

INSTALLATION MANUAL

DCX3200

Installation Manual



IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

IMPORTANT SAFETY CONSIDERATIONS

The plug is the main disconnect device. It shall remain readily accessible and operable.

The apparatus shall not be exposed to dripping or splashing and no object filled with liquids, such as vases, shall be placed on the apparatus.

DURING TRANSPORTATION TO THE SUBSCRIBER HOME

Transport the cable terminal in its shipping box or an equally padded container.

Do not expose the terminal to rain or moisture.

DURING INSTALLATION



- Do not place the cable terminal in an enclosed area where the cooling vents are blocked or impede the flow of air through the ventilation openings.
- Install the terminal so that its position does not interfere with its proper ventilation. For example, do not place the terminal on a bed, sofa, rug, or similar surface that could block the ventilation openings.

- Install the terminal away from heat sources such as radiators, heat registers, and stoves. Installation of the terminal near consumer electronics devices, such as stereo receiver/amplifiers and televisions, is permitted as long as the air surrounding the terminal does not exceed 40° C (104° F).
- Place the terminal on a flat surface not prone to vibration or impact.
- Do not install the terminal in an area where condensation occurs.
- To prevent the temporary loss of guide data and cause a temporarily non-responding terminal, do not plug the AC power cord into a switched power outlet.

FCC COMPLIANCE

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by Motorola for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC DECLARATION OF CONFORMITY

Motorola Inc., Home and Network Mobility, 101 Tournament Drive, Horsham, PA 19044, 1-215-323-1000, declares that the DCX3200 receiver complies with 47 CFR Parts 2 and 15 of the FCC rules as a Class B digital device.

CANADA INDUSTRY CANADA (IC)

This Class B digital device complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Caring for the Environment by Recycling



When you see this symbol on a Motorola product, do not dispose of the product with residential or commercial waste.

Recycling your Motorola Equipment

Please do not dispose of this product with your residential or commercial waste. Some countries or regions, such as the European Union, have set up systems to collect and recycle electrical and electronic waste items. Contact your local authorities for information about practices established for your region. If collection systems are not available, call Motorola Customer Service for assistance. Please visit www.motorola.com/recycle for instructions on recycling.

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1 INTRODUCTION

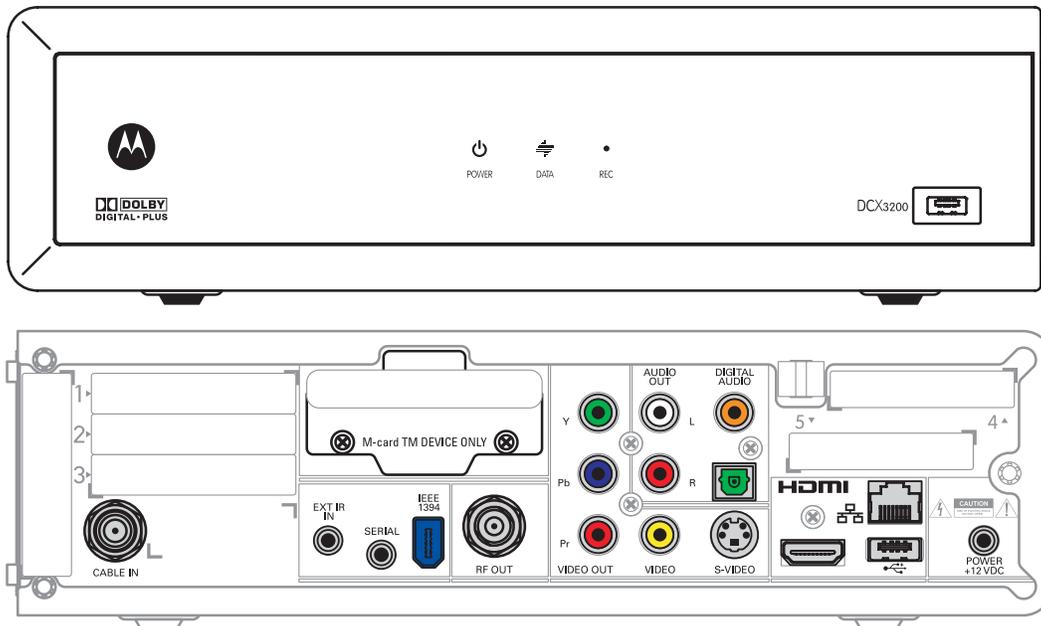
This manual provides instructions for cable operator personnel to install the Motorola DCX3200 All-Digital High-Definition Cable Set-top. This unit includes a high-end processor, expanded memory, and enhanced graphics to support digital and on-demand broadcast and interactive services. It provides a full complement of interconnection options.

The DCX3200 provides advanced capabilities, including:

- Authorization and purchase of on-demand programming
- HDTV output through component video (YPbPr), High-Definition Multimedia Interface (HDMI™), or IEEE-1394
- Surround-sound audio through a variety of analog and digital interconnection options
- DOCSIS 2.0+ embedded Cable Modem with support for DSG
- Ethernet and Universal Serial Bus (USB) 2.0 ports for future home networking applications
- Adaptability to various software platforms

As with all Motorola digital cable set-tops, the hardware features are enabled by core operating and third party application software.

Figure 1-1 Front and Rear views



1 INTRODUCTION

Features

Tuners

- One All Digital 1 GHz (54 to 1002 MHz) video tuner
 - MPEG-2 Main Profile @ High Level (High-Definition)
 - MPEG-4 H.264 (AVC) High-Definition decode
- One dedicated tuner for the DOCSIS high-speed data services channel, up to 1 GHz
- One dedicated tuner for the out-of-band (OOB) control channel

Standard Audio/Video Features

- ITU standard 64/256 QAM/FEC/enhanced adaptive equalizer
- DES based encryption/DCII (via inserted CableCARD™) access control
- Out-of-band data receiver (70-130 MHz) 2.048 Mbps
- Digital video scaling (picture in graphics)
- Accelerated 2-D graphics support in hardware
- Macrovision® copy protection
- High-Definition video output through:
 - HDMI™ (also compatible with DVI using an HDMI-to-DVI converter cable)
 - Component Video (YPbPr)
 - IEEE-1394
- Standard-Definition video output through:
 - S-Video
 - Baseband
 - RF
- Audio output through:
 - S/PDIF electrical and optical digital audio connections
 - One Baseband L/R stereo analog audio connection

Standard Data Features

- Integrated DOCSIS 2.0+ capable cable modem
- 64 MB FLASH memory
- 256 MB DRAM
- Two Universal Serial Bus (USB) 2.0 ports (one on the front panel and one on the rear panel)
- 10/100 Mbps Ethernet Port (RJ-45) on the rear panel

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- On-board real-time RF return (DOCSIS compliant)

Standard Miscellaneous Features

- Messaging capabilities
- Digital diagnostics

If You Need Help

If you need assistance while working with the DCX3200, contact the Motorola Technical Response Center (TRC):

- Inside the U.S.: 1-888-944-HELP (1-888-944-4357)
- Outside the U.S.: 1-847-725-4011
- Motorola Online: <http://businessonline.motorola.com/>

The TRC is on call 24 hours a day, 7 days a week. In addition, Motorola Online offers a searchable solutions database, technical documentation, and low-priority issue creation and tracking. For specific toll-free numbers when calling from outside the United States, please refer to the product manual or our Web page.

Calling for Repairs

If a Motorola set-top requires repair service, please call one of the following Motorola Authorized Service Centers:

Company	From USA or Canada	Outside USA or Canada
World Wide Digital	1-800-227-0450	1-956-541-0600
Teleplan	1-800-352-5274	1-302-322-6088

To ensure efficient service, request a Return for Service Authorization (RSA) number. Be sure to display the RSA number prominently on all equipment boxes.

The Service Center will provide the shipping address of the location performing your repairs.

To ship your equipment for repair:

- Pack the unit securely, if possible in its original factory shipping carton.
- Print or display the RSA number so it is easily visible on all equipment boxes.
- Enclose a note describing the exact problem. Complete and enclose the checklist provided with the unit.
- Ship the unit PREPAID to the address provided by the Service Center.



2 OVERVIEW

Front Panel

Figure 2-1 Front panel

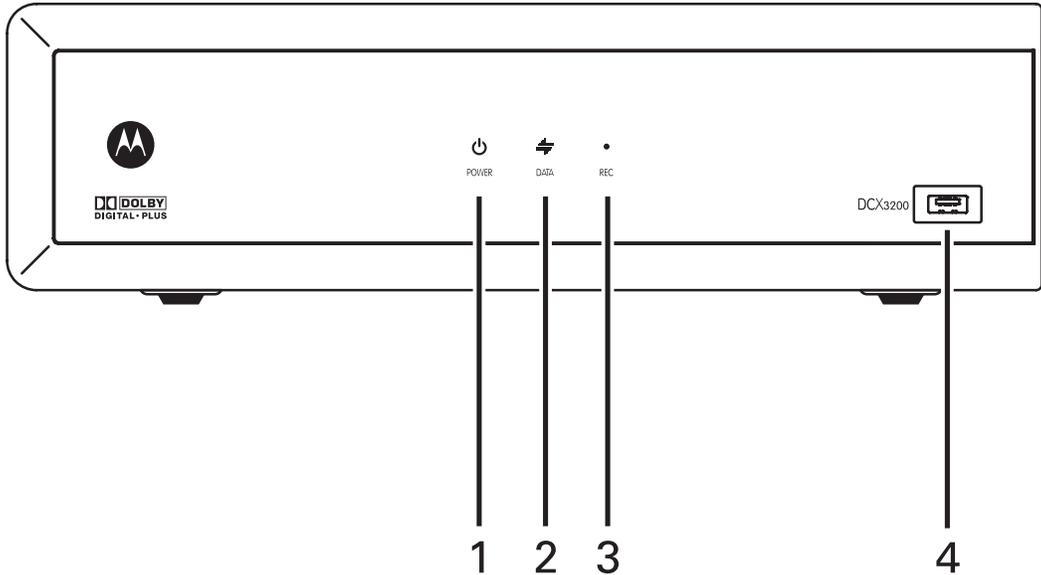


Table 2-1 Front panel

1	Power — turns the set-top on and off (standby)
2	Data — Dual function LED <ul style="list-style-type: none"> Flashes twice per second to indicate unit is booting Flashes once per second to indicate unit is provisioning Illuminates to indicate one or more set-top boxes and or DVR devices are detected on the home network
3	Rec — Unit is in record mode on a home network device (only available on DCX3200-M model) with MoCA option
4	USB connector*

**The availability of certain features is dependent upon application support.*

Rear Panel

The rear panel contains connectors for video, audio, and RF cabling; data output; and modem and data interface connectors. Some connectors are not enabled and require the support of application software.

2 OVERVIEW

Figure 2-2 Rear panel

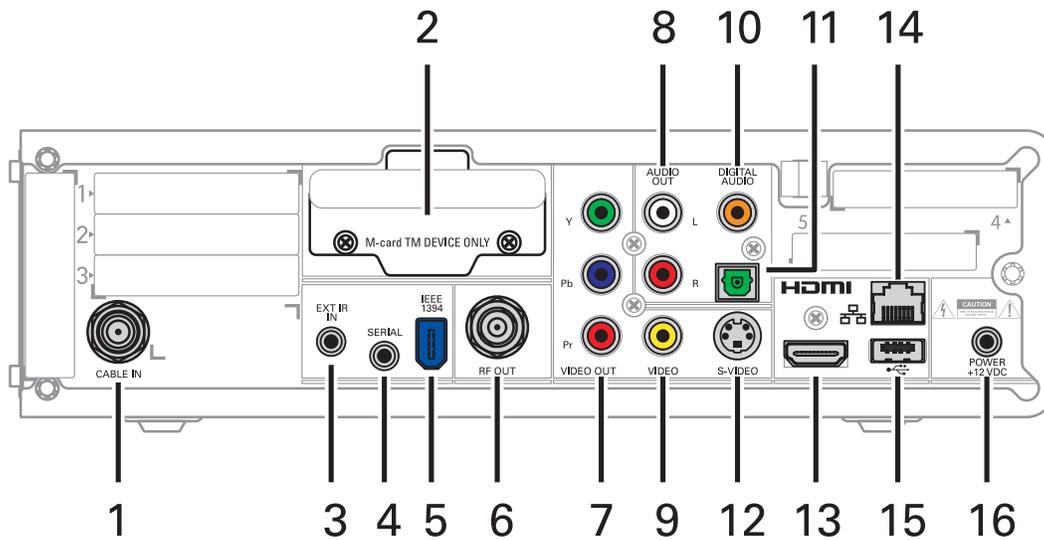


Table 2-2 Rear panel connections

1	Cable In — Connects to cable signal from the service provider
2	M-Card — Inserted M-Card
3	Ext IR Input – Connects to a remote control receiver accessory cable
4	Serial — Data test connector (service personnel only)
5	IEEE-1394 — Audio and video device connection
6	RF Out — Ch 3/4 modulated audio/video (SDTV) to TV or VCR
7	Video outputs / YPbPr — Component video output (HDTV)
8	Audio Out — L/R audio (SDTV)
9	Video Out — Composite Video (SDTV)
10	Digital Audio (coaxial) — Provides Dolby® Digital 5.1 audio or PCM output
11	Digital Audio (optical) — Provides Dolby® Digital 5.1 audio or PCM output
12	S-Video — Connects to S-Video (SDTV) input of TV or VCR
13	HDMI™ — High-Definition TV (HDTV) connector (Provides Dolby® Digital Plus (7.1) audio)
14	Ethernet* — Network connection
15	USB* 2.0 — High-Speed peripheral device connection
16	Power connector

* Availability of certain features is dependent upon application support.

M-Card™

The M-Card is required to view cable television programs or interactive on-demand programs. The M-Card should not be removed from the DCX3200.



3 INSTALLATION

Before You Begin

Before you move or change components on the subscriber's entertainment system:

- Review the installation instructions.
- Determine if you are connecting to a standard analog NTSC TV (supporting an RF input), a composite (baseband) video input, or a High-Definition TV (supporting component video input, HDMI™ input, or an IEEE-1394 input).
- Determine if the subscriber has other equipment to be connected to the terminal (home theater or A/V receiver, VCR, etc.).
- Verify that you have the necessary cables and other required items.

Cold Reset Procedure

This section describes the *Cold Reset* procedure for Motorola's DCX3200 set-top. The cold reset is generally used by operational and field personnel to accomplish the following:

- Restore the set-top to a known state.
- Clear channel maps and application settings.
- Remove application and software objects above the platform code.
- Clear the Out of Band (OOB) Last Known Carrier (LKC) and force the units to hunt for a new OOB control channel.

Cold Reset Method

1. Remove the set-top from its packaging.
2. Plug in a serial connector to the DCX3200 and open a terminal window.
3. AC power cycle the set-top.
4. When the words "Waiting for IR..." appear in the terminal window, press the Volume Down (–) button on the remote control.
5. All the following lights on the front panel LEDs will light up: Power, Data, and Record (Record is only present on MoCA models).
6. Press the following sequence of numbers on the remote control: 3, 2, and 8.
7. As each number in the sequence is pressed, the front panel LEDs will extinguish in the following order: Power, Data, and then Record (Record is only present on MoCA models.) In addition, the terminal window will echo back each button press as D, C, and X for each number in the sequence.
8. The set-top will cold reset.

3 INSTALLATION

Video Connection Options

Use the following guidelines to determine the best video connection for the subscriber's home entertainment system. To determine the available video inputs on the TV, check the manual supplied with the TV or the TV itself.

The DCX3200 offers the following video outputs:

Component (YPbPr)	HDTV and SDTV	The YPbPr output provides three component analog video signals to the TV. It is the most widely supported HD video connection.
HDMI™ or IEEE-1394	HDTV and SDTV	<p>HDMI™ and IEEE-1394 provide higher-quality digital HD video signals than analog component video signals. If the TV has an HDMI™ or a DVI input, use the HDMI™ output instead of the IEEE-1394 output.</p> <p>HDMI™ and IEEE-1394 are video and audio connections. If you use HDMI™ or IEEE-1394, no separate audio connection to the TV is required.</p> <p>HDMI™ is compatible with DVI. If the TV has a DVI input, you can use an HDMI-to-DVI converter cable or adapter to connect the DVI-equipped TV to the HDMI-equipped DCX3200.</p> <p>If you use the IEEE-1394 connection, you will be unable to see on-screen graphics (such as the EPG).</p>
S-Video	SDTV only	If the TV has an S-Video input, use S-Video. S-Video is the highest-quality Standard-Definition video output on the DCX3200.
Video (composite)	SDTV only	If the TV does not have an S-Video input, use the composite video (video) output.
RF	SDTV only	If the TV only has a coaxial RF input, connect it to the DCX3200 RF out connector.

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Audio Connection Options

When connecting to a home theater receiver, depending on its inputs, you can use the following DCX3200 audio outputs:

HDMI	Unlike a DVI connection, an HDMI™ connection is capable of carrying digital video and audio signals to the TV or a home theater receiver equipped with HDMI™ switching support. The HDMI™ connection can deliver Dolby® Digital Plus, Dolby® Digital, Linear PCM, and other digital audio formats to a compatible TV or home theater receiver.
Digital audio optical (S/PDIF) or digital audio coaxial (S/PDIF)	If the TV or home theater receiver supports it, use either the S/PDIF digital audio optical or S/PDIF digital audio coaxial outputs to deliver Dolby® Digital and Linear PCM audio to a Dolby® Digital home theater receiver. <ul style="list-style-type: none">• For an HDMI™ or IEEE-1394 video connection, no additional audio connections to the TV are required.• For RF output, no further audio connection is required.
Baseband Audio L / R	If the audio receiver does not support Dolby® Digital, use the baseband AUDIO L and R outputs to connect to the audio receiver.

Connect the stereo audio cable to the AUDIO L and R connectors on the DCX3200 and the audio left and right connectors on the TV. If the equipment supports it, use either the optical S/PDIF or coaxial digital S/PDIF output (there is no difference in audio quality between the two) instead of the AUDIO L and R outputs. These outputs offer better audio quality, including support for Dolby® Digital 5.1 Surround Sound.

The cabling diagrams show audio/video (A/V) connections to an audio receiver, where the receiver functions as an A/V router. When connecting to an audio receiver, reference its installation guide for directions on connecting to baseband and digital audio ports.

The VCR and TV receive their A/V signals from the currently selected input device on the audio receiver. This is important when the subscriber has another A/V device such as a DVD player, a secondary VCR, a CD player, or other electronic component. Motorola recommends connecting the TV to the monitor output so on-screen menus for the receiver can be displayed. (Receivers themselves often have interactive on-screen menus.)

Installation Overview

1. Determine if you are connecting to a:

High-Definition TV or monitor	Use the component video (YPbPr), HDMI, or IEEE-1394 outputs. No other video connection supports HDTV. If the TV has a DVI input, connect a DVI-to-HDMI adapter or cable to the HDMI™ out connector on the DCX set-top instead of the IEEE-1394 connection and the DVI-HDTV connector on the TV.
Standard-Definition TV	Connect the S-Video connector using an S-video cable or connect the composite video connector using a composite (RCA phono) cable. If the TV only has a coaxial RF input, connect it to the DCX3200 RF OUT connector.

3 INSTALLATION

2. Determine if you are connecting the audio to a home theater receiver or directly to the TV:
 - For an HDMI™ or IEEE-1394 video connection, no additional audio connections to the TV are required.
 - If the receiver or TV has a digital audio (S/PDIF) input, use the digital audio OPTICAL (S/PDIF) or COAXIAL (S/PDIF) outputs.
 - Otherwise, use the baseband left and right audio outputs.
3. Locate the cabling diagram(s) that best match the subscriber's configuration.
4. Connect the audio and video cables in a manner matching that diagram.
5. Determine if you are connecting to a data device (see [Data Device Connections](#) in this section). For installation details, refer to the instructions included with the data device.
6. Connect the cable terminal to the coaxial cable wall outlet.
7. Perform the operational check for the remote control.
8. Optimize the High-Definition settings.

Connecting HDTV — Single Connection for Video/Audio

Cable-In

Connect an RF coaxial cable to the cable wall outlet and the CABLE IN connector on the DCX set-top.

HDMI

If the TV has an HDMI™ input, this is for both audio and video if you are using the TV speakers. Connect a Standard HDMI™ cable to the TV and to the HDMI™ connect on the DCX set-top.

IEEE-1394

If the HDTV has an IEEE-1394 connector, you can use the IEEE-1394 for both the video and audio connection:

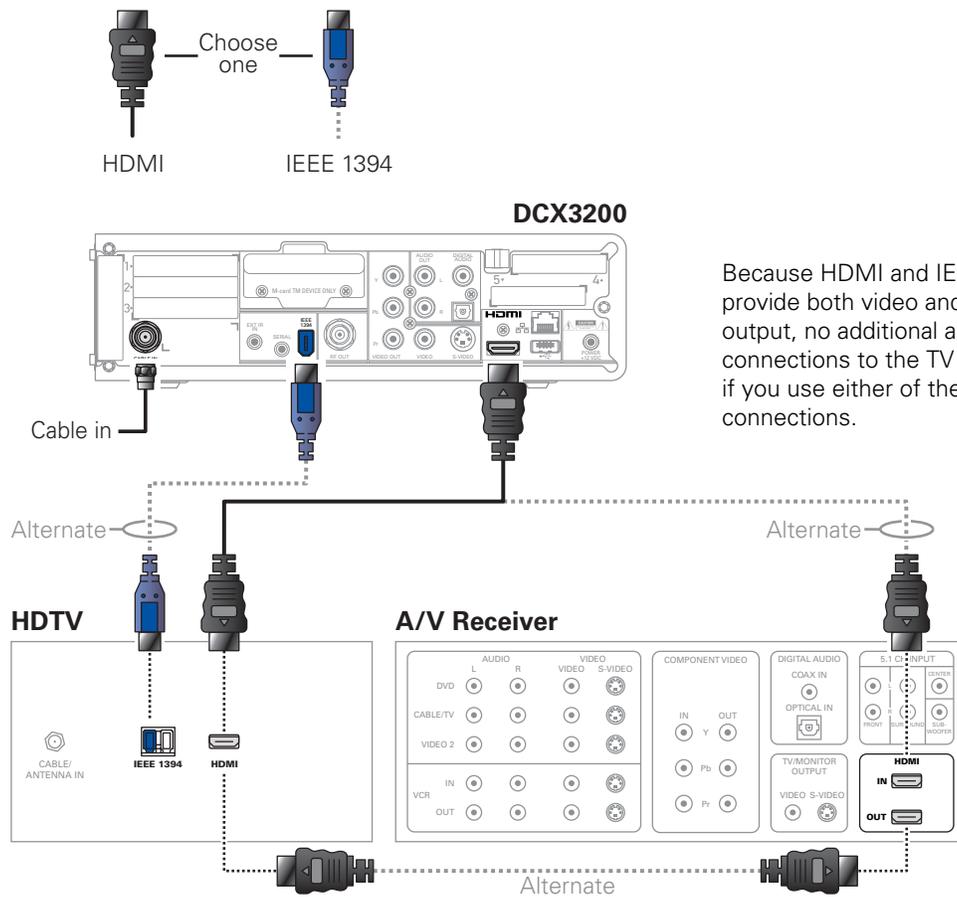
- Connect an IEEE-1394 cable to the IEEE-1394 connector on the HDTV and DCX set-top.

Note: On screen graphics will not be displayed when you are using the IEEE-1394 connection on the rear panel of the DCX set-top.

If there is an audio/video receiver and you are not using the TV's speakers, go to [Connecting the DCX Set-top to an A/V Receiver — Audio](#).

3 INSTALLATION

Figure 3-1 Connecting the DCX Set-top to an HDTV — Single Connection for Video/Audio



Because HDMI and IEEE-1394 provide both video and audio output, no additional audio connections to the TV are required if you use either of these connections.

Note: Only (1) HDTV video/audio connection needs to be made to an HDTV.

Note: On-screen graphics will not be displayed when using IEEE-1394 connection. Refer to [Graphics Overlaying the Video](#) for more information.

Note: Solid lines indicate optimum connections.

Note: Optional HDMI™ connection to A/V Receiver shown but not required.

3 INSTALLATION

Connecting HDTV — Separate Video/Audio Connections

Cable In

Connect an RF coaxial cable to the cable wall outlet and the Cable In connector on the DCX set-top.

DVI

If the TV has a DVI input, use the DVI connection for the video:

- Connect a HDMI-to-DVI adapter or cable to the HDMI™ out connector on the DCX set-top and the DVI connector on the TV.

Note: A DVI connection supports only the video connection between the DCX set-top and the HDTV. To connect your audio connections with your TV speakers, go to Audio section below. To connect the audio connections for an A/V receiver, go to [Connecting the DCX Set-top to an A/V Receiver — Audio](#).

Component Video (YPbPr)

Connect the component video cables to the **Y**, **Pb**, and **Pr** connectors on the HDTV and the DCX set-top.

Note: This connection supports only the high-definition video connection between the DCX set-top and the HDTV. To connect your audio connections with your TV speakers, go to Audio section below. To connect the audio connections for the HDTV, go to [Connecting the DCX Set-top to an A/V Receiver — Audio](#).

Audio

If the TV does not have digital audio inputs:

- Connect the stereo audio cable to the AUDIO L and R connectors on the DCX3200 Series set-top and the audio left and audio right connectors on the HDTV.

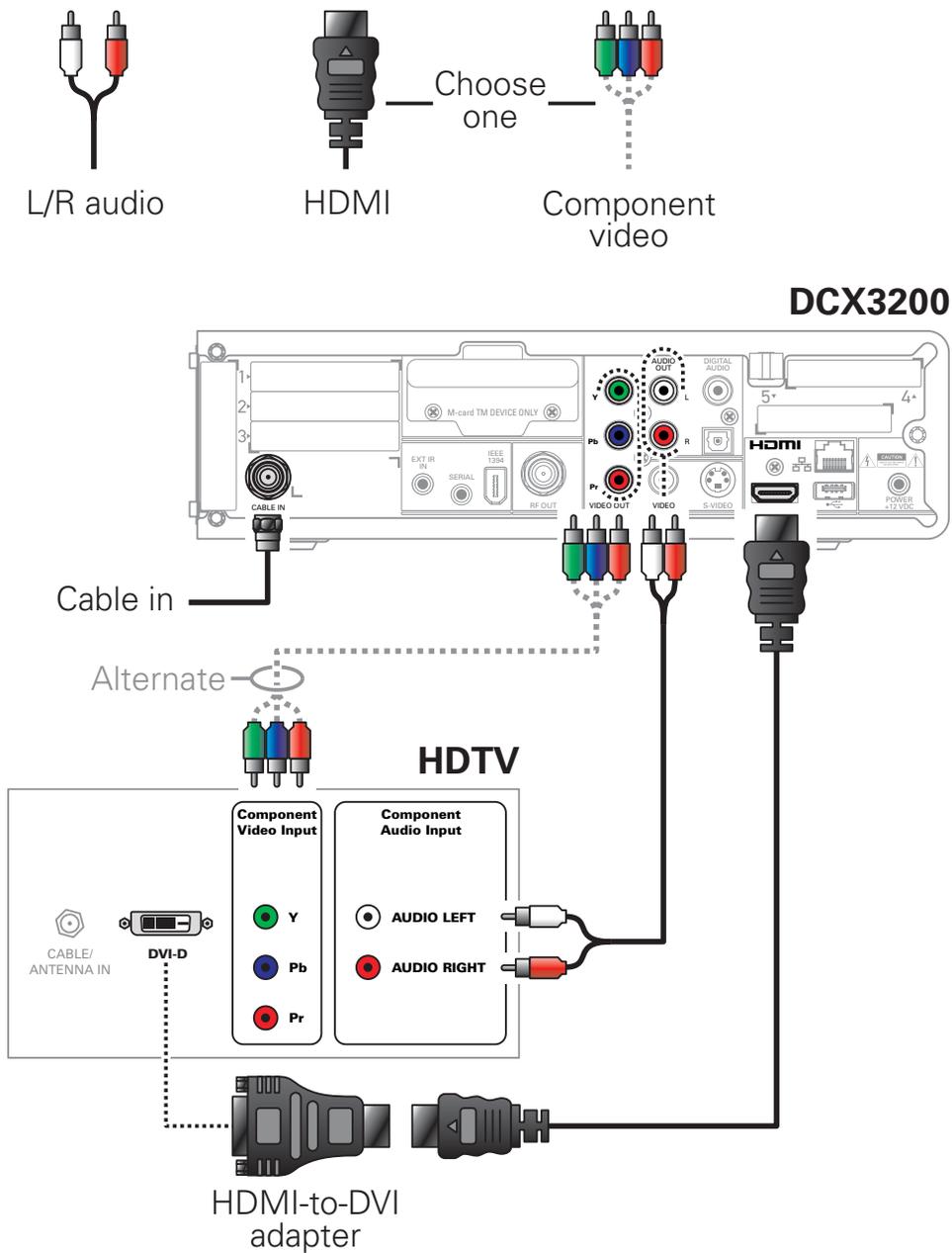
If the TV supports a digital audio input:

- If the equipment supports it, use the digital audio OPTICAL S/PDIF or COAXIAL S/PDIF outputs instead of the AUDIO L and R outputs. S/PDIF offers better audio quality, including support for Dolby® Digital audio.

For more information on configuring the DCX setup-top settings, see [Configuring Audio, Video, and Closed Caption Settings](#).

3 INSTALLATION

Figure 3-2 Connecting the DCX Set-top to an HDTV — Separate Video/Audio



Note: If the receiver can check the baseband and digital audio (S/PDIF) ports for appropriate channels, connect both the baseband and digital audio connections. Otherwise, do not connect both the baseband left/right composite connections and the coaxial digital connection. The baseband connections are not necessary because the digital audio port provides a single audio interface for digital channels.

Note: If the A/V receiver includes HDMI™ inputs & output(s) then the DCX3200 HDMI™ output can be directly connected to the A/V receiver.

3 INSTALLATION

Connecting an A/V Receiver — Audio

There are several options available for audio connections to the A/V receiver:

- Digital audio (OPTICAL S/PDIF)
- Digital audio (COAXIAL S/PDIF)
- Stereo audio (AUDIO L and R)

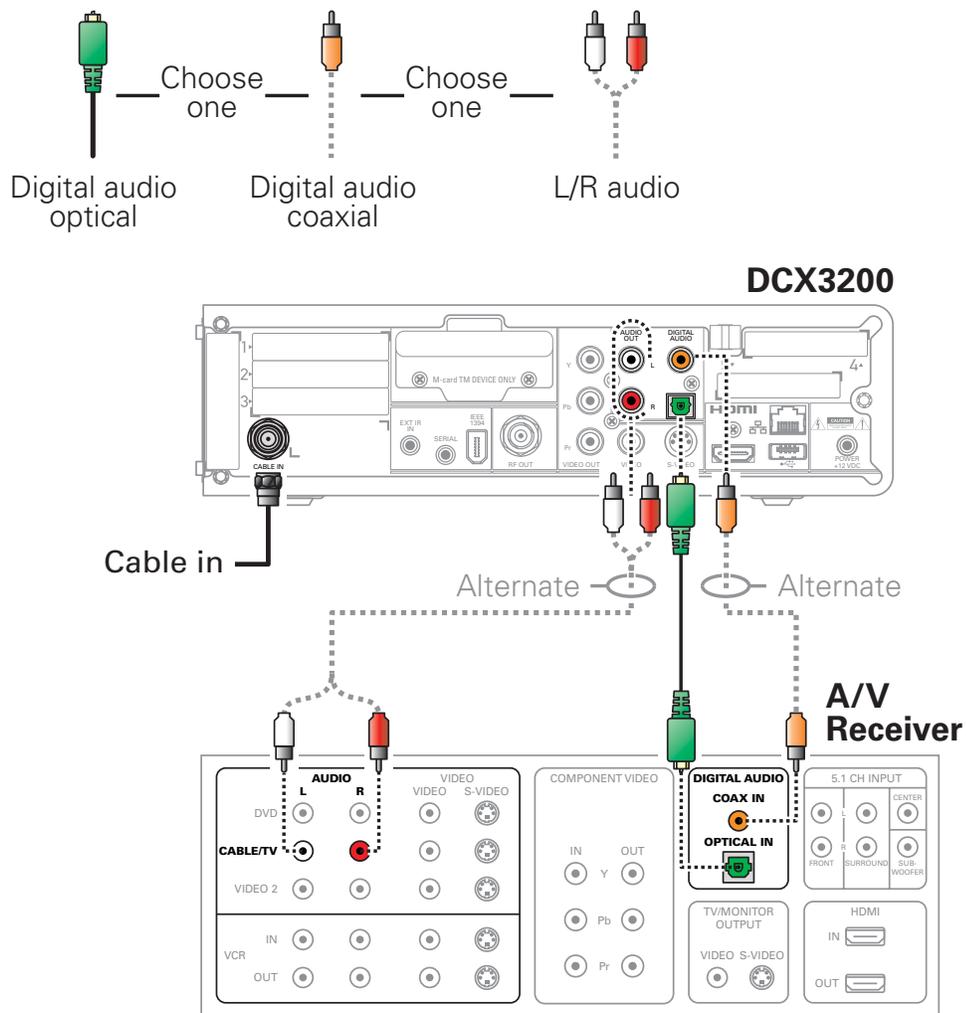
If the A/V receiver supports it, the optical (S/PDIF) or coaxial (S/PDIF) audio outputs may be used in place of the stereo audio outputs (AUDIO L and R). These outputs offer a higher level of audio quality, including support for Dolby® Digital audio.

- **Digital audio optical (S/PDIF)** — Connect the optical cable to the digital audio optical connector on the DCX set-top and the optical connector on the A/V receiver.
- **Digital audio coaxial (S/PDIF)** — Connect the digital audio cable to the digital audio connector on the DCX set-top and the DIGITAL INPUT COAX connector on the A/V receiver.
- **Stereo audio** — Connect the stereo audio cable to the AUDIO L and R connectors on the DCX set-top and the AUDIO LEFT and AUDIO RIGHT connectors on the A/V receiver.

For information on configuring the DCX set-top settings, see [Configuring the Audio, Video, and Closed Caption Settings](#).

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Figure 3-3 Connecting the DCX Set-top to an A/V Receiver — Audio



Note: Because some entertainment equipment cannot simultaneously support baseband composite video and S-Video, never simultaneously connect both video inputs.

Note: This connection method does not support HDTV. For information, see [Connecting HDTV — Separate Video/Audio Connections](#) in this section.

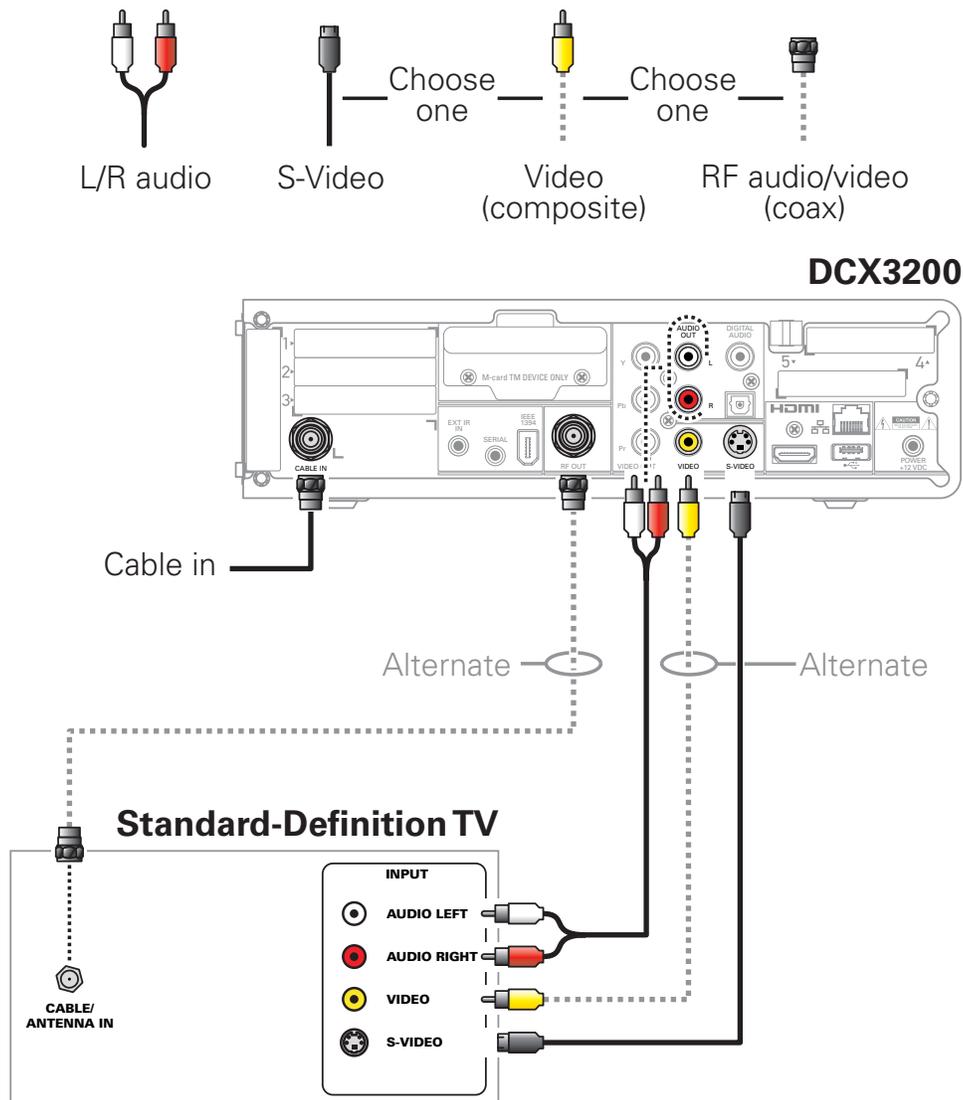
3 INSTALLATION

Connecting a Standard-Definition TV (SDTV)

1. Connect the stereo audio cable to the AUDIO L and R connectors on the DCX set-top and the AUDIO L and AUDIO R connectors on the Stereo TV (SDTV).
2. Connect a video cable to the VIDEO OUT connector on the DCX set-top and the INPUT VIDEO on the TV or an S-video cable to the S-VIDEO connectors on the DCX set-top and the TV.

Note: These video connection methods do not support HD video. If you have an HDTV, see [Connecting HDTV — Separate Video/Audio Connections](#).

Figure 3-4 Connecting a Standard-Definition TV (SDTV)



3 INSTALLATION

Depending on the TV's inputs:

1. If possible, use the S-Video and audio connects on the DCX set-top.
2. If the TV has no S-Video input, use the composite video and audio connectors on the DCX set-tops.
3. If the TV has an RF input only, use the RF out connector on the DCX set-top. The RF connection carries video and audio.

Note: S-Video and Composite video require separate audio connections.

Connecting a Standard-Definition TV (SDTV) and VCR/DVD Recorder

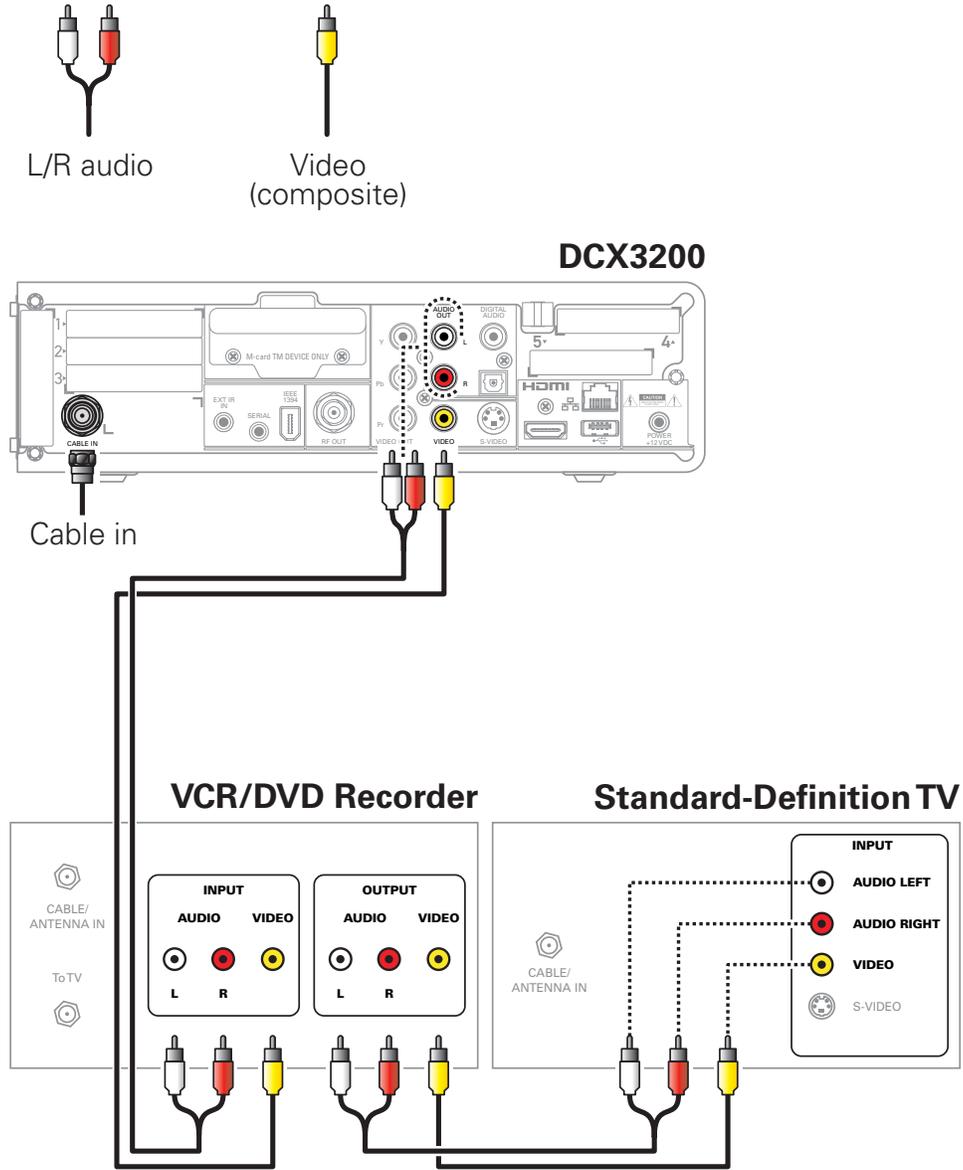
1. Connect a stereo audio cable to the AUDIO OUT L and R connectors on the DCX3200 Series set-top and the INPUT AUDIO L and R connectors on the stereo VCR.
2. Connect a video cable to the VIDEO OUT connector on the DCX3200 Series set-top and the INPUT VIDEO connector on the stereo VCR.
3. Connect a stereo audio cable to the OUTPUT AUDIO L and R connectors on the Stereo VCR and the INPUT AUDIO LEFT and RIGHT connectors on the Stereo TV (SDTV).
4. Connect a video cable to the output video connector on the stereo VCR and the input video connector on the Stereo TV (SDTV).

Note: You can also connect using the S-Video connectors if supported by the stereo VCR.

These video connection methods do not support HD video. If there is an HDTV, see [Connecting HDTV — Separate Video/Audio Connections](#).

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Figure 3-5 Connecting the DCX Set-top to an A/V Receiver, Standard-Definition TV (SDTV), and VCR/DVD Recorder



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Connecting an A/V Receiver, TV, and VCR

1. Connect a stereo audio cable to the AUDIO OUT L and R connectors on the DCX set-top and the INPUT L and R connectors on the A/V receiver.
2. Connect a video cable to the video out connector on the DCX set-top and the cable/TV video connector on the A/V receiver.
3. Connect a stereo audio cable to the VCR AUDIO OUT L and R connectors on the A/V receiver and the INPUT AUDIO L and R connectors on the stereo VCR.
4. Connect a stereo audio cable to the OUTPUT AUDIO OUT L and R connectors on the stereo VCR and the VCR AUDIO IN L and R connectors on the A/V receiver.
5. Connect a video cable to the input video connector on the stereo VCR and the video VCR OUT connector on the A/V receiver.
6. Connect a video cable to the output video connector on the stereo VCR and the video VCR IN connector on the A/V receiver.
7. Connect a video cable to the input video connector on the Stereo TV (SDTV) and the TV/monitor output video connector on the A/V receiver.

If the equipment supports it:

- The digital audio (OPTICAL S/PDIF or COAXIAL S/PDIF) audio outputs may be used in place of the stereo audio outputs (AUDIO L and R). These outputs offer a higher level of audio quality, including support for Dolby® Digital 5.1 audio.
- S-Video connections may be used in place of the standard composite video connections. S-Video offers a higher level of standard definition video quality than composite video.

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Data Device Connections

The DCX3200 provides optional high-speed data services such as Internet access, USB, Ethernet, and more. The functionality of each data device port requires, and depends on, installed application software.

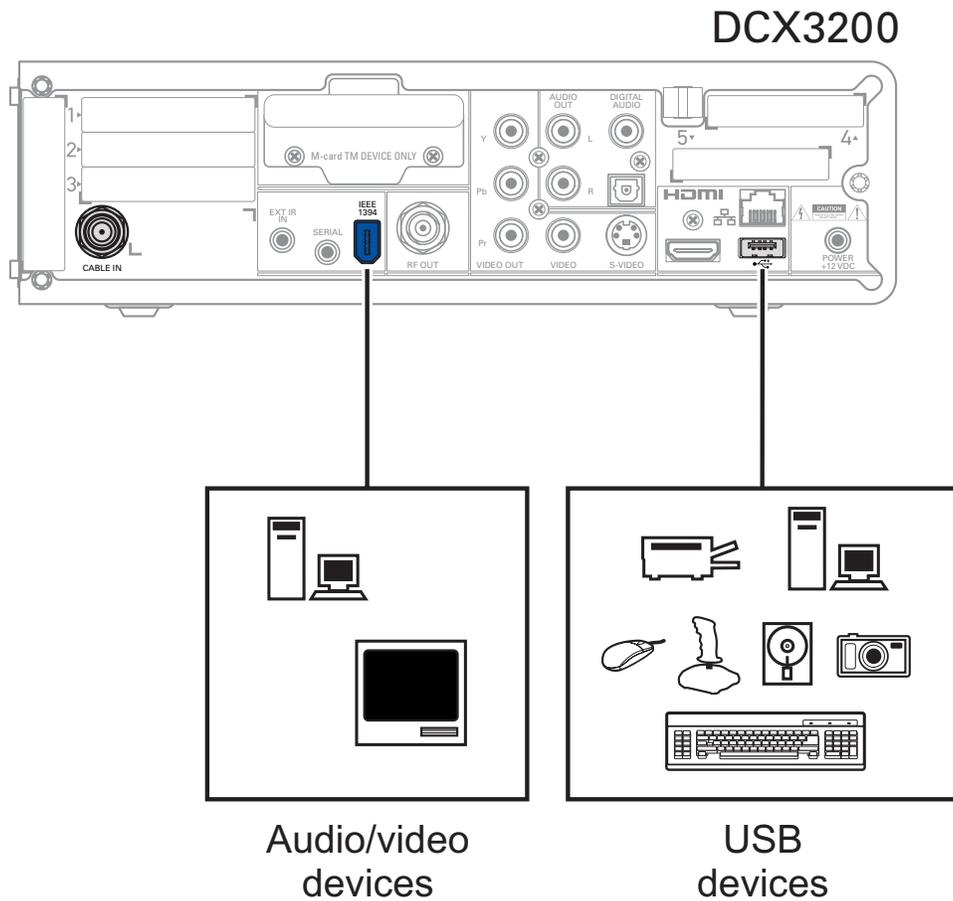
The DCX3200 rear panel provides the following data ports:

USB 2.0	Can be used to daisy-chain USB devices such as printers and storage devices, or to interface with keyboards, joysticks, and other USB PC peripherals.
Ethernet	10/100 Mbps RJ-45 port
IEEE-1394	Can be used to connect an MPEG-2 compatible display device

The DCX3200 front panel provides:

USB 2.0	Can be used in the same manner as the rear panel USB 2.0 port
----------------	---

Figure 3-7 Sample data devices you can connect to the DCX3200



3 INSTALLATION

Operational Check for the Remote Control

The operational check tests communication with the remote control:

Table 3-1 Operational check procedures

Feature	Testing Procedure
Power on	Press POWER on the remote control to turn on the DCX3200. Tune to the output channel (3 or 4) if using the RF output.
Channel selection	Scan through the channels using the CHANNEL + or - keys. Tune to several channels by entering the channel number using the numeric keys.
Volume control	Press VOLUME + or - on the remote control to increase the volume to its upper limit, lowest level, and to a comfortable level. Press MUTE to turn the sound off. Press MUTE again to restore the sound.

If the DCX3200 does not operate properly, refer to the Troubleshooting section.

Configuring the Audio, Video, and Closed Caption Settings

This subsection describes how to configure the audio (for HDMI™ connections), SD and HD video settings, and closed caption settings for the DCX3200.

Before you adjust the output settings:

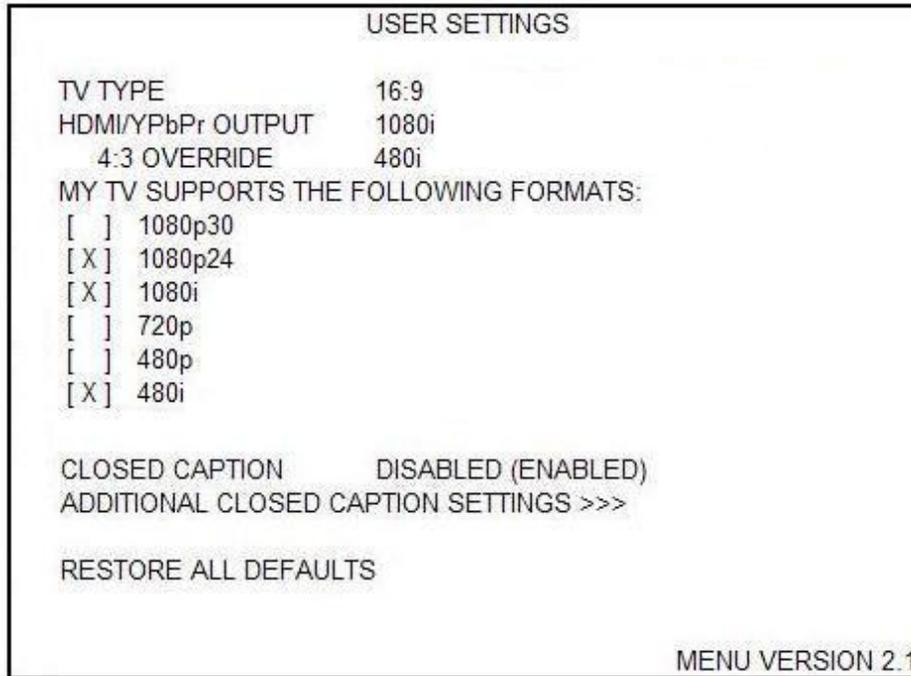
- Connect the DCX3200 to the TV and other home entertainment devices
- Plug the DCX3200 into an AC power outlet
- Initialize the DCX3200 and authorize it for services
- Turn the TV on

When using an HDMI™ connection between the DCX3200 and the television, be sure to have the cable connected and the TV powered on before adjusting the video settings. Motorola recommends using HDMI™ cables less than 20 meters long.

To configure the DCX3200 settings on the main User Settings menu screen:

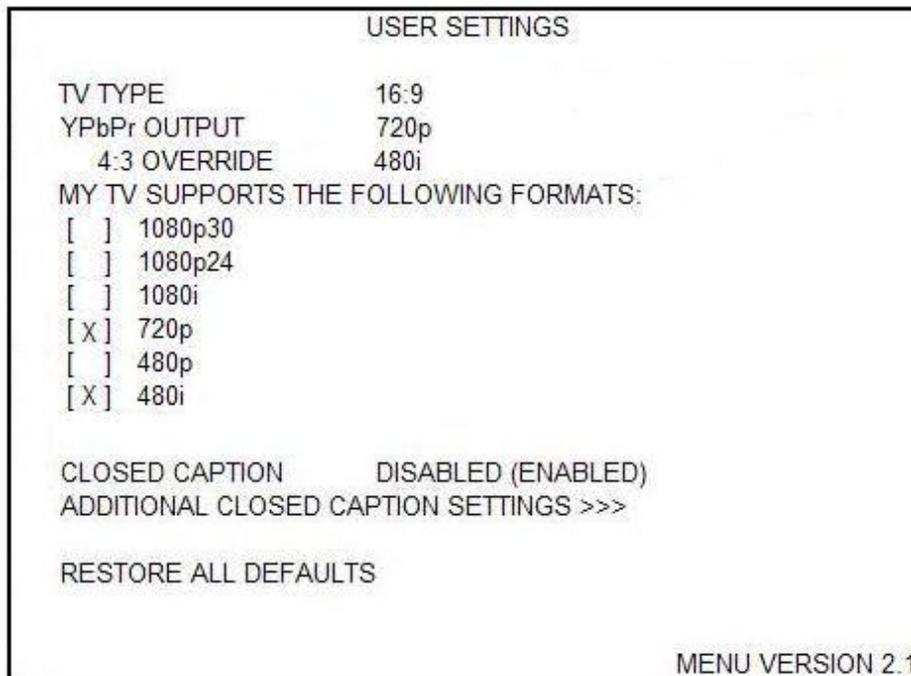
1. Power off the DCX3200 and then immediately press the MENU key on the remote control. If the TV is on, the on-screen menu lists the settings you can be adjusted:

3 INSTALLATION



An example of the User Settings menu when the HDMI™ output is connected

Note: The User Settings Menu indicates whenever an HDMI™ connection is in place between the DCX3200 and another device. When the HDMI™ connection is not being used, the User Settings Menu will update to reflect this:



An example of the User Settings menu when the HDMI™ output is not connected

2. Use the remote control to navigate the on-screen menus:

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- Press the ▲ and ▼ keys to highlight the setting you wish to change.
- Press the ► key to select an option.
- To exit the setting and move to another setting, press the ▲ or ▼ key.

If the User Settings menu does not display on the HDTV screen, the TV may not support the default video output setting. Use the Format button on the remote control to select a video output format that can be displayed by the TV as described in “There is no video on the TV screen” in the [Troubleshooting](#) section.

The User Settings menu options are:

Setting	Description
TV Type	<p>The TV Type setting allows you to specify the style of television connected to the DCX3200. Options include 16:9, 4:3 LETTERBOX, and 4:3 PAN SCAN. By default, the 16:9 option is selected. The options are used as follows:</p> <ul style="list-style-type: none">• 16:9 designates that a widescreen television is connected to the DCX3200.• 4:3 LETTERBOX designates that a standard-screen television is connected to the DCX3200 and that widescreen programs should be scaled to fit the screen with black bars above and below the picture.• 4:3 PAN SCAN designates that a standard-screen television is connected to the DCX3200 and that widescreen programs should be cropped so that the picture fills the entire screen.

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Setting	Description
HDMI/YPbPr Output	<p>The HDMI/YPbPr Output setting allows you to specify the video output format of the DCX3200 for all programs (when the 4:3 Override setting is set Off or Stretch) or for all widescreen programs (when the 4:3 Override is set to 480i or 480p). Options include 1080i, 720p, 480p, 480i, and Native. By default, the 1080i option is selected.</p> <p>The options are used as follows:</p> <ul style="list-style-type: none"> • 1080i — The DCX3200 will present programs in the High-Definition 1080i format (1920 x 1080 pixels with interlaced scanning at 30 frames per second). • 720p — The DCX3200 will present programs in the High-Definition 720p format (1280 x 720 pixels with progressive scanning at 60 frames per second). • 480p — The DCX3200 will present programs in the Enhanced-Definition 480p format (720 x 480 pixels with progressive scanning at 60 frames per second). • 480i — The DCX3200 will present programs in the Standard-Definition 480i format (720 x 480 pixels with interlaced scanning at 30 frames per second). • Native — The DCX3200 will present programs in the format that most closely matches their native format according to the compatible formats selected from the “My TV Supports The Following Formats” list (see below). <p><u>Note 1:</u> Some televisions may only support certain video formats. Please consult the television’s user manual for more information on video format compatibility.</p> <p><u>Note 2:</u> The DCX3200 can detect when the HDMI™ connection is in use. If you are not using the HDMI™ connection on the DCX3200, the “HDMI/YPbPr Output” setting will display as “YPbPr Output” in the User Settings Menu.</p>
4:3 Override	<p>The 4:3 Override setting allows you to specify the video output format of the DCX3200 when it is tuned to a Standard-Definition. Options include 480i, 480p, Stretch, and Off. By default, the 480i option is selected.</p> <p>The options are used as follows:</p> <ul style="list-style-type: none"> • 480i — The DCX3200 will present Standard-Definition programs in the Standard-Definition 480i format (720 x 480 pixels). • 480p — The DCX3200 will present Standard-Definition programs in the Enhanced-Definition 480p format (720 x 480 pixels). • Stretch — The DCX3200 will automatically stretch all Standard-Definition programs to a widescreen aspect ratio and present the video in the format designated by the HDMI/YPbPr Output setting. Note that the Stretch option is only available when the TV Type setting is 16:9. • Off — The DCX3200 will create a widescreen version of a Standard-Definition program by adding black bars to the left and the right of the picture and present the video in the format designated by the HDMI/YPbPr Output setting. <p><u>Note 1:</u> Some televisions may only support certain video formats. Please consult the television’s user manual for more information on format compatibility.</p> <p><u>Note 2:</u> If the HDMI/YPbPr Output setting is set to either 480i or Native, the 4:3 Override feature is disabled and is no longer selectable in the menu.</p>

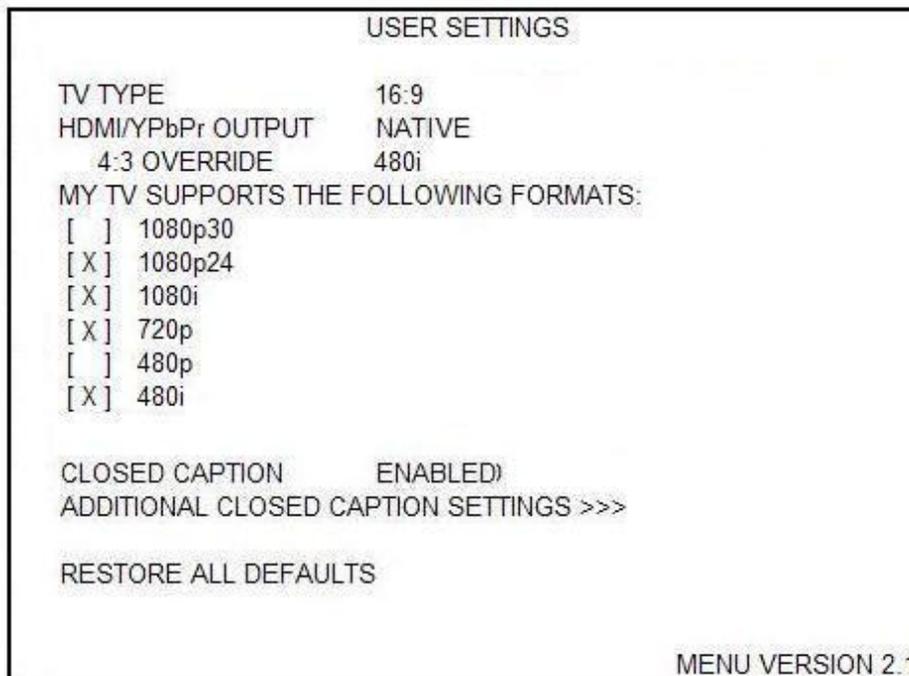
3 INSTALLATION

Setting	Description
	<p>The 4:3 Override feature is available when the HDMI/YPbPr Output setting is 1080i, 720p, or 480p.</p>
<p>My TV Supports The Following Formats</p>	<p>The My TV Supports The Following Formats checklist allows you to configure the Native mode operation of the DCX3200. The checklist becomes accessible only when the HDMI/YPbPr Output setting is set to Native. The DCX3200 is capable of delivering all of the video formats listed in this checklist depending upon the type of video connection (HDMI™ or YPbPr) being used. By default, the 1080i and 480i formats are checked in this checklist.</p> <p>The options are used as follows:</p> <ul style="list-style-type: none"> • 1080p30 — The DCX3200 will present programs broadcast in the High Definition 1080p30 format (1920 x 1080 pixels with progressive scanning at 30 frames per second) using the HDMI™ connection only. The DCX3200 cannot convert any other broadcast format to the 1080p30 format. • 1080p24 — The DCX3200 will present programs broadcast in the High Definition 1080p24 format (1920 x 1080 pixels with progressive scanning at 24 frames per second) using the HDMI™ connection only. The DCX3200 cannot convert any other broadcast format to the 1080p24 format. • 1080i — The DCX3200 will present programs broadcast in the High Definition 1080i format using both the HDMI™ and YPbPr connections. The DCX3200 can also convert any other broadcast format to the 1080i format. • 720p — The DCX3200 will present programs broadcast in the High Definition 720p format using both the HDMI™ and YPbPr connections. The DCX3200 can also convert any other broadcast format to the 720p format. • 480p — The DCX3200 will present programs broadcast in the Enhanced Definition 480p format using both the HDMI™ and YPbPr connections. The DCX3200 can also convert any other broadcast format to the 480p format. • 480i — The DCX3200 will present programs broadcast in the Standard Definition 480i format using both the HDMI™ and YPbPr connections. The DCX3200 can also convert any other broadcast format to the 480i format. <p><u>Note 1:</u> The DCX3200 cannot provide 1080p30 or 1080p24 video using the YPbPr output. When using the DCX3200 in Native mode, these two formats are disabled and inaccessible if there is no HDMI™ connection in place.</p> <p><u>Note 2:</u> When connecting the DCX3200 to an HDMI™ (or DVI) TV, the TV provides the DCX3200 with its list of supported video formats. The DCX3200 will automatically place a check next to the formats in the checklist that it can verify are supported by the TV. The checklist may be modified manually after the DCX3200 performs the automatic configuration.</p> <p><u>Note 3:</u> While this checklist provides the ability to customize the Native mode experience when using the DCX3200, it can also result in a loss of video if the checklist is modified without a clear understanding of the video formats supported by the TV. These settings should only be modified by a professional installer or someone with a good working knowledge of the video formats supported by the TV.</p> <p><u>Note 4:</u> When using the DCX3200 in Native mode, at least one of the following formats (1080i, 720p, 480p, 480i) MUST be checked even if one or both of the 1080p formats has been checked. The DCX3200 cannot be</p>

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Setting	Description
	configured to provide video only in the 1080p30 and/or 1080p24 formats. The DCX3200 also does not support the 1080p60 video format. <u>Note 5:</u> The DCX3200 will provide 480i format video on the YPbPr output whenever 1080p30 or 1080p24 format video is being provided on the HDMI™ output.
Additional HDMI™ Settings	The Additional HDMI™ Settings option is available whenever an HDMI™ connection is in place. Selecting this option will present a new menu screen with settings specific to the HDMI™ connection. These settings are discussed in more detail below.
Closed Caption	The Closed Caption setting turns closed captions off or on. When this option is set to Disabled, the DCX3200 does not render (draws) closed captions on any video output. When this option is set to Enabled, the DCX3200 renders (draws) closed captions on all video outputs. By default, the Disabled option is selected.
Additional Closed Caption Settings	The Additional Closed Caption Settings option is available whenever the Closed Caption setting is set to Enabled. Selecting this option will present a new menu screen with settings specific to closed captions. These settings are discussed in more detail below.
Restore All Defaults	To reset all User Settings to their default values, move the cursor to this option and press the ► key.

- To exit the menu and save the new settings, press the POWER or MENU key.

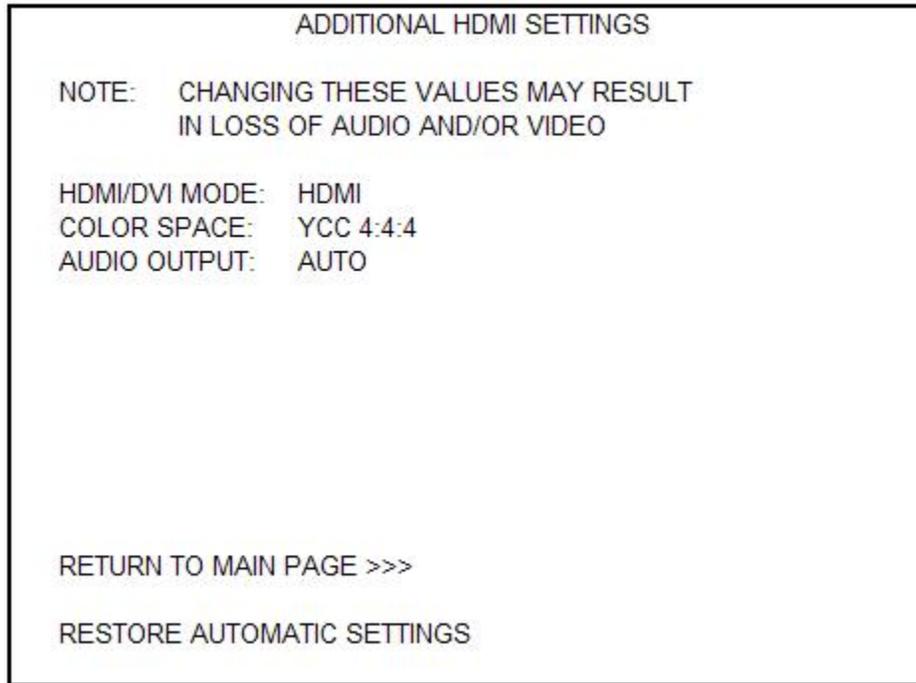


An example of the User Settings menu when configured for Native mode operation

To configure the DCX3200 settings on the Additional HDMI™ Settings menu screen:

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1. With an HDMI™ connection in place, power off the DCX3200 and then immediately press the MENU key on the remote control. This will display the main User Settings menu. Move the cursor next to the “Additional HDMI Settings” option and press the ► key.



An example of the Additional HDMI™ Settings menu

The Additional HDMI™ Settings menu options are:

Setting	Description
HDMI/DVI Mode	<p>The HDMI/DVI mode settings allow you to optimize the HDMI™ output to work with both DVI-equipped televisions and HDMI™ equipped televisions. By default, this option is set to HDMI. The options are used as follows:</p> <ul style="list-style-type: none"> • HDMI™ designates that an HDMI™ television is connected to the DCX3200. • DVI designates that a DVI television is connected to the DCX3200 (via an HDMI-to-DVI adapter).
Color Space	<p>The Color Space setting allows you to adjust the color space used by the DCX3200 to generate the video signals on the HDMI™ output. By default, this option is set to YCC 4:4:4. The options are used as follows:</p> <ul style="list-style-type: none"> • YCC 4:4:4 designates that the DCX3200 will generate video signals within the YCC color space. • RGB designates that the DCX3200 will generate video signals within the RGB color space. <p>Note 1: Adjusting these settings could result in a loss of video. Only a professional installer or someone with a good working knowledge of the color spaces supported by the TV should change this setting.</p>

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Setting	Description
Audio Output	<p>The Audio Output setting allows you to specify the digital audio format delivered over the HDMI™ connection by the DCX3200. Options include Auto, L-PCM, and Pass Through. By default, the Auto option is selected. The options are used as follows:</p> <ul style="list-style-type: none"> • Auto designates that the DCX3200 will provide the digital audio format specified by the connected device (TV or home theater receiver) when that device was first connected to the DCX3200. • L-PCM designates that the DCX3200 will provide all audio in the Linear Pulse Code Modulation digital audio format. The L-PCM format is widely supported by most HDMI™ televisions and home theater receivers. • Pass Through designates that the DCX3200 will provide the same digital audio format on the HDMI™ output as is provided with the program being viewed at that time. For example, if the program has a Dolby® Digital soundtrack, the DCX3200 will pass the Dolby® Digital audio to the HDMI™ output. This option is most useful when connecting the DCX3200 to a home theater receiver that has HDMI™ switching capability. <p><u>Note 1:</u> Adjusting these settings could result in a loss of audio. Only a professional installer or someone with a good working knowledge of the digital audio formats supported by the TV and/or home theater receiver should change this setting</p>
Return To Main Page	Selecting this option will return you to the main User Settings menu screen.
Restore Automatic Settings	Selecting this option will restore all of the settings on this screen (HDMI/DVI Mode, Color Space, and Audio Output) to their default value. Use this option if audio and/or video have been lost after adjusting these settings from their default values.

To configure the DCX3200 settings on the Additional Closed Caption Settings menu screen:

1. Power off the DCX3200 and then immediately press the MENU key on the remote control. This will display the main User Settings menu. Move the cursor next to the "Closed Caption" option and adjust this setting to "Enabled." The option to enter the Additional Closed Caption Settings menu is now available.

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Setting	Description
Settings	Sets the default settings for closed captions (AUTO) or the settings you have configured (USER). Defaults to AUTO. Options are AUTO or USER.
Return To Main Page	Selecting this option will return you to the main User Settings menu screen.
Restore Closed Caption Defaults	To reset all of the Additional Closed Caption settings to their default values, select this option and press the ► key.

Graphics Overlaying the Video

The DCX3200 can generate graphics that overlay the video programming or fill the entire television screen. Common examples include on-screen menus (such as the User Setting menu), closed captions, and IPG. The DCX3200 overlays these graphics whenever you open a menu, enable closed captions, or scroll through a program grid.

On-screen graphics are available for all DCX3200 video outputs except IEEE-1394.



4 DIAGNOSTICS

Diagnostics are displayed on the on-screen display (OSD). They confirm proper installation, including:

- Checking error states and signal integrity.
- Identifying the cable terminal on the network.
- Verify communications with the headend.

For the diagnostics described in this section:

- All indicators are in decimal notation, unless otherwise noted.
- All signal-level and quality indicators use a 1% to 100% scale, unless otherwise noted.
- All sample displays are illustrative; actual data may differ from the examples.

Using the Diagnostics

To use the diagnostics:

1. Ensure that the DCX3200 is installed with the Thin Client software and that it is connected to an AC outlet.
2. Ensure the set-top is powered on.
3. Press POWER on the remote control to put the set-top in stand-by mode.
4. Within two (2) seconds press SELECT on the remote control to enable diagnostic mode.
5. The Diagnostics main menu is displayed on the OSD.

You can use the following keys to navigate the diagnostics menus:

- Press channel ▲, channel ▼, cursor ▲, or cursor ▼ to select d01 through E.
- Press cursor ◀, cursor ▶, select or enter to execute the selected diagnostic.
- Select E from the main menu or press power to exit.

4 DIAGNOSTICS

General Status

This diagnostic displays system status information on the OSD. The information is updated each time the diagnostic is displayed.

```
DIAGNOSTICS
> d01 GENERAL STATUS
d02 PURCHASE/POLL STATUS
d03 OOB STATUS
d04 INBAND STATUS
d05 UNIT ADDRESS/SECURITY
d06 CURRENT CHANNEL STATUS
d07 UPSTREAM STATUS
d08 CODE MODULES
d09 MEMORY CONFIG
d10 AUDIO/VIDEO STATUS
d11 INTERFACE/PORT STATUS
d12 USER SETTING STATUS
d13 DVR/HDD STATUS
d14 DOCSIS STATUS
d15 APPLICATION SPECIFIC INFORMATION
d16 INTERACTIVE STATUS
d17 CONNECTED HOME
d18 KEYPAD/LED
E EXIT
```

```
GENERAL STATUS

ERROR:          EP00  CONNECTED  DES

PLATFORM ID:    0x0805
MAPPED PLATFORMID: 0x0805
FAMILY ID:      0x001D
MODEL ID:       0xE626
REMOD CHANNEL:  03
SETTOP TIME:    Jun 16 2008 16:15:53
DST ACTIVE:     YES
TIME ZONE:      GMT-05:00
DST ENTRY TIME: Apr 06 2008 03:00:00
DST EXIT TIME:  Oct 26 2008 02:00:00
CURRENT GPS TIME: Jun 16 2008 20:15:53
```

4 DIAGNOSTICS

The General Status fields are:

Field	Description																										
Error	Error codes display on the OSD when an error occurs. If multiple errors occur, the last recorded error is displayed:																										
	<table border="1"> <thead> <tr> <th>Error Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>EP00</td> <td>No error</td> </tr> <tr> <td>EP01</td> <td>Not connected</td> </tr> <tr> <td>EP03</td> <td>DRAM error</td> </tr> <tr> <td>EP04</td> <td>SRAM error</td> </tr> <tr> <td>EP07</td> <td>ROM verification failure</td> </tr> <tr> <td>EP08</td> <td>RAM test failure</td> </tr> <tr> <td>EP09</td> <td>Battery test failure</td> </tr> <tr> <td>EP11</td> <td>Invalid unit address</td> </tr> <tr> <td>EP12</td> <td>Power on self test failure</td> </tr> <tr> <td>EP14</td> <td>GITV startup failure</td> </tr> <tr> <td>EP15</td> <td>TSI structure corrupt</td> </tr> <tr> <td>EP18</td> <td>Driver initialization failure</td> </tr> </tbody> </table>	Error Code	Description	EP00	No error	EP01	Not connected	EP03	DRAM error	EP04	SRAM error	EP07	ROM verification failure	EP08	RAM test failure	EP09	Battery test failure	EP11	Invalid unit address	EP12	Power on self test failure	EP14	GITV startup failure	EP15	TSI structure corrupt	EP18	Driver initialization failure
Error Code	Description																										
EP00	No error																										
EP01	Not connected																										
EP03	DRAM error																										
EP04	SRAM error																										
EP07	ROM verification failure																										
EP08	RAM test failure																										
EP09	Battery test failure																										
EP11	Invalid unit address																										
EP12	Power on self test failure																										
EP14	GITV startup failure																										
EP15	TSI structure corrupt																										
EP18	Driver initialization failure																										
Connected State	A DCX-operations connect or disconnect message determines whether the DCX3200 is CONNECTED or DISCONNECTED.																										
Platform ID	A unique 16-bit hexadecimal number that identifies the platform image (also called the ROM ID).																										
Family ID	The manufacturer and product family, in hexadecimal.																										
Model ID	The model, in hexadecimal.																										
Remod Chan	The interface to the subscriber TV; channel 3 or 4 in the USA.																										
Set-top Time	The current time setting on set-top.																										
DST Active	Daylight Saving Time. Yes indicates DST is active. No indicates DST is disabled.																										
Time Zone	Time Zone selected on set-top.																										
DST Entry Time	Date and Time set-top will begin Daylight Savings Time.																										
DST Exit Time	Dates and Time set-top will end Daylight Savings Time.																										
Current GPS Time	The current OOB time displayed in global positioning system (GPS) seconds from Jan 6, 1980. It is displayed in Greenwich Mean Time (GMT).																										

4 DIAGNOSTICS

Purchase Status

This diagnostic displays the status of subscriber event purchases on the OSD. The information is updated each time this diagnostic is viewed:

```

                                PURCHASE/POLL STATUS

PURCHASES:
  UNSENT:           00
  UNACK:            00
  LAST SEQ NUM:    0000
  LAST RB TIME:    N/A

IPPV STATUS:        DISABLED
LAST POLL STATUS
  PREP CMD:         0      N/A
  PREP ACK:         0      N/A
  POLL REQ:         0      N/A
  POLL ACK:         0      N/A

STACK LIMIT:       00000010
SHOW COUNT:        00000000
CREDIT TOTAL:      0000010000
DEBIT TOTAL:       0000000000
  
```

The Purchase Status fields are:

Field	Description
Unsent	The number of purchases in the DCX remaining to be polled. It can be an integer from 0 to 63.
Unack	The number of reports that have not been acknowledged by the controller. It is an integer.
Last Seq Num	The last acknowledged sequence number of a purchase sent by the controller. It is a 16-bit, unsigned hexadecimal number.
Last RB Time	The last time the DCX3200 attempted to report back purchases to the controller, in GPS seconds.
IPPV Status	If IPPV is enabled, the IPPV status indicator is on. If IPPV is disabled, the IPPV status indicator is off.
Prep CMD	"Last Prepare for Poll Command" sequence number and time of the last prepare for poll request command that was sent by the controller. Note that each requesting process maintains an independent sequence of poll requests to uniquely identify the poll responses.
Prep ACK	"Last Prepare for Poll Acknowledge" sequence number and time of the last Report Purchase request sent by the controller.
Poll Request	Sequence number and time of the last send poll buffer command that was sent by the controller.
Poll Acknowledge	Sequence number and time of the last Poll Acknowledge message sent by the controller.
Stack Unit	Unit used in purchase processing.
Show Count	Count used in purchase processing.

4 DIAGNOSTICS

Field	Description
Credit Total	Credit used for purchase processing
Debit Total	Debit used for purchase processing

Out-Of-Band (OOB) Status

This diagnostic indicates the out-of-band control channel status on the OSD. The information is updated every 5 seconds.

```

OOB STATUS

OOB FREQUENCY:      075.25 MHz
CARRIER LOCK:      YES
DATA:                YES
EMM DATA:          NO

SNR:                 21.1 dB      GOOD
AGC:                 23 %        GOOD

EMM PROVIDER ID:    0x0001
EMM PID:            0x1503
NETWORK PID:        0x0777

HUNT MODE:          Hunted
LKC:                075.25 MHz
    
```

The Out-Of-Band Status fields are:

Field	Description
OOB Frequency	Indicates the OOB tuner center frequency, from 70 to 130 MHz.
Carrier Lock	Indicates whether the OOB receiver is locked to the carrier:
	OSD Description
	YES Carrier locked
	NO Carrier unlocked
Data	Indicates whether data is being carried by the OOB and EMM traffic, which is tracked separately:
	OSD Description
	YES OOB data detected within the last 5 seconds
	NO OOB data not detected within the last 5 seconds
EMM Data	Indicates whether EMM data is being carried on the OOB stream:
	OSD Description
	YES EMM data detected within the last 5 seconds
	NO EMM data not detected within the last 5 seconds

4 DIAGNOSTICS

Field	Description
SNR	When carrier lock has been established, displays an estimate of the carrier signal-to-noise ratio in dB, with an explanation: GOOD — Good value FAIR — Marginal signal level, check the signal POOR — Unusable signal INVALID — Invalid SNR value
AGC	When carrier lock has been established, displays an estimate of the AGC as a percentage, with an explanation: GOOD — Good value FAIR — Marginal signal level, check the signal POOR — Unusable signal INVALID — Invalid AGC value
EMM Provider ID	Displays the conditional access stream for the DCX3200, in hexadecimal.
EMM PID	Displays the packet identifier (PID) stream the DCX3200 tunes to for EMM data, in hexadecimal.
Network PID	Displays the network PID to which the DCX3200 is tuned to receive network messages, in hexadecimal.
Hunt Mode	The hunt mode includes Hunted, None, Round Robin (RR), Search (SRCH), Fixed Frequency (FIX), or EMM Provider ID (EMM).
LKC	The last known carrier is the last valid OOB frequency displayed in MHz and ranges from 70 to 130 MHz, with the specific values of: 75.25, 104.20, 72.75, 92.25, 98.25, 107.25, 107.40, 110.25, 116.25, and 103.75. LKC will remain blank during hunting if a valid carrier has not been found, and will be populated once a valid OOB is found.

Agile OOB Tuner Hunting

An OOB frequency can be selected manually by pressing the MENU button while in the OOB Status diagnostics screen. To exit this mode, press the MENU button a second time, or press the POWER button.

If the set-top is in the process of hunting for an OOB frequency, control of frequency selection is suspended, i.e. pressing Menu button on OOB status screen to display MAN FREQ is not available when the set-top is hunting.

Manual Selection of the OOB Frequency (OSD Frequency Override in Hunted Mode)

The manual override frequency capability is only displayed if the box is not currently hunting and the operator presses the MENU key while OOB OSD diagnostics are displayed. The MAN Freq displays the LKC and allows the operator to select (via scroll up/down) a specific frequency to check if a valid OOB is on that specific frequency. The MAN Freq parameter is the OOB frequency selected in the frequency selection mode and displayed in MHz, with the specific values of 75.25, 104.20, 72.75, 92.25, 98.25, 107.25, 107.40, 110.25, 116.25, and 103.75.

4 DIAGNOSTICS

1. When in the OOB Receiver Status Diagnostic, press the MENU button on the remote control to enter the frequency selection mode. The OSD displays a new "MAN FREQ" line at the bottom of the screen, which indicates the last known carrier frequency. At this point, if desired, the frequency change mode can be exited by pressing the MENU key a second time.
2. Use the UP/DOWN channel or cursor keys on the remote control to scroll through all 10 frequencies until the desired new OOB frequency is found. The new frequency selections will appear on the "MAN FREQ" line of the OSD.
3. When the desired new frequency has been selected, press the SELECT key on the remote control to start the search. The manual frequency search will last up to 40 seconds. On the OSD, the "MAN FREQ" line of text will be cleared, the "HUNT MODE" will display "FIX" to indicate a search on a fixed frequency, and the "OOB FREQ" field will change to the frequency being searched for.
4. If the frequency is found with the proper EMM Provider ID, the OSD "LKC" field will change to display the new frequency.
5. If after 40 seconds the frequency search is not successful, the product will perform a warm reset.
6. To abort a search without waiting the 40 seconds, the POWER key on the remote control can be pressed to cause an immediate warm reset.

In-Band Status

This diagnostic displays the in-band status for the last attempted tuned channel on the OSD. The information is updated every 5 seconds.

IN-BAND STATUS	
IN-BAND TUNER 1	
MODE:	256 QAM
CARRIER LOCK:	YES
PCR LOCK:	NO
DATA:	YES
FREQUENCY:	0651.000 MHz
SNR:	33.2 dB GOOD
5 SECOND ERROR COUNTS:	
UNCORRECTABLE: 0000	CORRECTABLE: 0000
IN-BAND TUNER 2	
MODE:	256 QAM
CARRIER LOCK:	YES
PCR LOCK:	NO
DATA:	YES
FREQUENCY:	0567.000 MHz
SNR:	38.0 dB GOOD
5 SECOND ERROR COUNTS:	
UNCORRECTABLE: 0000	CORRECTABLE: 0000

4 DIAGNOSTICS

The In-Band Status fields are:

Field	Description	
Mode	The values displayed on the OSD are: 64 QAM — 64 QAM digital channel 256 QAM — 256 QAM digital channel	
Carrier Lock	Indicates whether the in-band receiver is locked to the carrier. If a digital carrier is not present, it indicates the carrier is not locked:	
	OSD	Description
	YES	Carrier locked
	NO	Carrier not locked
PCR Lock	Indicates whether the in-band receiver is locked to the current program clock reference for a digital video service on the specified tuner. If a digital carrier is not present, it indicates the PCR is not locked.	
Data	Indicates whether data is being carried on the in-band stream. The indicators cover all packet processors regardless of the stream they are monitoring:	
	OSD	Description
	YES	In-band data detected within the last 5 seconds
	NO	In-band data not detected within the last 5 seconds
Frequency	The in-band frequency is center RF carrier frequency tuned for the digital service on the specified tuner. The frequency is displayed in MHz in xxxx.xxx format and ranges from 54 to 860 MHz.	
SNR	When carrier lock has been established, displays an estimate of the carrier signal-to-noise ratio in dB, with an explanation: GOOD — Good value FAIR — Marginal signal level, check the signal POOR — Unusable signal INVALID — Invalid SNR value	
5 Second Error Counts	Indicates the number of correctable and uncorrectable digital multiplex errors, up to 9999. It is updated every 5 seconds and reset each time the DCX3200 is power cycled or another digital multiplex is tuned. The maximum value displayed is 9999, even if there were more than 9999 errors.	

4 DIAGNOSTICS

Unit Address

This diagnostic displays the unit address of the CableCARD if inserted:

```

UNIT ADDRESS

TVPC INSTALLED:                NO
CableCARD INSERTED:           YES
UNIT ADDRESS: 000-00036-68858-022

OOB ADDRESSES:
NETWORK: 000-00000-00001-026
MULTICAST 16 FOR: NET
                0x0000 0x0000
                0x0000 0x0000

HOST SERIAL NO: M10814TD3542
HOST MAC ADDRESSES:
MAC-Address1: 00 1E 46 3E 1C D7
MAC-Address2: 00 1E 5A B8 C6 26
MAC-Address3: 00 1E 5A FF FE B8 C6 29
MAC-Address4: 00 1E 5A B8 C6 28
MAC-Address5: 00 1E 5A B8 C6 27

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```

The Unit Address fields are:

Field	Description
TvPC Installed	Indicates whether the TvPC renewable security system is installed: NO — TvPC is not installed (Note: the DCX3200 does not include a TvPC slot.)
CableCARD Inserted	YES — CableCARD is inserted. NO — CableCARD is not inserted.
Unit Address	A unique decimal number that indicates the unit address or physical address.
OOB Addresses	
Network	The DCX3200 network address displayed in decimal format.
Multicast 16 Address	Specifies the stream to which the OOB multicast 16 addresses are assigned. The stream type and multicast 16 addresses cycle on the OSD every 5 seconds. The valid stream types nnnn are: Net — Network EMM — EMM SCC — SCC_ECM Dnld — Download Data — Data Poll — Polling packet identifier (PID) The 16-bit multicast address is displayed in 4-byte hexadecimal format. The multicast 16 addressed messages filter on a 16-bit multicast address. The user processor can define up to four multicast addresses in hardware, and any message matching one of the four is processed. Messages not matching the multicast address are discarded.

4 DIAGNOSTICS

Field	Description
Serial Number	The Host Serial Number is displayed on the Unit Address diagnostic screen.
MAC Addresses	The DOCSIS, Ethernet, 1394, USB, and MAC addresses are stored in protected flash and displayed in hexadecimal.

Separable Security

This diagnostic displays information on the inserted M-CARD and CableCARD Interface with the DCX.

```

                                     ^^^ scroll up ^^^
Separable security

CARD Interface: GOOD
CableCARD ID:   000-003-668-858-8
Host ID:        044-006-108-430-5
Data ID:        053-210-970-80
Validation:     UNKNOWN

Pairing Rpt Method:MMI
MSO Phone Number: 1-215-323-2000

CableCARD
  Object Name:   MCB1Card
  Object Ver:    02.65
  Manufacturer: 0x0000
  HW Version:    0x0265
  Boot Version: 03.25
  2nd Version:   NONE
Page 2 of 2
  
```

Field	Description
CARD Interface	CableCARD Interface is a status indication of the interface between the Host and CableCARD. It will indicate Good if no errors are detected, Error if there is an error establishing the CableCARD interface, or Unsupported CARD if the inserted CableCARD is not an M-CARD.
CableCARD ID	The unique identifier provided by the CableCARD.
Host ID	The unique identifier in the Host Device Certificate.
Data ID	A value generated by the CableCARD for the Pairing report.
Validation	<ul style="list-style-type: none"> • UNKNOWN if a Validation message was not received by the product. • VALID or INVALID as set by the Host Validation Message received from the headend. • BINDING if the CableCARD is busy with the binding authentication process. • NOT BOUND if Card validation status is not bound for CableCARD reasons. • HOST CERTIFICATE INVALID if the status is not bound because the Host Certificate was invalid.

4 DIAGNOSTICS

Field	Description
	<ul style="list-style-type: none"> • HOST SIGN FAILED if status is not bound because of failure to verify Host's SIGN. • AUTH KEY FAILED if status is not bound because of failure to match AuthKey from the Host Device. • FAILED if binding failed for other reasons.
Pairing Rpt Method	Set to MMI or Reportback as received by a message from the headed, or set to Unknown if the headend message was not received.
MSO Phone Number	MSO Phone Number as configured at the headend.
CableCARD	
Object Name	Code object name executing on the CableCARD.
Object Ver.	Code object version executing on the CableCARD.
Manufacturer	CableCARD manufacturer.
HW Version	Version number provided by the CableCARD.
Boot Version	Version number provided by the CableCARD
2nd Version	Version number provided by the CableCARD

Current Channel Status

This diagnostic displays a status of the last attempted channel you attempted to tune on the in-band stream. The channel type determines the status display.

```

                                CURRENT CHANNEL STATUS
PRIMARY A/V SOURCE:           N/A
IB TUNER 1
TYPE: DIGITAL                 CLR
STATUS:   Acquired Not playing
PREVIEW:                               NO
PURCHASABLE:                         NO
PURCHASED:                            NO
EPOCH Num:                           000
Auth Reason:                          0x00
Service: 0      Status: 0      ID: 0x000000
CH: 800      Tuned Frequency: 651.0000 MHz
VCT ID: 1      SOC: DISABLED
CCI: 0x00  APS: 0x00  RC Flag: 0x00
CIT: 0x00  DRM: 0x00  RS:  FOREVER

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```

4 DIAGNOSTICS

```

                                ^^^ Scroll Up ^^^
CURRENT CHANNEL STATUS
IB TUNER 2
TYPE: DIGITAL                      ENC
STATUS:   Acquired Not playing
PREVIEW:                                NO
PURCHASABLE:                          NO
PURCHASED:                             NO
EPOCH Num:                             026
Auth Reason:                           0x07
Service: 0      Status: 1      ID:0x020000
CH: 381      Tuned Frequency: 567.0000 MHz
VCT ID:                                1
CCI: 0x02  APS: 0x00  RC Flag: 0x00
CIT: 0x00  DRM: 0x00  RS:  FOREVER

Page 2 of 2

```

The Current Channel status fields are:

Field	Description	
Type	Indicates whether the channel is analog or digital:	
	OSD	Description
	DIGITAL	Digital
Status	Indicates the current status of channel acquisition.	
	OSD	Description
	Acquired	Service has been acquired and is playing, but stream components may not be locked yet if the service is digital. For an analog service, there are no stream components to lock, so this is the final status.
	Acquiring	Service is being reacquired.
	Not Acquired	Service has not been acquired due to a failure.
	OSD	Description
	Acquired and Locked	Digital service has been acquired, and all relevant stream components for the service are locked. If the service is purchasable, the stream components will not be locked until the service is purchased.
	Acquired Not Playing	Service has been partially acquired, but is not playing. For the MPEG-2 services, this means that no components are selected.
Preview	Indicates whether the current program is in preview mode.	
Purchasable	Indicates whether the current program can be purchased for viewing.	
Purchased	Indicates whether the current program has been purchased.	
EPOCH Num	Number of authorization requests originating from set-top.	
Auth Reason	The current epoch authorization reason is displayed in the hexadecimal format 0xbb on the OSD.	

4 DIAGNOSTICS

Field	Description
Service	Service number from the secure processor. It is a one bit value; 0 or 1.
Status	Service status from the secure processor. It is a decimal value from 0 to 3.
ID	Service ID from the secure processor. It is a hexadecimal value. First 2 bytes indicate MPEG service number and the last byte indicates another unique identifier.
CH	Current Channel the set-top is tuned to.
Tuned Frequency	(Digital channels only) The center RF carrier frequency for the digital service. It can be from 54 to 860 MHz.
VCT ID	Virtual Channel Table ID
SOC	Selectable Output control enabled or disabled
CCI	The copy control information: 00 — copy free 01 — no more copies 10 — copy once 11 — never copy N/A — the value is invalid or cannot be retrieved
APS	The Analog Protection System; for example, Macrovision: 00 — No Macrovision 11 — Type 3 Macrovision N/A — the value is invalid or cannot be retrieved
RC Flag	Displays whether the broadcast flag is present: 0 — no flag/not defined 1 — the flag is present/enabled N/A — the value is invalid or cannot be retrieved
CIT	The constrained image trigger, as delivered in the PRK or the Set DRM API: 1 — set 0 — not set N/A — the value is invalid or cannot be retrieved
DRM	The digital rights management valid flag bit: 1 — set 0 — not set N/A—the value is invalid or cannot be retrieved
RS	The retention state: Forever, 1 week, 2 days, 1 day, 12 hours, 6 hours, 3 hours, 90 minutes, or Not Defined N/A — the value is invalid or cannot be retrieved

4 DIAGNOSTICS

RF Modem (Upstream)

This diagnostic displays the RF modem status, if an RF modem is installed in the DCX3200. The information is updated each time this diagnostic is displayed.

RF MODEM	
STATUS:	CONFIGURED
CENTER FREQUENCY:	0008.096 MHZ
REQUESTED POWER LEVEL:	060 dB
ACTUAL POWER LEVEL:	INVALID
REPORT BACK ADDRESS:	0x000005

The RF Modem fields are:

Field	Description
Status	CONFIGURED or NOT CONFIGURED.
Center Frequency	The RF modem center frequency is displayed on the OSD in MHz.
Requested Power Level	The value in dB assigned to the DCX3200 during RF leveling (blank if it is not configured).
Actual Power Level	The power level is displayed in dB on the OSD or is blank if the power level has not been set.
Report Back Address	Displayed in 4-byte hexadecimal format, if configured.

Code Modules

This diagnostic includes information about the firmware loaded in flash memory and all non-volatile code versions are installed on the DCX3200. When the native suite is running, the diagnostics of the application operating system and all associated objects should be accessible.

4 DIAGNOSTICS

```

ASTB VALD      Lst:  26 Ver:   3
Boot Code:    09.10
Platform Built: Version: 22.12
               May 02 2008 16:28:49
               Processor: M01
Analog Secure Processor: N/A

Object  Ver  Status  ID  LO
TC_CS_CD 22.12 ENABLED 0897 0
Tv_Guide 75.59 ENABLED 07DA 1
    
```

The Code Modules fields are:

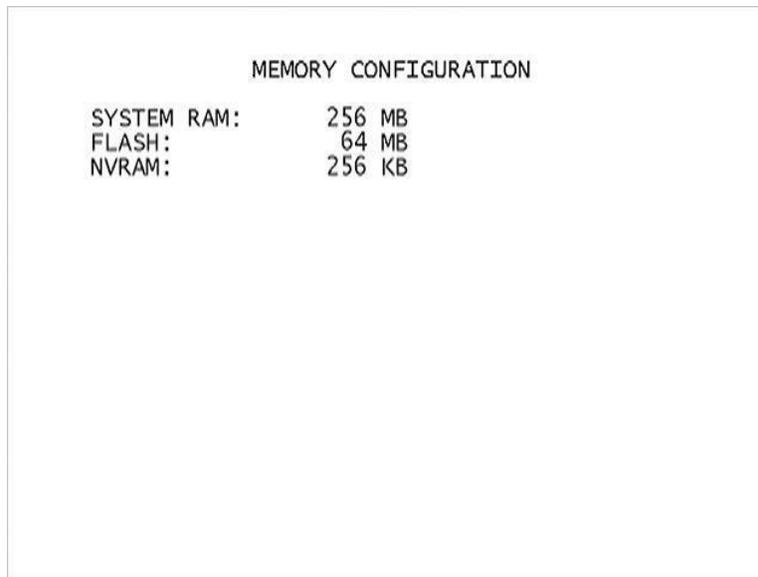
Field	Description		
Boot Code	The boot code version in ASCII format.		
Platform Built	The date platform software was built.		
Version	The firmware version and build date in ASCII format.		
Processor	The digital secure processor version in ASCII format.		
Analog Secure Processor	The analog secure processor version in ASCII format.		
Downloadable Object Information Table	Lists all objects loaded, or being loaded, onto the DCX3400 in ASCII format. The information displayed for each object depends on the running environment. If a download is not in progress, the OSD displays the currently running environment and version number.		
Object	The object name.		
Ver	The object version.		
Status	The object status, updated on the OSD every 5 seconds while you display the diagnostic:		
	OSD	Status	Description
	MEM ALLOC	Allocated	Memory for object is allocated
	LOADING	Loading	Object is being loaded
	STARTING	Enabling	Object is being started (the constructor is running)
	ENABLED	Enabled	Object is running
	ENA-NOT RUN	Enabled_Not_Runnable	Object is enabled, but cannot run
	STOPPING	Disabling	Object is being stopped (the destructor is running)
	DISABLED	Disabled	Object has been disabled

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Field	Description		
	DIS-NOT RUN	Disabled_Not_ Runnable	Object is disabled and cannot run
	DELETING	Deleting	Object is being deleted
	POSTPONED	Postponed	Object cannot run on the current system; it will be enabled during the next boot
	CONNECTED	Connect	Connected to download PID — awaiting data
	PEND CONNECT	TryingToConnect	Trying to connect
ID	The object identifier		
LO	The Local Origination states whether the object is located locally on the set-top.		

Memory Configuration

This diagnostic displays the DCX3200 memory configuration. The information is updated when you display the diagnostic.



```
MEMORY CONFIGURATION
SYSTEM RAM:      256 MB
FLASH:           64 MB
NVRAM:           256 KB
```

The Memory Configuration fields are:

Field	Description
System RAM	The allocated system RAM in MB
Flash	The allocated flash memory in MB
NVRAM	The allocated NVRAM in KB

Audio/Video Status

Audio/Video Status diagnostics display information regarding audio and video content and settings configured for the set-top.

4 DIAGNOSTICS

```

                                AUDIO / VIDEO STATUS
SPDIF Output: N/A                LFE: 0
Audio Mute: ON
Video Mute: MUTED
Captions Detected: N/A
N/A                               Primary Lang
Digital subtitles status
Enabled: NO                       ISO Lang: eng
Enhanced: NO                       Rendered: NO
PiP Focus: N/A

INPUT SOURCE                      N/A
ADP LOCK:                          N/A
AUDIO MODE:                         N/A
VP LOCK:                            N/A
INPUT FORMAT:                       N/A

```

Field	Description
AUDIO S/PDIF	Indicates S/PDIF Mode as set by application software.
OSD Display	Description
N/A	Audio S/PDIF mode is not applicable.
IEC958PCM	PCM audio selected.
Dolby® Digital	For Dolby® Digital selection, the following speaker selection is set:
1/0	right front or left front
2/0	right front and left front
3/0	right front and left front and center
2/1	right front and left front and (right rear or left rear)
3/1	right front and left front and center and (right rear or left rear)
2/2	right front and left front and right rear and left rear
3/2	right front and left front and center and right rear and left rear
LFE: Low Frequency Effect	The LFE indicates if the nomenclature low frequency effects are available in the Dolby® Digital audio stream as indicated if the "0.1" is present in the Dolby® Digital 5.1 nomenclature (for example, "Dolby® Digital 5.1 surround"). Valid values include:
OSD Display	Description
0	LFE is not available
1	LFE is available (for example, "Dolby® Digital 5.1 surround").
Muting State and Method	The Audio and Video Mute Status indicates if the audio and/or video have been muted by the software. The audio mute is either On or Off. The Video Mute describes the MPEG muting method selected by the software and indicates if the output video is in the mute state by displaying On or Off, followed by the mute method. Methods include:
OSD Display	Description

4 DIAGNOSTICS

Field		Description
	UNMUTED	Displayed if mute method is not selected.
	MUTE to STILL	Displayed if the mute method includes stopping video and presenting a still frame, similar to a pause function.
	MUTE to BLACK	Displayed if mute method presents a black screen.
Captions		The captions mode displays captions present on the service. <i>Note: The caption options are set via the User Setting Menu, where the subscriber can enable closed captions and select options.</i>
1st Caption Row: Caption Detected:		
	OSD Display	Description
	708	EIA-708 captions detected
	608	EIA-608 captions detected
	608 and 708	Both EIA-608 and EIA-708 captions detected
	None	No Captions detected
2nd Caption Row: Caption Options Set, followed by Service Selected (xxxxxxxxxxxx):		
	OSD Display	Description
	708 Set xxxxxxxxxxxx	EIA-708 captions enabled, with options set by user
	708 Default xxxxxxxxxxxx	EIA-708 captions enabled, with no options set by user
	608 Set xxxxxxxxxxxx	EIA-608 captions enabled, with options set by user
	608 Default xxxxxxxxxxxx	EIA-608 captions enabled, with no options set by user
	None Set	Captions detected but not enabled

The OSD status, 2nd caption row displays captions based on the setting selected in the User Settings menu and what is available in the stream.

708 or 608 is the type of caption displayed, dependent on what was detected.

The Set or Default directly reflects the User Setting Status parameter of SETTINGS, which is Auto for Default or User for set by user via the User Setting Menu.

The xxxxxxx parameter should directly reflect the User Setting Status parameter of SERVICE SELECTION for Analog or Digital services as described below.

xxxxxxxxxxxx is the Service Selected parameter (which should directly reflect the User Setting Status parameter of SERVICE SELECTION for Analog or Digital services) and will be shown as one of the following if captions are enabled (See section 16.5 and 16.6 for further information on service selection):

	OSD Display	Definition
	CC 1	Closed Caption service CC 1 (default)
	CC 2	Closed Caption service CC 2
	CC 3	Closed Caption service CC 3
	CC 4	Closed Caption service CC 4

4 DIAGNOSTICS

Field	Description
T 1	Closed Caption service T 1
T 2	Closed Caption service T 2
T 3	Closed Caption service T 3
T 4	Closed Caption service T 4
Primary Lang	Primary language established by the provider (default, Service 1)
Second Lang	Secondary language established by the provider (Service 2)
Service 3	Set by the provider Service 3.
Service 4	Set by the provider Service 4.
Service 5	Set by the provider Service 5.
Service 6	Set by the provider Service 6.
Digital Subtitle Status	<p>The subtitle parameter indicates if subtitles are enabled and, if enabled, what language is selected and if the subtitle is being rendered. The language is displayed as the 3-character ISO639.2/B language code.</p> <ul style="list-style-type: none"> • Enabled is indicated with Yes or No. • The language is displayed as the 3-character ISO639.2 language code. • Enhanced mode is indicated with Yes or No. • Rendered status is indicated with Yes or No.
PiP Focus	The Picture in Picture focus indicates N/A and is not a standard supported DCX feature (dependent upon application software).
Input Sources	<p>The input source list information on ADP Lock, Audio Mode, VP lock, and Input Format.</p> <p>The ADP Lock indicates whether the audio stream is locked. Valid values are:</p> <ul style="list-style-type: none"> • YES: Audio Processor is locked to the audio stream • NO: Audio Processor is not locked to the audio stream <p>Audio Mode indicates the audio Mode of in incoming digital service. Valid values include:</p> <ul style="list-style-type: none"> • N/A: the audio mode is not applicable to the currently tuned stream • Mono: the audio mode is monophonic • Stereo: the audio mode is stereo • Surround: the audio mode is surround sound • 5.1: the audio mode is Dolby® Digital 5.1 surround sound <p>VP Lock indicates whether the video stream is locked. Valid values are:</p> <ul style="list-style-type: none"> • YES: Video Processor is locked to the video stream • NO: Video Processor is not locked to the video stream <p>The input format includes the aspect ratio (4:3 or 16:9), the screen pixel size (nnnnXnnnn), pixel display ('i' for interlaced, 'p' for progressive), and frames per second (24, 25, 30, or 60).</p>

4 DIAGNOSTICS

Interface Status

The Interface Status diagnostic displays when running in Thin Client. The information on the OSD is updated when you display the diagnostic.

```

                                     INTERFACE / PORT STATUS
                                     ENABLED   ACTIVE
DOCSIS                               YES      NO
1394                                  YES      NO
DVI/HDMI                              NO      NO
ETHERNET                              YES      NO
IR XMIT                               YES      YES
SMART CARD                            NO      NO
SPDIF                                  YES      YES
RF BYPASS                              NO      NO
USB                                    YES      NO
HMA AUTHORIZED                        NO      NO
MOCA AUTHORIZED                       NO      NO
  Internal                             YES      NO
  External                             YES      YES

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```

```

                                     ^^^ Scro11 Up ^^^
                                     INTERFACE / PORT STATUS
DVI/HDMI
MODE:      N/A   COLOR SPACE:      RGB
DEVICE CONNECTED:  NO
REPEATER:      N/A
VIDEO XMISSION:   N/A
HDCP ENABLED:    N/A
OUTPUT FORMAT:   N/A
ASPECT RATIO:    N/A
EDID DATA       N/A
NO DATA AVAILABLE

AUDIO: PCM      RATE:      32KHz
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```

4 DIAGNOSTICS

```
          ^^^ Scroll Up ^^^  
          INTERFACE / PORT STATUS  
1394  
ACTIVE PORTS:          0  
DATA XMISSION:        NOT ACTIVE  
5C IMPLEMENTATION:    NO  
COPY CONTROL:         Copy Free  
CYCLE MASTER NODE:    YES  
IRM NODE:             YES  
ROOT NODE:            YES  
LOOP DETECTED :      NO  
  
EUI-64:                0x0018C0FFFE06BF0D  
  
CONNECTED DEVICES: 01  
  DEVICE ID  
  0x0018C0FFFE06BF0D  
  N/A  
  N/A  
Page 3 of 4          vvv Scroll Down vvv
```

```
          ^^^ Scroll Up ^^^  
          INTERFACE / PORT STATUS  
  
USB DEVICES  
NO DEVICES
```

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4 DIAGNOSTICS

The Interface Status fields are:

Field	Description
DOCSIS Tuner & Xmitter	Indicates if enabled; indicates if active
1394 I/O Device	Indicates if enabled; indicates if active
USB I/O Device	Indicates if enabled; indicates if active
Ethernet Device	Indicates if enabled; indicates if active
Parallel Port	Indicates if enabled; indicates if active
IR Xmit	Indicates if enabled; indicates if active
Hard Drive Status	Indicates if enabled; indicates if active
Smart Card	Indicates if enabled; indicates if active
HDMI™ Port	<p>If a device is connected to the HDMI™ port only, the following diagnostics display to help troubleshoot the HDMI™ interface. They all display N/A if no device is connected to the HDMI™ port, or the value is invalid or cannot be retrieved.</p> <ul style="list-style-type: none"> • Device Connected — Indicates whether a device is connected to the HDMI™ port—Yes or No. • Repeater — Indicates whether the connected device is a repeater — Yes or No. • Video Xmission (transmission) — Indicates whether the DCX3200 is transmitting video over the HDMI™ port — Not Active or Active. • HDCP Enabled — Indicates whether the DCX3200 is using HDCP to encrypt video transmitted over the HDMI™ link — Yes or No. If the Video Xmission status is Not Active, the HDCP Enabled status is No. • Output Format — Indicates the timing format of the video sent through HDMI: • 1920 x 1080I — 1920 pixels wide by 1080 pixels high, interlaced • 1280 x 720P — 1280 pixels wide by 720 pixels high, progressive • 720 x 480P — 720 pixels wide by 480 pixels high, progressive • 720 x 480I — 720 pixels wide by 480 pixels high, interlaced • 640 x 480P — 640 pixels wide by 480 pixels high, progressive • Aspect Ratio — Indicates the aspect ratio of the video sent through HDMI™ — 4:3 or 16:9
EDID Data	<p>Indicates the video timing formats that were read from the Extended Display Identification Data (EDID) register for the connected device, in particular the detailed timing description blocks. The list displays all of the formats that the DCX3200 could read, up to a maximum of 12 formats. If the DCX3200 cannot read any formats, EDID Data is blank. An asterisk (*) after the aspect ratio means the DCX3200 supports the format. If more than twelve video timing formats are discovered, the supported formats only are listed first, followed by up to twelve remaining formats.</p>

4 DIAGNOSTICS

User Setting Status

This diagnostic displays the user settings. The format may vary. The information is updated when you display the diagnostic.

USER SETTING STATUS	
TV TYPE:	16:9
YPbPr OUTPUT	1080I
4:3 OVERRIDE	480i
CLOSED CAPTION	DISABLED
SERVICE SELECTION	
ANALOG	CC1
DIGITAL	PRIMARY LANG
FONT SIZE	AUTO
FONT STYLE	AUTO
FONT COLOR	AUTO
FONT OPACITY	AUTO
FONT EDGE TYPE	AUTO
FONT EDGE COLOR	AUTO
BACKGROUND COLOR	AUTO
BACKGROUND OPACITY	AUTO
SETTINGS	AUTO

The User Setting Status fields are:

Setting	Description
TV Type	<p>Allows you to specify the style of television connected to the DCX set-top. Options include 16:9, 4:3 LETTERBOX, and 4:3 PAN SCAN. The 16:9 option is the default selection. The options are used as follows:</p> <ul style="list-style-type: none"> • 16:9 designates that a widescreen television is connected to the DCX set-top. • 4:3 LETTERBOX designates that a standard-screen television is connected to the DCX set-top and that widescreen programs should be scaled to fit the screen with black bars above and below the picture. • 4:3 PAN SCAN designates that a standard-screen television is connected to the DCX set-top and that widescreen programs should be cropped so that the picture fills the entire screen.
HDMI/YPbPr Output	<p>Allows you to specify the video output format of the DCX set-top for all content (when the 4:3 override setting is Off) or for all 480p, 720p, and 1080i content (when the 4:3 override is used). Options include 1080i, 720p, 480p, and 480i. By default, the 1080i option is selected. The options are used as follows:</p> <ul style="list-style-type: none"> • 1080i — The DCX set-top will present programs in the High-Definition 1080i format (1920 x 1080 pixels). • 720p — The DCX set-top will present programs in the High-Definition 720p format (1280 x 720 pixels). • 480p — The DCX set-top will present programs in the Enhanced-Definition 480p format (720 x 480 pixels). • 480i — The DCX set-top will present programs in the Standard-Definition 480i format (720 x 480 pixels). <p>Some televisions may only support certain video formats. Please consult the television's user manual for more information on format compatibility.</p> <p>The DCX set-top can detect when the HDMI™ connection is in use. If you are not using the HDMI™ connection on the DCX set-top, the HDMI/YPbPr Output setting will display as YPbPr Output in the User Settings Menu.</p>

4 DIAGNOSTICS

Setting	Description
4:3 Override	<p>The 4:3 Override setting allows you to specify the video output format of the DCX set-top when it is tuned to a Standard-Definition. Options include 480i, 480p, Stretch, and Off. By default, the 480i option is selected. The options are used as follows:</p> <ul style="list-style-type: none"> • 480i — The DCX set-top will present Standard-Definition programs in the Standard-Definition 480i format (720 x 480 pixels). • 480p — The DCX set-top will present Standard-Definition programs in the Enhanced-Definition 480p format (720 x 480 pixels). • Stretch — The DCX set-top will automatically stretch all Standard-Definition programs to a widescreen aspect ratio and present the video in the format designated by the HDMI/YPbPr Output setting. Note that the Stretch option is only available when the TV Type setting is 16:9. • Off — The DCX will create a widescreen version of a Standard-Definition program by adding black bars to the left and the right of the picture and present the video in the format designated by the HDMI/YPbPr Output setting. <p>Some televisions may only support certain video formats. Please consult the television's user manual for more information on format compatibility.</p> <p>If the HDMI/YPbPr Output setting is 480i, the 4:3 Override feature is disabled and is no longer selectable in the menu. The 4:3 Override feature is available when the HDMI/YPbPr Output setting is 1080i, 720p, or 480p.</p>
Closed Caption	Turns closed captions off or on. The OSD indicates the status of the closed captions. Defaults to DISABLED. Options are ENABLED or DISABLED.
Service Selection	<p>Sets the service used for closed captions:</p> <ul style="list-style-type: none"> • Digital: PRIMARY LANGUAGE, SECONDARY LANGUAGE, 3, 4, 5, or 6. The default is PRIMARY LANGUAGE.
Font Size	Sets the font size for closed captions. Defaults to AUTO. Options are AUTO, STANDARD, LARGE, or SMALL.
Font Style	Sets the font style for closed captions. Defaults to AUTO. Options are AUTO, MONO SERIF, PROPORTION SERIF, MONO NO SERIF, PROPORTION NO SERIF, CASUAL, CURSIVE, or SMALL.
Font Color	Sets the font color. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
Font Opacity	Sets the opacity. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
Font Edge Type	Sets the edge appearance — AUTO, NONE, RAISED, DEPRESSED, UNIFORM, LEFT SHADOWED, or RIGHT SHADOWED. The default is AUTO.
Font Edge Color	Sets the edge color — AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN. The default is AUTO.
Background Color	Sets the background color for closed captions. Defaults to AUTO. Options are AUTO, WHITE, BLACK, RED, GREEN, BLUE, YELLOW, MAGENTA, or CYAN.
Background Opacity	Sets the background opacity for closed captions. Defaults to AUTO. Options are AUTO, TRANSPARENT, TRANSLUCENT, SOLID, or FLASHING.
Settings	Sets the default settings for closed captions (AUTO) or the settings you have configured (USER). Defaults to AUTO. Options are AUTO or USER.
Restore All Defaults	To reset all User Settings to their defaults, select this option and press the ► key.

4 DIAGNOSTICS

DOCSIS Status

This three-screen diagnostic displays status information for the embedded cable modem (eCM):

```
DOCSIS STATUS
DOCSIS Enabled: NO
Acquire DS Channel: N/A
Obtain US Parameters: N/A
Establish IP Connectivity: N/A
Obtain Configuration File: N/A
eCM Registered: N/A
Network Access: N/A
Initialize BPI: N/A
System UP Time:
  000 Days 00 Hours
  00 Mins 00 Seconds

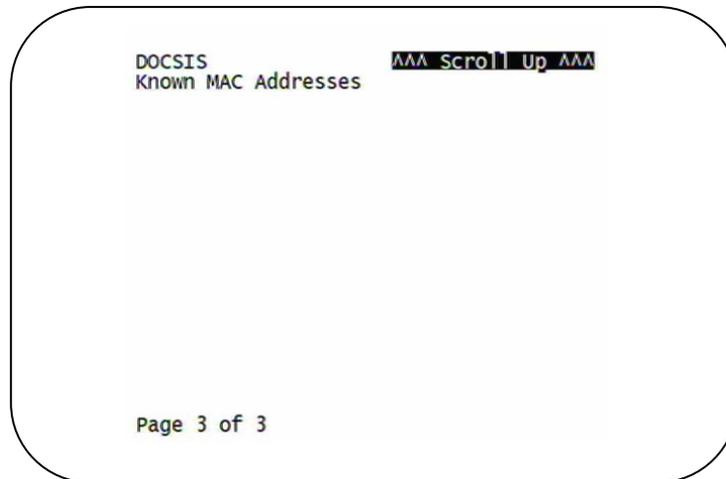
IP Addresses
Cable Modem: 000.000.000.000
Set-top Box: 000.000.000.000

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```

```
DOCSIS
MAC addresses
Cable Modem: 00:00:00:00:00:00
Set-top Box: 00:00:00:00:00:00
Downstream Channel
Carrier Lock: N/A
Frequency: N/A
LKC: N/A
Mode: N/A
Power Level: 000 dBmV
SNR: 00.0 dB
Upstream Channel
Frequency: N/A
Mode: N/A
Channel ID: N/A
Power Level: 000 dBmV
Symbol Rate: 0.000 MSym/sec

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```

4 DIAGNOSTICS



The fields are:

Field	Description
DOCSIS Enabled	For a DOCSIS-enabled set-top, YES. Otherwise, NO.
Acquire DS Channel	The DOCSIS downstream channel acquisition status: <ul style="list-style-type: none"> • YES — The downstream channel is acquired. • NO — The set-top is acquiring the downstream channel. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Obtain US Parameters	The DOCSIS upstream channel descriptor (UCD) acquisition status: <ul style="list-style-type: none"> • YES — The UCD is acquired. • NO — The set-top is acquiring the UCD or the downstream channel. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Establish IP Connectivity	Displays whether the cable modem has acquired its IP address, typically from a Dynamic Host Configuration Protocol (DHCP) server: <ul style="list-style-type: none"> • YES — The IP address is acquired. • NO — The set-top is acquiring its IP address. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Obtain Configuration File	Displays whether the cable modem has downloaded its DOCSIS cable modem configuration file from the TFTP server: <ul style="list-style-type: none"> • YES — The cable modem configuration file has been successfully downloaded. • NO — The set-top is downloading its cable modem configuration file. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.

4 DIAGNOSTICS

Field	Description
eCM Registered	<p>Displays whether the embedded cable modem has registered with the cable modem termination system (CMTS):</p> <ul style="list-style-type: none"> • YES — DOCSIS registration is complete. • NO — DOCSIS registration is in progress, or the set-top could not register. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Network Access	<p>Displays whether the cable modem has been granted access to the DOCSIS network:</p> <ul style="list-style-type: none"> • YES — The cable modem was granted DOCSIS network access. • NO — The set-top is obtaining DOCSIS network access. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Initialize BPI	<p>The Baseline Privacy Interface (BPI) status:</p> <ul style="list-style-type: none"> • YES — BPI has been successfully initialized for the cable modem. • NO — BPI initialization is in progress, has failed, or was not requested by the network. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
System Up Time	<p>The Days, Hours, Mins (minutes), and Seconds the DOCSIS system has been operational. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, each field displays zeros.</p>
IP Addresses	<p>The Cable Modem and Set-Top IP addresses in dotted-decimal format xxx.xxx.xxx.xxx. Each byte value is padded with zeros when necessary. For example, 10.0.1.10 is displayed as 010.000.001.010. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, 000.000.000.000 is displayed.</p>
MAC Addresses	<p>The Cable Modem and Set-Top MAC address in hexadecimal format xx:xx:xx:xx:xx:xx. Each byte value xx ranges from 00 to FF and is padded with zeros when necessary. For example, 0:0:2D:1:F1:D is displayed as 00:00:2D:01:F1:0D. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, 00:00:00:00:00:00 is displayed.</p>
Downstream Channel (carries data from the headend to the set-top)	
Carrier Lock	<ul style="list-style-type: none"> • YES — The cable modem is locked to a DOCSIS downstream channel. • NO — The cable modem is not locked to a downstream channel. • N/A — The value is invalid or cannot be retrieved, or DOCSIS is not enabled.
Frequency	<p>The center frequency of the channel to which the DOCSIS downstream channel receiver is tuned. It can be 54 to 860 MHz. If the value is invalid or cannot be retrieved, downstream Carrier Lock is NO, or if DOCSIS is not enabled, N/A is displayed.</p>
LKC	<p>The last known carrier (LKC); the frequency of the last tuned downstream channel used if the embedded cable modem enters hunt mode. It can be 54 to 860 MHz. If the value is invalid or cannot be retrieved, Carrier Lock is NO, or if DOCSIS is not enabled, N/A is displayed.</p>

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Field	Description
Mode	The DOCSIS downstream channel modulation: QAM 64 or QAM 256. If the value is invalid or cannot be retrieved, Carrier Lock is NO, or if DOCSIS is not enabled, 000 is displayed.
Power Level	The downstream channel power level in dBmV. If the value is invalid or cannot be retrieved, Carrier Lock is NO, or if DOCSIS is not enabled, 000 is displayed.
SNR	The estimated downstream channel carrier signal-to-noise ratio in the format xx.x dB. It is the value reported as SNR in the MIB. If the value is invalid or cannot be retrieved, Carrier Lock is NO, or if DOCSIS is not enabled, 00.0 is displayed.
Upstream Channel (carries data from the set-top to the headend)	
Frequency	The center frequency of the channel to which the DOCSIS upstream channel receiver is tuned. It can be 5 to 42 MHz. If the value is invalid or cannot be retrieved, Carrier Lock is NO, or if DOCSIS is not enabled, N/A is displayed.
Mode	The DOCSIS upstream channel modulation: QPSK, QAM 8, QAM 16, QAM 32, QAM 64, or QAM 128. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, N/A is displayed.
Channel ID	The upstream channel identifier 0 to 255. If the value is invalid or cannot be retrieved or DOCSIS is not enabled, N/A is displayed.
Power Level	The upstream channel power level in dBmV. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, 000 is displayed.
Symbol Rate	The upstream channel symbol rate in mega-symbols per second. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, 0.000 is displayed.
Known MAC Addresses	Displays up to 32 MAC addresses learned by the DCX3200 cable modem, including the Set-Top MAC and future MAC addresses assigned by DSG, in hexadecimal format xx:xx:xx:xx:xx:xx on two screens if necessary. If the value is invalid or cannot be retrieved, or if DOCSIS is not enabled, no values are displayed.

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Application Specific Information

This diagnostic displays information about application servers:

```
APPLICATION SPECIFIC INFORMATION
NO ADDITIONAL INFORMATION
SERVER 1 NAME:
SRV 1 IP ADDR:
SERVER 2 NAME:
SRV 2 IP ADDR:
SERVER 3 NAME:
SRV 3 IP ADDR:
SERVER 4 NAME:
SRV 4 IP ADDR:
SERVER 5 NAME:
SRV 5 IP ADDR:
```

The fields are:

Field	Description
Server # Name	The application server name of up to 14 alphanumeric characters. It is blank if the value is invalid or no value can be retrieved.
Srvr # IP Addr	The application server's IP address in dotted-decimal format xxx.xxx.xxx.xxx; each xxx is from 0 to 255. It is blank if the value is invalid or no value can be retrieved.

Interactive Status

This diagnostic describes the interactive information that is displayed only when the Thin Client platform is running. The information is updated at least once every 5 seconds while the diagnostic is displayed. This is an example of a code module display with status descriptions:

4 DIAGNOSTICS

```

                                INTERACTIVE STATUS

IP ADDRESS:          000.000.000.000
UPM:                00000000
UPSTREAM ID:        0000
DOWNSTREAM ID:      0000
STATE:              UNCONFIG
MAC ABORT CNTR:    0000

SOCKET PORT STATE:
0                UNUSED
1                UNUSED
2                UNUSED
3                UNUSED
4                UNUSED
    
```

The Interactive Status fields are:

Field	Description	
IP Address	The IP address in dotted-decimal format xxx.xxx.xxx.xxx assigned by the NC 1500 to the DCX3200. 0.0.0.0 is displayed if the IP address is not configured or unknown.	
UPM	The upstream modem address value is the same as the terminal ID assigned by the DAC 6000. It is a unique, system-generated, eight-digit integer between 1 and 16777215. 00000000 is displayed when the UPM is not configured or if it is unknown.	
Upstream ID	A four-digit decimal value from 0000 to 9999 assigned by the DAC 6000 to the DCX3200. 0000 is displayed if the Upstream ID is not configured or if it is unknown.	
Downstream ID	A four-digit decimal value from 0000 to 9999 assigned by the DAC 6000 to the DCX3200. 0000 is displayed if the Downstream ID is not configured or if it is unknown.	
State	The interactive status of the DCX3200:	
	OSD	Description
	UNCONFIG	The DCX3200 is not configured for the interactive system, and the platform should run as pre-interactive.
	MAC_CONNECT	The DCX3200 is waiting to establish a connection to the MAC PID Stream.
	INIT_WAIT_DC_OR_C	The DCX3200 is in the interactive initialization state and waiting for the default configuration or the contention channel list messages.
	WAIT_LM_ACK	The DCX3200 is in the interactive initialization state and waiting for Link Management Response ACK for Local Address Message.
	WAIT_SO_ACK	The DCX3200 is in the interactive initialization state and waiting for a Sign On acknowledgement.
	WAIT_LA_OR_S O	The DCX3200 is in the interactive initialization state and waiting for Logical Address or Sign On with verification Frequency message.

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Field	Description
	INIT_STOPPED The DCX3200 is in the interactive initialization state and the TransMode has stopped.
	RUN_WAIT_DC_OR_C The DCX3200 is in the interactive state and waiting for the default configuration or the contention channel list messages.
	RUNNING Interactive state is running, sending idle messages, and waiting for any prepare for poll or MAC messages.
	RUN_STOPPED The interactive run state has stopped and DCX3200 is waiting for status or a transmission control message.
	INVALID The interactive state is unknown or invalid.
MAC Abort Cntr	This counter increments every time the MAC layer reaches the cell abort count limit. It is reset by the successful upstream transmission of a cell: for example, when the DCX3200 receives an ACK. If the counter reaches the MAC abort count limit, the DCX3200 assumes the MAC layer is unavailable due to noise, congestion, or some other problem. The DCX3200 stops transmitting data upstream, reports an error to the calling function, and attempts to re-enter the network using the initialization process. 0000 is displayed as the default or if the MAC Abort CNTR is not configured or unknown.
Socket Port State	The socket mode and activity: <ul style="list-style-type: none"> • UNUSED — The socket is not being used. • OPENED — The socket is open. • READY — The socket is ready to send or receive. • RECEIVING — The socket is receiving data from the application server. • SENDING — The socket is sending data to the application server. • UNKNOWN — The socket state is invalid or unknown.



5 TROUBLESHOOTING

Troubleshooting guidelines follow. If problems still occur after performing the diagnostics, call the TRC for assistance as described in the Introduction.

Problem	Possible Solution
The DCX set-top will not power on	<p>The DCX set-top may have received a software update and may not power on while the new software is being installed. Try again in a few minutes.</p> <ul style="list-style-type: none">• Verify that the AC power cord is connected to the DCX set-top and an AC outlet. Unplug the DCX set-top from the AC outlet, plug it back in, and then press the POWER button on the remote control.• If the DCX set-top is connected to a switched outlet on another unit, verify that that unit is powered on. Unplug the power cord from the DCX set-top's AC outlet, plug it back in, and then press the POWER button on the remote control. It is recommended to use an unswitched outlet, if possible.
The remote control does not work	<p>Verify that the remote control is in Cable mode.</p> <p>Verify that there are no obstructions between the remote control and the DCX set-top. Aim the remote control directly at the DCX set-top, not the TV or VCR. The angle between the remote control and the DCX set-top may be too large. Stand in front of the DCX set-top and not too far to either side.</p> <ul style="list-style-type: none">• Press and release operation keys one at a time, firmly and deliberately.• Check the batteries in the remote control. Install new batteries if needed.
There is no audio when viewing cable channels	<p>Verify that the mute button on the DCX set-top or the remote control has not been pressed. Press mute on the remote control to restore sound.</p> <ul style="list-style-type: none">• If the DCX set-top audio output is connected to the TV, verify that the mute button on the TV has not been pressed.• If the DCX set-top audio output is connected to a home theater receiver, verify that the receiver is set to the appropriate input source and the mute button on the receiver has not been pressed.• Verify that you have the correct cables for the audio connections.• Verify that the audio cables are firmly connected between the DCX set-top and the audio playback device (TV, receiver, DVD player, etc.).
There is no audio from the center and/or surround speakers of a home theater receiver connected to the DCX set-top	<p>Not all programs feature full Dolby® Digital [5.1] or Dolby® Digital Plus [7.1] surround sound. In some cases, the programs may only contain left and right stereo audio.</p> <ul style="list-style-type: none">• Verify that the S/PDIF cable (coaxial or optical) is firmly connected to the DCX set-top and the home theater receiver.• Verify that the home theater receiver is set to a surround sound audio mode (Dolby Pro Logic®, Dolby Pro Logic II®, Dolby Pro Logic IIx®).• Verify that the receiver is properly configured to work with all connected speakers.

5 TROUBLESHOOTING

Problem	Possible Solution
<p>There is no video on the TV screen</p>	<p>Verify that the TV is powered on and set to the appropriate input source for the DCX set-top.</p> <p>Verify that the DCX set-top is powered on and tuned to an authorized cable channel.</p> <p>Verify that all video cables between the DCX set-top and the TV are firmly connected.</p> <p>Verify that the coaxial cable feed is firmly connected to the DCX set-top and the wall jack.</p> <ul style="list-style-type: none"> • If the DCX set-top video output is connected to a home theater unit, verify that the home theater unit is powered on and set to the appropriate input source. • If the DCX set-top video output is connected to a TV through an HDMI™ connection, power off the TV and then power off the DCX set-top. Wait one second and then power on the devices. <p>Not all HDTVs can display every output format (1080i, 720p, 480p, or 480i) available on the DCX set-top. To select a different format:</p> <ol style="list-style-type: none"> 1. Ensure that your DCX set-top is plugged into a power outlet and is turned off. 2. Press the MENU key on the remote control. Your settings are displayed on the DCX set-top OSD. 3. Press the ▲ and ▼ keys to display the HDMI/YPbPr OUTPUT setting. 4. Press the ► key to cycle through the available output formats until a picture displays on the TV.
<p>No graphics or program guides appear on the TV screen</p>	<p>If you use the IEEE-1394 connection, on-screen graphics, including closed captions and program guides, are not displayed by the DCX set-top. On-screen graphics and captions may still be overlaid by the TV, if enabled. Alternatively, use HDMI™ or component video instead.</p>
<p>No closed captions display</p>	<p>Verify on the User Settings menu that closed captions are enabled on the DCX set-top.</p> <p>Verify that closed captions are enabled on the TV.</p> <p>Note: Closed captioning may not be available on the current program.</p>
<p>There are black bars to the right and left of the picture</p>	<p>Widescreen TVs display 4:3 programs in this format unless set to Stretch. Turn on the 4:3 OVERRIDE feature in the User Settings menu. This enables most widescreen TVs to stretch the video to fill the screen (see the TV manual for information about stretching 4:3 video).</p> <ul style="list-style-type: none"> • If the DCX3200 is connected to a widescreen TV, verify that the TV TYPE is set to 16:9 in the User Settings menu. <p>Many HD programs are broadcast in pillar-box format with black bars to the left and right of the picture. These programs are broadcast in 16:9 HD formats, even though the video is not 16:9.</p>

5 TROUBLESHOOTING

Problem	Possible Solution
<p>There are black bars above and below the picture</p>	<p>All 4:3 HDTVs display HD programs in letterbox format (black bars above and below the picture) because of the shape of the display screen.</p> <ul style="list-style-type: none"> • Turn on the 4:3 OVERRIDE feature in the User Settings menu. This enables most standard-screen TVs to display a full screen picture when the DCX3200 is tuned to a 4:3 program. • Set the TV TYPE to 4:3 Pan-Scan. This enables the DCX3200 to remove the black bars above and below the picture when possible. <p>Some SD programs are broadcast in the letterbox format with black bars above and below the picture. Some widescreen TVs offer a zoom feature that may be able to remove the black bars (see the TV manual for information about zooming 4:3 video).</p>
<p>There are black bars on all four sides of the picture</p>	<p>This may occur on a 4:3 TV if the 4:3 OVERRIDE setting is OFF. To set 4:3 SD programming to fill the screen, depending on the capabilities of the TV, set 4:3 OVERRIDE to 480i or 480p.</p> <p>This may occur on a 16:9 TV if the active video for an SD broadcast is in letterbox format. To confirm, wait for a commercial or look for a graphic, such as a network logo. If the commercial fills the screen from top to bottom, or the graphic appears below the active video, the program is being letterboxed by the broadcaster. You can minimize this by activating the zoom feature on the TV.</p> <p>A broadcaster may include black bars on either side of a widescreen broadcast. This is called a “hybrid” aspect ratio and results in a black border surrounding the video on a 4:3 TV. Because this is part of the broadcast, the DCX3200 cannot correct the video. You may be able to minimize the border using the zoom feature on the TV.</p>
<p>Colors do not appear correctly</p>	<p>Be sure to match up each signal to the same YPbPr connection on the TV. Otherwise, colors will not appear correctly on the TV.</p>



MOTOROLA



Motorola, Inc.
101 Tournament Drive
Horsham, PA 19044 U.S.A.

<http://www.motorola.com>

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