Setting Up the Telecoil Compensation Filter for PARAGON Digital™ Products

Information Note

Introduction

The purpose of the telecoil compensation filter is to ensure that the response of the hearing instrument in telecoil mode is similar to its response when in microphone mode.

To meet certain manufacturers' requirements for telecoil response matching, it is now possible to specify the corner frequency and the normalization frequency of the telecoil compensation filter for PARAGON Digital™ products.

Telecoil Compensation Filter

The typical frequency response of a microphone is relatively flat whereas the typical response of a telecoil is 6dB/octave upwards rising. To compensate for this difference, the telecoil compensation filter is designed as a first order low pass filter. The compensation filter is calculated based on the following parameters:

- Corner Frequency
- Normalization Frequency
- Gain

The corner frequency is where the response of the filter drops by 3dB. The normalization frequency is the point where the response of the filter is normalized to the gain value. The gain of the filter is either calculated from the measured sensitivity of the telecoil or is specified from ARKonline™.

Setting Up the Telecoil Compensation Filter In ARKonline™

The telecoil compensation filter is specified in the Front End page of ARKonline. To specify the corner frequency and normalization frequency of the filter, select the **Specify Telecoil Compensation Corner Frequency and Normalization Frequency** check box at the bottom of the page.

Note: If this box is not selected, the corner frequency and normalization frequency will be set to 500Hz and 1000Hz, respectively.

Overriding the Telecoil Gain When Specifying the Corner Frequency and Normalization Frequency

Specifying the corner frequency and normalization frequency will eliminate the option of specifying a lookup table for the telecoil gain. This is because the memory map of PARAGON Digital does not contain information to store the corner frequency and normalization frequency to the device. Any attempt to read the gain from the device would yield erroneous values.

Telecoil Compensation Filter's Response Curve: Non-Specified vs. Specified Values

When the corner frequency and normalization frequency are not specified, it is assumed that the normalization filter at 1kHz is 9dB down from DC, so the telecoil compensation filter will apply 9dB of gain in addition to the telecoil gain. This is because the calculated value is based on ideal attenuation at 1kHz.

When the corner frequency and normalization frequency are specified, and if these values are set to the same values as the default constant values, the calculated normalization gain at 1kHz is 7dB. Thus, the telecoil compensation filter will apply 7dB of gain in addition to the telecoil gain. This is because the calculated value is based on actual attenuation at 1kHz. The actual attenuation is determined during calibration using CalConfig2 program. Thus, there is a 2dB difference in response at 1kHz relative to what is obtained when the corner frequency and normalization frequency are not specified.

Note: In order to make the response consistent with previous library builds, use the default configuration.

Revision History

Version	ECR	Date	Change Description
1	148702	May 2008	Document conversion to new template.

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Mailing Address: P.O. Box 278 , Burlington , Ontario , Canada , L7R 3Y2

www.SoundDesignTechnologies.com