **na—**DHCT does not support CVT download
Image ID	The image number currently loaded in FLASH ROM **Note:** The Image ID is determined by the DNCS. The same ROM image may display differently on different system hardware.	■ **[Hexadecimal Image ID]—**ID is created by the DNCS ■ **0x000000xx—**"xx" are two numeric values ■ **na—**Bootloader not loaded
Word 1	The first word of the resource descriptor	■ **[Text]—**hexadecimal format
Word 2	The second word of the resource descriptor	■ **[Text]—**hexadecimal format

Field Name	Description	Possible Values
Word 3	The third word of the resource descriptor	■ **[Text]—**hexadecimal format
Word 4	The fourth word of the resource descriptor	■ **[Text]—**hexadecimal format
NVM Writes	The number of writes to the NVM since the DHCT last booted	■ **[Integer > 0]** ■ **n/a—**Bootloader not loaded

SAM Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the SAM Information diagnostic screen. You can view this screen to determine which downloaded applications are present in memory and currently active.

Important: Data will only appear in this screen when third-party applications are implemented.

Performing Tasks

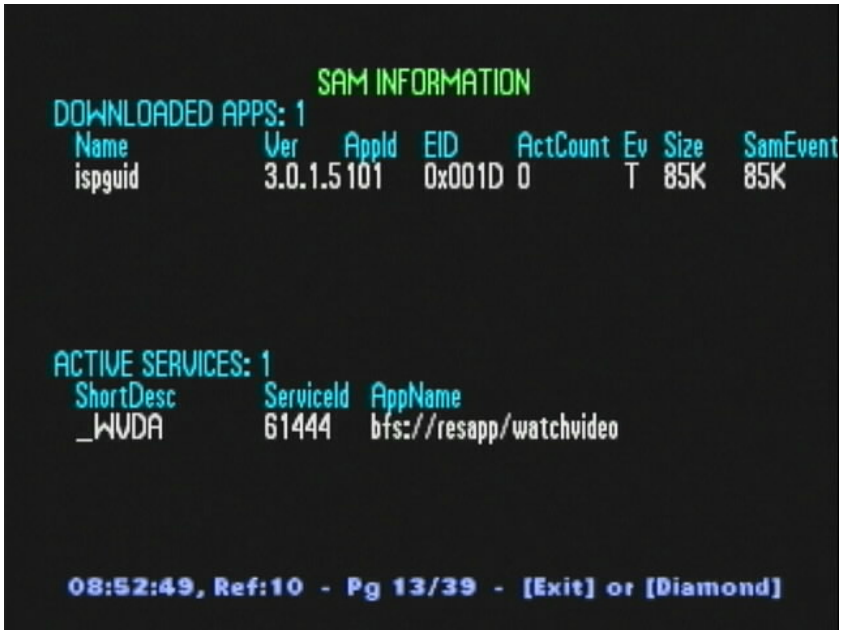
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the name of downloaded applications
- Determine what services are currently running
- Verify the EID required to run an application

Screen Components

- Downloaded Apps
- Active Services

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Downloaded Apps

This section provides information about applications that have been downloaded from the network and are currently present in memory.

Note: This section will not include data if a third-party application is not present.

Field Name	Description	Possible Values
Name	The name of the application	■ **[Application-dependent]**
Ver	The version of the application	■ **[Application-dependent]**
AppId	The ID number for the application	■ **[Assigned by OS]**
EID	The entitlement ID number required to run the application	■ **[Hexadecimal value]**
ActCount	The number of times the application has been activated since it was downloaded	■ **0**—application has not run ■ **> 0**—application has been run
Ev	An indication of whether or not an application uses SAM events	■ **F (false)**—does not use SAM events ■ **T (true)**—uses SAM events
Size	The file size of the application (K)	■ **[Application-dependent]**

Active Services

This section provides information about services that are currently running.

Field Name	Description	Possible Values
ShortDesc	A short description of the service	■ **[Alphanumeric text string]**—alphabetical text saved on the system
ServiceId	The ID associated with the service used by the SAM	■ **[Numeric ID]**—ID of service saved on the system
AppName	The full URL of the application	■ **[HTML address]**

SARA Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the SARA Information diagnostic screen. You can view this screen to obtain information about SARA. If SARA detects any unusual or failure conditions, the screen displays these conditions on the bottom half of the screen under the heading of **Software Anomalies**.

Performing Tasks

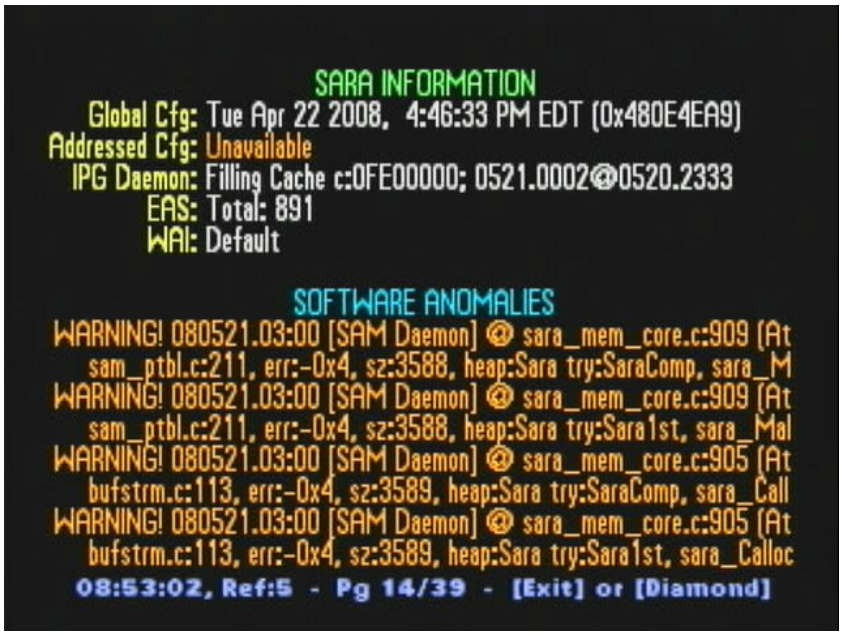
By accessing this diagnostic screen, you can perform the following tasks:

- Determine when the global configuration data was sent to the DHCT
- Determine when the DHCT-specific configuration data was created and sent to the DHCT
- Verify when the most recent IPG data was received by the DHCT

Screen Components

- SARA Information
- Software Anomalies

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Software Information

Field Name	Description	Possible Values
Global Cfg	The date and time that the global configuration data was created	■ **[Date, Time]**—ASCII and hexadecimal format ■ **Unavailable**—DHCT has not received any individually addressed configuration data
Addressed Cfg	Displays the date and time that the DHCT-specific configuration data was created and sent to the DHCT	■ **[Date, Time]**—ASCII and hexadecimal format ■ **Unavailable**—DHCT has not received any individually addressed configuration data
IPG Daemon	Displays information about the collection of IPG data from the network in the following format: Status|Cache State Indicator|Timestamp|Update Status	
	Status—a description of the current status for the IPG daemon	■ **Awaiting Update**—update notification received but updated data has not yet been read from BFS ■ **Filling Cache**—daemon attempting to cache 7 days of IPG data ■ **Freed Resources**—purged data by request ■ **Getting Data**—reading title and program data ■ **Getting Desc**—reading a file containing program text descriptions ■ **Getting Update**—reading updated data ■ **Idle/Waiting**—idle
	Cache State Indicator—displays bits that represent days of month that are currently cached into DHCT memory	■ **Idle/Waiting (never loaded)** ■ **0**—zero is never used ■ **Bit 1**—first day of month ■ **Bit 2**—second day of month **Example:** 0000C000 means the data was cached into DHCT memory for the 14th and 15th of the month

Field Name	Description	Possible Values
	Timestamp—(1st timestamp) the time when the most recently updated file was loaded into cache (MMDD.hhmm)	■ **[Time]**
	Timestamp—(2nd timestamp) the most recently updated file was read and displays initial load if no update notifications exists since the previous boot of the DHCT (MMDD.hhmm)	■ **initial load**—no updates have been read since the DHCT was rebooted ■ **@ [followed by the timestamp]**—the creation timestamp for the file most recently updated **Example:** 0000C000 means the data was cached into DHCT memory on the 14th and 15th of the month.
EAS	Information about the Emergency Alert System (EAS)	■ **Total**—total number of EAS messages received ■ **Last Load/Start**—load and start times for the last EAS message received by the DHCT (MMDD.hhmm)
WAI	Provides the current status location information within SARA **Note:** This field is controlled by third-party applications.	■ **Default** ■ **Enabled**

Software Anomalies

This section *only* includes messages when SARA detects unusual or failure conditions. The following messages may appear when SARA detects software anomalies.

Important: The presence of an anomaly does not necessarily indicate a problem with the DHCT. The DHCT may have detected an anomaly within the network or at the headend. If any anomalies appear, record the entire message, and then contact your system administrator or Cisco Services for further assistance.

QAM Channel Status Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the QAM Channel Status Information diagnostic screen. You can view this screen to review the status of various QAM channels for the Explorer DHCTs.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

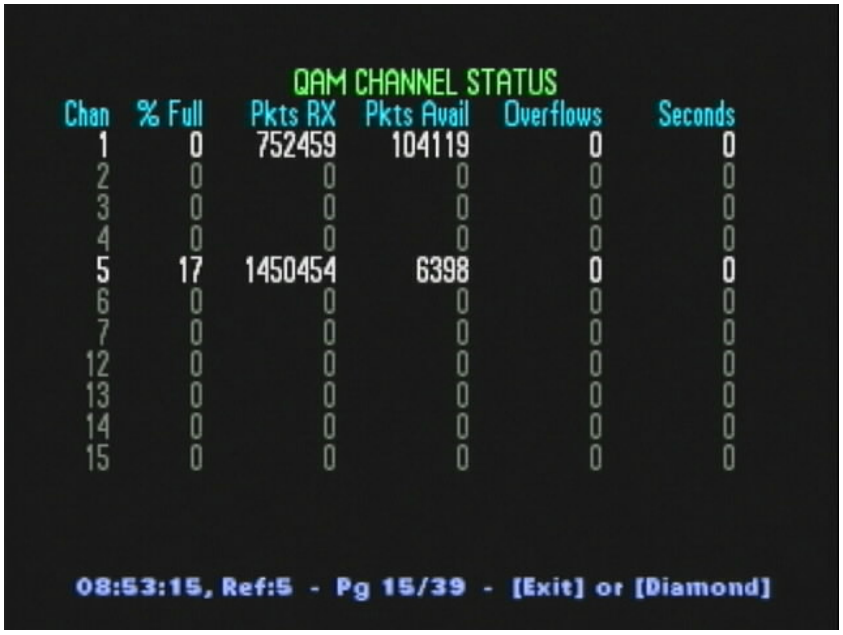
- Check the integrity of the QAM signal
- Determine the current capacity of QAM buffer
- Verify the total number of packets received since the QAM channel became active
- Determine the status of a QAM channel

Screen Components

The color of each row on the QAM Channel Status diagnostic screen represents one of the following status types for the channel:

- **Gray**—indicates an inactive channel
- **White**—indicates an active channel with a nominal current condition and no previous errors
- **Amber**—indicates an active channel with a nominal current condition, but previously had overflow errors
- **Red**—indicates an active channel that is presently in an overflow condition

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
Chan	The QAM channel number	■ **[Integer > 0]**
% Full	The percentage of the current QAM buffer that has already been filled	■ **[Integer ≥ 0]**—expressed as a percentage
Pkts RX	The total number of packets received since the channel became active	■ **[Integer ≥ 0]**
Pkts Avail	The total number of packets that passed all filtering and were made available to the consumer since the channel became active	■ **[Integer ≥ 0]**
Overflows	The total number of QAM buffer overflows that have occurred since the channel became active	■ **0 [or a very low value]—**desired value ■ **[Large value]—**contact Cisco Services
Seconds	The number of seconds that the channel has been active	■ **[Integer ≥ 0]**

QPSK Channel Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the QPSK Channel Status Information diagnostic screen. You can view this screen to verify the status of the host FDC QPSK receiver DMA channels for Explorer DHCTs.

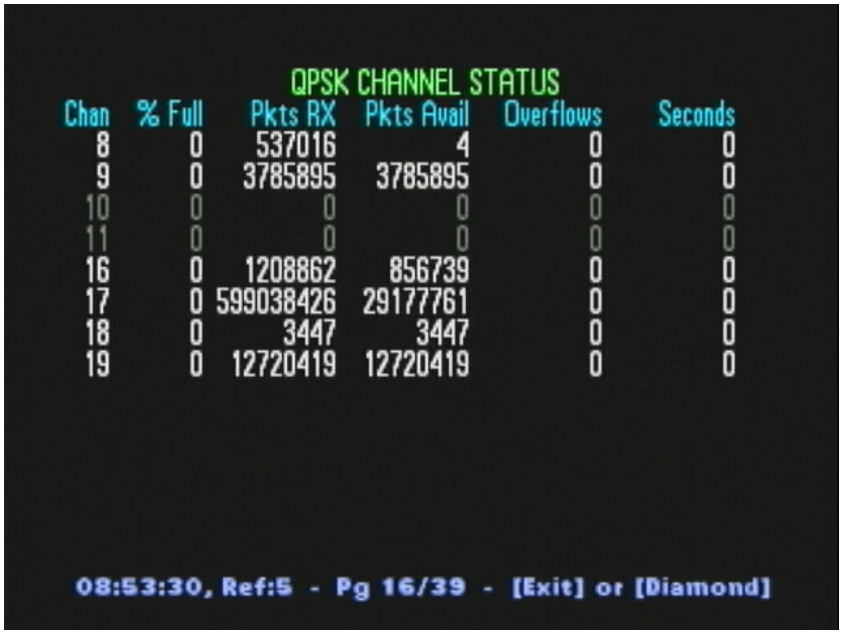
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Check the integrity of the QPSK signal
- Determine the capacity of the DMA buffer
- Verify the total number of packets received since the QPSK channel became active
- Determine the status of a QPSK channel

Screen Components

Example:



The color of each row on the QAM Channel Status diagnostic screen represents one of the following status types for the channel:

- **Gray**—indicates an inactive channel
- **White**—indicates an active channel with a nominal current condition and no previous errors
- **Amber**—indicates an active channel with a nominal current condition, but previously had overflow errors
- **Red**—indicates an active channel that is presently in an overflow condition

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
Chan	The DMA channel number	■ **[Integer > 0]**
% Full	The percentage of the current DMA buffer that has already been filled	■ **[Integer ≥ 0]**—expressed as a percentage
Pkts RX	The total number of packets received since the channel became active	■ **[Integer ≥ 0]**
Pkts Avail	The total number of packets that passed all filtering and were made available to the consumer since the channel became active	■ **[Integer ≥ 0]**
Overflows	The total number of DMA buffer overflows that have occurred since the channel became active	■ **0 [or a very low value]—**desired value ■ **[Large value]—**contact Cisco Services
Seconds	The number of seconds that the channel has been active	■ **[Integer ≥ 0]**

Component Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the Component Information diagnostic screen. You can view this screen to verify the software and driver versions installed on the DHCT.

Performing Tasks

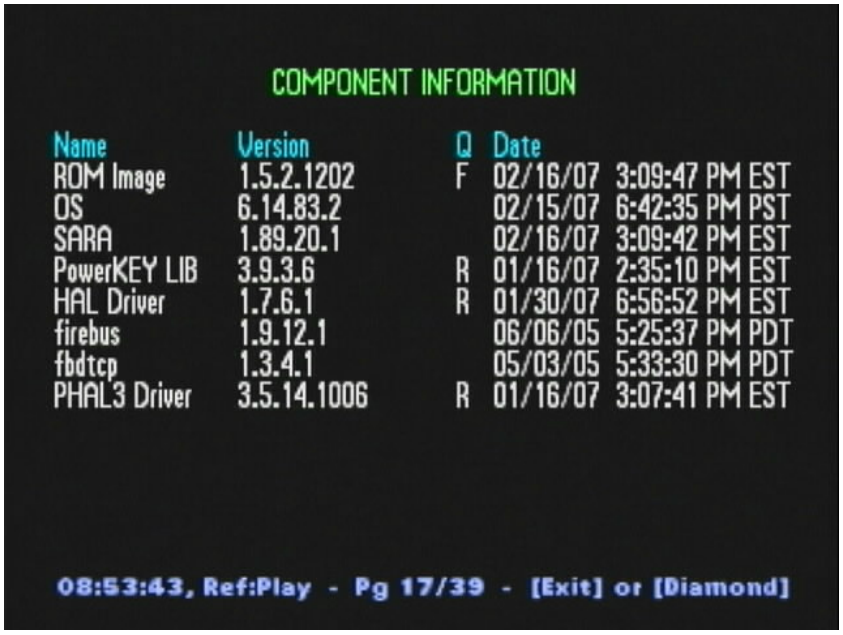
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the software and software version for components installed on the DHCT
- Verify release status for software and driver components installed on the DHCT
- Determine when a component was created

Screen Components

- Name
- Version
- Q (Quality)
- Date

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Name

Lists the name of the component installed on the DHCT.

Version

The Version section includes information about the versions of the various software components that are installed on the DHCT.

Quality

The Q (Quality) section includes information about the development or release status of the various software and driver components that are installed on the DHCT.

Field Name	Description	Possible Values
Q	The release status of the various software and driver components	**a (alpha)**—Indicates the software is in an alpha version
		b (beta)—Indicates the software is in a beta version
		d, D—Indicates the software is in a development version
		R—Indicates the software is in an officially released version

Date

The Date section includes the date that the component was created.

SAM EDCT Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the SAM EDCT Information diagnostic screen. When the EDCT feature is installed, the channel lineup can be customized for individual DHCTs. The SAM EDCT Information diagnostic screen provides information about the EDCT feature.

Performing Tasks

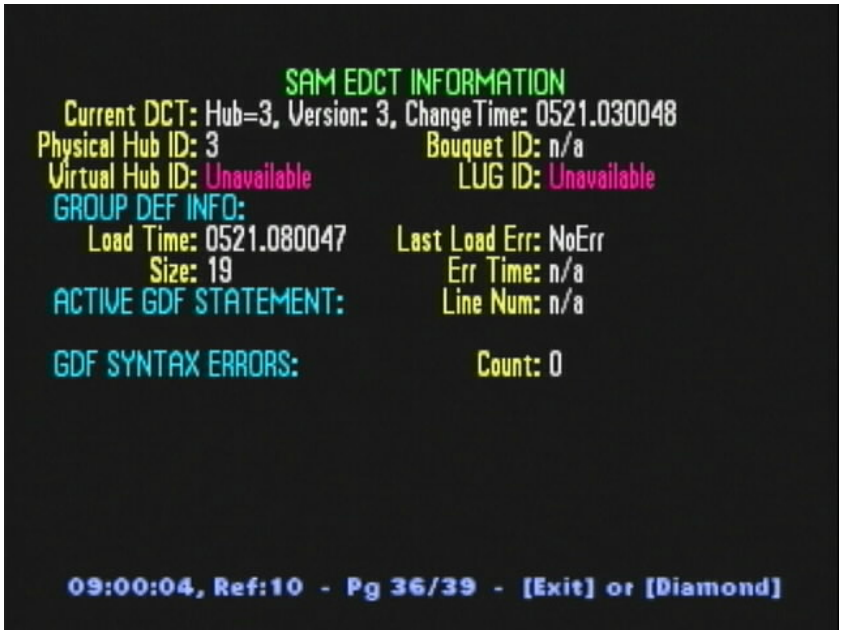
By accessing this diagnostic screen, you can perform the following tasks:

- Identify information about the currently loaded and currently assigned display channel table (DCT)
- Determine the physical hub or bouquet ID assignment for the DHCT
- Evaluate possible errors that the DHCT experienced while attempting to load the Group Definitions File (GDF) from BFS.

Screen Components

- General Fields
- Group Def Info
- Active GDF Statement
- GDF Syntax Errors

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

General Fields

The first section of the SAM EDCT Information diagnostic screen includes general information about the DCT, as well as various identification data associated with the DHCT.

Field Name	Description	Possible Values
Current DCT	The display channel table information including the channel table selection mode and identifier (hub, virtual hub, bouquet, or lineup group) **Format:** <selection mode>=<id>, Version: <DCT version>, Change Time: <MMDD.hhmmss>	■ **[Selection mode=Integer > 0], [Version: Integer > 0], [Time]** ■ **Unavailable**—DCT is not loaded
Physical Hub ID	The unique ID of the physical hub that the DHCT belongs to	■ **[Integer ≥ 0]** ■ **Unavailable**—DHCT is in a DVB-SI system environment using NDS conditional access

Field Name	Description	Possible Values
Virtual Hub ID	The unique identifier for the virtual hub that the DHCT belongs to	■ **[Integer ≥ 0]** ■ **Unavailable**—DHCT is in a DVB-SI system environment using NDS conditional access
Bouquet ID	The unique identifier assigned to the DHCT that is used when applying the default channel table selection strategy	■ **[Integer ≥ 0]** ■ **Unavailable**—DHCT is not in a DVB-SI system environment. The physical hub ID should be used for the default channel table selection
LUG ID	The unique identifier of the lineup group (LUG) that is assigned to the DHCT **Notes:** ■ The LUG ID will override the Hub ID if it is defined. ■ The LUG is a group of hubs that use the same DCT.	■ **[Integer ≥ 0]** ■ **Unavailable**—no lineup ID is assigned

Group Def Info

The Group Def Info section includes information related to the loading of the group definition file (GDF). The GDF is loaded out-of-band via the BFS.

Field Name	Description	Possible Values
Load Time	The date and time that the GDF was loaded on the DHCT (MMDD.hhmmss)	■ **[Time]** ■ **Not Loaded**—no GDF is currently loaded
Size	The size of the currently loaded, uncompressed GDF (bytes)	■ **[Integer > 1]** ■ **0**—no GDF file is currently loaded
Last Load Err	The last error experienced by the DHCT when the DHCT attempted to load the GDF from BFS	■ **NoErr**—no load errors occurred ■ **PathNotFound**—the GDF does not exist on BFS ■ **OutOfMemory**—not enough memory to load the GDF ■ **ReadErr**—failed to read the file from BFS ■ **ExceededMaxLength**—the GDF exceeded the maximum allowable length ■ **FileChanged**—the GDF was modified on BFS while attempting to load on the DHCT ■ **UnknownErr**—unknown error

Field Name	Description	Possible Values
Err Time	The date and time when the last error occurred when the DHCT attempted to load GDF from BFS (MMDD.hhmmss)	■ **[Time]**
Line Num	The line number of the active GDF statement in the currently loaded GDF	■ **[Integer > 1]** ■ **n/a**—no active GDF statement exists

Active GDF Statement

The Active GDF Statement section includes status information about the active GDF statement.

Field Name	Description	Possible Values
Active GDF Statement	The actual statement from the currently loaded GDF in which the current DCT assignment is based on	■ **[Correlates with Assigned DCT value]** **Note:** If there is no active GDF statement, then the line below the Line Num field is blank and the Assigned DCT field will reflect the default channel table selection mode and identifier.

GDF Syntax Errors

The Active GDF Statement section includes status information about the active GDF statement.

Field Name	Description	Possible Values
Count	The total number of lines with syntax errors in the currently loaded GDF	■ **[Integer ≥ 0]** **Note:** A count of zero indicates that there are no syntax errors.
<Warning Statements>	The error type, line number, and offset for each syntax error **Note:** The offset is the number of characters from the beginning of the GDF statement minus any non-delimiting white space where the syntax error was detected.	Type of syntax errors include: ■ **ParseErr**—token, delimiter, or keyword is out of sequence ■ **IllegalTokenChar**—illegal character was found while reading the token ■ **UnrecognizedCondition**—condition did not match one of the valid condition ■ **UnrecognizedActionType**—action type did not match the valid actions ■ **InvalidConditionValue**—the condition value is invalid ■ **InvalidActionValue**—the action value is invalid ■ **IncompleteStatement**—the end of line was encountered prematurely

3

SRM Sessions Diagnostic Screen

Introduction

This chapter provides the diagnostic screen specific to the Session Resource Manager (SRM) Sessions diagnostic screen. Depending on your system, the following DHCTs may include this diagnostic screen:

- 1850
- 3250HD
- 4200 and 4200HD
- 4250 and 4250HD

In This Chapter

SRM Sessions Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the SRM Sessions diagnostic screen. The SRM informs the connection manager of streaming client needs or issues and a protocol is used to carry control messages between the DHCT and the server. You can view this screen to obtain information related to this connection.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify the current status of DHCT-to-server connection
- Verify that the connection IP address is valid and is being read by the system
- Determine the identification number of the current session on the DHCT

Screen Components

Example:

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Display 1 and Display 2 Parameters

Field Name	Description	Possible Values
Session ID	The ID of the session in the current connection	■ **[Network-dependent]**
Server ID	The ID of the server in the current connection	■ **[Network-dependent]**
Connection IP Address	The IP address defined for the current connection	■ **[Network-dependent]**
Status	The current status of the connection	■ **Connected** ■ **Connecting** ■ **Early Release** ■ **Network Releasing** ■ **Not Connected** ■ **Releasing** ■ **Timeout**

4

NDS Information for Explorer 1850, 4200, 4200HD, 8300 and 8300HD DHCTs

Introduction

Note: The NDS diagnostic screens only appear if your system utilizes NDS conditional access.

This chapter provides an overview of the NDS Information diagnostic screens, including the fields and parameters that are included in the screens. These screens accumulate data about your NDS conditional access system such as Verifier software version, the status of the smart card or Verifier software, decryption status, and the number of EMM packets that the DHCT has received form the conditional access manager (CAM).

In This Chapter

NDS Information #1 Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the NDS Information #1 diagnostic screen. You can view this screen to identify the real-time status of the NDS conditional access system.

Performing Tasks

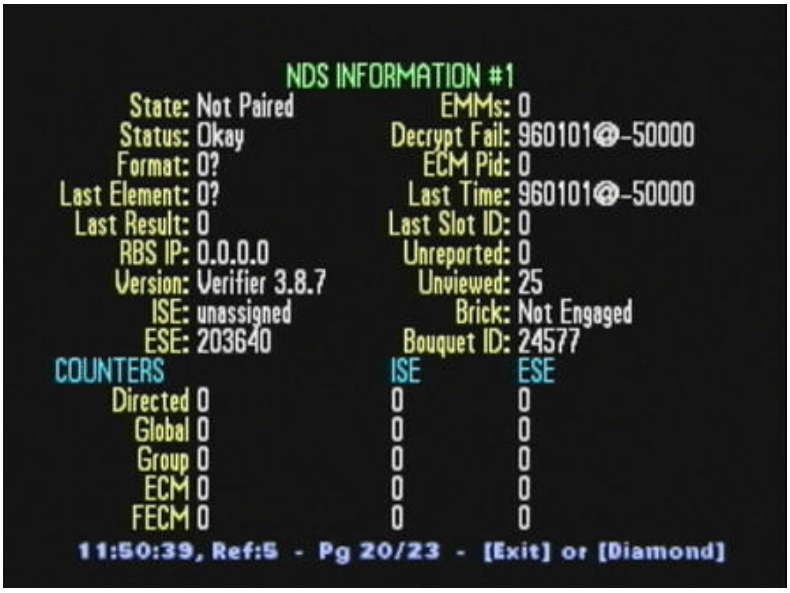
By accessing this diagnostic screen, you can perform the following tasks:

- View the operational state of the NSD smart card and Verifier software
- Determine the Verifier conditional access software that you are running
- Check the decryption status
- Identify the encryption format in use
- Determine why a DHCT might not be receiving services

Screen Components

- [Basic Parameters]
- Counters
- ISE
- ESE

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Basic Parameters

Field Name	Description	Possible Values
State	The operations state of the NDS smart card and Verifier software	■ **Bad card** ■ **No card** ■ **Not paired**—smart card not paired with host DHCT; could cause problems for services expecting a pairing such as PPV ■ **Ready** ■ **Waiting EMM**—transient state
Status	The decryption status	■ **Blacked out**—the program is unavailable in the geographical area where the DHCT resides ■ **ECM stream error**—internal error condition in the ECM stream exists for the current program ■ **No longer authorized**—the DHCT is not authorized to show program ■ **Okay**—decryption is working properly; the program is transmitting properly

Field Name	Description	Possible Values
Format	The encryption format currently in use	■ **DVB common mode** (scrambling mechanism) ■ **PowerKEY** (encryption program)
Last Element	The purchase device for the last IPPV purchase attempt	■ **ISE** ■ **ESE**
Last Result	A list of results for the last IPPV purchase attempts	■ **[Hexadecimal number]**
RBS IP	The IP address for the Report Back server	■ **[Network and device dependent]**
Version	The NDS Verifier software version number	■ **[Software-dependent]**
ISE	The ISE installed on the DHCT	■ **[Integer ≥ 0]** ■ **Unassigned** ■ **[Hardware-dependent]**
ESE	The ESE stored on the smart card	■ **[Integer ≥ 0]**
EMMs	The number of EMM packets this DHCT received from the CAM	■ **[Integer ≥ 0]**
Decrypt Fail	The time of the last decryption failure (YYMMDD@hhmmss)	■ **[Time]**
ECM Pid	The digital PID on which ECMs associated with the current program are being received	■ **[Integer ≥ 0]**
Last Time	The time of the last IPPV purchase attempt (YYMMDD@hhmmss)	■ **[Time]**
Last Slot ID	The NDS slot ID for the last purchase attempt	■ **[Integer ≥ 0]**
Unreported	The number of IPPV events purchased and viewed but not reported	■ **[Integer ≥ 0]**
Unviewed	The number of IPPV events purchased but not yet viewed or reported	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
Brick	The reason why the DHCT is not authorized to receive services	■ **NDS**—NDS conditional access system has declared brick mode ■ **No CAS Authorized**—DHCT not authorized for conditional access ■ **No NDS card**—the external NDS secure element is not inserted in DHCT ■ **Not Engaged**—DHCT is not in brick mode ■ **PowerKey**—PowerKEY conditional access system does not contain required entitlement to avoid brick mode
Bouquet ID	The unique ID assigned to the smart card; it represents a group of services authorized for the user	■ **[Integer ≥ 0]**

Counters

Field Name	Description	Possible Values
Directed	The number of directed EMMs delivered to each device	■ **[Integer ≥ 0]**
Global	The number of Global EMMs delivered to each device	■ **[Integer ≥ 0]**
Group	The number of group EMMs delivered to each device	■ **[Integer ≥ 0]**
ECM	The number of ECMs delivered to each device	■ **[Integer ≥ 0]**
FECM	The number of FECMs delivered to each device	■ **[Integer ≥ 0]**

NDS Information #2 Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the NDS Information #2 diagnostic screen. You can view this screen to identify the real-time status of the NDS conditional access system.

Performing Tasks

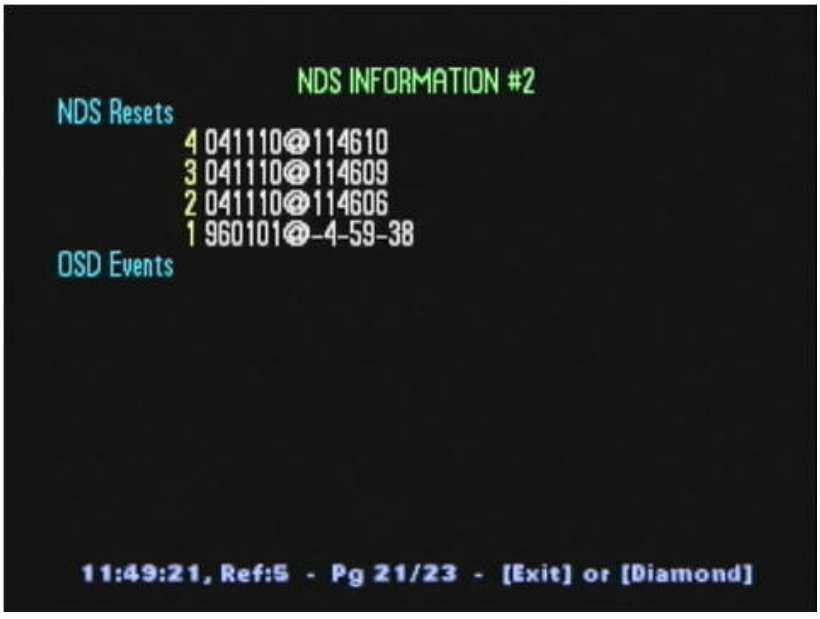
By accessing this diagnostic screen, you can perform the following tasks:

- View the most recent NDS reset events
- View any messages sent from the Verifier software

Screen Components

- NDS Resets
- OSD Events

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
NDS Resets	A list of NDS secure micro reset events, sorted with the most recent NDS event first (includes time and date of reset) (<n> YYMMDD@hhmmss)	■ **[#Resets Time]** **Example:** 4 071112@114610
OSD Events	A list of NDS on-screen display (OSD) events sent by the NDS Verifier software, sorted with the most recent OSD event first (includes time the event displayed and when it was removed) (YYMMDD@hhmmss)	■ **[Time**

5

Copy Protection Diagnostic Screens

Introduction

This chapter includes the diagnostic screens specific to copy protection, including the fields and parameters that are included within these screens. These screens accumulate data that describe the copy protection settings for devices connected to the 1394 port and various output ports that deliver broadcast and on-demand program content to the DHCT.

In This Chapter

1394 Information Diagnostic Screen

Information

This section provides an overview of the 1394 Information diagnostic screen, and includes information that reports copy protection data about the 1394 port and for any device connected to the 1394 port.

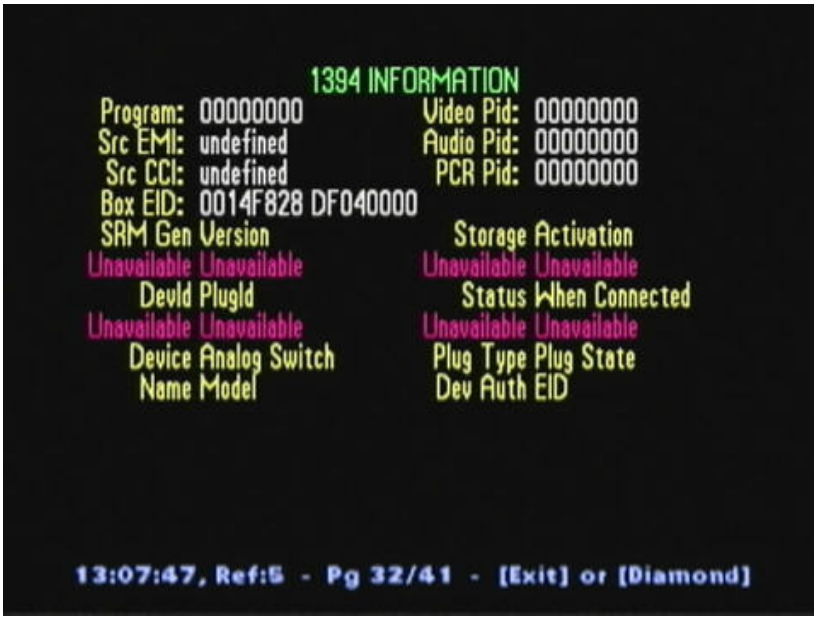
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Identify devices connected to the 1394 port
- Verifies the status of the port
- Verify the level of copy protection for devices connected to the 1394 port
- Verify encryption mode indicator (EMI) and copy control information (CCI) values

Screen Components

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Important: If a DHCT does not support a specific field or the data is not currently applicable, **Unavailable** appears as the value.

Field Name	Description	Possible Values
Program	The MPEG program number assigned to the video stream	■ **[Hexadecimal number]** (dependent on current video stream)
SRC EMI	If streaming, the current source encryption mode setting (SRC EMI) being encoded into the 1394 stream will appear	■ **free—**unlimited copying of content ■ **never—**content cannot be copied ■ **no more—**content cannot be copied ■ **once—**content can be copied once ■ **undefined—**no EMI value
SRC CCI	If streaming, the source copy control information (SRC CCI) value being encoded into the program map table (PMT) will appear	■ **free—**unlimited copying of content ■ **never—**content cannot be copied ■ **no more—**content cannot be copied ■ **once—**content can be copied once ■ **undefined—**no CCI value
Box EID	The serial number of the DHCT	■ **[Dependent upon version]**
Video Pid	The video PID number in the MPEG stream that contains the video information being decoded	■ **[Hexadecimal number > 0]—**streaming ■ **[Hexadecimal number = 0]—**not streaming
Audio Pid	The audio PID number in the MPEG stream that contains the audio information being decoded	■ **[Hexadecimal number > 0]—**streaming ■ **[Hexadecimal number = 0]—**not streaming
PCR Pid	The PID number in the stream that refers to the PCR time stamp	■ **[Hexadecimal number > 0]—**streaming ■ **[Hexadecimal number = 0]—**not streaming
SRM Gen	A system renewability message that lists devices that are no longer authorized to play copy protected content	■ **[List of devices]** ■ **Unavailable**

Field Name	Description	Possible Values
Version	The version number of the SRM	■ **[Dependent upon version]** ■ **Unavailable**
Storage	The location of where the SRM data is stored	■ **local—**stored on local hard drive ■ **network—**stored on the network ■ **Unavailable**
Activation	The activation time when the device began using the SRM data (MMDD.hhmmss)	■ **[Date.Time]** ■ **Unavailable**
DevId	An eight-digit number that identifies the connected device	■ **[Hexadecimal number > 0]—** (dependent upon connected device)
PlugId	The unique plug identification of the 1394 port	■ **[Hexadecimal number > 0]—** (dependent upon 1394 device)
Status	The status of the port when it is connected	■ **not compliant—**connected port not compliant with 1394 ■ **supported**-**—**connected port supported by 1394
When Connected	The date and time when a device was connected to the 1394 port (YYMMDD.hhmmss)	■ **[Time]**
Device	The device number for the connected device	■ **[Integer > 0]** (dependent on number of none connected devices)
Analog Switch	Indication of whether or not analog switching is supported for the video plug	■ **none** ■ **supported**
Plug Type	The plug type associated with the connection device	■ **input** ■ **output**
Plug State	The current state of the 1394 port	■ **active** ■ **idle** ■ **ready** ■ **suspended**
Name	The brand name of the connected device **Note:** There may be more than one connected device.	■ **[Device-dependent]**

Field Name	Description	Possible Values
Model	The model number for the connected device **Note:** There may be more than one connected device.	■ **[Device-dependent]**
Dev Auth	The current authorization level of the connected device	■ **full**-can access all content protected programs after successful authentication ■ **none**-can access *copy freely* protected content ■ **restricted**-can access *once* and *no more* copy protected programs after successful authentication
EID	The unique number for the connected device	■ **[Device-dependent]**

Copy Protection Diagnostic Screen

Information

This section provides an overview of the Copy Protection diagnostic screen, and includes information related to the copy protection settings for the current video stream, as well as for output ports.

Performing Tasks

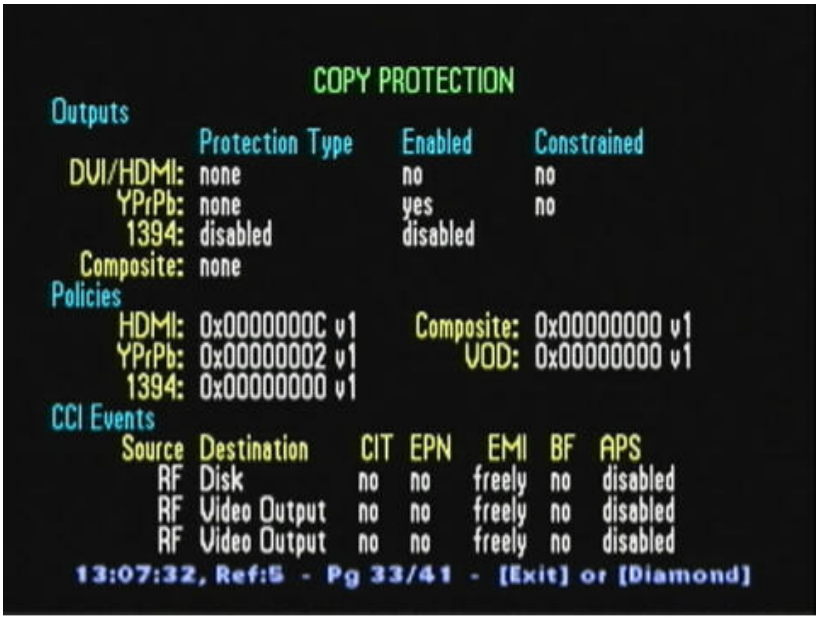
By accessing this diagnostic screen, you can perform the following tasks:

- Determine copy protection settings associated with the content stream that is currently playing
- Determine the copy protection schemes and policies that are currently applied to particular output ports

Screen Components

- Outputs
- Policies
- CCI Events

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Outputs

The Outputs section of the Copy Protection diagnostic screen describes the following output parameters for the DVI/HDMI (digital video interface/high definition multimedia interface), YPrPb, 1394, and composite output ports.

- **Protection Type**—describes the copy protection scheme being applied to an output port
- **Enabled**—indicates whether the output port is currently enabled (displaying video)
- **Constrained**—indicates whether the image displayed on the output is constrained (effective resolution of an image is limited)

Field Name	Possible Values		
	Protection Type	**Enabled**	**Constrained**
DVI/HDMI	■ **HDCP**—high bandwidth digital content protection ■ **none**	■ **no** ■ **yes**	■ **no** ■ **yes**
YPrPb	■ **none**	■ **no** ■ **yes**	■ **no** ■ **yes**
1394	■ **disabled**—not supported by hardware ■ **DTCP**—digital transmission content protection ■ **none**	■ **disabled**—not supported by hardware ■ **no** ■ **yes**	**N/A**
Composite	■ **Macrovision** ■ **none**	**N/A**	**N/A**

Policies

The Policies section of the Copy Protection diagnostic screen indicates what copy protection policies are currently applied to a particular output port. It also indicates the version of the policy format that is currently used. Policies can affect output and output ports in the following ways:

- Define the copy protection scheme applied to an output
- Define whether an output port is enabled or disabled
- Determine whether the image on an output port is constrained
- Provide the version number regarding the copy protection policies that are currently being used

Field Name	Description	Possible Values
HDMI	The group and version number for the copy control policy relating to HDMI ports **Note:** The possible values for the policy bits only apply to version 1 of the policy format.	**Format:8-bit value** [HDMI policy] [policy format version] ■ **[Bit 0]** **1:** Disable (block) HDMI port at all times ■ **[Bit 1]** **1:** Output a constrained image to HDMI port when HDCP authentication fails ■ **[Bit 2]** **1:** Block output to HDMI port when HDCP authentication fails ■ **[Bit 3-4]** **00:** Use HDCP if EMI is NOT 'copy freely', or if CIT bit is set; **01:** Always use HDCP **10:** Never use HDCP ■ **[Bits 5-7]—**Reserved ■ **[v1]—**version number of policy format

Field Name	Description	Possible Values
YPrPb	The group and version number for the copy control policy relating to YPrPb ports **Note:** The possible values for the policy bits only apply to version 1 of the policy format.	**Format:8-bit value** [YPrPb policy] [policy format version] ■ **[Bit 0]** **1:** Disable (block) YPrPb port at all times ■ **[Bit 1]** **1:** Output a constrained image to YPrPb port when CIT bit is set ■ **[Bit 2]** **1:** Block output to YPrPb port when CIT bit is set ■ **[Bit 3]** **1:** Enable Macrovision for YPrPb port when enabled on composite outputs **Note:** This is not currently supported. **[Bits 4-7]—**Reserved ■ **[v1]—**version number of policy format
1394	The group and version number for the copy control policy relating to 1394 ports **Note:** The possible values for the policy bits only apply to version 1 of the policy format.	**Format:8-bit value** [1394 policy] [policy format version] ■ **[Bit 0]** **1:** Disable (block) 1394 port at all times ■ **[Bit 1-7]** **1:** Reserved ■ **[v1]—**version number of policy format
Composite	The group and version number for the copy control policy relating to composite outputs **Note:** The possible values for the policy bits only apply to version 1 of the policy format.	**[Format:8-bit value** [Composite policy] [policy format version] ■ **[Bit 0-7]:** Reserved ■ **[v1]—**version number of policy format

Field Name	Description	Possible Values
VOD	The group and version number for the copy control policy relating to VOD **Note:** The possible values for the policy bits only apply to version 1 of the policy format.	**Format:8-bit value** [1VOD policy] [policy format version] ■ **[Bit 0]** **0:** Do not override CCI settings for VOD content **1:** Override CCI settings for VOD content ■ **[Bit 1-7]:** Reserved ■ **[v1]—**version number of policy format

CCI Events

The Copy Control Information (CCI) Events section of the Copy Protection diagnostic screen provides information about the CCI events for a video stream.

Field Name	Description	Possible Values
Source	The type of source that is carrying the input video stream	■ **Disk** ■ **Ext Video** ■ **Memory** ■ **RF**
Destination	The type of destination of the output stream	■ **Aux Video Out** ■ **Disk** ■ **In Home Net** ■ **Memory** ■ **Video Output**
CIT	The indicator that identifies whether the constrained image trigger was set for the input content **Note:** This bit does not necessarily cause the output to be constrained or blocked (policy-dependent).	■ **no**—CIT is not set ■ **yes**—CIT is set
EPN	An indicator that identifies if encryption plus non-assertion (EPN) exists for the 1394 port **Note:** The EPN copy control bit is directly related to controlling content delivered via the IEEE 1394 port. Currently the default state of the EPN is set to "no" in accordance to FCC en-coding rules.	■ **no**—does not exist (default) ■ **yes**—exists

Field Name	Description	Possible Values
EMI	The copy protection (encryption mode indicator [EMI]) mode	■ **freely**—unlimited copying of content ■ **never**—content cannot be copied ■ **no more**—content cannot be copied ■ **once**—content can be copied once
BF	An indicator that is embedded in programs that identifies the restriction rules for content	■ **yes**—content distribution is restricted ■ **no**—content distribution is not restricted (copy freely)
APS	A descriptor that identifies how the analog protection system (APS) is defined. APS will control how the Macrovision circuit is driven	■ **2 line**—macrovision circuit enabled with AGC Process On, 2 Line Split Burst On ■ **disabled**—no analog protection system (macrovision is disabled)

6

DOCSIS-Specific Diagnostic Screens

This chapter provides the diagnostic screen specific to the Data Over Cable Service Interface Specification (DOCSIS) and DOCSIS Set-Top Gateway (DSG). This screen provides information about the entire DOCSIS environment, including the DOCSIS-compliant DHCT.

The following DHCTs include the DOCSIS and DSG diagnostic screens:

- 1850s
- 4200s and 4200HDs
- 4250s and 4250HDs
- 8300 and 8300HD Home Entertainment Servers

In This Chapter

DOCSIS Information Diagnostic Screen

Information

This section provides an overview of the DOCSIS Information diagnostic screen for DHCTs in Basic or Advanced DSG mode, including the fields and parameters that are included in the screen.

Performing Tasks

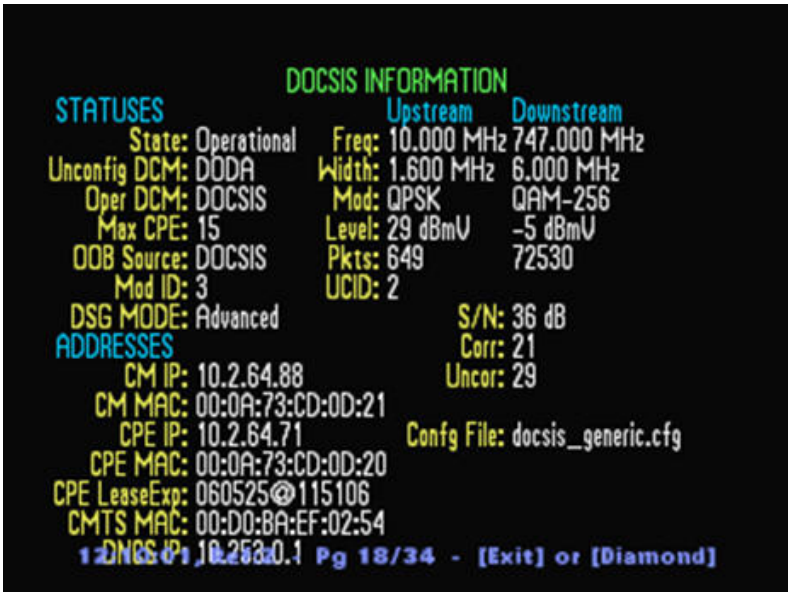
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the status of the DOCSIS network operations on your system
- Verify if the DHCT is running in DSG mode
- Verify the DNCS MAC and IP addresses

Screen Components

- Statuses
- Addresses
- Upstream Downstream

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Notes:

- Fields that are only included in the diagnostic screen for *DHCTs without DSG* will include an *.
- Fields that are only included in the diagnostic screen for *DHCTs with DSG* will include an **.

Statuses

Field Name	Description	Possible Values
State	The operational state of DOCSIS	■ **EstablishTOD** ■ **ImageDwnload** ■ **Inactive** ■ **ObtainingIP** ■ **Operational** ■ **Ranging** ■ **ReadingUCD** ■ **Registering** ■ **Scanning** ■ **SendingaParams** ■ **Unauthorized** ■ **Unavailable**—displays in red
Unconfig DCM	The status of the DHCT cable modem (DCM)	■ **DAVIC** ■ **DAVICONLY** ■ **DOCSIS** ■ **DOCSISONLY** ■ **DODA** ■ **DODAONLY** ■ **Ethernet** ■ **EthernetOnly** ■ **TelcoReturn** ■ **Unknown**
Oper DCM	The location where the out-of-band data is coming from	■ **DOCSIS** ■ **DAVIC**

Field Name	Description	Possible Values
Max CPE	The maximum number of external Ethernet devices the cable modem can support plus one	■ **[Integer > 1]**
OOB Source	The out-of-band source information	■ **DAVIC**—operational state ■ **DOCSIS01**—operational state ■ **DOCSIS02**—operational state ■ **UNCONFIG**—non-operational state
Mod ID	The identification number for the QPSK modulator	■ **[Integer > 1]**
DSG Mode**	The DSG mode of operation for a DHCT	■ **Advanced**—DSG advanced mode ■ **Basic**—DSG basic mode ■ **SA Basic**—basic DSG mode ■ **Disabled**—the DSG-CC is not operating

Addresses

Field Name	Description	Possible Values
CPE MAC	The MAC address for the cable modem host	■ **[Network-dependent]**
CPE IP	The IP address for the PowerTV CPE	■ **[Network-dependent]**
CPE Lease Exp	The expiration date for the lease on the PowerTV CPE (YYMMDD.hhmmss)	■ **[Time]**
CM MAC	The MAC address for the PowerTV customer premises equipment (CPE)	■ **[Network-dependent]**
CM IP	The IP address for the cable modem host	■ **[Network-dependent]**
DNCS IP	The IP address for the DNCS	■ **[Network-dependent]**
CMTS MAC*	The MAC address for the cable modem termination system (CMTS)	■ **[Network-dependent]**

Upstream Downstream

Field Name	Description	Possible Values
Freq	The downstream and upstream frequency (MHz)	■ **[Dependent on frequency]**
Width	The upstream and downstream signal bandwidth	■ **6 MHz**—downstream for DOCSIS ■ **8 MHz**—downstream for Euro-DOCSIS ■ **Variable**—bandwidth for upstream signal
Mod	A downstream and upstream mode for the inband tuner	■ **Downstream** • Analog • Analog Clr • Invalid • QAM-64 • QAM-128 • QAM-256 • QAM-64AClr • QAM64AEnc • QAM64BClr • QAM64BEnc • QAM-128AClr • QAM-128AEnc • QAM128BClr • QAM-128BEnc • QAM-256AClr • QAM256BClr ■ **Upstream** • Invalid
Level	The downstream and upstream power levels relative to 1 millivolt (dBmV)	■ **[Integer ≥ 0]**
Pkts	The cumulative number of packets received downstream and transmitted upstream	■ **[Integer ≥ 0]**
bps**	The downstream and upstream transmission rates in bits per second (bps)	■ **[Integer ≥ 0]**
Rate**	The upstream baud rate in kilosymbols per second (ksps)	■ **[Network-dependent]**

Field Name	Description	Possible Values
UCID*	The upstream channel ID (UCID) identification value that is associated with a DSG rule	■ **[Integer ≥ 0]**

General Fields

Field Name	Description	Possible Values
S/N	The approximate downstream S/N ration (db)	■ **[Integer ≥ 0]**
Corr	The number of correctable errors	■ **[Integer ≥ 0]**
Uncor	The number of uncorrectable errors	■ **[Integer ≥ 0]**
Config File*	The file name that represents the configuration file	■ **[Network-dependent]**

DSG Information Diagnostic Screen

Information

This section provides an overview diagram and field descriptions for the DSG Information diagnostic screen. The DSG Information diagnostic screen provides information about the status of DSG, including information about the timers.

Performing Tasks

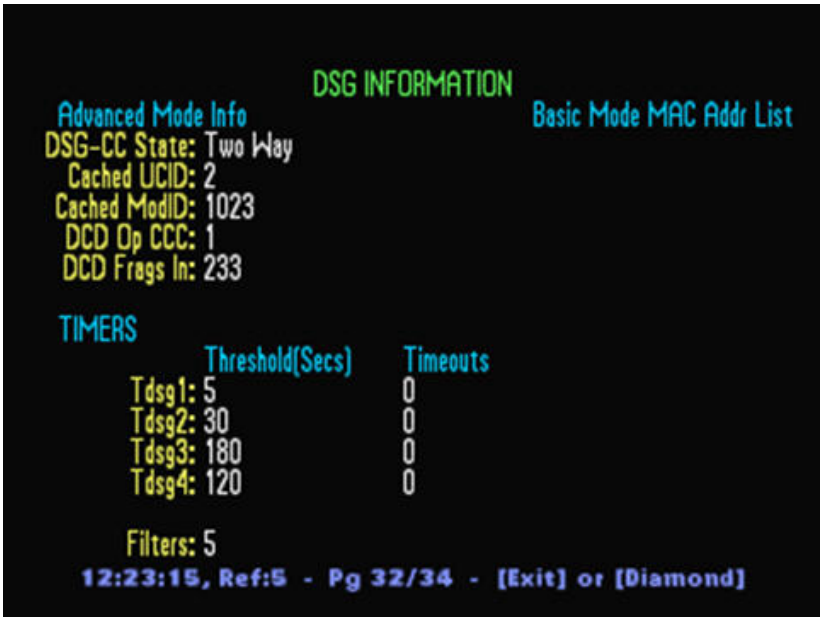
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the current status for the DSM-CC (DSG client controller)
- Identify the timeout values, as well as the number of timeouts, for each timer

Screen Components

- Advanced Mode Info
- Basic Mode Info
- Timers

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Advanced Mode Info

Field Name	Description	Possible Values
DSG-CC State	The current state of the DSG-CC	■ **TwoWay**—the DSG embedded cable modem (eCM) is in two way mode of operation ■ **NoUcidM**—the upstream channel ID (UCID) does not match ■ **CachedOp**—the state is in cached operation ■ **CacheCWt**—Cache confirm wait ■ **brSel**—Bridge selection ■ **dsEval**—Downstream evaluation and search ■ **Stopped** ■ **na**—Not applicable
Cached UCID	The current value of the cached UCID for the DSG-CC.	■ **[Integer ≥ 0]**
Cached ModID	The current value of the cached modem ID.	■ **[Integer > 0]**
DCD Op CCC	The value for the DCD change configuration count (CCC) that is currently used by the DSG-CC for operation.	■ **[Integer ≥ 0]** ■ **-1**—a DCD file is not currently in use
DCD Frags In	The number of DCD fragments received by the DSG-CC since the agent was initialized.	■ **[Integer ≥ 0]**

Basic Mode MAC Addr List

The Basic Mode MAC ADDR List section provides a list of MAC addresses defined for DHCTs in Basic DSG mode.

Field Name	Description	Possible Values
[MAC address]	The list of MAC addresses that applies to DHCTs in Basic DSG mode.	■ **[MAC address]**

TIMERS

The TIMERS section of the DSG Information diagnostic screen includes information about the timers that have been set up for DSG.

Notes:

- The "threshold" is the amount of time (seconds) that must elapse before the timer "times out."
- The "timeouts" value is the number of times a specific timer expired in the DSG eCM since the last reboot.

Field Name	Description	Possible Values
Tdsg1	The DSG initialization timeout value (seconds) which is the time that the eCM remains on the DOCSIS channel during initialization and waits for the DSG packets to arrive from the CMTS. **Note:** If DSG packets are not received within this time period, the DOCSIS channel is declared invalid, and the DHCT will not lock on a particular DOCSIS channel.	■ **Threshold [Integer ≥ 0**, where 2 is the default value ■ **Timeouts [Integer ≥ 0]**
Tdsg2	The DSG operational timeout (seconds) which is the time allowed for DSG packets to reach the DHCT's eCM during normal operation. **Note**: If DSG packets do not arrive within this time period, the DSG One-Way retry Timer (Tdsg4) is activated.	■ **Threshold [Integer ≥ 0**, where 600 is the default value ■ **Timeouts [Integer ≥ 0]**

Field Name	Description	Possible Values
Tdsg3	The DSG two-way retry timer (seconds) which is the time that the DHCT's eCM waits before it attempts to re-establish two-way connectivity with the CMTS while the eCM is in a one-way operational state.	■ **Threshold** **[Integer ≥ 0**, where 300 is the default value ■ **Timeouts** **[Integer ≥ 0]**
Tdsg4	The DSG one-way retry timer (seconds) which determines how long the DHCT's eCM will wait until it rescans for a DOCSIS downstream channel that contains DSG packets after an operational timeout has occurred. **Note:** If this time period expires, the DOCSIS channel is declared invalid and the DHCT's eCM will scan for another DOCSIS channel.	■ **Threshold** **[Integer ≥ 0**, where 1800 is the default value ■ **Timeouts** **[Integer ≥ 0]**
Filters	The number of filters defined for the DSG protocol	■ **[Integer ≥ 0 and ≤ 12]**

DSG Forwarding Stats - Filters Diagnostic Screens Diagnostic Screen

Information

This section provides an overview of the DSG Forwarding Stats - Filters diagnostic screens, including the fields and parameters that are included in the screen. The information within the screens provides forwarding and filtering statistics for each DSG tunnel filter.

Note: Two separate DSG FORWARDING STATS diagnostic screens exist; one for filters 1 through 6 and one for filters 7 through 12. Each screen contains the same fields which are described in this section.

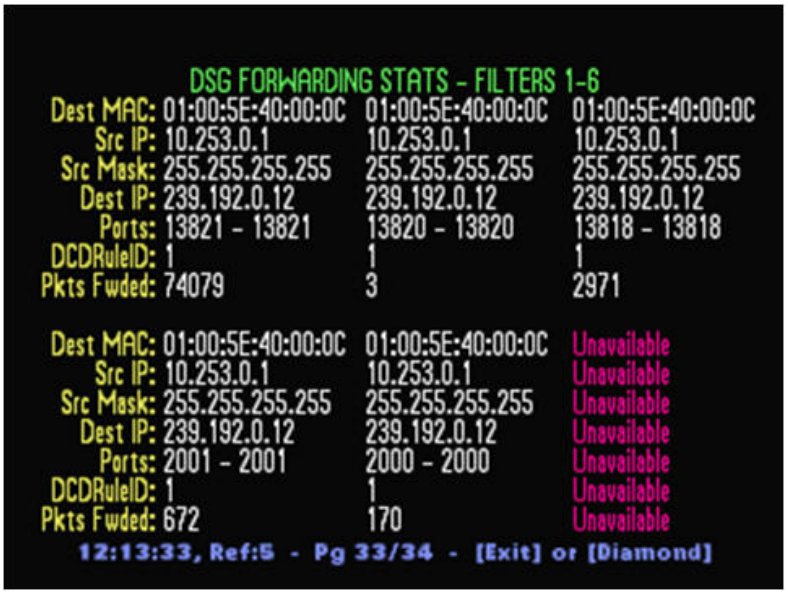
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Determine the destination MAC and IP address for a DSG tunnel
- Determine the number of packets that have been filtered through a tunnel

Screen Components

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
Dest MAC	The destination MAC address associated with the DSG tunnel entry	■ **[Network-dependent]**
Src IP	The source IP address that is associated with the DSG tunnel and is used with the DSG eCM filtering and forwarding process.	■ **[Network-dependent]** ■ **0**—indicates that the source IP filtering does not apply
Src Mask	The source IP subnet mask for the DSG stream that is used to filter and forward DSG traffic	■ **[Network-dependent]**
Dest IP	The destination IP address that is associated with the DSG tunnel and used with the DSG eCM filtering and forwarding process	■ **[Network-dependent]** ■ **0**—indicates that the destination IP address does not apply
Ports	The upper and lower UDP port values that are associated with the DSG tunnel	■ **[Integer ≥ 0 and ≤ 65535]**
DCDRuleID	The DSG tunnel identifier that is passed to the DSG eCM by the DSG-CC for a tunnel filter entry	■ **[Integer > 1]** ■ **0**—indicates Basic DSG mode
Pkts Fwded	The total number of packets that are being classified and filtered for the DSG tunnel entry since the entry was created	■ **[Integer ≥ 1**

7

DVR-Specific Diagnostic Screens

This chapter includes the diagnostic screens specific to DVR-capable DHCTs, including the fields and parameters that are included within these screens. The DVR-capable DHCTs include the following Explorer set-tops:

- Explorer 8000 and 8000HD Home Entertainment Server DHCTs
- Explorer 8300 and 8300HD Home Entertainment Server DHCTs

These screens accumulate data that describe the DVR hard disk drive, the various file systems, the current status of the second QAM, and the status of conditional access of encrypted channels.

In This Chapter

DVR HDD Information Diagnostic Screen

Information

This section provides a diagram and field descriptions of the DVR HDD Info diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information regarding the hard disk drive on the DHCT that is used to store digitally recorded video programs.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

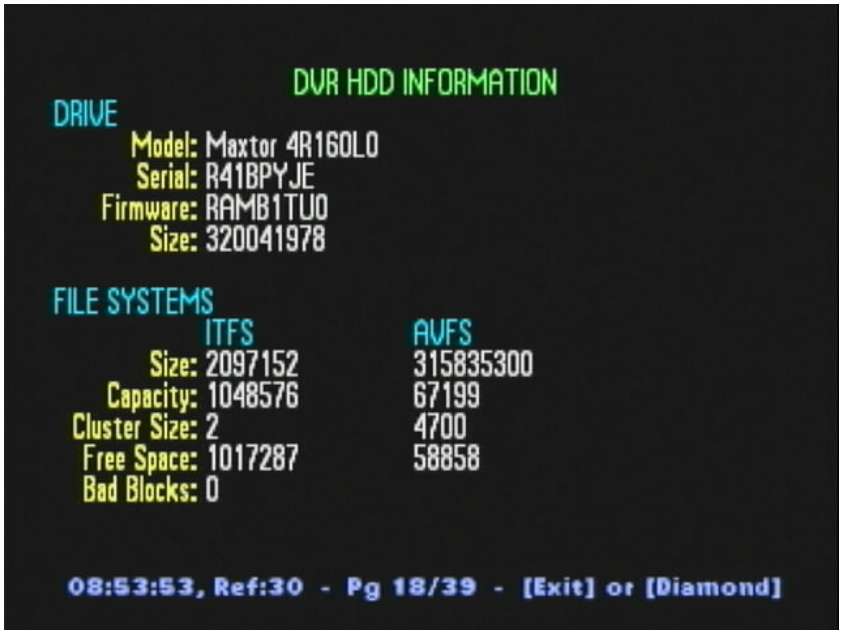
- Determine the model and serial number of the hard drive
- Verify the amount of available free space
- Determine the size and capacity of the ITFS (Information Technology File System) and the AVFS (Audio/Video File System) file systems
- Verify statistical information about the DVR hard disk in the DHCT

Screen Components

- Drive
- File Systems

Important: If any of the fields display "Unavailable," then there is a failure to communicate with the drive. This is a critical situation. Contact Cisco Services for further assistance.

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Drive

Field Name	Description	Possible Values
Model	The model type for the DVR HDD	■ **[Model-dependent]**
Serial	The serial number for the DVR HDD	■ **[Model-dependent]**
Firmware	The firmware identification number	■ **[Software-dependent]**
Size	The size of the sectors for the HDD	■ **[Hard drive-dependent]**

File Systems

Field Name	Description	Possible Values
Size	The amount of space allocated to the ITFS and AVFS partitions in sectors	■ **[Integer > 0]**
Capacity	The amount of space available to the ITFS and AVFS partitions in clusters	■ **[Integer > 0]**
Cluster Size	The number of sectors in one ITFS or AVFS cluster	■ **[Integer > 0]**
Free Space	The amount of unused ITFS or AVFS space in clusters	■ **[Integer > 0]**
Bad Blocks	The number of bad ITFS clusters	■ **0**—desired value **Note**: An integer > 0 could indicate an issue.

MPEG Encoder Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the MPEG Encoder Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains current status and detailed specifications for each MPEG encoder on the DHCT.

Performing Tasks

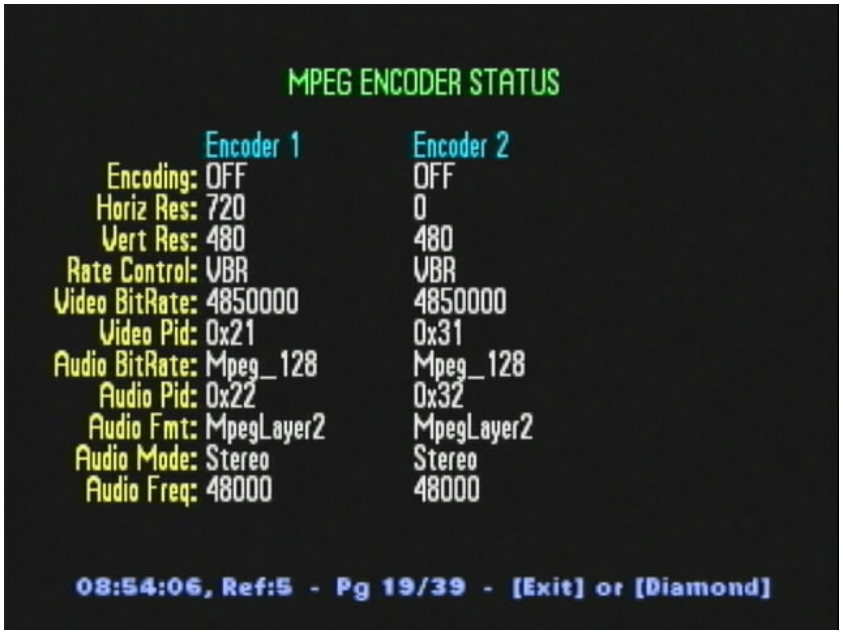
By accessing this diagnostic screen, you can perform the following tasks:

- Verify if encoding is active
- Determine the horizontal and vertical resolution of each MPEG encoder
- Verify the audio and video bit rates
- Verify the frequency of the audio that is sampled

Screen Components

- Encoder 1
- Encoder 2

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
Encoding	The encoding status condition **Note:** The encoder is in use when the analog channel is being recorded.	■ **OFF**—encoder is not in use ■ **ON**—encoder is in use
Horiz Res	The horizontal resolution of the encoded video	■ **[Stream-dependent]**
Vert Res	The vertical resolution of the encoded video	■ **[Stream-dependent]**
Rate Control	A rate control code that Indicates if the source is encoded at a constant or variable rate	■ **CBR**—constant bit rate ■ **VBR**—variable bit rate
Video BitRate	The bit rate at which the source is encoded	■ **[Integer > 0]**
Video Pid	The PID in which the video is encoded	■ **[Hexadecimal number > 0]**—streaming ■ **[Hexadecimal number = 0]**—not streaming
Audio BitRate	The bit rate at which the audio is encoded	■ **Mpeg_128** ■ **Mpeg_64**
Audio Pid	The PID in which the audio is encoded	■ **[Hexadecimal number > 0]**—streaming ■ **[Hexadecimal number = 0]**—not streaming
Audio Fmt	The type of audio encoding format	■ **MpegLayer1** ■ **MpegLayer2** ■ **MpegLayer3** ■ **Dolby AC3** ■ **PCM**
Audio Mode	The type of audio mode	■ **Mono** ■ **Stereo**
Audio Freq	The audio encoding sampling rate (MHz)	■ **[Integer > 0]**

Second Tuner Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the Second Tuner Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information that allows you to verify the status of the second QAM tuner and MPEG decoder that exist in the DHCT.

Important:

- The information displayed in the Second QAM section of the Second Tuner Status diagnostic screen always refers to the Second Tuner.
- The information displayed in the Second MPEG Decoder section of the Second Tuner Status diagnostic screen always displays PIP video data.

Performing Tasks

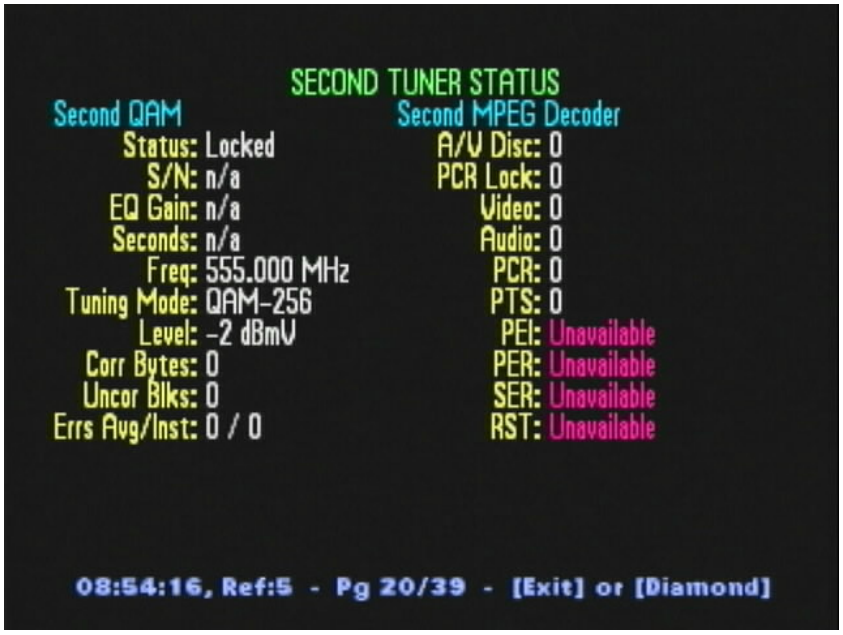
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the working status of the second QAM and second MPEG decoder
- Determine if the second tuner is picking up sufficient frequency
- Verify the tuning mode of the second QAM

Screen Components

- Second QAM
- Second MPEG Decoder

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Second QAM

The following table provides a description of the current status of the QAM. For more information, go to Current QAM Parameters in the ***RF Status Diagnostic Screen*** (on page 34).

Important: The only way to verify which tuner is tied to an output is to change channels on that output (Main or PIP), and observe the frequency and modulation changes that occur in the ***RF Status Diagnostic Screen*** (on page 34) and the ***Second Tuner Status Diagnostic Screen*** (on page 133).

Field Name	Description	Possible Values
Status	The status of the second QAM	■ **Locked**—receiver is locked onto a valid analog or QAM channel ■ **Unlocked**—valid data is not being received
S/N[9]	The approximate signal-to-noise ratio (dB)	■ **[Integer ≥ 0]** ■ **n/a**

[9] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.

Field Name	Description	Possible Values
EQ Gain	The QAM equalizer gain on the QAM data channel	■ **Amber**—marginal signal problem that needs corrected ■ **Red**—serious signal problem exists and needs corrected ■ **White**—no signal problems exist
Seconds[10]	The number of seconds the tuner has been locked on current frequency	■ **[Integer ≥ 0]**
Freq	The frequency to which the inband tuner is tuned (MHz)	■ **[Dependent upon tuned frequency]**
Tuning Mode	The tuning mode of the inband tuner	■ **Analog** ■ **QAM-64** ■ **QAM-128** ■ **QAM-256**
Level[11]	The approximate signal level	■ **Amber**—level is marginally too high or too low ■ **Red**—level is too high or too low ■ **White**—level is normal
Corr Bytes[10]	The number of bites received in error that were successfully corrected by the FEC code	■ **[Integer ≥ 0]**
Uncor Blks[10]	The number of data blocks received in error that were not successfully corrected by FEC code	■ **[Integer ≥ 0]**
Errs Avg/Inst[10]	Two unique numbers that describe data errors **First Number**—the average number of errors during the time the frequency was locked **Second Number**—the number of errors since the last time the screen was refreshed	■ **[Integer ≥ 0]/[Integer ≥ 0]**

[10] This field applies to QAM Data Channels only. It does not apply to analog channels.
[11] The level and signal-to-noise data is provided for your convenience. These measurement results are not a substitute for measurements taken with signal level meters or spectrum analyzers.

Second MPEG Decoder

The second MPEG Decoder section includes information about the DHCT when it is tuned to a digital channel and when an MPEG stream is being detected. For more information, go to MPEG Stats in the ***Status and Network Parameters Diagnostic Screen*** (on page 27) section.

Field Name	Description	Possible Values
A/V Disc	The sum of the discontinuity errors encountered on either the audio or video streams that have occurred since the current stream was tuned **Note:** Discontinuity errors indicate that packets were transmitted out of order or with a gap between them. This indicates data loss.	■ **0**—desired value ■ **[Integer > 0]**—indicates an issue
PCR Lock	The time stamp of the last PCR synchronization lock	■ **[Integer > 0]**—number should change each time the screen refreshes; otherwise video may be lost.
Video	The video PID number in the MPEG stream that contains the video information being decoded	■ **[Hexadecimal value > 0]**—streaming ■ **[Hexadecimal value =0]**—not streaming
Audio	The audio PID number in the MPEG stream that contains the audio information being decoded	■ **[Hexadecimal value > 0]**—streaming ■ **[Hexadecimal value =0]**—not streaming
PCR	The PID number that is used to decode the PCR information **Note:** The PCR PID is typically the same as the Video PID.	■ **[Channel-dependent]**
PTS	A presentation time stamp that changes each time the screen refreshes	■ **[UNIX format]**—number should change each time the screen refreshes **Important:** If this number does *not* change each time the screen refreshes, then video may have been lost.
PEI	The number of errors in the MPEG stream before reaching the broadband interface processor (BIP)	■ **0**—desired value ■ **[Integer > 0]**—indicates an issue

Field Name	Description	Possible Values
PER[12]	The PERs reported by the MPEG decoder chip	■ **Digital**—0 ■ **Analog**—0
SER[11]	The number of SERs reported by the MPEG decoder chip	■ **Digital**—0 ■ **Analog**—n/a
RST[11]	The number of times the software driver has restarted the MPEG decoding process	■ **0**—desired value ■ **[Integer > 0]** **Note:** If the RST value is incrementing, a source issue could exist. Please contact Cisco Services**.**

[12] This field is only valid for the standard-definition (SD) set-tops.

DVR Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the DVR Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information that allows you to verify the status of the DVR.

Performing Tasks

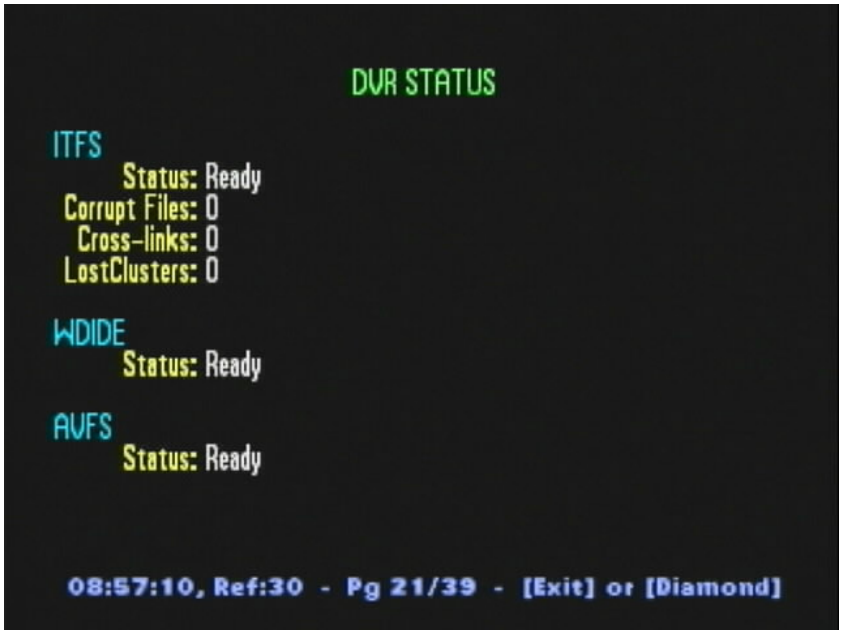
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the current status of the ITFS, WDIDE, and AVFS
- Determine the status of cross links
- Verify whether or not any files are corrupt

Screen Components

- ITFS
- WDIDE
- AVFS

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

ITFS

Important: The fields within the ITFS section should only change after a loss of power or after a reboot.

Note: After a loss of power or a reboot, it would not be unusual that the "LostClusters" field display number(s) other than 0 (zero). That condition is expected. It indicates that a recording was in progress when the DHCT rebooted, and open files were not closed. The last few seconds of the recording might be lost and would be indicated here as "lost clusters." It is possible for the other fields to display number(s) other than 0 as well, but that would indicate more serious issues.

Field Name	Description	Possible Values
Status	The current working status of the ITFS	■ **Ready**—this value should always appear **Note:** If Ready does not appear, contact Cisco Services.
Corrupt Files	The number of corrupt or impaired files within the ITFS	■ **0**—desired value ■ **[non-0]**—contact Cisco Services
Cross-links	The number of cross-links clusters	■ **0**—desired value ■ **[non-0]**—contact Cisco Services
LostClusters	The number of allocated clusters not associated with any file	■ **0**—desired value ■ **[non-0]**—contact Cisco Services

WDIDE

Field Name	Description	Possible Values
Status	The current working status of the IDE device driver	■ **Ready**—desired value **Note:** If Ready does not appear, contact Cisco Services.

AVFS

Field Name	Description	Possible Values
Status	The current working status of the audio video file system (AVFS) device driver	■ **Drive Asleep**—may appear when the DHCT is powered off ■ **Not Ready** ■ **Ready**—desirable value

PowerKEY CAM Status Diagnostic Screen

Information

This section provides information about the PowerKEY CAM Status diagnostic screen, including the fields and parameters that are included in the diagnostic screen. You can access this screen to verify the status of conditional access management (CAM).

Performing Tasks

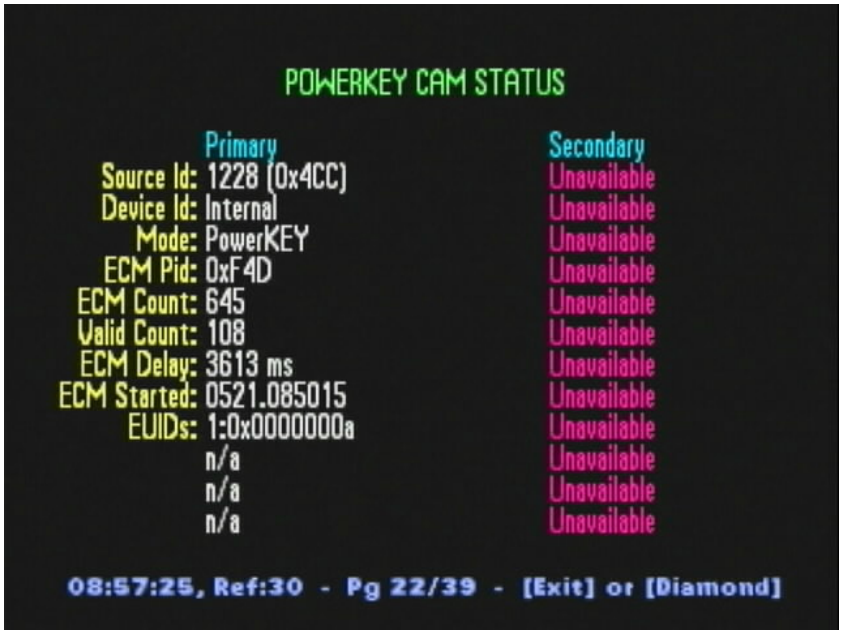
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the status of conditional access management (CAM)
- Verify that a valid ECM PID has been received
- Verify that total number of ECMs that have been received
- Determine which package IDs have authorized a program

Screen Components

- Primary
- Secondary

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Primary and Secondary Parameters

Note: The primary and secondary sections include information about the same parameters. Therefore the following table describes the parameters and values for each section.

Field Name	Description	Possible Values
Source Id	The source ID for the PowerKEY CAM	■ **Source ID Number** (integer and hexadecimal format) ■ **Unavailable**—not tuned to an encrypted channel
Device Id	The authorization information about the PowerKEY secure micro	■ **Internal** ■ **External** ■ **Unavailable**—not tuned to an encrypted channel
Mode	The type of encryption format	■ **PowerKEY**—Cisco encryption format ■ **Harmony**—Cisco/Motorola cooperative encryption format ■ **Scrambled Analog** ■ **Unavailable**—not tuned to an encrypted channel
ECM Pid	The PID number of the PID that is carrying the PowerKEY ECM stream	■ **[PID number]** (hexadecimal format) ■ **Unavailable**—not tuned to an encrypted channel
ECM Count	The total number of PowerKEY ECMs received for this program	■ **[Integer ≥ 0]** ■ **Unavailable**—not tuned to an encrypted channel
Valid Count	The number of unique (key-change) PowerKEY ECMs processed	■ **[Integer ≥ 0]** ■ **Unavailable**—not tuned to an encrypted channel
ECM Delay	The worst case timing between received PowerKEY ECM packets (ms) **Note:** QAM transmission timing is set to 100 ms.	■ **[Integer ≥ 0]** ■ **Unavailable**—not tuned to an encrypted channel
ECM Started	The date and time when the program originally started (MMDD:hhmmss)	■ **[Time]** ■ **Unavailable**—not tuned to an encrypted channel

Field Name	Description	Possible Values
EUIDs	The list of package IDs that are authorizing the program (hexadecimal format)	■ **[Package ID]** ■ **Unavailable**—not tuned to an encrypted channel

HDD Info Diagnostic Screen

Information

This section provides a diagram and field descriptions of the HDD Info diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information about the hard drive included within your DHCT.

Important: The 8000 and 8000HD Home Entertainment Servers do not support the use of a Serial Advanced Technology Attachment (SATA) device; therefore, "Unavailable" will appear for all fields in this diagnostic screen.

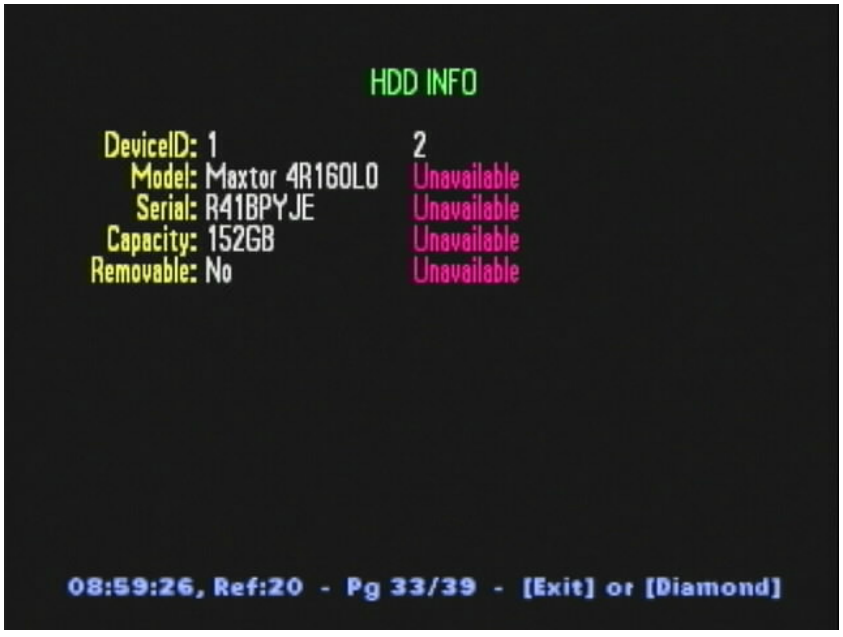
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify the storage capacity of the hard drive
- Determine if the hard drive is removable

Screen Components

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Field Name	Description	Possible Values
DeviceID	The ID of the hardware device	■ **1** ■ **2**
Model	The model type for the hard drive	■ **[Model-dependent]** ■ **Unavailable**
Serial	The serial number associated with the hard drive	■ **[Model-dependent]** ■ **Unavailable**
Capacity	The total amount of disk space available on the hard drive	■ **[Model-dependent]** ■ **Unavailable**
Removable	A confirmation that indicates if the hard disk is removable	■ **No** ■ **Yes** ■ **Unavailable**

Partition Info Diagnostic Screen

Information

This section provides a diagram and field descriptions of the Partition Info diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information about the partition that exists on the hard drive.

Important: The Explorer 8000 and 8000HD Home Entertainment Servers do not support the use of a SATA device; therefore, "Unavailable" will appear for all fields in this diagnostic screen.

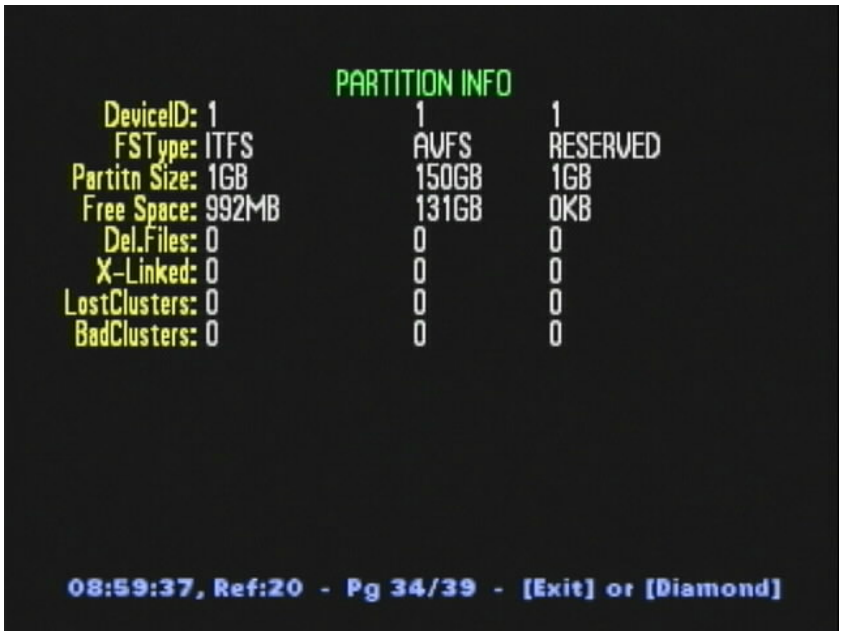
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify the capacity for the partition
- Verify the amount of available space that remains in the partition
- Determine if any lost or bad clusters exist in the partition

Screen Components

Example:



Important: A second Partition Info diagnostic screen exists in the diagnostic screen sequence. Both Partition Info screens contain the same parameters; however, the data reflects a different device.

Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Important: The Explorer 8000 and 8000HD Home Entertainment Servers do not support the use of a SATA device; therefore, "Unavailable" will appear for all fields in this diagnostic screen.

Field Name	Description	Possible Values
DeviceID	The ID hardware device	■ **1** ■ **2**
FSType	The type of file system present within the partition	■ **AVFS** ■ **ITFS** ■ **Reserved**
Partitn Size	The total size of this partition within the hard drive	■ **[Integer > 0]**
Free Space	The amount of available space within this partition	■ **[Integer > 0]**
Del.Files	The number of files deleted from this partition	■ **[Integer > 0]**
X-Linked	The number of crosslinked files that exist within the partition.	■ **0**—desired value **Note:** If this is a large value, contact Cisco Services.
LostClusters	The number of lost clusters (data fragment that does not associate with any files) within the partition	■ **0**—desired value **Note:** If this is a large value, contact Cisco Services.
BadClusters	The number of bad clusters (clusters having a physical flaw) on the hard disk.	■ **0**—desired value **Note:** If this is a large value, contact Cisco Services.

8

MR-DVR Server Diagnostic Screens

This chapter describes the diagnostic screens that relate specifically to Explorer 8300 and 8300HD MR-DVR servers using SARA DVR 1.5.2 and later. This chapter also provides an overview for each diagnostic screen.

In This Chapter

MR-DVR App Info Diagnostic Screen

Information

This section provides a diagram and field descriptions of the MR-DVR App Info diagnostic screen. You can view this screen to obtain information about the catalog and the MR-DVR application on the server.

Performing Tasks

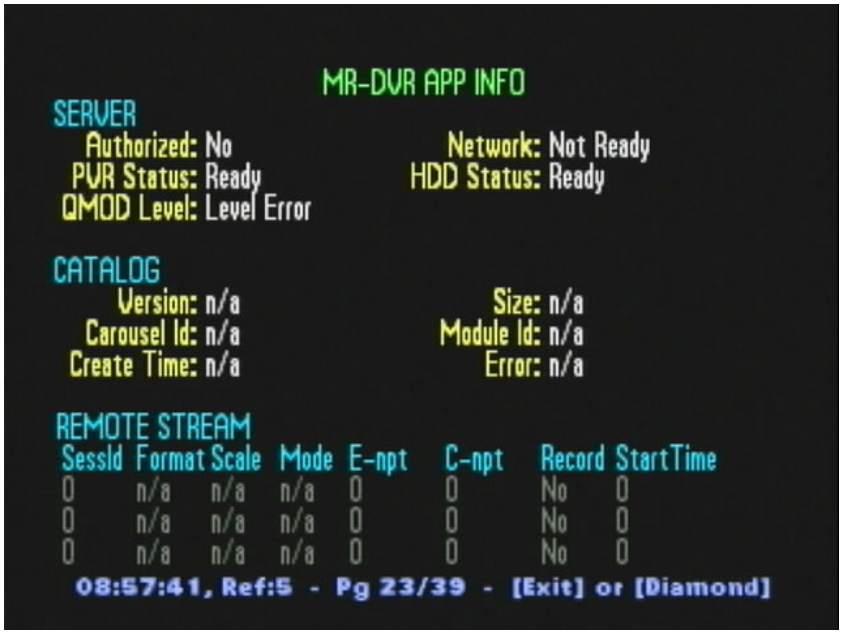
By accessing this diagnostic screen, you can perform the following tasks:

- Determine if the server is authorized for MR-DVR with a package from the headend
- Determine if the server is authorized for the DVR package
- Identify the status of the network and the hard disk drive
- Obtain detailed information about the catalog
- Obtain detailed information about the stream that is playing in relation to its format (SD or HD), playing speed, and operating mode

Screen Components

- Server
- Catalog
- Remote Stream

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Server

Field Name	Description	Possible Values
Authorized	Indicates whether the service is authorized for MR-DVR with a package from the headed	■ **Yes**—service is authorized ■ **No**—service is not authorized
PVR Status	Indicates whether the server is authorized for the PVR package	■ **Ready**—authorized for PVR package ■ **<All other values>**—not authorized for PVR package
QMOD Level	Indicates the strength of the signal being sent from the QAM modulator	■ **High** ■ **Med** ■ **Level Error**
Network	Indicates the current status of the network	■ **Ready** ■ **Not Ready**
HDD Status	Indicates the current status of the hard disk drive (HDD) in the server	■ **Ready** ■ **Not Ready**—server may not be authorized for the PVR package or there may be problems with the HDD

Catalog

Field Name	Description	Possible Values
Version	The version of the catalog currently being published	■ **[Version-dependent]**—displayed in decimal characters; dependent on catalog
Carousel Id	The carousel ID for the in-home carousel	■ **[ID number]**—displayed in hexadecimal characters ■ **<All other values>**—not authorized for PVR package
Create Time	The time that the catalog was last published (YYMMDD@hhmmss)	■ **[Time]** **Example:** A value of 030208@145516 indicates that the catalog was last published on March 2, 2008 at 2:55:16 PM.
Size	The file size of the catalog (kB)	■ **[Integer > 0]** ■ **N/A**
Module Id	The module ID for the in-home carousel	■ **[ID number]**—displayed in hexadecimal characters
Error	The errors that the server encountered while trying to publish and send the last catalog	■ **0**—No errors encountered ■ **[Integer > 0]**—the number of errors encountered

Remote Stream

Field Name	Description	Possible Values
SessId	A session identifier for each MR-DVR session currently in progress	■ **[Session-dependent]**
Format	The format of the content playing in the stream	■ **HD**—high definition ■ **SD**—standard definition

Field Name	Description	Possible Values
Scale	The speed at which the stream is playing	■ **FW**—normal forward speed ■ **FF1**—fast forward at 1 times the fastest speed ■ **FF2**—fast forward at 2 times the fastest speed ■ **FF3**—fast forward at 3 times the fastest speed ■ **STF**—slow motion forward ■ **FR1**—Reverse speed at 1 times the fastest speed ■ **FR2**—Reverse speed at 2 times the fastest speed ■ **FR3**—Reverse speed at 3 times the fastest speed ■ **STR**—slow motion reverse ■ **PS**—pause
Mode	The current operation for the stream	■ **Play**—stream is playing ■ **Pause**—stream is paused ■ **Stop**—stream is stopped ■ **N/A**—no stream or an error exists
E-npt	The end normal play time for the stream and defines the current position in the stream **Note:** This value changes as the event progresses.	■ **[Value]**—hexagonal format ■ **0**—no stream or an error exists
C-npt	Indicates the current normal play time for this stream and indicates the current position in the stream **Note:** This value changes as the event progresses.	■ **[Value]**—hexagonal format ■ **0**—no stream or an error exists
Record	Indicates whether or not the stream is recording to the hard disk	■ **Yes**—program is recording to the hard drive ■ **No**—program is not recording to the hard drive
StartTime	The time that the stream began playing (YYMMDD@hhmmss)	■ **[Time]**

In-Home Protocol Server Diagnostic Screen

Information

This diagnostic screen section provides the information about the network traffic between the server and the clients, and includes the fields and parameters that are included in the diagnostic screen.

Performing Tasks

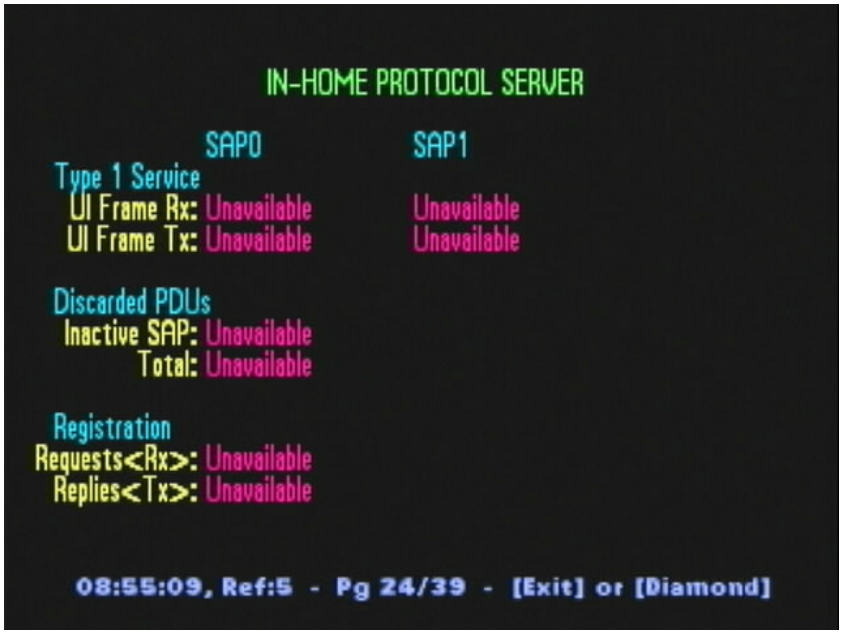
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the number of protocol data units (PDUs) that were received or accepted by the Link Service Access Point (LSAP)
- Verify the number of registration requests or replies initialized on a station
- Determine the number of PDUs that were rejected

Screen Components

- Type 1 Service
- Discarded PDUs
- Registration

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 1 Service

Field Name	Description	Possible Values
UI Frame Rx	The number of PDUs that were received by the LSAP from the MAC sublayer and passed to the user sublayer	■ **[Integer ≥ 0]**
UI Frame Tx	The number of PDUs that were accepted by the LSAP from the user sublayer and passed to the MAC sublayer	■ **[Integer ≥ 0]**

Discarded PDUs

Field Name	Description	Possible Values
Inactive SAP	The number of PDUs that were rejected because of an inactive Destination Service Access Point (DSAP)	■ **[Integer ≥ 0]**
Total	The total number of PDUs that were rejected	■ **[Integer ≥ 0]**

Registration

Field Name	Description	Possible Values
Requests<Rx>	The number of registration requests that the server has received since the (in-home protocol (IHP) protocol was initialized on this station	■ **[Integer ≥ 0]**
Requests<Tx>	The number of registration replies that the master has sent since the protocol was initialized on this station	■ **[Integer ≥ 0]**

In-Home Protocol Server Connections Diagnostic Screen

Information

This section provides a diagram and field descriptions of the In-Home Protocol Server diagnostic screen. This diagnostic screen describes information for each connection between the server and the clients. You can view this screen to obtain information about the data being received by each of the clients.

Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify the MAC address of the clients that are connected to the server
- Verify the current state of each client to server connection
- Verify if any resets were initiated on the server by the server, a subscriber, or a provider

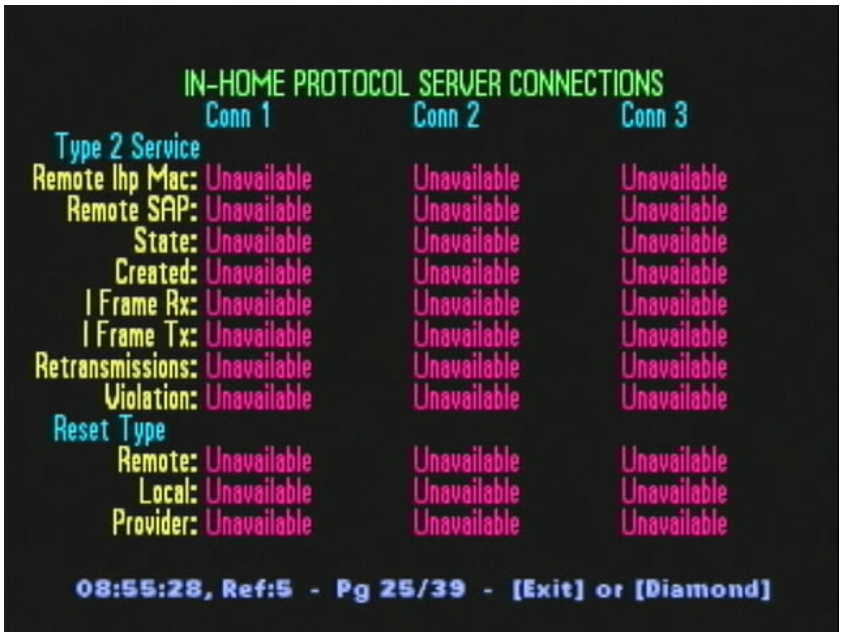
Screen Components

- Type 2 Service
- Reset Type

Example:

Notes:

- You may have more than three clients connected to the server. However, you can only play back recordings on three clients at a time.
- This diagnostic screen can show that three MR-DVR clients are receiving data from the server. If a client is UNAVAILABLE, then it is not connected to the server or it is not currently playing back a recording.



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 2 Service

Field Name	Description	Possible Values
Remote Ihp Mac	The MAC address of the client	■ **[MAC address]**—network dependent
Remote SAP	The value of the remote SAP address	■ **1** ■ **0**—indicates this is a broadcast SAP
State	The current state of each connection as described by IEEE 802.2 Connection Component states	■ **Administrative(1)** ■ **Set Up(2)** ■ **Normal(3)** ■ **Busy(4)** ■ **Reject(5)** ■ **Awaiting(6)** ■ **Await Busy(7)** ■ **Await Reject(8)** ■ **dConn(9)** ■ **Reset(10)** ■ **Error(11)** ■ **Conn(12)** ■ **Reset Check(13)**
Created	The time that each connection was made (mmdd.hhmmss)	■ **[Time]**
I Frame Rx	The number of IHP frames that each client has received	■ **[Integer ≥ 0]**
I Frame Tx	The number of IHP frame that each client has sent	■ **[Integer ≥ 0]**
Retransmission	The number of times that each client should attempt to transfer PDUs	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
Violation	The number of protocol violations detected by each connection. Protocol violations include the following: ■ Those that cause the Logical Link Control (LLC) entity to send an FRMR frame ■ Those that cause the receiving LLC entity to reset the data link	■ **[Integer ≥ 0]**

Reset Type

Field Name	Description	Possible Values
Remote	The number of times the server initiated a reset in this connection while the server was connected	■ **[Integer ≥ 0]**
Local	The number of times a subscriber initiated a reset in this connection while the server was connected	■ **[Integer ≥ 0]**
Provider	The number of times the provider (MSO) initiated a reset in this connection because a FRMR PDU was sent or received or because of a time out	■ **[Integer ≥ 0]**

IHP Mac Statistics Diagnostic Screen

Information

This section provides a diagram and field descriptions of the IHP Mac Statistics diagnostic screen. You can view this screen to obtain PDU information for the server.

Performing Tasks

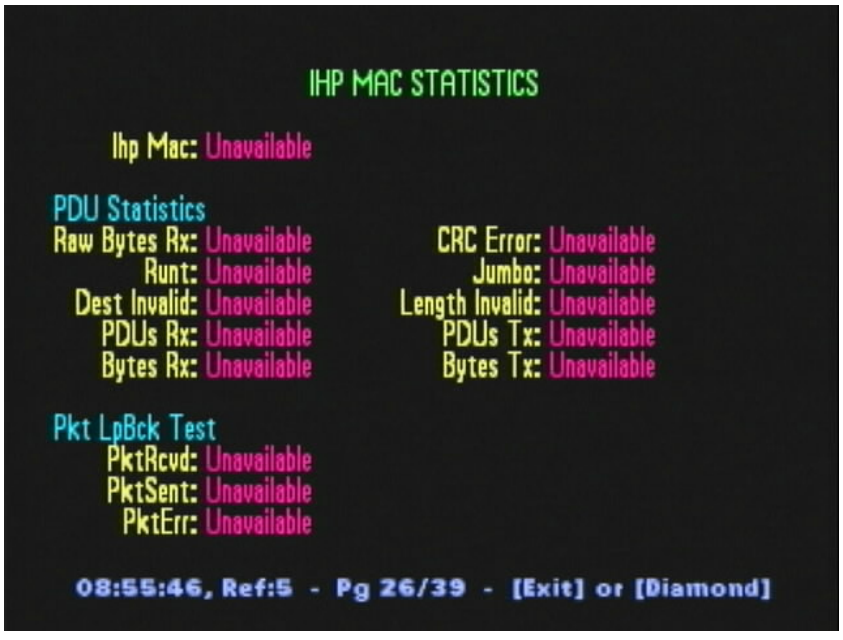
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the MAC address of the server
- Review the PDU statistics affecting the server and the clients
- Determine packet information since the last packet loopback test began

Screen Components

- PUD Statistics
- Pkt LpBck Test

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 2 Service

Field Name	Description	Possible Values
Ihp Mac	The MAC address of the server	■ **[MAC address]**—network dependent

PDU Statistics

Field Name	Description	Possible Values
Raw Bytes Rx	The total number of bytes received by the server that are part of a PDU, whether or not the frame passed other validity tests	■ **[Integer ≥ 0]**
Runt	The number of received partial PDUs that were rejected by the client	■ **[Integer ≥ 0]** ■ **0**—desirable value ■ **Unavailable**
Dest Invalid	The number of PDUs that were rejected because of an invalid destination address	■ **[Integer ≥ 0]** ■ **0**—desirable value ■ **Unavailable**
PDUs Rx	The number of PDUs that the server has successfully received and passed to the next higher layer	■ **[Integer ≥ 0]** ■ **Unavailable**
Bytes Rx	The total number of bytes received by this MAC layer, whether or not the frame passed other validity tests. This field includes all bytes, whether or not they are part of a PDU	■ **[Integer ≥ 0]** ■ **Unavailable**
CRC Error	The number of received PDUs that failed the Cyclic Redundancy Check (CRC)	■ **[Integer ≥ 0]** ■ **0**—desirable value ■ **Unavailable**
Jumbo	The number of received PDUs that have a length field that is larger than the maximum packet size	■ **[Integer ≥ 0]** ■ **0**—desirable value ■ **Unavailable**
Length Invalid	The number of received PDUs with a length field that is less than the minimum packet size	■ **[Integer ≥ 0]** ■ **0**—desirable value ■ **Unavailable**
PDUs Tx	The number of PDUs that the server as sent	■ **[Integer ≥ 0]** ■ **Unavailable**

Field Name	Description	Possible Values
Bytes Tx	The total number of bytes that have been sent by this MAC layer, including frame start and CRC bytes	■ **[Integer ≥ 0]** ■ **Unavailable**

PktLp Bck Test

Field Name	Description	Possible Values
PktRcvd	The number of packets received from the client since the last packet loopback test began	■ **0**—desired value
PktSent	The number of packets sent to the client since the last packet loopback test began	■ **0**—desired value
PktErr	The number of errors detected in the last packet loopback test	■ **0**—desired value

In-Home Service Info Diagnostic Screen

Information

This section provides a diagram and field descriptions of the In-Home Service Info diagnostic screen. You can view this screen to obtain information about each of the current sessions as well as identification information for the carousel module.

Performing Tasks

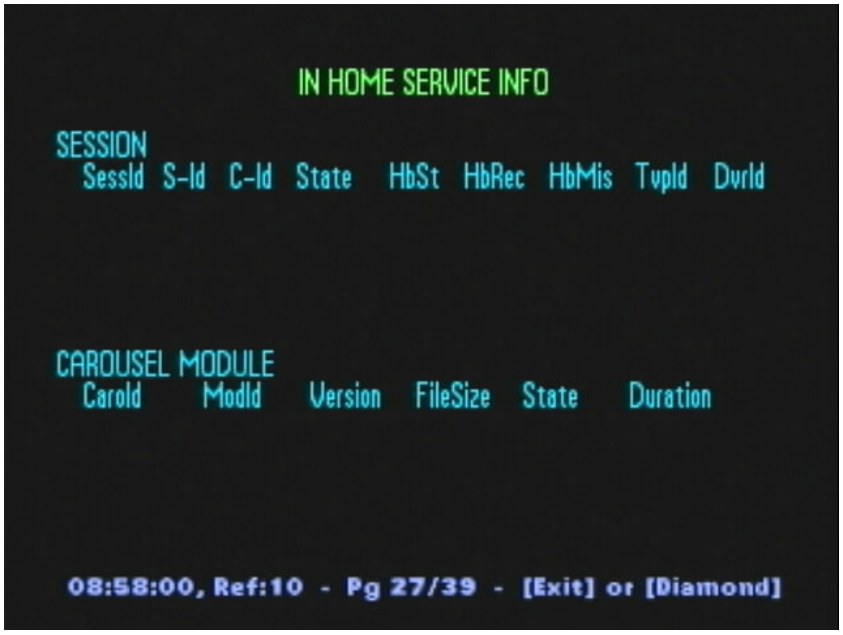
By accessing this diagnostic screen, you can perform the following tasks:

- Ensure that a session is identified for each MR-DVR session in progress
- Verify the station ID for the server and the client in the in-home network (IHN)
- Identify the DVR stream associated with an in-home session
- Retrieve data concerning the number of heartbeat messages involved in the client to server connection
- Verify information related to the carousel module

Screen Components

- Session
- Carousel Module

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Session

Field Name	Description	Possible Values
SessId	The session identifier for each MR-DVR session currently in progress	■ **[Integer ≥ 0]**
S-Id	The station ID of the server in the IHN	■ **[Integer ≥ 0]**
C-Id	The station ID of the client in the IHN. This ID should be the same as the IHN ID (shown on the MR-DVR Client Info diagnostic screen on client DHCTs)	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
State	The current state of the server connection	■ **Administrative** ■ **Awaiting** ■ **Await Busy** ■ **Await Reject** ■ **Busy** ■ **Conn** ■ **dConn** ■ **Error** ■ **Normal** ■ **Reject** ■ **Reset** ■ **Reset Check** ■ **Reset Wait** ■ **Set Up**
HbSt	The number of heartbeat messages that the server has sent to the client	■ **[Integer > 0]**
HbRec	The number of heartbeat messages that the server has received from the client	■ **[Integer > 0]**
HbMis	The number of heartbeat messages that have been missed	■ **[Integer > 0]**
TypID	The TVP manager resource that is associated with an in-home session **Note:** The TVP Manager manages the allocation of system resources called "paths", which are required to display video on the screen, in PIP, through the video output ports or to remote MR-DVR clients.	■ **[Integer > 0]**
DvrId	The DVR stream associated with an in-home session	■ **[DVR-stream dependent]**

Carousel Module

Field Name	Description	Possible Values
CaroId	The in-home carousel identifier where the module data is located	■ **[Carousel-dependent]**
ModID	The module identifier	■ **[Module-dependent]**
Version	The module version number	■ **[Module-dependent]**
FileSize	The size of the module (bytes)	■ **[Integer > 0]**
State	The current state of the carousel module	■ **Delete** ■ **Pause** ■ **Ready** ■ **Start** ■ **Stop**
Duration	The length of time that the module data will remain on the carousel (seconds)	■ **[Time (hexagonal format)]**

Audio, HDMI, HDCP, and Closed Captioning Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the Audio, HDMI, HDCP, and Closed Captioning diagnostic screen. You can view this screen to obtain information about the audio channel, HDMI, HDCP, and the digital closed caption status.

Performing Tasks

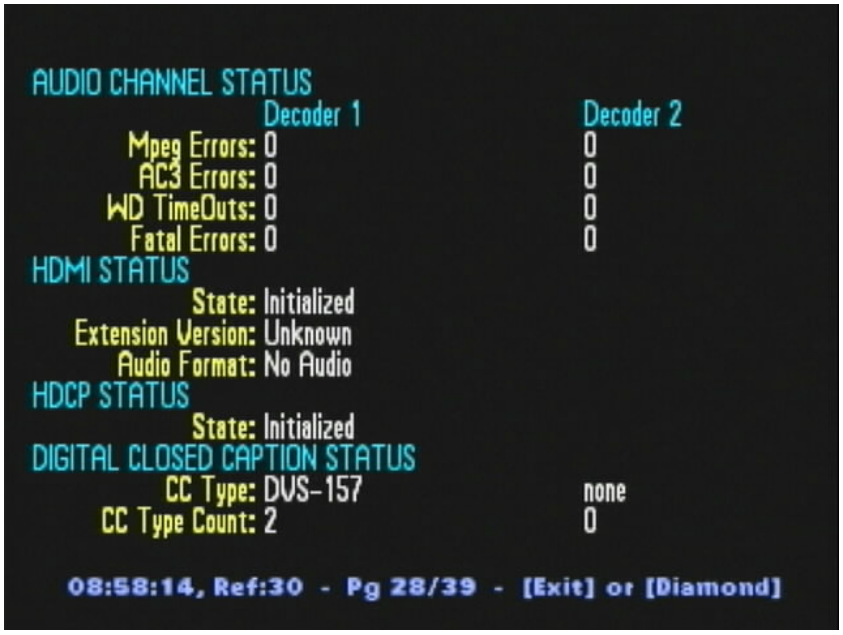
By accessing this diagnostic screen, you can perform the following tasks:

- Identify if any errors have occurred that relate to MPEG or AC3 decoding (during playback)
- Determine the type of audio format being sent through the HDMI port
- Verify the type of closed captioning being decoded

Screen Components

- Audio Channel Status
- HDMI Status
- HDCP Status
- Digital Closed Caption Status

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Audio Channel Status

Note: There are two possible decoder entries.

Field Name	Description	Possible Values
Mpeg Errors	The number of MPEG decoding errors detected by the audio DSP since the playback began	■ **[Integer ≥ 0]**
AC3 Errors	The number of AC3 decoding errors detected by the audio DSP since the playback began	■ **[Integer ≥ 0]**
WD TimeOuts	The number of times the audio DSP has reset because a Watch Dog timeout	■ **[Integer ≥ 0]**
Fatal Errors	The number of times the audio DSP has reset count because of a fatal error	■ **[Integer ≥ 0]**

HDMI Status

Field Name	Description	Possible Values
State	The current state of the HDMI port	■ **Compatible Monitor connected** ■ **Incompatible Monitor connected** ■ **Initialized** ■ **Pre-Initialized** ■ **Revoked Monitor connected**
Extension Version	The Electronic Industries Alliance (EIA) standard to which this television complies	■ **EDID** ■ **EIA-861** ■ **EIA-861A** ■ **EIA-861B** ■ **Unknown**
Audio Format	The type of audio being sent out through the HDMI port	■ **AC3 (compressed)** ■ **Linear Pulse Code Modulation (LCPM; uncompressed)** ■ **No Audio**

HDCP Status

Field Name	Description	Possible Values
State	The current state of the HDCP process	■ **Authenticated** ■ **In process / Incompatible** ■ **Initialized** ■ **Pre-initatiated**

Digital Closed Caption Status

Field Name	Description	Possible Values
CC Type	The type of closed-captioning being decoded	■ **DVS-157 (Digicypher)** ■ **EIA-708 w/ DTVCC** (EIA-708 with Digital Television Closed Captioning) ■ **EIA-708 w/o DTVCC** (EIA-708 without Digital Television Closed Captioning) ■ **none** ■ **SA type 0**
CC Type Count	The number of Closed Captioning formats currently available in the stream	■ **[Integer ≥ 0]**

MPEG Decoder Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the MPEG Decoder Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information about the MPEG stream.

Performing Tasks

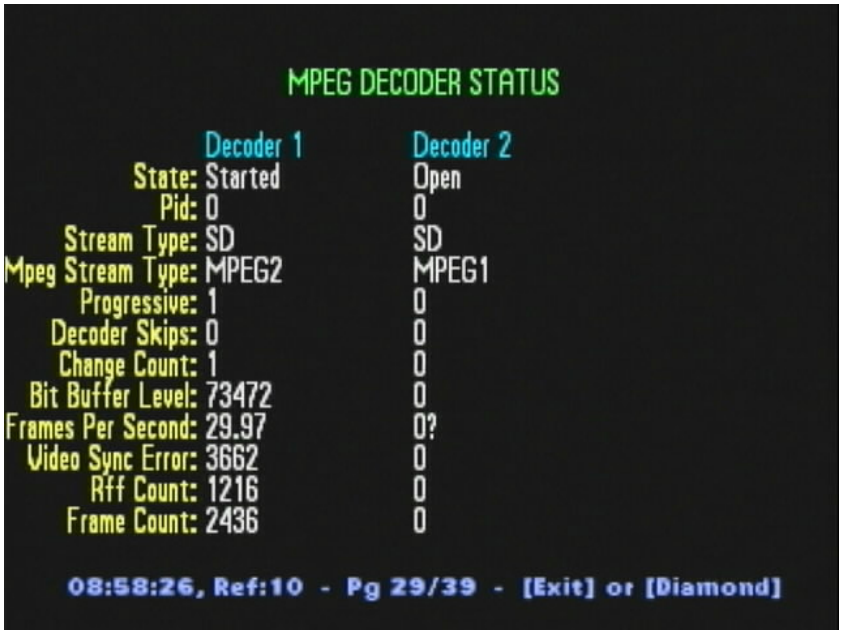
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the MPEG Transport PID for each decoder
- Verify whether the MPEG stream is progressive or interlaced for each decoder
- Determine the number of frames that have been decoded on the current channel

Screen Components

- Decoder 1
- Decoder 2

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Decoder 1 and Decoder 2 Parameters

Field Name	Description	Possible Values
State	The current state of the MPEG channel	■ **Connected** ■ **Initialized** ■ **Open** ■ **Pre-initialized** ■ **Started**
Pid	The MPEG transport PID used to encapsulate IHP PDUs within MPEG-PS sections in order to transmit them to the client	■ **0**—no PID is assigned or it is not known ■ **[Integer > 0]**
Stream Type	The type of stream being sent	■ **HD**—high definition ■ **SD**—standard definition
Mpeg Stream Type	The type of stream being decoded	■ **MPEG1** ■ **MPEG2**
Progressive	An indication of whether the stream is progressive or interlaced	■ **0**—interlaced stream ■ **1**—progressive stream
Decoder Skips	The number of times the decoder has *skipped* since tuning to this channel	■ **[Integer ≥ 0]**
Change Count	The number of times that the stream has changed since tuning to this channel	■ **[Integer ≥ 0]**
Bit Buffer Level	The number of bits that are being held in the buffer	■ **[Integer ≥ 120,000]**—desired value ■ **[Integer < 120,000]**—contact Cisco Services
Frames Per Second	The frame rate of the stream	■ **[Integer ≥ 0]**
Video Sync Error	The difference between the PTS value and the PCR value	■ **[Integer ≥ 0]**
Rff Count	The number of times that the Repeat First Field flag has occurred	■ **[Integer ≥ 0]**
Frame Count	The number of frames that have been decoded since the DHCT was booted	■ **[Integer ≥ 0]**

MPEG Display Status Diagnostic Screen

Information

This section provides a diagram and field descriptions of the MPEG Display Status diagnostic screen, including the fields and parameters that are included in the screen. This screen contains information about the MPEG configuration.

Performing Tasks

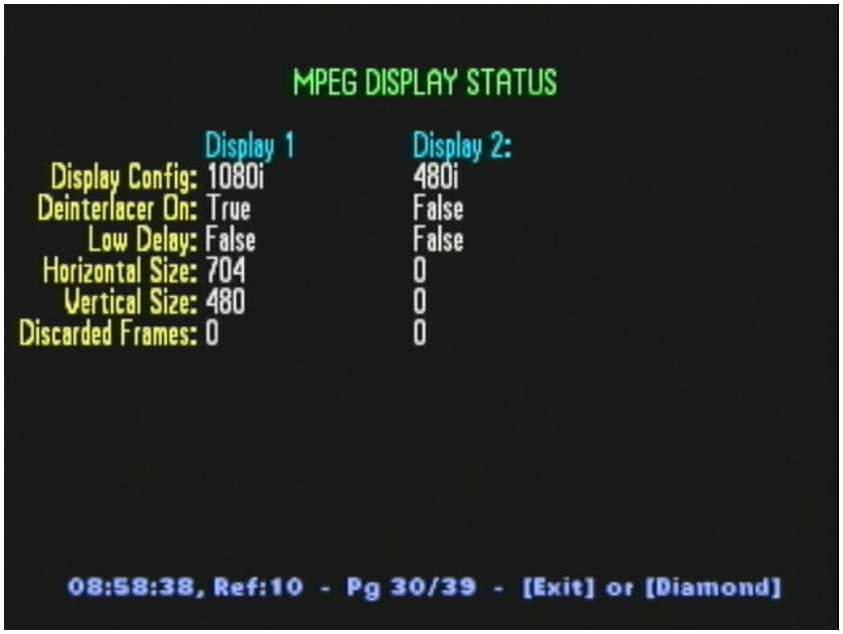
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the current resolution of each stream that is being displayed
- Identify the horizontal and vertical size of the frame
- Determine if any frames were discarded
- Identify if the deinterlacer is activated for either stream

Screen Components

- Display 1
- Display 2

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Display 1 and Display 2 Parameters

Field Name	Description	Possible Values
Display Config	The current output configuration of the display	■ **480i** ■ **480p** ■ **720p** ■ **1080i**
Deinterlacer On	An indication of whether the Deinterlacer is turned on or off	■ **False** ■ **True**
Low Delay	Indicates whether or not the stream is low delay video encoding capable	■ **False** ■ **True**
Horizontal Size	The horizontal size of the frame	■ **[Frame-dependent integer value]**
Vertical Size	The vertical size of the frame	■ **[Frame-dependent integer value]**
Discarded Frames	The number of late frames that were discarded	■ **[Integer ≥ 0]**

9

MR-DVR Client Diagnostic Screens

This chapter describes the diagnostic screens that relate specifically to MR DVR clients using SARA version 1.60 and operating system (OS) version 3.10. MR-DVR clients can include 2100, 2200, 3100, 3200, and 3250HD DHCTs.

Note: For MR-DVR clients to function properly, the eVOD application must be downloaded onto your system. To verify if eVOD is downloaded, check the ***SAM Information Diagnostic Screen*** (on page 74).

This chapter provides an overview of the MR-DVR Client diagnostic screens.

In This Chapter

MR-DVR Client Info Diagnostic Screen

Information

This section provides an overview diagram and field descriptions of the MR-DVR Client Info diagnostic screen, and includes information about the IHP and the network. You can view this screen to obtain identification information about this client station as well as the tuning frequency for the in-home QAM channel, along with the version and timestamp of the catalog.

Performing Tasks

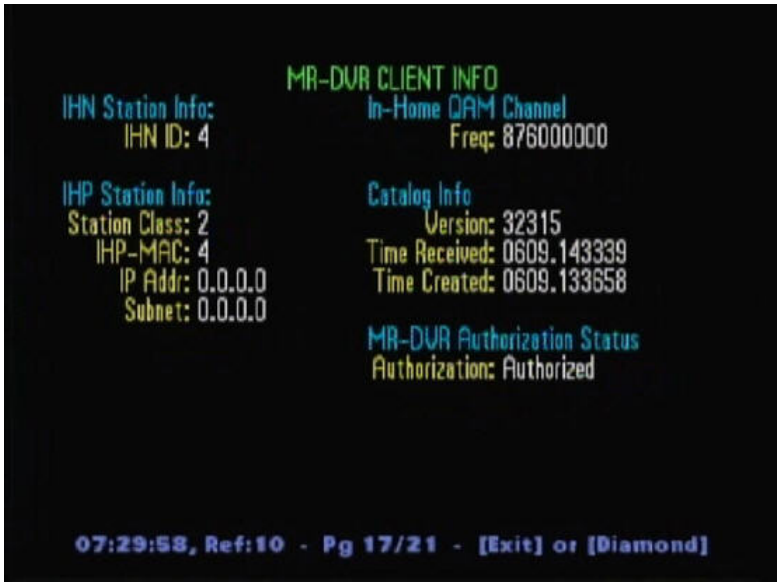
By accessing this diagnostic screen, you can perform the following tasks:

- Verify the network parameters of the in-home network
- Determine if the DHCT client is authorized for MR-DVR services
- Check the frequency in which the DHCT client is tuned

Screen Components

- IHN Station Info
- IHP Station Info
- In-Home QAM Channel
- Catalog Info
- MR-DVR Authorization Status

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

IHN Station Info

Field Name	Description	Possible Values
IHN ID	A unique station identifier for the in-home network	■ **[Integer > 0]**

IHN Station Info

Field Name	Description	Possible Values
Station Class	An indication of whether the station is a server or a client	■ **1**—primary server DHCT ■ **2**—client DHCT
IHP MAC	The IHP MAC address assigned to this client	■ **[Network-dependent]**
IP Addr	The IP address of the station on the in-home network	■ **[Network-dependent]**
Subnet	The assigned subnet mask for the in-home network IP addresses	■ **[Network-dependent]**

In-Home QAM Channel

Field Name	Description	Possible Values
Freq	The tuning frequency for the in-home QAM channel in which client tunes to receive data from the server (Hz)	■ **[Integer > 0]**

Catalog Info

Field Name	Description	Possible Values
Version	The version number of the catalog currently being published	■ **[Version number]**—displayed in decimal characters
Time Received	The time that the catalog was received from the server and onto the client (MMDD@hhmmss)	■ **[Time]** **Example:** 0102@145516 indicates that the catalog was last published on January 2 at 2:55:16 PM
Time Created	The time that the catalog was created (MMDD @hhmmss)	■ **[Time]** **Example:** 0102@144927 indicates that the catalog was last published on January 2 at 2:49:27 PM

MF-DVR Authorization Status

Field Name	Description	Possible Values
Authorization	An indication of whether this client is authorized for the MR-DVR service	■ **Authorized** ■ **No**

In-Home Protocol Client Diagnostic Screen

Information

This section provides an overview of the In-Home Protocol Client diagnostic screen, and includes information about the data that a client is receiving. Details about the current session for the client are also provided.

Performing Tasks

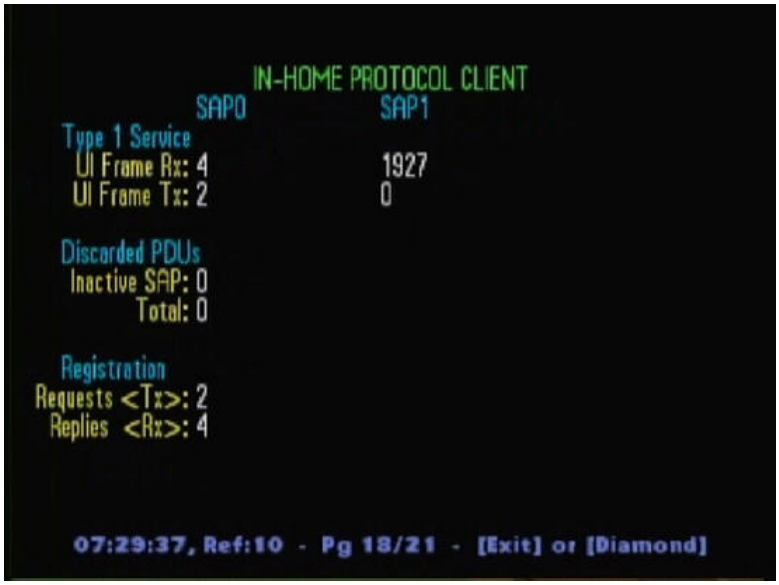
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the number of registration requests and replies a client has sent since the registration protocol was initialized
- Determine the number of user data PDUs that were received and accepted by LSAP

Screen Components

- Type 1 Service
- Discarded PDUs
- Registration

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 1 Service

The following table provides information about the number of user data PDUs that were received and accepted by LSAP, along with the available values.

Field Name	Description	Possible Values
UI Frame Rx	The number of user data PDUs that were received by the LSAP from the MAC sublayer and passed to the user layer. This includes commands received with group addresses of which this LSAP is a member	■ **[Integer ≥ 0]**
UI Frame Tx	The number of user data PDUs that were accepted by the LSAP from the user layer and delivered to the MAC sublayer	■ **[Integer ≥ 0]**

Discarded PDUs

The following table provides information about the number of user data PDUs that were discarded, along with the available values.

Field Name	Description	Possible Values
Inactive SAP	The total number of PDUs that were discarded because of an inactive DSAP	■ **[Integer ≥ 0]**
Total	The total number of PDUs that were discarded (or invalid)	■ **[Integer ≥ 0]**

Registration

The following table provides information about the number of registration requests sent and received since the registration protocol was initialized on this DHCT, along with the available values.

Field Name	Description	Possible Values
Requests <Tx>	The number of registration requests this client has sent since the registration protocol was initialized on this client	■ **[Integer ≥ 0]**
Requests <Rx>	The number of registration replies this client has received since the registration protocol was initialized on this client	■ **[Integer ≥ 0]**

In-Home Protocol Client Connection Diagnostic Screen

Information

This section provides an overview of the In-Home Protocol Client Connection diagnostic screen, and includes information about the data that this client is receiving from the server.

Performing Tasks

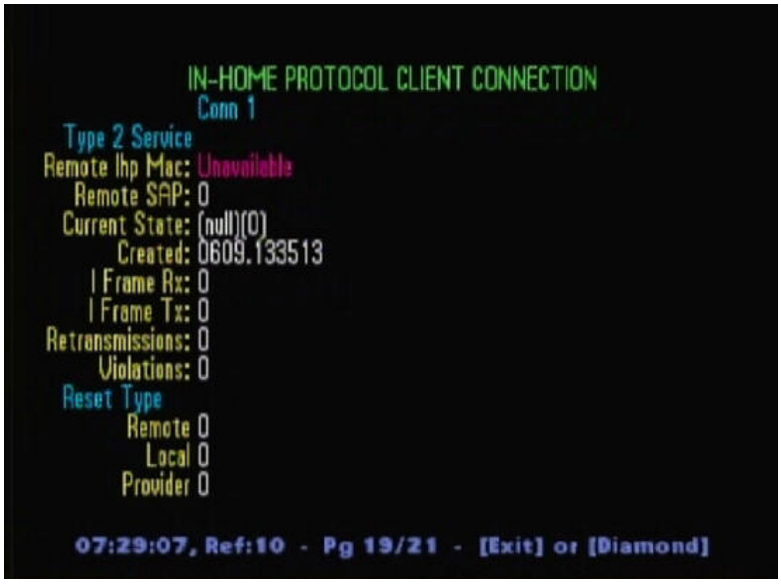
By accessing this diagnostic screen, you can perform the following tasks:

- Determine if the MR-DVR server-to-client network is in a working state
- Determine that the MAC address of the server and the remote DHCT are present
- Ensure that IHP frames are being sent and received by the DHCT client

Screen Components

- Type 2 Service
- Reset Type

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 2 Service

Field Name	Description	Possible Values
Remote Ihp Mac	The IHP MAC address of the server	■ **[MAC address]**—network-dependent
Remote SAP	The IHP MAC address of the number of the remote DHCT in this connection. In many cases, this will be an MR-DVR server	■ **[MAC address]**—network-dependent
Current State	The current state of the connection, as described by IEEE 802.2 Connection Component states	■ **1**—Administration ■ **2**—Set Up ■ **3**—Normal ■ **4**—Busy ■ **5**—Reject ■ **6**—Awaiting ■ **7**—Await Busy ■ **8**—Await Reject ■ **9**—dConn ■ **10**—Reset ■ **11**—Error ■ **12**—Conn ■ **13**—Reset Check ■ **14**—Reset Wait
Created	The time that the connection was made (MMDD.hhmmss)	■ [**Time]** **Example:** 0102.173745 indicates that the connection occurred on January 2 at 5:37:45 PM.
I Frame Rx	The number of IHP frames that the client has received	■ **[Integer ≥ 0]**
I Frame Tx	The number of IHP frames that the client has sent	■ **[Integer ≥ 0]**
Retransmissions	The number of times that the client should attempt to transfer PDUs	■ **[Integer ≥ 0]**
Violations	Indicates the number of protocol violations detected by this connection	■ **[Integer ≥ 0]**

Reset Type

Field Name	Description	Possible Values
Remote	The number of times the server initiated a reset while the client was connected	■ **[Integer ≥ 0]**
Local	The number of times a subscriber initiated a reset while the client was connected	■ **[Integer ≥ 0]**
Provider	The number of times the provider initiated a reset because a FRMR PDU was sent or received or because of a time-out	■ **[Integer ≥ 0]**

IHP MAC Statistics Diagnostic Screen

Information

This section provides an overview of the IHP MAC Statistics diagnostic screen, and includes information about the data that this client is receiving from the server.

Performing Tasks

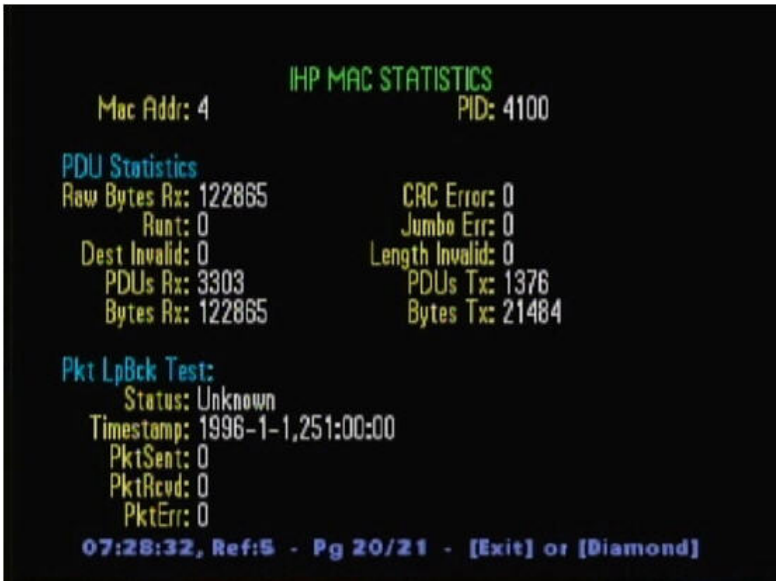
By accessing this diagnostic screen, you can perform the following tasks:

- Determine the IHP MAC address for the client
- Determine the MPEG transport PID used to encapsulate IHP PDUs within MPEG-PS sections
- Verify the number of PDUs and bytes received by the client
- Determine if any PDUs were rejected
- Obtain information about the last pack loopback

Screen Components

- PUD Statistics
- Pkt LpBck Test

Example:



Screen Fields and Values

This section describes the fields and possible values that can appear in this diagnostic screen.

Type 2 Service

Field Name	Description	Possible Values
Mac Addr	The IHP MAC address for this client	■ **[MAC address]**—network dependent
PID	The MPEG Transport PID used to encapsulate IHP PDUs within MPEG-PS sections in order to transmit them to the client	■ **0**—indicates that no PID has been assigned or that it is not known ■ **[Integer > 0]**

PDU Statistics

Field Name	Description	Possible Values
Raw Bytes Rx	The total number of bytes received by the server that are part of a PDU, whether or not the frame passed other validity tests	■ **[Integer ≥ 0]**
Runt	The number of received partial PDUs that were rejected by the server	■ **[Integer ≥ 0]**
Dest Invalid	The number of PDUs that were rejected due to an invalid destination address	■ **[Integer ≥ 0]**
PDUs Rx	The number of PDUs that have been successfully received by the client	■ **[Integer ≥ 0]**
Bytes Rx	The total number of bytes received by the client	■ **[Integer ≥ 0]**
CRC Error	The number of received PDUs that failed the CRC	■ **[Integer ≥ 0]**
Jumbo Err	The number of received PDUs that were rejected because the length field was larger than the maximum packet size	■ **[Integer ≥ 0]**
Length Invalid	The number of received PDUs that were rejected because the length field was less than the minimum packet size	■ **[Integer ≥ 0]**
PUDs Tx	The total number of PDUs transmitted by the client	■ **[Integer ≥ 0]**

Field Name	Description	Possible Values
Bytes Tx	The total number of bytes transmitted by the client, including frame start and CRC bytes	■ **[Integer ≥ 0]**

Pk tLp Bck Test

Field Name	Description	Possible Values
Status	The status of the last IHP loop back test	■ **Fail**—test ran to completion and failed ■ **inProg**—test is currently in progress ■ **Marg**—test ran to completion and results were in marginal section of operation ■ **OK**—test ran to completion and m et passing criteria ■ **Unknown**—test has never been run or has aborted
Timestamp	The time that the packet loop back test last changed (YYMMDD@hhmmss)	■ **[Time]**
PktSent	The number of packets sent to the server since the last packet loopback test began	■ **[Integer > 0]**
PktRcvd	The number of packets received from the server since the last packet loopback test began	■ **[Integer ≥ 0]**
PktErr	The number of errors detected in the last packet loopback test	■ **[Integer ≥ 0]**

SAM Information Diagnostic Screen

Information

This section identifies an application that must appear on the SAM Information screen for MR-DVR clients to function correctly. For more information, go to ***SAM Information Diagnostic Screen*** (on page 74).

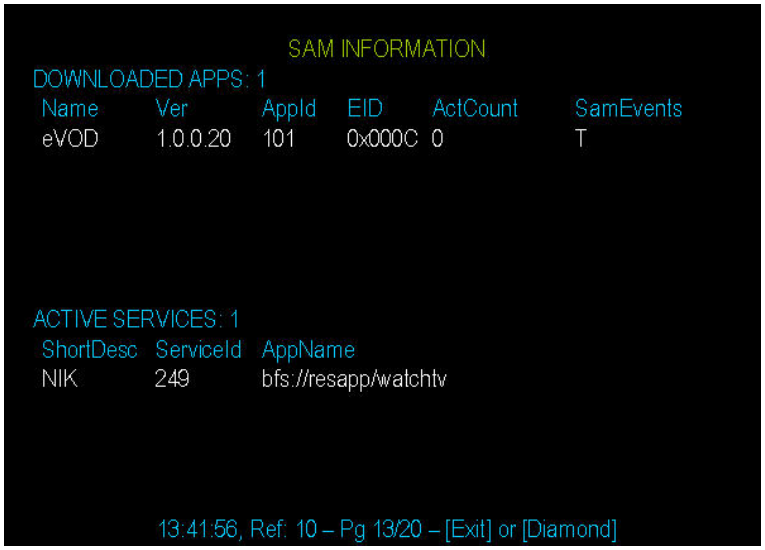
Performing Tasks

By accessing this diagnostic screen, you can perform the following tasks:

- Verify that eVOD is correctly downloaded on the DHCT client
- Verify that there is an active session on the DHCT client

Screen Components

Example:



The SAM Information diagnostic screen includes the following sections:

- Downloaded Apps
- Active Services

Refer to ***SAM Information Diagnostic Screen*** (on page 74) for details about the components of this screen.

Important: If the eVOD application is not listed or "NA" appears for the version number, eVOD may not be properly configured at the headend. Please contact Cisco Services immediately

10

Boot Issues

This chapter identifies common issues associated with booting up Explorer DHCTs. It also includes diagnostic measures for determining what the issue might involve.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

DHCT Does Not Boot

Description

The DHCT did not complete the boot process.

Possible Causes

- The DHCT is not receiving UNcfg messages, system information (SI), BFS, SAM, or is unable to connect to the network.
- The DHCT has RF level issues.

Diagnosing the Issue

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 1—Status Summary	Tuner	**-8 dBmV to +8 dBmV**—desired value **Note:** If this value appears in red, an RF issue exists, check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.
	FDC	**-10 dBmV to +10 dBmV**—desired value **Note:** If this value appears in red, an RF issue exists, check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.
	RDC	**0 dBmV to +53 dBmV**—desired value **Note:** This value is based on the reverse path loss.
Page 2—Post Results and Boot Status	Uncfg	**READY**—desired value **B'cast Only**—desired value for one-way mode **SEARCHING**—not receiving UNcfg message. Check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	BFS	**READY—**desired value **SEARCHING**—not loading BFS directory. Check the signal levels. It is also recommended that you check the DNCS for issues. If the BFS signal levels are within range and you still have an issue, contact Cisco Services.
	Si	**READY—**desired value **SEARCHING**—not loading SI tables. Check the signal levels. It is also recommended that you check the DNCS for issues. If the RF signal levels are within range and you still have an issue, contact Cisco Services.
	SAM	**READY—**desired value **WAITING**—waiting to load tables. Check the signal levels. It is also recommended that you check the DNCS for issues. If the RF signal levels are within range and you still have an issue, contact Cisco Services. **WAITING CONFIG**—the DHCT has not loaded or is loading the global configuration file. Check for BFS issues on the DNCS and for signal level issues.

11

WatchTV Issues

This chapter identifies issues that affect the WatchTV application on Explorer DHCTs. The WatchTV application contains the operation attributes that tell the DHCT how to tune to and display a standard audio/video program service so that subscribers can hear and view the service.

The most common issues are described and diagnostic measures are presented to help you to determine why these issues might be present.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

Digital Channels Freeze or Block (Macroblocking)

Description

The picture on a digital channel freezes, or shows blocking or tiling (macroblocking).

Possible Causes

- Some type of interference with the external signal.
- The signal-to-noise (S/N) ratio is out of range.
- The signal level is not within the acceptable working range.

Diagnosing the Issue

See the following table to diagnose why a digital channel is freezing, showing blocking, or showing tiling.

Important: Please check all of the diagnostic screens and fields contained in the following table *before* you contact Cisco Services. Various combinations of failures will point to the source of any potential problems as listed in the following examples.

Examples:

- If the signal levels are good, the S/N value is poor, and there is a rapid change in byte counts, then noise ingress is present.
- If the signal levels are poor, the S/N value is poor, and there is a rapid change in byte counts, then there is a "drop" problem.
- If the signal levels, S/N value, and byte counts are good, and a problem continues to exist, an issue exists prior to the QAM or transport network.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 1—Status Summary	Tuner	**Frequency level of inband tuner should display in the "white"**—acceptable value ■ **-8 dBmV to +8 dBmV**—desired value **Note:** If the tuner value appears in amber or red, check the signal levels.
Page 4—Statuses and Network Parameters **Important:** If all of these values are 0 and macroblocking still exists, contact Cisco Services.	MPEG STATS ■ PEI ■ PER ■ SER ■ RST ■ A/V Disc	**0**—desired value **Note:** If all of these values are 0 and macroblocking still exists, check the QAM and the quality of feed coming out of the QAM.
Page 5—RF Status	CURRENT QAM ■ Freq	**Tuner**—should be tuned to correct QAM **Status**—locked (desired value) **Note:** If the status is not "locked," check the QAM and the RF signal levels.
	CURRENT QAM ■ S/N	**QAM-64**—28 dBmV to 34 dBmV desired range (minimum 25 dBmV) **QAM-256**—32 dBmV to 34 dBmV desired range (minimum 39 dBmV) **Note:** If the S/N value is not within the desired range, check the QAM and the RF signal levels.
	CURRENT QAM ■ Corr Bytes ■ Uncor Blks/Current FDC	**Corr Bytes and Uncor Blks should be static**—if the values are incrementing rapidly, the QAM could be sending bad blocks of data. Check the RF signal levels coming out of the QAM and the DHCT connection.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	CURRENT FDC ■ Current FDC	**FDC frequency**—should match the frequency on the QPSK **Note:** If the FDC frequency does not match that of the QPSK or is changing, check the RF signal levels and the signal quality coming out of the QPSK and the DHCT connection.

Subscribers Are Seeing a Black Screen on a Digital Channel

Description

The channel number appears in the channel banner on the TV screen but no picture is displaying for digital channels on the television screen.

Possible Causes

- An authorization issue exists at the source.
- Tuning a high definition (HD) stream with a standard definition (SD) DHCT.
- RF signal is lost.
- QAM signal is lost.

Diagnosing the Issue

See the following table to diagnose why subscribers are seeing a black screen.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 1—Status Summary	Tuner	**Frequency level of inband tuner should display in the "white"**—acceptable value ■ **-8 dBmV to +8 dBmV**—desired value **Note:** If the tuner value appears in amber or red, check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.
Page 4—Statuses and Network Parameters	MPEG STATS/Video	**Non–0 number**—digital channels **0**—the DHCT is not receiving the video stream. Check the RF signal levels **n/a**—analog channels
	MPEG STATS/Video	**Non–0 number**—digital channels **0**—the DHCT is not receiving the video stream. Check the RF signal levels **n/a**—analog channels

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	MPEG STATS/Audio	**Non−0 number**—digital channels **0**—the DHCT is not receiving the audio stream. Check the RF signal levels **n/a**—analog channels
	MPEG STATS ■ PCR Lock ■ PTS	**Incrementing in step**—values will increment in step if you are seeing a video stream **Note:** If the values are not incrementing, check the RF signal levels.
	MPEG STATS/RST	**Static value**—should not be incrementing **Note:** If RST value is incrementing, there could be a problem with the video feed. Check the integrity of the video stream.
	STATUSES/TV Mgr	**Active** **Note:** If "Active" does not appear, a tuning problem to the QAM could exist. Check the QAM and the integrity of the video stream.
	STATUSES/Tuner State	**Found QAM**—digital channels **Found Sync**—analog channels **Note:** If either of these values do not appear, check the integrity of the video stream and, if on a digital channel, check the QAM.
Page 5—RF Status	CURRENT QAM ■ Freq	**Tuner**—should be tuned to correct QAM (digital) or to correct frequency (analog) **Status**—Locked (desired value) **Note:** If the status is not "locked," check the QAM and the RF signal levels.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	CURRENT QAM ■ S/N	**QAM-64**—28 dBmV to 34 dBmV desired range (minimum 25 dBmV) **QAM-256**—32 dBmV to 34 dBmV desired range (minimum 39 dBmV) **Note:** If the S/N value is not within the desired range, check the QAM and the RF signal levels.
	CURRENT QAM ■ Corr Bytes ■ Uncor Blks	**Corr Bytes and Uncor Blks should be static**—if the values are incrementing rapidly, the QAM could be sending bad blocks of data. Check the RF signal levels coming out of the QAM and the DHCT connection.
	CURRENT FDC ■ Freq	**FDC frequency**—should match the frequency on the QPSK **Note:** If the FDC frequency does not match that of the QPSK, check the RF signal levels and the signal quality for noise.

12

Authorization Issues

This chapter identifies common authorization issues associated with Explorer DHCTs and provides diagnostic measures for determining what the issue could involve.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

EMM Receipt Issues

Description

The DHCT is not responding to any authorization transactions.

Possible Causes

- The DHCT is not receiving valid EMMs.
- RF signals are not within an acceptable range.

Diagnosing the Issue

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 4—Statuses and Network Parameters	ISE[1]	**0x00000001**—desired value **Note:** If the value is not 0x00000001, send an instant hit from the DNCS or the billing system to the DHCT.
	TV Mgr	**Active**—desired value
Page 5—RF Status	CURRENT FDC/Level	**Signal levels should display in the "white"**—within acceptable range **Note:** If the Level value appears in amber or red, the DHCT is not receiving an adequate RF signal. Check the RF signal levels.
Page 6—PowerKEY Information	EMMs (Received)	**Value should increment after sending an "instant hit"** **Note:** If the EMM value does not increment, verify that EMMs are loaded on the DHCT. Contact your DNCS administrator to verify that EMMs are properly loaded on the DHCT.
	Sub Expires	**Date greater than 20 days into the future** **Note:** If a date less than 20 days into the future or if **Expired** appears, send an instant hit to DHCT to see if the Sub Expires date updates.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	ISE Errors	**0**—no ISE errors exist **Note:** If ISE errors exist, verify that EMMs are loaded on the DHCT. Contact your DNCS administrator to verify that EMMs are properly loaded on the DHCT.

DHCT Is Not Receiving Encrypted Services

Description

A subscriber sees NOT AUTHORIZED message when viewing an encrypted channel.

Possible Causes

- EMMs have expired.
- The DHCT is not authorized for the encrypted service.
- DHCT sub expires has expired.
- The RF signal is degraded (for example, noise or interference)

Diagnosing the Issue

See the following table to diagnose why a DHCT is not allowing a subscriber to receive encrypted services.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 1—Status Summary	RF PARAMETERS/FDC	**Value should be static** **Note:** If the value is changing, check the RF signal levels.
Page 4—Statuses and Network Parameters	ISE[1]	**0x00000001**—desired value **Note:** If the value is not 0x00000001, send an instant hit from the DNCS or the billing system to the DHCT.
Page 5—RF Status	CURRENT FDC/Status	**Locked**—desired value **Note:** If **Unlocked** appears, check the RF signal levels.
	CURRENT FDC/Level	**Signal levels should display in the "white"**—within acceptable range **Note:** If the Level value appears in amber or red, the DHCT is not receiving an adequate RF signal. Check the RF signal levels

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 6—PowerKEY Information	EMMs (Received)	**Value should increment after sending an "instant hit"** **Note:** If the EMM value does not increment, verify that EMMs are loaded on the DHCT. Contact your DNCS administrator to verify that EMMs are properly loaded on the DHCT.
	Sub Expires	**Date greater than 20 days into the future** **Note:** If a date less than 20 days into the future or if **Expired** appears, send an instant hit to DHCT to see if the Sub Expires date updates.
	Decrypt Stat	**Okay**—desired value **Note:** If the value is not **Okay**, the DHCT is not authorized for the service on this channel.

13

Interactive Failures

This chapter identifies common issues that occur between the subscriber and their DHCT. A description of the issues, along with possible causes and diagnostic measures are included to help you diagnose the issue.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

DHCTs Are Not in Two-Way Mode

Description

Subscribers are unable to use the DHCT in an interactive mode.

Possible Causes

- The DHCT is not receiving UNcfg messages from the DNCS.
- The DHCT is not receiving the IP address assigned from the DNCS.
- RF levels may not be set correctly.
- The QPSK has a modulator/demodulator configuration issue.

Diagnosing the Issue

See the following table to diagnose why the DHCT may not be in two-way mode.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 2—Post Results and Boot Status	Uncfg	**READY**—desired value; DHCT is in two-way mode **B'cast Only**—check the DNCS configuration and RF levels **SEARCHING**—not receiving UNcfg message. Check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.
Page 4—Statuses and Network Parameters	IP Address (in RF Network section)	**IP Address**—DHCT successfully booted in two-way mode **Note:** If **No IP Address** appears, the DHCT did not boot in two-way mode. Contact your DNCS administrator to verify that the DHCT is enabled for two-way communication
Page 5—RF Status	CURRENT FDC/DAVIC	**Connected**—desired value' DHCT is in two-way mode **Note:** If **Ready B'cast Only** appears, the DHCT is in one-way mode. Contact your DNCS administrator to verify that the DHCT is enabled for two-way communication.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
	CURRENT RDC/Freq	**Should match frequency of the demodulator at the headend**
	CURRENT RDC/Power	**Static value < 55 dBmV** **Note:** If the power value is greater than 55 dBmV, check the RF signal levels and/or the demodulator hardware.

Subscribers Are Not Receiving Any IPG Data or IPG Data Beyond the Second Day

Description

When accessing the interactive program guide (IPG), a "Loading Data. Please Wait" message appears for all days or for those days beyond the second day. After a period of time, a "No Data Available" message appears.

Possible Causes

- A communication issue exists with BFS.
- The IPG files are not built or updated on BFS.

Diagnosing the Issue

See the following table to diagnose why a subscriber is not receiving IPG data.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 2—Post Results and Boot Status	IPG	**READY QAM**—desired value **Note:** If **READY QPSK, TRYING** or **WAITING** appears, verify the signal integrity to the BFS QAM.
	SAM	**READY QPSK**—desired value **Note:** If **TRYING** or **WAITING** appears, check the QPSKs and forward data carriers (FDCs).
Page 5—RF Status	CURRENT FDC/Level CURRENT QAM/Level	**Signal levels should display in the "white"**—within acceptable range **Note:** If the values display in amber or red, the DHCT is not receiving an adequate RF signal. Check the QAM and the RF signal levels.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 14—SARA Information	IPG Daemon	**Hexadecimal Number**: located after the "c:"—indicates the number of days of IPG data that is loaded on DHCT **Note:** This should be a non-zero value. If this value is 0, verify the RF signal levels for the FDC (QPSK) and the BFS QAM.

Subscribers Cannot Load an Application

Description

Subscribers are unable to load an application such as VOD, xOD, or Services Portal.

Possible Causes

- An issue exists with the BFS carousel.

Diagnosing the Issue

See the following table to diagnose why a subscriber cannot load an application.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 1—Status Summary	Tuner	**-8 dBmV to +8 dBmV**—desired value **Note:** If the tuner value appears in amber or red, check the RF signal levels. If the signal levels are within range and you still have an issue, contact Cisco Services.
Page 2—Post Results and Boot Status	BFS	**READY**—desired value **SEARCHING**—not loading BFS directory
	SI	**READY**—desired value **SEARCHING**—not loading SI tables. Check the signal levels. If the RF signal levels are within range and you still have an issue, contact Cisco Services.
	SAM	**READY**—desired value **WAITING**—waiting to load tables. Check the signal levels. If the RF signal levels are within range and you still have an issue, contact Cisco Services.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 13—SAM Information	DOWNLOADED APPS	**Application should be listed and include a version number** **Note:** If the application is not listed or does not include a version number, verify the signal integrity going to the BFS QAM. If the signal is acceptable, contact your DNCS administrator to verify that the application is loaded on the system.

Subscribers Cannot Purchase Video-on-Demand Programs After the Application Has Loaded

Description

Subscribers are unable to purchase video-on-demand (VOD) programs.

Possible Causes

- The DHCT does not have an IP address.
- The DHCT did not acquire a service group.

Diagnosing the Issue

See the following table to diagnose why a subscriber cannot purchase a VOD program.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 4—Statuses and Network Parameters	RF NETWORK/IP	**IP Address**—IP address of DHCT **Note:** The IP address should match the IP address in billing system. If it does not match, contact Cisco Services.
Page 11—VOD Information	Service Group	**Service Group ID Number**—service group acquired by DHCT **Note:** If this value is unavailable, verify the RF signal levels at the QPSK (FDC) and check the QPSK and the BFS QAM.

14

PPV and IPPV Issues

This chapter identifies common PPV and IPPV issues associated with Explorer DHCTs. A description of each issue, along with methods to diagnose each issue is included in this chapter.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

Subscribers Cannot Make PPV or IPPV Purchases

Description

Subscribers cannot make PPV or IPPV purchases.

Possible Causes

- The DHCT may not be enabled for PPV or IPPV purchases.
- The DHCT may be in one-way mode.
- The subscriber has exceeded their purchase limit.

Diagnosing the Issue

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 2—Post Results and Boot Status	PowerKEY	**READY**—desired value **Note:** If Ready does not appear, contact your DNCS administrator and verify the quality of the RF signal levels.
Page 4—Statuses and Network Parameters	ISE[1]	**x00000001**—desired value **Note:** If the value is not 0x00000001, send an instant hit from the DNCS or the billing system to the DHCT.
Page 7—IPPV Information	Prch GBAMs	**Non-0**—desired valued **0**—make sure you are tuned to a PPV channel

PPV Buy Windows Are Not Available

Description

When a subscriber tunes to channel that requires them to purchase the event, either a PPV events are shown on this channel message appears or the B button is missing.

Possible Causes

- A BFS issue exists.

Diagnosing the Issue

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 9—PPV Service Summary	State	**Purchase Barker**—there is a purchasable event and the barker for that event is being shown **Note:** If a value other than Purchase Barker appears, ensure that you are tuned to a PPV channel.

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MR-DVR and DVR Issues

This chapter identifies common issues related to MR-DVR and DVR servers, as well as client DHCTs. A description of possible issues, along with possible causes and diagnostic measures, are included to help you diagnose the issue.

Note: If the suggested actions to any boot issue do not yield results or you are unable to correct a problem that the diagnostics tool seems to demonstrate, contact Cisco Services.

In This Chapter

DHCT Does Not Boot

Description

Subscribers cannot record programs on an MR-DVR server DHCT, and when attempting to do so, they receive one of the following messages:

- Recording not available
- Not Authorized message

Possible Causes

- The MR-DVR home entertainment server is not authorized for the PVR package.

Diagnosing the Issue

See the following table to diagnose why a program is not recording on the MR-DVR server DHCT.

Important: The page number for MR-DVR diagnostic screens vary and depend on the version of SARA that is loaded on the DHCT

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page varies (dependent on version of SARA)—MR-DVR App Info diagnostic screen	SERVER/Authorized	**Yes**—desired value **Note:** If **No** appears, call your DNCS administrator to verify that the DHCT is authorized for the MR-DVR package.
Page Varies—DVR HDD Information diagnostic screen	SERVER/HDD Status	**READY**—desired value **Note:** If **Not Ready** appears, verify that the DVR packages exists and that the MR-DVR channel is on the channel map.

Program Recorded on the MR-DVR Server Does Not Play on the MR-DVR Client

Description

Subscribers cannot play back programs on an MR-DVR client DHCT. When attempting to play back a program, an "ATTENTION: DVR playback service is not available" message appears.

Possible Causes

- The eVOD application is not loaded on the MR-DVR client DHCT.
- MR-DVR server DHCT is not authorized as a server.
- The client DHCT is not authorized for the MR-DVR package.
- A connection issues exists between the MR-DVR server and client DHCTs.

Diagnosing the Issue

See the following table to diagnose why a program recorded on an MR-DVR server DHCT will not play on an MR-DVR client DHCT on the same in-home network.

Important: The page number for MR-DVR diagnostic screens vary and depend on the version of SARA that is loaded on the DHCT.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 13—SAM Information	DOWNLOADED APPS	**eVOD**—eVOD application and version number should be listed with version information **Note:** If eVOD is not present on page 13, contact your DNCS administrator to load the application.
Page varies—In-Home Protocol Server Connections diagnostic screen	Remote Ihp Mac	**MAC Address**—desired value **Note:** If **Unavailable** appears, check the in-house network setup. You can also perform a loopback test.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page Varies—MR-DVR App Info diagnostic screen	SERVER/Authorized	**Yes**—desired value **Note:** If **No** appears, call your DNCS administrator to verify that the DHCT is authorized for the MR-DVR package.
Page Varies—In-Home Protocol Server Connections diagnostic screen	Remote Ihp Mac	**MAC Address**—desired value **Note:** If **Unavailable** appears, contact Cisco Services.
	State	**Normal**—desired value; server-to-client connection is normal **Note**: If **Busy**, **Reset**, or **Error** appears, contact Cisco Services.
Page Varies—MR-DVR Client Info	Authorization	**Authorized**—desired value **Note:** If **Not Authorized** appears, verify that the MR-DVR package exists and that the MR-DVR channel is on the channel map.

Recorded Programs Are Not Listed in the Record List

Description

Previously recorded programs are not showing up in the recorded program list.

Possible Causes

- The DVR hard drive on the DHCT is full.

Diagnosing the Issue

See the following table to diagnose why programs that were previously recorded are not shown in the recorded program list.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page Varies—DVR HDD Information diagnostic screen	DRIVE/Size	**Integer**—capacity of DVR hard drive
	FILE SYSTEMS (ITFS and AVFS) ■ Free Space	**Integer**—should be large enough to record programs **Note**: If the value is not large enough to record programs, delete programs off of the hard drive
	FILE SYSTEMS (ITFS and AVFS) ■ Bad Blocks	**0**—desired value **Note:** If this value is not 0, format the hard drive. Please be advised that this will delete all existing recordings.

DVR is Freezing or Tiling on Playback

Description

The picture on playback of a recorded video freezes, or the picture shows blocking or tiling (macroblocking).

Possible Causes

- External signal interference
- A problem with the signal strength or signal level exists
- Software (code) may be out-of-date

Diagnosing the Issue

See the following table to diagnose why DVR recordings are freezing or tiling on playback.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 3—Software Versions and Serial Numbers	Software Versions	**Latest software versions**—call your DNCS administrator to verify that the software is up-to-date
Page 4—Statuses and Network Parameters **Important:** If all of these values are 0 and macroblocking still exists, contact Cisco Services.	MPEG STATS ■ PEI ■ PER ■ SER ■ RST ■ A/V Disc	**0**—desired value **Note:** If all of these values are 0 and macroblocking still exists, check the QAM and the quality of feed coming out of the QAM. If the QAM and the feed are acceptable, contact Cisco Services.

Remote Control Keys Are Not Operating Correctly in DVR Mode

Description

The PAUSE, PLAY, REWIND, and FAST FORWARD remote control keys are not working correctly in DVR mode.

Possible Causes

- The DHCT does not have an IP address
- The remote control does not have functioning batteries

Diagnosing the Issue

See the following table to diagnose why DVR recordings are freezing or tiling on playback.

Access the following diagnostic screen.	Evaluate the following field.	What value do I want to see?
Page 4—Statuses and Network Parameters	RF NETWORK/IP	**IP Address** ■ Verify DHCT has IP address ■ Verify IP address matches the IP address in the billing system **Note**: If an IP address does not appear, check the reverse path (RDC) on page 5 and the UNcfg value on page 4 of the diagnostic screens. The RDC value should be 55 dBmV or below and the UNcfg should be **Ready**.

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Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

A

Diagnostic Screens Available on SARA and DVR Platforms

Introduction

This appendix provides information to help you locate diagnostic screens on specific DHCTS, and on specific SARA, DOCSIS, and DVR platforms. This appendix includes tables that identify the diagnostic screens that may appear for the following versions of SARA, DOCSIS, and DVR software:

- SARA 1.60 or later
- SARA 1.89 or later
- HD 1.60 or later
- SARA DVR 1.5.2 or later

Note: The first 16 diagnostic screens are common to all Explorer DHCTs on all SARA platforms.

In This Appendix

Diagnostic Screens Common to SARA Version 1.60

The following table lists the diagnostic screens and its corresponding page number for diagnostic screens on Explorer DHCTs that are running SARA version 1.60. The following Explorer DHCTs can include SARA version 1.60:

- 2000 and 2000 rev 3
- 2100
- 2200
- 3000
- 3100 and 3100HD
- 3250SD

Diagnostic Screen	Page Number
Status Summary	1
POST Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
MR-DVR Client	17
In-Home Protocol Client	18
In-Home Protocol Client Connection	19
IHP MAC Statistics	20

Diagnostic Screen	Page Number
Copy Protection	21 **Note:** This is page 17 if the DHCT is not an MR-DVR client.
SAM EDCT Information	22 **Note:** This is page 18 if the DHCT is not an MR-DVR client.

Diagnostic Screens Common to 3250HD v1.6

The following table lists the diagnostic screens and its corresponding page number for 3250HD that are running the HD v1.6 resident application.

Diagnostic Screen	Page Number
Status Summary	1
Post Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
Component Information	17
SRM Sessions	18
1394 Information	19
Copy Protection	20
SAM EDCT Information	21

Diagnostic Page Matrixes for DHCTs in a DOCSIS Environment

The following sections identify diagnostic screens and the possible page number for Explorer DHCTs in a DOCSIS environment.

- 1850
- 4200SD and 4200HD
- 4250SD and 4250HD
- 8300 and 8300HD Home Entertainment Servers

Note: Some of the diagnostic screens listed in the following table are found only on DHCTs that are set up as MR-DVR clients and servers in an MR-DVR environment; therefore, some diagnostic screen page numbers may vary slightly for each DHCT while some may not appear at all.

Locating Diagnostic Screens Common to Explorer 1850, 4200SD, 4200HD, 4250SD, and 4250HD DHCTs

The following table lists the diagnostic screens for 1850, 4200SD, 4200HD, 4250SD, and 4250HD DHCTs running in a DOCSIS environment.

Diagnostic Screen	Page Number
Status Summary	1
Post Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
Component Information	17
SRM Sessions	18
NDS Information #1	19
NDS Information #2	20
Copy Protection	variable
1394 Information	variable
SAM EDCT Information	variable
MR-DVR Client	variable
In-Home Protocol Client	variable
In-Home Protocol Client Connection	variable
IHP MAC Statistics	variable

Locating Diagnostic Screens Common to Explorer 8300 and 8300HD DHCTs

The following table lists the diagnostic screens for 8300 and 8300HD DHCTs running in a DOCSIS environment.

Diagnostic Screen	Page Number
Status Summary	1
Post Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
Component Information	17
DOCSIS Information	variable
NDS Information #1	variable
NDS Information #2	variable
DVR HDD Information	variable
MPEG Encoder Status	variable
Second Tuner Status	variable
DVR Status	variable
PowerKEY CAM Status	variable
MR-DVR APP Info	variable
In-Home Protocol Server	variable
In-Home Protocol Server Connections	variable
IHP MAC Statistics	variable
In Home Service Info	variable
Audio/HDMI/HDCP/Closed Captioning Status	variable

Diagnostic Screen	Page Number
MPEG Decoder Status	variable
MPEG Display Status	variable
1394 Information	variable
Copy Protection	variable
HDD Info	variable
Partition Info	variable
Partition Info	variable
DSG Information	variable
DSG Forwarding Stats —Filters 1–6	variable
DSG Forwarding Stats —Filters 7–12	variable
SAM EDCT Information	variable

Diagnostic Screens Common to SARA DVR 1.5.2

Locating Diagnostic Screens Common to the Explorer 8000 and 8000HD Home Entertainment Servers

The following table lists the diagnostic screens and its corresponding page number for all Explorer 8000 and 8000HD DHCTs that are using DVR v1.5.2.

Diagnostic Screen	Page Number
Status Summary	1
Post Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
Component Information	17
DVR HDD Information	variable
MPEG Encoder Status	variable
Second Tuner Status	variable
DVR Status	variable
PowerKEY CAM Status	variable
MPEG Decoder Status	variable
MPEG Display Status	variable
Copy Protection	variable
HDD Info	variable
Partition Info	variable

Diagnostic Screen	Page Number
Partition Info	variable
SAM EDCT Information	variable

Locating Diagnostic Screens Common to the Explorer 8300 and 8300HD Home Entertainment Servers

The following table lists the diagnostic screens and its corresponding page number for all Explorer 8300 and 8300HD DHCTs that are using DVR v1.5.2.

Important: Some of the diagnostic screens listed in the following table are found only on 8300 and 8300HD DHCTs that are set up as MR-DVR servers in an MR-DVR environment; therefore, some diagnostic screen page numbers may vary slightly for each DHCT.

Diagnostic Screen	Page Number
Status Summary	1
Post Results and Boot Status	2
Versions & Serial Numbers	3
Statuses and Networks	4
RF Statistical	5
PowerKEY Information	6
IPPV Information	7
QPSK SIL Information	8
PPV Service Summary	9
Digital Video Status	10
VOD Information	11
Bootloader Information	12
SAM Information	13
SARA Information	14
QAM Channel Status	15
QPSK Channel Status	16
Component Information	17
DVR HDD Information	18
MPEG Encoder Status	19
Second Tuner Status	20
DVR Status	21
PowerKEY CAM Status	22

Diagnostic Screen	Page Number
MR-DVR App Info	23
In-Home Protocol Server	variable
In-Home Protocol Server Connections	variable
IHP MAC Statistics	variable
In Home Service Info	variable
Audio/HDMI/HDCP/Closed Captioning Status	variable
MPEG Decoder Status	variable
MPEG Display Status	variable
1394 Information	variable
Copy Protection	variable
HDD Info	variable
Partition Info	variable
Partition Info	variable
SAM EDCT Information	variable

Glossary

1394

A high-speed two-way connection that allows easy transfer of digital video.

ac-3

Digital audio compression – 3 (Dolby Labs)

ana

Automatic network analyzer.

analog

A format in which information is transmitted by modulating a continuous transmission signal, such as amplifying the strength of a signal or varying its frequency.

authorization

The process of granting or denying access to specific resources.

AVFS

Audio/video file system.

bandwidth

The maximum data carrying capacity of a transmission link. For networks, bandwidth is usually expressed in bits per second (bps).

BCM

Block-coded modulation.

BFS

Broadcast File System. The primary interface (means of communication) between the AppServer and the DHCTs that are connected to the network.

BGATE

QPSK transceiver (encoding and decoding).

BIP

Bit interleaved parity.

blended image

A screen image on the host device that displays the current channel video, along with the diagnostic screen.

boot

The loading of the operating system (OS) and application programs into the main memory or random access memory (RAM) of the system.

bootloader

A factory program installed into the DHCTs to ensure reliable upgrades.

brick mode

A state in which the DHCT is not authorized to receive services. Provided by a package which stops all functions of the DHCT, including the ability for it to turn on. Also called *service disconnect*.

BTSC

Broadcast Televisions Standard Committee.

CA

See Conditional Access.

CableCARD

A device that plugs into a digital cable-ready TV or DHCT and allows the receipt of encrypted services.

CAM

Conditional access module. An electronic device, usually incorporating a slot for a smart card, which equips a DVB television or set-top box with the appropriate hardware facility to view conditional access content that has been encrypted using a conditional access system.

Client, MR-DVR

A requesting DHCT in a MR-DVR network that can play back DVR-recorded programs saved on the MR-DVR server.

cluster

A group of servers and other resources that act like a single system and enable high availability and, in some cases, load balancing and parallel processing.

conditional access

An encryption/decryption process, which provides access to the broadcaster's services and ensures secure purchase transactions for interactive services.

copy protection

A system for preventing the unauthorized reproduction of copyrighted media through setting the copy protection levels for a program or service. There are three types of copy protection settings: Copy freely, Copy once (high-value), and Copy never (high-value)

CPE

customer premise equipment. Network devices (PCs, set-top boxes) that are located at a customer site and connect to a cable modem (CM) or other access network.

CPU

Central processing unit.

data bus

The bus (connections between and within the CPU, memory, and peripherals) that is used to carry data to and from a processing unit or storage device.

DAVIC

Digital Audio Visual Council. DAVIC is becoming the industry standard for end-to-end interoperability of broadcast and interactive digital audio-visual information and of multimedia communication.

DDS

Digital data service.

decoder

A device that receives a digital signal and converts it back into an analog signal.

decryption

The process of decoding encrypted data into its original and understandable language.

DHCT

Digital Home Communications Terminal. Our digital set-top that is two-way capable for interactive services. *See also* Explorer.

DIS

Digital interface service.

DMA

Direct memory access.

DMS

Digital multiplex systems.

DNCS

Digital Network Control System. A computer server that monitors and controls the DBDS network elements; located at the DBDS headend or at a remote site.

DOCSIS

Data over cable service interface specification. This specification defines interface requirements for cable modems involved in high-speed data distribution over cable television system networks. This standard was developed by CableLabs in North America and approved by the International Telecommunication Union (ITU).

downstream

The digital transmission path from the server (headend) to the subscriber.

DRAM

Dynamic random access memory.

DVB

Short for Digital Video Broadcasting Project (DVB), DVB is an industry-led consortium of more than 260 broadcasters, manufacturers, network operators, and regulatory bodies and others in over 35 countries committed to designing global standards for the global delivery of digital television and data services.

DVB is also the name used to describe the various European systems for television, radio and data broadcasting in all areas of the world outside of North America.

DVR

digital video recorder. A device that records television programs without the use of videotape and saves them to a hard drive located inside the recorder. The programs can then be deleted, saved to a tape, or left on the hard drive. A DVR allows you to pause live broadcast for interruption, such as creating your own instant replays. *Also known* as PVR.

DVR HDD

DVR hard disk drive.

E-MAC

Ethernet media access.

EAID

Equipment authorized in-use detail.

EAS

Emergency Alert System. A warning system that is activated at the headend and broadcasts emergency messages to subscribers.

ECM

Entitlement Control Message. System-wide information that "unlocks" an encrypted service by transmitting control words. Each ECM is unique for each service. An ECM enables cryptographic partitioning so that different Entitlement Agents (EAs) can selectively grant access to their own services.

EMM

Entitlement Management Message. Contains information for a specific DHCT that enables it to access secure services.

encoder

A device that converts an analog signal into a digital signal.

encryption

The process of converting plain text into a coded signal for security.

EQ Gain

QAM equalizer gain.

ESE

External secure element.

Explorer

Our registered trademark name for the Digital Home Communications Terminal (DHCT). Also known as a set-top box.

FDC

Forward Data Channel. Carries digital data (tuning, management, Internet, and at least two days of IPG data) in ATM cells on RF signals from the ATM switch to a router, which then forwards the data to the correct network. *Also known* as out-of-band data channel.

FECM

Future entitlement control messages.

filter

A device that selectively sorts signals and passes them through a desired range of signals while suppressing the others. This filter is used to suppress noise or to separate signals into bandwidth channels.

flash ROM

A rewritable ROM that does not lose its information when the power turns off.

forward path

A physical connection from the hub to a DHCT that may support multiple analog transmission channels, digital transmission channels, and forward data channels.

FPM

Forward purchase message.

frequency

The number of times an electromagnetic wave repeats an identical unit of time, usually one second. One Hertz (Hz) is equal to one cycle per second.

gain

The extent to which an analog amplifier boosts the strength of a signal.

GBAM

Global broadcast authenticated message. GBAMs provide a mechanism that allows IPPV purchases to be secured. The combination of tokens required to purchase specific events.

HAL

Hardware adaptation library.

HDTV

high-definition television. The high-resolution subset of the DTV system.

headend

The location of the network elements that processes the signal by receiving and preparing the source signals and making them ready for the transport network. *See also* network elements.

heap

A segment of memory used by a program.

horizontal resolution

The number of vertical lines (or pixels) that can be resolved from one side on an image to the other side.

hub

Physical locations designed to serve a specific number of subscribers, usually 50 to 15,000. May be co-located with the headend or miles away from the headend. Hubs receive, modulate, and boost the signal prior to sending it to the network of HFC nodes for distribution to the subscriber. Hubs usually contain QPSK modulalators/demodulators that establish the two-way communications with the DHCTs.

inband

Interactive content sent as part of a broadcasted data stream (like MPEG-2).

Internet Protocol

The standard protocol within TCP/IP that defines the basic unit of information passed across an Internet connection by breaking down data messages into packets, routing and transporting the packets over network connections, then reassembling the packets at their destination.

IP

See Internet Protocol.

IPG

Interactive Program Guide. Our name for the on-screen program guide provided by the Explorer DHCT.

IPPV

impulse pay-per-view. Service for which cable subscribers can electronically order program events using two-way (or reverse path) methods. Subscribers are charged a user fee for individual program events. *See also* PPV.

ISE

Internal secure element.

ITFS

Information technology file system.

MAC address

Media Access Control address. A unique physical address embedded into a network device. Similar to a serial number.

macroblocking

Blocking, freezing, or tiling of a picture due to signal interference or signal strength and level issues.

memory

Data storage used by computers or other digital electronic devices or systems to hold programs and data while they are temporarily in use.

microprocessor

A central processing unit (CPU) implemented on a single chip that performs the bulk of the processing and controls the parts of a system.

MPEG

Moving Picture Experts Group. An international video compression standards-setting group working under the supervision of the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). MPEG's mission is to develop standards for compressed full-motion video, still image, audio and other associated information.

MR-DVR

Multi-Room Digital Video Recorder.

NVM

non-volatile memory. Memory that holds its content when the device it is associated with is turned off.

one-way operation

Operation in which transmission is made in only one direction (from the headend to the subscriber).

OOB

Out-Of-Band. *See* FDC.

OOB signaling

Data is sent through an addressable transmitter to subscribers on a separate RF carrier outside of the normal frequency range.

PAT

program association table. A second table in the transport stream which contains a list of all MPEG programs on the transport stream along with their associated program numbers.

PCR

program clock reference.

PEI

Packet error indication.

PER

Pipeline errors.

PHAL

Platform hardware adaptation layer.

PID

packet/program identifier. A number assigned to MPEG transport packets to identify the contents of the data and the information stream to which they belong. The 13-bit PID number is assigned in the MPEG-2 transport packet headers. All packets from the same stream have the same PID number.

PIP

Picture-in-Picture. Allows you to watch more than one TV program (channel) at the same

time on television sets or other devices. With PIP feature of TV, one program will be displayed on the entire TV screen, and another program or programs will be displayed in individual smaller squares on the screen.

POST

Power on self test. Set of hardware diagnostics that runs on a hardware device when that device is powered up.

PPV

pay-per-view. Service for which subscribers are charged a user fee for individual program events. *See also* IPPV.

PTS

Presentation time stamp.

PVR

See DVR.

QAM

quadrature amplitude modulation. A frequency modulation technique primarily used for program audio and video. QAM supports data rates from 27 Mbps to 36 Mbps.

QAM modulator

A device that uses QAM techniques to modulate a digital signal onto an HFC network to deliver voice, video, and data to a DHCT.

QPSK

Quadrature Phase-Shift Keying. Digital modulation scheme that send data by modulating the phase of a reference signal (the carrier wave).

Radio Frequency

Logical grouping of information that includes a header containing control information and (usually) user data.

RAM

Random access memory. Volatile memory that can be read and written by a microprocessor.

RDC

Reverse data channel.

reverse path

A physical connection between a DHCT and a hub in which the reverse path can support multiple reverse data channels

RF

Radio frequency. The range of electromagnetic frequencies above the audio range and below infrared light. Most wireless transmission uses RF, including radio, TV, satellites, portable phones, cellular phones, and wireless networks.

SAM

Service Application Manager. Associates a specific service with an application that defines the medium to be used for that service, such as the World Wide Web. The SAM maintains the application in a specific directory to be used when needed by the DHCTs.

sampling

A digital process by which analog information is measured in order to convert analog data to digital data

SARA

The set of operating programs that is “permanently” loaded into the DHCT. These programs are immediately available to the subscriber upon activation of the DHCT.

SDV

Switched Digital Video. SDV is a technology that allows cable operators to recover bandwidth from infrequently-viewed channels, by making these channels "on-demand." Instead of sending all channels to the set-tops, lightly viewed channels are put into a switching pool and are only sent to the set-tops when viewers tune to them.

SER

Severe errors

server, MR-DVR

A MR-DVR DHCT that connects to client DHCTs and allows them to play back previously recorded content from the server DHCT.

SI

System information. A standard set of tables providing the data necessary for a navigation device to discover and access services.

signal level

The signal power or intensity at a specified point and with respect to a specified reference level.

SIL

Signaling interface level.

SRM

Software resource management.

subnet mask

32-bit address mask used in IP to indicate the bits of an IP address that are being used for the subnet address.

TDMA

Time division multiple access.

timestamp

The current time, recorded on the network at the headend, in which an event occurs.

tuner

A hardware device that allows live video content, such as from cable or broadcast television, to display on a local host.

TVP

TV program manager.

two-way operation

Operation in which transmission is made in two directions (from the headend to the subscriber and from the subscriber to the headend).

upstream

The transmission path from the subscriber to the headend.

VCI

Virtual channel indicator.

VCXO

Voltage–controlled crystal oscillator.

vertical resolution

The number of horizontal lines (or pixels) that can be resolved from the top of an image to the bottom.

VOD

Video-on-demand. The ability of a subscriber to select a program event and watch it within moments of selection. VOD allows pausing and rewinding of the event.

VPI

Virtual path indicator.

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