Avocet IIA
Quantum DAC

VER 2 20151022

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

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

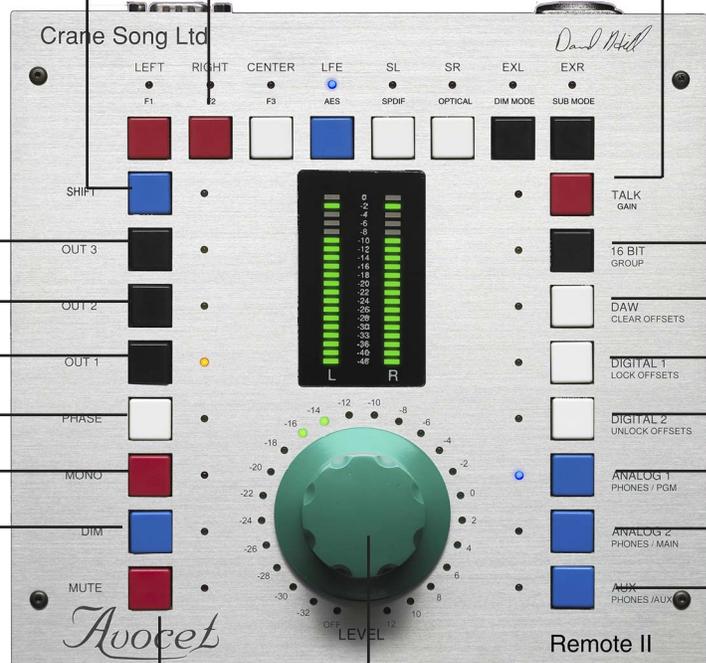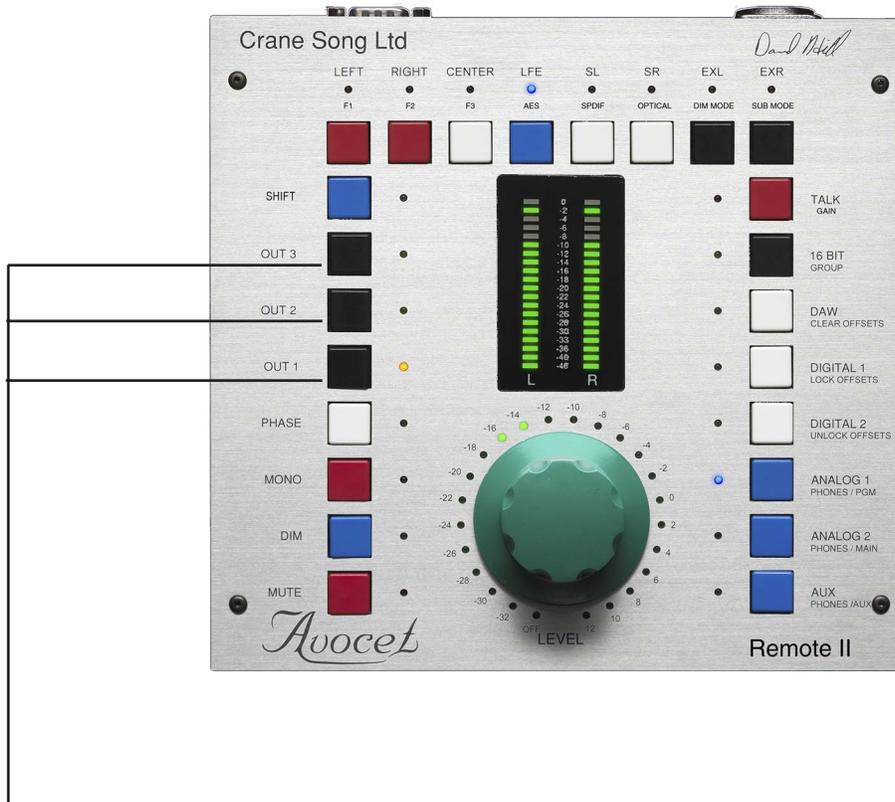SHIFT MODE to reach the setup functions (they have the smaller text on the panel)

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.

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 Bal-anced

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

Crane Song Ltd

LEFT RIGHT CENTER LFE SL SR EXL EXR
F1 F2 F3 AES SPDIF OPTICAL DIM MODE SUB MODE

SHIFT
OUT 3
OUT 2
OUT 1
PHASE
MONO
DIM
MUTE

TALK GAIN
16 BIT GROUP
DAW CLEAR OFFSETS
DIGITAL 1 LOCK OFFSETS
DIGITAL 2 UNLOCK OFFSETS
ANALOG 1 PHONES / PGM
ANALOG 2 PHONES / MAIN
AUX PHONES /AUX

L R

LEVEL

Avocet

Remote II

CLEARING THE INTERNAL SETTINGS
System Reset

By pressing all three output selection buttons at the same time Avocet will reset all of it's 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 comminution in
both directions while in talk mode.

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

GAIN TRIMS

Gain Trims are adjustable
by plus or minus 10db
on all INPUTS and the
MONO function in surround

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

SHIFT KEY TO ENABLE SHIFT MODE

Gain trim offset clear

Gain trim offset lock

Gain trim unoffset lock

must be in shift mode
to enable these 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

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

.

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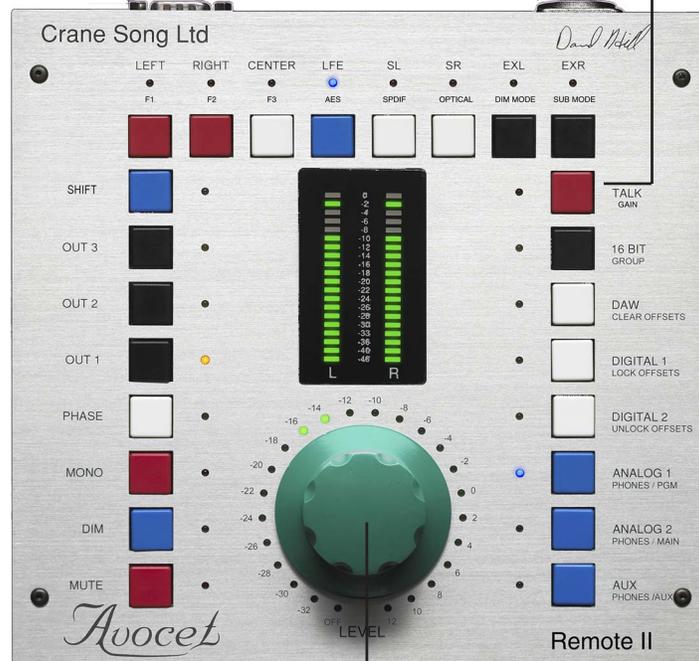with outputs 1 and 2
for use as a sub woofer
output

Functions F1, F2
for future features

F3 allows turning both
ANALOG 1 & ANALOG 2
at the same time
it mixes the 2 inputs
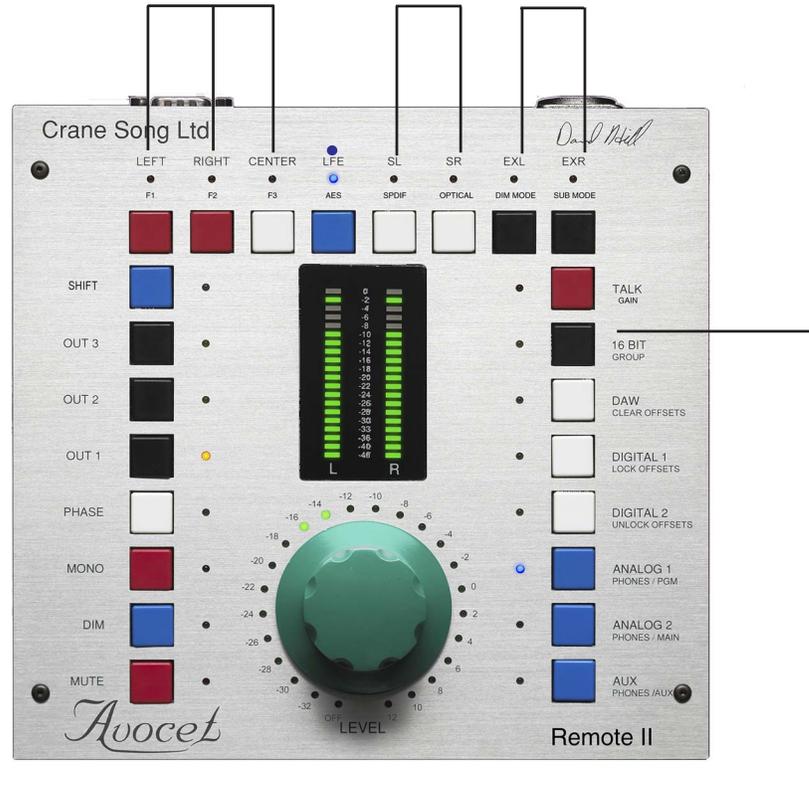
SHIFT MODE TALK BACK GAIN FUNCTIONS

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
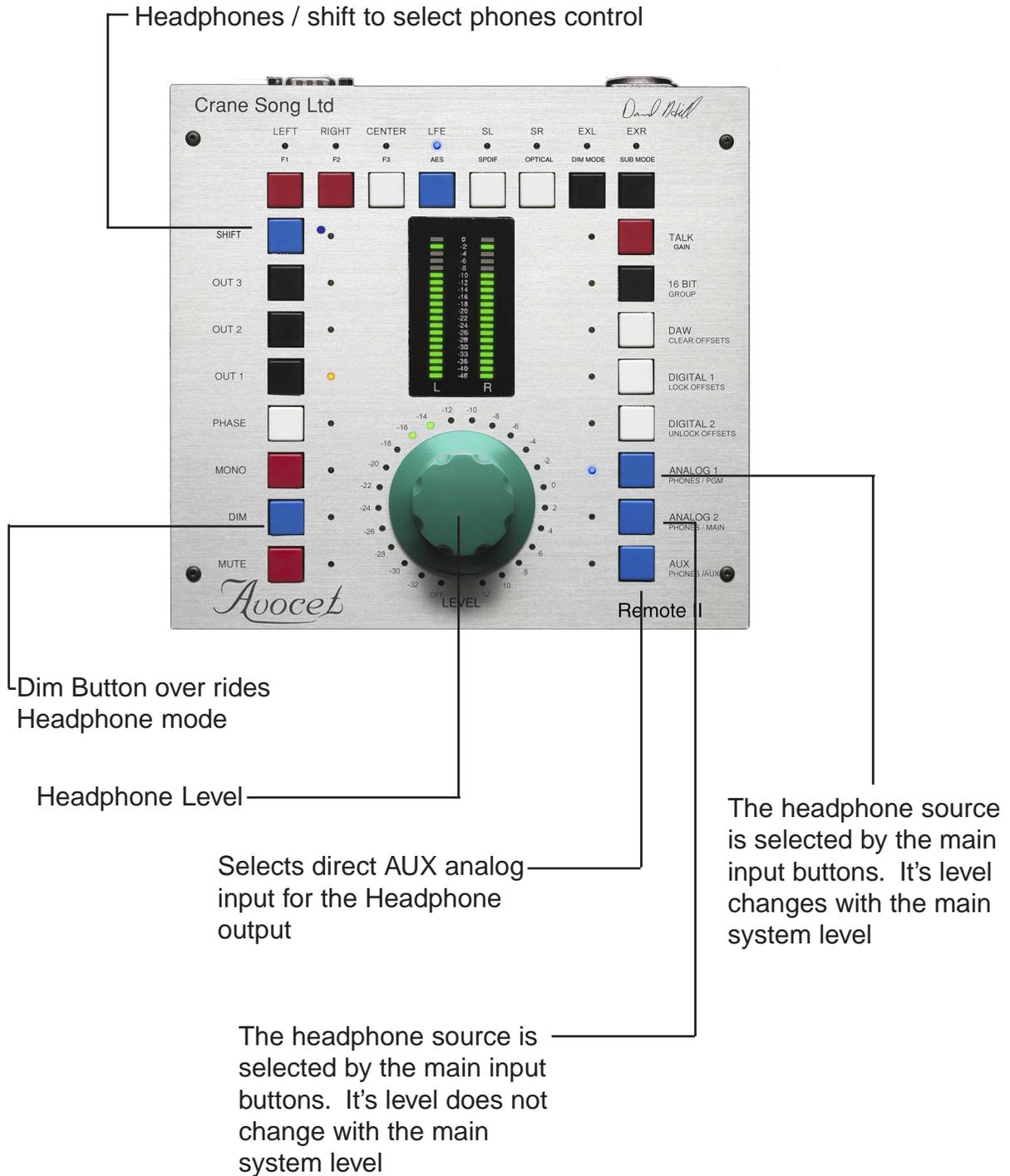are 3 db steps to 72 db of gain

GAIN

SHIFT MODE GROUP FUNCTIONS

This showes 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

Headphones / shift to select phones control

Crane Song Ltd

Dim Button over rides
Headphone mode

Headphone Level

Selects direct AUX analog
input for the Headphone
output

The headphone source is
selected by the main input
buttons. It's level does not
change with the main
system level

The headphone source
is selected by the main
input buttons. It's level
changes with the main
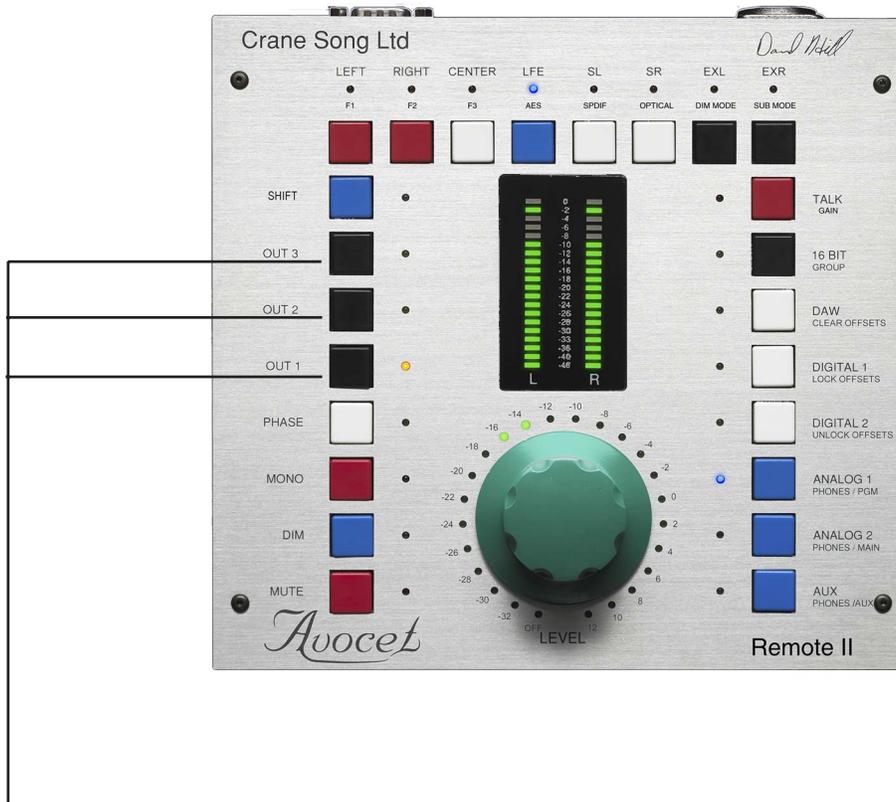system level

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 setupthe following thing are controled 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
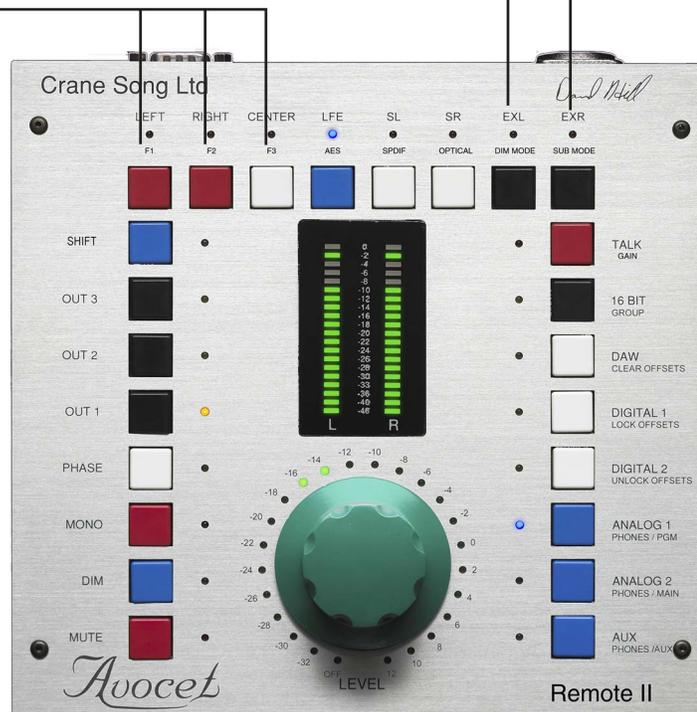
The OUTPUT LEVEL of each speaker may be trimmed down for speaker level matching.
When setting up the system so that the normal listening level is around 0 on the dial.
When entering the speaker / output setup. No reduction in level is indicated with the level leds
showing 0. The speaker trims are in 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

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

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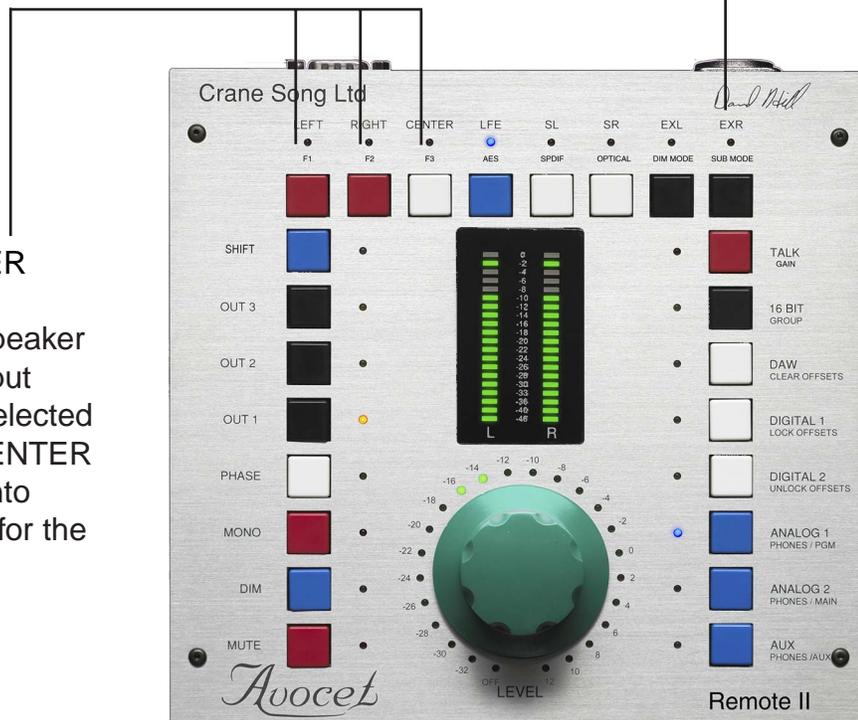Surround mode for the
selected output

The OUTPUT LEVEL of each speaker may be trimmed down for speaker level matching
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

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

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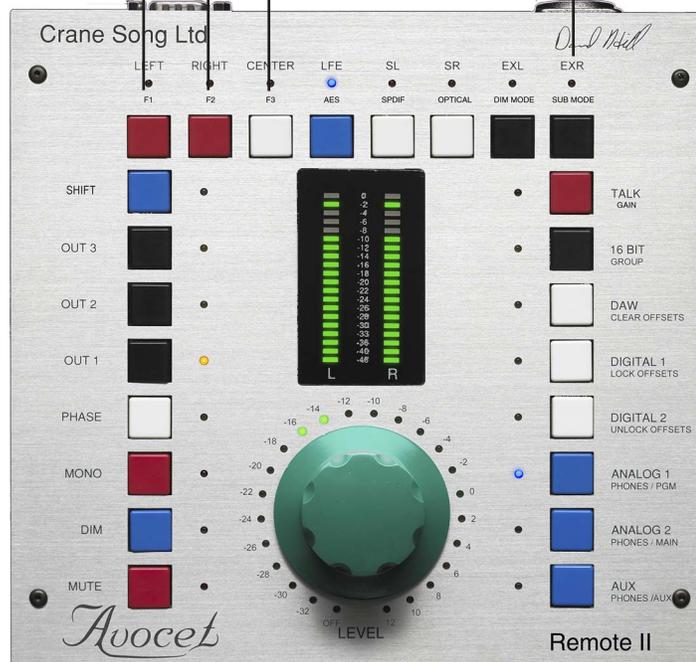Surround mode for the
selected output

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.

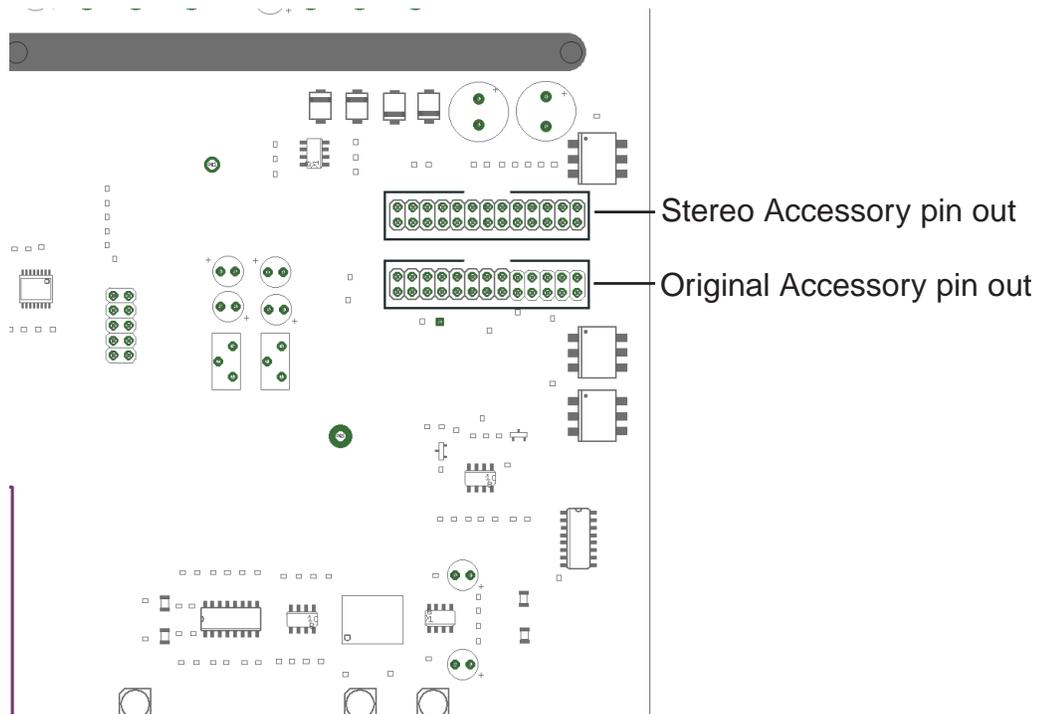# DUAL FUNCTION ON THE ACCESSORY CONNECTOR

Stereo Accessory pin out

Original Accessory pin out

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 and 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 avaliable
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		
CH6_COLD	17	hot to gnd for talk on		
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

Phase Noise L(f) in dBc/Hz

Notes	Input Freq	Sample Interval	dBc/Hz at 10 Hz	RMS Jitter	Duration	Acquired	Instrument
▶ Avocet -114dBcHz	27.000 MHz	0.010 s	−114.5	5.4E−13 s	3m 0s	18000 pts	Symmetricom 3120A
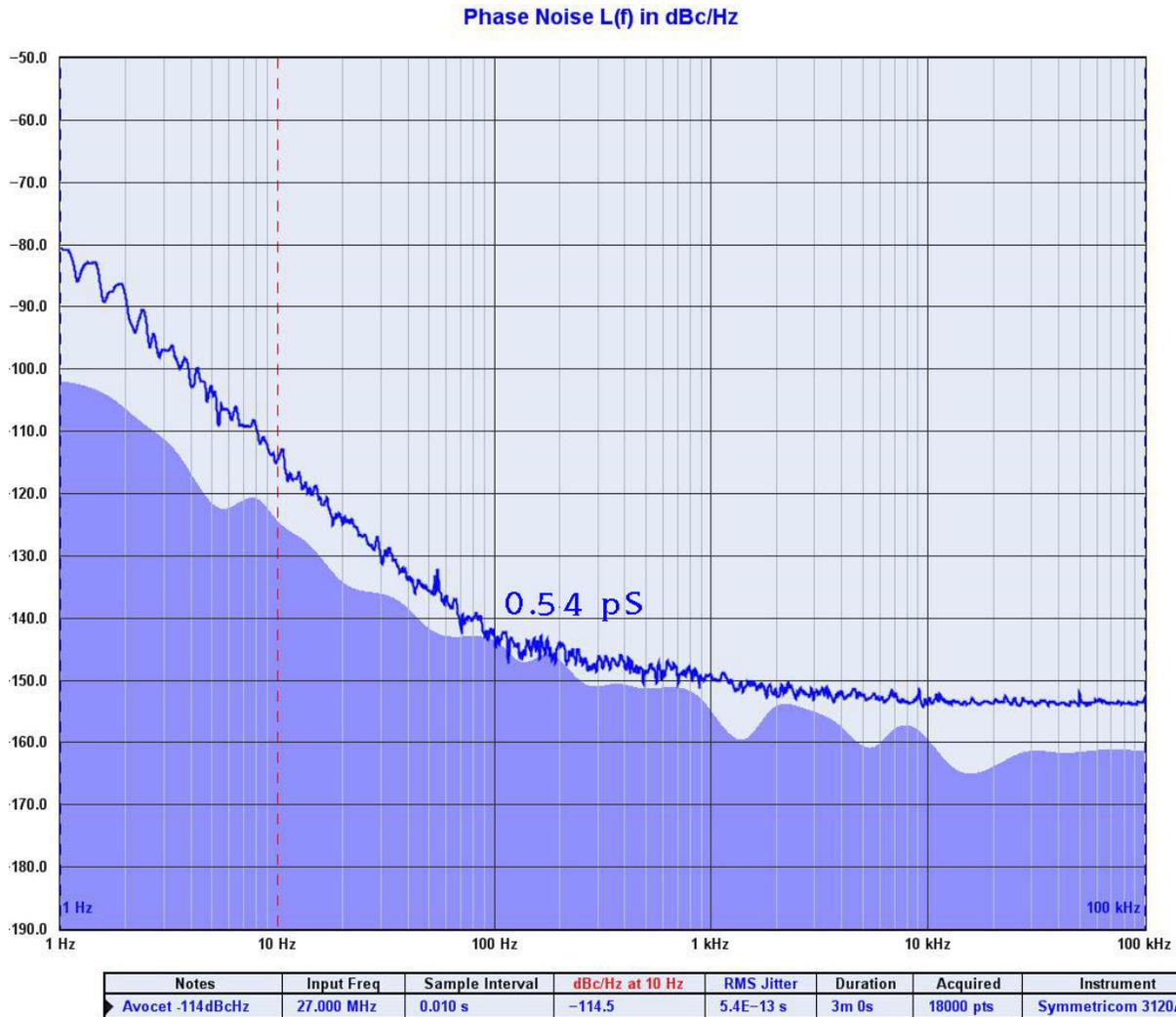
The jitter value in this measurement from 1Hz to 100KHz is 0.54pS typical measured with a Symmetricom 3120A using a Stanford Research Systems Rubidium Frequency Standard, PRS10
Without info on the measurement bandwidth and test instrument used, the measurement is impossible to know about

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

592.3 Hz   **−128.8 dBc/Hz**

44 femto Seconds

Y-axis: −50.0, −60.0, −70.0, −80.0, −90.0, −100.0, −110.0, −120.0, −130.0, −140.0, −150.0, −160.0, −170.0, −180.0, −190.0

10 Hz   20 kHz

X-axis: 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz

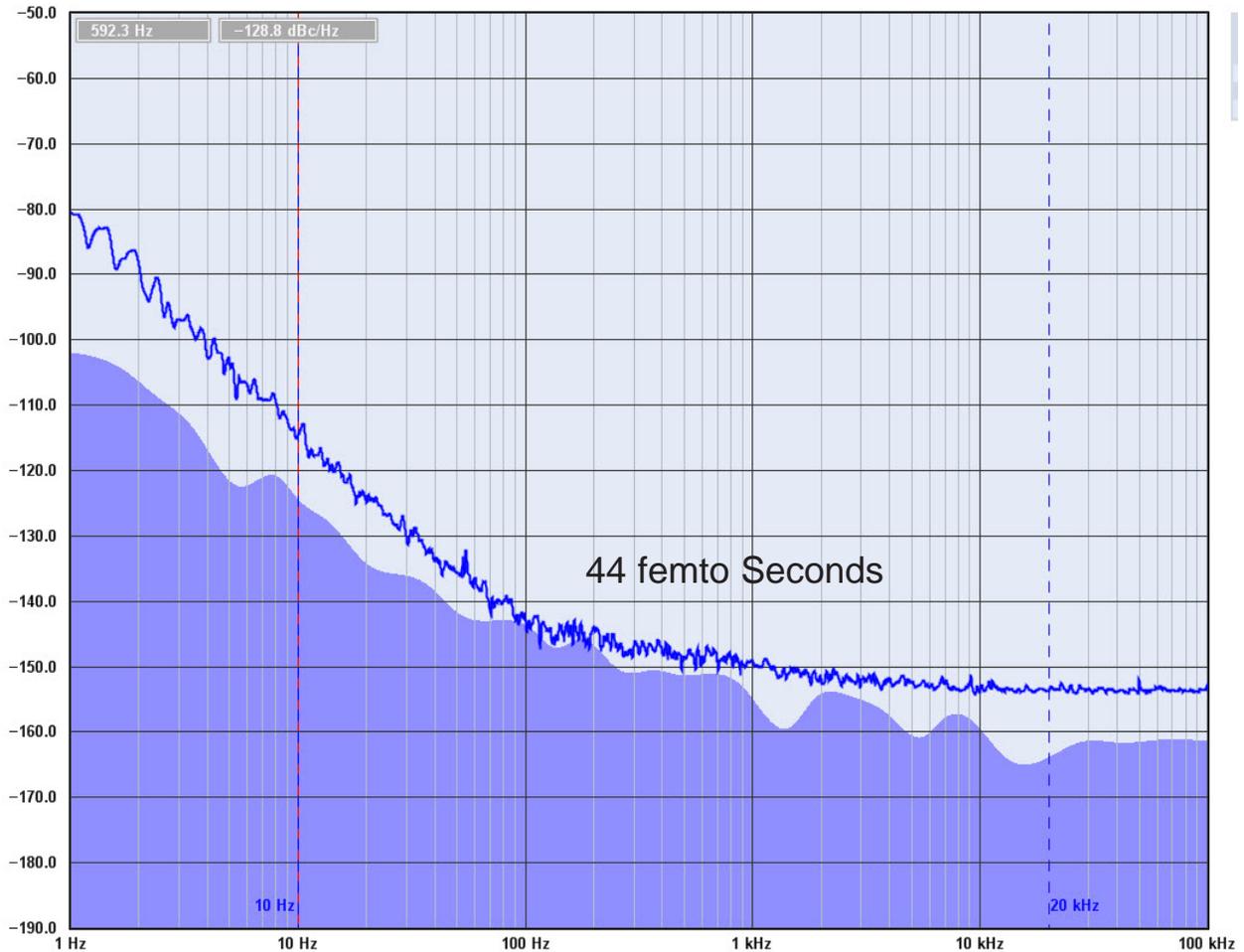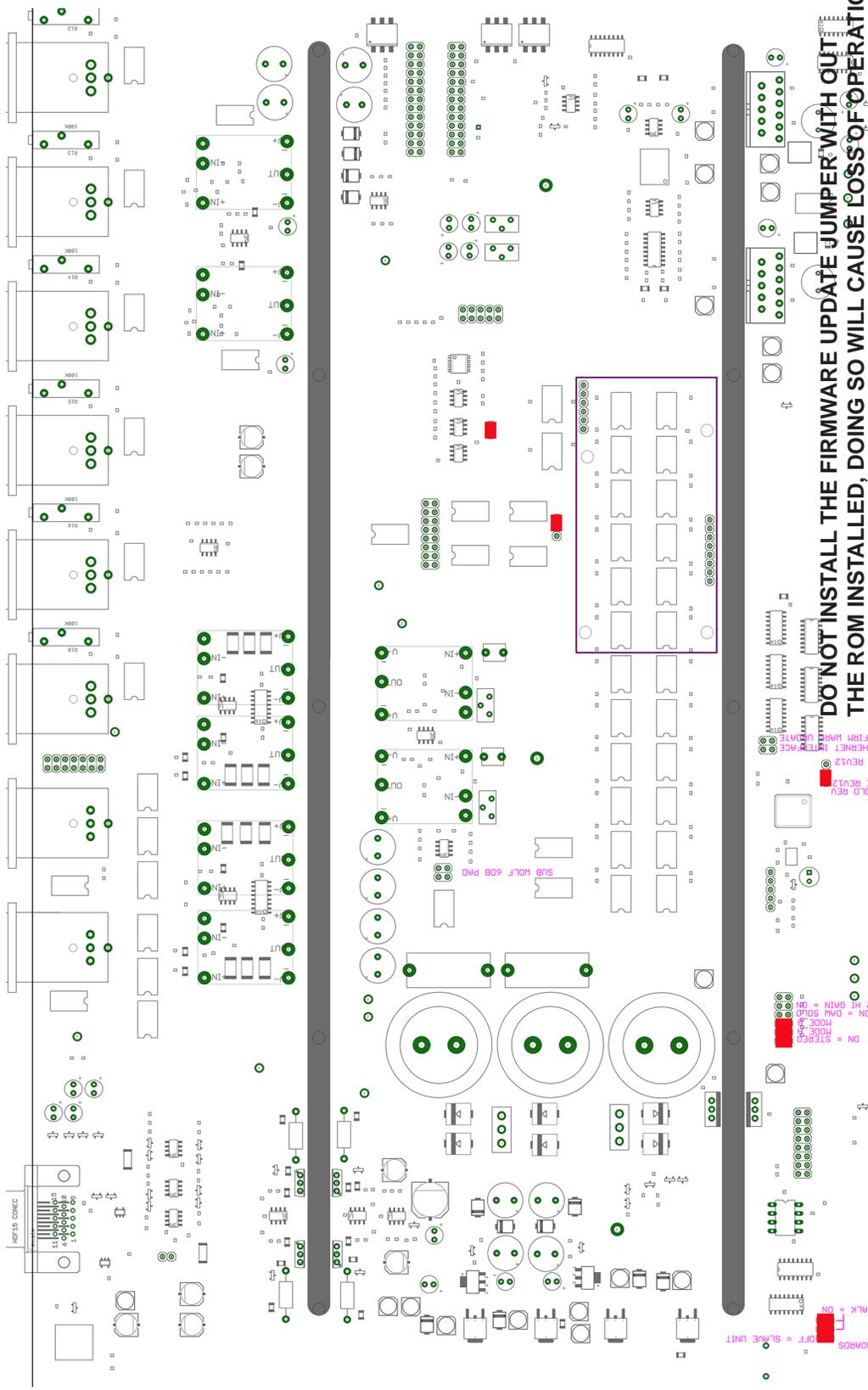| Notes	Input Freq	Sample Interval	dBc/Hz at 10 Hz	RMS Jitter	Duration	Acquired	Instrument
-114dBcHz	27.000 MHz	0.010 s	−114.5	4.4E−14 s	3m 0s	18000 pts	Symmetricom 31

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

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.

CONFIGURATION JUMPERS

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

STEREO

R12
R13
R14
R15
R16
R18
100K

HDF15 CONEC

SUB WOLF 60B PAD

+IN
-IN
OUT

ON = ETHERNET INTERFACE
ON = FIRM WARE UPDATE
JMP HERE FOR SURROUND MASTER REV12
AND SURROUND SLAVE FIRMWARE REV12
JMP HERE FOR SURROUND WITH OLD REV

ON = STEREO
MODE B
MODE A
ON = DAW SOLO
AMX2 HI GAIN = ON

NORMAL TALK = ON
ON = FOR OLD BOARDS
ON = MASTER
OFF = SLAVE UNIT

FRONT L - R SURROUND

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

HDF15 CONEC

R12
R13
R14
R15
R16
R18
100K

SUB WOLF 608 PAD

JMP HERE FOR SURROUND MASTER REV12
ON = ETHERNET INTERFACE
ON = FIRM WARE UPDATE

JMP HERE FOR SURROUND WITH OLD REV AND SURROUND SLAVE FIRMWARE REV12

ON = STEREO
MODE 50
MODE 40
ON = DAW SOLO
ANM2 HI GAIN = ON

NORMAL TALK = ON
OFF = SLAVE UNIT
ON = MASTER
ON = FOR OLD BOARDS

CENTER LFE

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

ON = ETHERNET INTERFACE
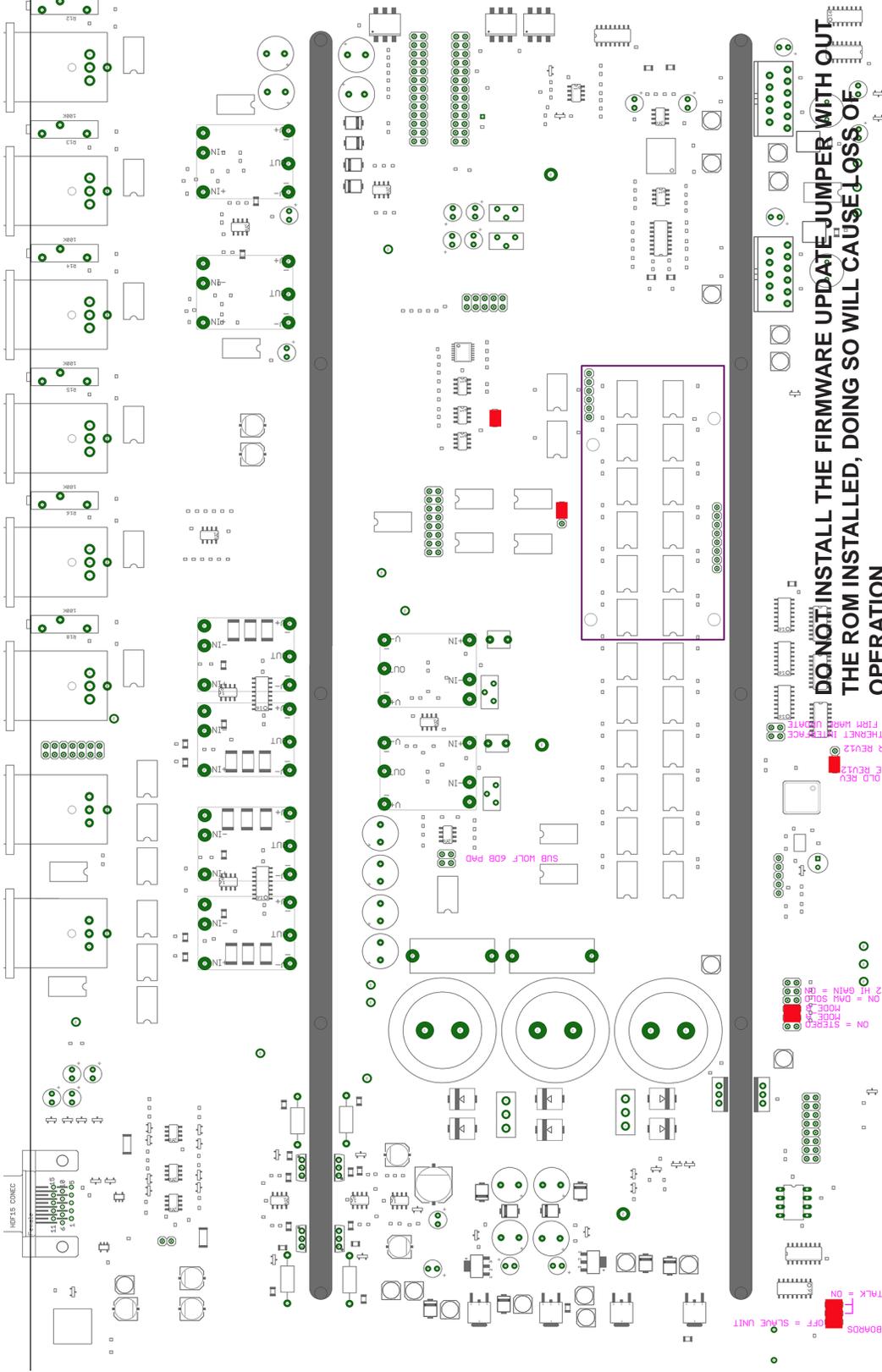ON = FIRM WARE UPDATE
JMP HERE FOR SURROUND MASTER REV12
JMP HERE FOR SURROUND WITH OLD REV
AND SURROUND SLAVE FIRMWARE REV12

SUB WOLF 6DB PAD

ON = STEREO
ON = DAW SOLID MODE A
ANA2 HI GAIN = ON MODE B

NORMAL TALK = ON
TALK = ON
OFF = SLAVE UNIT
ON = MASTER
ON = FOR OLD BOARDS

R12
R13
R14
R15
R16
R18

HDF15 CONEC

L - R SURROUND

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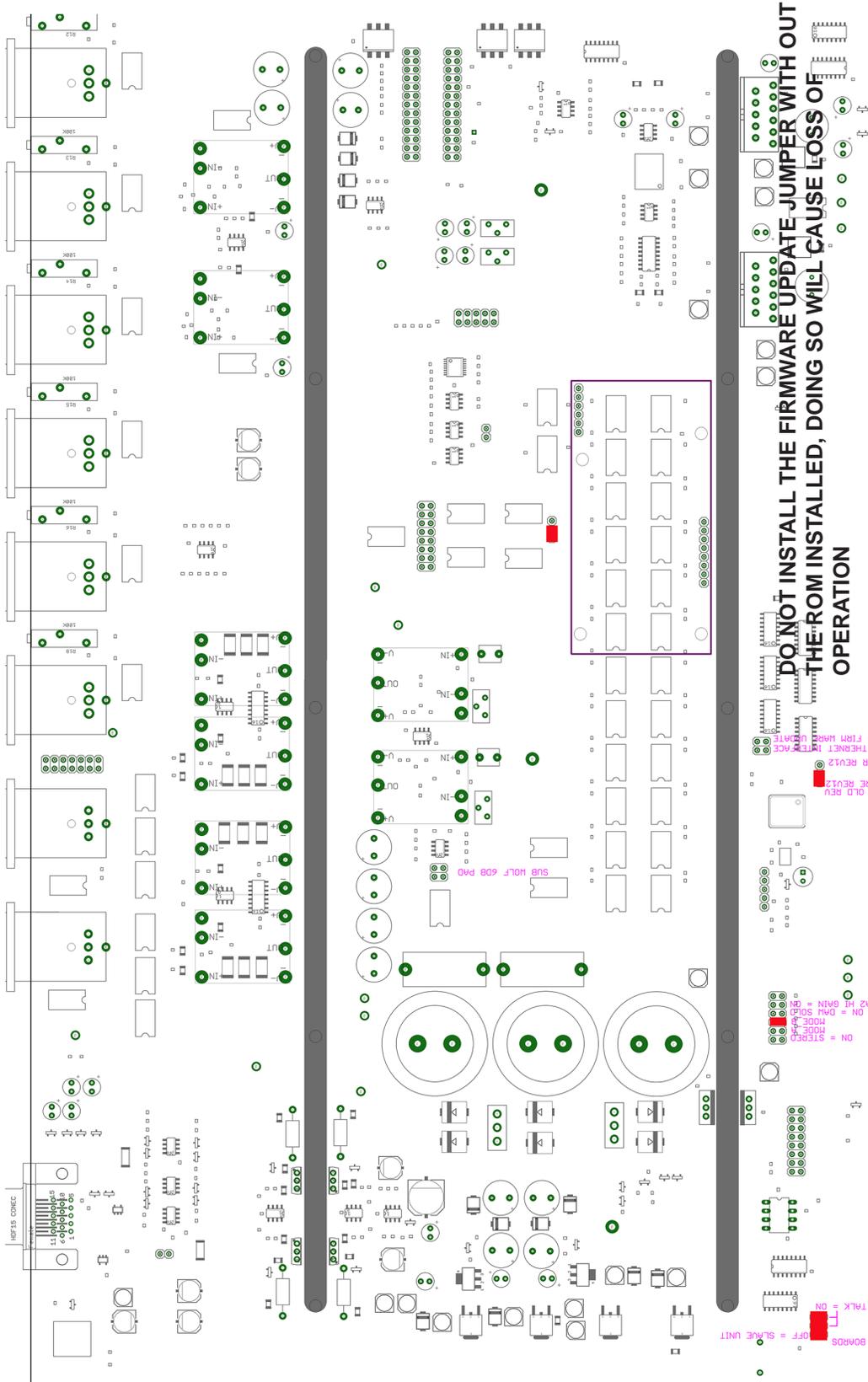THE ROM INSTALLED, DOING SO WILL CAUSE LOSS OF
OPERATION

R12
R13   100K
R14   100K
R15   100K
R16   100K
R18   100K

-IN
+IN
OUT

SUB WOLF 6DB PAD

HDF15 CONEC

ON = ETHERNET INTERFACE
ON = FIRM WARE UPDATE
JMP HERE FOR SURROUND MASTER REV1.2
JMP HERE FOR SURROUND WITH OLD REV
AND SURROUND SLAVE FIRMWARE REV1.2

ON = STEREO
MODE 1
MODE 2
ON = DAH SOLO
ON = DAH2 HI GAIN = ON
ANA2 HI GAIN = ON

NORMAL TALK = ON
ON = FOR OLD BOARDS
OFF = SLAVE UNIT
ON = MASTER

EXTRA SURROUND

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

ON = ETHERNET INTERFACE
ON = FIRM WARE UPDATE
JMP HERE FOR SURROUND MASTER REV12
JMP HERE FOR SURROUND WITH OLD REV
AND SURROUND SLAVE FIRMWARE REV12

SUB WOLF 6DB PAD

ON = HI GAIN HI ANAZ
ON = DAW SOLO
MODE B
MODE A
ON = STEREO

NORMAL TALK = ON
OFF = SLAVE UNIT
ON = MASTER
ON = FOR OLD BOARDS

HDF15 CONEC

100K
100K
100K
100K
100K

R12
R13
R14
R15
R16
R18

REV 10.5 SURROUND REFERENCE

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

ON FOR MASTER-FNT L-R
OFF ON SURROUNDS-LFE-C

ON = ETHERNET INTERFACE
ON = FIRM WARE UPDATE

JMP HERE FOR SURROUND MASTER REV12
JMP HERE FOR SURROUND WITH OLD REV
AND SURROUND SLAVE FIRMWARE REV12

ON = STEREO
MODE A
MODE B
ON = DAW SOLID
ANA2 HI GAIN = ON

NORMAL TALK = ON
OFF = SLAVE UNIT
ON = MASTER
ON = FOR OLD BOARDS

SUB WOLF 6DB PAD

QUANTUM DAC PCB SHOWING GAIN TRIMS AND JUMPERS

D/A Gain Trims

Meter Gain Trim

Meter Gain Trim

Meter Master = jmp on
Surround Slave = jmp off