

Installation Instructions

MBSR100MW MBS Repeater



U.S Patent #4,791,717, #5,020,149

READ ME FIRST!

The EMCEE MBSR100MW is a professional solid state low-power MBS Band retransmission repeater (amplifier) system, and is formed from a combination of a pre-selected frequency input pre-amplifier module (P/N 701007) and an AGC controlled 100mW post amplifier module (P/N 50800002A), each of which is in a separate chassis/housing and connected via an interconnecting coaxial cable with Type 'N' connectors. The system is capable of retransmitting from one to seven MBS channels with either analog NTSC or digital modulation. The system provides an end-to-end electrical gain typically 70dB. The system has no frequency generating circuits, and as such, the output carrier frequencies and modulations are dependent on the inputs. The pre-amplifier contains a dual section inter-digital filter system which provides high Q MBS pass-band circuitry at the input stage. This is to prevent pre-amplifier input overloads due to out of band interference from close stations utilizing the LBS and UBS bands. The input pre-selection also prevents the retransmission of out of band signals. The output (post) amplifier has an output AGC range of 20dB, with a 20dBm average power output power threshold. The AGC circuitry is designed to provide a constant low distortion output with varying input signal power levels due to fades and other signal anomalies.

The system has the following average output power capability:

- 1 Channel @ 20dBm/Channel ± 1 dB (20dBm Composite Power)
- 2 Channels @ 17dBm/Channel ± 1 dB (20dBm Composite Power)
- 4 Channels @ 14dBm/Channel ± 1 dB (20dBm Composite Power)
- 7 Channels @ 11dBm/Channel ± 1 dB (20dBm Composite Power)

Warning: DO NOT EXCEED 20dBm Composite Power Output!

PLANNING the INSTALLATION

Proper installation pre-planning will yield the best performance of the installed system.



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Field deployment and configuration of the system includes fitting the system with the appropriate receive and re-transmit antennas. Typically, narrow beam parabolic reflectors are used to provide the necessary input/output link budget and output coverage area. The system, fully into the AGC range, has a maximum input power level of -35 dBm and is labeled "DO NOT EXCEED -35 dBm Input" accordingly.

A typical installation will have input link characteristics as follows:

Base Station EIRP (maximum)	60.0 dBm
10 Mile Path Loss	-124.9 dB
Receive Antenna Gain (typical)	<u>24.0</u> dBi
System Input Level	- 40.9 dBm
System Gain	70.0 dB
Inter-Connecting Cable Loss	-3.0 dB
Transmit Antenna Gain (typical)	<u>24.0</u> dBi
EIRP	50.1 dBm

Using a spectrum analyzer in the channel power mode, measure the RF output power level from the prospective receive antenna and confirm that the input power level is between -35 and -47dBm. If necessary, use a larger or smaller antenna to adjust the input level accordingly. As an alternate method, if the receive antenna output level is too high, a 50 Ohm, type 'N' attenuator may be used. Note: DO NOT use attenuators between the pre-amp and post-amp sections of the system.

The repeater system has ~70dB of electrical gain plus the gain of the receive and transmit antennas. It is important that the transmit and receive antenna installation provides a high degree of isolation (at least 100dB) between them so the system does not oscillate due to feedback. This can be accomplished through vertical separation and cross-polarization of the antennas (50 feet recommended), providing input to output shielding by using building blockage or other means, while using good field engineering and installation practices.

Install the pre-amplifier module as close as possible to the receive antenna to minimize the noise figure of the system. Also install the post-amp module as close as possible to the transmit antenna. Utilize a premium low-loss cable with quality connectors between the pre-amp and post-amp modules for the best performance results.



Choose a transmit antenna that will provide the best coverage pattern for the shadowed area to be served.

SERVICING the SYSTEM

There are no internal user adjustments or user serviceable parts inside the unit. Do not disassemble the unit; the Warranty will be void if the unit is opened. If either module does not properly function, return it to the factory for repair or replacement.

UNPACKING the SYSTEM

Remove the power supply, then insert a finger into the finger hole of the inner carton liner, lift to expose unit and accessories.



Remove the “L-Screw” from the mounting bracket and replace the bracket as shown. Install the power supply indoors close to an available AC outlet. Use a good quality RG-6 cable (min.) to connect the power supply between module power input and the power inserter.



ATTACHING MODULES to the ANTENNA MAST

Mount the modules with the connectors facing down. Slide the mounting clamp into the indentations on the housing and up into place. **Hand-Tighten** the “L-Screw” to secure the module to the antenna mast or tower leg. **DO NOT** use a wrench or pliers to tighten the “L-Screw”. Mast or tower leg size can be 1” to 2-1/2”.



CONNECTING THE MODULES

Connect the antenna output connector to the RF Input ‘N’ connector on the pre-amp module. Connect the RF inter-connecting cable ‘N’ connector to the ‘N’ jack marked RF output. Connect the RF inter-connecting cable ‘N’ connector to the RF input connector of the post-amp module.

DANGER STOP WATCH FOR WIRES

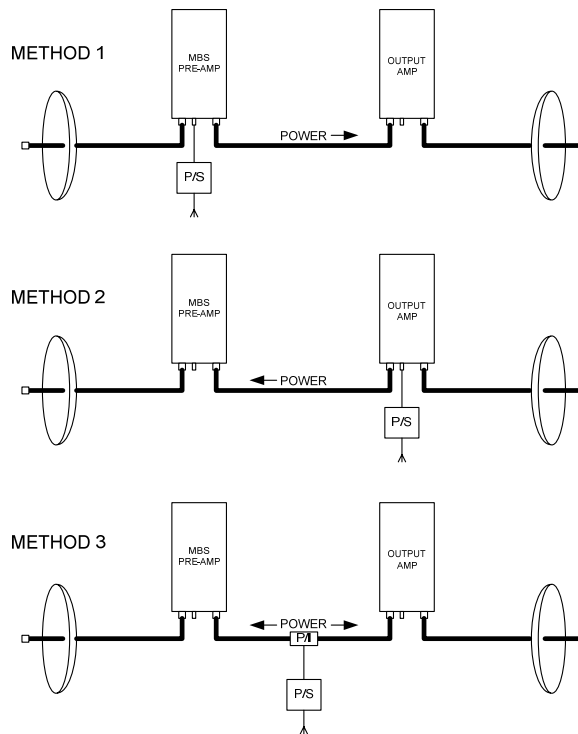
You can be KILLED!
If this product comes near electric power lines.

Hand-Tighten all connectors! **DO NOT** use a wrench or pliers on any of the connectors. Use only good quality solid conductor cables and self-sealing connectors. Connectors may be weather-proofed if desired.

POWERING the SYSTEM

Using the diagram below, select the system powering option most suitable to the installation.

MBS REPEATER POWERING OPTIONS



NOTE 1:
24V, 1A (BUT-24) SUPPLY PROVIDED AS STANDARD EQUIPMENT, WITH 'F' TYPE POWER INSERTER (TYPE 'N' POWER INSERTER IS OPTION).

For Further Technical Information Contact:

EMCEE Communications
 1635 W. 12 Place
 Tempe, AZ 85281 USA
 Tel. 480-315-1661
 Fax 480-315-0679
www.emceecom.com

DANGER STOP WATCH FOR WIRES You can be **KILLED!** If this product comes near electric power lines.

MBS-BAND LOW NOISE PREAMPLIFIER-Design Specifications

EMCEE Part Number 701007

Input Frequency	2572-2614 MHz
Noise Figure	4.5 dB Typical
Gain	35 dB \pm 2 dB
Gain Flatness	\pm 1.5 dB
P-out-1dB Compression Point	+12/+5 dBm (single carrier)
Output 3rd Order Intercept Point	+21/+14 dBm
Input VSWR	1.5:1
Output VSWR	1.5:1
Input Connector	50 Ohm, Type 'N' Female
Output Connector	50 Ohm, Type 'N' Female
DC Supply Voltage	+16 to 24 VDC
Current	60ma Typical
Power Supply Connector	Type 'F' Female or Thru Output Connector
Temperature Limits:	
Operating	-40°C to +50°C
Storage	-50°C to +85°C
Weatherproofing	Tongue and Groove Case with Full Gasket
Leak Testing	Per CWT DT-2005.1
Finish	Polyester Powder Coat Paint
Physical Dimensions:	
Size	10.0"x 4.75"x2.0 in (254x120x50 mm)
Weight	2.5 lbs. (1.18 Kg)



MBS-BAND LOW-POWER REPEATER AMPLIFIER-Design Specifications

EMCEE Part Number 50800002A

Input Frequency	2572-2614 MHz
Noise Figure	1.2 dB Typical (At AGC Threshold)
Open Loop Gain	35 dB \pm 2 dB
Gain Flatness	\pm 1.0 dB
Gain over Temperature	\pm 1.0 dB
AGC Dynamic Range	20dB Typical
Output Power (6MHz Channel)	+20dBm per Channel (1 Channel) +17dBm per Channel (2 Channels) +14dBm per Channel (4 Channels) +11dBm per Channel (7 Channels)
Input VSWR	1.5:1
Output VSWR	1.5:1
Input Connector	50 Ohm, Type 'N' Female
Output Connector	50 Ohm, Type 'N' Female
DC Supply Voltage	+16 to 28 VDC
Current	550ma Typical @ 16VDC Input
Power Supply Connector	Type 'F' Female or Thru Input Connector
Temperature Limits: Operating	-40°C to +50°C
Storage	-50°C to +85°C
Weatherproofing	Tongue and Groove Case with Full Gasket
Leak Testing	Per CWT DT-2005.1
Finish	Polyester Powder Coat Paint
Physical Dimensions: Size	10.0"x 4.75"x2.0 in (254x120x50 mm)
Weight	2.6 lbs. (1.19 Kg)



