



**BLONDER  
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## INSTRUCTION MANUAL

# AQM Series

## Agile QAM Modulator

Model	Stock No.	Description
AQM	6271B	Agile QAM Modulator

## Accessories

Model	Stock No.	Description
MIPS-12C	7722C	Power Supply
MIRC-12V	7715	Chassis

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651215600D

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

Purchase Location Name:	
Purchase Location Telephone Number:	
AQM 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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## Section 1 — General & Safety Instructions

	<p>The STOP sign symbol is intended to alert you to the presence of <b>REQUIRED</b> operating and maintenance (servicing) instructions that if not followed, may result in product failure or destruction.</p>
	<p>The YIELD sign symbol is intended to alert you to the presence of <b>RECOMMENDED</b> operating and maintenance (servicing) instructions.</p>
	<p>The LIGHTNING flash symbol is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.</p>
<p><b>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.</b></p>	

**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

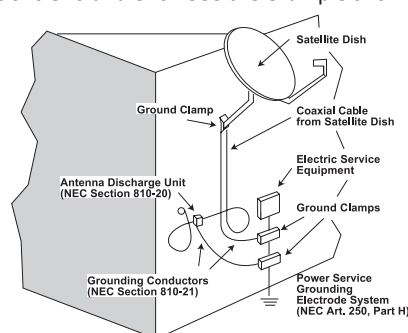


**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE  
AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- **Elevated Operating Ambient** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature per Section 2.3.
- **Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading** - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- 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.

## Safety Instructions - continued

- 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.
- 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.

## Section 2 — Product Summary

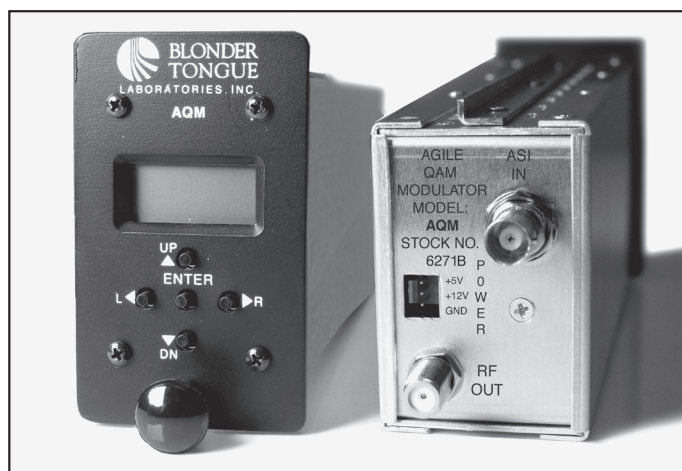
### 2.1 Revision History & Reason

This is the fourth issue of the Instruction Manual.

The reason for this revision was to include the sub-band feature and to reformat the document.

### 2.2 Product Application & Description

#### Application:

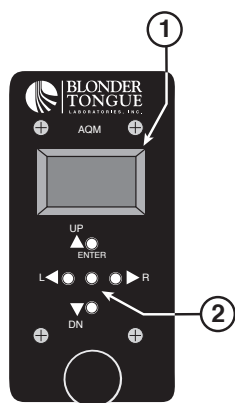


The AQM accepts a DVB ASI (Asynchronous Serial Interface) digital transport stream and modulates it into a QAM (Quadrature Amplitude Modulation) signal. The QAM modulator supports QAM modes 256, 512 & 1024. Additionally, if needed, the built-in bit stuffing circuitry ensures that Null Packets are inserted into the ASI transport stream to ensure the correct baud rate is transmitted.

- Compact design allows 6 modules in a 2 RU rack chassis
- DVB ASI Input complies with DVB ASI standards
- Improve bandwidth efficiency with support for all advanced QAM Modes including, 256, 512 & 1024 QAM
- Agile QAM Output 5.75—864 MHz, (NTSC Mode: Channel 2—135, T7-T14; Frequency Mode: 12.5 kHz increments)
- NTSC & PAL B/G capable
- Self-test PRBS mode
- Optional IF Output available (special order)
- Optional LVDS Input available (special order)

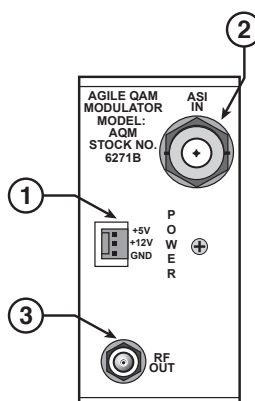
## Section 3 -The AQM Unit

### Front Panel



1. **LCD Display** - 2-line Liquid Crystal Display screen for displaying unit information.
2. **Navigation Keypad** - Buttons used to navigate between menus and enter unit information.

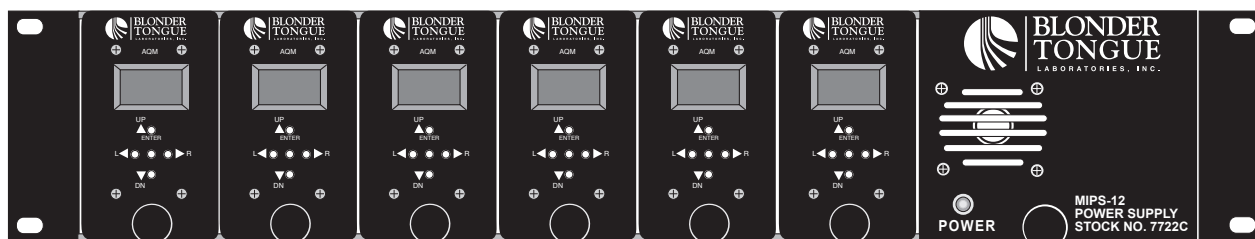
### Rear Panel



1. **Power** - 3-pin female connector to receive power cable from the MIPS-12 power supply.
2. **ASI IN** - BNC connector for ASI (Asynchronous Serial Interface) input.
3. **RF OUT** - 75 ohm QAM RF Output.

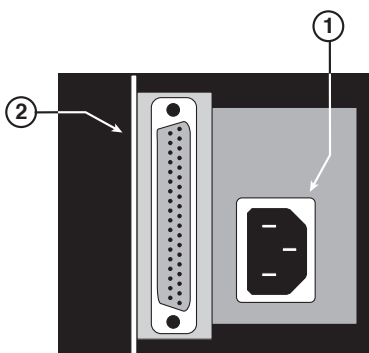
## 3.1 Micro-Modulator Rack Chassis and Power Supply Units

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



### MIPS-12C Power Supply Connections

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



1. **AC Input** - The power supply is available in 110 VAC/60 Hz and 220 VAC/50 Hz models.
2. **DC Output** - The polarized D connector provides 12 sets of +12 Vdc, +5 Vdc and ground cables for the modules. 12 sets is only required if analog modulators are used within the rack.

## 3.2 Product Specification

### Input

<b>Connector:</b>	BNC Female
<b>Standard:</b> <b>Transport Rate:</b>	DVB-ASI; EN 50083-9 270 Mbps
<b>Impedance:</b>	75 $\Omega$

### Output

<b>Connector:</b>	"F" Female
<b>QAM Modulation Modes:</b>	16, 32, 64, 128, 256, 512, and 1024
<b>DVB Symbol Rate:</b>	Variable; 1 to 10 MSymbols/sec (MBaud)
<b>Frequency Range:</b>	5.75 to 864 MHz
<b>QAM Tuning</b> <b>NTSC:</b> <b>PAL:</b>	Per channel's number from 2 to 135 & T7 to T14 Per channel's center-frequency (12.5 kHz increments)
<b>RF Level:</b>	+40 dBmV $\pm 1$ (100 dB $\mu$ V $\pm 1$ )
<b>RF Level LCD Screen Error:</b>	$\pm 2$ dB
<b>RF Level Adjustment Range:</b>	30 to 40 dBmV
<b>Frequency Stability:</b>	$\pm 10$ kHz over 32 to 122 °F (0 to 50 °C)
<b>Frequency Tolerance:</b>	$\pm 0.5$ kHz @ 77 °F (25 °C)
<b>Amplitude Flatness:</b>	$\pm 0.25$ dB (over 6 MHz channel)
<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
<b>Spurious:</b>	-60 dBc
<b>Broadband Noise:</b>	-75 dBc (@ +40 dBmV output level, 4 MHz bandwidth)
<b>Impedance:</b>	75 $\Omega$
<b>Return Loss:</b>	12 dB
<b>Spectral Inversion:</b>	Auto Recognition
<b>Carrier Suppression:</b>	55 dB
<b>SNR:</b>	Greater than 40 dB
<b>MER:</b>	Greater than 40 dB
<b>I/Q Phase Error:</b>	Less than 1 degree
<b>I/Q Amplitude Imbalance:</b>	Less than 1%

### General

<b>Dimensions (W x D x H)</b> <b>AQM Module:</b> <b>Power Supply:</b> <b>Rack Chassis:</b>	2.3 x 7.5 x 3.5 inches (58 x 191 x 89 mm) 4.6 x 7.5 x 3.5 inches (106 x 191 x 89 mm) 19.0 x 12.0 x 3.5 inches (483 x 305 x 89 mm)
<b>Power</b> <b>MIPS-12C:</b> <b>MIPS-12C PAL:</b>	110 VAC/60 Hz 220 VAC/50 Hz
<b>Power Dissipation:</b>	5 W (per AQM module)
<b>Weight</b> <b>AQM Module:</b> <b>Fully Loaded Chassis:</b>	2.3 lbs (1.04 kg) 24.2 lbs (10.9 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensation

### Alarms/Monitoring/Control

<b>Local Monitoring:</b> <b>Local Control:</b>	Front-panel, 16-character, 2-line LCD screen Front-panel Navigational Key-pad
<b>Remote Monitoring/Control:</b>	Not available




## Section 4 – Installation & Power-up

The AQM is designed to be installed in the MIRC-12V Series rack chassis. The chassis can support 6 AQM modules, each utilizing 2 standard single slots.

You can mount the chassis in a standard EIA, 24 inch (610 mm) deep, enclosed rack. Secure the rack chassis front panel to the rack by inserting four machine screws, with cup washers, through the four mounting holes in the front panel.

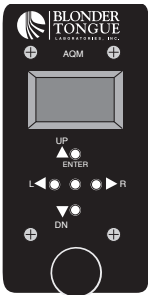
When installing one or more chassis in a headend rack, it is recommended to leave a 1 rack unit space (1.75" high) between units to maximize air flow, but it is not required.



**FOR SAFE AND RELIABLE OPERATION, THE POWER SUPPLY REQUIRES  
A PROPER GROUND CONNECTION FOR THE THIRD PRONG OF  
THE UNIT'S POWER CORD PLUG**

### 4.1 Operating Interface Instructions

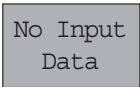
The AQM module uses an easy-to-read LCD (Liquid Crystal Display) and keypad to control and monitor the AQM. The following information describes the LCD methodology and approach.



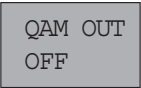
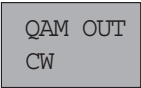
LCD & Front Panel Navigation Controls

### 4.2 Boot-Up Display Sequence

When the unit is in "Normal Mode" and is first plugged in for use, the AQM checks for the presence of input data. If data is not detected, it displays the appropriate module condition on the LCD readout as depicted below.



If unit is set to "CW" or "Off Mode" the following will be displayed by the LCD.



**Note:** Factory default values shown in Box

4.3 Main Interactive Sequence

The main interactive sequence is where all the core module programming is performed. This sequence is accessed when a user depresses one of the ◀(L) or ▶(R) and ▲(UP) ▼(DN) buttons on the keypad. The following diagram depicts the LCD screens available in the main interactive sequence.

Main Interactive Sequence

QAM MODE ITU-A	ENCODER DVB	QAM 64	ALPHA 15%	INTERLV I12, J17	BD Rate 5.0000 M	INPUT ASI	RF OUT NTSC 100	OUTPUT 509.0875	QAM OUT NORMAL	OUT LVL 40 dBmV
ITU-A ITU-B	DVB DAVIC	16 32 64 128 256 512 1024	12 15 18	I128,J1:I12,J17 I128,J2:I17,J12 I128,J3:I34,J6 I128,J4:I51,J4 I128,J5:I68,J3 I128,J6:I102,J2 I128,J7:I204,J1 I128,J8:I1,J204 I64,J2:I2,J102 I32,J4:I3,J68 I16,J8:I4,J51 I8,J16:I6,J34 I4,J32 I2,J64 I1,J128	RANGE IS 1 TO 6.9M	ASI PRBS 23M PRBS 23 PRBS 15M PRBS 15	NTSC MHz  (NTSC RANGE IS CH 2-135, 6 MHz STEPS)  (FREQ RANGE IS 54-864 MHz, 12.5 kHz STEPS)	NTSC 134 509.0875  (NTSC MODE DISPLAYS CH #)  (MHz MODE DISPLAYS ACTUAL CENTER FREQ)	NORMAL INVERTED OFF CW	RANGE IS 28-42 dBmV
Version 1.6b AQM	BIT RATE 41.205 M									
DISPLAY ONLY	DISPLAY ONLY  (DISPLAYED IN NORMAL MODE ONLY)									

Note: Factory Reset Default values shown in illustration.

4.4 Programming a Variable

1. When at a screen whose variable needs to be changed, depress the ENTER button until the blinking cursor is displayed.
2. After the blinking cursor is displayed simply press the ▲(UP) or ▼(DN) buttons to increment or decrement to the appropriate desired value.
3. Press the ENTER button again to save the change. The corresponding AQM module stores the new information.

## Section 5 - Interactive Sequence Detail

### 5.1 QAM Mode

---

The AQM can be set to comply with the ITU-TJ-83 Annex A & Annex B specifications.

ITU-A - is used for DVB operation

ITU-B - is used for DigiCiper II operation

### 5.2 Encoder

---

The Encoder selection is only used in ITU-A Mode. If set to ITU-B Mode, then the Encoder shows NONE.

### 5.3 QAM

---

The QAM modulation type is user selectable. If the unit is set to ITU-B Mode, then only QAM 64 or 256 are available.

### 5.4 Alpha

---

The Alpha setting is used to set the roll-off factor. Settings are dependent on the Operation Mode.

The standard settings are as follows:

ITU-A - 15%

ITU-B - 18%

### 5.5 Interleaver

---

The Convolutional Interleaver is user selectable. Various choices are available depending on the Operation Mode. The standard settings are as follows:

ITU-A - I 12, J17

ITU-B - I 128, J1

### 5.6 Baud Rate

---

The Baud Rate needs to be programmed based on the Input Data and QAM Mode used. The range is from 1 to 6.9 MBaud.

### 5.7 Input

---

The Input Signal is fed to the module via the BNC connector on the rear panel. For normal operation, use ASI (Asynchronous Serial Interface). The unit is also programmed with the ability to generate a PRBS (Pseudo Random Binary Sequence) test signal. The PRBS signal is a polynomial sequence that is determined by the Input Selection choice. The following settings are available.

PRBS 25M

PRBS 23

PRBS 15M

PRBS 15

These selections are also valuable if an Input ASI signal is not available. This can be helpful in balancing the Output Levels of several units without the need for an Input ASI signal.

## 5.8 RF OUT

The unit delivers a fully-modulated QAM RF output. There are two modes that determine the upconversion programming.

NTSC: The NTSC mode permits programming the RF output using a standard NTSC channel number.

MHz: The MHz or Frequency Tuning mode permits programming the RF output to the desired frequency.

## 5.9 Output

In the NTSC Mode it can be upconverted in 6 MHz increments to any NTSC standard channel, 2-135 (center frequency). See Appendix A for Frequency details.

In the Frequency Mode it can be upconverted to any desired frequency in 12.5 kHz increments. Press the ▲(UP) or ▼(DN) buttons to increment or decrement to the appropriate desired value for each digit, or press and hold the button to scroll.

## 5.10 QAM Out

The unit has three QAM modes.

NORMAL: The NORMAL QAM mode outputs a QAM modulated signal.

INVERTED: The output spectrum is inverted.

OFF: The OFF QAM mode outputs no signal from the module.

CW: The CW QAM mode outputs a CW signal that is useful for measuring the output level of the unit. (See Appendix A for more detail).

## 5.11 Output Level

The AQM features electronic output level control.

The output level can be adjusted in any of the QAM modes listed above.

The output level is displayed and measured as an average value. (See Appendix A for more detail).

The output level for a QAM CW is a true representation of a QAM signal level.

The output level range is +30 dBmV to +40 dBmV.



**FOR OPTIMUM NOISE PERFORMANCE, OUTPUT LEVEL FOR EACH MODULE SHOULD BE SET NOMINALLY AT +40 dBmV**

## 5.12 Bit Rate

This is the actual input data rate that the QAM signal is locked to. This is only displayed in the QAM Out Normal Mode.

## 5.13 Factory Reset

The unit has a built-in “Factory Reset” capability that allows a user to erase all the current programming information for the AQM and restore it to its factory default setting.

To perform this function, press and hold simultaneously, the ENTER and ▼ (DN) buttons until the LCD displays “Factory Reset.” This will cause the unit to reset the programmed information to the factory default settings shown in section 4.3.

FACTORY  
RESET

Factory Reset



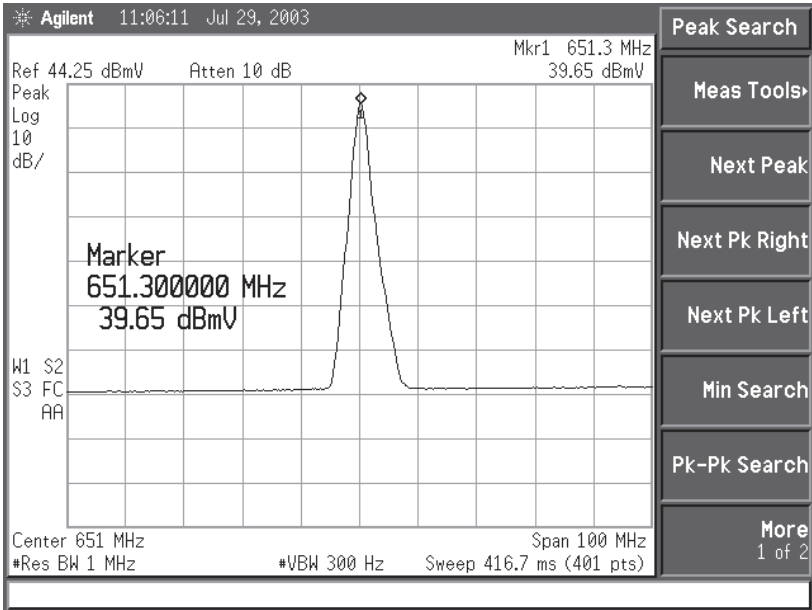
**THIS WILL RESET ALL PROGRAMMING INFORMATION FOR THE UNIT AND IS ONLY RECOMMENDED WHEN AN ERROR CONDITION IS DISPLAYED BY THE LCD THAT CAN NOT BE CORRECTED BY A NORMAL POWER CYCLE**

Appendix A - QAM Signal Level Testing

This section describes the preferred method for measuring and setting the QAM output level of the unit. It requires the ability to output a CW (carrier wave) QAM signal.

The CW QAM signal is used to provide the true equivalent signal level for the QAM carrier. The AQM is capable of supplying the output QAM signal in CW mode. This simplifies the level measurement process dramatically because the level does not need to be adjusted for the limitation in analyzer bandwidth settings. After setting the appropriate level in CW mode, the unit is changed back to normal mode.

Any meter that can measure CW Carrier Power Level can be used. The CW Carrier Level is equal to the QAM Power Level that will be presented in normal mode.



## CATV Channel Frequency Chart

### 54 MHz to 864 MHz

Chan.	EIA Chan.	Standard		Chan.	EIA Chan.	Standard		Chan.	EIA Chan.	Standard		Chan.	EIA Chan.	Standard	
T7	none	7.0000	11.5000	AA	37*	301.2625	305.7625	-	86	592.2500	599.7500	-	140	889.2500	893.7500
T8	none	13.0000	17.5000	BB	38*	307.2625	311.7625	-	87	601.2500	605.7500	-	141	895.2500	899.7500
T9	none	19.0000	23.5000	CC	39*	313.2625	317.7625	-	88	607.2500	611.7500	-	142	901.2500	905.7500
T10	none	25.0000	29.5000	DD	40*	319.2625	323.7625	-	89	613.2500	617.7500	-	143	907.2500	911.7500
T11	none	31.0000	35.5000	EE	41*	325.2625	329.7625	-	90	619.2500	623.7500	-	144	913.2500	917.7500
T12	none	37.0000	41.5000	FF	42*	331.2750	335.7750	-	91	625.2500	629.7500	-	145	919.2500	923.7500
T13	none	43.0000	47.5000	GG	43*	337.2625	341.7625	-	92	631.2500	635.7500	-	146	925.2500	929.7500
T14	none	49.0000	53.5000	HH	44*	343.2625	347.7625	-	93	637.2500	641.7500	-	147	931.2500	935.7500
2	02	55.2500	59.7500	II	45*	349.2625	353.7625	-	94	643.2500	647.7500	-	148	937.2500	941.7500
3	03	61.2500	65.7500	JJ	46*	355.2625	359.7625	-	100	649.2500	653.7500	-	149	943.2500	947.7500
4	04	67.2500	71.7500	KK	47*	361.2625	365.7625	-	101	655.2500	659.7500	-	150	949.2500	953.7500
A8	01	NA	NA	LL	48*	367.2625	371.7625	-	102	661.2500	665.7500	-	151	955.2500	959.7500
5	05	77.2500	81.7500	MM	49*	373.2625	377.7625	-	103	667.2500	671.7500	-	152	961.2500	965.7500
6	06	83.2500	87.7500	NN	50*	379.2625	383.7625	-	104	673.2500	677.7500	-	153	967.2500	971.7500
A5	95	91.2500	95.7500	OO	51*	385.2625	389.7625	-	105	679.2500	683.7500	-	154	973.2500	977.7500
A4	96	97.2500	101.7500	PP	52*	391.2625	395.7625	-	106	685.2500	689.7500	-	155	979.2500	983.7500
A3	97	103.2500	107.7500	QQ	53*	397.2625	401.7625	-	107	691.2500	695.7500	-	156	985.2500	989.7500
A2	98*	109.2750	113.7750	RR	54	403.2500	407.7500	-	108	697.2500	701.7500	-	157	991.2500	995.7500
A1	99*	115.2750	119.7750	SS	55	409.2500	413.7500	-	109	703.2500	707.7500	-	158	997.2500	1001.7500
A	14*	121.2625	125.7625	TT	56	415.2500	419.7500	-	110	709.2500	713.7500				
B	15*	127.2625	131.7625	UU	57	421.2500	425.7500	-	111	715.2500	719.7500				
C	16*	133.2625	137.7625	VV	58	427.2500	431.7500	-	112	721.2500	725.7500				
D	17	139.2500	143.7500	WW	59	433.2500	437.7500	-	113	727.2500	731.7500				
E	18	145.2500	149.7500	XX	60	439.2500	443.7500	-	114	733.2500	737.7500				
F	19	151.2500	155.7500	YY	61	445.2500	449.7500	-	115	739.2500	743.7500				
G	20	157.2500	161.7500	ZZ	62	451.2500	455.7500	-	116	745.2500	749.7500				
H	21	163.2500	167.7500	AAA	63	457.2500	461.7500	-	117	751.2500	755.7500				
I	22	169.2500	173.7500	BBB	64	463.2500	467.7500	-	118	757.2500	761.7500				
7	07	175.2500	179.7500	CCC	65	469.2500	473.7500	-	119	763.2500	767.7500				
8	08	181.2500	185.7500	DDD	66	475.2500	479.7500	-	120	769.2500	773.7500				
9	09	187.2500	191.7500	EEE	67	481.2500	485.7500	-	121	775.2500	779.7500				
10	10	193.2500	197.7500	FFF	68	487.2500	491.7500	-	122	781.2500	785.7500				
11	11	199.2500	203.7500	GGG	69	493.2500	497.7500	-	123	787.2500	791.7500				
12	12	205.2500	209.7500	HHH	70	499.2500	503.7500	-	124	793.2500	797.7500				
13	13	211.2500	215.7500	III	71	505.2500	509.7500	-	125	799.2500	803.7500				
J	23	217.2500	221.7500	JJJ	72	511.2500	515.7500	-	126	805.2500	809.7500				
K	24*	223.2500	227.7500	KKK	73	517.2500	521.7500	-	127	811.2500	815.7500				
L	25*	229.2625	233.7625	LLL	74	523.2500	527.7500	-	128	817.2500	821.7500				
M	26*	235.2625	239.7625	MMM	75	529.2500	533.7500	-	129	823.2500	827.7500				
N	27*	241.2625	245.7625	NNN	76	535.2500	539.7500	-	130	829.2500	833.7500				
O	28*	247.2625	251.7625	OOO	77	541.2500	545.7500	-	131	835.2500	839.7500				
P	29*	253.2625	257.7625	PPP	78	547.2500	551.7500	-	132	841.2500	845.7500				
Q	30*	259.2625	263.7625	-	79	553.2500	557.7500	-	133	847.2500	851.7500				
R	31*	265.2625	269.7625	-	80	559.2500	563.7500	-	134	853.2500	857.7500				
S	32*	271.2625	275.7625	-	81	565.2500	569.7500	-	135	859.2500	863.7500				
T	33*	277.2625	281.7625	-	82	571.2500	575.7500	-	136	865.2500	869.7500				
U	34*	283.2625	287.7625	-	83	577.2500	581.7500	-	137	871.2500	875.7500				
V	35*	289.2625	293.7625	-	84	583.2500	587.7500	-	138	877.2500	881.7500				
W	36*	295.2625	299.7625	-	85	589.2500	593.7500	-	139	883.2500	887.7500				

# Limited Warranty

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 receiver/distribution amplifiers (including TRAILBLAZER™, RETRO-LINX™ and TWIN STAR™ products) as well as for 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 such products. 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 Refurbished/Closeout Product.

(b) BT will at its sole option, either repair or replace (with a new or factory-reconditioned product, as BT may determine) any product sold by BT which at the time of sale constituted a refurbished or closeout item ("Refurbished/Closeout Product"), 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, for a period of ninety (90) days from the date of original purchase. Notwithstanding the foregoing, in some cases the warranty on third party software and 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 BT limited warranty for Refurbished/Closeout Products. In such cases, BT's warranty for Refurbished/Closeout Products constituting such third party software, 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, notwithstanding the foregoing, (i) certain Refurbished/Closeout Products that are not manufactured (but are resold) by BT, carry the original OEM warranty for such products, which may be longer or shorter than the BT limited warranty for Refurbished/Closeout Products. All sales of Refurbished/Closeout Products are final.

To obtain service under this warranty, the defective product, together with a copy of the sales receipt or other satisfactory proof of purchase and a brief description of the defect, must be shipped freight prepaid to: Blonder Tongue Laboratories, Inc., One Jake Brown Road, Old Bridge, New Jersey 08857.

This warranty does not cover damage resulting from (i) use or installation other than in strict accordance with manufacturer's written instructions, (ii) disassembly or repair by someone other than the manufacturer or a manufacturer-authorized repair center, (iii) misuse, misapplication or abuse, (iv) alteration, (v) lack of reasonable care or (vi) wind, ice, snow, rain, lightning, or any other weather conditions or acts of God.

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All claims for shortages, defects, and non-conforming goods must be made by the customer in writing within five (5) days of receipt of merchandise, which writing shall state with particularity all material facts concerning the claim then known to the customer. Upon any such claim, the customer shall hold the goods complained of intact and duly protected, for a period of up to sixty (60) days. Upon the request of BT, the customer shall ship such allegedly non-conforming or defective goods, freight prepaid to BT for examination by BT's inspection department and verification of the defect. BT, at its option, will either repair, replace or issue a credit for products determined to be defective. BT's liability and responsibility for defective products is specifically limited to the defective item or to credit towards the original billing. All such replacements by BT shall be made free of charge f.o.b. the delivery point called for in the original order. Products for which replacement has been made under the provisions of this clause shall become the property of BT. Under no circumstances are products to be returned to BT without BT's prior written authorization. BT reserves the right to scrap any unauthorized returns on a no-credit basis. Any actions for breach of a contract of sale between BT and a customer must be commenced by the customer within thirteen (13) months after the cause of action has accrued. A copy of BT's standard terms and conditions of sale, including the limited warranty, is available from BT upon request. Copies of the limited warranties covering third-party proprietary sub-assembly modules and private-label products manufactured by third-parties are also available from BT on request. DigiCipher ® is a registered trademark of Motorola Corp. (Rev 0509)



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