



Avocet IIA

Quantum DAC

VER 2.1 20160204

New DAC

The Quantum DAC is the 5th generation design from Crane Song with ultra low jitter.

The Quantum DAC uses 32 bit a converter and ASRC for jitter reduction up sampling to 211KHz. Avocet has always upsampled to 211KHz. The reference clock has less then 1pS, 0.5pS typical 1Hz to 100KHz and a proprietary reconstruction filter for accurate time domain response.

New

Direct sub woofer outputs for each of the three output have been added.

The output levels are now programmable in 0.25 db steps for speaker level matching

NOTE:

There is information in the Avocet II manual that applies to the Avocet IIA
This information will be added to this doc at some point in time

MAIN FUNCTIONS

Truncates the digital input to 16 bits. For checking what 16 bits sounds like

Channel Selection to 7.1 surround

SHIFT MODE to reach the setup functions (they have the smaller text on the panel)

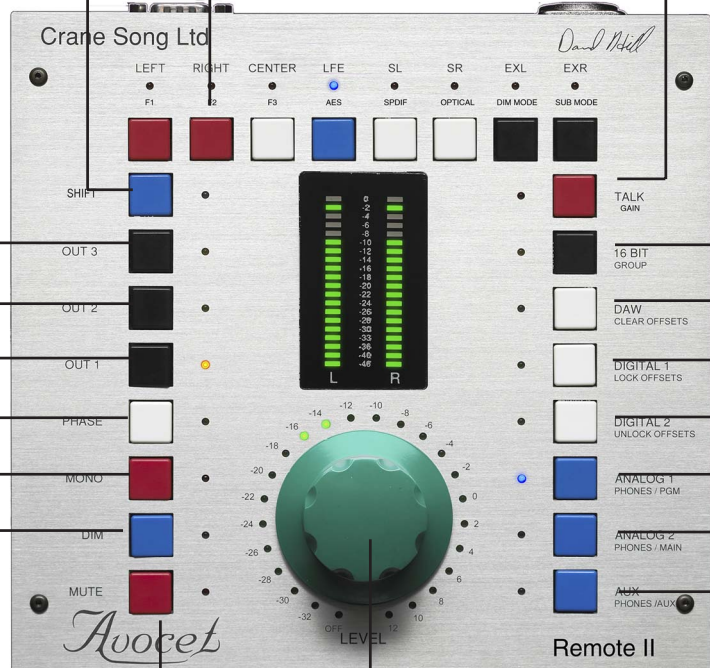
Selects which speaker output 1 of 3

Changes the phase of one channel, disabled in surround mode

Monos the stereo source

Dims the main audio path. The dim level is set by turning the level while dim mode is active. Selection of phones is over ridden by selecting dim.

Talk back button sends the talk mic into the head-phone output. It is push-on push-off, however holding it for 2 seconds allows quick release - non latching



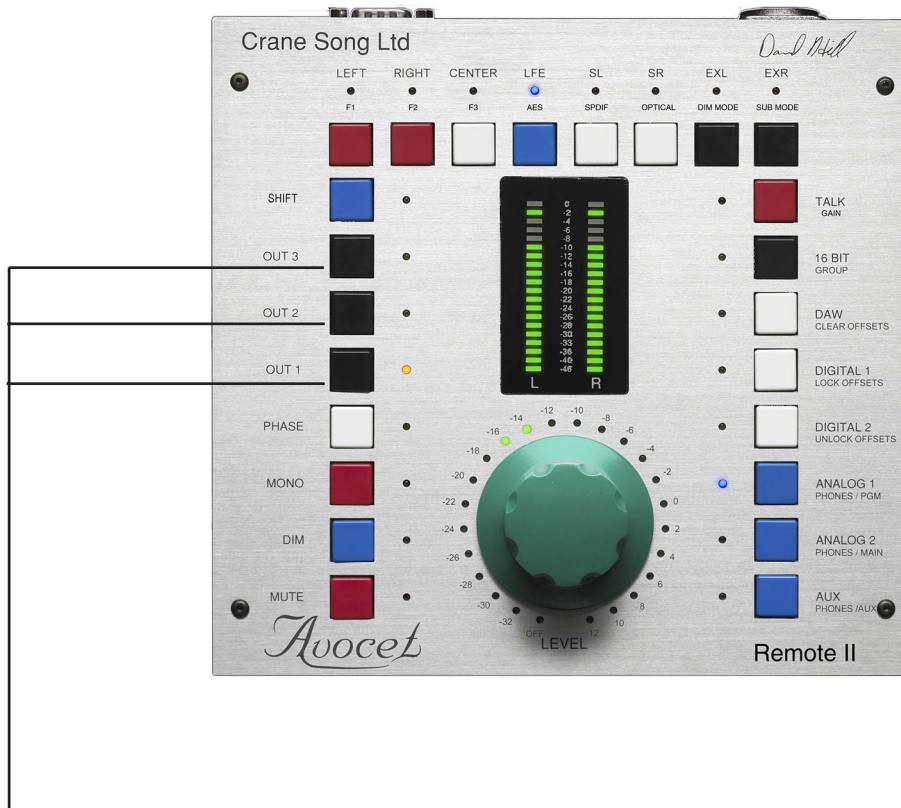
Input selection
The DAW input will be S/PDIF, AES or Optical selected in Shift mode. Digi- 1, 2 are AES, the analog inputs are Balanced

Input level when Phones or Dim modes are not selected
1 DB steps through most of the range

Mute kills the main output. On power up Avocet is muted

CLEARING THE INTERNAL SETTINGS

System Reset

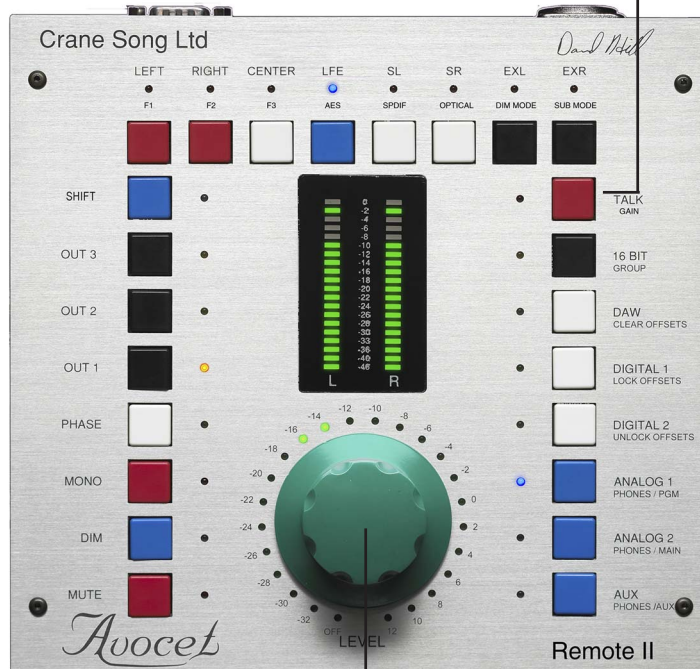


By pressing all three output selection buttons at the same time Avocet will reset all of its internal settings. This is the same as rebooting the remote.

All gains, main and phones are set to zero
Output 1 is the selected output
DAW is the input selected
Phones are set to the Aux input
Stereo speaker selection is selected
All offsets are cleared

TALKBACK OPERATION

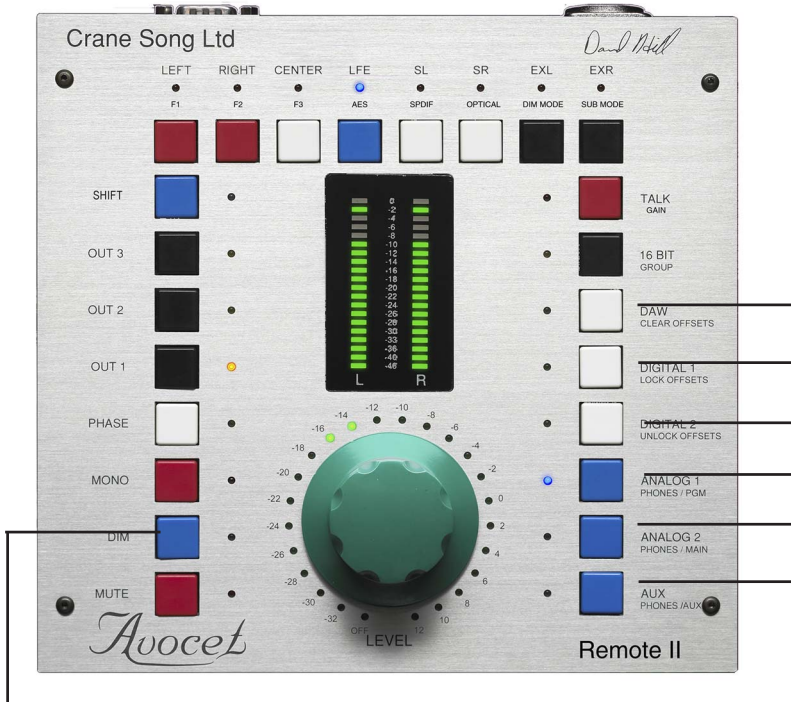
Talk mic is on when the LED is on. It has push-on, push-off operation or latching. However if the talk button is held for one half second or more, the talk back releases when the button is released, non latching



The dim monitor level can be set when the talkback button is pushed. The monitors can be dimmed to off or a level that is below feedback. This will allow communication in both directions while in talk mode.

When in talkback all other buttons are locked out until talkback is released

GAIN TRIMS



If one presses and holds the input select button a second time it will enable the input gain trim mode. It requires about one half second of hold time to enter the trim mode. Trim mode allows changing the input level on the selected input relative to all other inputs. Gain trim has an offset range of plus or minus 10 db in 1 db steps. It is adjusted by turning the GAIN knob. By pressing the input button a third time, the input will return to normal operation while remembering the gain trim. Selecting any other input will also exit the trim adjust mode.

Gain trim can be cleared, locked or enabled by using the Shift key to reach the desired selection. See shift mode setup functions

The mono function also has a gain trim for level matching in surround. After selecting mono a second time, if one presses and holds the mono select button for one half second or more Avocet will enter the mono gain trim mode. To leave the gain trim mode press the button again. This will cause the gain trim to be remembered and the mono mode to be exit.

In normal operation all input gains will track. At the end of the stepped attenuator range the offset gains could reach a limit where they will not change. As an example if you trim an input up by 10 db and then move the main gain to max that input will be max +10 which is not possible. Bringing the main gain back down, the 10db offset will still exist. The same thing will happen on the bottom end of the control range.

SHIFT MODE SETUP FUNCTIONS

SHIFT MODE GAIN TRIM FUNCTIONS



Gain trim can be cleared, locked or enabled by using the Shift key to reach the desired selection.

Clearing the offsets set all input trims and the mono trim to 0 so all inputs are at the default setting. The mono trim works in surround mode only.

Locking and unlocking the trims prevent unintended changing of the trims or allow access to the trims. The hold down timer and the led flash will not happen when offsets are locked.

This is for input level matching.

SHIFT MODE SETUP FUNCTIONS

Changes DIM
from relative LEVEL
to absolute LEVEL

Changes output 3
to work in parallel
with outputs 1 and 2
for use as a sub woofer
output

In the Shift Mode Select the
source for the DAW input between
AES, SPDIF, OPTICAL

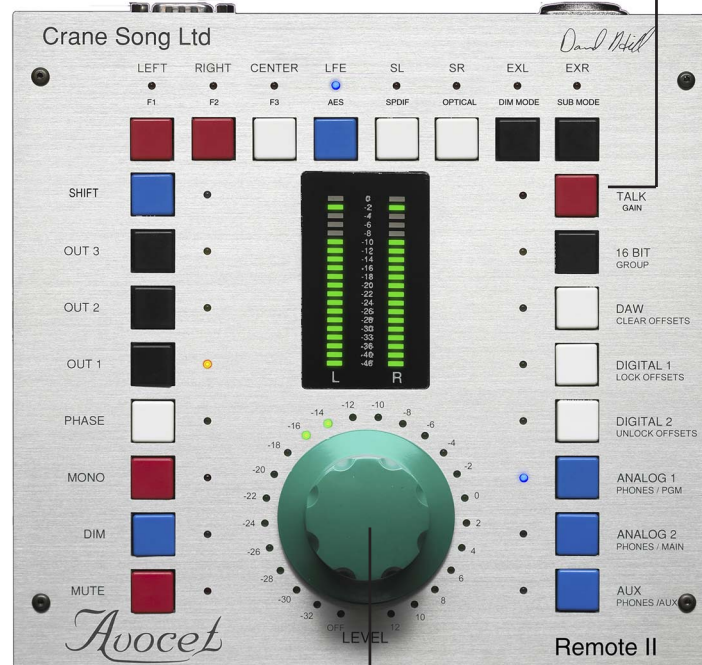
Functions F1, F2
for future features

F3 allows turning both
ANALOG 1 & ANALOG 2
at the same time
it mixes the 2 inputs



SHIFT MODE TALK BACK GAIN FUNCTIONS

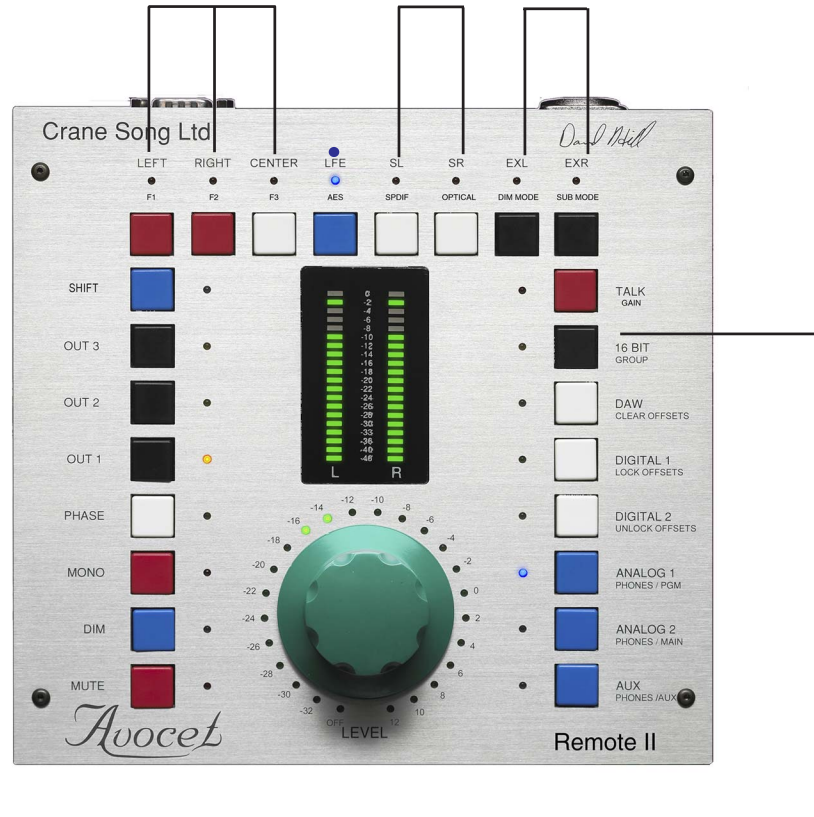
TALK BACK MIC GAIN is changed by selecting the TALK button when in the SHIFT MODE. Turning the gain knob changes the mic gain. The gain steps are 3 db steps to 72 db of gain



GAIN

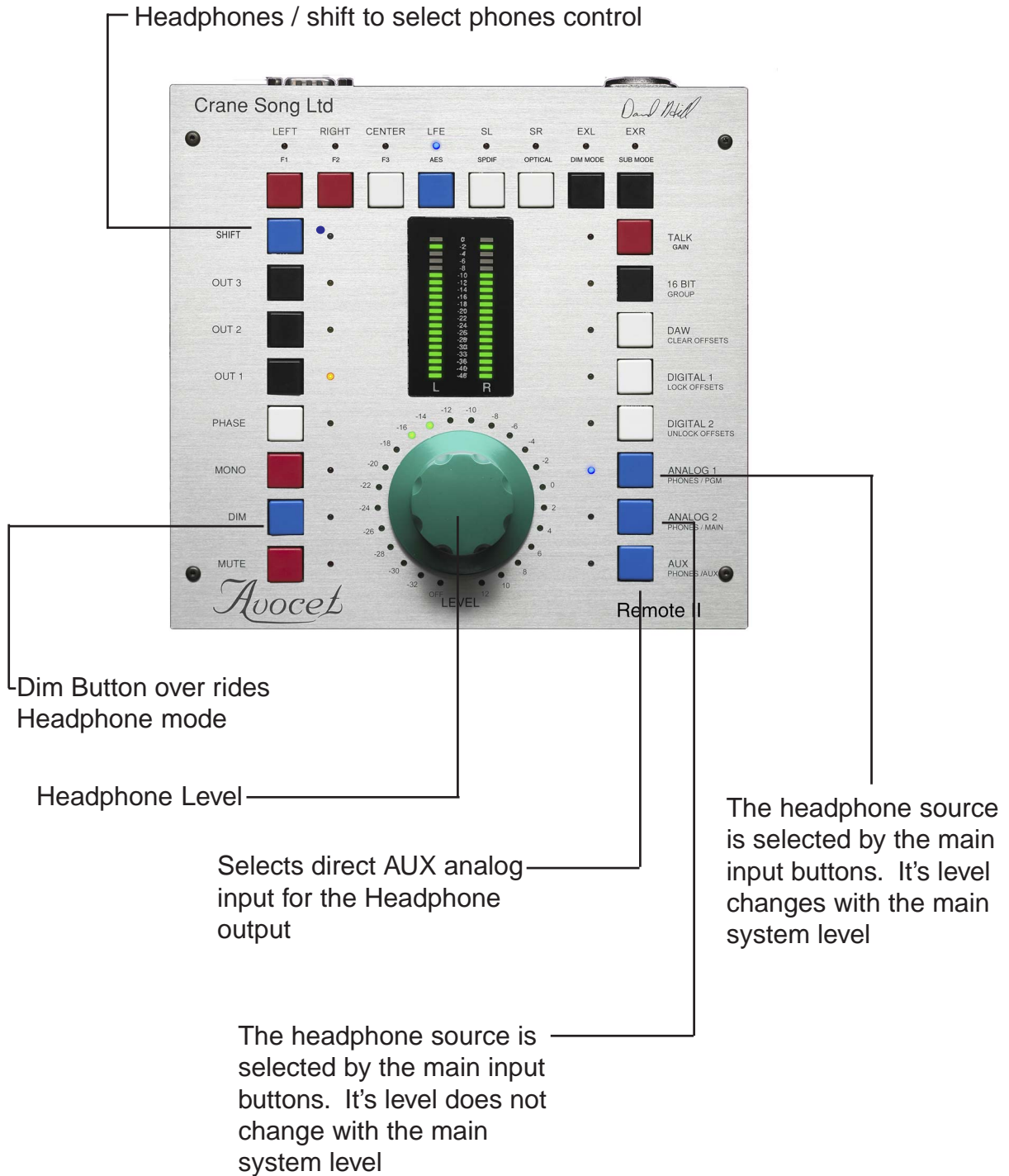
SHIFT MODE GROUP FUNCTIONS

This shows the key grouping



The group function is reached by the shift button and then selecting the group button. What it does, is in surround mode, it groups together Left, Right, Center to function as one button, Surround Left and Surround Right as one button, and Extra Left and Extra Right as one button

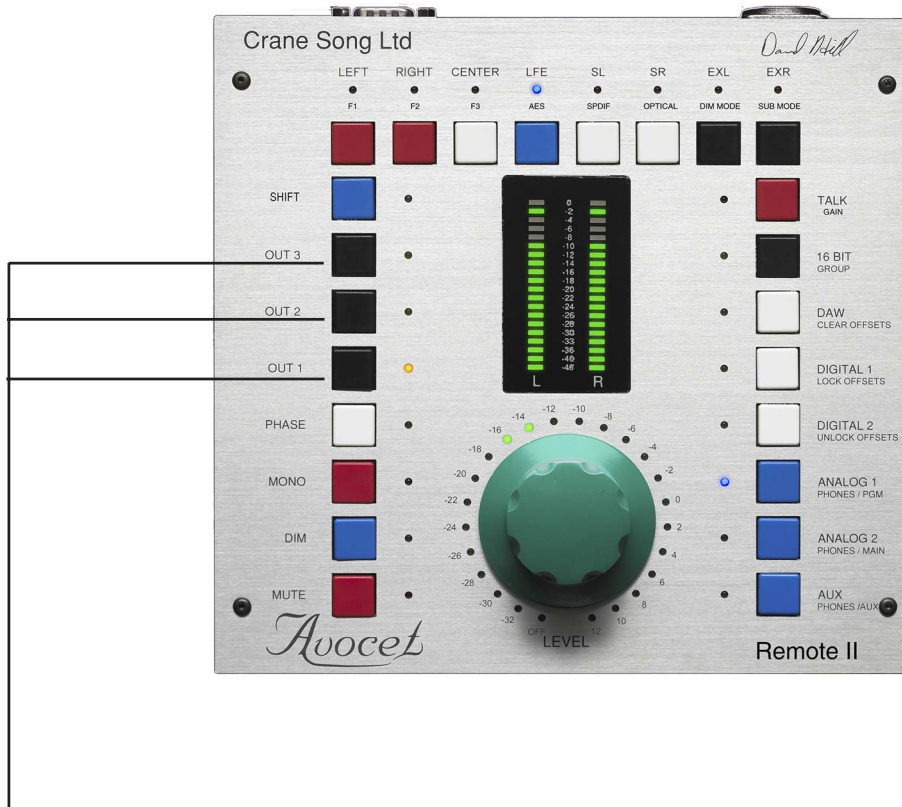
SHIFT MODE HEADPHONE SETUP



SPEAKER / OUTPUT SETUP

Stereo to Surround

Direct Sub mode and Speaker Gain Trim



By pressing any one of the speaker select buttons a second time and holding it for about 0.5 seconds will put Avocet into the speaker set up mode.

If SHIFT is selected the speaker setup is disallowed.

Selecting the center channel button will cause the center channel be the mono speaker when selecting mono. This is the surround mode of operation

Selecting the left, right, or both, (left and right) will disable the surround channels. This selects which speaker is the mono speaker, when the mono function is selected. This is the stereo mode of operation

To exit the setup mode touch the output select button a second time During Speaker setup the Sub Woofer mode is disabled.

Once set up, switching between the speaker systems is user transparent.

SPEAKER MODE SETUP

In the speaker mode setup the following things are controlled for each speaker or output

Mono Speaker, L, R, or center for surround

In OUT1 setup there is a transparent mode for surround on all outputs

The transparent mode removes some of the lock outs that exist when in stereo
the center speaker will be used for the mono speaker

New to Avocet IIA

Direct Sub Out can be turned on or off for each of the outputs

Level matching of the 3 speaker outputs is set by turning the knob, external pads are no longer required

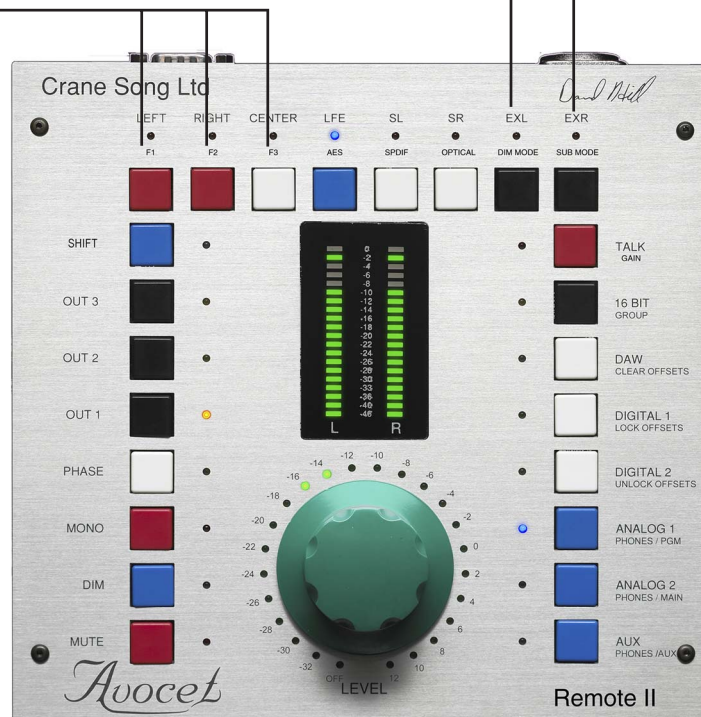
SPEAKER SETUP OUT 1

Transparent Surround Mode

TRANSPARENT SURROUND SETUP
 turning this button on
 will cause the unit to be in surround
 mode at all times
 (Transparent Surround ` Mode)
 the mono speaker select
 function determines the
 active speakers when mono is selected

DIRECT SUB MODE
 By selecting this function
 which must be set in each
 output the Direct Sub
 output is turned on when
 the OUT1 is selected

MONO SPEAKER
 SELECT
 Selects which speaker
 is the mono output
 when mono is selected
 Selecting the CENTER
 will put Avocet into
 Surround mode for the
 selected output

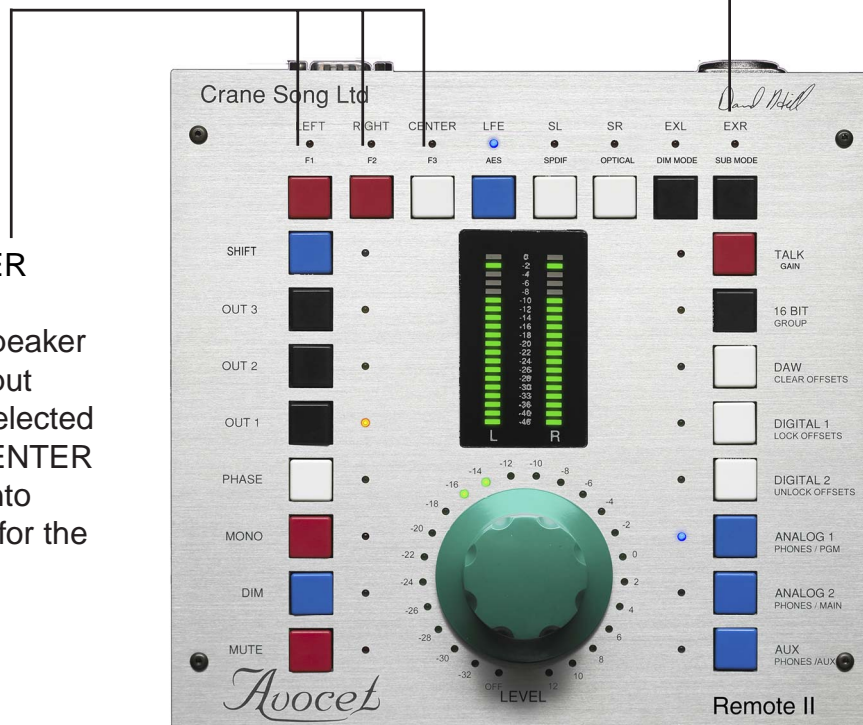


The OUTPUT LEVEL of each speaker may be trimmed down for speaker level matching. When setting up the system so that the normal listening level is around 0 on the dial. When entering the speaker / output setup. No reduction in level is indicated with the level leds showing 0. The speaker trims are in 0.25 db for a max trim of -15.75db. There are 4 steps per db or 8 steps to get to the -2 setting on the dial.

SPEAKER SETUP OUT 2

MONO SPEAKER SELECT
 Selects which speaker is the mono output when mono is selected
 Selecting the CENTER will put Avocet into Surround mode for the selected output

DIRECT SUB MODE
 By selecting this function which must be set in each output the Direct Sub output is turned on when the OUT2 is selected

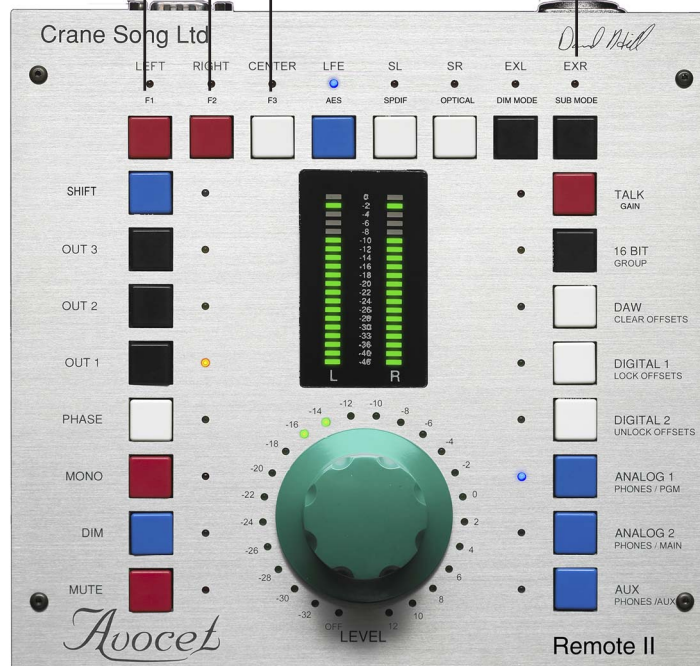


The OUTPUT LEVEL of each speaker may be trimmed down for speaker level matching
 And setting up the system so that the normal listening level is around 0 on the dial.
 When entering the speaker / output setup. No reduction in level is indicated with the level leds showing 0. The speaker trims are in 0.25 db for a max trim of -15.75db. There are 4 steps per db or 8 steps to get to the -2 setting on the dial.

SPEAKER SETUP OUT 3

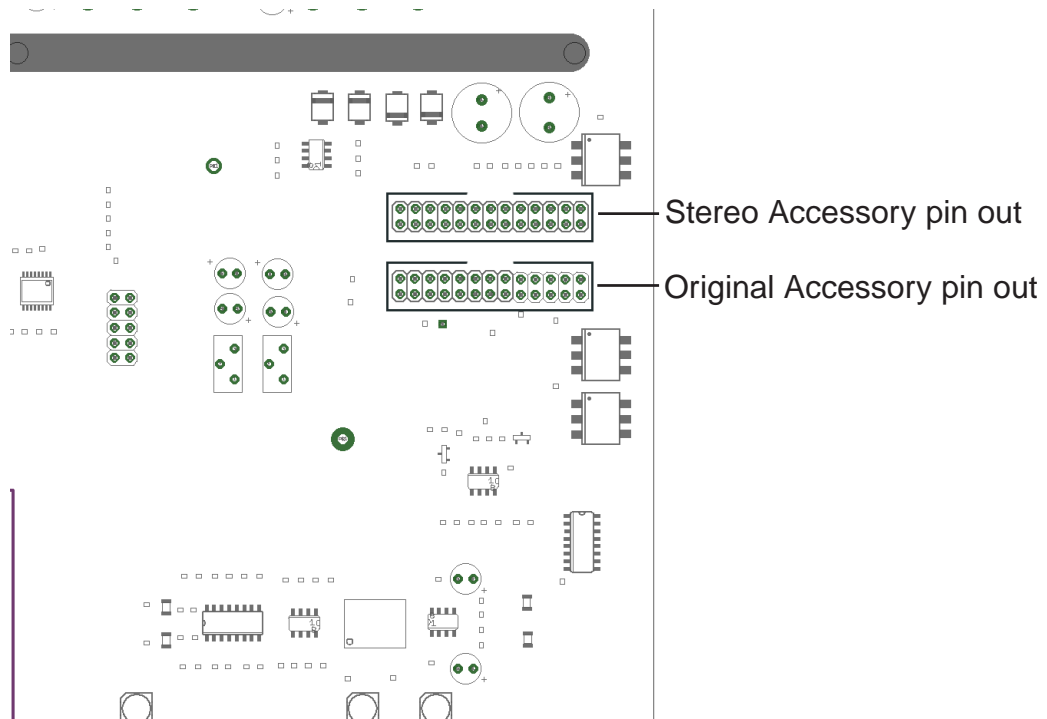
MONO SPEAKER SELECT
Selects which speaker is the mono output when mono is selected. Selecting the MONO SPK will put Avocet into Surround mode for the selected output.

DIRECT SUB MODE
By selecting this function, which must be set in each output, the Direct Sub output is turned on when the OUT3 is selected.



The OUTPUT LEVEL of each speaker may be trimmed down for speaker level matching. And setting up the system so that the normal listening level is around 0 on the dial. When entering the speaker / output setup, no reduction in level is indicated with the level LEDs showing 0. The speaker trims are in 0.25 db for a max trim of -15.75db. There are 4 steps per db or 8 steps to get to the -2 setting on the dial.

DUAL FUNCTION ON THE ACCESSORY CONNECTOR



Avocet IIA shipped configured for stereo will have the Accessory connector configured in the stereo mode. This uses the Tascam style of signal assignment. Any one who upgrades from an earlier version and uses the Accessory connector may need to move the internal ribbon cable

DUAL FUNCTION ON THE ACCESSORY CONNECTOR

The accessory connector can have 2 different functions

In the Avocet IIA stereo mode the accessory connector has the following signals available using the Tascam pinout. All outputs are line level

In Surround configurations the pin out has not changed. The Accessory connector pinout can be changed by moving an internal ribbon cable between 2 different ports

CH1= Direct Sub Right

CH2 = Direct Sub Left

CH3 = Phones Left

CH4 = Phones Right

CH5 = Talk Output

CH6 = talk back switch input

CH7 = Meter Left analog

CH8 = Meter Right analog

PINOUT DETAILS STEREO

		SIGNAL		
CH1_HOT	24	SUB RIGHT	Symmetrical	TO UNBALANCE DO NOT CONNECT XLR PIN 3
CH1_COLD	12			
CH1_GND	25			
CH2_HOT	10	SUB LEFT	Symmetrical	TO UNBALANCE DO NOT CONNECT XLR PIN 3
CH2_COLD	23			
CH2_GND	11			
CH3_HOT	21	PHONES LEFT	PIN2 SIG-	
CH3_COLD	9			
CH3_GND	22			
CH4_HOT	7	PHONES RIGHT	PIN2 SIG-	
CH4_COLD	20			
CH4_GND	8			
CH5_HOT	18	TALK OUT	PIN2 SIG-	
CH5_COLD	6			
CH5_GND	19			
CH6_HOT	4	ext talk cmd in hot to gnd for talk on		
CH6_COLD	17			
CH6_GND	5			
CH7_HOT	15	METER LEFT	PIN 2 SIG +	
CH7_COLD	3			
CH7_GND	16			
CH8_HOT	1	METER RIGHT	PIN 2 SIG +	
CH8_COLD	14			
CH8_GND	2			

ACCESSORY CONNECTOR PINOUT DETAILS SURROUND MODE

1	Right Channel Source Output
2	gnd
3	gnd
4	talk mic output - When talk button is pushed (Mic Output)
5	Right phones out (Line level phone bus)
6	Left phones out (Line level phone bus)
7	gnd / ground
8	data I/O do not connect
9	gnd
10	gnd
11	gnd
12	Surround mono input 6
13	Surround mono input 5
14	Left Channel Source Output
15	mono out
16	talk command in - enable by tying to gnd
17	mute+
18	mute-, solo-
19	solo+
20	used in surround wiring from left-right to center channel
21	gnd
22	Surround mono input 1
23	Surround mono input 2
24	Surround mono input 3
25	Surround mono input 4

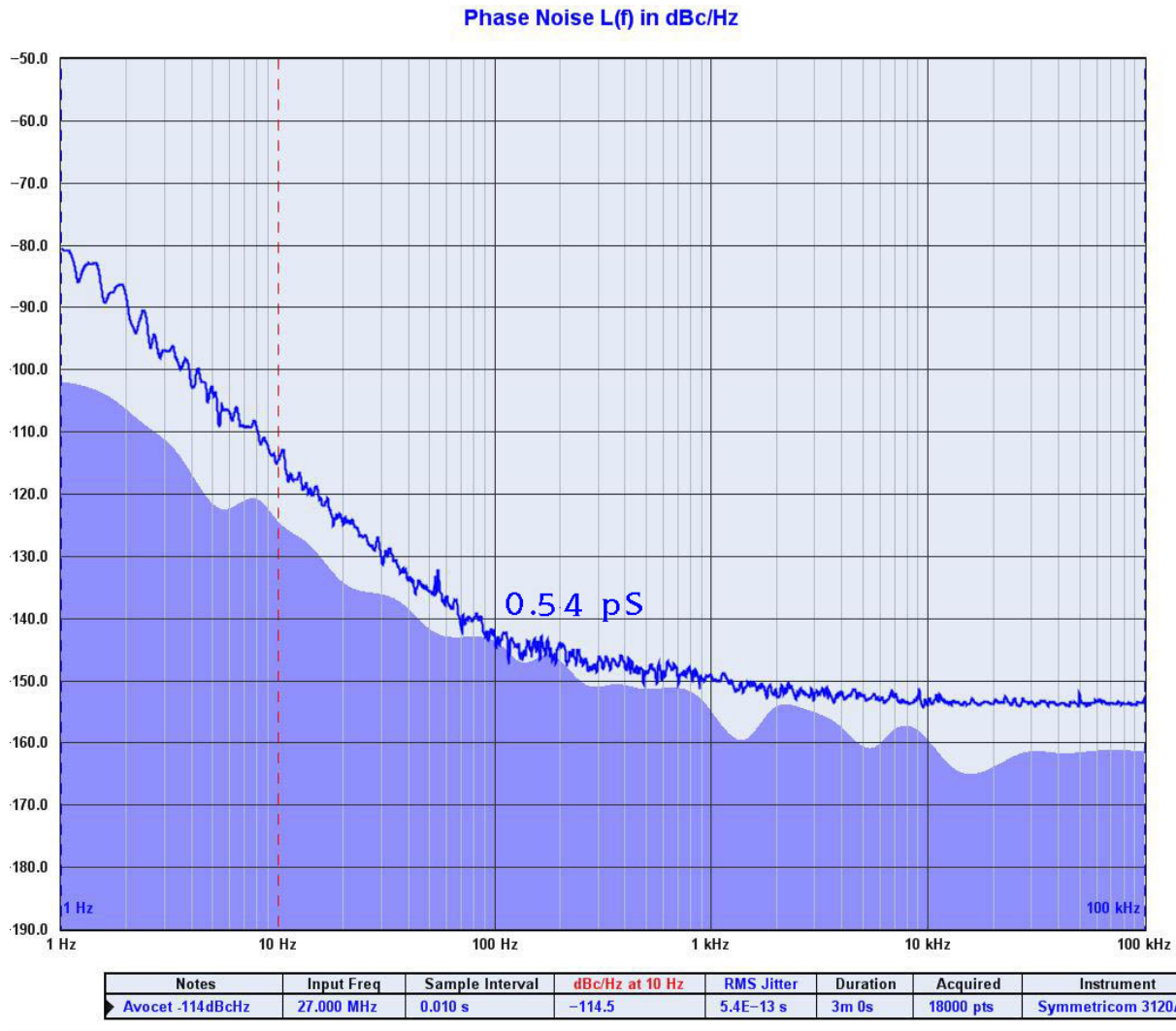
To use the external mute or solo inputs 5 to 15 volts needs to be applied to the control input lines. Polarity must be followed. These inputs are optical isolated.

The mute control is push on - push off, the talk input is also push on - push off or latching. The solo switching remains in the soloed state as long as the control voltage is applied. A jumper is provided on the main pcb that selects either the solo is the DAW or ANA1 input as the solo input.

All audio signals are unbalanced

Starting with the rev5 pcb the low connection for mute and solo has changed
See the section on headphone setup and the external wiring connections.

QUANTUM DAC JITTER MEASUREMENT



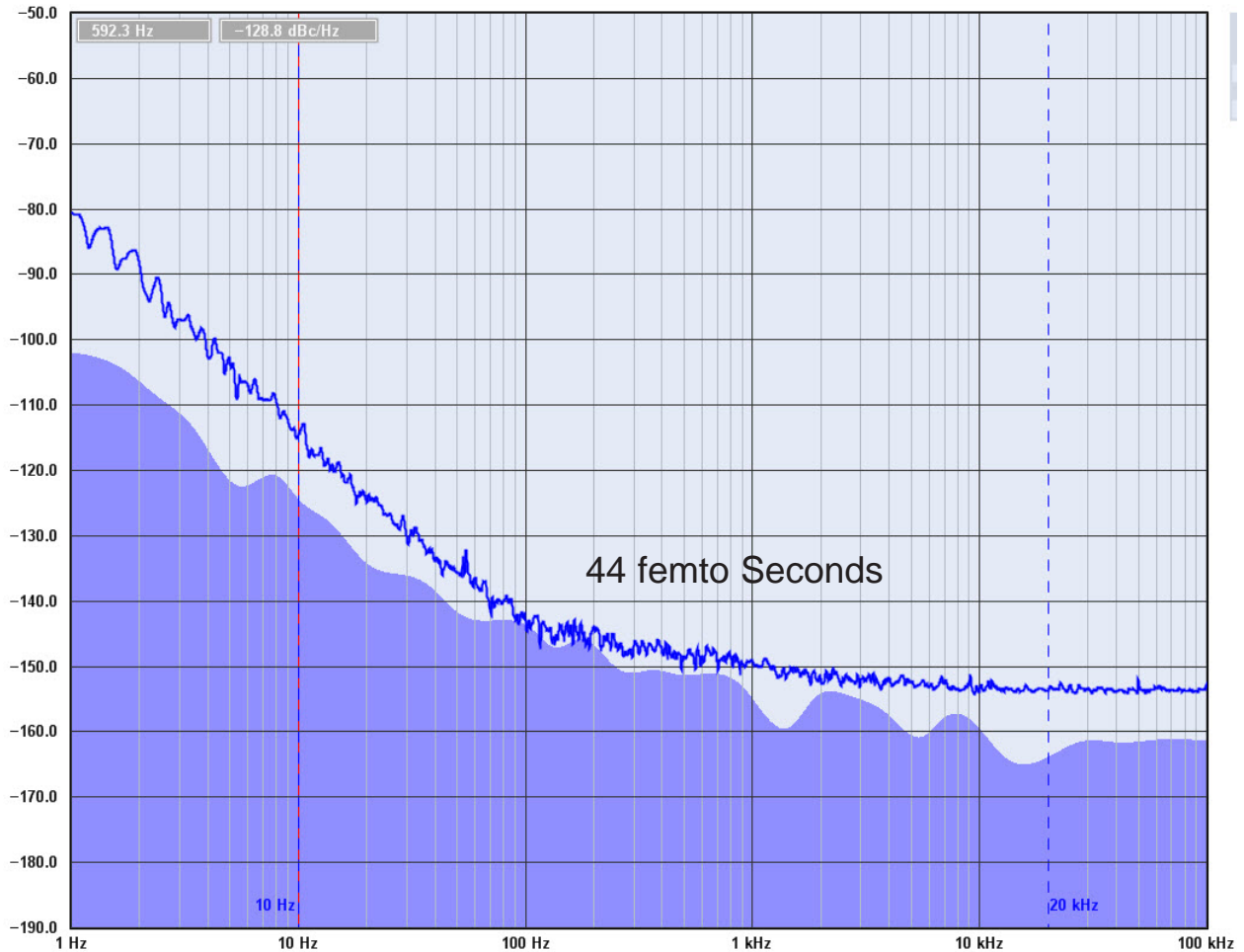
The jitter value in this measurement from 1Hz to 100KHz is 0.54pS typical measured with a Symmetricom 3120A using a Stanford Research Systems Rubidium Frequency Standard, PRS10

Without info on the measurement bandwidth and test instrument used, the measurement is impossible to know about

Test Software does not make a distinction between random and deterministic jitter. AES-12id-2006 (r2011) excludes modulation components below 10 Hz in it's jitter definition.

Jitter requirements depends on the curcuits being used and the desired results.

Phase Noise L(f) in dBc/Hz



Notes	Input Freq	Sample Interval	dBc/Hz at 10 Hz	RMS Jitter	Duration	Acquired	Instrument
▶ -114dBcHz	27.000 MHz	0.010 s	-114.5	4.4E-14 s	3m 0s	18000 pts	Symmetricom 31

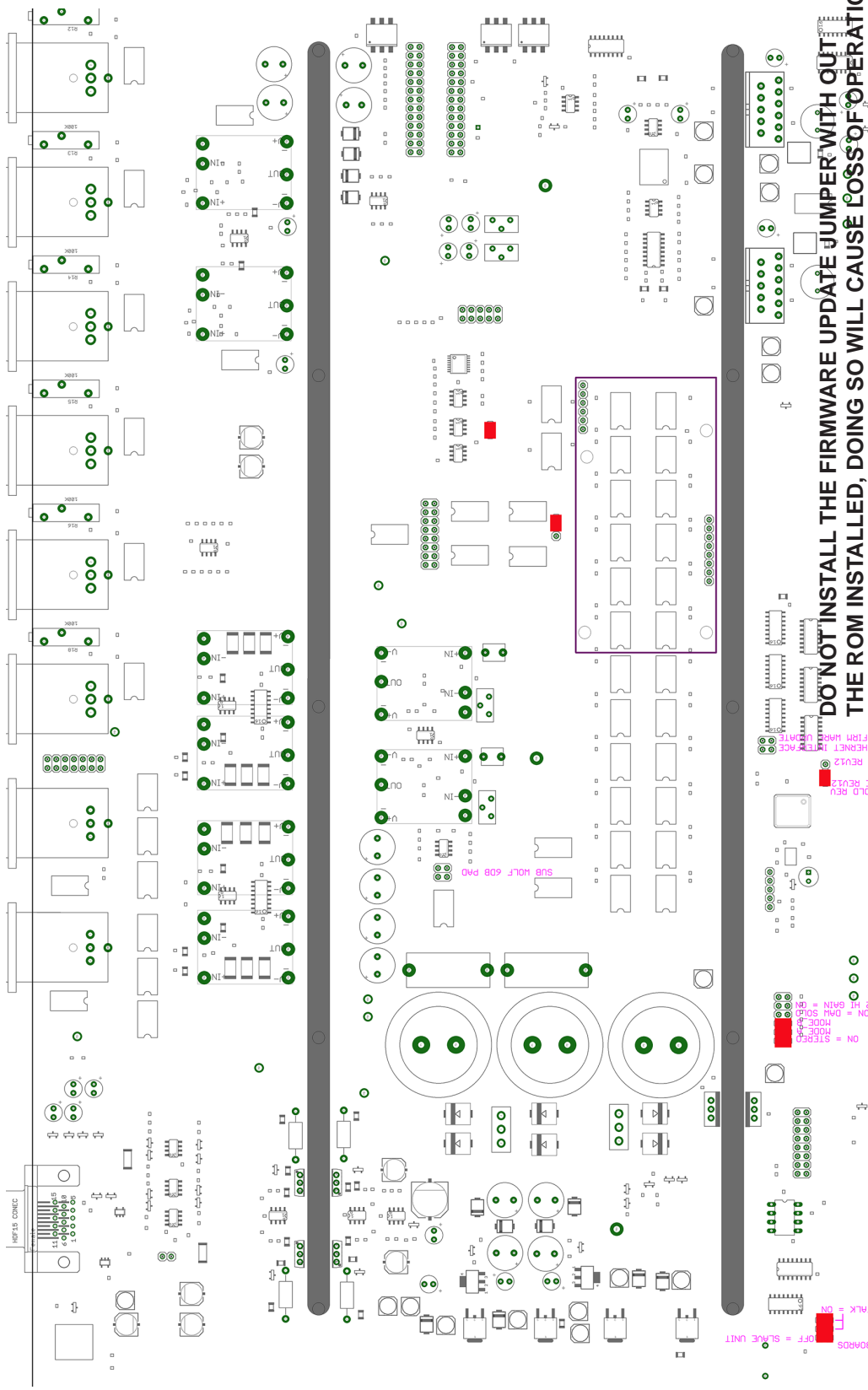
Jitter measured from 10Hz to 20KHz is 0.044pS or 44 fS typical
 measured with a Symmetricom 3120A using a Stanford Research Systems
 Rubidium Frequency Standard, PRS10
 without info on the measurement bandwidth and test instrument used, the measurement is
 impossible to know about

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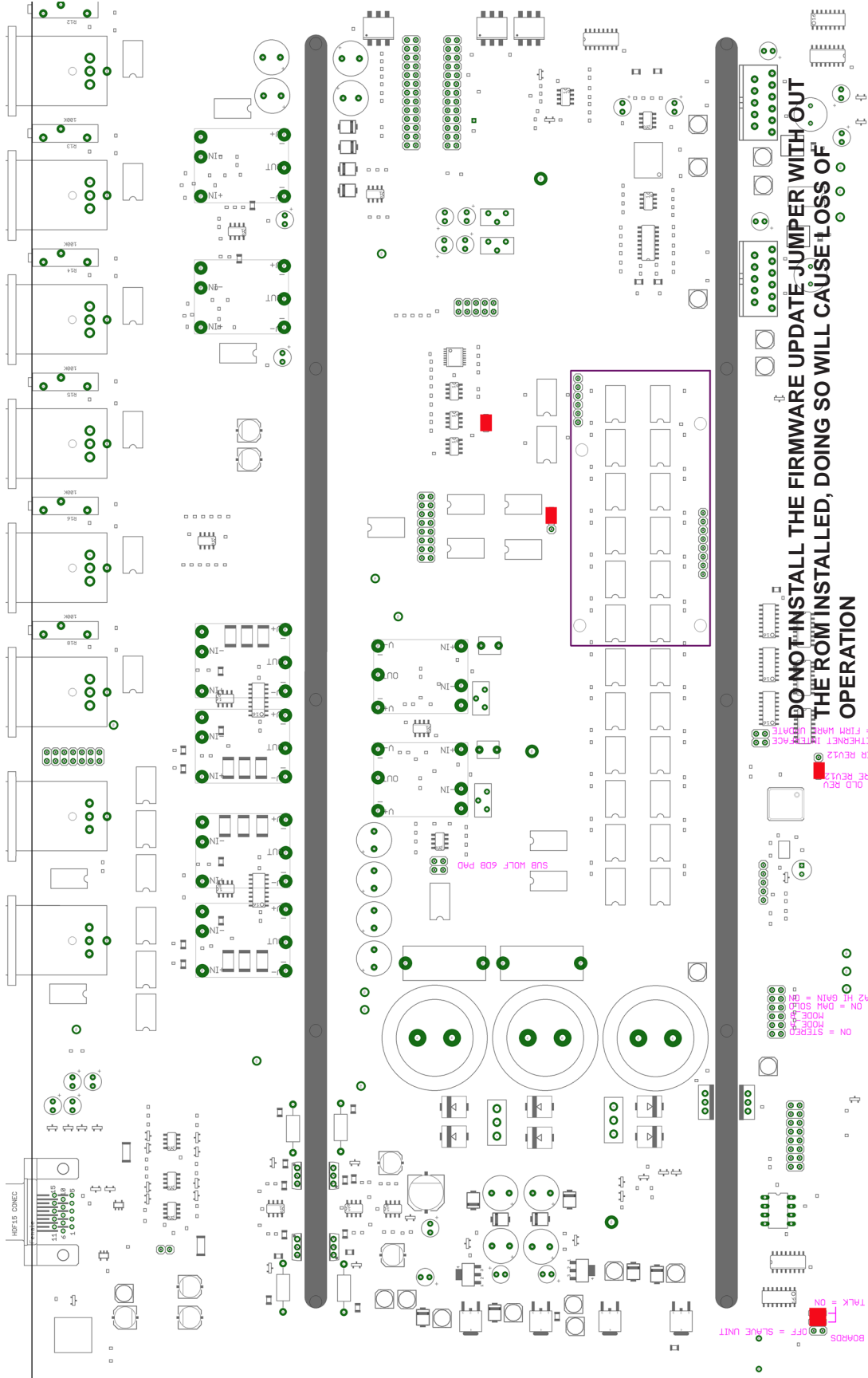
CONFIGURATION JUMPERS

Do not change unless one is certain that you understand what they do
They are factory set. Provided for reference



DO NOT INSTALL THE FIRMWARE UPDATE JUMPER WITH OUT THE ROM INSTALLED, DOING SO WILL CAUSE LOSS OF OPERATION

STEREO



DO NOT INSTALL THE FIRMWARE UPDATE JUMPER WITH OUT THE FIRM INSTALLED, DOING SO WILL CAUSE LOSS OF OPERATION

ON = FOR OLD BOARDS
 ON = MASTER
 OFF = SLAVE UNIT
 NORMAL TALK = ON
 ON = STEREO
 MODE 50
 ON = DATA
 HI GAIN = ON
 ON = DATA
 HI GAIN = ON
 JHP HERE FOR SURROUND MASTER REV12
 ON = ETHERNET
 JHP HERE FOR SURROUND SLAVE FIRMWARE REV12
 JHP HERE FOR SURROUND WITH OLD REV

EXTRA SURROUND

QUANTUM DAC PCB SHOWING GAIN TRIMS AND JUMPERS

