



StarFish™ Display for the MSD600M Family

- StarFish™ provides intuitive monitoring of surround sound.
- True volume from the loudspeakers displayed on screen
- Phase relations indicated by displayed colour
- Sound levels and channel correlations shown in one combined display.
- StarFish™ is installed in the MSD600M family of audio meters
- Software upgrades are available for the types MSD600M++ and PT0600M

Understanding The StarFish™

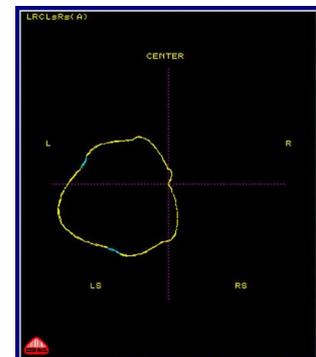
The StarFish™ visualizes surround sound in an intuitive way that is simple to understand and easy to read. It gives an accurate view of the volume of the sound coming from the loudspeakers, as it is perceived by the listener. Further, in the same display it shows the correlation between the sound channels indicating to the audio engineer of possible problems.



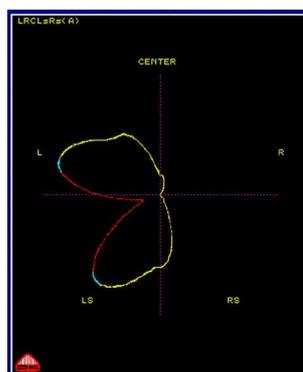
Picture 1. L signal only.

To illustrate how the StarFish™ works, let us start with the display of a single tone in the left loudspeaker (L). In picture 1 the characteristic display extends from the centre towards the upper left of the display. The size of the figure depends on the volume of the tone.

When we now also switch on the same tone to the left surround (Ls) loudspeaker, we obtain the display in picture 2. It extends from the centre to the upper left and lower left of the screen, indicating that the sound is coming from both left hand loudspeakers. The colour of the contour is yellow to indicate that the signals are correlated, as the two channels carry the same signal and are in phase. In the middle left side of the screen the figure has its largest extension from the centre to indicate that the sound comes from a direction between the two loudspeakers.



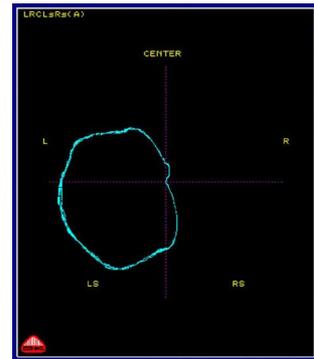
Picture 2. L and Ls signals equal and in phase.



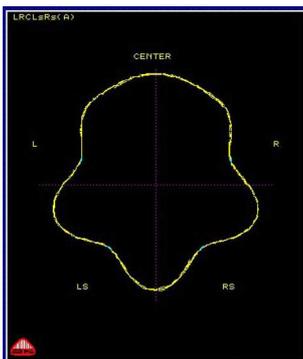
Picture 3. L and Ls signals are equal, but out of phase.

If we still apply the same tone to the L and Ls loudspeakers, but reverse the phase to one of the loudspeakers, we obtain a completely different display as shown in picture 3. Because of the opposite phases the signals cancel each other between the two loudspeakers. The contour of the display changes to red between L and Ls to indicate the negative correlation between the channels.

In picture 4 we apply two different tones with the same level to the L and Ls loudspeakers. On the display the volume is shown as equal in the two loudspeakers, and the contour is blue to indicate that the tones are uncorrelated.



Picture 4. L and Ls signals have equal levels, but are uncorrelated.



Picture 5. The StarFish™ display of a 5.1 surround sound with the same signal in all channels.

When we extend these principles to the 5 channels in the 5.1 surround sound signal and apply the same tone to all the channels, we obtain the characteristic star-shaped display from which the StarFish™ has got its name. When a real surround sound signal is applied to the audio meter, the shape and colour of the StarFish™ changes continuously like a jellyfish to indicate that the volume and the correlation of the audio signal.

StarFish™ is available in

MSD600M++	Stereo and Surround Sound Meter, desktop version. Base unit with utility module for DC supply, sync input, RS-232, and VGA output. Incl. mounting bracket.
PT0600M	Stereo and Surround Sound Meter, rack mount version. Base unit with utility module for DC supply, sync input, RS-232, and VGA output.
PT0660M	Multichannel Audio Monitor, base unit with sync. input, VGA-output, RS232, and utility module
PT0660M-LS	Multichannel Audio Monitor & Stereo Loudspeakers, base unit with sync. input, VGA output, RS232, and utility module.

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