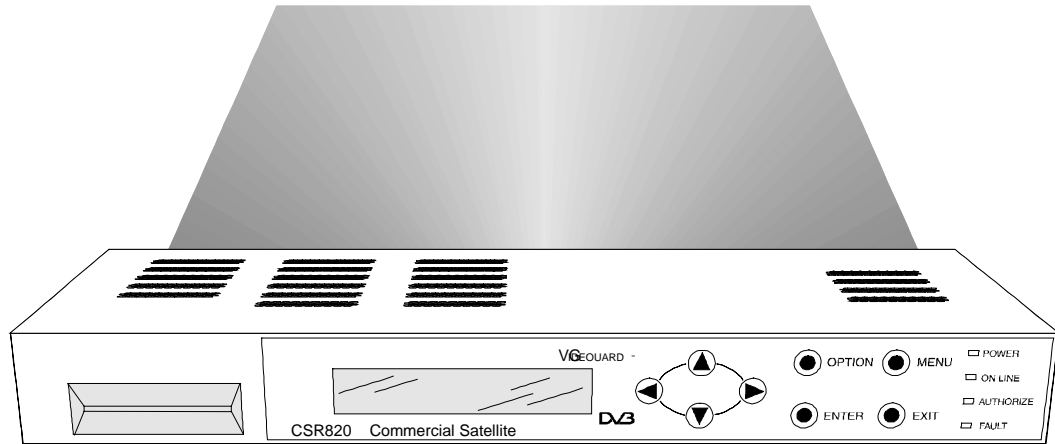


CSR820



Commercial Satellite Receiver

Installation and Operation



DVB
Digital Video
Broadcasting

TANDBERG
Television

<p>Safety Symbols</p>	 <p>The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.</p> <p>The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.</p> <p>CAUTION To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.</p>
<p>FCC Statement</p>	<p>NOTE: This equipment has been tested and found to comply with the limits for a Class A 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 instruction 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.</p>
<p>Product Safety Statement</p>	<p>This product is safety certified by the Canadian Standards Association (CSA) to American, Canadian and international standards. When installed as a rack-mounted component, it is the responsibility of the end user to obtain any additional safety certifications required in the end-user environment.</p> 
<p>European Community Statement</p>	<p>This product conforms with all applicable European Union/ European Community directives.</p>
<p>Copyright</p>	<p>© 1998 TV/COM, Inc. All rights reserved. VideoGuard is a trademark of NDS, Inc. Manual P/N: 603410-1 Rev. X3 IRD P/N 603400-1</p>



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Specifications subject to change without notice.

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Introduction to CSR820

The CSR820 is a commercial Integrated Receiver/Decoder (IRD) intended for use in cable head-ends and other digital satellite downlink applications. It may be placed on a desktop or installed into a standard 19-inch equipment rack.

The CSR820 accepts L-Band input from an LNB. The CSR820 demodulates, decrypts, and decompresses the digital signal and converts it into composite video, analog audio, and RS-232 data outputs.

Features

- Accepts QPSK modulated 950–2150 MHz L-Band input at symbol rates of 1–45 Msps.
- Front panel control with alphanumeric display and LED fault indicators.
- Processes MPEG-2, Main level, Main profile compliant signal.
- DVB compliant.
- NDS VideoGuard™ Conditional Access, with ISO 7816 Smart Card.
- NTSC or PAL B, D, G, H, I, M, N, video formats.
- Provides one composite video and one stereo or two mono audio channels.
- Accepts flash download over network.
- Voltage range from 100-240 VAC. Provides selectable DC voltage to the LNB.
- Alarm relay contacts to control external equipment.
- Reinsertion of closed captioning. Provides DVB teletext and embedded subtitling.
- Outputs 19.2 Kbps Asynchronous serial data through an RS-232 port.
- Network Control Protocol, over-the-air command capable.
- Ad insertion relays controlled by over-the-air command.
- High performance video and audio (professional quality).
- LNB polarity control through LNB voltage change.

Safety Notes

Observe the safety cautions on the label affixed to the bottom of the CSR820. Also observe general industry safety practices while working with the CSR820.

1. The CSR820 must be properly grounded to aid in current surge protection.
2. The CSR820 must have Power OFF before making cable connections.
3. The ambient temperature of the CSR820 must not exceed 122° F (50°C).
4. For desktop use, ensure that four rubber feet are firmly installed on the bottom of the CSR820. Do not stack more than three units on top of each other.
5. For rack mounting, leave a minimum of one rack unit space above and below each unit for ventilation.
6. Do not use liquids near the CSR820.
7. Do not block the ventilation openings.
8. If multiple CSR820s are connected to an LNB, ensure that only one CSR820 LNB voltage is turned on. Turn off the LNB voltage on the other IRDs. (see pages 8 and 10 - "LNB Voltage").

Product Contents

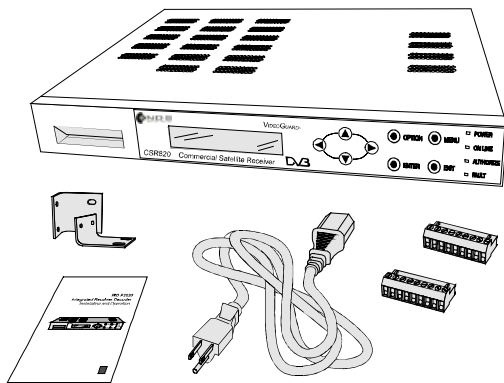


Figure 1: Items shipped with CSR820

Your CSR820 is shipped with the following items:

- 2 Rack mounting brackets
- 2 Plug-in connector blocks (9-pin)
- 1 US Power cable
- 1 Installation and Operation Guide

Installing the CSR820

The CSR820 may be installed into a standard ANSI/EIA RS310-C 19" (48mm) rack (one rack unit height). Installation includes attaching signal connections and powering-up the unit.

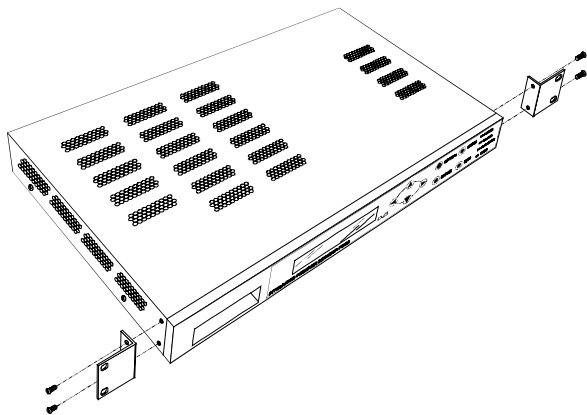


Figure 2: Rack Mounting

- 1. Locate the two mounting brackets in the installation kit.
- 2. Use the existing mounting screws on the CSR820 to install the mounting brackets onto the sides of the IRD.
- 3. Place the unit in the rack. Mount the CSR820 to the rack using four screws (not supplied).
- 4. If the mounting brackets are attached properly, they will support the weight of the CSR820. Leave one RU space above and below each unit for reliable operation.

Rear Panel Connections

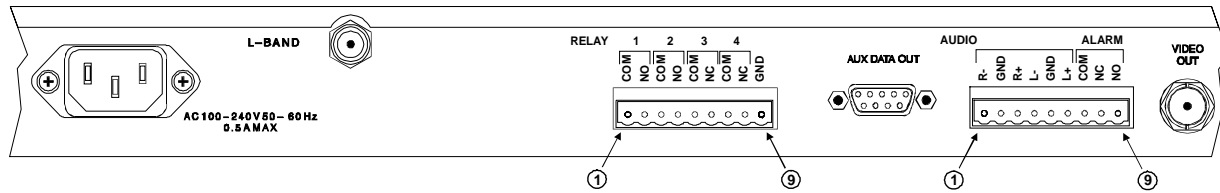


Figure 3: CSR820 Rear Panel

Item	Connection	Cable	Connector
POWER	Main AC power input (110-240 VAC).	(supplied)	IEC-320 C-14
L-BAND	RF input from the LNB.	75Ω coax	F-type (75Ω)
AUX DATA OUT	Connect to the serial port of an auxiliary data device.	Twisted pair 22-24 AWG	DB-9 for RS-232 interface
VIDEO OUT	Connect to a monitor or video distribution equipment	75Ω coax	BNC (75Ω)
AUDIO	Connect to speakers or audio distribution equipment Connect shields to the GND connectors.	Shielded twisted pair	9-pin screw-type block,

Pin	Name	Description
1	R-	Right -
2	GND	Audio Ground
3	R+	Right +
4	L-	Left -
5	GND	Audio Ground
6	L+	Left +

ALARM	<p>Connect to fault alarm system.</p> <p>The Alarm Relay states shown on the rear panel are Power Off and Fault state. When the CSR820 is powered on, the relay state will change NC to Open and NO to Closed.</p> <ul style="list-style-type: none"> The Alarm Relay cable shield must be connected to one of the Audio Ground pins (2 or 5). <p>Caution: Relay maximum input power rating is 24 VDC, 1Amp. Do not exceed the maximum power rating.</p>	Shielded	9-pin screw-type block
--------------	---	----------	------------------------

Pin	Name	Description
7	COM	Relay Common
8	NC	Normally Closed if unpowered or in fault state.
9	NO	Normally Open if unpowered or in fault state.

RELAY	<p>Connect to external equipment. Relay connectors are opened or closed by external software commands.</p> <ul style="list-style-type: none"> The Relay cable shield must be connected to pin 9. <p>Caution: Relay maximum input power rating is 24 VDC, 1Amp. Do not exceed the maximum power rating.</p>	Shielded	9-pin screw-type block
--------------	---	----------	------------------------

Pin	Name	Description
1	COM	Relay 1 Common
2	NO	Relay 1 Normally Open
3	COM	Relay 2 Common
4	NO	Relay 2 Normally Open
5	COM	Relay 3 Common
6	NC	Relay 3 Normally Closed
7	COM	Relay 4 Common
8	NC	Relay 4 Normally Closed.
9	GND	Relay 1-4 Shield Ground.

Front Panel

The front panel includes a backlit LCD alphanumeric display, eight push buttons, and four LEDs. The push buttons allow you to view and control the information that is displayed on the LCD.

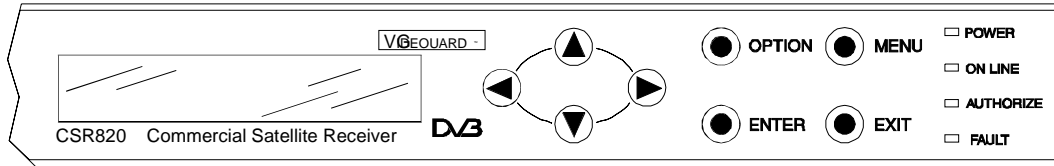






Figure 4: CSR820 Front Panel

Keys	Function
MENU	Move to the next main menu screen.
OPTION	Move to the next screen in a submenu series.
ENTER	Accept a setting and execute a command.
EXIT	Leave the current screen and move one level up the menu tree.
	Scrolls through setting options or move the cursor to the left.
	Scroll through setting options or move the cursor to the right.
	Increase a numerical value
	Decrease a numerical value

LEDs	Status
POWER	Glows green when the CSR820 is ON.
ON LINE	Glows yellow when the CSR820 locks on to an incoming signal.
AUTHORIZE	Glows orange when the CSR820 decrypts the selected program.
FAULT	Glows red when the CSR820 detects a fault or failure. If FAULT LED remains lit, contact Tandberg Television Customer Service.

Menu Structure

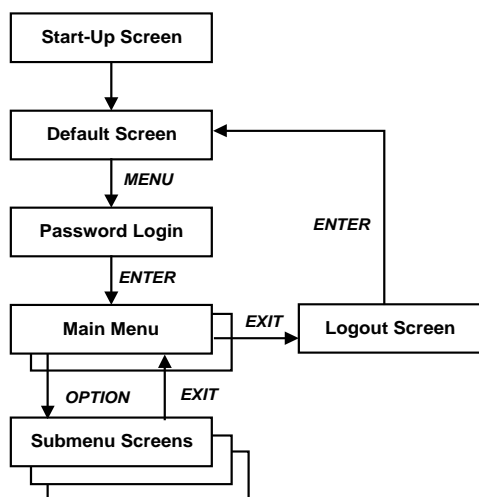


Figure 5: Structure of CSR820 Screens

The CSR820 menu includes a start-up screen, default screen, password login, main menus, and submenus.

- On power-up, the CSR820 displays the start-up screen.
- After completing power-up, the CSR820 displays the default screen, showing the current service and receiver status.
- The user can enter the IRD menu either in a login mode or view mode. To login, the user must enter the correct 4 digit password. To enter in view mode, the user can scroll past the password screen and navigate directly into the menu system. (see page 8, Password Entry)

Menu Screen Format

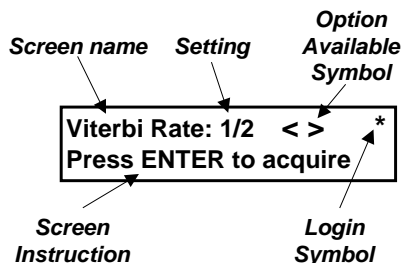


Figure 6: Menu Screen Format

- The first line shows the name of the screen, setting value or setting option.
- Some screens display < > Option Available Symbols in the upper right corner of the screen which indicates setting options are available when ◀ or ▶ Keys are pressed.
- Login Symbol will be present if logged into the menu system.
- The second line displays instructions or status information about the current parameter.

Menu Operation

1. Press the **MENU** key to cycle through the five main menus (Receiver Setup, Service Setup, IRD Setup, IRD Status, and Pre-Set Channels).
2. Press **OPTION** from any main menu screen to cycle through the submenus.
3. While in any submenu, press ◀ or ▶ to move between setting options or move the cursor left or right. Press ▲ or ▼ to change setting values.
4. Press **EXIT** at any point to move one level up the menu tree.
5. To log out, press **EXIT** from any main menu. At the Logout screen, press ◀ or ▶ to toggle Yes or No. If you select Yes, press any key to log out.
6. The CSR820 will automatically log out and move up to the default screen after 3 minutes, from last key activity.

Getting Your IRD authorized

CSR820 can decrypt audio, video, and data programs encrypted by NDS VideoGuard conditional access system.

In order to decrypt a program the IRD must be authorized by the program provider and a correct Smart Card must be inserted in the IRD smart card slot located on the front of the IRD.

Ensure the Smart Card is fully seated in the IRD.

To get your IRD authorized, contact the program provider.

Entering and changing Password

To operate and change any of the IRD settings, a correct password must be entered to log into the IRD menu system. When you have successfully logged in, an “*” will appear on the top right corner of all the menu screens.

The IRD is delivered with an initial default password of 0 0 0 0.

Entering the Password

1. From the Default screen, press **MENU**. The Password login screen appears.
2. Enter the factory installed password of 0 0 0 0. Press ◀ or ▶ to move between positions. Press ▲ or ▼ to change the values.

3. Press **ENTER** to accept the password.
4. Verify an * is in the right hand corner of the menu screen.

Changing the Password

1. The Password can only be changed if you are operating with the correct password entered.
2. Press **MENU** to IRD Setup menu screen.
3. Press **OPTION** to the New Password screen.
4. Enter a new password.

Quick Install and Setup Guide

This section outlines the minimum steps needed to set up your CSR820.

Before starting the installation, take a moment to review the front panel and menu operation (pages 5-6).

- If you will be receiving an encrypted signal, the CSR820 must be authorized to receive this signal and an authorized Smart Card must be inserted. Contact your program provider for authorization.
- Make sure that the satellite antenna is properly installed, and the LNB is operational.

Initial Setup

1. Connect the LNB input, audio, video, and data. Select relay output per the rear panel connection instructions (page 4).
2. Plug in the power cord. Verify that the POWER LED is ON.
3. Observe the Self Test Screen and allow the CSR820 to complete its self test (about 30 seconds). Once the Self Test is successfully completed, the Default Screen will appear.
4. If the FAULT LED remains lit, contact Tandberg Television Customer Service.
5. Press **MENU** to display the Password screen.
6. Enter the default password or your own password.
7. Press **ENTER** to accept the password.

Acquire the Signal

1. Press **MENU** to display the **Receiver Setup** menu.
2. Press **OPTION** to display the **Frequency** submenu. Enter the **L-Band Frequency**.
3. Press **OPTION** and enter the **Symbol Rate**.
4. Press **OPTION** and enter the **Viterbi Rate**.
5. Press **OPTION** and enter the **LNB Polarity**.
6. Press **OPTION** and enter the **Satellite Band**.
7. Press **OPTION** and set the **LNB On or Off**.
8. Press **ENTER** to acquire the signal.
9. Verify that the **ON LINE** LED is lit.

Select a Video Mode (NTSC or PAL)

1. Press **MENU** to display the **IRD Setup** menu.
2. Select a **Video Mode**. The selected mode should be the same as the transmitted video format.
3. Allow 30 seconds for the CSR820 to reboot.

Select a Service

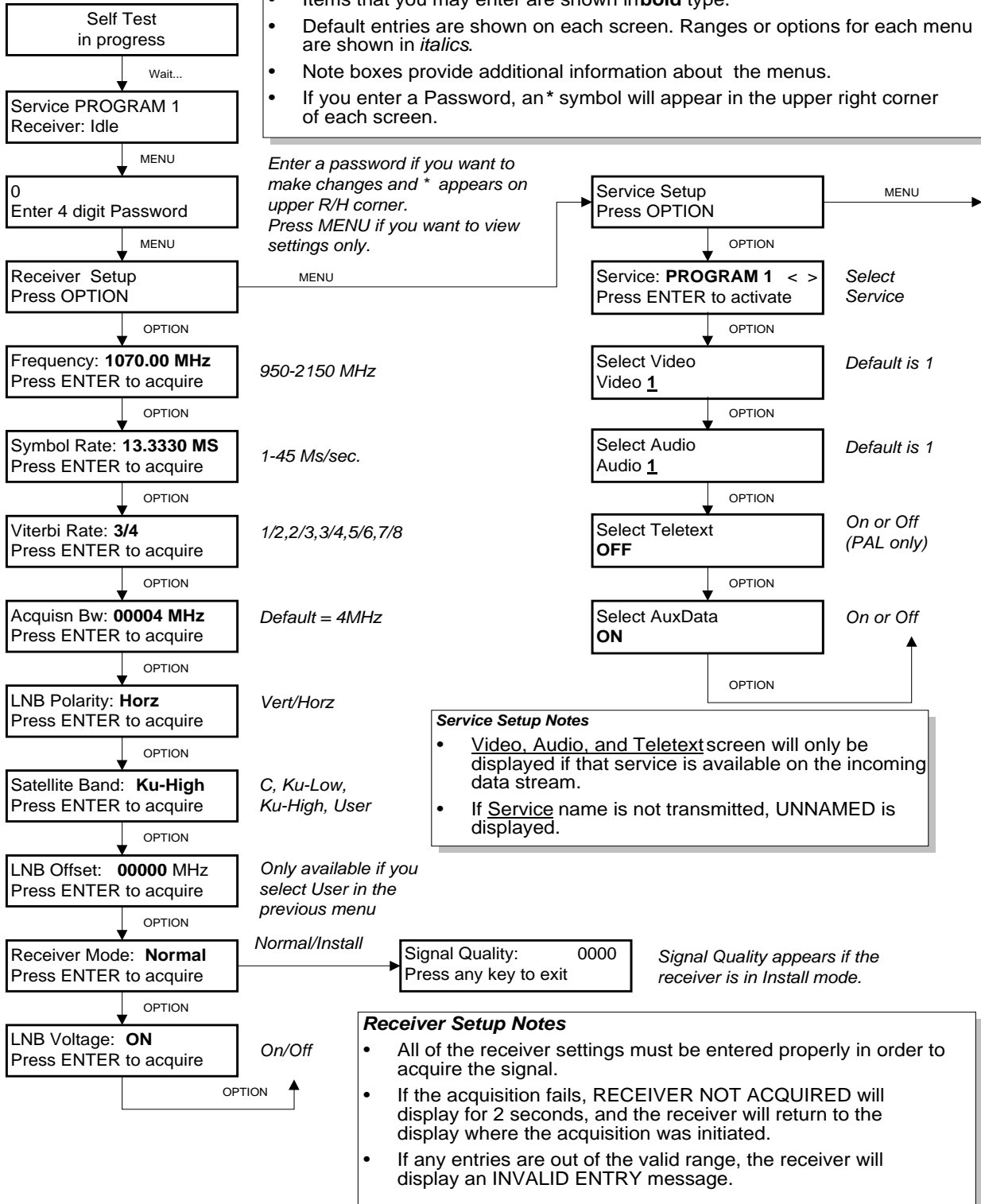
1. Press **MENU** to display the **Service Setup** menu.
2. Select a **Service** from the ones that are displayed.
3. Select a **Video** channel.
4. Select an **Audio** channel.
5. Verify that audio and video are present.

Menu Tree Menu Tree

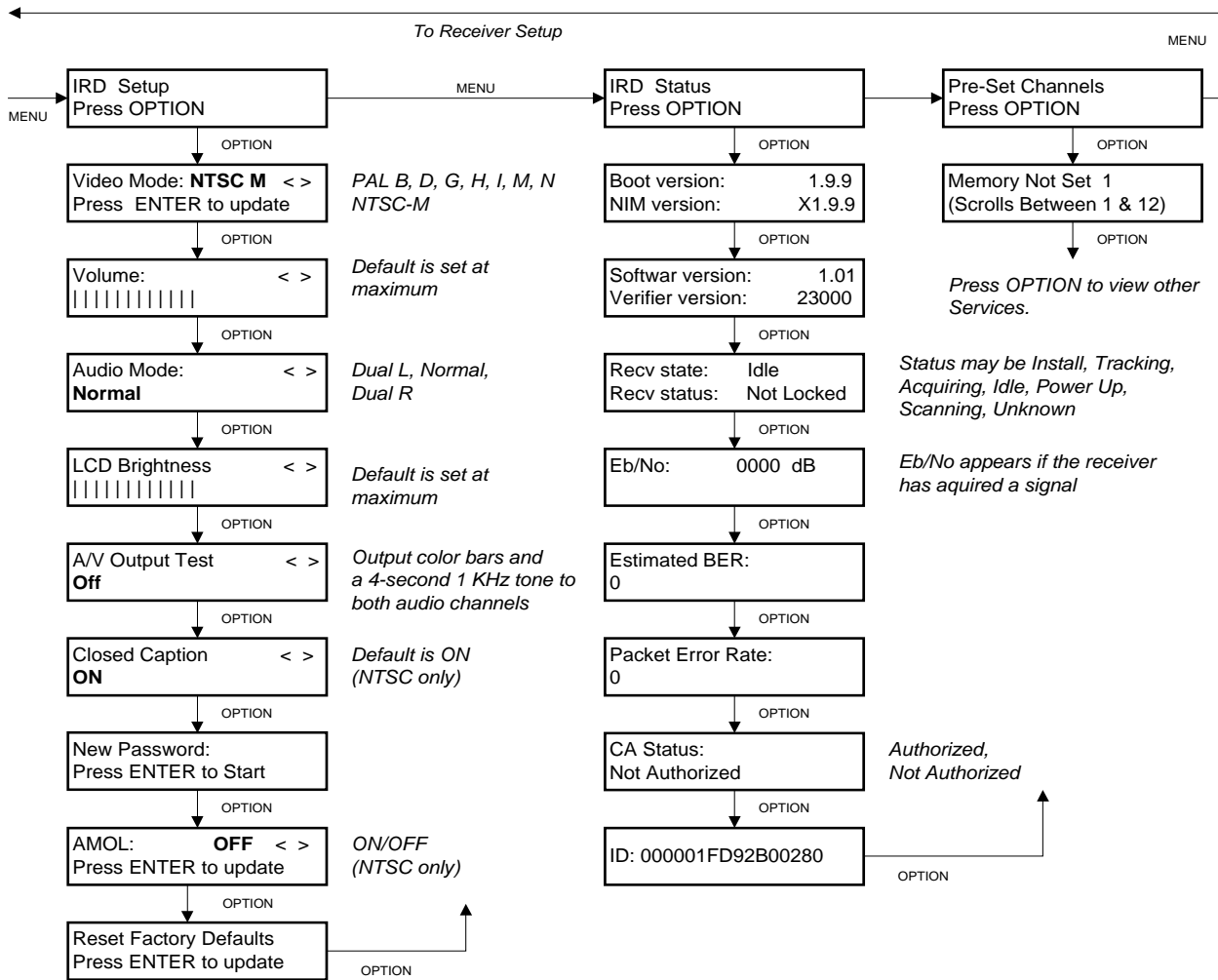
CSR820 Menu System

This diagram includes all of the menus and submenus in the CSR820 menu system.

- Arrows indicate the order of submenu within each main menu. Press OPTION or MENU as indicated.
- Items that you may enter are shown in **bold** type.
- Default entries are shown on each screen. Ranges or options for each menu are shown in *italics*.
- Note boxes provide additional information about the menus.
- If you enter a Password, an * symbol will appear in the upper right corner of each screen.



Menu Tree



IRD Setup Notes

Video Mode

The system will reboot after you change the Video Mode selection. Video mode selected should match both video format received and video format of monitor.

Audio Modes

Normal - If the audio input is stereo, the two audio channels (left and right) are output to the audio output connectors.

Dual Right - Right channel audio is selected for both audio output connectors.

Dual Left - Left channel audio is selected for both audio output connectors.

Reset Factory Defaults

This feature will reset all settings to the factory default settings shown on this page. The system will reboot after you reset the defaults.

IRD User Helpful Hints

Frequency

Enter the IRD input frequency as accurate as is known. If the exact frequency is not known, the entered frequency should be accurate within the selected acquisition Bandwidth. Valid values, 950 MHz to 2150 MHz.

Symbol Rate

Enter the symbol rate being received.

Viterbi Rate

Select the code rate being received.

Acquisition Bandwidth

The default acquisition bandwidth is 4MHz. The acquisition bandwidth is used to limit or expand the receiver scanning range.

The user can select the desired acquisition bandwidth to help find the desired signal. If the user is uncertain of the exact IRD input frequency to receive, increase the bandwidth to increase the receiver scanning range. If multiple signals are close to each other, limit the bandwidth to limit the receiver scanning range.

The receiver will scan the width of the acquisition bandwidth from the entered IRD input frequency.

LNB Polarity

LNB Polarity option changes the LNB voltage that is supplied on the LNB input connector.

When Vertical polarity is selected, the LNB voltage is approximately 13VDC. When Horizontal polarity is selected, the LNB voltage is approximately 17VDC.

Satellite Band

The Satellite Band option is used by the IRD to enter the LNB Local Oscillator (LO) frequency. This frequency is used by the IRD to determine the frequency of the channels in the transmission at the input to the IRD.

The IRD is programmed with the following LO frequencies for the given bands.

1. C Band: 5.15 GHz
 2. Ku Low Band 9.75 GHz
 3. Ku High Band 10.6 GHz
- Selecting Ku High will also output a 22KHz signal on the input connector to select the Ku High LO in the LNB. This band is also the default condition.

If other than the above LO frequencies are being used by the LNB, the User option can be selected to enter the custom LO frequency.

The IRD must have the correct settings to lock onto the initial signal (home channel). The following are required: LO frequency or Band, IRD input frequency, LNB polarity, Symbol rate and Viterbi rate. Once the home channel is found, the Network Information Table

(NIT) in the data stream supplies further information if available. The NIT Satellite Delivery system descriptor frequency is the frequency on which the satellite transmits the multiplex (Transponder Frequency).

The formula to calculate the IRD input frequency is based on the NIT satellite delivery descriptor frequency (Transponder Frequency) and the Local Oscillator (LO) frequency:

$$\text{IRD input frequency} = \text{Transponder Frequency} - \text{LO Frequency (GHz)}$$

For C Band only, use the Eq.:

$$\text{IRD input frequency} = \text{LO Frequency (GHz)} - \text{Transponder Frequency}$$

Note: LO may be User Defined or one of the standard bands selected by the operator.

Example: Suppose that the Transponder Frequency is 12.3 GHz, and Ku-High is set. From the table, Ku-High has an LO frequency of 10.6 GHz. The NIT frequency descriptor would be 012.30000.

IRD Input Frequency = (12.3 - 10.6) GHz = 1.7 GHz
The IRD will tune to 1.7 GHz.

Receiver Mode

Receiver Mode selection allows the user to see the relative signal strength from the LNB. This feature can be used to sight the dish antenna to a desired satellite.

Normal setting is selected to use the IRD as a receiver decoder. Install setting is selected to view the signal level. If Install is selected, the IRD will stop receiving and decoding functions, thus no video, audio, or data will be outputted.

LNB Voltage

LNB Voltage on or off selection allows the user to turn off the LNB voltage when multiple CSR820s are connected to one LNB or when the IRD does not need to provide the LNB power. This feature negates the need to use DC block in the network.

Service Selection

The service name will only appear if the service name is available in the SDT table in the signal.

Select Video

All the video programs available in the selected service will be displayed. This feature allows the user to select the desired video program within the selected service.

Select Audio

All the audio programs available in the selected service will be displayed. This feature allows the user to select the desired audio program within the selected service.

Select Teletext

Select Teletext screen will only appear when the video mode has been selected to PAL. This feature allows the user to turn on or off the teletext being received.

Video Mode

Video Mode options allows the user to select the correct Video Format. The video mode selected must match the video format being received for the IRD to display the video correctly. When video selection is made, the IRD will reboot then output the video in the correct video format.

Audio Mode

Audio Mode option allows the user to direct one of the channels to both IRD audio connectors.

Closed Caption

Closed Caption screen will only appear when the Video Mode has been selected to NTSC. Closed caption can be selected on or off.

Reset Factory Default

Reset Factory Default feature allows the user to change all the IRD settings to the default settings. The default settings are shown in the Menu Tree diagram.

Boot Version

Boot Version displays the version number of the IRD's boot software. The version number will change if the boot software is changed through over-the-air download.

NIM Version

NIM Version displays the version number of the IRD's Network Interface Module (QPSK Receiver) software. The version number will change when the NIM software is changed through over-the-air download.

Software Version

Software Version displays the version number of the IRD's top level software. The version number will change if the software is changed through over-the-air download.

Verifier Version

Verifier Version displays the version number of the IRD's conditional access (Verifier) software. The version number will change if the Verifier software is changed through over-the-air down load.

Eb/No (Energy over Noise)

Eb/No display will only appear when the IRD has successfully received a signal. It is desirable to have a high signal to noise ratio.

BER (Bit Error Rate)

BER reading provides information on bit error rate.

Packet Error Rate

Packet Error Rate provides information on packet error rate.

ID Number

The ID number displayed is the IRD ID number. This number can be used to identify the IRD when getting the IRD authorized.

Pre-Set Channel

The Pre-Set Channel screen is used to tune the CSR820 to a pre-set channel from the service provider's transport stream.

The CSR820 stores 12 pre-set channels. Channel 11 is reserved for Power Up. Channel 12 is the Emergency Home channel.

The Pre-Set Channels screen allows the operator to tune to any of the Pre-Set Channels, but does not allow any change to any of the channel settings.

To clear all items in the Pre-Set Channels memory, reset the factory defaults.

If the Power-Up channel is not available the CSR820 will display "Memory Not Set 11" and the IRD will tune to the last channel prior to power down.

Customer Service Information

If you have problems installing or operating the unit after you have carefully followed the instructions in this manual, contact Tandberg Television Customer Service for assistance or service.

Confirmed defective units should be returned to the Tandberg Television repair center. Return authorization may be required, and return instructions can be obtained by contacting Tandberg Television.

Customer Service Telephone Numbers

Be sure to write down the Serial Number of your CSR820 (located on the rear panel) before calling Tandberg Television Customer Service.

You may contact customer service at one of the following numbers:

1-888-637-0023 (United States only)

or

(949) 725-2699

Tandberg Television

Customer Service Department
25901 Commercentre Drive
Lake Forest, CA 92630 USA

Specifications

Power Input

Input Voltage	100 – 240 VAC Single-phase
Line Frequency	50 – 60 Hz
Power Consumption	35 W max.

RF Input

Connector	F-type connector, 75 ohm
Input Waveform	Shaped QPSK at variable symbol rates of 1 to 45 Msps
RF Input Frequency Range	950 – 2150 MHz
RF Input Power Levels	-65 to -25 dBm

Analog Audio Output

Connector	9-pin screw-type connector on the back panel.
Audio Output	1 stereo or 2 monaural channels
Signal-to-Noise Ratio	> 54 dB unified weighted
Dynamic Range	> 20Hz - 15 kHz
Gain-Frequency Response	± 0.5 dB p-p, 20 Hz – 20kHz
Total Harmonic Distortion Plus Noise	< 0.5% at 1 kHz
Output Level Range	-4 dBm to +18 dBm into 600Ω balanced

Analog Video Output

Connector	75Ω BNC connector on the back panel
Video Output	Composite video
Frequency Response	± 1.5 dB at 1kHz to 5 MHz
Video Level	1V p-p ± 2.5%
Signal-to-Noise Ratio	60 dB unified weighted
Luminance Nonlinearity	< 4%
Differential Gain	± 2%
Differential Phase	± .5°
Chrominance-Luminance	37.5 nS max.

Relay Contact Rating

24 VDC, 1 Amp

LNB Power Supply

Vertical Polarization	11.5-14 V
Horizontal Polarization	16-19 V

Auxiliary Data Output

Connector	DB-9/RS232 connector on the back panel
Baud Rate	19.2 kbps max.
Format	Asynchronous, 8 data bits, no parity, 1 stop bit

Environmental Operating Restrictions

Operating Temperature Range (ambient)	0 °C to +50 °C (32 °F to 122 °F)
Maximum Humidity	95% non-condensing
Maximum Altitude	4500 meters (14,864 ft)

Physical

Dimensions (W x H x D)	4.5 mm x 47.3 mm x 39 mm (1 3/4" x 1 8 5/8" x 1 5 3/8")
Weight	3.6 kg (8 lbs.)

Warranty

Tandberg Television warrants that Products delivered hereunder shall be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the delivery of Products to Buyer. If, during such twelve month period:

- (i) Tandberg Television is notified promptly in writing upon discovery of any defect in the Products, including a detailed description of such defect;
- (ii) such Products are returned to Tandberg Television, F.O.B. Tandberg Television's facility;
- (iii) any such return is authorized by the release by Tandberg Television of a Return Material Authorization (RMA) and the RMA number issued Tandberg Television is clearly marked on all accompanying documentation; and
- (iv) Tandberg Television's examination of such Products discloses to Tandberg Television's satisfaction that such Products are defective and such defects are not caused by accident, abuse, misuse, neglect, alteration, improper installation, repair or alteration by someone other than Tandberg Television, improper testing, or use contrary to any instructions issued by Tandberg Television, then within a reasonable time Tandberg Television shall (at its sole option) either repair, replace or credit the Buyer for such products. Tandberg Television shall return any Products repaired or replaced under this warranty to the Buyer, transportation prepaid. The performance of this warranty does not extend the warranty period of any Products beyond that period applicable to the Products originally delivered.
 - This warranty does not cover charges for any assembly, installation, setup or removal, or adjustment of controls.
 - This warranty shall be void if any product marking or label has been altered, defaced, or removed, or if any component has been altered, modified, used improperly, or had its housing opened.
 - The foregoing warranty shall not cover any damage or defect that is caused by accident, abuse, misuse, neglect, alteration, improper installation, setup, removal, maintenance, shipment, repair, or alteration by someone other than Tandberg Television, improper testing or use contrary to any instructions issued by Tandberg Television, damages or inoperability caused by assembly or use with incompatible products, or reception problems caused by inadequate antenna systems.
 - The foregoing warranty constitutes Tandberg Television's exclusive liability, and the exclusive remedy of buyer, for any breach of any warranty or other nonconformity of products. This warranty is exclusive, and in lieu of all other warranties, express, implied, or statutory, including but not limited to the warranties of merchantability and fitness for a particular purpose, which are hereby expressly disclaimed. There are no warranties that extend beyond the description of this limited warranty.

- For breach of any written or implied warranty with respect to the product, in no event shall Tandberg Television be liable, in contract or in tort or under any other legal theory, for incidental, indirect, special or consequential damages incurred or sustained by you or by others, regardless of whether Tandberg Television was informed about the possibility of such damages, and in no event shall Tandberg Television's total liability exceed an amount equal to the consideration paid for the products.

How to Obtain Warranty Service

To obtain warranty service, you must:

1. Call or write Tandberg Television Americas, Inc. Customer Service within the applicable warranty period to obtain a Return Material Authorization (RMA) number at:

Tandberg Television Americas, Inc.

Customer Service Department
25901 Commercentre Drive
Lake Forest, CA 92630 USA
Telephone: 1-888-637-0023
or (949) 725-2699

When you call or write, ask for the address to send the product, if the product is to be returned. **Do not return the unit to the above address unless instructed to do so.**

2. If the Tandberg Television Customer Service Department requests that you return the product, pack it safely and securely, preferably in the original shipping carton. Enclose a letter explaining the problem. Be sure to enclose a copy of your sales receipt or other proof of purchase date and include the Return Material Authorization (RMA) number, your name, address, and phone number. Ship it insured to the authorized service center address specified by Tandberg Television. All packing, shipping, and insurance charges to return the component to Tandberg Television must be prepaid by you. A qualified technician will be required to remove or install a product, and any out-of-warranty charges for such work are your responsibility.

User Notes:

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TANDBERG

Television

Tandberg Television
25901 Commercentre Drive
Lake Forest, CA 92630 USA
(888) 637-0023 (United States only)
(949) 725-2699