

# MULTIPLE VOLUME CONTROL

ACTIVE PREAMP FEATURES WITH PASSIVE PERFORMANCE  
DIGITALLY CONTROLLED STEPPED ATTENUATOR WITH 1 DB STEPS  
SIGNAL SPLITTING, BLENDING AND LOW PASS FILTERING OPTIONS



**MSB**  
TECHNOLOGY

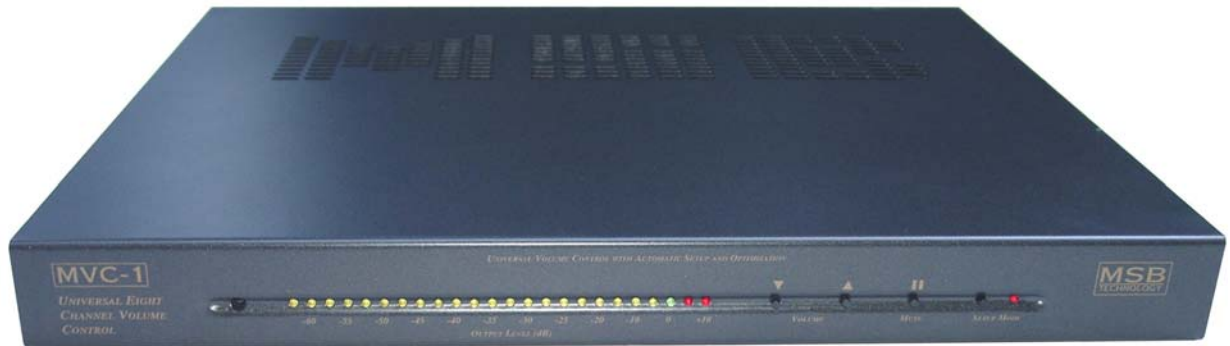


WHIRLPOOL GALAXY VIEWED BY NASA'S HUBBLE SPACE TELESCOPE

# THE MVC PREAMP FAMILY OF PRODUCTS

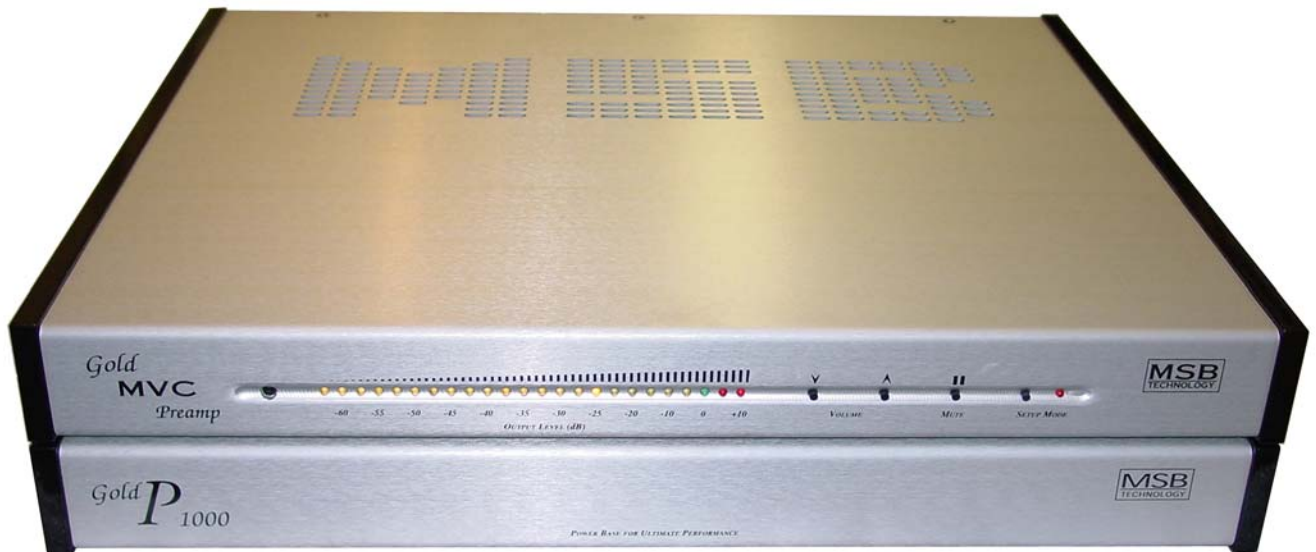
## MVC-1

A very high performance 8 channel volume control in the basic MSB enclosure. A great value for both 2 channel audiophile systems, and high-end home theater systems.



## GOLD MVC

A no holds barred model with our silver brushed aluminum cover and all the tweaks. Suitable for very high resolution single-ended systems.



### SPECIFICATIONS MVC AND GOLD MVC

<b>INPUTS:</b>	<b>8 LINE LEVEL RCA INPUTS</b> (5VRMS MAXIMUM, 10 VRMS WITH JUMPER) 50 KOHM IMPEDANCE
<b>OUTPUTS:</b>	<b>8 VOLUME CONTROLLED RCA OUTPUTS</b> (7 VRMS MAX) 50 OHM IMPEDANCE
<b>ATTENUATION:</b>	<b>-70 dB TO +9 dB (-76 dB TO +3 dB)</b>
<b>STEP SIZE:</b>	<b>1 dB PER STEP</b>
<b>TRIM RANGE:</b>	<b>26 dB IN 1 dB SIZE STEPS</b>
<b>S/N</b>	<b>130 dB</b>
<b>OPTIONS:</b>	<b>CHANNEL MIXING</b> <b>MASTER SLAVE CONFIGURATION FOR</b> <b>16+ CHANNELS OR REMOTE LOCATIONS</b> <b>OPTIONAL LOW PASS FILTERING</b>



## Theory of operation

Like most of MSB's products, the design and technology of the MVC is unique in the industry. Volume controls, or preamps fall into two categories: active and passive.

Passive volume controls are usually simple products which use a variable resistor, or a series of resistors (stepped attenuator) to reduce the audio signal amplitude by creating a resistive divider between the signal and ground. A 2 volt input can be reduced to near zero with infinite steps as with a variable resistor, or discrete steps as with a stepped attenuator. These volume controls do not provide any gain and normal listening levels are usually near full volume, depending on speaker efficiencies. These controls are also usually manually controlled with little or no features. Passive preamps do very little to color or change the quality of the sound, but at the price of inconvenient use.

Active volume controls (preamps) are usually based on a voltage-controlled amp (VCA). Many IC makers provide integrated volume control packages; other products are made discretely. They usually include gain, so a higher-level signal can be output than the input signal. They also usually include many automated and remote functions. The problem with all active preamps is that they always color the sound, and the vast majority produce significant degradation in sound quality.

MSB has been producing DACs (digital-to-analog converters) for 20 years and is very familiar with the quality issues associated with this interface. Simply, some DACs create an analog voltage by applying a reference voltage to resistors of different values. The application of the voltage is turned on and off with a switch, and the resistor is an analog element very much like the resistors used in a stepped attenuator volume control. By applying a DAC to volume control, MSB has created the "4096 level digital stepped attenuator". The volume control is actually a ladder of resistors that are switched in and out using the digital information provided to the DAC. A buffer with 3 db is provided on the input and 6 db on the output of the DAC so 9 db of gain is available, but as far as the signal is concerned, resistors are being switched in and out to change volume. In keeping with MSB's minimalistic design approach, the signal path is very short, and at no time does the audio pass through a capacitor, a serious source of phase error. Unlike most volume controls, the MVC's digital control is shut down when playing music. It only becomes active when the volume is changed. It is not constantly updating the volume, creating digital noise as some VCAs do.

The first four channels pass cleanly through the MVC. The second four include a summing feature allowing the mixing or duplicating of channels and an optional low pass filter. These additional features have no effect on the quality of the main four channels. There are many applications for these features.

## Testing and Development

The MVC has been over 2 years in development. We set a very stringent requirement that in our most revealing system, the MVC had to be indistinguishable from a cable with a resistor to ground. We built such an A/B test system and started listening. We tried all the "favorite" chipsets but always could spot the volume controls contribution to the sound. Finally the MVC we are now producing was created and extensively tested. Over and over in blind A/B testing, the group could not tell which was the cable and which was the MVC. We encourage you to use and enjoy the MVC in the most demanding applications with confidence.

# THE MVC PREAMP FEATURES

## PASSIVE PERFORMANCE WITH GAIN

A high quality opamp provides gain and our DAC technology provides stepped attenuation for control without coloration.

## CHANNEL DUPLICATION

Input channels can be duplicated to provide identical outputs for bi-amping and subs.

## CHANNEL MIXING

Channels can be mixed for special effects such as mono subs, side channels or center rear.

## 7.1 INPUT WITH AUTO SWITCHING OPTION

The MVC has a DB-25 connector on the back. With the optional 7.1 input upgrade (user installable) a second set of 8 inputs is activated. These inputs are manually or automatically selected when audio is present.

## EASY-TO-READ DISPLAY

Simple to understand LED display shows volume level and channel trims during setup.

## MASTER/SLAVE MODE

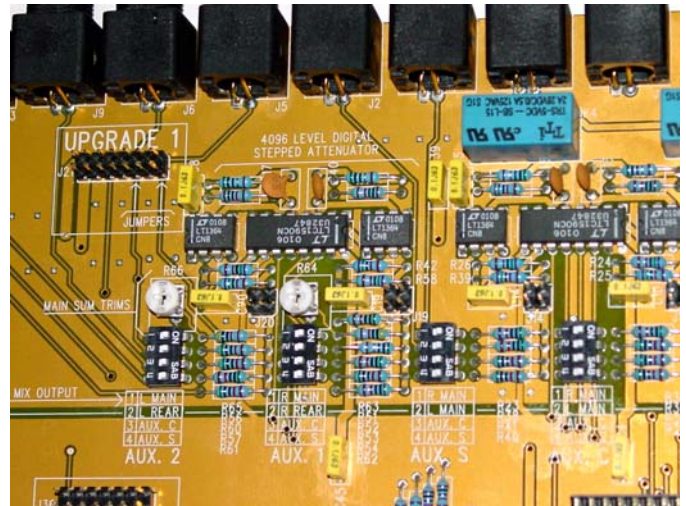
More than one slave MVC can be added to the master MVC, including the Platinum MVC allowing mixed balanced and single ended systems.

## REMOTE CONTROL

Setup of each of the 8 channels as well as master volume and mute are all on the remote.

## STANDARD MSB POWER SUPPLY

The MVC is shipped with the standard MSB Desktop supply used on all MSB products. The GOLD P1000 power supply is supplied with the GOLDMVC. (shown above) When the MVC is used with a PLATINUMLINK DAC, the MVC can be plugged directly into the auxiliary power port on the PLATINUMLINK.



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