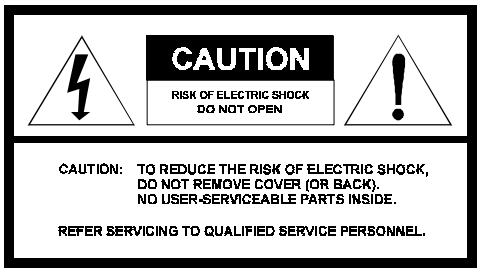
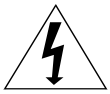
DCT 1000
Cable Terminal

Installation Manual

General Instrument



Graphical symbols and supplement warning marking locations on the bottom of the appliance.

	This symbol means that dangerous voltage levels are present within the equipment. These voltages are not insulated, and may be of sufficient strength to cause serious bodily injury if touched. The symbol may also appear on schematics.
	This symbol calls attention to a critical procedure, or means refer to the instruction manual for opening or service information. Only qualified service personnel are to install or service the equipment. The symbol may also appear in text and on schematics.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:
TO PREVENT ELECTRICAL SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE, OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

FCC Compliance: 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Installation Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by General Instrument could void the user's authority to operate this equipment under the rules and regulations of the FCC.

Canadian Compliance: This Class B digital apparatus meets all requirements of he Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe A respects toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Repairs: If repair is necessary, call the General Instrument Repair Facility at **1-800-227-0450** for a Return for Service Authorization (RSA) number before sending the unit. The RSA number must be prominently displayed on all equipment cartons. Pack the unit securely, enclose a note describing the exact problem, and a copy of the invoice that verifies the warranty status. Ship the unit **PRE-PAID** to the following address:

GI Communications
4694 Coffee Port Road
Brownsville, TX 78521
Attn: RSA #_____

NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close as possible to the point of cable entry as practical.

General Instrument reserves the right to revise this publication and to make changes in content from time to time without obligation on the part of General Instrument to provide notification of such revision or change. General Instrument provides this guide without warranty of any kind, either implied or expressed, including, but not limited, to the implied warranties of merchantability and fitness for a particular purpose. General Instrument may make improvements or changes in the product(s) described in this manual at any time.

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Section 1
Introduction

The DCT 1000 is an analog/digital cable terminal designed to be configurable and upgradeable to meet the future needs of emerging technologies in the communications industry. The base unit supports numerous configurations. This manual provides instructions on installing the base unit and the following options:

- A/B Switch-out
- A/B Switch-in
- RF Bypass Switch
- STARVUE II Module
- STARFONE Module

The DCT 1000 operates in the same system with existing analog set-top terminal products. Existing set-tops are not affected by the new information flowing from the system to the DCT 1000 cable terminals.

Features and Options

The General Instrument DCT 1000 cable terminal offers the following standard features:

- 54 to 860 MHz integrated tuner
- RF, video, and audio ports
- IR Blaster port
- Data output port
- Application interface port
- Switched accessory outlet

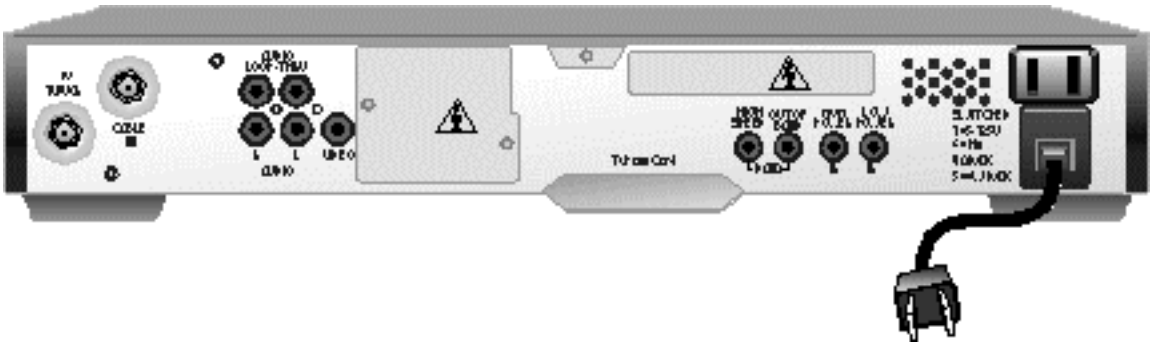
Among the optional features available are:

- STARVUE II and STARFONE modules
- RF Bypass switch
- A/B Switch-in
- A/B Switch-out
- Audio loop-thru
- High and low power IR Blaster modules

The following illustrations show the front and rear views of the standard unit:

Figure 1-1
Front view of the DCT 1000 cable terminal

Figure 1-2
Rear view of the DCT 1000 cable terminal



Using This Manual

This manual provides instructions for the following tasks necessary to install and configure a DCT 1000 cable terminal.

Section 1	Provides a brief introduction to the product, identifies the information contained in this manual, lists related documentation, and gives the helpline telephone number and return procedure.
Section 2	Describes the DCT 1000 cable terminal and provides an overview of its use. This section also identifies the front panel displays and switches, and describes the rear panel connectors.
Section 3	Provides instructions on how to install a DCT 1000 cable terminal in a subscriber location and perform operational tests.
Section 4	Provides instructions on how to connect a VCR or stereo equipment to a DCT 1000 cable terminal in a subscriber location.
Section 5	Provides instructions on checking-out operation of TV Guide On Screen (an optional electronic program guide), and on a few basic operations so that you can introduce your subscriber to the guide.
Appendix A	Lists technical specifications for the DCT 1000 cable terminal.
Appendix B	Provides instructions on accessing and interpreting the built-in diagnostics.

Related Documentation

Separate instruction manuals are available for associated components. Although these may be of interest to you, they are not necessary to install or operate the basic DCT 1000 cable terminal.

- *DCT 1000 User Guide*, part number 437-011-400
- *XRC 100 Remote Control User Guide*, part number 437-053-400
- *A/B In Switch Installation Instructions*, part number 437-043-200
- *A/B Out Switch Installation Instructions*, part number 437-044-200
- *Starfone Installation Instructions*, part number 436-420-202
- *Starvue II Installation Instructions*, not yet released

If You Need Help

If you need assistance while working with the DCT 1000 cable terminal, call the General Instrument Technical Response Center at **1-800-537-7653**. The Technical Response Center is open from 7:30 a.m. to 9:00 p.m. Eastern Standard Time, Monday through Friday. When the Technical Response Center is closed, emergency service *only* is available on a call-back basis.

If calling from outside the United States, please use our main switchboard number, **1-215-674-4800**, when contacting the Technical Response Center.

Calling for Repairs

If repair is necessary, call the General Instrument Repair Facility at **1-800-227-0450** for a Return for Service Authorization (RSA) number before sending the unit. The RSA number must be prominently displayed on all equipment cartons. The Repair Facility is open from 8:00 a.m. to 5:00 p.m. Central Standard Time, Monday through Friday.

If calling from outside the United States, dial your appropriate international access code, then dial **52-891-40739**, to contact the Repair Facility.

When shipping equipment for repair, follow these steps:

Pack the unit securely.

1. Enclose a note describing the exact problem.
2. Enclose a copy of the invoice that verifies the warranty status.
3. Ship the unit **PRE-PAID** to the following address:

   GI Communications
   4694 Coffee Port Road
   Brownsville, TX 78521
   Attn: RSA #_____

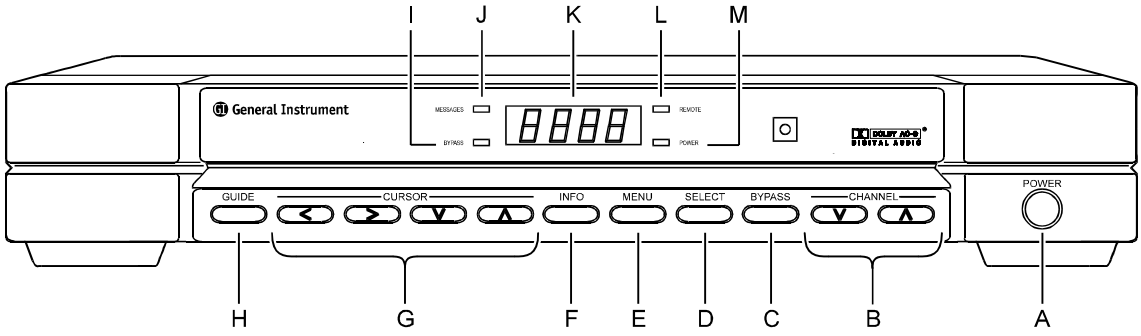
Section 2
Overview

In this section you will find illustrations and tables showing the features of the front and rear panels of the DCT 1000 cable terminal. Before beginning the installation process, please take the time to familiarize yourself with the various controls and displays.

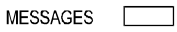
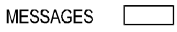
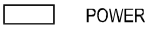
Front Panel Controls and Displays

The front panel, illustrated below, contains selection buttons, tuning buttons, various displays, and the power switch. These controls are designed to provide a minimum, but functional, capability in the event that the cable terminal remote control is lost or is temporarily out of service. However, certain functions (for example, those requiring numeric entry) are not available without a remote control.

Figure 2-1
DCT 1000 cable terminal front panel



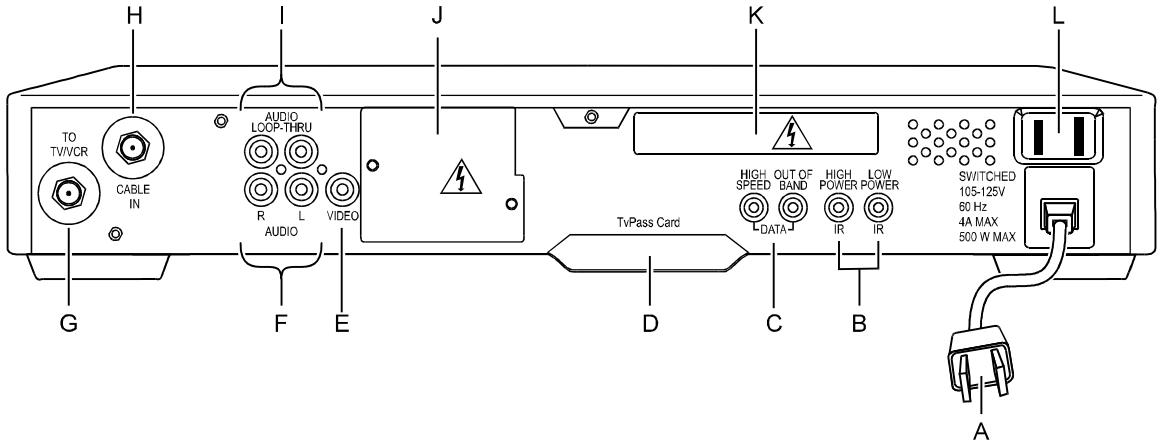
See the following table for an explanation of the controls accessible from the front panel (A through H) and a description of the LEDs (I through M).

Key	Connector	Function
A		Turns terminal on/off.
B		Change channel up and down.
C		Operates the A/B or RF bypass switch.
D		Selects function options and pay-per-view (PPV) events, and tunes channels from the electronic program guide.
E		Displays main menu.
F		Displays current channel and program information.
G		Move cursor in menu and program guide screens.
H		Displays program guide.
I		Lights if RF bypass mode is selected.
J		Lights if a message is present.
K		Normally displays current channel number. In the diagnostic mode, displays diagnostic codes.
L		Flashes when an error-free signal is received from the remote control.
M		Lights when the unit is on.

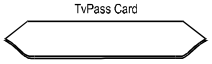
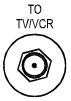
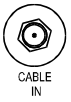
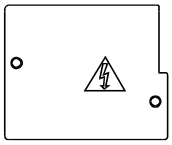
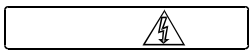
Rear Panel Connectors

The rear panel of the DCT 1000 cable terminal, displayed in Figure 2-2, contains a switched power outlet; connectors for video, audio, and RF cabling; data output connectors; IR blaster output connectors; and an ac power plug. If a pay-per-view (PPV) module is not installed in the cable terminal's rear panel, protective plates will cover the opening in the rear panel reserved for the modules. The protective plate should *not* be removed in the subscriber location unless you are installing new hardware in the opening.

Figure 2-2
DCT 1000 cable terminal rear panel



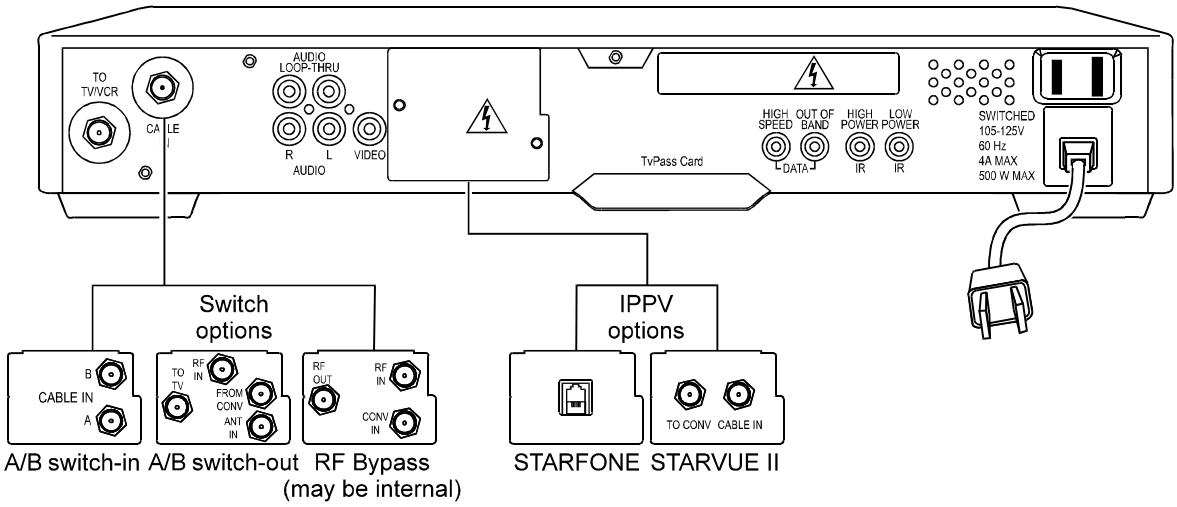
See the following table for the description of each of the rear panel features identified above.

Key	Connector	Function
A		Standard 2-prong polarized plug to connect the cable terminal to a power source.
B		Mini phone jacks for connecting an optional IR Blaster. The high power output is optional.
C		Mini phone jacks for connecting data output from the terminal.
D		This slot is reserved for future use.
E		The RCA jack used to connect the cable terminal to a composite (baseband) video TV or a monitor. In some configurations this jack connects to a VCR.
F		The left and right audio RCA jacks used for stereo audio output.
G		An F-type connector used to connect the cable terminal to a standard TV or to a VCR.
H		An F-type connector used for the coaxial cable input port.
I		The optional RCA jacks for looping through audio from audio equipment.
J		Covers slot used for STARVUE II and STARFONE options.
K		Covers slot reserved for future options.
L		An ac power outlet that can be configured as a switched or unswitched outlet.

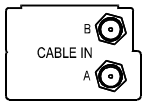
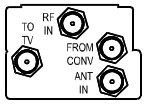
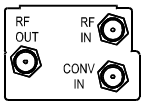
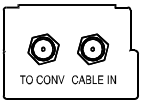
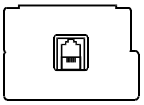
Configuration Options

The DCT 1000 platform supports a variety of configurations. These options allow your company to offer options tailored to the needs of individual subscribers. Figure 2-3 shows the various options available for the DCT 1000 platform.

Figure 2-3
DCT 1000 options



The following table describes the function of each of the options shown in Figure 2-3.

Optional Module	Function
 A/B Switch-in	Used in a dual cable system to receive both cables. Please verify the location of the A and B connectors on your particular A/B switch. They may be reversed.
 A/B Switch-out	Used to receive off-the-air signals from an antenna, or used to watch and/or record channels at the same time.
 RF Bypass	Allows the cable signal to bypass the cable terminal and go directly to a TV or VCR. An RF Bypass switch is internal on some DCT 1000 terminals. Before installing an external switch, verify that the terminal does not have an internal switch.
 STARVUE II	Used in a two-way addressable system to send impulse pay-per-view (IPPV) information to the ACC 4000D or other controller through the return system.
 STARFONE	Used in a two-way addressable system to send impulse pay-per-view (IPPV) information to the ACC 4000D or other controller through the subscriber's telephone hookup.

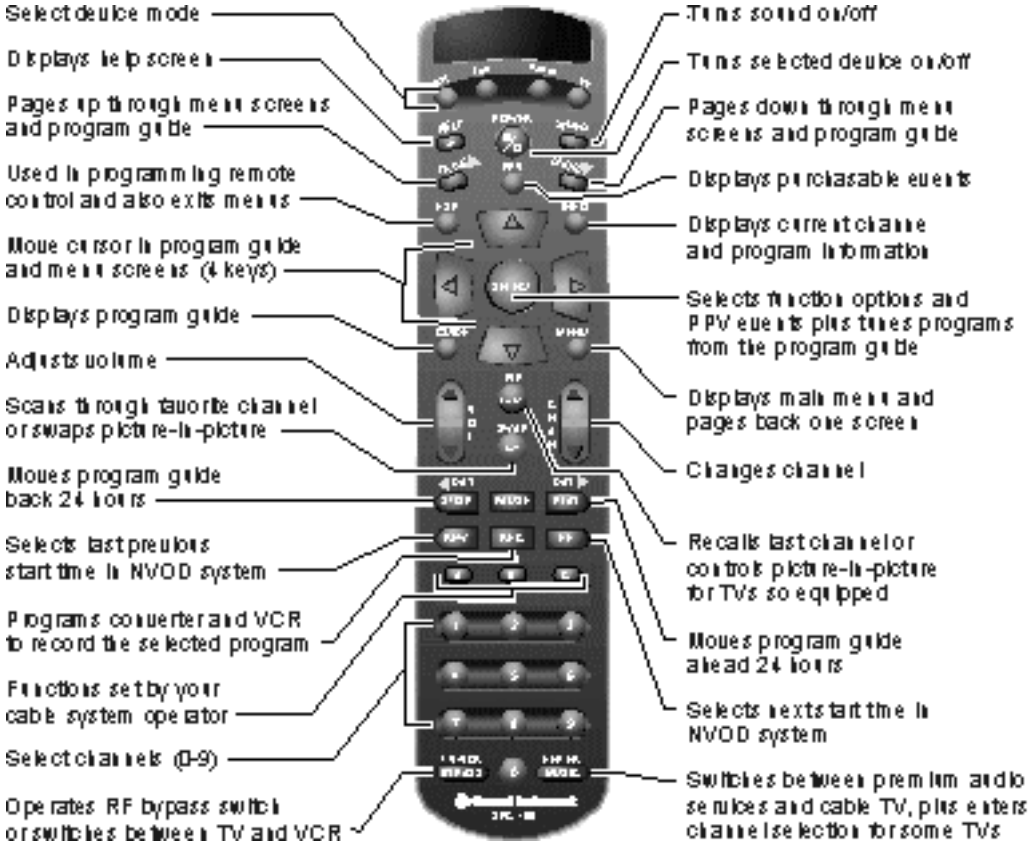
Remote Controls

The basic DCT 1000 uses the XRC 100 remote control. If your system offers an optional electronic program guide, a different remote control may be required; refer to *Section 5, TV Guide On Screen*. The XRC 100 may require programming before use; refer to its user guide for programming instructions.

XRC 100 Remote Control

Figure 2-4 illustrates the XRC 100.

Figure 2-4
XRC 100 remote control



Installing Batteries in Remote Control

Before a remote control can be used, two AA (1.5 volt) alkaline batteries must be installed in it. Battery access is located on the back of the remote control.

To install batteries in an XRC 100:

Press and slide the battery compartment cover off.

1 Place the batteries in the compartment being careful to observe the correct polarity.

2 Slide the battery compartment cover back into place.

Section 3
Installation

This section provides step-by-step instructions for installing and cabling the cable terminal in the subscriber's location. The cabling diagrams shown in this section include the following configurations, both with and without PPV options (STARFONE and STARVUE II):

- Standard wiring
- A/B Switch-out
- A/B Switch-in

If you are adding a VCR or stereo components to the configuration, see *Section 4, Adding a VCR or Stereo Components*, for cabling suggestions.

Before You Begin

Before beginning the installation process, do the following:

- Look at the TV set or monitor to determine if it is a standard TV or a composite (baseband) monitor. Make certain you have the correct connecting cables.
- Make certain you have the correct connecting cables for the audio connectors.
- Determine if you are going to connect a VCR to the DCT 1000 cable terminal.
- If the subscriber location requires an A/B switch-in, an A/B switch-out, or a STARVUE II or STARFONE module, install these options before beginning cabling. Installation of these units is described in the installation instructions provided with them.

After installation is completed, the cable terminal should be placed on a smooth, flat surface with no obstructions to interfere with the free flow of air over, under, and around the cable terminal. Tell the subscriber that nothing should be placed on top of the unit.

Installing the DCT 1000

To install the DCT 1000 in your subscriber's site:

Refer to the section that describes the cabling for the subscriber's cable terminal configuration: standard wiring (page 3-2), A/B switch-out (page 3-4); or A/B switch-in (page 3-6).

1. Follow the general instructions as you do the cabling.
2. Perform the basic operational check beginning on page 3-8 after you successfully install the cable terminal.
3. Check the troubleshooting suggestions on page 3-9 if you have a problem with the operational check.

General Configuration Instructions

The DCT 1000 cable terminal is available in numerous configurations. The cabling for each configuration is illustrated in this section. Use these general installation instructions and the cabling illustrations to install the terminal in the subscriber location.

To install the DCT 1000 cable terminal:

Connect the 75-Ohm coaxial cable drop to the F-type connector that is labeled RF IN on the cable terminal.

1 If your configuration includes a STARVUE II module, connect the 75-Ohm coaxial cable jumper as shown on the appropriate configuration illustration.

2 To connect the video, do one of the following:

For a conventional TV set, use a 75-Ohm coaxial cable with F-type connectors to connect the cable terminal labeled TO TV either directly to the input of the TV set or through a matching transformer to the 300-Ohm input of the set.

For a monitor, use a cable with an RCA connector to connect the cable terminal labeled VIDEO to the monitor.

3 Plug the TV set into the convenience outlet on the back of the cable terminal.

Standard Wiring Cabling Diagrams

Figure 3-1 illustrates a standard wiring configuration. If the cable terminal has an RF or telephone return modem, use Figure 3-2 or Figure 3-3) to determine the correct wiring for the configuration.

Figure 3-1
Standard wiring without a PPV module

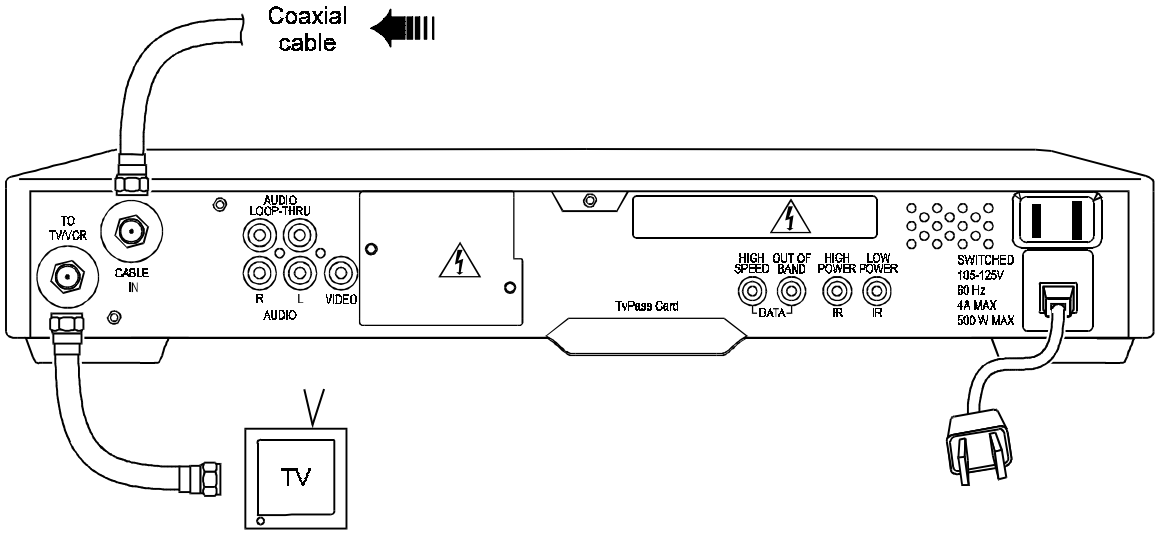


Figure 3-2
Standard wiring with a STARVUE II module

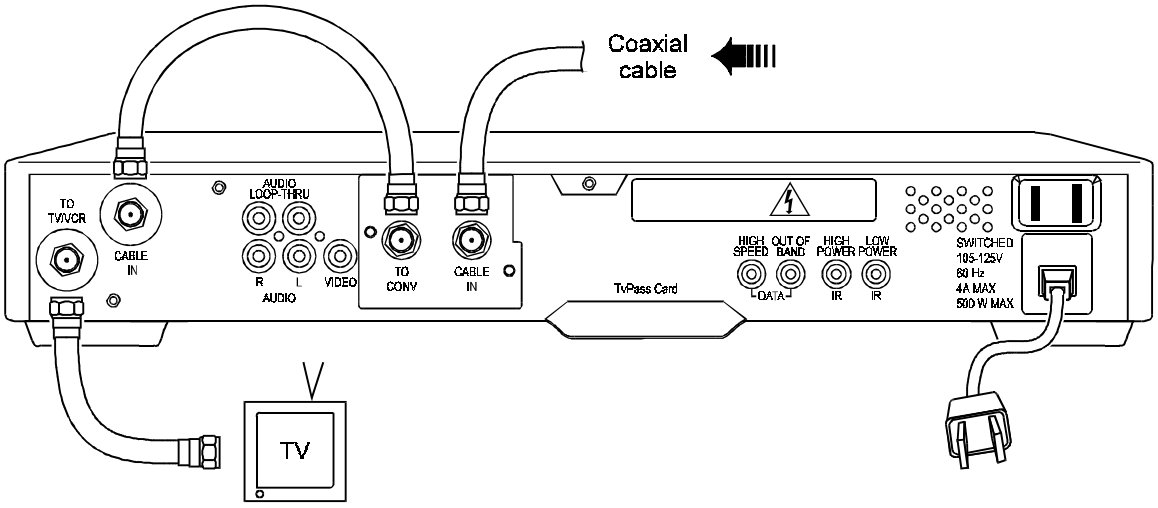
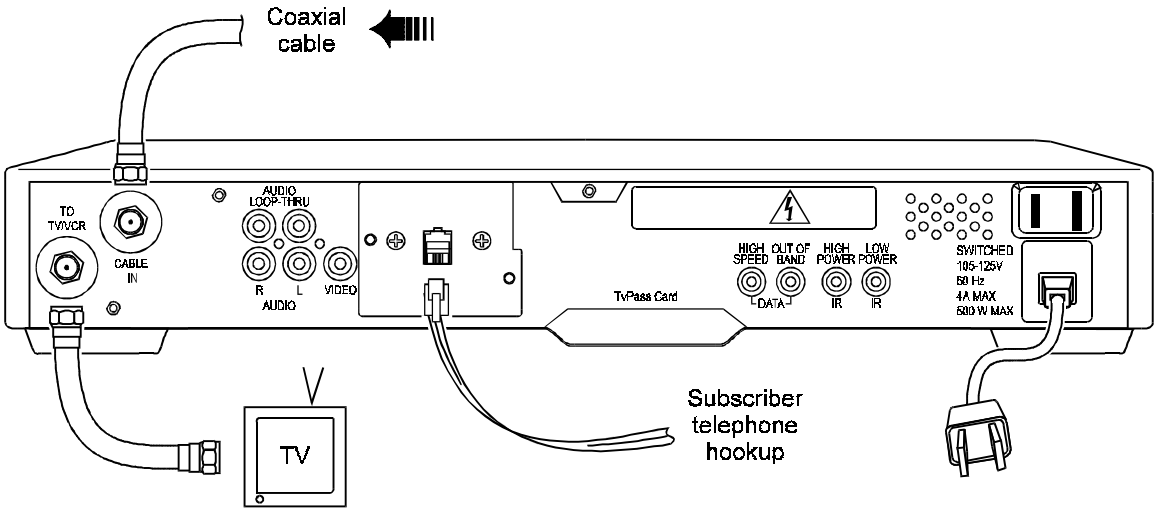


Figure 3-3
Standard wiring with a STARFONE module



A/B Switch-out Cabling Diagrams

Figure 3-4 illustrates a standard wiring configuration which includes an A/B switch-out. If the cable terminal has a PPV module, refer to the PPV diagrams (Figure 3-5 and Figure 3-6) to determine the correct cabling for the configuration.

Figure 3-4
A/B switch-out without a PPV module

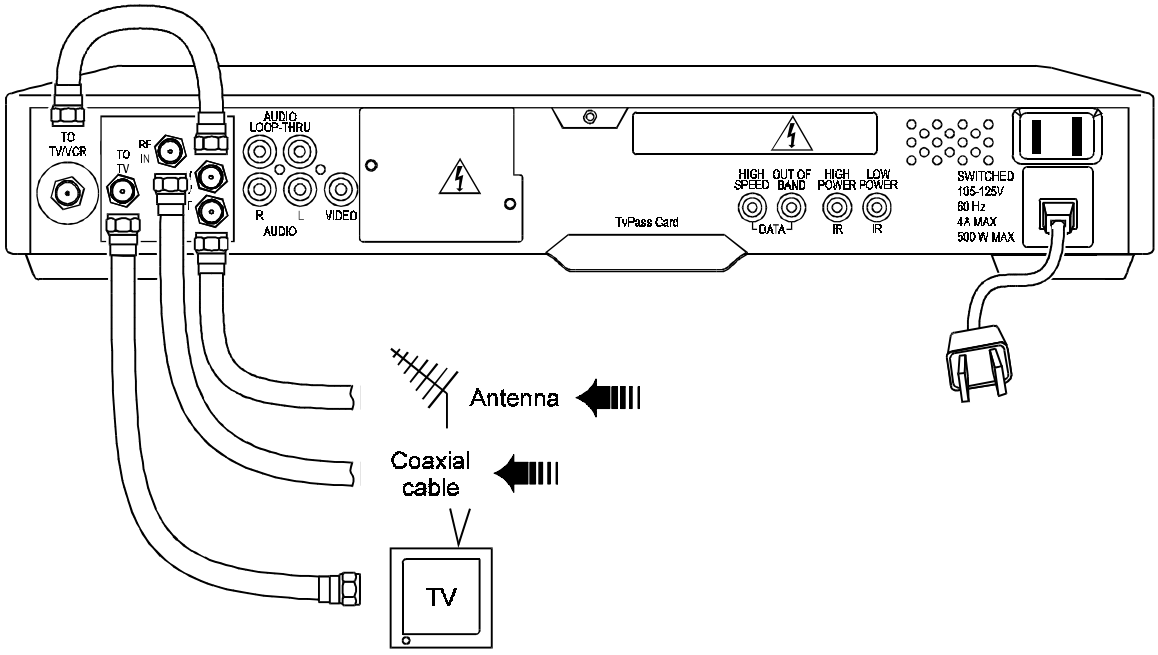


Figure 3-5
A/B switch-out with a STARVUE II module

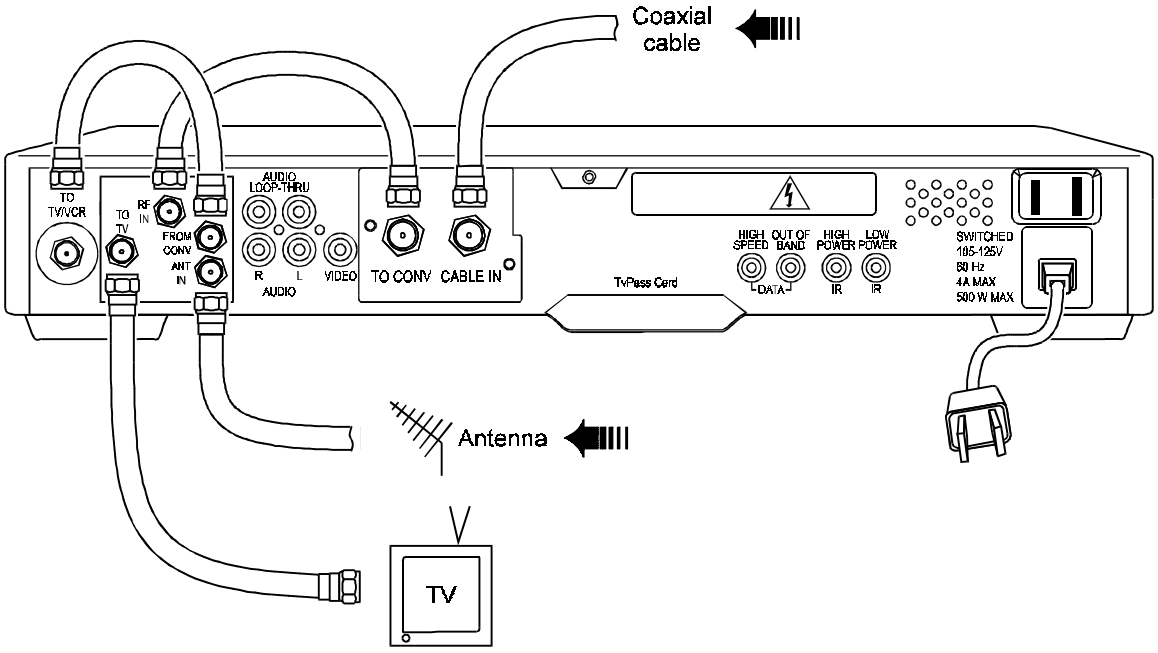
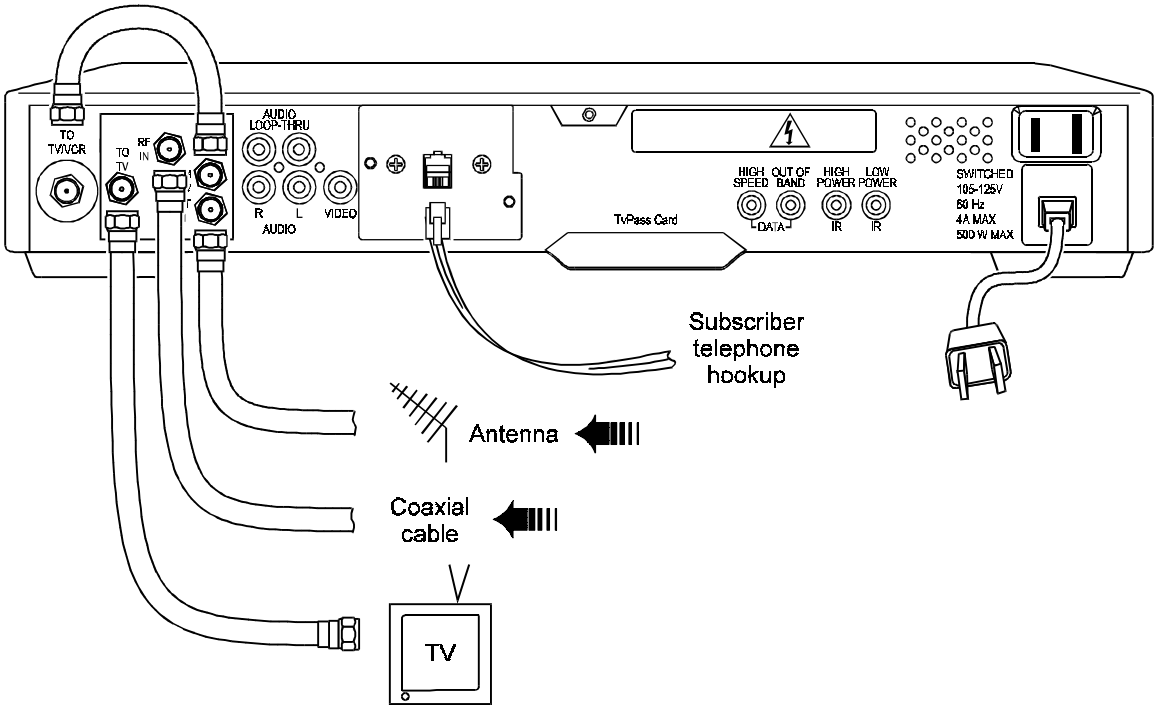


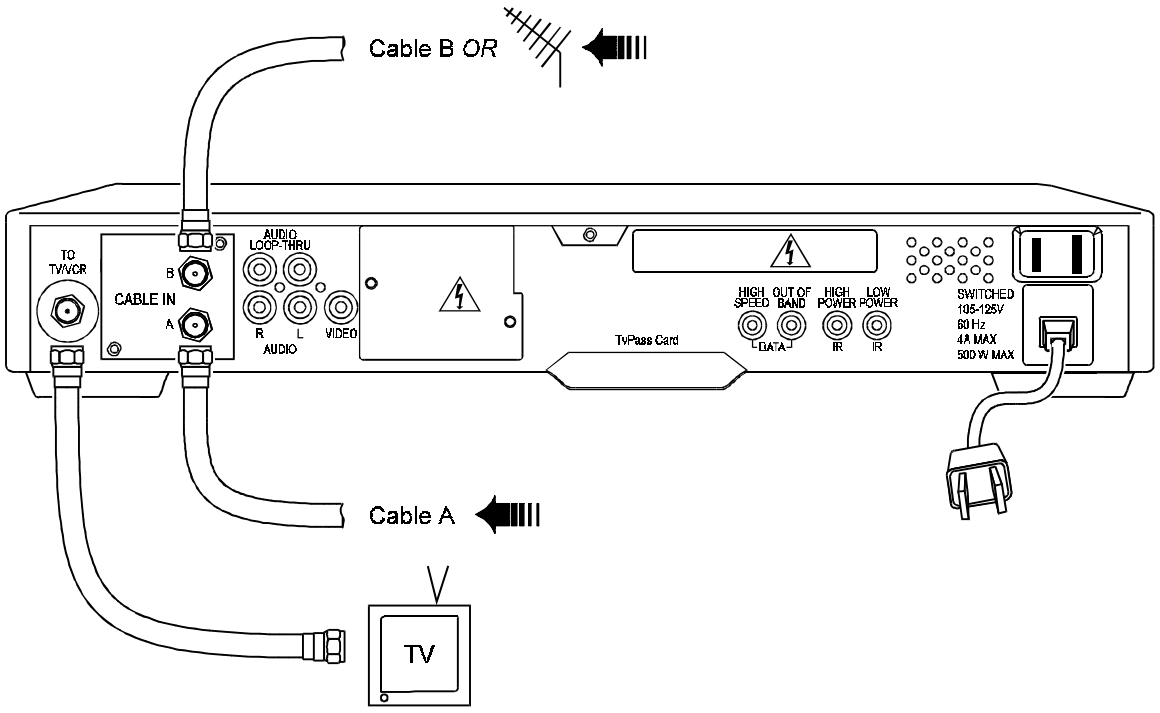
Figure 3-6
A/B switch-out with a STARFONE module



A/B Switch-in Cabling Diagrams

The A/B switch-in is commonly used in dual-cable systems. Figure 3-7 illustrates a standard configuration that uses an A/B switch-in.

Figure 3-7
A/B switch-in without a PPV module



If the cable terminal is equipped with a PPV module, refer to the PPV diagrams (Figure 3-8, Figure 3-9, and Figure 3-10) to determine the correct wiring for the configuration. The path for the return system determines which configuration to choose, the one shown in Figure 3-8 (return on cable A) or the one shown in Figure 3-9 (return on cable B).

Figure 3-8
A/B switch-in with a STARVUE II module and the return on cable A

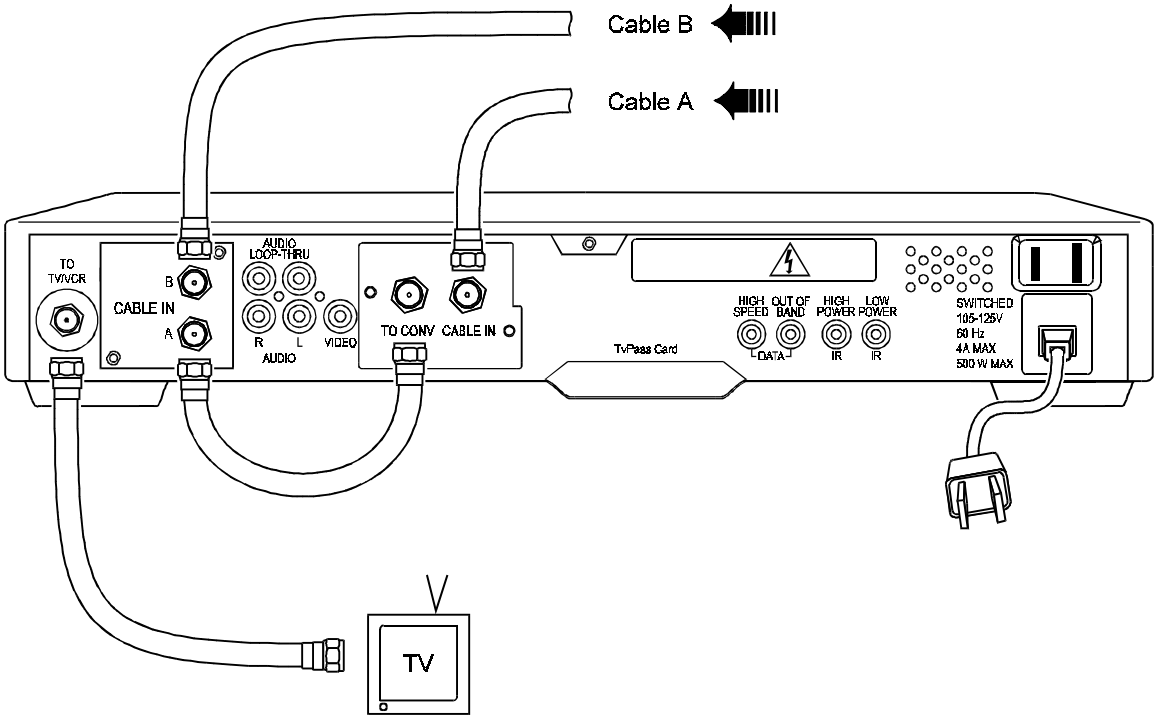


Figure 3-9
A/B switch-in with a STARVUE II module and the return on cable B

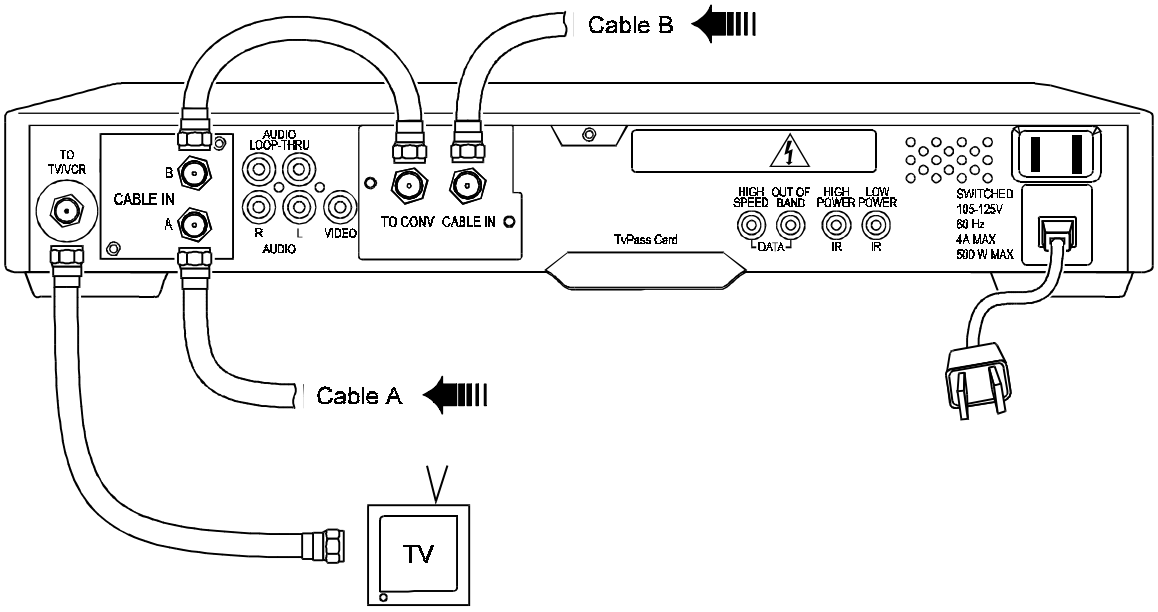
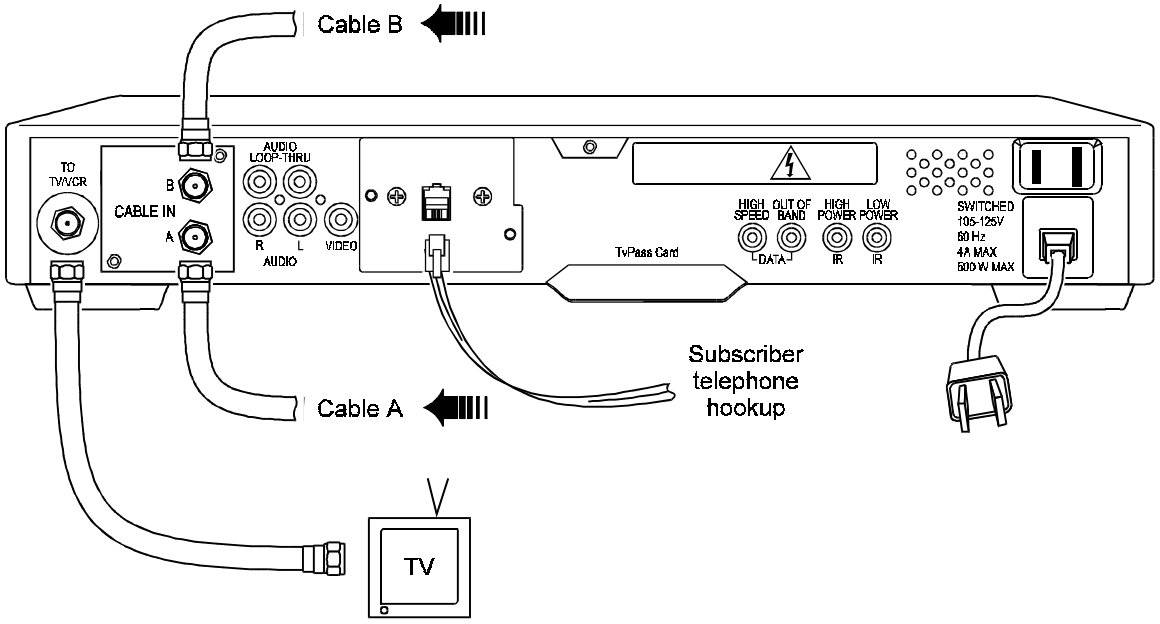


Figure 3-10
A/B switch-in with a STARFONE module



Operational Check

The operational check tests the communication link between the remote control and the cable terminal. The procedures verify the terminal's response to the remote control commands. You use the remote control to test a basic cable terminal. If the terminal does not operate properly, refer to the *Troubleshooting* section.

Testing Procedure		Action
Power on	**1**	Press and release the POWER key to turn on the terminal.
	2	Turn on the TV and tune it to the output channel of the cable terminal (channel 3 or 4).
Channel Selection	**1**	Scan through the channels using the CHANNEL keys on the cable terminal and the CHAN keys on the remote control.
	2	Tune to several channels by entering the channel number with the numeric keys on the remote control.
Volume Control	**3**	Using the TV set volume control, adjust the sound volume to a moderate level.
	4	Using the VOL key on the remote control, increase the volume to its upper limit.
	5	Again using the VOL key, reduce the volume to its lowest level. Adjust the volume to a comfortable level using the VOL key.
	6	Press MUTE to turn the sound completely off. Press MUTE again to restore the sound.

Troubleshooting

Occasionally a terminal may fail to operate as described. Follow these suggestions to correct problems:

- Press and release operation keys one at a time, firmly and deliberately.
- Aim the remote control directly at the cable terminal, not the TV or VCR. Be sure there are no obstructions between the remote control and the cable terminal.
- Be certain that the TV set is tuned to the output channel of the terminal (channel 3 or 4).

If the channels can be changed with the cable terminal buttons, but not with the remote control keys, the problem may be a weak remote control battery or the terminal is not initialized correctly.

Section 4

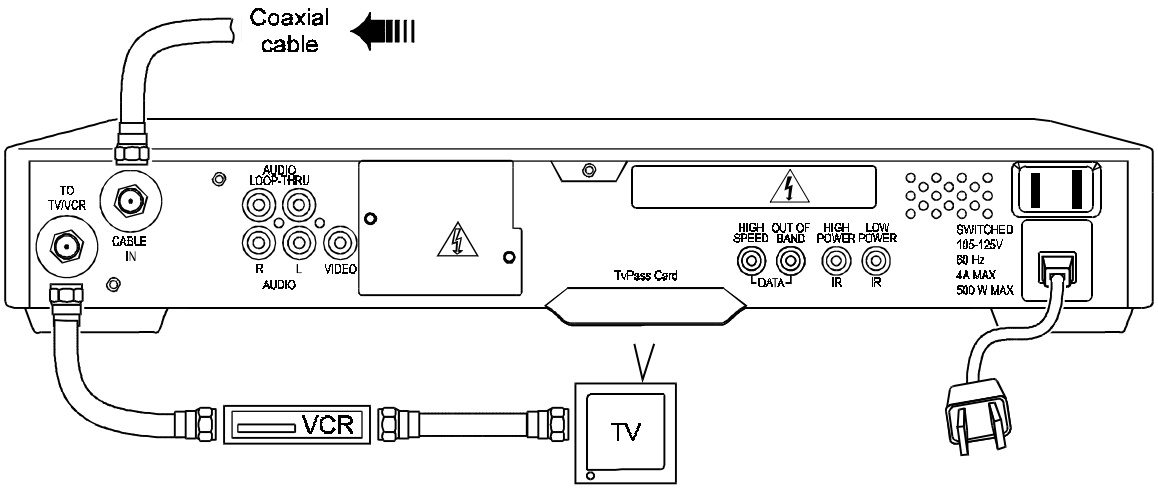
Adding a VCR or Stereo Component

Depending on the options in the DCT 1000 and the equipment attached to the cable terminal, there are numerous methods to connect a VCR or stereo equipment. This section gives a few of the standard configurations.

Standard VCR Cabling Diagram

The configuration shown in Figure 4-1 allows recording the same channel being viewed.

Figure 4-1
Standard VCR cabling



RF Bypass Switch VCR Cabling Diagrams

The configurations shown in Figure 4-2 and Figure 4-3 allow viewing an unscrambled analog channel directly on a TV while recording another channel through the terminal.

Figure 4-2
RF Bypass switch with VCR

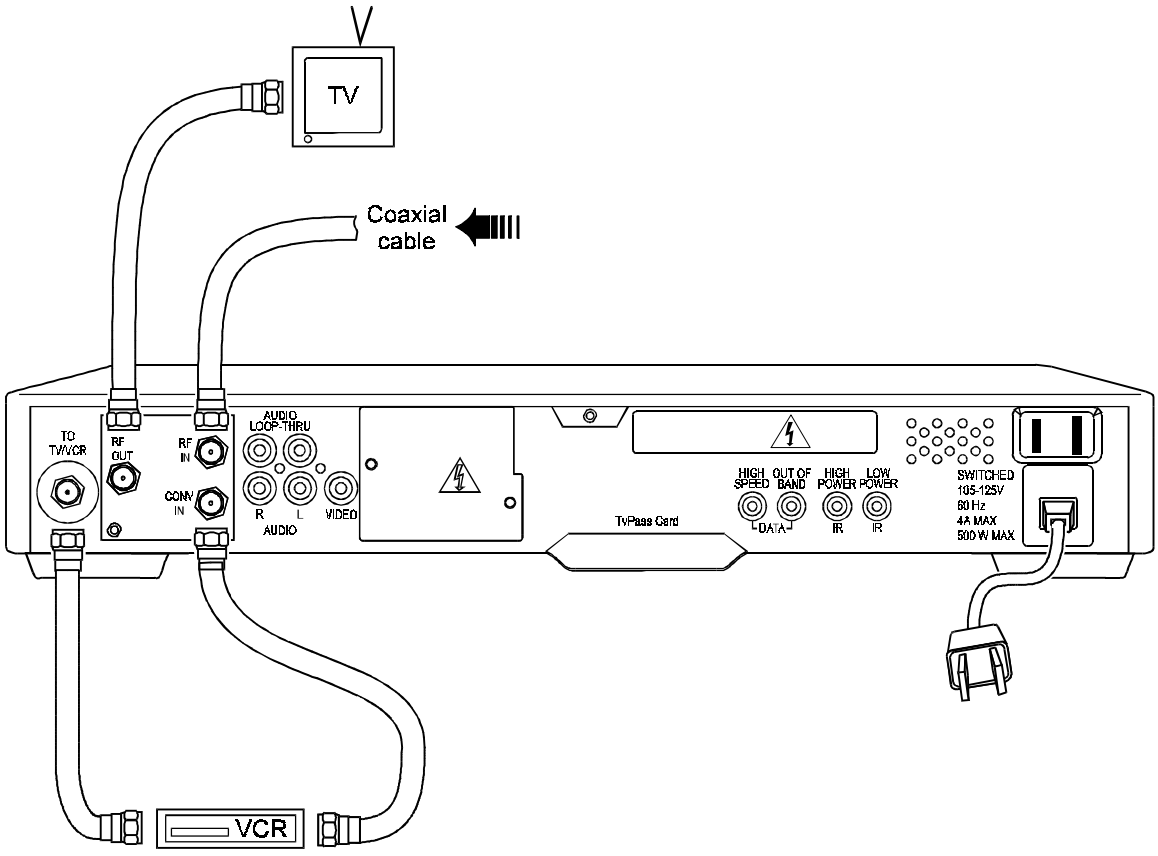
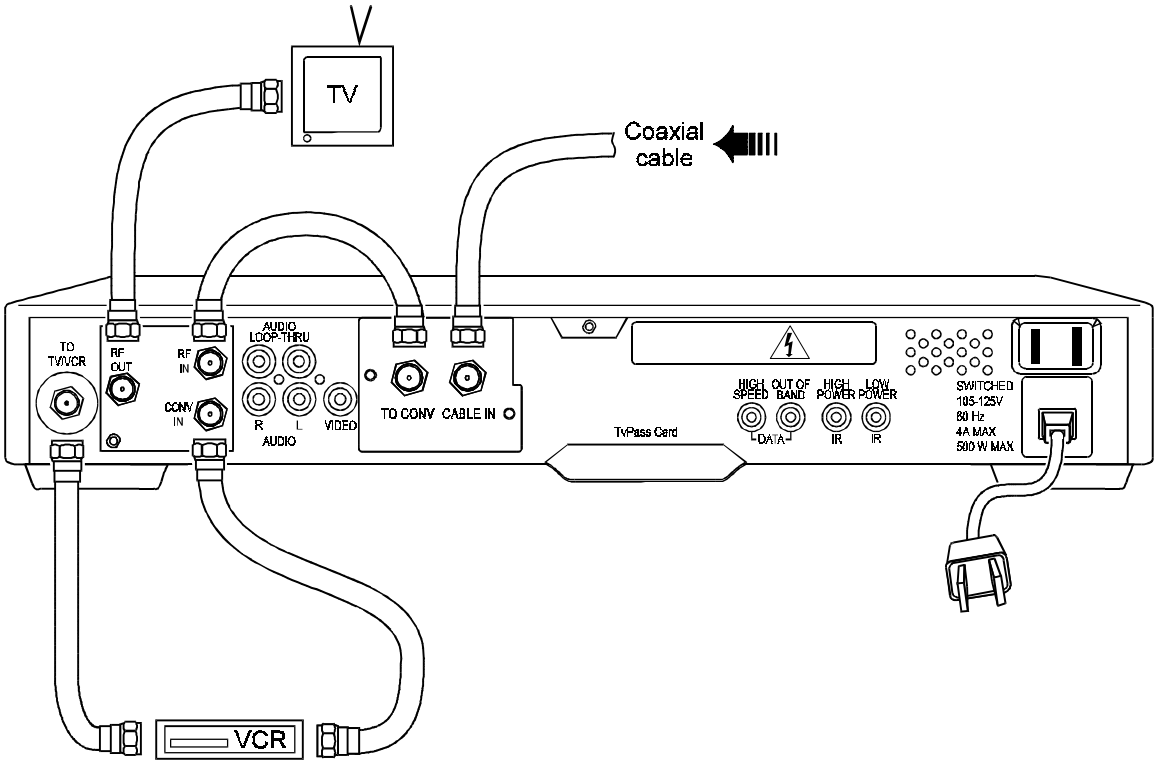


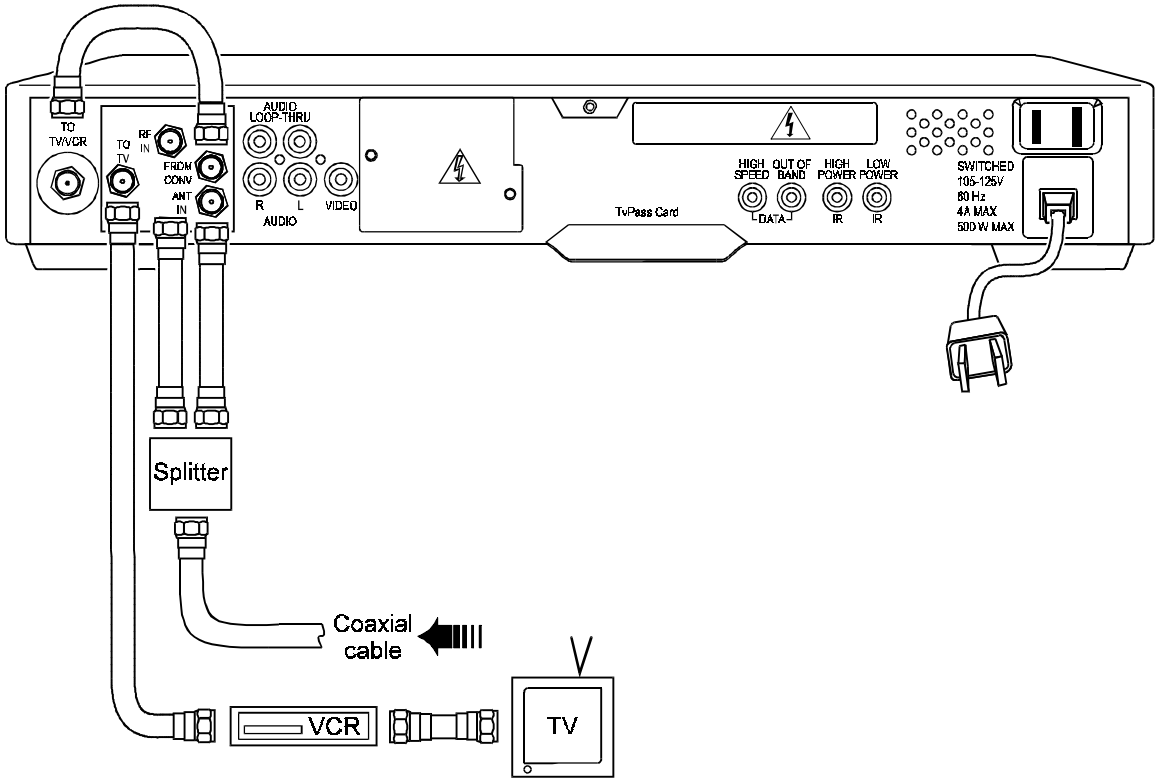
Figure 4-3
RF Bypass switch with VCR and STARVUE II module



A/B Switch-Out VCR Cabling Diagram

The arrangement shown in Figure 4-4 allows both the TV and the VCR to receive cable-ready channels directly.

Figure 4-4
A/B switch-out with VCR

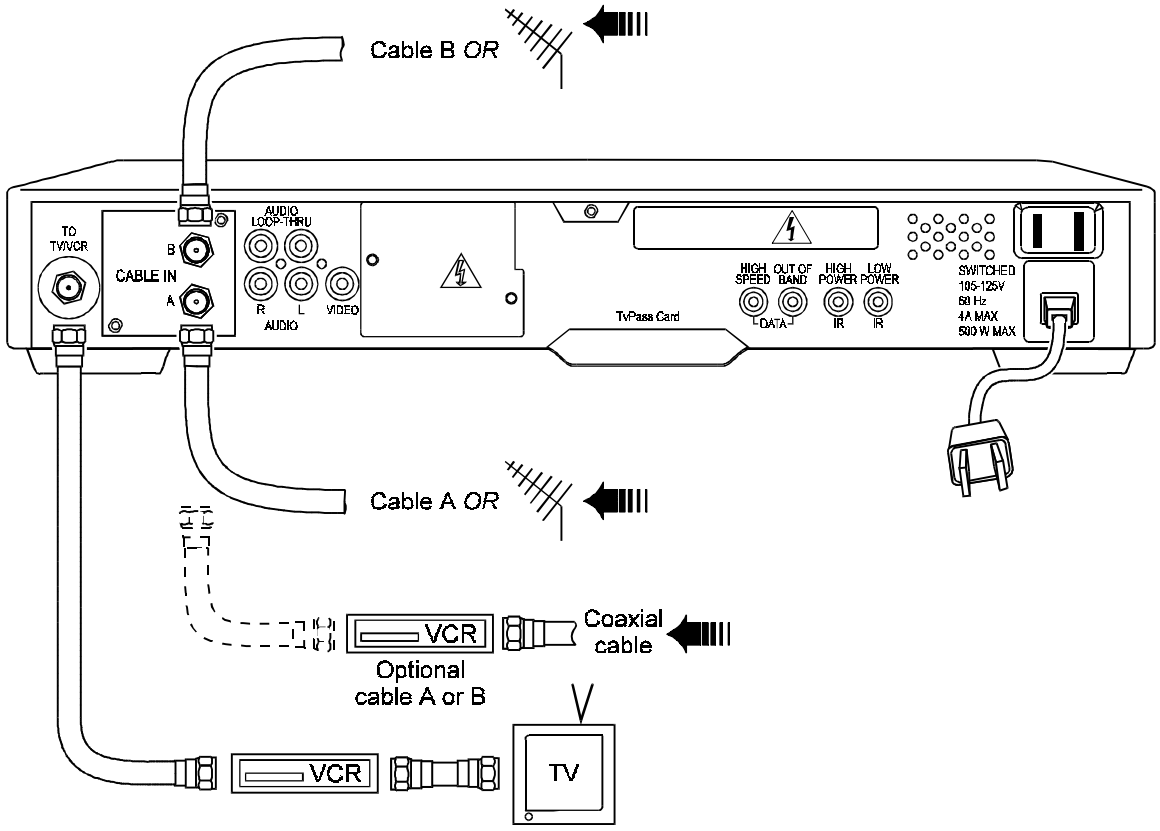


A/B Switch-In VCR Cabling Diagram

The cabling configuration illustrated in Figure 4-5 allows for one of the following:

- In the primary configuration (shown in solid lines), mode A tunes the TV to the VCR output channel and the VCR can record a scrambled or non-scrambled channel. Mode B allows B cable channels to operate in the same manner.
- The alternate configuration (indicated by dotted lines), shows an optional placement for a VCR in either the A or the B side.

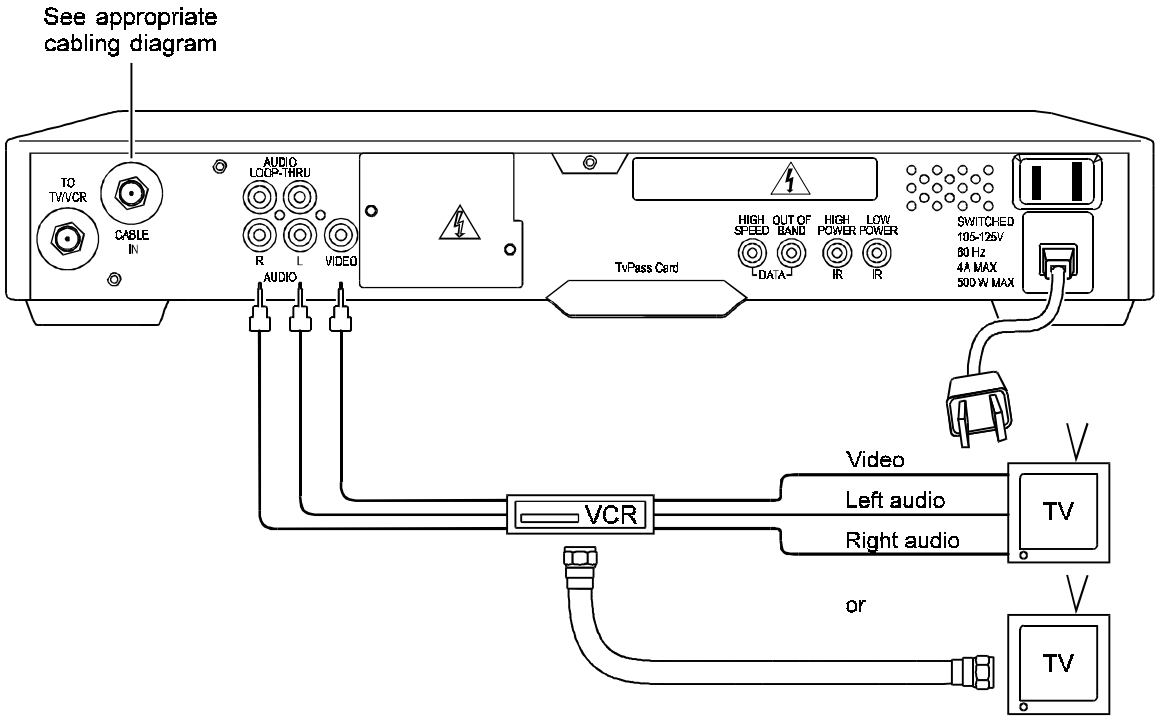
Figure 4-5
A/B switch-in with VCR



Composite (Baseband) VCR Cabling Diagram

The baseband audio and video outputs of the cable terminal are available to connect to a VCR as displayed in Figure 4-6. The VCR can be cabled to either a standard TV by an F-type connector or to a TV/monitor with audio and video connectors.

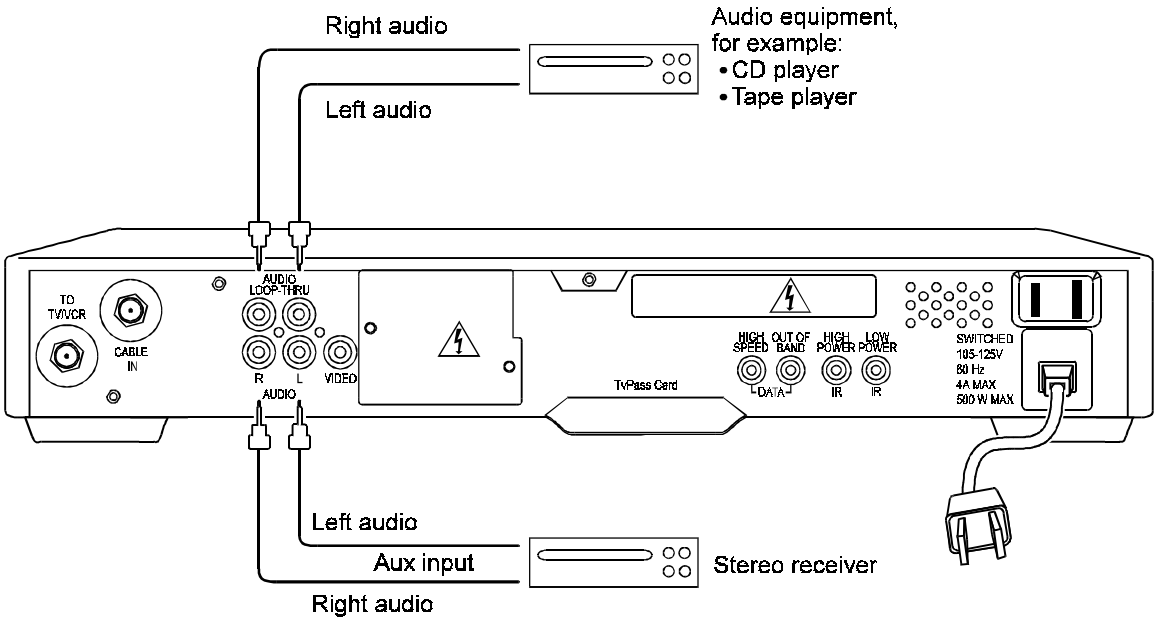
Figure 4-6
Composite VCR Cabling



Stereo System Cabling Diagram

The configuration shown in Figure 4-7 uses the audio loop-through inputs on the DCT 1000. In this configuration a subscriber's CD player and VCR can be played through a stereo receiver.

Figure 4-7
Stereo system cabling



Section 5

TV Guide On Screen

The DCT 1000 supports the TV Guide On Screen electronic program guide. If your cable company offers this service, this section will help you get TV Guide On Screen up and running for your subscriber. It also describes a few basic operations to help you introduce the subscriber to TV Guide On Screen. Refer the subscriber to the *TV Guide On Screen Reference Guide* for complete instructions on all the features and their use.

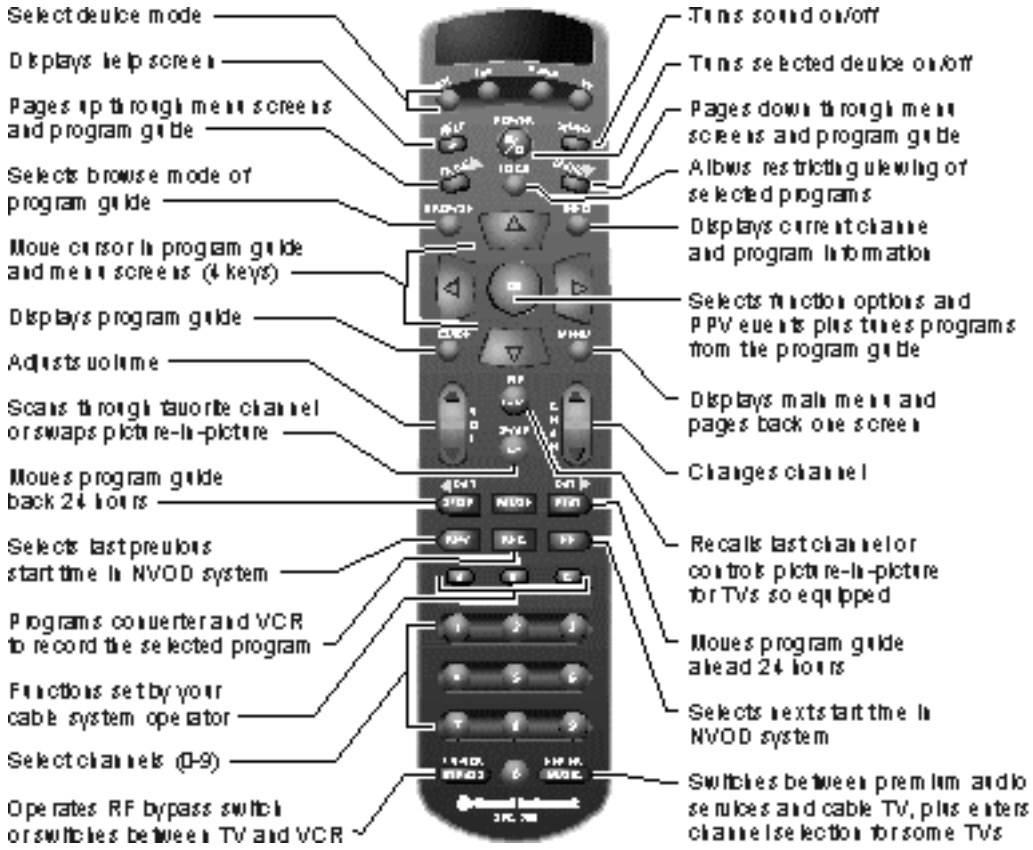
Remote Control

When operating through the TV Guide On Screen program guide, the DCT 1000 uses the XRC 200 remote control. The XRC 200 may require programming before use; refer to its user guide for programming instructions.

XRC 200 Remote Control

Figure 5-1 illustrates the XRC 200 remote control.

Figure 5-1
XRC 200 remote control



Installing Batteries in Remote Control

Before a remote control can be used, two AA (1.5 volt) alkaline batteries must be installed in it. Battery access is located on the back of the remote control.

To install batteries in an XRC 200 unit:

Press and slide the battery compartment cover off.

1 Place the batteries in the compartment, being careful to observe the correct polarity.

2 Slide the battery compartment cover back into place.

Quick Tips for the Program Guide

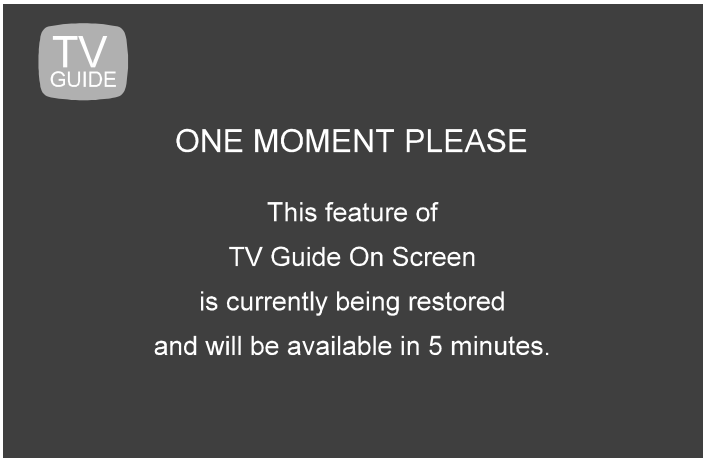
- Use the directional arrows to navigate throughout the guide.
- Yellow is the highlight color throughout the guide. Any item in the guide that is yellow is currently highlighted.
- To select a currently highlighted item, press OK.
- To return to the previous screen, press LAST. Continue pressing LAST to return to television.
- Typically, when pressing a key to enter a screen or mode, such as Menu, Browse, Fav, and Help, pressing the same key will exit that screen or mode.

Setting Up the Program Guide

Once the DCT 1000 cable terminal has been successfully installed as described in *Sections 3, Installation*, and *Section 4, Adding a VCR or Stereo Components*, it will take approximately 5 to 15 minutes for TV Guide On Screen to become functional with listings information for the current hour. Inform the subscriber that it will take approximately 60 minutes to receive the listing information for the next 36 hours. **Please note that actual download times will be determined following system testing.**

To check the status of TV Guide On Screen, press MENU on the remote control. If TV Guide On Screen is not yet available, you will see the screen shown in Figure 5-2:

Figure 5-2
Notice screen



Confirm Proper Installation

Once TV Guide On Screen becomes available, follow these easy steps to confirm that it is functioning properly:

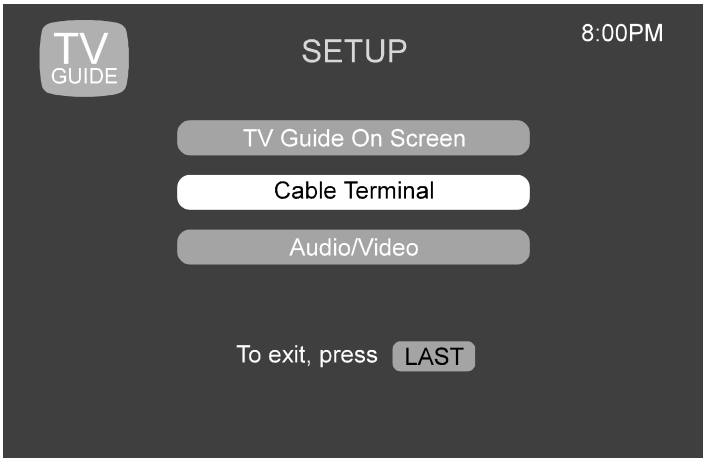
Press MENU.

1 Press the Down Arrow to open the Viewer Services section of the menu.

2 Press the Right Arrow to highlight Setup.

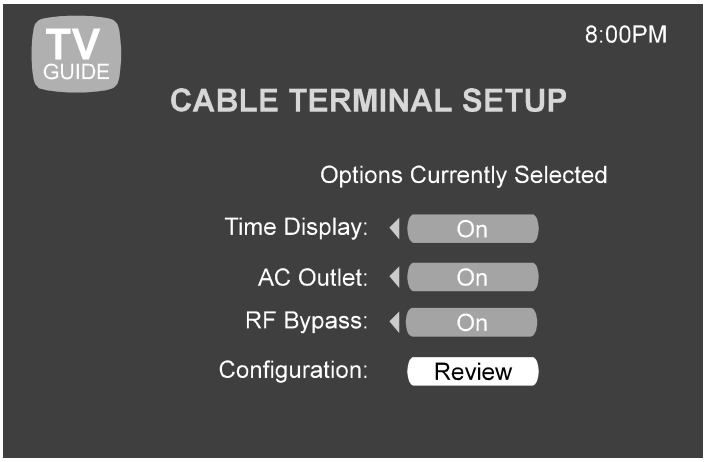
3 Press OK. The setup screen shown in Figure 5 will appear:

Figure 5-3
Setup screen, with Cable Terminal selected



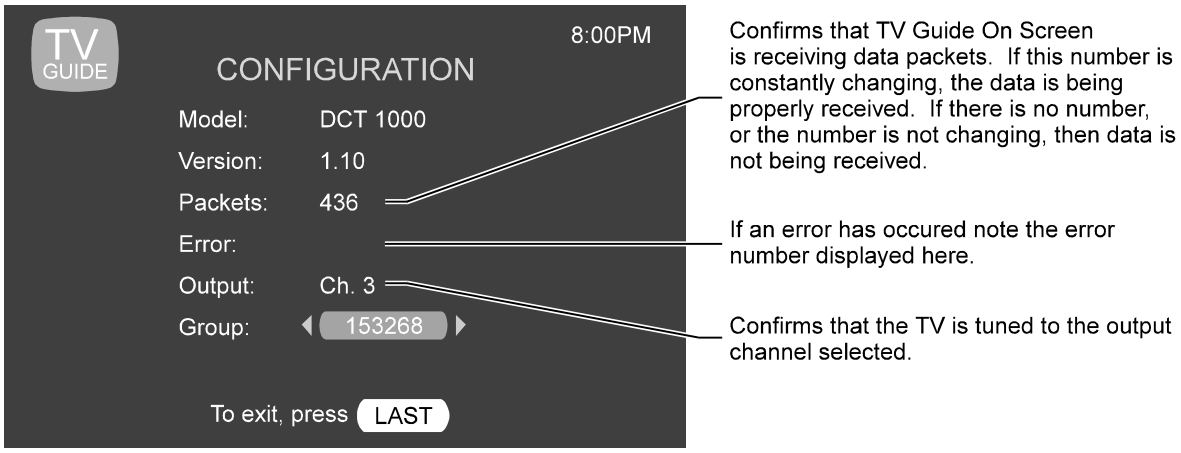
4 Highlight Cable Terminal, then press OK. The screen shown in Figure 5-4 will appear:

Figure 5-4
Cable terminal setup screen



5 Highlight Review, then press OK. The configuration screen shown in Figure 5-5 will appear. Review the meaning of the various parts of the screen with the subscriber.

Figure 5-5
Configuration screen



6 After confirming that TV Guide On Screen is functioning properly, press MENU twice to return to television viewing.

Configure TV Guide On Screen

Once you have confirmed that TV Guide On Screen is functioning properly, go through the following steps with the subscriber. This will demonstrate to the subscriber how to configure the guide to suit his or her needs:

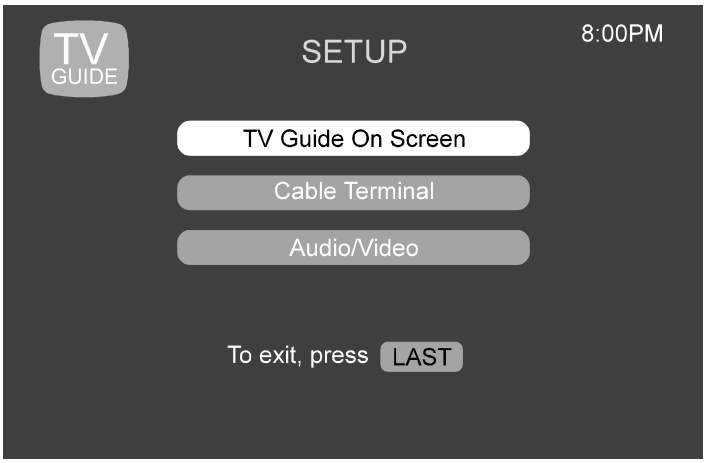
Press MENU.

1 Press the Down Arrow to open the Viewer Services section of the menu.

2 Press the Right Arrow to highlight Setup.

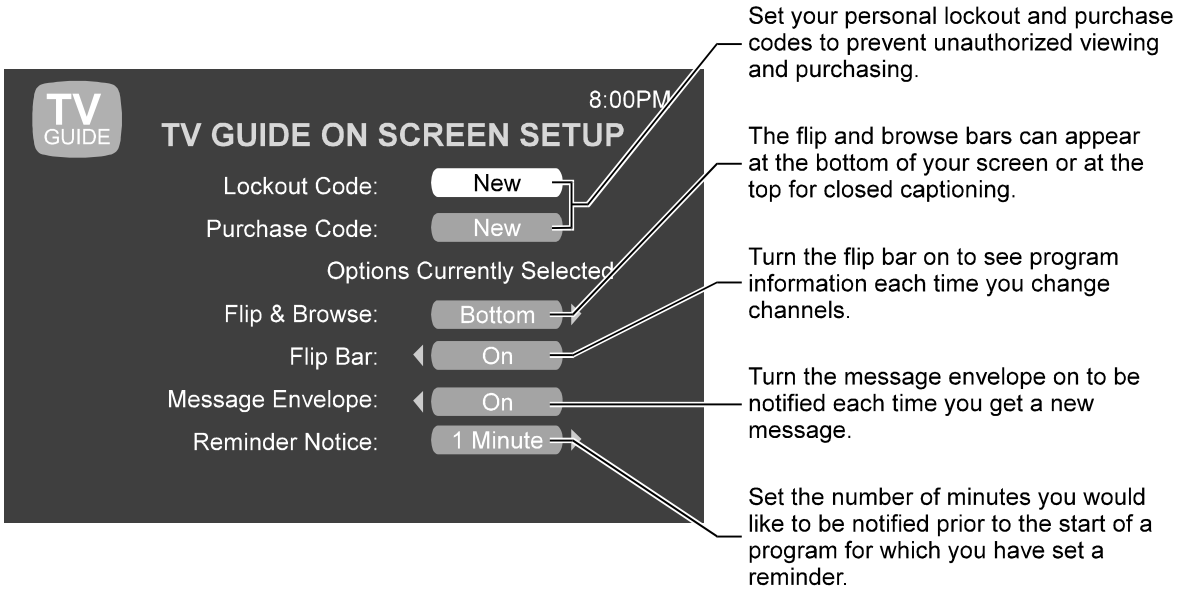
3 Press OK. The setup screen shown in Figure 5-6 will appear.

Figure 5-6
Setup screen, with TV Guide On Screen selected



4 Highlight TV Guide On Screen, then press OK. The screen shown in Figure 5-7 will appear. Review the meaning of the various parts of the screen with the subscriber.

Figure 5-7
TV Guide On Screen Setup



5 Press MENU twice to return to television viewing.

Getting Started with the Program Guide

Here are a few things to point out to the subscriber about using TV Guide On Screen. Remind the subscriber to refer to the *TV Guide On Screen Reference Guide*.

Flip

The flip bar will appear each time the channel is changed and will disappear after 5 seconds. To make the flip bar appear or disappear on command, press OK.

Browse

Press BROWSE and then the UP/DOWN arrows to see what's on other channels without leaving what you're watching. Press **OK** to tune to a channel seen by browsing. Press the RIGHT/LEFT arrows to see what's on at other times. The subscriber can choose to watch something that comes on later by pressing OK to set a reminder for it. Press BROWSE again to exit browse mode.

Listing Menus

Press MENU to view the Main Menu. Within the TV Guide On Screen section, you will see six different ways that program listings are organized: by Time, Channel, Title, Movies, Sports and Children. To access a listing menu, highlight it then press OK.

Within each menu, you may do the following:

- Highlight a program that is on now, press OK and tune to it.
- Highlight a program that is on later, press OK and set a reminder for it.
- Highlight a pay-per-view program, press OK and purchase it.
- Highlight a program, press LOCK and lock it (locking restricts viewing).

Pay-Per-View

The subscriber can order a pay-per-view program, by following these steps:

Highlight the program title from within the pay-per-view menu or from any of the listing menus, then press OK. (The subscriber can also purchase a pay-per-view program by flipping or browsing to the channel.)

1. Highlight the desired start time, then press OK.
2. Highlight Confirm (or enter your four-digit purchase code if you have one set), then press OK.
3. Reminders are automatically set for pay-per-view programs.

Messages

A yellow envelope in the upper right-hand corner of your screen indicates that you have a message. To read the message:

Highlight Messages from within the Viewer Services section of the Main Menu, then press OK.

1. Highlight the message, then press OK.

2 After reading the message, the subscriber can highlight either Keep or Delete, then press OK.

Lockout

The subscriber may restrict viewing of certain programs based on its MPAA rating, the channel it's on, or even its title. To set a lock:

Highlight Lockout from within the Viewer Services section of the Main Menu, then press OK. The subscriber may also press LOCK while watching a program or while highlighting a program name in any of the listing menus.

1 The subscriber would then enter his four-digit lockout code, then press OK.

2 To set a lock, highlight the desired rating, channel, or title, then press OK.

3 To remove a lock, highlight the locked criteria, then press OK.

Channel Manager

The Channel Manager can be used to locate and tune to a channel or to set favorite channels.

Highlight Channel Manager from within the Viewer Services section of the Main Menu, then press OK.

1 Highlight By Number to organize the list of channels numerically, or By Name to organize them alphabetically.

2 Highlight a channel then press OK to tune to it.

3 Highlight a channel then press FAV to include/exclude it in the favorite channel list.

Timers

Setting a Timer forces the cable terminal to tune to a particular channel at a particular time. This is a helpful tool for recording programs while the subscriber is not at home. To set a timer:

Highlight Timers from within the Viewer Services section of the Main Menu, then press OK.

1 Highlight one of the eight Available bars, then press OK.

2 Enter the desired Timer information.

3 When all information is entered and the name of the desired program appears at the bottom of the screen, press OK to accept the Timer.

Help

Pressing the HELP key on the remote brings up helpful information pertaining to the portion of the guide currently in use. To exit Help, press the HELP key again.

Appendix A
Specifications

Input Frequency	54 to 860 MHz (excluding data carrier frequency)
HRC/IRC Frequency Assignments	Downloadable
Number of Channels	136 carriers per cable, 1 or 2 cables
Analog	1 channel per carrier
Digital	More than 1 channel per carrier, content dependent
Dual A/B Cable Switching	Optional A/B switch (field upgradeable)
Input Analog Video Level	0 dBmV to +15 dBmV
Input Analog Sound Level	–17 dBmV to +2 dBmV
Average Digital Input Level	–10 dBmV to +5 dBmV
Data Carrier	QPSK modulated carrier
Frequency	75.250 MHz
Bandwidth	± 200 kHz standard FM
Level	–15 dBmV
Video S/N	49 dB @ 0 dBmV input level
Output Frequency Accuracy	± 150 kHz
Return Loss	
Input	6 dB minimum
Output	8 dB minimum
Spurious Output	–57 dBc maximum, in band
Cross Modulation Distortion	–56 dB (136 channels, each @ + 15 dBmV)
Composite Second Order Distortion	–57 dB (136 channels, each @ + 15 dBmV)
Second Order Distortion	–60 dB (136 channels, each @ + 15 dBmV)
Composite Triple Beat Distortion	–57 dB (136 channels, each @ + 15 dBmV)
Converter Input Beats (With All Input Signals)	–25 dB (136 channels, each @ + 15 dBmV)
Hum Modulation Distortion	3 IRE
Output Level	10 to 15 dBmV
Isolation (Input/Output)	70 dB minimum

Differential Phase	10 degrees (maximum)
Scrambling Method	Gated sync suppression or dynamic gated sync suppression, video inversion, audio privacy, Hamlin compatibility
On Screen Display	
Screen Size	352 x 480 pixels
Message/Barker Capacity	Up to 40 pages (configuration dependent)
Channel Descriptors	4 character, maximum
Mechanical Security	Standard: security screws; security pin; uni-chassis construction
Two-Way Systems Compatibility	With addition of STARVUE II, STARFONE, or Network Module
Operating Environment Range	
Temperature	0 to 40 degrees C (32 to 104 degrees F)
Humidity	5 to 95% (non-condensing)
ac Voltage	105 Vac to 125 Vac, 60 Hz
Power Dissipation	45 watts at 115 VAC
Surge Protection	Provided on power supply and RF ports
Size	17.13 × 13.25 × 2.75 inches
Weight	10 pounds

Appendix B
Diagnostics

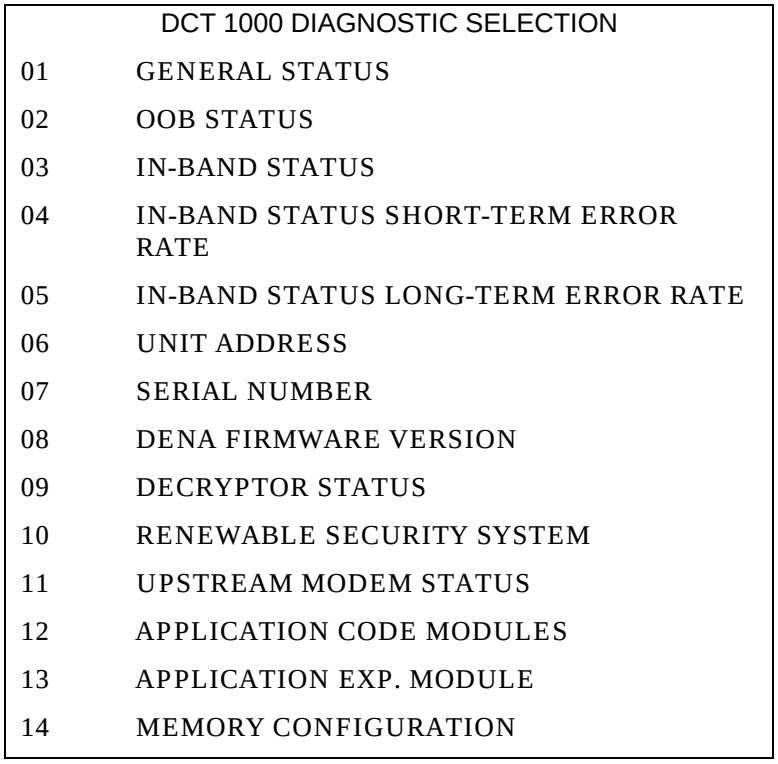
This section describes the diagnostics provided for the DCT 1000 cable terminal. The diagnostics are designed to confirm proper installation of the DCT 1000. They include provisions to identify the terminal on the network and to verify communications with the headend. The diagnostic information is displayed on the terminal's front panel LEDs and on the on screen display (OSD).

Accessing Diagnostics

To put the DCT 1000 in the diagnostic mode:

1. Install the DCT 1000.
2. Connect the cable terminal to an ac outlet.
3. Press POWER to turn the cable terminal on.
4. Wait five seconds.
5. Press POWER to turn the terminal off.
6. Within two seconds, press SELECT. The cable terminal is now in the diagnostic state, as indicated by the appearance of the diagnostics screen (Figure B-1) and the display of **d 01** on the front panel LEDs.
7. Use the CHANNEL keys to select the desired diagnostic.
8. Press the CURSOR < or CURSOR > key to execute the selected diagnostic.
9. To exit the diagnostic mode, press POWER.

Figure B-1
Diagnostics selection OSD display data



Summary of Diagnostic Modes

The following table summarizes the diagnostic modes:

LED	Diagnostic	LED	OSD
d 01	General status of the DCT 1000	X	X
d 02	QSPK out-of-band receiver status	X	X
d 03	64 QAM in-band receiver status/analog channel status	X	X
d 04	64 QAM short-term error count	X	X
d 05	64 QAM long-term error count	X	X
d 06	Unit address	X	X
d 07	Unit serial number	X	X
d 08	Dena firmware version	X	X
d 09	Current channel status	X	X
d 10	Renewable security system	X	X
d 11	Upstream modem status	X	X
d 12	Application code modules		X

LED	Diagnostic	LED	OSD
d 13	Application expansion module		X
d 14	Memory configuration		X

d 01: DCT 1000 General Status

This diagnostic indicates the general status of the terminal. The LED display (Figure B-2) alternates between the error code and the purchase count. The OSD display (Figure B-3)) shows the error code, a short description of the error, and the purchase count.

Figure B-2
General status LED display

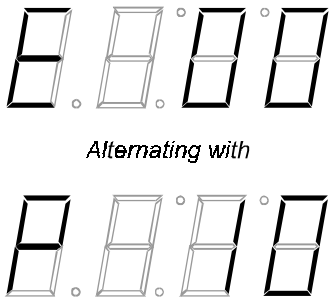


Figure B-3
General status OSD display data

DCT 1000 STATUS	
ERROR:	E00
NO ERROR	
PURCHASES	10

Currently, the following error codes are supported:

Error Code	On Screen Display	Cause	Remedy
E 00	NO ERROR	Indicates normal condition after initialization.	Not applicable.
E 01 to E 06		Not currently defined.	Not applicable.
E 07	FAULTY ROM	Faulty ROM.	Return unit to repair center.
E 08		Not currently defined.	Not applicable.
E 09	FAULTY RAM	Faulty RAM or dead battery. Occurs if the battery fails to keep the RAM alive during power down. This causes the terminal to be disconnected.	Initialize terminal to clear the error. If error persists, return unit for repair.
E 10	INVALID SERIAL NUMBER	Invalid serial number.	Return the terminal for repair.
E 11	INVALID UNIT ADDRESS	Invalid unit address.	Return the terminal for repair.
E 12	POST	Terminal fails power on self test.	Return the terminal for repair.
E 13 to E99		Not currently defined.	Not applicable.

d 02: Out-Of-Band Receiver Status

This diagnostic indicates the status of the out-of-band receiver. The LED and OSD displays are shown in Figure B-4 and Figure B-5. The condition of no data received is indicated by the LED display shown in Figure B-6.

Figure B-4
Out-of band status LED display

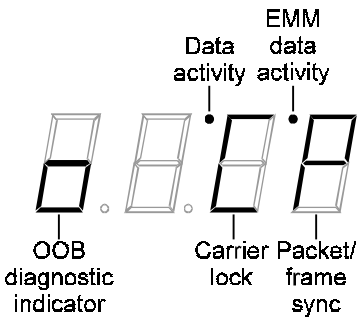
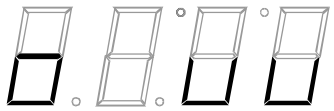


Figure B-5
Out-of-band status OSD display data

OUT-OF-BAND DIAGNOSTIC	
DATA	*
EMM DATA	*
CARRIER LOCK	YES
PACKET/FRAME SYNC	YES

Figure B-6
LED indication of no data received



Carrier Lock

Carrier lock indicates whether or not the out-of-band receiver is locked to the carrier. LED and OSD indications are as follows:

LED	OSD	Status
C	YES	Carrier locked
u	NO	Carrier unlocked

Packet/Frame Sync

Packet/frame sync indicates whether the out-of-band receiver is synched to the incoming data stream. The carrier must be locked before packet boundaries can be detected.

LED	OSD	Status
P	YES	Packet/frame synched
u	NO	Packet/frame unsynched

Data Activity

Indicates that a message was received. The indicator will be cleared when this diagnostic mode is entered and three seconds after the last message is received. The indicator covers all packet processors regardless of which stream they are monitoring.

LED	OSD	Status
off	blank	No data received
on	*	Data received

EMM Data Activity

Indicates that a message was received on the EMM stream. The indicator will be cleared when this diagnostic mode is entered, and three seconds after the last message is received.

LED	OSD	Status
off	blank	No data received
on	*	Data received

d 03: In-Band Receiver Status

The DCT 1000 displays the digital diagnostics. If there is no digital carrier, these diagnostics indicate the carrier is not locked. The LED and OSD displays are shown in Figure B-7 and Figure B-8.

Figure B-7
In-band receiver digital status LED display

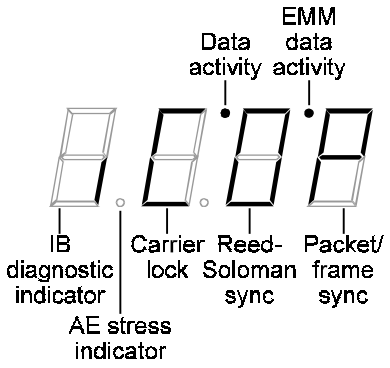
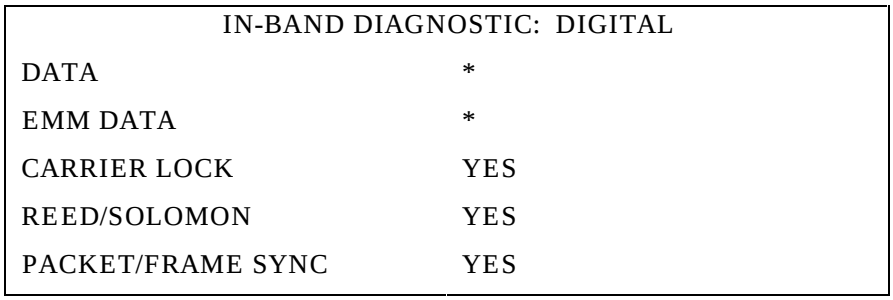


Figure B-8
In-band receiver digital status OSD display data



Carrier Lock

This diagnostic indicates whether or not the in-band receiver is locked to the carrier. The LED and OSD indications are as follows:

LED	OSD	Status
C	YES	Carrier locked
u	NO	Carrier unlocked

Reed-Solomon Sync

The Reed-Solomon FEC packet sync indicates if the Forward Error Correction hardware is synched up on FEC boundaries. The carrier must be locked before packet boundaries can be detected.

LED	OSD	Status
O	YES	Reed-Solomon FEC packet sync OK
u	NO	Reed-Solomon FEC packet unsynched

Packet/Frame Sync

Packet/frame sync indicates the status of the in-band receiver front end.

LED	OSD	Status
P	YES	Packet/frame synched
u	NO	Packet/frame unsynched

Adaptive Equalizer Stress

The status of the adaptive equalizer (AE) is indicated as follows:

LED	OSD	Status
on	YES	AE is near its operating limit
off	NO	AE is operating within design parameters

Data Activity

Indicates that a message was received. The indicator will be cleared when this diagnostic mode is entered and three seconds after the last message is received. The indicator covers all packet processors regardless of which stream they are monitoring.

LED	OSD	Status
off	blank	No data received
on	*	Data received

EMM Data Activity

Indicates that a message was received on the EMM stream. The indicator is cleared when this diagnostic mode is entered and three seconds after the last message is received.

LED	OSD	Status
off	blank	No data received
on	*	Data received

d 04: QAM Receiver Short-Term Error Rate

This diagnostic displays the latest Reed-Solomon error count (a 16-bit counter) approximately every five seconds. This value is displayed as four hex digits on the LED display, and is updated approximately every five seconds. The OSD screen also displays the adaptive equalizer coefficients 0 to 39.

The LED and OSD displays are shown in Figure B-9 and Figure B-10.

Figure B-9
Receiver short-term error rate LED display

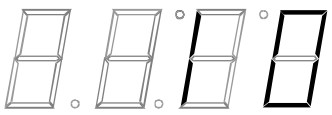


Figure B-10
Receiver short-term error rate OSD display data

IN-BAND RECEIVER STATUS

SHORT-TERM ERROR COUNT

10

AE COEFFICIENTS (1 of 2)

	0	1	2	3	4
00	000	001	002	003	004
05	005	006	007	008	009
10	010	011	012	013	014
15	015	016	017	018	019
20	020	021	022	023	024
25	025	026	027	028	029
30	030	031	032	033	034
35	035	036	037	038	039

d 05: QAM Receiver Long-Term Error Rate

This diagnostic displays the latest Reed-Solomon error rate over an extended period of time, typically 24 hours. This value is displayed as four hex digits on the LED display. The OSD screen also displays the adaptive equalizer coefficients 40 to 79.

The LED and OSD displays are shown in Figure B-11 and Figure B-12.

Figure B-11
Receiver long-term error rate LED display

Figure B-12
Receiver long-term error rate OSD display data

IN-BAND RECEIVER STATUS

LONG-TERM ERROR COUNT

200

AE COEFFICIENTS (2 of 2)

	0	1	2	3	4
40	040	041	042	043	044
45	045	046	047	048	049
50	050	051	052	053	054
55	055	056	057	058	059
60	060	061	062	063	064
65	065	066	067	068	069
70	070	071	072	073	074
75	075	076	077	078	079

d 06: Unit Address

This diagnostic displays the terminal's 16-digit (40-bit) unit address, which is written at manufacturing time. It shows in five parts on the four-section LED display. The address display stays on each section for five seconds. An example of the LED display for unit address 123-45678-90123-456 is shown in Figure B-13.

On the OSD screen, illustrated in Figure B-14, the unit address is shown in the decimal form and in the TCP/IP decimal byte form. All the other addresses are shown in TCP/IP decimal byte form.

Figure B-13
Unit address LED display

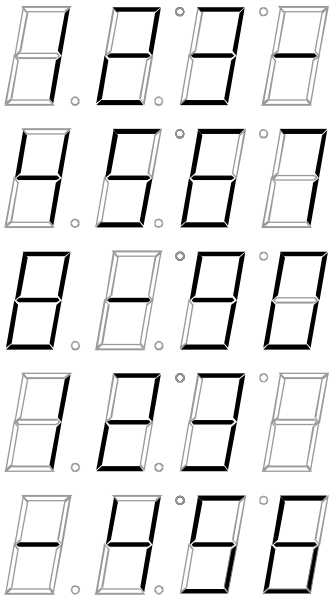


Figure B-14
Unit address OSD display data

Unit Address		
Unit Address	123-45678-90123-456	
Network Address	123-45678-90123-456	
TVPC	123-45678-90123-456	
Multicast 16 Address	255.255	255.255
	255.255	255.255

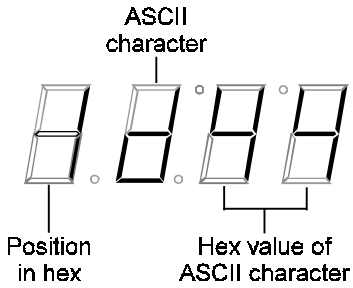
d 07: Unit Serial Number

This diagnostic displays the terminal's unit serial number which is assigned at manufacture. It is shown in parts on the four LED sections. The serial number display will stay lit on each part for five seconds. The meaning of the digits in each four-digit group is as follows:

- First digit: The position, in hex notation.
- Second digit: The ASCII character.
- Third and fourth digits: The hex value of the ASCII character.

A typical LED display for the first part of a serial number is shown in Figure B-15.

Figure B-15
Unit serial number LED display



The serial number is displayed directly on the OSD screen, as illustrated in Figure B-16.

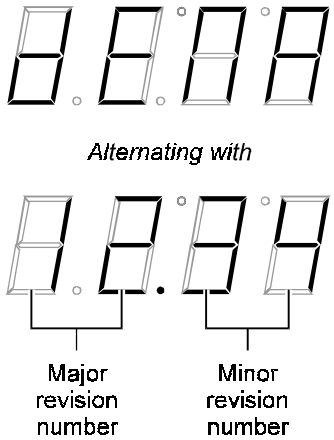
Figure B-16
Unit serial number OSD display data

DCT 1000 SERIAL NUMBER
D53G9176543267

d 08: Dena Firmware Version

This diagnostic shows the Dena firmware version. The LED display, as illustrated in Figure B-17, alternates between showing the firmware version number and the characters dENA.

Figure B-17
Dena firmware version LED display



The OSD screen, as illustrated in Figure B-18, displays the revision number and the build date.

Figure B-18
Dena firmware version OSD display data

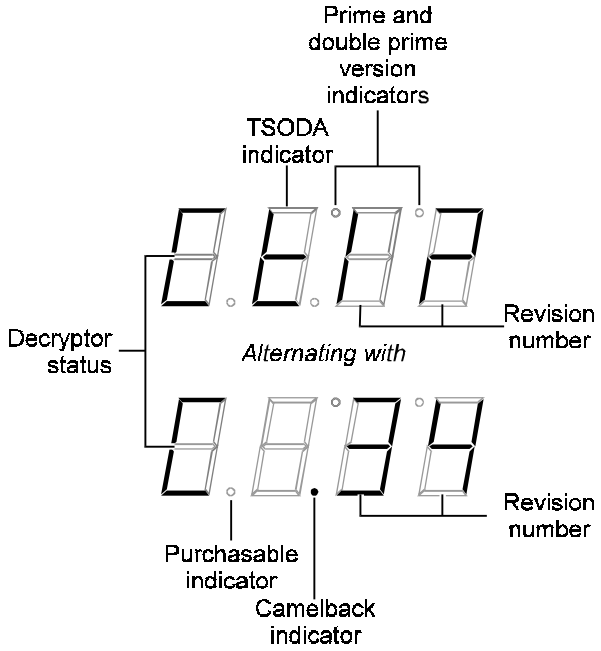
DENA FIRMWARE VERSION
12.34
12/31/94

d 09: Current-Channel Status

This diagnostic gives the instantaneous status of the last tuned channel on the in-band tuner. It indicates if the current program is analog clear, analog with tagging data, barker channel, or a digital channel. This diagnostics also indicates if the current channel is purchasable.

The LED display, illustrated in Figure B-19, alternates between the TSODA firmware version, and the camelback firmware version. The decryptor status is indicated for the currently tuned channel and type. This is in spite of showing both TSODA (digital) and camelback (analog) firmware versions.

Figure B-19
Decryptor status LED display



The OSD screen is shown in Figure B-20.

Figure B-20
Decryptor status OSD display data

CURRENT-CHANNEL STATUS	
STATUS	CLEAR
PURCHASABLE	YES
TSODA VERSION	12
CAMEL VERSION	34

Decryptor Status Modes

The LED and OSD indications of the decryptor status modes are as follows:

LED	OSD	Meaning
C	CLEAR	Clear analog channel
S	SCRAM	Analog channel with tagging data
b	BARK	Barker channel
d	DIGIT	Decrypted digital program

Purchasable Status

The LED and OSD indications for purchasable status are as follows:

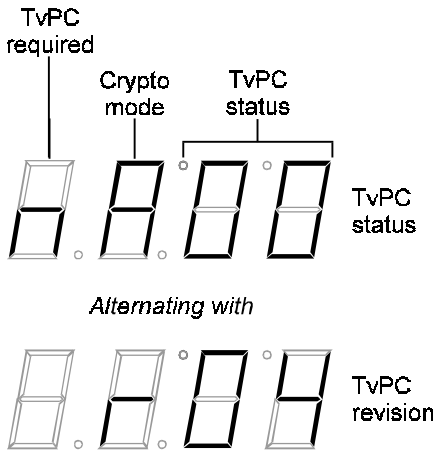
LED	OSD	Meaning
off	NO	Channel is not purchasable at present
on	YES	Channel is purchasable at present

d 10: Renewable Security System

The renewable security system returns the current status of the TvPC. This includes an indication of whether or not the TvPC is required, and the mode, status and version.

The LED display is shown in Figure B-21.

Figure B-21
Renewable security status LED display



The OSD screen is shown in Figure B-22.

Figure B-22
Renewable security status OSD display data

RENEWABLE SECURITY SYSTEM STATUS	
TVPC	NOT REQUIRED
CRYPTO	STAND ALONE
STATUS	00
VERSION	04

TvPC Required

The requirement for TvPC is indicated as follows:

LED	OSD	Status
n	NOT REQUIRED	TvPC not required
Y	IS REQUIRED	TvPC is required

Current Mode

The current mode is indicated as follows:

LED	OSD	Status
A	STAND ALONE	Stand alone
S	SUPPORT	Support
n	NOT MATED	Not mated

TvPC Status

TvPC status is indicated as follows:

LED	OSD	Status
00	**00**	OK
01	**01**	TvPC communication problem
02	**02**	TvPC required
03	**03**	Validator does not match between GK and TvPC
04	**04**	Invalid unit key number
05	**05**	Old TvPC unit address
0a	**0a**	TvPC not mated
0b	**0b**	TvPC/base module unit address mismatch
0C	**0C**	New TvPC, but wrong version number
0d	**0d**	TvPC unit address mismatch

d 11: Upstream Modem Status

These diagnostics will display the appropriate set of RF or telephone modem information based on the module installed within the cable terminal. Note that a false indication of the presence of a STARFONE module is possible.

STARVUE II Diagnostics

This diagnostic shows the status and operating parameters for the STARVUE II module. The LED and OSD displays are shown in Figure B-23 and Figure B-24.

Transmit frequency is shown in megahertz. The display range is 8.0 to 15.0 MHz

Level shows the hex value of the power level of the STARVUE II transmitter. This is a relative value and is used for balancing the received power at the headend.

Figure B-23
STARVUE II diagnostics LED display

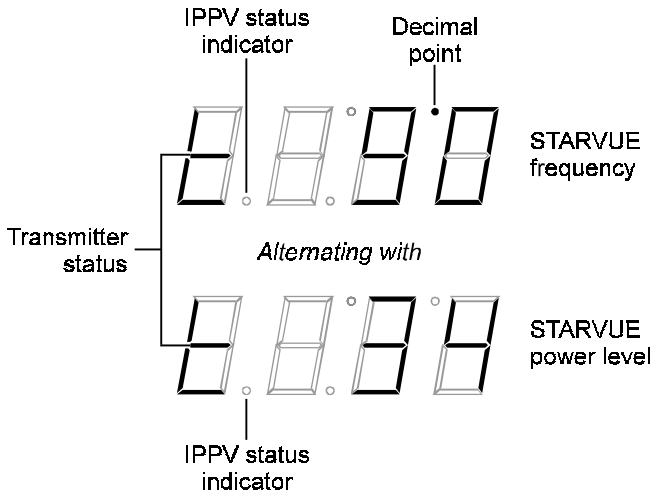


Figure B-24
STARVUE II diagnostics OSD display data

STARVUE II DIAGNOSTICS	
STATUS	t
FREQUENCY	9.0 MHz
LEVEL	34
IPPV	DISABLED

Transmitter status is indicated as follows:

LED	OSD	Status
–	–	Idle
t	t	Transmitting

IPPV status is indicated as shown in the following table. Note that UNSENT is followed by the number of unsent transactions.

LED	OSD	Status
on	ENABLED	IPPV enabled
flashing	UNSEEN– ##	This terminal contains unsent IPPV transactions
off	DISABLED	IPPV disabled

STARFONE Diagnostics

This diagnostic shows the status and operating parameters for the STARFONE module. The LED and OSD displays are shown in Figure B-25 and Figure B-26.

Figure B-25
STARFONE diagnostics LED display

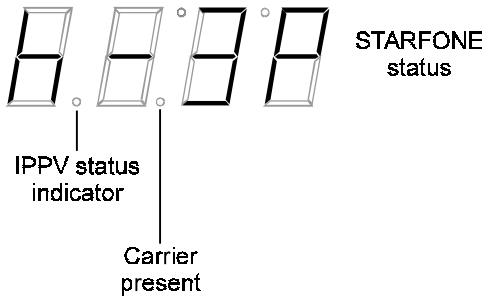


Figure B-26
STARFONE diagnostics OSD display data

STARFONE DIAGNOSTICS	
STATUS	h–
CARRIER	*
BAUD	300
PARAMETERS	NOT SET
20 DIGIT PH#1	1-215-555-1234
20 DIGIT PH#2	1-215-555-5678

The status of the transmitter is shown as follows:

1st Digit	2nd Digit	Meaning
h	*	On Hook (* = hang-up code)
t	–	Test for line available
d	–	Dialing
A	–	Waiting for answer
c	r	Communicating, receiving
c	t	Communicating, transmitting
c	–	Communicating, Idle
r	*	Waiting for retry (* = hang-up code)

The hang-up code is shown as follows:

Mode	Status
–	Normal hang-up
A	Answer time-out
r	Phone ringing
c	Carrier loss
L	Line in use
E	Errors (data)
U	User line request
P	Parameters invalid
t	Data time-out
C	Communication protocol fault

The IPPV status indicator is shown as follows:

LED	OSD	Mode
on	ENABLED	IPPV enabled
flashing	UNSENT	This terminal contains unsent IPPV transactions
off	DISABLED	IPPV disabled

The third digit baud rate is shown as follows:

LED	OSD	Mode
3	300	300 Baud

The fourth digit telephone parameters are shown as follows:

LED	OSD	Mode
—	NOT SET	Telephone parameters not set
P (flashing)	NOT VALID	Telephone parameters not valid
P (solid)	SET	Telephone parameters OK

d 12: Application Code Modules

This diagnostic displays the currently downloaded code modules. This can be a multipage display. Additional pages are displayed by pressing the SELECT key on the cable terminal.

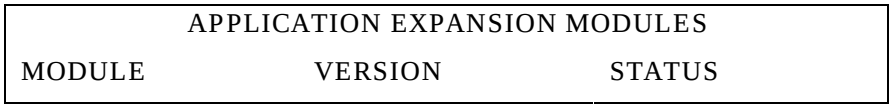
The OSD display is shown in Figure B-27. There is no LED display for this diagnostic.

Figure B-27
Application code modules OSD display data

d 13: Application Expansion Modules

This diagnostic indicates the presence of expansion modules in the terminal. The OSD display is shown in Figure B-28. There is no LED display for this diagnostic.

Figure B-28
Application expansion modules OSD display data



d 14: Memory Status

The memory free value is the sum of all free memory. This free memory is not necessarily in one block. The OSD display is shown in Figure B-29. There is no LED display for this diagnostic.

Figure B-29
Memory status OSD display data

MEMORY STATUS		
TYPE	TOTAL	FREE
NVRAM	129072	18954
DRAM	258435	10876

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