

digital audio

weiss engineering ltd.

Florastrasse 42, 8610 Uster, Switzerland

☎ +41 1 940 20 06 ☎ +41 1 940 22 14

🌐 <http://www.weiss.ch> / <http://www.weiss-highend.com>

weiss



GAMBIT POW-R OPERATING MANUAL



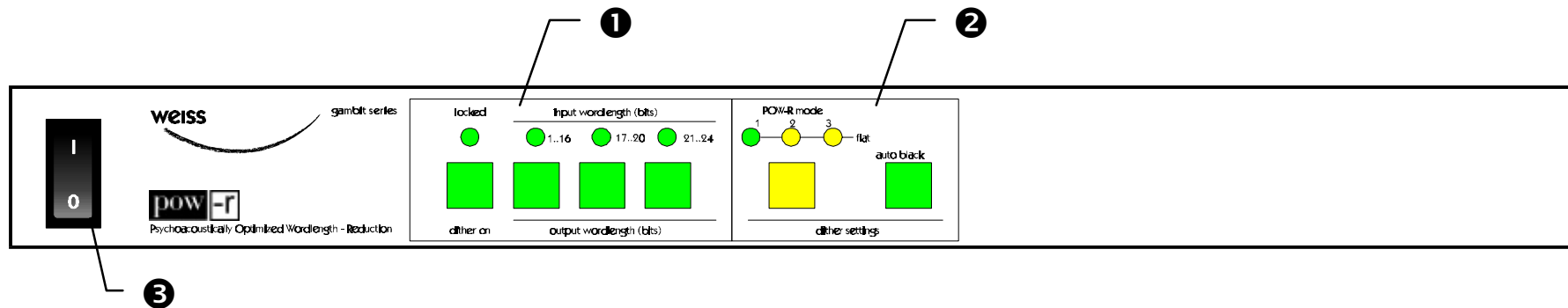
Software Version:

OS: 1.0

CONTENTS

CONTENTS	2
FRONT PANEL	3
INTRODUCTION	4
Features	4
OPERATION	5
Connections	5
Changing Output Wordlength	5
Selecting Dither Type	5
TECHNICAL DATA	6
AES/EBU Input	6
AES/EBU Output	6
Power	6
Dither vs. No Dither	7
POW-R graphs	8

FRONT PANEL



Graph 1: Front Panel Elements

The front panel of the POW-R offers several control and display features. These can be grouped according to Graph 1:

- ❶ - control and display elements for wordwidth
- ❷ - control and display elements for dither type
- ❸ - Mains power switch

This manual will explain how to operate the POW-R according to these groups

INTRODUCTION

Congratulations on purchasing the Weiss Gambit Series POW-R !

POW-R is a unique, patent-applied-for algorithm, which reduces longer word lengths (20, 24), to CD standard 16-bit format or 20bit format while retaining a high degree of perceived dynamic efficiency and very low noise. POW-R is ready for all sample rates from 44.1kHz to 96 kHz.

The POW-R set consists of three algorithms, including noiseshaped dither and nyquist dither. Additionally, the Weiss Gambit POW-R unit also offers flat dither for comparison to the POW-R set, and 8bit wordlength for auditioning of noise type.

Features

- * Auto detection and display of input wordlength
- * Lock LED to indicate valid AES/EBU signals
- * Selection of output wordlength with large, backlit push buttons
- * Supported sampling frequencies:
44.1 / 48 / 88.2 / 96 kHz
- * Supported input wordlengths up to 24bit, output wordlengths from 8bit to 20bit.
- * Bit transparent if no dither is applied
- * 24bit I/O on single wire AES/EBU interfaces
- * Selectable autoblackening for dither – mutes dither if no signal present.
- * 40bit floating point digital signal processing

OPERATION

Connections

Connect the AES/EBU signal to the input and output plugs at the rear of the POW-R.

The wordlength of the connected signal will either display in ❶.

Changing Output Wordlength

If the “dither on” push button is not lit, the POW-R passes the input signal to the output without any processing. The output will be bit equal to the input.

Pressing “dither on” activates wordlength reduction. Select one of the three wordlength options by pressing the appropriate button (8bit to audition the dither type, 16bit for DAT, CD or 16bit DAWs, 20bit for higher resolution DAWs).

The selected button will be lit so that the status of the POW-R can be confirmed visually.

Selecting Dither Type

The POW-R set consists of three algorithms which can be selected by repeatedly pressing the “POW-R mode” button in the dither settings field (❷) – the three LEDs above this button indicate which type is active. If all three LEDs are lit, flat (white noise) dither is applied. In contrast, all POW-R dither types have non-flat dither to reduce noise level in critical bands (see attached graphs).

One will find that optimal results depend on the programme material, one’s personal taste and on dither type.

Activating the “auto black” function (active if button is lit) results in digital “black” (zero) signals not being dithered and therefore remaining “black” – useful for dithering programme with breaks in between, where the breaks have to be at digital zero.

TECHNICAL DATA

AES/EBU Input

Sampling Frequencies:	44.1 kHz, 48.0 kHz, 88.2 kHz, 96kHz
Maximum Input Wordlength:	24 Bits
Channel Status Data:	Input accepts professional or consumer format.
Channel Status Bits forwarded to AES/EBU output:	all
Connector:	XLR female

AES/EBU Output

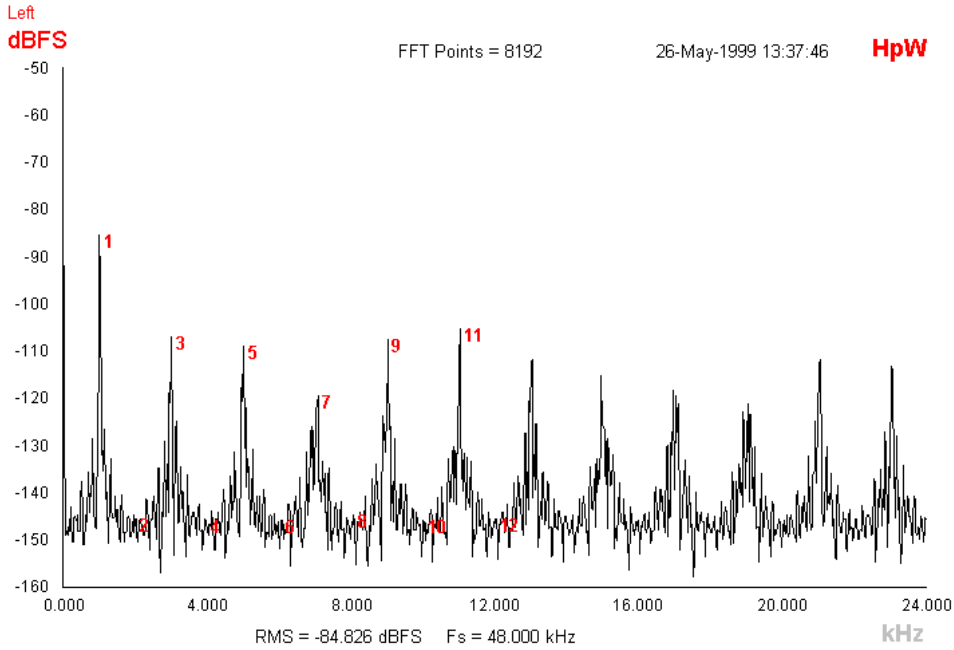
Sampling Frequencies:	44.1 kHz, 48.0 kHz, 88.2 kHz, 96kHz
Output Wordlength:	24 Bits, 20 Bits, 16 Bits or 8 Bits
Connector:	XLR male

Power

Mains Voltage:	110 / 220 Volts with voltage selector
Fuse rating:	500 mA slow blow
Power Consumption:	40VA max

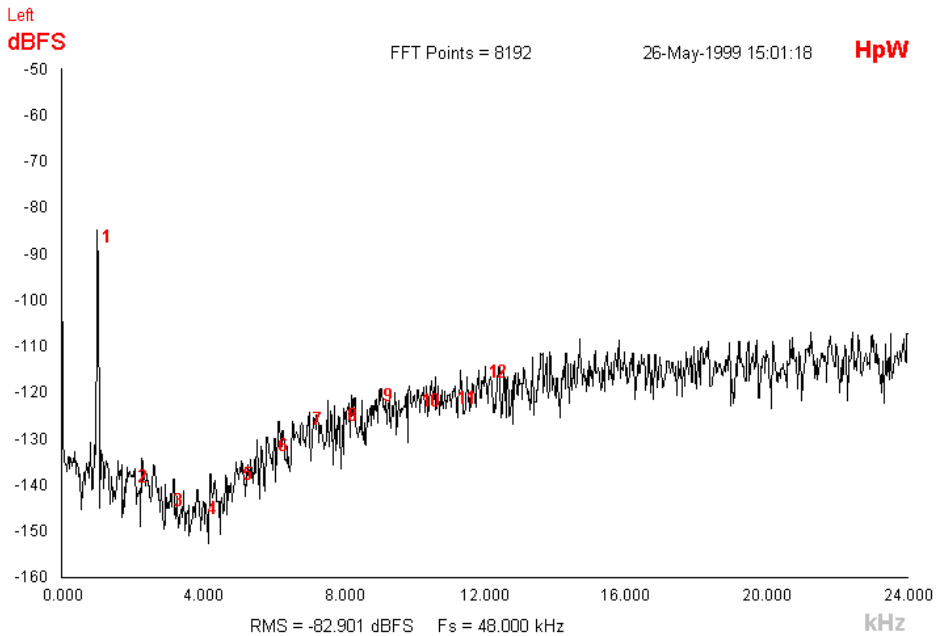
Dither vs. No Dither

If no dither is applied to the digital signal when recording to 16bit or 20bit media (e.g. DAT, CD-R etc), the signal will be truncated, which leads to quantization noise. Graphic 2 shows a 24bit sine wave at -85dBFS truncated to 16bit.



Graphic 2: Sine wave truncated

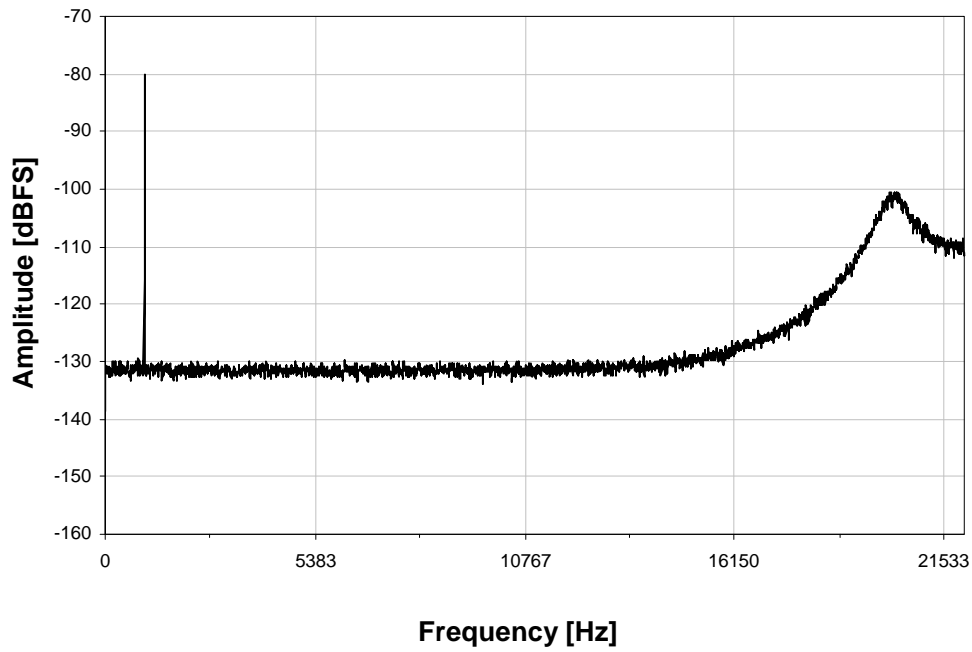
Graphic 3 shows the same sine wave, but dithered to 16bit. This eliminates quantization distortion.



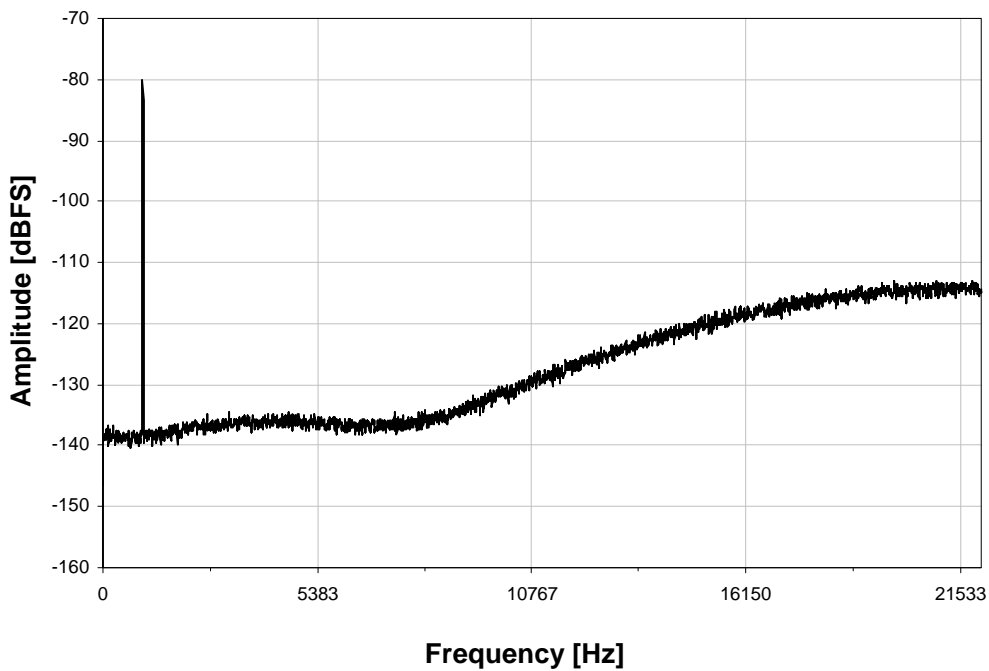
Graphic 3: Sine wave dithered

POW-R DITHER GRAPHS (16 BIT)

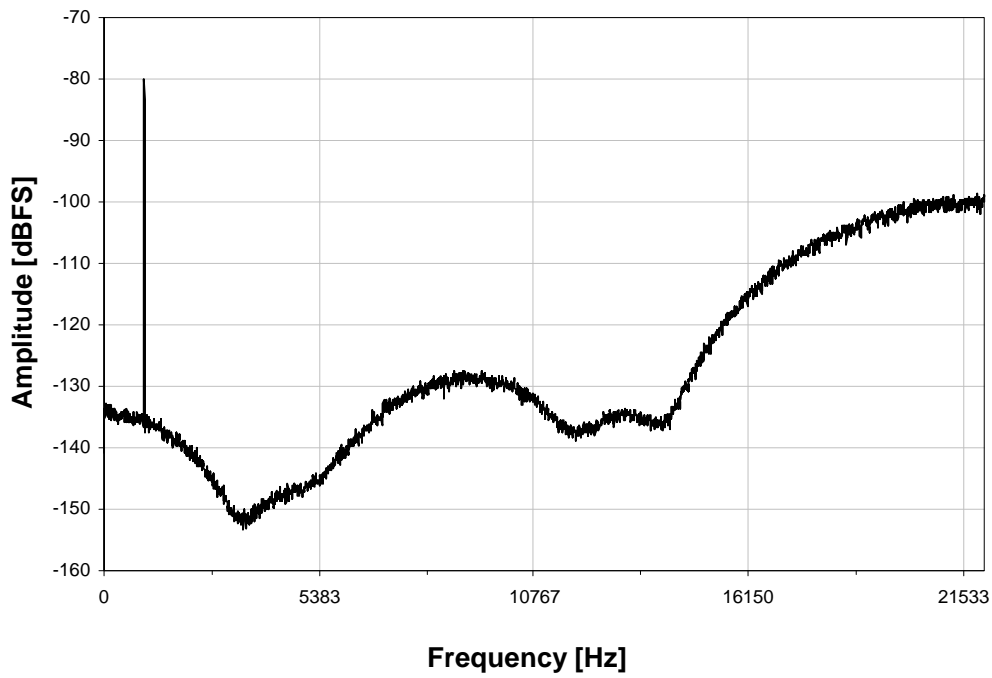
1kHz Sine at -80dB (44.1kHz) with POW-R 1



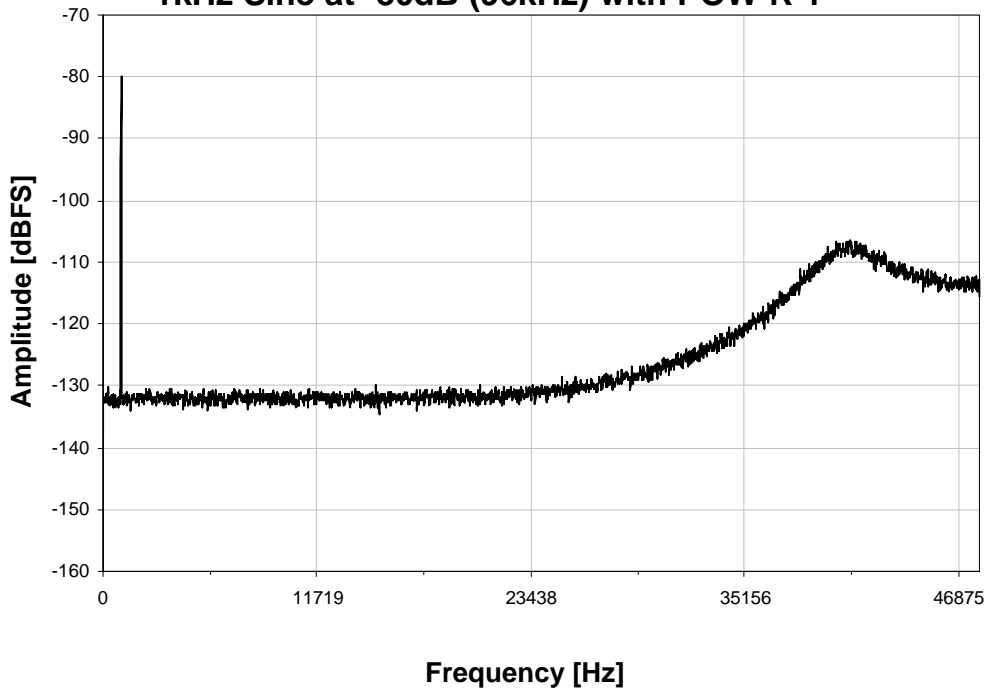
1kHz Sine at -80dB (44.1kHz) with POW-R 2



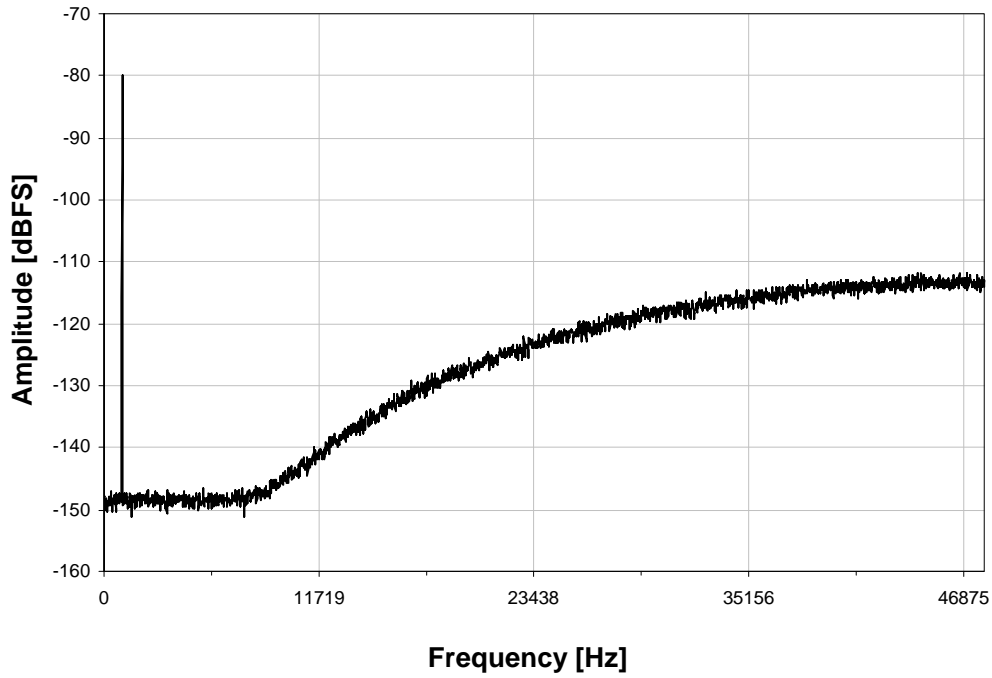
1kHz Sine at -80dB (44.1kHz) with POW-R 3



1kHz Sine at -80dB (96kHz) with POW-R 1



1kHz Sine at -80dB (96kHz) with POW-R 2



1kHz Sine at -80dB (96kHz) with POW-R 3

