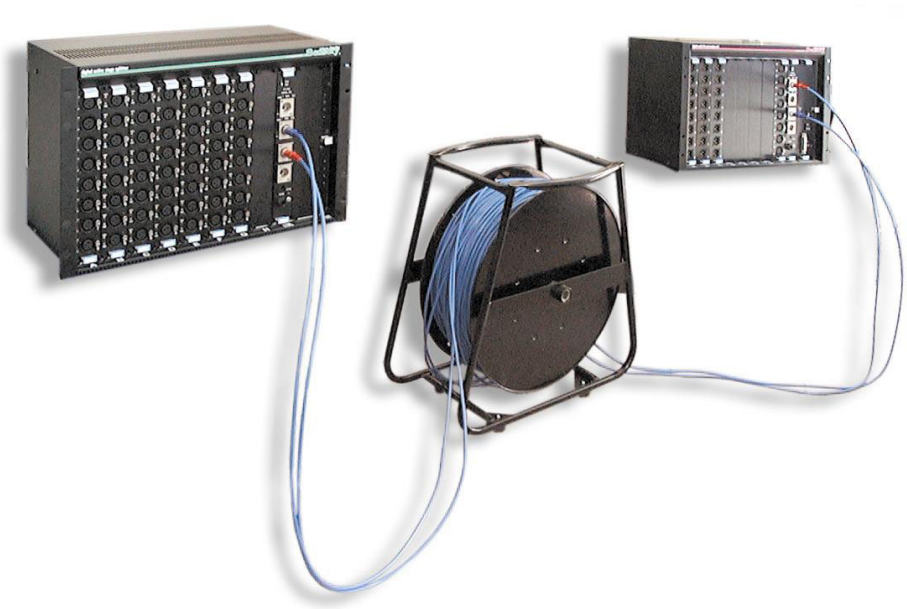
innovaSON

TECHNICAL FILE

AR1-A



THE MUXIPAIRE

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WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



The Muxipaire must be maintained by experienced, authorized & qualified technicians

Before starting any disassembly please refer to the User Guide which contains precious information regarding the problem that you may encounter…



The Muxipaire contains components that may be damaged by electrostatic Discharge.

Before any manipulation, all standard ESD precautions must be taken.

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INTRODUCTION

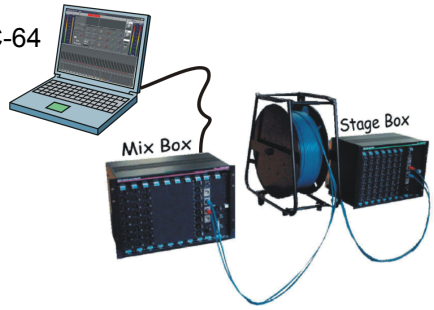
This document describes the technical details about the MUXIPAIRE.

The Muxipaire is a 64 channels digital audio transmission system.

This system is totally modular and allows a quick maintenance thanks to its architecture.

A Muxipaire is constituted (at minimum) by :

- One local audio rack (Mix Box) controlled by MC-64
- One distant audio rack (Stage Box) controlled by SC-64
- The coax connection between both racks
- A computer to control the platform
- One distant input module
- One local output module



It is, of course, possible to enlarge the configuration with several audio rack (Mix Box) and modules.

All the system is controlled be a software : *SENSOFT*

The Muxipaire, when plugged to a Sensory or Sy series consoles is the audio engine of such a platform.

The Sy40 has the peculiarity to integrates its own Mix Box. This integrated Mix Box has the same technical specifications and functioning than the Audio Rack described in this document.

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1. THE MUXIPAIRE SYSTEM

1.A The Mix Box

The Mix Box is a 19 inch audio rack, with 11 slot.

The slots are forecast to receive

- Audio Module Input and output (8 slots) (A to H)
- One control module MC-64 in a specific slot "***CTRL"***
- One DSP module in a specific slot "DSP" (DMMK-n / DSP Sy-)
- PWR switcher , this module switch manually between the main PSU and its redundant one.

1.B The Stage Box

The Stage Box is a 19 inch audio rack, with 11 slot

Its slots are forecast to receive :

- Audio Module Input and output (8 slots) (A to H)
- One control module SC-64 in a specific slot "***CTRL"***
- PWR switcher , this module switch manually between the main PSU and its redundant one.

In order to be controlled by Sensoft, the Stage Box must be connected to the Mix Box thru a coaxial cable.

The stage Box is a digital splitter, several mix box can be connected on its coax TX.

1.C coaxial cable

120 Millions of bits are exchanged in real time between the Stage Box and the Mix Box. The reliability of the transmission will depend of the quality of the coax cable and connectors as well as the quality of the equipotential Earth.

With the standard delivered coaxial cables, supplied by InnovaSON, the audio racks will immediately establish a stable and reliable transmission.

In case of using another kind of Coax cable you may be constrained to use the adjustable RX1 Coax Inout, the Stability of the transmission will then depend of the ambient temperature and humidity. That's why we strongly recommend to check the transmission adjustment 30mn before the show, to be sure that you still are in the good locking area of the adjustable capacitor (RX1).

In all the case, we strongly advise to use a 50m minimum length of coax. It's better to use the 150m not totally unrolled than a 10/20m cable.

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1.D Earthing and external disruptions

A faultless earthing is fundamental for all the digital systems used in the live applications. Only such a condition guarantee a correct functioning of the entire platform.
The System require a main powering exempt from electromagnetic interference sources like motors, lighting power blocks, or any not conform to the current CE rules (European standard) peripheral.
The SC-64 and MC-64 Rx indicators will indicate the transmission instability (blink between green to red), take care of them during the firsts minutes of the system is operational.
A transmission's instability can be accompanied by any possible crackles on the audio channels and irregular vu-meter readouts. You can also be confronted to a software instability : the status, on Sensoft, changes between MASTER/SLAVE/LOCAL modes.

1.E Muxipaire

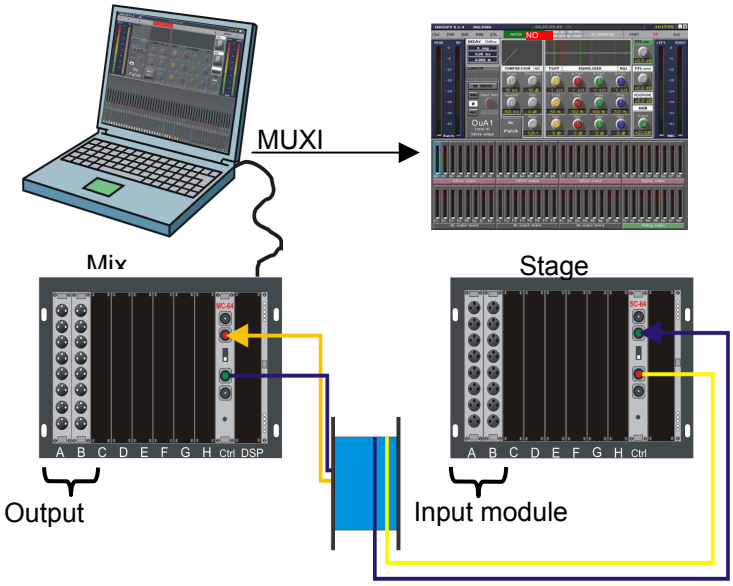
1.E.1Configuration minimum, configuration without DSP

Alone, a Muxipaire allows to control :

- Local and distant pre-amps' gains
- Local and distant 48V Ph
- Outputs Patch and Mute
- Snapshots
- Signals metering

In the limitations of this use, a DSP module is not necessary as only the transmission between inputs and outputs is involved.

Here is an example of transmission with 16 inputs and 16 outputs :



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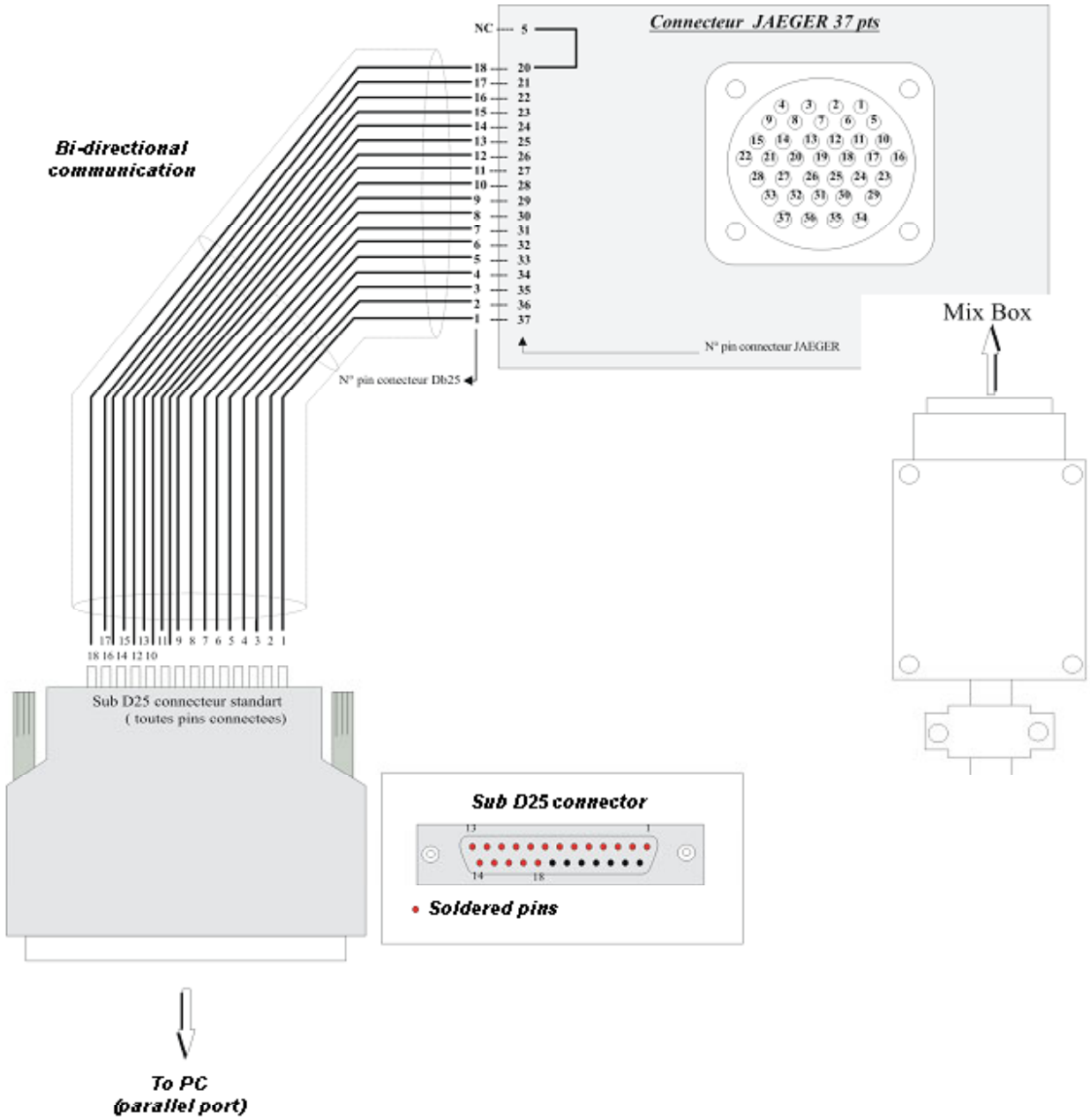
1.E.2Configuration for check

The next configuration explains the way to check and control a rack thanks to the Jaeger to parallel adapter (Ref : **SC0007-001-01**).

Jaeger – SubD25 adapter



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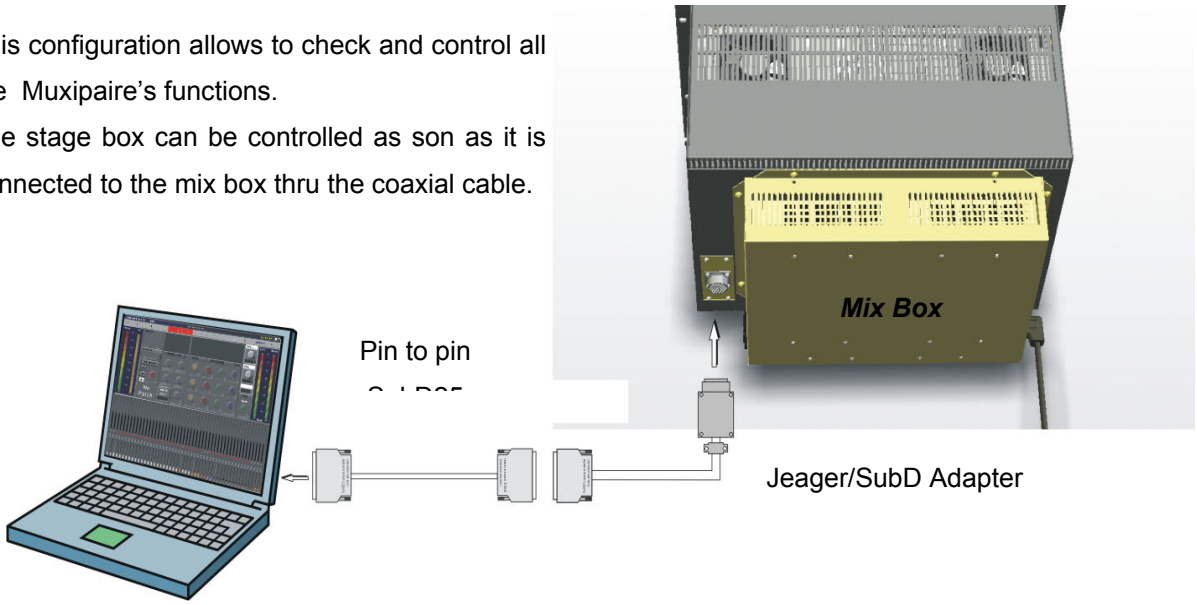
This configuration allows to check and control all the Muxipaire's functions.
The stage box can be controlled as son as it is connected to the mix box thru the coaxial cable.



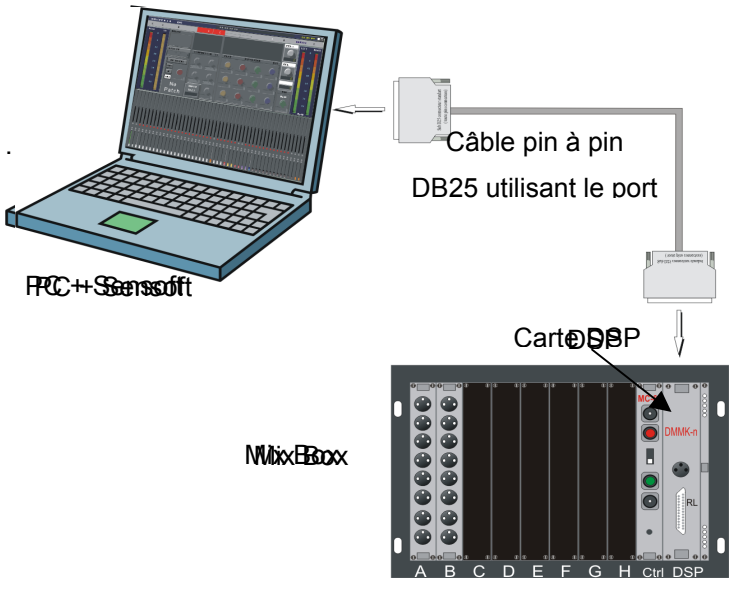
In order to use an external computer or a laptop, it is imperative to install have Sensoft installed.

See the user manual for Sensoft installation guide.

1.F Mix Box and a desk

1.F.1DSP Module

The desk is the remote of Sensoft's controllers which controls all the DSP parameters. Thru the knobs and faders the user accedes to these parameters. The same adjustments could be made directly from the PC.



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1.F.2Control surface

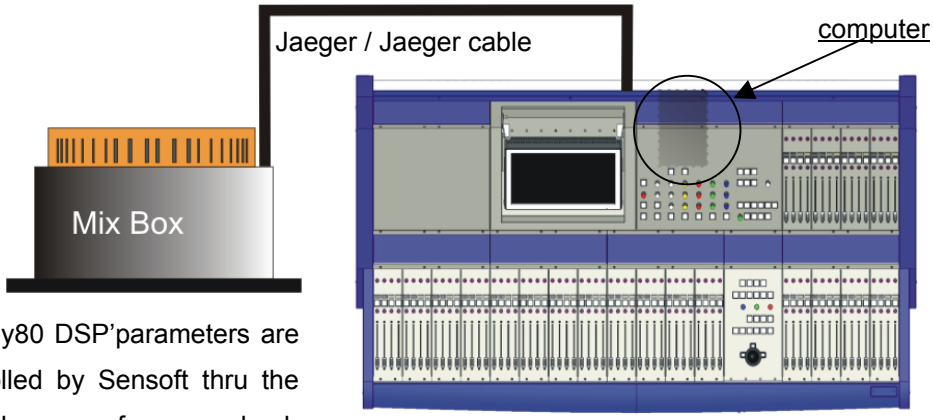
The Muxipaire can be controlled by the Sensory and Sy series control-surfaces : Sensory, Sy40 (except the Mix Box), Sy80 ...

When a Mix Box (and his DSP module) is connected a desk, the system becomes a local configuration.

The computer is integrated into the desk and communicates with the Muxipaire thru its parallel port.

The system use a Jaeger-Jaeger (37pts) cable to transport parallel signal from the computer to the Mix Box

Local Configuration :



The Sy80 DSP'parameters are controlled by Sensoft thru the control surface knob adjustments.

Sy80

Control Surface

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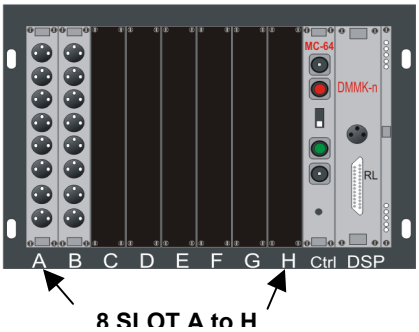
1.F.3Sy40 console

The Sy40 console is an integrated combination of one Mix Box and one remote console, one PC and one VGA Screen.

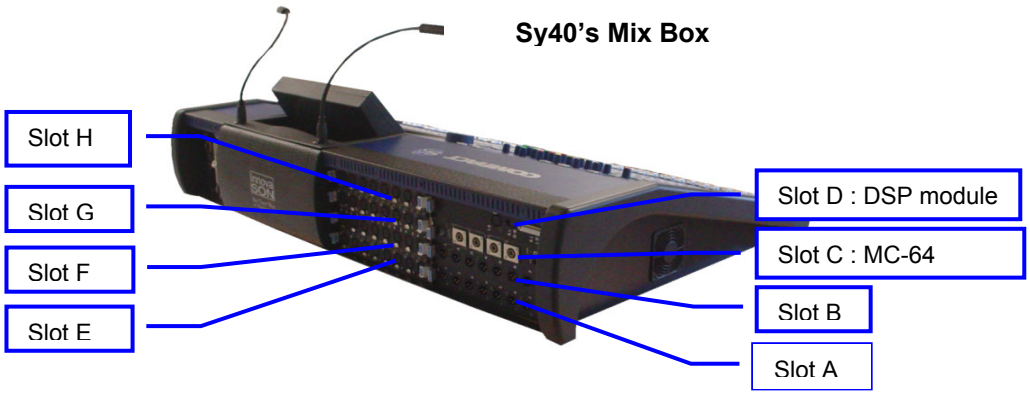


In order to be compact, the integrated Mix Box have been lighten.
The result is that 6 I/O slots instead of 8 are available in the Sy40's Mix Box.

Mix Box standard



Sy40's Mix Box



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2. SENSOFT AND THE MUXIPAIRE SYSTEM

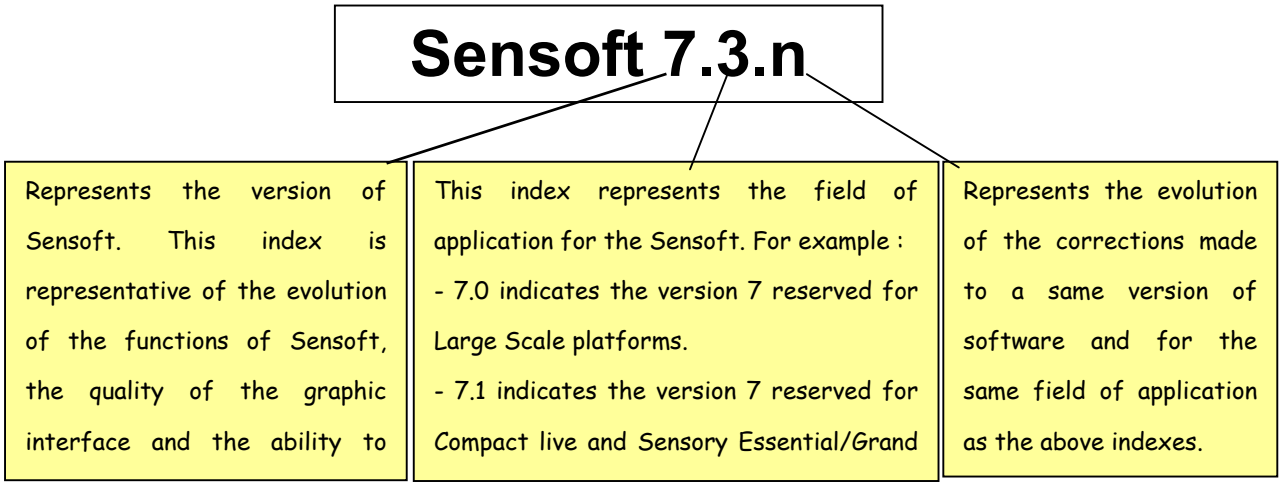
Sensoft is a program, as in the software world, we have release and update.

2.A Release of Sensoft

Sensoft is a complex software, always under construction to improve functions and ergonomics.

Each Sensoft version can be identified with a number example **: Sensoft 7.3.n**

When a version is in progress the **n** has a specific value. This index is incremented each time that a new release is available. By new release we mean a version where possible bugs, which have been discovered by our beta-testers, have been corrected. The following diagram will help you to understand the meaning of Sensoft indexes.



Despite Sensoft is not universal for all desks (this concerns the old platforms of Sensory) it is universal when used on a simple Muxipaire. Each version of Sensoft contains all the necessary functions to control the audio racks.

Here is the List of the Sensoft version for each console :

Desk	Sensoft Version
Compact Live	Sensoft 7.1.12
Sy-40	Sensoft 7.3.6
Grand Live	Sensoft 7.1.12
Large Scale	Sensoft 7.0.7
Sy-80	Sensoft 8.1.10
Grand live upgraded 8 *	Sensoft 8.1.10
Sy-40 upgraded 8 *	Sensoft 8.1.10
Sy48	Sensoft 9.0.1

With sensoft 7, each type of desk have its own version

With sensoft 8 & 9, all the desk run the same software

- Upgrade kit required

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2.B Sensoft and communication parameters

All the parameters can be controlled and adjusted by Sensoft

On Sensoft V 7.n.n

- Menu "ABOUT" shows the MC-64 Desk Version (VN xxxx)
- Menu UTIL select ABOUT then type the password "innova" .The hard configuration windows appears and the communication parameters can be adjusted.

  ➔Use the right arrow on the parameter "tempo" to adjust automatically the value of TEMPO

  ➔ *See Sensoft's user manual for the DSP parameters adjustment*

On Sensoft 8.n.n or Sensoft 9.n.n

- Menu UTIL select ABOUT then type the password "innova" to accede to the configuration windows.
- **[Alt] + [C]** shows the hardware configuration windows where the MC-64 version, Desk Version, fader configuration can be displayed and/or adjusted.

  ➔ *See Sensoft 8 user manual for the detailed parameters adjustment.*

MC-64 module

The MC-64 module is installed in the controller slot of the Mix Box. All the system is controlled by the MC-64 board.(see diagram bellow)

The Computer control the audio rack thru its parallel port connected to the MC64 board thru the Jaeger when a control surface is used.

The MC64 module allows :

- to control the 8 audio Slots (A to H) of the audio rack "Mix Box"
- the control the DSP module (mix parameters) in accordance with the adjustments made on the desk
- to control the transmission between the MB and the SB thru the Coax.
- send remote data to the Stage Box (48v phantom / patches etc …) thru the same coax cable.

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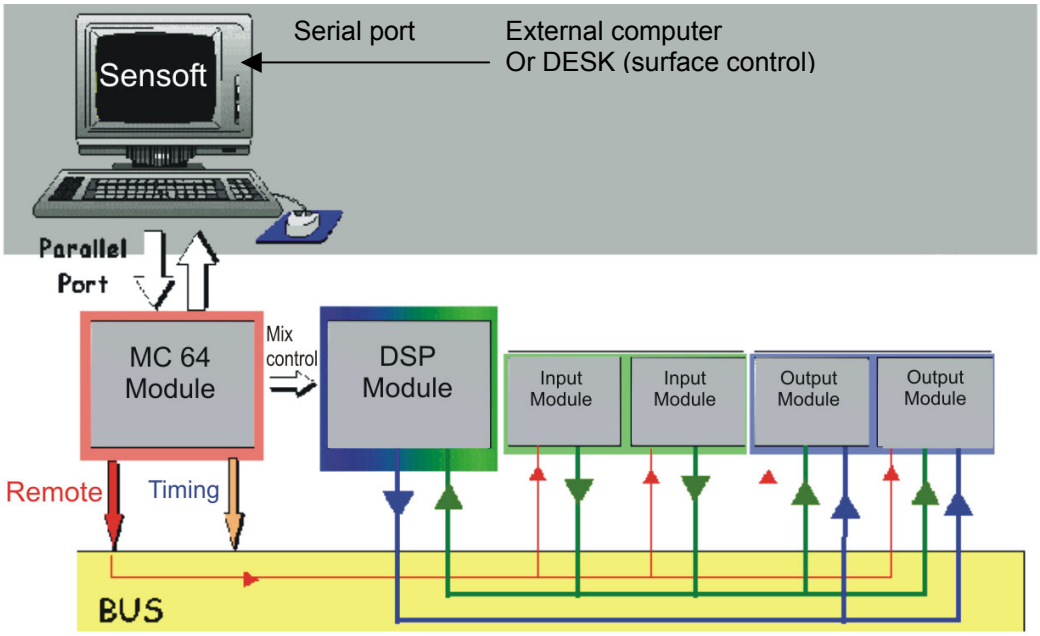
System communication diagram



2.B.1 Configuration of the parallel communication

The menu “Utils / ABOUT” allows to accede to the important adjustments

(type “innova” to enter in the hard config windows).

The MC-64 module can use two different methods of communication with Sensoft :

- One is used for all the system controlled by Sensoft 6.n or 7.n (except the LS and Sensoft 7.0), the other is used by all the platform controlled by Sensoft 8.

This important parameters adjust the time separating the different frames sent by the computer to the MC-64. After a frame of data, Sensoft must wait the time needed by the MC-64 to “understand” these remotes. After this time, Sensoft can send the next frame of data.

On Sensoft 7.n.n and previous Sensoft :

The communication with the MC-64 module is calculated one time for all (Tempo mode).

In the “Utils / About “ password “innova” window, the operator adjusts automatically the Synchro MC value to : Tempo . While the “Sync MC” is selected press the right arrow to lunch the Tempo value calculating, your communication is configured.

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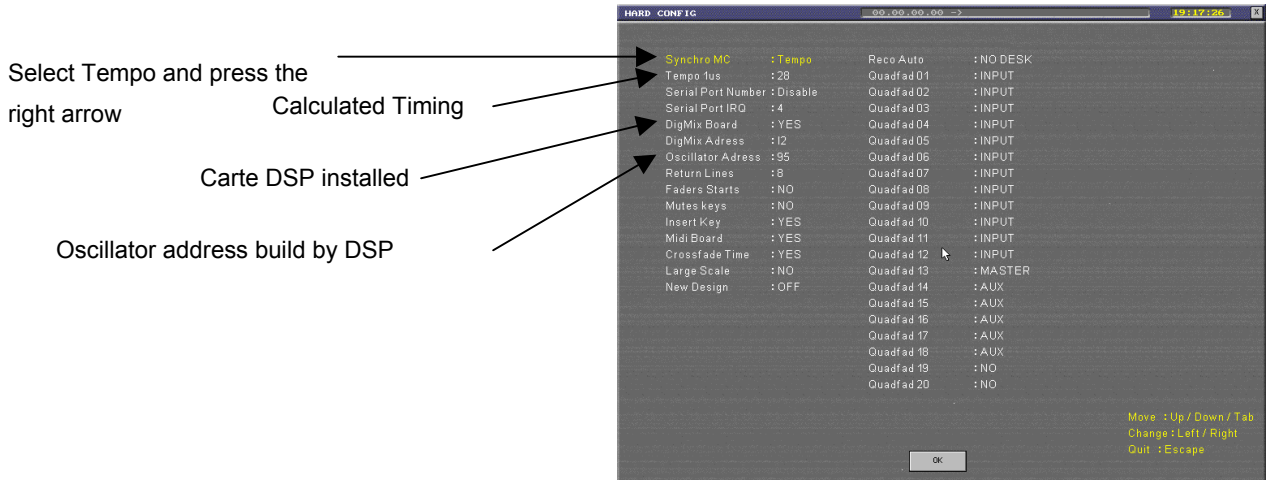
Menu Util, select About type password "innova"



The computer must wait **25µs** between each remote frames sent to the MC-64.

The synchro MC value adjust a number of loop accorded to the computer's speed.

By this way the computer check his own speed and adjust the number of loops that it has to wait in order to obtain a **25µs** interval between the frames.

This adjustment must be done *immediately* after the installation of Sensoft.

Nota :
With the Large Scale platform, which uses Sensoft 7.0.7, the "Sync MC" parameters must be adjusted to "ACK".

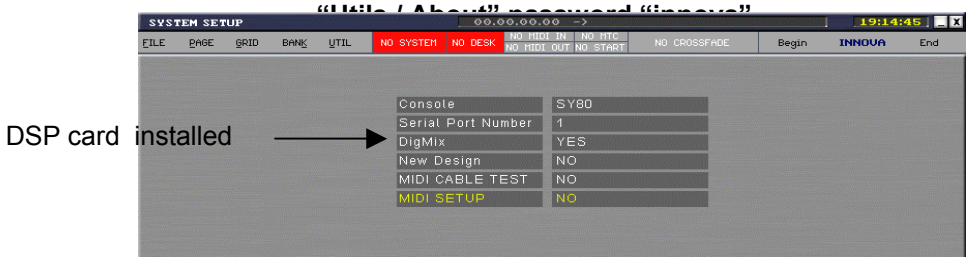
On Sensoft 8.n.n and above

An acknowledge information is returned by the MC-64 after the reception of a remote frame.

Sensoft has just to wait for this acknowledge before sending the next frame.

On Sensoft 8, no adjustments are required regarding the acknowledge mode (automatically activated).

"Utils / About" password "innova"



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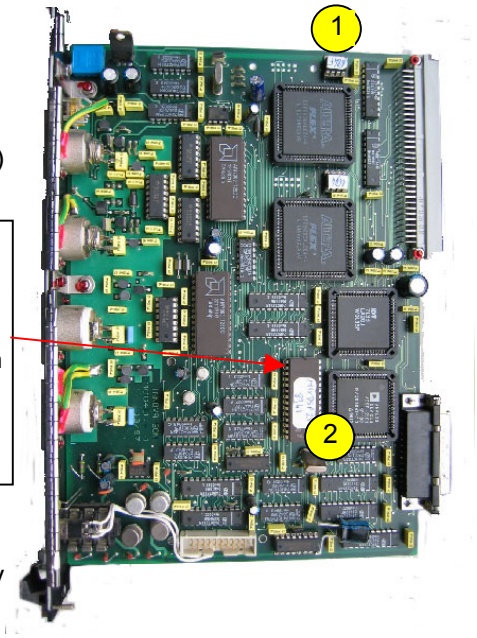
2.B.2 MC-64 version

The MC-64 Eproms version fix the communication mode used by the system

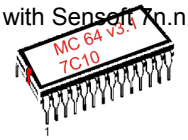
For example : MC-64 version 2.5 can be controlled only by Sensoft 7.n.n

- The MC-64 version is indicate directly on the MC-64 board :



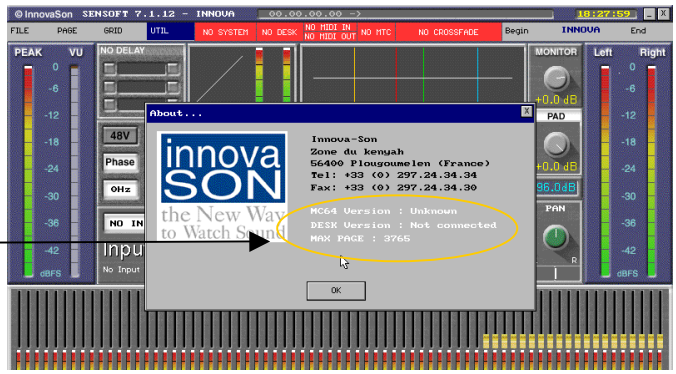
A MC-64 version is the association of the PROM (1),and the EPROM (2)

The MC-64 version is written on this EPROM(2)
Below : Version 3.1,
Not compatible with Sensoft 7.n.n



- The MC-64 version is indicated on Sensoft
  - With Sensoft 7.n.n, go to “Utils / About” password “innov

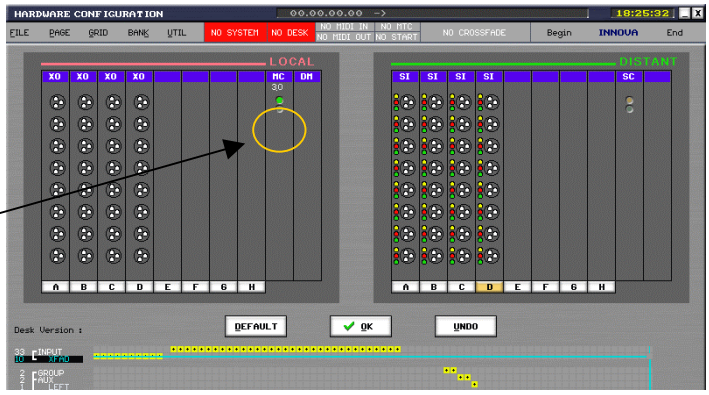
“Unknown” or the MC-64 version is indicated in this area.



- With Sensoft 8.n.n & 9.n.n

Type [**alt]+[C**] to accede to the hard configuration windows.

Here the MC-64 Version is 3.0



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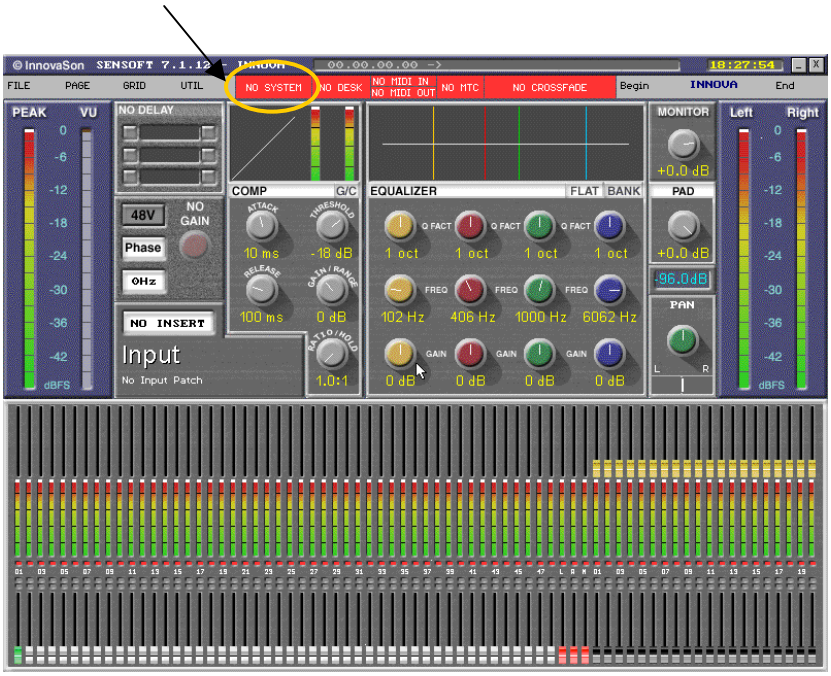
2.B.3 MC-64 version and Sensoft version compatibility :

Sensoft version	Compatible Mc-64 version
From Sensoft 6.6 to Sensoft 7.1.12	up to MC 2.5
Sensoft 7.07	MC 3.0
From Sensoft 8.P30 and superior	from MC 3.0 and superior
Sensoft 9.n.n	From MC3.2

If the MC-64 module is installed with a non compatible E-prom version an error message could appears and persists :



Any communication with the Mix Box is not possible when this message is displayed.

See Page 89 for Trouble Shooting.

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3. THE TRANSMISSION

The Muxipaire system is based on the MC-64 ←→ SC-64 transmission (64 audio channels).
Both modules are almost the same; except the on-board software (EPROM), the Headphones (only cabled on MC-64) and a few added wires on the MC-64.
Conversion :
A/D conversion (SI8D3), D/A conversion (XO8D2) and digital processing use a 48-kHz sampling rate and 24-bit for the digital words .

Transmission:

The transmission accepts to be locked on an external clock from 43kHz to 49kHz.
Without this external clock the system uses its own 48kHz sampling rate.

3.A The Channel of the system

The period of the sample frequency (48KHz = 20,83µs) is divided by 104 timing slots.
Some channels are used for audio and some are used for remote control.
All the 104 Channel are available for the MC-64 (Mix Box) and only some of them are available for the SC-64 (Stage Box).

These 104 channels are distributed like following :

	Channel	Module	Module which receive	Data
a	0 .. **N**-1	SC64	DMMk , DSP Sy80, DO8X, XO8D, MO8D, MC64	Audio from **N** input module on Stage Box
a	**N** .. 63	Local Mix Box SI8D, DI8D	DMMk , DSP Sy80, DO8X, XO8D, MO8D, MC64	Audio from Local Input Card
b	64 .. 95	Local Bus DMMk , DSP Sy80	DO8X, XO8D, MO8D , MC64	32, Audio mix bus compute by DSP
c	64,65,66	MC-64	SC-64, input module	Remote “P0-P7” to control Input (gain/48V) And patch for output module
d	96, 97	MC64	DO8X, XO8D	Remotes X-module
	98			Not used
e	99	DO8X, XO8D, DO8A, DI8	MC64	*Remote return from XO8D/DO8X ➔CRC return *Module version (boot or Alt+C command)
f	100	DSP Sy80	DO8X, XO8D, MO8D , MC64	DSP Sy80 : Sinus / oscillator
g	101	SC64	MC64	Return from stage : Output module configuration
h	102, 103	SC64	MC64	Remote return from SC-64 for Master / slave status

The 104 channels are common between the Mix Box and the Stage Box.
At one time slot, only one input card is allowed to put its data (sample) on the bus, that’s why two slots identified by the same channels can’t have the same kind of module plugged. The output and DSP modules are able to catch and process the incoming data on the different channels.

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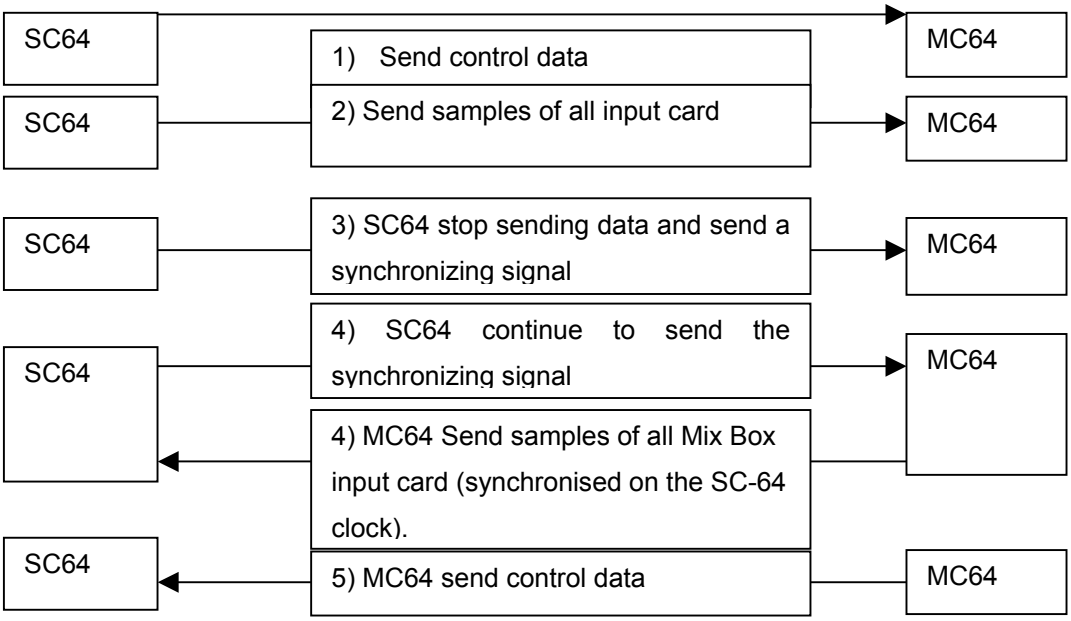
3.B The transmission in details

The Stage Box is always the master of the clock. Both rack are synchronised on the Stage Box' clock.

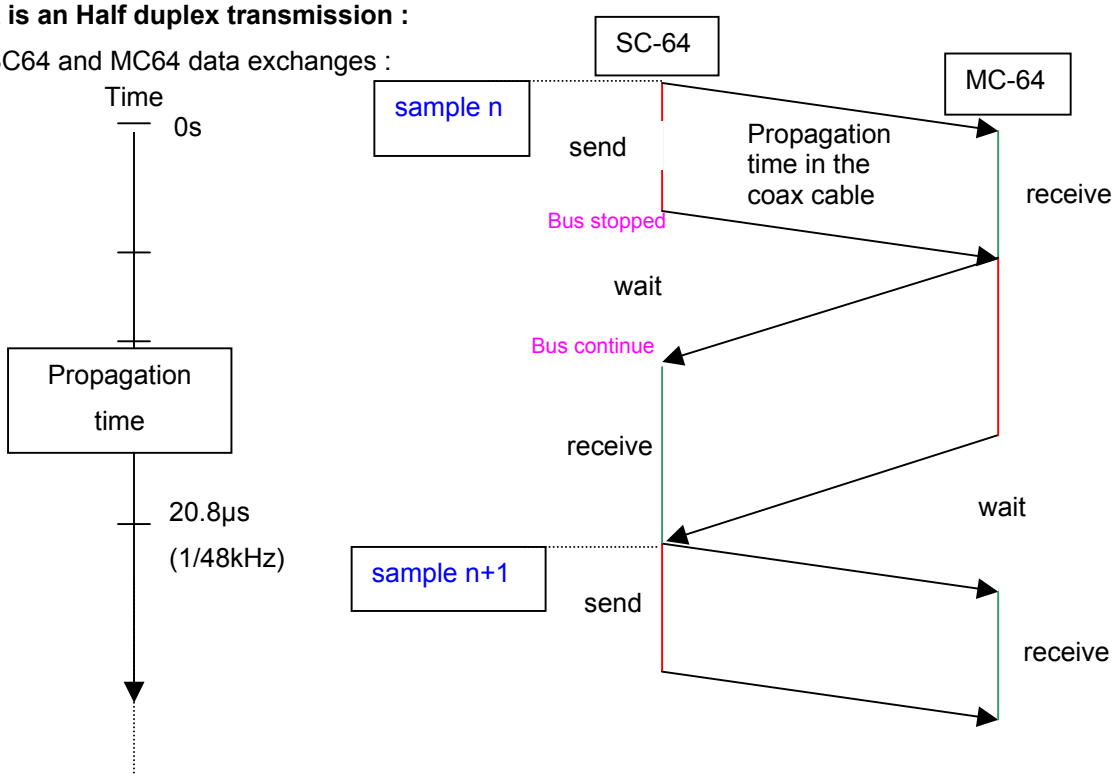
An external clock can be connected, to the stage box.

Transmission diagram :



It is an Half duplex transmission :

SC64 and MC64 data exchanges :



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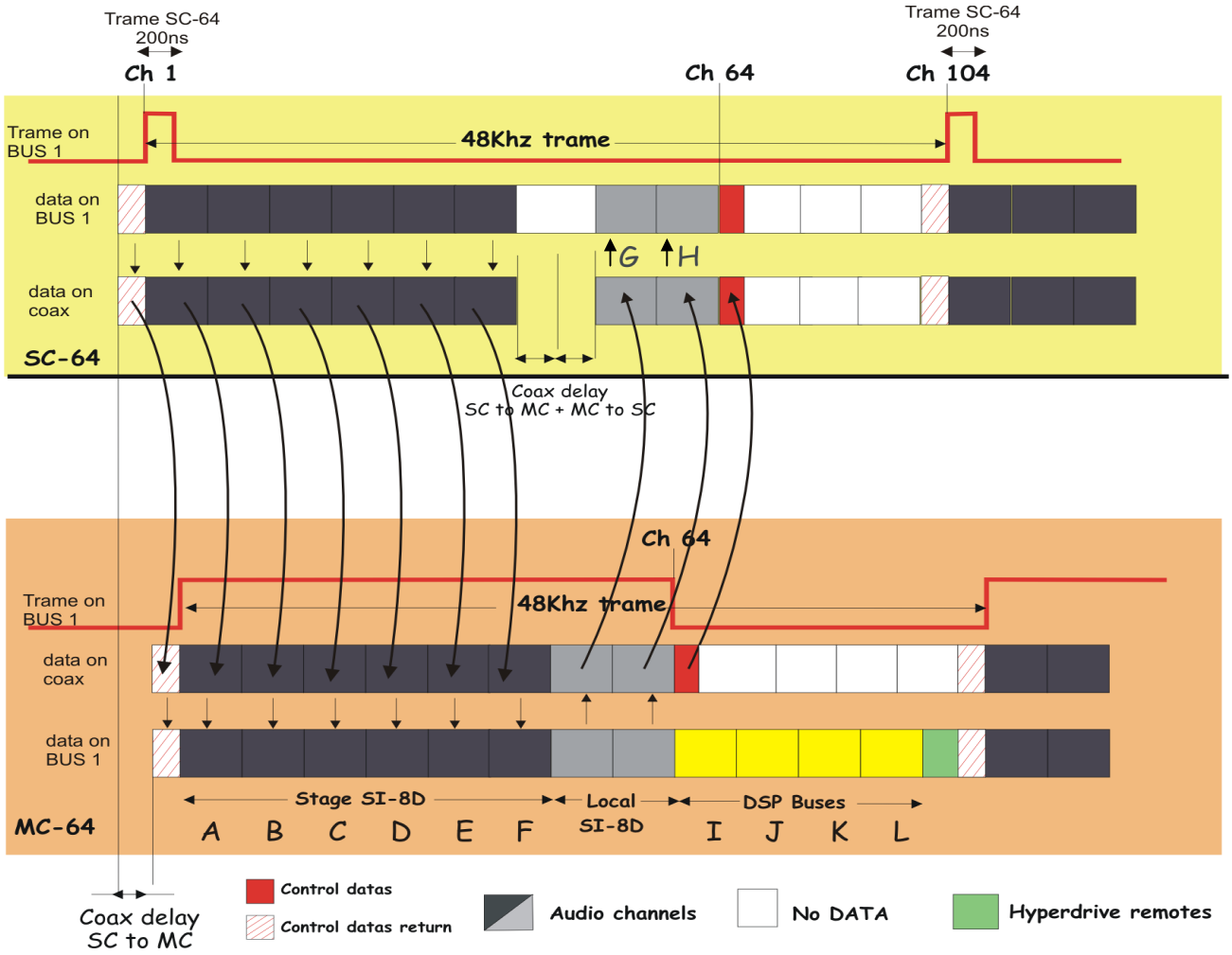
The Mix Box - Stage Box transmission diagram :



This diagram allows to understand that :

- The DSP buses are not transmit on the coax cable and stay only on the Mix Box BUS1.

So all the DSP buses will be patchable only on the local output cards.

- The clock trame of the Stage Box (SC-64) is different than the one of the Mix Box (MC-64).

The transmission starts by sending data from Stage Box : control data These data allow the system to recognize its status "MASTER/LOCAL/SLAVE"

3.C DSP

During the 64 audio channels' transmission (slot A to H) the DSP catches the audio data samples present on the bus. During SLOTS I to L the DSP computes and puts the audio mix buses on the local bus1.
The DSP is not able to transmit its data on addresses 1 to 63 (SLOT A to H), it writes on channel 64 to 95.
Only the output modules of the Mix Box can be patched on those channels (MO8D3 ; XO8D2 ; DO8A ; DO8X etc…).

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3.D Muxipaire Status

Sensoft displays all the time the status of the Muxipaire : MASTER, LOCAL, SLAVE

The **LOCAL** mode indicates that only a Mix Box is used in the platform.

The **SLAVE** mode indicates that a stage box is available in the platform, but as only the TX of the Stage Box is connected to the RX of the Mix Box, the Software is not able to control the distant gains and 48V PH.

The **MASTER** mode indicates that a Stage Box is available and controlled by the MC-64, this mode is given by the fact that RX and TX are connected between the Mix Box and the Stage Box. As only on RX is available at the same time, only one Mix Box can control the Stage Box and take the Master status.

Sensoft sends some control data to the Stage Box, if those data are returned (by SC-64) the Status switch automatically to **MASTER Mode**. If the returned data are not the same than the sent data, the status switch to **SLAVE Mode.**

If no data are returned, the status switch to **LOCAL Mode.**

3.E The MC-64 / SC-64 timing

Clocks :

The MC-64, when used alone (Mix Box status LOCAL) build its own clock. The Frame clock signal is present on the BUS1.

Address bus (A0 to A6) :

The 104 channel address are created by bus A0 to A6 (7bits). Each time slot width is 200ns (104 channel at 48kHz)

Data bus (D-8 to D15) :

The audio data are latched by the signal A-1, freq 5 MHz

Remote data :

P0-P7 is a 8 bit bus data, to control Gain / 48v / patch of output/input module.

This bus data is latched by logical combination of signal P=S and signal Slot.

SLOT Signal :

Mix Box rack is equipped with 8 physical slot (A to H) to receive input/output module an one for DSP slot (I).

The SLOT signals provide to trig each module in each slots separately.

MC-64 module send on 8 separately line, 8 SLOT signal : Sa,Sb,Sc,Sd etc…

RD & WR :

The RD signal indicates the presence of input card in the slot

The WR signal indicates the presence of output card in the slot

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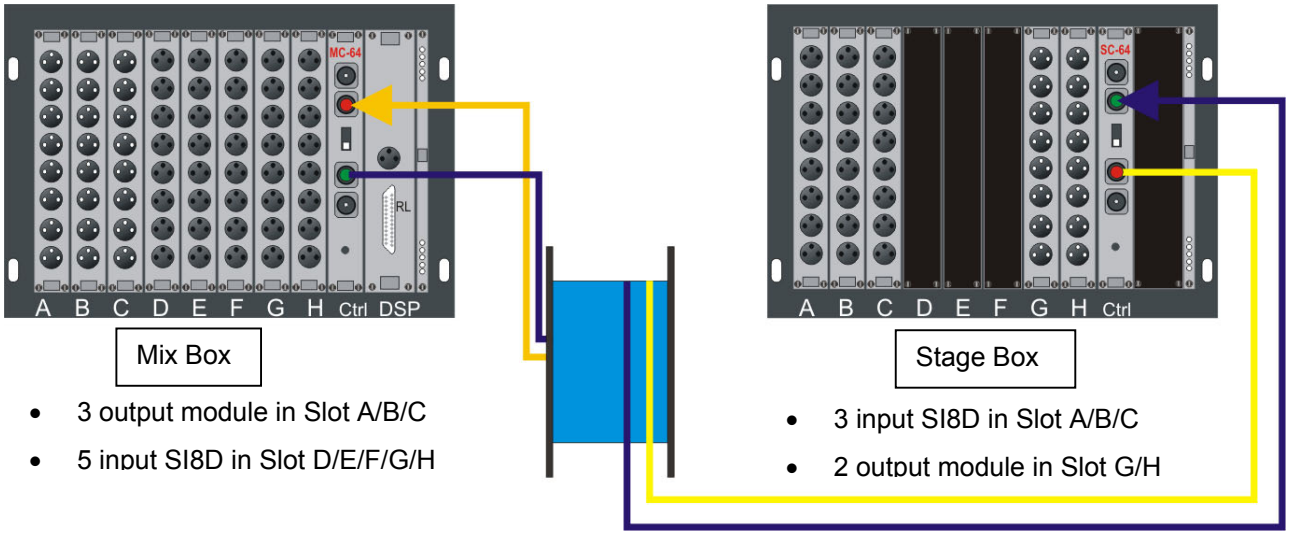
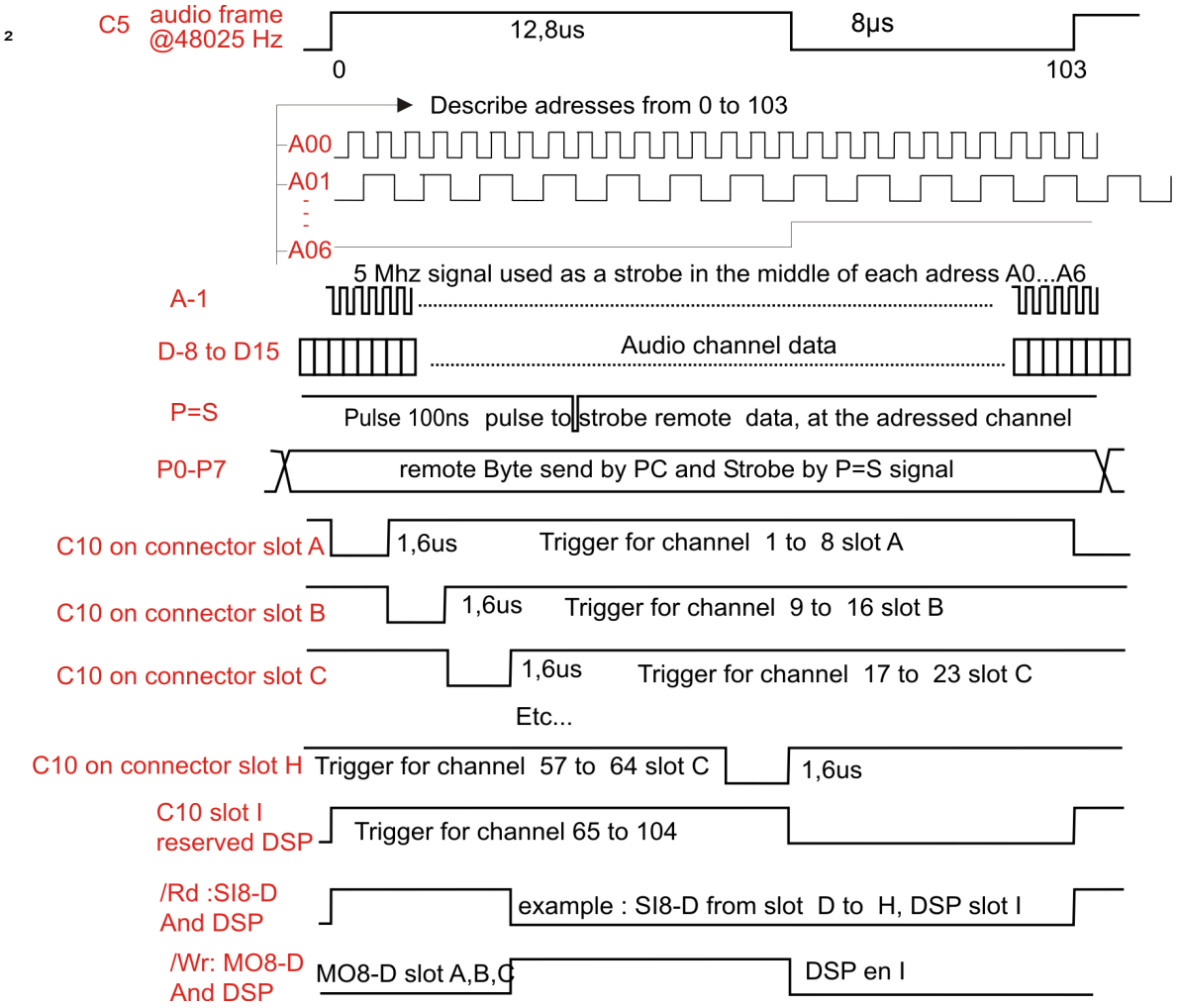
The next signal diagram is based on the following configuration :



MC-64 Timing:

In red, the name of the pin on BUS 1 connector.



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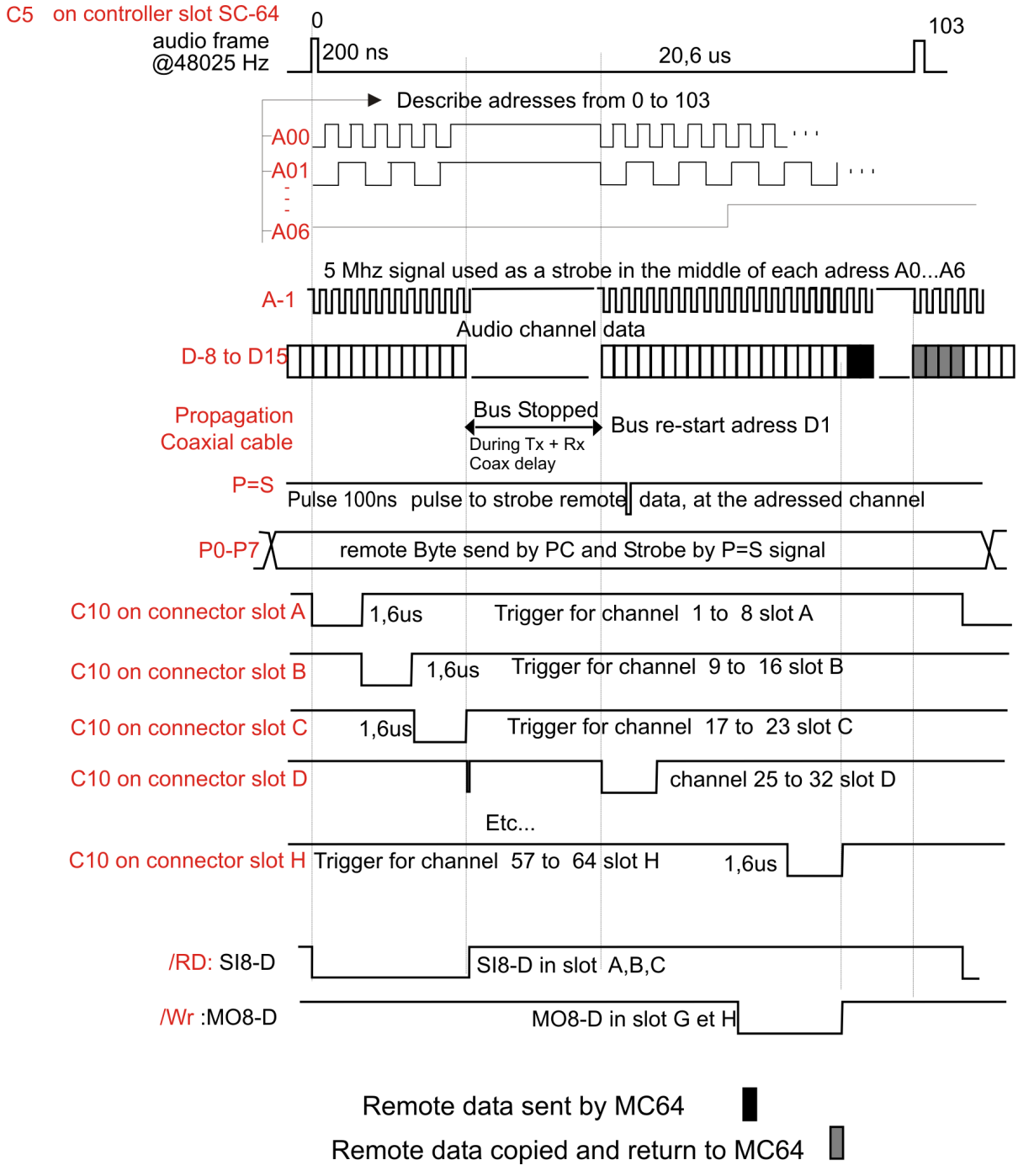
SC-64 Timing :

In red, the name of the pin on BUS 1 connector.



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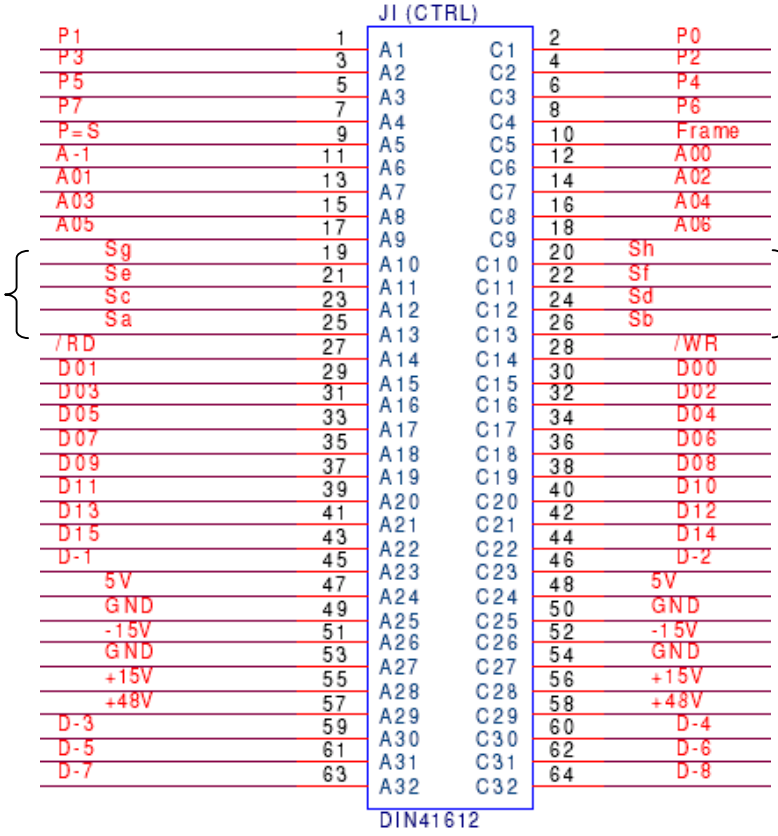
MC-64/SC-64 are connected on BUS 1 , a "41612" connector :

MC-64 /SC-64

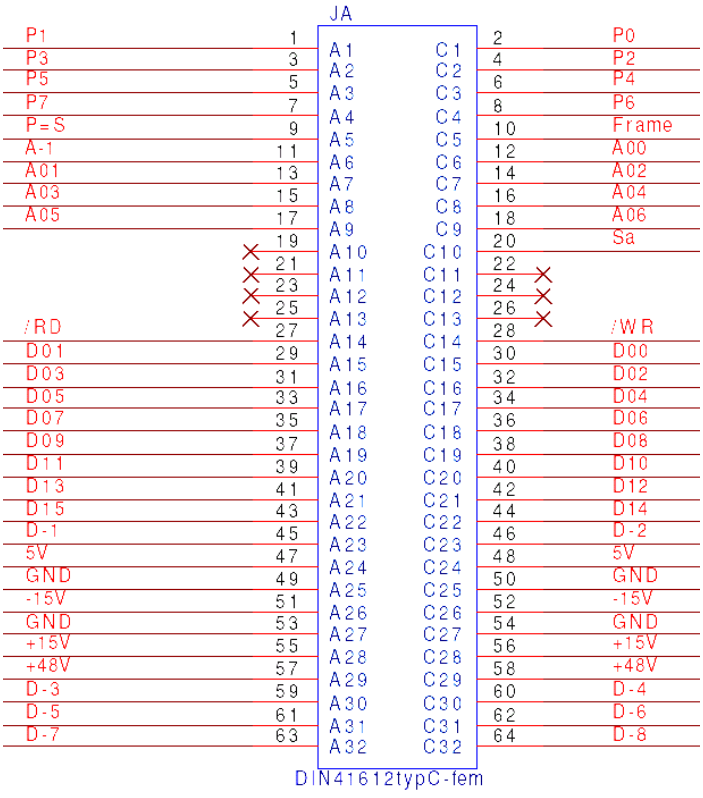
BUS 1 connector slot Ctrl



Slot signal to adress slot A,B etc…

Module input/output

Slot A to H



-Slot signal Sa from MC-64 or SC-64

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3.F Transmission Clock

The modules MC-64 and SC-64 use the electronic device TAXI chip to permit the transmission and reception of data thru a coax cable :

TAXI chip AM79**69** for reception (RX)

TAXI chip AM79**68** for transmission (TX)

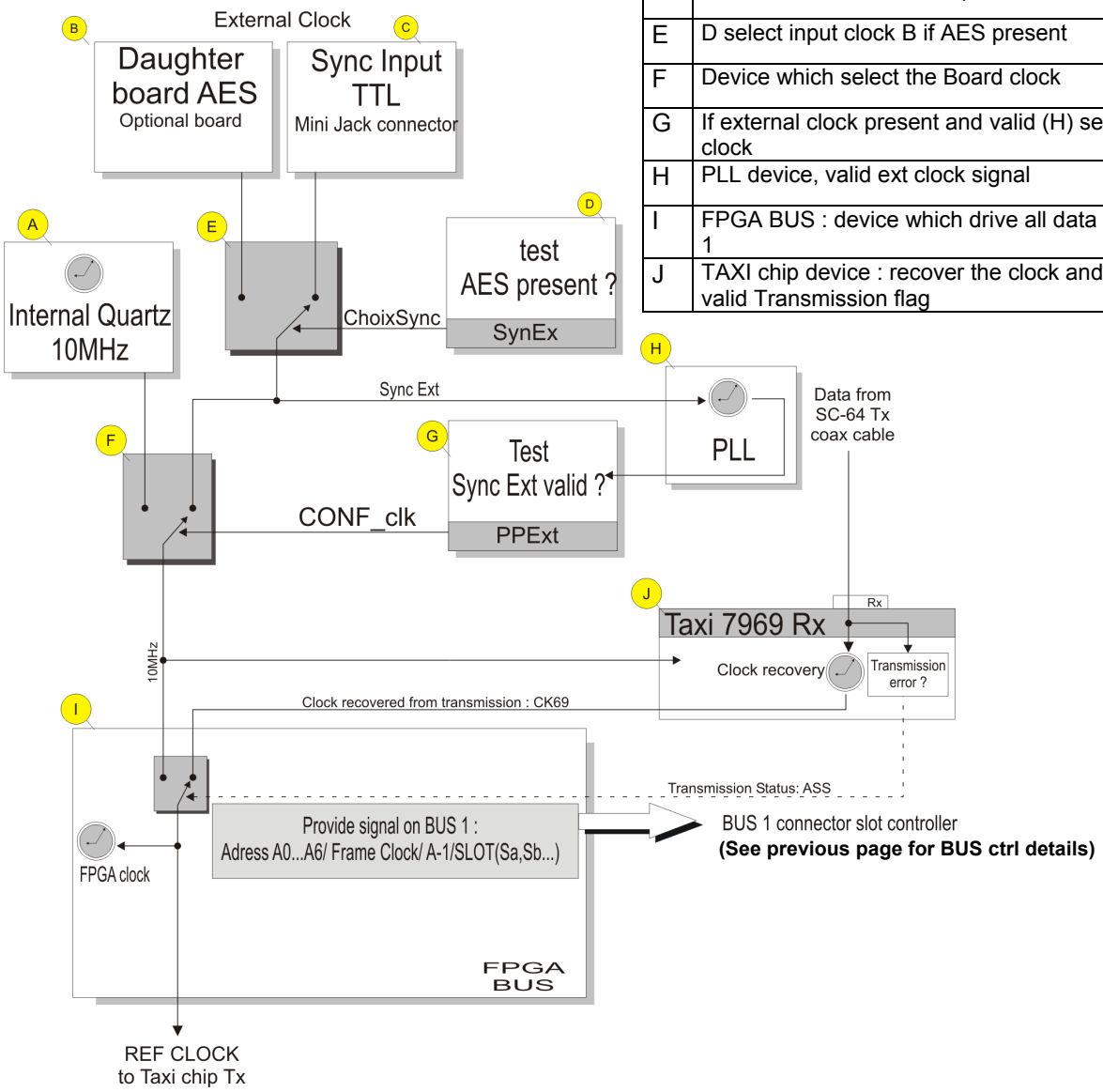
The TAXI chip integrates all the technologies to separate and distribute clock and incoming data.

The Stage Box can distribute its data and its clock to more than one Mix Box.

If the Mix Box works alone, it can be synchronized to an external Clock connected to the MC-64 Sync mini-jack or its AES option. *See user manual chapter 9 for AES option details*

See bellow the diagram of the MC-64 module's clock

A	Internal Quartz 10MHZ : selected if no ext sync
B	Optional board : AES signal input
C	External TTL Clock input : mini jack connector
D	Device which validate the presence of an AES
E	D select input clock B if AES present
F	Device which select the Board clock
G	If external clock present and valid (H) select ext clock
H	PLL device, valid ext clock signal
I	FPGA BUS : device which drive all data on BUS 1
J	TAXI chip device : recover the clock and send valid Transmission flag



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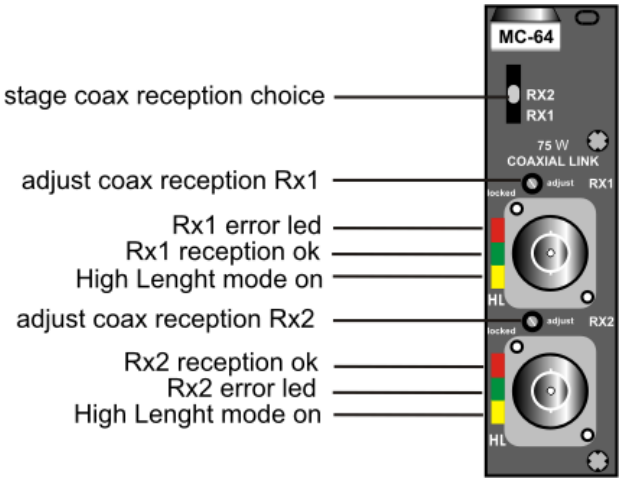
3.G Transmission adjustment

Two RX stages are available on the MC-64 and the SC-64 modules. **RX2** is not adjustable (except if the card is very old you should have a hole instead of the adjustment screw) and is to be used in priority when a standard coax cable with a length higher than 50m is used.

RX1 is reserved for the non standard coax cable, in case of the lock is difficult on RX2 for any raison.

This module have two adjustable RX connector, if your module is in this situation please contact our technical service to upgrade it.



In case of non locking (blink between Red and Green LED), check the following elements :

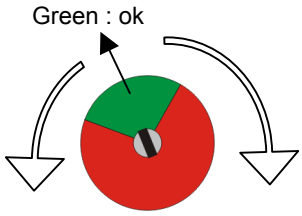
- The condition of the coaxial cables and their BNC connectors.
- The RX coax input is connected to a valid TX

In case of the use of a non standard coax cable use the adjustable RX1 inputs. To do it, apply the following procedure :

- Switch to Rx1 on the MC-64 / SC-64 module
- Use a small flat screwdriver to adjust the variable cap (no limit) behind the “adjust” hole
- Turn the screw Clock Wise. The LEDs must go red.
- Turn slowly (CW) until the LEDs are going green. Memorize this position (A)
- Continue turn slowly (CW) until the LEDs are going back to red (position B)
- Turn back (CCW) to get the adjustment in the middle of A and B positions.

The transmission is now optimized and reliable.

This is similar to a radio station tuning, just before or just after, the signal is lost, in the middle it’s tuned.



Red : transmission not OK

See chapter 93, Trouble Shooting for transmission problem

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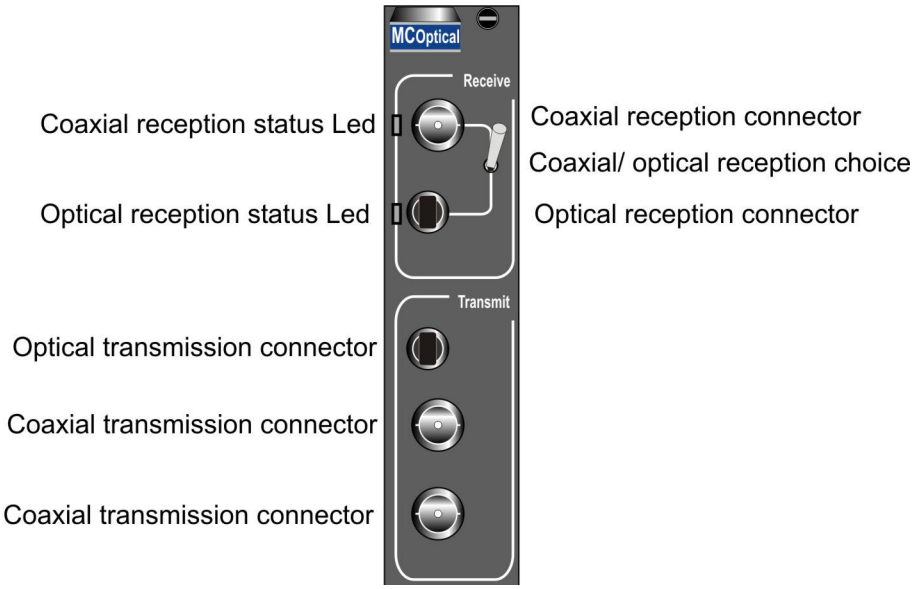
3.H Transmission adjustment with OPTICAL MC/SC module

The MC Optical and Sc Optical are both equipped with two transmission technologies, optical and coaxial. The MC/SC optical modules are equipped with BNC jack filter connector and an auto-equalized input stage witch able to auto adjust the transmission.

As the Coaxial interface, the optical interface *need no adjustments to be functional.*



Coaxial cable and Fibber length limit :

- Fibber: from 1 m, up to 400m in Master mode, 2000 m in Slave mode
- Coaxial : from 1m, up to 500m in Master & Slave mode

In case of non locking (blink between Red and Green LED), check the following elements :

With Optical transmission:

- The condition of the fibber cables and their ST connectors.

The ST connector on the MC / SC module if no dust are inside With Coaxial transmission:

- The condition of the coaxial cable and their BNC connectors
- The Reception switch is on the upper position ?
- Be sure to use the standard cable if two different generation of transmission module is used.

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4. THE COAXIAL CABLE

With the coaxial cables supplied by InnovaSON the audio racks will immediately establish stable transmission. However, to ensure you have the best conditions, make sure of following points:

- The typical impedance must be 75 ohms.
- Attenuation must not be greater than 25dB @100MHz (ie. 200 meters of KX6, or 300 meters of VCB75 cable)

The length of cable usable between two racks depends on the specification of this cable. If the total attenuation exceeds 20dB, you must use the “long distance” HL mode provided on MC-64 and SC-64 modules (see module descriptions).

Any intermediate connection adds approximately 6dB of attenuation, and it is better to ban the use of T-BNC connectors or joins.

Type of cable	**KX-6**	**VCB-75 ***	**KX-8**	**VCB-100**	**1505A**
Manufacturer	Alcatel	S2CEB	Alcatel	S2CEB	Belden
100m @ 100MHz	12dB	7dB	5dB	4.8dB	5dB
Diameter	6mm	6mm	10mm	7mm	6mm
Maximum length	150m	300m	500m	500m	500m

- VCB75 is the cable supplied with your system by InnovaSON..

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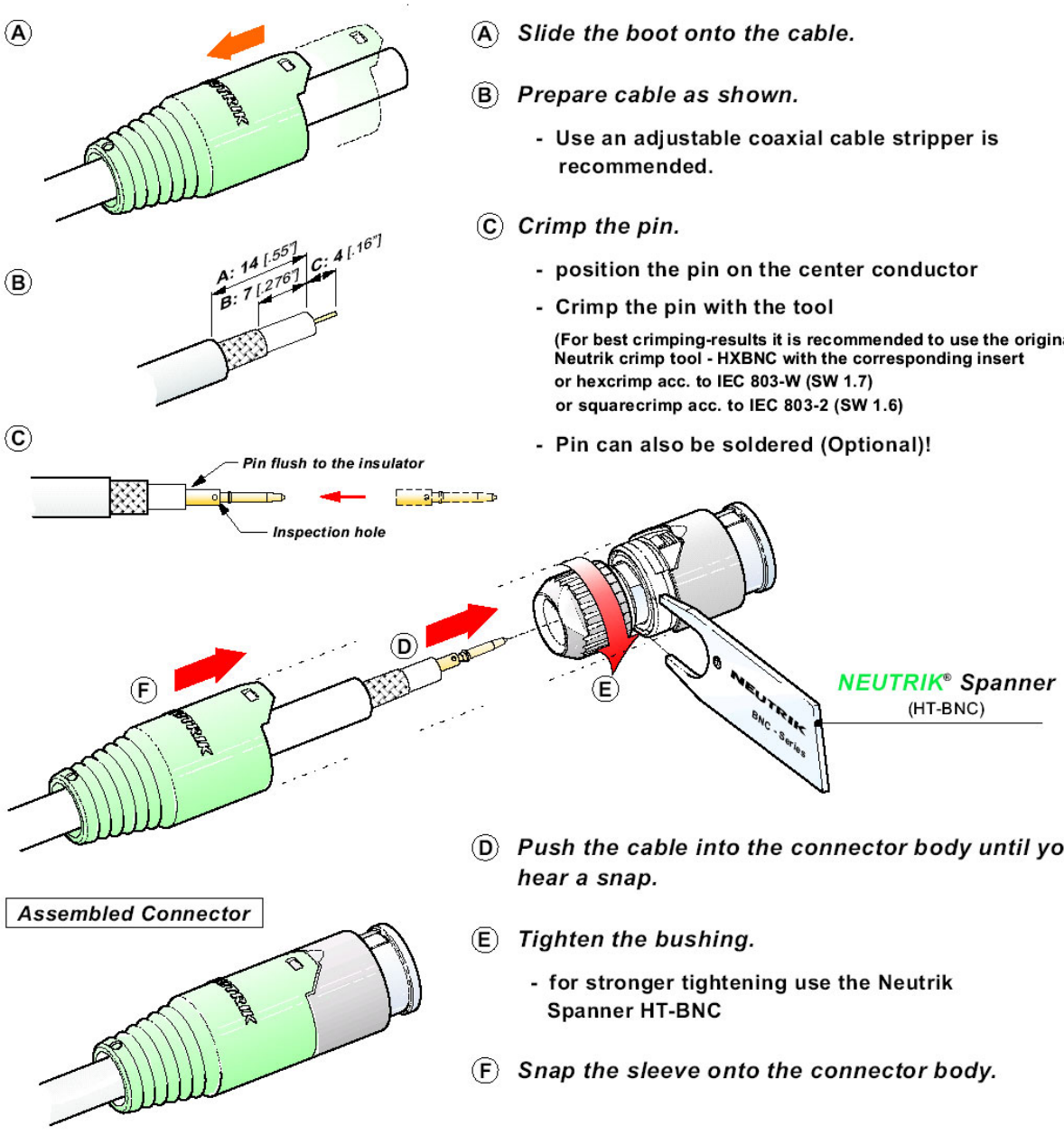
4.A.1 BNC connections

The drums of coaxial cable supplied by InnovaSON are equipped with the Push-pull NBNC75PLS9 connectors from Neutrik.

The following drawing (supplied by Neutrik) shows how to install this kind of connectors to your coax cable.

Assembly Instructions

Select the proper connector part number in Neutrik`s cable cross reference list!



Ⓐ *Slide the boot onto the cable.*

Ⓑ *Prepare cable as shown.*

- Use an adjustable coaxial cable stripper is recommended.

Ⓒ *Crimp the pin.*

- position the pin on the center conductor
- Crimp the pin with the tool

(For best crimping-results it is recommended to use the original Neutrik crimp tool - HXBNC with the corresponding insert
or hexcrimp acc. to IEC 803-W (SW 1.7)
or squarecrimp acc. to IEC 803-2 (SW 1.6)

- Pin can also be soldered (Optional)!

Ⓓ *Push the cable into the connector body until you hear a snap.*

Ⓔ *Tighten the bushing.*

- for stronger tightening use the Neutrik Spanner HT-BNC

Ⓕ *Snap the sleeve onto the connector body.*

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5. THE RACKS

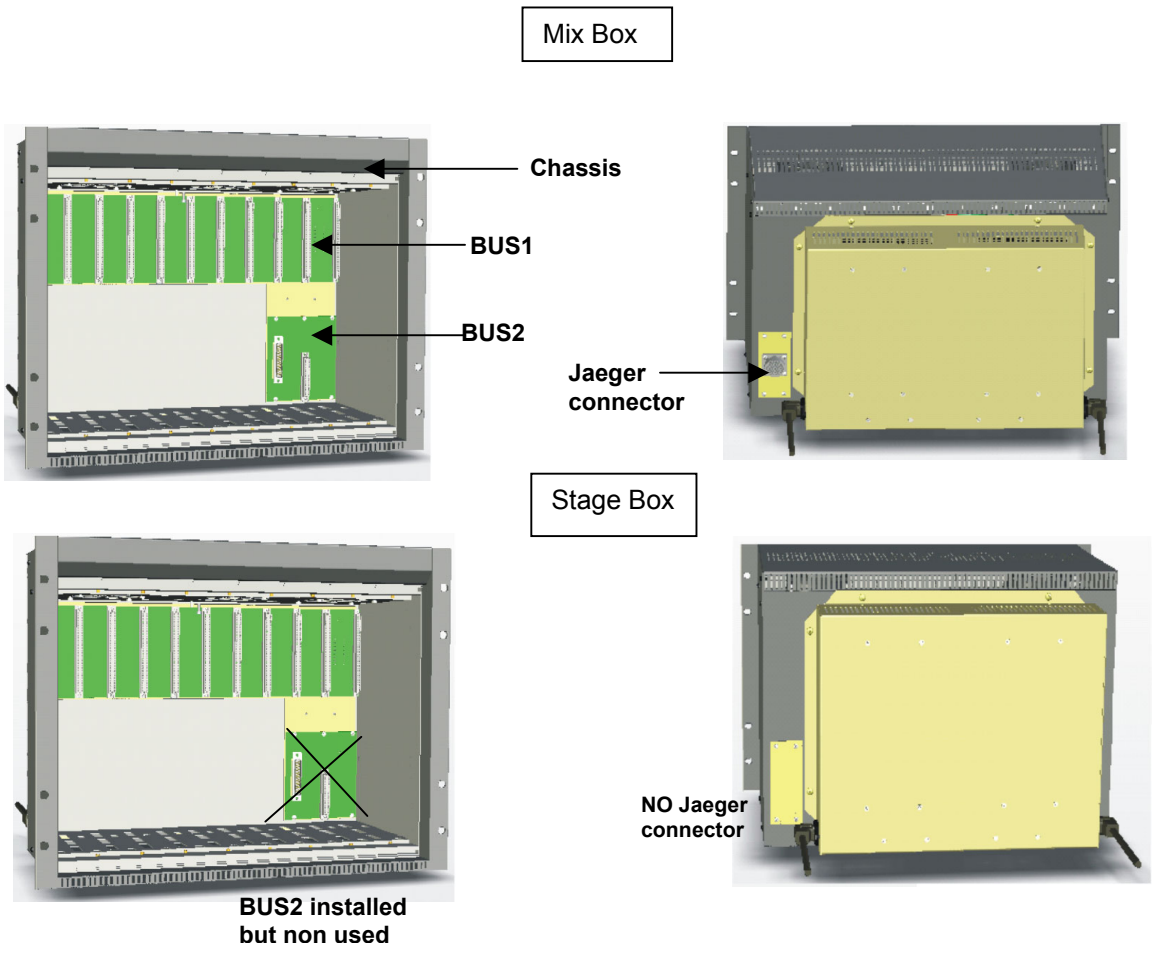
They are built into a standard format – 19 inches wide (482 mm), 7U high (312 mm) – the frame is 325 mm (13 inches) deep.

The same mechanical racks are used for the Stage Boxes or the Mix boxes. The common Chassis is named CBA96-R and is equipped by a redundancy power supply on its back.

The audio rack for an Sy40 console is integrated into the rear of the control surface. It is electronically compatible, but mechanically different.

Two busses, in the bottom of the rack allow to interconnect the modules. 11 connectors (41612 type) on the main bus carry power, control signals and digital audio data. 2 connectors on the auxiliary bus (BUS-2) handle the connection of the Mix Box to the control surface via the 37-pin Jaeger connector fitted on the rear of the rack. The Stage Box is of course not equipped with this Jaeger interface.

5.A The Mix Box, Stage Box difference



The Mix Box can be used as a Stage Box without any modification (just use an SC-64 module)

The Stage Box can became a Mix Box by adding a rear Jaeger connector and a MC-64 module.

Bus 2 is installed in the Stage Box, but is not used.

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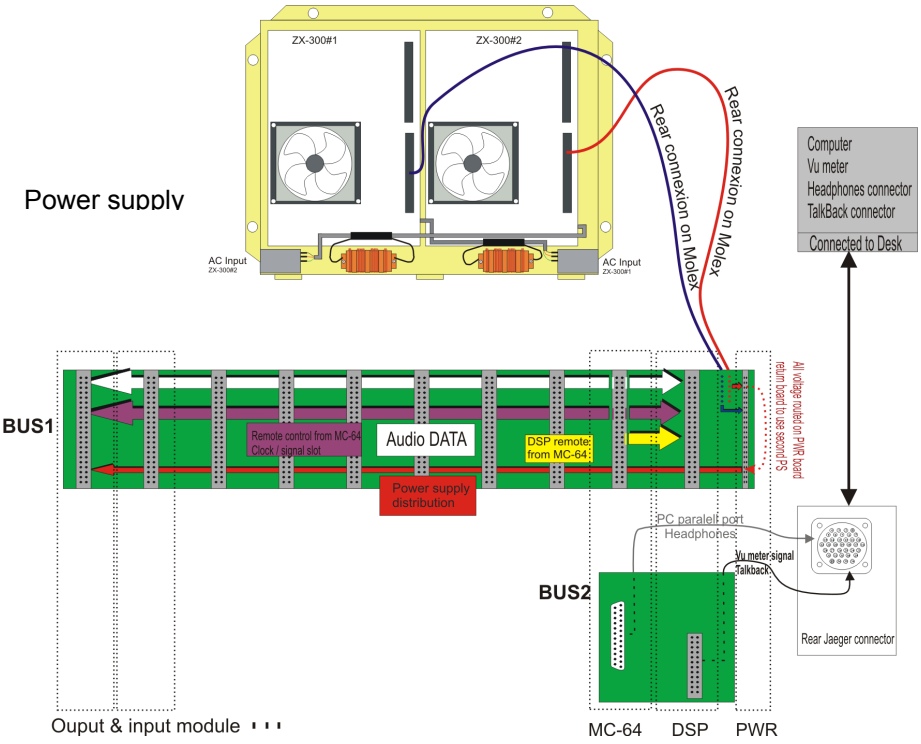
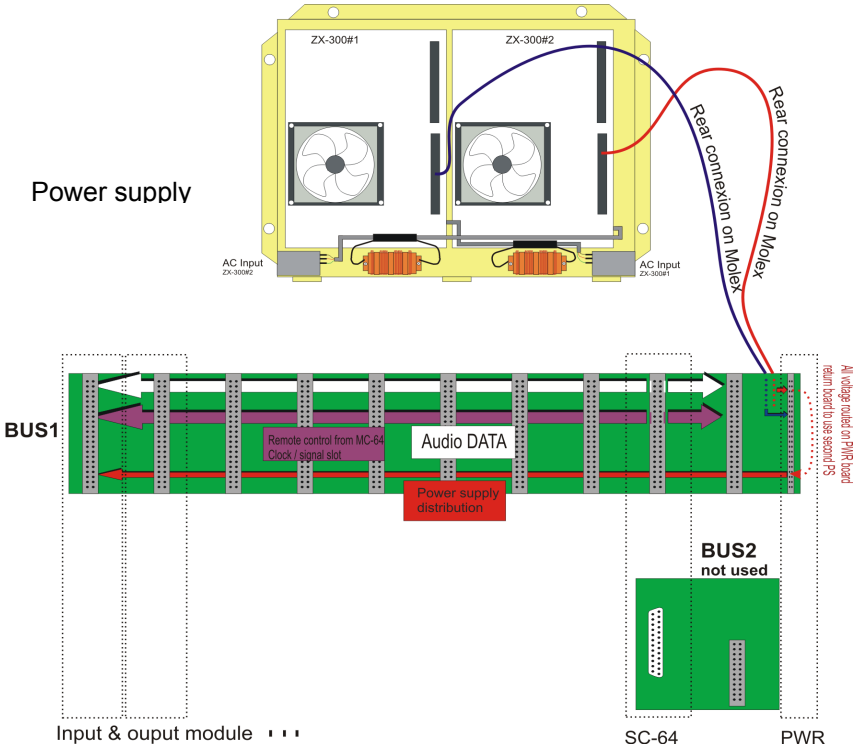
5.B Block diagram interconnection

5.B.1 Mix Box



5.B.2 Stage Box



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5.C Audio Racks and Sensoft 8 Upgrade

The new console Sy80 have to use the new DSP board : the DSP Sy80.

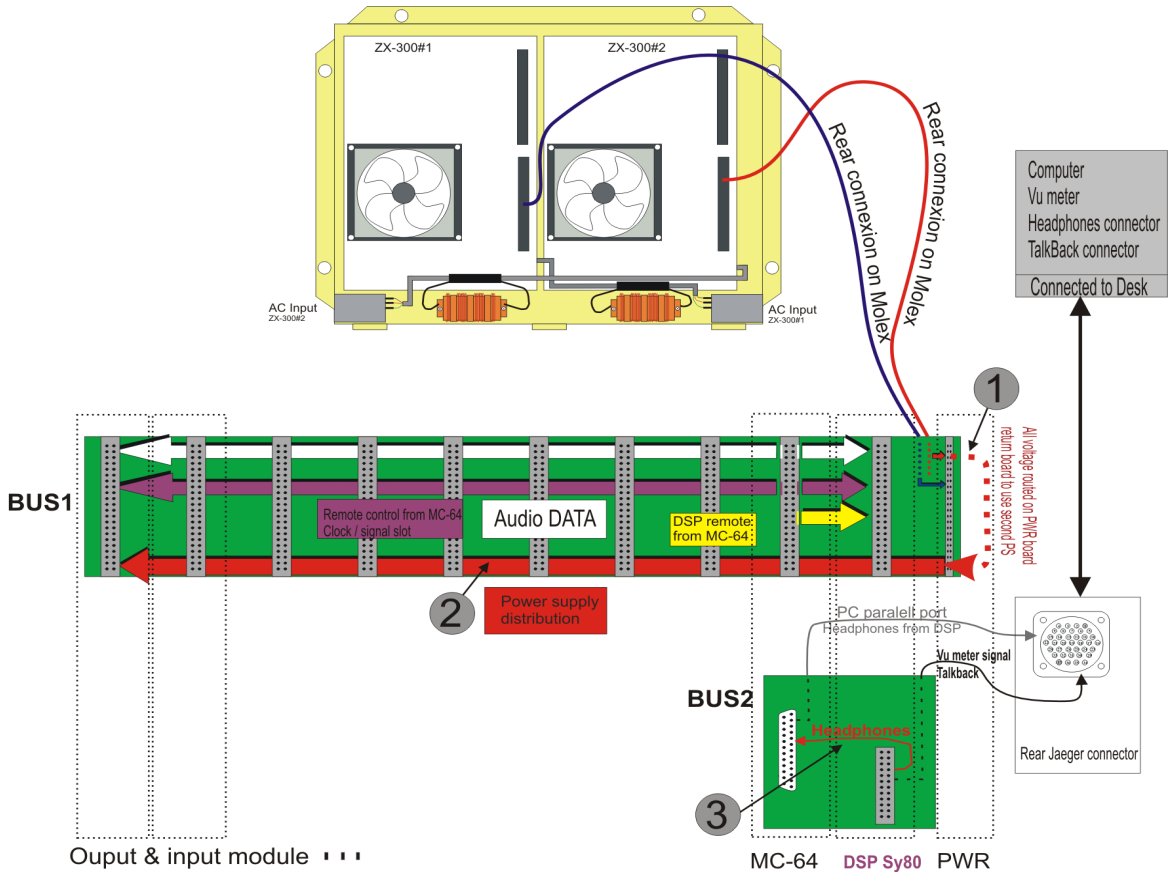
As DMMK(n), the DSP Sy80 provide computation and mix. The Sy80 provide also the headphone amplifier, this was provided by the MC-64 on the previous platforms (GL, Sy40, …).

It is necessary to use a modified Mix Box with DSP Sy80 :

- The DSP Sy80 consumes more power from the BUS1
- The Sy80 DSP needs a modified BUS2 to send Headphones signal to the Jaeger connector. This cabling replace the old one where the MC-64 provide the headphone amplifier.

Modification details :

1. Reinforcement of the +5 volt PWR board's track (PSU switch module)
2. Reinforcement of +5 volt BUS1 board's track
3. Addition of Headphones line from DSP, instead of MC-64, carried to the console thru the Jaeger cable (BUS2).



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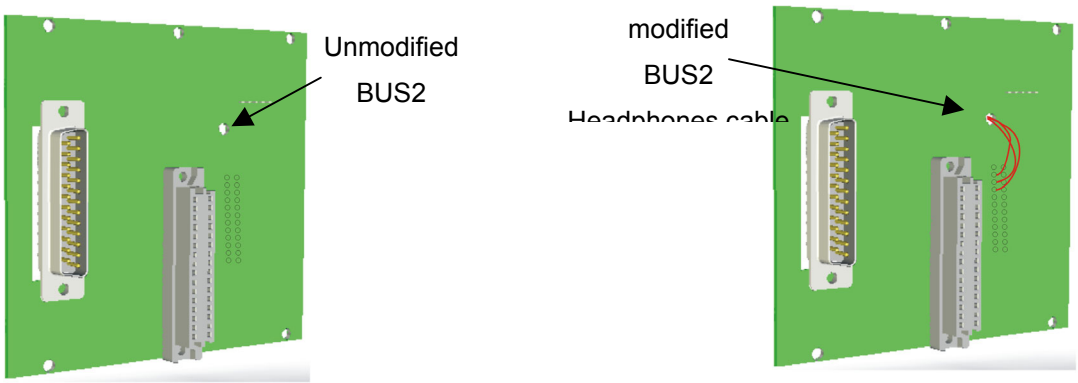
ALL the new upgraded Mix boxes and Stage Box (since serial number 385) are Sensoft 8 compatible.
Some Upgrade kits are available to modify the audio racks and make them compatible.
Contact InnovaSON for all details.



5.D The Jaeger Connection

5.D.1 Rear Jaeger connection

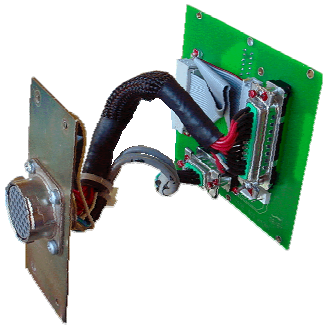
The Rear connector Jaeger provide for the Mix Box the transport of different signal:

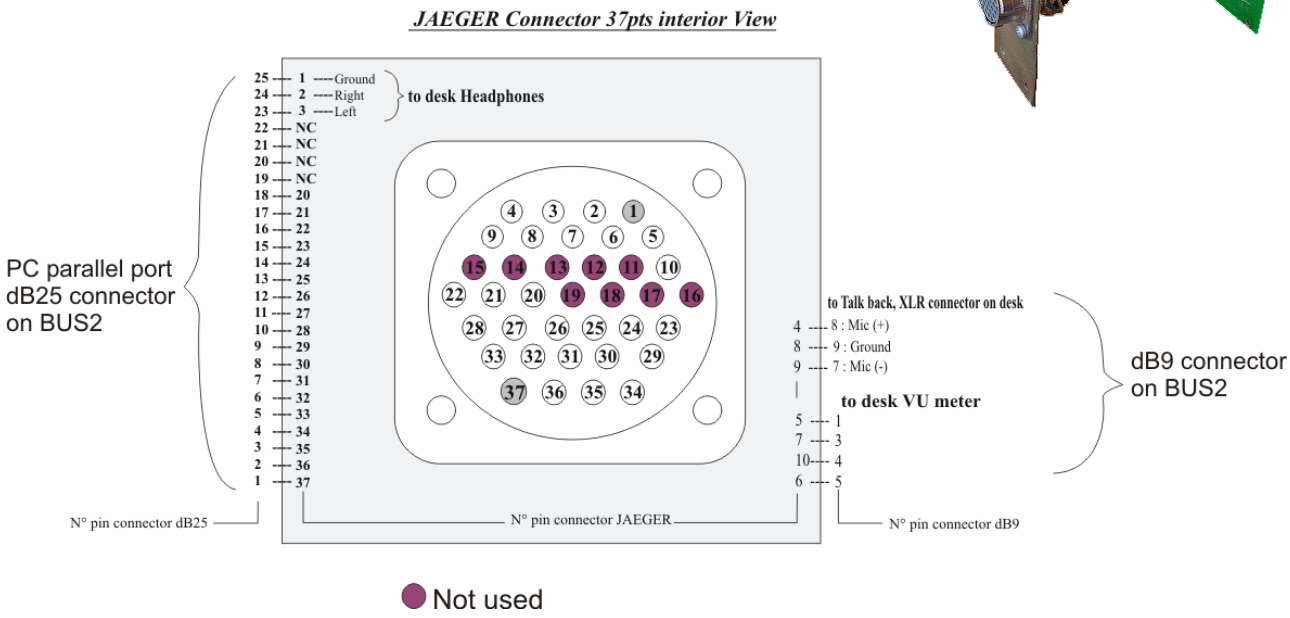
- Parallel communication between PC and MC-64 module
- Headphones signal
- Desk Vu meter signal
- Talk back line

All of these signals are connected to the Jaeger connector, via the BUS2 board.

See the following diagram for pin out details

rear Jaeger 37pts and Bus 2





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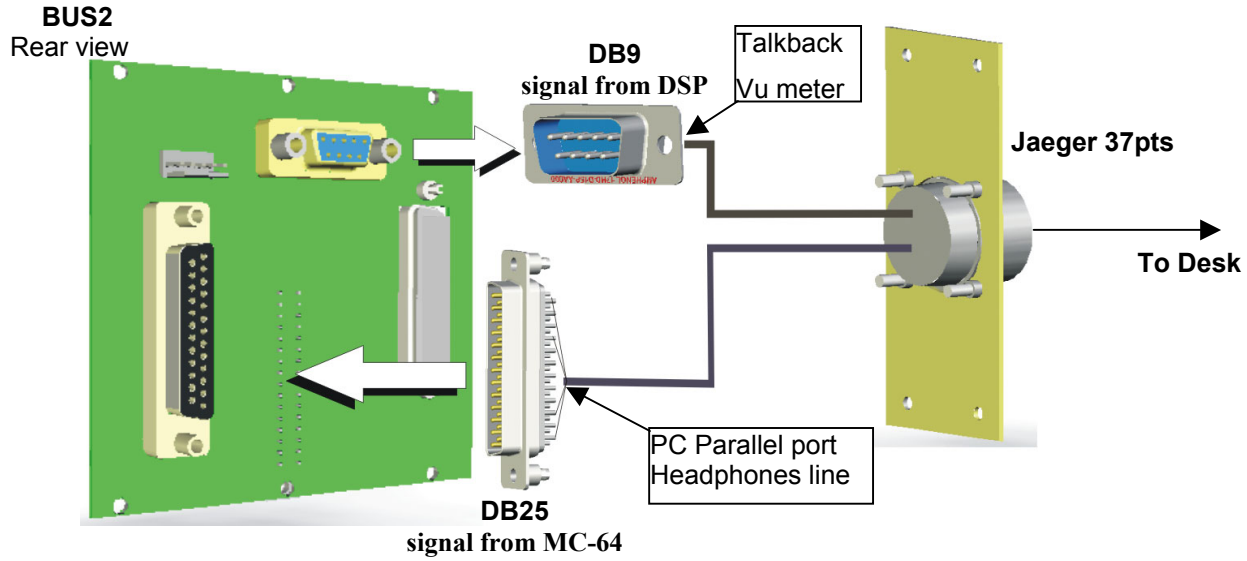


5.D.2 Jaeger cable

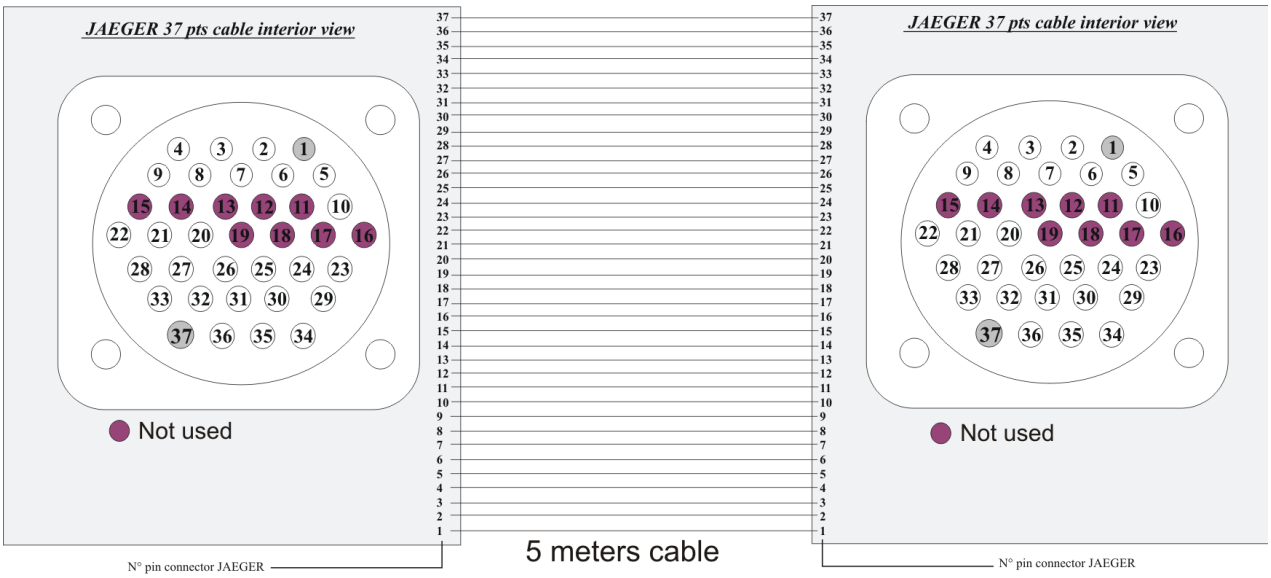
The Mix Box is connected to the control surface thru a Jaeger cable.

The parallel port specification impose a max length of 5m for the cable.

Check the following important points :

Verify the 37 pins of the connector each time that the cable is plugged and unplugged.

The cable is a Jaeger to Jaeger cable, pin to pin (1 to 1 …37 to 37 except pin 11 to 19 which are not used)



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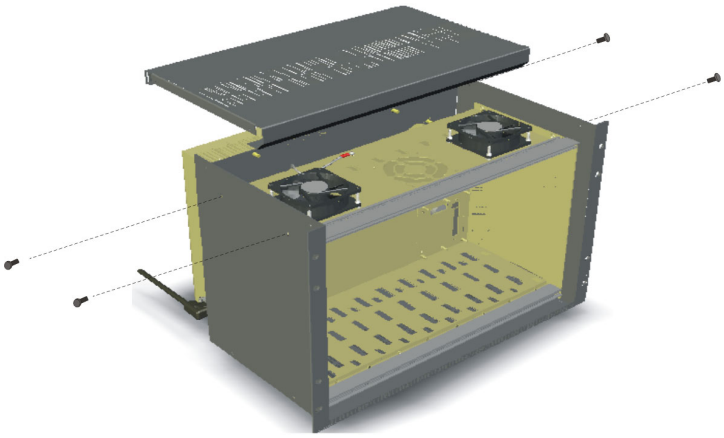
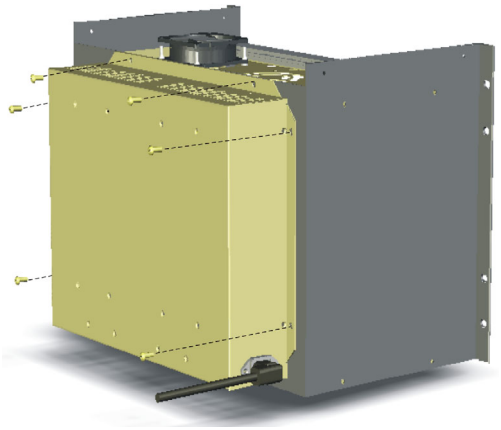
5.E Opening racks

5.E.1Power supply disassembly

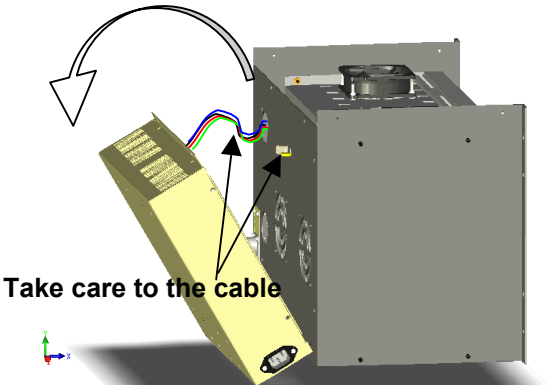
A) remove the cover of the rack :



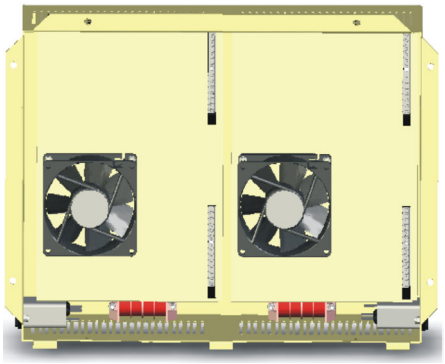
B) remove the screws of the Power supply module:



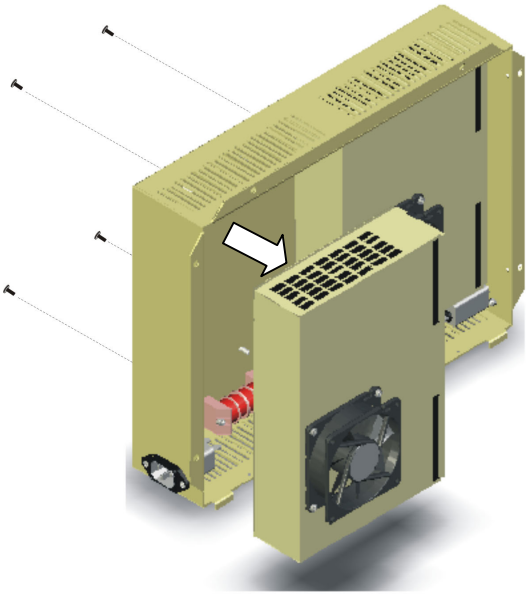
C) unscrew the Power supply :



D) Power supply module:



E) disassemble the Power supply unit:



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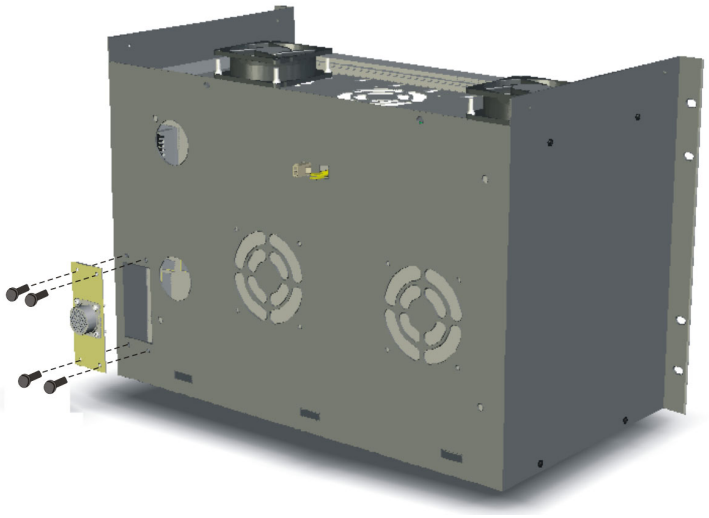
5.E.2Jaeger connection disassembly

A) Unscrew the Jaeger connector



B) Unscrew the dB25 and dB9 connected to BUS2

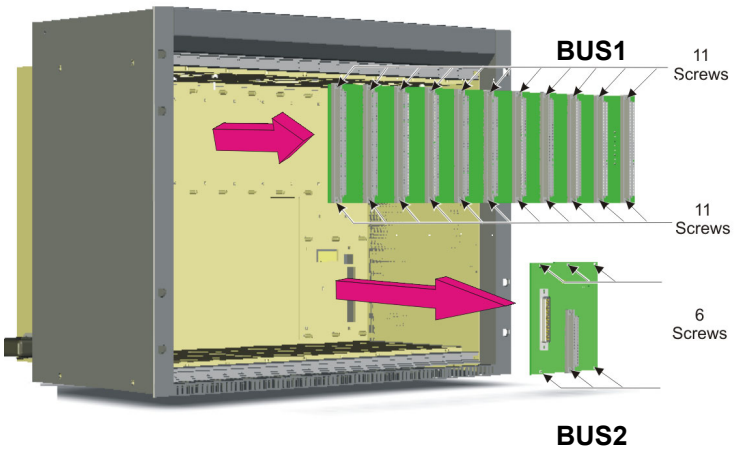
5.E.3BUS 1 and BUS 2 disassembly

Attention:
For the Mix Box : the Bus 2 can be removed only after the rear Jaeger connector has been removed.

BUS1 :

is attached with 11 screws

The power suplly are connected behind the board by two molex



BUS 2

is attached with 6 screws

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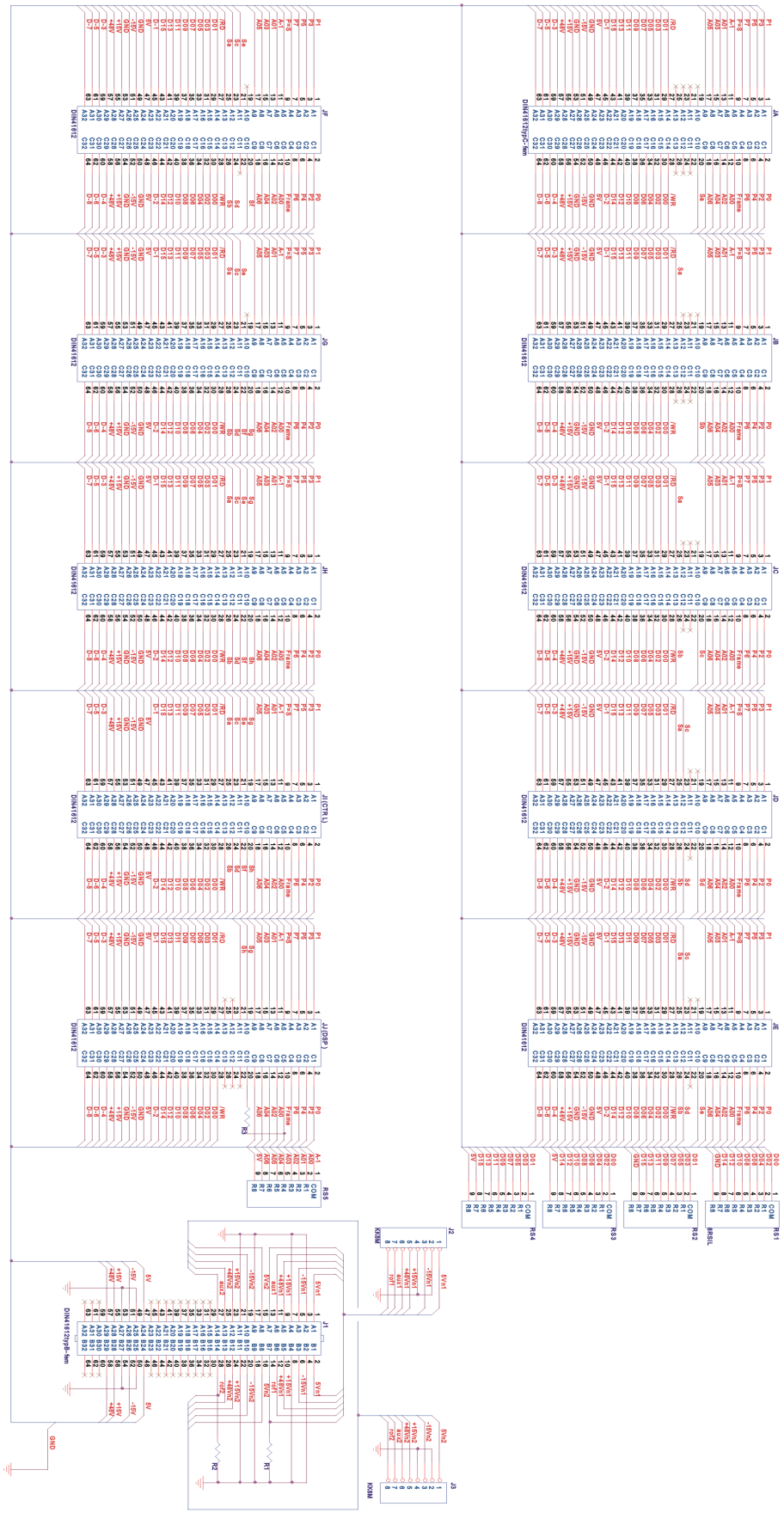
5.F Bus1 schematic



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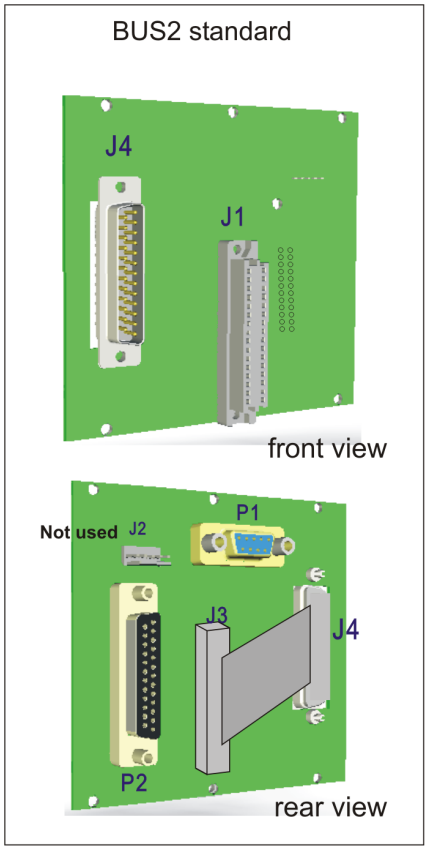
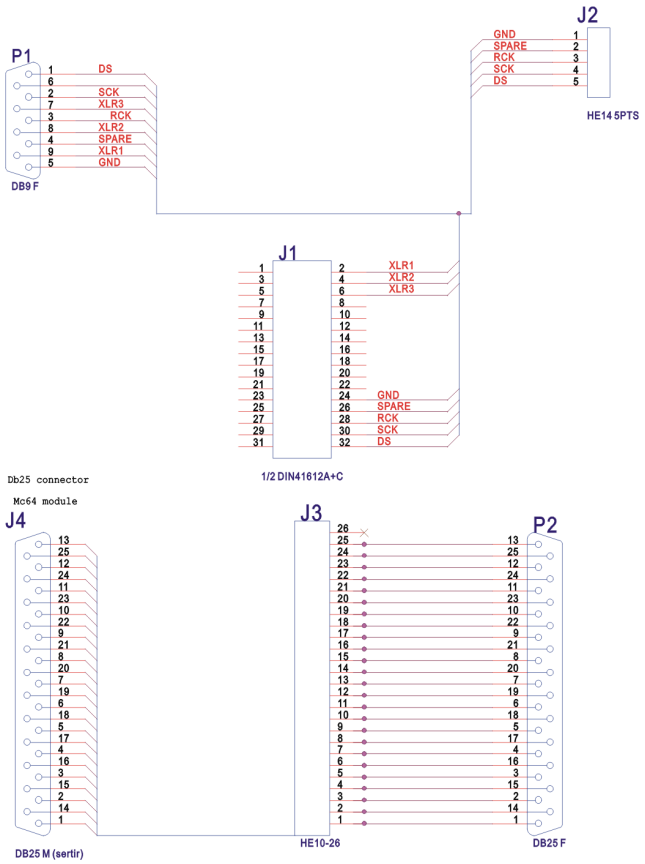
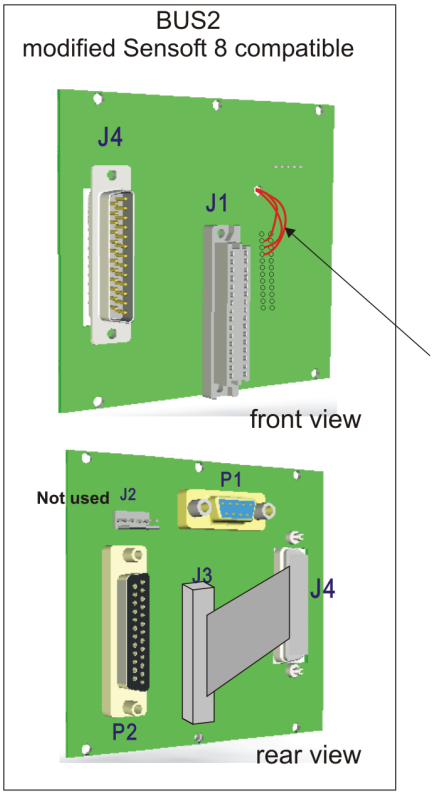
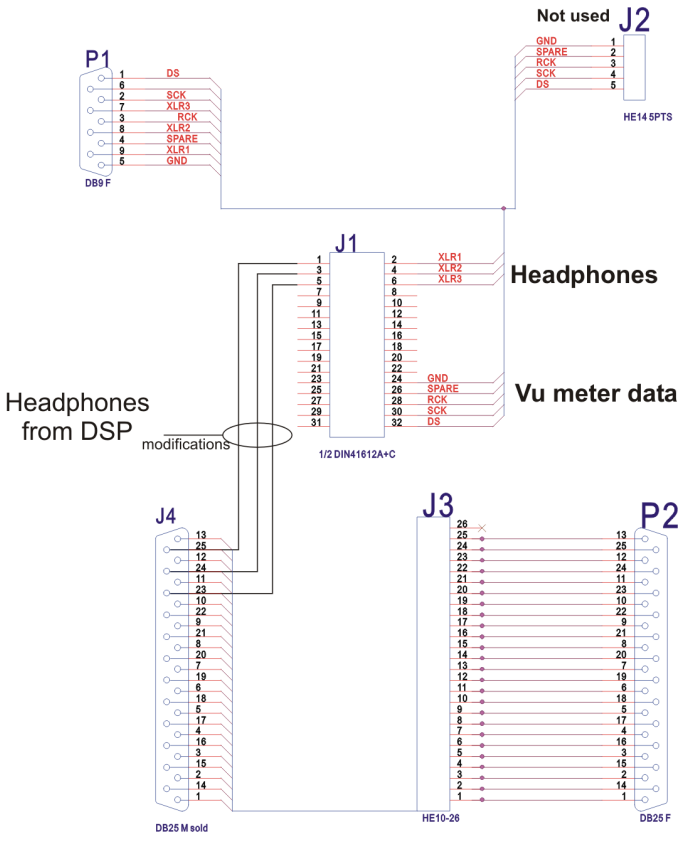
5.G BUS2 schematic





5.H modified BUS 2





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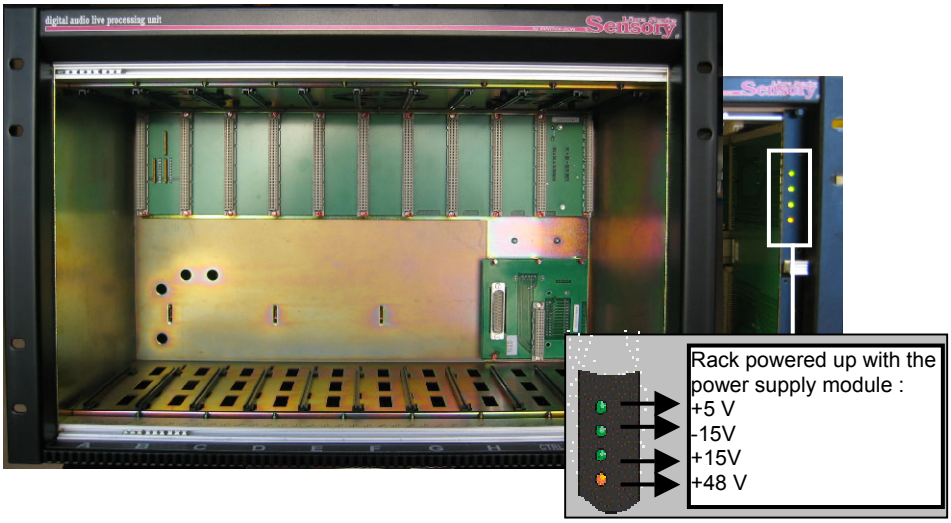
5.I Power suplly

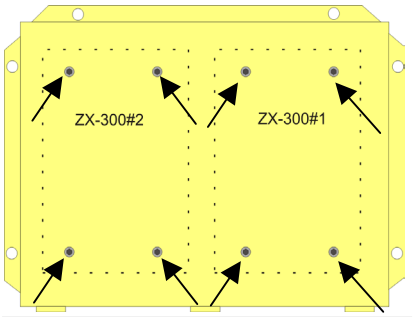
5.I.1 Power supply access

Both Audio racks (Mix Box and Stage Box) are equipped with a Power Supply status Board.
The audio racks have a redundant power supply (2 power supplies per rack) which are changed over manually.
To change of power supply unit make sure that both mains cords, one per power supply, are connected, then extract and return the **PWR switcher** module.

Power Status Led :

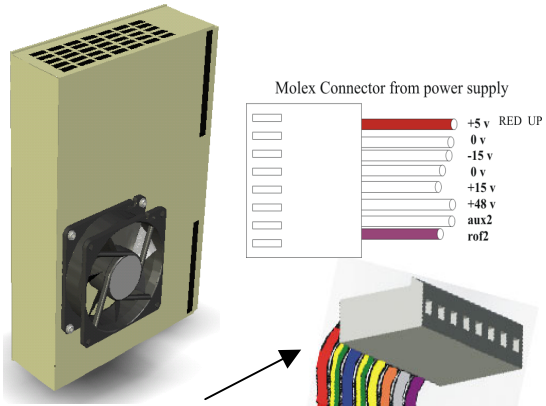


Screw location :

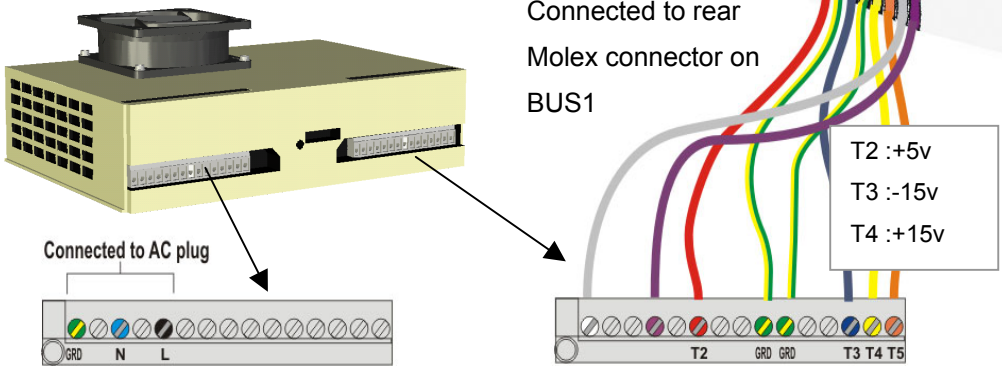


Unscrew the 8 screws to remove the both power supply

Disassembled Power supply ZX300 :



Connected to rear Molex connector on BUS1



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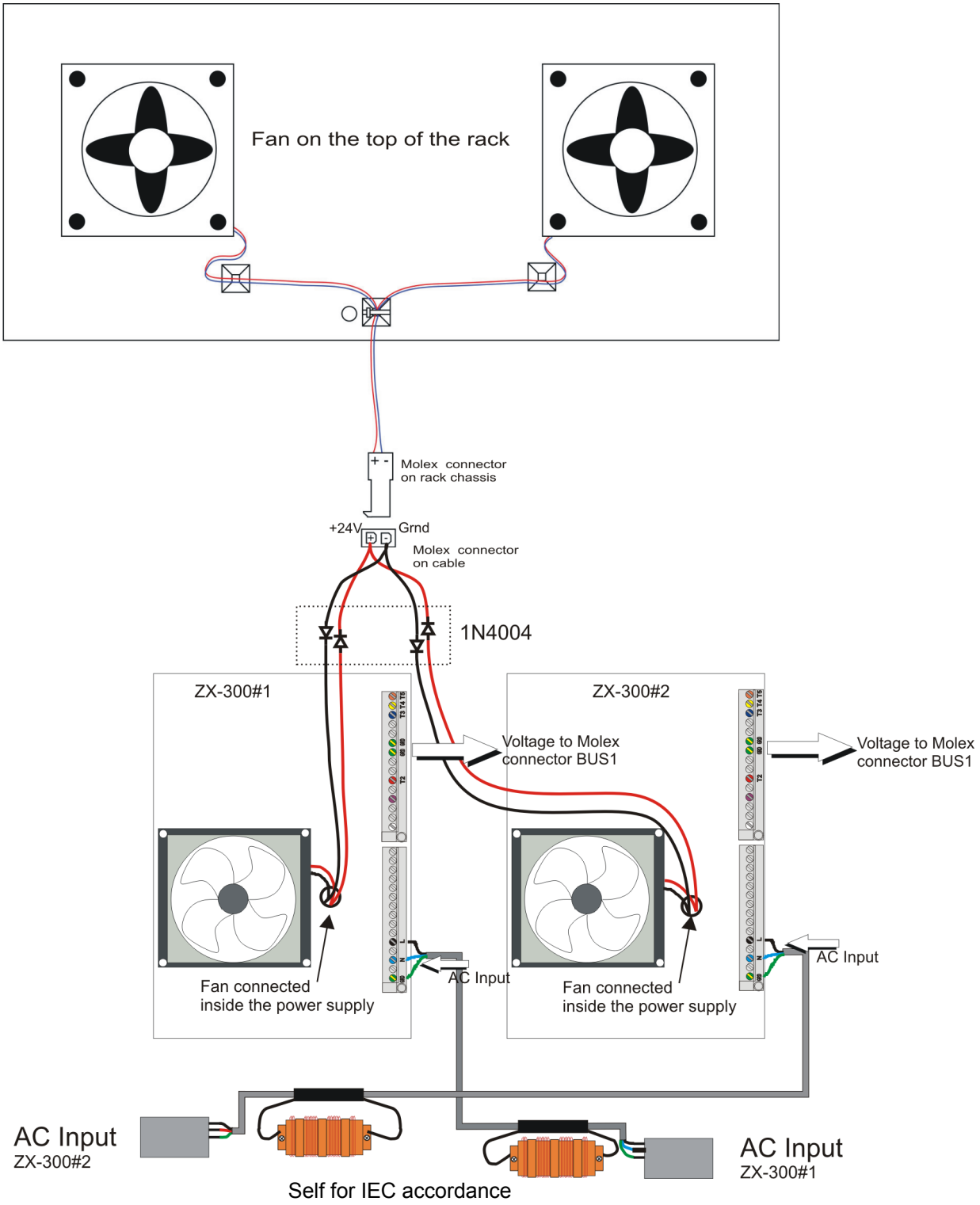
5.I.2 Power supply cabling



See chapter 9.A, for details and distributor incident report

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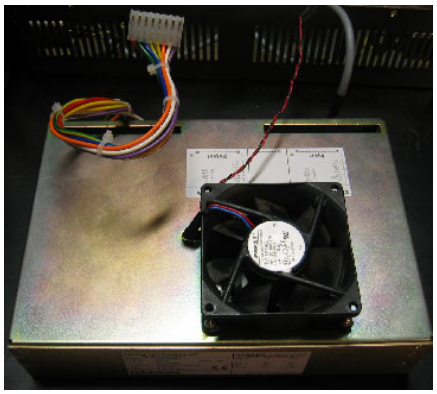
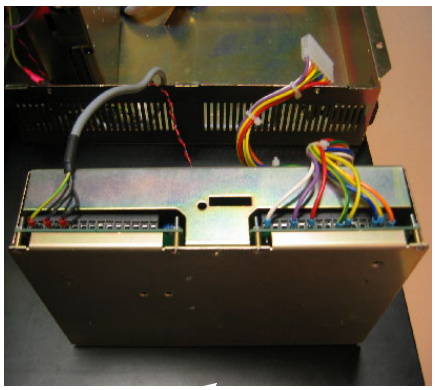
5.I.3 Power supply adjustment

To adjust the DC voltage of the Power Supply, and verify the correct range of voltage proceed as following :
If the Mix box is a CBA96-**R**, this adjustment will be done for **each** ZX-300 (power supply).

- Open ZX-300, the fan cable must stay connected between both ZX-300

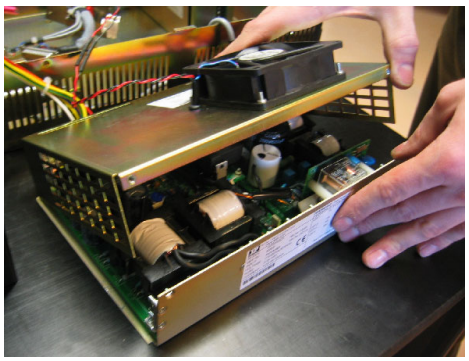


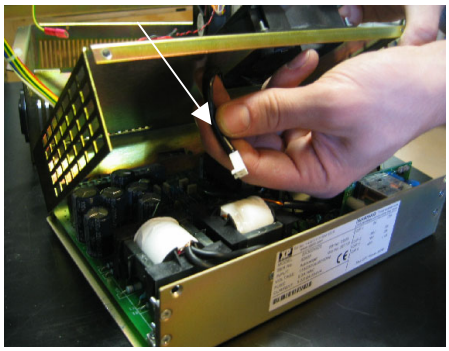


Unscrew the 3 screws

- open the ZX-300 power supply carefully.

Be careful to the fan cable





- DC 5 volt Adjustment

There is only **one** adjustment on the Power supply board, the 5 volt (5volt trimmer pot)
Use a DIGITAL multimeter (voltage controller).

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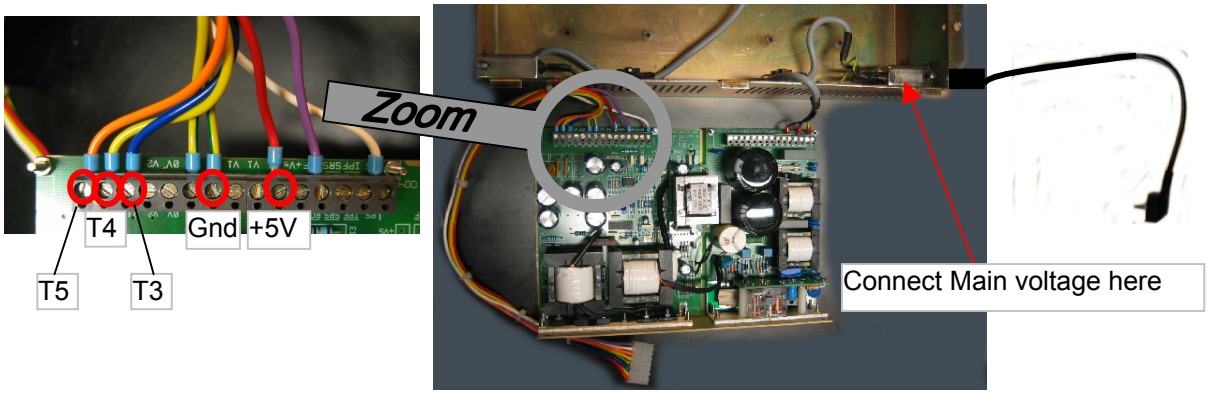
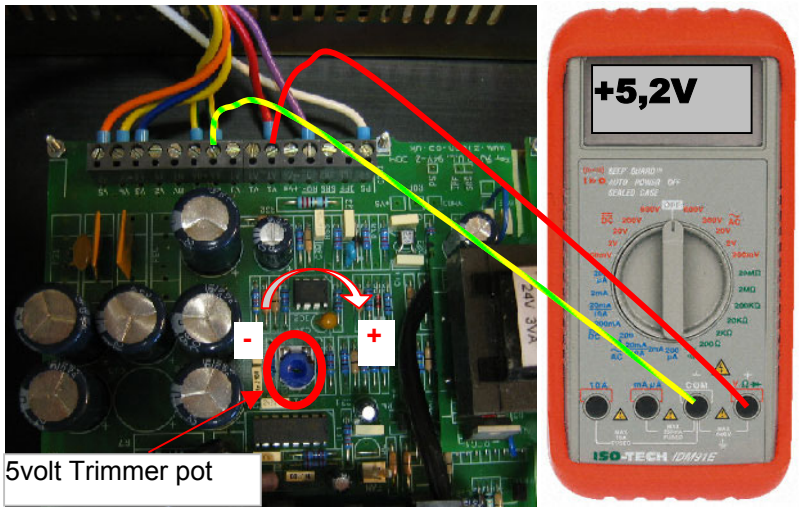
Connect the main voltage to the open ZX-300 module, ***Be careful*** **to Electric shock!**

The ZX-300 is not connected to the rack and is **ON** once the main voltage is plugged



Turn the 5volt Trimmer pot to Adjust the 5 volt :

The correct adjustment is : +5,2 volt +/- 0,02 Volt



Check the other 3 voltages on the Board, between T5, T4, T3 and the ground :

-17 volt <	**T3**	**< -15 volt**
+15 volt <	**T4**	**< + 17 volt**
+48volt <	**T5**	**< +50 volt**

coat the 5volt trimmer pot with a drop of varnish

- When the adjustment is correct switch off and reassemble carefully the ZX-300 power supply. Be careful, don't forget the Fan cable inside the ZX-300
- Repeat this operation with the second ZX-300.

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6. THE MODULES

6.A SI-8D2 module (8 mic/line analogue input)

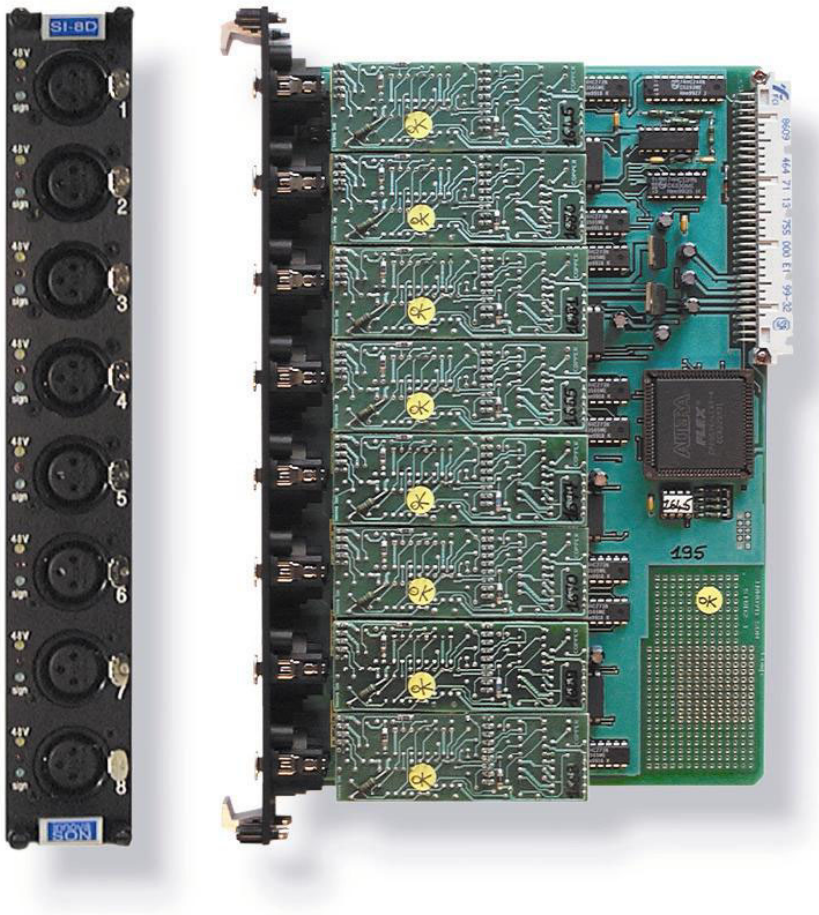
This module integrates a Mic preamp and make the digital conversion of the analog incoming audio signals. On the front of the module you will find :

- 8 XLR-3 female connectors, numbered 1 to 8
- Each input benefits of a green led for signal presence, a red led for clipping and a yellow led for Phantom Power.

The module can drive 8 analog signals with the following specifications :

- Max input level : +12 dBu (gain at 0dB)
- Programmable gain (3 dB steps) from -27 to + 63 dB, sensitivity –51 to + 26 dBu
- balanced inputs, phantom power supply (+ 48V) switchable
- Analogue to digital conversion : 20 bits, 48 kHz, Delta-sigma (64 over-sampling).

Installation
The SI-8D module can be installed in the Stage Box or Mix Box, in the slots A to H.



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6.A.1 Global view

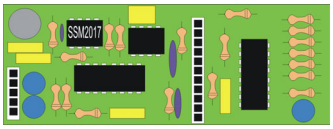
The Si8D2 is equipped with 8 removable preamplifiers.

Each preamplifier is referenced SPR408.

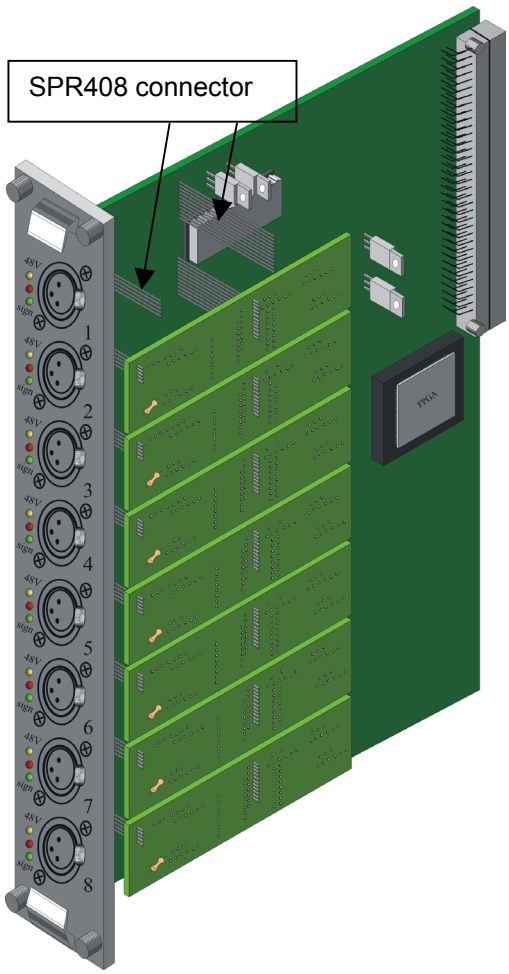
Be aware of the correct position of modules before power up the system.

For better performance and avoid any problem, clean usually SPR408 connectors on SI8D2 mother board.

SPR408 board



This technology give a quick solution to most of preamplifier default : simple exchange.



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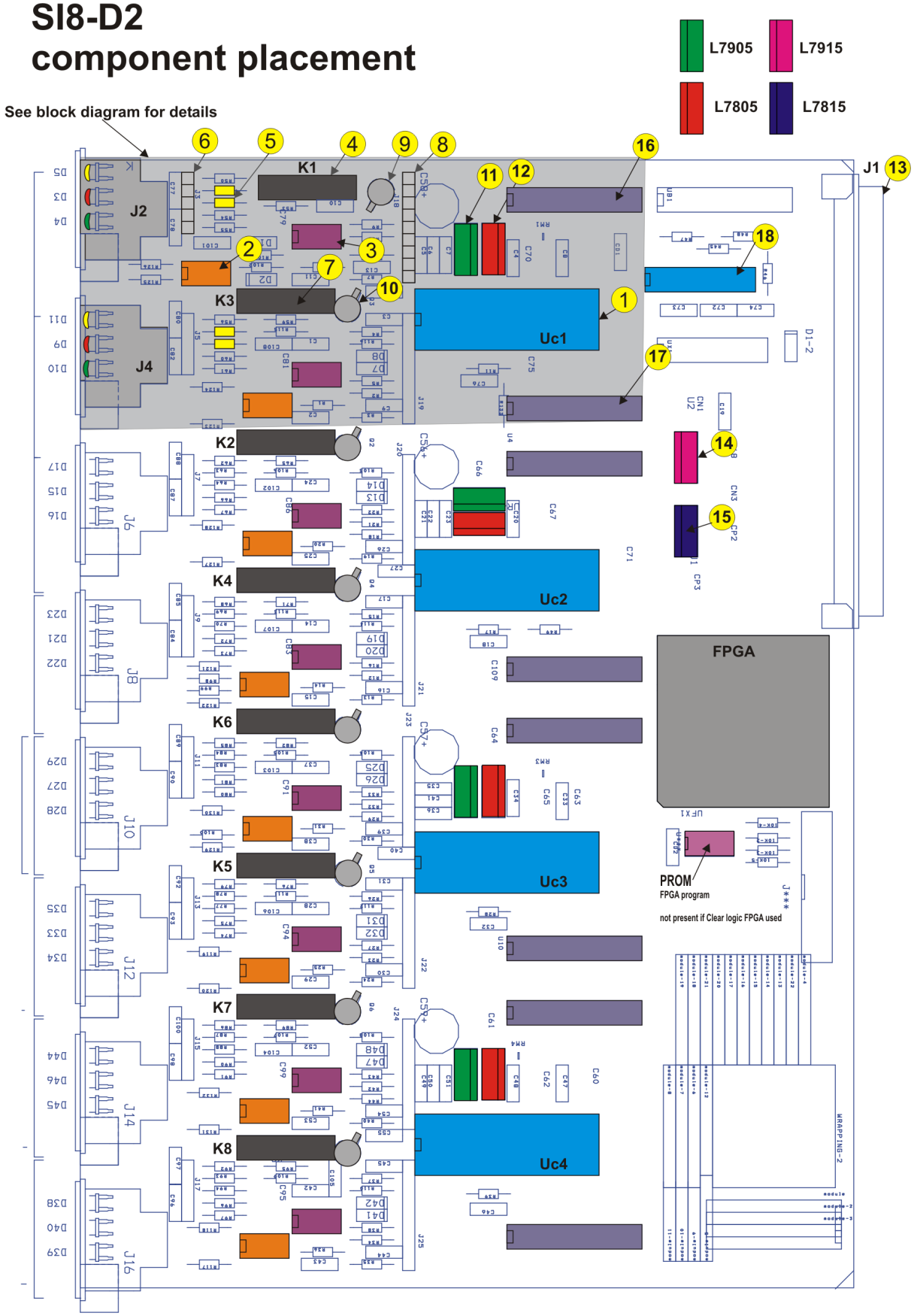
6.A.2 Components placement

SI8-D2
component placement



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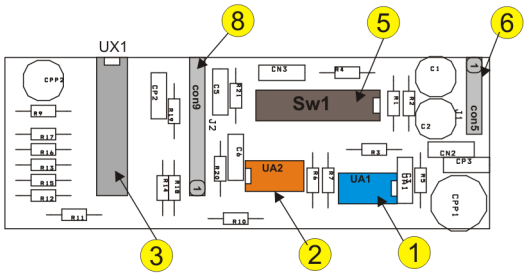
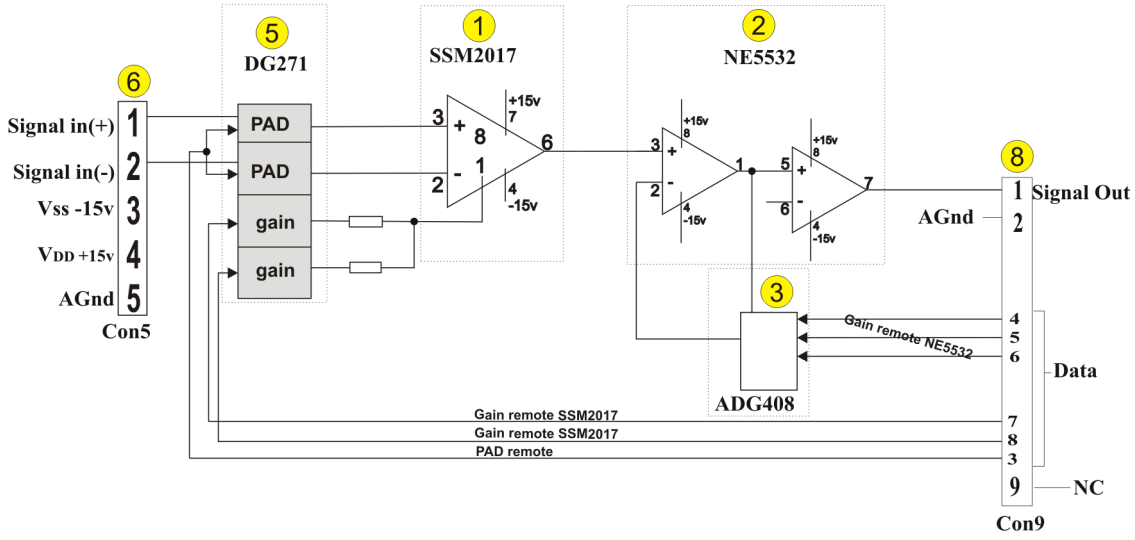
6.A.3 Block Diagram

SPR-408
component placement

1. SSM2017 :Excellent Noise Performance audio preamplifier
2. N25532: hight performance Operational amplifier
3. ADG408 OR DG508 : Multiplexeur gain select for Ne5532 (2)
8. 9 pin connector : AUDIO out, DATA remote from board
5. DG271 or ADG201 : analogue switch for PAD or GAIN
6. 5 pin connector : AUDIO input, Voltage input



SPR-408
Block diagram



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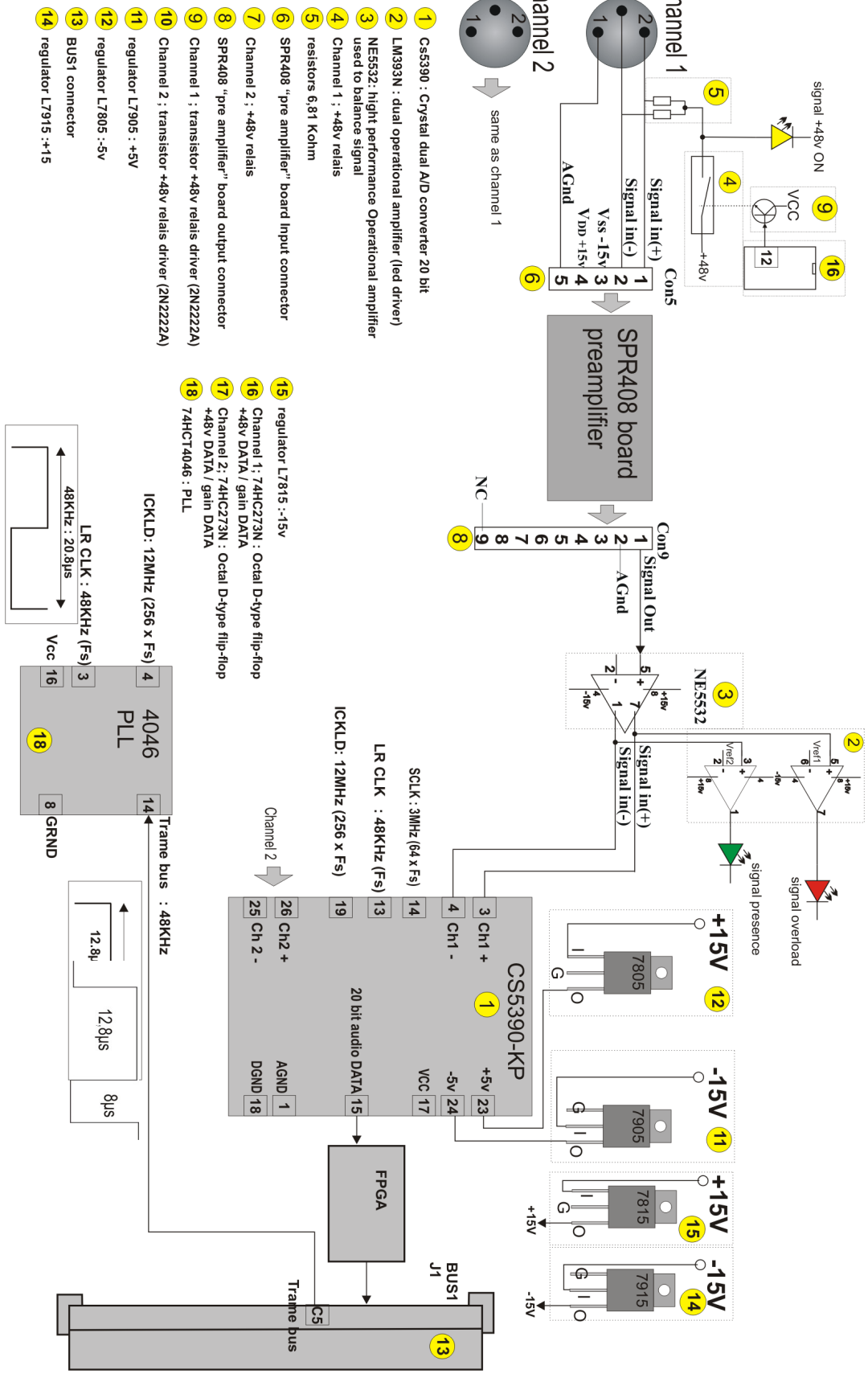
6.A.4 SI8-D2 block Diagram



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6.B SI-8D3 module (8 mic/line analogue inputs)

This module provides Mic preamps and digital conversion of the incoming analog audio signals. On the front of the module you will find :

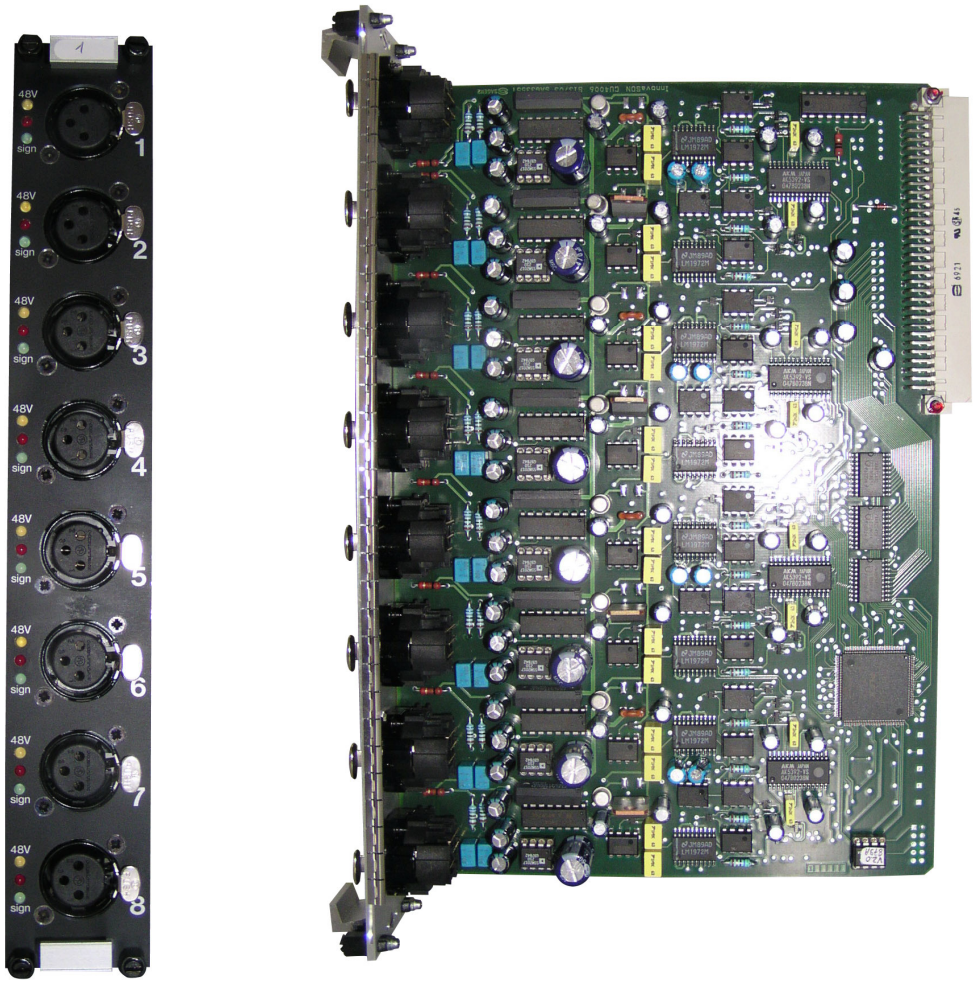
- 8 XLR-3 female connectors, numbered 1 to 8
- Each input benefits of a green led for signal presence, a red led for clipping and a yellow led for Phantom Power.

The module can drive 8 analog signals with the following specifications :

- Max level : 12 dBu (gain at 0dB)
- programmable gain (1.5 dB steps) from -27 to + 64.5 dB, sensitivity –52.5 to + 26 dBu
- balanced inputs, phantom power supply (+ 48V) switchable
- Analogue to digital conversion : 24 bits, 48 kHz, Delta-sigma (128 over-sampling).

Installation

The SI-8D3 module can be installed in the Stage Box or Mix Box, in the slots A to H.



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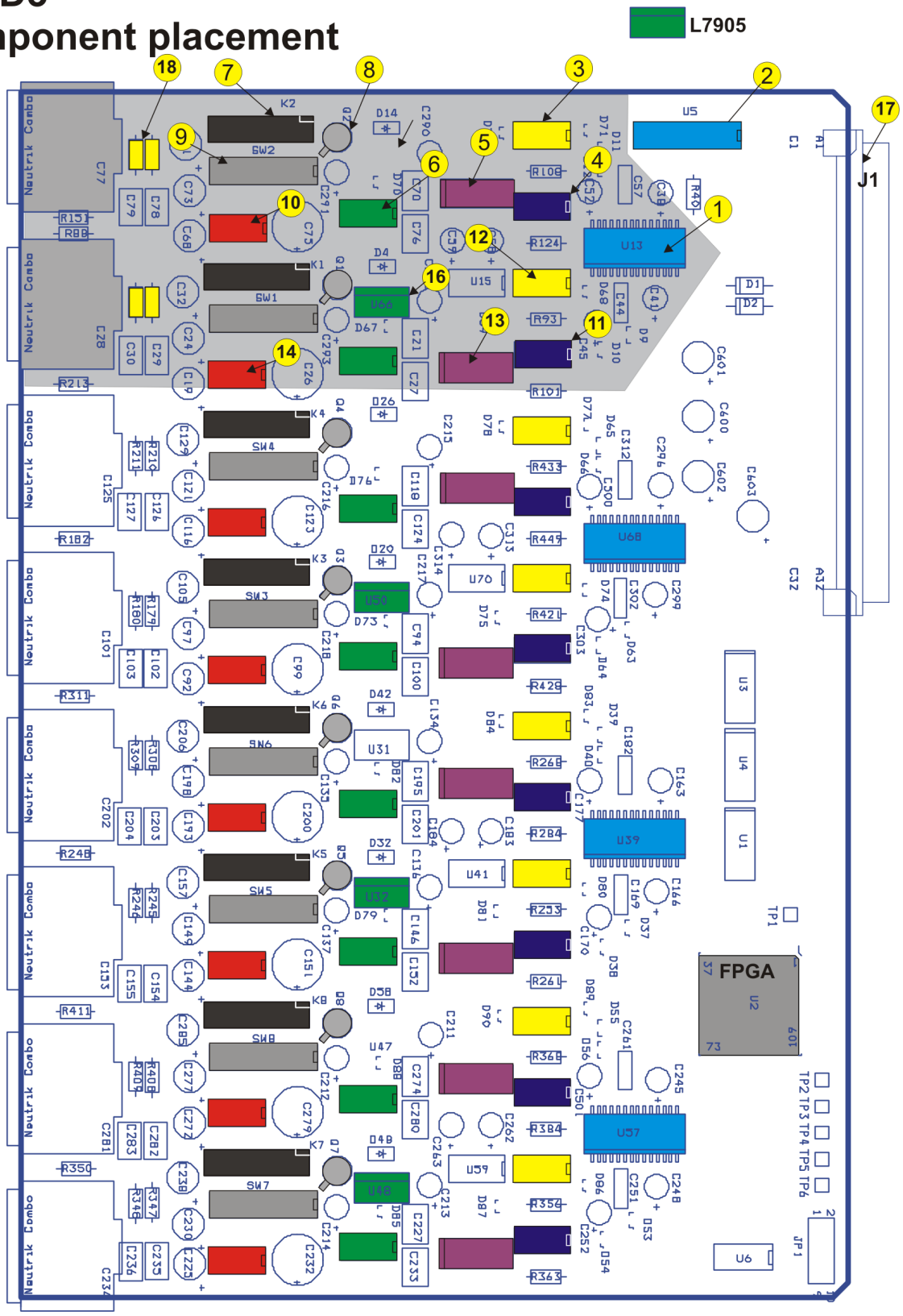
6.B.1 SI8-D3 components placement

SI8-D3 component placement



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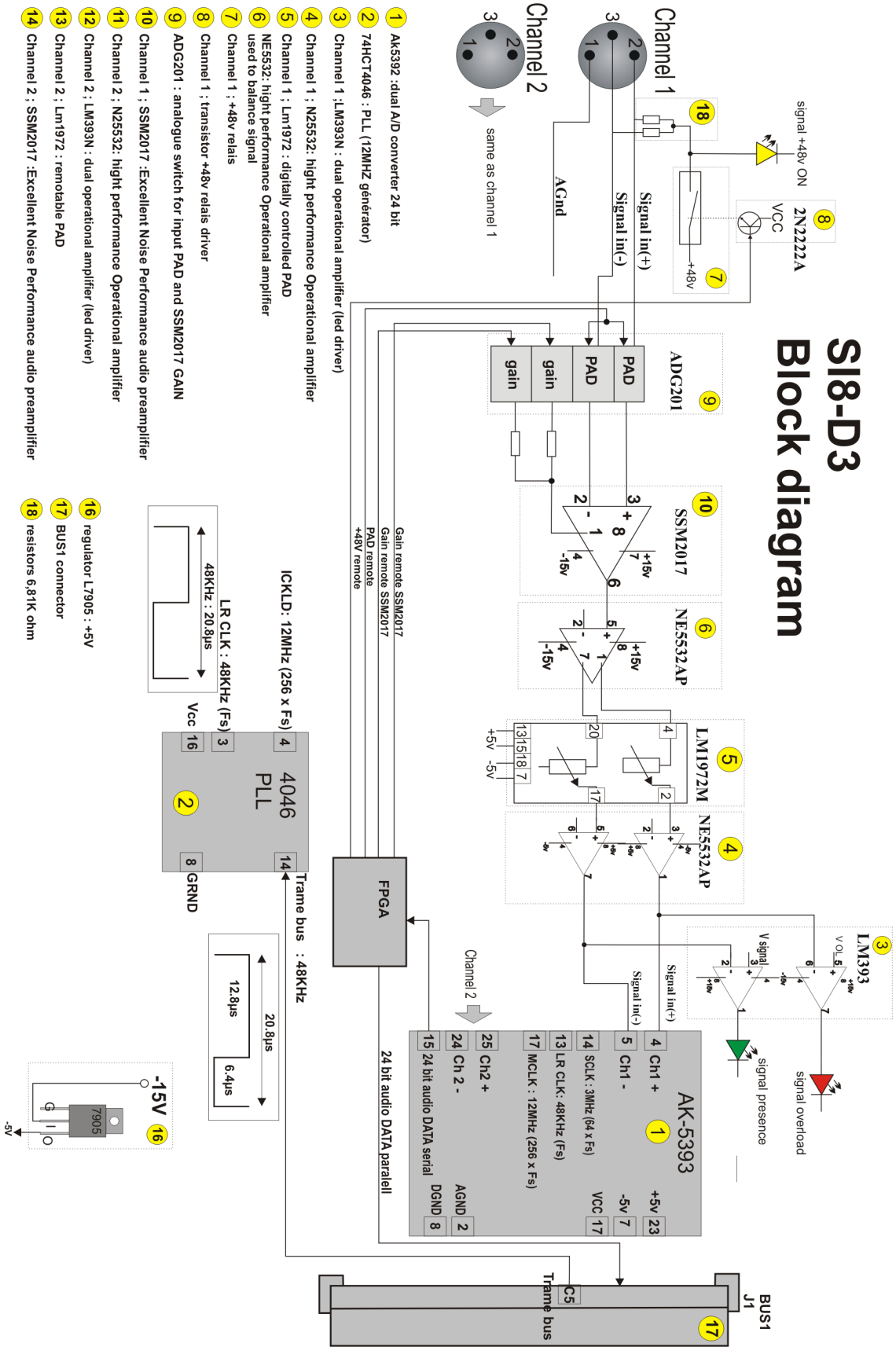
6.B.2 SI8-D3 Block diagram



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6.C MO-8D3 module (8 analogue outputs)

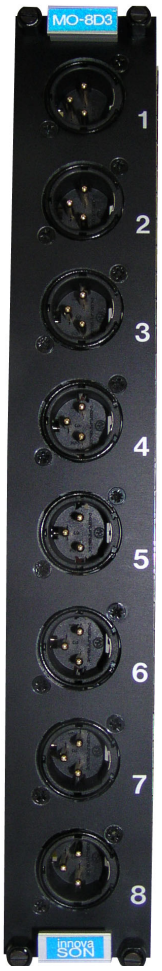
This module allows a digital to analog conversion of the audio signals available on the Bus.

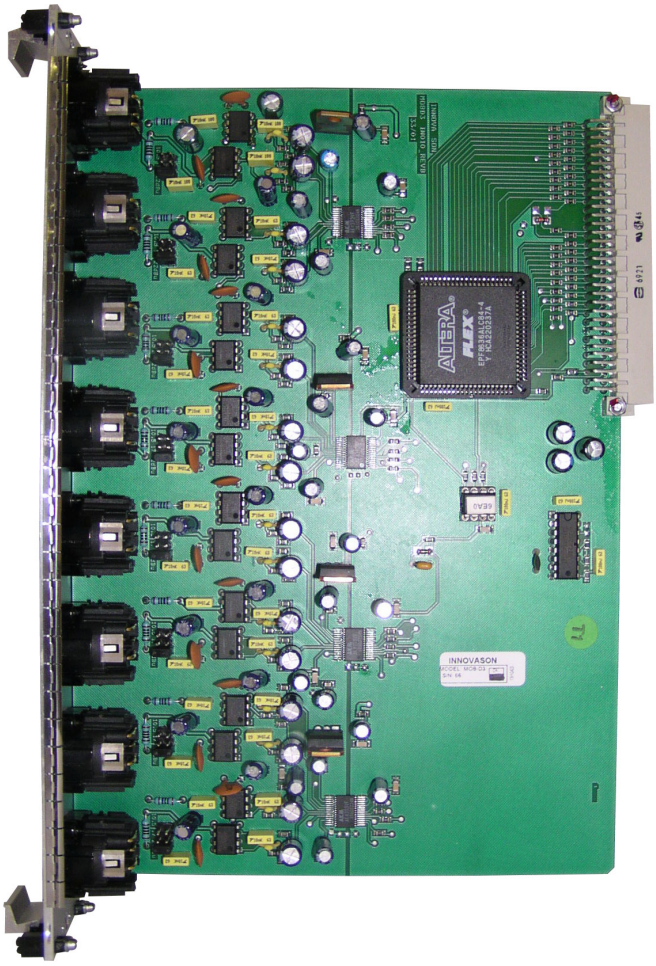
On the front of the module you will find 8 male XLR connectors, numbered from 1 to 8.

The module handles eight analog signals :

- Balanced outputs, Max level adjustment by « jumper » +11.5, +18, +22 dBu (defaut) for 0 dBFS
- programmable output mute
- programmable patch
- digital /analogue conversion: 24 bits, 48 kHz, Delta-sigma (128 over-sampling).

Installation
The MO-8D module can be installed in the slots B to H of the Stage Box and A to H of the Mix Box.





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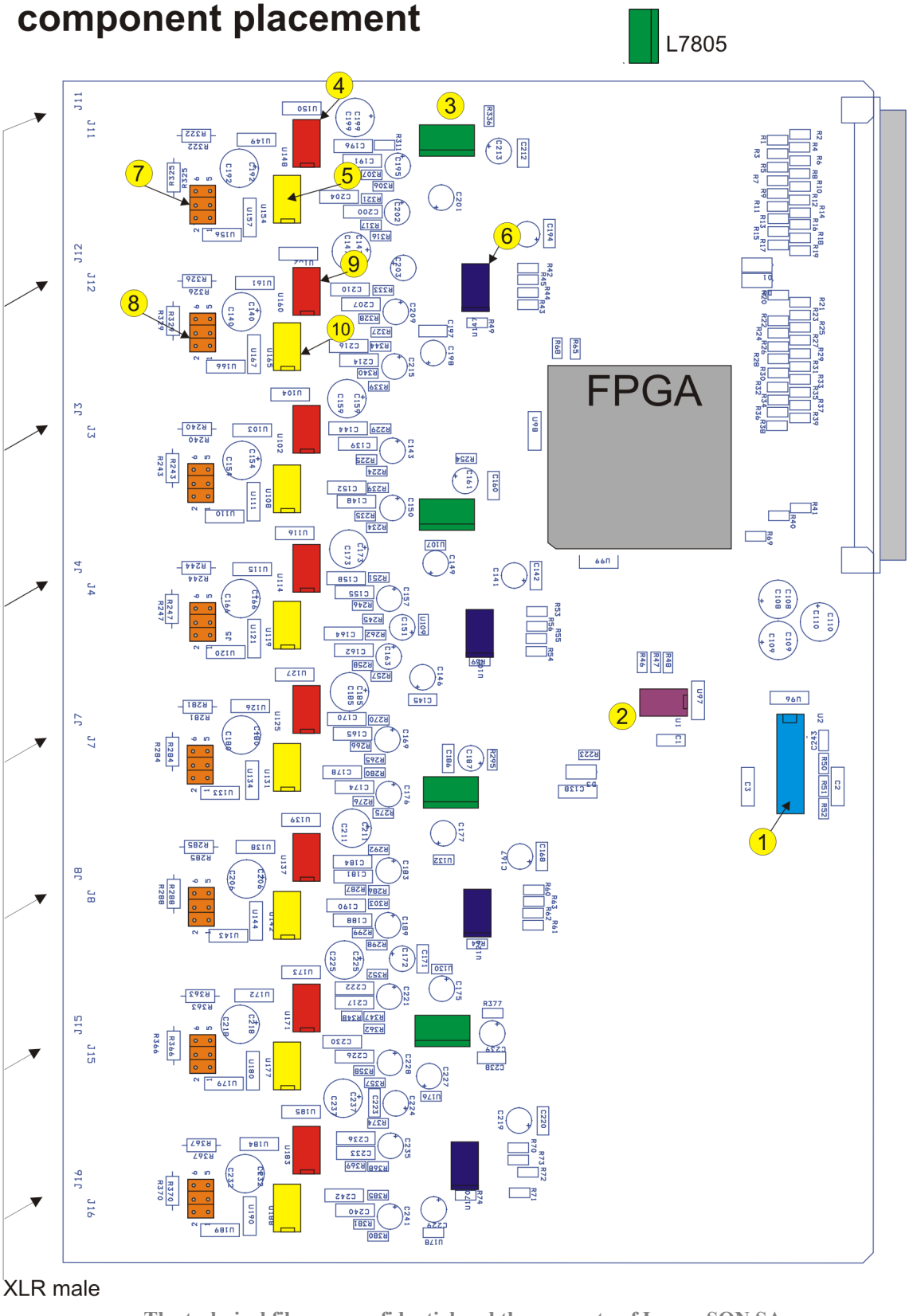
6.C.1 MO8D3 components placement



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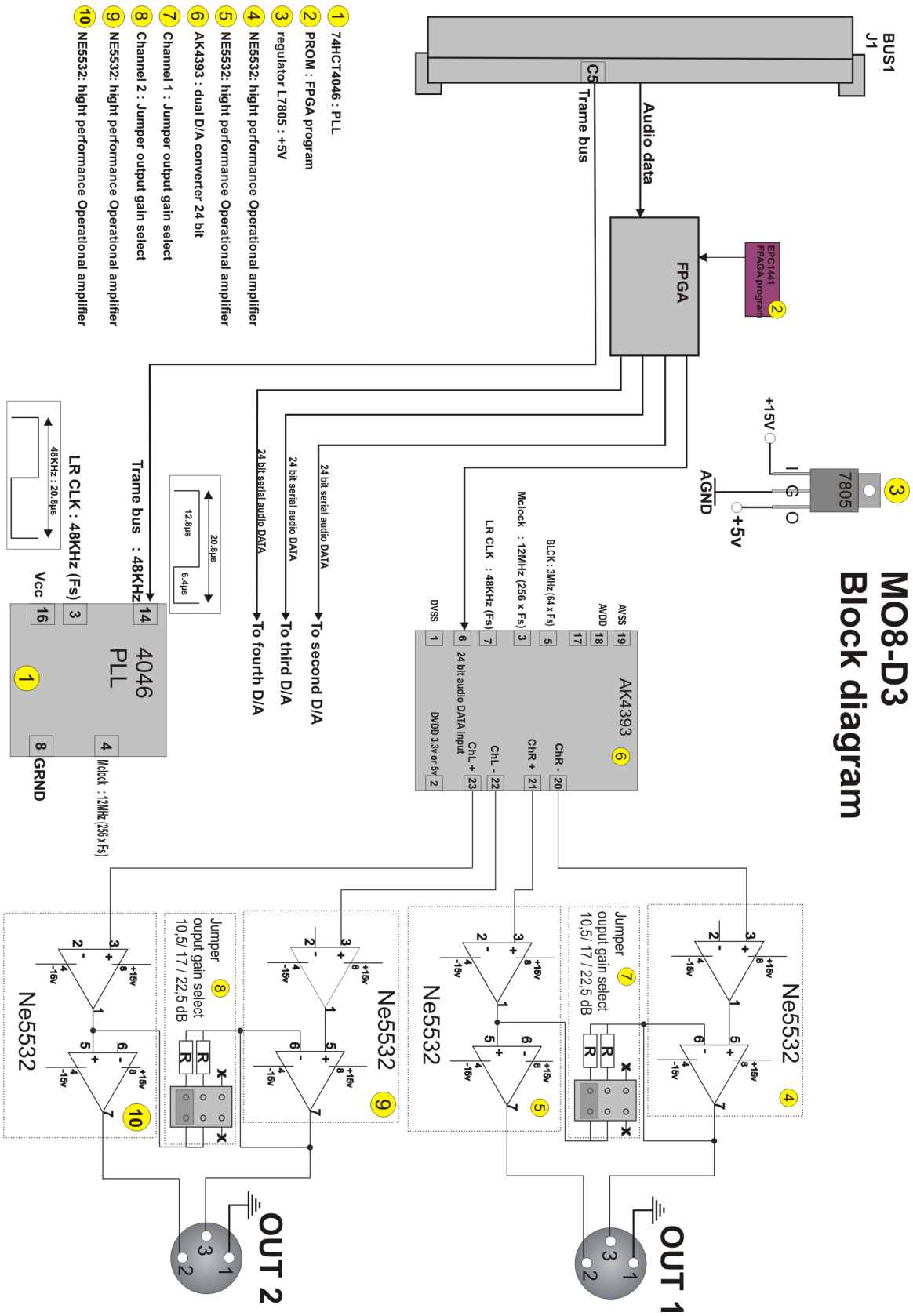
6.C.2 MO8D3 Block diagram



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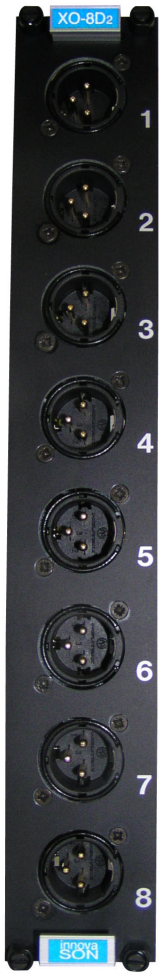
6.D XO-8D2 module (8 analogue outputs with Hyperdrive)

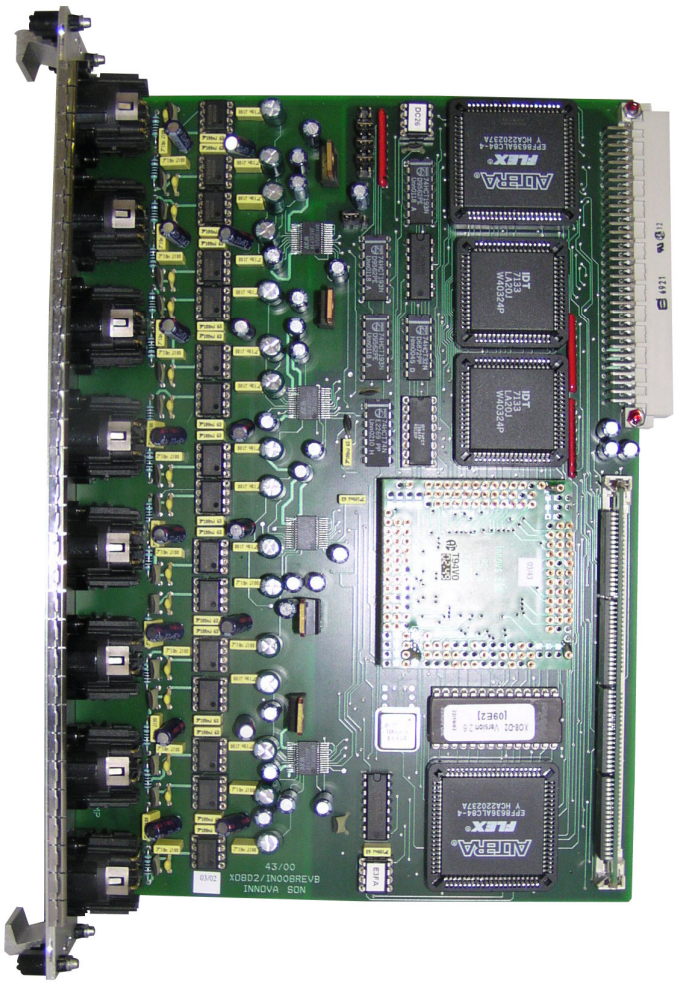
The XO-8D2 module provides 8 analog balanced outputs with processing on each output :

- Maximum output level adjustable from Sensoft from 10.5 to 22 dBu, steps of 0.5 dB
- Digital to analogue conversion : 24 bits, 48kHz, Delta-sigma (128 over-sampling)
- 8 full bands parametric equalizer
- Independent compressor and gate for each output
- Adjustable, sample-accurate, 1300 ms delay per output
- Twin DSP signal processing
- Programmable patch and output mute

Installation

This module works only in the Mix Box rack, slots A to H.





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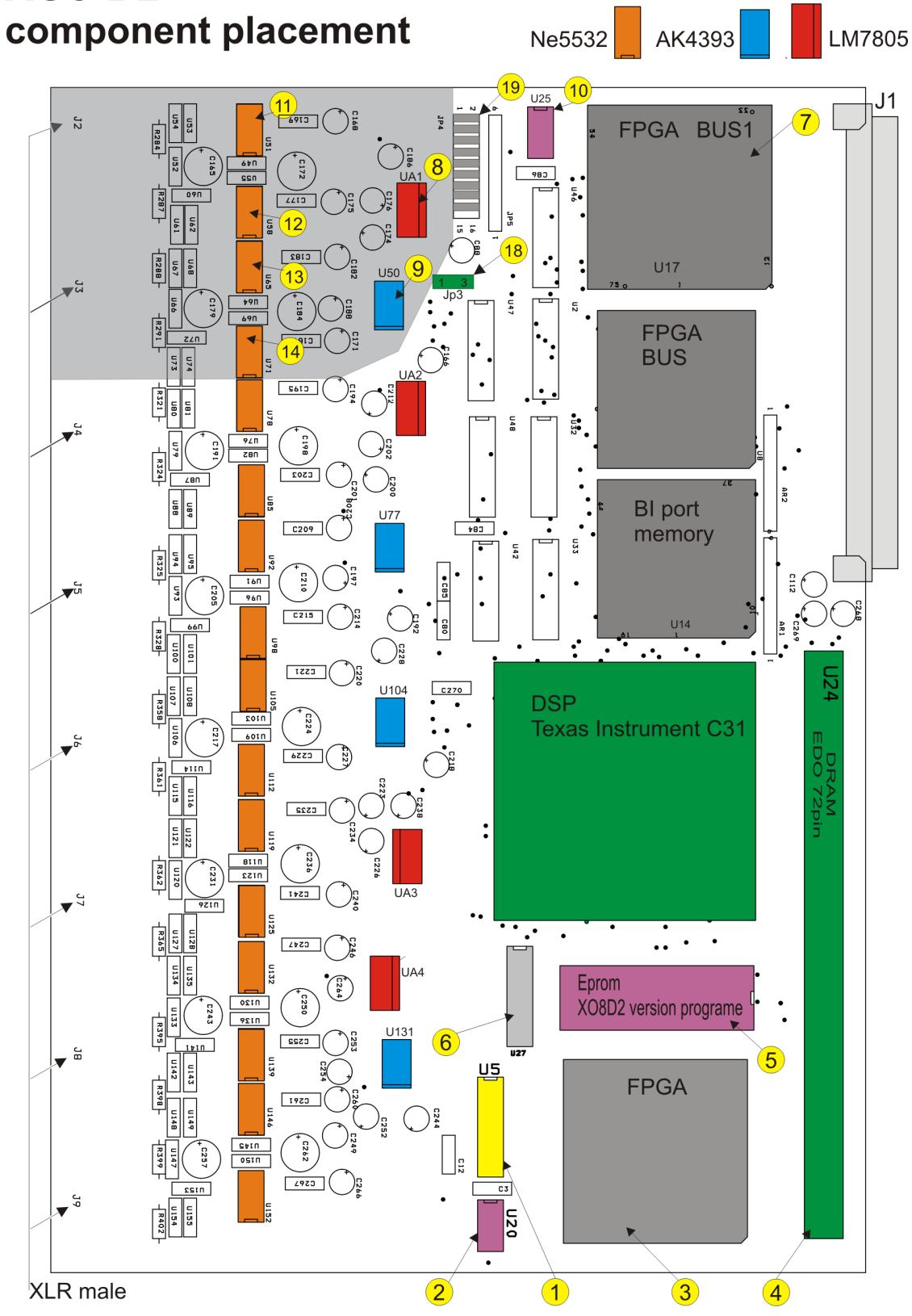
6.D.1 XO8-D2 components placements



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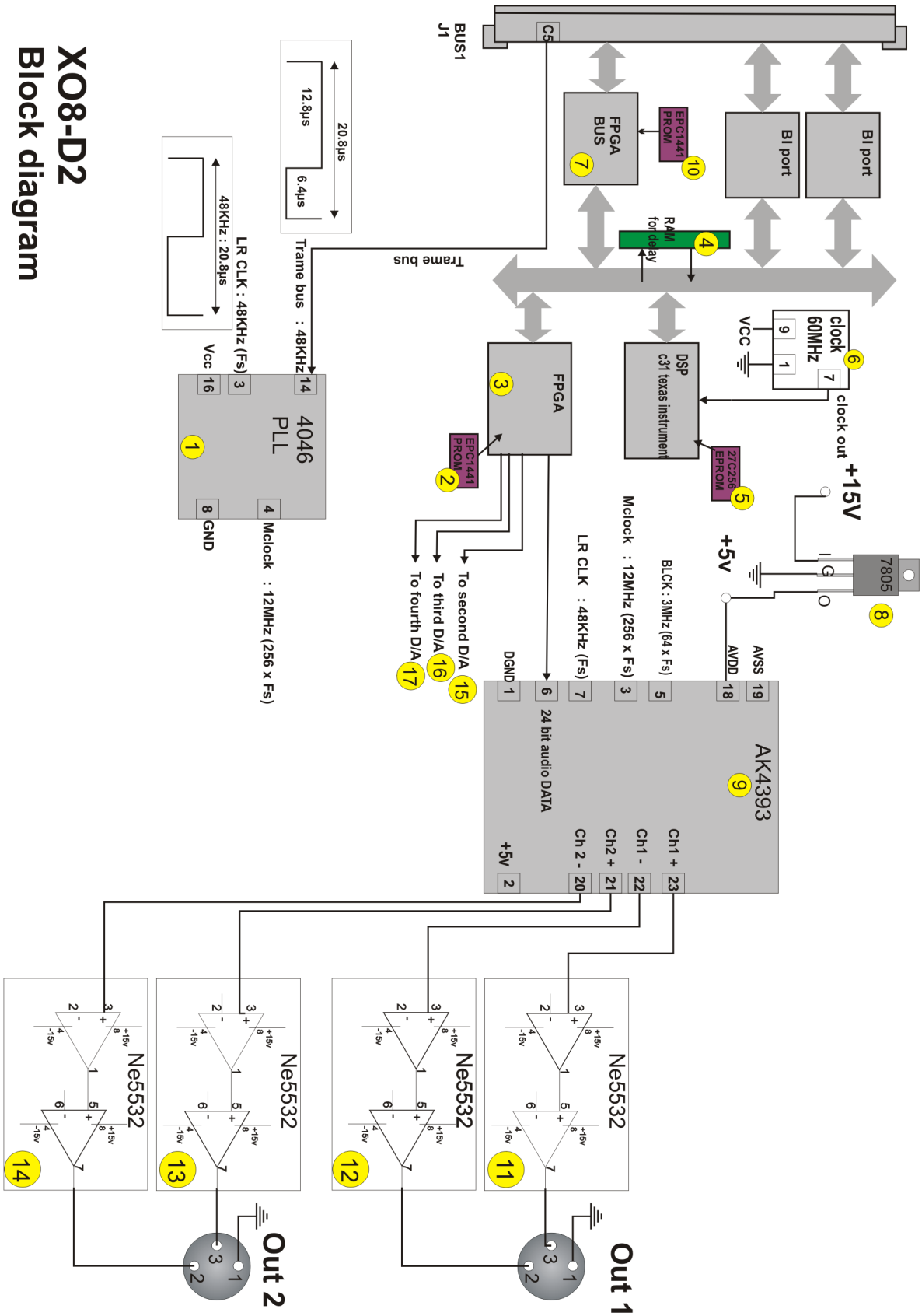
6.D.2 XO8-D2 Block diagram



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6.E DI-8S module (synchronous AES digital inputs)

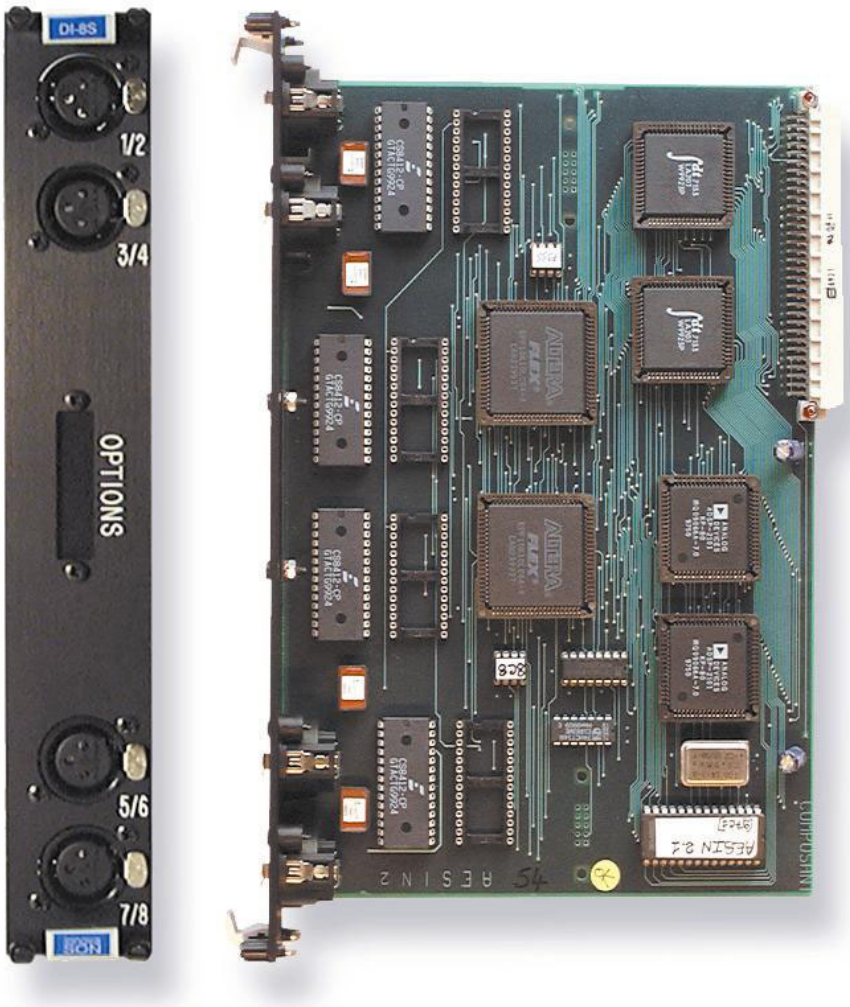
This module allows a conversion of the incoming digital audio signals to the AES format.

On the front of the module are available 4 female XLR connectors, numbered from ½ to 7/8.

The module can receive four AES digital data streams (ie. eight different audio signals) :

- programmable sensitivity from +6 to –6 dB in 0.1 dB steps
- balanced 110 Ω inputs, sensitivity and levels to the AES standard
- sampling synchronous with internal or external system sampling frequency.
- programmable delay from 0 to 5 ms (one sample step)

Note : When digital input modules are installed in a Stage Box, Sensoft recognizes them as SI-8D modules; the gain and delay values are initialized at 0, and cannot be changed.
Installation : The DI-8S module can be installed in slots A to H of the Stage Box or the Mix Box. A switch determine if the module is Mix Box or Stage Box compatible.



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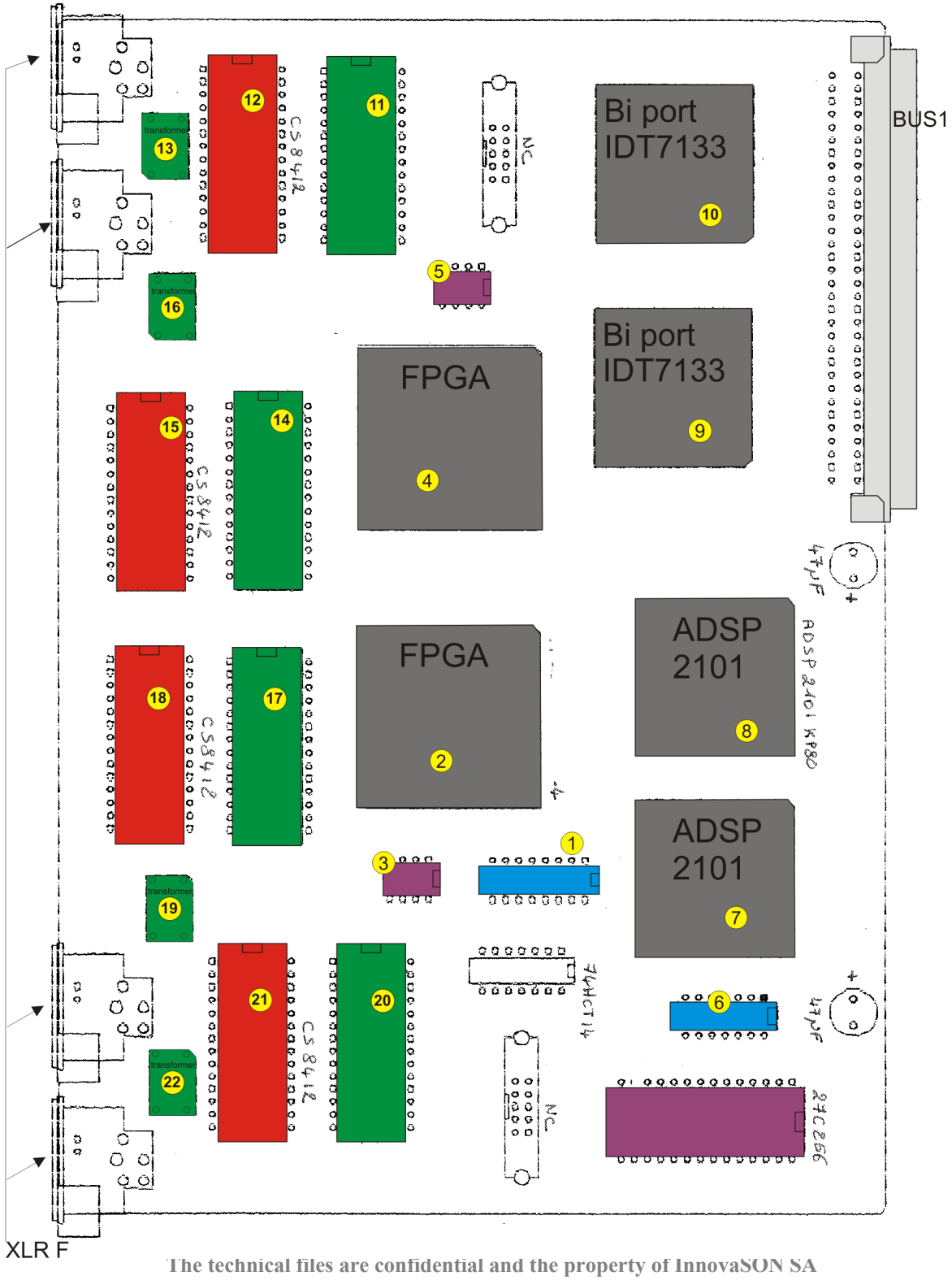
6.E.1DI8S and DI8-SRC components placements



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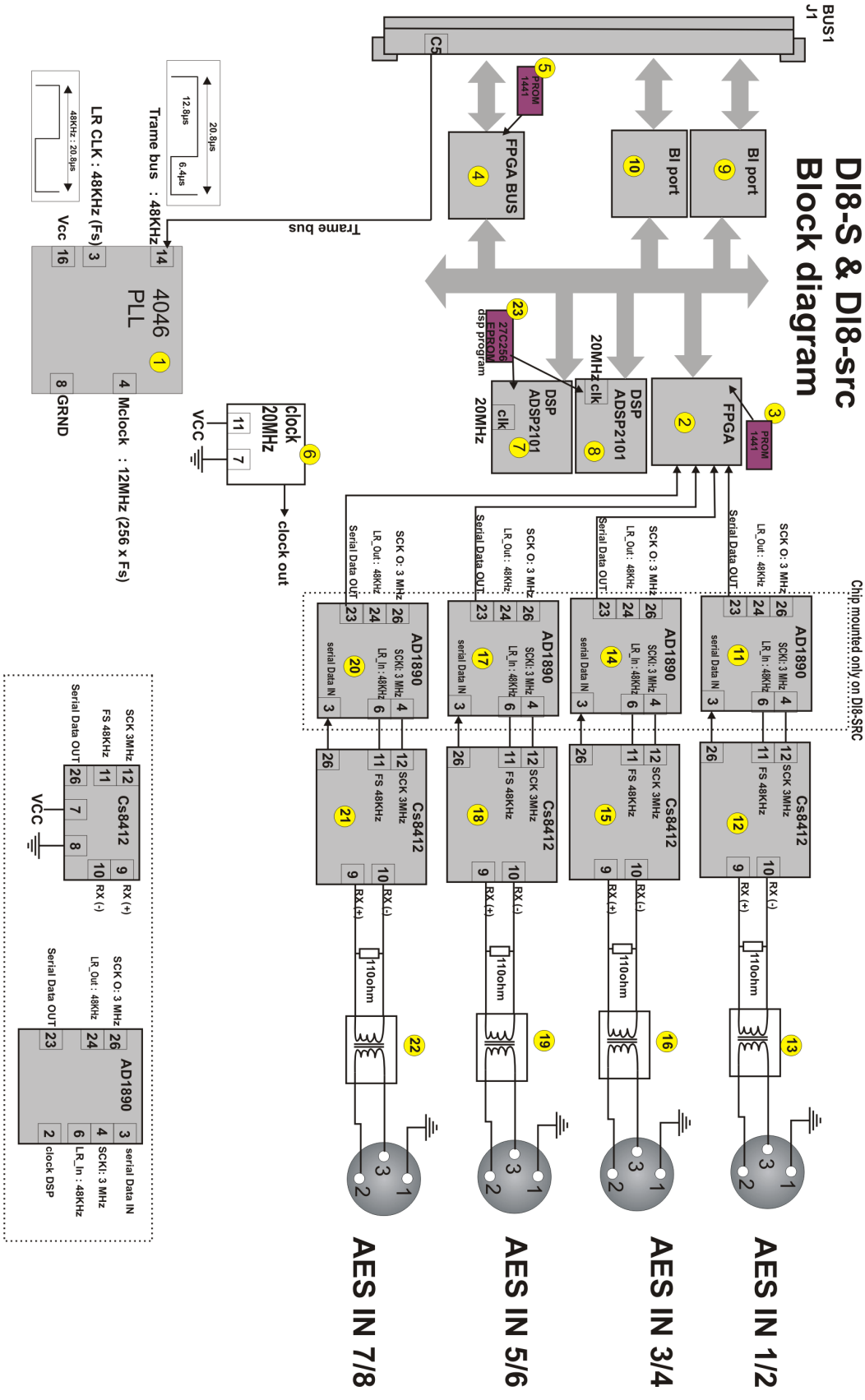
6.E.2DI8S and DI8-SRC Block diagram



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6.F DI-8Src module (asynchronous AES digital inputs)

This module provides asynchronous conversion of incoming digital audio signals in the AES format. On the front of the module are available 4 female XLR connectors, numbered from ½ to 7/8.

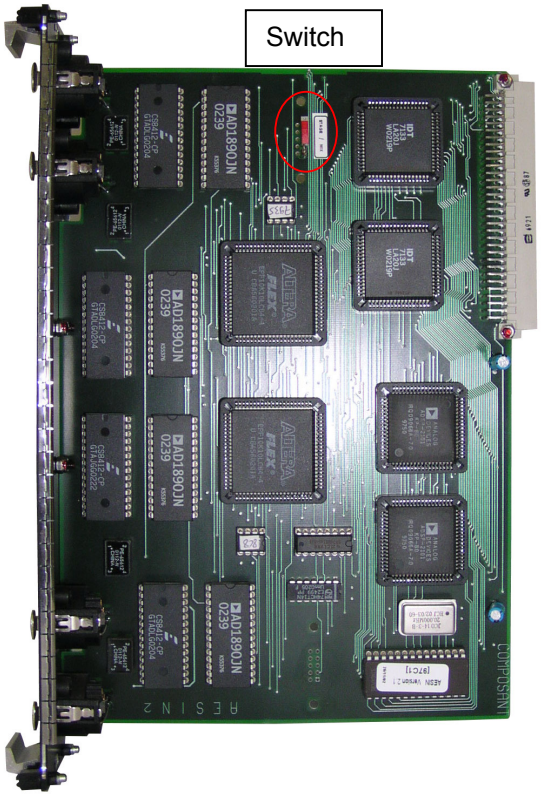
The module can receive four AES digital data streams (ie. eight different audio signals) :

- Programmable sensitivity from +6 to –6 dB in 0.1 dB steps
- Balanced 110 Ω inputs, sensitivity and levels to the AES standard
- Sample rate conversion from 32 to 50 kHz, independent of the system clock.
- Programmable delay from 0 to 5 ms (one sample step)

Note: when digital input modules are installed in a Stage Box, Sensoft recognizes them as SI-8D modules; the gain and delay values are initialized at 0, and cannot be changed.

Installation :

The DI-8Src module can be installed in the slots A to H of the Stage Box or the Mix Box. A switch determines the Mix Box or Stage Box compatibility.



For components placement and block diagram see schematic of DI8-S previous chapter

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6.G DO-8A module (synchronous digital AES outputs)

This module provide 8 digital AES outputs. On the front of the module, 4 male XLR connectors are available numbered from ½ to 7/8s

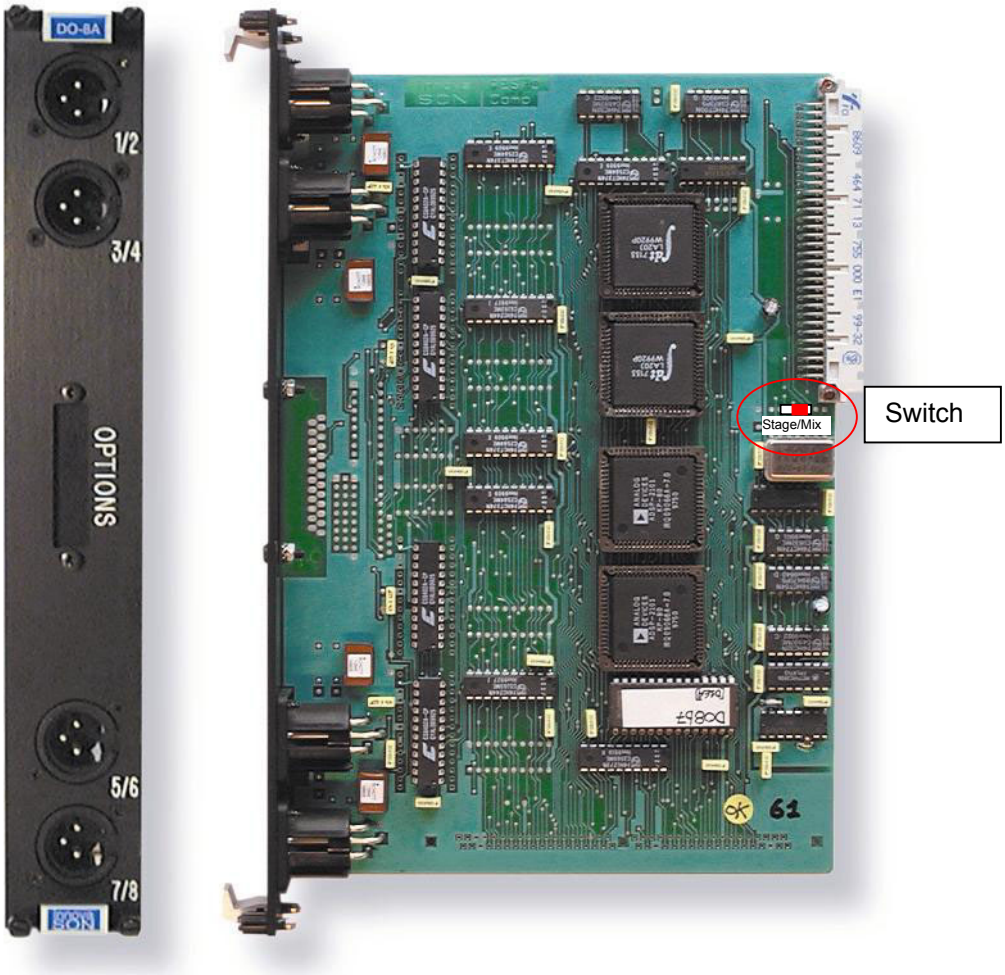
This module distributes 4 AES frames (or 8 audio signals) :

- Balanced 110 Ω outputs, levels compliant to the AES standard
- Sampling frequency synchronous with the system clock
- programmable output patch
- programmable output mutes

Note : When DO-8A modules are fitted to a Stage Box, they are recognized by Sensoft as MO-8D modules.

Installation :

The DO-8A module can be equally installed in either audio rack, in the slots designated B to H for Stage Box and from A to H for Mix Box, depending on the position of a switch situated on the card.



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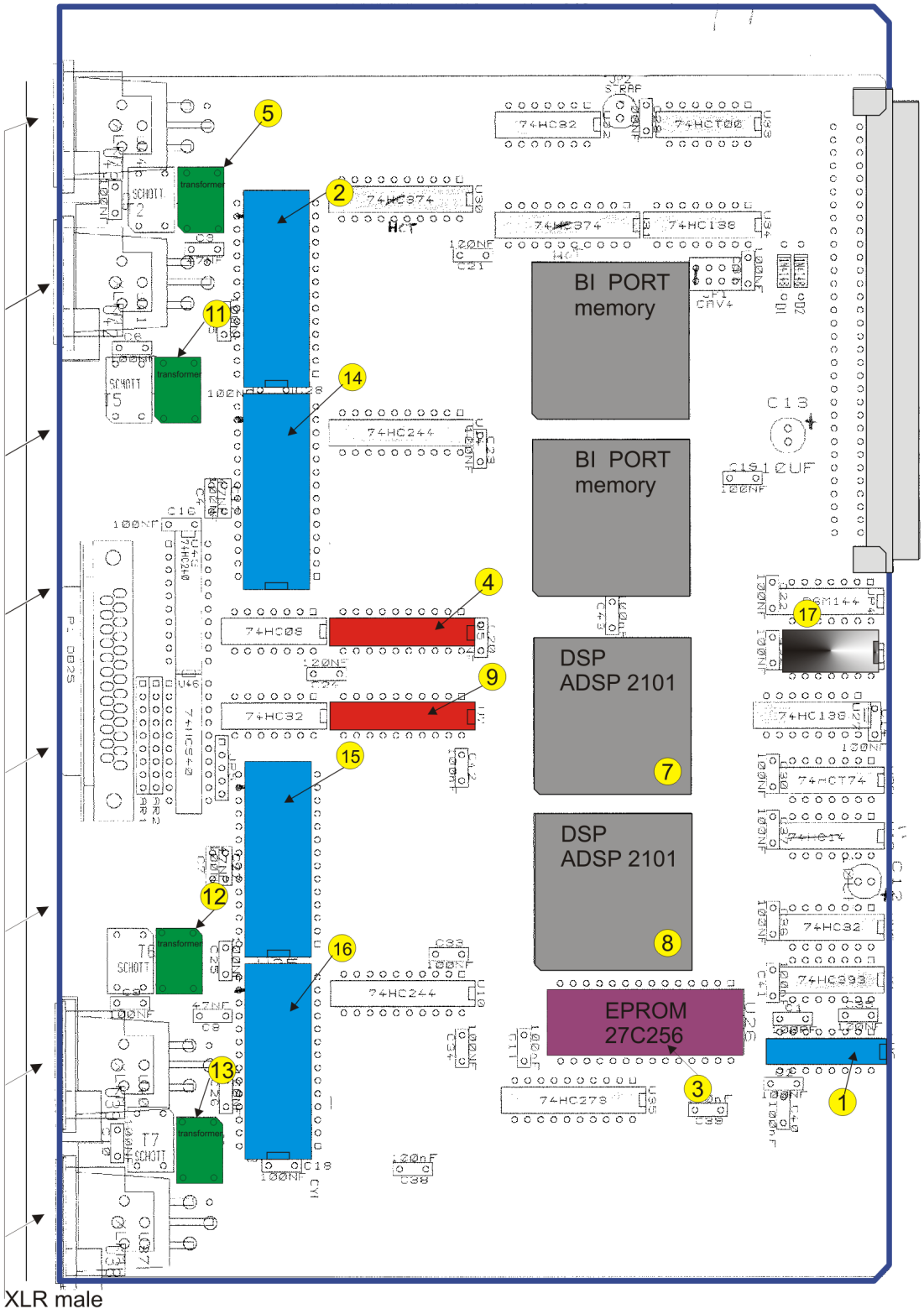
6.G.1 DO8A components placement

DO8-A components placement



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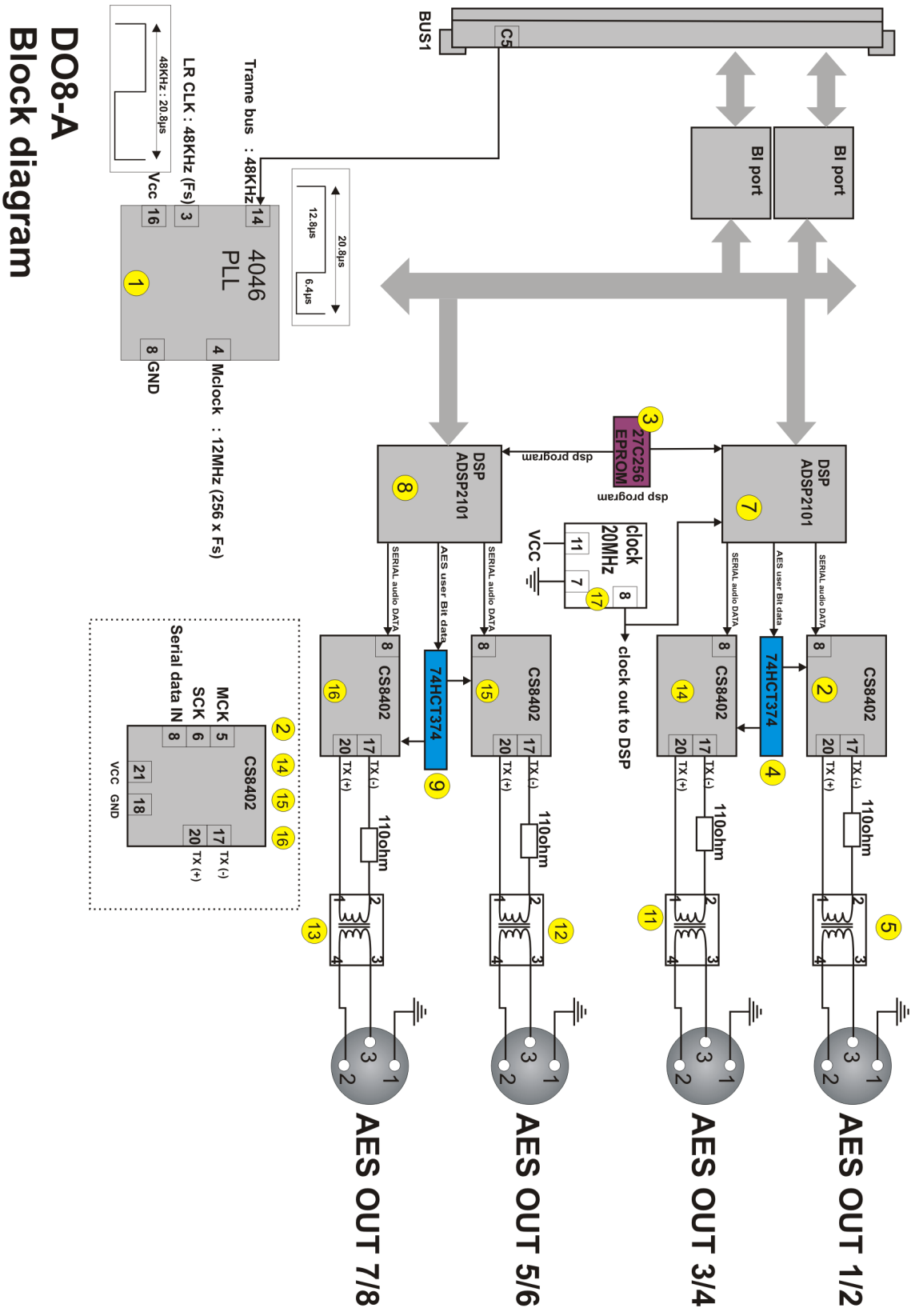
6.G.2 DO8A Block diagram



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6.H DO-8X module (8 synchronous digital AES outputs with hyperdrive)

The DO-8X module offers 4 AES digital outputs with signal processing for each channel.

On the front there are 4 male XLR connectors numbered from ½ to 7/8.:

- Balanced 110 Ω outputs, levels to the AES standard
- Output level attenuator from 0 to –11.5 dB in steps of 0.5 dB
- Sampling frequency synchronous with the system clock
- 8 Full bands parametric equalizer.
- Compressor and gate independent for each channel
- Adjustable, sample-accurate, 1300 ms delay per output
- Twin DSP signal processing
- Programmable Patch and Mute for each channel

Installation :

This module works only in the Mix Box rack, in slots A to H. DO-8X modules are recognized and managed by Sensoft as XO-8D modules.

.



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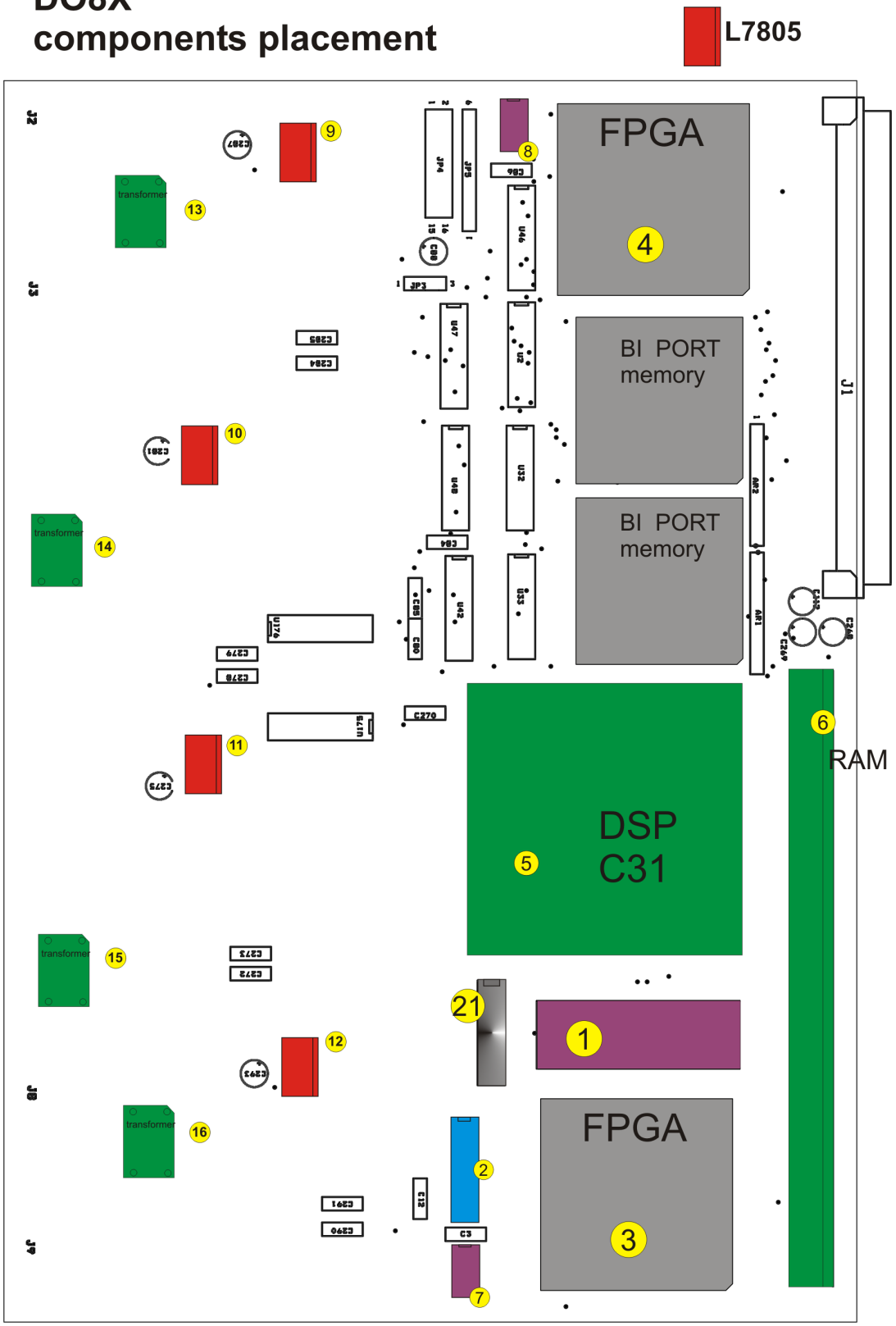
6.H.1 DO8X component placement TOP view



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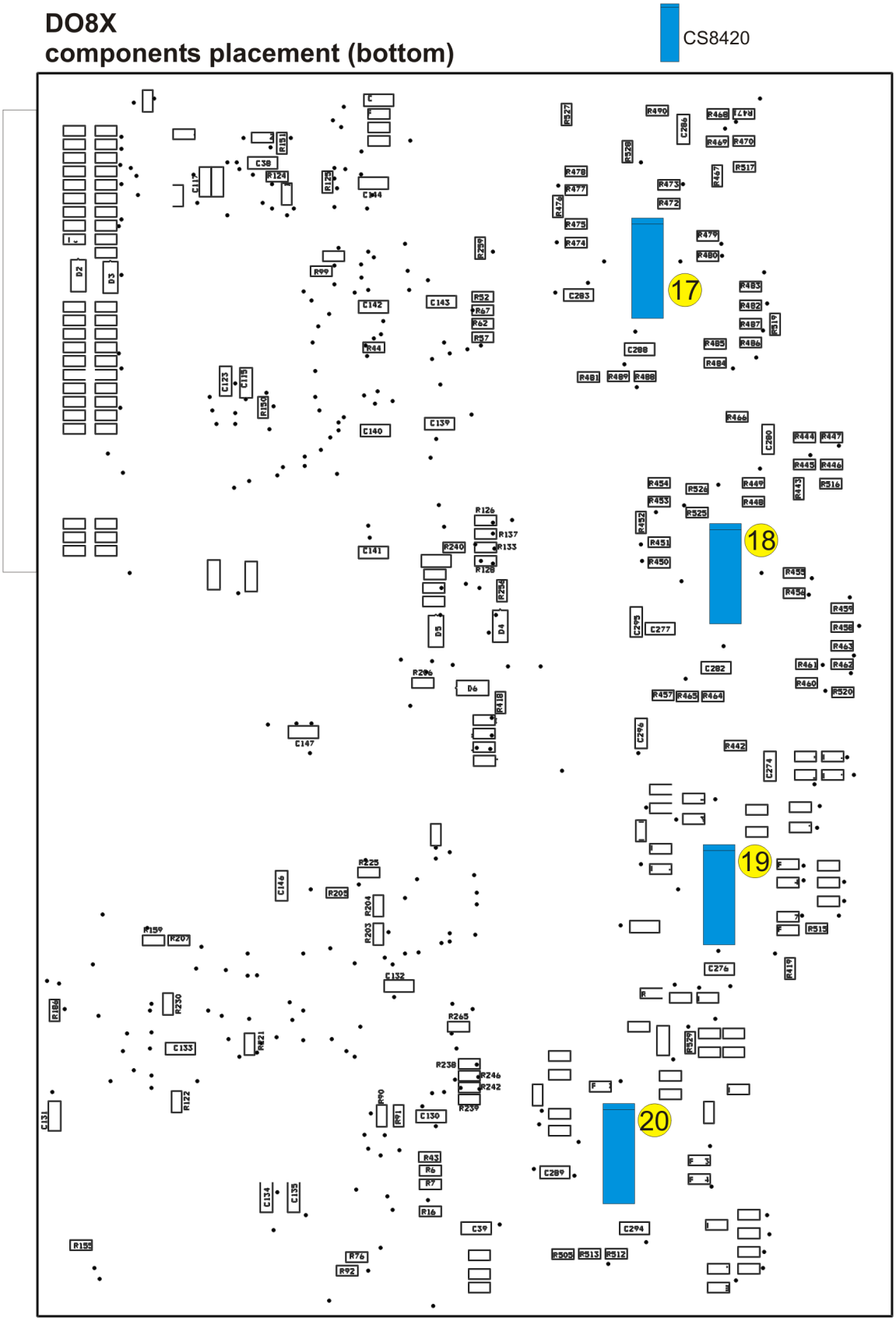
6.H.2 DO8X component placement bottom view



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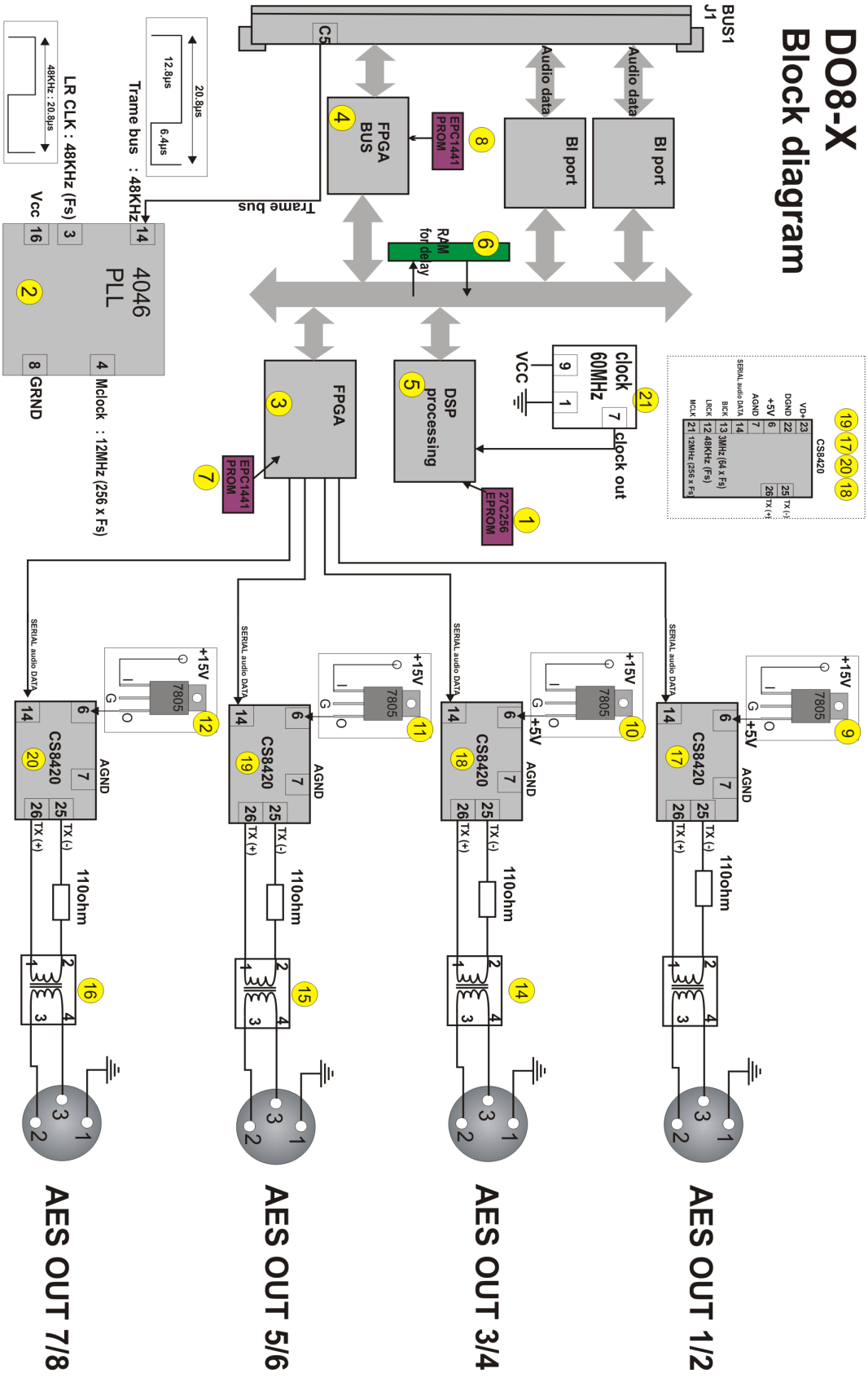
6.H.3 DO8X Block diagram



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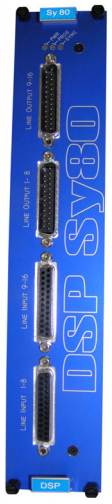
6.I DSP Sy80 module (signal processor for Sy80 console and Sensoft 8.1)

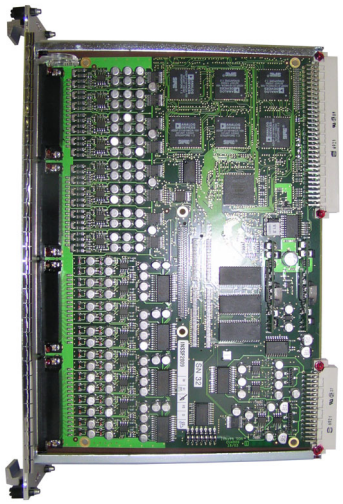
This module is the heart of an Sy80 platform. Its mission is to run and manage the following audio processing :

- 80 inputs(patch, delay, phase, low-cut, noise-gate, compressor, 4 bands parametric equalizer)
- 48 mix busses
- Stereo bus and converter for the monitor circuit available on both ¼" jacks on the console
- Test signal generation (sine oscillator or white/ pink noise)
- Management of 82 meters on the control surface (73 for Sensory Essential)
- Talk Back input, available on both XLR3 connectors located on console's front.
- Converters for 16 line inputs and 16 line outputs.

The digital signal processing is floating point 32/40 bits. The internal processing software is re-programmable and stored in flash memory. A specific procedure is required to update this software.
On the front of the module are installed 3 red/green LEDs indicating the status of the module, and 4 Sub-D25 connectors, 2 male connectors for 16 line level outputs (SL), and 2 female connectors for 16 line level inputs (RL).
4 XLR interface cables are supplied with the console, the pin-outs for these connectors are detailed below :

Audio XLR	Sub-D25 Connector		Audio XLR
NC	P13		
R-SL1 -	P12	P25	R-SL1 gnd
R-SL2 gnd	P11	P24	R-SL1 +
R-SL2 +	P10	P23	R-SL2 -
R-SL3 -	P09	P22	R-SL3 gnd
R-SL4 gnd	P08	P21	R-SL3 +
R-SL4 +	P07	P20	R-SL4 -
R-SL5 -	P06	P19	R-SL5 gnd
R-SL6 gnd	P05	P18	R-SL5 +
R-SL6 +	P04	P17	R-SL6 -
R-SL7 -	P03	P16	R-SL7 gnd
R-SL8 gnd	P02	P15	R-SL7 +
R-SL8 +	P01	P14	R-SL8 -





Installation :

It is imperative that the DSP Sy80 module is installed in the PROCESSING slot of a Mix Box.

This Module have no technical documentation for service.

ALL services one this module must be done by InnovaSON after sales Servcice, contact InnovaSON for any questions.

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6.J DSP Sy40-8 module (signal processing for Sy40 console and Sensoft 8.1)

This module is the heart of an Sy40 platform. Its mission is to run and manage the following audio processing :

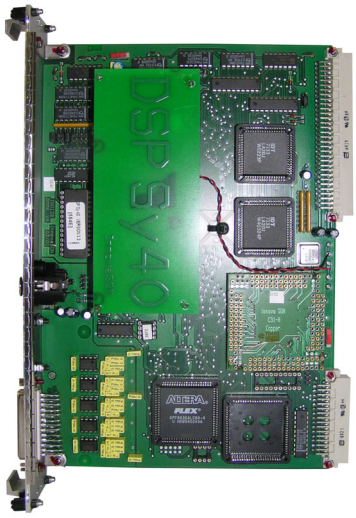
- 48 inputs(patch, phase, low-cut, noise-gate, compressor, 4 bands parametric equalizer)
- 26 mix busses
- Stereo monitoring bus
- Test signal generation (sine oscillator or white/ pink noise)
- Management of 47 meters on the control surface
- Talk Back input pre-amp and converter, XLR3 only present on the front of this module
- Converters for 8 line inputs.
- The digital signal processing is floating point 32/40 bits. The internal processing software is stored in EEPROM memory. A security circuit (watchdog) can be customized by jumpers..

A red LED, indicating the module's reset is located on the front of the module, 1 female XLR3 connector for the talkback input, and 1 Sub-D25 female connector for 8 line inputs (RL).

An XLR interface cable is supplied with the console, the connector pin-outs are detailed below :

Audio XLR	Sub-D25 Connector		Audio XLR
NC	P13	P25	NC
NC	P12	P24	NC
NC	P11	P23	NC
NC	P10	P22	NC
RL8 +	P09	P21	RL8 -
RL7 +	P08	P20	RL7 -
Common GND	P07		
RL6 +	P06	P19	RL6 -
RL5 +	P05	P18	RL5 -
RL4 +	P04	P17	RL4 -
RL3 +	P03	P16	RL3 -
RL2 +	P02	P15	RL2 -
RL1 +	P01	P14	RL1 -





Installation :

It is imperative that the DSP Sy40-8 module is installed in the DSP slot of the Sy40 console.

Nota : The DSP Sy40 is the same architecture than the DM-MK9, described below.

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6.K DM-Mk9 module (Sensory Live and Sensoft 7 signal processor)

This module is the heart of a Sensory Live console. It runs and manages the following audio processing::

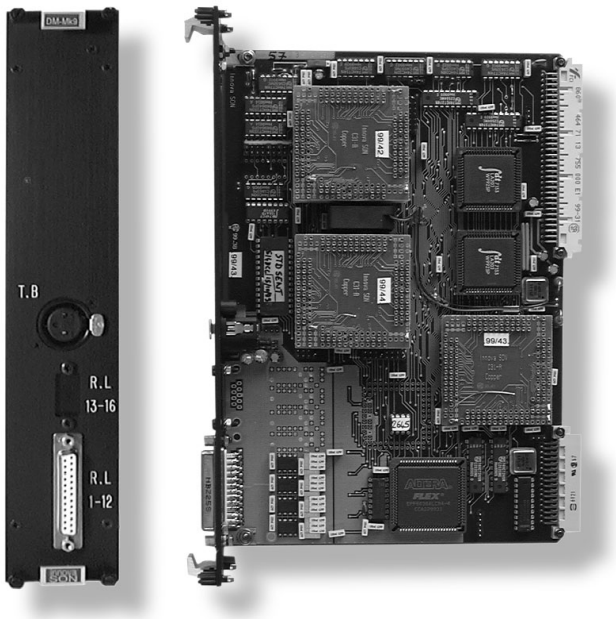
- 48 inputs (patch, phase, low-cut, noise-gate, compressor, 4 bands parametric equalizer)
- 23 mix busses (LRM, 20 auxiliaries)
- Stereo monitoring bus
- The test signal generation (Sine oscillator)
- Management of 73 meters on the control surface
- Talkback input, also available via a female XLR on the control surface
- Converters for 8 line inputs.

The digital signal processing is floating point 32/40 bits. The internal processing software is stored in EEPROM memory. A security circuit (watchdog) can be customized by jumpers.

A ed LED, indicating the module's reset is located on the front of the module, 1 female XLR3 connector for the talkback input (also available on the control surface), and 1 Sub-D25 female connector for 8 line inputs (RL).

An XLR interface cable is supplied with the console, the connector pin-outs are detailed below :

Audio XLR	Sub-D25 Connector		Audio XLR
NC	P13	P25	NC
NC	P12	P24	NC
NC	P11	P23	NC
NC	P10	P22	NC
RL8 +	P09	P21	RL8 -
RL7 +	P08	P20	RL7 -
Common GND	P07		
RL6 +	P06	P19	RL6 -
RL5 +	P05	P18	RL5 -
RL4 +	P04	P17	RL4 -
RL3 +	P03	P16	RL3 -
RL2 +	P02	P15	RL2 -
RL1 +	P01	P14	RL1 -



Installation :

It is imperative that the DM-Mk9 module is installed in the PROCESSING slot of a Mix Box.

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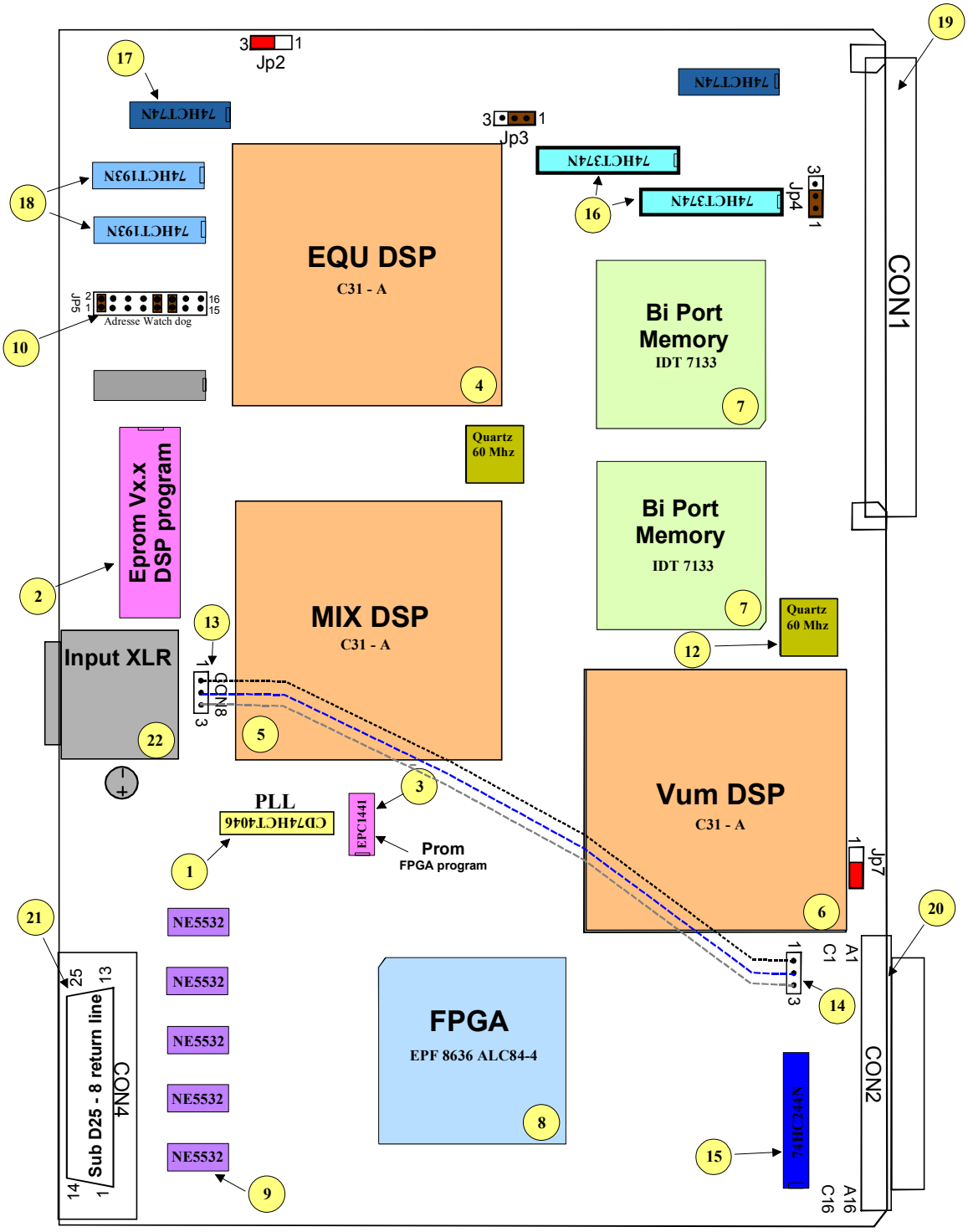
6.K.1 DM-MK9 components placement TOP view



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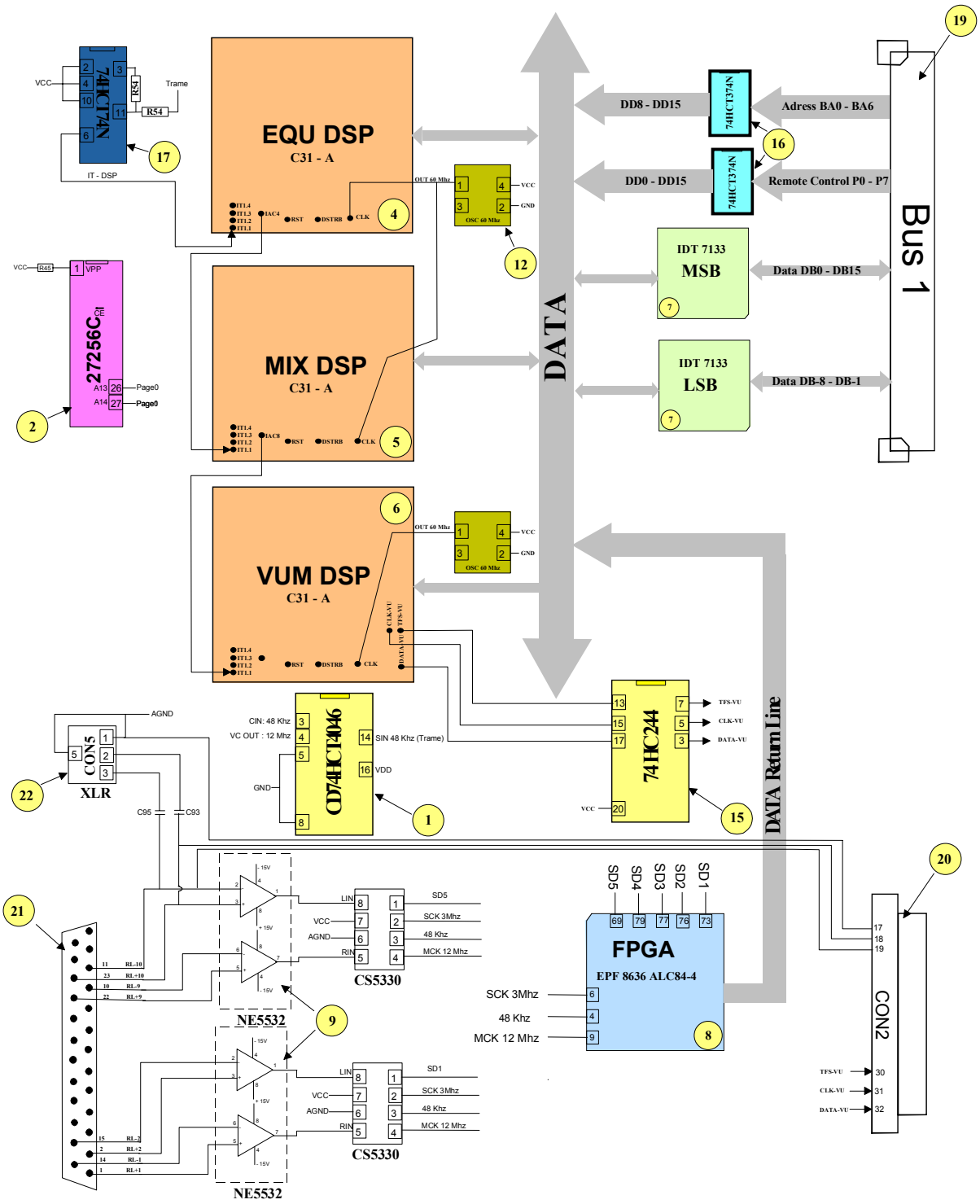
6.K.2 DM-MK9 block diagram



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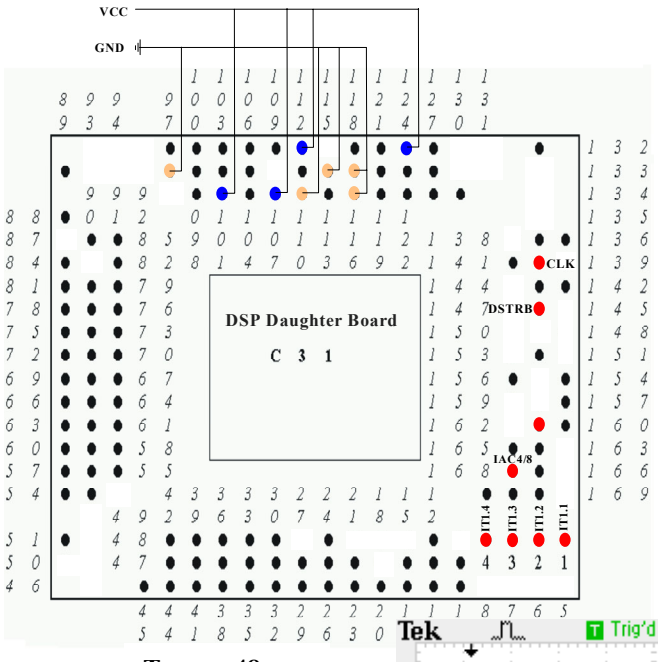
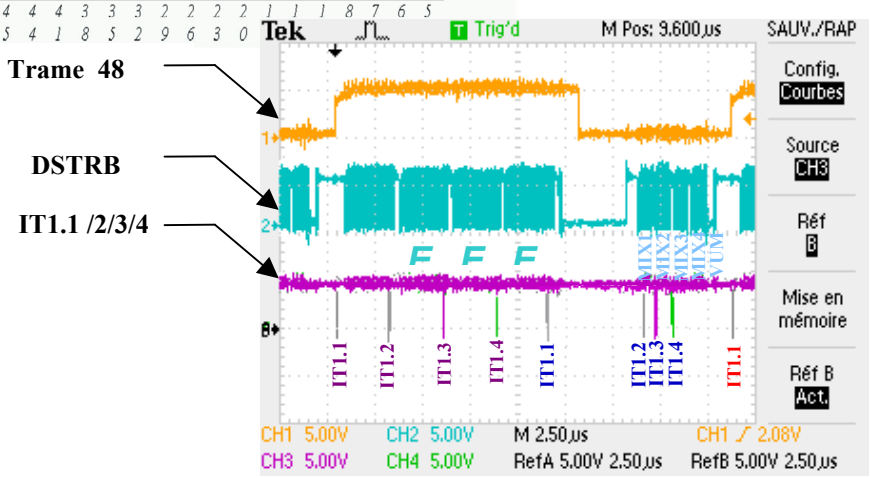
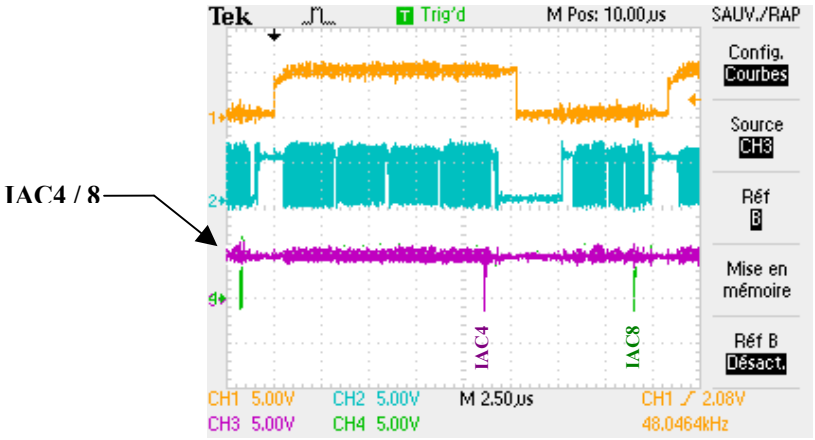
6.K.3 DM-MK9 DSP signals



Measures taken on a DM-MK9 / DSP 40 card (4 DSP of EQU, 4 DSP of MIX and 1 DSP of VUM)





- **DSTRB:** is a signal of DSP cards working during a period of time " 25 µs"
- **IT1.1/2/3/4:** is an interruption for the working of each DSP
- **IAC4:** is an interruption from EQU4 which allows the start up of MIX DSP (IAC4 = IT1.1 of MIX DSP)

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6.L MC-64 module (Mix Box controller)

This module controls the other modules. It is installed in its reserved controller slot.

It has many functions:

- digital stream reception (Rx) from a stage rack inputs (distant).
- digital stream transfer (Tx) toward the stage rack outputs.
- Remote controls transmission to the Stage Box cards.
- Remote controls distribution for the local cards in the Mix Box.
- Main bus management, clocks and digital signals generation.
- remote control interface from the PC parallel port to the local modules.
- system information interface from the rack to the PC parallel port.

The front panels connectors are :

BNC connectors : 2 TX and 2 RX Transmit and Receive the digital data frames to/from audio racks. A switch above the RX BNC connectors allows to choose the active receive channel. RX1 is adjustable (see section 9.C) for variable lengths of cable; RX2 is optimized for a 150 meter cable. The RX connectors have 3 indicators :

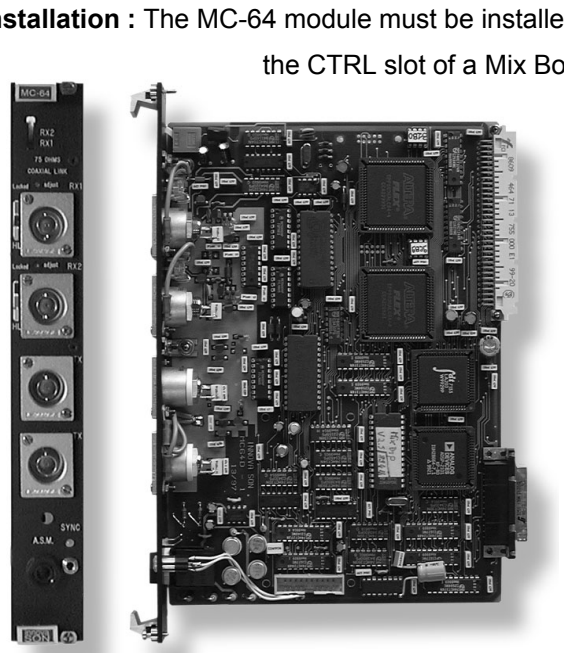
LEDs :

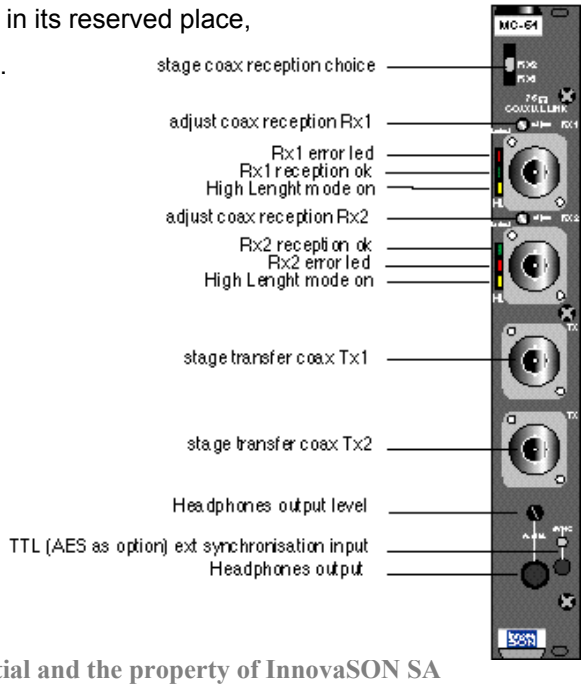
- Green led: Normal case, reliable transmission
- Red led : Transmission errors
- Yellow led (HL) : increased sensitivity for long distance transmission (>300m), configuration by switch located behind the front panel on the copper side of the module's PCB.

3.5mm jack : External sync input for the audio rack; TTL format, 44 to 49 kHz (optional AES format). The SYNC indicator indicates a valid and operational sync signal. If a Stage Box is connected this input is by-passed and the Sync input available is the SC-64 (Stage Box) one.

¼ inch jack : Headphone output (not used on Sy80)

Installation : The MC-64 module must be installed in its reserved place, the CTRL slot of a Mix Box.





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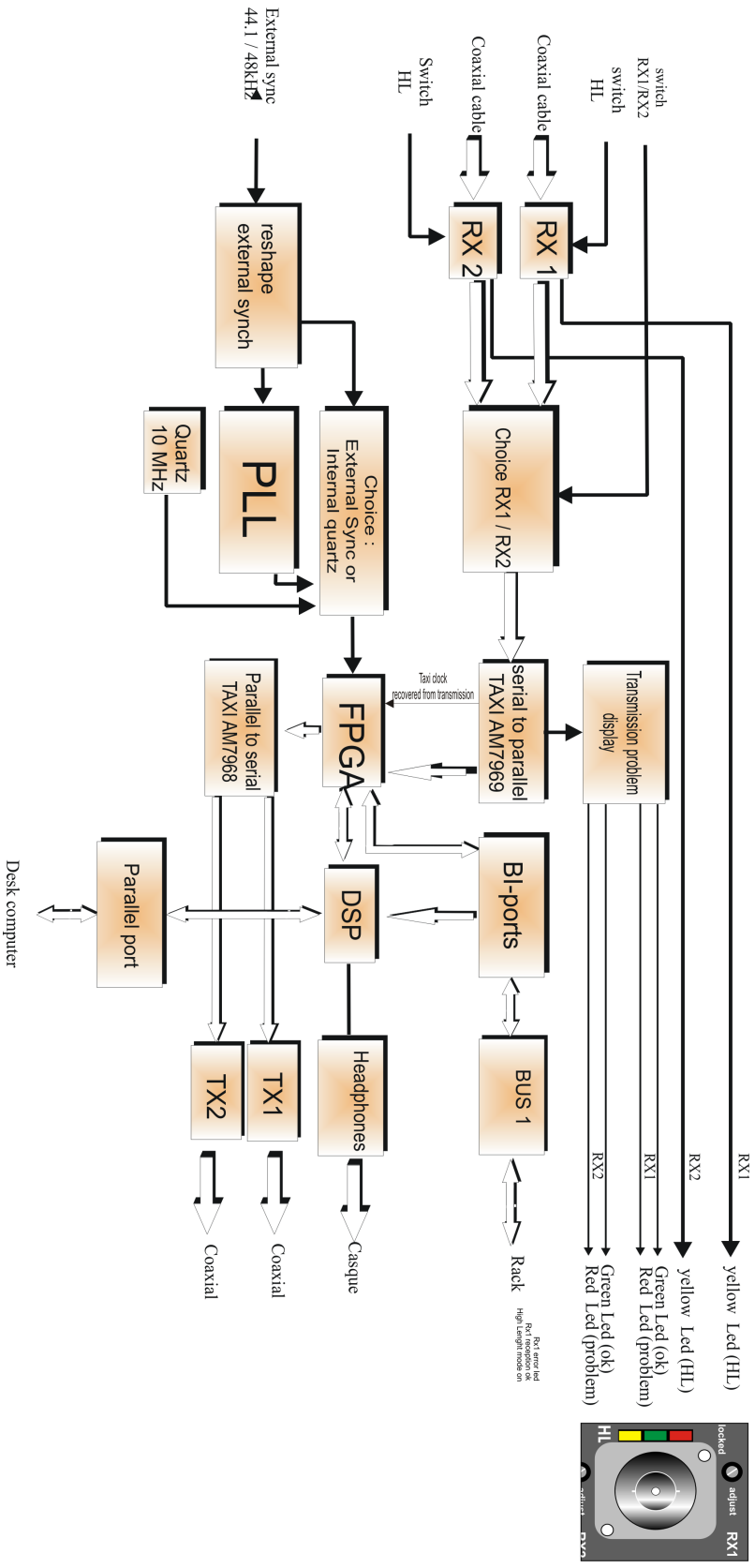
6.L.1MC-64 Block diagram



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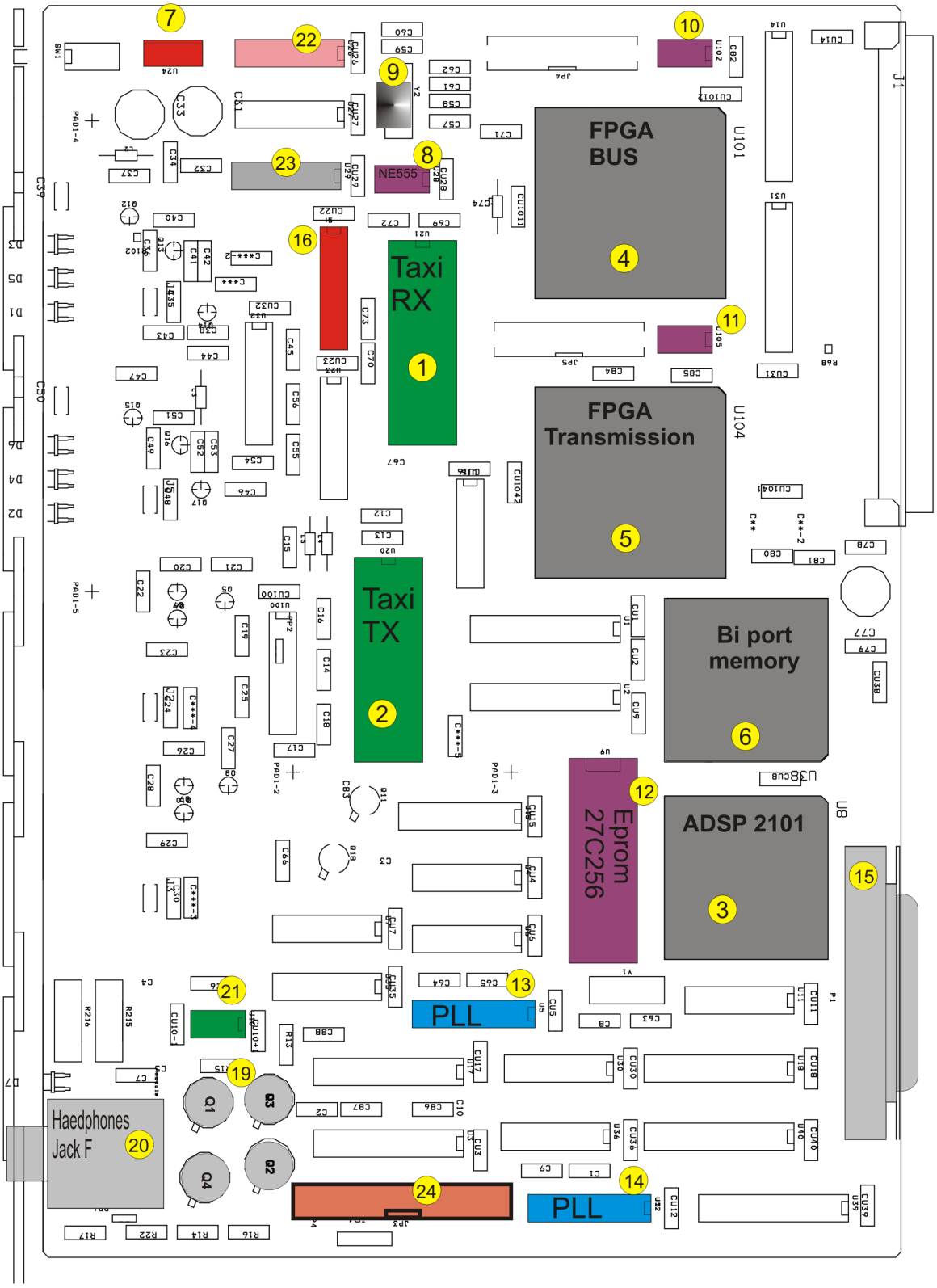
6.L.2MC-64 components placement TOP view

MC-64
component placement



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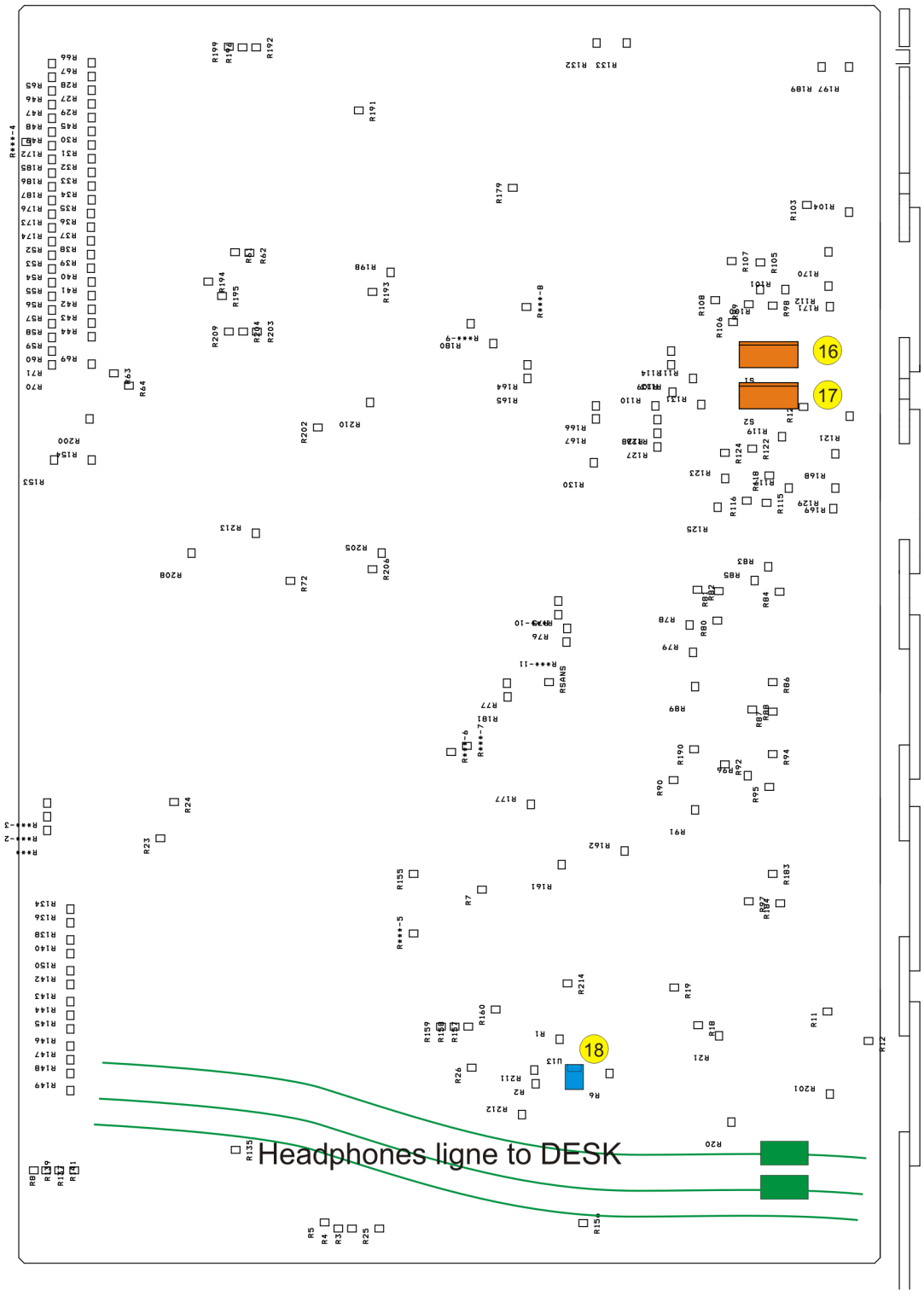
6.L.3MC-64 components placement BOTTOM view

MC-64
component placement (bottom)



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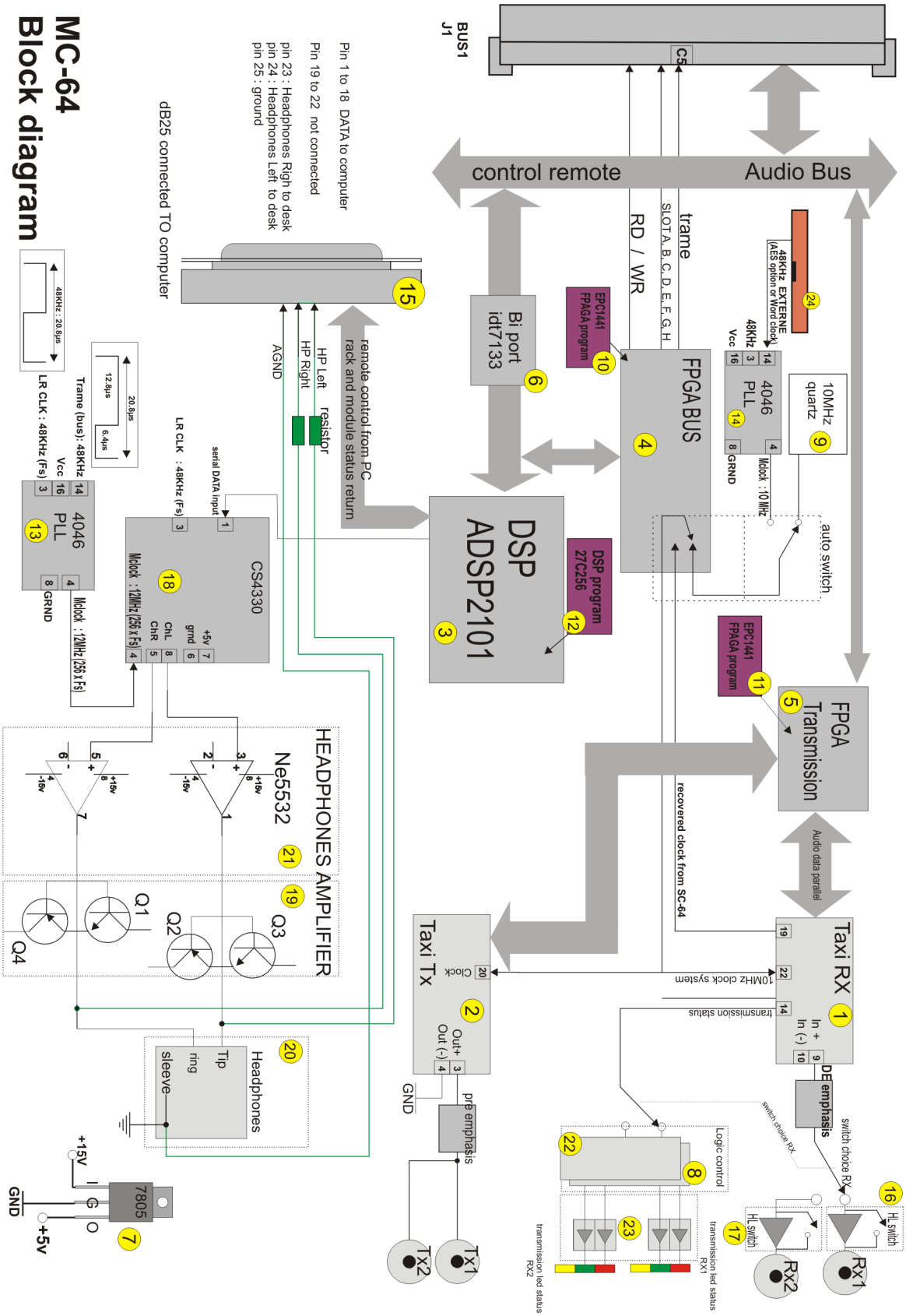
6.L.4MC-64 block diagram



6.M SC-64 module (Stage Box controller)

This module controls the Stage Box and the distribution of digital data (2-way splitter). It undertakes the following functions :

- Transmission, distribution of digital data frames from input modules detected in the Stage Box
- Reception of digital data frames from the input modules of the linked Master Mix Box
- Reception and acknowledge of the remote control signals received from Mix Box
- Distribution of remote control signals to the various modules of the Stage Box.

The connectors on the front of the module have the following functions :

BNC connectors : 2 TX and 2 RX Transmit and Receive the digital data frames to/from audio racks. A switch above the RX BNC connectors allows to choose the active receive channel. RX1 is adjustable (see section 9.D) for variable lengths of cable; RX2 is optimized for the 150 meter cable supplied with the Stage Box. The RX connectors have 3 indicators:

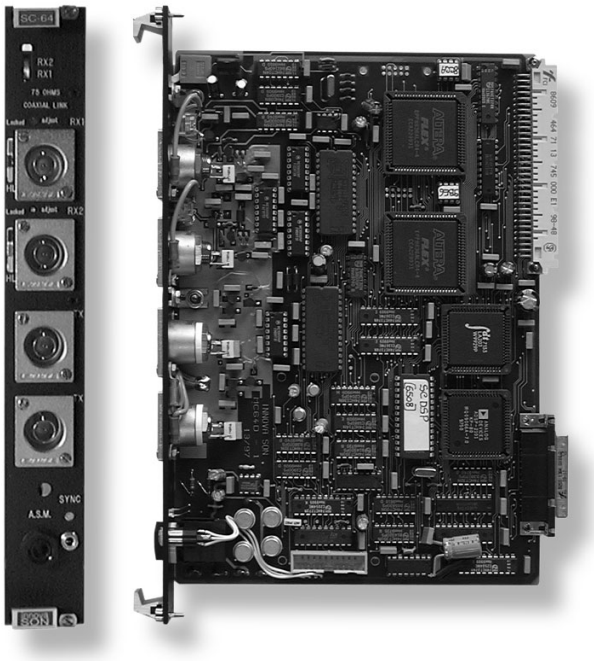
LEDs :

- Green led: error-free transmission, normal case
- Red led : Transmission errors
- Yellow led (HL) : increased reception sensitivity for long distance transmissions (> 300m), configured by a switch located on the copper side of the module's PCB, set back behind the front.

3.5mm jack : External sync input for the audio rack; TTL format, 44 to 49 kHz (optional AES format). The SYNC indicator indicates a valid and operational sync signal. The Stage Box distributes the sync signal to the whole installation, so any external sync signal must be connected to this module.

¼ inch jack : Headphone output (not used).

Installation : The SC-64 module must be installed in its reserved place, the CTRL slot of the Stage Box.



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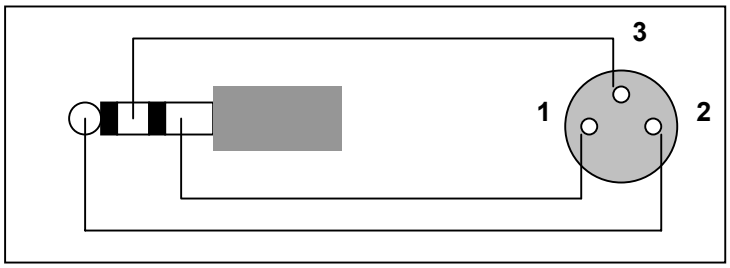
6.M.1 Sync-A module (optional AES synchronization)

This daughter-board is designed to be fitted to an MC-64, SC-64 or SC-64-3 module so that it may receive a digital sync signal in the AES format, as well as the TTL Word-Clock format which these modules accept normally.

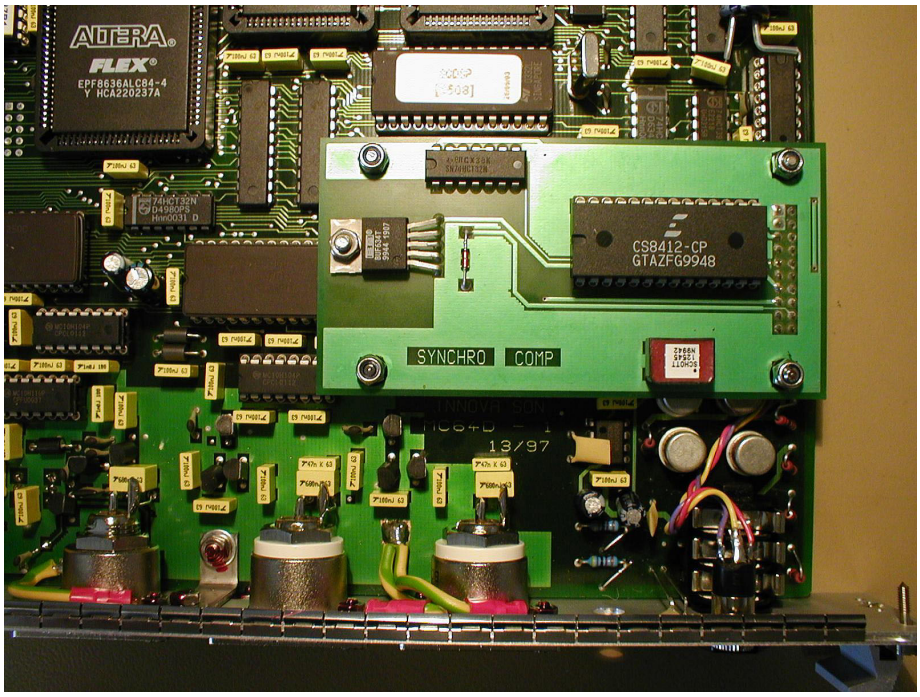
The 3.5mm jack sync connector then uses its 3 poles to accept the AES signal (balanced with ground) used to synchronize the system. The use of TTL Word-Clock sync is still possible by using the tip and ground of this connector.

If a valid AES signal is detected, the system slaves to it, and the SYNC LED lights.

The following cable is recommended between the 3.5mm Jack and a male XLR (usual AES connector).



Installation : The Sync-A daughter-board must be installed by an authorized technician or, better still, at the system's point of manufacture. The module is installed in a reserved place on MC-64 and or SC-64 (see following photo).



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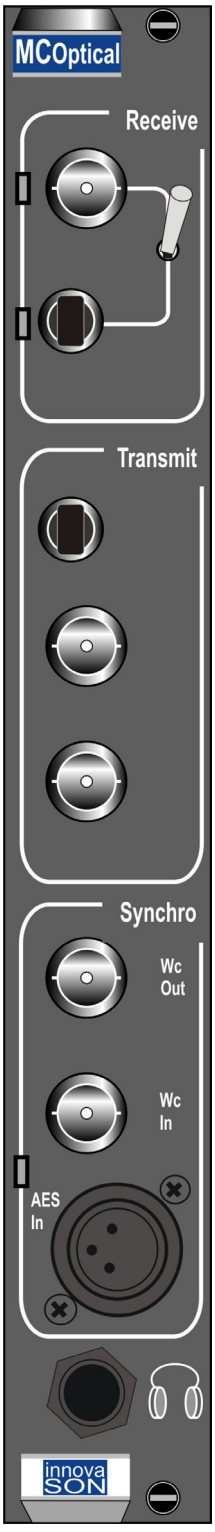
6.N The MC-64, SC-64 optical



Compatible with all INNOVASON console the MC Optical and Sc Optical card provide all the function of standard MC-64 or SC –64 module :

- digital stream reception (Rx) from a stage rack inputs (distant).
- digital stream transfer (Tx) toward the stage rack outputs.
- Remote controls transmission to the Stage Box cards.
- Remote controls distribution for the local cards in the Mix Box.
- Main bus management, clocks and digital signals generation.
- remote control interface from the PC parallel port to the local modules.
- system information interface from the rack to the PC parallel port.

The front panels connectors are :

ST connector : 2 ST connector receive the fibber cable, one for receive, one for transmission. It is very important for the reliability of the system to close the connector with their plug after use (to avoid dust inside the connector)

BNC connectors : 2 TX and 1 RX Transmit and Receive the digital data frames to/from audio racks. A switch above the RX BNC connectors allows to choose the active receive channel

The RX connectors have 2 different indications: see 31 32

Reception LEDs :

- Green led: Normal case, reliable transmission
- Red led : Transmission errors

BNC word clock in : External sync input for the audio rack; TTL format, 44 to 49 kHz (The Led indicates a valid and operational sync signal (orange). If a Stage Box is connected this input is by-passed and the Sync input available is the SC card (Stage Box) one.

AES Word clock on XLR input (The Led indicates a valid and operational sync signal (Green). see 38

BNC word clock Out : the desk can synchronize slave digital machine to its audio clock Or If the module is synchronized to an external clock, this output can be the copy of the Word clock In (jumper on board) in order to obtain a real word clock thru. See 42

¼ inch jack : Headphone output (not used on Sy80)

Installation : The MC-Optical/ SC-Optical module must be installed in its reserved place, the CTRL slot of a Mix Box

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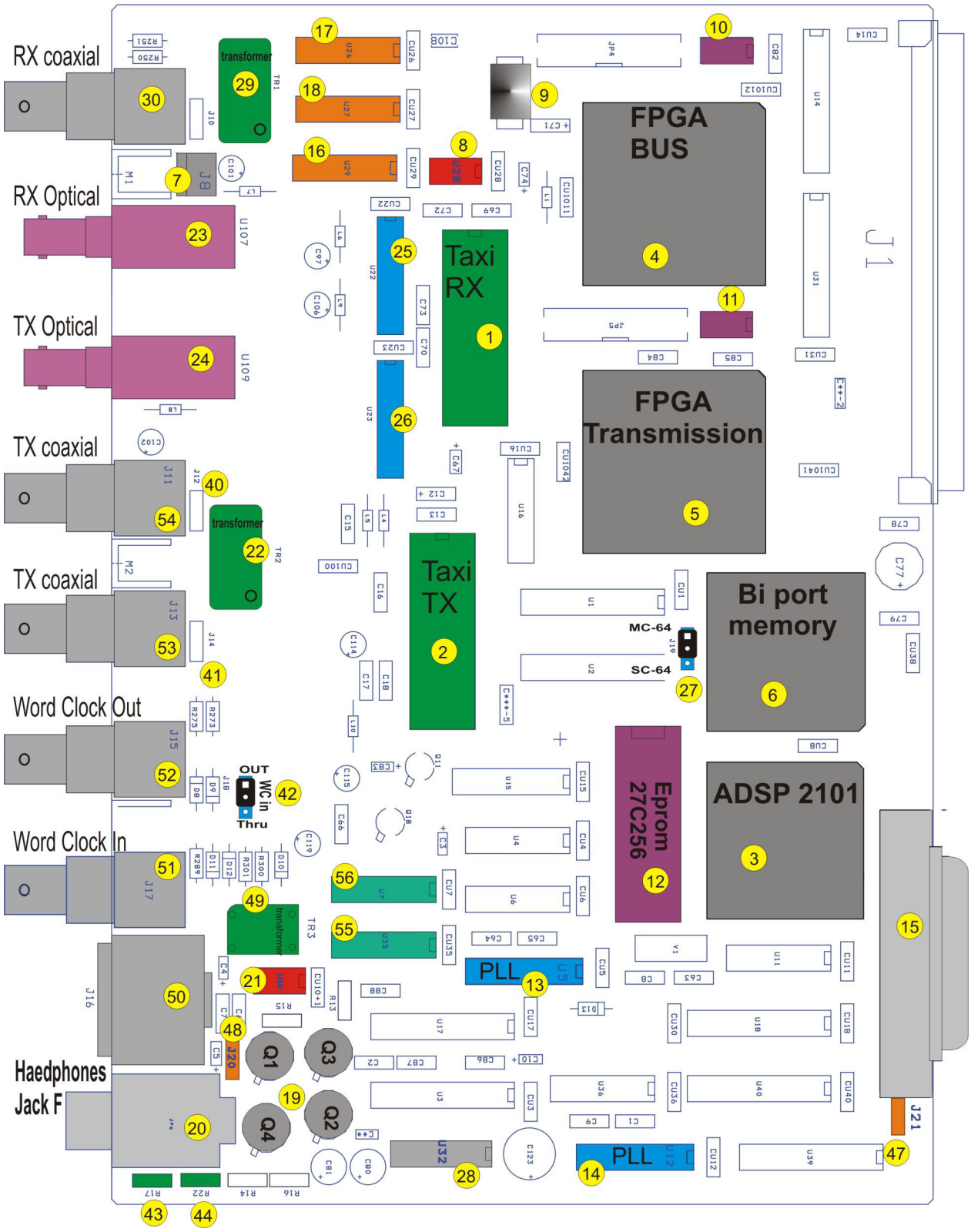
6.N.1 MC-64 Optical components placement TOP view

MC-64 OPTICAL component placement



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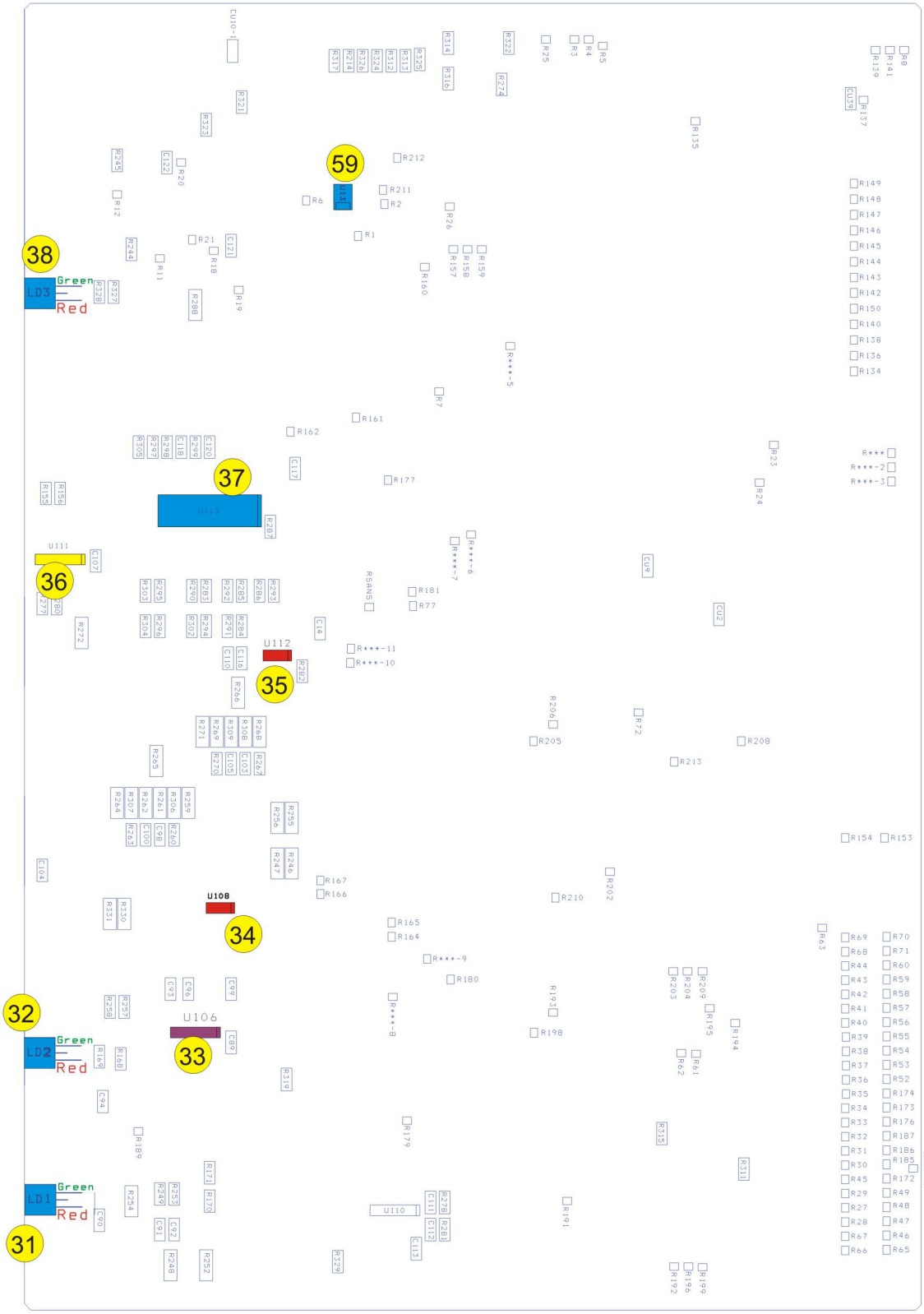
6.N.2 MC-64 Optical components placement BOTTOM view

MC-64 OPTICAL component placement (bottom)



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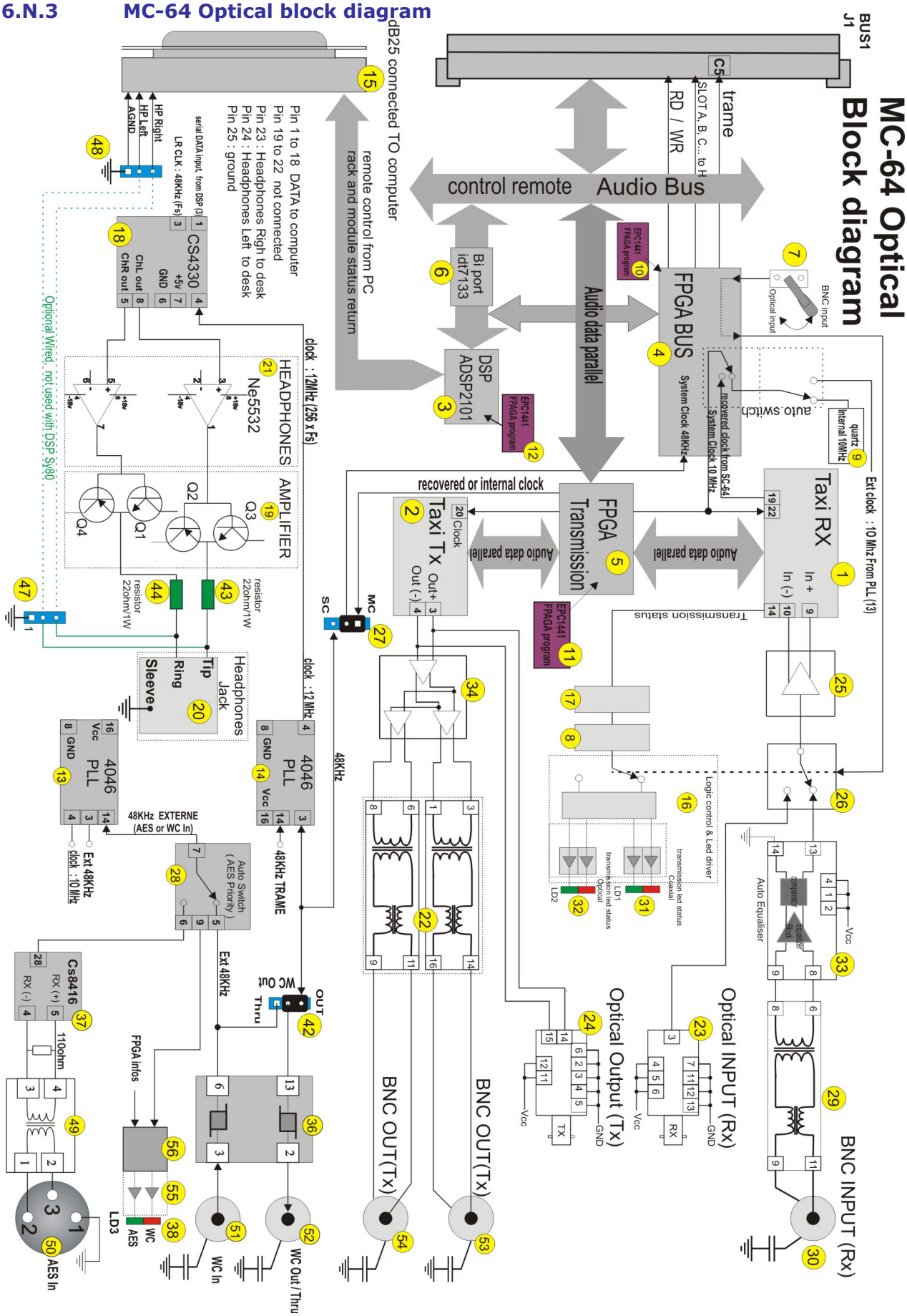
6.N.3 MC-64 Optical block diagram



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6.N.4 MC, SC optical maintenance :

Except the Taxi chip components, no parts on this module can be removed without risk.

Optical:

Using multimode 50/125µm standard fibre with ST connector (see 23 & 24)
This technology provide total electro-magnetic isolation.
Lambda = 1300nm
Latency 0,5µs / 100m + 1,2µs
Max length : from 1m to 400m in Master mode, 2000m in Slave mode

Coaxial:

Coaxial cable 75ohm impedancy adapted
BNC jack filter connector associate with auto-equalized (see 33) input stage provide to use Cable from 1m to up to 500m.
All stage (input/output) protected with transformer (see 29 & 22)

Transformation of an Mc into a SC module

1) select the right position for SC

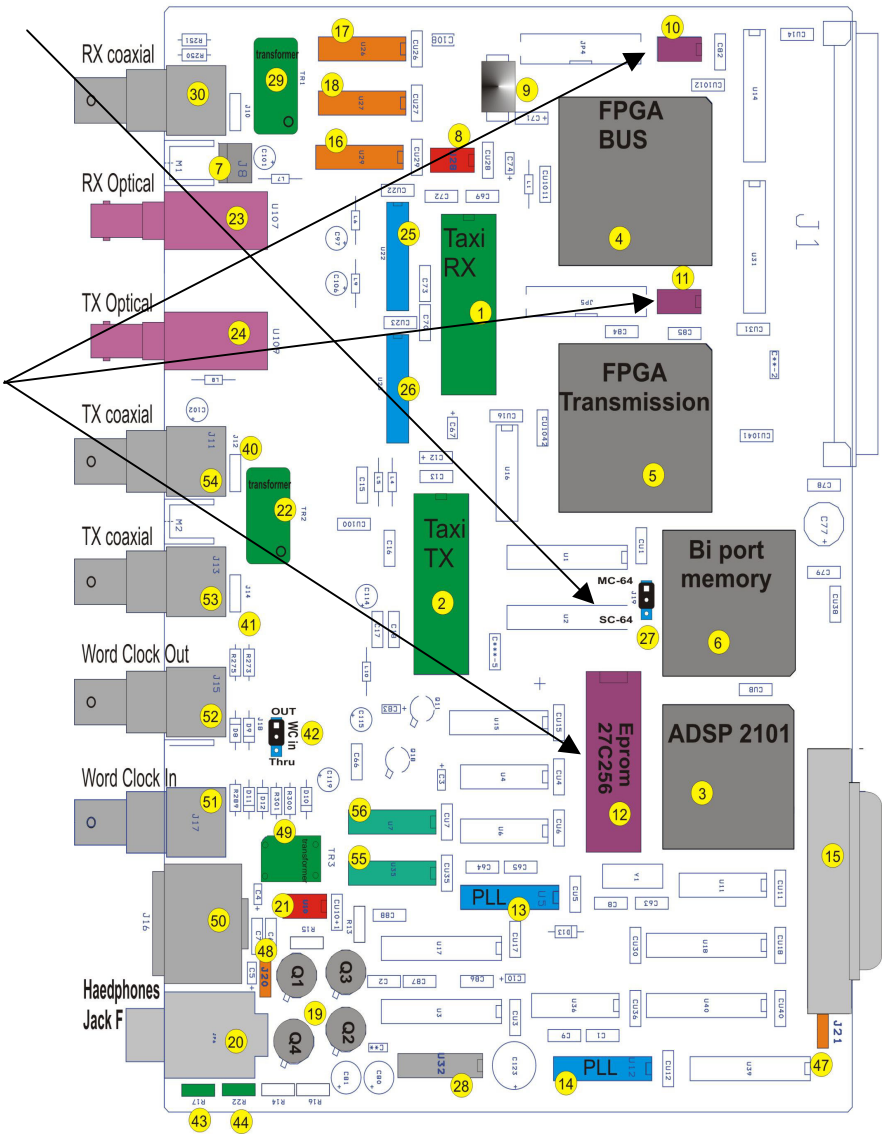
2) install the 3 Eproms of the SC

Eprom for MC module :

- 12 MC-64 V3.2 [7C30]
- 10 V4.0 [8EE9]
- 11 V1.0 [16D4]

Eprom for SC module :

- 12 SC-64 V3.0 [5BE4]
- 10 V2.0 [EE83]
- 11 [37B1]



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7. TROUBLE SHOOTING

Preliminary :

- Never plug or unplug any module when the rack is under voltage.
  The module could be damaged seriously.
- Use AC cord to turn on or turn off audio rack.
- Before any intervention, you must be sure that the module is truly defective and the default doesn't come from a software error or a bad configuration
- Consult chapter 7.B below to check if the problem comes from the limitation of the system
- Consult chapter 7.C below to check if the problem comes from a bad use of the system
- If An "error message" is returned by the system see section 7.D below
- Any intervention on the desk is under the responsibility of the user
- Any weld or intervention not authorized by InnovaSON can damage the modules.

The modularity of the system give the possibility to make a quick and reliable service. A simple exchange of the supposed faulty module by a spare part could solve most of problem in few minutes.

In some case, it is possible to use redundancy aspect of the system to find a solution and finish the work.

- With CBA96-R audio rack, the rack is equipped with two power supply

(A CBA96 can be modified to become a CBA96-R)

- A Mix Box can be used as a Stage Box if necessary without any modification (just plug an SC-64 module)
- The coax cable can be cut and repair with an intermediate connection,(see chapter 0 above to stay in accordance with the system specification)

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7.A Using extender cable (DIN 41612)

InnovaSON product are modular. By this way it is easy to check a system : exchange the supposed faulty board, try again and note if the problem follows the suspected module.

However it could be necessary to search for a problem directly on board.

InnovaSON advice to use an extender cable in order to plug modules outside of the chassis.

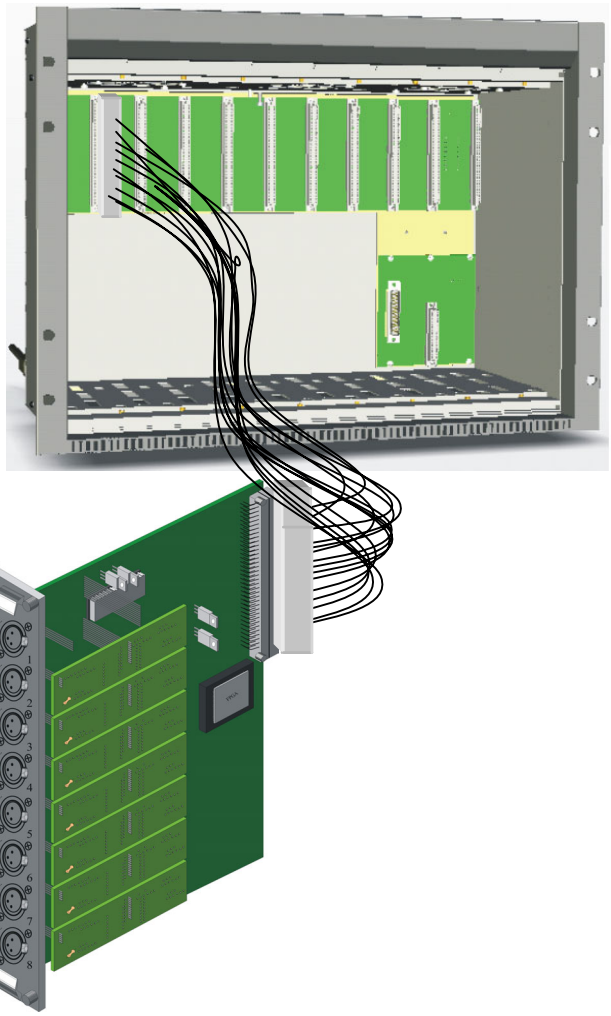
Extender cable :

Two Din connector 41612 (one male, one female) link by 64 cable.
All the wires of the ribbon must be free. If it's not the case, the connected board may have some troubles.
This cable allows to connect the module to the bus1

- The MC-64 module must be connected with a SubD25 cable to the PC.

Before any connection power off audio rack

Audio Module connection :



Module ready for test

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7.B Limit of the system

7.B.1 Audio Channel transmission

- Up to 64 audio channel can be transmit into the coaxial cable whatever the repartition of Input/output module between the Stage Box and the Mix Mox.
- Mix Box :
  - Sensoft 7.n.n the Mix Box must be equipped at least with one output module in his first SLOT (A)
  - Sensoft 8.n.n the Mix Box can works alone with only the DSPSy80 inserted
  - It is imperative to have all output module consecutive first and all input module next
- Stage Box :
  - must be equipped at least with one Input card in the First SLOT (A)
  - It is imperative to have all input module consecutive first and all output module next
- At same time only one SLOT can write on the transmission bus, so it is forbidden to have two same type of module in same SLOT name (between Mix and Stage, A/B/C/D/E/G/F/G/H)
- It is forbidden to have an empty slot between two input module
  - Input and output module can be separate by one or more empty SLOT
- Mix busses can't be directly send to output module in stage box, see chapter 9.C.3 user manual for method to send Mix bus to stage.
- The number of different mixes are define by the DSP module

7.B.2 System limitation

- The perfect earthing of a system is fundamental; use always the same ground for Mix Box and Stage Box
- ALL Input module do not accept DMX signal or Intercom signal
  Any tentative could damaged seriously the system
- ALL analogue output module do not accept +48v phantom
  Output operational amplifier could be damaged by +48v
- Switch on, at the same time, more than 32 phantom power can stop running the system
  - It is suggest to switch ON, maximum 32 phantom power at the same time.
- Input module SI8D3 need more current than SI8D2 thus Stage Box or mix Box must be modified with new BUS1 and PWR board to accept more than 3 SI8D3. All audio racks with a serial number superior to 385 are modified.
  Precedent rack can be modified, contact InnovaSON for more information.
- It is not recommended to use coaxial cable with a length inferior to 50 meters

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- To avoid any compatibility problem check the version of each module installed
    - All this information are notice in the Hardware configuration panel
  - Take care of the MC-64 version see chapter 2.B.3 Example : to use more than 4 XO8D2 in a Mix Box, the module must have an Eprom v2.7
    - Distributor have been informed of module version evolution by mail each time it is necessary
- External computer must be connected with standard cable
    - Parallel cable : 5 meters at maximum
    - Use cable cabled pin to pin (1 to 1 …) all pin connected

7.C Simple Verification before disassembly the system

7.C.1 NO power (Power Led Status off)

- Rack are connected to main voltage ?
    - Connect both AC cord (CBA96-R audio rack only)
    - Plug correctly the PWR board
    - With CBA96 try to return PWR board, see chapter 7.E.2

7.C.2 NO sound

Is it a Sensoft problem ? :

1)Sensoft problem

- First try to reboot the computer
- Is there an error message on screen (like error slot …) ?
    - An Reset DSP or ERROR Slot message can stop the sound!
- Is there signal on Sensoft/Desk vu meter for the defective input/output ?
- Is the input signal is well patched or routed to a mix bus?
- Is the gain is adjusted correctly on the input ?
- Do you need phantom power on this input?
- The mix bus is well patched on the listened output ?
- All the input, Aux, Aux send, master, VCA, matrix level are well positioned ?
- Control the PAN position
- No Mute active ?
- Control if any MuxiMute are active ? see user manual for details about the Muxi window.

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After check (1) It seems it is not a Sensoft problem :

2) Module problem

- Is the transmission works? Both coaxial cable are well connected ?
- Is it a problem on all output/input of one board ?
    - If yes, exchange by a new one and try again.
    - See the dedicated module chapter for service
- To check an output or input individually :

  A Direct in/out patch offer to the technician the way to bypass totally the DSP module

  By this way the signal go directly from the input to the desired output.

- If he problem appears on a single or couple of output
    - See the dedicated module chapter for service

7.C.3 NO correct transmission

- Open Hard configuration Windows **[Alt]+ [C]** and check the correct configuration of the system
- Try to invert the TX and RX coaxial cable; after walking 150 meters we can forget who is TX and who is RX or if it's not you which connect the Stage Box.
- Try to use the other RX connector ? see chapter 3.G
- MC-64 or SC-64 module are not screwed properly in their SLOT ?
- The ground is not the same between Mix Box and Stage Box ?
- Light machine or motor are plugged on same main voltage?
- Coaxial cable are to short ? (inferior to 50 meters)
- The Stage Box is OFF ?

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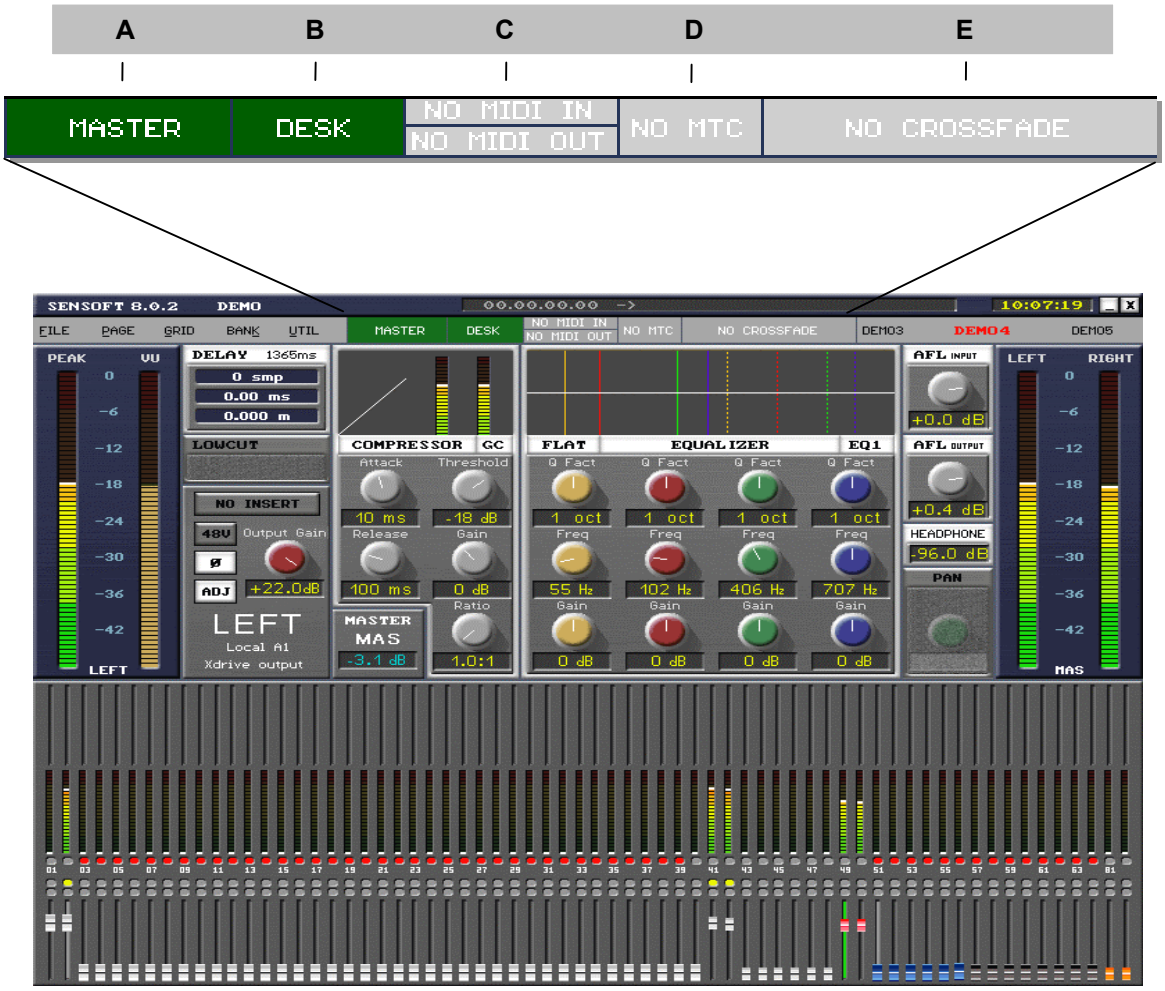
7.D System Status and ERROR message

7.D.1 System Status

Sensoft indicates some important messages in the main window :



A. Indicate the Status of the desk

- **Master mode:** Receive and control the channels from a stage box **(RX & TX connected)**
- **Slave mode :** Only receive the channels from a stage box **(Only RX connected)**
- Local mode : No communication with stage box (RX & TX disconnected)
- **Off Line :** Displayed in red with all vu-meters at top indicate that no communication between the desk and audio rack (it's used to modify some parameters during the show)
- **NO System :** Displayed in red with all vu meters at top indicate that no communication between the desk (PC)and the audio rack

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B. Indicate if there is communication between the PC and the desk (Sensplit master) or not

- **Desk :** Displayed in green, indicate that the communication between the desk and PC is well, all hard modules of the desk are recognised by the soft
- **NO Desk :** Displayed in red indicate that no communication between desk and PC .

C. Indicate the state of midi in / out function

- **No Midi In /Midi No Out :** Displayed in grey indicate that the midi function is not used
- **Midi In / Midi Out :** Displayed in blue indicate the midi function is applied.

To applied the Midi In / Out function, select in menu Util / Automation or directly by F4 key to display the automation then select the enable IN / OUT in Midi Program Change.

D. Indicate the state of synchronization of the desk with another digital equipment (console, recorder...)

- **No MTC :** No synchronization applied
- **MTC :** In case of synchronization with another digital equipment, the MTC is activated in Util/automation or F4 by marking on Play or record as the case may be if the console is master or slave.

E. Indicate the state of the Crossfade time

7.D.2 Error message



No system message indicate that no system (MC-64 module) are in communication with Sensoft.

Diagnosis procedure:

- Verify if the audio rack is under voltage (4 leds switched on the PSU card on the front) and the led green / red of MC-64 too.
- Verify the connection between the audio rack and the desk (Jaeger cable)

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- To see well if the defect come from the jaeger connection, stir the connection of the jaeger cable at the level of desk and audio rack.
- Restart the audio rack then the desk
- Verifier the continuity of the pins of the jaeger cable
    - with an Ohmmeter
- Check your system with a spare PC
- Replace the MC-64 card by an other one functional
- Verify the connectors inside the desk (Paralell cable)

RESET DSP / RESET XO8D :

Means that you have a communication between PC and audio Rack

- It is not an Error Message but an Information
- If the message is continuously present :
- Check the right configuration of the system Menu About, code Innova ; see user manual for all details
    - Verify the 3 leds of DSP SY80 module (there must be Green)
    - Verify the Led of The MC-64
    - Verify the cabling between Mix Box and Stage Box (no antenna with Coax)
    - Verify that the rack configuration is OK, no input modules at the same slots (local and distant…).
    - Verify that the MC-64 or SC-64 is not switched on Long distant although you use a 50 to 300m coax cable.This perturbs the transmission and creates some reset on the common bus.
    - Verify that, on the both rack, the RX locking is always green. If it's not the case verify the adjustment ifyou use RX2, check the coax connectors and check that MB and SB are on a same potential Earth.
    - Re-start the Mix Box
    - Verify the XO8D2 version (last release v1.6 or v2.6, v2.7)
    - Try to replace the DSP card or MC-64

Hard configuration windows appears :

- Problem of communication between MC/SC
- Transmission problem result from losing transmission during few time
    - Verify the MC-64 to computer communication
    - Verify the Coaxial cable
    - Verify MC-64 and SC-64 (if present)
        - Version of the MC/SC board see chapter 2.B.2
        - Verify the functioning of Taxi chip device

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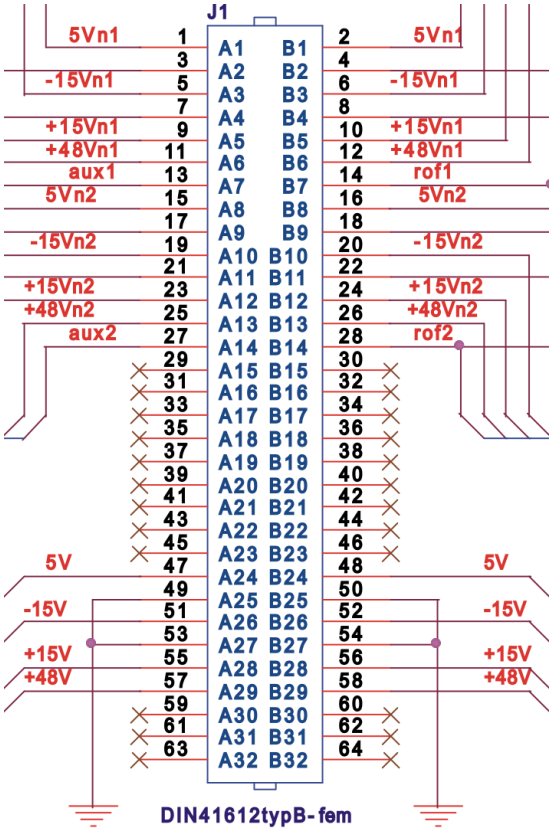
7.E Standard Check on module

7.E.1Power supply

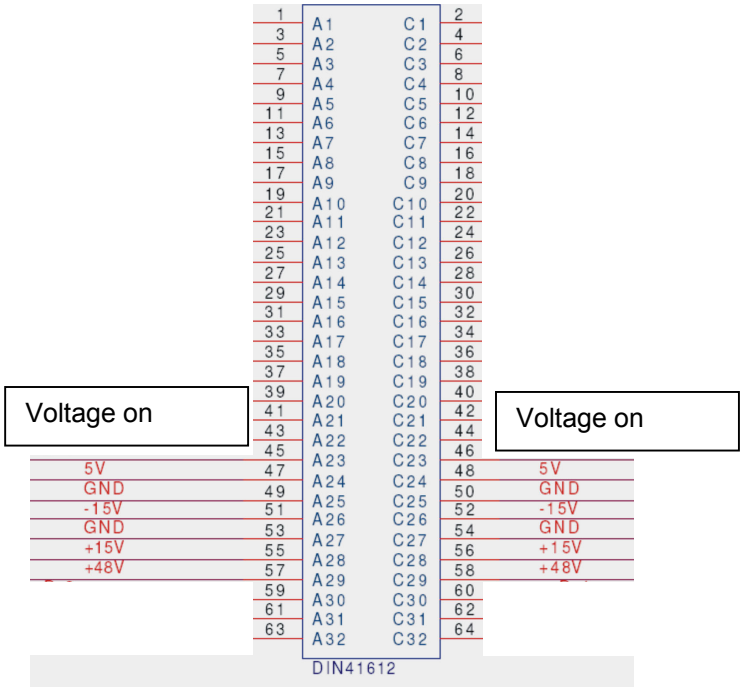
PWR BOARD BUS1 connector:

Voltage on PWR board, Din41612 connector BUS1



MODULE :

All module on SLOT A to H receive all this voltage on same pin number on their own BUS1 connector



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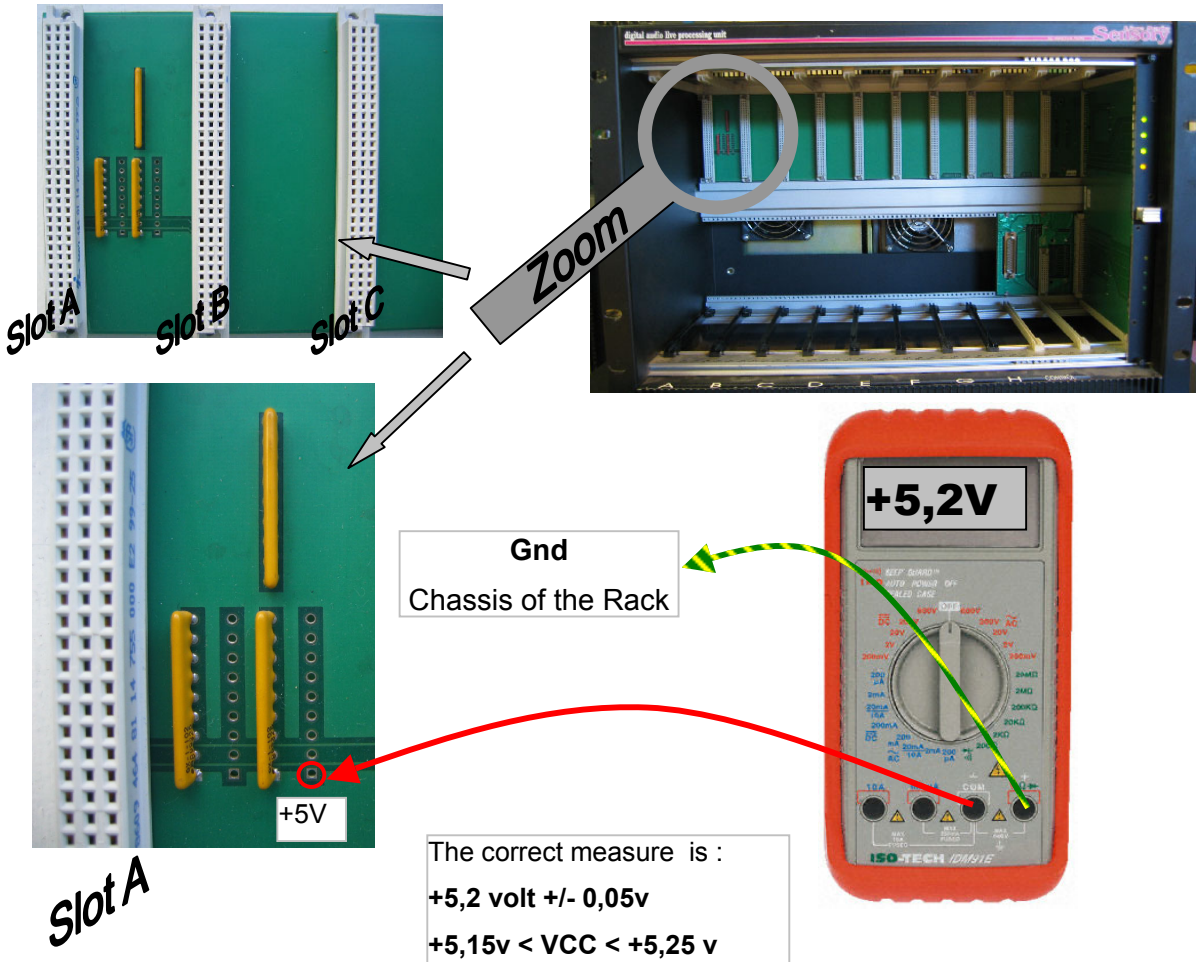
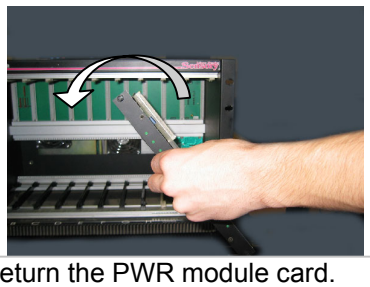
7.E.2Check the VCC (+5volt) on the BUS 1

- This check verify the +5 volt presence and is value, this test check one ZX-300.

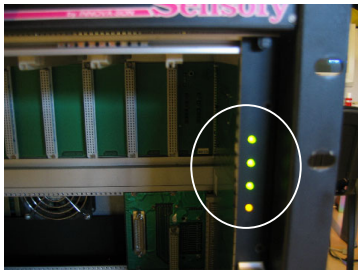


To active the second Power supply :

- Return the PWR module to check the ***second*** ZX-300 power supply if present.



Return the PWR module card.



the 4 leds must light up.

- Repeat the same +5 volt check

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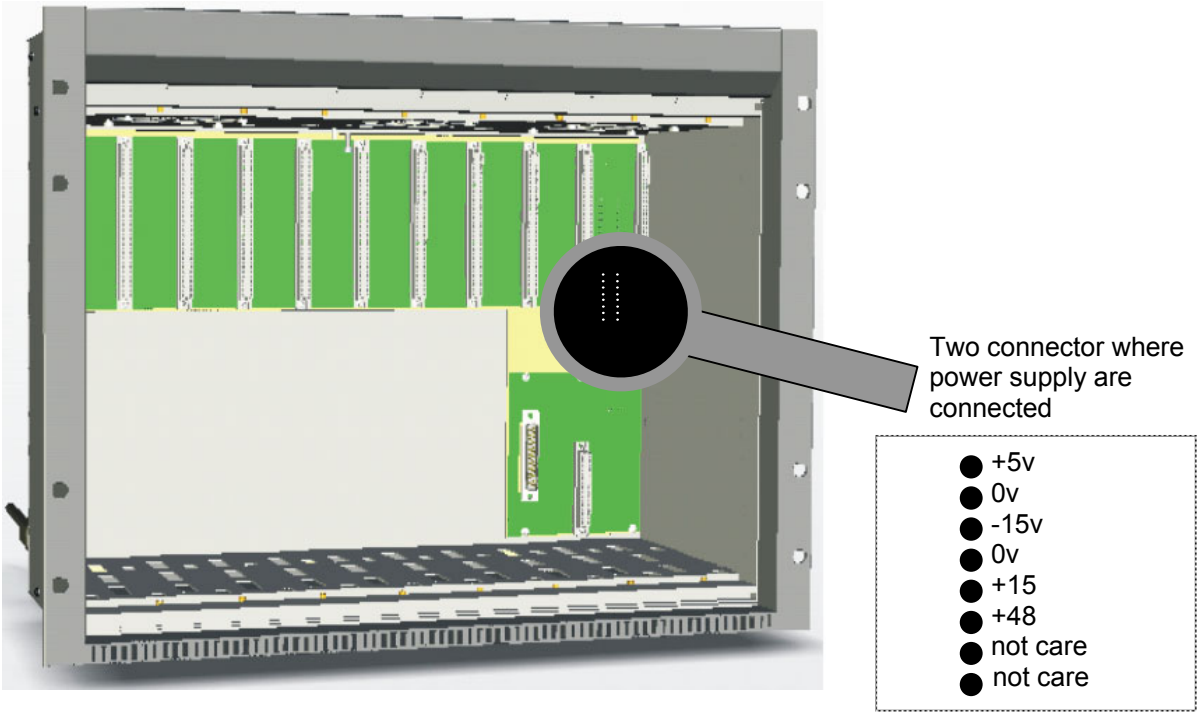
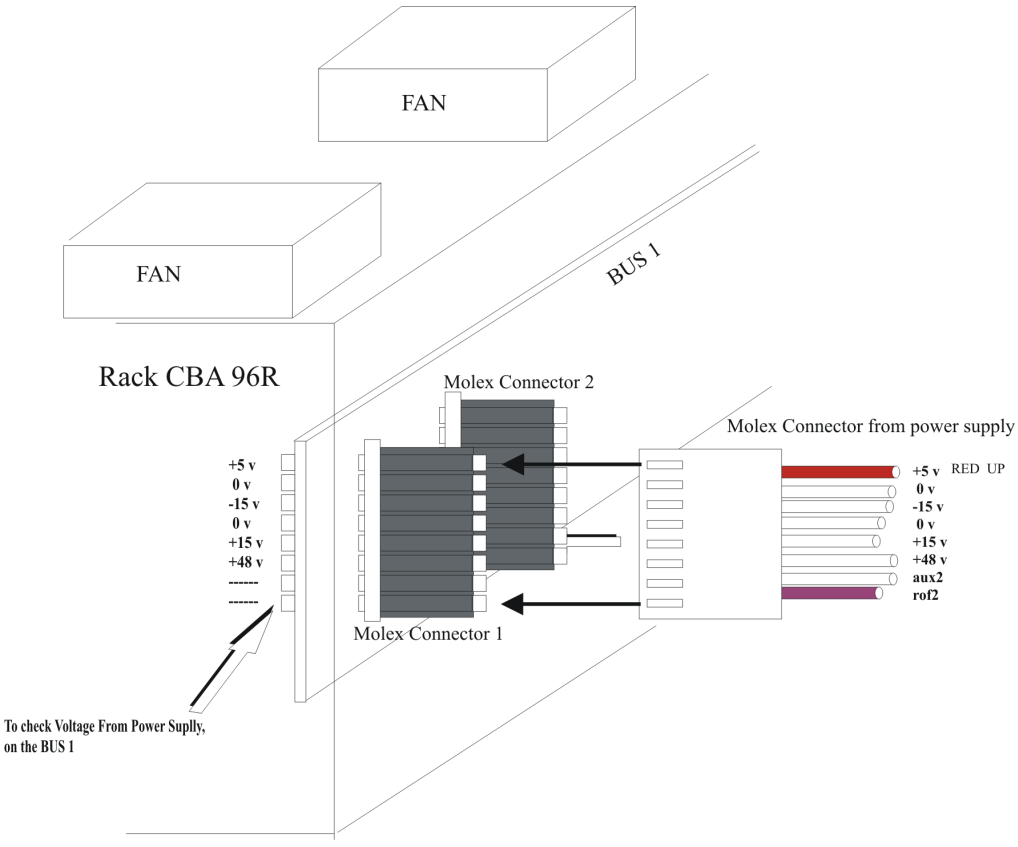
7.E.3Check the voltage coming from the Power supply

The DC voltage are accessible without disassembly the rack



Remove all module and plug AC voltage

Check the DC voltage as below



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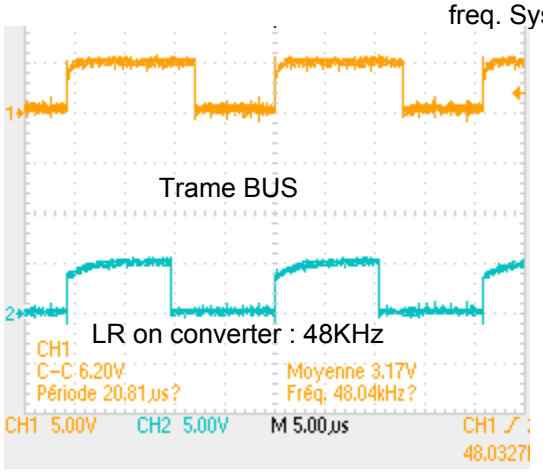
7.F Standard check on Module

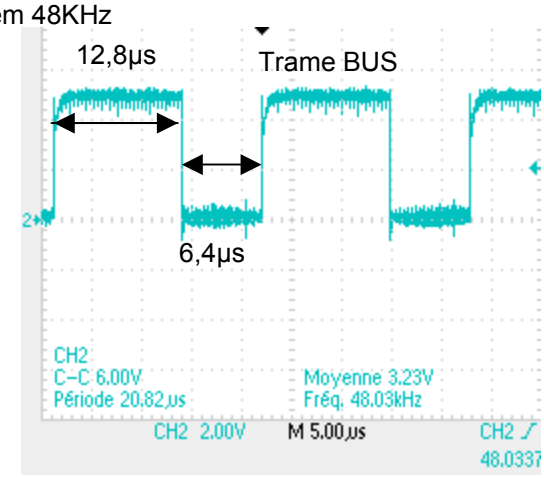
7.F.1Check the TRAME BUS signal

Each Board will receive this signal on pin C5 connector DIN41612 BUS1

Standard diagram

freq. System 48KHz



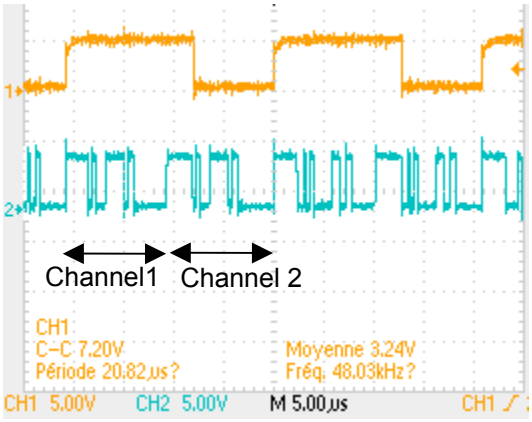


7.F.2Check serial data input of DO8A converter

Data input OK :

Trame BUS

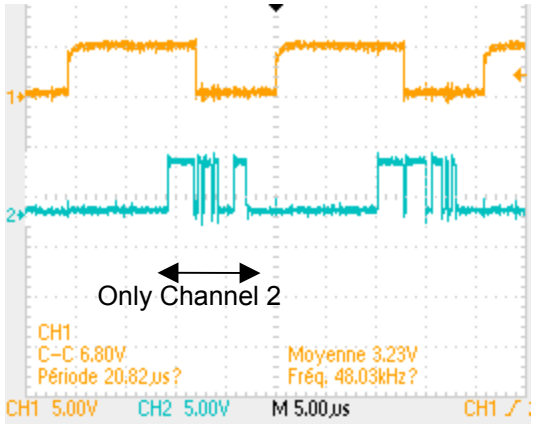
Serial data on input Pin, D/A converter



Data input Not OK :

Trame BUS

Serial data on input Pin, D/A converter
Here only ONE channel is sent to
the converter



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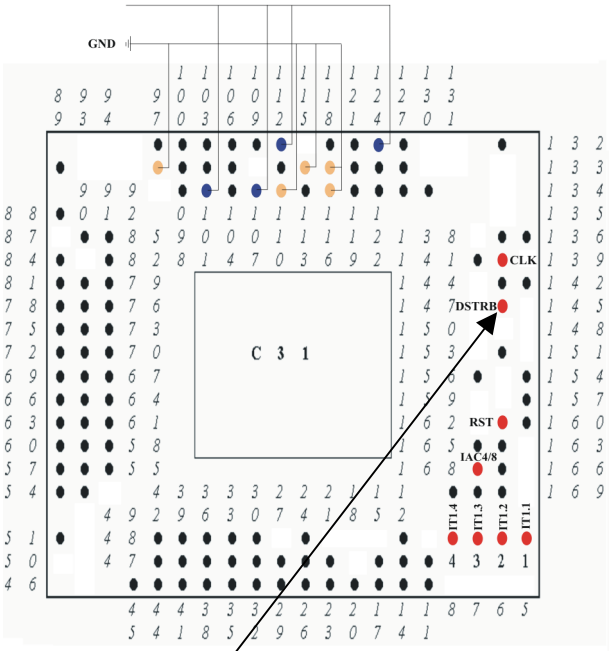
7.F.3DSP important Signal

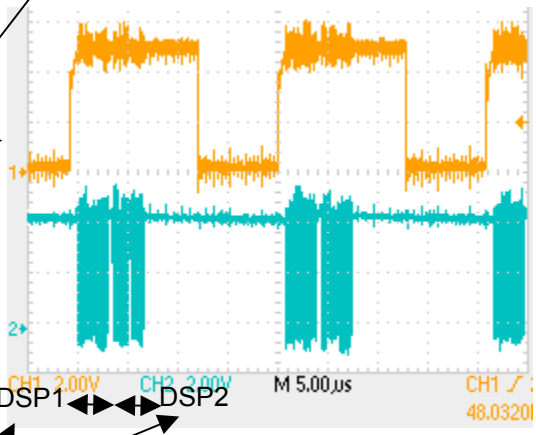
The C31 DSP on all X module or DSP module (DMMK(n) can boot incorrectly.
it is possible to check is the DSP is on works.

DSP pin placement :



PIN C5 TRAME,
bus connector DIN41612 BUS1

Trig oscilloscope on TRAME signal



DSP1 DSP2

Pin 146 STROB on C31 DSP

This measure has been done on XO8D2 with 2 DSP.
With DMMK9 the measure would show 9 DSP as on previous figure.

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If a problem appears or the DSP has not boot correctly :

This signal is the RESET

Normal value always High Level

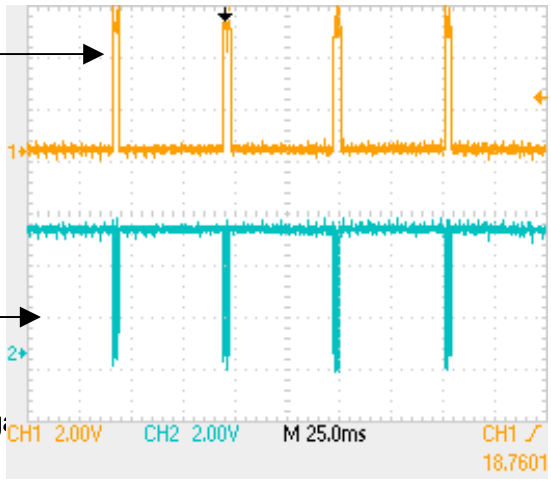
In this case we have an automatic reset

Each tip is a reset.

Reset on pin 161 (RST)

Pin 146 STROB on C31 DSP

Wee see that the DSP load his program and reboot ag



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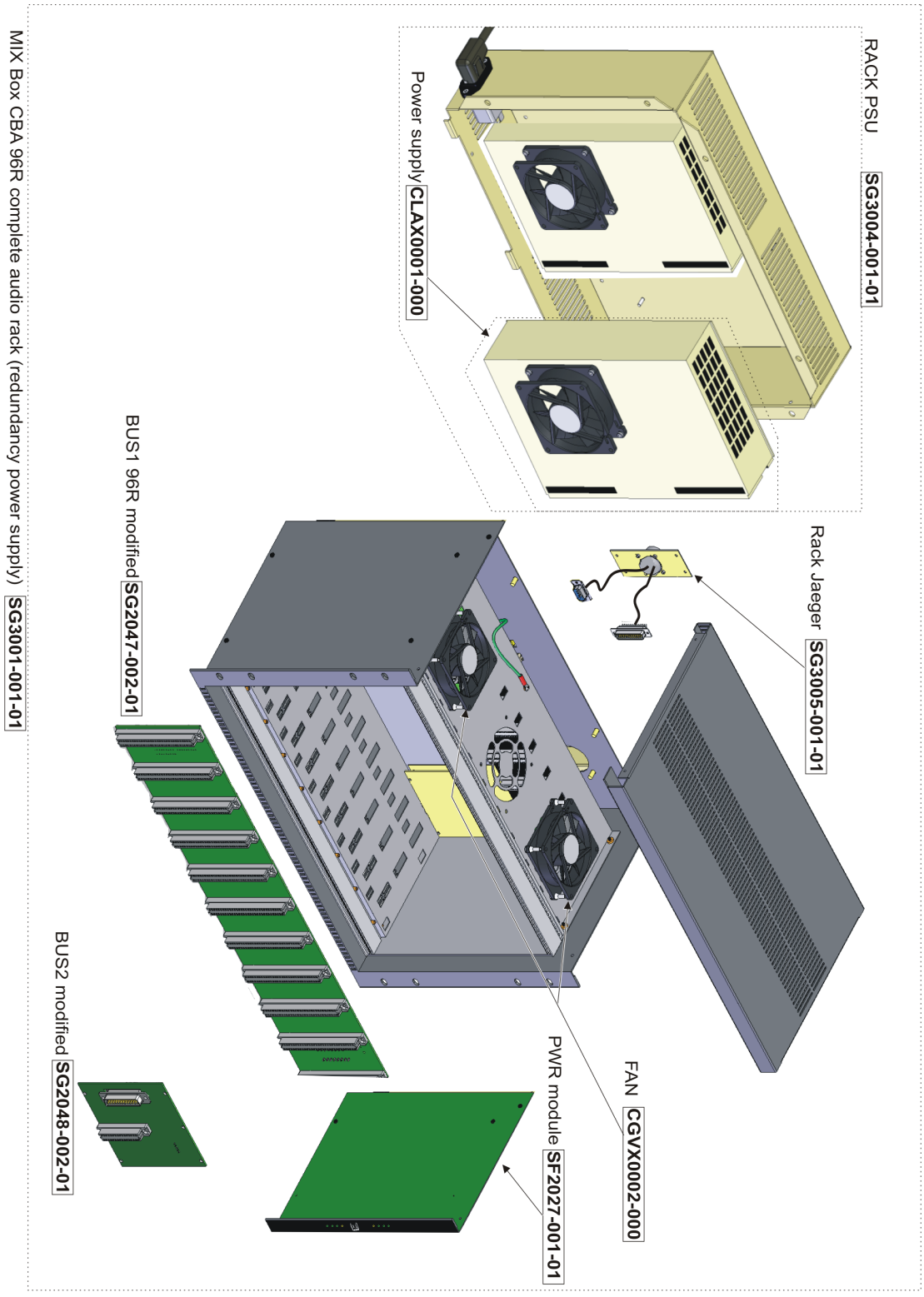
8. PART LIST

8.A Mix Box part list



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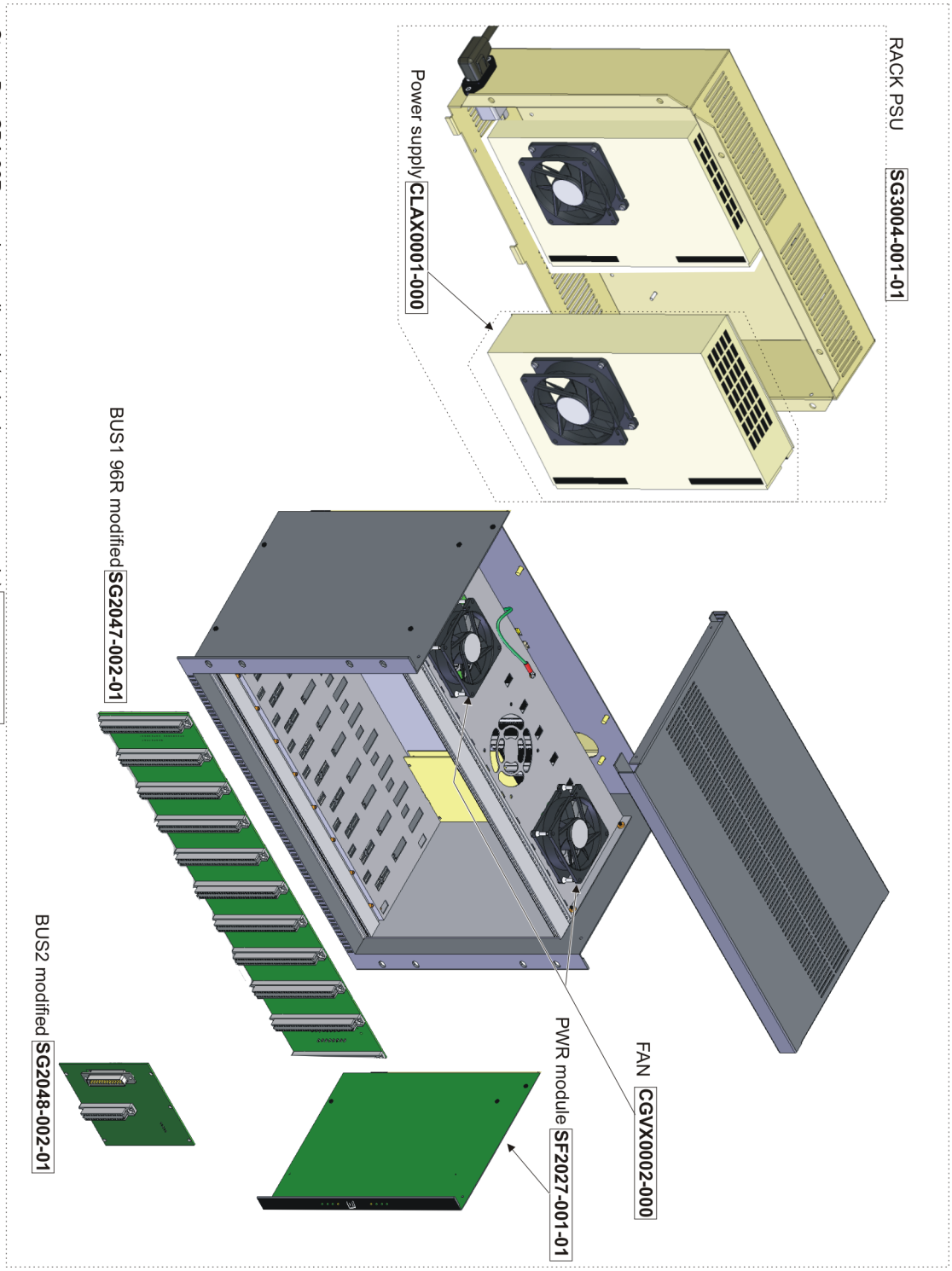
8.B Stage Box Part list



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8.C Test part

8.C.1 Extender cable

8.C.2 Jaeger connector to dB25

Part number : SC0007-001-01

C31 :SF2030-001-01 DSP daughter board for DMMK module and DO8X /XO8D module

SSM2017 : CIDT-4002-000 Mic/line audio amplifier

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9. INCIDENT REPORT

This section assemble information note sent to distributor at the time k

9.A Incident report #2 : removing self in audio racks

Further to some complaints on behalf of some customers concerning the noise generated by the PSU of the CBA96/96R audio racks, here is the result of our investigations.
This “buzz” noise is generated by the magnetic field transmitted by the coil to the sheet metal of the back cover of the rack. This coil was strongly advised by the CE organism in 1999 but now, we’ve received a report which explain that the norm has been made more flexible about harmonics on the main voltage.
We are thus happy to announce that you can henceforth shunt this **noisy coil**.

Please print and follow carefully the attached guide.
Thank you for your attention,

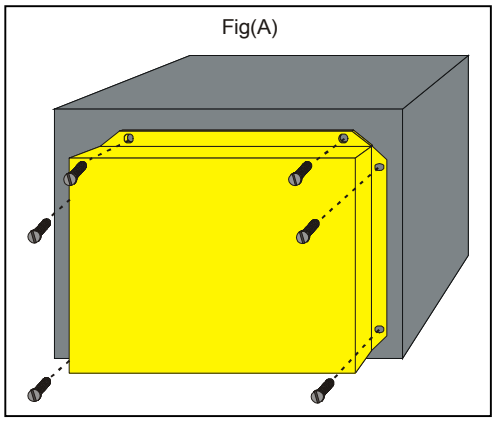
----------PROCEDURE----------

Inside Audio Rack type : CBA96R, CBA96 some coil vibration can be noticed.

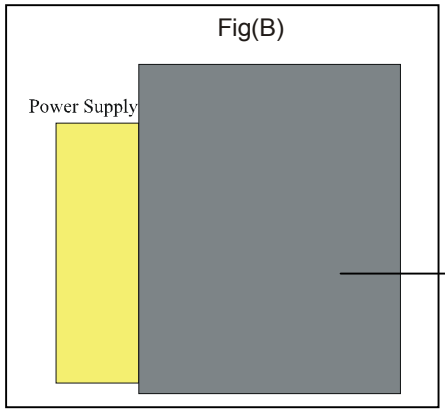
See below for the procedure to shunt or and remove coil

Remove the rear Power supply box, only 6 screw ----------Fig(A), Fig(B), Fig(C)

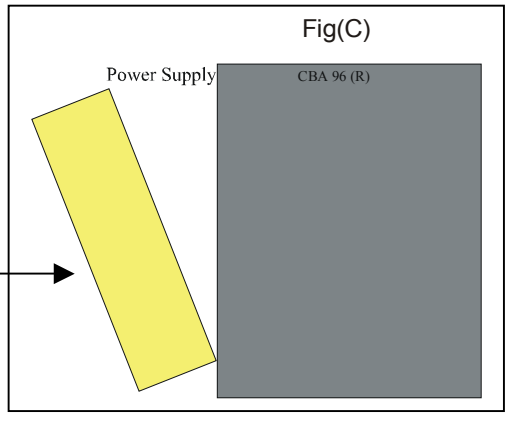
Fig(A)



Fig(B)



Fig(C)



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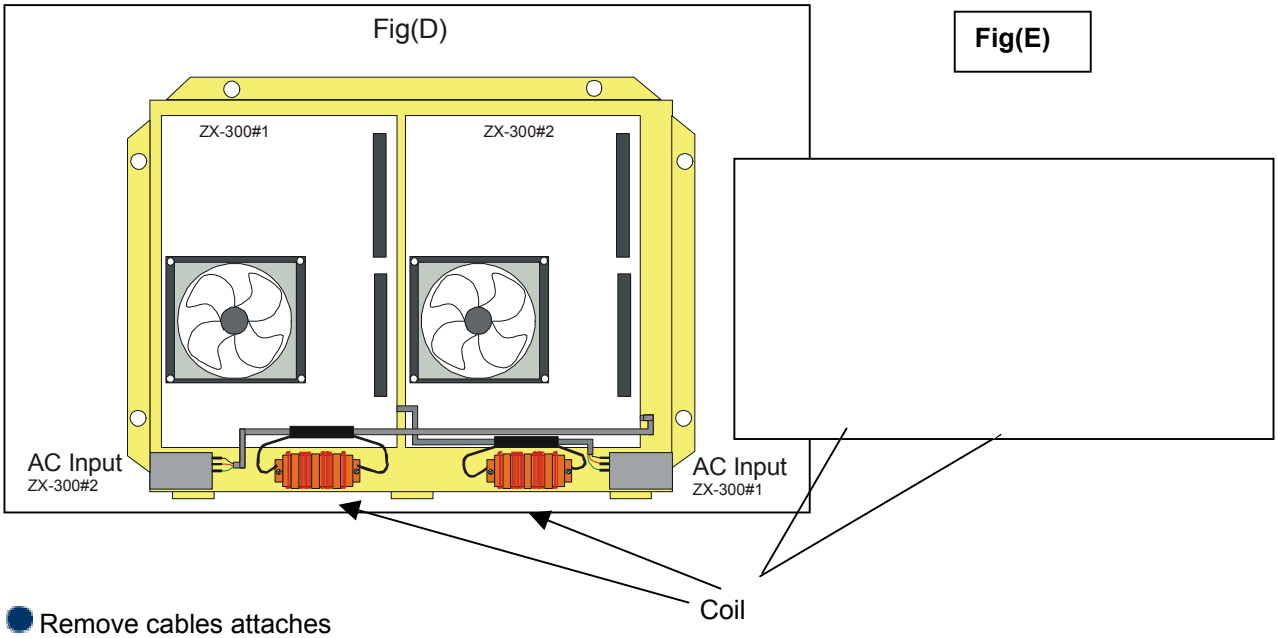
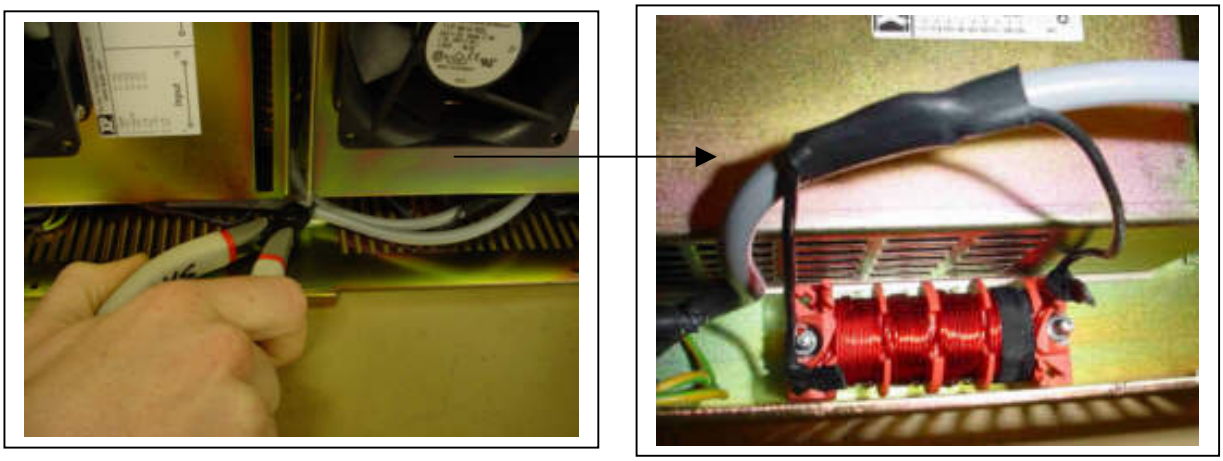
- Inside view of the Power supply Box, see in red the coil which must be shunted ----------Fig(D), Fig(E)

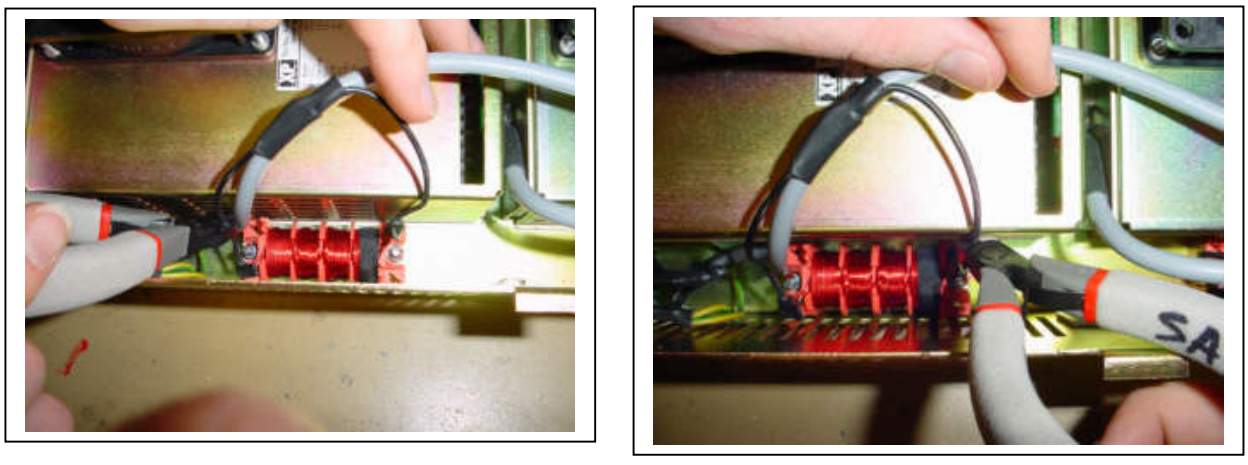
Fig(D)



- Remove cables attaches



- Cut the coil connection: **it is important** to cut both cable directly on the coil, to have the max length of black cable.



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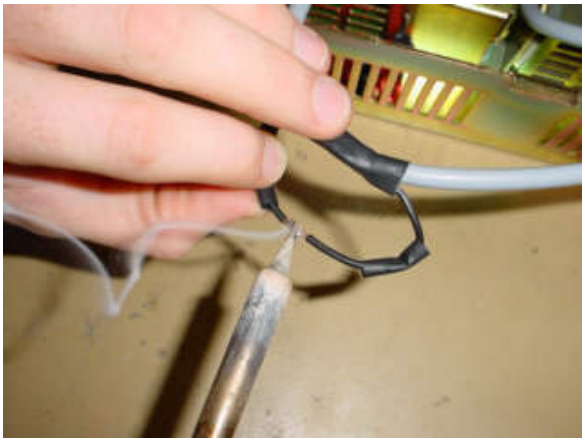
- Put two retractable Thermal corset as below. Solder the black cable

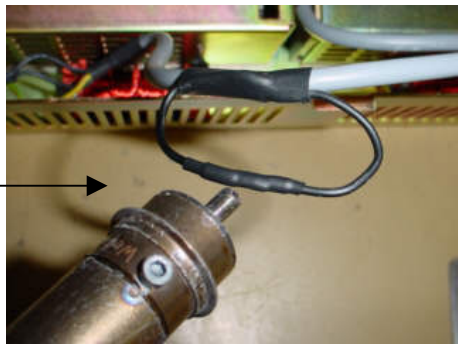




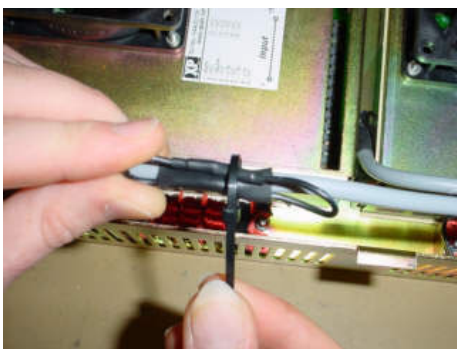
- With precaution, use “hot” tools to contract thermal corset. **One by one.**



Put the second corset on the first….



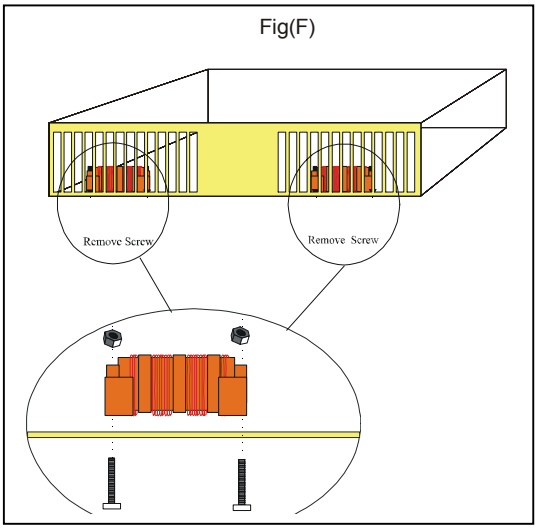
- Repeat the precedent operation with the second coil.
  - Replace all cable and fix it.





- It is possible to remove the unused coil.----------Fig(F)

Fig(F)



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9.B Incident report #4 : Sensoft 7.1.11

Dear Partners,

You will find enclosed to this e-mail the release 7.1.11 of Sensoft for and only for Compact Live and Essential plateforms (Not for SY-40 and LS).

This release corrects the following unfunctionings :

- Erroneous max delay on DI8 modules.
- Link between Inputs faders ans Masters.
- Start Up problem of the Mix Box when Sensoft is already launched.

This last unfunctionning is very important because if for any reason you lose the synchronization with the Mix Box, you ought to re-start all your system, Sensoft 7.1.11 fixes it.
Unzip and use the enclosed program to make a Sensoft 7.1.11 install floppy disk. Exit from Sensoft, put the floppy in the drive and type : a:update (enter to validate). At the message “Good Job”, remove the floppy and restart the desk. Don’t hesitate to contact us if you meet some problems.
Thank you for your attention

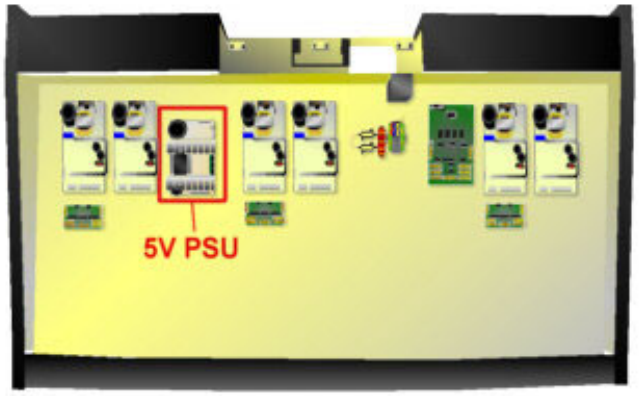
9.C Incident report #5 : Essential/Grand Live 5V PSU

In order to improve the reliability of the Essential/Grand Live serie’s consoles we have qualified a new version of 5V PSU which allows the use of the console in intensive environnements (warmth and sunlight) with all the label light at 100% and without causing any communication problem between the console and the internal PC.

Of course, This upgrade is HIGHLY RECOMMENDED.

The upgrade procedure is as following :

- Contact our service department (e-mail or fax) and give us the serial number of the console and the model of the actual 5V PSU in the console (NLP40-7605 or NFN40-7605) :



- The PSU kit (Ref :RLM110PS05) will be available for a price of 200 Euro (+ transport costs).

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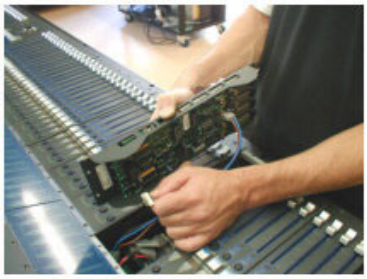
9.D Incident report #6 : Replacement of a chip on the Quadfad modules

One of our suppliers has sent us a potentially defective batch of a components used in the quadfads: the AD7226, four channels analog to digital converter for the faders tracks. It is likely that your Sy80 has been assembled with devices coming from this batch and therefore as a precaution we are sending you 20 devices (one for each Quadfad) to replace them.

To replace the AD7226

Ensure that the console is **switched off** and make sure that you are always in contact with the metallic chassis to avoid electrostatic discharges

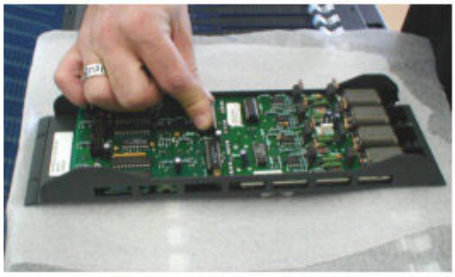
Follow the procedure shown below :



1- Disassemble the quadfad and disconnect the ribbon and power connector.



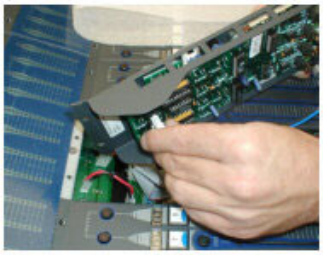
2- Remove with precaution the AD7226 device.



3- Put back the good Device, take care to the orientation. A bad orientation will destroy it.



4- Put back the Power connector



5- Put back the ribbon connector



6- Put back the Quadfad and do these operations for all the quadfads.

manufacturer to enable them to diagnose the problem. Would you please therefore return your old AD7226 devices to our service department .

Please contact us if you need more details or more help.

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9.E Incident report #8 : XO8D / DO8X /XO8D2 with Sy80

Dear Partners,

We have noticed that if you want to use more than 5 XO-8D/XO-8D2 or DO-8X plugged in one Mix Box, you can be confronted to a communication problem between Sensoft and these modules. The result is a bad detection by sensoft (you see 8 modules while you have installed 6, ...) a bad indication of board version (Ex :XO-8D 2.0 or 6.0 instead of 2.6), and surely some other that we haven't detect yet. In this situation the system is not able to work properly and we strongly advise to avoid this configuration.

Solution :

To solve this problem and give the possibility to use more than 5 local XO-8D/XO-8D2 or DO-8X we have developed an upgrade kit (two E-prom) which updates the firmware from v2.6 to v2.7 for the XO-8D2 and from v1.6 to v1.7 for the XO-8D and DO-8X.

This Kit is very easy to install and is delivered with a procedure. All the new plateforms will now be delivered with the kits already installed. For the other, the price of one kit is 23,50 euro (+ shipment cost).

Please send your order to Isabelle Tatrie (i.tatrie@innovason.com), the references are : **XO-8D2 2.7 Upgrade KIT, XO-8D 1.7 Upgrade KIT and DO-8X 1.7 Upgrade KIT.**

Thank you for your attention,

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