DTV735
Digital Television Processor
Fox Version

User's Manual

WEGENER®

Advanced Digital Technologies

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The Wegener DTV735 is approved under FCC Part 15B Class A, UL1950, and CSA.

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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 Model DTV735 Digital Television Processor, referred to throughout the manual as the DTV735.

NOTE: User interface details in this manual are based on application software version 102.

The manual is divided into the following chapters:

1 General Information - a description of your DTV735, its functions and specifications, and a glossary of terms

2 Installation - procedures and information for the correct and safe installation of your DTV735.

3 Operation - instructions on starting and operating your DTV735

4 Maintenance and Troubleshooting - information on maintaining your DTV735 and resolving possible operating difficulties

5 Customer Service - Our warranty and information on obtaining help

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1.2 DTV735 Overview

The DTV735 Digital Television Processor (see Figure 1.1) receives an input ASI MPEG Transport Stream and provides an output DHEI stream for connection to cable system transmission equipment. Programs may be remapped or selected for removal from the output stream. The Transport Stream that is output on the DHEI connector is also available on the two ASI output BNC connectors.

Physical Description

The DTV735 is housed in a standard, rack-mountable chassis. Its front panel provides a user interface through an LCD, eight LEDs, and six push buttons (see section **3.3 DTV735 Controls and Indicators** on page 23). The rear panel holds the ports that allow connection to power, incoming signal, and peripheral devices.

Figure 1.1 DTV735 Digital Television Processor

Features

Your DTV735 has the following features:

- Two ASI MPEG Transport Stream inputs – ASI-1 is active, ASI-2 may be used for future expansion (BNC connectors)
- Two duplicate ASI MPEG Transport Stream outputs (BNC connectors),
- DHEI Output Module,
- Time re-stamping of PCR, PTS, and DTS information,
- User selection of input programs to be included in the output stream,
- User selection of output program numbers and audio mode,
- One Ethernet TCP/IP control interface (RJ-45 connector), and
- One asynchronous data input/output (DB-9 connector).

1.3 DTV735 Specifications

Table 1: Technical Specifications

Characteristic	Specification
ENVIROMENTAL	
Use	Indoor
Altitude	Up to 2000 meters
Temperature Range	+10° C to +40° C Operating
	-20° C to +70° C Storage
Cooling	Internal fan
Relative Humidity (max.)	80% for temperatures up to 31° C decreasing linearly to 50% relative humidity at 40° C.
INPUT AC POWER	
Voltage	90 to 132 Vac and 175 to 264 Vac
Frequency	50/60 Hz ± 2%
Power Consumption	43 Watt
MECHANICAL	
Height	1 std. RU (1.75 inches nominal) (44.5 mm)
Width	EIA std. 19-inch mounting (482.6 mm)
Depth	13.5 inches (342.9 mm)
Weight	10.5 lb (4.81 kg)
Expansion Module Slots	3 - each 2.5"W x 1.375"H x 7"D on rear panel
SERIAL PORTS	
Standard	RS-232
Handshaking	None
Service	Software download
Baud Rates	115.2 kbps
Formatting	8 data-bits, 1 start, 1 stop-bit, no parity

Table 1: Technical Specifications

Characteristic	Specification
ETHERNET PORT	
Physical Layer	10BaseT/100BaseT (twisted pair) on RJ-45 jack
Media Access and Link Layer	Per IEEE 802.3 (Ethernet)
ALARM RELAYS	
Alarm Function	Contact closure for main power off, loss of input signal
Type	Form C, Normally Open and Normally Closed
Rating	30Vdc open circuit, 500 mA max current closed
EXPANSION MODULE SLOT	Allowable expansion modules: · DHEI transport stream output · 8VSB tuner module

1.4 Safety Summary

The DTV735 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 your DTV735:

Do not open the DTV735's chassis cover.

1.5 Glossary of Terms and Abbreviations

Table 2: Glossary of Terms

Term	Definition
AC	Alternating current
Alarm	A condition or notification of a condition that prevents your DTV735 from performing properly
Application Software	The main host software which sets up the unit hardware, runs the process of acquiring Transport Stream sources, sets up and monitors the multiplexing processes, monitors unit operations, and provides interfaces with the network and local users.
ASI (or DVB-ASI)	An "asynchronous" bit-serial physical interface for Transport Streams. Transmitting and receiving functions are designed such that the time relationships between all packets and their timing references are unchanged.
ATSC	Advanced Television Systems Committee - sets standards for standard definition and high definition television in the U.S. Sometimes used to mean the HDTV standards.
Boot loader	Software residing in non-writable zone of flash which executes at unit reset.
Carrier	An RF signal containing coded audio, video, and/or other data
DVB-ASI	see ASI
EIA	Electronic Industries Association
Ethernet	The widely-used LAN technology specified by IEEE standard 802.3
Flash memory	A memory dedicated to storing the unit's software and an image of some hardware programming code.
IEEE	Institute of Electrical and Electronics Engineers
LAN	Local area network. Your DTV735 may be connected to an Ethernet LAN.
LCD	Liquid crystal display. The front-panel text screen on your DTV735 is a liquid crystal display.
LED	Light-emitting diode. The front-panel indicator lights on your DTV735 are LEDs.
Mbps, kbps	Megabits per second or kilobits per second - units of data transport rate.
MPEG	Moving Picture Experts Group - refers to the method of video compression established by this group.
NVRAM	Non-volatile memory. A memory dedicated to storing the unit's setup parameters. This memory retains its contents through power outages.
PAT	Program Allocation Table. Master table which identifies all the Programs in the Transport Stream. It associates Program numbers to the PIDs bearing the associated Program's PMT.

Table 2: Glossary of Terms

Term	Definition
PCR	Program Clock Reference. Time-base signal used to synchronize transport stream data.
PID	Packet Identifier. The unique Transport Stream packet identifier assigned to each constituent data stream within the Transport Stream. Also, in this document, "PID" is used to designate the stream itself.
PMT	Program Map Table. Table for a given Program identifying all the PIDs for its PCR, video, audio, and user data streams.
Program	In the MPEG hierarchy, a grouping of related audio, video, or generic data PIDs sharing a common PCR time base and (usually) sharing a common schedule. See PMT.
PSI Tables	Program-Specific Information Tables. A group of information-bearing tables, each borne by well-known PIDs, regularly transmitted in the Transport Stream. See also "PAT" and "PMT". Also, ISO 13818-1 gives a thorough description of these and other Tables.
PSIP	Program and System Information Protocol - a method for transporting digital television system information and electronic program guide data.
RAM	Random access memory. A general term for all memory volatile memory types out of which application software executes and into which its variables, state information, and messages are stored. RAM is also used to designate the volatile storage used by the Transport Demux and decompression devices.
RF	Radio frequency
TMRA	Maximum Recommended Ambient Temperature, the highest operating temperature for which the unit is rated
Transport Stream (or MPEG Transport Stream)	A multiplex of several data streams, each of which is borne in Transport packets, 188-byte blocks containing a sync word, header information (including a PID), and payload data. This multiplex includes PSI data tables, Programs, and padding in the form of null packets.

Chapter 2 Installation

This chapter provides instructions on unpacking, mounting, and connecting your DTV735 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 DTV735 should be located indoors and may be mounted in a standard, 19-inch equipment rack within one standard RU.

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.

DANGER

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

Elevated Operating Ambient

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

Reduced Air Flow

Equipment should be installed such that airflow required for safe operation of the equipment is not compromised.

Mechanical Loading

Mounting of the equipment in a rack should be such that a hazardous condition is not produced by uneven loading. This unit is not very heavy, but total rack loading must be considered. Also, do not rest any unsupported equipment on your DTV735.

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

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (use of power strips, chassis ground lugs, etc.).

Rack Mounting

Your DTV735 is sized to fit in an EIA-standard, 19-inch-wide equipment rack.

a) First install angle brackets or cross-supports capable of supporting both the unit and its connecting cables. Screw or bolt the supports securely to the equipment rack.

b) Place the DTV735 on its supports and use four anchor screws or bolts and nuts to secure the unit's front brackets to the rack.

c) Connect the chassis grounding screw to an earth ground before connecting the power cord to the unit.

WARNING

The front brackets must be secured to the rack. If front brackets are left unsecured, the unit may shift forward and fall from the rack during installation or operation. Failure to secure the front brackets may result in personal injury and/or damage to the equipment.

WARNING

Locate the DTV735 and its cables to avoid impacts, spills, and pulling cables and to ensure sufficient air flow. Failure to locate the DTV735 in a proper environment may result in damage to the equipment.

2.3 DTV735 Connections

Figure 2.1 DTV735 System Setup below shows placement of the DTV735 in a typical cable headend. Figure 2.2 DTV735 Rear Panel illustrates details of the DTV735's rear panel.

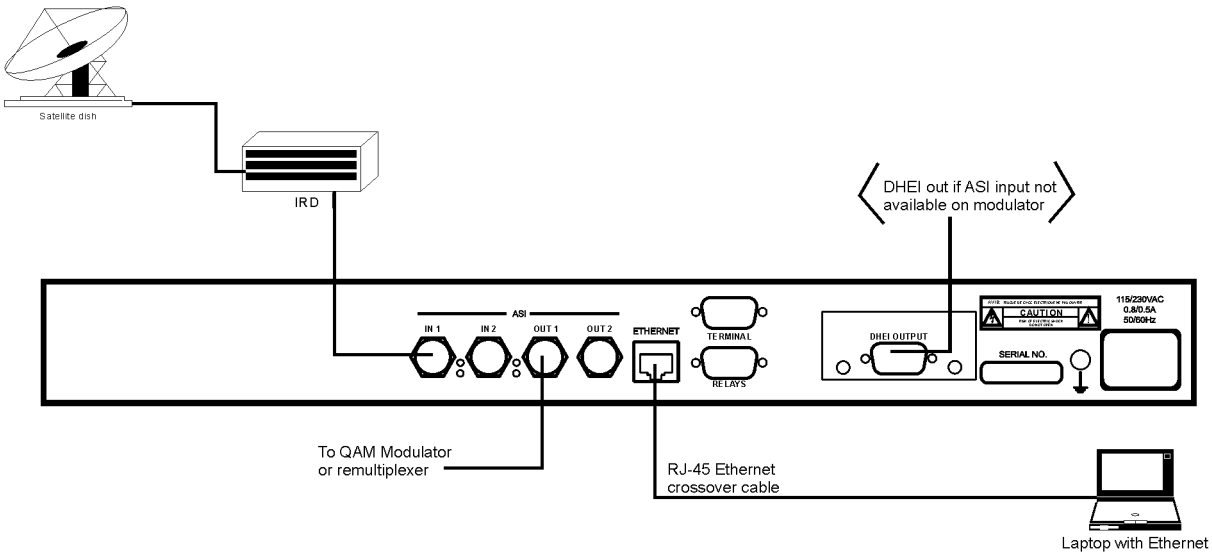


Figure 2.1 DTV735 System Setup

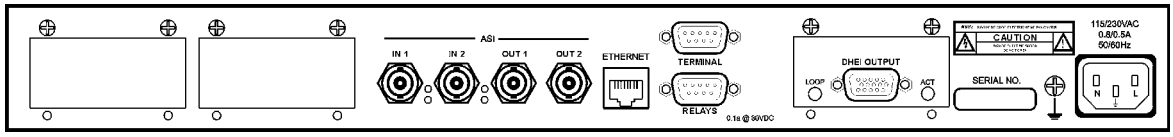


Figure 2.2 DTV735 Rear Panel

Before applying power, make the following connections to your DTV735 (refer to Table 3 for connector details):

a) Connect the chassis grounding screw to an earth ground before connecting the power cord to the unit.

b) Connect the ASI Output signal from your Unity 4600 receiver to the DTV735's ASI IN 1 port.

c) Connect the DHEI output connector to the cable headend DHEI equipment using a 15-pin to 26-pin DHEI cable. Be sure to use the correct cable depending upon whether you are connecting to the DHEI Expansion Input or the DHEI Expansion Output connector.

d) Connect other transmission or monitoring equipment to the ASI OUT 1 and ASI OUT 2 ports as desired.

e) Connect your LAN line to the DTV735's Ethernet port.

f) If desired, connect the Relays port to your equipment to provide contact closures during alarms.

g) Finally, connect the supplied ac power cord to the DTV735's IEC receptacle and to a 90-to-132 Vac source.

Table 3: DTV735 Connector Details

Designation	Connector Type	Pin Number	Signal Name
115/230 Vac Power	Male IEC receptacle		AC LINE IN
ASI In 1	female BNC		ASI IN 1
ASI In 2	female BNC		ASI IN 2
ASI Out 1	female BNC		ASI OUT 1
ASI Out 2	female BNC		ASI OUT 2
DHEI Out	D subminiature 15-pin	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	RESERVED RESERVED RESERVED RESERVED SIGND SENSEOL PSYNCO+ PDATAO+ PCLKO+ REFCLKO+ SENSEOR PSYNCO- PDATAO- PCLKO- REFCLKO-
Ethernet LAN	female RJ-45	1 2 3 4 5 6 7 8	EN OUT + EN OUT - EN IN + NC NC EN IN - NC NC

Table 3: DTV735 Connector Details

Designation	Connector Type	Pin Number	Signal Name
Serial Async I/O	DB-9	1 2 3 4 5 6 7 8 9	DCD (+5V, 4.7 kΩ) RxD (output) TxD (input) NC GND DSR (+5V, 4.7 kΩ) NC CTS (+5V, 4.7 kΩ) RI (+5V, 33 Ω)
Alarm Relay	male DB-9	1 2 3 4 5 6 7 8 9	Not used Not used Not used ALARM COM GND Not used Open on ALARM Not used Close on ALARM

Ethernet An Ethernet 10BaseT/100BaseT port is included and is the primary user interface using an HTML browser-based interface. The unit has an URL which is assigned via the front panel. The "home" page is then accessed by users via the Ethernet port. From this page, the desired channel selections may be performed and status monitored.

Terminal I/O The Terminal serial port is configured to 115.2k, N, 8, 1. The Terminal device is used for command and control of the DTV735. This I/O is a basic, VT100-like emulation. User input text strings terminated in carriage-returns prompt all I/O. The terminal should be set to local echo ON because the DTV735 only echoes a carriage-return/linefeed and then a '>' prompt after entry of a command-line terminated in carriage-return.

Chapter 3 Operation

3.1 Operation Overview

This chapter contains detailed operating instructions for your DTV735. The following sections address:

- Ethernet/Web Browser Control
- DTV735 Controls and Indicators
- Front-panel Operation
- Initialization
- Transport Stream Processing
- Alarm System
- Software Downloads

Local user control is from a LAN via RJ-45 Ethernet or the front-panel LCD/keypad. All settings may be presumed to be retained through power cycling unless otherwise specified. This means that they are still in effect through resets, whether by power outage, commanded reset, or failure-recovery resets.

3.2 Ethernet/Web Browser Control

The DTV735's primary user interface is from a web browser using the rear-panel Ethernet LAN connection. An HTML script interface allows a user to control and monitor the unit using a standard web browser. Each unit contains a user-defined quad URL address, subnet mask, and gateway address (See **Table 4: DTV735 IP Setup**).

There are two basic methods of using the Ethernet connection – with a directly connected PC or with a PC connected through a LAN.

Directly connected PC

For control from a local PC, attach the DTV735's Ethernet port to the Ethernet network connector on the PC using a crossover RJ-45 cable (8 pins).

Before using this Ethernet connection, the appropriate IP address, netmask, and gateway must be selected via the front-panel interface.

Perform the DTV735 IP Setup as shown in Table 4 and the PC IP Setup as shown in Table 5:

Table 4: DTV735 IP Setup

Parameter	Setting
IP Address	172.016.100.020
Netmask	255.255.000.000
Gateway	000.000.000.000

Table 5: PC IP Setup

Parameter	Setting
IP Address	172.016.100.001
Subnet Mask	255.255.000.000

LAN Connection

For LAN connection, attach the DTV735's Ethernet port to the LAN using a normal, straight-through, RJ-45 cable (8 pins). Set the DTV735 IP Address, Netmask, and Gateway as directed by your network administrator. Use any PC on the LAN to connect to the DTV735 using the web browser instructions below.

NOTE: Each unit on the network must have a unique address.

Using the Web Browser

To begin monitor and control functions from a PC or LAN connection:

a) Open the current internet browser of your choice from the local PC or computer on the LAN attached to your DTV735.

b) Set the browser's address field to http://nnn.nnn.nnn.nnn where nnn.nnn.nnn.nnn is the IP address of the unit to be controlled (set from the DTV735's front-panel, IP Address screen).

NOTE: For IP addresses which include subfields with leading zeros, you must omit those zeros when entering the address in your browser. For example, IP address 128.092.050.004 must be entered as 128.92.50.4.

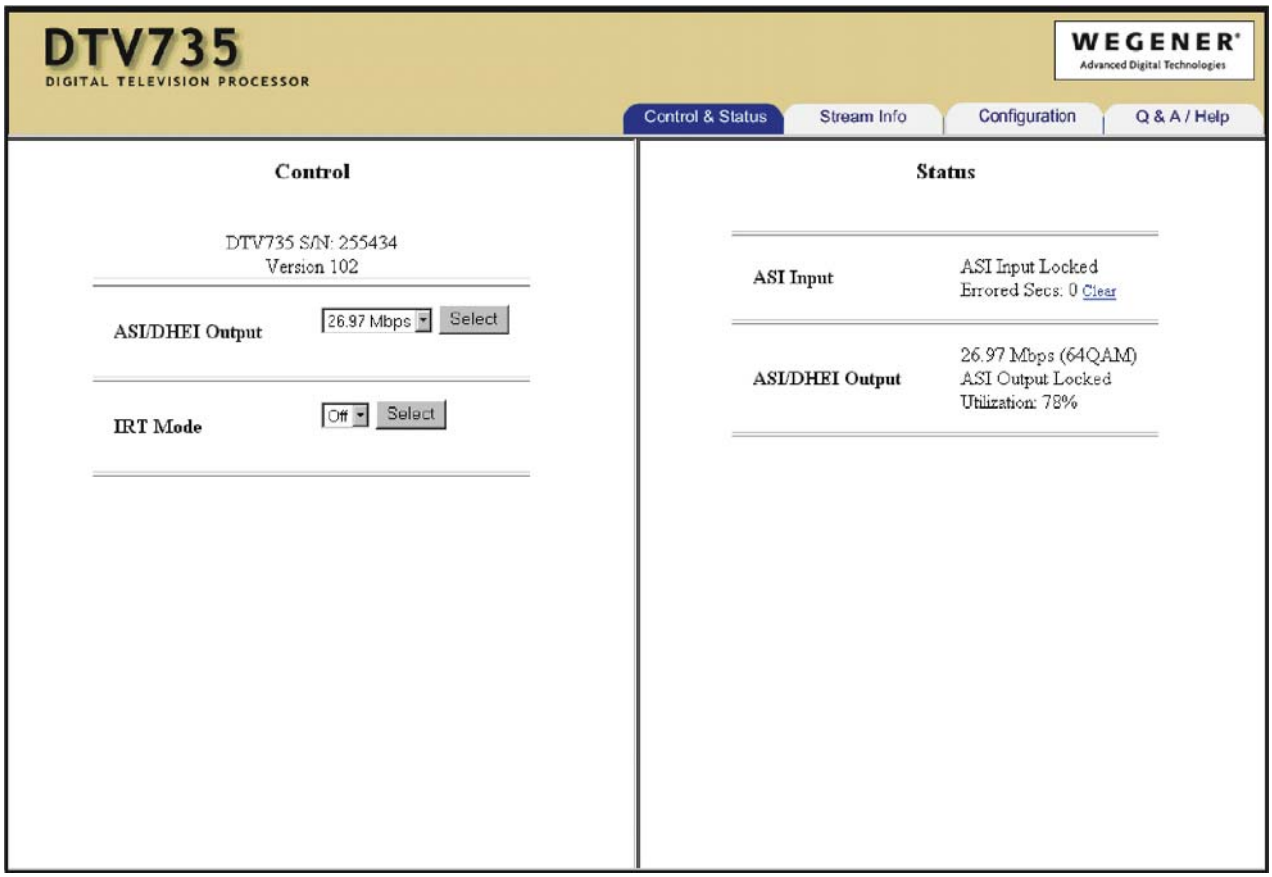
The DTV735 Control and Status screen will appear. You may select either the Stream Information, Configuration, or Q&A/Help pages at any time by clicking on their respective tabs at the top of the screen.

Normally you will first select the Control & Status screen to select the output data rate and then select the Configuration screen. Use the Configuration

screen to select the included programs for output, assign new program numbers if desired, and select the audio to be included in each program's output. Finally, select the Stream Info screen to verify the input and output data processed.

Control and Status Page

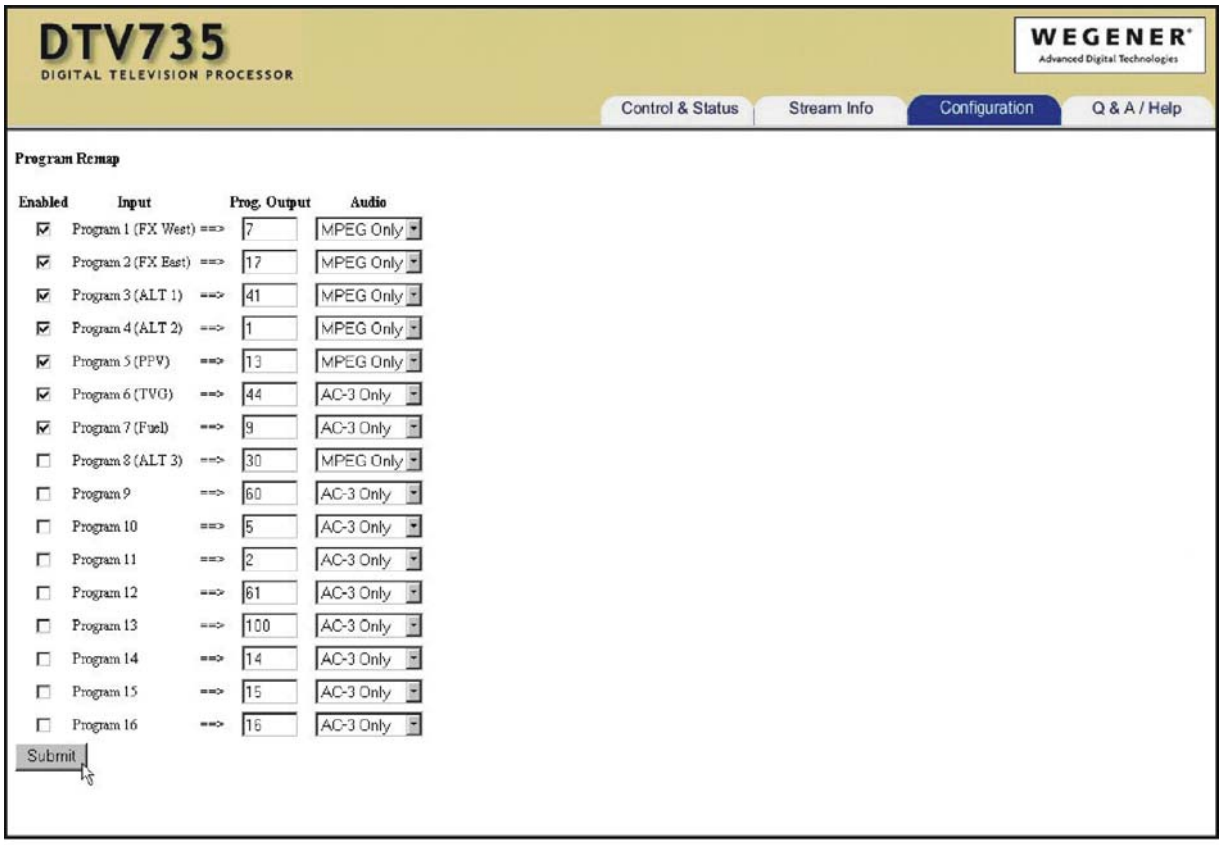
The Control side of this screen gives the serial number of the DTV735 unit and the version number of the application software installed in the unit. The ASI Output box allows the user to set the output data rate to either 26.97 Mbps or 38.81 Mbps. The IRT Mode box allows the user to enable or disable functions needed for use in systems with the Motorola IRT product. This is normally set to OFF. (Refer to **IRT Mode** on page 34 for more details.)



The Status side provides the unit input and output signal status. The ASI Input part of Status indicates the presence or lack of an ASI input signal on ASI Input 1. The Errored Secs indicates the number of seconds in which errors occurred since the last time the error counter was cleared. ASI/DHEI Output lists the output stream's data transport rate as well as the output lock status. (The QAM modulator associated with the data rate is shown after the data rate, 64 QAM for 26.97 Mbps or 256 QAM for 38.81 Mbps.) Utilization indicates the percentage of the output Transport Stream's data rate that is occupied with actual data (not null packets). This indicator may be used to determine whether additional programs may be enabled for output.

Configuration Page

The Configuration screen shown below allows the selection of programs to be included in the output. In the example shown, programs 1 through 7 have been selected by placing a check in the boxes next to the input program number. Program reassignments have been selected by placing the new output numbers in the corresponding Prog. Output boxes. For example, Input Program 1 is mapped to Output Program 7, Input Program 2 to Output Program 17, etc. The Audio selection boxes allow MPEG audio, AC-3 audio, or both to be selected for output on each program. You should ensure that the selected audio format is available on the input program. If you select MPEG only and the input has AC-3 only, you will receive video but no audio for that program. If in doubt, select both.

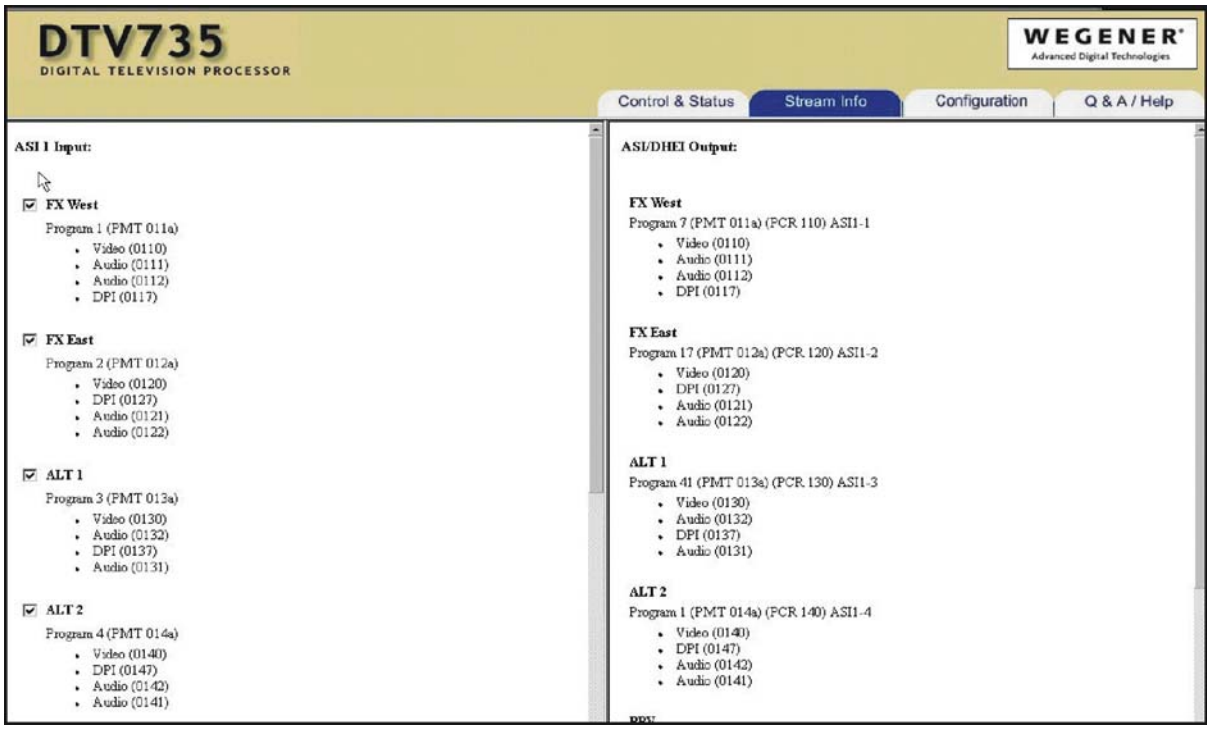


Stream Information Page

The Stream Info screen shown below allows additional control and monitoring of the input and output streams. The ASI 1 Input side shows all the programs present in the ASI input. The number in parentheses after the program number is the PID number (in hexadecimal form) of that program's PMT. All streams included in the program are listed below the program number with their PID locations indicated in parentheses (in hexadecimal form). For example, in the screen below, Program 3 has its PMT located in PID 0x3a and its video is located in PID 0x0130 with audio located in PIDs 0x0131 and 0x0132. Check boxes allow you to select the program streams that you wish to include in the output. Click the box to the left of a program to check that program and add it to the output and then click the Update Selected Programs bar at the bottom of the screen. Click the Uncheck All hyperlink if you wish to remove checks from all input check boxes.

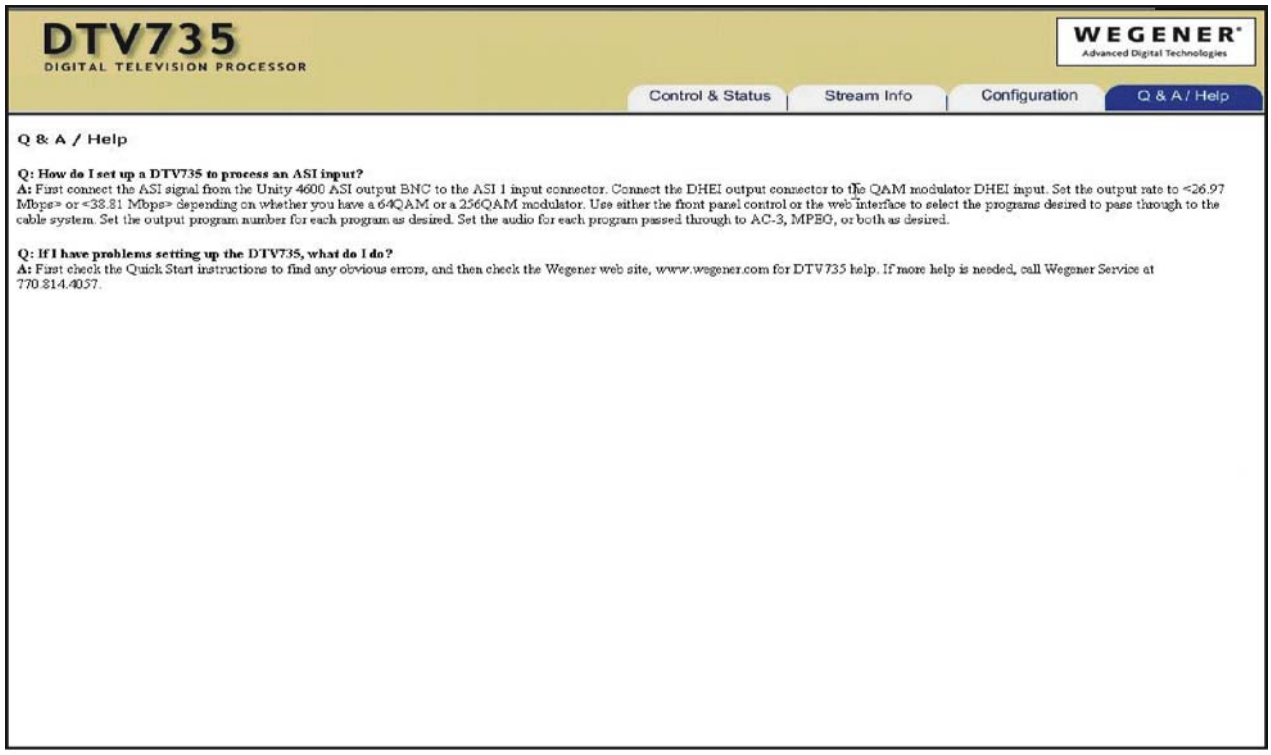
Program numbers may be changed by entering the desired values in the program number boxes before clicking on the Update Selected Programs box. Program numbers must be unique. If you attempt to assign the same program number to more than one program, an error message will appear and no change will be made.

NOTE: Program numbers are unique. Do not attempt to assign two input programs to the same output program number.



Q&A/Help Page

A list of questions and answers about operating your DTV735 is available on the Q&A/Help page. Click the Q&A/Help tab to display this page.



3.3 DTV735 Controls and Indicators

There are three major parts of your DTV735's front-panel controls and indicators: the liquid-crystal display (LCD), the six push buttons, and the eight LED indicators. Essentially all control available through the terminal is also available via the front panel (shown below in Figure 3.1).

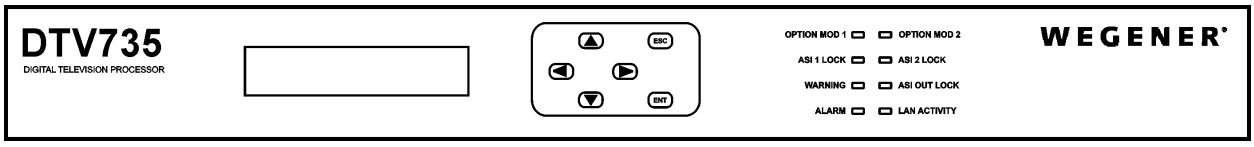
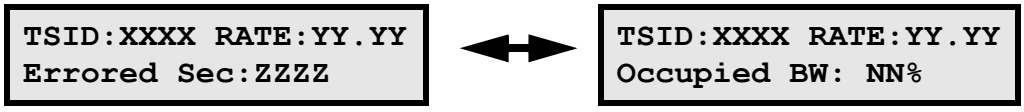


Figure 3.1 DTV735 Front Panel

Liquid-crystal Display(LCD)

The DTV735's 2-line by 20-character LCD indicates unit status and prompts for and reflects user input. Here, you will see your DTV735's "home screen" which shows the Transport Stream ID (TSID) and the output data rate. Information in the bottom row alternates between showing the number of errored seconds since signal acquisition (or since error reset) and the occupied bandwidth of the output data stream. No matter which front panel screen is currently shown, holding in the **ESC** button returns the display to the home screen. From this home screen, press the **ENT** button to display the unit's serial number and the version number of the application software. Using the adjacent push buttons, you can navigate the DTV735's various screens and edit input fields (see section **3.4 Front-panel Operation** on page 26).



The default front panel screen is this "home screen". No matter where a user may be in the screen hierarchy, if no front-panel key press is made for more than five minutes, then the screen reverts to the "home screen".

Push buttons

These six push buttons (shown below in Figure 3.2) are your means of commanding the DTV735 from the front panel. The four arrow buttons allow navigation through the menu screens and character selection when editing user-input fields. The Enter (**ENT**) button serves to select menu options (downward navigation), to open user-input fields, or to commit user input to the DTV735. The Escape (**ESC**) button allows exit from user-input fields without saving the entry or selection. **ESC** also provides upward navigation through the menu structure to the home screen. The arrow buttons also provide navigation through user-input screens and switching between user-selectable options.

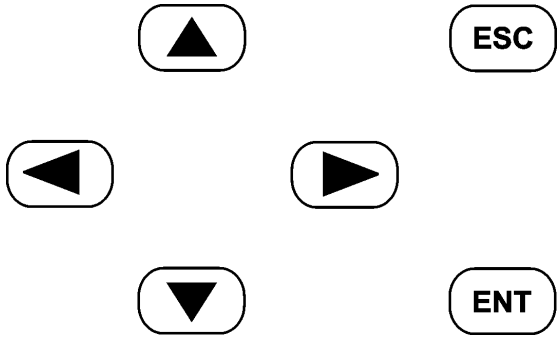


Figure 3.2 DTV735 Push Buttons

Front-panel LED Indicators

Figure 3.3 below shows the eight light-emitting diodes (LEDs) that provide status information about your DTV735 and its processes. **Table 6: LED Indicator Descriptions** on page 25 provides the meaning of the color and state of each LED.

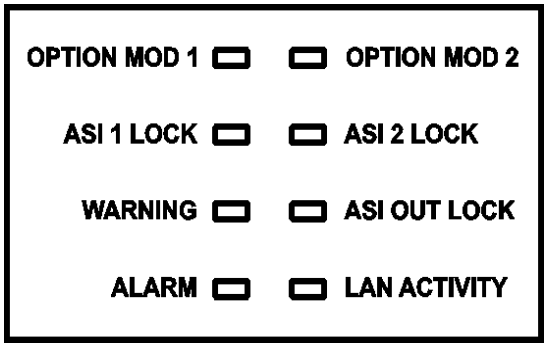


Figure 3.3 DTV735 LED Indicators

Table 6: LED Indicator Descriptions

Indicator Label and Color	Indicator State	Indicator Meaning
OPTION MOD 1	Constant	Option module 1 installed and operating
GREEN	Off	Option module 1 not installed or not operating
OPTION MOD 2	Constant	Option module 2 installed and operating
GREEN	Off	Option module 2 not installed or not operating
ASI 1 LOCK	Constant	ASI 1 input has Transport Stream synchronization present
GREEN	Off	ASI 1 input does not have Transport Stream synchronization present
ASI 2 LOCK	Constant	ASI 2 input has Transport Stream synchronization present
GREEN	Off	ASI 2 input does not have Transport Stream synchronization present
WARNING	Constant	Warning condition(s) exists *(The Fox version of the DTV735 does not have any Warning conditions.)*
YELLOW	Off	No Warning condition exists
ASI OUT LOCK	Constant	ASI Output is active
GREEN	Off	ASI Output is inactive
ALARM	Constant	Alarm condition(s) exists
RED	Off	No Alarm condition exists
LAN ACTIVITY	Flash	LAN activity present. Only lights when data is transferred to the DTV735. This is not a continuous monitor of LAN communications.
GREEN	Off	No transfer of LAN data to the unit

Rear-panel indicators

Three LED indicators on the rear panel give Ethernet and ASI Input status:

ACT – LED: Ethernet activity blinks OFF and ON for activity detected

LAN – LED: Ethernet rate indicator, OFF for 10baseT and ON for 100baseT

ASI Input – Red/Green LED: OFF for not selected, RED for no input signal, GREEN for input signal detected

3.4 Front-panel Operation

The DTV735 may be set up and controlled from the front panel as follows:

NOTE: From any screen, pressing the ESC key twice will return you to the Home Screen.

Home screen

The Home screen alternates between the following two modes every four seconds:

(A)

```
TSID:XXXX RATE:YY.YY
Errored Sec:ZZZZ
```

Where **XXXX** is the hexadecimal transport stream identifier, **YY.YY** is the current output rate in Mbps, and **ZZZZ** is the number of errored seconds since the last reset of the counter.

(B)

```
TSID:XXXX RATE:YY.YY
Occupied BW: NN%
```

Where **NN** is the percentage of the unit's output bandwidth currently occupied by selected programs.

Press the **ENT** key to view the second-level Serial Number and Application Software Version Number screen.
Press the ► key to go to Alarms/Warnings.

Second-level Screen

Serial Number and Application Software Version Number Screen

```
S/N: XXXXXX
VER: YYY
```

Where **XXXXXX** is the unit's six-digit serial number and **YYY** is the version number of the unit's currently installed application software.

Press the **ESC** key to return to the Home Screen.

Alarms/ Warnings screen

```
View Alarms/Warnings
```

Press the **ENT** key to view any active alarms or warnings on the second-level Alarms/Warnings Message screen.
Press the ► key to go to Clear Errored Seconds (if counter is non-zero) or Program Setup.
Press the **ESC** key to go to the Home Screen.

Second-level Screen

Alarms/Warnings Message Screen

```
No Alarms
```

Any active alarms or warnings are described here.
Press the ► key to view the next alarm or warning (if more than one).
Press the **ESC** key to return to the Alarms/Warnings screen.

Clear Errored Seconds screen

```
Clear Errored Secs
Press<ENT>
```

This screen only appears if the errored seconds counter is non-zero. Otherwise the next screen, Program Setup is displayed.
Press the **ENT** to clear the errored seconds counter.
Press the ► key to go to the Program Setup screen.
Press the ◄ key to go to Alarms/Warnings.
Press the **ESC** key to go to the Home Screen.

Program Setup screen

```
Program Setup...
Select? Press<ENT>
```

Press the **ENT** key to bring up the second-level Program Input screen.
Press the ► key to go to Program Status.
Press the ◄ key to go to Clear Errored Seconds (if counter is non-zero).
Press the **ESC** key to go to the Home Screen.

Second-level screens

Program Input Screen

```
ProgIn XXXXX
ABCDEF
```

Where **XXXXX** is the program number and **ABCDEF** is the service descriptor for that program.
Press the ► key to go to the next program on the input stream.
Press **ENT** and use the ▲ or ▼ keys to select <ON> or <OFF>, adding or removing this program to or from the output stream. Press **ENT** again to confirm.
Press the ► key to go to the Output Remap screen.
Press the **ESC** key to return to the Program Input screen.
Press the **ESC** key again to return to the main-level Program Setup screen.

Output Remap Screen

```
Output Remap:
XXXXX
```

Where **XXXXX** is the output program number.
Press the **ENT** key to edit the output program number.
Press the ► key to go to the Audio Stream Selection screen.
Press the ◄ key to go to the Program Input screen.
Press the **ESC** key to return to the Program Input screen.
Press the **ESC** key again to return to the main-level Program Setup screen.

Audio Stream Selection Screen

```
Audio Stream:
XXXX
```

Where **XXXX** is the currently selected audio stream.

Press **ENT** and use the ▲ or ▼ keys to select <AC-3>, <MPEG>, or <MPG/AC3>. Press **ENT** again to confirm.
Press the ◄ key to go to the Output Remap screen.
Press the **ESC** key to return to the Program Input screen.
Press the **ESC** key again to return to the main-level Program Setup screen.

Program Status screen

```
Program Status...
Select? Press<ENT>
```

Press the **ENT** key to view the second-level program status screens.
Press the ► key to go to Output Rate Selection.
Press the ◄ key to go to Program Setup.
Press the **ESC** key to go to the Home Screen.

Second-level screens

2nd-level Program Status Screen

```
ProgIn XXXXX AAAAAAA
ProgOutYYYY  BBBBBBB
```

where **XXXXX** is the program number at input, **AAAAAAA** is the service descriptor for the program, **YYYY** is the decimal program number at output, and **BBBBBBB** is the available audio on the input for the program (AC-3, MPEG, or MPG/AC3).
Press the ► key to view the status of the next program (all programs present may be viewed but only programs 1 through 16 may be selected for output).
Press the **ESC** key to return to the Program Status screen.

Output Rate Selection screen

Press the **ENT** key and then the ▲ or ▼ key to select 26.97 Mbps (64QAM) or 38.81 Mbps (256QAM). Press the ENT key to confirm the selection.
Press the ► key to go to IRT Mode Selection.
Press the ◄ key to go to Program Status.
Press the **ESC** key to go to the Home Screen.

IRT Mode Selection screen

Select ON to enable the DTV 735's IRT mode. See **IRT Mode** on page 34 for more details.

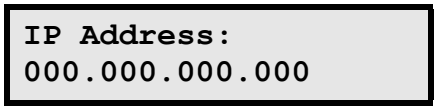
Press the **ENT** key and then the ▲ or ▼ key to select OFF or ON. Press the **ENT** key to confirm the selection.
Press the ► key to go to IP Setup.
Press the ◄ key to go to Output Rate Selection.
Press the **ESC** key to go to the Home Screen.

IP Setup screen

Press the **ENT** key to go to IP Address Selection.
Press the ► key to go to Reset Unit Screen.
Press the ◄ key to go to IRT Mode Selection.
Press the **ESC** key to go to the Home Screen.

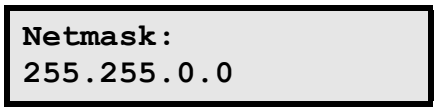
Second-level screens

IP Address Selection Screen



Press the **ENT** key and then press the arrow keys to change the IP address.
Press the **ENT** key to confirm the selection.
Press the ► key to go to the Netmask Selection.
Press the **ESC** key to go to IP Setup.

Netmask Selection Screen

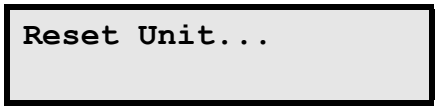


Press the **ENT** key and then press the arrow keys to change the Netmask.
Press the **ENT** key to confirm the selection.
Press the ► key to go to Gateway Selection.
Press the ◄ key to go to IP Address Select.
Press the **ESC** key to go to IP Setup.

Gateway Selection Screen

Press the **ENT** key and then press the arrow keys to change the Gateway.
Press the **ENT** key to confirm the selection.
Press the ◄ key to go to Netmask Selection.
Press the **ESC** key to go to IP Setup.

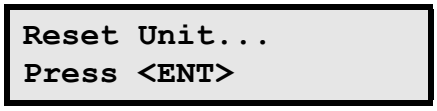
Reset Unit screen



Press the **ENT** key to go to the second level Reset Unit Entry screen.
Press the ► key to go to the Home Screen.
Press the ◄ key to go to IP Setup.
Press the **ESC** key to go to the Home Screen.

Second-level screens

Reset Unit Entry Screen



Press the **ENT** key to reset the unit and start the boot loader.
Press the **ESC** key to go to the Reset Unit Screen.

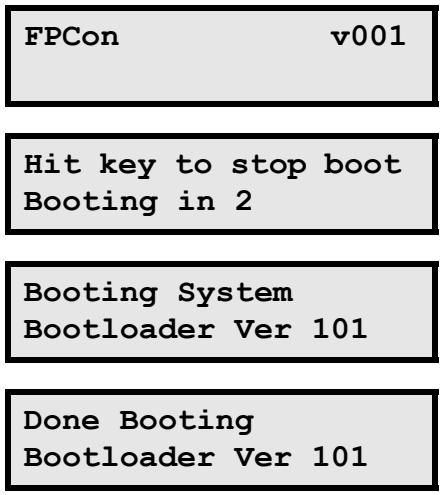
Unit Shutdown Simply remove power to the unit to shut down your DTV735. No special procedure is required.

3.5 Initialization

Software Code Structure The DTV735 Processor contains the following unit software: A boot loader and one version of operating application software. Before power-up, these components are stored in non-volatile memory. The boot loader resides in a portion of the memory that may only be written at the factory while the application is stored in a portion of memory that can be over-written with downloads of new software. The boot code has the responsibility of deciding if the resident application software image should be allowed to execute.

Initialization Sequence

At power up, the boot loader software executes first. It performs a test of RAM and then relocates itself for further execution from there. During boot-up, the following screens appear in sequence on the LCD:



All front-panel LEDs light are OFF during boot process.

Following normal boot-up, the "home" screen will appear as described in section **3.4 Front-panel Operation** on page 26 and the LEDs reflect the actual state of the unit.

Initialization Failure

When in Initialization Failure mode, the unit is essentially dead. There is no ASI output, the alarm relay is de-energized (alarm state), the alarm LED is ON, and the unit does not attempt acquisition of input streams. Call Wegener Customer Service.

3.6 Transport Stream Processing

Refer to ISO 13818-1 for supporting details on the structure of MPEG Transport Streams.

Input to Output Processing

The basic DTV735 has an ASI input and two duplicate ASI outputs. The unit processes the input, selects programs based on user input, and provides an output signal on the DHEI and ASI outputs. The processing includes program number changes as selected. Based on user selection, certain programs may be selected and then passed to the ASI output with time stamping updated.

PSIP Structure and Program Selection

Within the transport stream there are PIDs carrying tabular information on that stream. The PAT describes all the programs available. The program number identifies each program in the transport stream. When a source of data is acquired, the stream is passed to the internal transport demultiplexer. This circuit then extracts the PAT and PMT information and provides this information to the user via the Stream Info and Configuration pages of the web interface. The user may then select programs to be included in the ASI output as described in section **3.2 Ethernet/Web Browser Control**.

IRT Mode

With systems using the Motorola IRT product, certain additional elements must be included in the output transport stream. In such systems, be sure to enable the DTV 735's IRT Mode by selecting IRT Mode ON from the web browser interface or front panel (see **Control and Status Page** on page 19). When the IRT Mode is on, the DTV735 performs the actions listed here.

•A CAT (Conditional Access Table) PID (0x0001) is included and a CA system descriptor is added in this packet pointing to a reserved location (PID 0x0ff9) for the EMM (Encryption Management Message).

•For each program in the stream, a CA descriptor pointing to itself is added in the PMT. This is a null ECM (Encryption Control Message).

•To the PAT, Program 0 (NIT) is added, pointing to PID 0x0ffe which carries the STT (System Time Table) clock information.

•The NIT (Network Information Table) must also be present in the transport stream. This PID (0x0ffe) is created at the uplink and is passed through.

3.7 Alarm System

The alarm and warning system is intended to provide indications to local user of a critical failure or imminent failure. See **Table 6: LED Indicator Descriptions** on page 25 for actual indications.

Alarm Conditions

Generally, if the unit is unable (or presumed to be unable) to present output from a selected transport stream, then that is an alarm state. The following list defines all alarms during normal operation (also see **Initialization Failure** on page 33).

1. ASI Input Unlocked – A valid ASI stream is not present on ASI Input 1.
2. Unit oversubscribed – The combined data rate of the input programs selected exceeds the output data rate selected.
3. PAT missing – The Transport Steam on the input does not have a PAT present (should be located in PID 0x01.
4. PMT missing – The Transport Steam on the input does not have a PMT present (should be located in PIDs as shown in the PAT).

3.8 Software Downloads

The DTV735 may be field upgraded with new application software. Contact Wegener Customer Service for more information.

Chapter 4 Maintenance and Troubleshooting

4.1 Maintenance

Maintenance of the DTV735 is limited to keeping the chassis clean and ensuring that cables remain firmly connected. Occasionally wipe the exterior with a soft, damp cloth to remove any accumulated dust and dirt and check that cables are securely attached.

The DTV735 incorporates security labels over some of the screws. There are no user-serviceable components within the DTV735. Tampering with the security labels or opening the unit will void your warranty. If you have any questions, contact Wegener's Customer Service Department at the address or numbers listed under Customer Service.

4.2 General Troubleshooting

This section is not an intended as an exhaustive list of all possible situations. Please contact us as directed in **Chapter 5 Customer Service** on page 39, with any problems you cannot resolve independently.

If you are experiencing any difficulties, first check the LCD and LED indicators on the DTV735 to determine if any warnings or alarms are active. See **Table 6: LED Indicator Descriptions** on page 25 for descriptions of LED states. If operating over the Ethernet interface, check the Control and Status tab on your browser for Warning messages.

No functions at all

If the unit is not functioning at all and neither the LCD nor any LEDs are active, there may be a loss of ac power. Do the following:

a) Check that ac power cord is firmly connected at both ends.

b) Check that your ac power source is supplying ac power.

4.3 Alarms

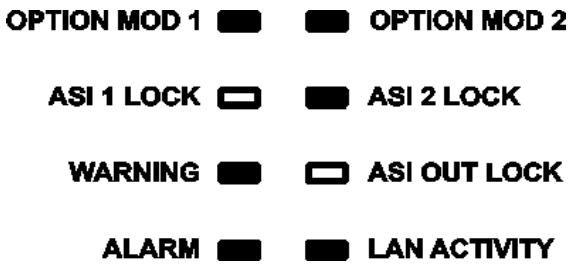
In the following sections, LEDs are illustrated as black (off) or white (on) to represent actual LED appearance.

= LED Off

= LED On

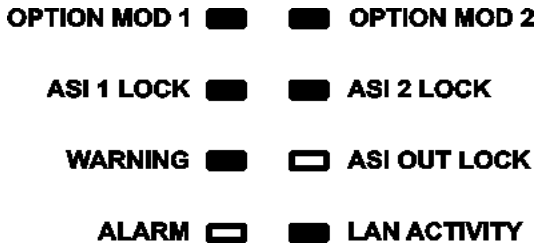
Normal Operation

ASI Input and ASI Output Locked - The LEDs are shown here reflecting the DTV735 in normal operation with no Alarms:



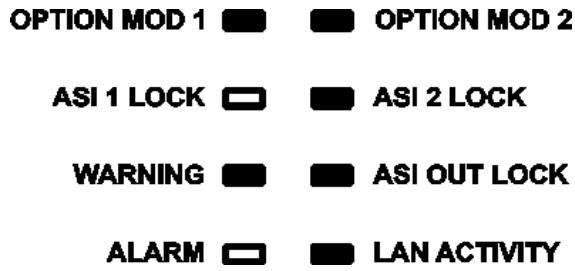
ALARM: ASI Input Unlocked

Video is lost when the incoming signal is lost. When the ASI IN LOCK LED is inactive or unlit (shown below), the ASI transport stream sync has been lost. The WARNING LED will light if both ASI input (1 or 2) and RF input are selected and RF CARRIER LOCK remains. Check ASI source and input connection.



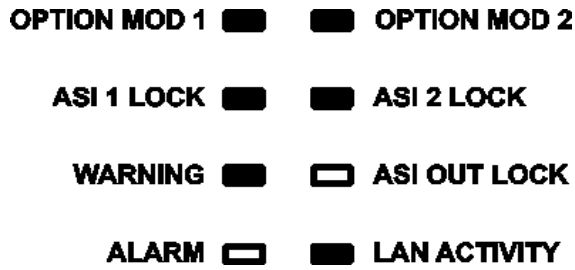
ALARM: Unit Over-subscribed

An oversubscription alarm means that the total rate of the selected ASI inputs is greater than the selected output rate. A corrupt signal is output from the DTV735. Oversubscription results in errors in the video output. On the front panel, this is indicated by a lit ALARM LED and an unlit ASI OUT LOCK LED (shown below). Solve the problem by reducing the number of input programs to fit the combined input data rate within the selected output data rate.



ALARM: PAT or PMT Missing

Video is lost when the incoming signal is missing either the PAT or PMT. When the ALARM LED is lit and both the ASI 1 LOCK and the ASI OUT LOCK LEDs are lit then the transport stream does not have sufficient PSI information included. Check with the service provider to insure that the source is correct.



4.4 Trouble with Browser Interface

If the unit appears to be functioning normally with no alarm or warning conditions, but you cannot use the web browser interface, first check the LED on the rear panel next to the Ethernet connector. It will illuminate and blink as LAN data are detected. If this LED is off check the cabling to the LAN. If the LED remains off after verifying the LAN connection, contact Customer Service. If the Ethernet LED is illuminated, check that you are using the correct IP address. (See "Ethernet/Web Browser Control" on page 17.)

If the address is correct, but the interface still does not function, check your computer's IP settings and consult your network administrator for additional help.

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Chapter 5 Customer Service

5.1 Warranty

The following warranty applies to all Wegener Communications products including the DTV735 Digital Television Processor:

> 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

In the event that the unit should fail to perform as described, or if you need help resolving problems with your DTV735, 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:

a) Obtain a Return Material Authorization (RMA) number by completing and faxing a copy of the RMA Request Form to (678) 624-0294. You may E-mail the same information instead to: **service@wegener.com**

b) 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.

c) 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 the number above if you have any questions about obtaining service for your DTV735.

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