



# QUANTEC YARDSTICK 249x Series

## Operations Guide

pp. 157 to 158 are dedicated to all those fellow-humans  
who insist on **\*not\*** reading operations guides.

## Revision history

Revision 3.0	28.08.2009	bb/wolf	Revision 1.8	27.05.2008	bb
Revision 2.3	16.01.2009	bb/wolf	Revision 1.2a	17.01.2008	sq/bb/wolf
Revision 2.1	12.11.2008	bb/wolf	Revision 1.2	05.07.2007	bb
Revision 2.0	30.10.2008	bb/wolf	Revision 1.1	30.05.2007	bb

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We will prosecute anyone attempting to cheat us out of decades of hard work and we will assert our right to compensation.

## CE Conformity

The equipment described within this document conforms to applicable EC directives 73/23/EEG (Low Voltage Directives), amended by 93/68/EEG, and 89/336/EEG (EMC Directives – Electromagnetic Compatibility), amended by 91/263/EEG, 92/31/EEG and 93/68/EEG.

The standards applied here are for Low Voltage directive **EN60065:1993** (4.94 – formerly VDE0860) – "**Safety requirements for mains operated electronic and related apparatus for household and similar general use**", and for EMC directive **prEN55103-1:1995** (Emission) and **prEN55103-2:1995** (Immunity) – "**Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.**"

The equipment satisfies all of the operating environments of classes **E1** to **E5** described in EN55103:

- E1 **Residential (including both of the classes rural residential and urban residential as described in IEC 1000-2-5)**
- E2 **Commercial and light industrial (including theaters)**
- E3 **Urban outdoors**
- E4 **Controlled EMC environment (for example TV studios) and rural outdoors environment (far away from railways, transmitters, overhead power lines, etc.)**
- E5 **Heavy industrial (see EN 50081-2) and environments close to broadcast transmitters**



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# The QUANTEC YARDSTICK 249x Series

The YARDSTICK 249x series are high-quality, digital sound processing devices based on the original 1982 QRS algorithm.

Due to its unobtrusive, natural character and its superb room simulation, the original QRS has become a lot more than just a well-know production tool for pop music.

In the fields of classical music production, chamber music, as well as in movie post-production, the QRS is considered to be the yardstick for all competing products.

In other words,  
whenever a natural sounding *ambience* is desired,  
and any kind of artificial *reverberation* is not,  
the QRS algorithm has been repeatedly praised by countless sound professionals.

**The following options are available for controlling  
the YARDSTICK 249x Series:**

**Front panel controls**

**QUANTEC 241x remote control over Ethernet/RS-232 (in development)**

**Remote control over Ethernet/browser**

**MIDI**

**For the archiving of presets,  
the following options are available:**

**Loading/Saving to a PC using RS-232**

**Loading/Saving to a PC using USB (in development)**

**Loading/Saving to a PC over Ethernet (in development)**

**Loading/Saving to a PC using MIDI**

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# Introduction

## General

### Reverberation Chamber and Virtual Transducers

As seen in the block diagrams, the main signal processing is done in the reverberation chamber, having as elements virtual loudspeakers and microphones.

The following assumptions were applied to the microphones in the reverberation chamber:

- The distance between any two microphones is large
- The correlation between any two microphones is 50%

#### Background information:

At arbitrary locations within a reverberant chamber, an audio signal's content and energy are *statistically identical* – although scrambled and jagged in very complex patterns.

In the far field – and thus at the reverb chamber microphones – a point source is spread such as to eventually lose its spatial location. Integrated over time, all microphones receive an equivalent audio information, and are thus interchangeable.

Other than the left/right stage, front/back information doesn't rely on correlation. The initially equivalent virtual room microphones constitute their front and back illusion merely through user-defined staggered post-delay. This is the role of parameter *2nd Delay* described on p. 19. To preserve the horizontal (left/right) image when virtually stepping towards the back of the room, post-delay is locked in channel pairs.

However, for the discrimination of left/right signal, no extra processing is necessary. The ear uses the information of the first wave front as explained by the *Haas effect*. This first wave emanating from the front has all the required information, and no additional intervention is necessary.

A *correlation of 50%* guarantees that all microphones are located in the same room. *No correlation* would correspond to having the reverberation microphones distributed into independent rooms, but receiving the same source signal. As an acoustic design element, such an uncorrelated (*0% correlation*) reverb might be a desired effect. But in a real room, there is always a certain amount of »*statistic crosstalk*«. As a result, a correlation setting of 50% is the nominal value used by the QRS algorithm since its infancy.

## Device Types and Block Diagrams

The following QUANTEC YARDSTICK 249x series models are now available:

### 2492

2 digital AES3 inputs, 2 digital AES3 outputs, constant room size parameter set to  $10^5\text{m}^3$  (variable since revision 2.0), variable plug-in sample rates up to 216 kHz (*Varispeed*)

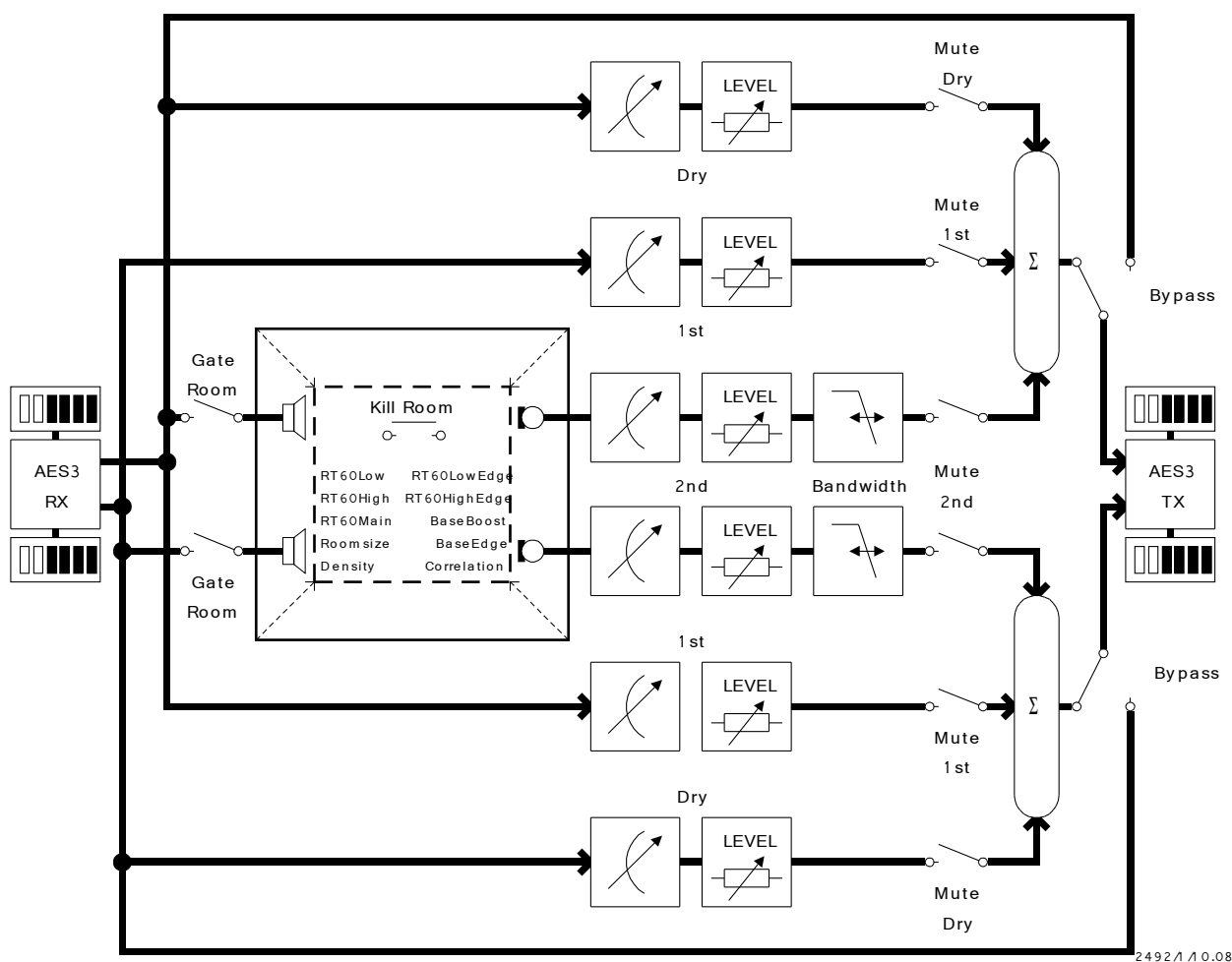


Figure 1: Block diagram 2492

**Note:** An overview of all QUANTEC units can be found on p. 173.

**2496**

2 digital AES3 inputs, 6 digital AES3 outputs, variable room size parameter, variable plug-in sample rates up to 108 kHz (*Varispeed*)

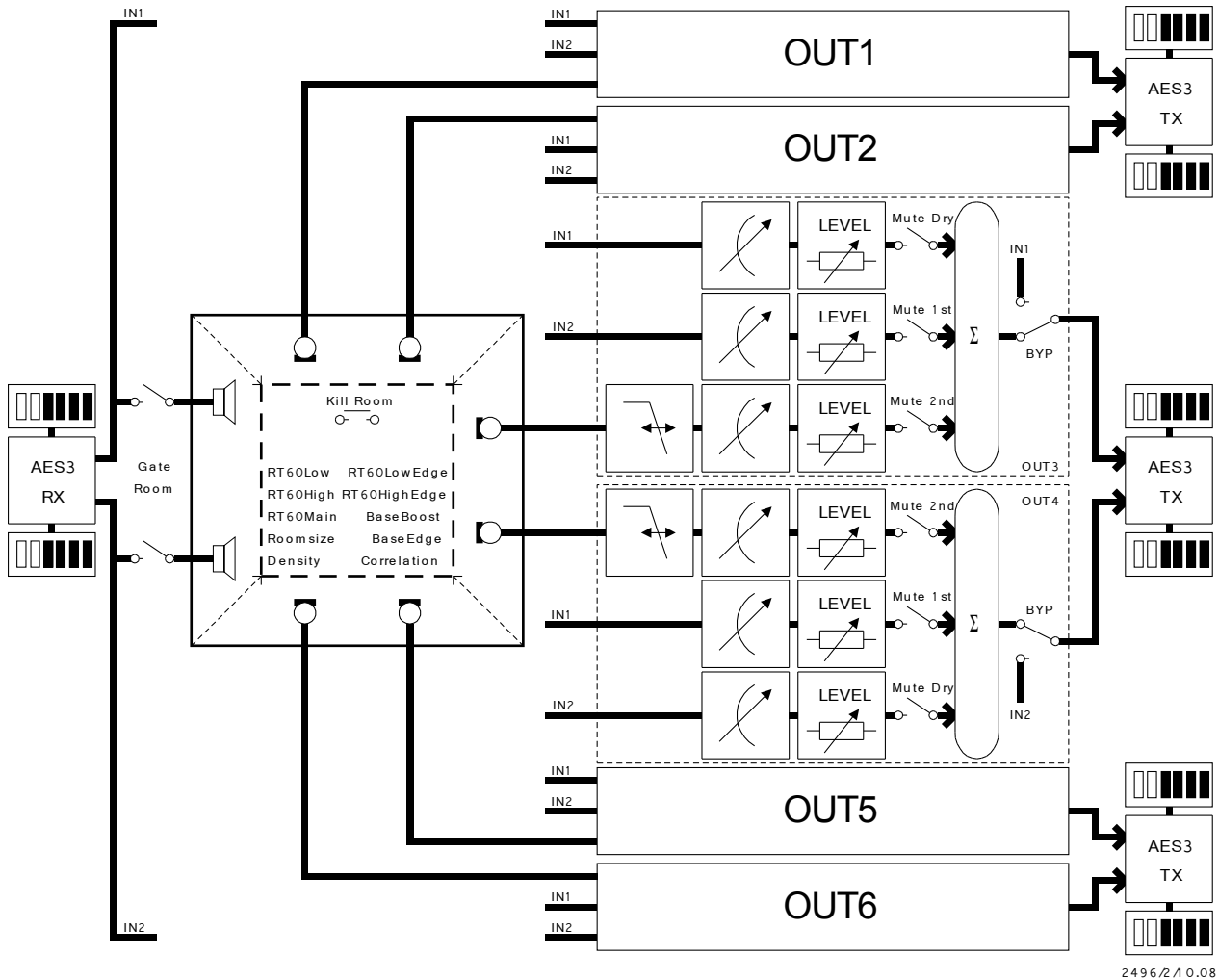


Figure 2: Block diagram 2496

**Note:** An overview of all QUANTEC units can be found on p. 173.

2498

8+2 digital AES3 inputs, 8 digital AES3 outputs, variable room size parameter, variable plug-in sample rates up to 54 kHz (*Varispeed*)

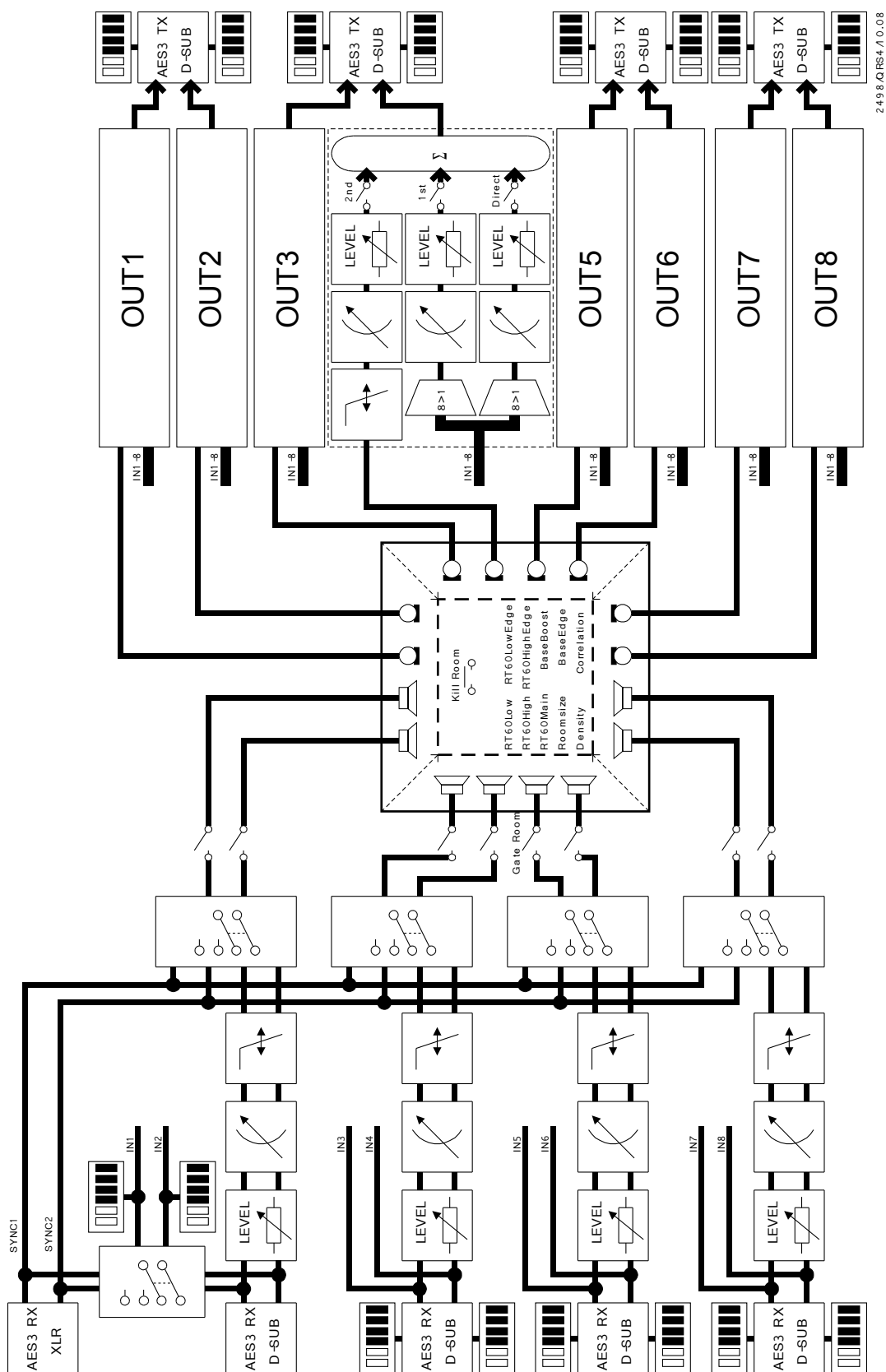


Figure 3: Block diagram 2498

## The 2498 operation modes

**Mode 2->8**

If the SYNC XLR input is locked exclusively, the unit falls back to the 2->8 mode. In this mode, the signal from the SYNC input will be evenly distributed across the entire set of room speakers. All pre-room level settings, delay lines, and filters will be disabled.

**Mode 8->8**

If at least one of the DSUB inputs is locked, the unit fully activates the 8->8 mode. In this mode, all DSUB input signal pairs will be forwarded to their individual room speaker pair. All input signals' levels, delays, and bandwidths may be individually adjusted. Each input pair contributes a quarter of the total echo and resonance density.

**Note:** An overview of all QUANTEC units can be found on p. 173.

## Caption for the block diagrams



level setting



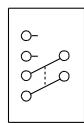
adjustable delay line



tunable low pass filter



bargraph



stereo selector



switch (SPST)



virtual loudspeaker



virtual microphone



pushbutton



sum/adder



8-in selector



2-in selector



AES3 (=AES/EBU) receiver



AES3 (=AES/EBU) transmitter

**Dry**

direct path (dry)

**1st**1<sup>st</sup> reflection**2nd**

reverberation path (wet)

# Effect Parameters

The effect parameters are divided into 4 groups. The 1<sup>st</sup> group affects the reverberation: *Room Size*, *Density*, *RT60 Main*, *RT60 Low*, *RT60 High*, *Low Edge*, *High Edge*, *Bass Boost*, and *Bass Edge*. The 2<sup>nd</sup> controls the mixing of the outputs: *Dry Level*, *1st Level*, *2nd Level*, *Dry Delay*, *1st Delay*, *2nd Delay*, and *Bandwidth*.

With the 3<sup>rd</sup> group, a crossbar can be configured, to bypass the dry signals around the reverberation chamber: *Dry Source* and *1st Source*.

The 4<sup>th</sup> group is only available on units with more than one input pair. With this group, the feeds into the reverberation chamber may be characterized and mixed as separated pairs: *Pre Level*, *Pre Delay*, and *Pre Bandwidth*.

## Room Size

The *Room Size* of the reverberation chamber takes on values of **1E0 m3**, **1E1 m3**, **1E2 m3**, **1E3 m3**, **1E4 m3**, **1E5 m3**, and **1E6 m3**.

For software versions 1.x and below, the *Room Size* parameter has been available on the 2496 and 2498 only. For the 2492, the *Room Size* has been fixed to 10<sup>5</sup> m<sup>3</sup>. For 2.0 and above, the *Room Size* parameter has been made available on all devices.

## Density

The *Density* of the reverberant sound field takes on values of **0%**, **10%**, **16%**, **25%**, **40%**, **63%**, **100%**, **125%**, **160%** and **200%**. **0%** (previously called **CONSTANT**) results in a constant reflection density. Non-zero values simulate reflected energy within real chambers which varies proportionally with the square of the elapsed time. The **100%** setting will closely mimic the former **BUILD UP**. Due to the 249x series' enormously increased echo density, this is only a rough approximation.

Density values above **100%** are a compromise between a desired initially high reflection density and a slight tendency for a metallic-sounding reverberation tail. High Density values also greatly lengthen the ends of the tails.

## RT60 Main

*RT60 Main* sets the reverberation time for a signal to decay by 60dB. Values follow the *R20 Renard scale*. Start and end values depend on the *Room Size* parameter. Here a sample of values: ... **1s, 1.12s, 1.25s, 1.4s, 1.6s** ...

Beyond the last numerical value the value **FREEZE** appears, which corresponds to the freeze room. Here, no damping exists and the RT60 is infinite. To mute all input to the freeze room, use hotkey *Gate Room*; to mute all signals within of the freeze room, use hotkey *Kill Room*.

**Note:** The QRS algorithm infinitely continues spawning fresh reverberation, even with RT60 set to FREEZE. No *loop* of previously-calculated samples is played. Gate Room will be automatically activated when entering the Freeze room, and deactivated when leaving it.

## RT60 Low, RT60 High

*RT60 Low* and *RT60 High* designate the reverberation times relative to RT60 Main for the low and high **frequencies, respectively, and are unit-less. Their values are: 0.1, 0.16, 0.25, 0.4, 0.63, 1, 1.4, 2.5, 4, 6.3, and 10.**

The selected coefficient is strictly valid only for the frequency determined by the *Low Edge* and *High Edge* parameters. The decay times change vs. frequency in a *continuous manner*. They typically increase for low frequencies and decrease in the high frequencies.

## Low Edge, High Edge

These two parameters have been introduced with version 2.0. On versions 1.x their values are fixed at **100Hz** and **5kHz**.

The *Low Edge (RT60 edge frequency for low frequencies)* may be picked from **25Hz, 40Hz, 63Hz, 100Hz, 160Hz, 250Hz, 400Hz, 630Hz, and 1kHz**. The *High Edge (RT60 edge frequency for high frequencies)* may be picked from **1kHz, 1.6kHz, 2.5kHz, 4kHz, 6.3kHz, 10kHz, and 16kHz**.

There is no concept of *crossover behavior* for separating low and high frequency channels. The decay times change vs. frequency in a *continuous manner*.

This edge parameter defines the frequency, at which the RT60 coefficient, as determined by the *RT60 Low* and *RT60 High* values, just reaches its predetermined value. Or should we say “intersects with”, as above and below that frequency point there is an additional run-out area with an additional  $\times 0.7/\times 1.4$  of RT60 overshoot, where the factor loses its tilt, and eventually reaches 0Hz or  $F_s/2$  asymptotically.



## Bass Edge, Bass Boost

These two parameters have been introduced with version 2.0.

*Bass Edge* specifies the 3dB edge frequency of a low-frequency filter in the reverb-path (*»2nd«*), which may be chosen from **10Hz**, **16Hz**, **25Hz**, **40Hz**, **63Hz**, **100Hz**, **160Hz**, **250Hz**, **400Hz**, **630Hz**, and **1kHz**. *Bass Boost* specifies the impact, i.e. gain or loss in the diffuse path level, reached asymptotically at 0Hz. You may pick from **-20dB**, **-18dB**, **-16dB**, **-14dB**, **-12dB**, **-10dB**, **-8dB**, **-6dB**, **-4dB**, **-2dB**, **0dB**, **+2dB**, **+4dB**, **+6dB**, **+8dB**, **+10dB**, **+12dB**, **+14dB**, **+16dB**, **+18dB**, and **+20dB**.

**Note:** Because an important clue for the perception of large rooms is the room's response to shock pressure (*»door bangs«*), there is no low-cut filtering within the QRS algorithm – it operates down to 0Hz.

## Dry Level

Parameter *Dry Level* adjusts the direct signal path from **-30dB** to **0dB** in steps of 1dB and can be disabled using **OFF**.

The 2492 uses parameter *Dry Level* for both output channels simultaneously.

On the 2496/2498, individual levels for each output channel pair can be set: **DryLEV12** for DigOut 1+2, **DryLEV34** for DigOut 3+4, **DryLEV56** for DigOut 5+6, **DryLEV78** for DigOut 7+8. It is also possible to set each channel's *direct path level*. To do so, enable the parameters **DryLEV1**, **DryLEV2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

## 1st Level

Parameter *1st Level* sets the level of the *first reflection* from **-30dB** to **0dB** in steps of 1dB and can be disabled using **OFF**.

The 2492 uses parameter *1st Level* for both output channels simultaneously.

On the 2496/2498, individual levels for each output channel pair can be set: **1stLEV12** for DigOut 1+2, **1stLEV34** for DigOut 3+4, **1stLEV56** for DigOut 5+6, **1stLEV78** for DigOut 7+8. It is also possible to set each channel's *first reflection level*. To do so, enable the parameters **1stLEV1**, **1stLEV2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

**Note:** Contrary to the *direct path*, the QRS algorithm interchanges left/right channels for the *first reflection path*. Setting both paths to *equal delay times* and *same levels* would result in an unmeant *mono* mixdown.

## 2nd Level

Parameter *2nd Level* sets the level of the *reverberation path* from **-30dB** to **0dB** in steps of 1dB and can be disabled using **(OFF)**.

The 2492 uses parameter *2nd Level* for both output channels simultaneously.

On the 2496/2498, individual levels for each output channel pair can be set: **2ndLEV12** for DigOut 1+2, **2ndLEV34** for DigOut 3+4, **2ndLEV56** for DigOut 5+6, **2ndLEV78** for DigOut 7+8. It is also possible to set each channel's *reverberation path level*. To do so, enable the parameters **2ndLEV1**, **2ndLEV2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

## Dry Delay

Parameter *Dry Delay* adjusts the delay of the *direct signal path* from **1ms** to **200ms** in 1ms steps.

The 2492 uses parameter *Dry Delay* for both output channels simultaneously.

On the 2496/2498, individual levels for each output channel pair can be set: **DryDLY12** for DigOut 1+2, **DryDLY34** for DigOut 3+4, **DryDLY56** for DigOut 5+6, **DryDLY78** for DigOut 7+8. It is also possible to set each channel's delay. To do so, enable the parameters **DryDLY1**, **DryDLY2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

## 1st Delay

Parameter *1st Delay* adjusts the delay of the *first reflection* from **1ms** to **200ms** in 1ms steps.

The 2492 uses parameter *1st Delay* for both output channels simultaneously.

On the 2496/2498, individual delays for each output channel pair can be set: **1stDLY12** for DigOut 1+2, **1stDLY34** for DigOut 3+4, **1stDLY56** for DigOut 5+6, **1stDLY78** for DigOut 7+8. It is also possible to set each channel's delay. To do so, enable the parameters **1stDLY1**, **1stDLY2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

**Note:** Contrary to the *direct path*, the QRS algorithm interchanges left/right channels for the *first reflection path*. Setting both paths to *equal delay times* and *same levels* would result in an unmeant *mono* mixdown.

## 2nd Delay

Parameter *2nd Delay* adjusts the delay of the *reverberation path* from **1ms** to **200ms** in 1ms steps.

The 2492 uses parameter *2nd Delay* for both output channels simultaneously.

On the 2496/2498, individual delays for each output channel pair can be set: **2ndDLY12** for DigOut 1+2, **2ndDLY34** for DigOut 3+4, **2ndDLY56** for DigOut 5+6, **2ndDLY78** for DigOut 7+8. It is also possible to set each channel's delay. To do so, enable the parameters **2ndDLY1**, **2ndDLY2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

## Bandwidth

Parameter *Bandwidth* sets the low pass filter cut-off frequency of the *reverberation path*. Possible values are: **2.5kHz**, **3.1kHz**, **4kHz**, **5kHz**, **6.3kHz**, **8kHz**, **10kHz**, **12kHz**, **16kHz**, and **FULL**. These are rounded values from the Renard scale.

The 2492 uses Parameter *Bandwidth* for both output channels simultaneously.

On the 2496/2498, individual filters for each output channel pair can be set: **2ndCUT12** for DigOut 1+2, **2ndCUT34** for DigOut 3+4, **2ndCUT56** for DigOut 5+6, **2ndCUT78** for DigOut 7+8. It is also possible to set each channel's bandwidth. To do so, enable the parameters **2ndCUT 1**, **2ndCUT 2**, etc. under menu item **Parameter Line Up** (p. 95) of main menu item **System Setup**.

The slope steepness is a constant *24 dB per octave*, the timing is *Bessel*.

## Correlation

This parameter has been introduced with version 2.0.

With the *Correlation* parameter, an intentional pairwise crosstalk between the outputs of **-0.5**, **-0.25**, **0**, **0.25**, and **0.5** may be defined. This will either narrow the stereo image, or compensate an acoustic crosstalk between left and right speaker.

Correlation settings from presets may be centrally overridden from **System Setup**. More details in the **Override Correlation** chapter starting on p. 89.

## Dry Source

The *Dry Source parameter* assigns, which input channel will be used for a certain output's *Dry Level* and *Dry Delay* parameters.

The output channels are linked in pairs. **Dry Source 12** controls DigOut 1+2, **Dry Source 34** controls DigOut 3+4, **Dry Source 56** controls DigOut 5+6, **Dry Source 78** controls DigOut 7+8. Input pairs may be assigned to outputs pairs. The mappings available are **12**, **21**, **34**, **43**, **56**, **65**, **78**, and **78**. Those eight sources are always assignable, even if a unit or plug-in does provide 2 input channels only. This permits using and maintaining surround plug-ins even on stereo-only devices.

Moreover, there is an option to define the mapping for each channel separately. One has to select the parameters **Dry Source 1**, **Dry Source 2**, ... in the submenu item **Parameter Line Up** (starting on p. 95) of the main menu item **System Setup**.

In operation mode 2->X the inputs 3 to 8 will not be fed by audio signals. To prevent the output levels from collapsing, all contradicting settings may be compulsorily bent to **12** or **21**. See more details in the submenu item **Override Dry/1st Source** (starting on p. 92) of the **System Setup**.

## 1st Source

The *1st Source parameter* assigns, which input channel will be used for a certain output's *1st Level* and *1st Delay* parameters.

The output channels are linked in pairs. **1st Source 12** controls DigOut 1+2, **1st Source 34** controls DigOut 3+4, **1st Source 56** controls DigOut 5+6, **1st Source 78** controls DigOut 7+8. Input pairs may be assigned to outputs pairs. The mappings available are **12**, **21**, **34**, **43**, **56**, **65**, **78**, and **78**. Those eight sources are always assignable, even if a unit or plug-in does provide 2 input channels only. This permits using and maintaining surround plug-ins even on stereo-only devices.

Moreover, there is an option to define the mapping for each channel separately. One has to select the parameters **1st Source 1**, **1st Source 2**, ... in the submenu item **Parameter Line Up** (starting on p. 95) of the main menu item **System Setup**.

In operation mode 2->X the inputs 3 to 8 will not be fed by audio signals. To prevent the output levels from collapsing, all contradicting settings may be compulsorily bent to **12** or **21**. See more details in the submenu item **Override Dry/1st Source** (starting on p. 92) of the **System Setup**.

## Pre Level

Due to the multiple inputs required, this parameter is available on the 2498 only.

With the *Pre Level* parameter, one may adjust the levels of the reverberation chamber's feeding pairs from **-30dB** to **0dB** in steps of 1dB, or disable the pair completely (**OFF**). **PreLEV12** controls DigIn 1+2, **PreLEV34** controls DigIn 3+4, **PreLEV56** controls DigIn 5+6, and **PreLEV78** controls DigIn 7+8.

Moreover, there is an option to adjust the level of each channel separately. One has to select the parameters **PreLEV1**, **PreLEV2**, ... in the submenu item **Parameter Line Up** (starting on p. 95) of the main menu item **System Setup**.

## Pre Delay

Due to the multiple inputs required, this parameter is available on the 2498 only.

With the *Pre Delay* parameter, one may adjust the delays of the reverberation chamber's feeding pairs from **1ms** to **200ms** in steps of 1ms. **PreDLY12** controls DigIn 1+2, **PreDLY34** controls DigIn 3+4, **PreDLY56** controls DigIn 5+6, and **PreDLY78** controls DigIn 7+8.

Moreover, there is an option to adjust the delay of each channel separately. One has to select the parameters **PreDLY1**, **PreDLY2**, ... in the submenu item **Parameter Line Up** (starting on p. 95) of the main menu item **System Setup**.

## Pre Bandwidth

Due to the multiple inputs required, this parameter is available on the 2498 only.

With the *Pre Bandwidth* parameter, one may adjust the lowpass filters of the reverberation chamber's feeding pairs from **2.5kHz**, **3.1kHz**, **4kHz**, **5kHz**, **6.3kHz**, **8kHz**, **10kHz**, **12kHz**, **16kHz**, to **FULL**. **PreCUT12** controls DigIn 1+2, **PreCUT34** controls DigIn 3+4, **PreCUT56** controls DigIn 5+6, and **PreCUT78** controls DigIn 7+8.

Moreover, there is an option to adjust the lowpass of each channel separately. One has to select the parameters **PreCUT 1**, **PreCUT 2**, ... in the submenu item **Parameter Line Up** (starting on p. 95) of the main menu item **System Setup**.

The filter edge frequencies correspond to a *Renard scale*, but are approximated due to display limitations. The slope steepness is a constant *24 dB per octave*, the timing is *Bessel*.

# Effect Setup Parameters

These parameters are used as general, set-and-forget values for all parameters in the menu group **Effect** under main menu item **System Setup**. By name they are: *Discorrelator Pattern 2X*, *Discorrelator Pattern 88*, *Direct Path Enable*, *Sample Rate Reference*, *Subsonic*, *Correlation Override*, and *Dry/1st Source Override*.

These parameters are not stored as part of a preset, but stored as part of the unit's initialization values. This separation of general and specific parameters makes it easy to accommodate an existing effects library to various application areas, e.g. 2-channel FOH or 6-channel studio.

## Discorrelator Pattern 2X, Discorrelator Pattern 88

The discorrelator pattern is a property of the virtual room microphones. All microphones in the reverberation chamber have a correlation of 50% towards each other, but an individual discorrelation pattern. Its value would not need to be modified in standalone use.

However, if more microphones are desired than output channels available, the solution is to operate two or more YARDSTICKS in tandem. In this case, the discorrelator patterns of the additional unit(s) will have to be accommodated.

For example, two 2496 units could be used to simulate a concert hall having 12 microphones with an effective 50% cross-correlation factor.

The *Discorrelator Pattern 2X* parameter assigns the patterns for plug-ins and operation modes with 2 inputs and an unspecified number of output channels (currently 2, 6, or 8). The *Discorrelator Pattern 88* parameter assigns the patterns for plug-ins and operation modes with 8 inputs and 8 outputs. This parameter is only available on the 2498.

**Note:** Use only on stable and fully locked *digital* interfaces. On an analog I/O 2493, quartz crystal inaccuracies can result in phasing errors and interference.

For further information, please refer to section »Stereo and 3D Compatibility« on p. 29. A more detailed discussion of the discorrelator pattern appears on p. 79 and 82.

## Direct Path Enable

The Direct Path Enable allows the direct signal path to be or not be added to the output.

In the past, a direct path through an effects box was not available. It was customary to feed the direct path through the mixing console ignoring that the effects would take a different and longer path. Today however, one would want to send direct signals through the effects processor, too, to minimize delay time deviations between the direct and reverb signal.

For further information on how to globally enable the direct path for all presets, please refer to p. 85.

## Sample Rate Reference

This parameter sets the *nominal* sample rate. As the YARDSTICK can be operated with a variable sample rate (*»Varispeed«*), it becomes necessary to specify a *nominal* sample rate.

Automatic detection can fail when the varispeed sample rate is close to a standard value (e.g., a 48 kHz signal slowed to 44.1 kHz). Here measurement would fail to detect a *nominal sample rate*. Workarounds include extracting the sample rate from the *Channel Status data*, or using a fixed house sync.

This parameter also serves to initialize the delay times and other processing constants within the algorithm. For further information on how to set the *input* for this parameter, please refer to p. 77.

## Subsonic

For input signals with considerable DC offsets, say, more than 3%, very-low frequency room resonances may gradually build up the DC level, then cross the clipping point, and eventually reach out well into the overdrive region. To be still able to process such deficient input signals, room resonances in the vicinity of air pressure shocks may optionally be suppressed.

For further information on globally enabling or disabling these resonances, please refer to p. 87.

## Correlation Override

This parameter has been introduced with version 2.0.

This parameter will be determined by the current monitoring situation: loudspeakers or headphones. For loudspeaker monitoring, it may occasionally make sense to reduce an excess width image (positive values), or to partially cancel the acoustic crosstalk between left and right speaker (negative values). For headphone monitoring, the setting should remain at 0 (neutral).

An in-depth description on how to adjust this parameter will be available on p. 89.

## Dry/1st Source Override

A preset defined for operation mode 8->8 may be operated in 2->X mode. Depending on the allowance from the preset, the sources of direct path and 1<sup>st</sup> reflection may point to a dead (non-driven) input. With this parameter, when operated in mode 2->X, all contradicting settings may be temporarily bent to the inputs IN12 or SYNC12. If dead sources weren't bent, they unintentionally may get lost.

An in-depth description on how to adjust this parameter will be available on p. 92.



# Basic Functionality

All YARDSTICK series 249x are based on the Quantec Room Simulator, or QRS, algorithm. It is controlled by the *parameters* previously described, and these are grouped into *presets*. These presets generally comprehensively specify a room reverb setting, and can be easily named, timestamped, saved or recalled. The parameters are described on p. 15ff.

The YARDSTICK 249x devices offer 2 *scratch presets* for temporarily storing a yet unnamed preset: SCRATCH A (read/write) and SCRATCH B (read-only). SCRATCH A can be edited, whereas SCRATCH B is solely used as a reference, e.g. for A/B comparisons.

## Unmatched sonic purity

Due to the sophisticated characteristics of the QRS algorithm, any QUANTEC room simulator stands out favorably among the competition. But there are quite a few situations where its sonic qualities really shine:

- In the final mix, where it is unobtrusively transparent with virtually no tendency to blur – even with a full dose over the entire set of tracks
- In a multitude of productions in classical music, where any room impression with an artificial smack is undesirable – for stylistic reasons alone
- In the production of movies and radio dramas, where its virtually tangible room illusions simulate real rooms, which – in cramped environments – may actually create a physically unpleasant feeling of pressure
- In movie productions, using its outstanding ambience in spacious effects
- In sound reinforcement and P.A., where those pronounced resonance lines and gaps in the acoustic spectrum of a hall not suited for musical performances can be averaged and smoothed out. As a result, the sound of a general-purpose municipal hall becomes more suitable for music, and the risk of feedback is reduced
- During the musical-improvisatory *play with the reverberation onset* – or the *effervescence of the room*

Since the sound characteristic of the QRS algorithm – and thus that of YARDSTICK as well – is quite a bit different when compared to the competition, it inevitably will have a significant influence on the number and types of the available parameters.

## How many first reflections?

People always ask us why the QRS algorithm comes with only a single, meager *first reflection* – after all, our competitors offer thirty or more early reflections, all of which can be defined individually in position and level.

Traditional reverberation algorithms separate their reverberation output, really the *room pulse response*, into two successive responses each produced by an algorithm, or even a signal processor, of its own:

- The *attack* response with its discrete initial reflections based on a multi-tap delay line
- The *reverberation tail* response with a reflection density as large as possible (read *infinite*). This reverberation is produced by cascaded all-pass networks, cross-coupled delay lines, or other sophisticated structures

This is different from what happens in the real world, where both phases of the room response are produced *by one and the same* signal processor. A *natural signal processor* – in other words, the elementary structure of a room with its usual six boundaries, as well as the objects (diffusers) in it – creates *both* the first reflections *and* the continuous spectra. Thus, for a natural-sounding room, the two phases of the room response should never be separated from each other. For this reason, the initial reflections cannot just be fished out from the total room, and naively be committed to the sound engineer.

In this context, we were told of a singer who once put this phenomenon into words. "*With this device, I had the impression for the first time that there was no more annoyances between my voice and the room*". No wonder as the annoying discontinuity between the attack and decay responses has now vanished.

Thus the first reflection of the QRS algorithm is nothing more than an *additional effect* with which to simulate slap echoes, such as those of a brass section, a backyard, or even mountain ranges.

## On the frequency-dependent RT60 response of reverb

Further features are the frequency-dependent resonators within the QRS algorithm. In stark contrast to some products from the competition, the input signal is not handed over to a number of band-pass separated reverberation generators – or *rooms* – via a multi-output crossover network. Some competitive units use a crossover network from which one room with, say, 500Hz bandwidth is optimized for the low-end reverberation, a second room between 500Hz and 5kHz for the mid-range, and a third room for the high-end reverberation above 5kHz.

Again, just as was mentioned for the first reflections: a natural signal processor does all this *at the same time*. That's why using a crossover network over several reverberation generators is a design mistake right from the beginning.

Equivalent to a natural room, the QRS algorithm treats the boundaries of a room, and also the boundaries of the diffusers inside the room, as resonators (low frequencies), or as absorptive surfaces (high frequencies). This furnishing either absorbs or reflects the arriving broadband sound spectrum according to its frequency components. This is done gradually: the lower the frequency, the less absorption, and thus the more pronounced the room resonance at that frequency.

## Stereo and 3D Compatibility

The idea is that a *real stereo signal*, and not some sort of *sum of both channels*, is fed into the simulated room. This is vital. With simple time-difference stereo, any kind of mixing prior to the reverb input will result in annoying comb filter effects, which will then be superimposed on the simulated room. Since listeners orient themselves mostly by the early diffuse component for their spatial impression, the inherent spatial depth of e.g. a 3D or dummy-head recording would compete and lose against that time-distorted *diffuse mush energy*. The *spatial impression* captured by a dummy-head recording would get lost in an overall impression of a *comb-filtered room*.

As an important prerequisite for the superior spatial transparency of the QRS algorithm, both stereo channels are mixed not before the complex phase and frequency behavior of the simulated room. This is the only way to transpose the input signal's spatial transparency into the simulated room. Such an approach even preserves the *vertical components* of real 3D signals. We challenge you to feed a most finely-structured signal both into the QRS algorithm and a competing product, and not marvel at the QUANTEC unit's ability to handle such a touchy input signal.

On the output side, a similar situation exists. It's not enough for the outputs to be *arbitrarily* related to each other. Let's consider the limit values. A 100% correlation would yield mono and ruin the room response completely.

At the other extrema, a 0% correlation between the outputs would correspond to a listener standing *at the door between two similar concert halls*. Both concert halls would be fed with the same music from a loudspeaker within each room. As a result, the left ear would receive the left concert hall response and the right ear the right one. If it wasn't for the inevitable crosstalk from the left concert hall into the right ear, and vice versa, the spatial clues would have been completely destroyed, again.

This picture all-too-true illustrates the trick of maximizing the spatial effect of a simulated room: set correct *amount of crosstalk* between the various outputs. This corresponds to correctly placing the "*virtual microphones*" that capture the pulse response, before finally carry-out the sound back into the real world.

Further information can be found in the description of the room microphones on p. 9, and the description of menu item **Discorrelator Pattern** on p. 79.

# Front Panel

2492:



2496:



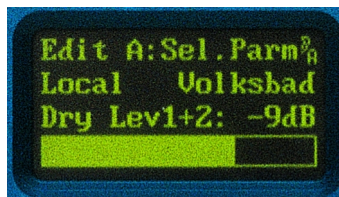
2498:



## Displays

The front panel display elements consist of the *Status and Bargraph LEDs*, the *Menu display*, and the *Overview display*.

### Menu Display



The OLED *Menu display* can display all settings and information related to the unit. Navigation is done using the Rotary wheel and key pair switch (refer to section **Menu Navigation** on p. 34).

For further information on accessing the menus, please refer to section **Menu Structure** on p. 57.

### Overview Display

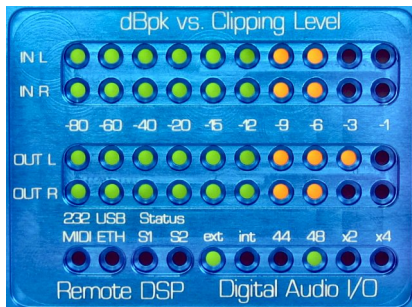


The OLED *Overview display* can display up to 14 parameters. It is also used to compare the settings of 2 presets. The display resolution can be set under **Display Mode**. **Param Up** and **Param Down** are used to page through parameters if they can't be all displayed on one screen.

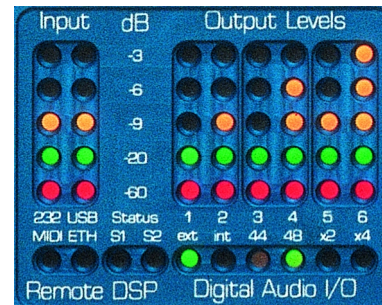
On the **2492**, access to **Display Mode**, **Param Up** and **Param Down** is done using the **Hotkey Menu**, whereas the **2496** and **2498** uses dedicated keys (refer to section **Function Keys** on p. 36).

## Status LEDs

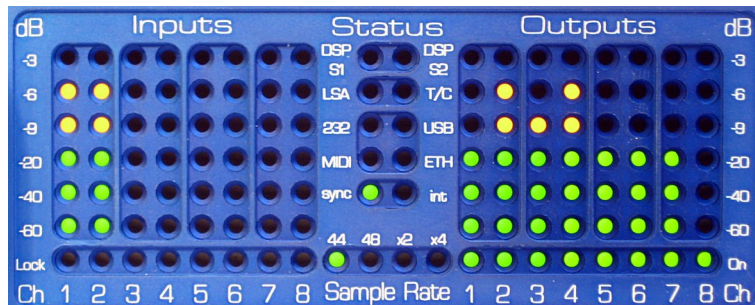
2492:



2496:



2498:



**Input/Output Levels** Each input and output channel has its own bargraph. Resolution and orientation are unit-dependent.

The **2492** has horizontal bargraphs with green LEDs at **-80dB**, **-60dB**, **-40dB**, **-20dB**, **-15dB** and **-12dB** and yellow LEDs at **-9dB**, **-6dB**, **-3dB**, and **-1dB**.

The **2496** has vertical bargraphs with green LEDs at **-60dB** and **-20dB** and yellow LEDs at **-9dB**, **-6dB** and **-3dB**.

The **2498** has vertical bargraphs with green LEDs at **-60dB**, **-40dB** and **-20dB** and yellow LEDs at **-9dB**, **-6dB** and **-3dB**.

The top LED of all units lights at -0.1 dB. When **Mute Dry**, **Mute 1st**, or **Mute 2nd** is active, the bottom bargraph LED becomes red. When **Bypass** is active, the bargraph displays a wandering dot.

### 232/MIDI

A flashing green LED shows RS-232 serial link or MIDI activity.

### USB/ETH

A flashing green LED shows USB or Ethernet activity.

### S1/S2

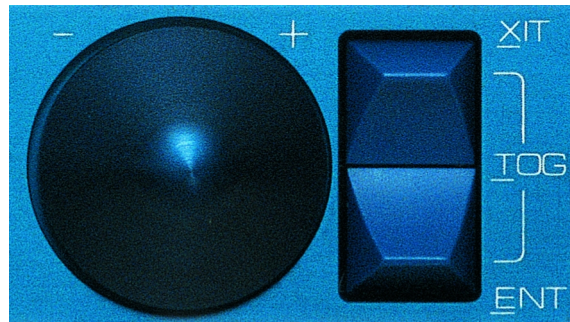
As yet unassigned LEDs for DSP effect use



<b>ext/sync</b>	Depending on LED color, shows the status of the external clock. For the <b>2492</b> and <b>2496</b> , this LED shows the lock status of the audio input. For the <b>2498</b> , this LED shows the lock status of the SYNC input. Green: The unit is slaved to a stable external clock presented to one of its inputs. Blinking Red: The expected external clock is missing. Random flashing or solid Red: The expected external clock is corrupted. In this case, reading the <b>Input Error Mask</b> (p. 72) will give an indication of the nature of the error. Off: The unit generates the master clock and no clock is detected at the inputs.
<b>int</b>	A green LED indicates the internal clock is active. The LED turns off when no internal clock is being generated, implying the need for an external clock.
<b>44/48/x2/x4</b>	Indicates the sample rate used: <b>44</b> for 44.1kHz, <b>48</b> for 48kHz, <b>x2</b> for a multiplicative factor of 2 and <b>x4</b> for a multiplicative factor of 4. Green LEDs indicate the standard rates of 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz – they turn yellow when <i>Varispeed</i> is used. More than one LED can be yellow at the same time when the actual rate is close to two frequencies, e.g., a 46kHz clock would have both <b>44</b> and <b>48</b> LEDs light yellow. Flashing indicates a contradiction between the frequency counter and the statements from the Channel Status data. (Please refer to menu <b>Sample Rate Reference</b> on p. 77). A slow blinking red LED indicates that the sample rate is higher than what hardware (the unit) or software (a plug-in) can accurately process.
<b>Lock</b>	On the <b>2498</b> there is a <i>Lock</i> LED for every single input. A green LED indicates a fault-free signal at the corresponding input. An occasional red flashing, or a permanent red LED, indicates a marginal, or faulty input signal.
<b>On</b>	On the <b>2498</b> there is an <i>On</i> LED for every single output. A green LED indicates that this output emits an AES3 audio signal, or empty AES3 frames. The LED doesn't implicate an audio signal; audio will be signaled by the bargraph.

## Operational Controls

### Menu Navigation



The Menu display items are selected and traversed using an input wheel and a pair of independent keys, both with opposite-curved tops, having the functions **ENT**, **XIT**, and **TOG**.

<b>Wheel -/+</b>	Used to move the menu cursor left or right, to select a preset, or to modify a parameter value.
<b>XIT</b>	The <b>XIT</b> (=EXIT) function is obtained by tapping the top key. It moves the menu cursor up, or cancels a parameter value. The <b>XIT</b> control is executed on release of the key to differentiate it from the <b>TOG</b> function.
<b>ENT</b>	The <b>ENT</b> (=ENTER) function is obtained by tapping the bottom key. It moves the menu cursor down, or confirms a parameter value. The <b>ENT</b> control is executed on release of the key to differentiate it from the <b>TOG</b> function.
<b>TOG</b>	The <b>TOG</b> (=TOGGLE) function is obtained by tapping one key while the other is being held. Simultaneous tapping also works. The <b>TOG</b> function selects the <b>Hotkey Menu</b> . It is also used in some menus for special selection, such as changing the cursor character. Contrary to the <b>ENT</b> and <b>XIT</b> function, the <b>TOG</b> function is executed as soon as the second key is hit.

## Overview Display Keys

The *Overview display* is used to display a large number of algorithm parameters concurrently.

On the **2496** or **2498**, 10 illuminated keys (top and bottom) and 14 toggle keys (left and right) surround the OLED display. The keys are divided into *Mute*, *Function*, and *Parameter* keys.

The **2492** is devoid of these keys, and uses the **Hotkey Menu** (p. 59) instead to access the algorithm parameters.



### Mute Keys (Top Row)

<b>Gate room</b>	Mutes the input to the reverb room. A red LED indicates <i>blocked input signal</i> . Note that existing reverb will be heard to die out in the reverb room.
<b>Kill room</b>	Stops all signal generation produced by the reverb room. A red LED indicates kill is active. Even if fed with an input signal (as with <b>Gate Room</b> transparent), no echoes can be established within the room.
<b>Mute Dry</b>	Mutes the direct signal. A red LED indicates <b>Mute Dry</b> is active. Mute status is also shown as a status LED.
<b>Mute 1st</b>	Mutes the first reflection. A red LED indicates <b>Mute 1st</b> is active. Mute status is also shown as a status LED.
<b>Mute 2nd</b>	Mutes the reverb path. A red LED indicates <b>Mute 2nd</b> is active. Mute status is also shown as a status LED.

## Function Keys (Bottom Row)

<b>Menu Shortcut</b>	Fast switchover between 4 menus parking in background. Allows fast access to 4 menu trees simply by pushbutton.
<b>Param Up</b>	Move back one page when more than one screenful of parameters is available. An orange LED indicates <b>Param Up</b> is active and there are more parameters on the previous page.
<b>Change Scratch</b>	Selects between Scratch A and B. The selected <i>Scratch preset</i> is displayed in the Menu display.
<b>Param Down</b>	Move forward one page when more than one screen of parameters is available. An orange LED indicates <b>Param Down</b> is active, and if there are more parameters on the next page.
<b>Display Mode</b>	Selects one of these display modes:

### 14 Parameters with bargraphs

```

RT60HE  4k  RT60Hi0.25
*         RT60  5.6
RT60LE  25  RT60Lo 2.5
BEdge   40  Densy 125
BGain   +12 RoomSz 1E4
*         *
*         *

```

### 14 Parameters

```

RT60HE  4k  RT60Hi0.25
*         RT60  5.6
RT60LE  25  RT60Lo 2.5
BEdge   40  Densy 125
BGain   +12 RoomSz 1E4
*         *
*         *

```

### 4 Parameters

```

RT60High  0.25
RT60      5.6s
RT60Low   2.5
*         *

```

**Note:** If a parameter is grayed out (both name and value), it has been temporarily replaced by a setting in **System Setup** and cannot be edited. The currently active value will be shown, not the one stored in the preset. An exception to this rule are *Dry Source* and *1st Source*. Even if the preset values are currently being displaced by a forced value from Setup, all *Source* parameters may still be assigned and maintained. The left hand, grayed out values are the forced ones, which are currently audible. The right-hand values represent the still accessible, and maintainable, preset specifications for multi-channel operation.

**6 Parameter Comparison**

**3 Parameter Comparison**


**Note:** The top line in the comparison display modes shows the preset name. As Scratch B is not editable, it will appear grayed out.

## Parameter Keys (Sides)

Each of 14 toggle keys on both sides of the Overview display can be pushed left or right from its center position, to decrease or increase a parameter value by a single step. Holding the key will autorepeat the stepping. Depending on the display mode, the toggle keys are assigned as follows:

**14 Parameters w. bargraphs** Keys 1 to 14 are each mapped to one parameter

**14 Parameters** Keys 1 to 14 are each mapped to one parameter

**4 Parameters** Left keys **1**, **3**, **5**, and **7** are mapped to 4 parameters.

**6 Parameter Comparison** Left keys **2** to **7** are mapped to 6 Scratch A parameters. *Scratch B* parameters can't be modified and thus the right keys are inactive.

**3 Parameter Comparison** Left keys **3**, **5**, and **7** are mapped to 3 Scratch A parameters. *Scratch B* parameters can't be modified and thus the right keys are inactive.

# Back Panel

2492:



2496:



2498:



The back panel hosts (from left to right) the *Mains Connector*, *Remote Data Interfaces*, and *Audio Interfaces*.



## Audio Interfaces

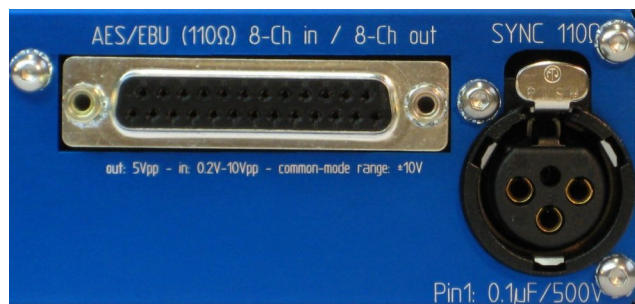
**2492:**



**2496:**



**2498:**



### AES3 Inputs

Both **2492** and **2496** host one AES3 input signal on an XLR chassis connector for **DigIn 1+2**.

The **2498** accepts an AES3 input signal from its XLR chassis connector **SYNC**. Four additional AES3 inputs are available on its 25-way female D-SUB connector **AES/EBU 8-Ch in / 8-Ch out**.

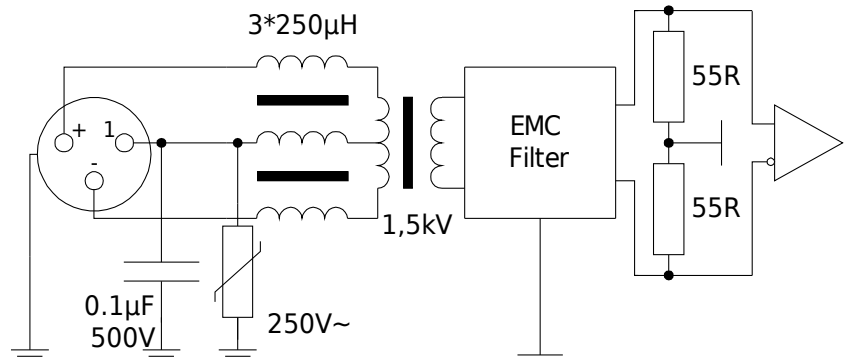
### AES3 Outputs

Both **2492** and **2496** host one or more AES3 outputs on their XLR chassis connectors. The **2492** has one connector (**DigOut1+2**), whereas the **2496** has three (**DigOut1+2**, **DigOut3+4**, **DigOut5+6**).

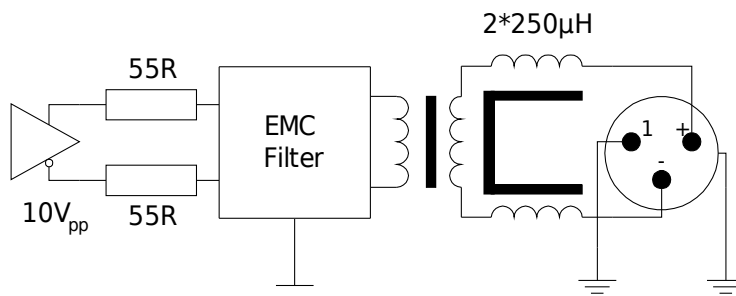
On the **2498**, four additional AES3 outputs are available on its 25-way female D-SUB connector **AES/EBU 8-Ch in / 8-Ch out**.

**XLR female connectors**

The XLR female connectors are terminated with  $110\Omega$ . Pin 1 connects to the chassis via a  $0.1\mu\text{F}$  capacitor, to prevent line-voltage ground loops.

**XLR male connectors**

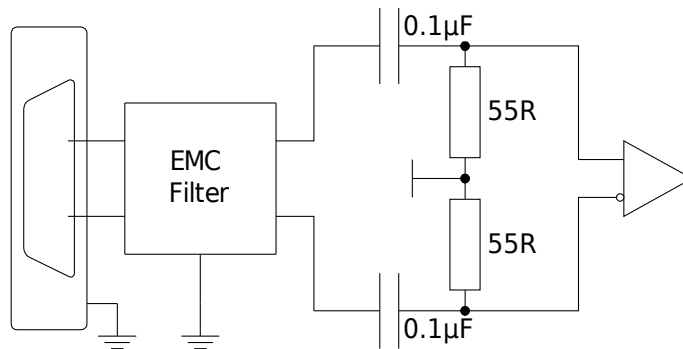
The XLR male connectors deliver  $5\text{V}_{\text{pp}}$  at  $110\Omega$ . Pin 1 connects directly to the chassis..



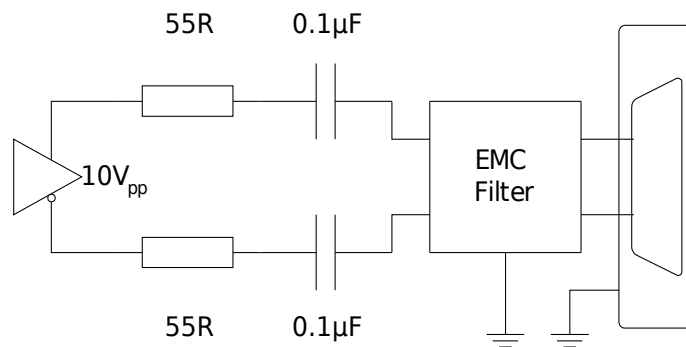


**D-SUB female connector**

On the D-SUB connector, four AES3 inputs terminated with  $110\Omega$  are combined with ...





... four AES3 outputs providing  $5V_{pp}$  at  $110\Omega$ .



By loosening the two hex bolts and rotating the D-SUB connector, the pinning layouts for YAMAHA and TASCAM devices can be selected. Many other manufacturers are supporting one of these quasi standards. A 3 meter cable snake will be included in the shipment, which provides all inputs on female XLR cable connectors, and all outputs on male. The D-SUB connector is mounted to match the snake. At the time of writing, the YAMAHA variant is being used.

Pinout of the D-SUB (female) connector:

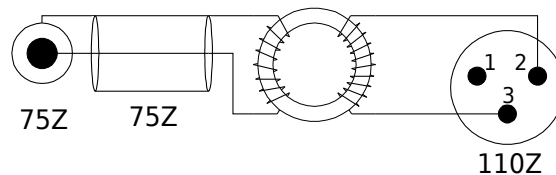
		
	YAMAHA	TASCAM
CH 1/2 IN +	1	24
CH 1/2 IN -	14	12
CH 1/2 IN GND	10	25
CH 3/4 IN +	2	10
CH 3/4 IN -	15	23
CH 3/4 IN GND	12	11
CH 5/6 IN +	3	21
CH 5/6 IN -	16	9
CH 5/6 IN GND	13	22
CH 7/8 IN +	4	8
CH 7/8 IN -	17	20
CH 7/8 IN GND	13	19
CH 1/2 OUT +	5	18
CH 1/2 OUT -	18	6
CH 1/2 OUT GND	22	19
CH 3/4 OUT +	6	4
CH 3/4 OUT -	19	17
CH 3/4 OUT GND	23	5
CH 5/6 OUT +	7	15
CH 5/6 OUT -	20	3
CH 5/6 OUT GND	24	16
CH 7/8 OUT +	8	1
CH 7/8 OUT -	21	14
CH 7/8 OUT GND	24	2
Not Connected	9,11	13

## Integration into an S/PDIF environment

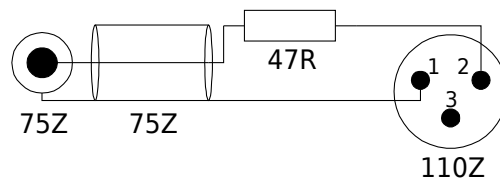
### S/PDIF output to AES/EBU input (*»Echo Send«*)

The main problem results from the S/PDIF signaling voltage, which is only one tenth compared to AES/EBU. Depending on the sample rate, the proposed circuits' usefulness may be limited to cable length of just a few feet!

The first circuit will operate with any YARDSTICK - **2492**, **2496**, and **2498**. A custom transformer is required, but its few turns can easily be stitched by hand. It's based on a ferrite toroid core with a diameter of 6.3 to 10 mm, and an  $A_L$  value of more than 2000. The S/PDIF primary requires 8, the AES/EBU secondary 10 turns of enameled or teflon-coated wire. Turning sense and polarity are irrelevant.



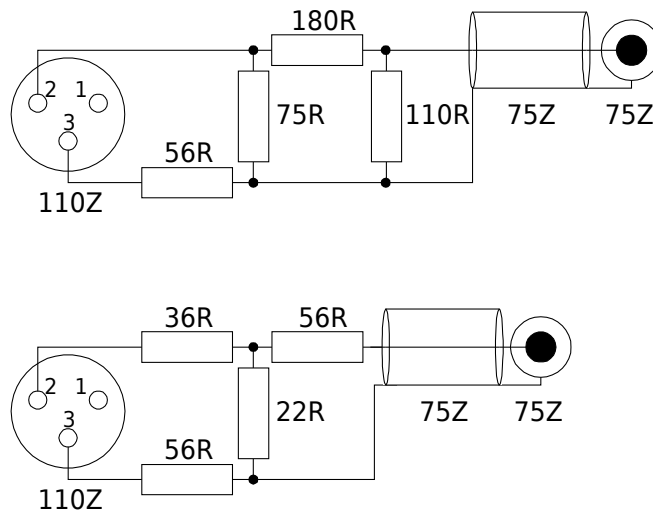
For both **2492** and **2496**, there is an even simpler solution without any transformer. But this one works only there, not with the 2498.



### AES/EBU output to S/PDIF input (»Echo Return«)

For the case of the outputs, there are two electrically equivalent circuits, one with a  ***$\Pi$***  and one with a  ***$T$***  structure. Both may be used arbitrarily with any of the YARDSTICKs: **2492**, **2496** and **2498**. Both terminate the AES/EBU output with a balanced load of 110Ω. From the viewpoint of the S/PDIF input, both networks look like an unbalanced 75Ω source with the correct voltage level.

Preferring one or the other may entirely be left to the currently available selection of resistor values at your repair shop.



Whenever the shield within the S/PDIF device is not grounded through the Cinch connector, the cable shield may alternatively be grounded at the AES/EBU end. Simply connect the cable shield to XLR pin 1. Don't ground both sides, as you will end in a mains power ground loop where high compensatory currents may flow.

As the output level margins are ample, the output cable length is much less critical than the input cable length.

## Remote Data Interfaces



<b>RS-232</b>	Allows a serial connection to a PC, for software updates or storing presets. Also allows the connection of a remote control and source its power.
<b>USB</b>	Allows connection of a Hi-Speed USB link to a PC for loading and storing presets. With LED activity indicator.
<b>MIDI</b>	Allows the use of MIDI signals for preset and parameter changes. Connectors for <b>MIDI in</b> , <b>MIDI thru</b> , and <b>MIDI out</b> are provided.
<b>Ethernet</b>	A 10Base-T Ethernet interface is provided with a green LINK LED and yellow ACT LED. Its MAC address is printed on the left side of the back panel next to the mains connector. Ethernet permits the YARDSTICK to be connected to a network allowing retrieval of presets from a central server, or for remote operation using a web browser.

## Mains Connector

The internal power supply is designed to function at 115V and 230V mains voltage. The selection is done automatically by the unit. Maximum power consumption of the 249x units lies between 12 VA and 20VA (refer to section **249x Specifications** on p. 173). Connection to mains is done using a 3-terminal cable.

# Remote Control via Web Browser

Starting from software version 3.0, all YARDSTICKs may be controlled from remote via Ethernet and a web browser. The two requirements are a browser which supports Javascript version 1.5, and an integration of the YARDSTICK into the studio's Ethernet LAN structure. For the simplest case, an Ethernet cross cable is all that's required. Amongst the web browsers standing out from the crowd due to their quick Javascript responses are Apple Safari 4, Google Chrome 2, Mozilla Firefox 3.5, and Opera 9. See more details about recommended browsers on the remote control splash page, which will be described on p. 47.

Hypothetically speaking, it would be easy to control a device located on the other side of the earth. But, with more than LAN-typical ping delays, a slow initial loading of the screen and a lagging input response may stretch performance beyond acceptability. This should not prevent a patient user to help his on-site colleague from his home office or hotel, or to carry out non-critical jobs such as preset administration, or installing of new software. Or, in the case of the author, taking screen shots for the Operations Guide.

## Preparation

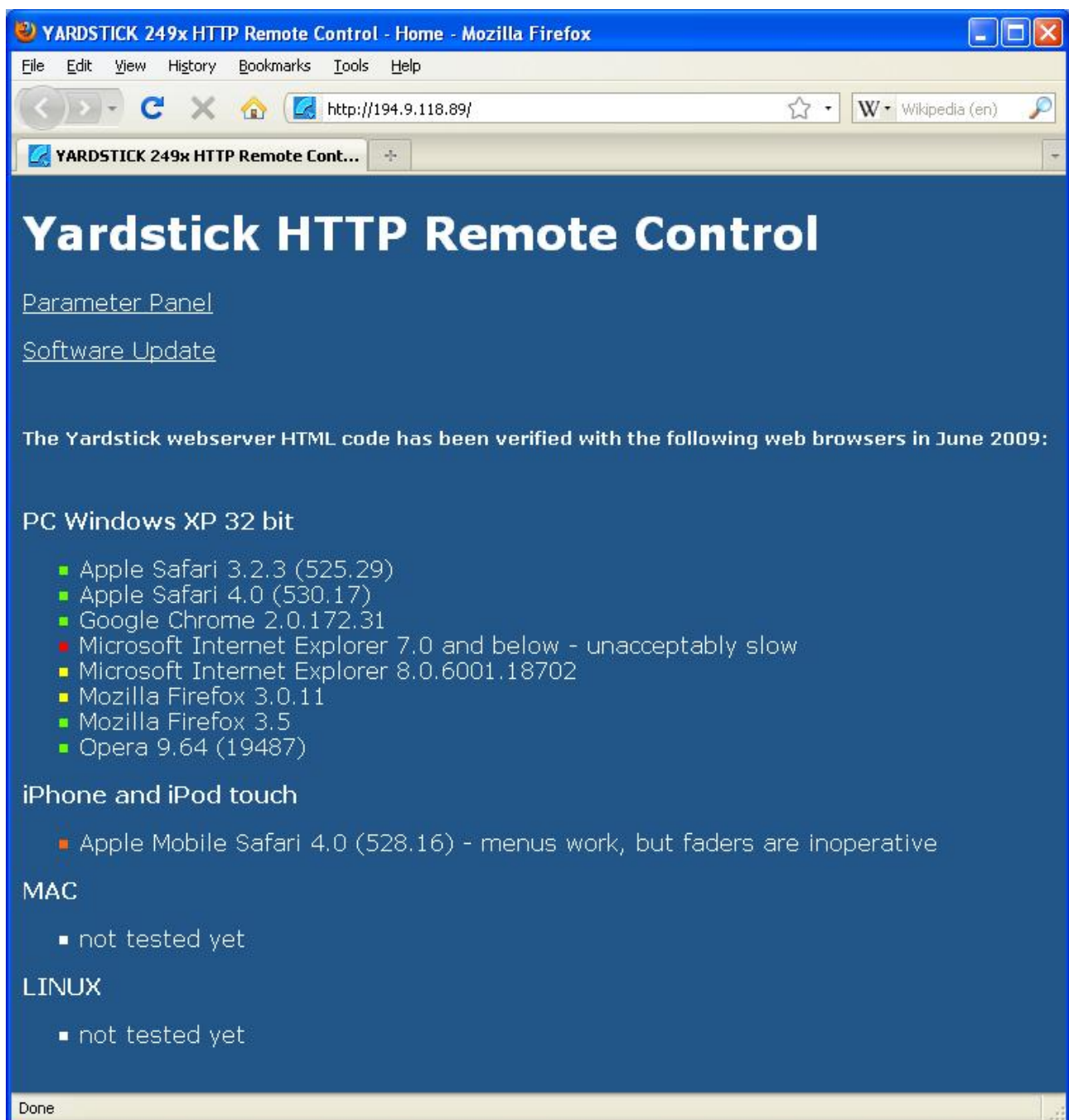
The device's Ethernet interface needs to be configured manually or via DHCP. More details are available in the **Configure Ethernet** chapter starting from p. 128. To protect a unit from DOS attacks (*»Denial of Service«*), it is expressly recommended to hide it behind a firewall.

The temporal distance between browser and unit directly influences the operation latency of the device. Estimate reasonable latencies with a test ping from the browser PC to the unit. We recommend not to exceed ping times of a few milliseconds.

## Establishing Connection

One way of establishing a connection requires entering the IP number into the browser's address field. If the IP numbers are dispatched by a DHCP server, one can verify the IP number which has been assigned to the YARDSTICK at turn-on, from the **Show Ethernet** menu item described on p. 127. Please configure your DHCP server to always allocate the same IP number whenever a certain MAC address tries to connect again later.

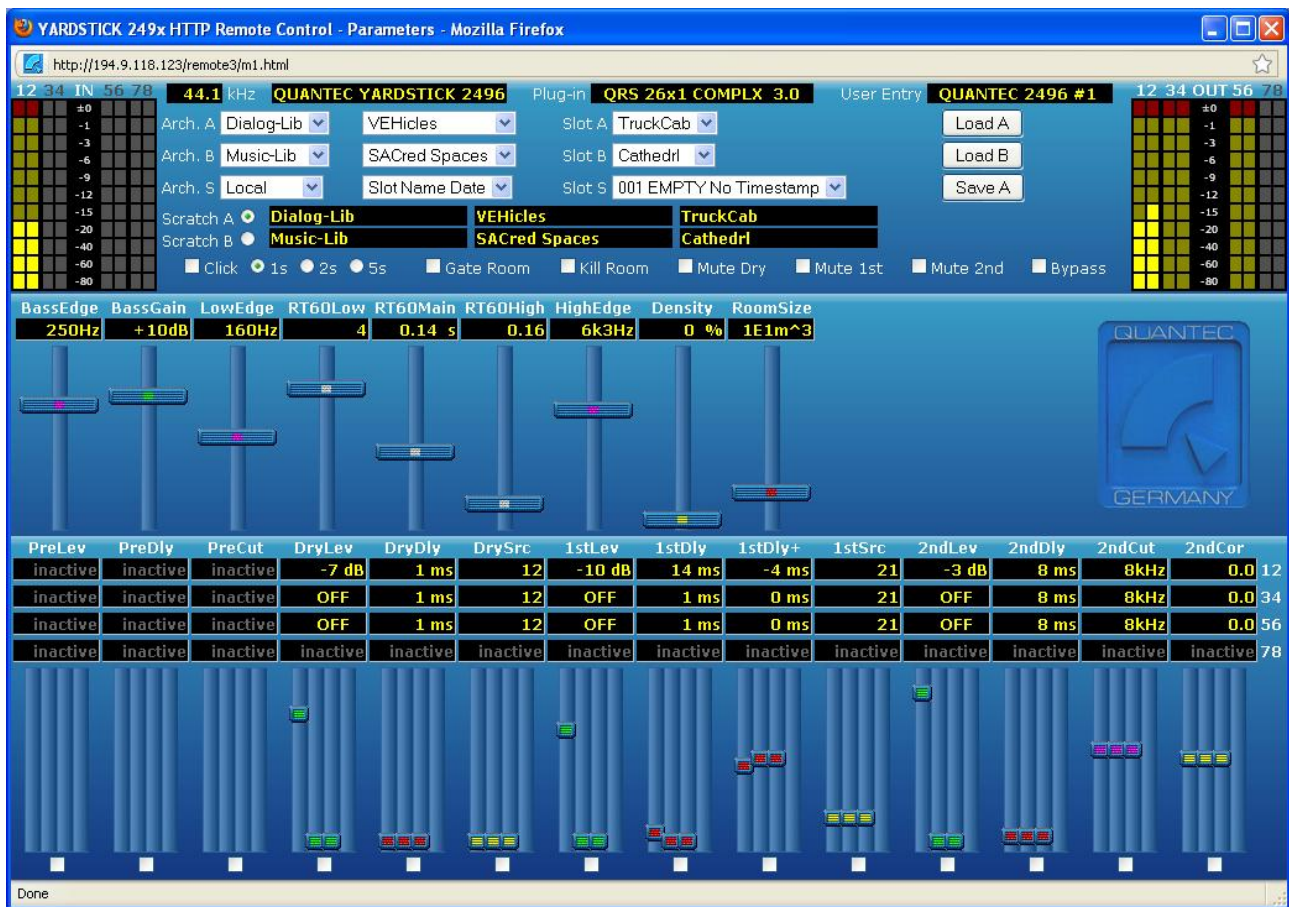
Customers with access to a DNS server may assign a plain text name to this IP number. This allows for entering a meaningful name into the browser's address field, instead of a number. After confirming the entry, the browser establishes connection with the YARDSTICK, and the following splash screen will be displayed:



Use the **Parameter Panel** link for operating a YARDSTICK from the web browser. Use **Software Update** to install additional plug-ins, or to delete obsolete ones. Both links open new windows – if necessary, you need to enable that in your browser.

## YARDSTICK Parameters

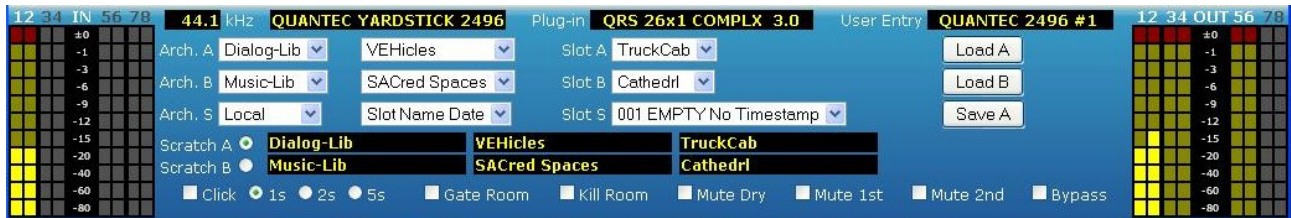
A browser window will be opened, which represents a summary of all parameters available from the plug-in of the currently attached YARDSTICK unit. The graphical layout is identical for all QRS plug-ins. For various units, certain elements are grayed out and inactive, whenever not available due to hardware restrictions.





## Status, Hotkeys, and Presets

The topmost window pane covers all status information, Hotkeys, and administration of the Presets.



All input bargraphs are on the left; all output bargraphs on the right. If any inputs or outputs are not available, they are grayed out.

The topmost row displays status information about sample rate, device type, active plug-in, and the text string from the **User Entry** field (see p. 108). This string acts as an identification, and should be individually assigned to each unit. This ID helps to select an individual unit from a bunch of similar ones.

From rows 2 and 3, the Preset sources for Scratch A and B may be selected with drop-down menus, and then transferred to the appropriate Scratch buffers by hitting the **Load A** and **Load B** buttons.

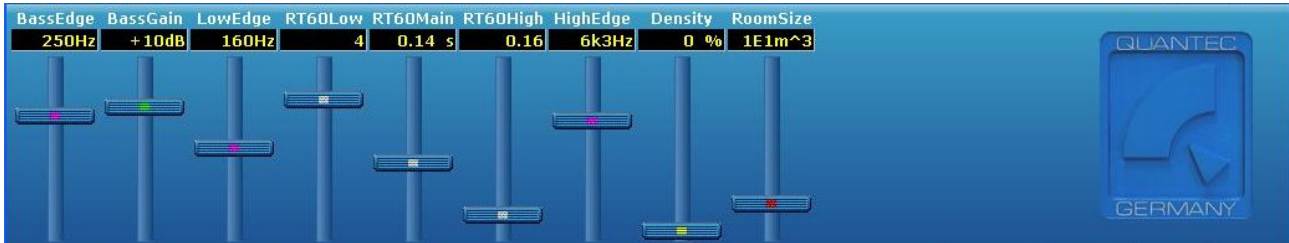
From row 4, a target position may be preselected for depositing the contents of Scratch A to an archive. Hitting the **Save A** button triggers the final transfer.

From rows 5 and 6, either Scratch A or Scratch B may be selected for monitoring. These two rows also visualize the original source paths of the two Scratch Presets.

Row 7 represents a collection of Hotkeys.

## Room Parameters

The center window pane covers all room parameters.



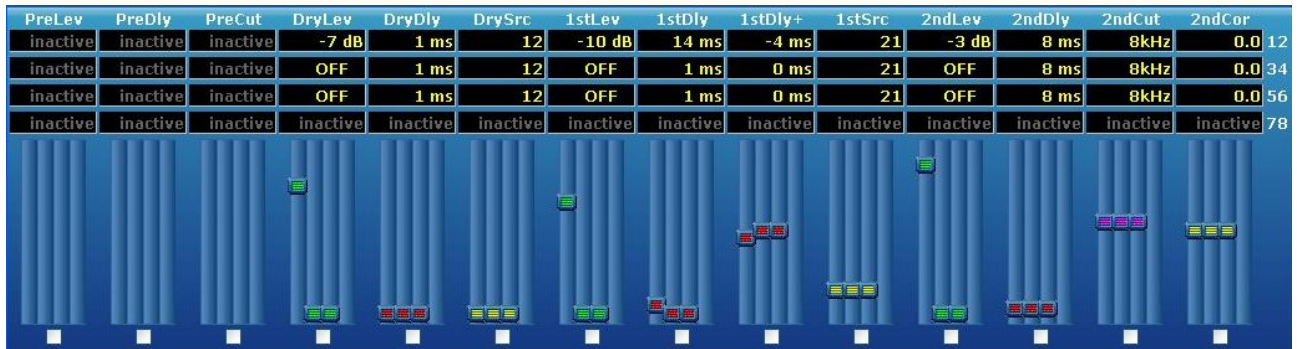
The topmost row displays parameter names; while the second row displays parameter values.

Below the text fields are the sliders, which can be moved by mouse actions. One can change a value either by clicking and dragging the slider button, or, while the mouse cursor has been positioned anywhere on the slider track, by rotating the mouse wheel.

When modified, a parameter value will instantly be transmitted to the unit, and while underway, will be displayed grayed out. As soon as the confirmation from the unit has dropped in, the display turns yellow again. For short Ping times, the gray interval may hardly be noticed at all.

## Input and Output channels

The bottom window pane incorporates all parameters which are assigned to any of the unit's input or output channels.



The topmost row displays parameter names; while rows 2 to 5 display the parameter values of the various input and output channel pairs.

Below the text fields are the sliders, which can be moved by mouse actions. One can change a value either by clicking and dragging the slider button, or, while the mouse cursor has been positioned anywhere on the slider track, by rotating the mouse wheel.

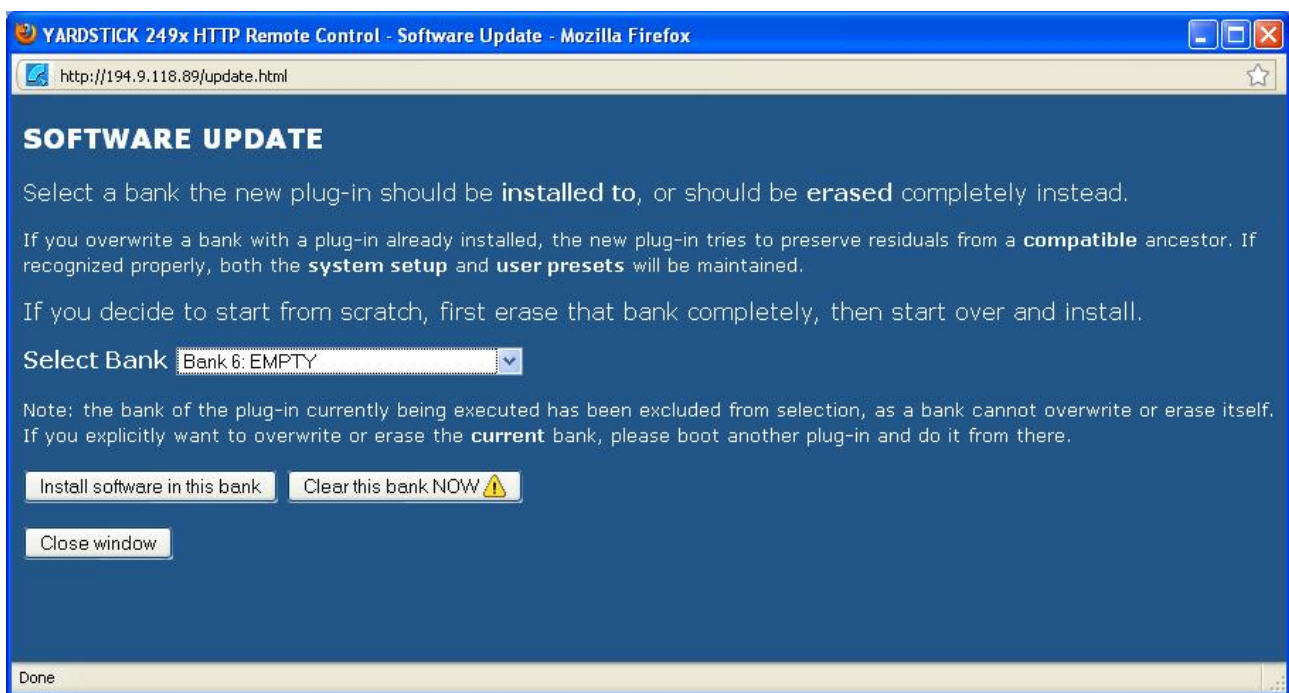
With the bottom row tick boxes, one may establish links between more than two channels. Whenever a tick box has been activated, all parameters under that name will be modified simultaneously. After a newly dropped tick, all sliders jump into lockstep immediately after the first modification; and will stay in lockstep up to a later deactivation.

Any parameters not available on this unit or plug-in are being displayed without slider knob, and with a gray **inactive** in the parameter value field(s).

## Software Updates

A browser window will be opened, which allows to install a new plug-in into a bank, or to delete a plug-in from a bank. This installing method differs fundamentally from the previous approach of temporarily attaching a unit to a PC with an RS-232 serial port. First, a serial port is no longer needed on the PC, second, the update software is now independent of the PC operating system, and third, the installation process is much, much faster now.

As the installation will be controlled from a currently running plug-in, there is no way of directly overwriting this active plug-in. Any other bank on the unit may be accessed for installing or deleting. If a need arises to erase or overwrite this currently active plug-in, just boot another one and do the job from there.



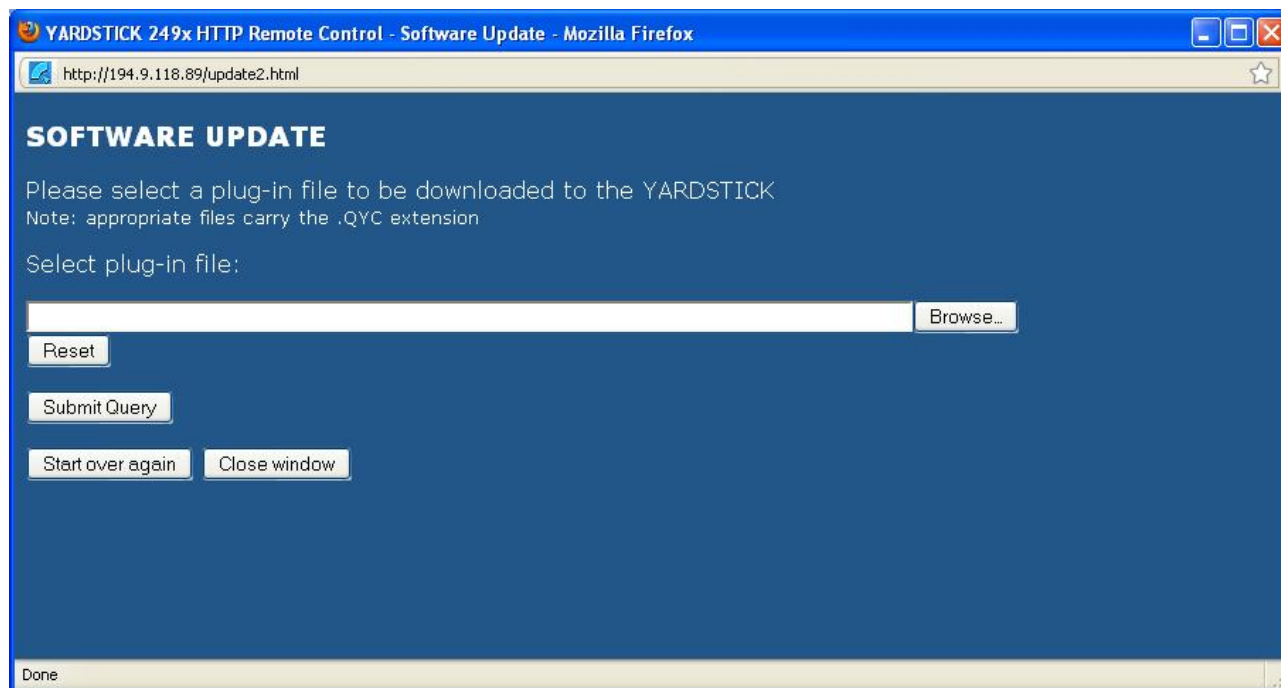
From **Select Bank** a target bank may be selected from a drop-down menu. To facilitate navigation, the bank numbers are complemented by names and version numbers of all plug-ins already installed. When opening this browser window, the topmost unused bank will be preassigned. If there is no empty bank left, the 1<sup>st</sup> or 2<sup>nd</sup> bank will be preassigned – depending on the currently active bank. Which means the bank *not currently blocked* by the actively running plug-in.

An empty bank will be assigned **EMPTY**. This does not necessarily mean that this bank is totally blank, i.e. that there are no residual data at all. **EMPTY** just means that in this bank, no valid installation is being recognized. There may well be residuals from an aborted installation, or Preset residuals from an abandoned plug-in.

The active bank is the one the currently running plug-in has been booted from. It will be displayed gray in the drop-down menu, which means it cannot be selected for overwriting.

By hitting the **Clear this bank NOW!** button, a new window will pop up, and the selected bank will be erased without further inquiry! Get more information from the **Clear Bank** section on p. 56.

By hitting the **Install software in this bank** button, a form will pop up to either enable entering a file name, or select any one from the files available.



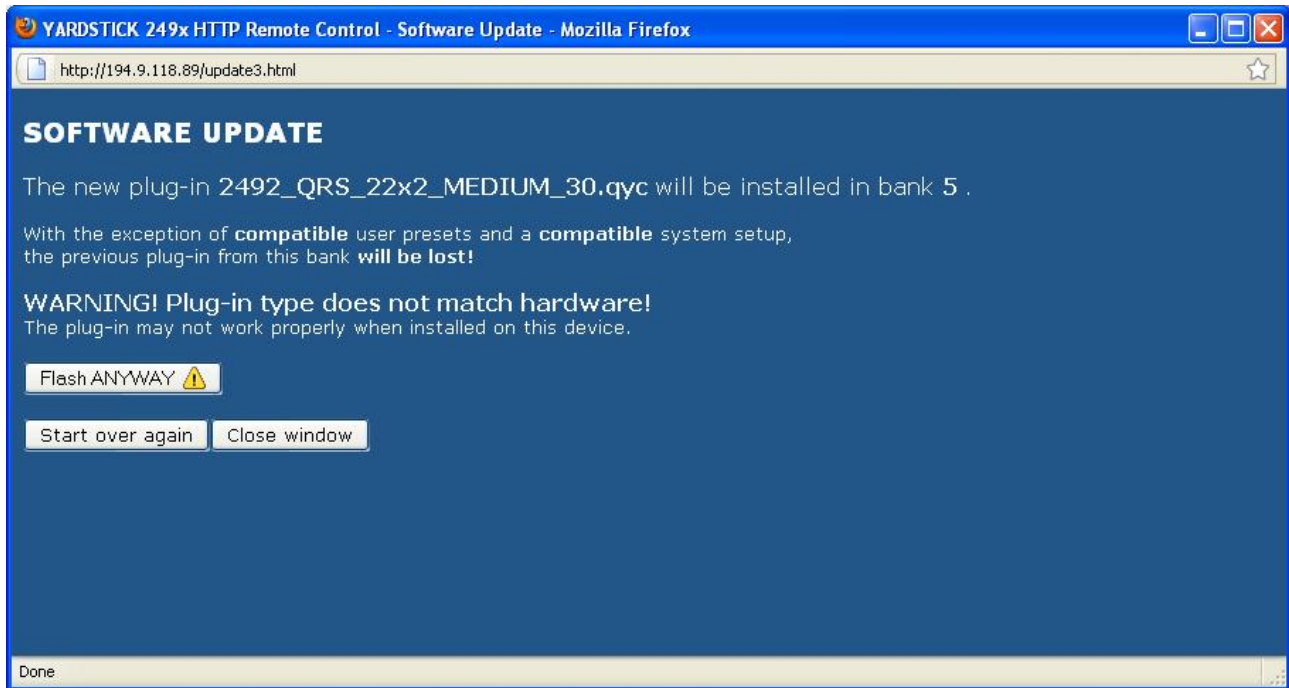
By hitting the **Browse** and **Reset** buttons, one may select a file for installation, or cancel the selection. The procedure may differ slightly according to browser type or operating system. The file to be selected requires a .QYC extension. Files for the various plug-ins may be downloaded from <http://www.quantec.de/download/index.shtml#firmware24xx>

CAUTION! Renaming files may lead to problems while installing them!

Hitting **Submit Query** confirms a selection, and starts the upload of the file to the unit. Note that this is just the upload, not the final installation. From a LAN, an upload should not take more than a few seconds. Around the globe, one may expect a minute or two.

**Note:** According to the language of the operating system and the web browser used, the labeling of the buttons may differ considerably. If in doubt, you can try to get a clue from the *position* of the button in question.

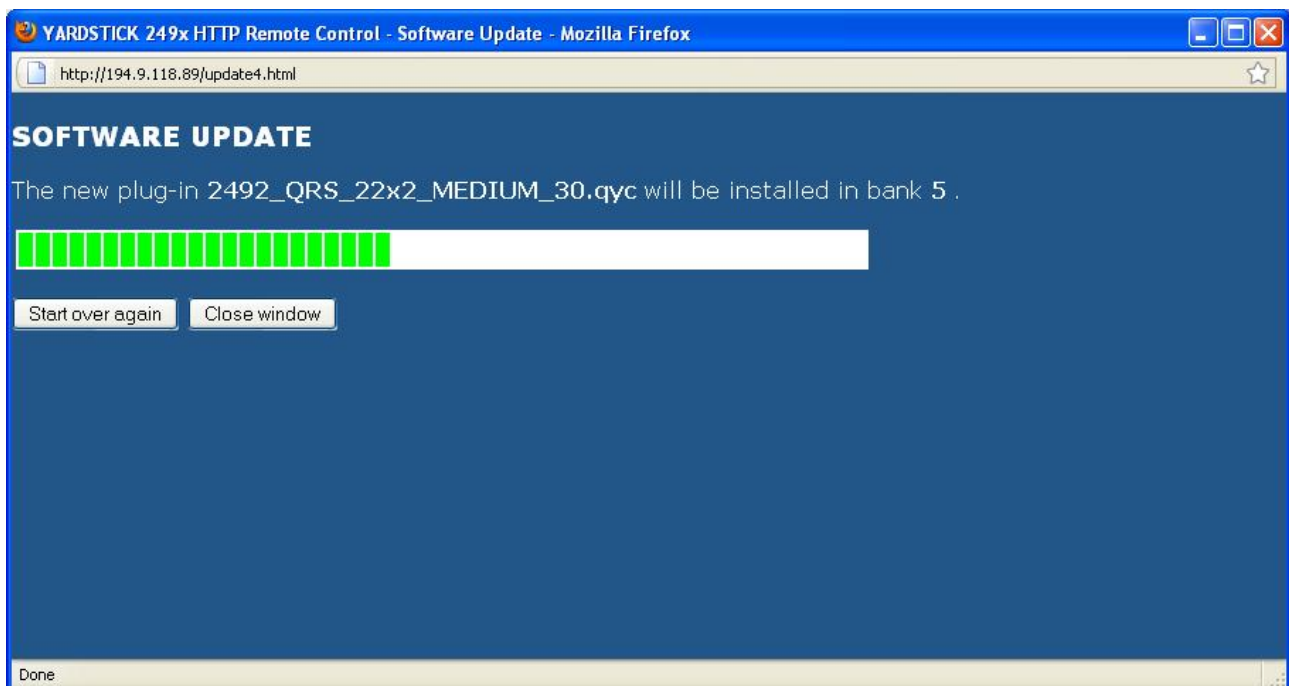
Before the plug-in will be ultimately installed, there is a final prompt for confirmation:



If a consistent plug-in cannot be located within the target bank, e.g. because it has been explicitly erased before, the top warning will be suppressed.

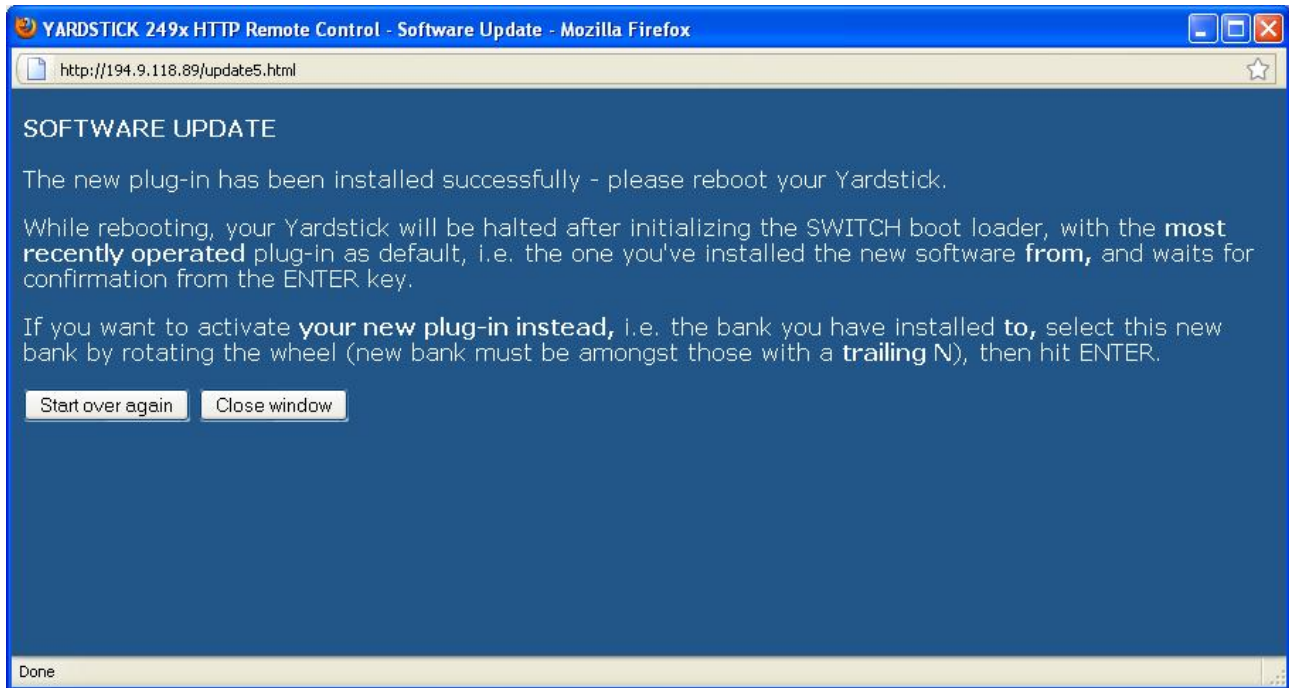
All information about the unit and the plug-in will be checked for plausibility. If both match, the bottom warning will be suppressed.

By hitting the **Flash NOW!** or **Flash ANYWAY!** button respectively, the installation of the plug-in will finally start up running. A green bar will indicate progress:





A successful installation will be confirmed by the following page:

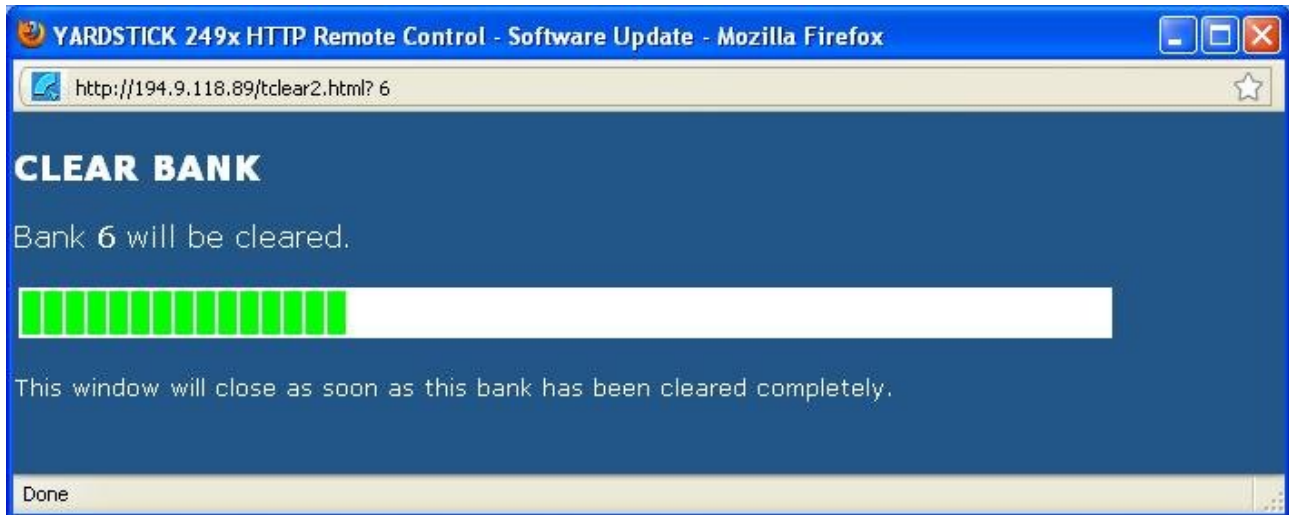


Whenever required, hitting **Start over again** would initialize an new sequence, which permits installing another plug-in to any of the banks. Otherwise, the installation procedure may be terminated by hitting **Close window**

## Clear Bank

From within the **Software Update** browser window, hitting the **Clear this bank NOW!** button initializes a complete erasure of the entire contents of a bank. Sometimes it makes sense to deliberately strip off any debris, in order to prevent an accidentally compatible plug-in to include or revive Presets or other residuals from long-forgotten installations.

A new window will pop up:



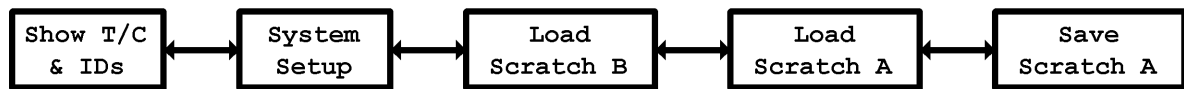
A green bar will indicate the progress of erasure. When finished, the window will close automatically.



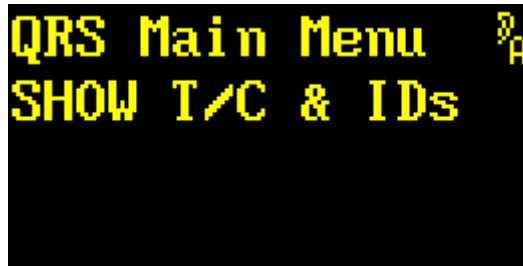
# Menu structure

Menus are ordered into 6 main menus each having associated menu items. In addition, there is the **Hotkey Menu**. All main menus are shown below:

2492, 2496, and 2498:



All main menus are similarly displayed. The first line shows the plug-in name, followed by the string **Main Menu**, an icon of an ear, and the selected Scratch preset (A or B). The stylized ear with the A or B character indicates which Scratch is being audible at the moment. The second line displays the name of the **Main Menu** selected.



<b>Wheel</b> ➔	Next main menu item
<b>Wheel</b> ⬅	Previous main menu item (Full stop)
<b>Exit</b>	(not assigned)
<b>Enter</b>	Selects main menu item <b>Show T/C &amp; IDs</b>
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

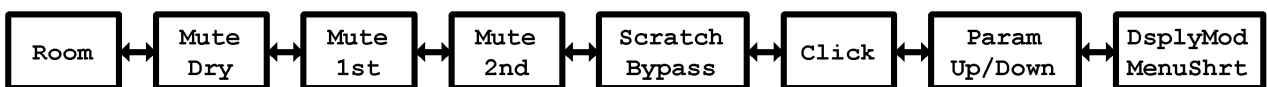
Rotating ⬅ and ➔ pages through the main menus.

**ENTER** confirms the selection.

**TOGGLE** jumps to the **Hotkey Menu**, unless a local function is defined.

# Hotkey Menu

The **Hotkey Menu** is an additional menu sequence that can be accessed from almost all menus and menu items using the **TOGGLE** keys – unless **TOGGLE** is assigned to specific local function. The **Hotkey Menu** forms a group of the most-often-used functions, and also serves as normal input for units lacking the Overview display keys.



A **Hotkey Menu** is easily noticed as it partially hides the menu from which it was called.



Wheel →	Next hotkey item
Wheel ←	Previous hotkey item
Exit	Function depends on menu item
Enter	Function depends on menu item
Toggle	Exit the <b>Hotkey Menu</b>

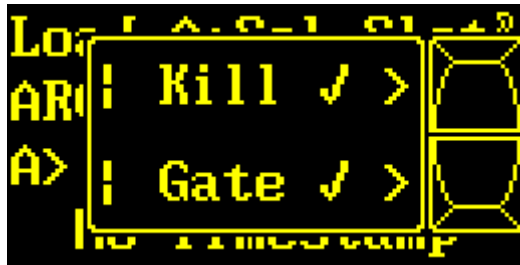
Rotating ← and → scrolls through the hotkey menus. The **Hotkey Menu** list can be traversed in both directions when the symbols < and > are visible. When the start or end point of the menu list has been reached, a | symbol appears indicating a full stop.

Each menu item displays two functions. The **EXIT** key is associated to the top function, the **ENTER** key to the lower one.

**TOGGLE** exits the **Hotkey Menu** and the displays returns to the last active menu.

# Room

This menu item gives access to functions **GATE** and **KILL**. These functions are mainly, but not necessarily, used in the *freeze room* setting.



<b>Wheel</b> →	Next hotkey item
<b>Wheel</b> ←	Previous hotkey item (Full stop)
<b>Exit</b>	Enable/Disable <b>Kill</b>
<b>Enter</b>	Enable/Disable <b>Gate</b>
<b>Toggle</b>	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey menus*.

**EXIT** enables or disables **KILL**. A checkmark indicates **KILL** is enabled.

**KILL** halts the reverberation output from the reverb room.

**ENTER** enables or disables **GATE**. A checkmark indicates **GATE** is enabled.

**GATE** stops the direct signal from entering the reverberation room.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last active menu.

**Note:** The *Density* parameter also applies to the freeze room. **Gate** will be automatically activated when entering the Freeze room, and deactivated when leaving it.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

# Mute Dry

This menu item is used to mute the *dry* or *all* signal paths.



<b>Wheel</b> →	Next hotkey item
<b>Wheel</b> ←	Previous hotkey item
<b>Exit</b>	Enable/Disable <b>Mute Dry</b>
<b>Enter</b>	Enable/Disable <b>Mute All</b>
<b>Toggle</b>	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** enables or disables **Mute Dry**. A checkmark in the center row indicates **Mute Dry** is enabled.

**ENTER** mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again resets the outputs to their previous settings.

**Note:** Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous 3 parameters. These will have to be individually re-enabled.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last viewed menu.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

# Mute 1st

This menu item is used to mute the *first* or *all* signal paths.



<b>Wheel</b> →	Next hotkey item
<b>Wheel</b> ←	Previous hotkey item
<b>Exit</b>	Enable/Disable <b>Mute 1st</b>
<b>Enter</b>	Enable/Disable <b>Mute All</b>
<b>Toggle</b>	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** enables or disables **Mute 1st**. A checkmark in the center row indicates **Mute 1st** is enabled.

**ENTER** mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again resets the outputs to their previous setting.

**Note:** Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous 3 parameters. These will have to be individually re-enabled.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last viewed menu.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

## Mute 2nd

This menu item is used to mute the *second* or *all* signal paths.



<b>Wheel</b> →	Next hotkey item
<b>Wheel</b> ←	Previous hotkey item
<b>Exit</b>	Enable/Disable <b>Mute 2nd</b>
<b>Enter</b>	Enable/Disable <b>Mute All</b>
<b>Toggle</b>	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** enables or disables **Mute 2nd**. A checkmark in the center row indicates **Mute 2nd** is enabled.

**ENTER** mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again resets the outputs to their previous setting.

**Note:** Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous 3 parameters. These will have to be individually re-enabled.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last viewed menu.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

# Scratch and Bypass

This menu item gives access to functions *Scratch* and *Bypass*. Function *Scratch* toggles between Scratch presets A or B. Function *Bypass* routes the input signal directly to the output



Wheel →	Next hotkey item
Wheel ←	Previous hotkey item
Exit	Toggle between <b>Scratch</b> A and <b>Scratch</b> B
Enter	Enable/Disable <b>Bypass</b>
Toggle	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** toggles between *SCRATCH A* and *SCRATCH B*.

**ENTER** enables or disables function *Bypass*. A checkmark indicates **Bypass** is enabled. In *Bypass* mode, the various devices act as follows:

2492: The input pair will be forwarded 1:1 to the output pair.

2496: The input pair will be forwarded to all output pairs.

2498: In operation mode 2->8, the SYNC12 input pair will be forwarded to the OUT12 output pair; OUT34, OUT56, and OUT78 will all be muted.

2498: In operation mode 8->8, the IN12 input pair will be forwarded to the OUT12 output pair. IN34 goes to OUT34, IN56 to OUT56, and IN78 to OUT78.

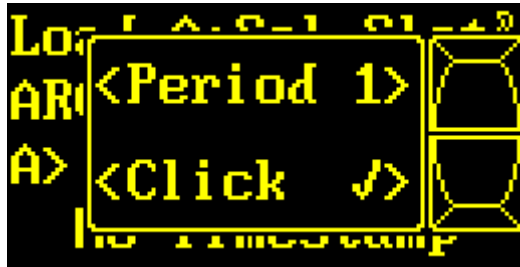
**Note:** All Bypass modes are forwarding their input signal bit by bit and as fast as possible to the corresponding output(s). As all sound effect algorithms induce some latency, turning Bypass on and off will cause audible phase jumps. As an alternative, a sound effect may be muted by activating either the Gate or Mute2nd button. As all Mutes provide a soft crossfade, any audible clicks will be avoided.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.



# Click Generator

This menu item allows *turning on and off a click test generator* and *to adjust its repetition rate*.



Wheel →	Next hotkey item
Wheel ←	Previous hotkey item
Exit	Change repetition rate
Enter	Enable/Disable click generator
Toggle	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** steps between repetition rates of **1**, **2**, or **5** seconds.

**ENTER** turns the click generator on or off. A checkmark ✓ indicates that the generator is enabled.

While the pulse generator is enabled, *all* input channels are driven by a 0dB full-level pulse of 56 to 78µs width. Any regular audio payload will be temporarily displaced. The exact pulse width depends on the current sample rate:

- 38,5kHz .. 54kHz: 3 samples
- 77kHz .. 108kHz: 6 samples
- 154kHz .. 216kHz: 12 samples

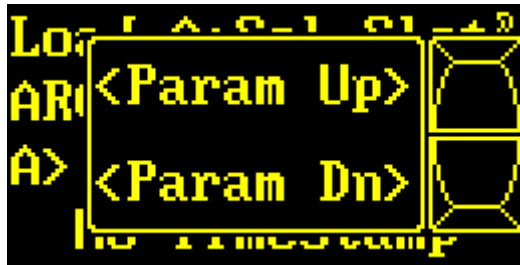
**Note:** As useful as an A/B comparison with the **Bypass** function, it likewise makes sense to occasionally verify the characteristics of the current room by stimulating it with a click. That's why both functions have been placed side by side

**Note:** A listening test with a click signal may also come in handy for becoming acquainted with the impact of the various frequency-dependent RT60 filter parameters on room characteristics.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

## Parameter Up/Down

Depending on the unit or display mode, not all parameters can be shown in *one* overview display. In this case, this menu is used to page through multiple overview displays.



<b>Wheel</b> →	Next hotkey item
<b>Wheel</b> ←	Previous hotkey item
<b>Exit</b>	Page forward to the next overview display
<b>Enter</b>	Page backward to the previous overview display
<b>Toggle</b>	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** displays the next overview display.

**ENTER** displays the previous overview display.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last viewed menu.

**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive but vital in order to distinguish them from the **TOGGLE** operation.

# Display Mode and Menu Shortcut

This menu item gives access to functions *Display Mode* and *Menu Shortcut*.



Wheel →	Next hotkey item (Full stop)
Wheel ←	Previous hotkey item
Exit	Select <b>DsplyMod</b>
Enter	Swap menus
Toggle	Exit the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the *hotkey* menus.

**EXIT** selects one of various overview display presentation modes described on p. 36.

**ENTER** directly jumps, through one of the menu shortcuts, to a previously selected distant menu position. The selected menu appears in the back display portion.

There are 4 menu shortcuts. After initial Software installation, the default menus point to important main menu entry points. Using a shortcut allows normal navigation through the entire menu. Should one use another shortcut, the present shortcut's menu position is being parked for a subsequent return.

**TOGGLE** exits the **Hotkey Menu** and the display returns to the last viewed or **MenuShrt** selected menu.

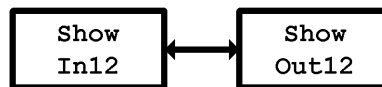
**Note:** Keys **XIT** and **ENT** react only upon release. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.



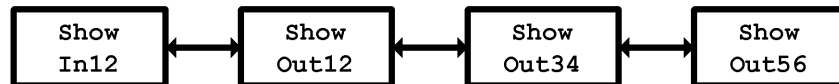
# Show T/C & ID

This main menu item is used to access *Timecode* data, and *origin and destination IDs* of the audio input and output channels. Depending on the unit, different menu items are available:

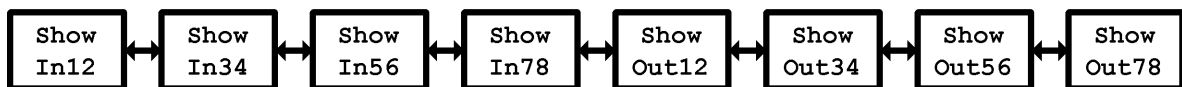
2492:



2496:

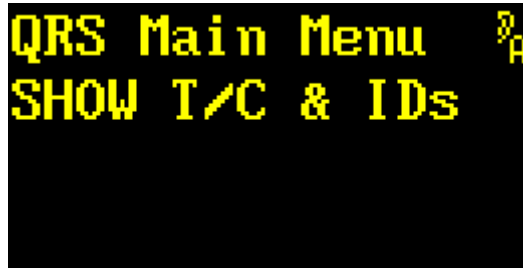


2498:



Since the menu items are build up identically for all inputs and outputs, only **Show In12** and **Show Out12** will be explained.

This main menu item appears as follows:



<b>Wheel</b>	<b>→</b>	Next main menu item
<b>Wheel</b>	<b>←</b>	Previous main menu item (Full stop)
<b>Exit</b>		(not assigned)
<b>Enter</b>		Selects main menu item <b>Show TCOD In 1+2</b>
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

## Show In12

This menu item is used to display *timecode data* and the *origin and destination IDs* of the AES3 inputs. Certain units have more than one input, but their structures are identical.



```

Show IN1+2 ClkM
O:0000 D:0000
LSA: 00:00:00:00
TOD: 00:00:00:00
  
```

<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item (Full stop)
<b>Exit</b>	Go to main menu item <b>Show T/C &amp; ID</b>
<b>Enter</b>	(not assigned)
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The first line displays the input channel number, and potentially **ClkM** (»Clock Master«), which reminds here that this input supplies the master clock.

The second line shows the 4-byte **Origin ID** after the **O:**, and **Destination ID** after the **D:**. In this example, the inverted "0"s indicate that no ID is set.

The third line shows the **Local Sample Address** using the format **HH:MM:SS:FF** (hours, minutes, seconds, and frames).

The fourth line shows the **Time Of Day** using the format **HH:MM:SS:FF** (hours, minutes, seconds, and frames).

Rotating ← and → selects the next or previous AES3 interface.

**EXIT** returns to main menu item **Show T/C & ID**.

**Note:** As there are 2 channels (left/right), the display alternates between channels every second.

## Show Out12

This menu item is used to display *timecode data* and the *origin and destination IDs* of the AES3 outputs. Certain units have more than one input, but their structures are identical.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item (Full stop)
<b>Exit</b>	Go to main menu item <b>Show T/C &amp; ID</b>
<b>Enter</b>	(not assigned)
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The first line displays the output channel number.

The second line shows the 4-byte **Origin ID** after the **O:**, and **Destination ID** after the **D:**. In this example, the inverted "0"s indicate that no ID is set.

The third line shows the **Local Sample Address** using the format **HH:MM:SS:FF** (hours, minutes, seconds, and frames).

The fourth line shows the **Time Of Day** using the format **HH:MM:SS:FF** (hours, minutes, seconds, and frames).

Rotating ← and → selects the next AES3 interface.

**EXIT** returns to main menu item **Show T/C & ID**.

**Note:** As there are 2 channels (left/right), the display alternates between channels every second.



# System Setup

All system setup settings are grouped into menus under **System Setup**. These menus have been grouped into the following menu groups:

**2492, 2496:**

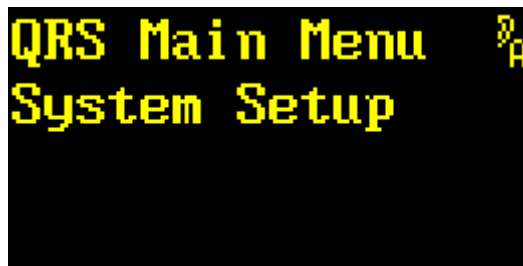


**2498:**



The items specific to each menu group are tabulated on p. 75.

This main menu item appears as follows:



<b>Wheel</b>	<b>→</b>	Next main menu item
<b>Wheel</b>	<b>←</b>	Previous main menu item
<b>Exit</b>		(not assigned)
<b>Enter</b>		Go to menu group <b>Effect</b>
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

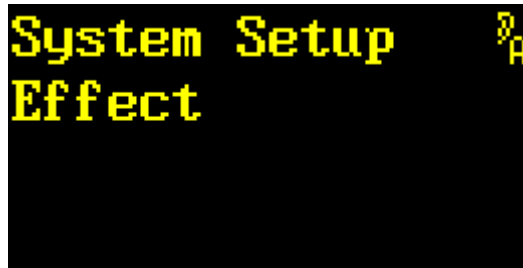
Rotating **←** and **→** scrolls through the main menus.

**ENTER** selects main menu item **System Setup**.

**TOGGLE** jumps to the **Hotkey Menu**.

# Menu Groups

This section describes the *menu groups* under System Setup. The first one is called **Effect**.



<b>Wheel</b> →	Next menu group item
<b>Wheel</b> ←	Previous menu group item (Full stop)
<b>Exit</b>	Return to main menu item <b>System Setup</b>
<b>Enter</b>	Go to menu group <b>Effect</b>
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

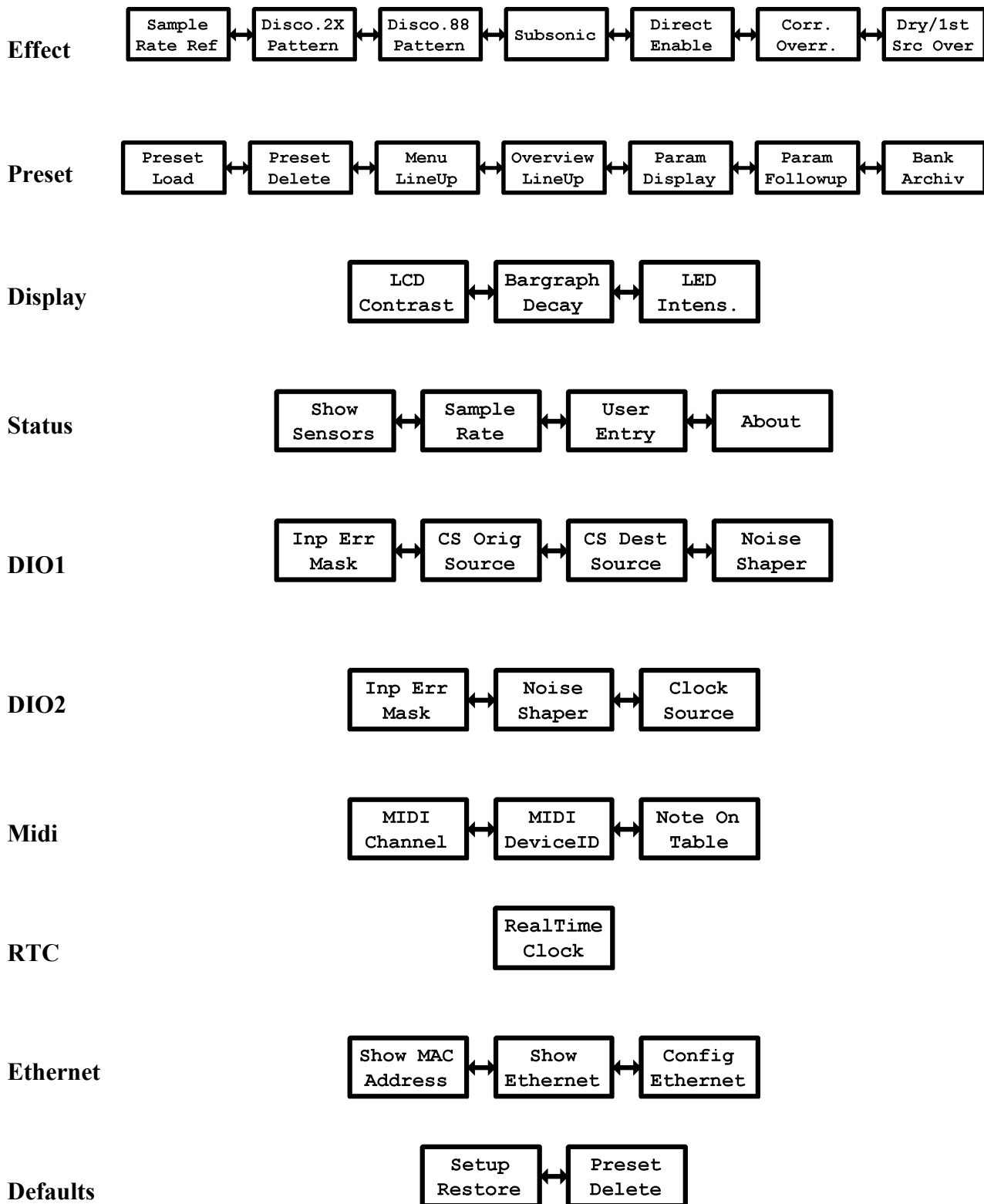
Rotating ← and → scrolls through the *menu group* items.

**EXIT** returns to the main menu.

**ENTER** jumps to selected menu group.

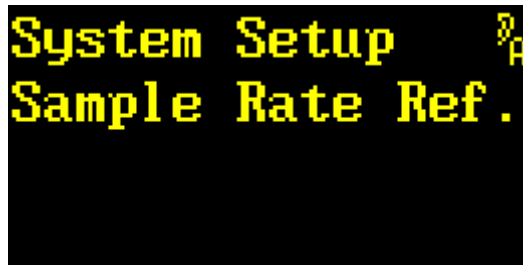
**TOGGLE** jumps to the **Hotkey Menu**.

The menu groups are composed of the following items:



# Sample Rate Reference

This menu item sets the reference, or equivalently, the *nominal sample rate*. This parameter is described on p. 23 in section **Effect Setup Parameters**.



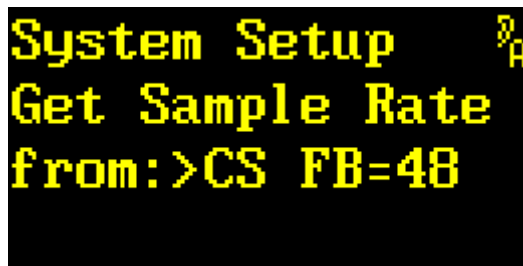
<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Select the sample rate source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the menu group items.

**EXIT** returns to the menu groups.

**ENTER** goes to the next menu to select the sample rate source.

**TOGGLE** jumps to the **Hotkey Menu**.



<b>Wheel →</b>	Next source
<b>Wheel ←</b>	Previous source
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating **←** and **→** steps through all sample rate choices:

<b>FIX 44.1</b>	Always lock to one of the standard rates of 44.1 kHz, 88.2 kHz, or 176.4 kHz. Measurement determines which of the 3 is used.
<b>FIX 48</b>	Always lock to one of the standard rates of 48 kHz, 96 kHz, or 192 kHz. Measurement determines which of the 3 is used.
<b>CS FB=FIX 44.1</b>	Use the input <i>Channel Status data</i> to determine the sample rate. When more than one input is present, then the <i>input clock</i> rate is used. Should this rate differ from the measured one, the sample rate falls back to <b>FIX 44.1</b> .
<b>CS FB=FIX 48</b>	Use the input <i>Channel Status data</i> to determine the sample rate. When more than one input is present, then the <i>input clock</i> rate is used. Should this rate differ from the measured one, the sample rate falls back to <b>FIX 48</b> .
<b>CS FB=MEAS</b>	Use the input <i>Channel Status data</i> to determine the sample rate. When more than one input is present, then the <i>input clock</i> rate is used. Should this rate differs from the measured one, the sample rate falls back to measured one. <b>WARNING:</b> Using <i>Varispeed</i> may cause ambiguity problems.
<b>MEASURE</b>	The sample rate is set to the measured input sample rate. When more than one input is present, then the <i>input clock</i> rate is used. <b>WARNING:</b> Using <i>Varispeed</i> may cause ambiguity problems.

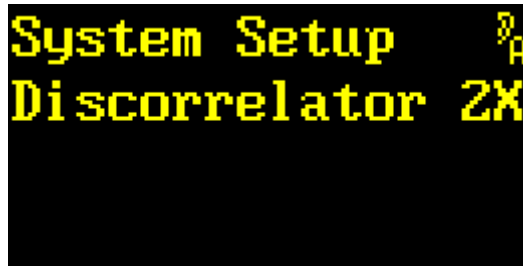
**EXIT** cancels the modified value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

# Discorrelator Pattern 2X

This menu item is used to set the *discorrelator* pattern for the reverberation chamber outputs. This selection is only valid for plug-ins with 2 inputs. For the 2498, this means: valid for its 2->8 mode only. This parameter is defined and discussed on p. 22 in section **Effect Setup Parameters**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Set the output discorrelator pattern
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

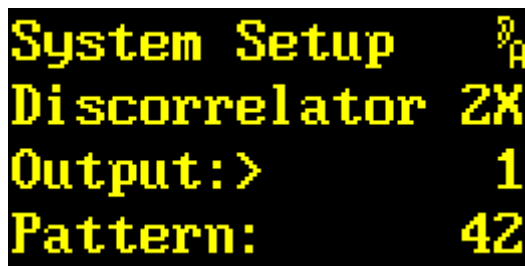
Rotating ← and → scrolls through the menu group items.

**EXIT** return to the menu groups.

**TOGGLE** jumps to the **Hotkey Menu**.

**ENTER** go on to set the discorrelator pattern for the output

At this point a prompt appears after **Output** – which can now be selected:



```
System Setup      %A
Discorrelator 2X
Output:>          1
Pattern:         42
```

<b>Wheel</b> →	Next outputs
<b>Wheel</b> ←	Previous outputs
<b>Exit</b>	Exit selection
<b>Enter</b>	Confirm selection
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → selects an output (**2492: 1 to 2**, **2496: 1 to 6**, **2498: 1 to 8**).

**EXIT** exits selection.

**ENTER** confirms the selected value.

**ENTER** confirms the selection and moves the cursor to the pattern selection.

**TOGGLE** jumps to the **Hotkey Menu**.



At this point a prompt appears after **Pattern** – which can now be modified:

```

System Setup      %A
Discorrelator 2X
Output:          8
Pattern:>        OFF
  
```

<b>Wheel</b> →	Next pattern
<b>Wheel</b> ←	Previous pattern
<b>Exit</b>	Cancel pattern
<b>Enter</b>	Confirm pattern
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → selects a pattern from a list. The size and numbering of a pattern list depends on the plug-in type. The numbering may be discontinuous due to the internal structures of the room models, but this is irrelevant to the user. There is an additional **OFF** pattern, which will be used to mute an unused output.

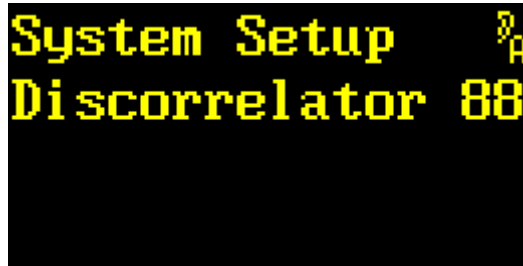
**EXIT** cancels a modified pattern and returns to the output selection.

**ENTER** confirms a modified pattern and returns to the output selection.

**TOGGLE** jumps to the **Hotkey Menu**.

## Discorrelator Pattern 88

This menu item is used to set the *discorrelator* pattern for the reverberation chamber outputs. This selection is only valid for 2498 plug-ins in 8->8 mode. This parameter is defined and discussed on p. 22 in section **Effect Setup Parameters**.



<b>Wheel</b> ➔	Next menu item
<b>Wheel</b> ⬅	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Set the output discorrelator pattern
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

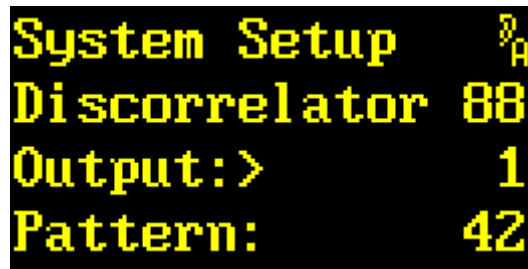
Rotating ⬅ and ➔ scrolls through the menu group items.

**EXIT** return to the menu groups.

**TOGGLE** jumps to the **Hotkey Menu**.

**ENTER** go on to set the discorrelator pattern for the output

At this point a prompt appears after **Output** – which can now be selected:



```

System Setup      2A
Discorrelator 88
Output:>          1
Pattern:         42
  
```

<b>Wheel</b> →	Next outputs
<b>Wheel</b> ←	Previous outputs
<b>Exit</b>	Exit selection
<b>Enter</b>	Confirm selection
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → selects one of the 8 outputs ( **2498: 1 to 8**).

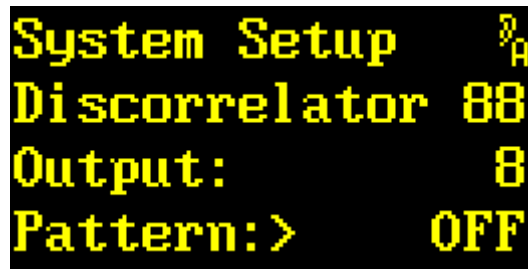
**EXIT** exits selection.

**ENTER** confirms the selected value.

**ENTER** confirms the selection and moves the cursor to the pattern selection.

**TOGGLE** jumps to the **Hotkey Menu**.

At this point a prompt appears after **Pattern** – which can now be modified:



```
System Setup      %A
Discorrelator 88
Output:          8
Pattern:>        OFF
```

<b>Wheel</b> →	Next pattern
<b>Wheel</b> ←	Previous pattern
<b>Exit</b>	Cancel pattern
<b>Enter</b>	Confirm pattern
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → selects a pattern from a list. The size and numbering of a pattern list depends on the plug-in type. The numbering may be discontinuous due to the internal structures of the room models, but this is irrelevant to the user. There is an additional **OFF** pattern, which will be used to mute an unused output.

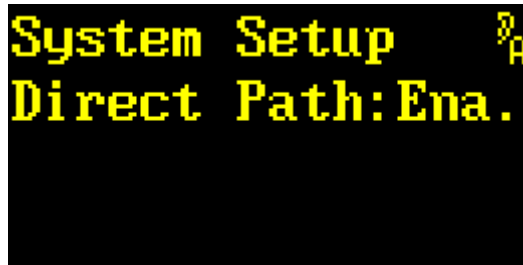
**EXIT** cancels a modified pattern and returns to the output selection.

**ENTER** confirms a modified pattern and returns to the output selection.

**TOGGLE** jumps to the **Hotkey Menu**.

# Direct Path Enable

This menu item *enables or disables the direct path*. This parameter is described on p. 23 in section **Effect Setup Parameters**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Jump to enable/disable direct path
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the menu group items.

**EXIT** returns to the menu groups.

Pressing **ENTER** makes a prompt appear, allowing the direct path to be set.

**TOGGLE** jumps to the **Hotkey Menu**.



<b>Wheel</b> →	Enable direct path
<b>Wheel</b> ←	Disable direct path
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles between enable (**Ena.**) and disable (**Dis.**) the direct (dry) path.

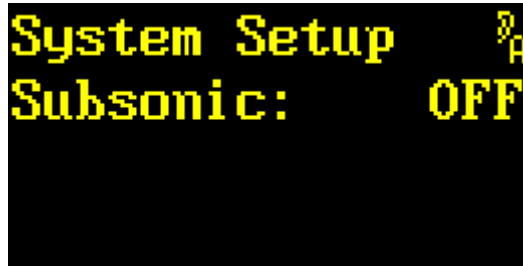
**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

# Subsonic

This menu item *allows or suppresses extra-low-frequency resonances* within the reverberation chamber. Arguments for enabling or disabling this type of resonances have been discussed on p. 23 in section **Effect Setup Parameters**.



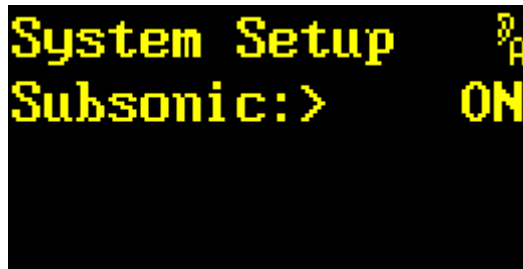
<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Jump to allow or suppress extra-low-frequency resonances
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the menu group items.

**EXIT** returns to the menu groups.

Pressing **ENTER** makes a prompt appear, allowing or suppressing extra-low-frequency resonances.

**TOGGLE** jumps to the **Hotkey Menu**.



<b>Wheel</b>	<b>→</b>	Allow extra-low-frequency resonances
<b>Wheel</b>	<b>←</b>	Suppress extra-low-frequency resonances
<b>Exit</b>		Cancel and restore the previous value
<b>Enter</b>		Confirm the new value
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

Rotating **→** and **←** toggles between allowing (**ON**) or suppressing (**OFF**) extra-low-frequency resonances.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

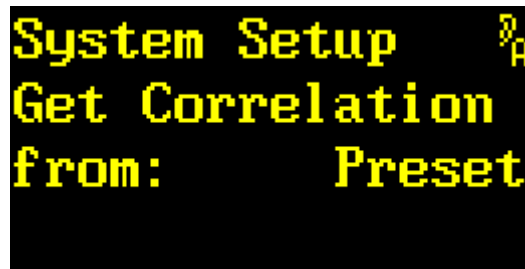
**TOGGLE** jumps to the **Hotkey Menu**.



# Override Correlation

This parameter has been introduced with version 2.0.

This menu item allows to temporarily displace the Preset value of the *Correlation* parameter. The idea behind this has been outlined on p. 24 under the **Effect Setup Parameters** section.



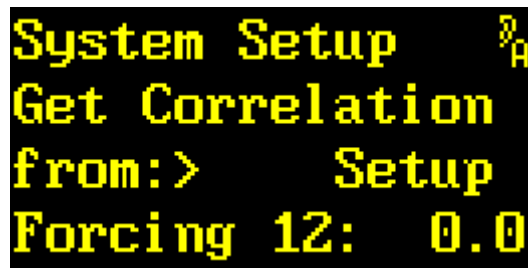
<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Modify setting
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the menu group items.

**EXIT** returns to the menu groups.

Pressing **ENTER** makes a prompt appear, allowing the setting to be changed.

**TOGGLE** jumps to the **Hotkey Menu**.



```

System Setup  %A
Get Correlation
from:>      Setup
Forcing 12: 0.0
  
```

<b>Wheel</b> →	Force Correlation from Setup
<b>Wheel</b> ←	Allow Correlation from Preset
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles between **Setup** and **Preset**.

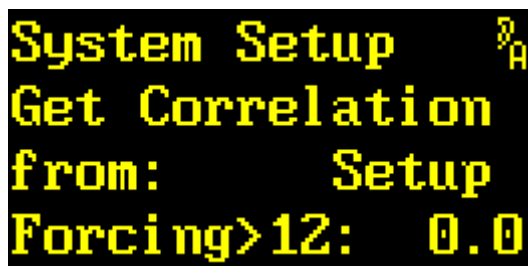
**Preset** is the standard setting and uses *Correlation* from the parameter.

**Setup** overrides the *Correlation* values from all Presets with a standard setting from Setup. The *Correlation* parameter will be grayed out, and may no longer be modified in **Edit Scratch A** by the toggle switches or a remote control. It's always the active one which will be displayed.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value. With **Preset** one resorts to the selection of the menu items, while **Setup** enables entering an individual override value for each output pair. For the 2492, one may immediately assign a correlation value, while for 2496 and 2498, the next step is selecting an output pair.

**TOGGLE** jumps to the **Hotkey Menu**.



```

System Setup  %A
Get Correlation
from:      Setup
Forcing>12: 0.0
  
```

<b>Wheel</b>	<b>→</b>	Select output pair
<b>Wheel</b>	<b>←</b>	Select output pair
<b>Exit</b>		Cancel selection
<b>Enter</b>		Confirm selection
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

Rotating **→** and **←** selects the output pair to be modified.

**ENTER** confirms the output pair and allows to pick and assign one of the correlation values.



```

System Setup  %A
Get Correlation
from:      Setup
Forcing 12:> 0.5
  
```

<b>Wheel</b>	<b>→</b>	Select new value
<b>Wheel</b>	<b>←</b>	Select new value
<b>Exit</b>		Cancel and restore the previous value
<b>Enter</b>		Confirm the new value
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

Rotating **←** and **→** sets the override value for *Correlation*.

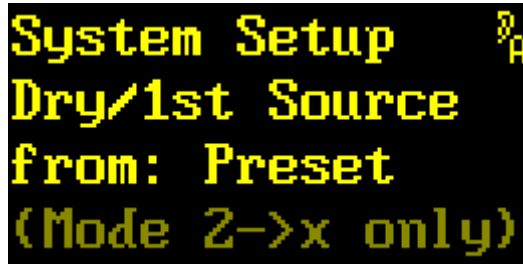
**EXIT** cancels the modified value and reloads the previous setting.

**ENTER** confirms the modified setting.

**TOGGLE** jumps to the **Hotkey Menu**.

## Override Dry/1st Source

This menu item allows to temporarily displace the Preset value of the *Dry Source* and *1st Source* parameters if operation mode 2->X is active. The idea behind this has been outlined on p. 24 under the **Effect Setup Parameters** section.



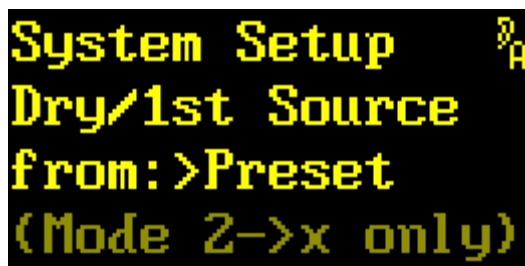
<b>Wheel</b> ➔	Next menu item
<b>Wheel</b> ⬅	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Modify setting
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ⬅ and ➔ scrolls through the menu group items.

**EXIT** returns to the menu groups.

Pressing **ENTER** makes a prompt appear, allowing the setting to be changed..

**TOGGLE** jumps to the **Hotkey Menu**.



System Setup 2/A  
 Dry/1st Source  
 from: >Preset  
 (Mode 2->x only)

<b>Wheel</b> →	Override source
<b>Wheel</b> ←	Don't override source
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← selects **Preset** or **Input12/21**

For the operation modes 2->X only, **Input12/21** forces all *Dry Source* and *1st Source* parameters to **12** or **21**. The Source parameters may still be edited, but all **34**, **56**, and **78** settings will be redirected to **12**. In the same way, all **43**, **65**, and **87** settings will be redirected to **21**. For the display, all redirected settings are preceded by a dim **12** or **21**. When writing to a preset, the brightly displayed original values will be used.

**Preset** *always* uses all settings from the preset.

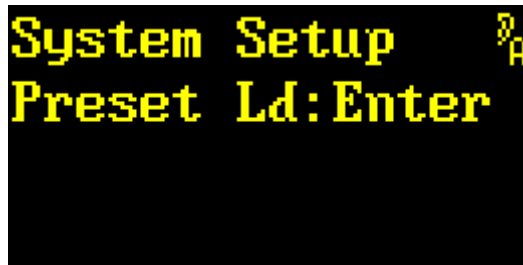
**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

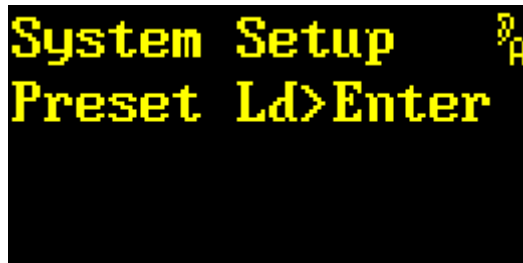
# Preset Load

This menu item is used to configure if *a confirmation step is required or not* to select a preset in menu items **Select Slot A** and **Select Slot B**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Change the configuration
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt indicating that the configuration can be modified.



<b>Wheel</b> →	Change configuration
<b>Wheel</b> ←	Change configuration
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm selection
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

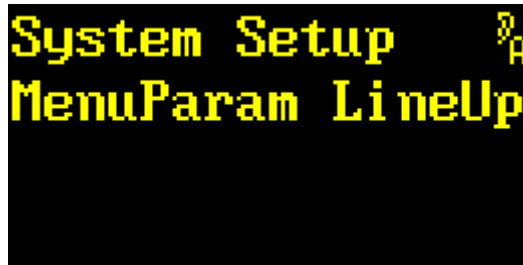
Rotating → and ← changes the number of steps required to change a preset in menu items **Select Slot A** (p. 142) and **Select Slot B** (p. 136). Selecting **Select** loads a preset immediately, whereas selecting **Enter** requires a confirmation with **ENTER** to load a preset.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

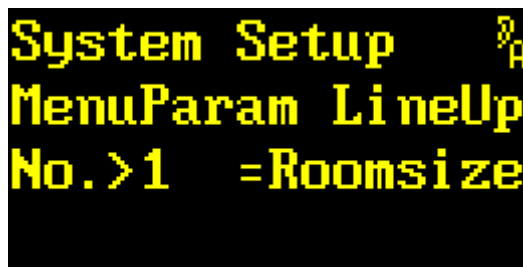
# Menu Parameter Line Up

This menu item is used to *change the order of the Menu parameter list* in main menu item **Edit Scratch A**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Edit parameter list
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** brings up a parameter which can now be relocated.



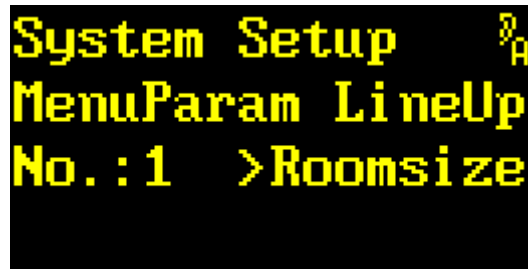
<b>Wheel</b> →	Next parameter position
<b>Wheel</b> ←	Previous parameter position
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Selects a parameter

Rotating → and ← scrolls through the parameter positions in the range of **1** to **64**.

**EXIT** cancels the modified value.

**ENTER** confirms the selected value.

Pressing **TOGGLE** moves the prompt to the parameter name which may now be changed.



<b>Wheel</b>	<b>→</b>	Next parameter
<b>Wheel</b>	<b>←</b>	Previous parameter
<b>Exit</b>		Cancel selection
<b>Enter</b>		Confirm the new value
<b>Toggle</b>		Select this parameter position

Rotating **→** and **←** scrolls through the parameter list. The parameters vary depending on the unit. The parameters are described on p. 15. An empty position in the list is shown by the entry **\*UNUSED\***. This token is also used to indicate the end of the list after which parameter names appear blank.

**EXIT** cancels the modified value and restores the previously-stored value.

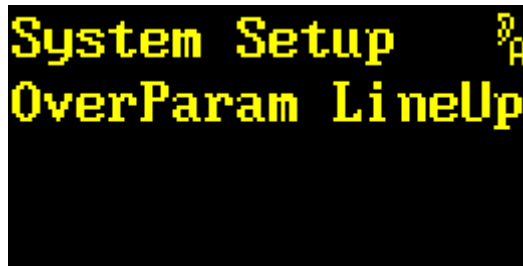
**ENTER** confirms the selected value.

Pressing **TOGGLE** moves the prompt to the parameter position, which may now be changed.



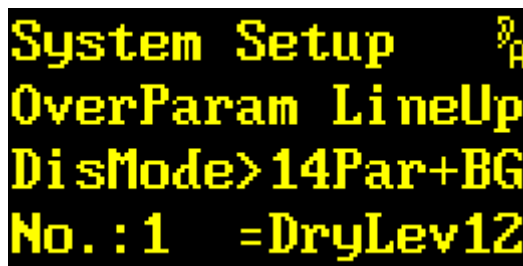
# Overview Parameter Line Up

This menu item is used to *change the order of the Overview parameter list* in main menu item **Edit Scratch A**. All *Display modes* may be configured individually.



Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to the menu groups
Enter	Edit parameter list
Toggle	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** brings up a menu to select one of the Display modes..

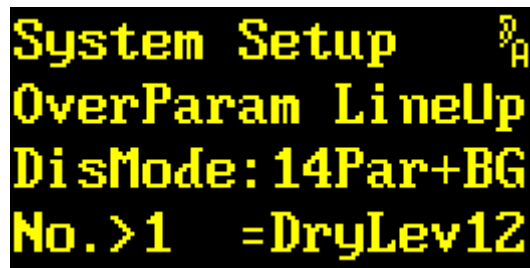


Wheel →	Select display mode
Wheel ←	Select display mode
Exit	Cancel selection
Enter	Confirm selection
Toggle	Jump to the <b>Hotkey Menu</b>

Rotating → and ← selects a display mode.

**EXIT** leaves selection.

**ENTER** confirms the selection and opens the menu to configure the parameter positions.



```

System Setup  ?A
OverParam LineUp
DisMode:14Par+BG
No.>1  =DryLev12
  
```

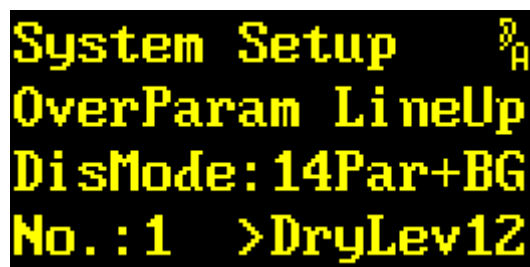
<b>Wheel</b> →	Next parameter position
<b>Wheel</b> ←	Previous parameter position
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Selects a parameter

Rotating → and ← scrolls through the parameter positions in the range of **1** to **64**.

**EXIT** cancels the modified value.

**ENTER** confirms the selected value.

Pressing **TOGGLE** moves the prompt to the parameter name which may now be changed.



```

System Setup  ?A
OverParam LineUp
DisMode:14Par+BG
No.:1  >DryLev12
  
```

<b>Wheel</b> →	Next parameter
<b>Wheel</b> ←	Previous parameter
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Select this parameter position

Rotating → and ← scrolls through the parameter list. The parameters vary depending on the unit. The parameters are described on p. 15. An empty position in the list is shown by the entry **\*EMPTY\***. The token **\*UNUSED\*** is used to indicate the end of the list after which parameter names appear blank.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

Pressing **TOGGLE** moves the prompt to the parameter position, which may now be changed.

# Parameter Display Type

This menu item is used to change the *parameter appearance* in main menu item **Edit Scratch A**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Configure appearance
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



<b>Wheel</b> →	Next appearance type
<b>Wheel</b> ←	Previous appearance type
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← scrolls through appearance types 1 to 3. Lines 3 and 4 immediately reflect the effect on font and style of the appearance type.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

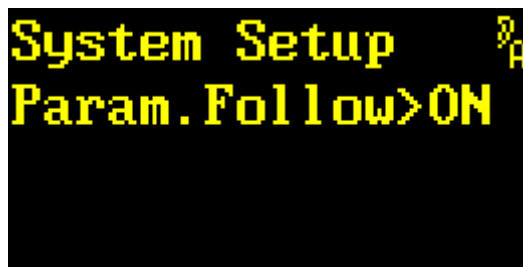
# Parameter Follow Me

This menu item is used to change the *behavior of main menu item Edit Scratch A when directly picking parameters from the parameter keys.*



Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to the menu groups
Enter	Configure <i>Parameter Follow Me</i>
Toggle	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



Wheel →	Enable <i>Parameter Follow Me</i>
Wheel ←	Disable <i>Parameter Follow Me</i>
Exit	Cancel selection
Enter	Confirm the new value
Toggle	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles *Parameter Follow Me* (ON) or (OFF). When in **Edit Scratch A** with *Parameter Follow Me* turned on, the menu display and input wheel automatically switch over to the parameter being picked from the parameter key.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

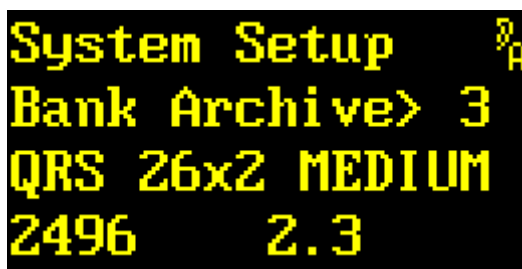
# Bank Archive

Since version 2.3 it is possible to tap a plug-in *from a foreign bank*, and load its contents to the *local* Scratch. This menu item *selects the bank* to be used for this kind of Preset transfer.



Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to the menu groups
Enter	Select Bank Archive
Toggle	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



Wheel →	Select Bank Archive
Wheel ←	Select Bank Archive
Exit	Cancel selection
Enter	Confirm selection
Toggle	Jump to the <b>Hotkey Menu</b>

Rotating → and ← selects a bank, or allows to disable those cross-references completely (**OFF**). A bank will only be advertised if a *compatible* plug-in has been installed there. This is the reason for potential discontinuities in the numbering. To help navigating through the plug-ins, the two lower rows show name, device type, and version number.

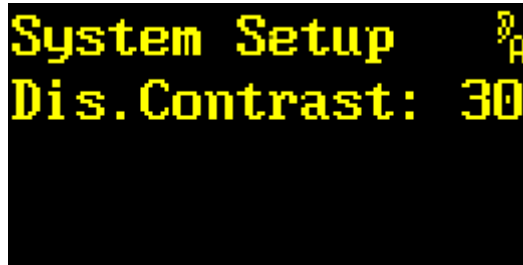
**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**Note:** Whenever a formerly tapped bank becomes invalid, e.g. because of being erased, or being overwritten, *Bank Archive* will be reset to **OFF**.

# Display Contrast

This menu item is used to *adjust the display contrast*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Adjust contrast
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



<b>Wheel</b> →	Increase contrast
<b>Wheel</b> ←	Decrease contrast
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← adjusts the display contrast to values in the range of 1 to 127. The immediate effect can be seen on the bottom gray level scale.

**EXIT** cancels the modified value and restores the previously-stored value.

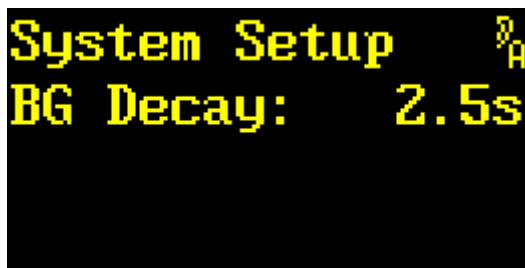
**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** High contrast levels lower the *life expectancy* of the display.

## Bargraph Decay

This menu item is used to adjust the *bargraph decay rate*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Adjust the decay rate
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** makes a prompt appear.



<b>Wheel</b> →	Increase the decay rate
<b>Wheel</b> ←	Decrease the decay rate
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← adjusts the bargraph decay rate to values of **2.5s**, **5s**, or **10s**.

**EXIT** cancels the modified value and restores the previously-stored value.

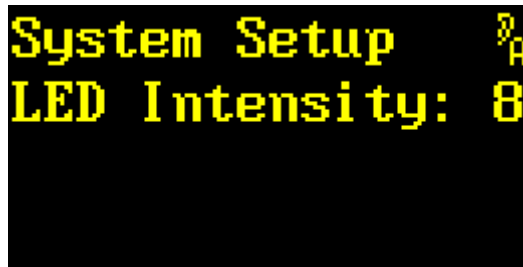
**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** The decay rate is the time required for a bargraph to fall by 20dB.

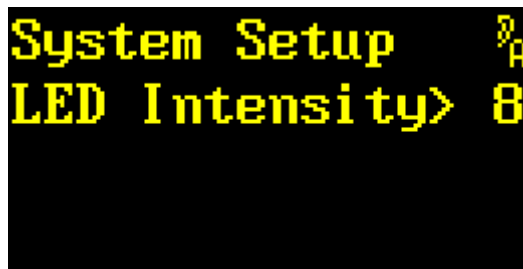
# LED Intensity

This menu item is used to adjust the *bargraph and status LED brightness*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Adjust brightness
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



<b>Wheel</b> →	Increase brightness
<b>Wheel</b> ←	Decrease brightness
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← adjusts the LED intensity to values of 1 to 15.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.



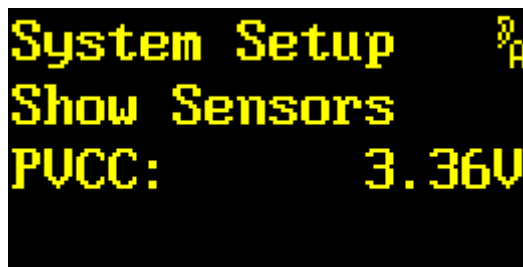
## Show Sensors

This menu item displays the *internal voltage and temperature sensor values*. Moreover, the *elapsed hours counter* may be displayed here.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Display value for this sensor
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

**ENTER** brings up the sensor measurements:



<b>Wheel</b> →	Next sensor
<b>Wheel</b> ←	Previous sensor
<b>Exit</b>	Return
<b>Enter</b>	Return
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← displays all the voltage and temperature sensor values and the elapsed hours counter. These values have been made available to help report operating problems. They strongly depend on the hardware version of the unit, so providing nominal values here would be of no practical use.

**EXIT** and **ENTER** return to the previous menu.

**TOGGLE** jumps to the **Hotkey Menu**.

## List of Power Supply Sensors:

<b>PVCC</b>	3.3V power supply (voltage)
<b>PV50</b>	5V power supply (voltage)
<b>PVCORE</b>	Core power supply (voltage)
<b>PTEMP</b>	Voltage regulator IC (temperature)
<b>PTCOOL</b>	Filter capacitors (temperature) ( <i>cool spot</i> )
<b>PTHOT</b>	Schottky diode (temperature) ( <i>hot spot</i> )

## List of Control-I/O Sensors:

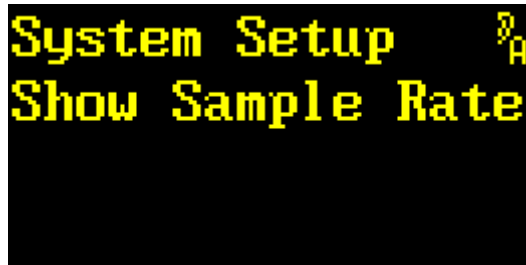
<b>CVCC</b>	3.3V power supply (voltage)
<b>CV232</b>	RS-232 power supply (voltage)
<b>CVUSB</b>	USB power supply (voltage)
<b>CTBAT</b>	RTC Lithium battery (temperature)

## List of Auxiliary Sensors:

<b>Elapsed</b>	Elapsed hour counter
----------------	----------------------

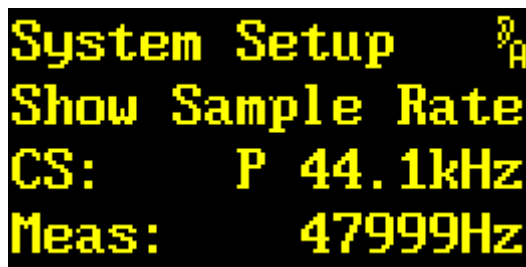
# Show Sample Rate

This menu item *shows* both the *measured sample rate* and the *sample rate deducted from Channel Status* data.



Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to the menu groups
Enter	Display sample rates
Toggle	Jump to the <b>Hotkey Menu</b>

**ENTER** brings up the sample rate values:



Wheel →	(not assigned)
Wheel ←	(not assigned)
Exit	Return
Enter	Return
Toggle	Jump to the <b>Hotkey Menu</b>

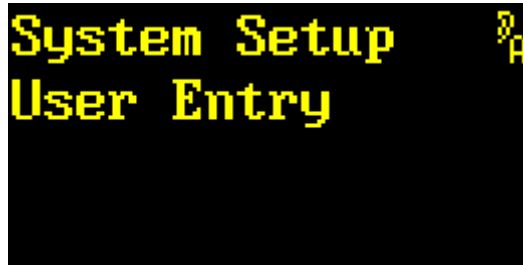
The third line shows the sample rate deducted from the Channel Status data. A **P** or **C** prefix indicates *Professional* or *Consumer* Channel Status format. The fourth line shows the sample rate measured by a frequency counter. All readouts refer to the manually or automatically selected clock source.

In the above example both sample rates are inconsistent. Either the Channel Status data of the AES3 input have been assigned erroneously, or the studio is being operated with +8.8% varispeed.

Both **EXIT** and **ENTER** close the display.

# User Entry

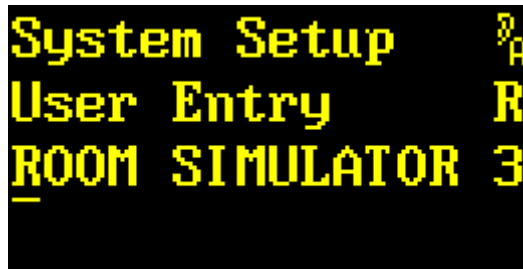
This menu item is used to display and *assign a name* of up to 16 characters to the YARDSTICK.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Change unit name
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The unit name is mainly used to identify the YARDSTICK when using a remote control.

Pressing **ENTER** allows the input of a new name.



<b>Wheel</b> →	Next ASCII character
<b>Wheel</b> ←	Previous ASCII character
<b>Exit</b>	Cancel and restore the previous unit name
<b>Enter</b>	Store the new unit name
<b>Toggle</b>	Move cursor to the right

The third line displays the current unit name. In this example, the cursor underlines the first letter **R**. At the end of the second line, the character being modified is duplicated.

Rotating → and ← scrolls through the ASCII characters for the underlined character. The ASCII characters include capitals, numeric, and symbolic characters.

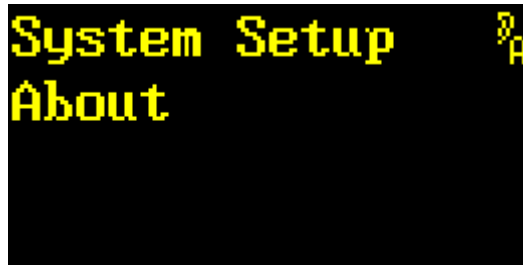
Pressing **TOGGLE** moves the cursor to the next character. This last character is used as the starting character in this new position. Moving right past the last character puts the cursor back to the start of the string.

Pressing **EXIT** replaces the modified unit name with the previously-stored one.

Once the name has been correctly entered, pressing **ENTER** stores it.

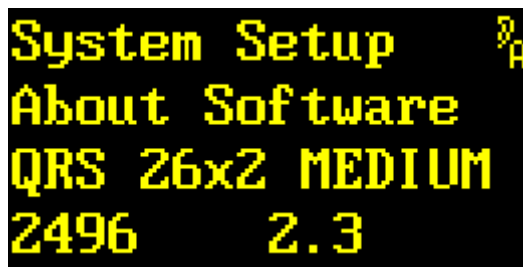
# About

This menu item is used to *display Hardware and Software type, plug-in name, version number, and internal Personal ID (PID)*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Show software information
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** reveals the name of the plug-in, the expected device, and the plug-in version.



<b>Wheel</b> →	(not assigned)
<b>Wheel</b> ←	(not assigned)
<b>Exit</b>	Return to previous menu
<b>Enter</b>	Show hardware information
<b>Toggle</b>	Return to previous menu

**Note:** Inconsistent device numbers (e.g. 249x) in hardware and software versions indicate an incorrect software version, which has been installed in spite of a warning message from the installation tool. This may lead to undefined behavior and stability problems!

Pressing **ENTER** reveals both the device type and the hardware version number.



```

System Setup  ?A
About Hardware
Type: 2496
Revision: 1.3
  
```

<b>Wheel</b> →	(not assigned)
<b>Wheel</b> ←	(not assigned)
<b>Exit</b>	Terminate About display
<b>Enter</b>	Display PID#
<b>Toggle</b>	Terminate About display

**ENTER** displays the Personal ID (PID) assigned to this particular YARDSTICK.



```

System Setup  ?A
About
PID#
QTC-DL13-S00265
  
```

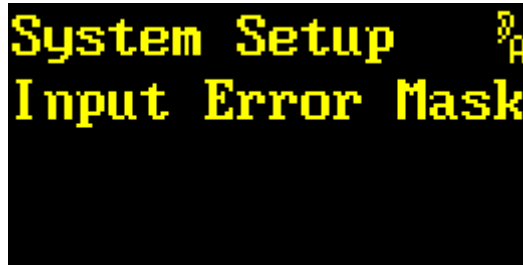
The last PID digits are always set to the unit's serial number. In this example, the unit's serial number is **00265**.

Pressing any key at this point returns to the version numbers display.

**Note:** Inconsistent device numbers (e.g. 249x) in hardware and software versions indicate an incorrect software version, which has been installed in spite of a warning message from the installation tool. This may lead to undefined behavior and stability problems!

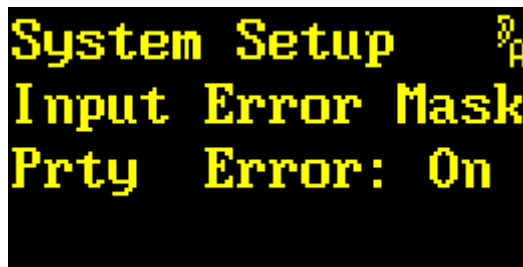
# Input Error Mask

This menu item is used to *enable or disable input error notifications*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Select error source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** lets select an error source.



<b>Wheel</b> →	Next error source
<b>Wheel</b> ←	Previous error source
<b>Exit</b>	Cancel and return to previous menu
<b>Enter</b>	Modify the mask for this error source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

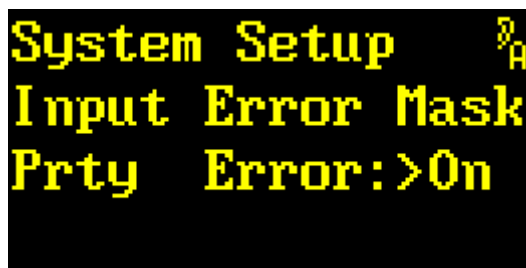
Rotating → and ← scrolls through the possible detected error sources:

<b>Prty Error</b>	Parity Error: binary sum on samples block not equal to block parity
<b>BPhs Error</b>	Bi-Phase Error: errors in detecting the bi-phase coded signal.
<b>Conf Error</b>	Confidence Error: signal level is too low
<b>Vldty Error</b>	Validity Error: audio signal not valid
<b>CSCRC Error</b>	Channel Status Cyclic Redundancy Check (CRC) Error
<b>Slip Error</b>	Slip Error: the sample rate of an input rub against an external or internal clock source

**EXIT** cancels the selection.



Pressing **ENTER** makes a prompt appear after the error code:



<b>Wheel</b> →	Enable error notification
<b>Wheel</b> ←	Disable error notification
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← enables (**On**) or disables (**Off**) an error indication.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** This menu item enables you to conduct research regarding the cause of a red Lock LED. Simply turn-off all error sources, one after the other, until the LED turns to green again. If you are done, don't forget to enable all unnecessarily mapped-out error sources again, to ensure that future errors will be noticed immediately and reliably.

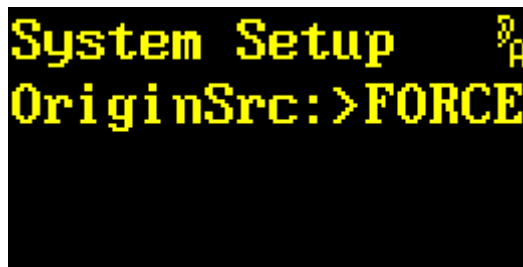
# Origin ID Source

This menu item is used to set the *source* of the *AES3 Channel Status Origin ID*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Select ID source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt. The handling of the *Channel Status Origin ID* can now be changed.



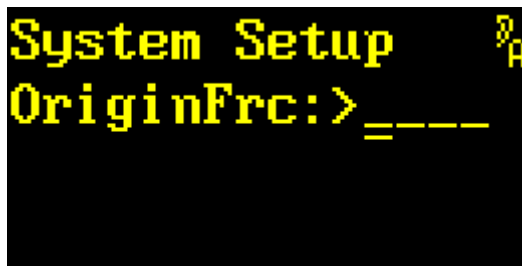
<b>Wheel</b> →	Next source
<b>Wheel</b> ←	Previous source
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles the *Channel Status Origin ID* source between **INPUT** or **FORCE**. Setting the source to **INPUT** passes the incoming *Channel Status Origin ID* unmodified. Setting the source to **FORCE** replaces the incoming *Channel Status Origin ID* with a user-defined value.

**EXIT** cancels the modified value and restores the previously-stored value.

**TOGGLE** jumps to the **Hotkey Menu**.

**ENTER** confirms the new setting. If the setting **FORCE** was selected, a 4-character value must be defined.



<b>Wheel</b> →	Next ASCII character
<b>Wheel</b> ←	Previous ASCII character
<b>Exit</b>	Cancel setting
<b>Enter</b>	Store ASCII character
<b>Toggle</b>	Move cursor to the right

Rotating → and ← scrolls through the ASCII characters for the underlined character. The ASCII characters include capitals, numeric, and symbolic characters.

**EXIT** cancels any changes in handling the *Channel Status Origin ID*.

**ENTER** confirms the new character and moves the cursor to the next character position.

Pressing **TOGGLE** moves the cursor to the next character. Moving right past the last character puts the cursor back to the start of the string.

**Note:** This function only operates on the *Professional* Channel Status Format. An input having the *Consumer* Channel Status Format is always passed unmodified. Settings from this menu item will be ignored.

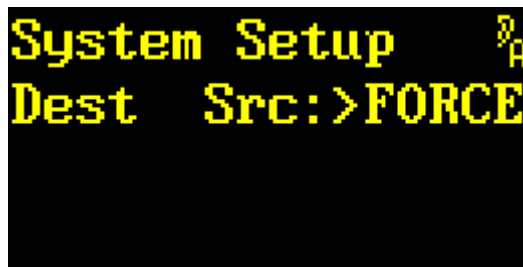
## Destination ID Source

This menu item is used to set the *source* of the *AES3 Channel Status Destination ID*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Select ID source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt. The handling of the *Channel Status Destination ID* can now be changed.



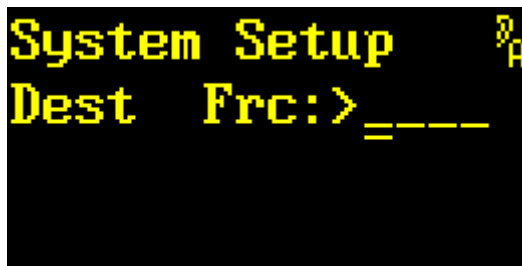
<b>Wheel</b> →	Next source
<b>Wheel</b> ←	Previous source
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles the *Channel Status Destination ID* source between **INPUT** or **FORCE**. Setting the source to **INPUT** passes the incoming *Channel Status Destination ID* unmodified. Setting the source to **FORCE** replaces the incoming *Channel Status Destination ID* with a user-defined value.

**EXIT** cancels the modified value and restores the previously-stored value.

**TOGGLE** jumps to the **Hotkey Menu**.

**ENTER** confirms the new setting. If the setting **FORCE** was selected, a 4-character value must be defined.



<b>Wheel</b> →	Next ASCII character
<b>Wheel</b> ←	Previous ASCII character
<b>Exit</b>	Cancel setting
<b>Enter</b>	Store ASCII character
<b>Toggle</b>	Move cursor to the right

Rotating → and ← scrolls through the ASCII characters for the underlined character. The ASCII characters include capitals, numeric, and symbolic characters.

**EXIT** cancels any changes in handling the *Channel Status Destination ID*.

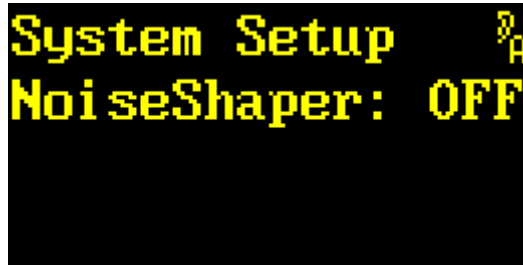
**ENTER** confirms the new character and moves the cursor to the next character position.

Pressing **TOGGLE** moves the cursor to the next character. Moving right past the last character puts the cursor back to the start of the string.

**Note:** This function only operates on the *Professional* Channel Status Format. An input having the *Consumer* Channel Status Format is always passed unmodified. Settings from this menu item will be ignored.

# Noise Shaper

This menu item is used to enable or disable the *16-bit Noise Shaper*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Change noise shaper
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt. The noise shaper can now be enabled or disabled.



<b>Wheel</b> →	Enable noise-shaping
<b>Wheel</b> ←	Disable noise-shaping
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles between noise shaper (**ON**) or (**OFF**).

The noise shaper is located near the output just before the line driver. Using a filter, it accumulates the bits lost due to 16-bit truncation until a 16-bit LSB appears, then adds it back to the 16-bit data stream.

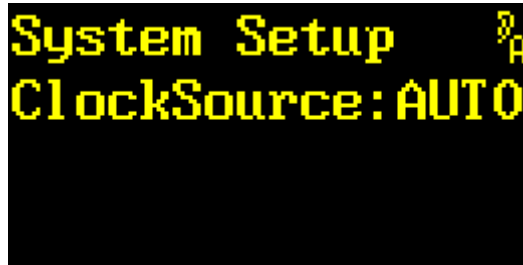
**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

# Clock Config

This menu item is used to configure a 2498 clock source.




```

System Setup  2A
ClockSource: AUTO
  
```

<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Change clock source
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** replaces the colon with a prompt.



```

System Setup  2A
ClockSource> SYNC
  
```

<b>Wheel</b> →	Modify clock source
<b>Wheel</b> ←	Modify clock source
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

With → or ← the clock source may be one of **AUTO**, **SYNC**, **IN12**, **IN34**, **IN56**, or **IN78**. The selected input will act as a master clock for the unit. When **AUTO** has been selected, the master clock will automatically be negotiated amongst the locked inputs. The priority order of the inputs is: **SYNC**, **IN12**, **IN34**, **IN56**, and **IN78**.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

# MIDI Channel

This menu item is used to select the *MIDI Channel*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Modify the MIDI channel
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** makes a prompt appear left to the *MIDI channel* to be edited.



<b>Wheel</b> →	Increment MIDI channel
<b>Wheel</b> ←	Decrement MIDI channel
<b>Exit</b>	Cancel selection
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← scrolls through the MIDI channel values from **01** to **16**.

**EXIT** cancels the modified value and restores the previously-stored value.

**ENTER** confirms the selected value.

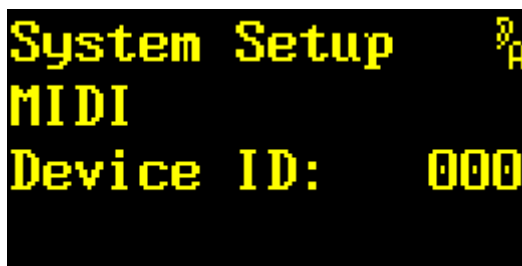
**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** All details about MIDI control and the YARDSTICK MIDI implementation are available from the **249x MIDI Interface** document; available for download at <http://www.quantec.de/download/>



## MIDI Device ID

This menu item is used to select the *MIDI Device ID*. The MIDI Device ID is required for routing *System Exclusive messages* to the right unit.



Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to the menu groups
Enter	Modify the MIDI Device ID
Toggle	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** makes a prompt appear left to the *MIDI Device ID* to be edited.



Wheel →	Increment MIDI Device ID
Wheel ←	Decrement MIDI Device ID
Exit	Cancel selection
Enter	Confirm the new value
Toggle	Jump to the <b>Hotkey Menu</b>

Rotating → and ← scrolls through MIDI Device IDs from 000 to 127.

**EXIT** cancels the modified value and restores the previously-stored value.

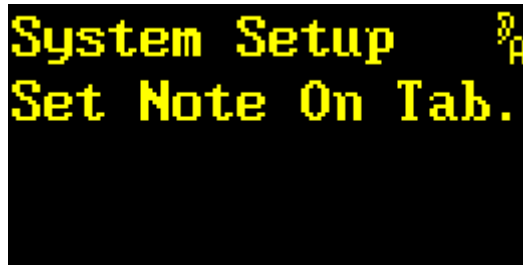
**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** All details about MIDI control and the YARDSTICK MIDI implementation are available from the *249x MIDI Interface* document; available for download at <http://www.quantec.de/download/>

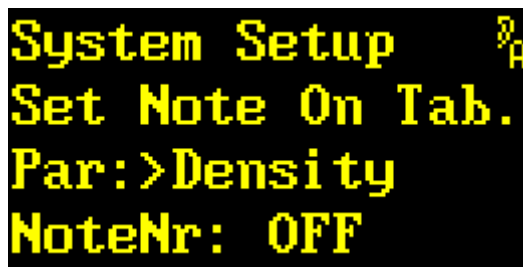
## Note On Table

This menu item edits the *Note On Table*. Here a note number of a *Note On MIDI message* can be assigned to a parameter.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Select parameter
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** associates the *Note On* message to the selected parameter.



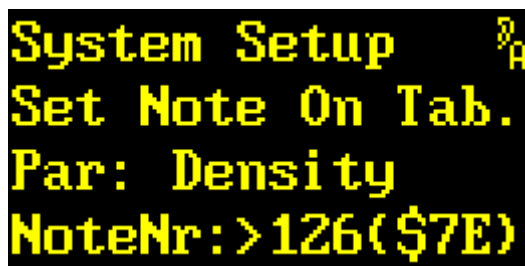
<b>Wheel</b> →	Next parameter
<b>Wheel</b> ←	Previous parameter
<b>Exit</b>	Cancel and restore the previous value
<b>Enter</b>	Select this parameter and edit the note number
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → or ← scrolls through the parameters list. The parameter are described on p. 15.

Following the parameter name is its associated *note number*.

**TOGGLE** jumps to the **Hotkey Menu**.

Pressing **ENTER** makes a prompt appear beside the *note number* to be edited.



The screenshot shows a black screen with yellow text. The text is as follows:  
 System Setup 7A  
 Set Note On Tab.  
 Par: Density  
 NoteNr: >126(\$7E)

<b>Wheel</b> →	Increase note number
<b>Wheel</b> ←	Decrease note number
<b>Exit</b>	Cancel change in note number
<b>Enter</b>	Confirm note number
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← scrolls through the *note numbers* with value from **001(\$00)** to **127(\$7F)** in addition to ignore *Note On* messages altogether (**OFF**). Each parameter should be assigned a unique note number.

**EXIT** cancels the modified value and restores the previously-stored value.

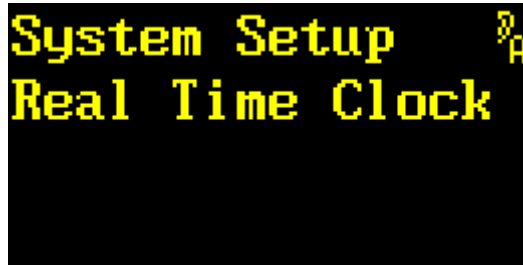
**ENTER** confirms the selected value.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** All details about MIDI control and the YARDSTICK MIDI implementation are available from the **249x MIDI Interface** document; available for download at <http://www.quantec.de/download/>

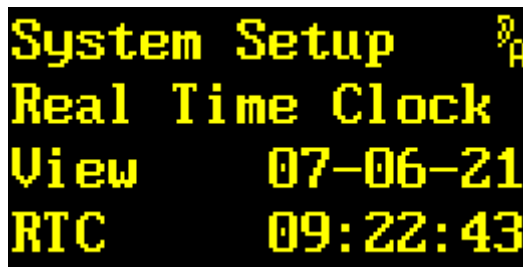
# Real Time Clock

This menu item is used to display and set the *Real Time Clock*.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Show RTC
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Hitting **ENTER** displays the present date and time of the RTC.

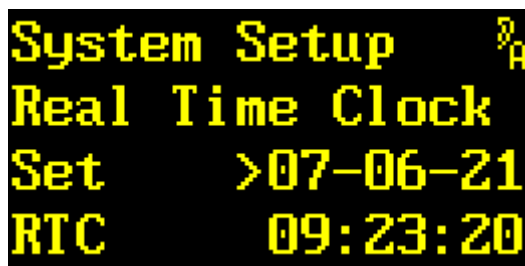


<b>Wheel</b> →	(not assigned)
<b>Wheel</b> ←	(not assigned)
<b>Exit</b>	Return to previous screen
<b>Enter</b>	Set the RTC
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The RTC format currently follows the ISO Format (YY-MM-DD HH:MM:SS).

**TOGGLE** jumps to the **Hotkey Menu**.

Hitting **ENTER** displays a prompt. Date and Time can now be modified:



The screenshot shows a monochrome LCD display with the following text:  
System Setup      ?A  
Real Time Clock  
Set            >07-06-21  
RTC            09:23:20

<b>Wheel</b> →	Increment value
<b>Wheel</b> ←	Decrement value
<b>Exit</b>	Cancel date/time
<b>Enter</b>	Confirm date/time
<b>Toggle</b>	Jump to next value

Rotating → and ← modifies the year, month, day, hour, minute, and second. The symbol > always moves to the left edge of the group of values to be modified.

**EXIT** cancels the changed value and restores the previously-stored value.

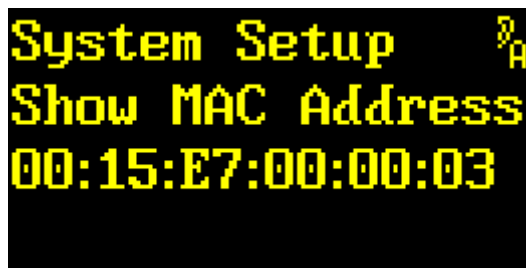
**ENTER** confirms the new value and sets the RTC accordingly.

**TOGGLE** advances the cursor > to the next position.

**Note:** The RTC time stamps each preset. The internal clock should thus be regularly verified and adjusted. An automatic procedure using the Internet Network Time Protocol (»NTP«) is in preparation.

# Show MAC Address

This menu item *displays* the MAC address of the *Ethernet interface*.



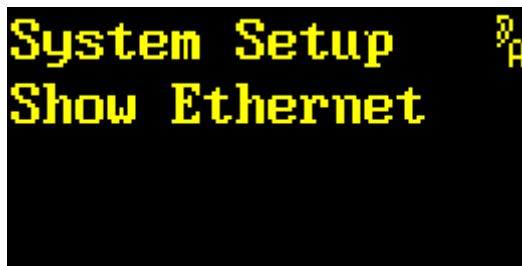
<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	(not assigned)
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The MAC address is shown on the third line in hexadecimal format. It also has been laser-printed on the back panel.

**TOGGLE** jumps to the **Hotkey Menu**.

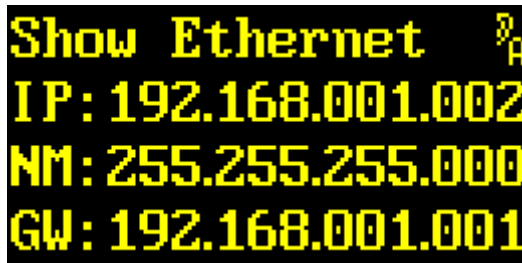
## Show Ethernet

This menu item *displays the assignments* of the *Ethernet interface*. Whenever the DHCP setting in the **Configure Ethernet** chapter (more details starting p. 128) has been set to **auto**, this menu item is the only way of verifying the allocated DHCP values right from the unit's front panel.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Show Ethernet assignments
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Hitting **ENTER** jumps to the display of *IP address*, *Netmask*, and *Gateway*.



<b>Wheel</b> →	(not assigned)
<b>Wheel</b> ←	(not assigned)
<b>Exit</b>	Return
<b>Enter</b>	Return
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The values for *IP address*, *Netmask*, and *Gateway* are being displayed as 4 octets each in a decimal representation.

# Configure Ethernet

This menu item displays and *configures the Ethernet interface*.

A screenshot of a terminal window with a black background and yellow text. The text reads 'System Setup' on the first line and 'Config Eth: man.' on the second line. A small cursor icon is visible at the end of the second line.

<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Configure Ethernet
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Pressing **ENTER** makes a prompt appear and the Ethernet interface can now be modified.

A screenshot of a terminal window with a black background and yellow text. The text reads 'System Setup' on the first line and 'Config Eth:>man.' on the second line. A small cursor icon is visible at the end of the second line.

<b>Wheel</b> →	Next setting
<b>Wheel</b> ←	Previous setting
<b>Exit</b>	Cancel setting
<b>Enter</b>	Confirm setting
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating → and ← toggles between the Ethernet interface setting: **auto** or **man.** Selecting **auto** permits automatic configuration using the values obtained over DHCP after power-on. This requires access to a DHCP server configured appropriately. The assigned values can be read from **Show Ethernet**. Selecting **man.** allows for manual entry of IP address, Netmask, and Gateway.

**EXIT** cancels the entered values and returns them to their previously-store values.

**ENTER** confirms either confirms the **auto** setting, or proceeds to the IP address field.

**TOGGLE** jumps to the **Hotkey Menu**.



The format of the IP address, Netmask, and Gateway is shown as 12 digit specifiers. A prompt after **IP**, **NW**, or **GW** indicates the values are editable:

```

Config Eth:      2A
IP>192.168.001.002
NM: 255.255.255.000
GW: 192.168.001.001
  
```

<b>Wheel</b> ➔	Increment underlined digit
<b>Wheel</b> ⬅	Decrement underlined digit
<b>Exit</b>	Cancel the change and restore previously-stored value
<b>Enter</b>	Confirm new 12 digit value, move to next line
<b>Toggle</b>	Move cursor to the right

Rotating ➔ and ⬅ increments or decrements the underlined digit. Note that a group of 3 digits has a range of **000** to **255**. To make setup easy, octet digits may be adjusted one by one. Controlled by the cursor **\_** position, an octet's value may be modified in steps of 1, 10, or 100.

**EXIT** cancels the entered values and restores the previously-stored values.

**ENTER** confirms the new 12 digit value and the cursor moves to the next line.

Hitting **ENTER** thus jumps from *IP address* to *Netmask* to *Gateway*, and then returns to menu group **Ethernet**.

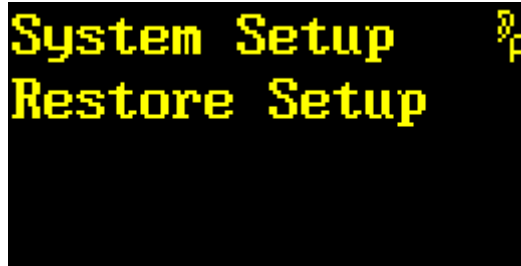
**TOGGLE** moves the cursor to right. Moving right from the last position returns the cursor to the first position.

**Note:** Values for the *IP address*, *Netmask*, and *Gateway* are assigned by the network's system administrator.

# Restore Setup

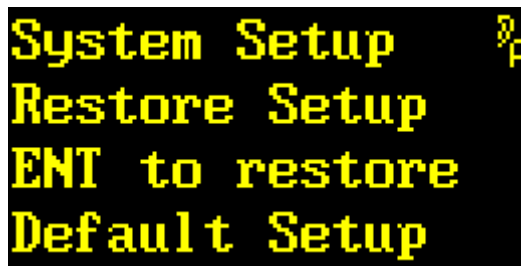
This menu item *restores the manufacturer configuration of the System Setup section.*

**CAUTION!** You will loose *all* settings of *all* menu items within **System Setup**.



<b>Wheel</b> →	Next menu item
<b>Wheel</b> ←	Previous menu item
<b>Exit</b>	Return to the menu groups
<b>Enter</b>	Go to confirmation step
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

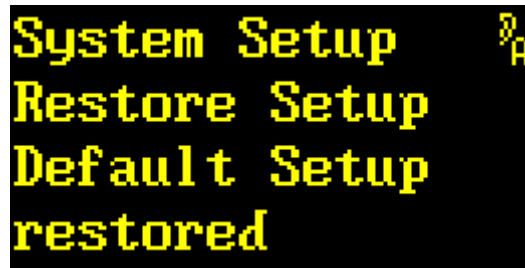
**ENTER** confirms the selection and advances to a confirmation step.



<b>Wheel</b> →	(not assigned)
<b>Wheel</b> ←	(not assigned)
<b>Exit</b>	Cancel
<b>Enter</b>	Overwrite Setup configuration with factory default
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

**EXIT** cancels the confirmation step. The presets remain unchanged.

**ENTER** overwrites the entire Setup configuration with the factory defaults. Thereafter the following message indicates the update has been done:



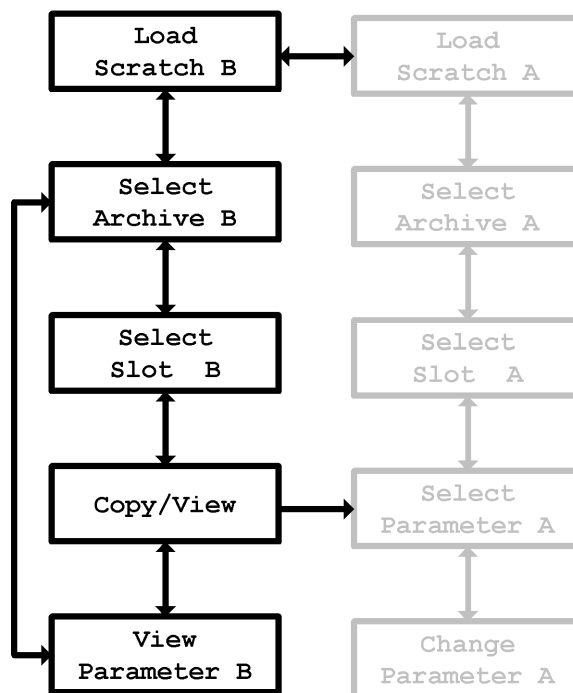
<b>Wheel</b> →	Back to select a menu item
<b>Wheel</b> ←	Back to select a menu item
<b>Exit</b>	Back to select a menu item
<b>Enter</b>	Back to select a menu item
<b>Toggle</b>	Back to select a menu item

Any further keystroke returns control to selection of the menu items.



# Load Scratch B

This main menu item handles the *loading of a preset into SCRATCH B*. Note that SCRATCH B is read-only. If parameter changes are foreseen, the read/write capable *SCRATCH A* should be used instead.



This main menu item appears as follows:



<b>Wheel</b>	<b>→</b>	Next main menu item
<b>Wheel</b>	<b>←</b>	Previous main menu item
<b>Exit</b>		(not assigned)
<b>Enter</b>		Select main menu item <b>Select Archive B</b>
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

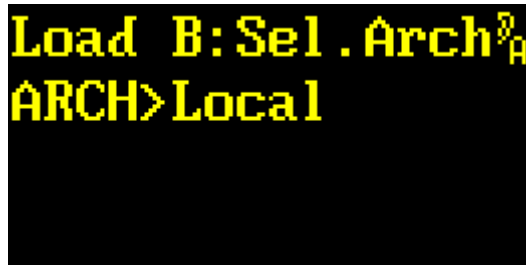
Rotating **←** and **→** scrolls through the main menus.

**ENTER** proceeds to menu **Load Scratch B**. The first menu item is **Select Archive B**.

**TOGGLE** jumps to the **Hotkey Menu**.

## Select Archive B

This menu item is used to select the *archive* from which the *preset* will be read and subsequently loaded into *SCRATCH B*.



Wheel →	Next archive
Wheel ←	Previous archive
Exit	Return to main menu item <b>Load Scratch B</b>
Enter	Confirm the new value
Toggle	(not assigned)

Rotating → and ← scrolls through the archives **Music-Lib**, **Dialog-Lib**, **Bank**, **Local**, or **Scratch A**.

**Music-Lib** selects an archive with *factory presets* for this plug-in. The archive contains presets optimized for music, with no unpleasant or obtrusive early reflections. It is always available. For ease of operation, the presets have been grouped hierarchically: **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCcert Halls**, **SACred Spaces**, **PLATes**, and **VARious**. Hitting **ENTER** once allows to select a group. Hitting **ENTER** again confirms the group, and proceeds to the submenu item **Select Slot B**.

**Dialog-Lib** selects an archive with *factory presets* for this plug-in. The archive contains lively presets optimized for dialogs, with generously added early reflections. It is always available. For ease of operation, the presets have been grouped hierarchically: **CONTainers**, **VEHicles**, **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**. Hitting **ENTER** once allows to select a group. Hitting **ENTER** again confirms the group, and proceeds to the submenu item **Select Slot B**.

**Bank** taps into the **Local** archive of a plug-in located *in another bank* of the same unit. This archive appears only after having selected a valid bank in **Bank Archive (System Setup**, p. 101). **ENTER** continues to menu item **Select Slot B**.

**Local** selects the *locally-stored archive*, and is thus always available. **ENTER** continues to menu item **Select Slot B**.

**Scratch A** selects preset *SCRATCH A*, and is thus always available. **ENTER** continues to menu item **View Parameter B**.

## Select Slot B

This menu item is used to *move a preset* located in a preselected *archive slot* into *SCRATCH B*.

Music-Lib, Dialog-Lib:

```
Load B:Sel.SlotA
ARCH:Music-Lib
B:SAC>Cathedr1 A
××No Timestamp××
```

Local, Bank:

```
Load B:Sel.SlotA
ARCH:Local
B>001 MyPreset B
09-01-14 12:01
```

Wheel →	Increment slot
Wheel ←	Decrement slot
Exit	Select menu item <b>Select Archive B</b>
Enter	Confirm the new value
Toggle	Jump to the <b>Hotkey Menu</b>

The second line displays the archive. The display layouts vary according to the type of archive.

For the factory presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **B>** – a mnemonic (first three characters) of the group name (**SAC** for **SACred Spaces**), followed by the name of the preset (**Cathedr1**).

For the user presets in *Local* and *Bank*, the display shows on its third line – after the **B>** – the slot number (**001**), followed by the name of the preset (**MyPreset**).

The symbols **A**, **B**, or <sup>A</sup>/<sub>B</sub> indicate this preset has already been loaded to *SCRATCH A* or *SCRATCH B*. The fourth line displays the date and time of the last change to this slot. The string **No Timestamp** appears if a factory preset is selected, as only customer presets do record date and time of their most recent modifications.

Rotating → and ← scrolls through the slot numbers. Depending on the setting of **Preset Load** (p. 94) in the **System Setup**, the preset either loads immediately, or waits for pressing **ENTER**. A loaded preset is indicated by the presence of symbols **B** or <sup>A</sup>/<sub>B</sub> at the end of the third line.

**EXIT** returns to menu item **Select Archive B**.

**ENTER** confirms the selection and goes to menu item **View/Copy preset B** as soon as the preset is loaded.

**TOGGLE** jumps to the **Hotkey Menu**.



## View/Copy Preset B

This menu item is used to *select* whether to *copy the preset SCRATCH B to SCRATCH A*, or to *display its parameters*.

Music-Lib, Dialog-Lib:

Local, Bank:

```
Load B:View/CpyA
ARCH:Music-Lib
B:SAC Cathedr1B
Copy to ScratchA
```

```
Load B:View/CpyA
ARCH:Local
B 001 MyPresetB
Copy to ScratchA
```

Wheel →	Toggle between View and Copy
Wheel ←	Toggle between View and Copy
Exit	Select menu item <b>Select Slot B</b>
Enter	Confirm the new value
Toggle	Jump to the <b>Hotkey Menu</b>

The second line displays the archive. The display layouts vary according to the type of archive.

For the factory presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **B>** – a mnemonic (first three characters) of the group name (**SAC** for **SACred Spaces**), followed by the name of the preset (**Cathedr1**).

For the user presets in *Local* and *Bank*, the display shows on its third line – after the **B>** – the slot number (**001**), followed by the name of the preset (**MyPreset**).

The symbols **A**, **B**, or <sup>A</sup>/<sub>B</sub> indicate this preset has already been loaded to *SCRATCH A* or *SCRATCH B*. The fourth line displays options **Copy to ScratchA** or **View Parameter**.

Rotating → and ← toggles between **Copy to ScratchA** and **View Parameter**.

**EXIT** returns to menu item **Select Slot B**.

**ENTER** confirms the selection. Confirming **Copy to ScratchA** copies the preset to *SCRATCH A*, then goes to menu item **Select Parameter A** of main menu item **Edit Scratch A**. Confirming **View Parameter** goes on to menu item **View Parameter B**.

**TOGGLE** jumps to the **Hotkey Menu**.

## View Parameter B

This menu item is used to *view the SCRATCH B parameters*.



Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Select menu item <b>View/Copy preset B</b>
Enter	Select menu item <b>View/Copy preset B</b>
Toggle	Jump to the <b>Hotkey Menu</b>

The second row shows the loaded preset's archive (**Local**) and name (**Backyard**). The third and fourth row displays the selected parameter's name, value, and a bargraph of its value. Since *SCRATCH B* parameters are read-only, they have been grayed out.

Rotating → and ← scrolls through the parameter list. The order of the parameter list can be modified using menu item **Parameter Line Up** (p. 95) in main menu item **System Setup**.

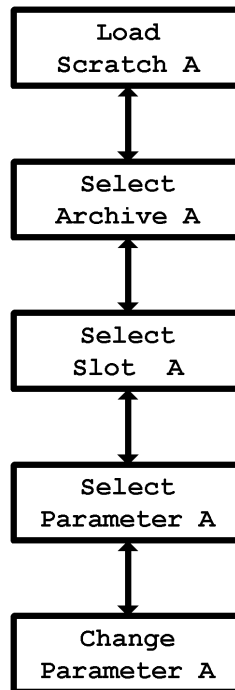
**EXIT** or **ENTER** return to menu item **View/Copy preset B**.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** The appearance of the parameters can be configured under menu item **Parameter Display Type** in main menu item **System Setup**.

# Load Scratch A

This main menu item handles the *saving of a preset into SCRATCH A*.



This main menu item appears as follows:



<b>Wheel</b> →	Next main menu item
<b>Wheel</b> ←	Previous main menu item
<b>Exit</b>	(not assigned)
<b>Enter</b>	Select menu item <b>Select Archive A</b>
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

Rotating ← and → scrolls through the main menus.

**ENTER** proceeds to menu **Load Scratch A**. The first menu item is **Select Archive A**.

**TOGGLE** jumps to the **Hotkey Menu**.

# Select Archive A

This menu item is used to select the *archive* from which the *preset* will be read and subsequently loaded into *SCRATCH A*.



Wheel →	Next archive
Wheel ←	Previous archive
Exit	Return to main menu item <b>Load Scratch A</b>
Enter	Confirm the new value
Toggle	(not assigned)

Rotating → and ← scrolls through the archives **Music-Lib**, **Dialog-Lib**, **Bank**, **Local**, or **Scratch B**.

**Music-Lib** selects an archive with *factory presets* for this plug-in. The archive contains presets optimized for music, with no unpleasant or obtrusive early reflections. It is always available. For ease of operation, the presets have been grouped hierarchically: **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCt Halls**, **SACred Spaces**, **PLAtes**, and **VARious**. Hitting **ENTER** once allows to select a group. Hitting **ENTER** again confirms the group, and proceeds to the submenu item **Select Slot A**.

**Dialog-Lib** selects an archive with *factory presets* for this plug-in. The archive contains lively presets optimized for dialogs, with generously added early reflections. It is always available. For ease of operation, the presets have been grouped hierarchically: **CONTainers**, **VEHicles**, **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**. Hitting **ENTER** once allows to select a group. Hitting **ENTER** again confirms the group, and proceeds to the submenu item **Select Slot A**.

**Bank** taps into the **Local** archive of a plug-in located *in another bank* of the same unit. This archive appears only after having selected a valid bank in **Bank Archive (System Setup**, p. 101). **ENTER** continues to menu item **Select Slot A**.

**Local** selects the *locally-stored archive*, and is thus always available. **ENTER** continues to menu item **Select Slot A**.

**Scratch B** selects preset *SCRATCH B*, and is thus always available. **ENTER** continues to menu item **View Parameter A**.

# Select Slot A

This menu item is used to *move a preset* located in a preselected *archive slot* into *SCRATCH A*.

Music-Lib, Dialog-Lib:

```
Load A:Sel.SlotA
ARCH:Music-Lib
A:SAC>Cathedr1 A
××No Timestamp××
```

Local, Bank:

```
Load A:Sel.SlotA
ARCH:Local
A>001 MyPreset A
09-01-14 12:01
```

Wheel →	Increment slot
Wheel ←	Decrement slot
Exit	Select menu item <b>Select Archive A</b>
Enter	Confirm the new value
Toggle	Jump to the <b>Hotkey Menu</b>

The second line displays the archive. The display layouts vary according to the type of archive.

For the factory presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **A>** – a mnemonic (first three characters) of the group name (**SAC** for **SACred Spaces**), followed by the name of the preset (**Cathedr1**).

For the user presets in *Local* and *Bank*, the display shows on its third line – after the **A>** – the slot number (**001**), followed by the name of the preset (**MyPreset**)

The symbols **A**, **B**, or <sup>A</sup>/<sub>B</sub> indicate this preset has already been loaded to *SCRATCH A* or *SCRATCH B*. The fourth line displays the date and time of the last change to this slot. The string **No Timestamp** appears if a factory preset is selected, as only customer presets do record date and time of their most recent modifications.

Rotating → and ← scrolls through the slot numbers. Depending on the setting of **Preset Load** (p. 94) in the **System Setup**, the preset either loads immediately, or waits for pressing **ENTER**. A loaded preset is indicated by the presence of symbols **A** or <sup>A</sup>/<sub>B</sub> at the end of the third line.

**EXIT** returns to menu item **Select Archive A**.

**ENTER** confirms the selection and goes to menu item **Select Parameter A** under main menu item **Edit Scratch A** as soon as the preset is loaded.

**TOGGLE** jumps to the **Hotkey Menu**.

# Select Parameter A

This menu item is used to *inspect the SCRATCH A parameters*.



<b>Wheel</b> →	Next parameter
<b>Wheel</b> ←	Previous parameter
<b>Exit</b>	Return to menu item <b>Edit Scratch A</b>
<b>Enter</b>	Select this parameter and go to menu item <b>Change Parameter A</b>
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The second row shows the loaded preset's archive (**Local**) and name (**Backyard**). The third and fourth row displays the selected parameter's name, value, and a bargraph of its value.

Rotating → and ← scrolls through the parameter list. The order of the parameter list can be modified using menu item **Parameter Line Up** (p. 95) in main menu item **System Setup**.

**EXIT** returns to menu item **Edit Scratch A**.

**ENTER** continues to menu item **Change Parameter A**.

**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** The appearance of the parameters can be configured under menu item **Parameter Display Type** in main menu **System Setup**.

## Change Parameter A

This menu item is used to *modify a selected SCRATCH A parameter*.



<b>Wheel</b> →	Increment parameter value
<b>Wheel</b> ←	Decrement parameter value
<b>Exit</b>	Cancel parameter change
<b>Enter</b>	Confirm parameter value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The second row shows the archive (**Local**) as well as the preset name (**Backyard**). The third and fourth row displays the parameter's name, value, and a bargraph of its value.

Rotating → and ← scrolls through the parameter values. A complete listing of these is given on p. 15.

**EXIT** cancels the parameter value change. The old value is restored and menu item **Select Parameter A** is selected.

**ENTER** confirms the new value and menu item **Select Parameter A** is selected.

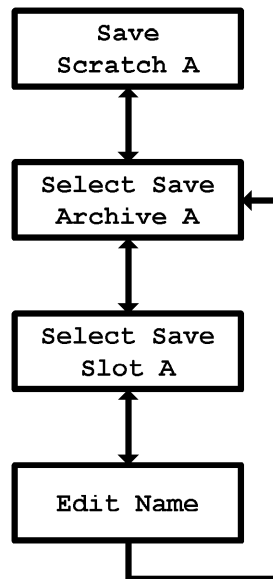
**TOGGLE** jumps to the **Hotkey Menu**.

**Note:** The appearance of the parameters can be configured under menu item **Parameter Display Type** in main menu item **System Setup**.



# Save Scratch A

This menu item is used to *store preset SCRATCH A into a memory slot* chosen from an archive location.



This main menu item appears as follows:



<b>Wheel</b>	<b>→</b>	Next main menu item
<b>Wheel</b>	<b>←</b>	Previous main menu item
<b>Exit</b>		(not assigned)
<b>Enter</b>		Select menu item <b>Select Save archive A</b>
<b>Toggle</b>		Jump to the <b>Hotkey Menu</b>

Rotating **→** and **←** scrolls through the menu items.

**ENTER** selects menu **Save Scratch A**.

The first menu item is **Select Save Archive A**.

**TOGGLE** jumps to the **Hotkey Menu**.

# Select Save Archive A

This menu item *selects the archive for preset SCRATCH A.*



<b>Wheel</b> →	Next archive
<b>Wheel</b> ←	Previous archive
<b>Exit</b>	Return to menu item <b>Save Scratch A</b>
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	(not assigned)

Rotating → and ← scrolls through the *archive* options: **Local**, or **Scratch B**.


**Local** selects the *locally-stored archive* and is thus always available. **ENTER** continues with menu item **Select Save Slot A**.

**Scratch B** selects preset *SCRATCH B* and is thus always available. **ENTER** copies the preset to *SCRATCH B* and continues with main menu item **Save Scratch A**.

**EXIT** returns to main menu item **Save Scratch A**.

# Select Save Slot A

This menu item is used to *select the memory slot* for preset *SCRATCH A*.



```

Save A:Sel.SlotA
ARCH:Local
A> 001:BackyardA
    No Timestamp
  
```

<b>Wheel</b> →	Select slot
<b>Wheel</b> ←	Select slot
<b>Exit</b>	Select menu item <b>Select Save archive A</b>
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Jump to the <b>Hotkey Menu</b>

The second line displays the archive, and the third line – after the **A>** – the slot number (**001**) and name (**Backyard**) of the preset. The symbols **A**, **B**, or <sup>A</sup>/<sub>B</sub> indicate this preset has already been loaded to *SCRATCH A* or *SCRATCH B*. The fourth line displays the date and time of the last change to this slot. The string **No Timestamp** appears if a factory preset is selected, as only customer presets do record date and time of their most recent modifications.

Rotating → and ← scrolls through the slot numbers.

**EXIT** returns to menu item **Select Save Slot A**. Note that slot A was not saved.

**ENTER** confirms the slot number and continues with menu item **Edit Name**. Note that the preset has not been stored yet, as a preset name is required first.

**TOGGLE** jumps to the **Hotkey Menu**.

## Edit Name

This menu item is used to *name a preset* using a string of up to 8 characters.



```

Save A:EditNameA
ARCH:Local
A: 001>BackyardB
No Timestamp
  
```

<b>Wheel</b> →	Next ASCII character
<b>Wheel</b> ←	Previous ASCII character
<b>Exit</b>	Return to menu item <b>Select Save Slot A</b>
<b>Enter</b>	Confirm the new value
<b>Toggle</b>	Move cursor to the right

The second line displays the archive, and the third line – after the **A>** – the slot number (**001**) and name (**Backyard**) of the preset. The symbols **A**, **B**, or <sup>A</sup>/<sub>B</sub> indicate this preset has already been loaded to *SCRATCH A* or *SCRATCH B*. The fourth line displays the date and time of the last change to this slot. The string **No Timestamp** appears if a factory preset is selected, as only customer presets do record date and time of their most recent modifications.

Rotating → and ← scrolls through the ASCII characters for the underlined character. The ASCII characters include capitals, numeric, and symbolic characters.

**EXIT** returns to menu item **Select Save Slot A**. Note that slot A was not saved.

**ENTER** stores the named preset into the selected slot and returns to menu item **Select Save Archive A**.

**TOGGLE** moves the cursor to the next character. Moving right past the last character puts the cursor back to the start of the string.



# Plug-in Boot Loader

The YARDSTICK 249x series is able to maintain multiple effect plug-ins within a single device. Depending on the device type, there are 15 or 63 banks available. A plug-in generally requires *one* bank. Complex plug-ins with substantial amounts of code, or plug-ins with extraordinary large preset libraries, may occasionally be *stretched over several banks*, e.g. a convolver-type reverb with an extensive library of room fingerprint samples.

Plug-ins are managed by a dedicated software: the plug-in boot loader SWITCH. It has been optimized for plug-ins of software version 2.0 and above. To complement an installation of *different* plug-ins, SWITCH may also be used to install *a newer version* of the same plug-in in a *separate* bank. This enables a risk-free test bed, as each bank supplies an individual sandbox for the presets, and thus avoids accidental altering or damaging of an existing preset collection.

Older versions, 1.x by name, cannot be bundled without some restrictions, as various specifications cannot be accessed. A comprehensive plug-in name, a software version, and a device type are all missing. Occasionally, conflicts may arise with device drivers not downward compatible, as old software may operate with the old driver only, and new software with the new one.

Traditionally, previous 1.x software may be installed solely in the boot bank 0; which is exactly the place claimed by SWITCH. Before overwriting bank 0 with its own installation, SWITCH searches for a previous 1.x effect there, and offers relocating it (including all presets) to a rearward bank from 1 to 15 (or 63). Not before that relocation has been successfully finalized, SWITCH asks for confirmation to start its own installation. If denied, a new installation of other 1.x software could be dumped to bank 0, which, once again, will be relocated with the next installation of SWITCH. By repeatedly using this trick, multiple banks could be equipped with e.g. versions 1.6, 1.7, and 1.8, including presets. Besides the current 2.x plug-ins, all those historic versions would be available for immediate selection and startup, too.

A useful idea might be to create numerous *virtual effect units* for your entire staff. With a multiple installation of the same plug-in in a single device, each sound engineer may be assigned an individual bank on that unit. When returning to the studio after hours or weeks, an engineer will find *his* unit with an exact snapshot of the settings from the moment he has left it. This holds true for even the tiniest details: position within the menu tree, status of the Mute buttons, and even temporary parameter changes, not yet written back to scratch or to the library, will reappear like magic.

Additional information on SWITCH can be found in the FAQs on p. 163.

Starting with version 2.3, a new archive **Bank** has been introduced. This enables read-only access to the user presets (**Local**) of *other* banks. To protect the external archives, write access to foreign banks is disabled. If such a „*tapped*“ preset has been altered, it can only be saved to the **Local** archive of the *own* bank.

This allows for two interesting strategies: on the one hand, potentially precious preset collections from older installations can still be used after one or more software updates. On the other hand, a system operator may establish a facility-wide *public preset archive* on a specially rededicated bank. To collect presets from his users, the sys-op temporarily mounts the various users' **Local** banks onto his own **Bank** archive, then copies *generally useful* presets to his **Local** archive, which in turn will later be referenced by his cohorts..

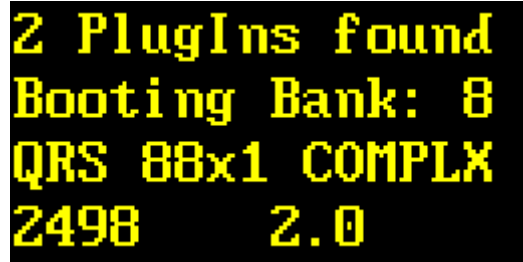
Additional information on how to select a bank for mounting can be found at **Bank Archive (System Setup** on p. 101).

Additional information on how to access presets from a foreign bank can be found at the FAQs starting from p. 166.



## Auto Boot

During power-up, SWITCH scans all banks sequentially for installed plug-ins, then automatically initializes the previous plug-in. For a short time, the following message will be flashed to the display:



```
2 PlugIns found
Booting Bank: 8
QRS 88x1 COMPLX
2498      2.0
```

The first line shows the number of plug-ins installed in this unit. The second line shows the bank number where a previously configured power-on plug-in will be loaded from. The lower two lines output the plug-in identifier, the device type, and the plug-in version number.

**Note:** For older versions 1.x, no more than **QRS**, **249x**, and **1.x** is being listed here.

## Manual Boot

A manual boot can be enforced by turning on the unit while pressing both the **ENT** and **XIT** keys, up to the moment the first display message is showing up:

```

2 PlugIns found
SelectPlugIn> 8N
QRS 88x1 COMPLX
2498      2.0
  
```

<b>Wheel</b> →	Next bank
<b>Wheel</b> ←	Previous bank
<b>Exit</b>	Discard selection
<b>Enter</b>	Confirm the new selection
<b>Toggle</b>	(not assigned)

The first line shows the number of plug-ins installed in this unit. The second line shows the bank number where the plug-in will be loaded from. A trailing **N** signalizes a *newly-installed* plug-in not yet launched since its installation. The lower two lines output the plug-in identifier, the device type, and the plug-in version number.

Turning → and ← selects a bank. Only banks with an installed plug-in will be shown, so empty banks will cause gaps in the numbering sequence.

**EXIT** discards a selection. The most-recent plug-in will be loaded again.

**ENTER** confirms a selection. The selected bank will be preassigned for future auto boots, and the plug-in from that bank will be initialized.

```

2 PlugIns found
Save Selection:
QRS 88x1 COMPLX
2498      2.0
  
```

**Note:** Whenever a new plug-in has been installed, a **Manual Boot** will be enforced. The most-recent plug-in will remain default. If required, the new one with the N needs to be formally selected.

**Note:** Plug-ins and occupied banks may be erased from the *installation tool*, simply by clicking the **CLEAR BANK** button. For safety reasons, clearing a bank from the device's menu is not possible.

## Error Messages

Following power-up, all banks will be scanned for installed plug-ins. If no plug-in can be detected, the device halts with the following message:



```
PlugInBootLoader  
No PlugIn found!
```

**Causes:** Either all the banks have been erased completely, or SWITCH has been installed on a device where only software of version 1.x has been installed previously, which has been overwritten instead of relocated.

**Solution:** Install a plug-in with software version 2.x or higher, then reboot the unit.

Finally, there is a test whether the auto boot plug-in is still available in the bank assigned for power-up. If that test fails, a **Manual Boot** will be enforced with a modified header line:



```
Invalid LastBank  
SelectPlugIn> 1  
QRS 88x1 COMPLX  
2498      2.0
```

**Causes:** The plug-in from the preassigned bank has been erased. An installation on top of the preassigned bank has been prematurely aborted. After an update of the SWITCH software, all preassigned information will purposely be lost.

**Solution:** First try to reinstall the damaged plug-in to the preassigned bank. Watch for potential aborts and verify that the plug-in is being installed up to the end. In the last resort, simply turn the wheel and select a different bank.



# Common Pitfalls

**Problem:** Whenever I double or quadruple the input sample rate, the RT60 scales by ½ or ¼. .

**Cause:** Your YARDSTICK doesn't recognize the input sample rate properly.

**Solutions:**

1. Verify the Channel Status bits of your mixing console's "effect send" path, and fix them as necessary.
2. If only one style of sample rates being used in the studio: go to the YARDSTICK's **System Setup Sample Rate Reference** and force **FIX 44.1** or **FIX 48**; the x1, x2, or x4 multiplier will be recognized automatically.
3. If all styles of sample rates are being used in the studio: go to the YARDSTICK's **System Setup Sample Rate Reference** and select **Measure**.

**CAUTION!** Measuring the frequency may be ambiguous due to the overlap of the varispeed sidebands.

**Problem:** I absolutely cannot agree with the chorus who is praising the sound of the QRS algorithm in such rhapsodic manner. With my YARDSTICK, particularly female voices sound unpleasant and discolored, just as the entire signal has been fed through a comb filter or flanger. Even changing room size or RT60 does help precious little.

**Cause:** The direct path may exist twice: through the YARDSTICK, and through the mixing console.

**Solutions:**

1. Disable the direct path in your console.
2. Go to **System Setup Direct Path Enable** and disable the direct path in your YARDSTICK.
3. If available, hit the mini pushbutton *Mute Dry* (lights up red).
4. Hit **TOGGLE** and enter the **Hotkey Menü**. Look for **Mute Dry** and enable it.

**Problem:** The YARDSTICK seems to process the the input clock erroneously. The Lock LED flashes irregularly, and occasionally I even hear clicks and gaps.

**Cause:** The AES3 input level is too low, or enters the unit unbalanced. Background: all QUANTEC devices provide a much higher common-mode rejection ratio (CMRR) than usual. EFT bursts of up to 1kV on the AES3 inputs and outputs are being absorbed without any audible clicks. But if the driver is unbalanced, e.g. a grounded S/PDIF output, the audio frame signal will be suppressed more or less, too. Even if your sound card's operations guide promises a ground-**lifted** output, this states by no means that this output is also ground-**balanced**. S/PDIF outputs generally provide a capacitor of 0.01 to 0.1µF between the Cinch connector's cold side to chassis. Without this cap, the sound card would emit its dirty-ground noise via the transformer stray capacity to the cable shield, which, from an EMC point of view, would be absolutely unacceptable. In the 50/60Hz range of mains power, such a cold-end capacitor may certainly be advertised as “ground-lift”. But in the RF Range, such a circuit is ground-referenced and completely unbalanced.

**Solutions:**

1. Feed the unit with a standard, ground-balanced AES3 signal (regardless of center grounded or floating).
2. When feeding the unit with an S/PDIF signal, please note the comprehensive adapter cable section on p. 43.

## An important note concerning our room models

**Impulse Responses created by Quantec room models are an essential element of the Yardstick series of devices, and are thus subject to copyright.**

Any recording of these Impulse Responses (*»Room Fingerprints«*) for the purpose of inclusion in publicly accessible or freely merchantable collections, e.g. convolution libraries, is prohibited. In particular, this applies to distribution via download (*»Internet«*) or storage media (*»CD, DVD«*), regardless of whether for commercial purposes, or free of charge.

Moreover, any use of our names and terms, such as Quantec, QRS, or Yardstick in conjunction with 3<sup>rd</sup>-party software or convolution reverberation products is prohibited – even in the form of similar-sounding distortions, or specially designed abbreviations, which are targeted to lead someone to suspect an association with Quantec products.

For additional legal notes see our disclaimer on p. 2.

# Frequently Asked Questions

**Question: Due to the room resonances, the spectral components of the diffuse signal are not identical with those of the direct signals, particularly for small rooms. When mixing direct and diffuse signals, how are the readouts from the display to be interpreted?**

Answer: With pink noise and a psophometric filter (*»dBA«*), the levels of both the direct and the diffuse components are almost identical, with an error of  $\pm 0.2\text{dB}$  or less.

Question: It's all very well to say that, but getting the right data seems to be not as trivial as it looks prima facie. Can I verify that by my own with a do-it-yourself recipe?

Answer: Yes. Set the unit's parameters as follows: **DryLEV  $\pm 0$ , 1stLEV OFF, 2ndLEV  $\pm 0$ , Density 0, BassBoost 0, RT60Hi 1, RT60Lo 1, and BW FULL**. Feed all relevant inputs simultaneously with pink noise of  $-20\text{dB}$ . First disable the diffuse signal, and measure the direct level with the psophometer. Then enable the diffuse signal again, but turn off the direct signal instead. Again with the psophometer, check the output level for every combination of room size and RT60.

**Question: While installing new software, I experience problems with XSOFT and RS-232. How can I verify the interaction between my PC, an attached USB-to-RS-232 adapter, and the YARDSTICK, which is connected to the USB adapter via a null-modem cable?**

Answer: When clicking the Download program's START button, a small dialog box will pop up and, at the same time, a BREAK signal will be output from the serial port. Do not confirm the dialog box yet. First check if the BREAK from the PC appears at the unit indeed. Check the voltage at pin 3 of your RS-232 port (at the PC or USB adapter end of the null-modem cable), or pin 2 (at the device end). While the BREAK is active, the voltage must be between  $+5$  and  $+15$  volts.

Whenever a YARDSTICK sees a BREAK while being turned on, it responds by sending another BREAK back to the PC. If you click the dialog box now, the PC verifies that back BREAK. As soon as a back BREAK is recognized, the PC enters the XSOFT protocol. You can verify the back BREAK at pin 3 of the device, or at pin 2 near the PC. Be aware that a back BREAK needs a functional cable link, i.e. both connectors plugged in. For connecting your multimeter, try to remove the hood from one of the connectors.

**Question: In contrast to the printed circuit board of competitors' products for 96 and 192 kHz operation, I cannot locate SRC chips (SRC=Sample Rate Converter) inside the YARDSTICK. To me, it seems that QUANTEC burdens the sample rate conversion job on the DSP, don't you?**

Answer: no way – there's not any sample rate conversion at all. If, as it's the case for the 2492, we explicitly allow 192 kHz operation, the entire algorithm operates at 192 kHz then, and all delay cells are quadrupled compared to 48 kHz. Or, from the other side: if a 2492 YARDSTICK with a 2492\_QRS\_22x4\_SIMPLE plug-in is operated at just 48 kHz, a lackadaisical DSP has to wait 75% of its time for the next sample.

**Question: To me it appears that its predecessors sound more mellow and with more bass than the 249x YARDSTICKs. Do I hear too much into things?**

Answer: You are right, and I'll give you the low down.

Besides the basic RT60 setting, there are the *RT60Lo* and *RT60Hi* parameters for modifying the reverberation time gradually towards lower and higher frequencies. One should expect that both parameters modify nothing but the reverberation time, and there should be almost no audible effect when e.g. fed with stationary pink noise. This exactly is the behavior of the new 249x series.

With the older 2402 YARDSTICK and its DSP limitations, the result is a bit different. Besides the influence on reverberation *time*, there is always a frequency-dependent boost or cut in the reverberation *level*. If e.g. RT60Lo will be set to **2.5**, the bass will be a bit louder, too, just as the bass potentiometer of a Baxandall filter network would be operated in parallel. In the same manner, the treble level will be reduced when setting *RT60Hi* to e.g. **0.25**.

The frequency characteristic is so simple that it could be mimicked with an equalizer in the effect-send or return path of your console. In fact, it's identical to a Baxandall equalizer with 6dB/octave.

Now back to the 249x series: for high frequency components, you may reduce their levels with the good old *Bandwidth* filters. For low frequency components, there is a new parameter pair called *Bass Boost* and *Bass Edge* – available since Rev. 2.0. This allows to archive bass boosts and bass cuts in the presets.

**Question: With headphones, an output correlation of 50% does a wonderful job. But when monitoring with loudspeakers, we will run into the problem that the left speaker also hits the right ear, and the right speaker also hits the left ear. Is there a way to counterbalance that?**

Answer: Available since Rev. 2.0, there is a new parameter *correlation*, which unbalances, or detunes, the device's output matrix in order to optionally emphasize or deemphasize the lateral or the center signal. This multi-step parameter is available for each output pair separately. With an appropriately allotted emphasis for the lateral signal, crosstalk between speakers may be compensated, at least to a certain degree.



**Question: Why do QUANTEC Room Simulations sound more impressive and more realistic than real rooms?**

Answer: First a formal objection on the part of the Reverberation Czar! - It goes without saying that natural rooms still sound better than our simulation models, first and foremost because of their outstanding spatiality. However, this only holds true as long as the listener is physically positioned inside the room, and thus gets flooded by the omnidirectional sound waves.

As soon as one tries to capture the room impression with microphones, all 3D magic will vanish.

Every sound transducer the acoustic event has to come about on its way to our ears is a bottleneck, which strips off a certain amount of the original room response's spatiality and liveliness. This is by no means a devaluation of our state-of-the-art microphones. But fact is that the microphone bundles all the omnidirectionally-arriving signals on its diaphragm, and then tunnels the precious payload through an electrical mono channel. Even if you would totally shut-off one ear while at the church, that does, on no account, sound monaural.

As the omnidirectional output of our room acoustic models is fed straight into the audio signal path, instead of being tunneled through a microphone's diaphragm, our models clearly sound more lively than a natural room captured with microphones. What is still unavoidable, even for us, is the bundling through the diaphragm of the playback transducer, currently the final acoustic difference remaining between a QUANTEC Room Simulation model and a person's physical presence inside a real room.

From the number of sound transducers involved, three quality classes may be derived:

- |                                  |  |
|----------------------------------|--|
| Class 0 – no sound transducer:   | The listener is physically positioned inside a real room; flooded by the omnidirectional sound waves.  |
| Class 1 – one sound transducer:  | The listener harks attentively to the QUANTEC Room Simulation model through loudspeakers or headphones.  |
| Class 2 – two sound transducers: | The listener follows a recording where room acoustics have been captured by microphones. Only those components of the natural room acoustics not yet stripped-off by the multiplication of recording and playback transducers will remain. |

While QUANTEC Room Simulation with its parametrized models belongs to class 1, the nowadays extremely popular convolution-type reverberation is clearly at class 2 candidate. Reason is that the convolution chain still comprises of two sound transducers: first the microphones to capture the room's "fingerprint", then later the playback transducers to monitor the convolution result.

Strange: if the room fingerprints would be deducted (i.e. "stolen") from our Room Simulation models, a convolution-type reverberator would ascend to class 1. Still unachievable for any size of fingerprint library would be our parametrized models' unrivaled ease of ad-hoc characterization.

**Question: Why are there no analog inputs and outputs any more? – The world is analog, and many recording studios still swear on analog audio technology.**

Answer: AD/DA converters age at a much higher rate than outboard signal processors. Which means that separate AD/DA converters typically are a more economical approach.

Digital audio inputs and outputs are an almost perfect interface: full 24 bits in and out – no noise, no distortion, and, if required, double or quadruple sample rates.

Our units are designed for an operating life of 15 to 20 years. Analog inputs and outputs, especially A/D and D/A converter chips, are changing from year to year. What today means the spearhead of technology has to be paid for with astronomical prizes – but may turn out to be outdated in just a few years. Here is an example: our 2493 builds on (currently still) high-performance and thus expensive converters. But what if a new trend will further manifest, which favors IIR instead of FIR anti-alias filters (because of the IIR's non-existent pre-echoes)? What about the 2493 with its time-tested linear-phase FIR filters – will these filters turn out to become a problem in a year or two? From our point of view, it doesn't make a lot of sense to burden an outboard unit with possibly doubtful converters, until its end of life.

Digital audio ports are much easier to keep up with converter advances. So we recommend: use your digital I/O YARDSTICK with external AD/DA converters, and replace them every few years with a then state-of-the-art model. Then the cost/performance ratio will be your decision, not ours...

**Question: Is it realistic to consider rebuilding an existing unit, e.g. from AES3 to Analog?**

Answer: All 249x units are designed with *modular* subassemblies. So it may look straightforward to exchange one or more modules. The main problem lies in the then obsolete and useless front panel and rear hood, which are costly to be recycled or disposed. Conclusion: never say never...

**Question: I have serious problems with the User Interface. The big switches and rotary wheel are ok, but to use only those is quite time consuming. The mini switches are really not very practical if you happen to have big hands, plus you need to be really on top of the unit to see what you are doing.**

Answer: You seem to have overlooked **Parameter Follow Me** mode. When enabled, the left display follows every mini key pressure immediately, showing the current parameter name and value with larger characters. There is also a large status bar for the selected parameter. You can turn the wheel to modify the parameter.

Confirm that **Parameter Follow Me (System Setup / Preset)** has been turned **ON**. With the big switches and the rotary wheel, step down the menu **Edit Scratch A** until you control an arbitrary parameter's value from the rotary wheel. Instead of allocating a new parameter by going up, sideways, then down again, just hit the appropriate mini switch.

**Question: If I install a new plug-in on an already used bank, what happens to the presets of the previous installation?**

Answer: It depends on the type of plug-in. If you simply install a *newer* version of a functionally identical plug-in, your presets will be maintained. If the parameters of the new version have been modified or expanded, all previous parameter versions will be recognized by the new software, and appropriately converted on-the-fly. New, previously non-existent parameters will be initialized to uncommitted values, which try to minimize changes of the previous presets' sonic characteristic.

If you install an *older* version of the same plug-in, and both preset structures are identical, your presets will be maintained. If caveats found, the older software assumes an unknown, non-related effect, and the preset area will be erased. If the over-installation has been done inadvertently, the old presets can be salvaged as long as the over-installed plug-in has not yet been manually selected, confirmed, and launched. It's only an actively running plug-in, which irrevocably erases or converts the presets.

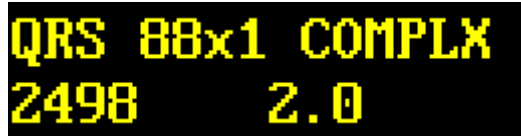
Example: Whenever a DLY plug-in will be installed on a bank which previously hosted a QRS plug-in, all presets will be lost. Functionally different plug-ins do all structure their preset areas at their own discretion, and are blissfully ignorant of any foreign heritage.

Incidentally, the installation tools' default setting always targets at an *unused* bank.

**Question: How can I recognize that a plug-in will definitely not damage my presets?**

Answer: Installing only *newer* versions of otherwise *functionally identical* plug-ins is a safe bet. Functionally identical means that the identification strings of both plug-ins match in every aspect but the version number. Exceptions from this rule are feasible, but will be documented explicitly.

A plug-in can be identified from the 3<sup>rd</sup> and 4<sup>th</sup> lines of the plug-in boot loader. This same text will be re-used in the filename of the installation tool. The filename always starts with the device type, followed by the full name of the plug-in, and ends with a version number. Blanks, '.', or other special characters will be replaced by '\_'. The boot loader may show the following text:



```
QRS 88x1 COMPLX
2498 2.0
```

The corresponding installation tool will then be called: **2498\_QRS\_88x1\_COMPLX\_20.EXE**

**Question: Out of curiosity, I've installed an older 1.x software on a unit already converted to 2.x. Now all my 2.x plug-ins have vanished, including my valuable preset collection. Too bad...**

Answer: Keep cool – that's what has happened: The YARDSTICK's bank 0 of a 2.x installation is being used by the SWITCH boot loader, while in version 1.x, the (one and only) effect software has been settled there. If, after an existing 2.x installation, a 1.x software is being installed, it will overwrite the 2.x boot loader. Because of the missing boot loader, the „bridge“ to the 2.x plug-ins and their preset libraries has gone. But they still exist, safely captured further down the Flash memory. It's just the „access“ which needs to be fixed.

**Question: How can the access be re-enabled?**

Answer: Download the current SWITCH code from our website, and re-install it to the boot sector again. Additional benefit: the 1.x software, installed by you out of curiosity, will not be overwritten initially, but will be offered by SWITCH to be relocated to a bank further down the Flash memory. Before copying, SWITCH will compile a list of all banks, regardless of occupied or free. Now it's up to you to enter a preferred target bank, wait a few minutes while the installation is being relocated, and then proceed with installing SWITCH until finished. With the next reboot, not only all your 2.x plug-ins are being advertised again, without any change. As an additional bonus, your stray 1.x installation will be offered for booting, too.

**Question: When doing some rework on older sessions, I sometimes wish to access earlier versions like 1.6, 1.7, or 1.8 - including the original presets of that time. Would it be possible to smuggle various 1.x versions into the unit, by repeatedly overwriting the SWITCH boot loader. Then relocate each one to another bank, in order to have all of them at my disposal when reopening a session?**

Answer: That's okay.

**Question: I've just finished overwriting my former 2.1 installation with version 2.3. Now I found that only parts of my preset collection can be used. Amidst my presets there are lots of voids yawning - I can read **Empty** all over the place. Looks like I've lost parts of my presets due to compatibility problems...**

Answer: Nope. Those *“knocked out teeth”* are all those former factory presets, which have been haphazardly interspersed with the **Local** user preset archive up to version 2.1 – just like a rope of pearls. All older factory presets, and many new ones, have been relocated to library directories like **Dialog-Lib** and **Music-Lib**. All users may refill those residual **Empty** voids with their own presets now.

**Question: What's the use of all that SIMPLE, MEDIUM, and COMPLX stuff, anyhow?**

Answer: For any DSP algorithm, extensive feature lists or higher sample rates can be traded against each other. The QRS algorithm's YARDSTICK 1.x versions have been designed under the assumption to be fully operational even at 192kHz. On the other hand this means that, at 48kHz, the DSP is active only one quarter, and otherwise waiting in idle the rest of the time.

For the user, such an approach is straightforward: any sample rate from 38 to 216kHz is acceptable. The unit digests everything, and the operating surface remains consistent.

For an ambitious algorithm designer, such an approach may be frustrating. How much more can be realized with the otherwise uselessly wasted double or quadruple DSP power. Before continuing, the designer must come to a momentous decision: If I double complexity, my algo cannot be operated at 192kHz any more; but at least will reach 96kHz. If I need four times the DSP power, 48kHz is the end of the line. Loosing a few customers when resorting from 192kHz to 96kHz may not really hurt your company, but loosing some 10 to 20% when sacrificing 96kHz will do. Moreover, such a move will alienate all the rest.

On the other hand, the entire customer base will be preserved if various complexities of an algorithm will be offered. Sometimes it doesn't make sense to stuff all bells and whistles into one plug-in. Quite often it may be realistic to trade-in some of the less important features for a result, which can be operated at double rate, too. Many a high-end customer may even favorite a feature-reduced version. Motto: why should I need baxandall filters for my \$3000 preamp, anyway...

Exactly this is the idea of SIMPLE, MEDIUM, and COMPLX. For a SIMPLE plug-in, all unnecessary ballast will be avoided; this is sort of a minimum version, but fully operational up to 216kHz. The COMPLX plug-in will be stuffed with all bells and whistles, even if just of occasional use; it's the flagship. And, right in between, a MEDIUM plug-in may be positioned, which provides some potential to play with, but compromises only marginally when it comes to sonic quality.

Quite often, the following relations can be assumed: COMPLX:48kHz, MEDIUM:48..96kHz, SIMPLE:48..192kHz; but don't take that for granted. To make it clear, all plug-ins have their maximum sample rate labeled as x1, x2, and x4.

The most universal and most commonplace plug-in is definitely the SIMPLE version. If the required design target can be achieved with it, any future plug-in should be limited to this singular version. This reduces maintenance efforts for the software staff, and minimizes gray zones and learning curves for the end user.

**Question: Can I access older user presets located in a foreign bank?**

Answer: Yes – that's generally possible. Older presets inherited from previous software versions will be converted to the new preset format on the fly. If the new preset format contains parameters not yet available in the older version, similar parameters will be converted (if possible). If all else fails, new parameters will be set to their default values. The idea is to make the updated preset sound as similar as possible to the one from the older software. In spite of all automatism, we strongly recommend to check the updated presets thoroughly.

**Question: Can I access factory presets located in a foreign bank?**

Answer: Yes, but not before they have been copied to the foreign **Local** archive.

**Question: Is erasing of a bank mandatory before installing a new plug-in?**

Answer: No. But if a bank has not explicitly been cleared, the previous Setup and all local User Presets remain in that bank. When updating to a *newer* version of the same plug-in, it often makes sense *not* to erase that bank. Launched for the first time, a newer plug-in tries to adopt the remaining data, then start to build on that heritage. Before, for whatever reason, installing an older version, a bank should always be cleared in advance!

**Question: Bullshit! - My YARDSTICK does not fit between the rails of my rack. Aren't those QUANTEC people in a position to adhere to the 19" specs?**

Answer: According to IEC60297, the clearance between the 19" rack rails is required to be 450 mm *minimum*. Our YARDSTICKs external width is 448.2 mm *maximum* – so where's the problem?

<http://www.quantec.de/download/IEC297-1.gif>

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# 249x Specifications

Yardstick 2492	Yardstick 2493	Yardstick 2496	Yardstick 2498
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## Effects

Room Simulation		yes	yes	yes	yes
	RT60 Parametr. model	0.01 to 100 sec	0.01 to 100 sec	0.01 to 100 sec	0.01 to 100 sec
	RT60 Convolver	no	no	no	yes, TBA
	Room size m <sup>3</sup>	1 to 1,000,000	1 to 1,000,000	1 to 1,000,000	1 to 1,000,000
	Bandwidth filter	yes	yes	yes	yes
	Density build-up	variable	variable	variable	variable
	Virtual microphones	2 (out of 12)	2 (out of 12)	6 (out of 12)	8
	Multichannel	no	no	2-in / 6-out	8-in / 8-out
	Predelay				0.25 sec (8x)
	Postdelay	0.25 sec (2x)	0.25 sec (2x)	0.25 sec (6x)	0.25 sec (8x)
	Minimum delay step	1 ms	1 ms	1 ms	1 ms
	Alternative algorithms	TBA	TBA	TBA	TBA

Delay Plug-in		2 channels	2 channels	2 channels	8 channels
	Delay max.	128 sec total	128 sec total	128 sec total	128 sec total
	Minimum delay step	1%samp = 50ns	1%samp = 50ns	1%samp = 100ns	1%samp = 100ns

Other Plug-ins	IIR / FIR filters	TBA / TBA	TBA / TBA	TBA / TBA	TBA / TBA
	Equalizers / Gates	TBA / TBA	TBA / TBA	TBA / TBA	TBA / TBA
	Flangers / Choruses	TBA / TBA	TBA / TBA	TBA / TBA	TBA / TBA

## User interface

Display(s)		dual gray scale	dual gray scale	dual gray scale	dual gray scale
Parameter change		turnw heel	turnw heel	turnw heel ± panel levers	turnw heel ± panel levers
Tap delay option		TBA	TBA	TBA	TBA
Preset change		turnw heel	turnw heel	turnw heel	turnw heel
Preset management		MIDI, RS-232 web browser	MIDI, RS-232 web browser	MIDI, RS-232 web browser	MIDI, RS-232 web browser

## Mechanical

Height	Panel units	1	1	1	1
Depth	mm	36	36	36	36

	Yardstick 2492	Yardstick 2493	Yardstick 2496	Yardstick 2498
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**Inputs**

# of channels		2	2	2	8
AES / EBU	via XLR (# of XLRs)	2 (1)	-	2 (1)	2(1)
AES / EBU	via D-SUB25	-	-	-	8
Analog	via XLR (# of XLRs)	-	2 (2)	-	-
Max. full level	dBu (balanced)	-	+22	-	-
Level setting		-	setup menu	-	-
Input impedance	ohms	-	6k	-	-
Signal-noise ratio	dB unw. (A-weight)	-	111 (114)	-	-
CMRR	dB (au)	-	>70	-	-
Conformity	IRT Pflichtenheft 3/5	-	full	-	-

**Outputs**

# of channels		2	2	6	8
Output interpolation		noise shaping 16, 24 bit	none	noise shaping 16, 24 bit	noise shaping 16, 24 bit
AES / EBU	via XLR (# of XLRs)	2 (1)	-	6 (3)	-
AES / EBU	via D-SUB25	-	-	-	8
Analog	via XLR (# of XLRs)	-	2 (2)	-	-
Max. full level	dBu (balanced)	-	+22	-	-
Level setting		-	setup menu	-	-
Output impedance	ohms	-	40	-	-
Signal-noise ratio	dB unw. (A-weight)	-	111 (114)	-	-
Unbalance of imp.	dB (au)	-	>70	-	-
Unbalance of EMF	dB (av)	-	>50	-	-
Conformity	IRT Pflichtenheft 3/5	-	full	-	-

**Power**

Mains Voltage	Volts	85..265	85..265	85..265	85..265
Power dissipation	Watts	14	18	15	20
Capacitor wearout	chemistry / strategy	zerolytic®	zerolytic®	zerolytic®	zerolytic®

**DSP**

Sampling rate	kHz	38 - 216	48 / 96 / 192	38 - 216	38 - 108
Audio data format	internal	floating point	floating point	floating point	floating point
Word length	bits	32	32	32	32
Block size (BS)	249x latency = 2*BS+3	16	16	16	16
Memory	words = samples	6,291,456	6,291,456	6,291,456	6,291,456
# of Plug-in Banks		15	15	15	63

Yardstick 2492	Yardstick 2493	Yardstick 2496	Yardstick 2498
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**AES3 control bits**

Channel Status		IDs assignable	-	IDs assignable outputs same	IDs assignable outputs per pair
User Bits		transparent	-	transparent	transparent
Timecode		-	-	-	internal LSA event list

**Non-audio interfaces**

MIDI		in / thru / out	in / thru / out	in / thru / out	in / thru / out
	Preset change	yes	yes	yes	yes
	Dynamic params	yes	yes	yes	yes
RS-232		yes	yes	yes	yes
USB 2.0	Classes supported	mass storage, firmw are upgr.	mass storage, firmw are upgr.	mass storage, firmw are upgr.	mass storage, firmw are upgr.
Ethernet	Speed	10BASE-T	10BASE-T	10BASE-T	10BASE-T
802.3af (PoE)	Handheld R/C power	from hub/sw itch	from hub/sw itch	from hub/sw itch	from hub/sw itch
IP address		assignable	assignable	assignable	assignable
Internet Protocols		ARP, DNS, HTTP, ICMP, XNTP, DHCP	ARP, DNS, HTTP, ICMP, XNTP, DHCP	ARP, DNS, HTTP, ICMP, XNTP, DHCP	ARP, DNS, HTTP, ICMP, XNTP, DHCP
Other interfaces		-	-	-	-

**Presets**

# of presets					
Parametrized model	within device	250	250	250	250
	external on PC	unlimited	unlimited	unlimited	unlimited
Conv@16bit/48kHz	within device	-	-	-	up to 10 min.
	external on PC	-	-	-	unlimited
Preset naming		8 chars	8 chars	8 chars	8 chars
Preset handling like installing, removing, renaming, distributing between units, ...		MIDI, RS-232, or from web browser on any computer via the unit's internal webserver	MIDI, RS-232, or from web browser on any computer via the unit's internal webserver	MIDI, RS-232, or from web browser on any computer via the unit's internal webserver	MIDI, RS-232, or from web browser on any computer via the unit's internal webserver
Physical location of preset library		within device or on harddisk of company's backed-up office server	within device or on harddisk of company's backed-up office server	within device or on harddisk of company's backed-up office server	within device or on harddisk of company's backed-up office server
Preset timestamps		internal RTC, NTP server	internal RTC, NTP server	internal RTC, NTP server	internal RTC, NTP server





# **Manufacturer Library**

The manufacturer libraries are partitioned according to their designated use. Grouped under two separated headers for music and dialog, both libraries consist of various subgroups, which typically are sorted according to their room sizes.

All library presets have been developed with headphone monitoring in stereo. Basically, the direct signal has been added within the YARDSTICK. If the direct signal will be fed through the mixing console instead, some presets may sound a bit queer, as level and delay balancing may be broken. Surround channels have not been enabled yet, but may be added at the sound engineer's discretion.

Please note that for Radio Drama productions, sound effects are painted with a pretty wide brush. Priority objective was to accentuate typical acoustic peculiarities, even if one room situation or the other turns out to sound a bit disproportionate.

# Music Library

From within the archives, this library is known as **Music-Lib**. This library contains presets optimized for music, with no unpleasant or obtrusive early reflections.

For ease of operation, the presets have been grouped hierarchically: **SMAll Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCcert Halls**, **SACred Spaces**, **PLAtes**, and **VARious**.

## Small Rooms

<b>SMA</b>	<b>SMAll Rooms</b>	<b>Comment</b>
<b>FustyCin</b>	Fusty Cinema	doesn't work with DirPath through the console
<b>Living+F</b>	Living Room furnished	
<b>Living-F</b>	Living Room unfurnished	new flat

## Medium Rooms

<b>MED</b>	<b>MEDium Rooms</b>	<b>Comment</b>
<b>Theater</b>	Small Theater	student cellar theater, music club
<b>CmbMuStu</b>	Chamber Music Studio	

## Large Rooms

<b>LAR</b>	<b>LARge Rooms</b>	<b>Comment</b>
<b>Volksbad</b>	Müllersches Volksbad	public natatorium with tiles

## Concert Halls

CON	CONcert Halls	Comment
<b>CHa113+A</b>	Concert hall 10 <sup>3</sup> m <sup>3</sup> - with Audience	a classic
<b>CHa113-A</b>	Concert hall 10 <sup>3</sup> m <sup>3</sup> - no Audience	a classic
<b>CHa114+A</b>	Concert hall 10 <sup>4</sup> m <sup>3</sup> - with Audience	a classic
<b>CHa114-A</b>	Concert hall 10 <sup>4</sup> m <sup>3</sup> - no Audience	a classic

## Sacred Spaces

SAC	SACred Spaces	Comment
<b>Oratory</b>	Oratory	
<b>Chapel</b>	Small Church	vocal music starts here
<b>Church</b>	Church	organ music starts here
<b>Cathedr1</b>	Cathedral	
<b>St. Peter</b>	St.Peter in Rome	various side naves and transepts
<b>TajMahal</b>	TajMahal mausoleum	

## Plates

PLA	PLAtes	Comment
<b>PlaDLY#1</b>	Plate set with Predelay #1	
<b>PlaDLY#2</b>	Plate set with Predelay #2	
<b>PlaDLY#3</b>	Plate set with Predelay #3	
<b>PlaDLY#4</b>	Plate set with Predelay #4	
<b>PlaDLY#5</b>	Plate set with Predelay #5	
<b>PlaDLY#6</b>	Plate set with Predelay #6	

## Various

<b>VAR</b>	<b>VARious</b>	<b>Comment</b>
<b>\$99verb</b>	Low cost reverb, embarrassing	what others do wrong (object to be studied)
<b>\$199verb</b>	Low cost reverb, not much better	what others do wrong (object to be studied)
<b>\$299verb</b>	Typical FOH reverb	what others do wrong (object to be studied)
<b>\$399verb</b>	Home Recording reverb	

# Dialog Library

From within the archives, this library is known as **Dialog-Lib**. This library contains lively presets optimized for dialogs, with generously added early reflections.

For ease of operation, the presets have been grouped hierarchically: **CONtainers**, **VEHicles**, **SMAll Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**.

## Containers

CON	CONtainers	Comment
<b>Breadbox</b>	Breadbox	doesn't work with DirPath through the console
<b>Cupboard</b>	Cupboard	solid OSB rear panel
<b>Wardrobe</b>	Wardrobe	booming pressboard rear panel
<b>Bathtub</b>	Bathtub	old free-standing enamel bath tub
<b>OilBarrel</b>	Oil Barrel	

## Vehicles

VEH	VEHicles	Comment
<b>Car</b>	Car	dialogs while driving
<b>TruckCab</b>	Truck Cabin	trucker romanticism, car radio with country music
<b>BoxVan</b>	Box Van	passenger transportation prohibited
<b>Submarin</b>	Submarine	

## Small Rooms

<b>SMA</b>	<b>SMAll Rooms</b>	<b>Comment</b>
<b>PrvSauna</b>	Private Sauna	doesn't work with DirPath through the console
<b>Tent</b>	Tent	cotton fabric
<b>Parlor</b>	Parlor	low coloration and versatile
<b>SmOffice</b>	Small Office	
<b>Garage</b>	Car Garage	
<b>Kitchen</b>	Kitchen	
<b>Bathroom</b>	Bathroom or Lavatory	
<b>Hall</b>	Entrance Hall	

## Medium Rooms

<b>MED</b>	<b>MEDium Rooms</b>	<b>Comment</b>
<b>LgOffice</b>	Large Office	
<b>Cinema</b>	Cinema	
<b>Museum</b>	Museum	low coloration and versatile
<b>Clasroom</b>	School Classroom	
<b>Refectry</b>	Refectory	
<b>Bank</b>	Bank	
<b>BigTop</b>	Circus Tent	plastic-coated tarpaulin
<b>Corridor</b>	Long Corridor	
<b>HalStair</b>	Hall and Staircase	door to staircase stands open
<b>StairCas</b>	Large Staircase	

## Large Rooms

LAR	LARge Rooms	Comment
Theater	Theater	
MuStCarP	Multi-Storey Car Park	
U-Garage	Underground Garage	
Townhall	Townhall	
BigStore	Big Store	multi-storey shopping mall
Cavern	Cavern	simulated vaults
Volksbad	Müllersches Volksbad	public natatorium with tiles

## Big Rooms

BIG	BIG Rooms	Comment
AirHangr	Aircraft Hangar	
Airport	Airport	
ConcertH	Concert Hall	
PowPlant	Power Plant	

## Outdoors

OUT	OUTdoors	Comment
AlleyWay	Alleyway	passage
NarrowSt	Narrow Street	
Backyard	Backyard	
SmallSqr	Small Square	brass ensemble or political speech
Platform	Railroad Station Platform	
SportsFd	Sports Field	
IceRink	Ice Rink	
SmalPark	Small Park	
Copse	Copse	borderline but useful

## Various

<b>VAR</b>	<b>VARious</b>	<b>Comment</b>
<b>RRtunnel</b>	Railroad Tunnel	simulation of vaults with depth
<b>Sewerage</b>	Sewerage	Vienna
<b>Labyrint</b>	Labyrinth	borderline but useful