

	MAPS - Bass Manager
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Thank you for purchasing the TMH Bass Manager. By this purchase you have shown a professional interest in “getting things right” that is exemplary. One day it is expected that most, if not all, multichannel professional sound systems will employ bass management, just as a great many consumer systems already do, and you have just joined the ranks of the earliest adopters of this new technology. There are features in this particular unit that make it especially well suited to its task, and to integrate with your other equipment exceptionally well. First, we’ll explain the principles of monitor bass management, then the particular features of this unit, and finally how to install and use it.

Our warranty is “limited” under the definition in federal law, although we mean to stand behind the product, unless it has been abused, now, and in the future.

The Bass Management Process

Bass management for monitoring does two jobs. 1. It sums the lowest bass from the five main channels and sends it to one or more subwoofers. This involves having appropriate high- and low-pass filters to form a crossover with the correct frequencies and slopes. 2. It conditions the LFE signal adding the required +10 dB gain for this channel.

In addition, for professional settings there is an advantage in having available a low-pass filter on the LFE channel that simulates the low-pass filter on format encoders such as AC-3 and DTS. In this way a studio without the expensive encoders can listen to the program material as it will be encoded downstream. The filter should be switchable so that when listening to pre-encoded material the effect of the filtering is not doubled. That is, in playback off discs, the filter should be switched out.

Unique features of the TMH Bass Manger:

- It is the only unit on the market to permit tuning the bass management function in a 5.1 channel monitor system to your choice of loudspeakers. Both the main channel high-pass filters and the subwoofer low-pass filter are adjust-

able. The range of the adjustment is from 25 to 80 Hz on both types of filters. The main channel filters are continuously variable, and the subwoofer filter is stepped in 1/3-octave steps. (The subwoofer filter is in steps in order to preserve the best flatness in the filter across the frequency range.)

- Insofar as we are aware, it is the only unit to include the proper LFE filter, which is different from the crossover filter for the subwoofer. The LFE filter is a 7th order elliptical filter simulating the response of the filters in the format encoders, such as AC-3 and DTS. The filter is switchable in or out.

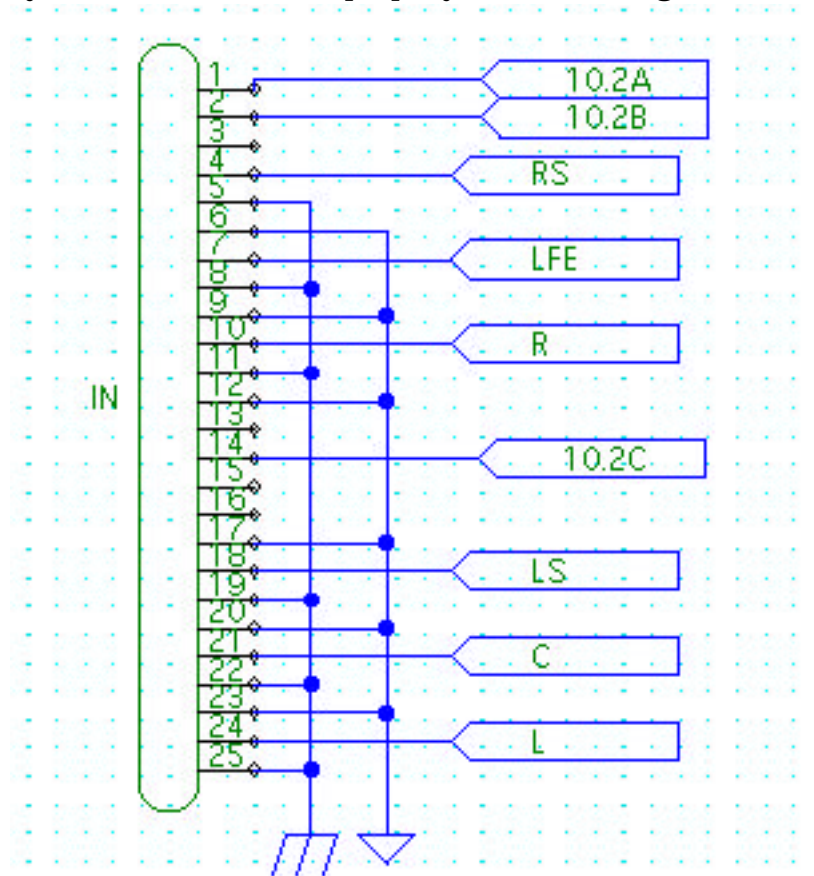
“In the case of Dolby Digital, the encoding system applies a brick wall filter to its [LFE] input. The emulation of this in the analog domain is a 6th or 7th order low pass filter at 120 Hz.” Jim Hilson, Dolby Laboratories Licensing Corporation, “DTV Audio Mixing for Maximum Impact and Compatibility,” *Proceedings of the 141st SMPTE Technical Conference and Exhibition*.

- Since all 5.1 input channels are summed in the subwoofer output, it is subject to potential overload. Internal gain staging has been performed to eliminate any premature internal clipping, and an overload light is provided when the output sum of the channels would exceed the output capability of the Bass Manager. The overload indicator circuit includes pulse stretching capability so that even the shortest overload is well indicated. At output overload, the bass manager is putting out more than 10 Vrms, a level sure to overload even the most robust power amplifiers.

- The units display tremendous dynamic range, typically 130 dB “A” weighted in the main channels and 113 dB in the subwoofer output (LFE input) channel. This is more range than the best available digital devices. Other specifications are equally as good, with all distortions such as total harmonic, SMPTE IM, high-frequency difference tone IM, and TIM at exceptionally low levels.

Setting up the Bass Manager:

The input and output for the main channels and the LFE input/subwoofer output appear on DB-25 connectors, wired to the Tascam standard. Cables are readily available to match these to XLR and 1/4" plugs as needed for your system. Here is a drawing of the input and output connectors; be certain not to reverse the two. We provide female inputs and outputs on the DB-25 connectors because male pins are more subject to damage and a lot harder to fix, so it is up to you to connect the unit properly. The 10.2 designators in the



drawing relate to connections made between two units to support 10.2 channel bass management.

Usually you would connect female XLR cables to the input DB-25, and male XLR cables to the output one. Wire and connect the cables, and connect the Bass Manager between the console monitor output and the room equalizer or

power amplifier inputs. It has unity gain, and a high input overload of more than +23 dBu, so monitor chains, that usually operate at a lower level than +4 dBu studio bus level, have plenty of headroom.

You may wish to mount the half-rack sized Bass Manager in a rack mount chassis. Mid Atlantic makes a suitable rack. Note that there are four number 4-40 threaded inserts mounted in the bottom of the unit for you to use to attach to a rack mount. Unfortunately, these had to be in locations that do not line up with holes in the Middle Atlantic UTR units, so you will have to drill four holes for mounting. Note that the width of this unit permits it to sit side by side with a TMH Balance Box in the same rack unit. (BGW half-rack units will not work dimensionally.)

Set the frequency of the high pass filters to match the 3 dB down frequency of your main monitors, and match the subwoofer filter to that frequency. If you don't know this frequency (because often manufacturers quote the -10 dB corner frequency as being within the "frequency response"), contact us or make a measurement. The slots in the controls are deliberately a bit hard to adjust, since this is a "set once" per monitor system setup. Adjustment can be most easily done with a dime coin.

Using a 1/3-octave spectrum analyzer, you can match the response through crossover, although it is essential to make a spatial average as the region in which you are making a splice is very affected by standing waves in most rooms. If you have a simple analyzer with only one microphone, move the microphone around slowly to determine a spatial average.

The LFE gain of +10 dB of "in band gain" is set internally very precisely. If the splice is correct to the main channels, the LFE level will be correct. It is not adjustable as this is the same fixed relationship that is implanted in all consumer bass management systems, and your monitor needs to reflect the same relationship.

This unit has unbalanced connections which have proved to work with complete dynamic range in five of six installation cases. We chose not to include balanced input/output in this box since many balanced circuits actually limit performance, and because it would add significant cost to the unit to do six correctly balanced input and output stages. Instead, the CASCADE ports have been provided to work with the TMH Balanced Box, a MAPS product dedicated to balancing and unbalancing signals properly.