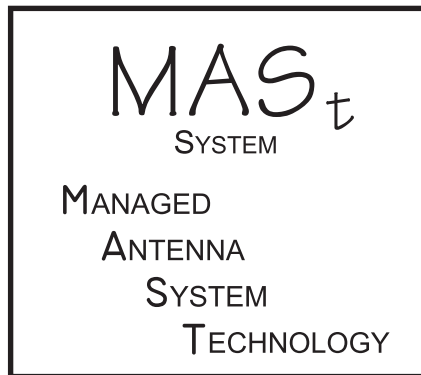




**Audio Specialties Group  
Products Division**

**MAS-101  
UHF Receive Antenna  
Combiner  
Operators Guide**



REV-4

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## **SECTION 1:**

### **1.0 Introduction**

The MAS-101 is a two-RU AC powered device that allows for multiple configurations of antenna inputs and distributed outputs. It is intended to assist in the management of large fixed or temporary installations which require multiple-zone receive antennas as well as the need to distribute to multiple receivers. All connections are made with BNC connectors.

## **SECTION 2:**

### **Features**

#### **2.1 Standard Configurations**

MAS-101/DIV Diversity system for wireless microphone receivers

- Dual 4x1 combiner: Provides four sets of diversity inputs, and one diversity output.
- Dual 4x4 combiner/Splitter: Provides four sets of diversity inputs, and four set of diversity outputs.

MAS-101/IC Non-Diversity system for intercom base-stations.

- Single 4x1 Combiner: Four inputs and one output.
- Single 4x4 Combiner Splitter: Four inputs and four, eight, or twelve outputs.

#### **2.2 Options**

Due to the environmental impact on RF performance, Audio Specialties considers each MAST™ product to be application specific. Even though products could be identical, it is only after research and analysis of customer's needs that the details of each product can be finalized. While this may seem like excess, products that are designed for best performance must properly interface with other equipment as well as its environment. This research leads to the wide variety of options that are available.

Since MAST™ products are often sold as a complete system with several units working together, care is taken to assure performance at the system level. This includes system-level and device-level spectrum analysis documentation.

- Filtering. Yes/no and at what frequencies. Fixed or variable.
- Amplification. Internal/external, Gain value.
- Powering external active device, Antennas, external preamps. Voltages, current requirements, number of channels.
- Variable Attenuation. Amount and number of channels.
- Antenna input On/Off control.

### **2.2.1 Filtering**

Each configuration is available with a wide range of filtering options. Except in cases where external filtered-amplification is used all configurations include high-pass and low-pass filtering. Filter frequencies are determined by specific customer needs at the time of ordering.

<b>Standard Low-Pass Frequencies</b>	<b>Standard Hi-Pass Frequencies</b>
400Mhz	500MHz
520	600
580	700
700	780
720	

Each MAS-101 is delivered with customer specified filter frequencies. In the future, should the customer need to change the filter frequencies, the unit can be returned to the factory for the necessary adjustments and calibration.

### **2.2.2 Input Biasing**

Antenna biasing can support a maximum of eight active antennas. Total current available is 1100mA 12V DC. Each antenna input is DC-isolated using auto-reset fuses so in the event that one antenna cable is damaged or short circuited, the power to the other antennas is not affected.

### **2.2.3 Amplification**

The losses of the combining and splitting circuits can be over-come in two ways. Method one is internal amplification, after the combining and before the splitting. This is the preferred method for quick set-up and transportable applications. Method two uses external pre-amplifiers with a pre-amp at each antenna. This method is more suited for fixed installations and provides a slightly improved noise figure.

### **2.2.4 Variable Attenuation**

Each input can be fitted with a front-panel attenuation switch to assist in balancing the RF levels from the various antennas. This provides the user the ability to set the diversity balance as well as the zone-coverage balance needed to properly cover the entire area without having hot-spots or dead-spots as the RF transmitters move about.

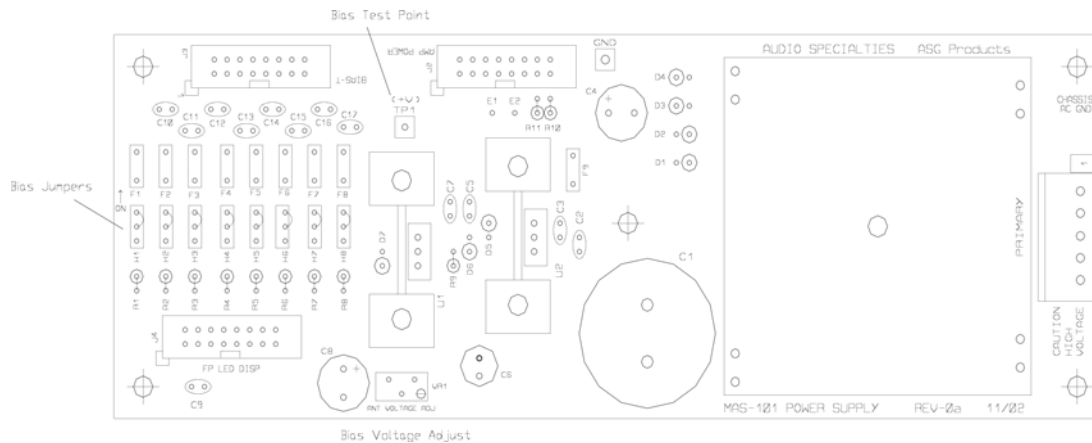
## 2.3 Internal Settings

### 2.3.1 Bias Voltage Adjustment (see note #1)

The bias voltage is set at the factory at 12V DC. To adjust the voltage, first measure the voltage at TP1 on the power supply PCB, then adjust VR1 on the power supply PCB to the desired voltage.

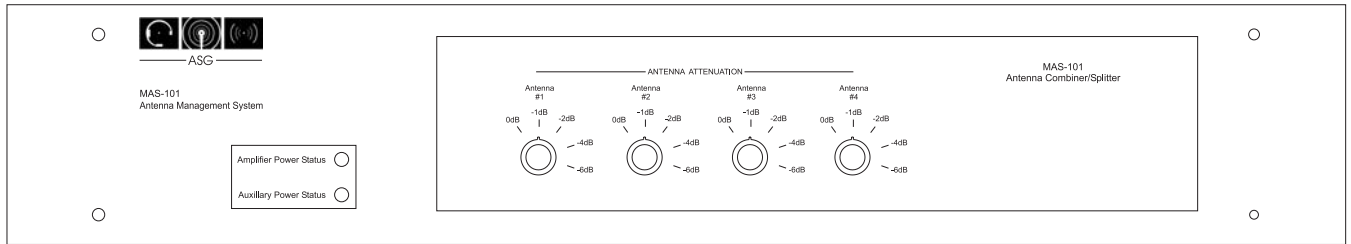
### 2.3.2 Bias Selection

When provided, each Antenna input is capable of providing DC bias voltage for use with phantom-powered devices such as in-line amplifiers and active antennas. Bias is applied to each input connection by selecting the "ON" position using programming jumpers on the power supply PCB. Front-panel indicators provide status of the power condition of each input.



## SECTION 3: Drawings

### 3.1 Front Panel

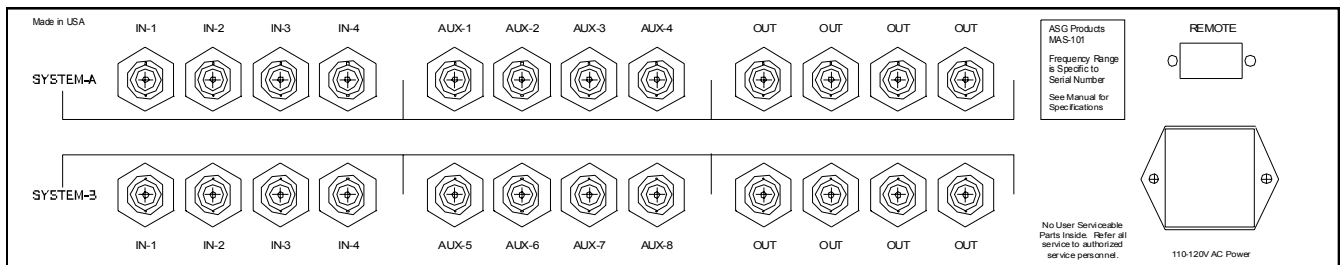


(Shown with INPUT ATTENUATOR Switches)

There are two power indicators on the front panel. One indicates power status for the amplifier circuits; the other indicates power status for the active antenna circuits. Later models, as shown, have a front panel accessory plate that can accommodate user specific needs. Examples could be switchable attenuator controls, antenna specific power indicators or front panel RF test points.

The attenuator controls allow each antenna (or antenna pair in a Diversity version) to be adjusted over a 6dBm range. As the attenuator switch is rotated clock-wise, the RF level is reduced by the indicated amount.

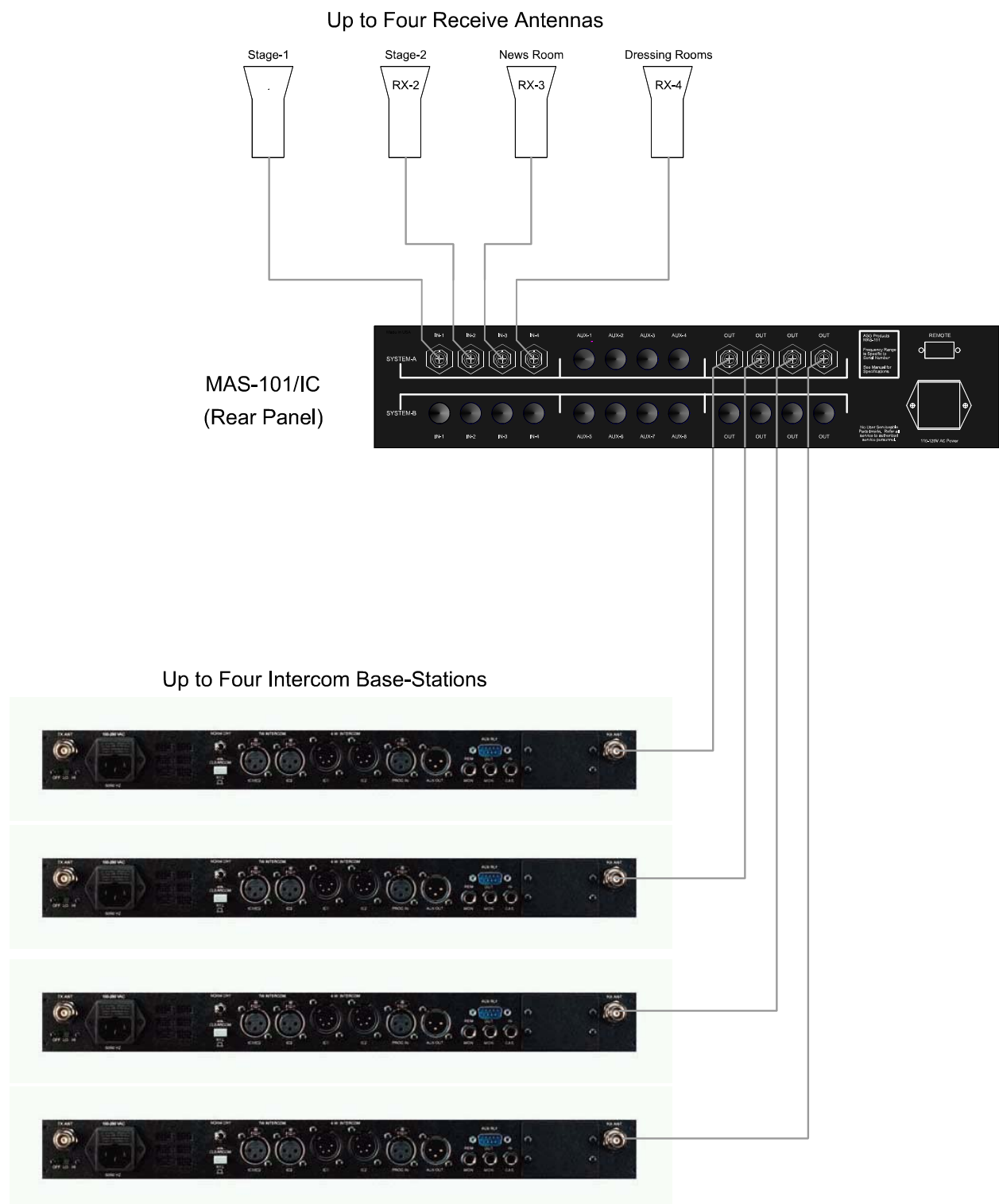
### 3.2 Rear Panel



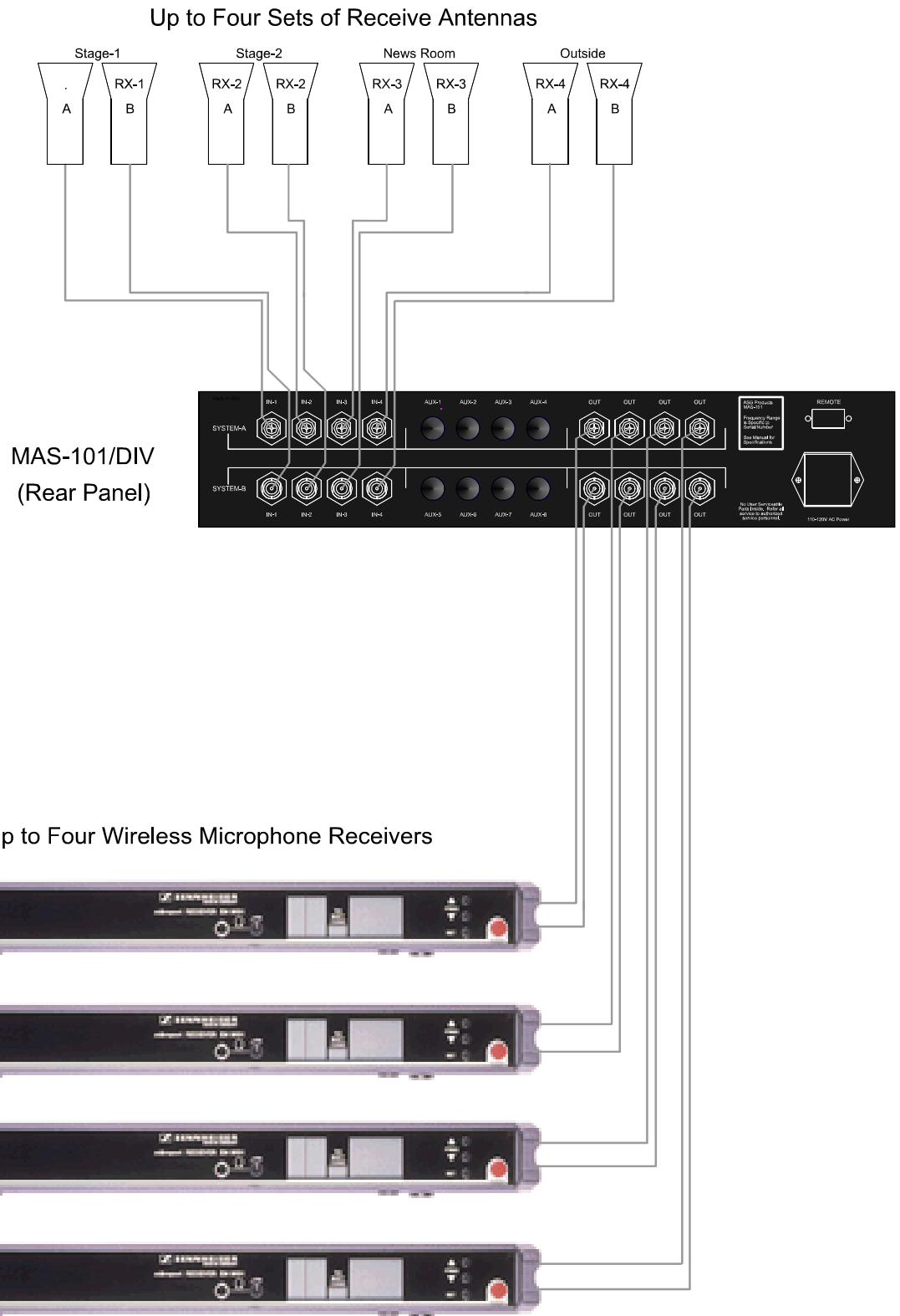
The rear panel is split into two primary sections; SYSTEM-A and SYSTEM-B. Further, each system contains four IN and four OUT designated connectors. Later models, as shown, include eight additional AUX connectors for application specific use.

Examples could be patchable attenuators, additional filtering or a non-amplified output. (Note: Connectors are omitted in units that are only partially loaded. Blank caps are provided to cover the holes.)

### 3.3 Four-by-Four Intercom Block Diagram



### 3.4 Four-by-Four Microphone Receiver Block Diagram





## **SECTION 4: Specifications**

### **4.1 Electrical Specifications**

#### **Power Requirements:**

120V AC 60Hz 30 Watts (Fuse = 1A GMA)

Caution: Inputs are not intended to combine transmitter outputs.

Maximum RF Signal Input Level = +5dBm

Input Impedance = 50ohm

Input Signal Isolation = -22dBm (typical)

Output Impedance = 50ohm

DC Current to Active Antennas = 1100mA total, 1000mA per Output Max.

12V DC.

### **4.2 Mechanical Specifications**

#### **Mechanical:**

Height: 3.46 (88 mm)

Width: 19 inches EIA Rack Mount

Depth: 12 inches (119 mm)

Weight: 8lbs

#### **Finish:**

Chassis is Black Anodize

Graphics are Silk-Screened