CANTAR X3

User Manual
Draft 1.3
Software v 1.62

AATON DIGITAL

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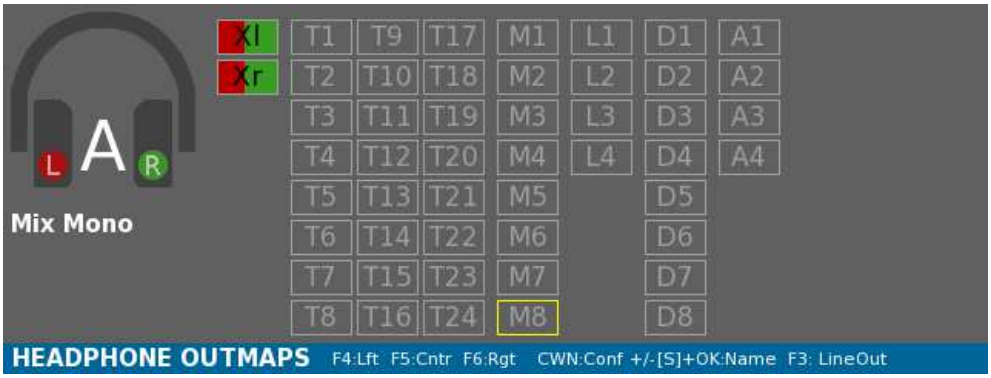
HEADPHONE

Headphone Outmaps can be modified while Main Selector is on 6 o'clock position.

You can configure up to 26 Headphone Out-maps (from 'A' to 'Z').



Pict. 01

I. Current Outmap

To go to next or previous Outmap, use the Left – Crown.

NB : Copy / Paste.
By Pressing Shift+F4, the current outmap is copied to the clipboard.
You can Paste it over any Outmap by pressing Shift + F6

II. Name

Each out-maps can be named (12 characters).

Press *Shift+Ok* to modify it.

Pict. 02

III. Inputs

Each input can be sent to Left and/or Right Ear.

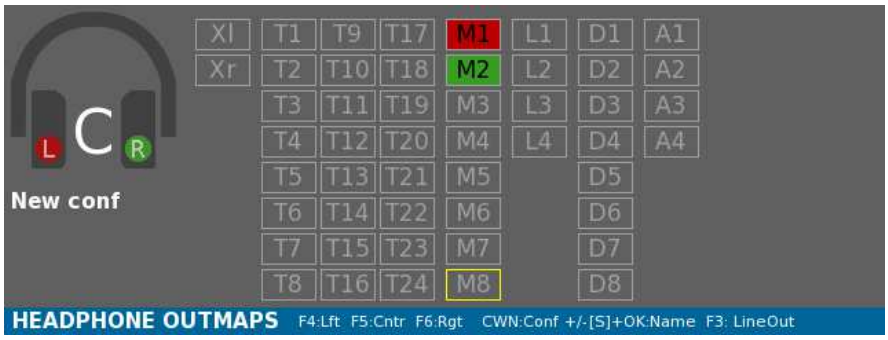
Left Ear is represented in RED.
Right Ear is represented in GREEN.

You can navigate through the input grid with Left-Right-Up-Down keys or using the Jogs.
Enable or disable Left mapping by pressing F4 key.
Enable or disable Right mapping by pressing F6 key.
Toggle between Left-Center-Right-Nothing by pressing F6 key.

An input sent to Left Ear will be colored in RED.
An input sent to Right Ear will be colored in GREEN.
An input sent to both Left and Right Ear will be colored in both colors.

Example :
- In Pict 01, Outmap 'A' : Mixdown Left and Right are sent to both ears.

- Pict 03, Outmap 'C'
  Mic 1 is sent to Left Ear
  Mic 2 to Right Ear.

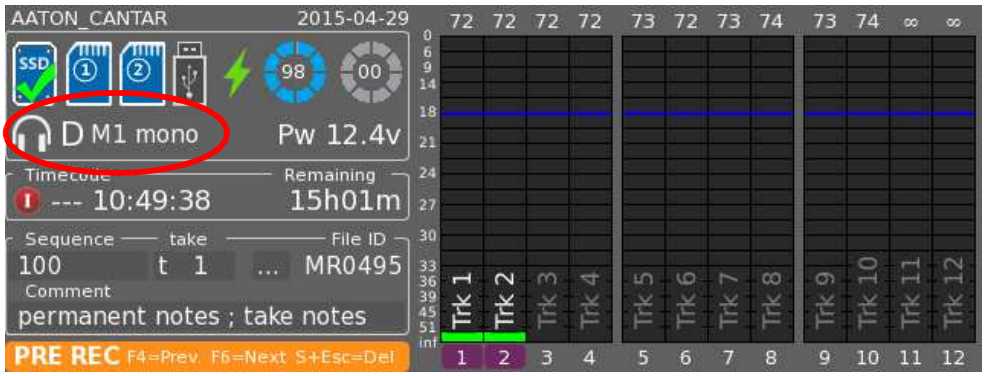


Pict. 03

IV. Other Main Selector Positions

When the Main Selector is on Pre Record, Record, Test position, the current Headphone Outmap is indicated bellow the medias.

Symbolised by a headphone, it displays the Outmap's letter and its name.



Pict. 04

You can directly change the current Headphone Outmap and go to previous or next with the Left Crown.

The letter and name will be updated.

By pressing the F2 key, you will see the Outmap grid (but the grid is only editable in 6 o'clock position).

Pict. 05

In that view it is also possible to use the Left Crown to go to previous or next Outmap.

LINE OUTPUTS

Cantar X3 offers 8 Line outputs.

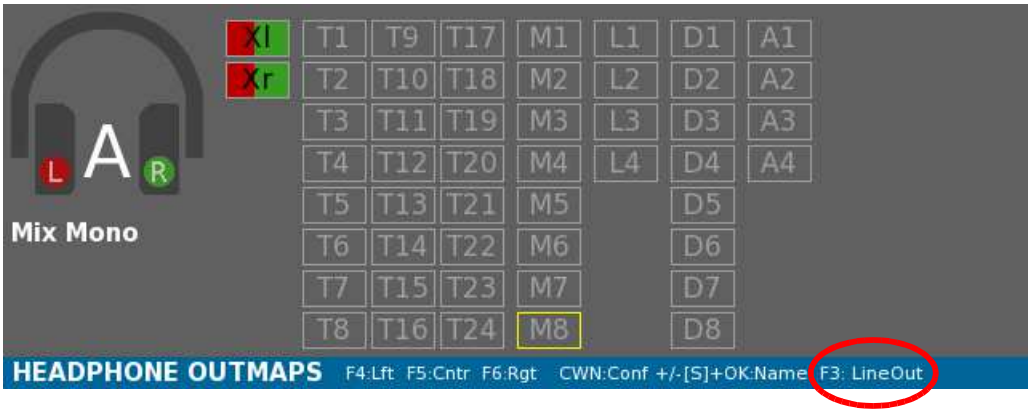
I. Outmaps

You can configure up to 26 Out-maps (from 'a' to 'z') applicable to each of the 8 outputs.

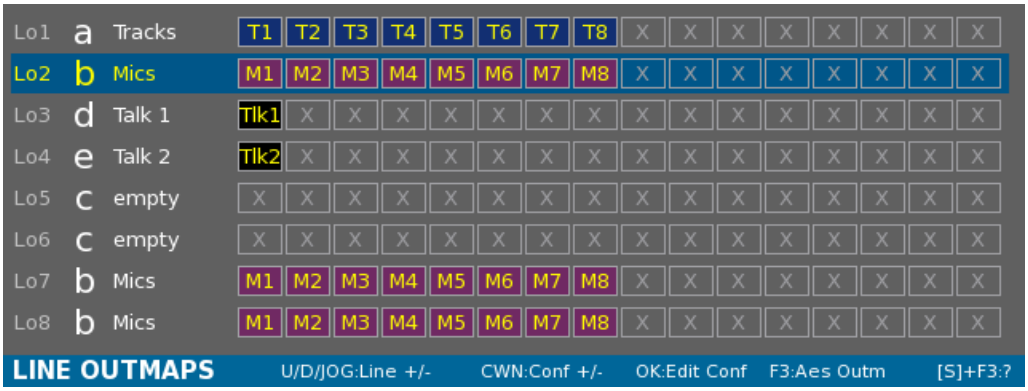
NB : Line and Aes Outmaps are shared. (Line Outmap 'a' is the same as Aes Outmap 'a').

Out-maps can be modified while MainSelector is on 6 o'clock position.

In that position, Headphone Outmaps are displayed but by pressing F3 key, you will access the Line Outmaps panel (another press on F3 will display the Aes Outmap panel).



Pict. 06



Pict. 07

Each row represents a Line Output.

In Pict 07: Line Out 1 has the Outmap 'a' which is named « Tracks ».
Tracks 1 to 8 are sent to Line Out 1.

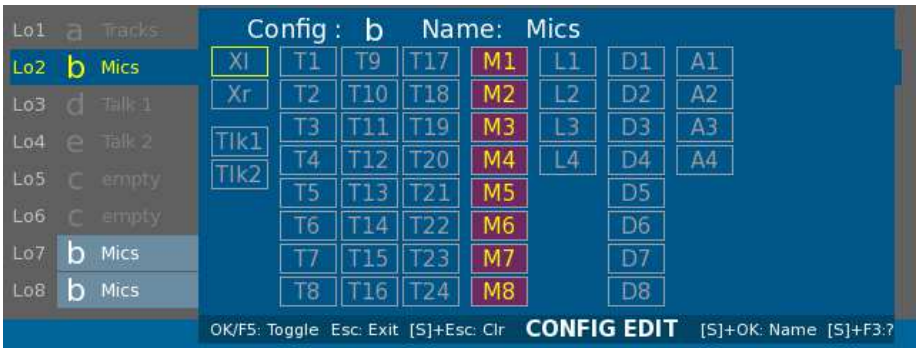
You can select a row using Up and Down keys.
Once a row is selected, the corresponding Outmap is applied on the Headphone ouput.

1. Current Outmap

You can change the Outmap applied to an Output by selecting its row and then move the Left Crown.
Letter, name and Outmap settings will be updated.

2. Change Outmap Inputs

Once a row is selected, press OK.It opens the Config Edit window.



Pict. 08

WARNING : Keep in mind that the configuration you are modifying can be applied to multiple outputs. Even more, as the outmaps are shared between Aes and Line Outputs it can also modify an Aes Output.

In Pict 08, outmap 'b' is applied to Lineout 2 but also to 7 and 8 (stated by the light-blue color). So any modification to 'b' will be on Lo 2,7,8.

Change to previous or next Outmap by moving the Left Crown.

i. Name

Each out-maps can be named (12 characters).
Press *Shift+Ok* to modify it.

ii. Inputs

Any Input can be sent to Line Output. Scroll through the grid with the direction keys or the jog and press OK to enable or disable an input.

iii. Talk

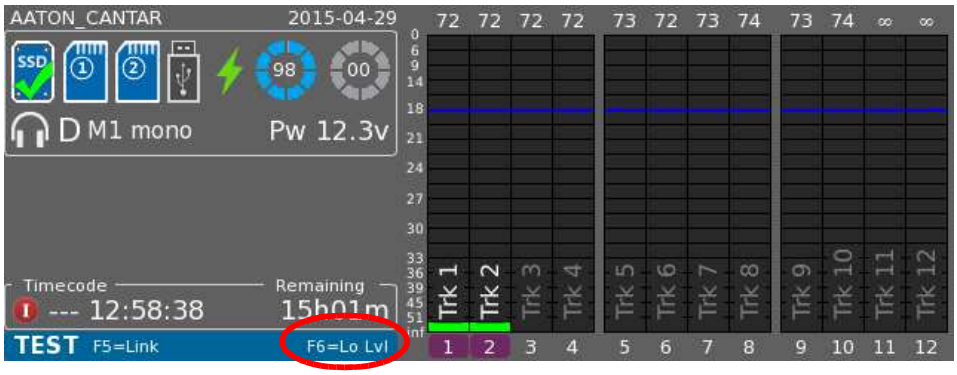
Compared to Headphone Outmap, you can choose Tlk1 and Tlk2.
It corresponds to the Talk keys.
Pressing those keys, enables the Slate Mic and the Jack 3,5mm Mic and will send the stream to the Headphones and to any outmap (Line, Aes, Dante) where the corresponding Talk function is routed.

In the previous example of the main view, Talk1 is routed to LineOut 3 and Talk2 to LineOut 4.
Pressing Talk 1 will send the Slate Mic to LineOut 3 but not on LineOut 4.
Pressing Talk 2 will send the Slate Mic to LineOut 4 but not on LineOut 3.

Note : Shift + Talk key sends to routed Outputs and to Tracks.

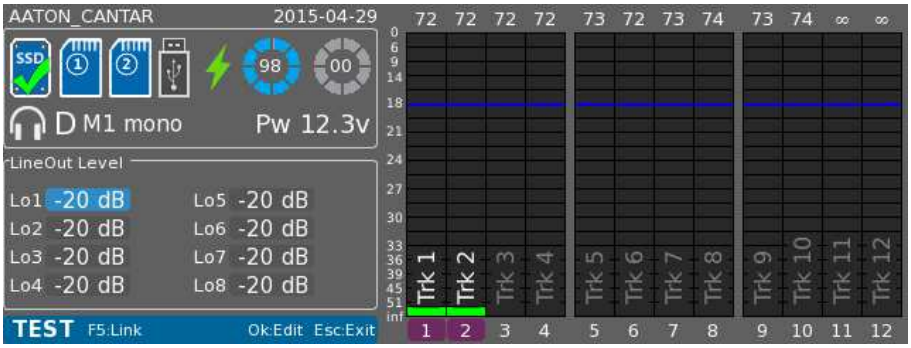
II. Outputs Levels

Outputs levels can be modified while MainSelector is on 10 o'clock position (TEST).



Pict. 09

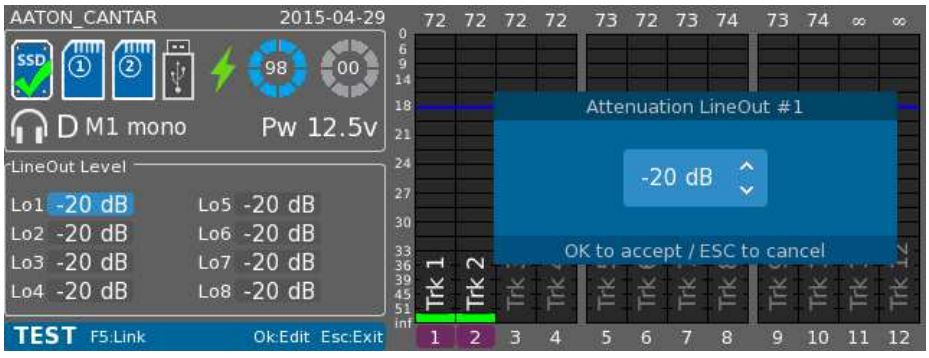
Press F6 key to open the Line Out Level Panel



Pict. 10

Using the direction Keys you can select the Line Ouput.

Press Ok to modify the Value



Pict. 11

AES OUTPUTS

Cantar X3 offers 8 Aes outputs.

I. Outmaps

You can configure up to 26 Out-maps (from 'a' to 'z') applicable to each of the 8 outputs.

NB : Line and Aes Outmaps are shared. (Aes Outmap 'a' is the same as Line Outmap 'a').

Out-maps can be modified while Main Selector is on 6 o'clock position.

In that position, Headphone Outmaps are displayed but by pressing F3 key twice, you will access the Aes Outmaps panel (another press on F3 will display the Headphone Outmap panel).

Please refer to the Line Outmap section.

DANTE OUTPUTS (optional)

Cantar X3 offers optionnaly 32 Dante outputs.

I. Outmaps

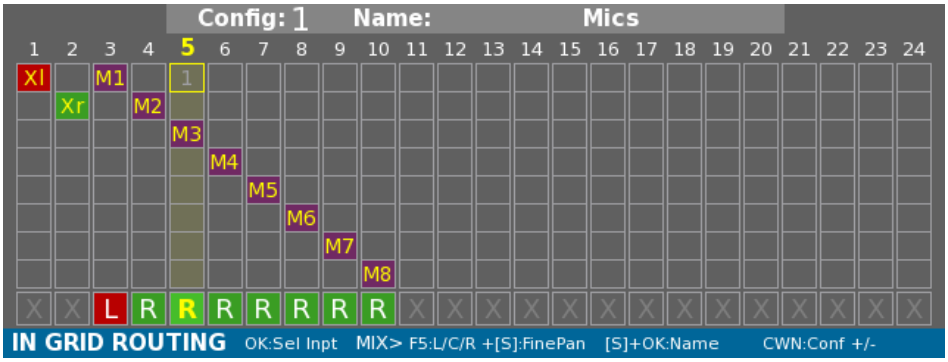
On the first 24 outputs (Dante Out 1 to Dante Out 24), are routed the Tracks (Track 1 to Track 24).

On the last 8 outputs (Dante 25 to Dante 32), the 8 Aes Outmaps are applied. (Do 1 to Do 8)

IN GRID ROUTING

In Grid routing can be modified while Main Selector is on 5 o'clock position.

You can configure up to 20 InGrid (from 1 to 20).



Pict. 12

I. Current Ingrid

You can change the InGrid applied move the Left Crown.
Number, name and InGrid settings will be updated.

NB : Copy / Paste.
By Pressing Shift+F4, the current InGrid is copied to the clipboard.
You can Paste it over any InGrid by pressing Shift + F6

II. Name

Each InGrid can be named (12 characters).
Press *Shift+Ok* to modify it.

III. Inputs

The In-Grid represents the 24 tracks with 24 columns.
On each column, 8 inputs can be routed.

On each row can be routed the corresponding input number i.e. on row 3 > Mic-3, Ms-M-3 Line-3, Digi-3, Aes42-3, Dante-3 (optional).

Last row displays the Pan-Pot to Mixdown.

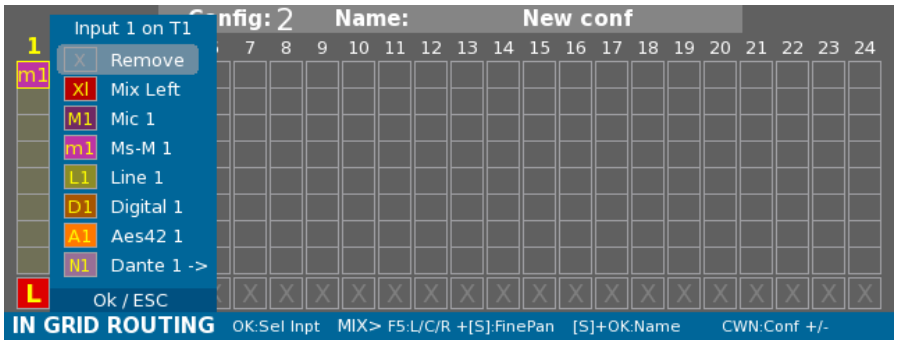
1. Inputs to tracks

Any input can be routed to any track (including Mixdown).

i. Add input

Use the direction keys to move the yellow selection box and select the wanted track and the input number.

Press Ok to display the Input choice Window.



Pict. 13

Use Up and Down keys to select the wanted input in the list and press OK.

NB: - Mix Left can only be accessed through Row 1
- Mix Right can only be accessed through Row 2
- Ms mics should be routed on adjacent tracks: M side on an impair Track Number and S side on the following track.
- When routing/removing a Ms-Mic, the other side (M or S) will be automatically routed/removed.
- For input number superior to 8: Dante (optional), an arrow is displayed, select the item and press Right/Left key to adjust the input number.

ii. Remove input

Use the direction keys to move the yellow selection box and select the wanted track and the input number.

- Press Ok to display the Input choice Window and choose "Remove".

Or - Double press Esc key

NB: All inputs routed to a track can be removed by holding the Esc key.

2. Pan-Pot to Mixdown

Each track can contribute to the Mixdown through the PanPot.
Pan-pot is represented on the last row and indicates each track contribution to the Mixdown Left and Right.

L means the track is sent to Mix-Left.
R means the track is sent to Mix-Right.
C means the track is sent to both Mix-Left and Mix-Right.
X means the track is not sent to Mixdown.

Exple: On Pict. 12, - track 3 is sent to Midown-Left
- tracks 4 to 10 are sent to Mixdown-Right
- other tracks are not sent to Mixdown (track 1 and 2 cannot for obvious reason by sent to Mixdown)

F4 key toggles Left contribution.
F6 key toggles Right contribution.

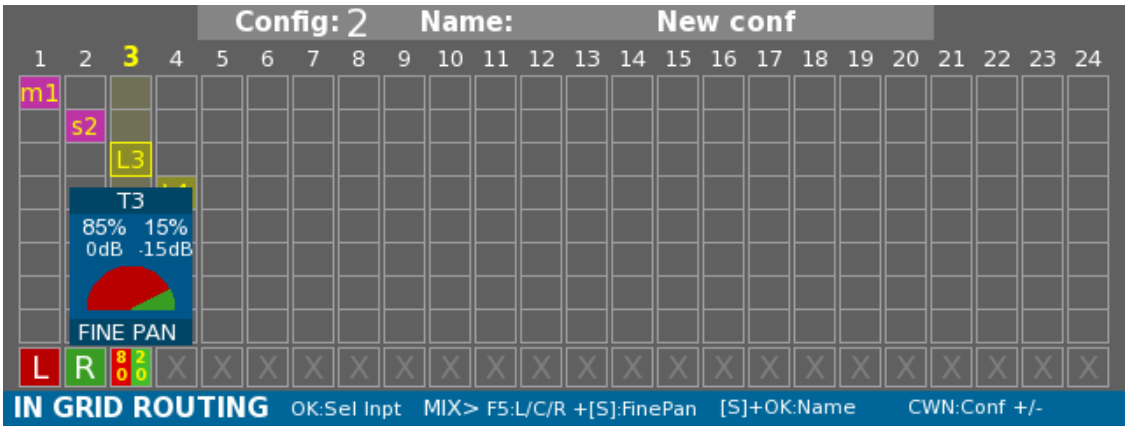
F5 key toggles between the L, R, C, X options.

NB: - If a stereo pair (Ms mic) is routed and each side is sent to Mixdown respectively Left and Right or both sides to Center, then Ms will be decoded into the Mixdown.

It is also possible to have more precision: Fine Pan.

The Pan-Pot letter is replaced by a percentage representing how the track is sent to Mixdown Left and Right.

Access the Fine Pan setting Window by pressing Shift + F5 key.



Pict. 14

Balance is set using Left and Right keys, each track contribution will be displayed in percentage and dB.

PRE RECORD

I. Ppr functionality

Pre Record Position is at 11 o'clock position and allows 3 important functions while displaying the main informations regarding the record session.

1. Ppr Buffer

While Main Selector is on PPR Position, the Cantar activates its Pre Record Buffer.
The pre-record buffer stores the audio in a First-In/First-Out (FIFO) buffer memory and dumps them to the recording media as soon as REC is activated.
Once the buffer is full, up to 10 sec. @ 48kHz, it starts discarding the First-In audio.

2. Metadata Edit

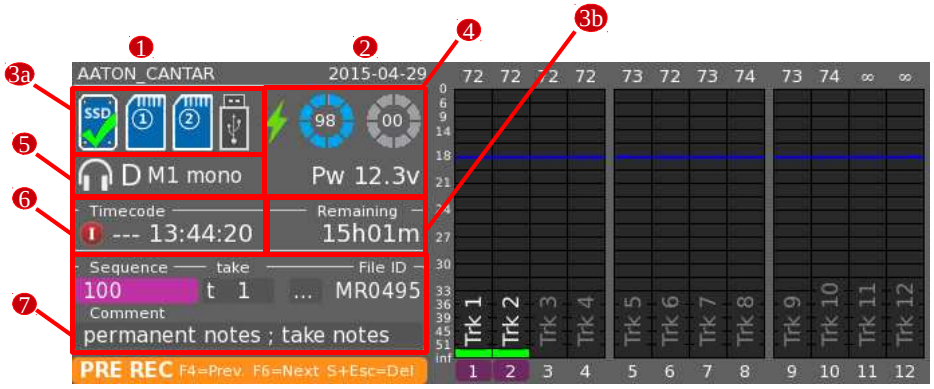
You can edit the previous or the next take metadatas.

3. Previous take trash

After a record, you can simply put the last take to a trash.

NB: Unused -not routed on current Ingrid or current Outmaps (Headphone, Line, Aes)- analog inputs are automatically turned off in order to save power. If a configuration number is changed and an unused inputs become used, it will be turned on automatically.

II. Global Screen presentation



Pict. 16

This screen is divided into 2 parts : Vu-meters and Record informations.

On the left part, Record Informations, from top to bottom :

- Recording Project Name(❶) and Recording Date (❷)
- Media State (❸a) (Internal SSD, SD 1, SD 2, USB).
- Remaining Time (❸b).
  The remaining recording time according to the Record parameters (tracks, frequency, bits depth) and to the smallest remaining free space above the recording Media.
- Power Informations (❹) : External Power, Batt-1, Batt-2.
  If no External Power, it displays the remaining time calculated by the batteries.
- Current Headphone Outmap (❺).
- Timecode Information (❻).
- Next Record Metadata : Scene – Take – Notes (❼).
- Track Mix Level (according to Display Track Level option will replace ❻+ ❼).

III. Medias State

- Grey : Not present, not used.

- Blue : Present, not used.

- Blue, green check : Present, used by a Recording process.

- Blue, red check : Not Present or Faulty, used by a Recording process
  > WARNING, please check

- Red and Orange : Slow medias.

  Cantar uses its Audio Buffer to deal with slow media but if your media is not fast enough according to the record parameters (tracks, sample rate, bits depth), it will warns you.
  > Orange = warning this media is slow, end of record may take a while in order to flush the Audio buffer.
  > Red = Alert very slow media, record may fail if the Audio buffer is fully filled.

NB: While 3 Usb ports are available, only one will be used: the first which was plugged and mounted.

IV. Metadatas

1. Next Record

i. Quick Edit (Scene-Take-Notes) : Directly in Ppr Menu

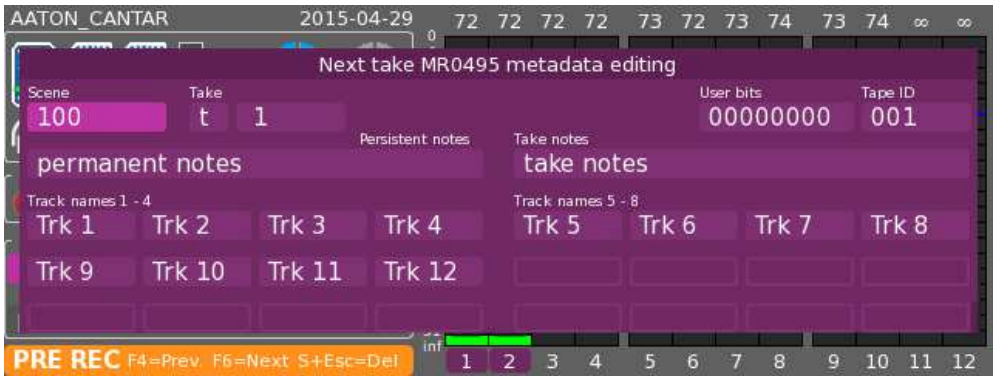
Once the pink selection box is displayed (if not available, press Ok), select the field you want to change and press Ok.
You will be able to modify the value with the direction keys and Jog.

Take type : Change Next Take Type by pressing F4

The « ... » field open the Full Edition Window.

ii. Full Edit

Press F6 to open the Full Metadata Edit Window.



Pict. 17

Select the wanted field and press OK to enter Edit mode.

NB : - Notes field is made of Persistent notes (which is repeated from take to take) plus Take notes (which will be cleared at take end).
- Changing the Scene resets the Take Number to '1'
- Take Number is automatically increased after each take.
- Take-gender:

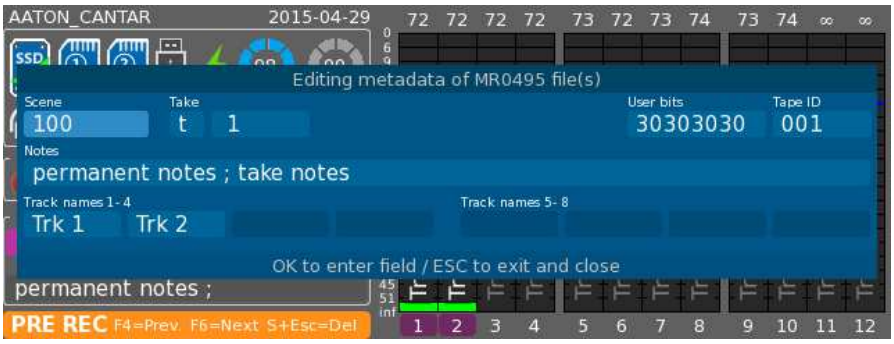
't' = time synced; 'p' = pick-up ; 'w' = wild take ; 'a' = announce ; 'n' = no good ; 'r' = rehearsal ; 'g' = sound guide

If a take is marked 'n', the take number will not be increased automatically.

- Clear Field: Press Shift + Esc keys.

2. Previous Record

Press F4 to open the Previous Full Metadata Edit Window.



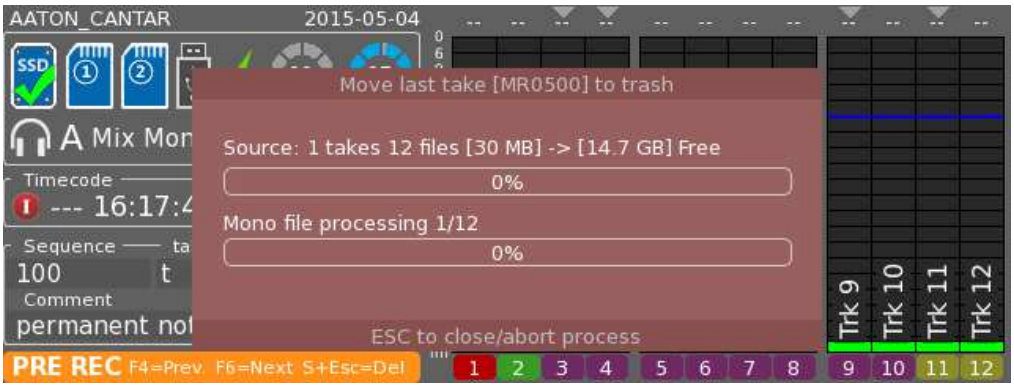
Pict. 18

Select the wanted field and press OK to enter Edit mode.

V. Trash

Cantar lets you trash the last take, e.g. a false start or aborted remix. In PPR, press Shift + Escape key.
The file is not erased, but moved to a folder name "AUDIO_TRASH".

The next take will carry the same take number as the erased one.



Pict. 19

NB: - This Trash function is also accessible in Browse File Menu.
- If trashing a take was a mistake, it is still possible to move it back to the day folder from the Backup Menu.
- To fully erase a take, apply the same procedure to files from Audio_Trash folder in Browse File Menu.

VI. Solo

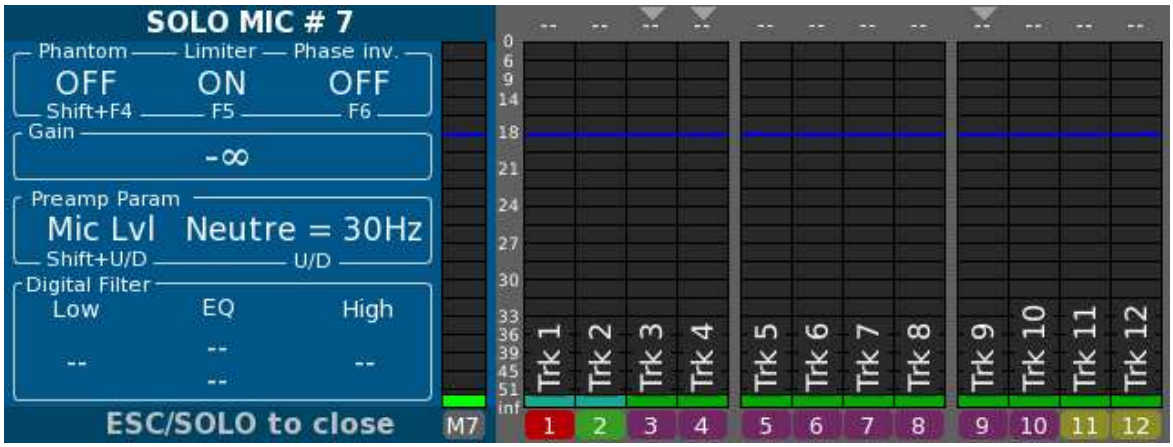
It's possible to have a direct monitoring of each input and output through Solo. Solo patches directly to headphones.
Solos can be accessed in Record, Ppr and Test positions.

Through Solo, many parameters can also be modified (Phantom, limiter, filter).
It is also a way of modifying attenuation of inputs which have no actuator assigned.

To activate a solo, press the Solo key of the wanted input. A short-press on the Solo key will open the Solo Window until it's closed by pressing the Solo key again or Escape key. If Solo

key is pressed and hold, the Solo Window will be closed upon release of the Solo key.
Press another Solo key to change Solo or use the Left-Crown to go to next/previous Solo.

1. Mic



Pict. 20

i. Phantom

Toggle Phantom Mic 48V Power with Shift + F4 key.
Turn it 'OFF' while using a dynamic microphone, the preamp gain will be boosted by +12dBu.

ii. Limiter

Toggle Limiter On/Off with F5 key.

While the limiter is turned 'ON', a grey triangle is displayed above the track where the mic is routed. If the signal level reaches the limiter zone (–6dBFS), the triangle will start blinking yellow. In 24-bit recording mode, it is common practice to adjust the input gain so that a 'normal' signal does not go over the -20dBFS level.
Limiter activated, the 32dBu head-room above the –8dBFS kick-in point gives 24dBu above the 'no-limiter' full scale. The Operator can count on a 44dBu reserve over the normal –20dBFS level.
If the signal does reach the 0dBFS level, a 'clip' red level appears above the top of the modulometer scale.

To maintain equilibrium between linked channels, the same limiter command is applied to ganged preamps.

iii. Phase Inv.

Toggle Limiter On/Off with F6 key.
NB: It is also possible out of the Solo Window to toggle Inversion by pressing Shift + Solo key.

iv. Filters

Change Filter with Up and Down keys.

As a basis, Cantar X3 implements an anti-rumble filter which is a 3rd order filter at 30 Hz (-3db attenuation and a slope of -18 dB per octave). This is the neutral position.
Then, three banks offer corner frequencies/slopes from 60Hz/–6dB to 180Hz/–12dB.

v. Attenuator

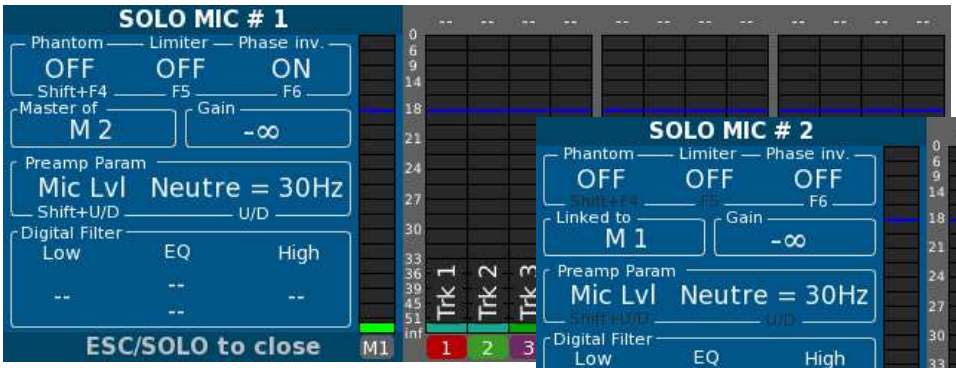
Toggle between Mic Level, High Level & Line Level with Shift + Up or Down keys.

Mic Level: default for all mic inputs.
High Level: a 26dBu attenuator converts mic to high level inputs.
Line Level: a 38dBu attenuator converts mic to line inputs.

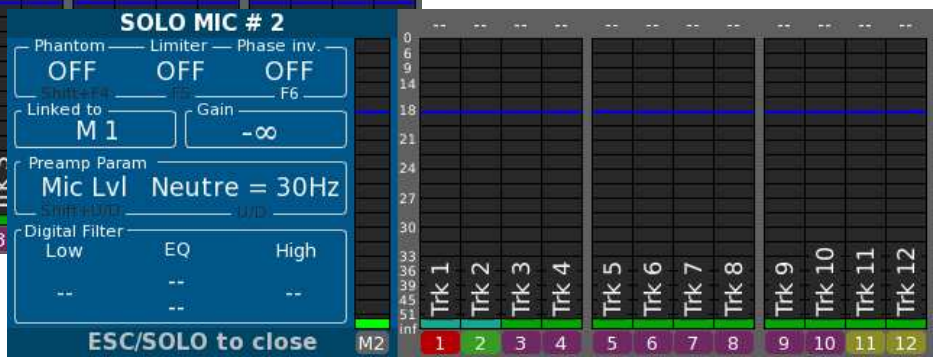
NB: Activating High Level or Line Level automatically cuts off Phantom Power.

vi. Link

For linked mic, it is indicated wether it is a master of other mics or it is linked to a master.
For slaved inputs, Limiter, Phantom power, attenuator, filters are set by master's parameters and cannot be changed.

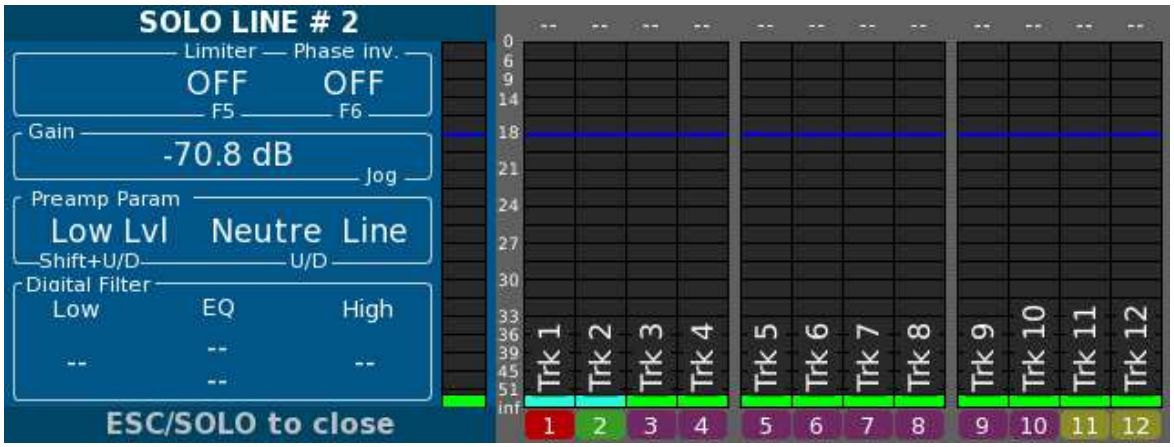


Pict. 21



Pict. 22

2. Line



Pict. 23

i. Attenuation

If a line input is not assigned to an actuator, its attenuation can be changed during Solo by moving the Jog.

ii. Attenuator

Toggle between High Level & Low Level with Shift + Up or Down keys.

Low Level: default for all line inputs.
High Level: a 20dBu attenuator is applied.

iii. Filter

Change Filter with Up and Down keys between Neutre, 60Hz/–6dB and 60Hz/–12dB.

iv. Other parameters

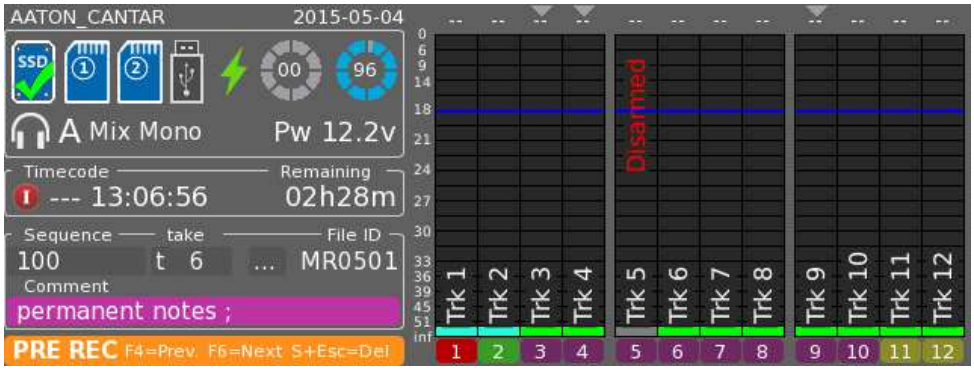
Please refer to Solo-Mic section.

3. Track

Pict. 24

i. Status (Track Disarming)

Toggle between On & Off with F3 key to arm or dis-arm a track.
Monophonic multi-track file recording doesn't waste disk space by recording empty tracks as is the case with polyphonic. It is wise to momentarily disarm a track when there is no use for it.
Disarmed tracks have their vumeters painted in grey and a red 'disarmed' icon displayed.



Pict. 25

NB: It is also possible out of Solo window to toggle Status in TEST or PPR, by pressing Shift + Solo key of the unwanted track.

ii. Mixdown PanPot

Toggle between Left, Right and Center with F4,F5 and F6 keys.
Access to Fine Pan through Shift + F5 key.

Nb: For Mixdown tracks, this item is inactive.

iii. Track Name

Edit track name with Ok key. Once in edit mode, Escape key to Cancel, Ok key to validate.

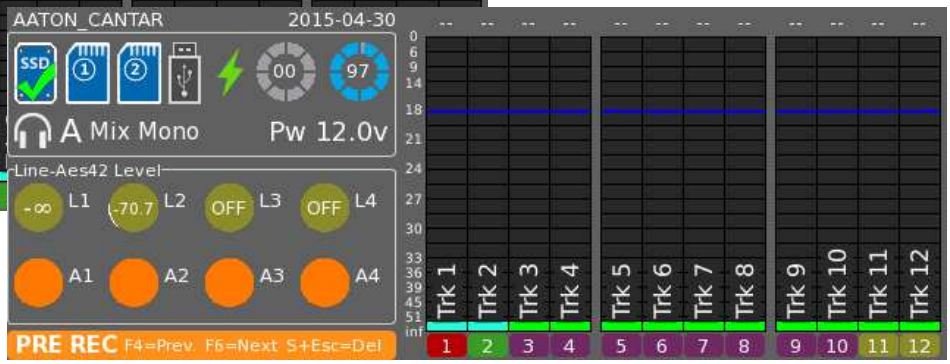
iv. Attenuation

If a track is not assigned to an actuator, its attenuation can be changed during Solo by moving the Jog.

VII. Levels

1. Inputs

Pict .26



Pict .27

In Record, Ppr, and Test positions, inputs levels can be displayed, as soon as a change occurs, replacing temporarily the metadata and timecode informations.

This feature can be enabled/disabled in the Technical Menu, item "Display Inputs Level".
If enabled, precision can be set: +/-0,1 dB; +/-0,5 dB; +/-1dB.

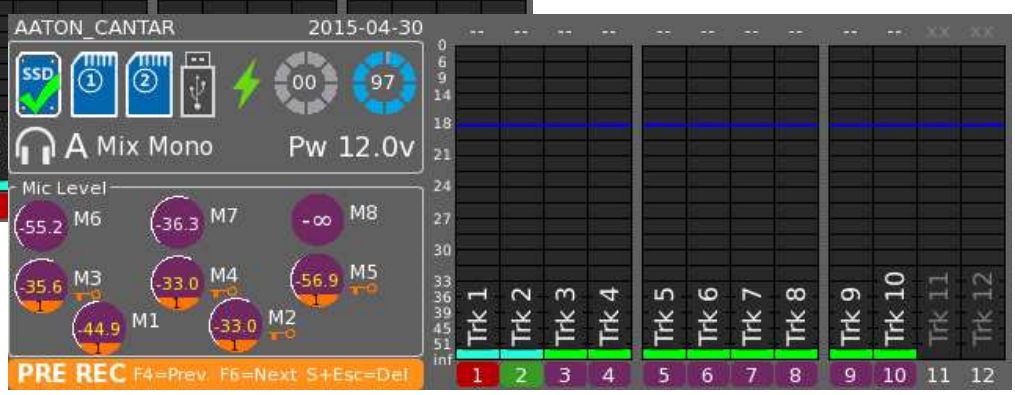
NB: - If an analog input is marked "OFF", it is because it is not used on current Ingrid or any Outmaps (Headphone, Line, Aes). So in order to save Power, the Cantar switches this input off.
- Inputs Level can be represented as circles if they are driven by a potentiometer (or jog for Lines and Aes42) or as a rectangle if they are driven by a fader or by the Cantarem.

i. Linked Inputs

Inputs can be linked. (see Link Inputs in Test Menu section)

Linked inputs have their lower part coloured (one colour per group) and the group number is displayed.
If the balance is locked (lock/unlock Balance in Audio/Timecode Menu), a key is displayed on the side.

Pict .28



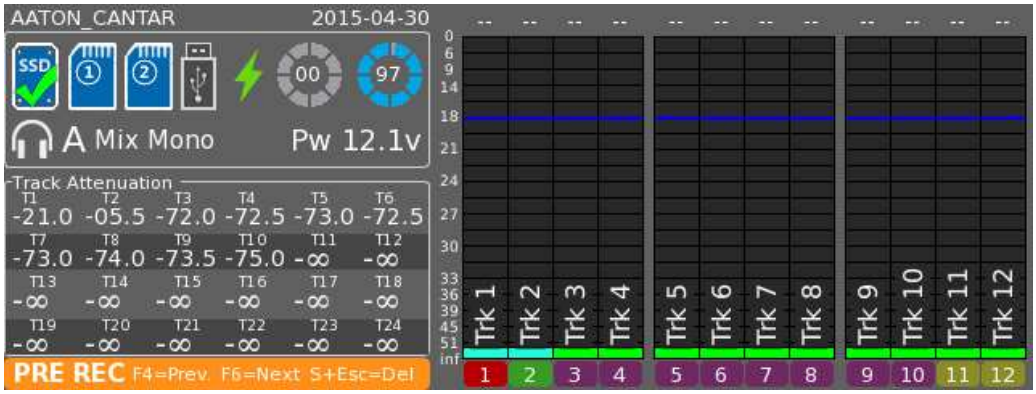
Pict .29

2. Tracks

In Record, Ppr, and Test positions, tracks attenuation can be displayed as soon as it changes.

This feature can be enabled/disabled in the Technical Menu, item “Display Trcks Att.”.

If “Dedicated Panel” is selected, the metadata and timecode informations will be replaced temporarily when the attenuation is changed. The track level is in that case displayed above the vumeters.



Pict .30

NB: If “Top of Vumeter” is selected, tracks attenuation will be displayed above vumeters.

VIII. Tone Generator

In TEST, PPR or REC, Shift + F5 key sends a 1kHz tone to the tracks, modulometers and mixdown. The level of the tone can be set in Audio Parameters Menu.
Releasing Shift key before F5 key locks the tone 'ON'; pressing Shift turns it 'OFF'.

IX. Talk

Pressing the Talk keys, enables the Slate Mic and the Jack 3,5mm Mic and will send the stream to the Headphones and to any outmap (Line, Aes, Dante) where the corresponding Talk function is routed.
Pressing Shift + Talk key will also sends the Talk stream to the Tracks.

X. Assignation

Mixer and Cantarem (if connected) actuators can be assigned to any input (Mic, Line) or track or Line out level.

NB: When a Cantarem is connected, its assignments override other actuators' assignments, making them unassigned.

1. Potentiometer

Those actuators cannot be assigned to anything but Mics.
If a Mic is assigned elsewhere, the potentiometer becomes unassigned.

2. Mixer Fader

To open the Assignation Window, press Shift + Mixer Slider Solo key.

Pict. 31

Assignation is changed by pressing Up and Down keys.
Go to next/previous actuator using Left Crown.

3. Cantarem (if connected)

To open the Assignation Window, press Shift on the Cantarem (diamond key) + Slider Solo key on the Cantarem.

Pict. 32

Assignation is changed by pressing Up and Down keys.
Go to next/previous actuator using Left Crown.

XI. Timecode

1. State

Timecode source can be chosen in Audio & Timecode Menu. It either can be Internal or External.

It is symbolized in Record, Ppr, Test and Stop Menus by a round icon with the letter 'E' for External and 'I' for internal.

This icon can be:

- Green: Timecode is initialized. E I
- Orange blinking: Timecode jamming. E I
- Red: Timecode not initialized. E I

At startup you will notice the timecode icon is red, this reminds you to verify the timecode state.

1. Internal Source Timecode Methods

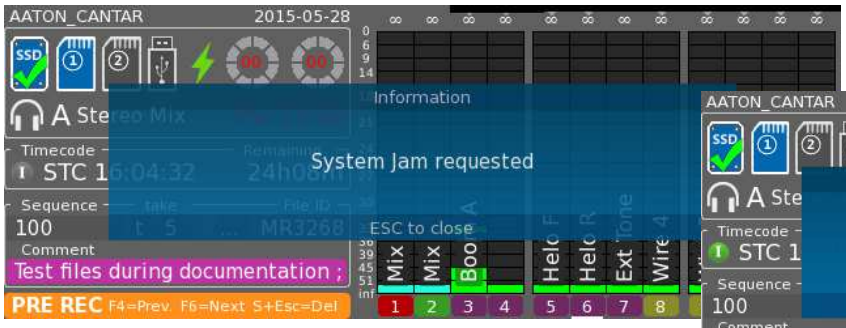
i. Internal Free-Run master clock

The internal TCXO 1ppm 'Sync Clock' keeps the time accurate to within ±0,5 frame in eight hours; this time is used to stamp the sound files with the very same TC as the one stamped on the camera's images (AatonCode method called 'Free-Run TC' in the video world).
Once initialized Cantar behaves as a master-clock.

Internal 'Sync Clock' initialization choices:

a. Calendar init.

At startup, Cantar reads the system's calendar date and time to initialize the 'Sync Clock', 'Stc' (System-TC) is displayed in the timecode area.
To remind you to sync other equipment around to the Cantar 'Sync Clock', the icon stays red until you press Shift + F3 key in order to confirm System Time as Timecode.



Pict. 33

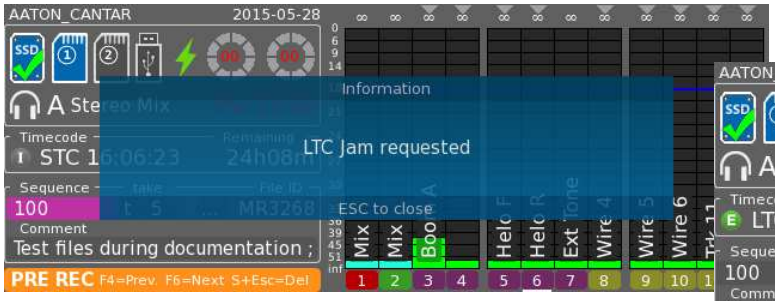
Pict. 34

b. Operator init.

If you want to set the 'Sync Clock' with your own time, go to Audio & Timecode Menu and choose 'Set Operator Tc'. 'Otc' (Operator-TC) is displayed in the timecode area.

c. LTC init. & control (from camera, GPS, or Cantar) LTC-out

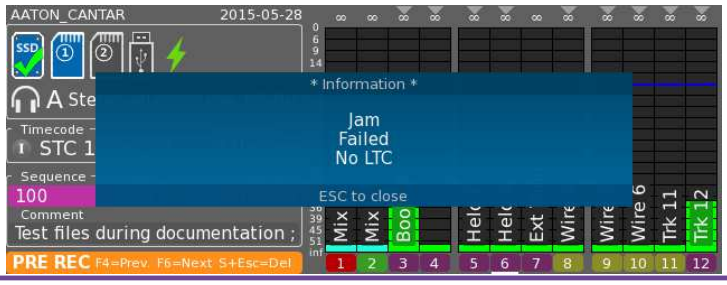
Press F3 key for more than three seconds; the entered LTC jams the internal 'Sync Clock', 'Jtc' (Jammed-TC) is displayed in the timecode area.



Pict. 35

Pict. 36

Jam has no effect if there is no valid timecode on the TC input, 'Jam Failed' appears.



Pict. 37

d. ASCII init (from Aaton OriginC)

On STOP, the 'Sync Clock' is set by an Aaton OriginC which also initializes cameras and GMT generators. 'Atc' (ASCII-TC) appears in the timecode area.

ii. internal Record-Run driving clock

Go to Audio & Timecode Menu, choose 'Set RecRun Tc', 01:00:00 is proposed as the first TC of the day (it can be modified). From now on, at the beginning of each audio file Cantar will stamp a start-TC incremented by two seconds later than the preceding take's end-TC. This clocking, called Record-Run, produces audio files which appear as if they have been recorded in continuity.
If for some reason Cantar is turned 'OFF', the Record-Run TC must be initialized again. To prevent any TC overlap, Cantar proposes to start on the next hour integer, e.g. if the last recorded take has been closed at 01:34:15, the next start-TC proposed to the Operator will be 02:00:00.
The Cantar Record-Run mode lets you use the pre-record buffer without creating TC overlaps. For example, if the preceding take ends at 01:45:00, and the pre-record buffer is set at thirteen seconds, the next audio file will start at 01:45:02.

iii. internal clock, AutoSlate on clapsticks

If the same TC is not running in Cantar and cameras, the only way to sync pictures and audio is to use clapsticks; forget digi-slates, they have too many drawbacks. The Cantar AutoSlate sample-accurate clapstick detection function puts a timecode crown over the simplest piece of wood.

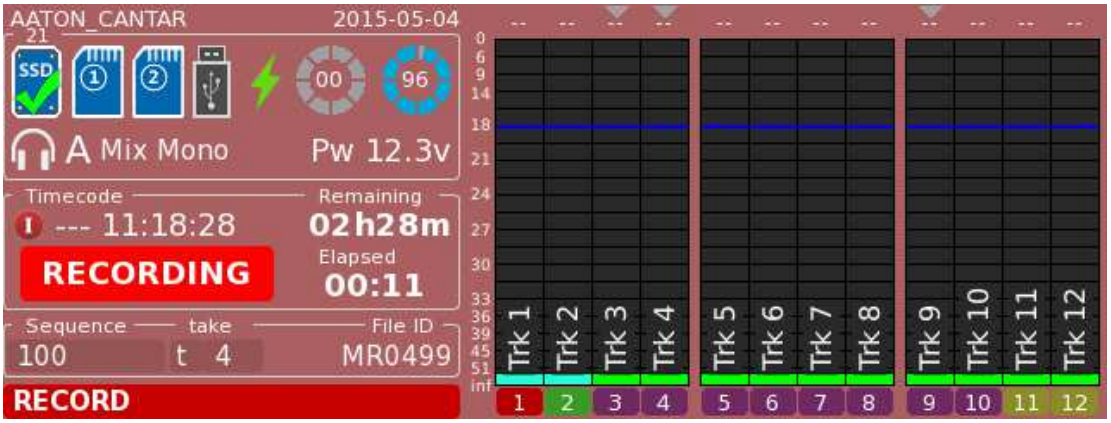
2. External Source

An externally-slaved Cantar stamps the audio files with the same TC as the one running in the video camera. This requires a link from the camera to Cantar.
Set 'Tc Source' to 'Ext. Clock' in Audio & Timecode Menu.
The 'E' timecode icon will blink in the timecode area, meaning that Cantar is waiting to be slaved to an external LTC, e.g. a video camera.
Cantar is usually in REC before the camera, so it monitors the Lemo 5 incoming LTC and grabs it when coherent TC is received. That is why the timecode icon keeps blinking orange indicating a timecode Jam, until the camera is up to speed.
Before closing the audio file, Cantar stamps the TC by using the latest valid timecode so as to eliminate spurious transmission errors and false camera starts. If there is no external timecode signal, an 'LTC Not Detected' warning appears.
Nevertheless, the external TC is grabbed if it is received before the take's end.

RECORD

Record position is at 12 o'clock position.
The background of the screen is Red during the whole Record Session and the Led of the Heaphone button is flashing.
NB: Be careful that after cutting the record and going back to Ppr or Test, the screen may remain red as Cantar is flushing internal Audio Buffers on the record media.

Monophonic Recording : As basis of the sound, monophonic recording is mandatory. So the Cantar won't let the record begin if not at least one monophonic process is selected on a media.



Pict. 38

I. Medias State

Please refer to Ppr section.

II. Solo

Please refer to Ppr section.

III. Metadata

During Record, only the take type can be modified, by pressing F5 key.

IV. Sync Points

1. Slate Detection

This is the most precise and simplest method ever invented to sync images and sounds.
In Audio Menu, select the slate detection channel.

While in REC, press Shift + F4 key within six seconds after a clapstick; the most plosive event preceding Shift + F4 key creates a Slate Mark. The successive slates generated by a multi-camera shoot are labeled SA, SB... SG. A maximum of 10 slates can be recorded.

The clapstick quality is displayed in the rectangular screen, 25% should be a minimum; at 75% score, you can congratulate the slateman!

If you forget to press Shift + F4 key, AutoSlate detects the most plosive sound of the take with a 95% chance of selecting the clapstick; in this case the Sound-Report's Slate-TC appears in 'Italic' to show it must be either confirmed or ignored.

2. User Marker

Press Shift + F6 key to create tabs labeled UM1, UM2... UM10 on wind clicks, boom noise, dialogue slip, etc..

V. Levels

Please refer to Ppr section.

VI. Tone Generator

Please refer to Ppr section.

VII. Talk

Please refer to Ppr section.

VIII. Timecode

Please refer to Ppr section.

TEST

Main Selector is on 10 o'clock position.

This Menu enables to set up the inputs (Phantom, Phase Inverse, Filter).
All analog inputs are powered on (contrarily of Ppr Menu where only the used inputs are powered on).

I. Link Inputs

You can slave one or multiple analog inputs to a master by declaring a Link group.
6 Link groups can be declared, 4 for Mics and 2 for Line.

Each group as a master:
Group-1: Mic-1 master; Group-2: Mic-3; Group-3: Mic-5; Group-4: Mic-7.
Group-5: Line-1; Group-6: Line-3.

A master can be linked to the superior inputs (e.g. M-3 can be linked to M-4 to M-8).

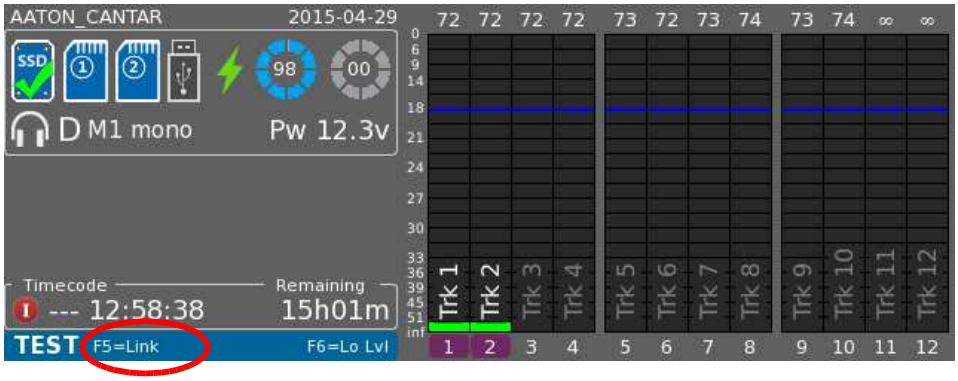
NB: - Stereo-pairs 1>2; 3> 4; 5>6; 7>8
- Surround: 1>2-3-4-5
- Double M/S: 1>2 & 3>4.5

Phantom, Limiter and filter are applied on slaves identically to the linked master.
Phase inverters remain independent.

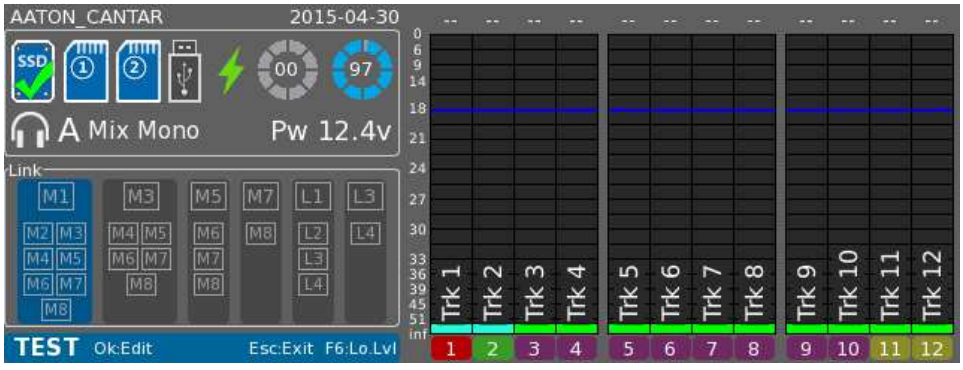
For a stereo pair, slaved input is the balance. Before its actuator middle-point (potentiometer, fader, cantarem) slave level is attenuated, after the middle-point, master's level is attenuated.

If there is more than one slave, slave's actuator position determines the ± 12dB gain applied from it's master value.

To show the Link Panel, press the F5 key.



Pict. 39



Pict. 40

Group can be selected with Left and Right keys. Edition is made through Ok key.

Depending on the Group Number, a slave list will be built.

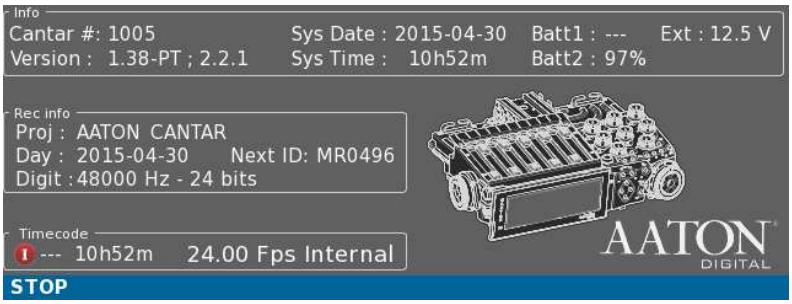
Pict. 41

II. Line Outputs Levels

Please refer to Line Outputs section.

STOP

Main Selector is on 9 o'clock position.
This position is a low-power position.



Pict. 42

I. Power On/Off

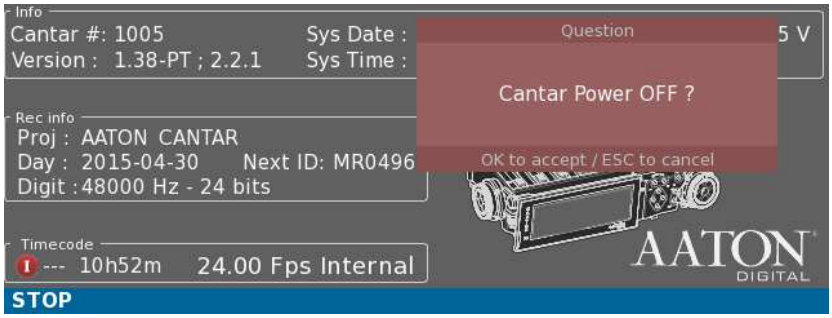
1. Power On

Press Power On/Off button to switch your Cantar On.
A few leds should power on.
A Cantar X3 logo will be displayed with a progress bar showing the system's loading.

Pict. 43

2. Power On

While in Stop Menu, press Power On/Off button.
Accept the confirmation window to turn your recorder Off.



Pict. 44

NB: Emergency shutdown. Cantar can be switched off if you press for more than 10 seconds on the Power On/Off button.

II. Rescue Mode

In case of a wrong shutdown sequence (power down due to end of power supply, emergency shutdown, system problem), Cantar detects it and launch a special mode with minimum system loading.

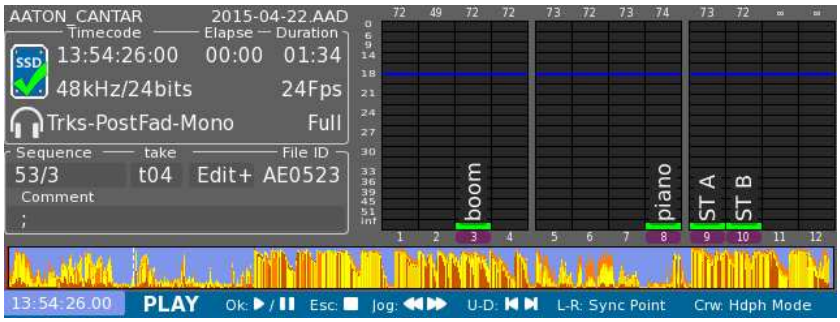
This mode enables to Reboot the machine, Shut it down or load a new firmware.

Choose the option with Up and Down keys and press Ok key to validate.

PLAY

Main Selector is on 8 o'clock position.

This Menu enables to play the audio files contained in the Project and Day Folder chosen into Browse File Menu.
For Cantar-X3 files, it displays a waveform calculated during the record and the sync points marked.

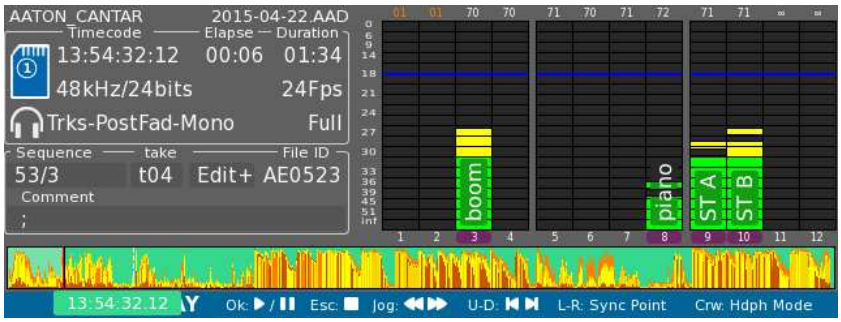


Pict. 45

I. Commands

Play-Pause: Ok key.
Stop: Esc key.

During Stop or Pause, the background of the timeline is blue (Pict. 45), during play it's green (Pict. 46).



Pict. 46

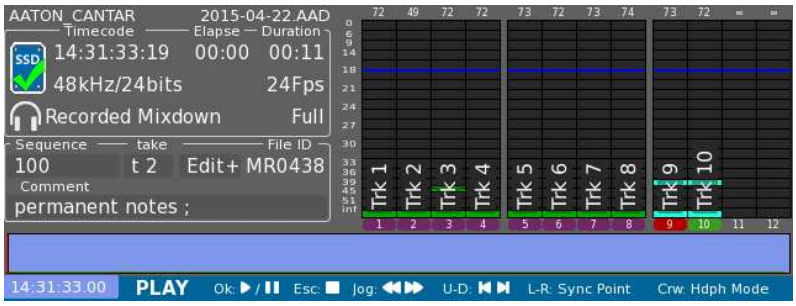
Scroll in file: Jog.
Next/Previous file: Up and Down keys.
Go to next/previous sync point: Left and Right keys.
Change Headphone Mode: Left-Crown.
View current Headphone Outmap: F2 key.
Edit Metadata: F4 key.
View take Ingrid: F1 key.

II. Headphone Modes

In Play, 3 Headphone Outmap modes are available:
- "Recorded Mixdown": Mixdown tracks played Pre-Fader, Mono
- "Trks-PostFad-Mono": Non-Mixdown tracks played Post-Fader, Mono
- User Outmaps "A" to "Z": Tracks played Post-fade according to User defined Outmap.

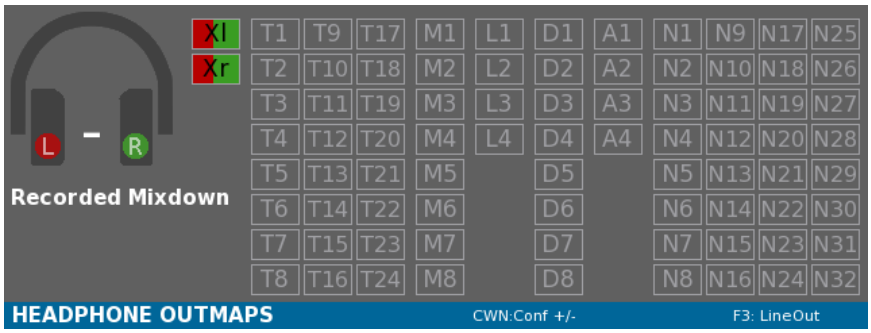
1. Recorded Mixdown

In this mode, are sent to headphone, Tracks corresponding to Mixdown-Left and Mixdown-Right. Tracks will be routed Mono (to both left and right ears), Pre-Fader (track level as recorded) Vumeters from other tracks than Mixdown are darken.



Pict. 47

This mode is symbolised on the Headphone Outmap grid by Xl and Xr inputs being active, at Center.



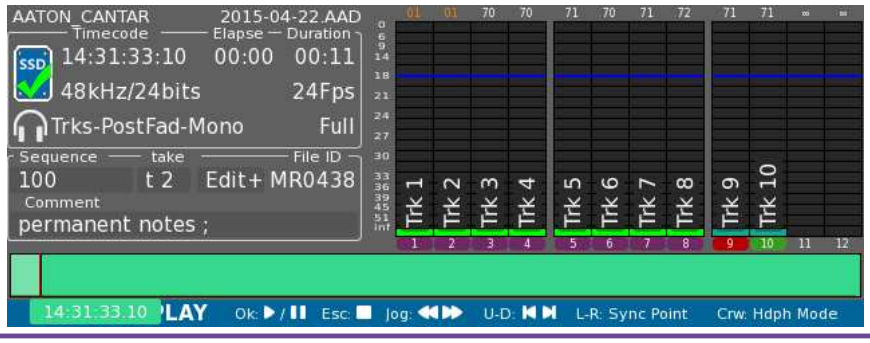
Pict. 48

2. Trks-Postfad-Mono

In this mode, are sent to headphone, all Tracks that are not Mixdown tracks.

Tracks will be routed Mono (to both left and right ears). Tracks are played Post-Play-Fader, meaning you can change the played track level, using the actuator affected to the track to modify the attenuation applied to the track.

NB: - On top of the vumeters is displayed attenuation applied to the tracks.
- If no actuator is assigned to a played track, its attenuation still can be change by Soloing the track (Solo of any track, then Left-Crown to access the wanted track) and then Shift + Jog.



Pict. 49

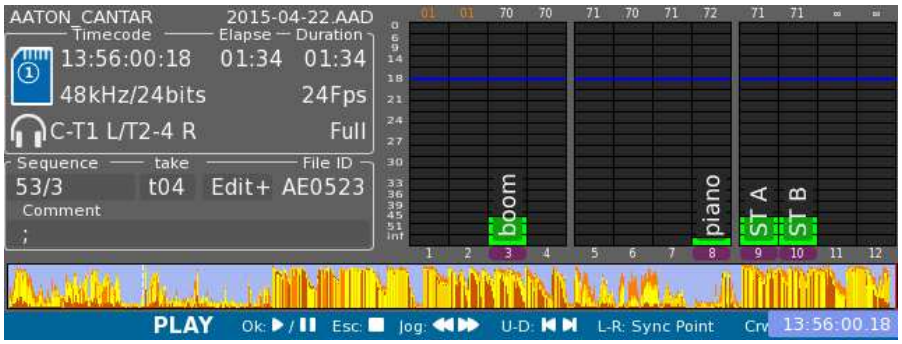
This mode is symbolised on the Headphone Outmap grid by played tracks being active, at Center. Tracks are labelled "P" to emphasize the PostFader property.

Pict. 50

3. User Outmaps

In this mode, are sent to headphone, all Tracks routed into the current User defined Outmap.

Tracks will be routed according to the Outmap. Tracks are played Post-Play-Fader, meaning you can change the played track level, using the actuator affected to the track to modify the attenuation applied to the track.

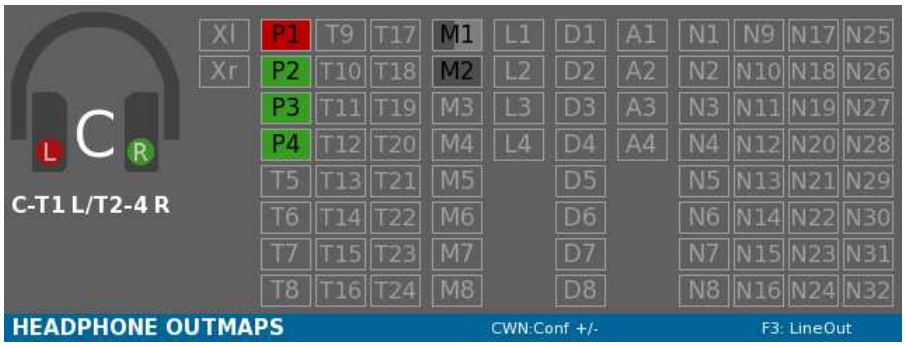


Pict. 51

NB: - On top of the vumeters is displayed attenuation applied to the tracks.
- If no actuator is assigned to a played track, its attenuation still can be change by Soloing the track (Solo of any track, then Left-Crown to access the wanted track) and then Shift + Jog.

This mode is symbolised on the Headphone Outmap grid by played tracks being active, at the side designated in the Outmap. Tracks are labelled "P" to emphasize the PostFader property.

Other inputs than tracks are marked inactive. Only tracks can be activated.



Pict. 52

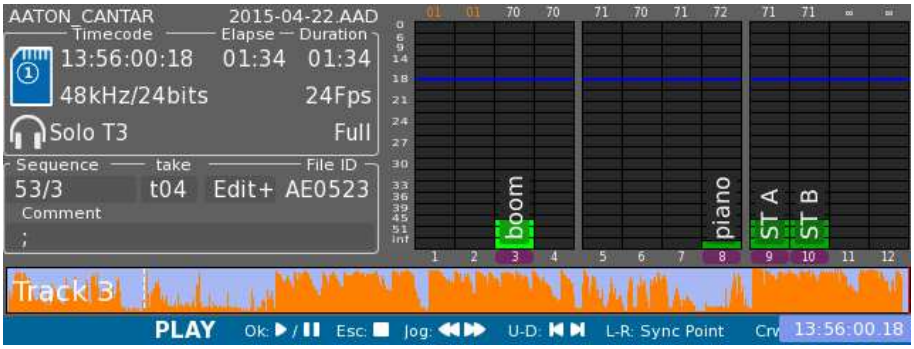
4. Solo

Track-Solo are also available. Solo of one or multiple tracks
Track(s) is(are) played Mono (to both left and right ears), Pre-Fader (track level as recorded).
The timeline displays only the waveform(s) corresponding to the selected track(s).

Press the Solo key corresponding to the track on the assigned actuator to trigger corresponding Track-Solo On/Off.

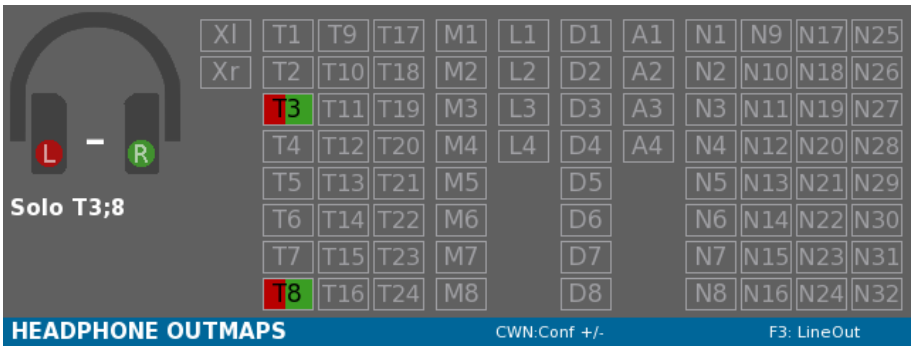
Press Esc to go back to normal Headphone Mode.

On Vumeters other tracks than solo(s) are darken.



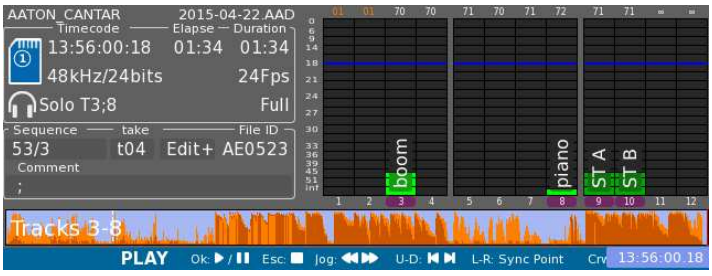
Pict. 53

This mode is symbolised on the Headphone Outmap grid by played tracks being active, at Center. Tracks are labelled "P" to emphasize the PostFader property.

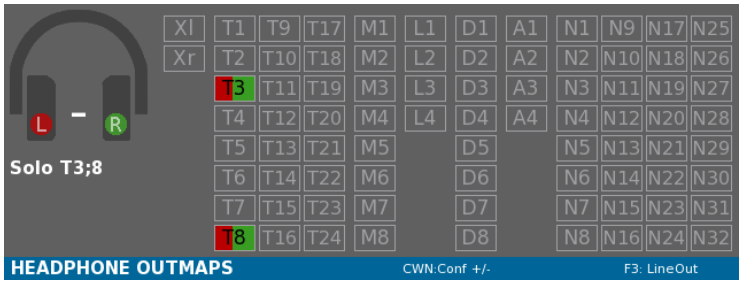


Pict. 54

To add another Solo, while holding Shift press the other Solo key.



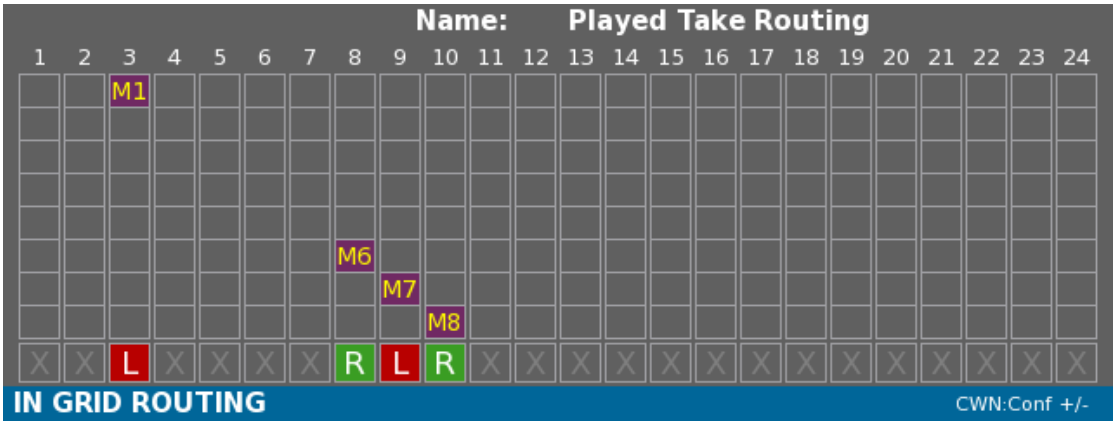
Pict. 55



Pict. 56

III. Routing

Recorded take's routing can be viewed by pressing F1 key, showing how inputs were routed during record and the way tracks were sent to Mixdown.



Pict. 57

IV. Sync Points

Sync points are displayed on the timeline as vertical dotted lines.

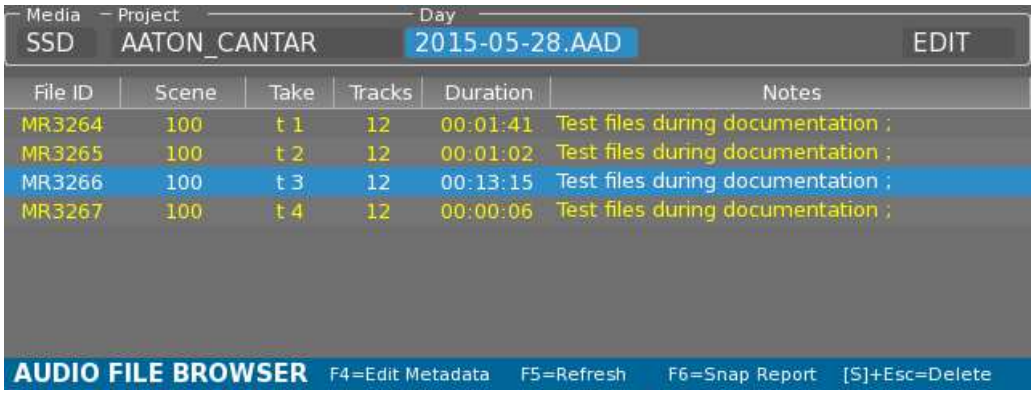
- White: Slate sync point.
- Black: User marker.

To go to previous/next sync point, press Left or Right keys.

AUDIO FILE BROWSER

Main Selector is on 7 o'clock position.

This position enables to browse take on all media, to view and modify metadata, to trash or un-trash or delete takes.



Pict. 58

I. Browser

In the top part, Media, Project folder and Day folder can be chosen.
Select the wanted field and press Ok.

NB: It is possible to refresh the Project list, by re-selecting the Media, as well as refreshing the Day list by re-selecting the Project.

II. Edition

1. Single edit

- Select one file with Up and Down keys.
- In the top part, select 'Edit' field and press Ok key
OR - press F4 key.

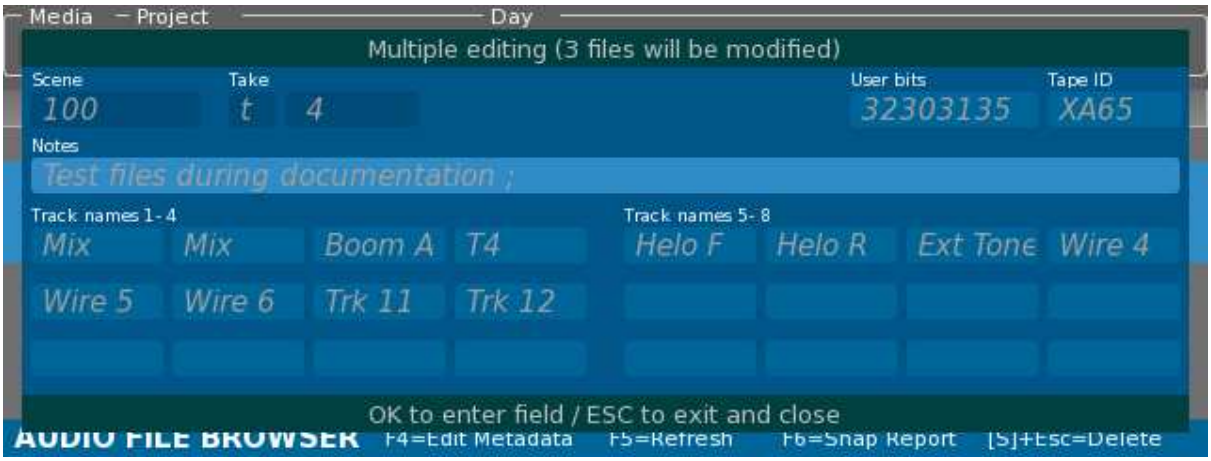
Pict. 59

- Select the wanted field with Left and Right keys, Enter key to enter Edit mode.
- Press Escape key to leave Edit mode
- Press Escape key to close the Edit Window

The modifications are applied once the Edit Window is closed.

2. Multiple Edit

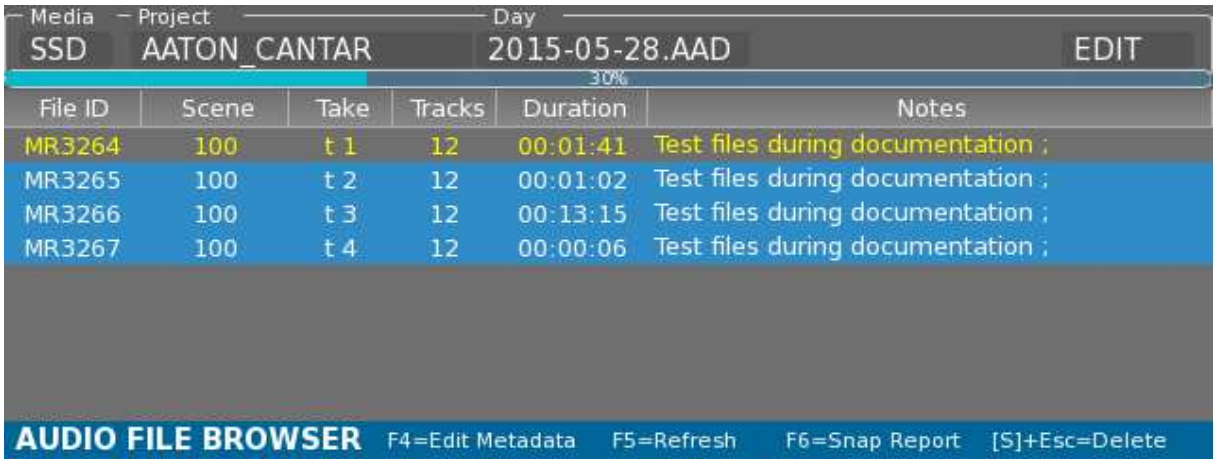
- Select multiple files by holding Shift key and pressing Up and Down keys.
- In the top part, select 'Edit' field and press Ok key
OR - press F4 key.



Pict. 60

The fields are filled with metadata from the first take of the selection.

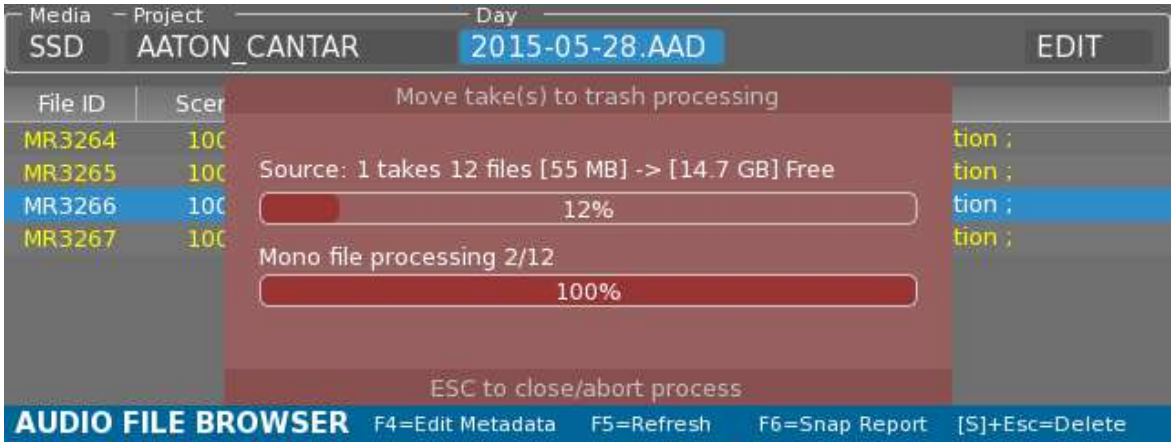
Depending on how fast is the media, how many modifications are needed, the Cantar will display a progress bar regarding the application of metadata modifications.



Pict. 61

3. Trash

- Select one or multiple files
- Press Shift + Escape key.

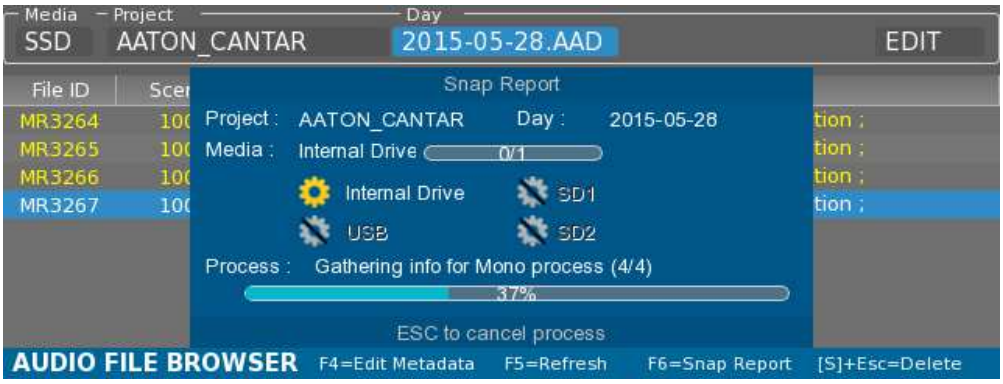


Pict. 62

III. Snap Report

In Audio Browser, it is possible to launch the Audio Sound Report Generation using F6 key.

The Snap Report process will, for each media detected, scan the current selected project and day folder looking for Mono, Stereo and Poly folder, in order to create a report representing the media state at the moment.



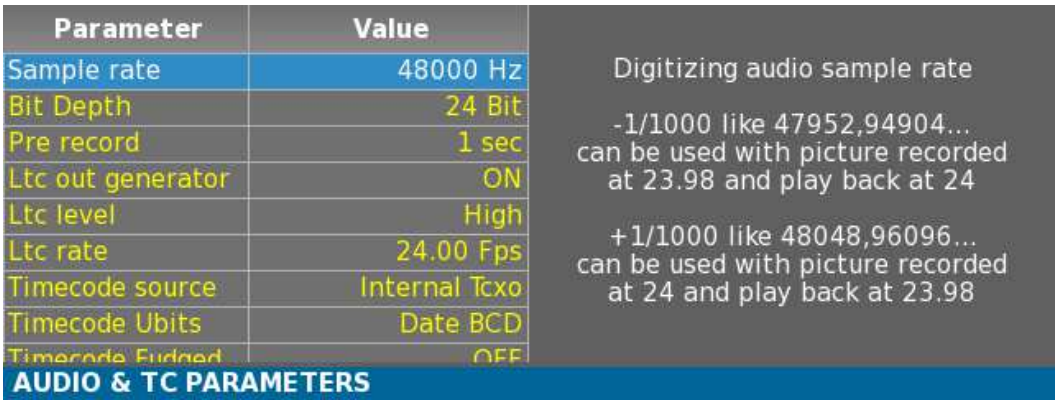
Pict. 63

Each media processing info is displayed : if any Sound folder was found (.AAD, .AAX, .AAN) the media process icon is marked as scheduled . Otherwise, non active .
During report generation the icon goes to and then once finished for every type .

AUDIO & TIMECODE

Main Selector is on 4 o'clock position.

In this position, Audio & Timecode parameters can be set. The Menu is made of items and their description on the right part of the screen.



Pict. 64

I. Sample Rate

Digitizing audio sample rate $^{-1/1000}$ such as 47952,94904... can be used with picture recorded at 23.98 and play back at 24.
Digitizing audio sample rate $^{+1/1000}$ such as 48048,96096... can be used with picture recorded at 24 and play back at 23.98.

II. Bit Depth

Bit depth is the number of bits of information in each sample. It directly corresponds to the resolution of each sample.

III. Pre Record Length

Audio buffering duration in seconds when the Cantar is in Ppr postion.

IV. Timecode Settings

1. Ltc Out Generator

Enable or disable LTC output generator: duplicate the in comming TC in record or generate audio files timecode during playback.

2. Ltc Out Level

Ltc output level

3. Ltc Rate

Timecode frame rate 24 25 29.97df 30 are dedicated to corresponding accurate camera speeds. Timecode will be separated with ':' 23/29 ndf A,B,C mode are dedicated to HD 23.976 and HD29.97 camera speeds.
By default select the C mode.
Timecode will be separated with '*'.

4. Timecode Source

Internal: Timecode runs on internal precise master clock.
External: Timecode will be grabbed from LTC input at each start in record.

5. Timecode User Bits

Define the content of LTC user bits

6. Timecode Fudged

The audio-file time stamps correct the TC flaw of some HD cameras.
WARNING: TC will be artificially shifted of 60 ms.
To prevent trouble this choice is not saved at power off.

7. Operator Tc

The Operator entered TC becomes the next recording session reference.
'OTC' is displayed as timecode flag.

8. RecRun Tc

Record-Run is activated for the full session until another timecode Source is selected; in this case the clock goes back to its default Free-Run mode.
'RTC' is displayed as timecode flag.

V. Clap Detection

Selects the AutoSlate detection channel.

VI. Mixer Fader Max Level

Mixer's faders top position gain.

VII. Tone & Beep

1. Tone Level

1kHz tone level.

2. Beep Level

Headphone beep level.

3. Rec Beep

Single beep on 'start', double beep on 'stop'.
Double beep is useful to warn you when the video camera stops, while recording in Remote Roll by LTC.

4. Beep Routing

Let user decide whether to route the beeps to outputs or not. (Line outputs, Aes outputs, Dante outputs)
Headphone is always enabled and cannot be changed.

VIII. Balance Lock

Slaved fader balance action (see Mic Link).

IX. Audio Power

1. Digital power

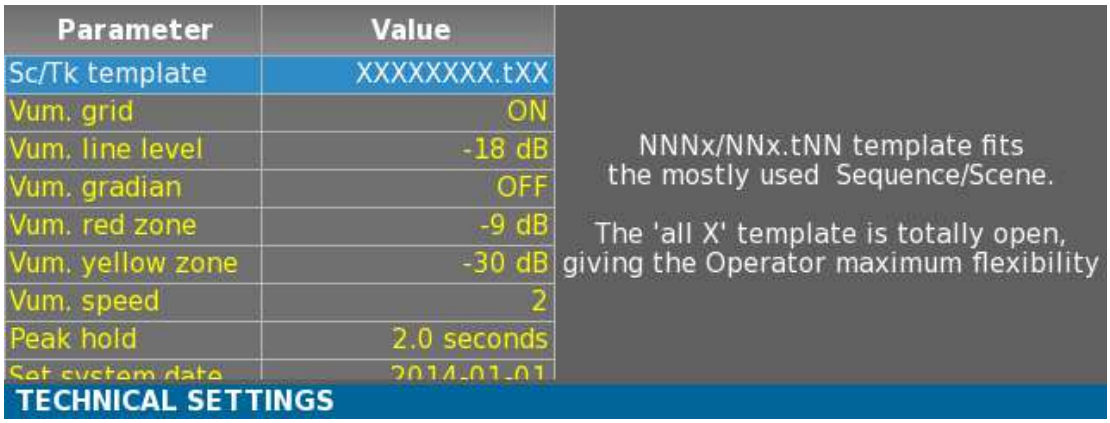
Toggle Aes Inputs & Outputs Power On or Off in order to save power.

2. Dante power

Toggle Dante module On or Off in order to save power.

TECHNICAL

Main Selector is on 3 o'clock position.



Pict. 65

I. Scene & Take template

NNNx/NNx.tNN template fits the mostly used Sequence/Scene.
The 'all X' template is totally open, giving the Operator maximum flexibility.

The default template is nnnA/nnA.nn for 'sequence, scene, take-gender and take #'.
- Sequence: three digits, followed by one character*.
- Scene: two digits, followed by one character*.
*'space', 'A' to 'Z', 'a' to 'z', '0' to '9'.
- Take-gender: 't' = time sync; 'p' = pick-up ; 'w' = wild take ; 'a' = announce ; 'n' = no good (keeps the take # for the next file); 'r' = rehearsal ; 'g' = sound guide.
- Take #: two digits.

II. Vumeter settings

1. Grid

Toggle the horizontal scale On/Off.

2. Line Level

Sets the level of the blue line.

3. Gradian

Vumeters are displayed a smooth color gradian from green to red.
When ON, red zone and yellow zone have no more effect.

4. Red Zone

Sets the level above which the vumeter is painted in red.

5. Yellow Zone

Sets the level above which the vumeter is painted in yellow.

6. Speed

Sets the speed of the vumeters, 1 is the slowest, 5 the fastest.

7. Peek Hold

Sets the Duration of peak hold in seconds.

III. System Clock

1. Date

The system date is used to create folder name (YYYY-MM-DD) containing the files for that workday.
Note that the workday folder can contain hours past midnight, if the recording session is not interrupted.
The workday is also used to fill the default MMDD name of the tape reference field.

2. Time

Enter the time from your watch, especially if you just started working in a new time zone.
It should not be confused with the timecode which is used for syncing picture and audio.

IV. Display Levels/Attenuation

1. Inputs Levels

In Record, Ppr, and Test positions, inputs levels can be displayed, as soon as a change occurs, replacing temporarily the metadata and timecode informations.

If enabled, precision can be set: +/-0,1 dB; +/-0,5 dB; +/-1dB.

2. Tracks attenuation

In Record, Ppr, and Test positions, tracks attenuation can be displayed as soon as it changes.

If "Dedicated Panel" is selected, the metadata and timecode informations will be replaced temporarily when the attenuation is changed. The track level is in that case displayed above the vumeters.
If "Top of Vumeter" is selected, tracks attenuation will be displayed above vumeters.

V. Light

1. Backlight

Adjust screen backlight brightness.
Keep in mind high brightness are power hungry.

2. Led

Adjust Led buttons brightness.

VI. Keyboard layout

Select the mechanical arrangements of the keys.

VII. Calibration

1. Potentiometer

Access rotating potentiometers calibration.
Calibration sequence is : put all potentiometers to the minimum position then press Ok key.

2. Mixer

Access rotating potentiometers calibration.
Calibration sequence is: put all faders to the minimum position then press Ok key, then put all faders to the maximum position and press Ok key.

VIII. Tech support

1. Test buttons

Check all keys, jogs and crown.

2. Ip Adress

Display Cantar's Ip Addresses.

3. Diagnostic

Selects a media where to generate a diagnostic file.

IX. Load firmware

Access firmware loading Window.

1 - Get the latest Cantar X3 firmware version from the Aaton Support web site.
(http://www.aaton.com/software-updates)
2 - The firmware file (extension .csw) can be contained in a zip, extract it and copy it on an USB or SD card.
2 - Before loading, check you have reliable power sources
3 - Open load firmware dialog box select the firmware and press OK.

WARNING

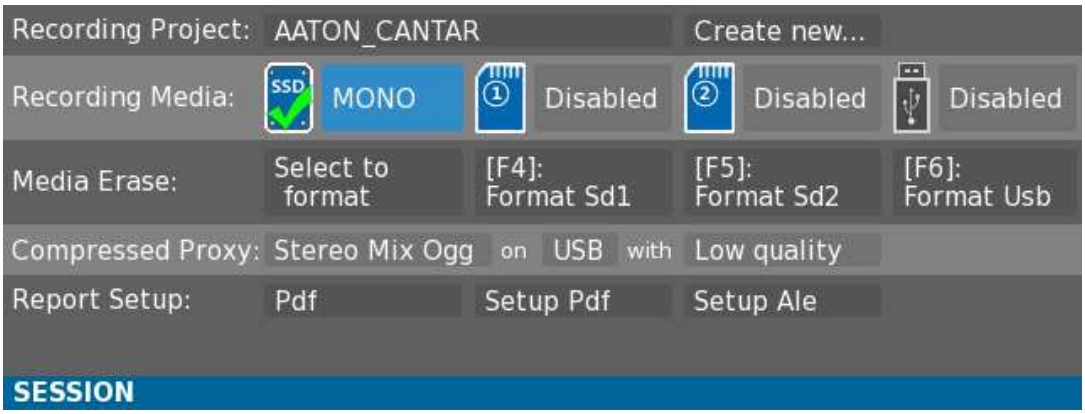
Loading a new version can update the FPGA content. After a software update, Cantar will reboot and the Cantar will update the FPGA. A dedicated screen with progress bar will appear.

As written **DO NOT POWER OFF** Cantar during this step. For safety, please use at least 2 power sources during update (e.g. 2 batteries or 1 external power on the XLR4 and 1 battery)

SESSION

Main Selector is on 2 o'clock position.

This Menu enables to set up Recording Session parameters and Report settings.
For each field, use direction keys to select the wanted field and press Ok key to edit.



Pict. 66

I. Record Parameters

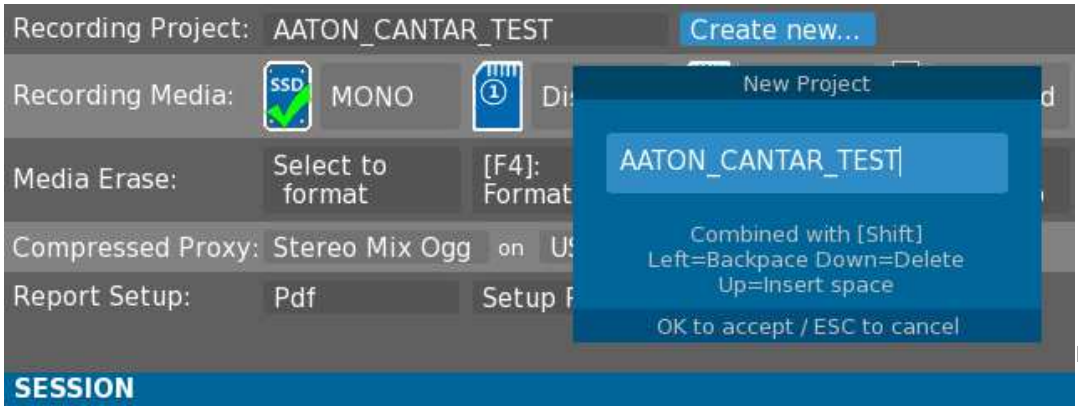
1. Project

i. Select a project

Pict. 67

Select the current recording Project throught the List build from the first enabled recording media.

ii. Create a new project



Pict. 68

Opens an edit Window to enter a new Project Name.

NB: If not already existing, Project dir and Day dir will only be created at the first record.

2. Media

Pict. 69

For each media, Cantar can record:

- Monophonic files: one file per track, named as "XXnnnn==SSSSSSSStNN==_T.wav"
  XXnnnn: Cantar's unique FileTag
  SSSSSSSStNN: Scene and Take-gender
  T: Track number from '1' to '9' and then 'A'(10) to 'N' (24).

- Stereo Mixdown file: Stereo file of Mixdown left and right interleaved.

- PolyPhonic file: Polyphonic file of all tracks interleaved. The number of channels is determined by the greatest track number used. All unused tracks will be replaced by blank channels.

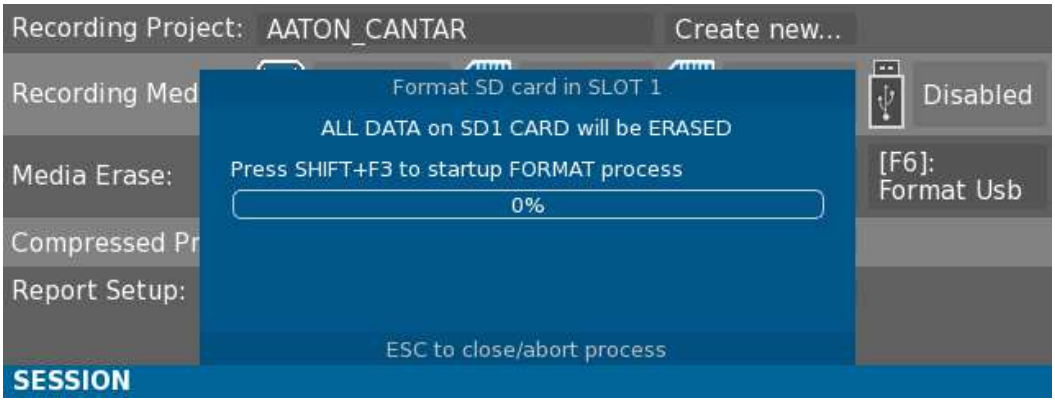
Exemple: If Track 1, 5,8 are recorded, only 3 monophonics files are created but the polyphonic file will contain 8 channels preserving track 8 on the 8th channel.

Please refer to Media State for media icon.

3. Media erase

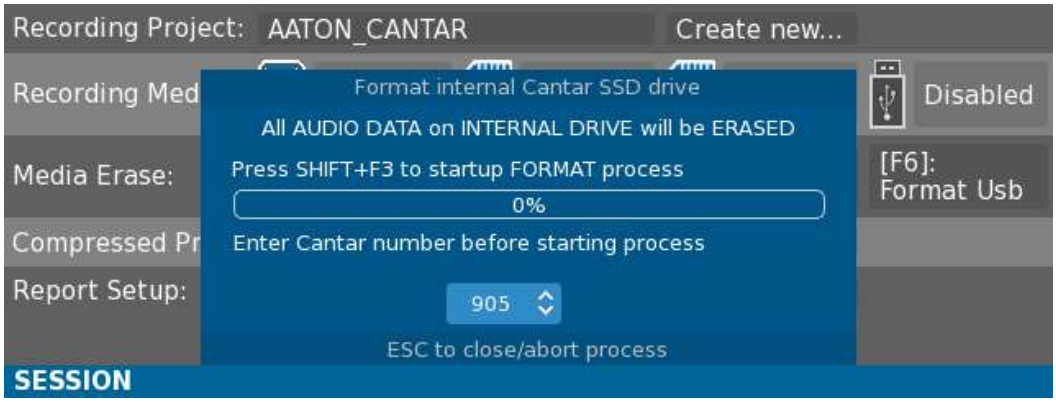
Select the field beneath the wanted media to format it. Press Ok, a confirmation Window will open. Confirm by pressing Shift + F3 key.

All information contained on the media will be lost.



Pict. 70

NB: In order to prevent mistakes, formatting the internal Drive is secured by the need to enter the Cantar number with Up and Down keys.



Pict. 71

4. Compressed Proxy

Additionnaly to the main recording processes (Monophonic, Stereo Mixdown, Polyphonic), a compressed file can be generated.
2 formats available : Ogg-Vorbis and Mp3, both format can contain Stereo Mixdown, Ogg-Vorbis can also contain Polyphonic channels.
Each format can be recorded on USB or SD media.

Compression is lossy and can be set up between, Low, Middle and High quality.

II. Report

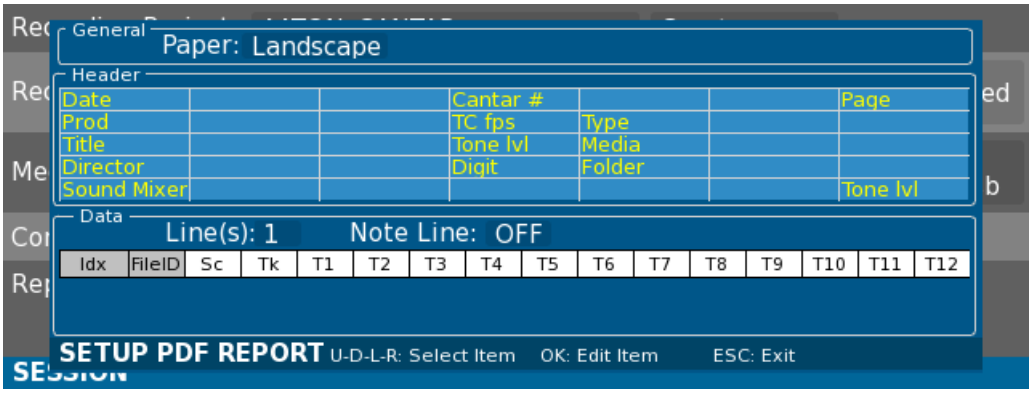
Reports are processed at the end of the backup (when a file is copied).

1. Report type

Choose between Off, Ale, Pdf or both.

2. Setup pdf

Header and Data parts of the Sound Report may be customized. Select the wanted field and press Ok to enter Edit mode.



Pict. 72

i. Header

Header is made of 5 lines and 7 columns.

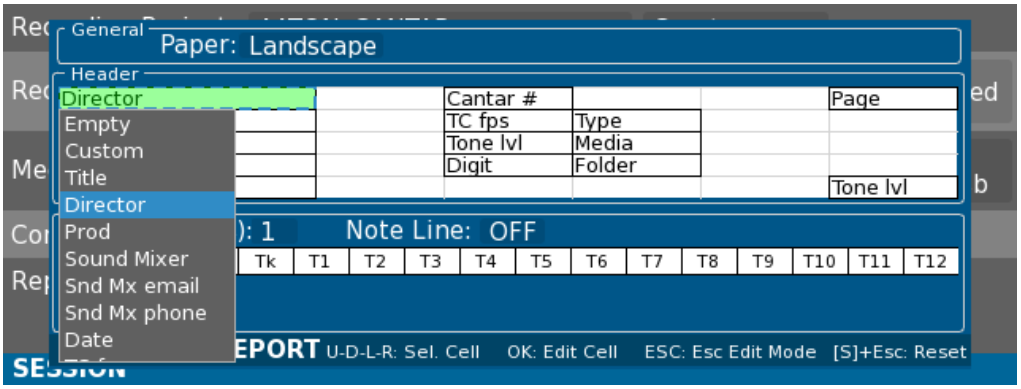
NB: Building the report, if one parameter along the header data is different from one take to another (for example Digit or TC Fps), a new page is added.
Use direction keys to select a cell and press Ok to edit the field content.

Some data types are 2 cells wide (for example Prod, Title etc...), other only 1.

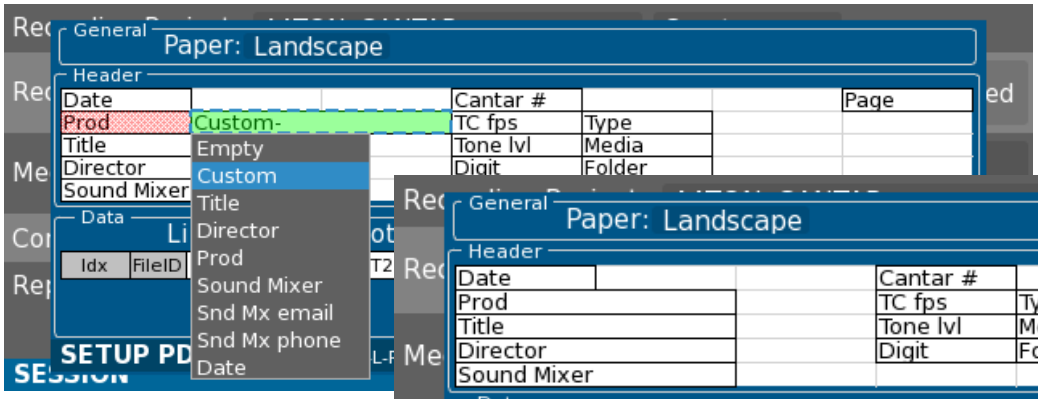
NB: - If a 2-cell wide field got its second field replaced by another field, the first field is painted in dotted red to show the fact that it will be deleted.

- If a 2-cell wide field is placed on the last column, it's painted in red to show that it is not possible.
- To change the customized text of a field, re-select the first cell and apply the same type.

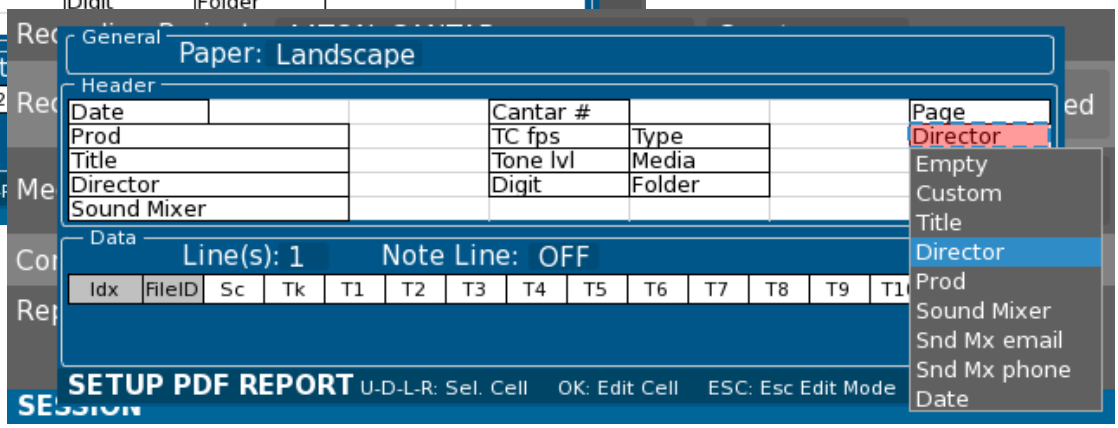
To reset to default settings, press Shift + Escape key.



Pict. 73



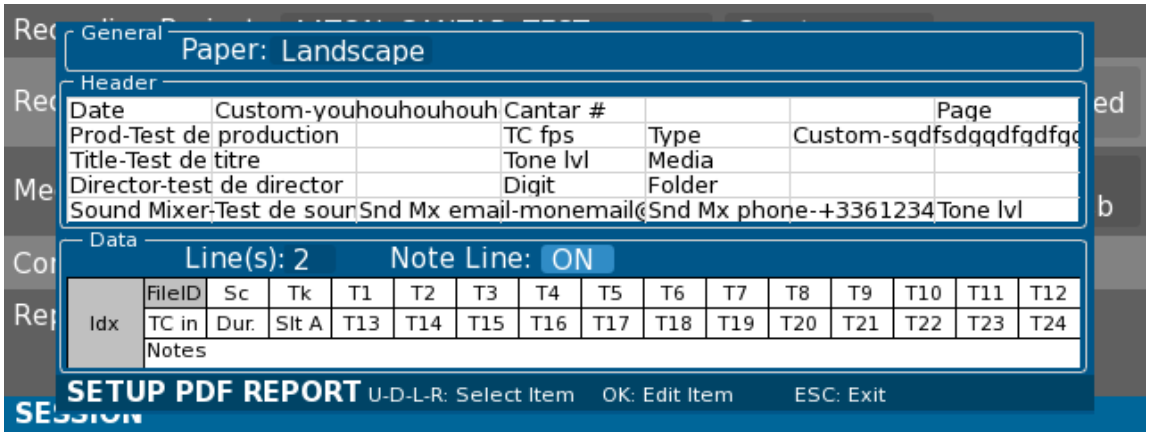
Pict. 74



Pict. 75

ii. Data

Each take can have one or two data lines plus eventually a note line.



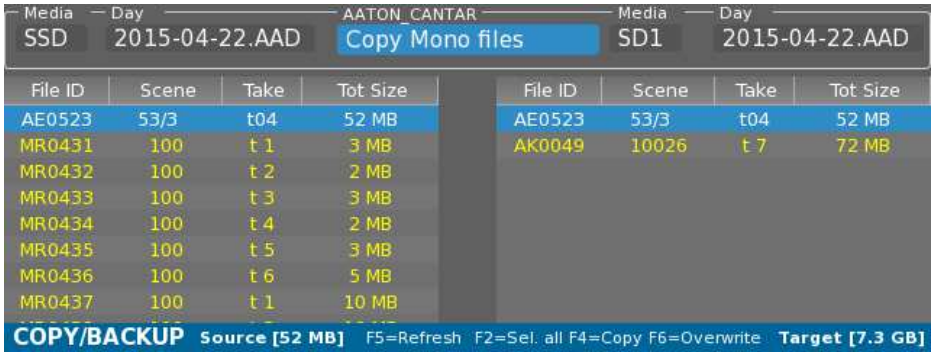
Pict. 76

Each data line can have up to 16 columns, given the first column is necessarily the take index on the current page and the second column the FileID on the first line.

BACKUP

Main Selector is on 1 o'clock position.

In this Menu, it is possible to copy from one media to another while eventually applying interleave process.



Pict. 77

The screen is divided in 2 parts: the left part is about the source and the right part about the target.

I. Backup settings

The header part enables to choose the Source Media and Day Folder as well as Target Media and Day.

NB: The current Project is indicated in the top-middle part of the screen, it can be changed in Session Menu or Audio File Browser.

Select the wanted field in the header with Left and Right keys, Ok key to edit.

Files lists will be updated on each sides upon folder choice. It can also be manually refreshed with F5 key.

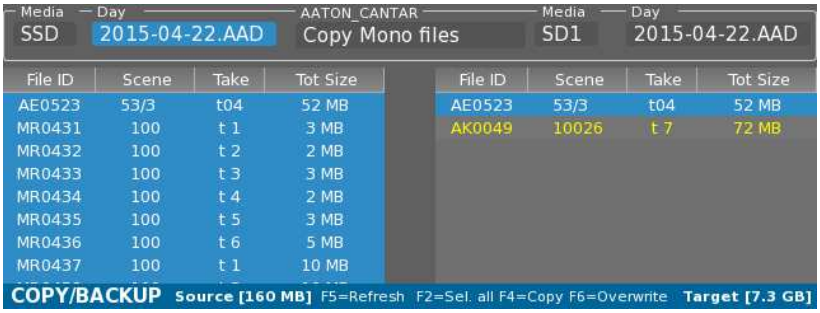
The process applied during backup can also be set up:
- Copy Monophonic files.
- Copy Polyphonic files (if not existing, they will be created).
- Copy Stereo Mixdown files (if not existing, they will be created).

Pict. 78

II. Backup process

It is possible to copy one or multiple takes.

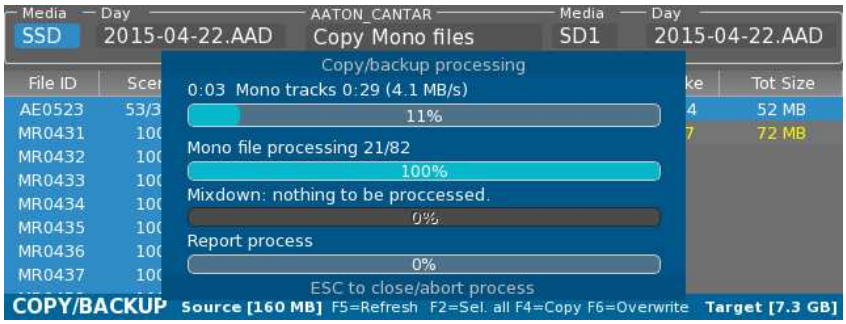
Select one take using Up and Down keys, or with Shift key for multiple selection, or F2 key in order to select all takes.



Pict. 79

While browsing the source list with Up and down keys, if a take is also on the target list, it will be highlighted.

To launch the backup process press F4. Note that in this mode, if a take is already existing in the target, it won't be overwritten, thereby sparing time.
With F6 key inbstead of F4 key, it will force to overwrite already existing files.



Pict. 80

At the end of the backup, if enabled, are processed the sound reports (only if at least one take was copied).

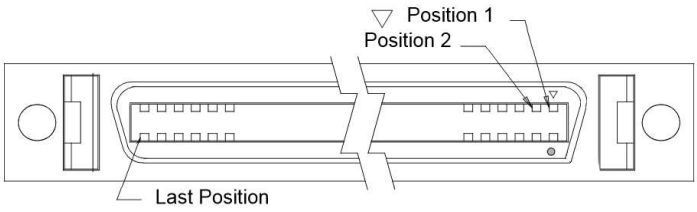
There is one sound report per Day Folder, gathering information about the takes present in that folder.

ANNEX

I. Connectors

1. Mini Delta Ribbon

As seen from the outside (user's side)



Pin description:

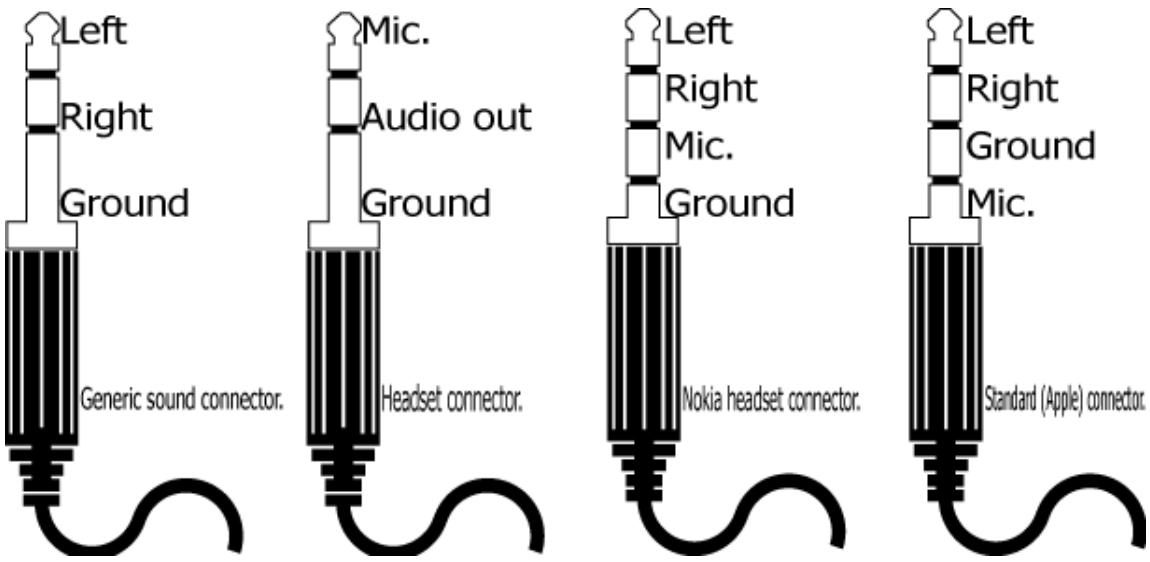
- 1, 2: Ground
- 3: LTC In
- 4: Ascii
- 9: World clock out
- 10 & 23: Tally (no polarity)
- 11: Cantarem
- 12: AES-6 Out -
- 13: AES-6 Out +
- 14 & 15: V Batt
- 16: LTC Out
- 21: World clock In
- 22: Ground
- 24: Power On/Off
- 25: AES-5 Out -
- 26: AES-5 Out +

- Other pins: reserved for future use, do not connect.

2. Headphone Jack 6.35mm & Slate Mic Jack 3.5mm

Cantar uses:

- a generic sound connector for its Jack 6,35mm headphone connector.
- a Nokia type headset connector for its Slate Mic Jack 3,5mm, 4 points, connector.



3. Cantarem Lemo 8

Lemo 8 wiring:
- 1 Ground (to Pin 1 of Mini Delta Ribbon)
- 2: Ltc Out (to Pin 16 of MDR)
- 3: Cantarem (to Pin 11 of MDR)
- 4: V Batt (to Pin 14 of MDR)
- 7: Ltc In (to Pin 3 of MDR)

4. Timecode Lemo 5 (F)

Lemo 5 wiring:
- 1 Ground
- 2 LTC-In
- 3 Ascii
- 4 N.C
- 5 LTC-Out

5. Power XLR-4 (M)

External power: 13 to 18 V – 4 Amps

- 1 Ground
- 2 NC
- 3 NC
- 4 + Batt

6. Mic XLR-3(F)

Symmetrical transformer (max+24dBu)

- 1 Ground
- 2 Hot
- 3 Cold

7. Mic XLR-5(F)

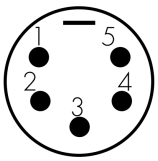
Symmetrical transformer (max. +24dBu)

- 1 Ground
- 2 Hot
- 3 Cold

Mic 3 / Mic 7

- 1 Ground
- 4 Hot
- 5 Cold

Mic 4 / Mic 8



8. Line-In XLR-5(F)

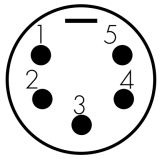
Symmetrical (max. +24dBu)

- 1 Ground
- 2 Hot
- 3 Cold

} Line 1 / Line 3

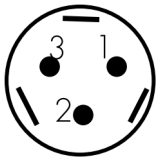
- 1 Ground
- 4 Hot
- 5 Cold

} Line 2 / Line 4



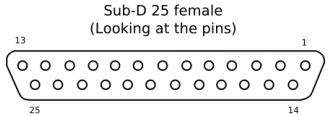
9. Aes-42 TA-3(F)

- 1
- 2
- 3



10. Aes-In / Out Dsub-25

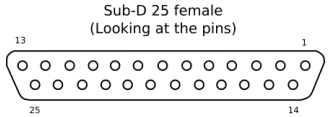
Tascam TD 88 standard



AES Inputs				AES Outputs			
Channel Pairl	Hot +	Cold -	Gnd	Channel Pairl	Hot +	Cold -	Gnd
1-2	24	12	25	1-2	18	6	19
3-4	10	23	11	3-4	4	17	5
5-6	21	9	22	5-6	15	3	16
7-8	7	20	8	7-8	1	14	2

11. Analog Output Dsub-25

Output			
Channel	Hot +	Cold -	Gnd
1	24	12	25
2	10	23	11
3	21	9	22
4	7	20	8
5	18	6	19
6	4	17	5
7	15	3	16
8	1	14	2



12. Hi-Rose

Tension : V-batt.
Current limitation: 500 mA, protected by a thermo-fuse.

II. Software history

version 1.62 (July 22, 2015)

- Media formatting improved for better record performance specially with monophonic files (80% faster).
- Audio file larger than 2 GB are now supported (in all cases audio files stay smaller than 4GB).
- Beep Routing to all selected outputs (Menu Audio / Beep routing)
- Track Solo button + Left Crown accessible while assignation in Play
- Reset parameters to factory settings (Menu Technical / Reset Factory)
- Attribute reset more verbose
- Bug fix on
  Battery communication
  Audio file size in Pdf report
  Track name visibility in Previous Edit for Track count of 9 and 17
  Solo track input reminder includes Ms type

version 1.61 (June 15, 2015)

- Audio stream control has been improved and new messages have been added in case of trouble.

version 1.53 (June 12, 2015)

- New control added on audio stream integrity.
- Bug fix: Lag of interface in record vumeters and play back position.

version 1.52 (June 10, 2015)

- Mic inputs have now 3 predefined inputs level Mic level / High level(-26dB) / line level(-38dB).
- +6dB gain booster with phantom mics available (AUDIO & TIMECODE PARAMETERS/Phantom Mic gain)
- Fader scale have been modified to be more comfortable for mix
- +12dB mixdown capability (AUDIO & TIMECODE PARAMETERS/Fader Max Level)
- Inputs (mics, lines …) directly rooted on line out are working in all position except in stop.
- Switching to REC position, RECORD will start even if a media is missing (e.e SdCard).
  Note: A monophonic audio file record is mandatory on one of the remaining media.
- In browser position a snap report (F6) have been added. It creates pdf/ale file on all removable media inserted into the Cantar.
  It has to be done at before removing the media when recording in mirror.
- Avid compatibility on track name into bext for numbers over 9
- At start up, with new day accepted, Tape id is automatically setup as MMDD (month-day)
- In edit fields, SHIFT+Left arrow erase filed content without confirmation

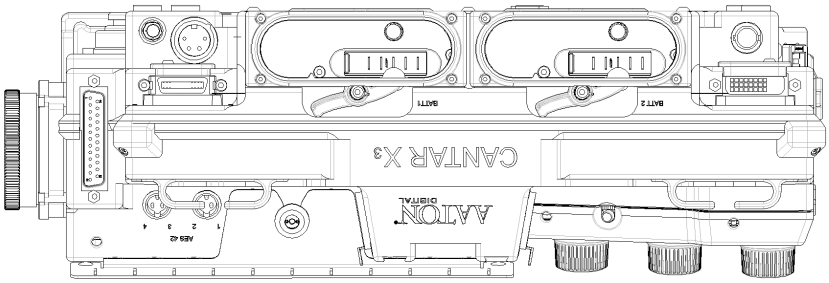
- Bug fix: Remaining size when a track is manually disarmed
- Bug fix: Critical error on audio stream fixed (happens very rarely).
- Bug fix: the date stay correct when Audio TC jump over midnight
  Bug fix: Read only attribute removed on recorded audio files

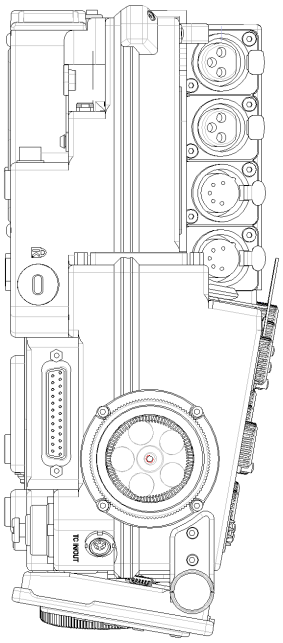
version 1.44 (May 25, 2015)

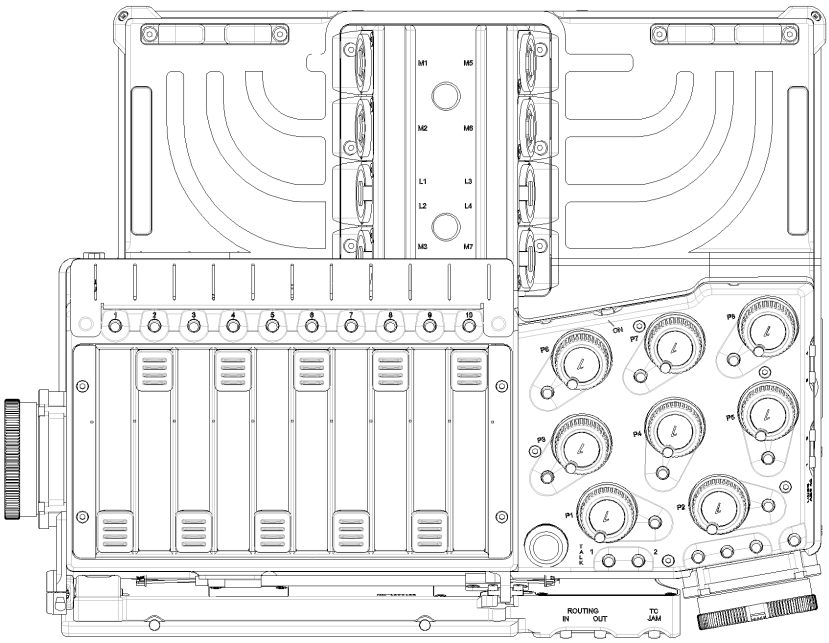
- Monophonic file naming change to _NN (NN start at 01 for first track to _24 for last track) for avid monophonic import compatibility.
- User warning added in case of trouble with the recorder (important for the safety of your records).
- Phase inverse identifier (bar at the bottom of vu-meter) only available if a single analog
- Shift+F2 solo line out access
- Digital out in headphone during setup
- Pdf track name repeated on sequence change
- Bug fix (phase invers link, empty timeline …)

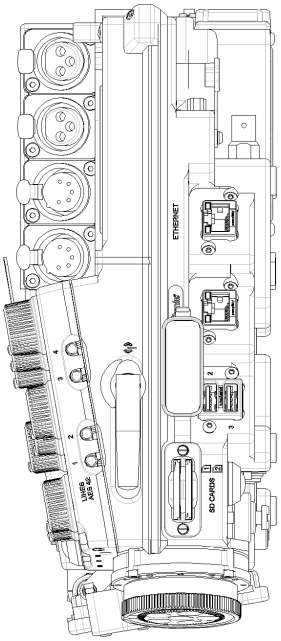
version 1.43

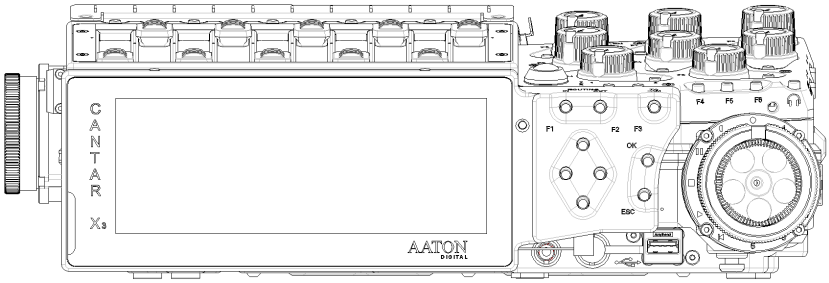
- Slate mic level adjustment.
- In solo, unused vumeter are darker.
- Bug fix TalkBack release and "black screen" in case of mistake in backup


CANTAR X3
AATON
DIGITAL
BATT 1
BATT 2


TC MODE


M1
M5
M2
M6
L1
L3
L2
L4
M3
M7
ROUTING
IN
OUT
TC
JAM


ETHERNET
SD CARDS
USB/S
ATA


CANTAR X3
AATON
DIGITAL
F1
F2
F3
F4
F5
F6
OK
ESC