

5.1 Analog Music Matrix Model MM-1



The SMART MM-1 is a 5.1 channel decoding matrix for playing two channel music in a multi-channel presentation. The Circle Surround™ matrix is used in this product to provide a very smooth and panoramic sound stage. The Circle Surround matrix delivers outstanding results compared to other matrix types used in the home cinema market.

The MM-1 can also properly decode matrix-encoded film soundtracks into 5.1 channels of sound simply by selecting the MOVIE format with the front-panel format switch.

A BYPASS switch allows easy LEFT/RIGHT pass through for two-channel listening with nothing in the signal path except for the switch contacts and input/output connectors.

Built-in pink noise lets you easily balance the channel levels, and if you have equalizers installed, the pink noise source gives you a signal that a Real Time Analyzer expects. This product has a built-in subwoofer output signal for extracting the very low frequencies to feed a subwoofer. This can significantly enhance your listening experience if your speakers do not handle low frequencies very well.

SMART
Devices, Inc.

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IMPORTANT SAFETY INSTRUCTIONS

CAUTION:

--Read all of these instructions.

--Save these instructions for later use.

--Follow all warnings and instructions in this manual and on the product.

- 1 Read all the safety and operating instructions **before** connecting and operating the product.
- 2 Follow all operating and use instructions.
- 3 Remove power from this product before cleaning.
- 4 Use only a slightly damp cloth for cleaning.
- 5 To avoid potential fire and shock hazards, do not use this product near water or damp places.
- 6 The product should only be operated from a power source of the type indicated on the power pack and on the product. Failure to do so could damage the equipment, void the warranty, and present a potentially dangerous situation.
- 7 Do not attempt to service this product yourself. Opening this product may expose you to dangerous voltage or other hazards.
- 8 If service is required, only authorized service centers should perform the work using only replacement parts specified by the manufacturer. Unauthorized parts substitutions may result in electric shock, fire or other hazards.
- 9 This product should be placed away from heat-producing sources such as radiators, heat registers, or other products (including amplifiers) that produce heat.
- 10 It is normal for this product to be warm to the touch in normal operation. It should not be so warm that you cannot comfortably leave your hand on the product for an indefinite period of time.

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

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE COVERS. THERE ARE NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Thank you for buying this SMART product.

Please take the time to familiarize yourself with this product by carefully reading this manual. Most questions can be answered by reading and following the instructions contained herein. Because of the multitude of products from other manufacturers, this manual cannot possibly cover all the different configurations and hookups. Please consult with your Home Cinema Dealer or the SMART factory for any unusual situations involving the connection and use of this product with equipment from other manufacturers. When properly connected and operated, this product should deliver outstanding results.

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is a trademark of SRS Labs, Inc.

Circle Surround technology is incorporated under license from SRS Labs, Inc.

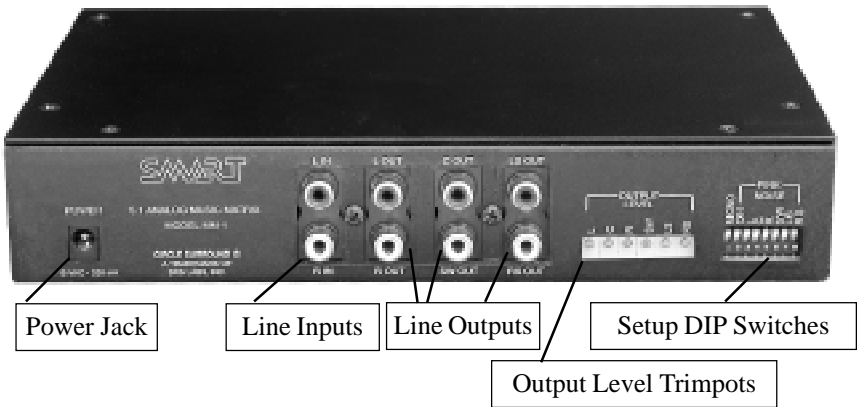
This product has a serial number located on the bottom.
Please record this serial number for your records.

SERIAL # _____

INSTALLATION PRECAUTIONS

Noise Interference may result if this product is placed too close to an operating television set or a computer, or if it is placed on top of an amplifier or power conditioner product.

High temperatures are detrimental to the performance and longevity of electronic equipment. Do not place too close to high temperature devices.



CONNECTIONS

The MM-1 connects between the two-channel analog outputs of a source such as a CD or DVD player and the multi-channel analog inputs of a processor or receiver.

POWER

Connect the power pack plug into the POWER jack. Make sure it is fully seated. Use ONLY the power pack supplied. Do not substitute as damage could occur.

LINE INPUTS

Connect RCA patch cables from the LINE OUTPUT jacks on your CD player, DVD player, LaserDisc player, or VCR to the LINE INPUT jacks on the MM-1. The source you use depends on what you are going to do with this product. If you are only using it for music playback, then connect to your music source such as a CD player. If

you are going to use it for music and film soundtracks, then connect to the playback source you will use, such as a DVD player.

LINE OUTPUTS

Connect RCA patch cables from the LINE OUTPUT jacks to the Multi-Channel Analog Inputs on your processor or receiver.

SETTING LEVELS

The MM-1 comes from the factory set up for unity gain levels. This means that whatever levels are going in are also the same levels going out. This is probably adequate for most situations. However, there are trimpots provided for adjusting the levels of each individual channel if necessary. Unless you have a specific reason for adjusting these levels, it is probably best to leave them at the factory settings.

There is built-in pink noise which can be used to help balance the levels between the channels if any adjustment is needed. To activate the pink noise, push down the DIP switch marked ON. Then to send the noise to a particular channel, push down the DIP switch corresponding to the desired channel. **Be sure to push all the Pink Noise DIP switches back up when you are finished with the pink noise.**

There are six OUTPUT LEVEL trimpots which are used to adjust the output levels if needed to balance the levels between the various channels. In most cases, these can be left at the factory settings. If you need to adjust these, use the supplied alignment tool or a small jeweler's type screwdriver. These trimpots are multi-turn types. If you turn them all the way to one end, they will click slightly as you continue to turn them. You cannot damage them by turning too far.

OPERATION

The MM-1 is very easy to use. There are only two front panel switches. Normally, the only thing to do is to select the proper format depending on whether you are playing music or a standard stereo movie soundtrack.

The pushbutton marked MUSIC and MOVIE is the format pushbutton. In the MUSIC format (pushbutton in), stereo music will be decoded into 6 channels for a multi-channel music presentation. This format directs center-panned material to the center channel speaker but has little effect on the left and right channels for very smooth music decoding.

The MOVIE format (pushbutton out) is used for playing matrix encoded stereo movie soundtracks. This format will present a multi-channel output with a hard center channel for proper dialogue localization, and in addition will properly steer all soundtrack information to the appropriate channels.



The ON/BYPASS pushbutton does not actually turn off power to the unit, but instead bypasses the L and R inputs directly to the L and R outputs. This pushbutton should be placed in the BYPASS position if you wish to hear just the normal LEFT/RIGHT presentation. In the BYPASS mode, the incoming signals are routed directly back to the output jacks, bypassing all processing.

SPECIFICATIONS

Device Type	Multi-Channel Surround Sound Decoder
Inputs	2 Line Level - L IN and R IN Unbalanced high impedance
Outputs	6 Line Level - L OUT, R OUT, C OUT, SW OUT, LS OUT and RS OUT Unbalanced low impedance Adjustable by trimpots on rear chassis
Signal to Noise Ratio	Better than -70 dB re: -10dBV input
Dynamic Range	85dB at operating input level of -10dBV
Headroom	14 dB above operating input level of -10dBV
Distortion	Typically less than .05% at 1 kHz at -10 dBV input level Typically less than 0.1% at 1kHz at +4dBV input level
Subwoofer Output	-3 dB at 80 Hz, 12dB per octave low pass crossover
Channel Separation	Typically better than 25 dB at 1 kHz
Pink Noise	Built-in pink noise source, switch selectable to each output
Power Supply	UL Approved Wall Plug Power Pack 120 VAC 60 Hz Input - 15 VAC 320 mA Output Power packs for other voltages are available
Weight and Dimensions	3.5 lbs. 8.6" W x 2.00" H x 6.25" D

LIMITED WARRANTY

SMART products and accessories are warranted against malfunction or failure due to defects in workmanship or materials for a period of one year from the date of shipment. If a problem occurs during the warranty period, the unit will be repaired, without charge for materials or labor. This limited warranty does not cover products that have been abused, altered, modified, or operated in other than specified conditions. Returned equipment or defective parts must be shipped freight prepaid to us by the dealer or customer. Our limited warranty does not cover damages resulting from accident, misuse or abuse, lack of responsible care, or failures not attributable to manufacturing defects, except as provided herein. SMART Devices, Inc. makes no warranties, express or implied, including warranties of merchantability or fitness for a particular purpose.