

Installation Guide
Model DVR395/DVR396
DIGITAL VIDEO RECEIVER

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When ordering parts from Wegener Communications, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

In all correspondence with Wegener Communications, Inc., regarding this publication, please refer to DVR395/DVR396-002E.

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CAUTION

As this unit is intended to interface with other electrical/electronic systems, proper engineering practices must be adhered to during installation and check-out.

All AC power and ground must be installed in accordance with National Electric Code Standards as to conductor size and limitations (see NFPA 70, articles 200-280, as amended, if required), and lightning protection must be provided.

All RF interconnections must be properly shielded to prevent ingress or egression of potential interfering sources to existing services.

Any damage to this unit caused by improper wiring/interconnections will void any warranty extended.

WARRANTY

The following warranty applies to all Wegener Communications products.

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.

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ABOUT THIS MANUAL

This manual was composed in Microsoft Word 97, and is configured to be used most easily as an electronic document. It can be printed and used as a hard copy, but some features, such as links, are not accessible in that mode.

If viewing the electronic version, we recommend you safeguard the original to avoid the effects of somehow altering your master copy.

1. Cross-references

Cross-references are internally linked for easy access. If you are viewing the electronic version of this manual, and see text that is blue and underlined, such as ([TABLE OF CONTENTS](#)) you can “click” your mouse on that text and “link” to that section.

When you are ready to return to the previous section, “click” on the web toolbar “back” arrow and return. The web toolbar should appear automatically when you use a link, but if it does not you can invoke it from *Toolbars* on the *View* menu.

Because many users will print the manual, we have also included the page numbers for most links.

2. Table of Contents

You can also link from the Table of Contents to any listed page. This also applies to the List of Tables and List of Illustrations. Just “click” on the **page number** for any section, table, etc., you want to move to. Return to the Table of Contents as in Number 1 above.

3. Other Viewing Methods

In the electronic Word version, there are several methods of moving about a document. “Clicking” *Document Map* or *Online Layout* on the *View* menu will open a window showing the document outline. This is similar to the Table of Contents, and will allow you to move about the document by “clicking” on a section. It has the advantage of not going away when you move to another section. It also has the disadvantage of taking up screen space when it is open.

Another way to better view the document is to “click” on the “Up arrow” icon on the Web Toolbar. This will minimize many of the toolbars, freeing most of the screen for viewing the manual. “Click” the arrow again to restore the toolbars.

4. Wegener Communications, Inc. Web Site.

This manual and others may be accessed on the Wegener Communications Web Site at <http://www.wegener.com/>. Once on the site, go to the appropriate product, access the manual, and read, print, or download it.

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SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

This section contains instructions for connecting the Model DVR395/DVR396 Digital Video Receiver into a satellite receive system, and operating it in that mode.

1.2 UNPACKING AND INSPECTION

Carefully unpack the unit and inspect it for obvious signs of physical damage, which might have occurred during shipment. Any damage claims must be reported to the carrier immediately. Be sure to check packing materials carefully for important documents and materials. Please contact Wegener Communications Customer Service Department with questions at (770) 814-4057 or fax (770) 232-0621. See Section [1.6](#) (Page 16) for more Technical Support assistance.

*** * * WARNING * * ***

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

1.3 PHYSICAL ENVIRONMENT

To avoid damage to this and other equipment, or personal injury, the following items should be strictly observed.

1.3.1 DVR395 Desktop Version

The DVR395 Receiver may be installed on any reasonably level surface located in a clean, dry environment. Avoid locations subject to severe vibration or jarring impacts. The unit will meet the full 10 to 40°C operating temperature specification only if adequate ventilation is provided. Set it on a hard surface so that the mounting feet can maintain clearance under the unit. Avoid stacking objects or equipment against or on top of the unit where the vent holes would be blocked.

1.3.2 DVR395 Rack-Mounting Version

Mount the DVR395 Receiver in a standard EIA 19-inch (48.3 Cm) equipment rack located in a clean, dry environment. Attach the front mounting ears at all four mounting points and do not stack any other equipment on the receiver. Check that the total rack current consumption is within the limits of the AC branch circuit and that a reliable earth safety ground is maintained. The unit will meet the full 10 to 40°C operating temperature specification only if adequate ventilation is provided. This requirement is easily met if the installer leaves one empty 1-3/4-inch (4.4 Cm) rack-unit space between units (50% rack utilization). Forced air is usually not

required if the room is cool (<75°F). For higher rack mounting densities, forced-air rack ventilation is strongly recommended. Please note the average per-unit power dissipation of 45 watts (@ max LNB DC current loading) and plan accordingly.

Table 1. Equipment Specifications

Parameter	Specification
Input Rating	115/230 VAC, 0.8/0.5A, 50/60Hz
Operating Temperature Range	5° - 40° 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

1.3.3 Elevated Operating Ambient

If equipment is installed in a closed or multi-unit rack assembly, the operating ambient of the rack may be greater than the room ambient. Therefore, considerations should be given to the TMRA, or Temperature inside the Mounting Rack, and not just inside the room.

1.3.4 Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

1.3.5 Mechanical Loading

Mounting of equipment in a rack should be such that a hazardous condition is not achieved due to uneven loading

1.3.6 Circuit Overloading

Consideration should be given to connection of the equipment to the supply circuit and the effect that overloading of circuits could have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

1.3.7 Reliable Earthing

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).

1.4 REAR PANEL CONNECTIONS

The DVR395 rear panel connections are shown and described in [Figure 2](#) (Page13).

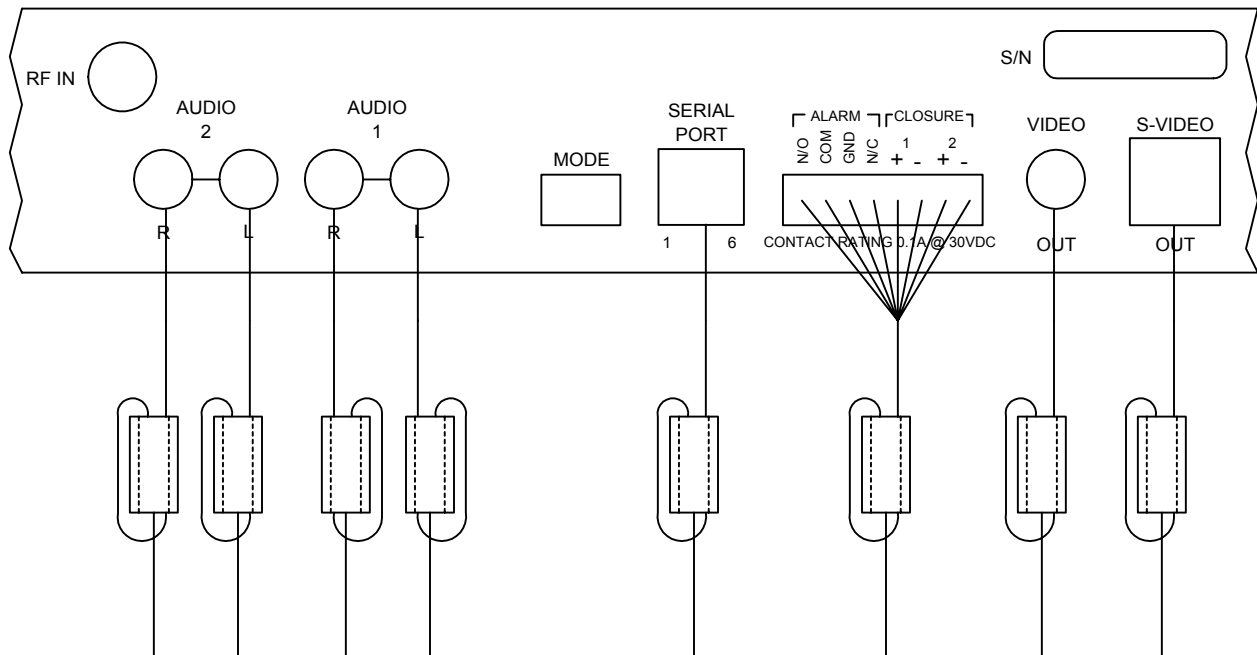


Figure 1. Ferrite Bead Installation For DVR396

1.4.1 Ferrite Cores And Their Installation

In order to meet FCC requirements for Radiated Emissions, this unit must have Ferrites installed on certain cables. Failure to install these cores may allow interference with other equipment, resulting in degraded audio and/or video signals. Eight ferrite cores have been shipped with the unit, and should be installed per the following instructions.

As a basic rule, all cables or wires to any one connector are looped through one ferrite. This is particularly important to the relay outputs (See [Figure 1](#) (Page 11)).

1.4.1.1 Types Of Ferrites

There are two different types of ferrites included with the unit – three large and 5 smaller ones. Both types are made to clamp on a loop of the cable(s) and minimize electronic signals being radiated from the cable.

This is necessary because cables carrying electronic signals often act as broadcast antenna, sending “Radio” signals to other cables, which can “Receive” them and inject them into other units’ signals, causing interference with the other signals. To reduce this as much as possible, all

installations, but especially in multi-service environments, should use high-quality shielded cables, with the shield grounded according to good engineering standards.

1.4.1.2 Ferrite Installation

For this installation, there are three ferrites that are larger than the others. These should be used for the cables numbered [6](#), [7](#), and [8](#) in the list below. These are the relay cables, the video cable, and the S-Video cable. The other five cables will normally have a smaller total diameter, and should fit into the smaller ferrites.

These ferrites must be installed on cables attached to the following connectors:

<u>Connector</u>	<u>Ferrite Size</u>
1. Audio 1 Left	Small
2. Audio 1 Right	Small
3. Audio 2 Left	Small
4. Audio 2 Right	Small
5. Serial Port	Small
6. Alarm and Closure Relays. One ferrite for all wires to relays.	Large
7. Video	Large
8. S-Video	Large

The cables must pass through the ferrite and then loop around and pass through again. See [Figure 1](#) (Page 11). For proper results, the core should be positioned on the cable as close to the chassis connector as possible. With minimal slack in the loop, the wiring alone should properly support the core. No additional support should be necessary.

Figure 2. DVR395 Rear Panel

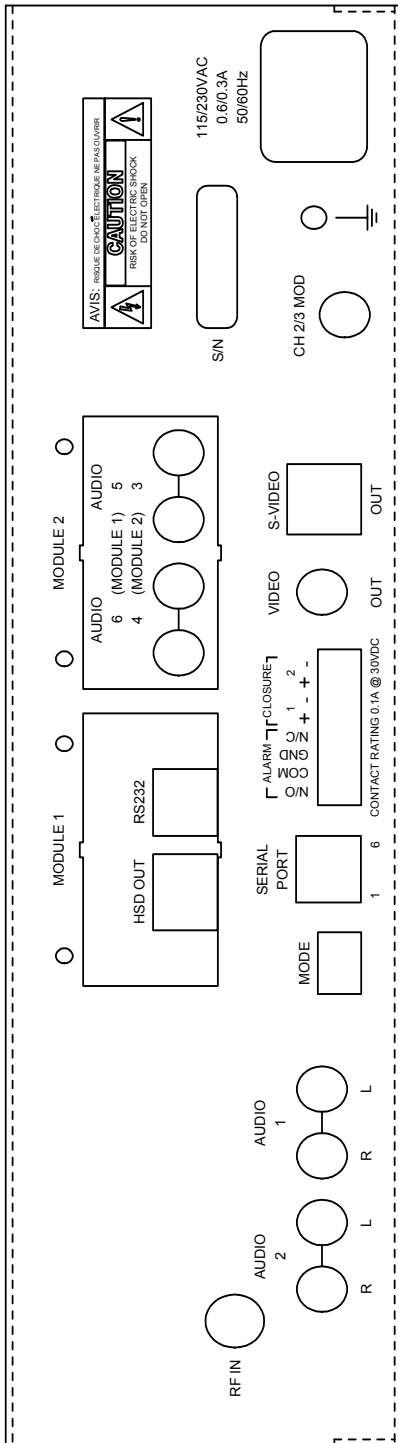
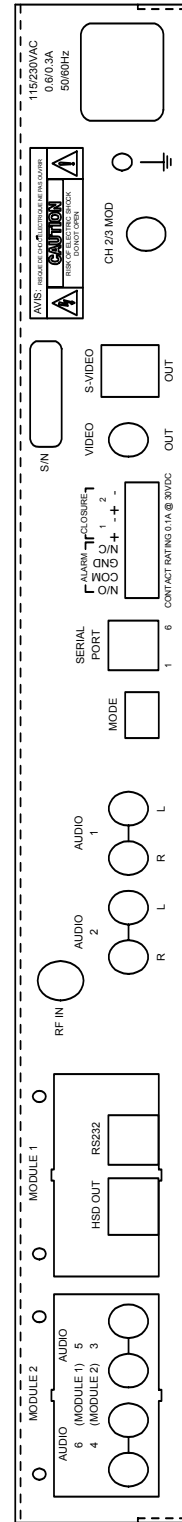


Figure 3. DVR396 Rear Panel



1.5 SECURITY LABELS

The DVR395 incorporates security labels. There are no user serviceable components within the IRD (integrated receiver decoder). Tampering with the security labels, opening the units, will void your warranty. If you have questions, contact Wegener's customer service department at the address and phone (fax) numbers shown in Section [1.6](#) (Page 16) of this manual.

Table 2. DVR395/DVR396 Interconnect Descriptions

Signal	Connector	Description
RF IN	F	950 to 2150 MHz signal accepted
COMPOSITE VIDEO OUT	Phono Jack	NTSC or PAL
S-VIDEO OUT	S-video	NTSC or PAL
AUDIO OUT	Two phono jacks	Audio stereo
SERIAL PORT	RJ-12	Serial Asynchronous Data. May be used for terminal, printer, modem, or local COMPEL control.
MODE SWITCH	4 Position DIP	Control DIP switches for NTSC/PAL; Modulator channel 2/3; Normal Video, Color Bars; and LNB Voltage ON/OFF.
ALARM	Terminal Strip	Receiver alarm contacts, Alarm : NC connects to COM NORMAL : NO connects to COM
CLOSURE	Terminal Strip	Solid state switch closures defined by the network control systems or equipment status.

Connect the receiver to the desired equipment as follows:

CHASSIS GROUND

Using #12 AWG or larger wire, connect the ground to a system or rack ground.

RF IN

Using 75 Ohm coaxial cable with a type F connector, connect your RF source to the **RF IN** connector.

*** * * CAUTION * * ***

When connecting cables to “F” type connectors apply a force of no more than 12 inch/lb. (Finger tight). Avoid connecting adapters directly to “F” type connectors. Use at minimum a 1-foot flexible extension cable between “F” type connectors and adapters.

VIDEO CONNECTIONS

Composite: connect the composite video output to the desired unit using a standard phono plug cable. The equipment it is connected to MUST have a 75-ohm termination.

S-video: connect the S-video output to the desired unit using a standard S-video mini-DIN connector.

AUDIO CONNECTIONS

Using standard shielded audio cable with phono plugs, connect the stereo audio output to the desired unit or equipment.

Serial Port

Using a cable terminated in an RJ-12 connector at one end and a DB9/DB25 at the other, connect the serial port to a terminal, printer, modem, or COMPEL control system.

A Null modem cable or adapter is required for use with a modem. Defaults are 19.2KBps, N, 8, in terminal mode.

Table 3. DVR395 Serial Cables To Terminal or Printer

DVR395 RJ-12		COMPUTER DB-9 (Female)		ASCII TERMINAL OR SERIAL PRINTER DB-25 (Male)	
PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
2	TX DATA	2	RX DATA	3	RX DATA
3	RX DATA	3	TX DATA	2	TX DATA
5	GROUND	5	GROUND	7	GROUND
6	RI	9	RI	22	RI

MODE SWITCH

Set the control DIP switches for NTSC/PAL, Modulator channel 2/3, Normal Video, Color Bars, and LNB ON/OFF as required for your system. See Section [2.2](#) (Page 17) for DIP switch information. FUNCTIONS ARE MODEL SPECIFIC.

*** * * CAUTION * * ***

DO NOT CONNECT RJ-12 DIRECTLY TO PHONE LINE.

1.6 TECHNICAL SUPPORT

In the event the unit fails to perform as described, contact Wegener Communications Customer Service at (770) 814-4057, FAX (770) 232-0621, or email “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 Form (See Section [1.6](#), Page 16) to (770) 232-0621. You may email the same information instead to:

service@wegener.com

2. Plainly write the RMA number on the **OUTSIDE** of the product-shipping container.

NOTE: Writing the RMA number on the outside of the shipping container will help us to return your equipment to you sooner. Thank you.

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.***

Please contact Customer Service at one of the numbers above if you have any questions regarding service procedures.

1.7 MANUALS

If you have any suggestions concerning this, or any Wegener Manual, you can E-mail them to manuals@wegener.com. If you would rather mail them, please do so to the address shown below. Our preference is that you copy the page(s) in question, mark it up, and fax or mail us the copy. We do appreciate constructive criticism. The Fax Number is 770-497-0411.

Attn: Manuals
Wegener Communications, Inc.
11350 Technology Circle
Duluth, GA 30097

SECTION 2 POWER ON PROCEDURES

2.1 GENERAL

This section provides information and procedures for powering up the unit.

2.2 CONTROL DIP SWITCHES

A four position DIP switch on the rear panel provides manual control and setup selection. Mode setting is as follows: (In setting the DIP switches, "D" = down and "U" = up, "X" = don't care for this function).

Table 4. Control DIP Switch Functions

Mode	Function
1 2 3 4	
	Setup Functions
U X X X	NTSC Video System*
D X X X	PAL Video System*
X U X X	Modulator Channel 3 (MODEL SPECIFIC)
X D X X	Modulator Channel 2 (MODEL SPECIFIC)
X X U X	Normal video
X X D X	Color Bars, Tones
X X X U	LNB Power OFF
X X X D	LNB Power ON

Set the switches to the settings appropriate for your system.

* The receiver must be set to the same format (NTSC or PAL) as the desired channel being received. The receiver will not operate correctly with incompatible settings.

2.3 FRONT PANEL CONTROLS AND INDICATORS

The front panel indicators and controls are shown in [Figure 4](#) (Page 18) and [Figure 5](#) (Page 18), and described in [Table 4](#) (Page 17).

Figure 4. DVR395 Front Panel

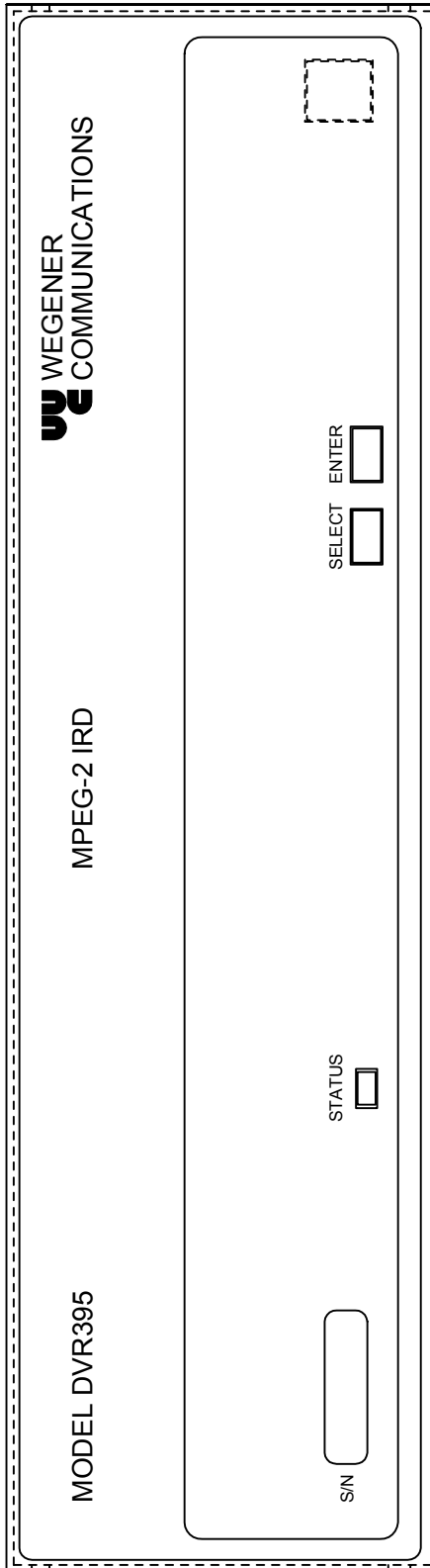


Figure 5. DVR396 Front Panel

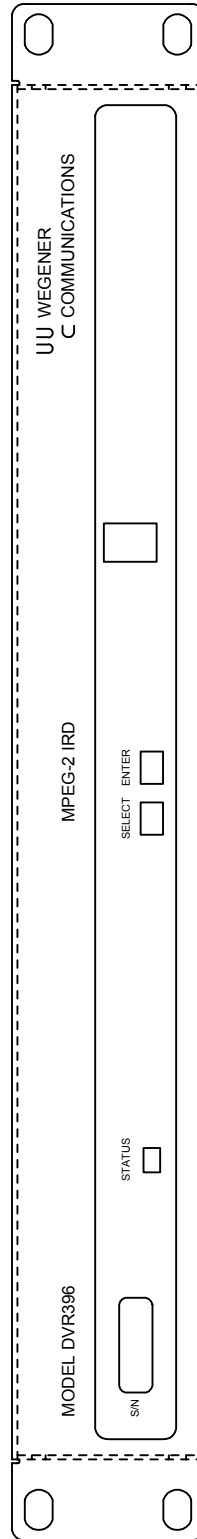


Table 5. Front Panel Controls and Indicator

Item	Description
IRD Status	A Red/Green/Amber LED used to show operating status, including normal operation, warnings, and alarms. See Table 6 (Page 20).
On Screen Display (OSD)	On Screen Display of IRD may be activated by pressing the <SELECT> front panel push-button switch. See Section 3.2 (Page 23).
Select	Push button activates OSD and selects options displayed.
Enter	Push button enters options selected on OSD.

2.4 LED & ALARM/WARNING CONDITIONS

The unit's only LED is RED/GREEN/AMBER, located on the front panel, and labeled Status. The LED's behavior is described in the following table, which includes a list of warning, alarm, and boot fail conditions.

Table 6. LED Indications

Mode	Condition	Status LED
Power Up	IRD is in process of powering up	RED/GREEN Blink Pattern
Boot Fail	EEPROM Boot Failure	RED
	Receiver Board Diagnostics Failure	RED
	Receiver Board Communications Failure	RED
	Secure micro / Host ID mismatch	RED
Alarm	Receiver Board Run-Time Failure	RED Blink w/ Count = 1
	In Fade Mode > 5 seconds (See Warnings Below.)	RED Blink w/ Count = 2
	Installation Mode > 5 seconds (See Warnings Below.)	RED Blink w/ Count = 3
	Carrier Table Search Mode	RED Blink w/ Count = 4
	Header Search Mode	RED Blink w/ Count = 5
	Satellite Search Mode	RED Blink w/ Count = 6
	Alarming Eb/No (and locked on carrier) (See Warnings Below.)	RED Blink w/ Count = 7
	No MPEG Data > 5 seconds (but locked on carrier) (See Warnings Below.)	RED Blink w/ Count = 8
	No Video Data > 5 seconds (but have MPEG data) (See Warnings Below.)	RED Blink w/ Count = 9
	NTSC - PAL mismatch.	RED Blink w/ Count = 10
	No Audio Program Table	RED Blink w/ Count = 11
Warning	Secure Micro Routine Failure	AMBER Blink w/ Count = 1
	Marginal Eb/No (and locked on carrier)	AMBER Blink w/ Count = 2
	COMPEL Required and No COMPEL within last 2 minutes	AMBER Blink w/ Count = 3
	Audio Free Running	AMBER Blink w/ Count = 4
	No MPEG data < 5 seconds	AMBER
	No Video Data < 5 seconds	AMBER
	Fade or Installation Mode < 5 seconds	AMBER
Normal	Normal Mode for a COMPEL-not-Required Unit	GREEN
	COMPEL addressed within last 5 seconds	GREEN Flutter
	COMPEL addressed within last 2 minutes	GREEN

The following definitions apply to [Table 6](#):

Blink - LED is OFF for 1 second, and then blinks on count times (ON for 250 ms and OFF for 250 ms). This overall pattern is continued.

Flutter - ON for 50 ms, OFF for 50 ms, repeating....

AMBER - RED and GREEN turned ON at the same time.

Note: ms = 1/1000 second

The conditions are listed in the order of their display priority with highest priority at top. For example, if the unit is in Satellite Search Mode, and there is an NTSC/PAL mismatch, the LED should indicate the Satellite Search condition.

Note that the alarm conditions are those conditions preventing the delivery of video.

2.5 POWER ON PROCEDURE

Apply power to the receiver. The unit performs a quick checksum test on the EEPROM (electrically erasable programmable read only memory). When the test passes, the unit initializes various devices and configures itself according to the EEPROM settings. It then waits for the receiver board to complete its power up test, which takes about 10 seconds. When the receiver board passes its test, the IRD sends a tune request to the receiver board and the Welcome Banner, shown in [Figure 6](#) (Page 21), to the serial port. If you are in Terminal mode, the banner displays on the terminal screen. Otherwise, “**ALARM: INSTALLATION**” displays on the monitor screen. The IRD then enters alarm mode until all of the alarm conditions are cleared.

X.X is the application code's version number. The text at the bottom of the screen is shown only if the serial device is set to Terminal mode.

```
*
Wegener Communications Copyright 1997
MPEG 2 Integrated Receiver Decoder
Firmware Version x.x
```

Figure 6. Welcome Banner

```
*
EEPROM Failure
Receiver Board Diagnostics Failure
Receiver Board Communications Failure
```

Figure 7. Failure Banner

* These screens are available in units with firmware versions 2.0 and above.

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SECTION 3 SETUP

3.1 GENERAL

This section provides procedures for initial setup of the unit.

3.2 ON SCREEN DISPLAY (OSD)

The OSD information is contained in the video output from the receiver. It is turned on by pressing either the <SELECT> or <ENTER> push-button on the front panel. The display is removed by selecting Exit from the Main Menu. When a menu is first shown, the cursor is always placed on its first action field (or action with edit field, which ever is first).

The OSD provides the following information and actions:

1. Carrier Status.
2. Signal Strength Monitoring.
3. Selecting the Perm Settings
4. Selecting the Serial Port device.
5. Software Version.

All menus are white text with a solid blue background with highlight as blue text on white background. There are four field types: **Action, Action w/ Edit, Edit, Edit w/ Choices**. The cursor can be moved only to these fields. The function of the <SELECT> and <ENTER> push-button for each field type is described below.

Table 7. SELECT And ENTER Key Functions

FIELD	SELECT	ENTER
Action Field	Moves cursor to next action field (or action w/ edit field, which ever is next). Wraps at end.	Takes action on the current field.
Action w/ Edit Field	Same as for action field.	Moves cursor to corresponding edit field.
Edit Field	If cursor is not on last digit within edit field, moves cursor to next digit. Else, moves to next action field (or action w/ edit field, which ever is next)	Increments current digit within edit field. Wraps back to beginning at 9.
Edit Field w/ Choices	Moves cursor to next action field (or action w/ edit field, which ever is next).	Scrolls through list of choices. Wraps back to beginning on last.

3.3 CUSTOMIZING SETTINGS FOR YOUR SYSTEM

You can customize the settings of the DVR395 to fit your system using the OSD and front panel push buttons.

To edit settings, perform the following procedures and see Table 7 (Page 23).

- Power up the unit.
- Connect a terminal for the On Screen Display. See Section [3.2](#) (Page 23).
- Access the Main Menu by pressing either the <SELECT> or <ENTER> push button on the front panel.
- Using the front Panel <SELECT> button, select/highlight the item you wish to edit.
- Press the <ENTER> push button to display that screen.

<p style="text-align: center;">Main Menu</p> <p style="text-align: center;">Carrier Status Signal Strength Carrier Select Serial Port Select Software Version Exit</p>
--

NOTE: The values shown on the following screens are examples only, and will likely be different in normal operation.

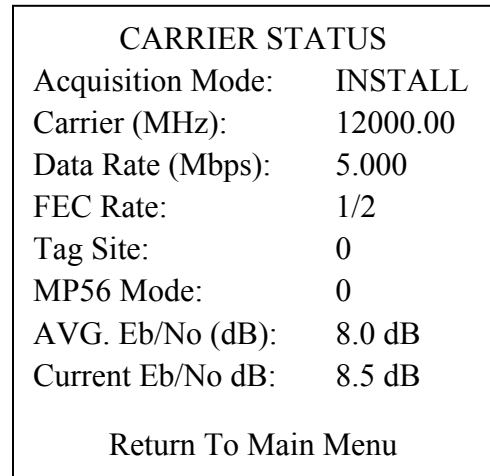
For Carrier Select:

- From the Main Menu, select “Carrier Select.”
- Press <ENTER> to display the “Carrier Select” screen.
- Press <ENTER> to enter the edit field.
- Use <SELECT> to place the cursor on the digit to be edited.
- Use the <ENTER> button to cycle the digit.
- Use <SELECT> to move to the next item in the scroll menu.
- Make further edits, if desired.
- Use <SELECT> to highlight “Activate Selection.”
- Press <ENTER> to save the new settings and exit this screen.
- To exit without saving the changes, Select “Return To Main Menu” and press <ENTER>.

<p style="text-align: center;">CARRIER SELECT</p> <p>From Table: <u>3</u> Carrier (MHz): 12000.00 Data Rate (Mbps) 4.992 FEC Rate: <u>1/2</u> Tag Site: <u>0</u> MPEG Mode: <u>TRANSPORT</u> LNB LO (MHz) <u>10750.00</u> Activate Selection Return To Main Menu</p>
--

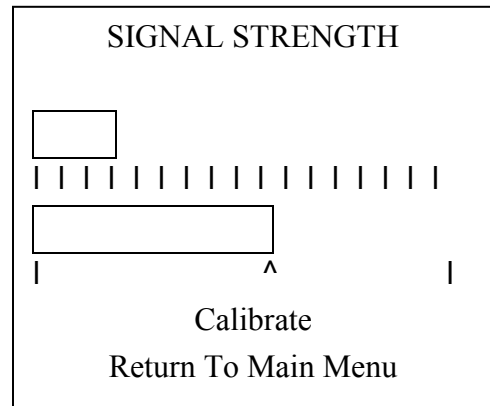
For Carrier Status:

- From the Main Menu, select “Carrier Status.”
- Press <ENTER> to display the “Carrier Status” screen.
- This is a read-only screen.
- Press <ENTER> to Return to the Main Menu.



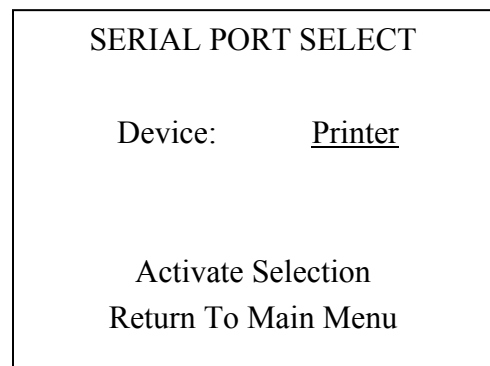
For Signal Strength:

- From the Main Menu, select “Signal Strength” and Press <ENTER> to display this screen
- Displays signal level. The upper bar is the signal strength. The lower bar gives a higher resolution of and deviation from the selected value.
- To use the lower bar, select “Calibrate” and Press <ENTER>.
- To exit this screen, select “Return To Main Menu” and press <ENTER>.



For Serial Port Select:

- From the Main Menu, select “Serial Port Select” and Press <ENTER> .
- Use <ENTER> to scroll the possible devices.
- When the desired device is displayed, press <SELECT> to highlight “Activate Selection.”
- Press <ENTER> to save the change and exit this menu.
- To exit without saving the changes, select “Return To Main Menu” and Press <ENTER>.



For Software Version:

This is a read-only screen showing the versions of the various software packages.

- Select “Software Version” from the Main Menu and press <ENTER> to display the screen.
- Press <ENTER> to return to the Main Menu.

SOFTWARE SELECT	
Application:	V1.3
Receiver:	17 (Type 48)
Video Decoder:	01.70
Audio Decoder:	BEPD0306
Descrambler:	r40_721b.hex
Boot:	1.2
DSP Demux:	V1.1
Return To Main Menu	

APPENDIX A RMA REQUEST FORM

Not every system or location will use the RMA Request Form shown on the following page. It is provided as a convenience for those customers who send units directly to Wegener Communications, Inc. for repair.

If there is any doubt regarding use of this form, contact Network Control or other higher authority for guidance.

service@wegener.com

RMA REQUEST FORM

Fax (770) 232-0621

Company Name: _____

Bill-To Address: _____

Ship-To Address: _____

Contact Name: _____

Phone # () - _____ Fax #: () - _____

Complete Model #: _____

Serial #: _____

In Warranty: Yes No

Problem: _____

Additional Comments: _____

SERVICE RETURN ADDRESS

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

CONTACT NUMBERS AND ADDRESSES

Voice: (770) 814-4057
FAX: (770) 232-0621
email: service@wegener.com