

Unity 550

VERSION 1

Enterprise Media Receiver



WEGENER®



Unity 550

VERSION 1

Enterprise Media Receiver User's Manual

800072-01 Rev. A

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The Wegener **Unity 550** is approved under **FCC Part 15B Class A, UL/C-UL1950 3rd Edition, and CE [EN60950, EN55022(94), and EN55024(98)]**.



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CHAPTER 1 GENERAL INFORMATION

1.1 Manual Overview

This manual provides instructions and reference information for the proper installation and operation of the **Wegener Unity 550**.

The manual is divided into the following chapters:

1. **General Information** - A description of the **Unity 550**, its functions and specifications, and a glossary of terms
2. **Installation** - Procedures and information for the correct and safe installation of the **Unity 550**
3. **Operation** - Instructions on starting and operating the **Unity 550**
4. **Search Functions** - Information on settings, parameters, modes, and signal monitoring for the **Unity 550**.
5. **Customer Service** - Our warranty and information about obtaining help.

An Index of keywords is also provided to help you quickly locate needed information.

Please E-mail any suggestions or comments concerning this manual to manuals@wegener.com. If you prefer to post through the mail, please send your comments to the address below. If you have substantial or complex changes to recommend, our preference is that you copy the page(s) in question, mark your changes on that copy, and fax or mail us the copy. We always appreciate constructive criticism.

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1.2 Unity 550 Product Overview

Digital Television Receiver

The **Unity 550 Digital Television Receiver** is a high-performance satellite Integrated Receiver-Decoder (IRD) designed to meet the needs of the private television market-place. Supporting both the PAL and NTSC video standards, the **Unity 550** is uniquely positioned to provide high-quality video, audio, and data to demanding customers. The **Unity 550** supports DVB World Standard Teletext and Line 21 Closed Captioning and Extended Data for enhanced video functionality.

Multiple data features are standard to provide additional ways to use spare digital spectrum for revenue and operational control. A 38.4-kbps asynchronous output provides constant streaming of control and user information. This data port is used for local and remote diagnostics, **COMPEL**[™] data delivery services, and auxiliary data. Using **COMPEL**, the data output can control external devices, such as collection encoding systems and video switching equipment. **COMPEL** is able to command the serial number to be displayed on screen for asset protection.

Unity 550 Features and Options

The **Unity 550** utilizes and supports the following standards:

- MPEG-2/DVB Compliant
- 2.5 - 30 Msps Symbol Rate
- SCPC and MCPC
- RS-232 Asynch Data up to 384 Kbps
- Line 21 Closed Captioning and Extended Data
- World Standard Teletext
- On-Screen Control

The **Unity 550** has integral support for the following **COMPEL™** features:

- **COMPEL™** Network Control
- **COMPEL™** CA and **Wegener** PIN Scrambling
- **COMPEL™** On-Screen E-Mail

COMPEL™ Network Control

COMPEL gives you the power to manage a network of **Unity 550s** and other Unity IRDs with unparalleled functionality. With its unique network management features, such as grouping, receiver control and scheduling, the operator can command individual groups of receivers to switch, tune, or "output" video or data targeted specifically for that one receiver or group of receivers. In addition, **COMPEL** is able to switch the **Unity 550** between satellite transponders - even to a different satellite - for unequalled disaster recovery.

1.3 Unity 550 Product Specifications

Table 1.1: Unity 550 Technical Specifications

Characteristic	Specification
RF Input	
Input Frequency Range	950.00 - 2150.00 MHz
Input Level Range	-25 dBm total signal power down to -135 dBm/Hz signal power spectral density (-25 to -65dBm)
Maximum Aggregate Input Power	-5 dBm at max input signal
Input Impedance	75 ohms, unbalanced
Input VSWR	<2.5:1
L.O. Leakage at Input	- 55 dBm
Demodulator/FEC	Convert Symbol rate F_s to Transport Rate F_t by: $(2R \cdot F_s) \cdot (188/204) = F_t$, where 'R' is the inner FEC code ratio, either $R = 1/2, 2/3, 3/4, 5/6, \text{ or } 7/8$.
Symbol-rate Range	2.5 - 30 Msps Note: The lower symbol rates will require a higher frequency stability on the LNB.
Max Eb/No @ Video Threshold	Depends on inner FEC: <ul style="list-style-type: none"> ■ 1/2: 4.5 dB ■ 2/3: 5.0 dB ■ 5/6: 6.0 dB ■ 7/8: 6.4 dB
Compression System	MPEG-2

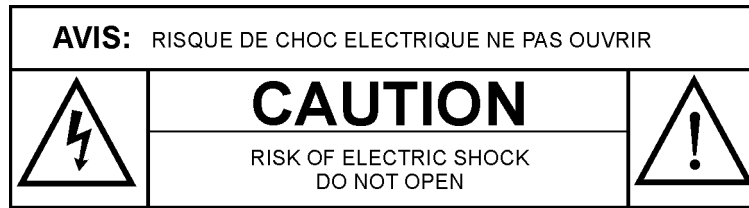
Characteristic	Specification
Analog Output Formats	NTSC or PAL
Supported Digital Video Resolutions	NTSC: 720Hx480V, 544Hx480V, 480Hx480V, 352Hx480V, 352Hx240V
PAL:	704Hx576V, 544Hx576V, 480Hx576V, 352Hx576V, 352Hx288V
Supported Chrominance Sampling	4:2:0
Video Output	All Video Output specs are for NTSC and PAL
Output Level	1.0 Vp-p, < +/- 5%
Output Impedance	75 ohms
Multiburst	From 0.5 to 4.2 MHz, < +0/-3dB
Differential Gain	< 3%
Differential Phase	< 3 Degrees
Line Time and Field Time	
W-form Distortion	< 2% p-p
Audio Decoder	
Compression System	MPEG-1 Layer 2
Sample Rates Supported	44.1 and 48 kHz
Unbalanced Audio Output	Measured at 256 kbps audio PES rate, dual mono mode
Output Level Adjust Range	0 to -14 dB attenuation from above output level.
Output Level - MAX PPL	+9.0 +/- 0.5 dBu, 0 dB level, RCA Phono Jack
Impedance	Unbalanced: 1000 ohms
Audio Parameters	
Frequency Response	20 Hz to 20 kHz, +0.5/-2.0 dB
Harmonic Distortion (1 kHz test tone, 1 dB below PPL)	< 0.5%
S/N Ratio	< 68 dB (22 Hz to 20 KHz) unweighted
Dynamic Range	16 Bits
A/V Sync	< +/- 50 ms error
Serial Ports	
RS-232	RJ12
Selectable Services	Auxiliary character-based async output E-mail character-based async output Terminal monitoring and control
Baud Rates	9,600 bps to 115,200 bps
Formatting	8 data bits; 1 stop; no parity; half-duplex.

Characteristic	Specification
Input Power Rating	115/230 VAC, 0.8/0.5A, 50/60Hz
LNB DC Power	Universal LNB supported
Voltage	13 or 18 VDC, for LNB polarity selection
22 kHz tone	22 kHz control tone, for LNB selection
Current	250 mA max
Short-circuit protection	Foldback regulator
AC Power Supply	
Input	100-240 V, 50/60 Hz, 1.5A
Output	12 VDC, 4.58A
Operating Environment	
Operating Temperature Range	+10° to +40° C in still air with unblocked vents
Storage Temperature Range	-20° to + 60° C
Operating Humidity	Maximum relative humidity 80% for temperatures up to 31° C, decreasing linearly to 50% relative humidity at 40° C.
Maximum Operating Elevation	6560 Ft (2000M) above sea level

1.4 Safety Summary

The **Unity 550** is designed for safe use with few special precautions required of the user. The following items are basic precautions to use when installing and working with the **Unity 550** unit:

Do not open the **Unity 550's** chassis cover.



The **Unity 550** incorporates security labels over some of the screws. There are no user serviceable components within the IRD. Tampering with the security labels, or opening the unit, will void your warranty. If you have questions, contact the **Wegener Customer Support Department** at the address or phone (fax) numbers listed in **Chapter 5 Customer Service**, of this manual.

CHAPTER 2 INSTALLATION

This chapter provides instructions on unpacking, mounting, and connecting your **Unity 550** as well as connector information including detailed pinouts.

2.1 Unpacking and Inspection

Carefully unpack the unit and its ac power cord and inspect for obvious signs of physical damage that might have occurred during shipment. Any damage claims must be reported to the carrier immediately. Be sure to check the package contents carefully for important documents and materials.

Note: Please save the packing materials and original shipping containers in case you must later return the unit for repair. Packing these units in other containers in such a way that they are damaged will void your warranty.

2.2 Location and Mounting

The **Unity 550** may be mounted in a standard 19-inch equipment rack or set up for desktop operation. In either location, maintain a clean, dry environment for the **Unity 550**.

Precautions **FCC-Mandated Suppression of Radio Frequency Emissions**

WARNING This is a Class A product. In a domestic environment this product may cause radio interference for which the user may need to take mitigating action.

If the Ethernet port has a cable connected to it, that cable must be properly shielded and grounded to minimize RF emissions that could interfere with nearby equipment.

DANGER To avoid damage to the **Unity 550** unit and other equipment, or personal injury, the following items should be strictly observed.

Elevated Ambient Operating Temperatures in Rack-Mounted Units

When equipment is installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the room's ambient temperature. Therefore, consideration should be given to the ambient air temperature within the rack (not just inside the room) when deciding if the maximum recommended ambient operating temperature (TMRA) is met or exceeded.

Reduced Air Flow

Equipment should be installed such that the airflow required for safe operation of the equipment is not compromised. The **Unity 550** may be arranged in a rack without empty spaces between units, if heat buildup is prevented by ensuring that the side vents remain unblocked, and that there is adequate clearance around the vent holes.

Mechanical Loading

Rack-mounted equipment should be installed in such a way that a hazardous condition is not produced by uneven loading. The **Unity 550** unit is not very heavy, but total rack loading must be considered. Also, do not rest any unsupported equipment on a rack-mounted **Unity 550** unit.

Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on overcurrent protection and supply wiring. Ensure that the total rack or breaker power consumption does not exceed the limits of the AC branch circuit. Appropriate consideration of equipment ratings should be used when addressing this concern.

Reliable Earthing

When connecting the Unity 550 unit to the power supply, review the ratings of all equipment in the circuit to ensure that the branch circuit, as well as the power source, will not be overloaded. Also make sure that the unit is properly grounded and/or that a protected power strip is used to attach it to the power supply.

Rack Mounting

The **Unity 550** unit should be installed in such a way that a half-inch clearance is allowed on each side and a quarter-inch on the top to ensure adequate air flow. Ensure that a hazardous condition is not produced by uneven loading, or by resting any unsupported equipment on a rack-mounted **Unity 550** unit.

Parts for the **Unity 550** unit include 2 angle rack mount brackets and 4 rubber feet. For rack mounting, do not attach the rubber feet as they interfere with the rack mounting.

1. Remove the 2 screws from the left and right sides of the unit.
2. Insert the angle brackets into the left and right sides of the unit ensuring that the screw holes for the unit and brackets are aligned.
3. Secure the brackets by re-inserting the screws through the brackets and unit.
4. Install the unit onto the rack.

Note: The front brackets must be secured to the rack. If the front brackets are left unsecured, the unit may shift forward and fall from the rack, and may result in personal injury and/or damage to the equipment. The internal temperature of the rack should not exceed 40° C.

Desktop Installation

Parts for the **Unity 550** unit include 2 angle rack mount brackets and 4 rubber feet. For desktop installation, do not attach the brackets.

1. Attach the 4 rubber feet onto the indented areas at the bottom of the unit.
2. Place the unit on a flat surface where it will not be subject to spills or impacts.
3. Route cables to the unit so that they will not be hit or pulled, causing damage to the connectors or to the unit itself. Ensure a sufficient flow of cool air so that the unit's operating ambient temperature range is not exceeded.

2.3 Rear Panel Connections

The **Unity 550** rear panel connections are shown in **Figure 2.1** and described in **Table 2.1** below.

Figure 2.1: Unity 550 Rear Panel



Connection Descriptions

Table 2.1 and **Table 2.2** list the interconnect descriptions and the serial cables to terminal or printer.

Table 2.1: Unity 550 Interconnect Descriptions

Signal	Connector	Description
RF Switch IN - Port 1	F	950 to 2150 MHz signal accepted. LNB power available
RF Switch IN - Port 2, 3, 4	F	950 to 2150 MHz signal accepted. NO LNB power available
Main Video OUT	Phono Jack	NTSC or PAL, Composite video at 1 Vp-p
Monitor Video OUT	Phono Jack	NTSC or PAL, Composite video at 1 Vp-p
Audio OUT 1 (R & L)	Two Phono Jacks	Audio stereo
Audio OUT 2 (R & L)	Two Phono Jacks	Audio stereo
RS232 Port	RJ-12	Serial Asynchronous Data. May be used for terminal, printer, or modem (to remote terminal)

Table 2.2: Unity 550 Serial Cables to Terminal or Printer

Unity 550: RJ-12		Computer: DB-9 (Female)		ASCII Terminal or Serial Printer: DB-25 (Male)	
Pin	Signal	Pin	Signal	Pin	Signal
1	No Connection				
2	TX Data	2	RX Data	3	RX Data
3	RX Data	3	TX Data	2	TX Data
4	No Connection				
5	Ground	5	Ground	7	Ground
6	+5V	9	+5V	22	+5V

CHAPTER 3 OPERATION

This chapter provides information and procedures for powering up and operating the unit.

The IRD can be controlled via **COMPEL**, local terminal, modem (remote terminal), and OSD (On-Screen-Display) push buttons. Normally, **COMPEL** is the primary method of controlling the IRD, while the other control methods are supplemental. See **COMPEL™ System Control on page 18** for more information, and the **COMPEL Manual** for a complete explanation of **COMPEL** controls.

3.1 Front Panel Controls And Indicators

Figure 3.1 shows the **Unity 550** front panel controls and describes them in **Table 3.1**. The IRD can be controlled via **COMPEL** Network Control, local terminal, modem (remote terminal) and OSD push buttons. Normally, **COMPEL** is the primary method of controlling the IRD, while the other control methods are supplemental.

Figure 3.1: Unity 550 Front Panel

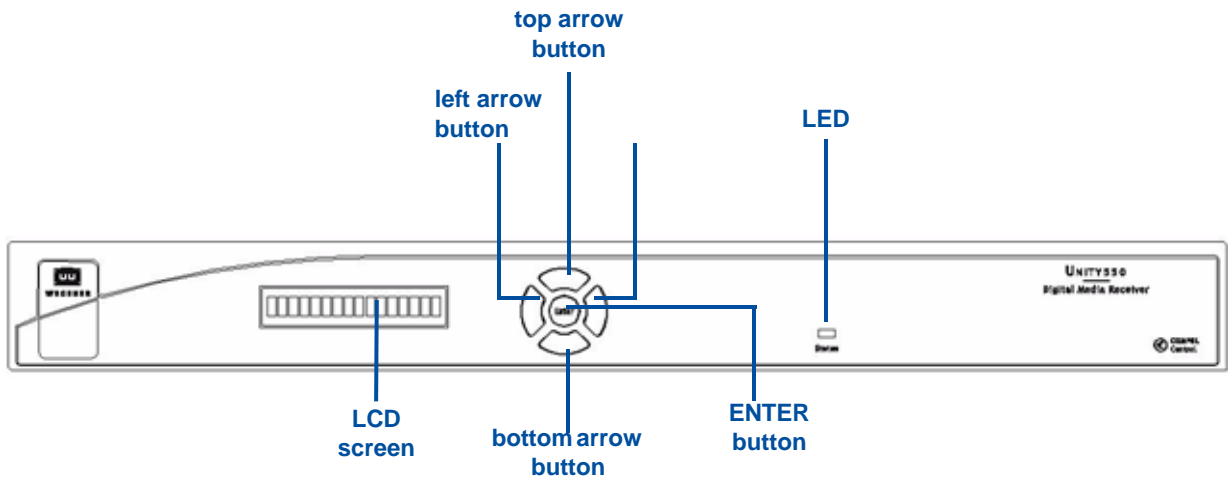


Table 3.1: Unity 550 Front Panel Controls and Indicators

Item	Description
LED	Activates automatically by certain status conditions, such as loss of signal.
Liquid-Crystal Display (LCD) screen	Displays menus that control various operating functions.
Arrow buttons	Push buttons for LCD navigation.
ENTER	Push button for LCD operation.

LCD Menu Navigation

Operate the **Unity 550** from the front panel using the arrow buttons and the LCD as shown in **Figure 3.1**. Menu screens on the LCD direct you to screens that control various operating functions including:

- programming
- audio

Front Panel Functions

Programming Setup

1. Use the right or left arrow buttons to navigate to Prgm:Prog **N**.

Note: **N** represents the available program.

2. To edit, press ENTER. The program begins flashing.
3. Use the up or down arrows to cycle through any available programs
4. To select a program, press ENTER.

Audio Setup

1. Use to setup Audio 1 or Audio 2 as indicated on the rear of the unit chassis.
2. Use the right or left arrow buttons to navigate to Aud1:**NNN**

Note: **NNN** represents the available program.

An asterisk preceding the program (Aud1: ***NNN**) indicates that it is the first available program.

3. To edit, press ENTER. The program number begins flashing.
4. Use the up or down arrows to cycle through any available programs.
5. To select a program, press ENTER.

Sub-titling Setup

This feature is not available for edit in the initial release.

3.2 LED Status and Alarm/Warning Conditions

The **Unity 550** unit's only LED is Red/Green, located on the front panel, and labeled Status. **Table 3.2**, lists the behavior of the Status LED during Power Up and Normal operation, as well as the color and blink/flutter pattern shown during various Warning and Alarm conditions.

The conditions are listed in the order of their display priority with highest priority at the top.

Note: The alarm conditions are those conditions preventing the delivery of video.

LED definitions

The following definitions of Amber, Flash, Blink, and Flutter explain the terms used in the **Status LED Display** column of **Table 3.2** on page 15.

Amber	Red and Green turned ON at the same time.
Flash	ON for 100 ms, OFF for 100 ms.
Flutter	ON for 50 ms, OFF for 50 ms.
Blink	LED is OFF for 1 second, then blinks ON for 250 ms and OFF for 250 ms between 1 and 12 times, according to the Alarm/Warning Code. Is then OFF for 1 second, and blinks 1-12 times again. This pattern continues until the alarm/warning condition is cleared. (For example, if the unit is displaying a "header search mode" alarm, the LED will be OFF for 1 sec., then will blink (RED) ON for 250 ms and OFF for 250 ms five times. It will then be OFF for 1 sec., followed

by blinking 5 times, etc. The LED blinking RED indicates an alarm, while AMBER indicates a warning.

Note: ms = 1/1000 second.

LED behavior Within approximately 15 seconds of power up, the IRD gives an indication of stable operation. It initializes all system components and supplies an operational status. A steady Green LED indicates that it is locked on a carrier and is capable of producing output (Audio/Video/Data).

If there is some problem with the IRD or the signal it is receiving the LED flashes Red for alarm conditions or Amber for warning conditions. In general, alarms indicate that the unit cannot produce output, while Warnings indicate that, although output is being produced, there is a problem that could require attention. The most common conditions that produce alarms or warnings are listed below.

Table 3.2: Unity 550 Status LED Indications

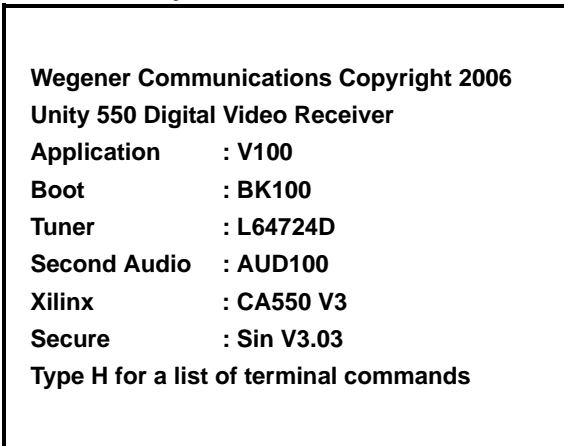
Mode	Condition	Status LED Display
Power Up	IRD is in process of powering up	Amber flutter
Alarm	Installation Mode	Red Blink = 3
	Carrier Table Search	Red Blink = 4
	Header Search Mode	Red Blink = 5
	Eb/NO Alarm	Red Blink = 7
	Not Authorized	Red Blink = 11
	Alarm Selected Program not available	Red Blink = 12
Warning	Selected Audio not available at Port 1	Amber Blink = 1
	Marginal Eb/NO	Amber Blink = 2
	COMPEL Required but No COMPEL in the last 2 minutes	Amber Blink = 3
	Selected Audio not available at Port 2	Amber Blink = 4
	RF Level Low	Amber Blink = 5
	RF Level High	Amber Blink = 6
Normal	Normal Mode for a COMPEL -not-Required Unit	Green
	Addressed COMPEL within last 5 seconds	Green Flutter
	COMPEL within last 2 minutes	Green

3.3 Power-On Procedure

Apply power to the IRD. The unit initializes various devices and configures itself according to the EEPROM settings. It then waits for the receiver section to complete its power up test, which takes about 10 seconds.

When the receiver section passes its test, the IRD sends a tune command and the Welcome Banner screen to the serial port.(An example is shown in **Figure 3.2** below.) If the unit is in Terminal mode, the banner displays on the terminal screen. The IRD then enters Alarm mode until all of the alarm conditions are cleared.

Figure 3.2: Unity 550 OSD Welcome Banner Screen



Your banner may be different from this example depending on the options purchased.

Note: The "Type H..." text at the bottom of the screen is shown only if the serial device is set to Terminal mode.

3.4 On-Screen Network E-mail

The network may, through the **COMPEL** network control system, send e-mail messages to the video (OSD) screen. The content, location, and duration of the messages are essentially under the control of the network. The local user may neither move nor scroll through the messages. If necessary, a message may be cleared by the local user by:

1. Either power-cycling the unit,
2. Or press ENTER on the front panel to get a local control menu and then exiting out of that menu.

See **OSD (On-Screen Display) Settings** on page 18 for more information.

3.5 IP Repeater Mode

The **Unity 550** IP Repeater mode allows users to send IP data over the satellite using DVB ETSI EN 301 192 Multiprotocol Encapsulation (MPE) in a DSMCC Section format for private data (ISO/IEC 13818-5[5]). Multiprotocol encapsulation allows IP data including both the destination MAC and IP addresses to be placed in MPEG section data. This is usually done at the uplink by an IP encapsulator that also packs the data into transport packets on an assigned PID.

The **Unity 550** is told which PID to look for the IP data on through the OSD. Any MPE data the **Unity 550** receives on that PID is sent out the ethernet port with no address changes, error checking or error correction. The **Unity 550** does not receive any data over the ethernet port and thus does not use ARP and will not respond to a PING command.

3.6 On-Screen Display (OSD)

Although the **Unity 550** is set up at the factory, you can customize its settings to fit your system using the OSD and front-panel buttons. You may also view the existing settings and the various status and version fields by using the push buttons to navigate through the menus displayed on an attached monitor.

The OSD menus allow you to set up or change settings for these functions:

- Carrier Status
- Carrier Select
- Software Version information
- Signal Strength Monitoring
- Serial Port device selection
- Audio Settings
- Data PID settings

OSD Setup

The OSD information is contained in a 14-line x 40-character display in the video output from the **Unity 550** receiver. View the OSD from a monitor connected to the video monitor output of the **Unity 550** receiver.

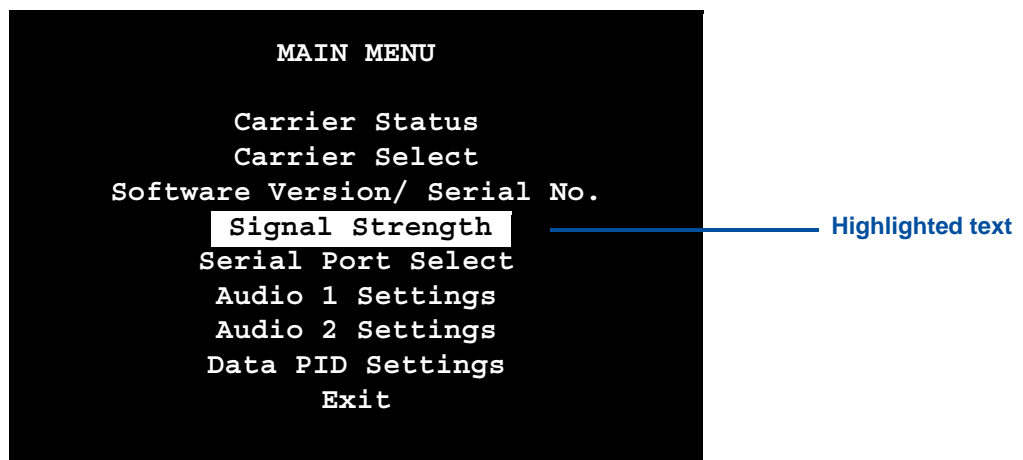
1. From the front panel, use the right or left arrow buttons to navigate to OSD.
2. To display the OSD on the monitor, press ENTER.

Note: To exit the OSD, select EXIT from the Main Menu on the monitor. When a menu is first shown, the cursor is always placed on its first field.

OSD Menus

All menus are white text with a solid black background. Highlighted items display as black text on a white background. **Figure 3.3** is a representation of the **OSD Main Menu**.

Figure 3.3: Unity 550 OSD Main Menu



Navigating OSD Menus

Use the arrow and **ENTER** buttons on the **Unity 550**'s front panel to navigate and edit the fields on the **OSD** menus. **Selectable fields** allow you to change the whole parameter from pre-determined options. **Editable fields** allow you to change each digit of the parameter.

Note: Once a field is updated, you must select **Activate and Exit** on the submenu and then press **ENTER** to update the value of the field. Before pressing **ENTER**, you may go back to any field and correct it prior to acceptance.

Table 3.3: Unity 550 Types of OSD Action Fields

Button	Actions		
	Main Menu	Submenu	Edit Mode
ENTER	selects submenu	goes to editable field	no action
right arrow	no action	goes to editable field	moves cursor to right
left arrow	no action	no action	moves cursor to left
up arrow	goes to previous submenu	goes to previous submenu item	increases value of highlighted item
down arrow	goes to next submenu	goes to next submenu item	decreases value of highlighted item

3.7 Customizing and Viewing Settings for Your System

Though the **Unity 550** is set up at the factory, you can customize its settings to fit your system using the OSD and front-panel push buttons. You may also view those settings and various status and version fields from the front panel, viewing on a monitor.

Note: The screens shown in **Section 3.8** contain only sample data. The actual data for normal operation will differ due to settings differences for each network or unit.

COMPEL™ System Control

The **Unity 550** IRD is most often controlled via the **Wegener COMPEL Control System**. This system is managed at the uplink site, sending a control stream with the usual audio and video data streams. The **COMPEL** System addresses units, and commands them to perform various functions.

Among its functions is the ability to enable or limit aspects of local control. (See the following section for more on this capability.) Also, **COMPEL** has the ability to mute the audio and video of an IRD if it is inadvertently tuned to a frequency it is not authorized to receive.

If an RF Switch option module is installed, **COMPEL** will control which of the four RF feeds is being processed. For more information on this, see the **COMPEL** Manual, or contact your service provider.

OSD (On-Screen Display) Settings

Several of the seven screens, which may be viewed on the OSD, have control functions, which may be limited by the **COMPEL™** system.

The Main Menu, Carrier Status, Software Versions / Serial #, and Signal Strength screens have no control over unit settings. Because of that, they are not included in this discussion.

However, the amount of control the on-site user has over the Carrier Select, Serial Port Select, and Audio Settings screens may vary, depending on **COMPEL** settings. There are four levels of control via **COMPEL**. These levels are:

- No Local Control - Pushbuttons disabled.
- Read Only - No changes permitted.
- Limited - Changes may be made to Carrier Presets only. For instance, on the Carrier Select screen, you may change the From Table setting, which will change the other settings on that screen according to the pre-loaded values.
- Full - Full Local Control.

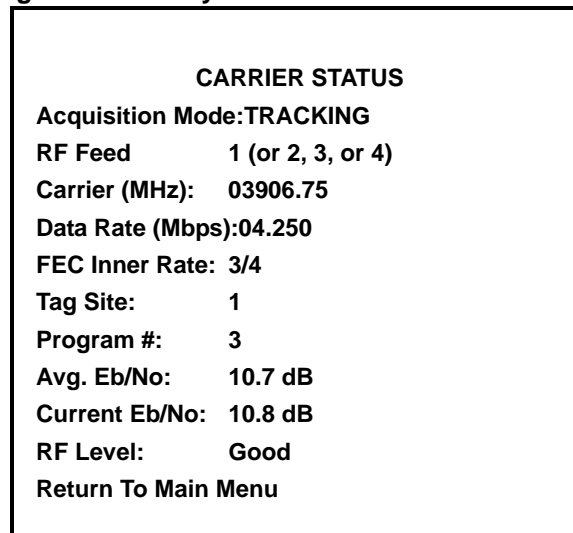
Carrier Status Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields

Carrier Status is a read-only screen. (No changes can be made here.)

While on the Main Menu page:

1. Press the down arrow button until Carrier Status is highlighted.
2. Press ENTER.
3. You may review the details as shown in **Figure 3.4**, below.
4. Press ENTER again to exit the Carrier Status screen.

Figure 3.4: Unity 550 OSD Carrier Status Screen



Carrier Select Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields.

While on the Main Menu screen,

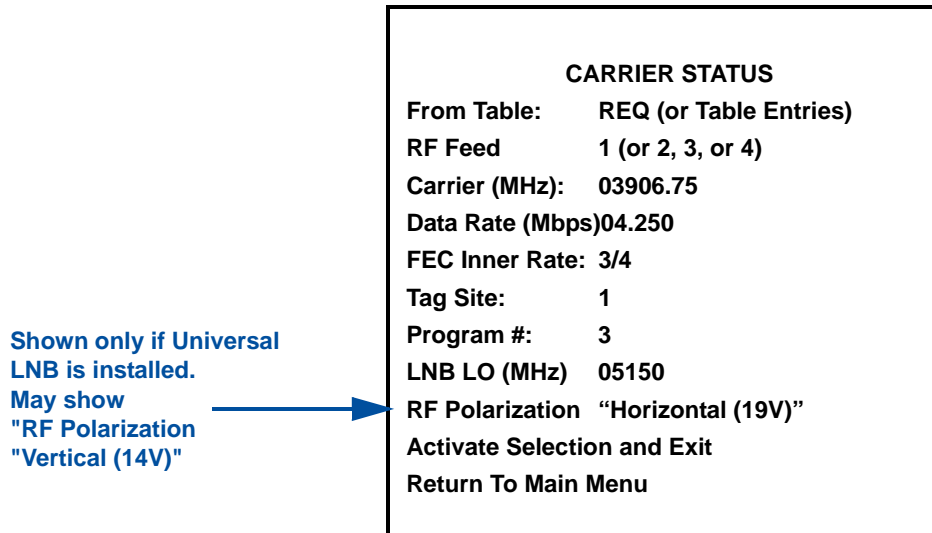
1. Press the down arrow button until Carrier Select is highlighted
2. Press ENTER to enter the highlighted menu.
3. Navigate using the arrow buttons to place the cursor on the field you wish to edit.
4. Press the up arrow to increase the value or the down arrow to decrease the value of the highlighted item.
5. Press ENTER to move to the next item or digit to be changed.
6. Repeat steps 3-5 for all fields.
7. After completing all changes, arrow down to select Activate Selection & Exit.

Note: The Carrier must be set before setting the LNB LO frequency.

Note: If you Exit without moving to Activate Selection & Exit, the unit will not retain the changes.

Note: LNB LO Frequency will change with the RF Input selected by the optional RF Switch, if that option is installed.

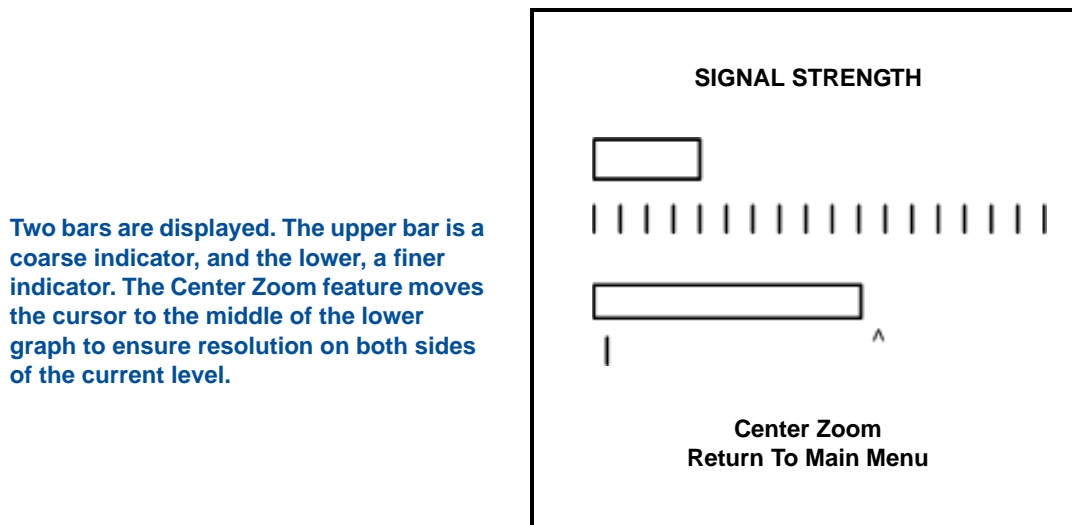
Figure 3.5: Unity 550 OSD Carrier Select Screen



Signal Strength

The SIGNAL STRENGTH screen (Figure 3.6) displays the relative received signal level while the IRD is locked onto a carrier. This is useful for fine-tuning antenna pointing. Because signal lock is a first requirement, coarse antenna pointing must be done using other tools.

Figure 3.6: Unity 550 OSD Signal Strength Screen



Serial Port Select

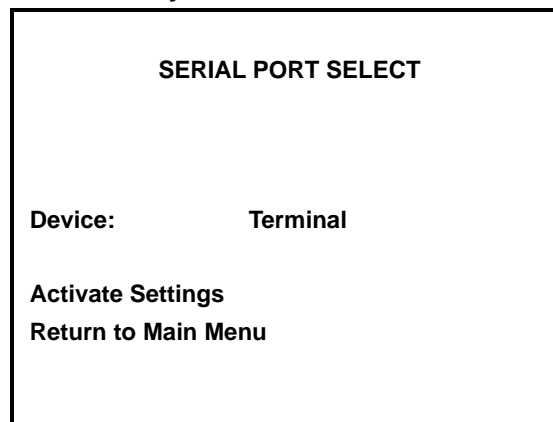
Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields

On the Main Menu screen:

1. Press the down arrow button to scroll through the menu until Serial Port Select is highlighted.
2. Press the ENTER button to open the Serial Port Select screen (Figure 3.7).

3. Press the ENTER button to move to the available device options for the serial port (Terminal, Modem, Printer, or Aux Data).
4. Press the right arrow button to move through the options until the desired one is highlighted.
5. Press ENTER to edit the selected option.
6. Press ENTER until the desired value is displayed.
7. Press the down arrow button to move to Activate Settings.
8. Press ENTER to save your selections to memory.
9. Press the down arrow button to move to Return To Main Menu.
10. Press ENTER to return to the Main Menu screen.

Figure 3.7: Unity 550 OSD Serial Port Select Screen



Audio Settings

Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields

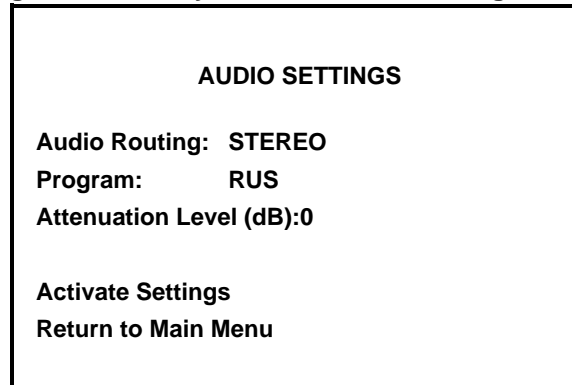
While on the Main Menu page:

1. Press the down arrow button until Audio 1 Settings or Audio 2 Settings is highlighted
2. Press ENTER to enter the selected Audio Settings menu (**Figure 3.8**).
3. Press the right arrow button to place the cursor on the field you wish to edit.
4. Press the down arrow to cycle through the highlighted field.
5. Press ENTER to move to the next item or digit to be changed.
6. After completing all changes, press the down arrow button to select Activate Settings.
7. Press ENTER to place the new settings in memory. This activates any changes you have made.

Note: If you exit without moving to the Activate Settings option and pressing ENTER, the unit will not retain the changes.

8. Press the down arrow button to move to Return To Main Menu.
9. Press ENTER to return to the Main Menu screen.

Figure 3.8: Unity 550 OSD Audio Settings Screen



Software Versions

Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields

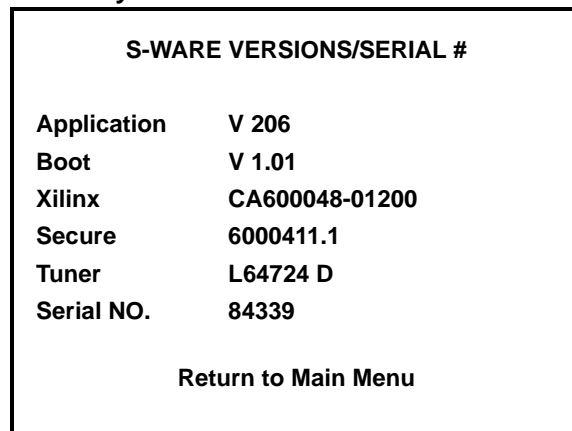
From the Main Menu screen:

1. Press the down arrow button until Software Version/Serial No. is highlighted.

Note: The Software Version/Serial No. screen is a Read Only screen.

2. Press the ENTER button to move to the S-WARE VERSIONS/SERIAL # screen. You may review the version identification fields on the simulated screen shown in **Figure 3.9** below.
3. Press ENTER to return to the Main Menu screen.

Figure 3.9: Unity 550 OSD Software Version/Serial No. Screen



Data PIDS Settings

Refer to **Table 3.3: Unity 550 Types of OSD Action Fields** on page 18 for updating specific fields

From the Main Menu screen:

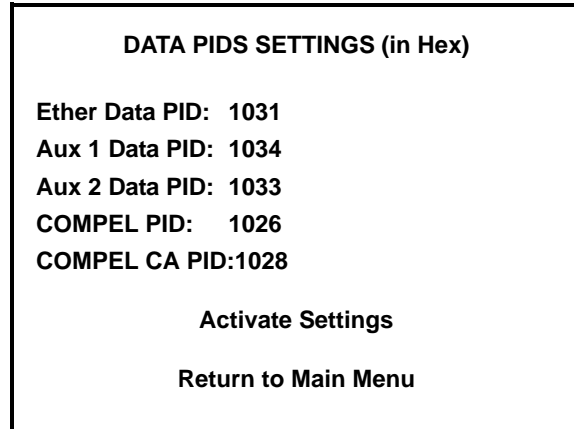
1. Press the down arrow button until Data PIDS Settings is highlighted.
2. Press the ENTER button to move to the DATA PIDS SETTINGS screen shown in **Figure 3.10** below.
3. Press the right arrow button to place the cursor on the field you wish to edit.
4. Press the up arrow to increase the highlighted value or the down arrow to decrease the highlighted value of the highlighted field.
5. Press ENTER to move to the next item or digit to be changed.

6. After completing all changes, Press ENTER to select Activate Settings.
7. Press ENTER to place the new settings in memory. This activates any changes you have made.

Note: If you exit without moving to the Activate Settings option and pressing ENTER, the unit will not retain the changes.

8. Press the down arrow button to move to Return To Main Menu.
9. Press ENTER to return to the Main Menu screen.

Figure 3.10: Unity 550 Data PIDS Settings Screen



Note: The screens in this section are samples only. The information on the actual screens will differ.

3.8 Universal European Single User LNB

Support for a Universal European LNB is a user-enabled feature. When this feature is enabled, and the IRD operator selects the Carrier Select OSD screen, the RF Polarization line will be present as a controlled menu item. (See **Carrier Select** on page 19, and the screen in **Figure 3.4**.)

RF Polarization provides for two modes of operation:

1. If you select the Vertical (14 V) mode, 14 Volts is supplied to the Universal LNB and Vertically polarized signals are processed by the LNB.
2. If you select the Horizontal (19 V) mode, 19 Volts is supplied to the Universal LNB and Horizontally polarized signals are processed by the LNB.

Note: The default mode of operation is Vertical (14 V).

The second feature of a Universal LNB is the reception of Low Band (10.70 to 11.70 GHz), and High Band (11.70 to 12.75 GHz) frequency bands. When the IRD is tuned to High Band, a 22 KHz signal is applied to the LNB. When the IRD is tuned to Low Band, the 22 KHz signal is removed from the LNB. For Low Band signals the LNB output frequency range is 950 to 1950 MHz, while for High Band signals the LNB output frequency range is 1100 to 2150 MHz.

CHAPTER 4 SEARCH FUNCTIONS

4.1 Perms/Temps/Searching & Settings

The term "settings" is used throughout this document and includes the following set of parameters:

Table 4.1: Settings Parameters for the Unity 550

Setting	Description
Carrier	The downlink frequency specified in MHz with up to two decimal places. This value's absolute difference with the LNB LO frequency must be as specified in main body of the Product Spec.
Data_rate	Data rate is specified in Mbps with up to three decimal places. See the main body of the Product Spec for the allowable range.
Fec_rate	The inner FEC code ratio can have one of the values specified in the main body of Product Spec.
Tag_site	The Carrier ID "tag" with a value range of 0 through 15. The tag is text representing the downlink carrier frequency in MHz. For multi-hop links, multiple tags are embedded in the control stream and the selected value must correspond to the particular downlink being received. Note: Tag site 15 is a special entry. It means "receive this carrier without requiring a matching carrier ID".
[program]	This is the Program number, the identifier for a Program within the received Transport stream. It must be a * wildcard or a number between 1 and 65535 inclusive. If the * wildcard is entered, the unit will select the first available program in a program table contained with the Transport stream.

The IRD is acting on one of three groups of settings at any given time, each of which is described in **Table 4.2**

Table 4.2: Unity 550 Settings Groups

Settings Group	Description
Temp	<p>These settings are entered via COMPEL or the TEMP / TEMPCH terminal commands. The unit is said to be inserting when it is configured to the temp settings. The maximum length of an insert is approximately 18 hours (65535 seconds). An insert terminates when:</p> <ol style="list-style-type: none"> 1. It times out, 2. An ABORT command is received, 3. Power is cycled, or 4. An invalid header is seen. <p>Any Temp commands received while the receiver is currently inserting are ignored. If a Perm command is received while inserting, the perm settings are updated but not acted on until the insert is terminated.</p>
Perm	<p>The perm settings are entered via COMPEL, the PERM / PERMCH terminal, or OSD Carrier Select screen, or automatically from within a search mode. (See below.) The perm settings are the only settings group that are stored in NVRAM.</p>
Search	<p>The search settings are active while in Carrier Search or Header Search modes. When the unit finds what it is looking for in the search mode, it copies the search settings to the perm settings. These are then considered to be the active settings. See Section 4.2 Settings Table (or Search Table).</p>

4.2 Settings Table (or Search Table)

This is an internal database retained in non-volatile memory (unaffected by loss of power). It contains a list of alternate carrier settings. Each valid entry is a complete description of a carrier/program setting (as used in a Perm command). This list is entered at customer request at the factory, and may be edited using **COMPEL** commands or ADDS and DELS terminal commands. The entries are referred to as "Table Entries" or "Search Settings Entries", etc.

The Settings Table is typically used for one of two possible operations. The first is for local users to quickly pre-program carrier/program combinations and tune the IRD to one of them. The second is as a source of alternate fallback carriers for times when the "normal" carrier is lost or has a failure in its **COMPEL** stream. The Carrier and Header Search IRD modes are examples of this second operation.

4.3 Acquisition Modes

The state diagram in **Figure 4.1** shows the transitions for each of the acquisition modes:

Note: [! means "not"].

Figure 4.1: Acquisition Modes

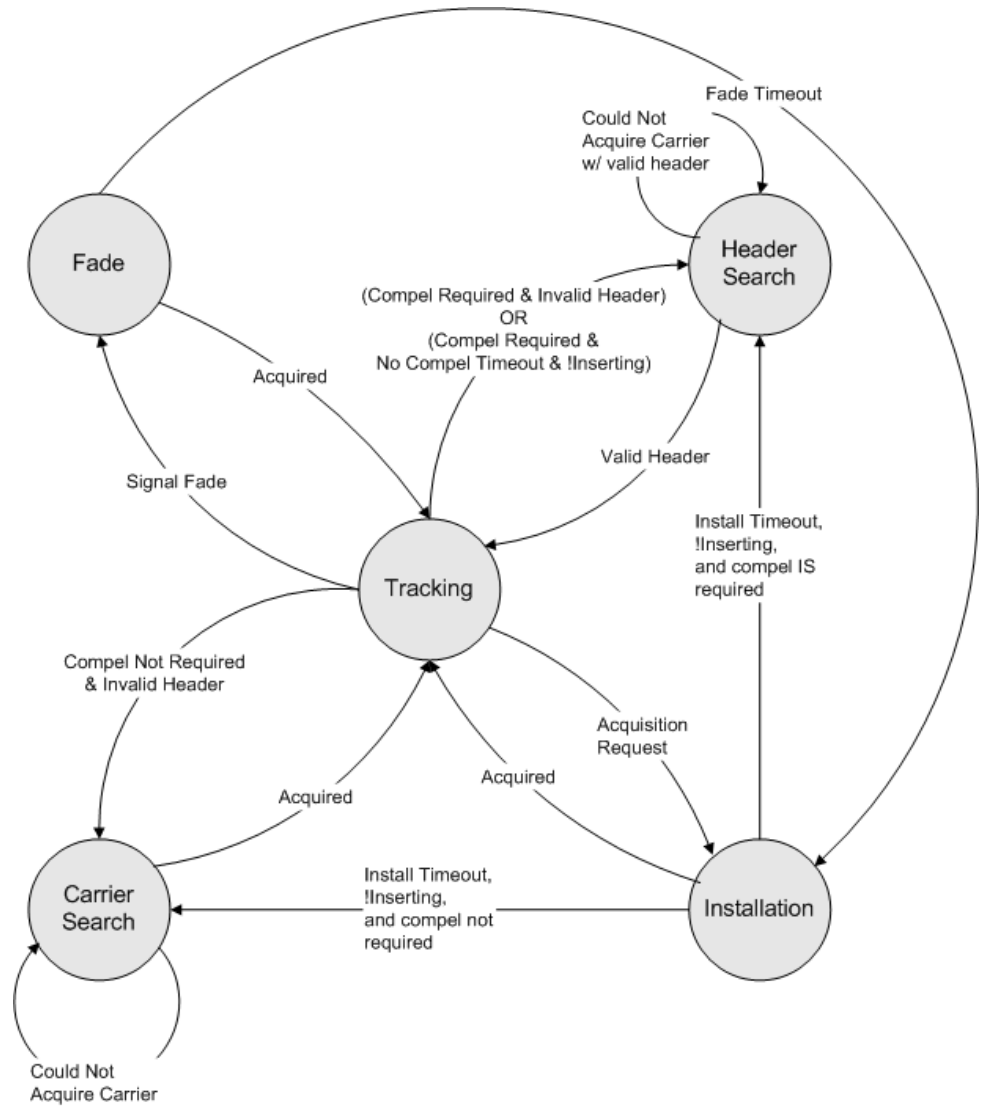


Table 4.3 describes the IRD's behavior for each of the acquisition modes and the defined timeouts. (See the SETTIMEOUT terminal command.)

Table 4.3: Acquisition Mode Behavior

Acquisition Mode	Description
Tracking	In Tracking Mode, the unit tracks (monitors) an acquired carrier. This is the only mode in which the unit can provide video, audio, and/or aux data. The unit will move to the Header Search mode if, (1) an invalid network header is detected in the COMPEL network stream, or (2) the time since the last valid network header was detected exceeds the No COMPEL Time-out (#4 in SETTIMEOUT command).
Fade	The purpose for this mode is to reacquire a faded carrier (caused by rain, sun-outs, etc.). The unit allows the receiver daughter-card to automatically reacquire the carrier on its own using a restricted search algorithm. This mode is vacated for the Installation mode after the Fade Timeout (#1 in SETTIMEOUT command).
Installation	While in Installation mode, the unit continually performs an installation-type acquisition on the requested carrier. Installation-type acquisitions cover a ~+/-2 MHz range, and should occur in under 30 seconds. This mode is generally used at power up and for all user-requested acquisitions. This mode is vacated for the Carrier Search mode after the Installation Timeout (#2 in the SETTIMEOUT command).
Carrier Search	While in Carrier Search mode, the IRD resorts to the Settings Table for finding a carrier. The IRD continually moves down the table performing one complete installation-type acquisition on each valid entry in the table, including the last-acquired and last-requested entries. Each individual search lasts one minute. After the last entry is searched, the unit repeats the search from the top of the table. This mode is vacated only if a carrier is successfully acquired, OR if a local user issues a tuning command. However, after expiration of the Carrier Search Timeout (#3 in the SETTIMEOUT command), if Local Control had been previously disabled, then it is re-enabled.
Header Search	The Header Search mode is identical to Carrier Search mode, except that the unit is looking for a carrier with valid COMPEL network headers present. If a carrier is encountered, the unit will wait the amount of time given by the Header Seek Timeout (#5 in the SETTIMEOUT command) before moving on to try other carriers in the Settings Table. This mode is vacated only if a carrier is successfully acquired and a valid header is received, OR if a local user issues a tuning command. However, after expiration of the Header Search Timeout (#6 in the SETTIMEOUT command), if Local Control had been previously disabled, then it is re-enabled.

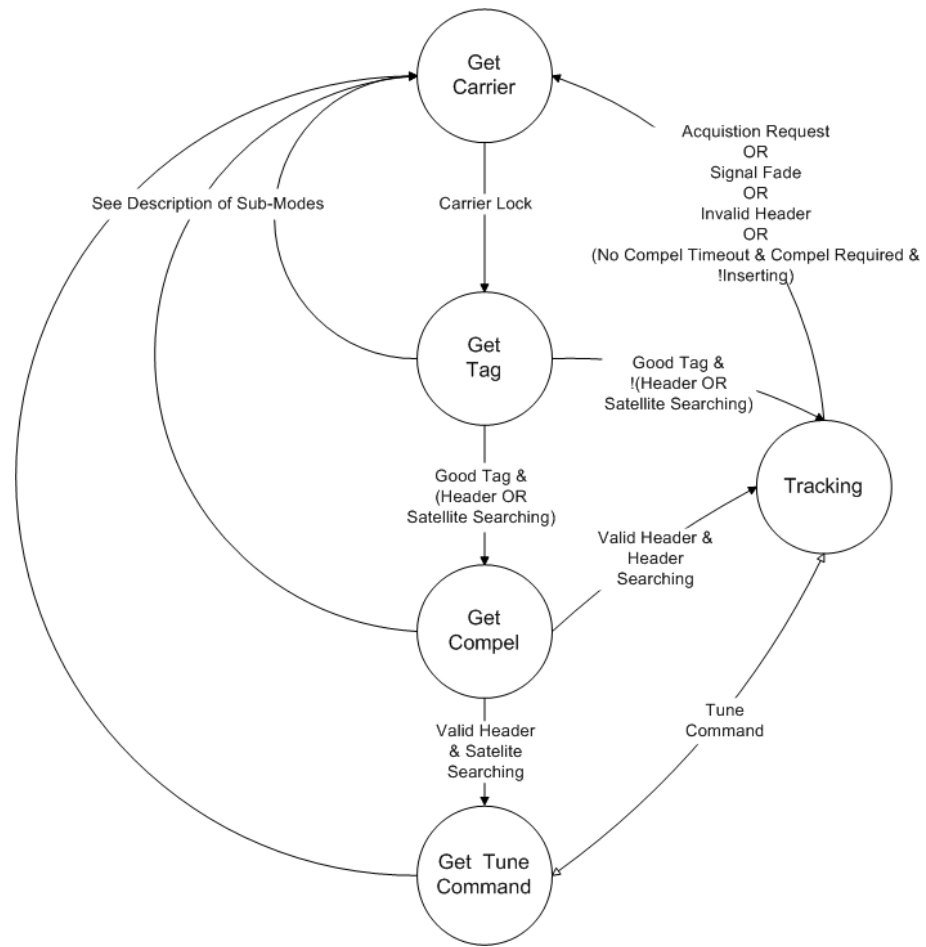
4.4 Acquisition Sub-Modes

The state diagram in **Figure 4.2** shows the transitions for each of the acquisition sub-modes within the acquisition modes.

Note: [! means "not"].

Note: "Satellite Searching" is obsolete and should be considered always true in the logic shown.

Figure 4.2: Acquisition Sub-Modes



4.5 Signal Quality Monitoring

The IRD provides the following signal quality information while tracking a carrier only:

Table 4.4: Signal Quality Information

Parameter	Description
Eb/No	<p>These are internal estimates* of normalized received signal-to-noise ratio. The "quick" Eb/No is updated approximately every 500 mS, and the average is a running 10-second average of these quick estimates. The Eb/No alarm is generated when the average Eb/No is found to be lower than the SNR Alarm Level. A Margin warning is generated when the average Eb/No is not yet low enough to be in full alarm, but it fails to exceed that alarm threshold by the Margin Offset (in dB).</p> <p>* The accuracy of these estimates is affected by any of a number of cumulative link imperfections, such as converter-LO phase jitter, amplitude/group delay distortion, and external impedance mismatches. Also, at high signal-to-noise ratios, the accuracy of the estimate is reduced. [This is why the estimate will "top out" as > xx dB at a high enough ratio.] Because of differing sensitivities to these imperfections, the user may expect different IRDs to show diverging estimates, especially as the Eb/No gets higher.</p>
RF Level	<p>Unit will show WARNING if the RF level is detected to be above -20 dBm or below -60 dBm.</p> <p>Note: This is not to be confused with the Signal Strength OSD screen. (See Signal Strength on page 20 and Figure 3.6 on page 20)</p>
Signal Fades	A counter is maintained for the transitions from Tracking mode to Fade mode.
RF Glitches	A counter is maintained for carrier "hits". A "hit" is when the receiver board detects one or more uncorrectable Reed-Solomon frames, yet small enough not to cause a transition from Tracking to Fade mode. Note that an RF hit will induce a hit on the unit's video/audio.
Availability	Shows the percentage of time that the unit has been locked on a carrier since that carrier was first acquired (timer.locked / timer.since_first_acquired).

4.6 Frequency Tagging

General Rules

Under normal operation, the IRD can only acquire carriers that contain frequency tags. These tags are inserted in the **COMPEL** control stream at the uplink and identify the carrier's frequency. Tagging was mandated so IRDs will not lock on an adjacent carrier while looking for the intended one. Traditionally, these tags have been sent at a rate of every 100 or 125 mS. The IRD supports both single and multiple tags. The "tag site", which is part of the settings, tells the receiver which of the possible tags to use (for multi-hop carriers). This IRD allows for Tag Site designations from 0 to 15 inclusive, with 15 specially reserved to mean "do not require a valid ID tag to lock on this carrier". To reduce processing overhead, the unit only looks for tags while it in the Get Tag sub-mode.

CHAPTER 5 CUSTOMER SERVICE

5.1 Warranty

The following warranty applies to all **Wegener Communications** products including the **Unity 550**:

All **Wegener Communications** products are warranted against defective materials and workmanship for a period of one year after shipment to customer. **Wegener Communications'** obligation under this warranty is limited to repairing or, at **Wegener Communications'** option, replacing parts, subassemblies, or entire assemblies. **Wegener Communications** shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are no other warranties, express or implied, except as stated herein.

5.2 Technical Support

If the unit should fail to perform as described, if you need help resolving problems with your **Unity 550**, or for questions about obtaining service for your **Unity 550**, please contact **Wegener Communications Customer Service** at (770) 814-4057, Fax (678) 624-0294, or e-mail service@wegener.com.

To return a product for service:

1. Obtain a **Return Material Authorization (RMA)** number by completing and faxing a copy of the **RMA Request Form** to (678) 624-0294. Or you may e-mail the same information to: service@wegener.com.
2. To help us identify and control returned units, plainly write the RMA number on the outside of the product-shipping container. This will help us return your unit to you as quickly as possible.
3. Return the product, freight prepaid, to the address below:

Service Department RMA# _____
Wegener Communications, Inc.
359 Curie Drive
Alpharetta, GA 30005

Note: All returned material must be shipped freight prepaid. C.O.D. shipments will not be accepted.

APPENDIX A: TERMINAL/MODEM MODE

Terminal/Modem Commands

Commands listed in this section detail command syntax and action taken. Commands consist of a command field and a parameter field. Each command field and parameter field is separated from others by a space. Optional parameters are indicated by square brackets, [], and conditional parameters are indicated by braces, { }.

For example, COMMAND_NAME parameter1 {parameter2} [parameter3] indicates that parameter1 must be entered, parameter2 entered only when a certain condition is met (certain option is installed, etc.), and parameter3 is optional. Both commands and parameters may be entered in upper or lower case; the interface is not case-sensitive.

Incorrect or incomplete commands result in Invalid Command responses being displayed at the terminal. Parameter errors on User commands generate Invalid parameter name responses, where parameter name is the name of the incorrectly entered parameter.

Network-Enabled Local Control Commands

These commands are allowed only if local control is enabled and are listed in **Table A.1** below. Commands that are always functional are discussed in **Local Control Commands** on page 35 and listed in **Table A.2**.

Table A.1: Unity 550 Network-Enabled Local Control Commands

ABORT
Insert is terminated. See TEMP command.
ADDS location settings
location: Value from 1 - 48 indicating location in settings_table.
settings: See Section 4.1 Perms/Temps/Searching & Settings on page 25
The settings are added to the settings_table at the specified location. Will also handle data rate rounding as explained for PERM.
AUXDATA [PID] [baud] [parity]
PID: Selects the PID (in hex) for the Transport packets carrying the desired data stream. Must be 20 to 1FFE inclusive.
baud: Selects the baud rate of the async data stream. Normally 19200.
parity: Sets the parity for the data output. Normally None.
Sets up the Aux Data serial port device.
DELS location
location: Value from 1 to 48 indicating location in the settings_table.
The entry in the settings_table at the specified location is deleted. The command is ignored if the settings_table contains only one entry.
MUTE [source][source]

<p>source: If no source is specified then video and all audio outputs are selected. Source can be any of the following:</p>
<p>V Indicates Video.</p>
<p>A[/string] Indicates Audio. An A alone indicates all audio outputs.</p>
<p>L mutes the left channel and R mutes the right.</p>
<p>Mutes the specified outputs. Example: MUTE V A1L A2, mutes the Video, Audio Port 1 left, Ports 2 left and right.</p>
<p>PERM settings</p>
<p>settings: See Section 4.1 Perms/Temps/Searching & Settings on page 25, Perms/Temps/Searching & Settings.</p>
<p>Unit sets its Perm settings to settings. See Section 4.1 Perms/Temps/Searching & Settings on page 25 for more information.</p>
<p>PERMCH location</p>
<p>location: Value from 1 to 48 indicating location in the Settings Table.</p>
<p>Unit sets its Perm settings to those retrieved from the Settings Table according to location. See Section 4.2 Settings Table (or Search Table) on page 26.</p>
<p>SETAUDIO port route [program] [atten]</p>
<p>port: Values of 1 to 6, indicating an audio port.</p>
<p>route:</p> <ul style="list-style-type: none"> S - Stereo (Left and Right components routed as connected at original MPEG encoder) 1 - Original Left component to both L and R outputs 2 - Original Right component to both L and R outputs R - Reverse stereo (reverse of Stereo above)
<p>[program]: Can be a three character name or an *. If the 3-character name is specified, the unit will route the audio program with the specified name to the port. If '*' is specified, the unit will default to the first audio program that is not routed to another port.</p>
<p>[atten] Must be a numeric value between 0 and 14 inclusive. This programs the net audio attenuation, where 0 gives 0dB attenuation (maximum level). If field is omitted, attenuation remains unchanged on that audio port.</p>
<p>The audio program is routed to the audio port's audio switch, and its components are routed to the Left and Right outputs according to route. That port's attenuation is changed to atten if that parameter is supplied.</p>
<p>SETTIMEOUT source time</p>

source:	
	<ul style="list-style-type: none"> 1 - Fade 2 - Installation 3 - Carrier Search 4 - No COMPEL 5 - (No COMPEL) Header Seek 6 - (No COMPEL) Header Search
time:	Time-out value in HH:MM:SS format. Minimum value is 00:00:00 and maximum value is 00:00:30 for Fade and 4660:20:15 for all others.
Timeout.source is set to time. See Section 4.3 Acquisition Modes on page 26 for an explanation of timeouts.	
SNR alarm_level margin_offset	
alarm_level:	Units in dB with range from 2.0 to 7.0, with one decimal place.
margin_offset:	Units in dB with range from 1.0 (with one decimal place) to difference between 12.0 and alarm_level.
Note: The sum of alarm_level and margin_level cannot exceed 12.0	
Sets SNR Alarm Level and Margin Offset accordingly.	
TEMP settings time	
settings:	See Section 4.1 Perms/Temps/Searching & Settings on page 25.
time:	Length of insert in HH:MM:SS format. Valid range is 00:00:00 to 18:00:00.
Does temporary insert as described in Table 4.2: Unity 550 Settings Groups on page 26. Unit sets its Temp settings to settings.	
TEMPCH location time	
location:	Values from 1 to 48, indicating location in the settings table.
time:	Same as for TEMP command.
Unit sets its Temp settings to those retrieved from the settings table according to location. See the TEMP command.	
UNMUTE [source][source]	
source:	Same as the MUTE command.
Identical to MUTE command, except that specified services are unmuted.	

Local Control Commands Local control commands that are always functional at the **Unity 550** Terminal are listed in **Table A.2**. Commands allowed only if local control is enabled by the **COMPEL** network and are listed in **Table A.1** above.

Table A.2: Unity 550 Local Control Commands

H [command]
command: Any of the terminal command names (H, R, TEMP, etc.).
If an H or any invalid command beginning with an H is entered and the command parameter is omitted, the whole Help screen will be displayed, displaying the list of all currently available commands and a brief description of each one. If an H or any invalid command beginning with an ' H is entered and the command parameter is a valid User Command Name, then detailed help for the specified command is displayed.
PC device baud
device: P for Printer or M for Modem.
baud: 9600 or 19200 for Modem; 1200, 2400, 4800, 9600, or 19200 for Printer; 1200, 2400, 4800, 9600, or 19200 for Aux Data
parity: O, E, or N, configurable for Printer or Aux Data devices ONLY. Modem is always N.
Configures any device other than the Terminal. See Serial Port Select on page 20 for details.
PW (password):
password: One to six alpha-numeric characters.
Changes the Modem password to the specified password.
R type [page]
type: Indicates the type of report as follows: <ul style="list-style-type: none"> C - Carrier Status P - Parameters G - Group Status NC - Network Controller Status M - MPEG S - Settings Status S - Settings Table SP - Serial Port Configuration
[page]: This option can have a value of 1 to 8 and is only applicable for the Group Status Report. Indicates the page to be reported. If omitted, all eight pages are reported and scroll off the terminal screen.
SETLNB port LO_freq
port: The number of the port can be from 1 to 4. Note: If no RF Switch is installed, 1 must be used as the port number.
LO_freq: This value represents the LNB LO frequency in MHz. It can have up to two decimal places and its valid range is from 0 to 14000.00.
Sets the assumed LNB LO frequency to the value entered in MHz.

Reports

This section lists the reports generated by the terminal commands, shows the options or origins of the reports, and gives examples of each report.

Carrier Status (Tracking)

Figure A.1: Sample Unity 550 Carrier Status (Tracking) Report

CARRIER STATUS	
Acquisition Mode:	TRACKING
Carrier:	12000.11 MHz
Data Rate:	1.536 Mbps
FEC Rate:	1/2
RF Level:	OK
Eb/No Level:	GOOD
Status in Last 10 Seconds	
Average Margin:	2 dB
Average Eb/No:	4 dB
Status Since Last Acquired	
Time:	08
45:	22
Best Eb/No:	5 dB
Worst Eb/No:	2 dB
Status Since First Acquired	
Time Since First Acquired:	899:35:15
Availability:	100.00%
Fades:	3
Glitches:	1

Table A.3: Terms Used in Unity 550 Carrier Status (Tracking) Reports

Term	Definition/Description
Acquisition Mode	Always shows TRACKING.
Carrier	freq_string (active_settings.carrier)
Data Rate	data_rate_string (active_settings.data_rate)
FEC Rate	active_settings.fec_rate
Tag Site	Current Tag Site
Program #	Current Program Number
RF Status	(Level) HIGH, LOW, or OK.
Eb/No Level	GOOD, MARGINAL, or ALARMING., showing state of rx.ebno_level
Status In Last 10 Seconds	10-second history. History is cleared when active_settings.carrier is changed.
Average Margin	Average Eb/No margin. See Section 4.5 Signal Quality Monitoring on page 29.
Average Eb/No	Averageebno_level over last 10 seconds. See Section 4.5 Signal Quality Monitoring on page 29.
Status Since Last Acquired	Status since carrier was last acquired.
Time Since Last Acquired	time_string (timer.acq_mode)
Best Eb/No	Best Eb/No level since last acquisition. See Section 4.5 Signal Quality Monitoring on page 29.
Worst Eb/No	Worst Eb/No level since last acquisition. See Section 4.5 Signal Quality Monitoring on page 29.
Status Since First Acquired	Status history since tracking mode first entered for active_settings.carrier.
Time Since First Acquired	time_string (timer.first_acquired).
Availability	0.00 % to 100.00%. timer.tracking_current divided by timer.first_acquired.

**Carrier Status
(Not Tracking)**

Figure A.2: Sample Unity 550 Carrier Status (Not Tracking) Report

CARRIER STATUS	
Acquisition Mode	FADE
RF In: (Shown if RF Switch is installed)	2
Carrier	12000.11 MHz
Data Rate	1.536 Mbps
FEC Rate	1/2
Tag Site	3
Program:	2
Time in Current Mode:	00:00:30
Acquisition Submode:	GET CARRIER
Time in Current Submode:	00:00:30
Acquisition Difficulties	2 dB
No Tag	12
Wrong Tag:	3 / 12000.00 MHz
Wrong Header	23
Bypassing Tag	

Table A.4: Terms Used in Unity 550 Carrier Status (Not Tracking) Reports

Term	Possible Output or Register Source
Acquisition Mode	FADE, INSTALLATION, CARRIER SEARCH, or HEADER SEARCH. State of acq.mode
RF In	If RF Switch is installed, the current setting. Otherwise not shown.
Carrier	freq_string (active_settings.carrier)
Data Rate	data_rate_string (active_settings.data_rate)
FEC Rate	Active_settings.fec_rate
Tag Site	Current Tag Site
Program	Active_setting program
Time In Current Mode	time_string (timer.acq_mode)
Acquisition Sub-Mode	GET CARRIER, GET MPEG, GET TAG, or GET COMPEL. State of acq.sub_mode.

Term	Possible Output or Register Source
Acquisition Difficulties	None is shown if all of the following four counters are zero. If the counters are not zero, they provide the following information:
No Tag*	Number of times unit timed out in Get Tag sub-mode and was still tracking.
Wrong Tag*	Number of times unit has seen a wrong tag in Get Tag sub-mode, and the last Tag's value.
Wrong Header*	Number of times unit has seen an invalid header in Get COMPEL sub-mode.
Bypassing Tag*	Only shown if bypassing tags.

Note: * These counters are cleared each time the unit enters Tracking mode.

Parameters

Figure A.3: Sample Unity 550 Parameters Report

PARAMETERS	
LNB LO	10750.00 MHz
SNR	
Margin Offset	2.0 dB
Alarm Level	5.0 dB
Video Mute Type	BLACK
Time-outs	
Fade	00:05:00
Install	01:00:00
Carrier Search	48:00:00
No COMPEL	01:00:00
COMPEL Seek	00:30:00
Header Search	48:00:00
Options	
Encryption:	INSTALLED
RF Switch:	NOT INSTALLED
Ethernet	NOT INSTALLED

Table A.5: Terms Used in Unity 550 Parameters Reports

Term	Possible Output or Register Source
LNB LO	freq_string (lnb_lo_freq[0]) {Blank if RF switch is installed.}
Margin Offset	Value of snr.margin_offset shown in dB with one decimal place.
Alarm Level	Value of snr.alarm_level shown in dB with one decimal place.
Video Mute Type	Video_mute_type
Fade	Fade timeout *
Install	Install timeout *
Carrier Search	Carrier Search timeout *
No COMPEL	No COMPEL timeout *
COMPEL Seek	COMPEL seek timeout *
Header Search	Header search timeout *
Encryption	INSTALLED or NOT INSTALLED.

Note: See **Section 3.2 LED Status and Alarm/Warning Conditions** on page 14 for further explanation.

Group Status

Figure A.4: Sample Unity 550 Group Status Report

GROUP STATUS																
Group Page: 2847																
Group Table:																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		X								X						
1																
2							X									
.																
.																
F	X															
							.									
							.									
							.									
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
270		X														

Table A.6: Terms Used in U550 Group Status Reports

Element	Description
Group Page	group.page_number
Group Table	group.table displayed in pages. Page 1 shows membership for groups 0 - 0xFF, Page 2 for groups 0X100 - 0X1FF, The last page shows groups 0x2700 - 0x270F. The X indicates a bit being set in the table, reflecting membership in the group corresponding to the number of the bit.

Note: This report may require up to 40 pages.

**Network
Controller
Status**

Figure A.5: Sample Unity 550 Parameters Report

```

NETWORK CONTROLLER STATUS

Delaying                00:00:32

Fixed

. Serial #              000101
. COMPEL Control        REQUIRED

Variable

. Lock                  UNLOCKED
. Local Control         ENABLED
. Network Mode          PROTECTED
. Last Header           00:00:05
. Last Addr Header      00:04:48

COMPEL Processing History

. Amount of History     383:35:11
. Total Processed       79848
. Invalid Headers       2
. Invalid Checksum      2
. Invalid Length        1
. Buffer Overflow        1
. Syntax Error          2
    
```

Table A.7: Terms Used in Unity 550 Network Control Status Reports

Term	Description
Delaying	time_string (timer.delay_remaining) {if non-zero}
Serial #	All six digits of Serial_number.
COMPEL Control	REQUIRED or NOT REQUIRED. State of COMPEL_required.
Lock	LOCKED or UNLOCKED. State of COMPEL.locked.
Local Control	ENABLED or DISABLED. State of local_control.
Network Mode	SHARED or PROTECTED. State of COMPEL.network_mode.
Last header	time_string (timer.last_header)

Term	Description
Last addr header	time_string (timer.last_addr_header)
Amount of History	time_string (timer.powered_up)
Total Processed	COMPEL_stats.processed.
Invalid Headers	COMPEL_stats.headers. {if non-zero and technical version}
Invalid Checksum	COMPEL_stats.checksum. {if non-zero and technical version}
Invalid Length	COMPEL_stats.length. {if non-zero and technical version}
Buffer Overflow	COMPEL_stats.buffer. {if non-zero and technical version}
Syntax Error	COMPEL_stats.syntax. {if non-zero and technical version}

MPEG Status

Figure A.6: Sample Unity 550 MPEG Status Report

MPEG STATUS			
Aggregate MPEG:	Transport stream at 10.000 Mbps		
Available Programs:	00001, 00002		
Video			
Presence:	NTSC		
Settings:	ALARM MUTED, COMMAND MUTED		
Audio Presence:	A01, ENG, SPA, FRE,, ITA, SP2, E3		
Audio Port Assignments: / Status:			
Program	ATTEN	Routing	Left Right
A01(PRI)		10 dB	STEREO
ALARM/CMD MUTE		ALARM MUTE	

Table A.8: Terms Used in Unity 550 MPEG Status Reports

Term	Description
Aggregate MPEG	If MPEG stream is present, shows Transport stream at data_rate in Mbps, obtained from active_settings. If MPEG stream is NOT present, shows Not Available.
Available Programs	Program numbers of available programs if MPEG stream is present
Video	
Presence	NTSC, Not Authorized, or Not Present.
Settings	NORMAL if both video.alarm_state and video.cmd_state are unmuted, Otherwise, any non-muted states will be shown.
Audio Presence	Shows 3-character designator for each audio program contained within the current program, if MPEG stream is present.
Audio Port	Only one audio port is possible in the.
Program	The audio program that was specified for the audio port. If the unit automatically picks the audio program, the chosen program will be shown in ().
Routing	The value in audio.port.route. Can be STEREO, 1 ON BOTH (meaning Left to both), 2 ON BOTH (meaning Right to both), or REVERSE.
Left/Right	The status of the port's individual audio component outputs. Can be -, CMD, ALARM, or ALARM&CMD depending on states of audio.output.cmd_muted and audio.outputs.alarm_muted.

Settings Status

Figure A.7: Sample Unity 550 Settings Status Report

SETTINGS STATUS			
	TEMP	PERM	SEARCH
	(00:18:53)		
Carrier:	12000.11	12000.11	-
Data Rate:	1.536	10.000	-
FEC Rate:	3/5	3/5	-
Tag Site:	0	2	-
Program:	* (EAST)	*	-
MESSAGE			

Table A.9: Terms Used in Unity 550 Settings Status Reports

Term	Description
TEMP	The temp_settings, w/ time_string(timer.insert_remaining is shown at top. {-s are shown and time is left blank when not inserting}.
PERM	The perm_settings.
SEARCH	The search_settings. {-s are shown if not searching}.
Carrier	Downlink carrier frequency in MHz.
Data Rate	Transport data rate in Mbps.
FEC Rate	Any of the supported FEC ratios (inner FEC)
Tag Site	0-15. See Section 4.6 Frequency Tagging on page 30.
Program	Selected program. If selected program is *, then actual program identifier is shown, if available. Otherwise, Program # is shown.
MESSAGE	If the current condition indicated on the LED is a Boot Fail, Alarm, or Warning condition, this line will contain a brief description of that condition. Boot Fail and Alarm descriptors will be identical to those used on OSD for alarm-muted video.

Settings Table Screen breaks are supplied to break this report into three separate screens. If unit is NOT configured for search table labels it will appear as shown in **Figure A.8**.

If the unit IS configured for labels, the table will be limited to 26 entries, and the label will be shown in an additional column. See the example in **Figure A.9**.

Figure A.8: Sample Unity 550 Settings Table Report (Without Labels)

SETTINGS TABLE					
Perm	Data Carrier	FEC Rate	Tag Rate	Site	Program
1)	12000.00	1.536	1/2	1	*
2)	12000.11	4.608	7/8	2	2
3)	-	-	2/3	1	4
4)	-	-	-	-	-
5)	-	-	-	-	-
6)	-	-	-	-	-
7)	-	-	-	-	-
8)	-	-	-	-	-
9)	-	-	-	-	-
10)	13100.00	9.984	5/6	0	1
11)	13200.00	38.000	7/8	0	*
12)	4060.00	10.400	2/3	1	*
13)	-	-	-	-	-

14)	-	-	-	-	-
15)	-	-	-	-	-
16)	12000.00	1.536	1/2	1	*
17)	12000.11	4.608	7/8	2	2
18)	10111.10	3.072	2/3	1	2
19)	-	-	-	-	-
20)	-	-	-	-	-
21)	-	-	-	-	-
22)	-	-	-	-	-
23)	-	-	-	-	-
24)	-	-	-	-	-
25)	13100.00	9.800	5/6	0	5
26)	13200.00	5.940	7/8	0	*
27)	13300.00	35.000	2/3	1	*
28)	-	-	-	-	-
29)	-	-	-	-	-
30)	-	-	-	-	-
31)	12000.11	4.608	7/8	2	7
32)	10511.10	3.072	2/3	1	1
33)	-	-	-	-	-
34)	-	-	-	-	-
35)	-	-	-	-	-
36)	-	-	-	-	-
37)	-	-	-	-	-
38)	-	-	-	-	-
39)	13200.00	25.000	5/6	0	2
40)	3800.00	41.470	3/4	0	*
41)	13300.00	9.600	2/3	1	*
42)	-	-	-	-	-
43)	-	-	-	-	-
44)	-	-	-	-	-
45)	-	-	-	-	-
46)	-	-	-	-	-
47)	-	-	-	-	-

48)	-	-	-	-	-
ACQ.	13200.00	20.000	7/8	9	*

Figure A.9: Sample Unity 550 Settings Table Report (With Labels)

SETTINGS TABLE						
Perm	Label 1	Data Carrier	FEC Rate	Tag Rate	Site	Program
1)	LABEL 1	12000.00	1.536	1/2	1	*
2)		12000.11	4.608	7/8	2	2
3)		-	-	2/3	1	4
4)		-	-	-	-	-
5)		-	-	-	-	-

Table A.10: Terms Used in Unity 550 Settings Table Reports

Term	Description
1) - 48)	Settings Table location.
PERM	Last requested settings, which is the current perm setting.
ACQ.	Last acquired settings.
Carrier	freq_string (carrier)
Data Rate	data_rate_string (data_rate)
FEC Rate	Any of the supported inner FEC rates.
Tag Site	0-15. See Section 4.6 Frequency Tagging on page 30.
Program	Number, string, or *.

APPENDIX B: RMA REQUEST FORM

Return Materials Authorization Request Form

Figure B.1: RMA Request Form

E-mail: service@wegener.com		Fax: (678) 624-0294	
Company Name:	_____		
Bill-To Address:	_____ _____ _____		
Ship-To Address:	_____ _____ _____		
Contact Name:	_____		
Phone #	() - _____	Fax #:	() - _____
Complete Model #:	_____		
Serial #:	_____		
In Warranty:	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
Problem:	_____ _____ _____ _____		
Additional Comments:	_____ _____ _____ _____		

<http://www.wegener.com/custservrma.htm>

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