



## INSTRUCTION MANUAL

# HE-12/HE-4

### *Modular Headend Chassis*

| Model         | Stock No. | Description |
|---------------|-----------|-------------|
| MIRC-12V      | 7715      | Chassis     |
| MIRC-4D       | 7711      | Chassis     |
| MIRC-4CUBE-CH | 7703      | Chassis     |

### *Modular Headend Products*

| Model         | Stock No. | Description  |
|---------------|-----------|--|
| MIPS-12C      | 7722C     | Power Supply                                       |
| MIRC-4CUBE-PS | 7702      | Power Supply                                       |
| AMCM-860B     | 7766B     | Agile Modulator                                    |
| AMCM-860HB    | 7766HB    | Agile Modulator (Horizontal)                       |
| AMCM-860S     | 7766S     | Stereo Agile Modulator                             |
| AMCM-860HS    | 7766HS    | Stereo Agile Modulator (Horizontal)                |
| MICM-45C      | 7797C     | A/V Modulator                                      |
| MICM-45S      | 7797S     | Stereo A/V Modulator                               |
| MIDM-806C     | 7740C     | Demodulator  |
| DHDC-DV       | 6264A     | Digital High Definition Downconverter (Vertical)   |
| DHDC-DH       | 6261A     | Digital High Definition Downconverter (Horizontal) |
| DHDC-UV       | 6265A     | Digital High Definition Upconverter (Vertical)     |
| DHDC-UH       | 6262A     | Digital High Definition Upconverter (Horizontal)   |
| AMM-806       | 7763      | Agile Micro Modulator                              |
| MSBC          | 7727      | Sub-Band Block Converter                           |

We recommend that you write the following information in the spaces provided below.

|                                     |  |
|-------------------------------------|--|
| Purchase Location Name:             |  |
| Purchase Location Telephone Number: |  |
| Serial Number:                      |  |

The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

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## General & Safety Instructions



The STOP sign symbol is intended to alert you to the presence of REQUIRED operating and maintenance (servicing) instructions that if not followed, may result in product failure or destruction.



The YIELD sign symbol is intended to alert you to the presence of RECOMMENDED operating and maintenance (servicing) instructions.



The LIGHTNING flash symbol is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be sufficient magnitude to constitute a risk of electrical shock.

**TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER FROM THIS UNIT.  
NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE**

### NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

## Safety Instructions

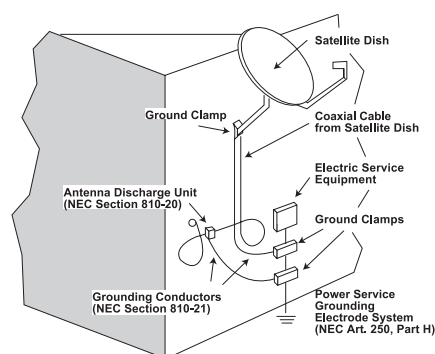


**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE  
AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- Read all safety and operating instructions before you operate the unit.
- Retain all safety and operating instructions for future reference.
- Heed all warnings on the unit and in the safety and operating instructions.
- Follow all installation, operating, and use instructions.
- Unplug the unit from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the unit.
- Do not use accessories or attachments not recommended by Blonder Tongue, as they may cause hazards, and will void the warranty.
- Do not operate the unit in high-humidity areas, or expose it to water or moisture.
- Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious personal injury and damage to the unit. Install the unit only in a mounting rack designed for 19" rack-mounted equipment.

## Safety Instructions - continued

- Do not block or cover slots and openings in the unit. These are provided for ventilation and protection from overheating. Never place the unit near or over a radiator or heat register. Do not place the unit in an enclosure such as a cabinet without proper ventilation. Do not mount equipment in the rack space directly above or below the unit.
- Operate the unit using only the type of power source indicated on the marking label. Unplug the unit power cord by gripping the plug, not the cord.
- The unit is equipped with a three-wire ground-type plug. This plug will fit only into a ground-type power outlet. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the ground-type plug.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
- Be sure that the outdoor components of the antenna system are grounded in accordance with local, federal, and National Electrical Code (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the following diagram:



- We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the unit is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the lines between the unit and the antenna. This will prevent damage caused by lightning or power line surges.
- Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
- Never insert objects of any kind into the unit through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- Do not attempt to service the unit yourself, as opening or removing covers may expose you to dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.
- Unplug the unit from the wall outlet and refer servicing to authorized service personnel whenever the following occurs:
  - ☐ The power supply cord or plug is damaged;
  - ☐ Liquid has been spilled, or objects have fallen into the unit;
  - ☐ The unit has been exposed to rain or water;
  - ☐ The unit has been dropped or the chassis has been damaged;
  - ☐ The unit exhibits a distinct change in performance.
- When replacement parts are required, ensure that the service technician uses replacement parts specified by Blonder Tongue. Unauthorized substitutions may damage the unit or cause electrical shock or fire, and will void the warranty.
- Upon completion of any service or repair to the unit, ask the service technician to perform safety checks to ensure that the unit is in proper operating condition.

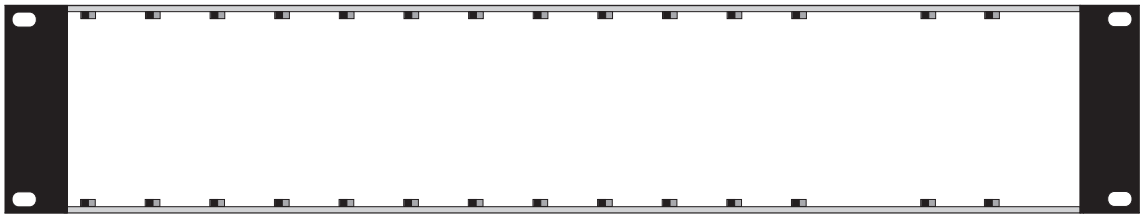
### Returning Product for Repair (or Credit)

**A Return Material Authorization (RMA) Number is required on all products returned to Blonder Tongue, regardless if the product is being returned for repair or credit.** Before returning product, please contact the Blonder Tongue Service Department at 1-800-523-6049, Ext. 4256 or visit our website: **[www.blondertongue.com](http://www.blondertongue.com)** for further information.

Modular Headend Chassis

MIRC-12V Description

The MIRC-12V is a professional quality modular headend system designed to maximize rack space. The 2 RU MIRC-12V chassis will house up to 12 single width modules and one MIPS-12C power supply. Modular components consist of modulators and demodulators. These modular components are fully shielded and are field installable. The MIRC-12V chassis allows the compact modules to be added from the front of the chassis without removing the chassis from the rack. Field service and channel upgrades are plug and play. The MIRC-12V chassis is fully compatible with all MICM, MIDM, AMCM and DHDC series units.



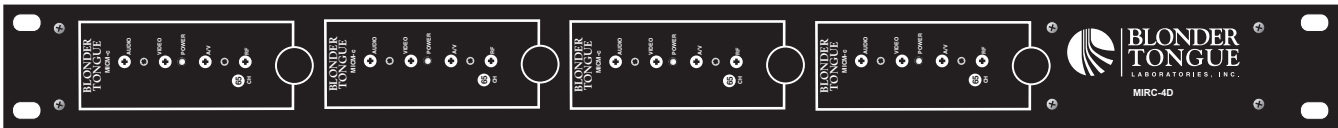
MIRC-12V Chassis

MIRC-12V Specifications

**Mechanical**  
Dimensions (W x H x D): 19 x 3.5 x 7.5 inches  
Weight: 1.1 lbs (0.5 kg)

MIRC-4D Description

The 1RU MIRC-4D chassis includes the modular power supply and holds up to four modules. The chassis (Stock No. 7711) is compatible with all modules.



MIRC-4D

MIRC-4D Specifications

|   |  |
|---|--|
| <p><b>General</b></p> <p>Power Requirements: 100 VAC to 240 VAC</p> <p>Frequency: 50 to 60 Hz</p> <p>Temperature Range: 0° to +50° C</p> <p>Output Voltage &amp; Current Capacity:</p> <ul style="list-style-type: none"> <li>+12 VDC @ 1.8 Amps</li> <li>+ 5 VDC @ 1.8 Amps</li> </ul> <p><b>Mechanical</b></p> <p>Dimensions (W x H x D) : 19 x 1.75 x 8.0 inches</p> <p>Weight: 3 lbs (1.4 kg)</p> | <p><b>Connectors/Impedance</b></p> <p>AC Input: IEC</p> <p>DC Output: 4 sets of cables</p> <p><b>Accessories Supplied</b></p> <p>AC Power Cable, 6 ft., IEC, USA</p> |
|---|--|

### MIRC-4CUBE-CH Description

The MIRC-4CUBE-CH is a standalone version of the MIRC-4. It can be used in any installation where modulators are required and no standard headend rack is available. The CUBE system consists of a chassis (MIRC-4CUBE-CH), power supply (MIRC-4CUBE-PS) and any combination of up to four modules.

### MIRC-4CUBE-CH Specifications

Dimensions (W x H x D): 7.25 x 6.625 x 7.75 inches

Weight: 6.0 lbs

### MIRC-4CUBE-PS Specifications

#### General

Power Requirements: 120 VAC to 240 VAC

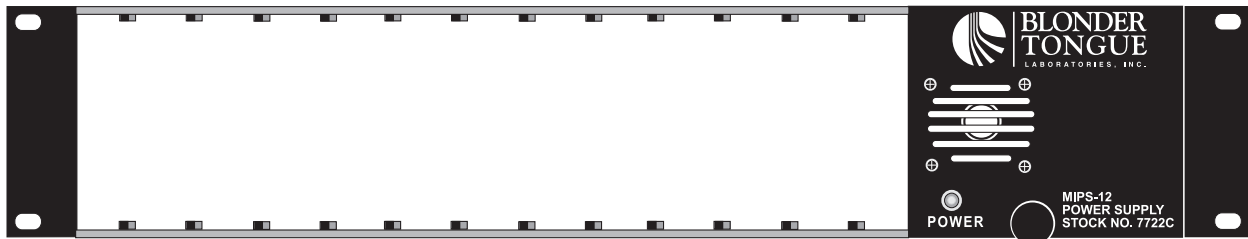
Frequency: 50 to 60 Hz

Temperature Range: 0° to +50° C

Output Voltage & Current Capacity:  
+12 VDC @ 1.8 Amps  
+ 5 VDC @ 1.8 Amps



### MIRC-12V Chassis with MIPS-12C Power Supply



### Specifications MIPS-12C (Stock #7722C) (Typical)

#### General

Power Requirements:

100 VAC to 250 VAC Frequency: 50 to 60 Hz

Temperature Range: 0° to +50° C

Output: +5 VDC @ 5.5 Amps, +12 VDC @ 4 Amps

#### Mechanical

Dimensions (W x H x D) : 4.16 x 3.5 x 7.50 inches

Weight: 1.10 lbs (0.50 kg)

#### Connectors/Impedance

AC Input: IEC

DC Output: 37 pin D

#### Indicators

Power 1 ON: LED, green

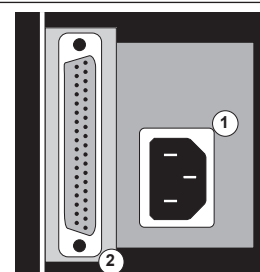
#### Accessories Supplied

AC Power Cable: 6 Ft, IEC, USA

### MIPS-12C Power Supply Connections

All the connectors on the power supply are located on the rear panel.

1. AC INPUT - The power supply accepts standard 100 to 250 VAC inputs.
2. DC Output - The polarized D connector provides 12 sets of +12 VDC, +5 VDC and ground cables for the modules.



## AMCM-860B MHz Agile Micro Modulator



### Description

The AMCM-860B is a professional quality agile audio/video modulator with an output frequency range of 54-860 MHz. It joins Blonder Tongue's impressive family of modular headend components and works in conjunction with the MIRC-4D and MIRC-12V rack chassis, MIRC-4CUBE-CH and MIPS-12C power supply.

The unit provides a modulated aural & visual carrier on any channel in the 54 to 860 MHz range. Frequency plans including Standard CATV, IRC, HRC and Broadcast are accommodated via front panel selection. Channel tuning is easily accomplished with the use of front panel switches following the entry instructions. All channels with appropriate FCC offsets are pre-programmed and tuned electronically via microprocessor.

### Features

- Supports all Broadcast and CATV channels, including HRC and IRC assignments from 54 to 860 MHz.
- Meets FCC docket 21006 aeronautical frequency response offset requirements
- Front panel access to all level controls and indicators
- Integrated stereo encoder available
- Die-cast chassis offers superior RFI protection



**The AMCM-860 dissipates twice the wattage in comparison to other Blonder Tongue HE-12 modulators and demodulators. Due to this wattage increase, care must be taken when installing AMCM-860's into an existing MIRC-12 configured with MIPS-12 power supplies (Stock No. 7722 or 7722B). These power supplies can only support one (1) AMCM-860. Installing more than one AMCM-860 will cause the power supply to fail. Should two (2) or more AMCM's be required, the power supply must be changed to the new MIPS-12C (Stock #7722C) power supply. The "C" version power supply can easily be identified by the presence of fan vents on the front panel.**

**A further enhancement to our HE Series product line is the MIRC-12V (Stock #7715) chassis. It is designed to provide increased ventilation for improved heat dissipation.**

## Specifications AMCM-860B (Typical)

### RF

Frequency Range: 54-860 MHz  
 Channels: CATV, VHF, UHF (STD, HRC, IRC)  
 FCC Offset (pre-programmed):  
     0, +12.5, or 25 kHz  
 Output Level - Min: +45 dBmV  
 Output Level Adjust: 15 dB  
 Aural/Visual Carrier Ratio: -10 to -17 dB  
 Visual Carrier Frequency Tolerance  
     Standard Channels:  $\pm 5$  kHz  
     FCC Aeronautical Channels:  $\pm 3$  max kHz  
 4.5 MHz Aural Inter Carrier Frequency:  
      $\pm 150$  Hz  
 Channel Selectivity:  
     Adjacent Aural and Below: -40 dB  
     Adjacent Picture and Above: -50 dB  
 Spurious Outputs: -60 dBc  
 C/N Ratio In Channel: 65 dB  
 Broadband Noise: -76 dBc  
 Output Impedance: 75  $\Omega$   
 Output Return Loss: 12 dB

### Video

Input Level: 1.0 V p-p  
 Frequency Response  
     fv-0.5 MHz to fv+4.2 MHz:  $\pm 1.0$  dB  
 P-P Video to RMS Hum Ratio: 65 dB  
 Video Signal-to-Noise Ratio,  
     NTC-7 Weighted: 62 dB  
 Differential Gain: 2.0 %  
 Differential Phase: 1.0 °  
 Over Modulation Indicator: 87.5,  $\pm 2.5$  %  
 Input Impedance: 75  $\Omega$   
 Input Return Loss: 24 min, dB

### Audio

Input Level: 140 mV RMS minimum  
 Input Impedance: 10k  $\Omega$ , Unbalanced  
 Total Harmonic Distortion (%): 1.0  
 Stereo Separation (AMCM 860S):  
     50 Hz - 100 Hz: 15 dB  
     100 Hz - 1 kHz: 25 dB  
     12 kHz: 18 dB

### General

Power Requirement: 5 W  
 Voltage:  
     12 VDC @ 280 mA  
     5 VDC @ 470 mA  
 Temperature Range: 0 to +50 ° C

### Mechanical

Dimensions (W x H x D):  
     1.15 x 3.5 x 7.5 in.  
     29 x 89 x 191 mm  
 Weight: .8 lbs., .36 kg

### Connectors

Video Input: "F" Female  
 L/R Audio Input: RCA Phono (2)  
 RF Output: "F" Female

### Controls

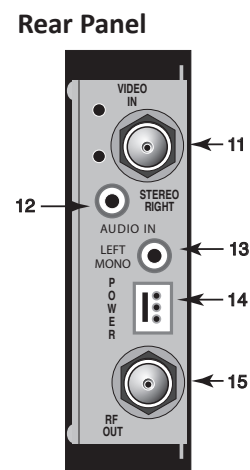
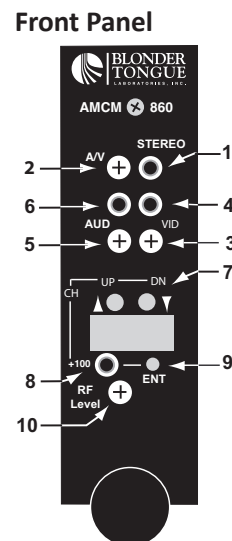
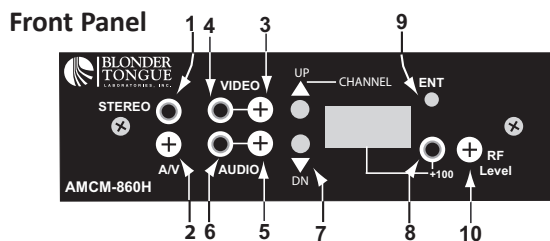
Channel Selection:  
     Push-Button Switches, UP/DOWN  
 Video Level: Control  
 A/V Ratio: Control  
 Audio Level: Control  
 RF Output Level: Control  
 Channel Enter: Push Button

### Indicators

Channel Indicator: 2 Digit LED, Red  
 Video Over Modulation: LED, Red  
 Audio Over Modulation: LED, Red  
 Stereo Indicator: LED, Green

## Operating Controls and Indicators

1. **Stereo Indicator** - Lit when video and stereo audio are present.
2. **Audio/Video Ratio Adjustment** - Adjustment of the A/V Ratio is permitted from approximately -17 dB (full clockwise position) to approximately -10 dB (full counterclockwise position) by rotating the potentiometer.
3. **Video Adjustment** - Adjustment of the Video Modulation Level is permitted by rotating the potentiometer.
4. **Video Over Modulation LED Indicator**
5. **Audio Adjustment** - Adjustment of the Audio Modulation Level is permitted by rotating the potentiometer.
6. **Audio Over Modulation LED Indicator**
7. **Up/Down Buttons** - Used to set the desired channel or mode.
8. **+100 Indicator** - Lights when channel settings are 100 -135.
9. **Channel ENT Button** - Enter button used to enter a desired channel or mode.
10. **RF Level Adjustment** - Potentiometer adjustment used to set the output level. Has a range of 15 dB, optimum performance with a 10 dB adjustment.
11. **Video Input** - "F" Connector
12. **Right Stereo Audio In** - RCA Connector
13. **Left Stereo Audio or Mono In** - RCA Connector
14. **Power Connector**
15. **RF Output** - "F" Connector



It is strongly recommended to use the Blonder Tongue MIPS-12C or the MIRC-4D power supplies with the AMCM-860. It is also recommended to use the optional headend fan unit (QTHF, Stock No. 6235) when deploying more than 6 AMCM-860 units in the MIRC-12V chassis. A rack space above and below the chassis unit is suggested for heat dissipation and air flow.

## Programming the Unit

The AMCM unit comes factory set to operate in the Standard CATV mode. The unit has 4 valid operating modes: STD CATV, IRC, HRC & Broadcast UHF/VHF. (Skip to the next section for programming the operating mode)

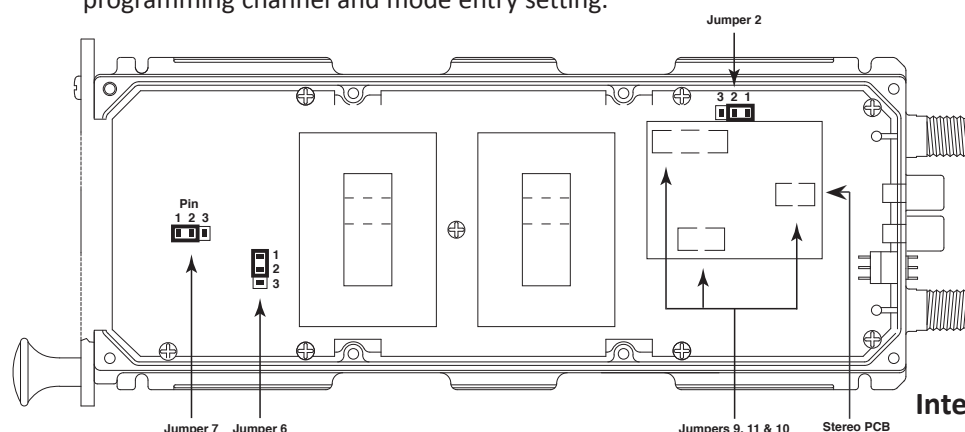
### Programming a Channel

1. Navigate to the desired channel number by depressing the ▲ UP and ▼ DN buttons.
  - a. Continuous past 99 for channels 100-135, the +100 red LED will illuminate.
2. Press **ENTER** when you reach the desired channel setting. This will tune the modulator output to the corresponding channel frequency for this entry.
  - a. The LED display will blink continuously during the channel programming process and will not change the output frequency the unit is programmed until **ENTER** is depressed.
  - b. The unit has a special feature that alerts an operator of an inadvertent or desired change to the channel display by flashing the LED readout. The LED display will continue to flash for 30 seconds if **ENTER** is not depressed and then will return to the display of the previously programming channel entry setting.

## Operating Mode Selection

The unit has 4 valid operating modes: STD CATV, IRC, HRC & Broadcast UHF/VHF. The AMCM unit comes factory set to operate in the Standard CATV mode. To change the operating mode:

1. Simultaneously depress ▲ UP and ▼ DN for approximately 5 seconds.
2. The Channel LED display will switch to the operating mode selection.
3. Use ▲ UP or ▼ DN to select the desired mode:
  - a. C = STD CATV
  - b. H = HRC
  - c. I = IRC
  - d. U = Broadcast (VHF/UHF)
4. After selecting the desired mode depress **ENTER** to set the mode.
5. The unit will return to the channel display mode.
  - a. Programming will reflect the mode chosen – See Appendix A for a detailed frequency plan.
  - b. The programming mode will also flash continuously during the programming process. The LED display will continue to flash for 30 seconds if **ENTER** is not depressed and then will return to the display of the previously programming channel and mode entry setting.



| JUMPER SETTINGS         |                           |
|-------------------------|---------------------------|
| MONO<br>Stock No. 7766B | STEREO<br>Stock No. 7766S |
| J2 - PIN 2-3            | J2 - PIN 1-2              |
| J6 - PIN 2-3            | J6 - PIN 1-2              |
| J7 - PIN 2-3            | J7 - PIN 1-2              |

Internal Jumper Settings - AMCM-860B

## Troubleshooting - AMCM-860

A continuous flashing CH Display indicates a Error Condition detected by the unit microcontroller. Sample conditions include:

- Channel Selector Entry does not match the channel number on which the modulator is operating, the display will flash for 30 seconds and then revert back to the previous CH entry.
- E1 is displayed if the Input & VCO is Not Locked
- E2 is displayed if the Output VCO is Not Locked

## Possible Error Condition Scenarios

1. An Error Condition may occur when a channel number was accidentally altered by changing the push button switch to a number that is different from the output channel set in memory, or if there was a switch malfunction.
2. An Error Condition may occur when a user sets a new mode and the previously programmed channel is not in the new mode's channel range.



**SEE APPENDIX A FOR A COMPLETE LIST OF AVAILABLE CHANNELS.  
STD CATV; IRC & HRC 1-135 AND BROADCAST 2-69**

## Correction Suggestions

The User should perform the following steps to correct an Error Condition:

1. Check that the Channel Display is set to the desired channel and reset as appropriate
2. Check that the unit is set to the appropriate desired operating mode
3. Verify the unit output on a spectrum analyzer
4. Disconnect and reconnect power to the unit

If an error condition continues to be displayed, unit should be replaced and serviced.

## MICM-45 Modulators

### Description

The MICM-45 is a professional quality, channelized, heterodyne audio/video modulator. The unit provides modulated RF carrier output on any single VHF channel, including: broadcast TV (2-13), CATV (14-135). The MICM-45 is ideal for placing audio and video onto any unused VHF channel. Any standard audio/video source can be used, such as satellite receivers, television cameras, video tape recorders, or television demodulators.

The MICM-45 utilizes SAW filtering with FCC group delay pre-distortion to provide true vestigial sideband selectivity. This makes the MICM-45 perfect for use in adjacent channel systems.

The MICM-45C takes baseband audio and video and modulates these signals onto the desired output channel. The MICM-45S takes baseband L/R audio and video and modulates these signals into the desired output channel. The heterodyne conversion process used in the MICM-45 employs a crystal referenced, PLL synthesized local oscillator. This guarantees rock solid, no-drift output for the life of the modulator. The MICM-45 meets FCC Docket 21006 aeronautical frequency offset requirements ( $\pm 5$  kHz video carrier accuracy). The modulator accepts standard polarity (sync negative) video in the range of 0.7 to 2.5 V p-p.

The MICM-45C has field defeatable audio pre-emphasis to provide stereo compatibility with any external BTSC stereo generator providing a composite stereo baseband output.

The MICM-45S is a stereo A/V modulator providing a stereo audio and video modulated RF carrier on any single VHF channel. All other features and specifications are identical to the MICM-45C except as noted below.

### Specifications MICM-45 (Typical)

#### RF

Frequency Range:  
54-860 MHz (Broadcast 2-13, Cable 14-135)  
Output Level: +45 dBmV  
Output Level Range: 10 dB continuously adjustable  
Aural/Visual Carrier Ratio:  
-11 to -19 dB continuously adjustable  
Visual Carrier Frequency Tolerance:  
 $\pm 10$  kHz (standard channels)  $\pm 5$  kHz  
(aeronautical channels)  
Aural Carrier: 4.5 MHz above visual  
Frequency Setting:  $\pm 1.5$  kHz  
Spurious Outputs: -60 dBc, minimum  
C/N Ratio In Channel: 60 dB  
Broadband Noise: -90 dB  
Output Return Loss: 12 dB  
IF (Internal) Frequency: 45.750 MHz

#### Video

Input Level: 1.0 V p-p for 87.5 % modulation  
Frequency Response fv -0.5 MHz to fv +4.2 MHz:  
 $\pm 1.0$  dB  
Video C/N: 60 dB (4 MHz BW)  
P-P Video to RMS Hum Ratio: 60 dB  
Differential Gain:  $\pm 4.0$  % @ 87.5% Modulation  
Differential Phase:  $\pm 2^\circ$  @ 87.5% Modulation  
Input Return Loss: 18 dB

#### Audio

Input Level: 140 mV RMS for 25 kHz peak deviation  
Input Impedance: 10k Ohm, unbalanced  
Frequency Range: 20 Hz to 20 kHz (MICM-45C)  
Frequency Response:  
 $\pm 1.0$  dB, (50 Hz to 12 kHz) Reference to Std.  
75  $\mu$ s Pre-emphasis (MICM-45C)  
 $\pm 0.3$  dB (50 Hz to 50 kHz) (MICM-45S)  
in Stereo Configuration w/o pre-emphasis  
Total Harmonic Distortion (%):  
1.0 at 25 kHz Deviation

#### Stereo Separation (MICM-45S):

50 Hz - 100 Hz: 15 dB  
100 Hz - 1 kHz: 25 dB  
12 kHz: 18 dB

Aural Intercarrier:  $\pm 5$  kHz ( $0^\circ$  to  $+50^\circ$  C), std.

#### General

Power Requirements  
External: +12 VDC @ 160 mA  
+5 VDC @ 130 mA (MICM-C)  
+5 VDC @ 180 mA (MICM-S)  
Temperature Range:  $0^\circ$  to  $+50^\circ$  C

#### Mechanical

Dimensions (W x H x D): 1.2 x 3.5 x 7.5 inches  
Weight: 0.65 lbs (0.30 kg)

#### Connectors/Impedance

Audio Input: RCA Phono, female (MICM-45C)  
L/R Audio Inputs: RCA Phono, female  
Video Input: 75 ohm "F" type, female  
RF Output: 75 ohm "F" type, female  
Power: 3 Pin Header

#### Controls

Video Level: Pot  
Audio Level: Pot  
Aural Carrier Level: Pot  
RF Output Level: Pot

#### Indicators

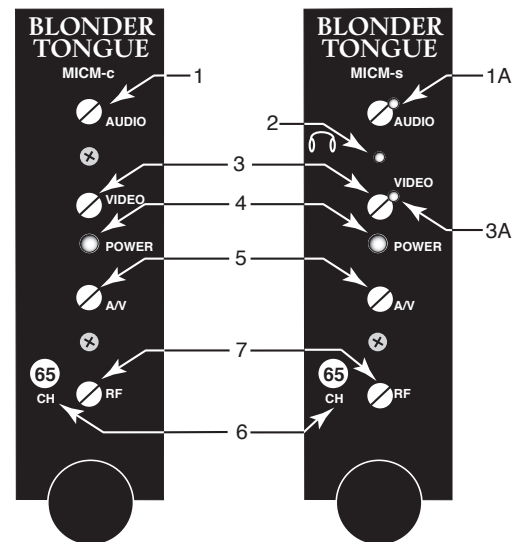
Power ON: LED, green  
Video Over Modulation: LED, red (MICM-45S)  
Audio Over Modulation: LED, red (MICM-45S)  
Stereo Indicator: LED, red (MICM-45S)

## Operating Controls and Indicators - MICM-45

### Front Panel

All operating controls are located on, or are accessible from the front panel.

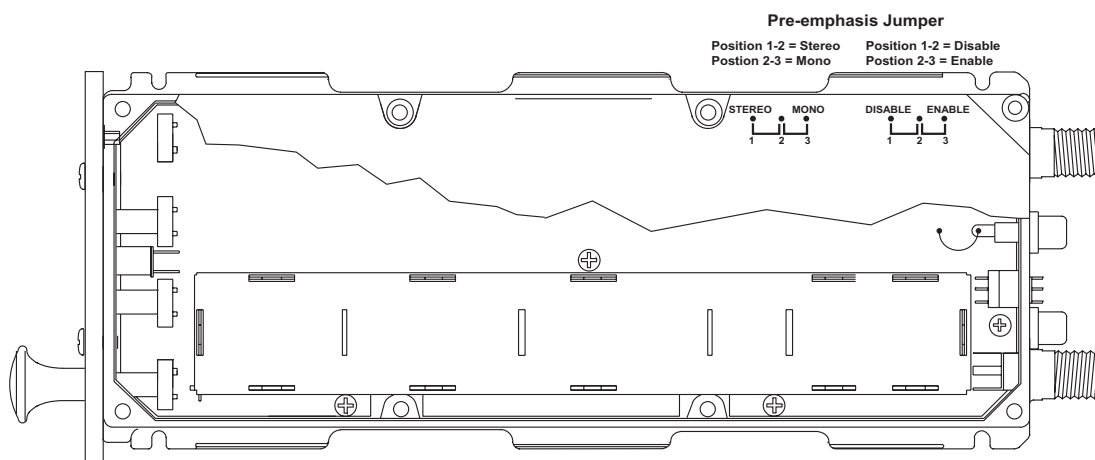
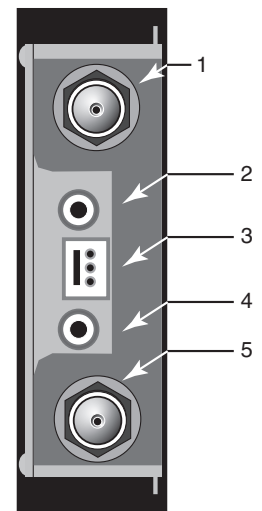
1. **Audio** - Adjusts the aural carrier modulation.  
1A Audio - Aural carrier modulation control/overmodulation indicator.
2. **Stereo Indicator**
3. **Video** - Adjusts the modulation percentage.  
3A Video - Modulation control/overmodulation indicator.
4. **Power** - The green LED indicates power is present and the fuse is good.
5. **A/V** - Controls the amplitude of aural RF carrier to change aural/visual ratio.
6. **Channel** - The modulator is factory aligned to the channel number indicated.
7. **RF** - The RF pot simultaneously adjusts the amplitude of aural and visual carriers to the final drive amplifier.



### Rear Panel

All the connectors on the Modulator are located on the rear panel.

1. **Video Input** - The modulator accepts standard negative sync video at a 0.7 to 2.5 Vp-p level.
2. **Audio Input** - The modulator accepts 140 mV RMS for 25 kHz peak deviation (MICM-C).  
Left audio input for MICM-S only.
3. **Power** - The polarized power connector accepts +12 VDC +5 VDC and ground.
4. **Right Audio Input** for MICM-S only. Connector not used in MICM-C (capped)
5. **RF Out** - The filtered RF signal is available for connection to a headend combiner.



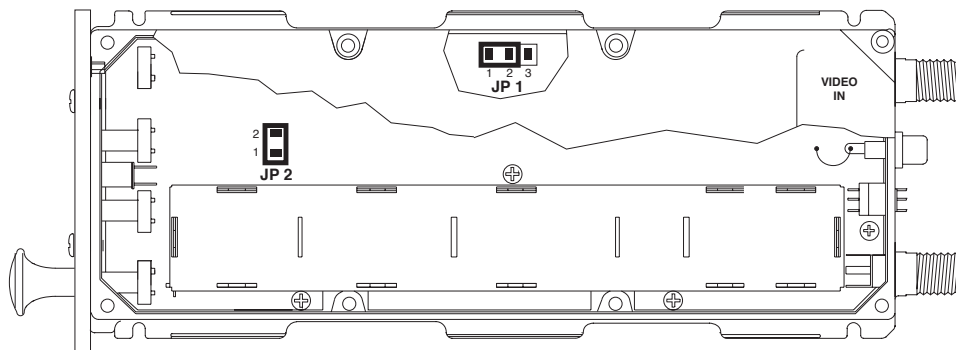
Internal Jumper Settings

DC Input  
+5 V  
+12 V  
GND



MICM-45C comes factory set for audio pre-emphasis enabled.

## Internal Jumper Settings - MICM-45B


MICM-45B comes factory set for audio pre-emphasis enabled. There are three (3) MICM-45B PC Board layout revisions available. Choose the applicable one from the diagrams below.

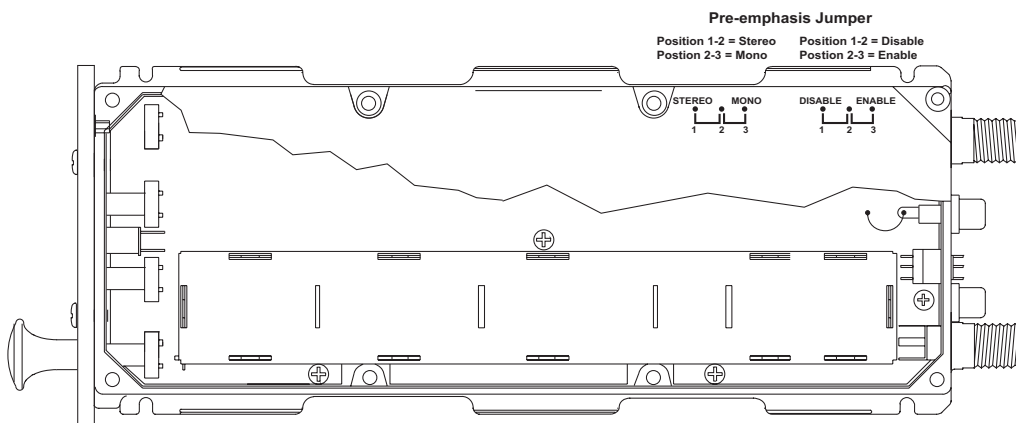
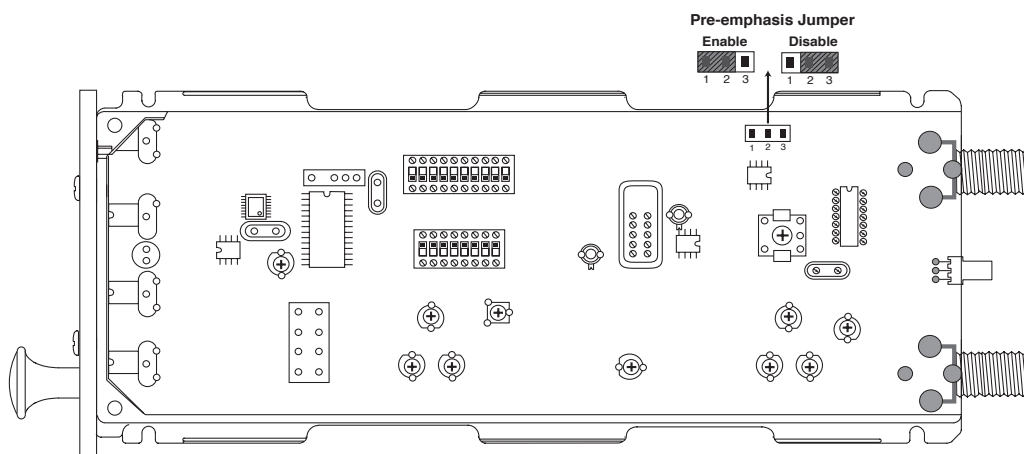


### Jumper 1 - Audio Pre-Emphasis Setting

1-2 position = Enabled . . .   
2-3 position = Disabled . . . 

### Jumper 2 - Not Used

Jumper must be set to 1-2 position. . . 



## AMM-806 — Agile Micro Modulator

### Description

The AMM-806 is an economical CATV agile audio/video modulator. It joins Blonder Tongue's family of modular headend components and works in conjunction with the MIRC-12V rack chassis and MIPS-12C power supply. It covers channel frequencies between 54-806 MHz. Channel selection is done by easy to use front panel DIP switches. FCC frequency offsets per Docket 21006 are automatic via the units internal pre-programmed micro processor.

The AMM-806 accepts standard audio/video sources such as satellite receivers, television camera, video tape recorders or demodulators. The advanced design ensures access for all level and over-modulation controls via the front panel. The audio pre-emphasis can be disabled internally for use with a BTSC Stereo Encoder.

#### RF

CATV Frequency Range:  
AMM-806 (CH 2-125)  
Output Level - Min: 35-45 dBmV, Continuously Variable  
Aural/Visual Carrier Ratio: -12 to -18 dB  
Visual Carrier Frequency Tolerance  
Standard Channels:  $\pm 10$  kHz  
FCC Aeronautical Channels (AMML Only):  $\pm 5$  kHz  
4.5 MHz Aural Inter Carrier Frequency:  $\pm 150$  Hz (max)  
Spurious Outputs: -60 dBc  
C/N Ratio In Channel: 60 dB  
Broadband Noise: -75 dBc  
Output Impedance: 75 ohm  
Output Return Loss: 10 dB

#### Video

Input Level: 1.0 V p-p  
Frequency Response: fv-0.5 MHz to fv+4.2 MHz:  $\pm 1.0$  dB  
Input Impedance: 75 ohm  
Input Return Loss: 18 dB min  
Differential Phase:  $2.0^\circ$   
Differential Gain: 1.0%  
Group Delay Response:  
Meets FCC CATV Predistortion Requirements  
for Color Operation

#### Audio

Input Level: 0.4 to 4.0 V p-p  
Frequency Range: 30 Hz to 15 kHz,  $\pm 0.5$  dB  
(Exceeds 100 kHz with Pre-emphasis Defeated)  
Input Impedance: 10k ohm, Unbalanced  
Distortion: 30 Hz to 15 kHz 0.6%

#### General

Power Requirements  
Voltage: +12 VDC @ 155mA  
Power: +5 VDC @ 265mA  
Temperature:  $0^\circ$  to  $50^\circ$  C

#### Mechanical

Dimensions (W x H x D):  
1.15 x 3.5 x 7.5 in., 29 x 89 x 191 mm  
Weight: 0.8 lbs, 0.36 kg

#### Connectors (Rear Panel)

Video Input: "F" Type, Female  
Audio Input: RCA Phono  
RF Output: "F" Type Female  
Power: 3 Pin Header

#### Controls (Front Panel)

Channel Selection: Dip Switches  
Video Level: Control  
A/V Ratio: Control  
Audio Level: Control  
RF Output Level: Control

#### Indicator (Front Panel)

Power ON: LED

### Setting up the AMM-806 Output Channel

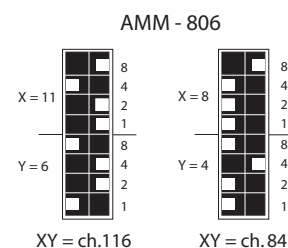
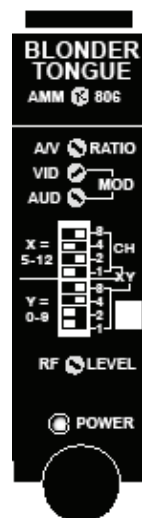
Channel setting is accomplished by setting the channel switch to the desired output channel.

The switch is divided into 2 sections, the Tens section (denoted as "X") and the Ones section (denoted as "Y").

In each section, there are 4 switches labeled - 8,4,2,1. This corresponds to the switch value.

Setting the switch to the right invokes the corresponding value of the switch.

The user sets the Tens section and the Ones section to reflect the desired channel. (i.e., For CH 116, you set 11 Tens and 6 ones for 116. For single digit channels, the Tens switch is set to zero.)



Examples of switch settings for various channels

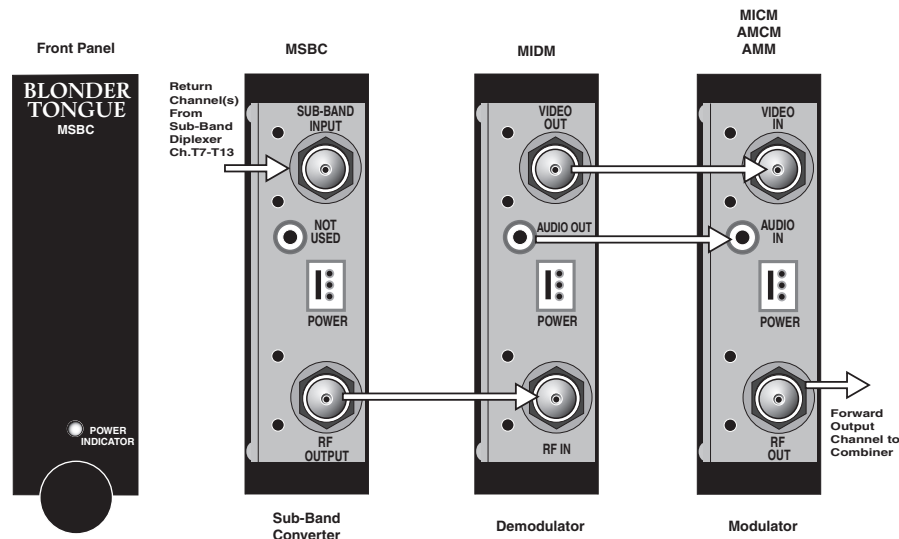
## MSBC - Sub-Band Block Converter

### Description

The MSBC is a modular sub band block up-converter designed for use in Blonder Tongue’s HE Series rack chassis’. The unit provides sub-band capability to MIDM-806C demodulators by block converting sub-band channels T7 to T13 to receivable VHF channels 7 to13. The MIDM-806C A/V outputs can then be connected to a modulator such as a MICM-45C, AMCM 860 or AMM Series for a complete modular headend processing solution.

### Specifications (Typical)

|  |   |
|--|---|
| <b>RF</b><br>Input Frequency Range: 5.75-47.75 MHz<br>(Channels T7-T13)<br>Output Frequency Range: 174-216 MHz<br>(Channels 7-13)<br>Recommended Input Level Range: 0 to +20 dBmV<br>Conversion Gain: 3 dB<br>Flatness: 1.5 dB P/V<br>LO Frequency accuracy @ 25 deg. C: +/- 500 Hz<br>Intermod Distortion: -60 dBc<br>(In band Ch. 7-13 @ 0 to + 20 dBmV input)<br>Input/Output Impedance: 75 Ohm<br>Return Loss: Input: 15 dB/ Output: 17 dB | <b>Mechanical</b><br>Dimensions: 1.15 x 3.5 x 7.5 in.<br>Weight: 13.5 oz.<br>Temperature Range: 0 to 50 degrees C |
| <b>Electrical</b><br>+12 VDC, 100 mA<br>1.2 Watts  | <b>Connectors (Rear)</b><br>Sub-Band Input: “F” Type Female<br>RF Output: “F” Type Female<br>Power: 3 Pin Header  |
|  | <b>Indicators (Front)</b><br>Power Green LED  |



| INPUT   |           | LO FREQ.   | OUTPUT  |            |
|---------|-----------|------------|---------|------------|
| Channel | Frequency |            | Channel | Frequency  |
| T7      | 7 MHz     | 168.25 MHz | 7       | 175.25 MHz |
| T8      | 13 MHz    | 168.25 MHz | 8       | 181.25 MHz |
| T9      | 19 MHz    | 168.25 MHz | 9       | 187.25 MHz |
| T10     | 25 MHz    | 168.25 MHz | 10      | 193.25 MHz |
| T11     | 31 MHz    | 168.25 MHz | 11      | 199.25 MHz |
| T12     | 36 MHz    | 168.25 MHz | 12      | 205.25 MHz |
| T13     | 43 MHz    | 168.25 MHz | 13      | 211.25 MHz |

## MIDM-806C Demodulators

### Description

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The MIDM-806C is a professional quality single channel, agile audio/video demodulator. It provides an A/V output from any VHF, UHF or CATV channel (54-806 MHz) and is designed for use in the Blonder Tongue Modular Headend System. The MIDM-806C demodulator and an MICM/AMCM modulator can be paired to perform off-air channel processing or to cherry pick cable channels.

☛ Note: A MIPS-12C, (Stock #7722C) Power Supply is required for full chassis deployment.

The MIDM-806C can demodulate any single Broadcast or CATV, VHF & UHF channel in the 54 to 806 MHz frequency range. It is ideal for off-air signal processing (audio/video processing and remodulation) and CATV cherry picking applications.

The MIDM-806C series features rock solid, phase lock loop (PLL) synthesized frequency control. Agile frequency selection is accomplished via front panel channel up/down buttons with a LED channel readout for easy on-the-fly channel changes. A channel lockout mode is also provided to prevent accidental channel changes. Non-volatile memory maintains the programmed channel selection in case of power loss. All MIDM series units are compatible with any modulators requiring a baseband input, and can be used in any combination with the MIPS-12C power supply in a MIRC-12V chassis.

### Specifications MIDM-806C (Typical)

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#### RF

Frequency: Range:  
54-806 MHz, VHF, UHF, CATV (Std., IRC, HRC)  
Input Level Range: -5 to +30 dBm VHF/UHF,  
+2 to +12 dBmV (CATV)  
Noise Figure: 8 dB  
Image Rejection: VHF 60 dB  
Input Impedance: 75 ohm

#### Video

Output Level: 1.0 V p-p  
Output Impedance: 75 ohm

#### Audio

Output Level: 1 Vp-p  
Output Impedance: 600 ohm, unbalanced

#### General

Power Requirements - External:  
+12 VDC @ 140 mA, 5 VDC @ 150 mA  
Temperature Range: 0° to +50° C

#### Mechanical

Dimensions (W x H x D): 1.0 x 3.5 x 7.5 inches  
Weight: 1.2 lbs (0.56 kg)

#### Connectors/Impedance

Audio Output: RCA Phono, female  
Video Output: 75 ohm "F" type, female  
RF Input: 75 ohm "F" type, female  
Power: Locking Header, 3 pin

#### Controls

Channel Selection: Push buttons  
ANT/CATV: Push button  
Power On/OFF: Push button  
Channel Lock: Push button  
Audio Level: Pot  
Video Level: Pot

#### Indicators

Channel: 2 digit, 7 segment LED

Operating Controls & Indicators - MIDM-806C

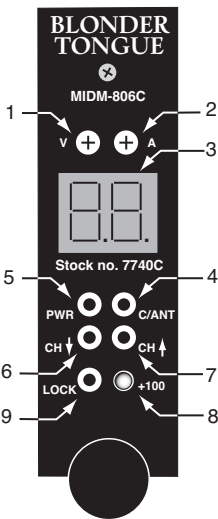
Front Panel

All operating controls are located on, or are accessible from the front panel.

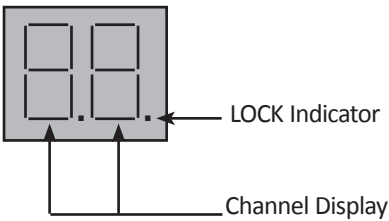
- 1. **Video** - Adjusts video output level
- 2. **Audio** - Adjusts audio output level
- 3. **Channel LED** - Displays ANT or CATV channel number
- 4. **C/ANT Mode Button** - Push button to enter the mode selection menu. Use the channel Up/Down keys to select the type of channel system required as follows:

| Display | Channel System |
|---------|----------------|
| S       | STD CATV       |
| H       | HRC            |
| I       | IRC            |
| U       | Broadcast U/V  |

- 5. **Power** - On / Off push button
- 6. **Channel Down** - Increments channel by -1
- 7. **Channel Up** - Increments channel by +1
- 8. **+100 LED** - When depressed, red LED lights to indicate channels 100 and higher
- 9. **Lock** - Depressing Lock button locks present channel or mode in memory preventing inadvertent change. A user must depress the lock button again for any channel mode/changes



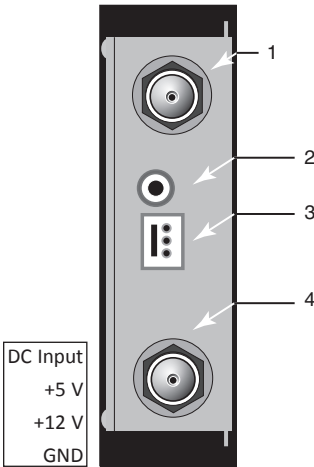
- 3. LED Display - Lights when in standby



Rear Panel

All the connectors are located on the rear panel.

- 1. **Video Output** - Standard negative sync video at a 0.5 to 1.5 Vp-p level.
- 2. **Audio Output** - Adjustable 0.5 to 1.5 Vp-p
- 3. **Power** - The polarized power connector accepts +12 VDC +5 VDC and ground
- 4. **ANT/CATV** - RF input from antenna or CATV drop



## DHDP - Digital High Definition Processor Series

DHDC-DV (Downconverter) • Stock No. 6264A

DHDC-UV (Upconverter) • Stock No. 6265A

DHDC-DH (Downconverter-Horizontal) • Stock No. 6261A

DHDC-UH (Upconverter-Horizontal) • Stock No. 6262A

DHDP-V - Vertical Combo Pack • Stock No. 6266B; (Combo: 6262A + 6265A)

DHDP-H - Horizontal Combo Pack • Stock No. 6263A; (Combo: 6261A + 6262A)

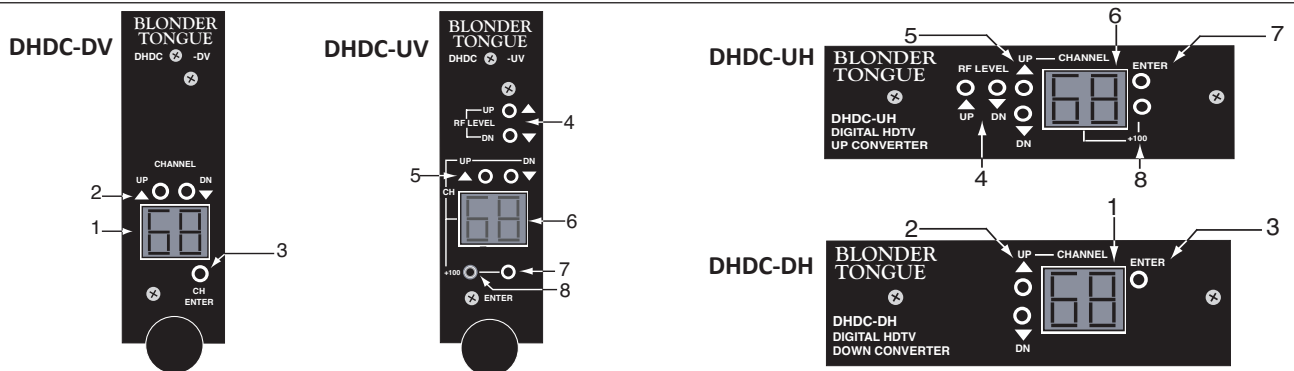
**Description:** The DHDP Series consists of 2 parts, the DHDC-D (Downconverter) and the DHDC-U (Upconverter). The units are intended to operate as a system in order to process digital & high definition television (HDTV) signals.

### Operating Controls and Indicators

#### Front Panel

- 2-Digit LED Display — 2 digit LED Channel display
- Up/Down Channel Buttons — Up & down push button controls for setting the channel.
- Enter Button - Button used to enter the displayed channel into memory.
- Up/Down RF Level Buttons — Up & down push button controls for RF level.
- Up/Down Channel Buttons — Up & down push button controls for channel and mode adjustment.
- 2-Digit LED Display — 2 digit LED display for Channel, mode and RF level information.
- Enter Button — Button used to “enter” channel, mode or RF level selection into memory.
- +100 Channel LED Indicator — LED illuminates to indicate CATV channels 100 to 135.

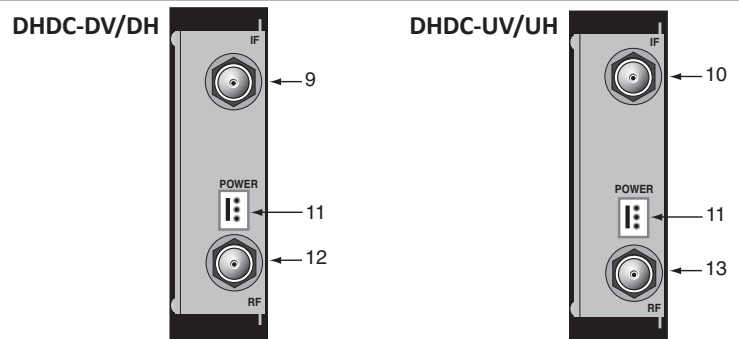
#### Front Panel Views



#### Rear Panel

- IF Output - “F” Connector
- IF Input - “F” Connector
- Power Connector
- RF Input - “F” Connector
- RF Output - “F” Connector

#### Rear Panel Views



### Specifications

#### DHDC-D Down Converter

Input Tuning Range (Off-Air 8VSB) (54-216, 470-864 MHz)

VHF: CH 2-13, UHF: CH 14-69, CH 70-78 Extended UHF

Operating Input Level Range: -20 to +25 dBmV

Installation Input Range: -15 to +20 dBmV

(any undesired channel < +25 dBmV)

Max undesired to desired channel ratio: < +25 dBc

Max adjacent to desired channel ratio: < +15 dBc

IF Output Level Digital: +30 dBmV\*

Rejection of Adjacent Analog Channels: -70 dB Typical

Power Requirements:

110 mA @ +12 VDC, 370 mA @ +5 VDC

#### DHDC-U Up Converter

IF Input Level: +30 dBmV

Output Frequency Range:

Standard CATV, IRC, HRC & Broadcast 54-864 MHz

RF Output Level Digital: +45 dBmV\*

Display Error: ±2 dB

Output Level Adjustment Range: +35 to +45 dBmV

Spurious Output (54-864 MHz): -60 dBc

Phase Noise @ 10 kHz Offset: -95 dBc/Hz

Broadband Noise, Out of Channel: -70 dBc (5.5 MHz BW)

Power Requirement:

310 mA @ +12 VDC, 320 mA @ +5 VDC

\* Average Measurement

## Setting Up the Units

---

1. Place each of the units into the appropriate Blonder Tongue Micromodular chassis by sliding the unit into the retaining rails.
  - a. It is recommended to physically place one Downconverter and one Upconverter next to one another in the chassis.
2. Connect the digital or HDTV signal (8VSB format) to the RF 'F' connector on the DHDC-D unit.
3. Connect the IF 'F' connector of the DHDC-D to the IF 'F' connector of the DHDC-U.
4. Connect the RF 'F' connector of the DHDC-U to the appropriate combining device.
5. Connect each unit to the power supply using one of the power supply cables.

## Programming the Unit

---

The DHDC-D unit is intended to accept any digital UHF or VHF signal and convert it to IF. The DHDC-U unit is intended to accept any digital IF signal and process it to any channel from 54-864 MHz. The unit has 4 valid operating modes, STD CATV, IRC, HRC & Broadcast UHF/VHF. It comes factory set to operate in Standard CATV Mode. If you wish to change the operating mode skip to the Operating Mode Selection section.

## Programming the DHDC-D

---

1. Navigate to the desired channel number by depressing the CH ▲ UP and ▼ DN buttons.
  - a. Press and hold the CH ▲ UP or ▼ DN arrow button for fast scrolling.
2. Press the ENTER button when you reach the desired channel setting. This will tune the downconverter input to the corresponding frequency for this entry.
  - a. The LED display will blink continuously during the channel programming process and will not change the channel until the ENTER button is depressed.
  - b. The unit has a special feature that alerts an operator of an inadvertent or desired change to the unit by flashing LED readout. The LED will continue to flash for 30 seconds if the ENTER button is not depressed and if no additional entries are made then the readout will return to the display of the previously programmed channel entry setting.

## Programming the DHDC-U

---

The DHDC-U unit comes factory set to operate in the Standard CATV mode. The unit has 4 valid operating modes: STD, CATV, IRC, HRC & Broadcast UHF/VHF (see the operating mode selection section for programming information).

## Programming a Channel

1. Navigate to the desired channel number by depressing the CH ▲ UP and ▼ DN buttons.
  - a. Continue past 99 for channels 100-135, the +100 LED will illuminate.
  - b. Press and hold the CH ▲ UP or ▼ DN arrow button for fast scrolling.
2. Press the ENTER button when you reach the desired channel setting. This will tune the upconverter output to the corresponding frequency for this entry.
  - a. The LED display will blink continuously during the channel programming process and will not change the output channel until the ENTER button is depressed.
  - b. The unit has a special feature that alerts an operator of an inadvertent or desired change to the unit by flashing LED readout. The LED will continue to flash for 30 seconds if the ENTER button is not depressed and if no additional entries are made then the readout will return to the display of the previously programmed channel entry setting.

## Programming the DHDC-U (Continued)

### Programming RF Level

1. Depress the RF Level ▲ UP or ▼ DN buttons to increment or decrement the RF output level to the desired setting.
  - a. The unit has a specified adjustment range of +35 dBmV to +45 dBmV output. The unit software however, will permit entries from +33 to +47 dBmV, the out of range entries of 33-34 & 46-47 dBmV are meant for usage to correct any display error, allowing the unit to be operated in the specified range.

#### ATTENTION!

It is also recommended to set the output level to +45 dBmV for optimum noise performance and externally attenuate down to a desired level.

2. Press **ENTER** when you reach the desired RF Level setting. This will tune the upconverter output to the corresponding level entry.
  - a. The LED display readout will also flash continuously during the RF Level programming process. The LED display will continue to flash for 30 seconds if **ENTER** is not depressed and then will return to the display of the previously programmed channel entry setting.

### Operating Mode Selection

The unit has 4 valid operating modes: STD CATV, IRC, HRC & Broadcast UHF/VHF.

The DHDC-U unit comes factory set to operate in the Standard CATV mode.

#### To change the operating mode

1. Simultaneously depress the RF Level ▲ UP and ▼ DN buttons for approximately 5 seconds.
2. The Channel LED display will switch to the operating mode selection.
3. Use the RF Level ▲ UP and ▼ DN buttons to select the desired mode:
  - a. C = STD CATV
  - b. H = HRC
  - c. I = IRC
  - d. U = Broadcast (VHF/UHF)
4. After selecting the desired mode depress **ENTER** to set the mode.
5. The unit will return to the channel display mode.
  - a. Programming will reflect the mode chosen – See Appendix for detailed frequency plans.
  - b. The operating mode will also flash continuously during the mode selection process. The LED display will continue to flash for 30 seconds if **ENTER** is not depressed and then will return to the display of the previously programmed channel & mode entry setting. **NOTE:** THE MODE PRESENTLY IN MEMORY WILL BE DISPLAYED WITHOUT FLASHING DURING THE MODE SELECTION PROCESS.

#### Trouble Shooting

A continuously flashing Channel Display indicates an Error Condition detected by the unit microcontroller.

##### Sample conditions include:

- Channel Selector Entry does not match the channel number on which the unit is operating, the display will flash for 30 seconds and then revert back to the previous CH entry
- E1 is displayed if the Input VCO is Not Locked
- E2 is displayed if the Output VCO is Not Locked

#### Correction Suggestion

The User should perform the following steps to correct an Error Condition:

1. Check that the Channel Display is set to the desired channel & reset as appropriate.
2. Check that the unit is set to the appropriate desired operating mode.
3. Verify the unit output on a spectrum analyzer.
4. Disconnect and reconnect power to the unit.

If an error condition continues to be displayed, unit should be replaced and serviced.

## Appendix A

Frequency Allocation Tables

| EIA Chan. | Standard Video | Incremental Video (IRC) | Harmonic Video (HRC)                          |
|-----------|----------------|-------------------------|---|
| 02        | 55.2500        | 55.2625                 | 54  |
| 03        | 61.2500        | 61.2625                 | 60  |
| 04        | 67.2500        | 67.2625                 | 66  |
| 01        | NA             | 73.2625                 | 72  |
| 05        | 77.2500        | 79.2625                 | 78  |
| 06        | 83.2500        | 85.2625                 | 84  |
| 95        | 91.2500        | 91.2625                 | 90  |
| 96        | 97.2500        | 97.2625                 | 96  |
| 97        | 103.2500       | 103.2625                | 102   |
| 98        | 109.2750       | 109.2750                | Cannot lock to comb<br>ref: refer to FCC regs |
| 99        | 115.2750       | 115.2750                |   |
| 14        | 121.2625       | 121.2625                |   |
| 15        | 127.2625       | 127.2625                | 126   |
| 16        | 133.2625       | 133.2625                | 132   |
| 17        | 139.2500       | 139.2625                | 138   |
| 18        | 145.2500       | 145.2625                | 144   |
| 19        | 151.2500       | 151.2625                | 150   |
| 20        | 157.2500       | 157.2625                | 156   |
| 21        | 163.2500       | 163.2625                | 162   |
| 22        | 169.2500       | 169.2625                | 168   |
| 07        | 175.2500       | 175.2625                | 174   |
| 08        | 181.2500       | 181.2625                | 180   |
| 09        | 187.2500       | 187.2625                | 186   |
| 10        | 193.2500       | 193.2625                | 192   |
| 11        | 199.2500       | 199.2625                | 198   |
| 12        | 205.2500       | 205.2625                | 204   |
| 13        | 211.2500       | 211.2625                | 210   |
| 23        | 217.2500       | 217.2625                | 216   |
| 24        | 223.2500       | 223.2625                | 222   |
| 25        | 229.2625       | 229.2625                | 228   |
| 26        | 235.2625       | 235.2625                | 234   |
| 27        | 241.2625       | 241.2625                | 240   |
| 28        | 247.2625       | 247.2625                | 246   |
| 29        | 253.2625       | 253.2625                | 252   |
| 30        | 259.2625       | 259.2625                | 258   |
| 31        | 265.2625       | 265.2625                | 264   |
| 32        | 271.2625       | 271.2625                | 270   |
| 33        | 277.2625       | 277.2625                | 276   |
| 34        | 283.2625       | 283.2625                | 282   |
| 35        | 289.2625       | 289.2625                | 288   |
| 36        | 295.2625       | 295.2625                | 294   |
| 37        | 301.2625       | 301.2625                | 300   |
| 38        | 307.2625       | 307.2625                | 306   |
| 39        | 313.2625       | 313.2625                | 312   |
| 40        | 319.2625       | 319.2625                | 318   |
| 41        | 325.2625       | 325.2625                | 324   |
| 42        | 331.2750       | 331.2750                | 330   |
| 43        | 337.2625       | 337.2625                | 336   |
| 44        | 343.2625       | 343.2625                | 342   |
| 45        | 349.2625       | 349.2625                | 348   |
| 46        | 355.2625       | 355.2625                | 354   |
| 47        | 361.2625       | 361.2625                | 360   |
| 48        | 367.2625       | 367.2625                | 366   |
| 49        | 373.2625       | 373.2625                | 372   |
| 50        | 379.2625       | 379.2625                | 378   |
| 51        | 385.2625       | 385.2625                | 384   |
| 52        | 391.2625       | 391.2625                | 390   |
| 53        | 397.2625       | 397.2625                | 396   |
| 54        | 403.2500       | 403.2625                | 402   |
| 55        | 409.2500       | 409.2625                | 408   |
| 56        | 415.2500       | 415.2625                | 414   |
| 57        | 421.2500       | 421.2625                | 420   |
| 58        | 427.2500       | 427.2625                | 426   |
| 59        | 433.2500       | 433.2625                | 432   |
| 60        | 439.2500       | 439.2625                | 438   |
| 61        | 445.2500       | 445.2625                | 444   |
| 62        | 451.2500       | 451.2625                | 450   |

| EIA Chan. | Standard Video | Incremental Video (IRC) | Harmonic Video (HRC) |
|-----------|----------------|-------------------------|----------------------|
| 63        | 457.2500       | 457.2625                | 456                  |
| 64        | 463.2500       | 463.2625                | 462                  |
| 65        | 469.2500       | 469.2625                | 468                  |
| 66        | 475.2500       | 475.2625                | 474                  |
| 67        | 481.2500       | 481.2625                | 480                  |
| 68        | 487.2500       | 487.2625                | 486                  |
| 69        | 493.2500       | 493.2625                | 492                  |
| 70        | 499.2500       | 499.2625                | 498                  |
| 71        | 505.2500       | 505.2625                | 504                  |
| 72        | 511.2500       | 511.2625                | 510                  |
| 73        | 517.2500       | 517.2625                | 516                  |
| 74        | 523.2500       | 523.2625                | 522                  |
| 75        | 529.2500       | 529.2625                | 528                  |
| 76        | 535.2500       | 535.2625                | 534                  |
| 77        | 541.2500       | 541.2625                | 540                  |
| 78        | 547.2500       | 547.2625                | 546                  |
| 79        | 553.2500       | 553.2625                | 552                  |
| 80        | 559.2500       | 559.2625                | 558                  |
| 81        | 565.2500       | 565.2625                | 564                  |
| 82        | 571.2500       | 571.2625                | 570                  |
| 83        | 577.2500       | 577.2625                | 576                  |
| 84        | 583.2500       | 583.2625                | 582                  |
| 85        | 589.2500       | 589.2625                | 588                  |
| 86        | 595.2500       | 595.2625                | 594                  |
| 87        | 601.2500       | 601.2625                | 600                  |
| 88        | 607.2500       | 607.2625                | 606                  |
| 89        | 613.2500       | 613.2625                | 612                  |
| 90        | 619.2500       | 619.2625                | 618                  |
| 91        | 625.2500       | 625.2625                | 624                  |
| 92        | 631.2500       | 631.2625                | 630                  |
| 93        | 637.2500       | 637.2625                | 636                  |
| 94        | 643.2500       | 643.2625                | 642                  |
| 100       | 649.2500       | 649.2625                | 648                  |
| 101       | 655.2500       | 655.2625                | 654                  |
| 102       | 661.2500       | 661.2625                | 660                  |
| 103       | 667.2500       | 667.2625                | 666                  |
| 104       | 673.2500       | 673.2625                | 672                  |
| 105       | 679.2500       | 679.2625                | 678                  |
| 106       | 685.2500       | 685.2625                | 684                  |
| 107       | 691.2500       | 691.2625                | 690                  |
| 108       | 697.2500       | 697.2625                | 696                  |
| 109       | 703.2500       | 703.2625                | 702                  |
| 110       | 709.2500       | 709.2625                | 708                  |
| 111       | 715.2500       | 715.2625                | 714                  |
| 112       | 721.2500       | 721.2625                | 720                  |
| 113       | 727.2500       | 727.2625                | 726                  |
| 114       | 733.2500       | 733.2625                | 732                  |
| 115       | 739.2500       | 739.2625                | 738                  |
| 116       | 745.2500       | 745.2625                | 744                  |
| 117       | 751.2500       | 751.2625                | 750                  |
| 118       | 757.2500       | 757.2625                | 756                  |
| 119       | 763.2500       | 763.2625                | 762                  |
| 120       | 769.2500       | 769.2625                | 768                  |
| 121       | 775.2500       | 775.2625                | 774                  |
| 122       | 781.2500       | 781.2625                | 780                  |
| 123       | 787.2500       | 787.2625                | 786                  |
| 124       | 793.2500       | 793.2625                | 792                  |
| 125       | 799.2500       | 799.2625                | 798                  |
| 126       | 805.2500       | 805.2625                | 804                  |
| 127       | 811.2500       | 811.2625                | 810                  |
| 128       | 817.2500       | 817.2625                | 816                  |
| 129       | 823.2500       | 823.2625                | 822                  |
| 130       | 829.2500       | 829.2625                | 828                  |
| 131       | 835.2500       | 835.2625                | 834                  |
| 132       | 841.2500       | 841.2625                | 840                  |
| 133       | 847.2500       | 847.2625                | 846                  |
| 134       | 853.2500       | 853.2625                | 852                  |
| 135       | 859.2500       | 859.2625                | 858                  |

| VHF Broadcast Channels |             |
|------------------------|-------------|
| Channel                | Video (MHz) |
| 2                      | 55.25       |
| 3                      | 61.25       |
| 4                      | 67.25       |
| 5                      | 77.25       |
| 6                      | 83.25       |
| 7                      | 175.25      |
| 8                      | 181.25      |
| 9                      | 187.25      |
| 10                     | 193.25      |
| 11                     | 199.25      |
| 12                     | 205.25      |
| 13                     | 211.25      |
| UHF Broadcast Channels |             |
| Channel                | Video (MHz) |
| 14                     | 471.25      |
| 15                     | 477.25      |
| 16                     | 483.25      |
| 17                     | 489.25      |
| 18                     | 495.25      |
| 19                     | 501.25      |
| 20                     | 507.25      |
| 21                     | 513.25      |
| 22                     | 519.25      |
| 23                     | 525.25      |
| 24                     | 531.25      |
| 25                     | 537.25      |
| 26                     | 543.25      |
| 27                     | 549.25      |
| 28                     | 555.25      |
| 29                     | 561.25      |
| 30                     | 567.25      |
| 31                     | 573.25      |
| 32                     | 579.25      |
| 33                     | 585.25      |
| 34                     | 591.25      |
| 35                     | 597.25      |
| 36                     | 603.25      |
| 37                     | 609.25      |
| 38                     | 615.25      |
| 39                     | 621.25      |
| 40                     | 627.25      |
| 41                     | 633.25      |
| 42                     | 639.25      |
| 43                     | 645.25      |
| 44                     | 651.25      |
| 45                     | 657.25      |
| 46                     | 663.25      |
| 47                     | 669.25      |
| 48                     | 675.25      |
| 49                     | 681.25      |
| 50                     | 687.25      |
| 51                     | 693.25      |
| 52                     | 699.25      |
| 53                     | 705.25      |
| 54                     | 711.25      |
| 55                     | 717.25      |
| 56                     | 723.25      |
| 57                     | 729.25      |
| 58                     | 735.25      |
| 59                     | 741.25      |
| 60                     | 747.25      |
| 61                     | 753.25      |
| 62                     | 759.25      |
| 63                     | 765.25      |
| 64                     | 771.25      |
| 65                     | 777.25      |
| 66                     | 783.25      |
| 67                     | 789.25      |
| 68                     | 795.25      |
| 69                     | 801.25      |

NOTE: Refer to unit specifications for their respective operating ranges.

**Appendix B****DHDC-D Input & DHDC-U Output  
Center Frequencies**

| VHF Broadcast Channels |       |
|------------------------|-------|
| Channel                | (MHz) |
| 2                      | 57    |
| 3                      | 63    |
| 4                      | 69    |
| 5                      | 79    |
| 6                      | 85    |
| 7                      | 177   |
| 8                      | 183   |
| 9                      | 189   |
| 10                     | 195   |
| 11                     | 201   |
| 12                     | 207   |
| 13                     | 213   |
| UHF Broadcast Channels |       |
| Channel                | (MHz) |
| 14                     | 473   |
| 15                     | 479   |
| 16                     | 485   |
| 17                     | 491   |
| 18                     | 497   |
| 19                     | 503   |
| 20                     | 509   |
| 21                     | 515   |
| 22                     | 521   |
| 23                     | 527   |
| 24                     | 533   |
| 25                     | 539   |
| 26                     | 545   |
| 27                     | 551   |
| 28                     | 557   |
| 29                     | 563   |
| 30                     | 569   |
| 31                     | 575   |
| 32                     | 581   |
| 33                     | 587   |
| 34                     | 593   |
| 35                     | 599   |
| 36                     | 605   |
| 37                     | 611   |
| 38                     | 617   |
| 39                     | 623   |
| 40                     | 629   |
| 41                     | 635   |
| 42                     | 641   |
| 43                     | 647   |
| 44                     | 653   |
| 45                     | 659   |
| 46                     | 665   |
| 47                     | 671   |
| 48                     | 677   |
| 49                     | 683   |
| 50                     | 689   |
| 51                     | 695   |
| 52                     | 701   |
| 53                     | 707   |
| 54                     | 713   |
| 55                     | 719   |
| 56                     | 725   |
| 57                     | 731   |
| 58                     | 737   |
| 59                     | 743   |
| 60                     | 749   |
| 61                     | 755   |
| 62                     | 761   |
| 63                     | 767   |
| 64                     | 773   |
| 65                     | 779   |
| 66                     | 785   |
| 67                     | 791   |
| 68                     | 797   |
| 69                     | 803   |

**Appendix C****DHDC-U  
Center Frequencies**

| EIA<br>Chan. | Standard<br>CATV | Incremental<br>(IRC) | Harmonic<br>(HRC) | EIA<br>Chan. | Standard<br>CATV | Incremental<br>(IRC) | Harmonic<br>(HRC) |
|--------------|------------------|----------------------|-------------------|--------------|------------------|----------------------|-------------------|
| 2            | 57               | 57                   | 55.75             | 63           | 459              | 459                  | 457.75            |
| 3            | 63               | 63                   | 61.75             | 64           | 465              | 465                  | 463.75            |
| 4            | 69               | 69                   | 67.75             | 65           | 471              | 471                  | 469.75            |
| 1            | 75               | 75                   | 73.75             | 66           | 477              | 477                  | 475.75            |
| 5            | 79               | 81                   | 79.75             | 67           | 483              | 483                  | 481.75            |
| 6            | 85               | 87                   | 85.75             | 68           | 489              | 489                  | 487.75            |
| 95           | 93               | 93                   | 91.75             | 69           | 495              | 495                  | 493.75            |
| 96           | 99               | 99                   | 97.75             | 70           | 501              | 501                  | 499.75            |
| 97           | 105              | 105                  | 103.75            | 71           | 507              | 507                  | 505.75            |
| 98           | 111              | 111                  | 109.75            | 72           | 513              | 513                  | 511.75            |
| 99           | 117              | 117                  | 115.75            | 73           | 519              | 519                  | 517.75            |
| 14           | 123              | 123                  | 121.75            | 74           | 525              | 525                  | 523.75            |
| 15           | 129              | 129                  | 127.75            | 75           | 531              | 531                  | 529.75            |
| 16           | 135              | 135                  | 133.75            | 76           | 537              | 537                  | 535.75            |
| 17           | 141              | 141                  | 139.75            | 77           | 543              | 543                  | 541.75            |
| 18           | 147              | 147                  | 145.75            | 78           | 549              | 549                  | 547.75            |
| 19           | 153              | 153                  | 151.75            | 79           | 555              | 555                  | 553.75            |
| 20           | 159              | 159                  | 157.75            | 80           | 561              | 561                  | 559.75            |
| 21           | 165              | 165                  | 163.75            | 81           | 567              | 567                  | 565.75            |
| 22           | 171              | 171                  | 169.75            | 82           | 573              | 573                  | 571.75            |
| 7            | 177              | 177                  | 175.75            | 83           | 579              | 579                  | 577.75            |
| 8            | 183              | 183                  | 181.75            | 84           | 585              | 585                  | 583.75            |
| 9            | 189              | 189                  | 187.75            | 85           | 591              | 591                  | 589.75            |
| 10           | 195              | 195                  | 193.75            | 86           | 597              | 597                  | 595.75            |
| 11           | 201              | 201                  | 199.75            | 87           | 603              | 603                  | 601.75            |
| 12           | 207              | 207                  | 205.75            | 88           | 609              | 609                  | 607.75            |
| 13           | 213              | 213                  | 211.75            | 89           | 615              | 615                  | 613.75            |
| 23           | 219              | 219                  | 217.75            | 90           | 621              | 621                  | 619.75            |
| 24           | 225              | 225                  | 223.75            | 91           | 627              | 627                  | 625.75            |
| 25           | 231              | 231                  | 229.75            | 92           | 633              | 633                  | 631.75            |
| 26           | 237              | 237                  | 235.75            | 93           | 639              | 639                  | 637.75            |
| 27           | 243              | 243                  | 241.75            | 94           | 645              | 645                  | 643.75            |
| 28           | 249              | 249                  | 247.75            | 100          | 651              | 651                  | 649.75            |
| 29           | 255              | 255                  | 253.75            | 101          | 657              | 657                  | 655.75            |
| 30           | 261              | 261                  | 259.75            | 102          | 663              | 663                  | 661.75            |
| 31           | 267              | 267                  | 265.75            | 103          | 669              | 669                  | 667.75            |
| 32           | 273              | 273                  | 271.75            | 104          | 675              | 675                  | 673.75            |
| 33           | 279              | 279                  | 277.75            | 105          | 681              | 681                  | 679.75            |
| 34           | 285              | 285                  | 283.75            | 106          | 687              | 687                  | 685.75            |
| 35           | 291              | 291                  | 289.75            | 107          | 693              | 693                  | 691.75            |
| 36           | 297              | 297                  | 295.75            | 108          | 699              | 699                  | 697.75            |
| 37           | 303              | 303                  | 301.75            | 109          | 705              | 705                  | 703.75            |
| 38           | 309              | 309                  | 307.75            | 110          | 711              | 711                  | 709.75            |
| 39           | 315              | 315                  | 313.75            | 111          | 717              | 717                  | 715.75            |
| 40           | 321              | 321                  | 319.75            | 112          | 723              | 723                  | 721.75            |
| 41           | 327              | 327                  | 325.75            | 113          | 729              | 729                  | 727.75            |
| 42           | 333              | 333                  | 331.75            | 114          | 735              | 735                  | 733.75            |
| 43           | 339              | 339                  | 337.75            | 115          | 741              | 741                  | 739.75            |
| 44           | 345              | 345                  | 343.75            | 116          | 747              | 747                  | 745.75            |
| 45           | 351              | 351                  | 349.75            | 117          | 753              | 753                  | 751.75            |
| 46           | 357              | 357                  | 355.75            | 118          | 759              | 759                  | 757.75            |
| 47           | 363              | 363                  | 361.75            | 119          | 765              | 765                  | 763.75            |
| 48           | 369              | 369                  | 367.75            | 120          | 771              | 771                  | 769.75            |
| 49           | 375              | 375                  | 373.75            | 121          | 777              | 777                  | 775.75            |
| 50           | 381              | 381                  | 379.75            | 122          | 783              | 783                  | 781.75            |
| 51           | 387              | 387                  | 385.75            | 123          | 789              | 789                  | 787.75            |
| 52           | 393              | 393                  | 391.75            | 124          | 795              | 795                  | 793.75            |
| 53           | 399              | 399                  | 397.75            | 125          | 801              | 801                  | 799.75            |
| 54           | 405              | 405                  | 403.75            | 126          | 807              | 807                  | 805.75            |
| 55           | 411              | 411                  | 409.75            | 127          | 813              | 813                  | 811.75            |
| 56           | 417              | 417                  | 415.75            | 128          | 819              | 819                  | 817.75            |
| 57           | 423              | 423                  | 421.75            | 129          | 825              | 825                  | 823.75            |
| 58           | 429              | 429                  | 427.75            | 130          | 831              | 831                  | 829.75            |
| 59           | 435              | 435                  | 433.75            | 131          | 837              | 837                  | 835.75            |
| 60           | 441              | 441                  | 439.75            | 132          | 843              | 843                  | 841.75            |
| 61           | 447              | 447                  | 445.75            | 133          | 849              | 849                  | 847.75            |
| 62           | 453              | 453                  | 451.75            | 134          | 855              | 855                  | 853.75            |
|              |                  |                      |                   | 135          | 861              | 861                  | 859.75            |

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Blonder Tongue Laboratories, Inc. (BT) will at its sole option, either repair or replace (with a new or factory reconditioned product, as BT may determine) any product manufactured by BT which proves to be defective in materials or workmanship or fails to meet the specifications which are in effect on the date of shipment or such other specifications as may have been expressly agreed upon in writing (i) for a period of one (1) year from the date of original purchase (or such shorter period of time as may be set forth in the license agreement specific to the particular software being licensed), with respect to iCentral™ (hardware and software) and all other software products (including embedded software) licensed from BT, (ii) for a period of one (1) year from the date of original purchase, with respect to all MegaPort, IPTV products and fiber optics receivers, transmitters, couplers and integrated receivers/distribution amplifiers (including TRAILBLAZER™, RETRO-LINX™ and TWIN STAR™ products) as well as for VideoCipher® & DigiCipher® satellite receivers, and (iii) for a period of three (3) years from the date of original purchase, with respect to all other BT products. Notwithstanding the foregoing, in some cases, the warranty on certain proprietary sub-assembly modules manufactured by third party vendors and contained in BT products and on certain private-label products manufactured by third parties for resale by BT are of shorter duration or otherwise more limited than the standard BT limited warranty. In such cases, BT's warranty with respect to such third party proprietary sub-assembly modules and private-label products will be limited to the duration and other terms of such third party vendor's warranty. In addition, certain products, that are not manufactured but are resold by BT, carry the original OEM warranty for that product. The limited warranty set forth in this paragraph does not apply to any product sold by BT, which at the time of sale constituted a Closeout Product.

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