

# GPB EDUCATION



## USING YOUR SATELLITE

## **GPB Education Technical Information Overview**

### **GPB Education Signal Parameters:**

- Ku Band
- AMC-3; 87 Degrees West
- Transponder 14
- Vertical Polarity Down
- L Band 1235.25 MHz

### **Downlink Requirements for GPB Education Reception:**

#### **Satellite Antenna: Reflector and Feed**

Solid surface reflector and feed assemble that provides a minimum of 48 decibel (db) gain in the mid range of the Ku Band. Mesh dishes are not recommended. Steerable systems' feeds are dual band (C & Ku) with remotely adjustable polarity. Steerable means the antenna can be remotely "steered" to point to different satellites.

The Ku Band Low Noise Block Converter (LNB): Noise figure equal to .8 db or less with a gain of 56 db or better. The C-Band LNB: Noise figure of 50 Degrees K or better with a gain of 62 db or better.

#### **Mount**

Suitable design to keep the reflector pointed in winds up to 40 mph. Antennae that are under maintenance contract must be approved by the maintenance contractor. There are steerable and fixed mounts in the GPB Education network.

#### **Digital Receiver (resident at all sites in the GPB Education Network)**

The Georgia Public Broadcasting (GPB) signal is transmitted in Digicipher II (DCII) format. The digital satellite receivers used in the GPB Education network are Integrated Receiver Decoders (IRDs) capable of decoding DCII program signals. The following IRDs are typically found in the network: General Instruments (now Motorola) DSR 4200c, 4200v, and 406. The 4200v is preferable to 4200c as it can receive signals of various widths that may be transmitted in the future.

#### **Analog Receiver (resident at the majority of GPB Education Network sites)**

Most steerable sites are equipped with the Chaparral Monterey 100C analog satellite receiver. This unit positions the satellite dish antenna to point at a selected satellite. The Monterey 100C processes the analog signals received by the dish antenna. The digital information from the dish antenna is passed to the digital receiver described above. Other analog satellite receivers used in the GPB Education network include the General Instruments (now Motorola) 4DTV and the Drake.

#### **Display Equipment / Miscellaneous Equipment**

GPB Education sites typically utilize a TV and a VCR as display equipment. Many sites have installed distribution systems to deliver programming to multiple TVs and VCRs within the location. A speaker telephone and a private telephone line are recommended for interactive programs and troubleshooting.

## **GPB Education Satellite Equipment Operation Basics**

**For operating details, consult the respective manuals and/or call the helpdesk for assistance at (800) 877-7805.**

### **Digital Receiver Operation**

*Facing the Digital Receiver (General Instruments or Motorola unit)*

- Verify a green light next to the word “signal” and a red light next to “SAT/TV.” The green signal light confirms receipt of the satellite signal and the red light indicates the digital receiver is processing digital signals.
- If the SAT/TV light is not illuminated, press the SAT/TV button (far right side of the unit) to enable the digital processing.
- If both signal and SAT/TV lights are illuminated and the program is not displayed on the TV, ensure that the display devices (the TV and VCR) are in the proper mode and on the correct channel. Also ensure the digital receiver’s channel is set properly. See channel instructions below.
- If the “signal” light is not illuminated, disable digital signal processing by pressing the SAT/TV button. Analog programming is now passed to your TV. Caution: there may not be any analog programming transmitted to view on the TV.
- Using the analog receiver remote (assuming a Chaparral Monterey 100c), press the center button labeled TIME. Note the display of R8 – 14 in the upper right corner of the TV.
- If R8 – 14 is not displayed, move the dish to satellite R8 and channel to transponder 14 by following the directions below. Contact the helpdesk at (800) 877-7805 if you require assistance.

*Selecting the GPB Education channel on the digital receiver:*

- Use the channel up and down buttons on the digital receiver remote control or on the front of the unit itself to select channels 400, 410, 420, 430.
- GPB Education programming will always have a small GPB Education logo on the bottom right hand corner of the screen

### **Antenna Pointing - GPB Education Satellite (assumes a Chaparral Monterey 100c)**

- Press the SATELLITE button on the Chaparral remote; note the list of satellites on the display. Press the up or down arrows to scroll to satellite R8 and press ENTER.

- After the dish has stopped moving, press the channel bar on the Chaparral remote until channel 14 is displayed.
- Once pointed to Satellite R8 and tuned to transponder 14, press the SAT/TV button on the front panel of the digital receiver (or use the digital receiver's remote) to begin processing the digital signals. The SAT/TV light will illuminate.
- The green signal light should also turn on. If the signal light on the digital receiver does not turn on, proceed to the dish peaking process below.
- Call the helpdesk at (800) 877-7805 for assistance if necessary.

### **Peaking the Satellite Dish Antenna - Chaparral Monterey 100C Analog Receiver**

If the Chaparral displays the position of satellite R8, and is tuned to transponder 14 but the digital receiver signal light is not illuminated, peak the dish as follows:

- Press the SAT/TV button on the digital receiver/remote until the SAT/TV light is off.
- Using the Chaparral remote control, press the MENU button and the number 7. (If you are asked for a password, enter 2345).
- Scroll through the menu, select DISH POSITION, and press ENTER.
- The screen prompt should read SET SATELLITE POSITION.
- Using the right and left arrows on the Chaparral remote control, increase or decrease this number slowly (five increments at a time).
- Monitor the digital receiver. As you increase or decrease the location, the green light will illuminate.
- When the green light is steady, press MENU on the Chaparral twice to set the new position.
- Press VIEW on the Chaparral remote.
- Place the digital receiver online by pressing its SAT/TV button. Ensure the digital receiver is on the proper channel and view the program (see selecting digital receiver channel directions above).

Remember to utilize the satellite helpdesk for any satellite problems. The helpdesk technicians are there to serve you.

## **Troubleshooting Simple Problems**

*The GPB Education Satellite helpdesk at (800) 877-7805 is available to assist with any problem.*

### **TILING**

Small colorful squares that distort the picture indicate that the digital signal is not sufficient to provide a good picture. To resolve, peak the dish.

### **BLANK SCREEN**

A black screen indicates that the television or VCR may not be on the proper channel or in the correct mode. Correct these problems using the TV and/or VCR remote controls.

### **WRONG SATELLITE**

If you are not tuned into the correct satellite, see the Antenna Pointing section of the GPB Education Satellite procedure.

### **BLUE SCREEN**

A blue screen indicates that the VCR may be on the wrong channel. Ensure that it is on Channel 3 or 4. There are many ways to send a signal to a display device; each way requires different wires and equipment settings. It is best to call the helpdesk with any GPB Education system problem that you cannot solve.

**The Satellite Helpdesk**  
**Convergent Media Systems**  
1-800-877-7805  
Monday – Friday 7:30am – 4:30pm

Convergent Media Systems is a Georgia company that specializes in the design, deployment, and maintenance of satellite-based communication networks. Convergent installed the GPB Education network in 1994.

GPB Education contracts Convergent Media Systems for maintenance and helpdesk services for all sites in the state. All field maintenance service calls, including repair or replacement of all failed Convergent Media Systems supplied components, are covered under this maintenance agreement. Failures caused by negligence, vandalism, or force majeure are not covered, however. Note: **Work on a site's distribution system is not covered by the warranty.** Sites provide a purchase order for \$255.00 on any distribution-related work. With few exceptions, Convergent Media Systems does not install distribution systems.

## The Maintenance Contract

*Convergent Media Systems provides site maintenance and helpdesk services as described below:*

- Under the maintenance contract, any school, library, university, or other facility that was installed by Convergent Media Systems is authorized to call the helpdesk for support.
- Onsite maintenance service calls, including repair or replacement of all failed components, are supplied by Convergent. The following items are covered under the maintenance contract:
  - Satellite Antenna
  - Ku Band LNB
  - C Band LNB
  - Co-rotor/Polar-rotor
  - Actuator Arm
  - Cable Connectors (IF and RF)
  - Chaparral 100C, Drake, 4DTV Analog Satellite Receiver
  - General Instrument DSR-4200C, 4200V, 406 Digital Satellite Receiver
  - Re-peaking and Reshaping of dish
  - Labor associated with repairing or replacing the above equipment.
- Under the maintenance contract, the following items are *not* covered:

*After every attempt is made to solve the problem using first level procedures, the TSC (helpdesk agent) may determine that the site requires a repair. If the problem was caused by negligence, vandalism or force majeure, the site will be billed for materials, labor and repair costs.*

- Vandalism
- Force majeure (lightning, storm damage, etc.)
- Equipment repair or equipment installation performed by others.
- Equipment damage resulting from work performed by others
- Cable cuts
- Distribution systems
- Replacement of TVs or VCRs

**Items not covered by maintenance are priced as follows:**

**Replacement Components/labor for the GPB Education Network**

|   |                  |
|---|------------------|
| Labor rate for onsite visits .....  | \$85.00 per hour |
| Digicipher 4200 .....   | \$1,040.00       |
| Chaparral Monterey 100c (refurb. if available) .....                            | \$1,475.00       |
| 4DTV .....  | \$1,475.00       |
| Chaparral Co-rotor .....  | \$150.00         |
| C-Band LNB .....  | \$100.00         |
| KU-LNB .....  | \$150.00         |
| Actuator .....  | \$325.00         |
| Chaparral UHF Kit .....   | \$100.00         |
| Surge Protector .....   | \$115.00         |
| Reflector Panels .....  | \$160.00         |
| Feed Supports .....   | \$65.00/system   |
| VC2 Board + sub fees .....  | \$450.00         |
| Chaparral Remote .....  | \$110.00         |
| Television .....  | \$381.65         |
| VCR .....   | \$100.00         |
| Repair for lightning-damaged 100c .....   | \$477.50         |
| Furnish and install RG-6 ribbon cable .....                                     | \$3.95 per foot  |
| Furnish and install RG-6 Teflon ribbon cCable .....                             | \$3.95 per foot  |
| Furnish and install RG-11 PVC cable .....                                       | \$5.90 per foot  |
| Trenching and burying cable .....   | \$2.00 per foot  |
| 1.8-meter fixed dish with ground mount and installation* .....                  | \$2,850.00       |
| 1.8-meter fixed dish with roof mount and installation* .....                    | \$3,250.00       |
| 3.7-meter steerable dish with analog satellite receiver and installation* ..... | \$6,100.00       |
| Satellite Relocation .....  | \$3100           |
| Site Visits/Survey .....  | \$400            |

\*Price is for a standard installation and does not include the Digicipher.

(Note: Price includes up to 3 hours of labor, troubleshooting distribution systems, and/or certifying equipment installed by others so that it can be placed under warranty).

**Installations – New Sites - Relocations**

Sites that wish to have a satellite system installed are to contact Convergent Media Systems through the helpdesk at (800) 877-7805. Sites may call the installations department directly and ask for the State of Georgia Installation manager at (770) 369-9000.

The installation process begins upon receipt of a purchase order (P.O.) for a site survey. Convergent will contact the school to schedule the survey, within 5-7 business days of P.O. receipt. The site survey normally takes 2-3 hours.



Convergent Media Systems will prepare a quote from the site survey within 5-7 business days. If the site decides to proceed with the installation, a purchase order for the installation is required. Convergent will order the equipment for the site and schedule the installation for the school within 14-21 business days. The whole process takes between 6-8 weeks.

The individual school system (site) is responsible for payment; the state does not provide antennae for new schools. The school system (site) is also responsible for de-installations/re- installations and relocations.

## Common Questions about GPB Education Installations

**What is a Site Survey?** A site survey is a visit by a qualified technician to the proposed site. The purpose of the visit is to determine a location for the satellite dish, the indoor equipment, and the cable routing that meets the school's requirements and provides for an affordable, functional installation. Issues such as site construction, required permitting, or other extenuating circumstances may impact the installation process causing deviation from a standard installation. Any deviations in cost are noted in the quote that accompanies the site survey. The site survey typically takes a few hours and will be scheduled at the school's convenience.

**How will I know where to put the dish?** Convergent will work with the site's designated representative to determine an appropriate location for the dish and the headed indoor electronic equipment. This is part of the site survey process.

**What is included in a standard installation?** Convergent attempts to locate the dish no more than 200 feet from the headed equipment. If the dish is further than 200 feet, additional charges may apply. Convergent will utilize existing conduits when practical, though we can supply and install a conduit if necessary. 3.7-meter steerable satellite dish antennae typically are installed in a 20-foot by 20-foot fenced area. 1.8 meter fixed satellite dishes are typically installed in a 10-foot by 10-foot fenced area. All cables will be buried and placed in conduit so that they are both protected and aesthetically pleasing.

**What is the difference between a steerable and a fixed dish system?** Steerable dishes can be remotely pointed to other satellites and therefore have access to additional programming on those other satellites. The dish is moved by a motorized actuator that moves the dish into positions preset at installation that correspond to locations of various satellites.

The fixed dish has no motor and is locked into position on the GPB Education satellite. Both systems are easy to use. The steerable dish is 3.7 meters in diameter and the fixed dish is 1.8 meters. Both systems should be enclosed in a fence for safety. The site is responsible for providing a fence.

**What are C and Ku Bands?** C and Ku Bands are two frequency ranges used in satellite transmissions. In the early 1980s as satellites became more popular, additional frequencies were required to meet transmission demands. The FCC allocated another range of frequencies - Ku Band - to address the need. The Chaparral receiver used in GPB Education network is capable of receiving both frequency ranges.

**Why does the VCR need to be on Channel 3 (4) ?** The "typical" GPB Education satellite system is configured with a VCR for recording programs. The typical system is wired so that when the VCR is set to channel 3 (4 in some areas), the programming from the satellite receiver is directed to the VCR tape. Note many GPB Education sites do not follow this pattern. If you are not sure of your system's wiring and/or operation regarding recording please call the helpdesk.

**I just recorded a program and it did not have any audio on the playback – Video was fine. What happened?** Check the Chaparral audio by pressing the volume up arrow on the Chaparral remote control. Note the volume display on the TV. Set the volume to approximately 2/3 of the maximum. If the audio is too loud after this adjustment, turn the volume down on the TV. There are numerous audio volumes in the system from TVs to VCRs to Digital and Analog receivers to additional distribution equipment. Contact the helpdesk for assistance.

**What is “Actuator Error” and how do I correct it?** The mechanism that moves the satellite dish in a steerable system is called an actuator. The actuator consists of a motor and a mechanical arm that physically maneuver the dish. Low voltage is sent from the analog receiver to the actuator’s motor to move the arm in or out. Occasionally, a circuit breaker will “trip” in the receiver and the actuator will have to be reset. A reset is performed by hitting the actuator reset button on the back right-hand side of the receiver. If this problem occurs frequently or resetting does not fix the problem, please call the helpdesk.

**What is “source not Monterey?”** The Chaparral receiver is capable of receiving audio/video from a number of sources such as a cable network, a camcorder, DVD, etc. The receiver can select what sources to distribute. In the GPB Education network, the receiver’s source will always be Monterey (i.e. the satellite signals). If the receiver is set to read the wrong input, the screen will display “source not Monterey.” To return to the Monterey source, simply press the “view” button to clear the screen, and press the “west/swap button” (right hand arrow) until the bottom of the screen reads “SOURCE: LARGE MONTEREY.” If further complications arise, please call the helpdesk.

**Why can’t I receive HBO and ESPN?** HBO and ESPN are encrypted, or scrambled signals. Most major broadcasters scramble signals for a variety of reasons. The Chaparral receivers in the GPB Education network are not capable of decoding these encrypted signals unless a video-cipher adapter card is purchased. This card fits into the front of the receiver. Specific channels can be authorized by paying fees to the broadcasting companies. Contact broadcaster of interest for decoding cards and rates.

**Sometimes when it rains, I get tiling or no video. Why is this?** The entire transmission path requires a direct line of sight between the transmitter dish and the satellite and the receiver dish. Moisture will attenuate signals, resulting in less signal reaching the receiving dish and causing tiling and eventual loss of signal (on a digital signal) or sparkles and eventual loss of signal (on an analog signal). Satellite signals are strong enough to penetrate most clouds; however, an occasional heavy storm can block programming. In these cases, the only remedy is to wait out the storm. If the problem persists after the storm, call the helpdesk.

**How can I get funding for a new satellite?** Satellite funding is part of the technology funding which is a line item to DOE through their school district’s technology block grant. There are new procedures for application. Please check with your system office for specifics.

## Important Buttons on the Chaparral

- Power:** Cycles the Chaparral analog receiver on and off.
- Volume:** Up and Down arrows adjust volume on receiver only.
- Time:** Press 1 time – Displays satellite channel and time of day.  
Press 2 times – Displays Timer menus.  
Press 3 times – Displays Timer event setup menu.
- View:** Clears all writing from the TV screen.
- Channel:** Tunes receiver to desired satellite channel.
- Favorite:** Displays list of favorite channels pre-programmed – consult manual.
- Satellite:** Displays list of satellite channels.
- Menu:** Allows access to different menus (access by pressing “menu” and then pressing corresponding menu number).
- Enter:** Enters a chosen selection – used mostly when choosing a favorite channel.
- Cancel:** Cancels any changes made to a menu.
- Letter/  
Number:** Used when selecting satellite channels, frequencies, polarities, or any number that is to be changed or entered. Receiver determines if a letter or number is required.
- Up/Down  
Arrows:** Used to select items in menus.
- Left/Right  
Arrows:** Used to adjust menu items.

For additional information on the different satellites, go to [www.satcodx.com](http://www.satcodx.com) or contact the satellite helpdesk at 800-877-7807.