

three innovations
the magic
auto•slate p.21
the built-in
pdf•report p.34
the editor friendly
poly•rotate p.36
and: deeper
slider•scale p.20
protected
fader•lock p.17
distant ltc
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cantarem p.42
arcana p.43



Aaton Cantar-X 1.87

Read 'The PostChain' on: www.aaton.com/files/cantar-post-chain-20.pdf

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Manuals and software for Cantar, Majax and Arcan are on: www.soft.aaton.com/swcantar/

- **your first visit:** click '**create an account**', enter your details, don't forget the country. After a few seconds you will receive an email with your password. Enter this password and your email address in the login page.
- **for your next visits:** If you forgot your password, click **lost password**. Enter your email address; as soon as it is found in the Cantar database the password is sent to your address.

REMINDER: Version 1.78 installation must have been done once in the life of Cantar as a "PASSAGE OBLIGE" to go from v1.77 (or older) to the current version.

1.87 -Recording starts on running LTC-in, and stops on frozen LTC from a video camera or Aaton GMT-u (no record-run TC overlaps, no record interruption on TC drop-outs). -**Remote control** of {STOP} {TEST} {PPR} {REC} from keyboard, CantaRem or Arcan-W. -**Line-out and Foldback levels** controlled by CantaRem sliders. -A new **ALE/PDF** page opens on each header item change. -Blank columns are allowed in the PDF Sound-Report. -CantaRem puts Cantar on {STOP} in 'forced' mode only. -Archive tags are ticked after backup@call, they let backup@call fill a half full DVD-RAM. -IdleCopy less prone to bus hangs with slow external HDDs (memory-leak fixed). -Solo bug induced by CantaRem's command, fixed. -Large file 16-bit treatment overflow fixed. -Sound-report csv file stored on internal hard drive speeds-up pdf burning on DVD-RAM.

1.78 -Opens the gate to 'Virtual-Cantar' software versions. -Internal generation of **PDF sound-report** plus tab-delimited text files. -One second delay protected Lock/Unlock of the mic & line faders. -Input routings are stored in the 'Routing' field of the iXML chunk of each track. -Digi-out AES 1to6 transmit either Tracks-1 to 6, or Mic1to5 + Line-in1. -FAT32 formatting goes down to 2GB for flash cards. -Steeper scale for the Gain/Position of the mixer sliders. -Disarmed tracks remain disarmed in {PLAY}, they are rearmed by the MainSelector's quick passage over {Routing}.

1.73 -Polyphonic conversion of T1-T8 with track rank shuffling (T7/T8 are sent to T1/T2). -Operator triggered AutoSlates show in roman font, self triggered AutoSlates shows in italic font in the PDF sound report. -Take metadata is edited in {BROWSE} without going to {ppr}. -Mic1 to 5 preamps can be routed to Digi-out 1 to 5. -New take-type list (t p w a n). -CantaRem shows same gain laws on Mic and Line sliders. -Slider attribution from CantaRem [ctrl] [key]. -Arcan-w 2.09 for WindowsMobile5, Arcan-P 1.15 for PalmOS.

1.70 -AutoSlate clapstick detector. -iXML1.5 compliant metadata. -CantaRem communication is activated -Solos are triggered from the CantaRem's 8 keys -Sliders are assigned from the AUDIO menu. -Time indexed event markers in metadata.

1.66 -A must install version, **never go back:** Improved memory latency tolerance -29.97nd A, B, C sampling rates stored in iXML.

Updates: new Cantar firmware is accessible to owners at: www.soft.aaton.com/swcantar/. Beta versions are not to be used for commercial work.

Cantar Users' Group: you can exchange tips and propose improvements on: <http://blake.aaton.com/mailman/listinfo/cantar-users>.

Pictures on the road: send us your pictures for the Cantar gallery found at: www.aaton.com/gallery/on-location.

Help post-prod people: download and spread around the 'Cantar PostChain'

1.64 -One hand operation to check/select the routings: PUSH the 'smp' slider for 'Inputs', PULL for 'Outputs'. -Signals sent to disarmed tracks are no longer audible. -Double dashed modulometer monitors disarmed tracks. -Solos show all other tracks. -Phones warning beeps can be sent to Line-out and Foldback too. -'Record' tally sent to subD15. -Batt1&2 are paralleled in {REC}. -Batt1, Batt2 alert levels are independant. -Take-type t p w n direct activation in {PPR} 'next take' and {REC}. -DVD-RAM remaining space is displayed.

1.57 -**C-mode** for 23.98/29.97fps NDF timecodes with 48/96K sampling rates. -The 'TapeRef' field carrying the MM-DD can be manually overwritten by an arbitrary workday.

1.54 -Native monophonic and interleaved Xa/Xb (24/16-bit) polyphonic files can be stored together on the backup disk in separate folders. -Interrupted idle backup files are readable on Mac OS-X.

1.51 -Tracknames entered by Cantar [jog], keyboard or PDA, are recorded in the iXML chunk. -All user's configs and physical setups are stored in an XML file on ext. or int. HDD, they can be reloaded/exported to any other Cantar to duplicate the same environment. -Addition of the 48048 and 96096 sampling rates. -Smoother mic fader gain law. -M/S left/right decoding of the mixdown channels.

1.45 -Formats DVD-RAM under UDF only and Hard drives under FAT32. -Records UDF & FAT32 formatted DVD-RAM. -Panning an M/S M track to full right or left eliminates the S track from the mix. -A track can be (dis)armed by [Shift] [Solo], still monitored in {TEST}, it is not monitored in {REC}. -The backup offers three options: 'Backup@end/ IdleCopy/PreConvert'. -IdleCopy can be done on ext. or int. DVD-RAM burner (mu-metal shielded UJ-845). -8.5GB double layer DVD+R burning is available. -Scandisk is performed by Cantar itself. -Record-run (Rtc) mode and free-run operator initialization (Otc) are activated. -88.2kHz sample rate is available. -[EYE] button toggles T5/T6 and T7/T8. -An iXML chunk stores the track descriptor, e.g. Xa, Xb, T1, T2, T6. -'Notes' can be entered via the Palm "touch screen". -Main switch on {STOP}, 'Inputs to Tracks' and 'Monitorings' are keyed from the Palm on the last selected configuration. -Peak level indicators hold from 0.5 to 5 sec. -Modulometer levels are sent to the Palm Arcan 1.11 eight bargraph display.

1.41 -T7/T8 modulometers on the rectangular screen top row. -Eight track modulometers are visible in {TEST} & {REC}. -Maximum gain of the mixer faders goes to +6dB. -The displacement/gain law

Fifteen permanent mechanical faders

The Cantar's nine rotary analog faders and six linear digital faders are specifically devoted to one task only, not shared and definitely not virtual. The Cantar interface is the easiest to use in the most difficult missions:

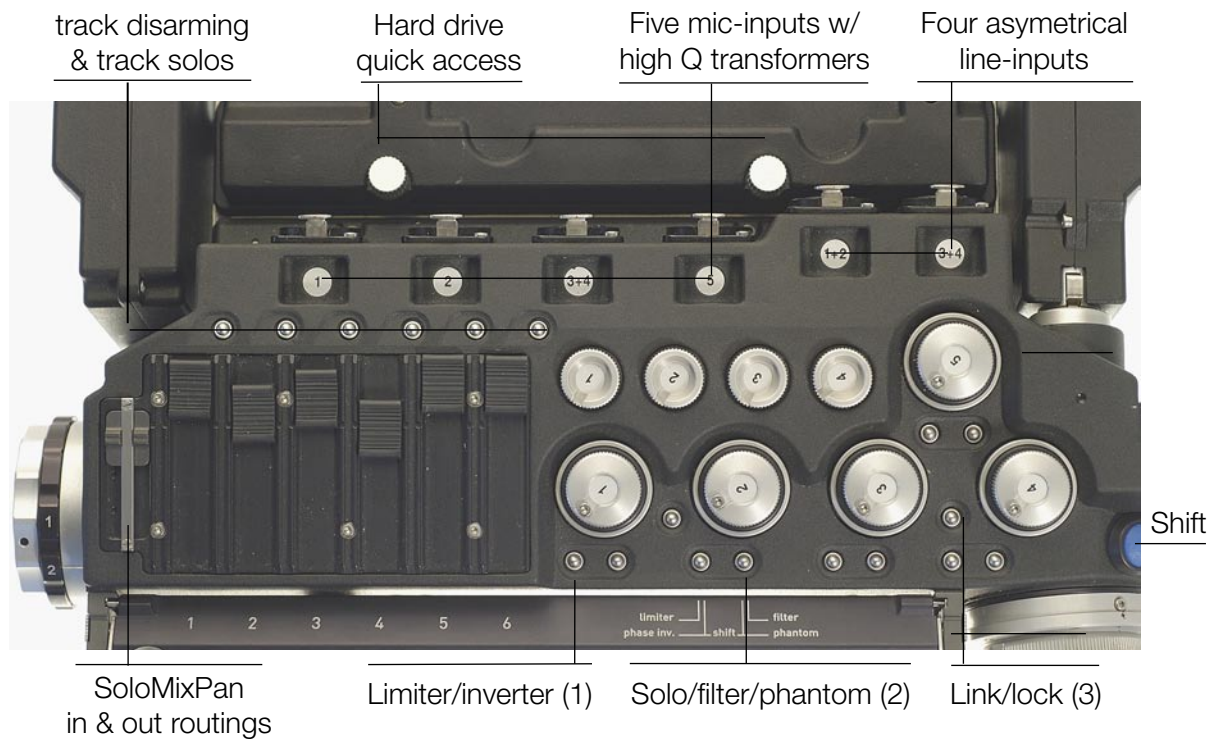
- because it offers the largest display surface of all portable recorders which simultaneously show every critical recording parameter.
- because the custom designed (sun, sand, sea, snow storm) high contrast LCD displays remain visible under bright sunlight, and at very low temperatures too (heater option).
- because the swivelling front panel always offers the best

viewing angle for both cart and over the shoulder work.

- because the large twelve position MainSelector eliminates diving into sub-directories.
- because the unique three-crown turret gives instant access to all recording and monitoring configurations, even with gloves on.
- because nine rotary analog faders plus six linear digital faders, each entirely devoted to one specific task, give more possibilities and are faster to handle than four multi-function knobs.

All XLR sockets pointed toward Earth

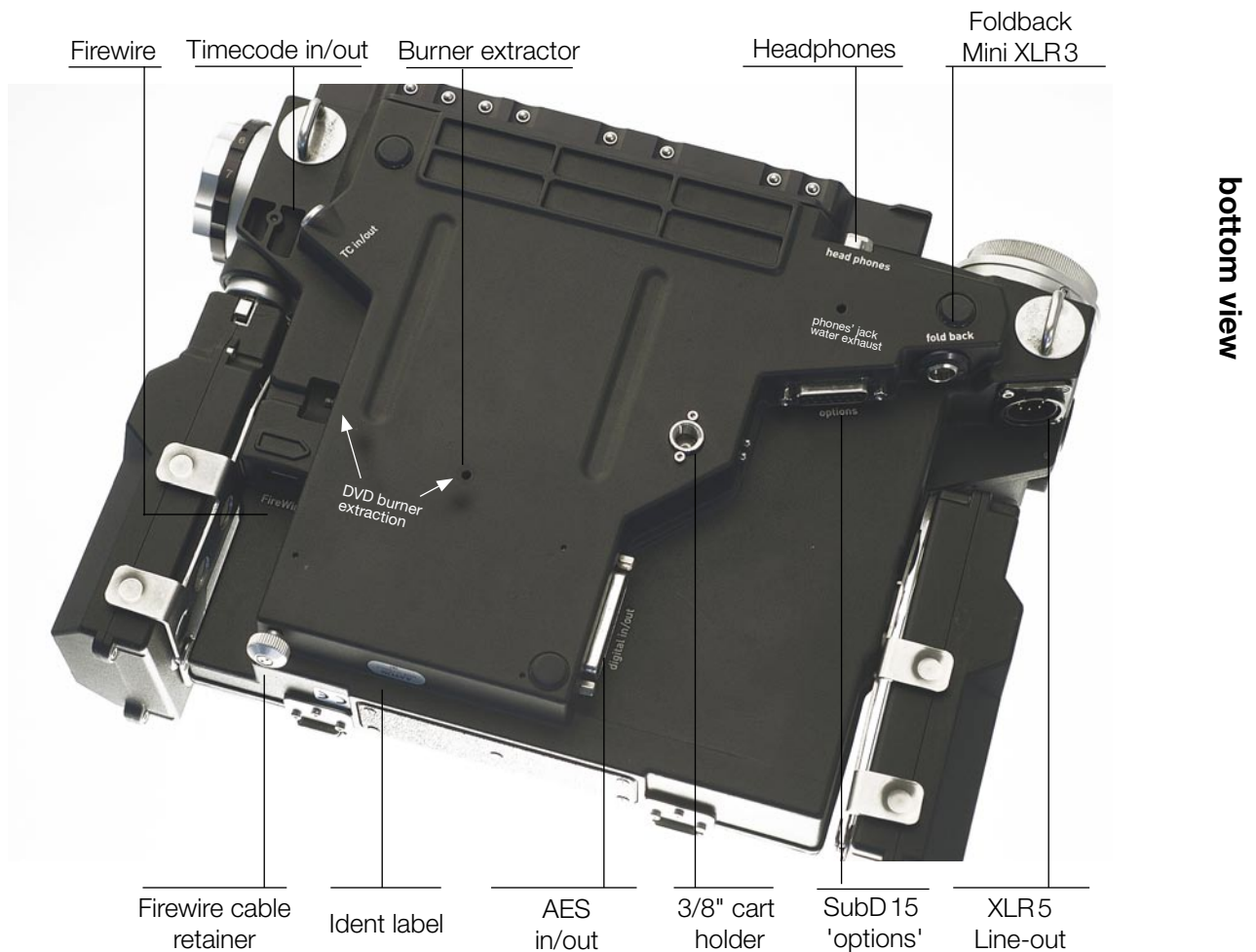
- Same direction as rain drops...



- [lim-inv] (1) Limiter ON/OFF.
 [shift] [lim-inv] Signal Inversion.
- [so-fil-tom] (2) Solo & Filter. Balance access.
 [shift] [so-fil-tom] Phantom 48V activation.
- [link-lock] (3) Left locks Mix, right locks Mic/Line faders.
 [shift] [link-lock] Links Mic 1/2, Mic 3/4.

- [SoloMixPan] pushed bAttery side:
 [routing] button shows inputs to *trAcks*.
 [track] button end of slider show *pAn-pots*.

- [SoloMixPan] pulled Operator side:
 [routing] button shows outputs to *mOnitors*.
 [track] button end of slider activates track *sOLO*.



- The *SubD 15* 'options' socket is used to connect Cantar-Rem (p.42) or a USB-PS2 keyboard adapter (p.46).
- The *3/8" screw* is placed at the center of gravity between three rubber pads, and is used to secure the Cantar onto a cart.
- The *hole* underneath the phone-jack socket is a drainage for water that has entered through the phone-jack.
- To *extract* the internal DVD/DVD-RAM burner, first remove its lateral retaining screw, then use a pencil or tooth pick in the DVD extractor hole to push the drive out of the Cantar housing (see the DVD burner extraction arrows on the picture above).
- The *Firewire* socket with no built-in plug-to-socket latch is a fragile connector, please remember the following lines.

- The *cable retainer screw* should be used at all times (use gaffer-tape if your Cantar is not equipped with it) to avoid intermittent contact or sudden cable pull-out. A loose Firewire connection induces 'bus hangs' and can even stop recording on the external and internal disks.
- **DO NOT plug a cable into the Cantar Firewire socket while it is powered.** The Firewire6 socket that powers external disks and burners has a HOT 12V pin in it. If the plug enters at an angle, it will produce a short between the +12V pin and the in/out pins and DESTROY the Cantar Firewire driver. Please follow the HDD formatting instructions (p.33).
- Only use *ferrite choke ring* equipped Firewire cables.



front view

Swivelling panel buttons

[routing] [SoloMixPan] slider pushed to the battery side, shows the *track input* routings on the circular screens.

[routing] [SoloMixPan] pulled to the operator side, shows the *routing output* maps.

[esc] shows sampling rate, bit-depth and TC numbering.

[shift] [esc] in {PPR} erases the entire 'comment' line.

[<] [>] moves cursor to the previous/next file or parameter.

[shift] [>] x10 accelerates the {PLAY} speed,

[shift] [<] toggles back to normal speed.

[ok] moves the rectangular screen 'focus' to the bottom line, then validates the selected bottom line parameter.

[shift] [ok] in {PLAY}, automatically plays the next file.

[shift] [ok] again cancels this function.

[eye] shows either track 5/6 or 7/8 modulometers on the right circular screen. XX indicates that T7/T8 is devoted to the mixdown recording. In 'operands' opens the 'help.'

[shift] [eye] toggles the rectangular screen bottom line between Scene & Take and Filetag & MBytes.

[TC jam] for three seconds sets the Sync clock to an incoming LTC signal feeding the Lemo 5 or the subD 15.

[shift] [TC jam] for three seconds sets the Sync clock to the calendar system time.

[batt 1] or [batt 2] a short pressure displays the battery voltage, a long pressure selects the battery.

[shift] [batt] turns 'OFF' Cantar, [MainSelector] on {STOP}.

Headphones

1/4" jack in an isolated compartment. It is driven by a 16 ohm capable loudspeaker amplifier. The stored output level of the headphones is protected by the [shift] button.

Talkback mic

Nested near the MainSelector, the automatic gain talkback mic can be routed to Line-out, Foldback and tracks (p.8).

MainSelector and TripleCrown

Easy to manipulate even with gloves on, they give access to all operating actions and operands (p.7 & 8).

Circular and Rectangular screens

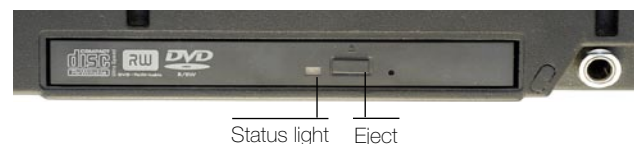
Always visible under the brightest light (p.9 & 10).

Mixer's faders

Dustproof and waterproof, they are magnetically driven. The sliders can be instantly replaced with colored ones.

DVD burner

The burner is protected by the swivelling front panel, to extract it see p.5, to replace it see p.46. Latest Matshita UJ846B DVD±R and DVD-RAM burners are slot machines





MainSelector positions

Easy to manipulate even with gloves on.

The six OPERATING positions, seven to twelve o'clock, control recording, storage and playback of audio. Their data is displayed on all of the screens.

The six OPERAND positions establish operating parameters and display their info on the rectangular screen.

REC	●
PPR	◐
TEST	
STOP	■
PLAY	▶
BROWSE	◀

①	BACKUP
②	SESSION
③	TECH
④	AUDIO/TC
⑤	ROUTING-INS
⑥	ROUTING-OUTS

① BACKUP	p.36	05 T7/T8 treatment	10 Media label
01 Save mode		06 Media type selection	11 Snap Sound-Report
02 Day to copy		07 Burn and check	12 Idle Sound-Report
03 Track selection		08 Files to copy	13 Run Backup
04 T1 to T8 treatment		09 File name length selection	
② SESSION	p.33	05 Scan disk	16-30 Column 02 to 16
01 Project name		06 Clean store	31 Long Note enable
02 New project		07 Delete files	32 Print size
03 HDD in Use		08-14 Sound-Report headers	33 Report export type
04 HDD & DVD format		15 Column layout selection	
③ TECH	p.30	09 Meter speed	18 Max File Size
01 Disk (dis)mount		10 Peak hold duration	19 Temperature Control
02 Backlight		11/12 Batt1/ Batt2 alert levels	20 System Time
03 View Faders' dB		13 HDD Power Down	21 System Date
04 Record beeps		14 External Communication	22 Equipment IDs
05 Clip detection beep		15 Factory Reset	23 License key
06 Lack of external clock beep		16 Save User's Setup	24 Software version info
07/08 Beep routing / Beep level		17 Load User's Setup	25 Software Install
④ AUDIO/TC	p.28	09 Balance fader lock	18 Record-Run TC initialization
01 Sample rate		10 Mic fader linking	19 Operator TC initialization
02 Bit-depth		11 Scene &Take templates	20 T7/T8 inputs
03 Reference tone level		12 AutoSlate trigger channel	21 Digi 1 to Digi6 output
04 Talkback mic routing		13 Record by LTC	22 Digi power
05 Line-out level		14 TC source	23 CantaRem com
06 Foldback level		15 LTC rate	24-31 CantaRem slider assign
07 Mix gain max		16 LTC generator output	⑤ ROUTING-INS
08 Pre-record duration		17 LTC User-bits	⑥ ROUTING-OUTS

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p.26



MainSelector buttons

[black], [silver] and [red] buttons can be activated by the thumb while the large blue button [shift] is activated by the index-finger.

TEST, PPR and REC

- [silver] inserts users's marker (REC only).
- [shift] [silver] triggers AutoSlate detection (REC only).
opens take editor (PPR only).
- [black] talkback mic to Line-out & Foldback left.
- [black] then [black] talkback mic to Line-out & Foldback right.
- [shift] [black] records talkback mic on all tracks.
- [red] toggles take-type (**t p w a n**), t=time sync, p=pick up, w=wild track, a=announce, n=no good.
- [shift] [red] 1kHz ref. 'Off' at [red] release;
remains active if [shift] is released first.

BROWSE

- [red] toggles the take-type (**t p w a n**)

PLAY

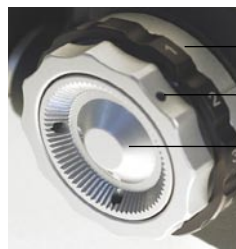
- [silver] goes to next User-Marker.
- [shift] [silver] goes to AutoSlate markers.
- [black] lays down play mark.
- [shift] [black] sets play mark to zero.
- [red] stop/start from marker.

ROUTING-INS and ROUTING-OUTS

- [black] creates a link.
- [red] removes a link.

Triple Crown

The large all weather triple crown is used to verify and select the input routings and monitor maps with only one hand.



Monitor Crown

- 1 {So} Mic, Line and Digi-inputs, plus active tracks are directly selected and sent to the headphones as 'solos'.
- 2 {Ph} Mixer output and seventeen user configurable maps (A to Q) to headphones.
- 3 {Lo} Mixer output and nine user configurable maps (R-Z) to dual line-out (XLR5).
- 4 {Fb} Mixer output and nine user configurable maps (R to Z) to dual foldback out (mini XLR3).
- 5 {Do} Mixer and nine user configurable maps (R to Z) to Digi-out on AES7&8.

Note: the headphones also receive the signal sent to the output being configured.

Config Crown

In {REC}, [SoloMixPan] slider pulled to the operator side, the [routing] button shows the monitor map on the circular screens which respectively become left, center

monitor

config

jog

and right ears. Since this checking has no interaction with the ongoing recording, it is possible to on-the-fly modify the listening map with the [config] crown. [SoloMixPan] slider pushed

battery side, the [routing] button shows the ins-to-tracks routings.

In {TEST} and {PPR} the [config] crown browses the fifteen available ins-to-tracks routings and selects the one shown at [routing] button release. In {REC}, to avoid finger trouble, the ins-to-track routings can't be modified but switching to {PPR} gives you up to 35 sec to change the routing configuration and switch back to {REC}, without loosing a single sample.

Jog Crown

The 'one finger' [jog] is used to move the cursor in the routing circular screens, to edit the scene and take, to select high pass filters, to adjust the backlight's intensity, to control the pan-pots, and to scrub the player in fast forward/reverse.

Note: [shift] [jog] accelerates the [jog] speed 10x.

Circular screens

These are the largest, easiest-to-read screens found on any audio recorder. They provide the user with ongoing data concerning every aspect of the machine while it is working. It takes a few hours getting used to them since four display paradigms are used for the many functions they handle. Once you are familiar with these functions you will drive the fastest machine you have ever worked with.

- routing inputs to tracks. The six primary tracks graphically display their links at the push of a button, even while recording.
- mapping the outputs. Thanks to the three screen layout emulating the left, center and right 'ears', the monitor maps are immediately understood.
- progressive panpots. The contribution of each track to the mixdown has never been so clear.
- modulometers. Their semi-circular shape makes the signal level easy to appreciate in a wink.
- permanent control of the disks, tracks, and setups.

• Routing the Inputs



The available 'Inputs' are shown in each circular screen: Line-in 1 to Line-in 4, Mic 1 to Mic 5, Digi 1 to Digi 6. The six tracks to which they can be connected are grouped in pairs, e.g. T1/T2 then T3/T4 then T5/T6 on the three screens. The way to create routing configurations by linking the inputs to the tracks is explained in the the chapter «Inputs to tracks routing» (p.25).

With the [SoloMixPan] slider pushed toward the battery side, the [routing] button (top-left of the swivelling front panel) instantly displays the 'inputs to tracks' grid, even while recording.

On the picture, the middle screen shows 'A4', the routing in use. Fifteen preset routing grids are stored in three banks. Each of which holds five grids, to help you sort and memorize your configurations, e.g. A1–A5 for mic only setups, B1–B5 when some line-inputs are on duty, C1–C5 for complex setups that include digi-inputs.

The [config] crown gives instant sequential access to all of them.

•• Mapping the Outputs



Here is where the Cantar three screen 'mapping' is at its best. Sources going to the left ear show on the left screen, sources to be listened to in mono show on the middle screen and those going to the right ear on the right screen.

All inputs – recorded or not –, and all tracks can be monitored along different monitor configurations for each of the four stereo outputs. 26 different maps spread over four benches: {Ph} Phones, {Lo} Line-out, {Fb} Foldback and {Do} Digital-out are available.

The black [monitor] crown gives instant access to all of them. To check and create 'outputs routing' maps, see p.26.

In the example above, the 'Ph d' phone routing shows:

Track 5 goes to the left ear, Track 1 and Track 2 go to the center (both ears) and Track 6 to the right ear.

With the [SoloMixPan] slider pulled toward the operator side, pressure on the [routing] button instantly shows the current monitor configuration.

••• Pan-potting T1-T6 to the mixdown



Push the [SoloMixPan] slider toward the battery side, press the [track-solo] button next to the mixdown digi-fader: the pan-pot of this track goes under [jog] control and shows its left/right contribution to either channel of the mixdown. The spatial position of the five other pan-pots is clearly visible on the circular screens while the exact dBFS value of the selected pan-pot is displayed in the rectangular screen.

•••• Metering the tracks



Cantar's large circular modulometers, visible under the brightest light as well as in the dark, are the most accurate metering tools found in any portable recorder. They feature a non-linear scale with increased resolution (1dB) in the most important range: -55 to -40dBFS (5dB per segment); -40 to -32dBFS (2dB / segment); -32 to -12dBFS (1dB / segment); -12 to 0dBFS (3dB / segment).

The peak level segment hold duration is adjustable from 0.5 to 5 sec (see AUDIO/TC.10). The Tracks are grouped into 'natural' pairs: T1/T2, T3/T4, T5/T6. When a track is momentarily dis-armed, its modulometer appears dashed.

••••• Monitoring physical status



The center of each circular screen continually displays the status of the main recording elements:

- activity of the internal HDD ('three platter' icon on the left screen), of the external HDD ('three platter' icon on the middle screen), and the DVD ('one platter' icon on the right screen). The disk activity is highlighted by the presence of the track IDs recorded onto it.
- sync clock mode: either master **int c** or slave **ext c**.
- mic preamplifier status: Limiter on/off, Direct/Invert, Phantom on/off.
- the current monitor map name (sent to the phones too) is constantly displayed by large alphanumeric numbers.
- the activation of the mixdown recording on T7/T8 is indicated by the 'mix' icon next to the '7' and '8' black squares.

Rectangular screen

This is also a multifunction display.

• Control of the settings

In {TEST} and {REC}

Top row by [jog]ing it successively shows T7/T8 bargraphs, battery voltage, available recording time, remaining disk space, etc.

Middle row shows the TC stamped in the audio file and its source, 'Atc' (ASCII from OriginC), 'Ltc' (jam from an LTC generator), 'Stc' (taken from the system calendar), 'Otc' (operator entered TC), 'Rtc' (record-run mode), and 'Etc' (permanently slaved by an external clock).

Bottom row shows the filetag and duration of the take, or by [shift] [eye] the scene and take.

In {PPR}

the screen is used to monitor scene, take and notes entries (see the PPR chapter).

In {AUDIO/TC}, {TECH}, {SESSION} and {BACKUP}

AUDIO/TC	01
SampleRate	
48048	

the screen shows the pathtree of each parameter value.

Top row operand and parameter ID, e.g. 'AUDIO/TC' and '01'.

Middle row parameter name, e.g. 'SampleRate'.

Bottom row parameter value, e.g. '48048'.

•• Modulometer for T7/T8



The top row of the display is mainly devoted to T7/T8 modulometers.

Either Xa/Xb (the mixdown signals) or Mic3/4 or Line-in3/4 or Digi 7/8 may be routed directly to T7/T8 in the AUDIO/TC.19 menu.

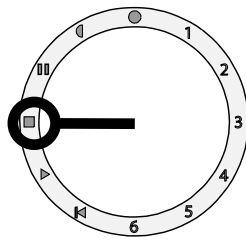
Note: pressing the [eye] button momentarily displays the 7/8 modulometers on the right circular screen.

Screen backlight

Visible in bright sunlight, you can save power by turning 'OFF' the screens' backlight.

To adjust its intensity, [MainSelector] on TECH.02, 'Backlight', [jog] from 0% to 100%.

TECH	02
Backlight	
Off	75%



Turn 'ON' Power

[MainSelector] on {STOP}, press the [batt 1] or [batt 2] button for a couple of seconds. The rectangular screen lights up to confirm that Cantar is starting correctly. On the left circular screen, the 'three platter' icon blinks for 3 to 5 seconds, the time it takes for the disk to wake up; it is surrounded by the icons of the currently routed tracks. At startup, the rectangular screen shows batt 1 and batt 2 voltage, plus the system day and hour. To shut down Cantar, put the [MainSelector] on {STOP}, maintain pressure on [shift] (the fat blue key) and [batt]. **Important notice:** when in {STOP}, with the internal HDD sleeping, the current drain is a mere 270mA. To keep the internal sync-clock running, do not turn 'OFF' Cantar during the working day.

The twin battery safety

The Cantar low power electronics offer the longest working time of all portable eight track audio recorders. With a single set of on-board Li-Ion batteries, the eighteen hour Cantar outperforms all other recorders. And with the twin battery system you will never be taken by surprise. While working on a cart from a mains power supply, leave a battery onboard and activate both inputs: the battery will buffer the possible mains power problems or the power cord being accidently disconnected. **Note:** the battery is not charged, just not discharged while Cantar is connected to mains power).

Minimum voltage

A battery switch-over is automatically done 300mV below the operator set BattAlert. This allows the use of 12.5V NiMH batteries with 10.5V triggering level, and 14.4V Li-Ion batteries with 12.4V triggering level (see TECH.11/12, p.30). Both batteries can be independantly set to their own alert level. A two beep alarm is sent to the headphones and the rectangular screen shows Batt1 or Batt2 low. As soon as the voltage drops under 10V, too low to run Cantar, both inputs are put on-duty. While in {REC}, both batteries are automatically put on duty as a safety measure, just in case you unplug one or the other battery.

Maximum voltage

16.6V is the maximum which can be applied to all Cantar power sockets, this rule applies to the Firewire socket too. **Never connect MAC G3, G4 or G5 desktops, they deliver 30V on the Firewire socket.** To connect the internal HDD to a Mac, either use a Mac laptop, (Firewire power voltage is <16V) or extract the disk from Cantar and connect it to the Gx, its Firewire to Atapi bridge sustains up to 40V. No problem with PCs, they deliver a safe 12V.

Battery check

In {TEST}, rotate the [jog] to display the battery voltage. It also appears in all positions of the [MainSelector] whenever you press the [batt 1] or [batt 2] button. Pressing a battery button for more than two seconds, turns 'ON' the selected battery.

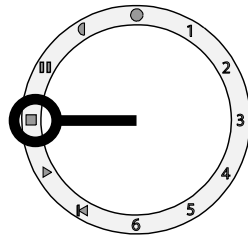
Li-Ion batteries

Aaton R-Cell Li-Ion batteries deliver 30% more power than the same size NiMHs; they are lighter too, e.g 560gr vs 695gr. **Charge:** to avoid their destruction by an NiMH charger, they are protected by an 80V reverse voltage diode on the XLR4 pin-4, and they are charged through pin-3. **Always turn 'OFF' the charger for 4 sec. before connecting a battery.** LED status: Red/orange = two hour fast charge to 85% capacity, Amber = three hour top-up, Green = charged. **Supply:** the +Batt. current is either flowing through the diode-protected pin-4, or through pin-3 to machines having their XLR4 socket pin-3&4 tied together, i.e. Cantar over #268 (XLR4 socket with four pins instead of two).

Power Consumption

{STOP} HDD active 420 mA, 'sleep mode' 270 mA
 {TEST} 600 mA (AES off, Phantom off, Heater off)
 {REC} 650 mA (AES off, Phantom off, Heater off)
 AES 'ON': + 100 mA
 Phantom 'ON': + 10 to 20 mA per mic (60 mA total)
 Heater 'ON': + 500 mA (until reaching +4°C under screens)

Note: a 12V external power supply must be able to deliver a 4A surge.



Error-free filing system

When you cold-start Cantar, it assumes you want to continue working on your latest project, which is displayed at the bottom of the rectangular screen.

When you rent a Cantar, its project memory should be empty; the rectangular screen should display 'No Project'. Once created, a 'project name' regroups all data related to it, such as the days of recording, the tracks and the disks used. The project name is stored in each audio file, there is no risk of a file getting lost in a maze of terabytes.

Unlike other machines, the Cantar file sorting system doesn't rely on disk partitions. Instead, it uses the Project, Working Day and Filename, which allows for the intuitive and safe retrieval of the audio files anywhere along the post-prod chain. It is *not operator-error prone*.

1. Project

To name a new project (max: 8 alpha/numeric characters), switch the [MainSelector] to SESSION.02, press [ok], a triangle points at the character to be modified. Run the [jog] to choose a character, then press [>], [<] to move to the next letter. Once the name has been entered, press [ok]. If you are in a pinch and have no time to create a project, go directly to {REC}, your audio files will be stored in a project named AACANTAR. Later, with a laptop move these audio files out of AACANTAR and into the project directory you would have created in the mean time.

Note: To validate the creation of a new project you must immediately record a short take in it.

2. Working Day

The 'work day' is not the same as the actual 'time-of-day' as defined by the sync clocks, it is an interpretation of the 'human' day (see **time** next page). The Cantar recorded files are multi-monophonic, i.e. independant files stored in the 'working day folder'. That folder is automatically created at the start of each working day and is named for the date, e.g. 20041206.AAD (see Calendar Time, p.13). Because the native multi-monophonic files can be interleaved into a large polyphonic one for editing machines which can only handle polyphonic audio files, there is a 'shadow folder', .AAP suffixed, which stores the associated polyphonic files for the day, e.g. 20041206.AAP.

At start up Cantar shows 'starting a new work day', giving you the opportunity to say 'NO'. Note that going to {TEST} or {REC} is a way to say 'OK'.

3. Filename

In 1997 the Aaton Indaw multitrack digital audio recorder introduced the Aaton filename system: filenames are made of an operator independent '*filetag*' which is different for each take, a '*suffix*' showing the status of the file, and an optional '*descriptor*'.

Note: the difficulty was performing these tasks while remaining compatible with EDL standards which can only handle '8+3' DOS filenames, and Mac OS9 which is limited to 31 characters (see the tutorial 'The PostChain' on www.aaton.com).

- The auto-incremented six character **filetag** (ADC123), differentiates 6.7 million takes, a sound mixer's lifetime! It must remain untouched all the way through to the final mix. One filetag represents a complete 'file group', e.g. ADC123 is the unique filetag of eight monophonic files from ADC123_1 to ADC123_8 and of its associated polyphonic file, e.g. ADC123PR.

- The **suffix** instantly flags: *the multi-monophonic original files (_1, _2, ... _8), *the interleaved poly-Native file (PN), *the interleaved poly-Rotated file (PR), *the poly miXdown (PX).

- The **descriptor** shows the scene, the take-type, and the take #, e.g. scene A18:2a, take-type t, take 04.

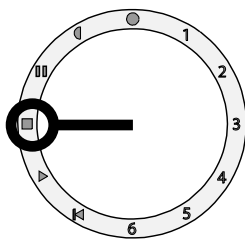
Filename examples:

A short filename: ADC123_1.wav

A long filename: ADC123==A18:2a t04==_1.wav

An operational problem?

Go to TECH.16 'SaveSetup' to create a file on the internal HDD; email this file to: cantar-support@aaton.com. This will help Cantar engineers answer your questions.



Calendar and Sync Times

Time is the essence of a digital audio recorder, two types of time are in use: 'CalendarTime' which organizes folders and files, 'SyncTime' in charge of linking sounds & images.

Calendar Time

The calendar dates and hours (system time) run for four to six years on a lithium battery powered medium precision clock which automatically creates the work day folders. The calendar date and hour show on the rectangular screen when in {STOP}.

The initialization of this clock is very important to the file management system. Its time must be checked for consistency (within ± 5 minutes) with the time-zone you are working in. Think of it when you get off of a six-hour flight. Go to TECH.20 and press [ok], a triangle points at the modifiable element. Using [jog], select the desired value, then press the [>] or [<] to move on to the next column, and so on, [ok] to exit.

The **Working Day** is related to the date defined by the calendar clock but not totally a clone of it. The working day is an interpretation of the 'human' day; its duration can be from 6 AM in the morning to 3 AM in the deep night next day. If you turn 'OFF' the batteries after midnight, Cantar thinks the operator has gone to sleep. But if your 'work day' is continued into the wee hours after a midnight snack, you would probably not want it to be considered a 'new' work day. That is why Cantar shows 'starting a new work day', giving you the opportunity to say 'NO'. Note that going to {TEST} or {REC} is a way to say 'YES'.

Thus, if you stop working at 2 AM one day, the audio files are still part of the (technically) previous work day folder. Conversely if you want to start a new work day right after midnight, just turn 'OFF' the battery, then turn it back 'ON' and answer 'YES' or go to {TEST}.

Sync Time

At start-up you will notice a blinking **int c** or **ext c** icon, depending upon the master (internal clock) or slave (external clock) mode selected in AUDIO/TC.14 'TcSource'. This blinking icon reminds you to verify that the same timecode is running

in all of the camera(s) and audio recorder(s). Three syncing methods can be used; and with Cantar's AutoSlate there is now a fourth one.

Method 1 'int c'

internal free-run master-clock

In AUDIO/TC.14 'TcSource', select *IntClock*. The internal TCXO 1 ppm clock keeps time accurate to $\pm$ one frame in nine hours; it is used to stamp the sound files with the very same TC as the one stamped on the camera's images. This is the AatonCode method. In the video world this is called the '**free-run**' mode. Once initialized, Cantar behaves as an independent master-clock.

• **Calendar init.** (from Cantar alone)

Pressing and holding the [shift] blue button, and then [TC jam] (in that order) results in Cantar jamming the System Time into the internal-TC clock, "Jam OK" shows, then 'Ctc' (calendar-tc) in the rectangular screen. *If under high pressure you forget to press [shift] [TC jam], the calendar date and hour are nevertheless used but the 'int c' icon keeps blinking.*

• **Operator init.** (from Cantar alone)

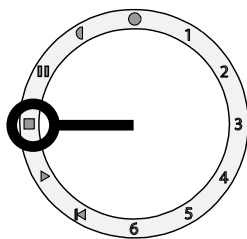
In case you don't want to use the calendar date and time, the TCXO clock can be set by the operator, see AUDIO/TC.18. 'Otc' (operator-tc) shows in the rectangular screen.

• **LTC init.** (from Camera, VTR, GPS, etc.)

Cantar on {TEST} press [TC jam] for more than two seconds, this makes the entered SMPTE LTC jam the Cantar TCXO clock. 'Jtc' (jammed-tc) shows in the rectangular screen. [TC jam] has no effect if there is no valid timecode on the LTC inputs, 'failed' shows in the rectangular screen, the '**int c**' icon continues to blink.

• **ASCII init.** (from Aaton OriginC)

Cantar on {TEST}, the TCXO clock is set by the Aaton OriginC used to set cameras and GMT-u generators 'Atc' (ASCII-TC) shows in the rectangular screen.



Cantar becomes a master-clock

As soon as the 'int c' icon stops blinking, Cantar starts generating timecode. This timecode is based on a TCXO (Temperature Compensated (X)crystal Oscillator), accurate to $\pm$ one frame in nine hours (1 ppm). This high accuracy makes Cantar THE timecode reference on set.

If you turn 'ON' the LTC generator output in AUDIO/TC.16, the LTC-out can be used to continuously sync all equipment through cable or RF. You can also initialize several Aaton GMT-u (low power, high accuracy, time keeper), attach them to the cameras and digi-slates and have TC that matches the Cantar's TC.

Do not power down the master

Being on a job on which the free-run time-of-day TC is the essence (AatonCode camera, HD camera with GMT-u reference generator, smart digi-slate), never power down Cantar during the working day to avoid the loss of its 1 ppm reference time! While the internal HDD is in sleep mode the total power consumption is a mere 270mA! Go to TECH.13 and set the HDD to sleep five minutes after {STOP}. If you still want to power down Cantar at lunch time, the blinking 'int c' icon at power up will remind you to re-initialize its sync clock and all other time keeping machines on the set.

Method 2 'int c'

internal **record-run** driving clock

Go to AUDIO/TC.18 'RecRunInit, [ok]/ 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 2 sec. over the preceding take's end-TC. This clocking, called Record-Run, produces audio files which appears as if they have been recorded in continuity.

If for some reason Cantar is unpowered, the rec-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 prerecord buffer is

set at 35 sec., the next audio file will start at 01:45:02 (two second gap), but the TC emitted by the LTC generator to the camera when hitting {REC} will be 01:45:37.

Since in 'Rec-Run' mode Cantar generates the reference TC, it must continuously be sent to all cameras on the set by wired or wireless LTC links.

Note: in {TEST} and {PPR}, the LTC-out is freezed on the end-TC value, it can thus be used as a master TC to start and stop another Cantar ('Record remote control', p.18).

Method 3 'int c'

internal calendar clock & **clapstick**

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

Method 4 'ext c'

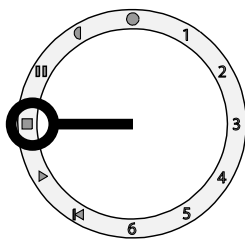
slaved to an external clock

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.

Select AUDIO/TC.14 'Ext.Clock'; 'ext c' blinks in the circular screen, meaning that Cantar is waiting to be slaved to an external LTC, e.g. a video camera. *Cantar set to external clock will only jam when you go to {REC}; pressing the [TC jam] button will do nothing.*

Cantar usually is in {REC} before the camera, so it monitors the Lemo5 / SubD15 incoming LTC and grabs it when coherent TC shows. That is why 'ext c' keeps blinking until the camera is up to speed.

Before closing the audio file, Cantar stamps a 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, a 'no ext-TC' warning shows in the rectangular screen and a phone beep is triggered every four sec. The beep is muted during 'w' tagged wild sound takes (see {PPR} 'Scene and Take'). The external TC is nevertheless grabbed if it shows before the take's end. Note that external LTC breaks can be used to slave the {REC} On and Off (see 'Record remote control', p.18).



Sampling Rate vs Camera Fps vs Audio-TC

These parameters are theoretically not correlated. The number of audio samples per Earth second (Hertz), is called the sampling rate, e.g. 48000 is 48kHz.

48kHz and 96kHz are universal, The film/video 'frames per second' value should have no influence at all on the audio sample rate frequency.

The frame rate used to express the audio time can be 30, while images are filmed at 24 or 25fps! Unfortunately, because of vintage post-machines, the NTSC drifting fps forces engineers to use tricks to sync real-time sounds with drifting-time images, e.g. disgraceful 48048 or 47952 samples per second (Hertz).

On the planet Earth

Timecode handling is simple at integer speeds such as 24, 25 and 30fps. *It is more complex at 29.97DF where a drop-frame lookup table is used to keep the image frame count in line with Earth's time: the frame count jumps over two images every minute except for every tenth minute.*

Stored in the BWF metadata, the camera fps is a simple reminder and can be changed later and then applied to the audio LTC used in some audio-post sync operations.

[U] Universal : 24.00 ... 25.00 ... 30.00 ... 29.97DF

In a file digitized at 48kHz, the Format stamp shows the number of samples digitized in a real-second, i.e. 48000; the Time-stamp carries the number of samples since midnight using the sample rate value found in the Format stamp. *This exact same logic is used in the Barebone mode-B of the 'slow-planet' recording mode.*

On the 'Slow-planet'

Unfortunately, NTSC-compatible 23.976fps HD cameras cannot use anti-drift lookup tables because nobody ever found a clever way to emulate the counting compensation invented for 29.97fps. When shooting HD in the U.S the **'slow second' still imposes its rule. The slow second is the time it takes to shoot 30 frames of NTSC video, i.e. 1.001 Earth second**. As soon as you enter **Camera fps = 23.98NDF** or **29.97NDF**, Cantar knows it must work

in the 'lazy-second' world, its TCXO clock switches to a slower beat and the TC separators change from ':' to '*', e.g. 12*45*36. You are on the Slow-planet with its 24 lazy speed (aka 23.98 on Earth) and 30 lazy TC (aka 29.97NDF on Earth).

Many nights of engineers' time have been spent trying to find a universal method to sync sound and images on the slow-second planet but nothing came out. In the U.S. you must ask your post-facility which one of these **three sample-stamp modes** is requested:

[A] Avid v11 : 23.98NDF -A ... 29.97NDF -A

In a file digitized at 48kHz the Format stamp shows the number of samples digitized in a lazy-second, i.e. 48048; the Time-stamp is the number of samples since midnight, using the 48048 value of the Format stamp.

Introduced on the AvidMC v11.3.2 the 'A' mode is slowly being replaced by the 'C' mode. See 'Avid-Recording-Rates' www.aaton.com/files/avid-recording-rates.pdf.

[B] Barebone : 23.98NDF -B ... 29.97NDF -B

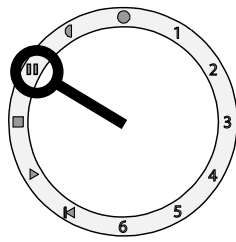
In an audio file digitized/recorded at 48kHz, the stamp shows the number of samples digitized in a real-second, i.e. 48000; the Time-stamp is the number of samples since midnight using the 48000 value of the Format stamp.

While images and timecode are beating the slow-second, the sound remains on Earth! Since recent post-machines (e.g. Indaw) perform high quality real-time sample rate conversion, 'Barebone' and 48kHz should be THE choice.

[C] Compensated: 23.98NDF -C ... 29.97NDF -C

The mode for challenged post-machines: in a file digitized at 48kHz the Format stamp shows the number of samples digitized per real-second, i.e. 48000, but the Time-stamp is the number of samples since midnight as digitized in lazy-seconds, i.e. 48048 (no longer the Format stamp value!), hence the '-F' suffix (for Fake or Faux) used by some manufacturers.

If it is 02h00m00s on Earth at {REC} start, the Time-stamp shows 345,945,600 samples (02h x 3600s x 48048).



Audio inputs

This position opens access to audio signals testing.

Five microphones M1, M2 and M5 on XLR3, M3 & M4 on XLR5.

Four lines L1 & L2 on XLR5, L3 and L4 on XLR5.

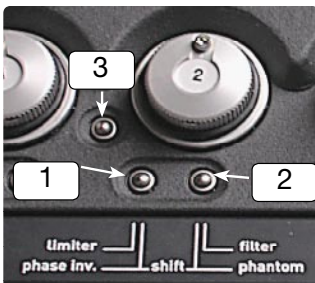
Eight AES-in Tascam SubD 25 (pin-outs p.46).

Microphone Preamps

The Cantar mic-preamps offer such a wide dynamic range in one stroke that they don't need any pre-conditioners or trims.

Dynamic or Phantom

Press [shift] [so-fil-tom] (2) to toggle that mic's phantom power 'ON/OFF'. The default setting for Phantom 48V is 'ON' for all mic-inputs. When connecting a dynamic microphone, turn 'OFF' the phantom power; the mic-preamp gain will be boosted by 12dBu. When the phantom power is disabled, the triangle below the mic number disappears from the right circular screen.



Limiters

Press [lim-inv] (1) to toggle the limiter 'ON/OFF'. While the limiter is turned 'OFF', a triangle disappears from

below the mic number on the left circular screen. While the limiter is turned 'ON', if the signal level reaches the limiter zone (-8dBFS), the triangle will start blinking.

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. When the limiter is activated, the 32dBu head-room above the -8dBFS kick-in point gives 24dBu above the 'no-limiter' full scale.

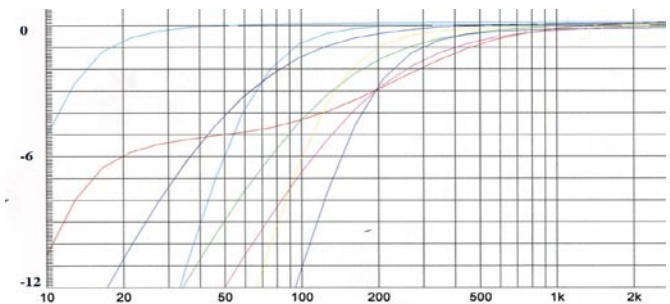
The operator can count on a 44dBu reserve over the normal -20dBFS level. If the signal does reach the -1dBFS level, a 'CLIP' icon appears at the end of the modulometer scale and a beep can be sent to the headphones (TECH.05).

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

High-pass filters and attenuators

The default setting is 'linear' on all mic-inputs. Press [so-fil-tom] (2) and [jog] to select a corner frequency/slope of which you control the effect in solo mode.

A first bank of filters shows in the rectangular screen, it goes from 60Hz/-6dB to 180Hz/-12dB and LFA (speech low frequency attenuator),



A second bank, identical to the first, activates a 10dBu attenuator which leaves the input faders in about the same working position as when high level mikes are used.

A third bank, identical to the first two activates a 'Low Gain' 24dBu attenuator which converts mic-inputs to line-inputs. This third bank is available on Cantars equipped with internal attenuators (Ref. SL1).

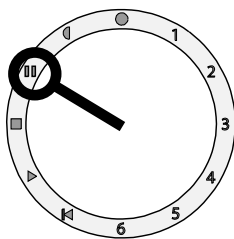
Inversion

Press [shift] [lim-inv] (1) to invert the phase of a mic-input signal; a triangle shows below the concerned mic number on the middle circular screen.

Differential delays

Delays inherent to sound propagation (3ms/m) or introduced by signal processing (up to 3.8ms in a digital wireless kit) can induce 'phasing' interference between mics placed at different distances (or time) from a sound source. In some instances it is advisable that all other audio inputs contributing to the onboard mixdown wait in a buffer for the 'late-sound' arrival.

Press [shift] [silver], 'Toggling to delays' shows, press [>] and [<] to scroll over Mic1 to Line-in4; press [ok] on the one to be set, [jog] from 0.0 to 85.0ms delay in 0.1ms increments (1ms increments by [shift] [jog]). You can fine tune the delay by listening to the tracks in 'double-solo' (see 'record / Recording / Solos of the tracks', p.20).



To protect your ears, a short mute is triggered each time you modify the delay. Note that the value of the longest delay is applied to all other channels but the one being set.

Example: you want a digital wireless lavalier (3.8ms processing delay) feeding Line-in 1 to be in phase with a boom at 6m distance (18ms sound propagation time) feeding Mic5. Set Mic5 at 18ms and Line-in 1 at 3.8ms. Cantar will automatically buffer all other inputs by 18ms while Line-in 1 will be buffered by $18 - 3.8 = 14.2$ ms, and Mic5 by 0.0ms.

Note: A nine 85msec A/D buffer circuit can be installed in Cantars containing a CM3+ mother board.

Mic Coupling

Go to AUDIO/TC.10 and select one of the available couplings: '1+2 3+4' (default mode), or '1+2+3', etc. Phantom, Limiter and Highpass-filters are identically applied to the coupled prefaders. Phase inverters remain independant. All of these couplings remain active when the Cantar on-board faders are taken over by the **CantaRem** linear sliders.

Stereo-pairs

Select '1+2 3+4' in AUDIO/TC.10. Press [shift] [link-lock] (3) between the Mic1 and Mic2 faders: Mic1 becomes the master of Mic2. Press [shift] [link-lock] (3) between the Mic3 and Mic4 faders: Mic3 becomes the master of Mic4.

Surround sound

Select '1+2+3+4+5' in AUDIO/TC.10. Press [link-lock] (3) between the Mic1 and Mic2 faders, Mic1 becomes the master of the gang.

Masters and slaves

Whenever you rotate a fader, all fader values are displayed on the rectangular screen; the master(s) is 'highlighted' by a black square, the slave(s) by a pipe. The slave tuning range is ± 12 dBu of its master's value.

★	Mic Bal	¥	★
-20	-25	■	-32
-15	-14	■	

Protecting the balances

Provided the balance lock has been locked in AUDIO/TC.09, the tuning of slaved prefaders is protected against flying fingers: balance modification can only be done while pressing [so-fil-tom] (2).

The memorized gain value is displayed in dBFS on the rectangular screen, the physical position of the fader is shown by < > signs. There is no sudden level change if re-activation takes place when the fader is positioned in such a way that it makes the 'pipe' sign show.

M/S pair handling

While routing inputs to tracks (see 'M/S Declaration', p.25), and passing over the '**m-s**' icon, activate it to make the monitor decode the M/S signals into M+S and M-S, i.e. L/R stereo.

For M/S *mono* monitoring, see 'Pan-pots', p.20.

Locking the Faders

Press the [link-lock] (3) button between the Mic1 & Mic2 faders to (dis)able the mixer's linear faders; press the [link-lock] (3) button between the Mic3 and Mic4 faders to (dis)able the rotary faders. Any action on a disabled fader makes the rectangular screen show 'Locked Fader' instead of its gain value. To prevent inadvertently (un)locking the faders, it is necessary to press the button for a full second to make the change.

Headphones

The headphones power amplifier is powerful enough to drive loudspeakers down to 8 ohms.

To facilitate extraction of a right angle adapter – a must to direct the cable out of your sight –, the headphone socket is located toward the bottom of the machine. This makes a



long straight plug hit the table on which you put Cantar. It is highly recommended that you always use a right angle adapter.

The headphone socket is not waterproof, water entering through it falls into a space separated from the general housing compartment, and empties out through a hole located in the compartment bottom (see pic. p.5).



The Pre-Post-Record position {PPR} is unique to Cantar, it gathers three essential functions: pre-record buffer activation, metadata keying/editing and last take erasure.

Pre-record buffer

While the [MainSelector] is on {PPR}, the pre-record buffer stores the audio in a First-in/First-out (FIFO) buffer memory and dumps them to the HDD as soon as {REC} is activated. The '•rec' icon blinks under the disk(s) selected for recording.

Once the buffer is full, and the FIFO starts discarding the first-in sound, the 'three platter' icon middle platter disappears. This is a way to check the pre-record buffer length. This length can be modified (up to 35sec. @48kHz), in AUDIO/TC.08.

Record remote control

In {PPR} position, be it in master 'int c' or slaved 'ext c' mode, Cantar starts recording on a **running LTC-in** and stops recording on a **frozen LTC-in** (see AUDIO/TC.13 'RecordByLtc', p.29), generated by a video camera or an Aaton GMT-u (p.44).

The LTC-in can carry a continuous *record-run* TC or a discontinuous *free-run* time-of-day TC. No time overlaps are created on the breaks since Cantar waits for 3 sec. to validate the new TC then go to {REC} while splicing the preceding three second audio stored in the pre-record buffer.

Cantar can also be controlled by a **keyboard** with converter (p.46): (press [ctrl] [alt] and 's' {STOP}, 't' {TEST}, 'p' {PPR}, 'r' {REC}) or by **CantaRem** (p.42) or **Arcan** (p.43).

Metadata entry

Arcan or keyboard with converter are recommended. While the [MainSelector] is on {PPR}, scene, take, comments and track-names may be entered before or after the recording of a given take. Press [shift] [silver].

• Scene and Take

The first screen shows 'Seq Sc Tk'.

Press [ok] to go down to the bottom line and use [>] or [<] to scroll along the characters and modify them with [jog]. Press [ok] to store and exit.

The default scene and take template offers Sequence, Scene, Take-type and Take#. An open template is also available in AUDIO/TC.11.

• **Sequence** three digits: 'a', 'b', 'c', 'd', 'e', 'f', 'r', 's', 't', 'A', 'B', 'C', 'D', 'E', 'F', 'R', 'S', 'T', and 'space'.

• **Scene** two digits: 'a', 'b', 'c', 'd', 'e', 'f', 'r', 's', 't', 'A', 'B', 'C', 'D', 'E', 'F', 'R', 'S', 'T', 'O' to '9', and 'space'.

• **Take-type** 't' = time sync audio, 'p' = pick-up, 'w' = wild sound, 'a' = announce, 'n' = no-good. This *tpwan* is selected with the [red] button.

• **Take#** two digits.

At each new recording the Sequence/Scene of the preceding file is maintained and the take# is incremented by one. Modifying the Sequence/Scene causes the take# to reset to 1. The rectangular screen shows the filetag of the NEXT recording.

•• Comments

[jog] to 'Tk comments' and press [ok] to activate the bottom line where the former comment appears. Characters can be entered with [<], [>] and [jog] but it much easier to use a keyboard or a remote PDA with Arcan (max: 200 char).

Depending upon the keyboard [insert] key toggle status, a flickering square (insert) or a flickering pipe (overwrite) is displayed. Enter your comments. and press [ok] to validate.

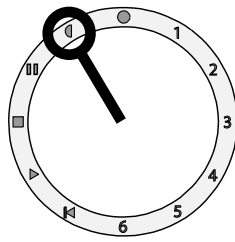
Note: To erase the comment line inherited from the preceding take, press [shift] [esc].

••• Track-names

[jog] to 'Track-name1', press [ok] to activate the screen bottom line. [shift] [jog] or keyboard's [shift] [up/down] arrows show the available list of track-names.

Track-name completion relies upon a library of the last thirty track-names in active use. This automatic process speeds up track-naming by letting you pre-store the names of the film's main actors and swiftly recall them by their first two letters. Press [ok] or [enter], and [jog] to the next track.

Note: The default entry mode is 'overwrite'. If you select 'insert', by pressing the keyboard [insert] key, it will revert to 'overwrite' on the last character because track-names are limited to ten characters.



Note3 If you are in a hurry and no time to name the tracks of the next take, it is better to remove the former take's track-names than to write incorrect ones. To bulk remove them, go to the track-name editing line (any track will do), and press [shift] [esc].

Note4 If the operator has not entered a track-name, one of the following defaults is used:

- T1–T8 on native monophonic tracks.
- ms+M and ms-S on M/S tracks.
- MixRight and MixLeft on mixdown tracks.

To allow for the possible entry from a PDA, the default track-names are only inserted upon completion of the take. Press a [track-solo] button to display that track's name in the rectangular screen.

••••Track-name cleaning

[jog] to 'Del name', press [ok], select the track-name to be deleted, and press [ok]. If you decide not to delete the track-name, press [esc].

•••••User's TapeRef

This is to be used to overwrite the automatic MMDD Cantar generated *DayStamp* and replace it with the incrementing shooting day of the film project or something like the VideoTape ID (see 'Practice2', p.41).

Post record

Go back to {PPR}. The scene, take and filetag to be used for the next file recording is displayed. If you need to modify the previous take's information, press [shift] [silver], the rectangular screen displays EDIT, the PREVIOUS filetag, and the scene and take of the last recorded file. Press [ok] and use [→], [←] and [jog] as explained in the preceding paragraphs.

You can modify the take-type (*tpwan*) with the [red] button. Press [ok] to confirm, then [shift] [silver] to close and go back to displaying the NEXT take's characteristics.

Scene and take can also be modified later by selecting the file in {BROWSE}, and performing the same editing operations as described here in {PPR}.

Pazienza! paciencia! patience!

When editing metadata entries, you are modifying the native files stored in the internal HDD. If you are working in simultaneous (mirroring) mode, these modifications are immediately applied to the external drive files as well. But if you are working in *IdleCopy* mode, they will only be applied later when Cantar is in {TEST} or {STOP} position. So, at the end of the session, keep in mind not to unplug the external HDD nor remove the DVD-RAM disk hastily, wait until *IdleCopy* finishes its revamping work!

File splitting

File closing/reopening can be performed during {REC}.

Manual split

To divide a file into shorter segments or to enter a new scene and take on-the-fly, quickly go from {REC} to {PPR} and back to {REC}. A new file with a new filetag is created. By default it carries the same scene but *the take is incremented*. You will not lose a single audio sample. A short pre-silence is added at the head of the new file to ease the splicing work in post.

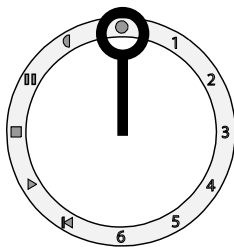
Automatic split

Four length settings are available: 260MB (30min at 24Bit, 48kHz), 690MB (700MB CD-R capacity), 2GB (FAT32 default setting), 4GB (Indaw max. filesize). The filetag is incremented but in this case the scene and take remain the same, e.g. if you need to record sound in an airplane flight for eight hours without interruption, but you don't want files larger than 4GB, Cantar closes the file and starts a new one without losing a single audio sample.

Last take erasure

Purposely, Cantar can only erase the last take, e.g. a false start. Open 'Edit' by [shift] [silver], select 'Erase' with the [jog], [ok]; [jog] the 'No' to 'Yes'; [ok] to delete. As a further protection the latest [MainSelector] position must have been {REC}, and the power supply must not have been turned 'OFF'. Go to SESSION.04 if you want to erase and format a complete disk.

Note: 'Take' represents a 'file group' sharing the same scene, take and filetag, e.g. CD2234 represents the monophonic files from CD2234_1 to CD2234_8.



Recording

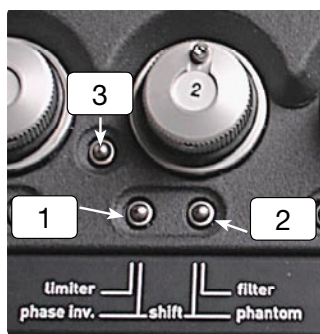
Go to the {REC} position, a '•rec' icon shows under the active disk drive and a red LED lights up underneath this icon. While in {REC}, the two batteries are paralled for additional safety.

Modulometers

In {REC}, {PPR} and {TEST}, the modulometers display the level of the signals sent to the disk. The circular modulometers' resolution is 1dB in the -35dBFS to -12dBFS working zone. The rectangular screen modulometers' resolution is 2dB in the same zone.

The ballistics emulate needle modulometers. The decay time can be adjusted in TECH.09 from 1=fast to 5=slow. 5 is recommended for low temp use. The default is 3. The peak-meters are always active, and their 'hold' period can be adjusted from 0.5 to 5 sec.

Solos of the inputs



If several inputs are routed to the same track, the **Inputs to tracks** configuration can be checked by pressing the [routing] button (top left of the front panel). It is easy to monitor a questionable mic by rotating the [monitor] crown to {So} or pressing its

[so-fil-tom] (2) button.

Solos of the tracks



Pull the [SoloMixPan] slider to {SOLO}, operator side. Press a [track-solo] button: you will hear the track's audio in both ears. While maintaining pressure on the button, press another. You will hear the first selected track in the left ear, and the second in the right ear. This is used to compare two track levels or phases.

When a [track-solo] is activated, the selected track's modulometer is differentiated from the others by a 'dashed' appearance.

Built-in Mixer

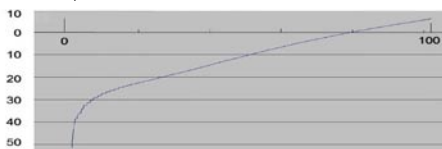
Pan-pots Push the [SoloMixPan] slider to {PAN}, battery side. Each track can be sent to the left or right tracks of the mixdown. Press the [track-solo] button and [jog] the marker to the left or the right of the circular screen. When it is in the center it provides a mono mix. The value in dBFS of what is left to the other side shows on the rectangular screen.

When a track pair is declared 'M/S', the pan goes to the middle and it is L/R decoded into the mix. If you create a Phone-out or Line-out monitor configuration out of an M/S declared pair, you will get pure stereo.

If you pan the M track to one side or the other, it goes 100% to the right or left, and the S signal disappears from the mix. That is the way to mono monitor an M/S pair.

Mixer Sliders Once the pan-pots have been set, each track's contribution to the mix is adjusted with the mixer's sliders. The maximum gain can either be +6dBu or 0dBu (AUDIO/TC.07). To listen to the mixdown, [monitor] crown on {Ph}, select 'Ph MX'.

To improve the CantaRem mixdown control, the sliders' scale has been expanded into the low gains region (see curve).

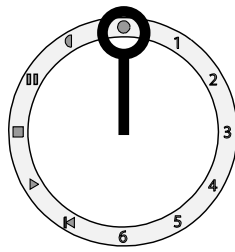


Mixer Bargraphs The mixer Xa/Xb outputs recorded on T7/T8 appear on the rectangular screen top row. dBFS values: -50 -45 -40 -38 -36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -9 -6 -3 .0 .Clip.



[jog] overwrites the bargraphs with the battery voltage, the available disk space, and the remaining recording time, calculated from the current track count, bit-depth and sample rate.

Note: pressing the [eye] button momentarily displays the 7/8 modulometers on the right circular screen.



Tone generator

In {TEST}, {PPR} or {REC}, [shift] [red] sends a 1kHz tone to tracks and modulometers; - 18dBFS and - 20dBFS can be selected in AUDIO/TC.03. Releasing [shift] before [red] locks the tone 'ON'; pressing any button, turns it 'OFF'. The mixdown receives this tone too, not the result of the mix!

Talkback mic

In {TEST}, {PPR} or {REC}, press and hold the [black] button to send the talkback mic to the left channel of Line-out or Foldback or both (see AUDIO/TC.04). Quickly press [black] then press and hold [black] again to send the talkback mic to the right channel. Press [shift] [black] to record the talkback mic on all tracks.

Warning beeps

The beep level is set in TECH.08. *one beep = record start (TECH.04) or clip detection (TECH.05). *two beeps = read the rectangular screen, low priority problem such as low battery voltage. The lack of external clock beep (TECH.06) is activated on sync 't' takes only. *three beeps = read the rectangular screen, high priority problem such as an accidentally unplugged external HDD.

Headphone level

The headphone level is protected by [shift], the stored value shows on the data panel. Rotating the fader makes '<' and '>' signs show up. There is no sudden level change if reactivation takes place when the fader is put back in its 'pipe' stored position, between '<' and '>'.

Take-type (t p w a n)

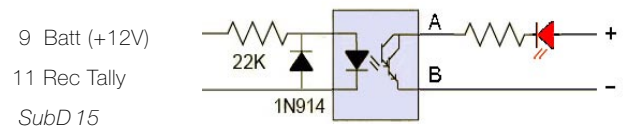
While in {PPR} or {REC}, press the [red] button to toggle the take-type: t=time sync audio, p=pick-up, w=wild sound, a=announce, n=no good, t p w a n.

Record tally

While in {REC}, the SubD 15 pin-11 is grounded by an open collector transistor (max: 40mA). To avoid ground-loops it should be used to drive optocoupler(s) tailored to the current and voltage of the controlled item(s).

Warning: do NOT use a coil activated device on pin 11, the flyback voltage would kill the 'tally' output transistor.

It is wise to use an opto-coupler to isolate the power supply of Cantar from your external equipment and avoid ground loops. On the drawing below, the 22k resistor provides the correct current to a NEC PS2502-1 darlington optocoupler, if you use a different model, you may need a different value.



AutoSlate and Markers

AutoSlate

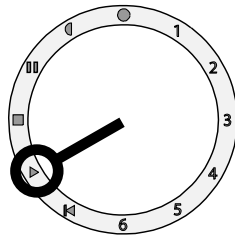
In AUDIO/TC.12 'SlateChan1', select the channel you want to detect the slates with. While in {REC}, press [shift] [silver] *within six seconds* after a clapstick to create a Slate Mark labeled SA, SB, SC etc. AutoSlate detects the most plosive event preceding the [shift] [silver] push. This allows for the automatic labeling of several successive slates generated by a multicamera shoot. The sharpness of the clapstick shows in the rectangular screen, 25% should be a minimum. If the slateman scores 75%, you can congratulate him for his work.

If you forget to press [shift] [silver], AutoSlate nevertheless detects the most plosive sound of the take with a 95% chance of selecting the clapstick. In this case the Sound-Report SlateTC shows in *Italic* font to remind the post people it must be either confirmed or ignored. This keeps the AutoSlate function active on non-sync takes too.

While in {PLAY}, [shift] [silver] starts the playback at the slate-marks. On Majax there is an upright icon on start-slates and a bottom-up icon on tail-slates; click this icon to listen to the slate announce.

Markers

While in {REC}, press the [silver] button to create a User-Mark labeled UM1, UM2, etc. These UM are accessible during playback by pressing the [silver] button, and in Majax by clicking the 'UM' icon (left of the 'Slate' icon). They can be used for events like wind noise, boom noise, dialogue mistake, etc.



Play the day

The [MainSelector] {PLAY} position opens access to all files of a day.

Note: press [shift] [eye] to replace the default 'filename and length' by 'scene & take' in the rectangular screen; it helps with searching for a take. This preference is stored until you turn 'OFF' the Cantar power.

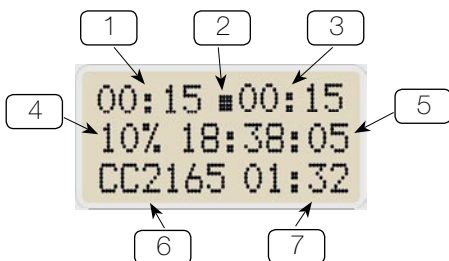
Files of the Day

When you select {PLAY}, the last recorded file is played. Arrows can be used to browse the files of the day. Once selected, a file is immediately played, press the [red] button to stop it.

Play control

On the rectangular screen:

- 1 = play-mark set by the [black] button or scrub [jog].
- 2 = play status
 - 'square' : the play has been stopped by [red] button
 - '>' plays at sync speed by [red] button
 - 'x' 2x speed by [shift] [>], back to 1x by [shift] [<]
 - '↵' jumps from one file to the next by [shift] [ok]
- 3 = elapsed time from start of take.
- 4 = percentage already played.
- 5 = timecode of played sound.
- 6 = filetag or scene by [shift] [eye].
- 7 = take or length by [shift] [eye].



[shift] [eye]
toggles
"filetag & length"
into
"scene & take"

Pause

The [black] button puts a play-mark on the current played position. The latest created play-mark overwrites the former one. To pause while playing a file, lay down a play-mark with the [black] button then stop with the [red] button or press [red] then [black].

To resume play, press [red] again. [shift] [black] resets the player to 00, i.e. the start of take.

[silver] sends the player to the next event marker.

[shift] [silver] sends the player to the next AutoSlate locator. Listen to the announce by scrubbing backward and forward, then go to {BROWSE} to edit the scene and take, if needed.

Continuous Playback

[shift] [ok] toggles the '—' continuous-playback flag, [shift] [ok] again resumes the 'one-file-only' playback mode.

Scrub

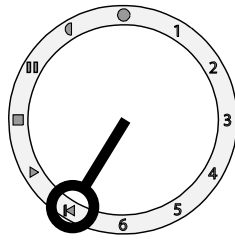
Rotating the [jog] shifts the play-mark forward and backward, resulting in a constant 1x forward playing sound which is much more intelligible than the stretched and reversed sound generated by other scrubbing methods. Press [shift] to accelerate the scrub 10x. Each [jog] tick causes a ten second instead of a one second jump.

LTC fps output

When playing back a recorded file, the TC and frame rate from the file is sent through the Lemo5, LTC-out pin. Switching to {REC}, makes the LTC-out revert to the current project time and frame rate.

File characteristics

[shift] [esc] makes the system display the file's characteristics on the bottom line, e.g. sample rate, bit-depth, TC fps.



All Days

[MainSelector] on {BROWSE} gives access to all of the working day folders for the current project, press [ok] to go to the bottom line of the rectangular screen, [jog] and [ok] to select a Work Day; the cursor jumps back to the middle line.

Working day

Work Day selected, press [ok]. The last file of the day is displayed; browse the files by [jog], [ok] on the selected one. You can edit the file's scene, take, comments and track names exactly as you do in {PPR}; the [red] button toggles the take-type (t p w a n). All these changes can be made through Bluetooth from an Arcan-W (p.43).

Note: press [shift] [eye] to replace the 'Filename & Length' default setting with 'Scene & Take' in the rectangular screen; this helps find a file to be edited. This setting is retained until you turn 'OFF' Cantar.

Other Projects

To explore the internal HDD, go to {SESSION} and successively select the various projects it contains, then go to {BROWSE} 'All days'.

To listen to the external drive files, switch SESSION.03 'DrivesInUse' to 'Ext.HDD' and don't forget to switch back to 'Int+Ext.HDD' afterwards.

Wake up HDD !

In {STOP}, the disk goes to sleep after one minute or more as set in TECH.13 'HddPwrDown'. Going directly from {STOP} to {BROWSE} or {PLAY} shows '*asleep, no disk*' or '*back & forth*'. To wake up the disk make a back & forth rotation of the [MainSelector].

This never happens when you go to {TEST}, {PPR} or {REC}, the whole system is operational in less than 2 seconds.

Operands

Six OPERANDS establish all Cantar's operating parameters and display their info on the *rectangular screen*.

- the *Operand* is displayed on the top row.
- the *Parameter* is displayed on the middle row.
- the *Value* is displayed on the bottom row.



Directly accessible through the 1 to 6 o'clock [MainSelector] positions, there is no deep diving in sub menus.

- 1 BACKUP is entirely devoted to the archiving of the Cantar recorded audio files (p.36).
- 2 SESSION deals with actions related to project, primary disk and Sound-Report (p.33).
- 3 TECHNICAL deals with parameters related to the recorder's day-in and day-out use (p.30).

- 4 AUDIO/TC deals with settings showing in the audio files and on the Cantar generated signals (p.28).
- 5 ROUTING-INS handles all graphically entered input maps (p.24).
- 6 ROUTING-OUTS handles all graphically entered output maps (p.26).

Routing inputs to tracks

Cantar records eight monophonic tracks.

Six main tracks

T1—T6

These tracks receive any one of the independent and permanently active inputs: Line-in 1 to Line-in 4, Mic 1 to Mic 5 and Digi 1 to Digi 6 (AES).

Fifteen *Inputs to Tracks* configurations can be stored. They can be instantly recalled through the swiveling panel [routing] button and the [config] crown, a one handed operation.

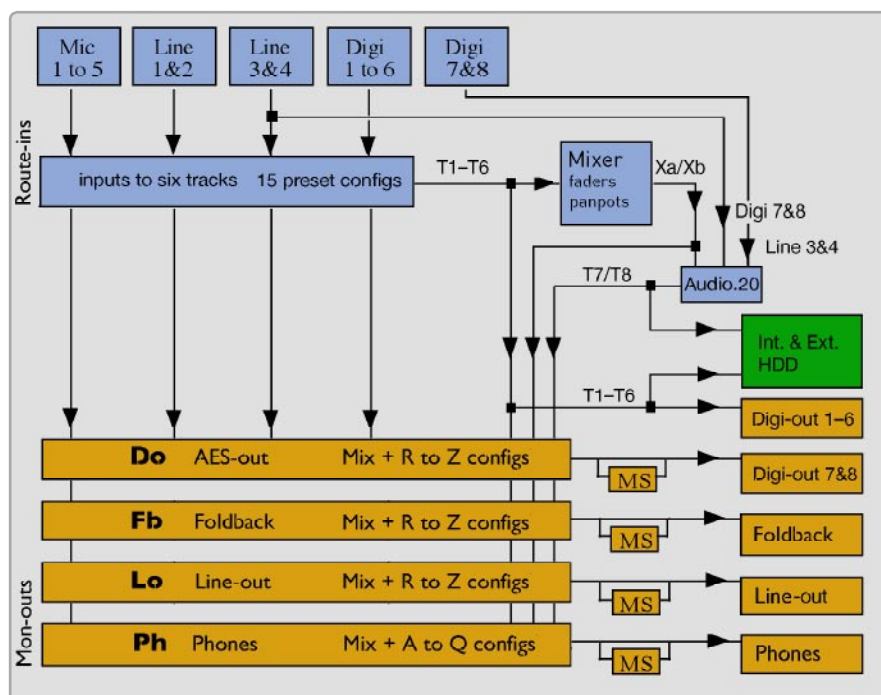
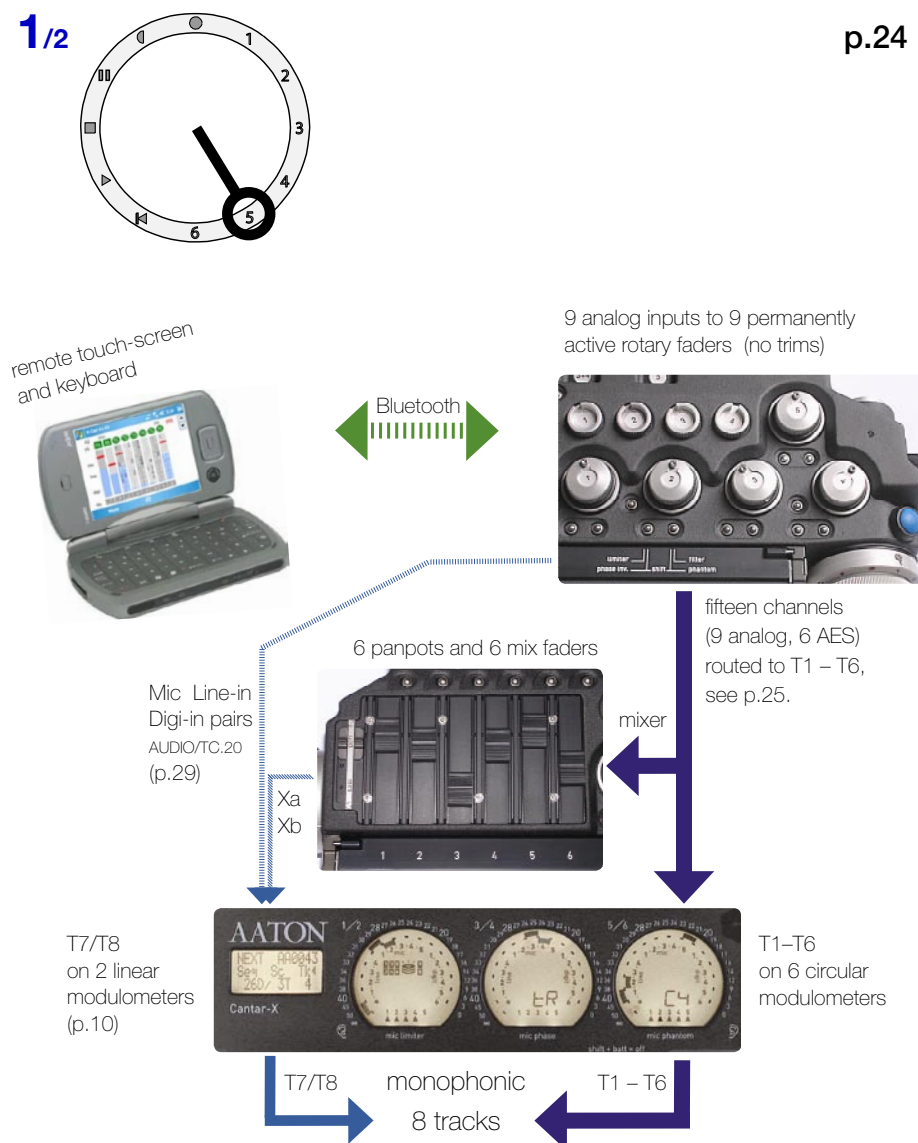
The primary tracks are monitored in pairs, T1/T2, T3/T4 and T5/T6, on the circular screens.

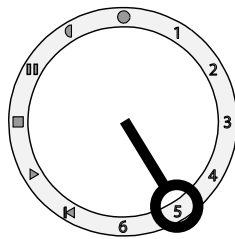
Two extra tracks

T7/T8

These tracks are clearly separated from the T1–T6 main tracks, and displayed on the rectangular screen bargraphs. They can also be displayed on the right circular screen by pressing the [eye] button. They record the selection made in **AUDIO/TC.20** (p.29):

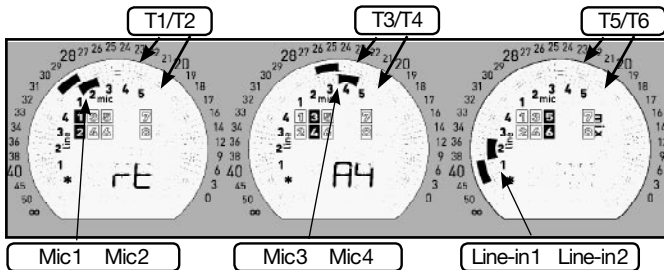
- the Xa/Xb audio mixdown pair; a 'mix' icon appears near the T7 and T8 black squares in the circular screens.
- a choice of analog or digi-in pairs, i.e. Line-in 3/4, Mic 3/4, Digi 7/8.
- nothing to save disk space.





Input-to-Track Routing Creation

Rotate the [MainSelector] to {ROUTING-INS}, Fifteen routings can be stored in three groups of five: A1-A5, B1-B5, C1-C5. They are displayed on the central circular screen.



The [config] crown gives sequential access to all of them in a wink. The last configuration in use is displayed. Select the configuration to be modified, a blinking cursor awaits your orders near the '*' icon of the left circular screen. For your learning tests it's easier to create a configuration from scratch: first erase an existing one by pressing the [red] button, then [jog] through the three circular screens.

Example: to route Mic 1 to Track 1, [jog] five positions up and put the blinking cursor facing the mic segment '1' then press the [black] button to accept it; to route Line-in 1 to Track5, [jog] the cursor through Tracks 2, 3, and 4 until you land on Track5 (odd tracks are on the outer circle, even tracks on the inner circle). Go to the pixel opposite Line-in1, accept with the [black] button; reject with the [red] button.

AES inputs routing

As soon as you select a Digi-input in a routing configuration, the Digi 1 to Digi6 input icons and the track icons, in the circular screens, start flashing to remind you to turn 'ON' the digi circuits. The AES converters of the Digi-in/out circuits consume 110mA at 48kHz and 200mA at 96kHz. It is wise to turn them 'OFF' if they are not in use (AUDIO/TC.22).

Input-to-Track on-the-fly Selection

In {REC}, you can silently check the active configuration: **PUSH** the [SoloMixPan] slider to the battery side / press the [routing] button with the thumb / rotate the [config] crown to browse the Input-to-Track presets. For the protection of the recording's integrity, you can't select another configuration while in {REC},

but you can do it on purpose: select {PPR}, press the [routing] button, rotate the [config] crown to select a new configuration and go back to {REC}. Since the pre-record buffer gives you up to 35sec to act, you are not hard pressed... not one single sound sample will be lost between the two audio files.

Track (dis)arming

Monophonic files don't waste space by recording empty tracks as is the case with polyphonic files. It is wise to momentarily disarm a track when there is no use for it. Go to {TEST}, press [shift] [track-solo] of the unwanted track. Its monitor is muted, and to remind you this track is disarmed, its '■' icon is blinking and its modulometer is dashed to make it less visible but still under control. Disarmed tracks are no longer rearmed by passing through {STOP}. You must pass over {ROUTING-INS}, or turn 'OFF' the power.

M/S Declaration

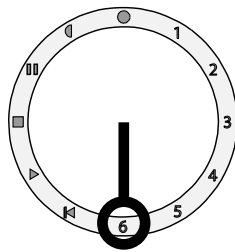
If two tracks carry a straight (encoded) M/S pair entered on say Mic3 and Mic4, use the [black] button to activate the 'm.s' icon attached to these two tracks while passing over it (see pic.). The suffix of the two files carrying M/S tracks will show a hyphen '-' instead of an underscore '_'. Being M/S declared, these files are monitored as L/R stereo tracks in the monitor configurations and in the mixdown (see 'record', p.20).

Majax (p.45) can decode and replace M/S pairs with L/R pairs for export to editing machines (e.g. Avid) which can't decode M/S stereo.

Paralleled Recorders

To impose the very same sampling rate frequency and phase to two recorders working in parallel like one single sixteen track machine, enter a **Wordclock** signal on the SubD 15 Pin-4, and select a 'Wclk' prefixed sampling rate in AUDIO/TC.01. If you select the wrong sampling rate or if the Wordclock reference is missing, the rectangular screen will tell you. *This function is available on Cantars equipped with a CM3+ motherboard only.*





Do Digi 7/8 output (AES) pair

Fb Foldback pair

Lo Line-out pair

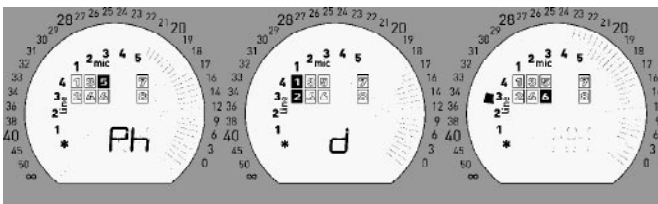
Ph Phones pair

So Solos for the phones only

Digi 1 to Digi6, AES (see AUDIO/TC.21)

The 3 Screens as maps to monitors

Here is where the Cantar three screen lay-out is at its best. Sources going to the left ear show on the left circular screen, sources to be listened to in mono show on the middle circular screen and those going to the right ear on the right circular screen. The middle circular screen does not represent a wired output but the 'mono' effect resulting from the routing of a source to both the left and right outputs.



- Track5 goes to the left side, Track1 goes to both sides (mono listening), and Track6 goes to the right side.
- Line-in3 directly goes to the phones right side.

Map creation

The [MainSelector] six o'clock position gives access to the creation of the monitoring maps.

Since headphones, Line-out, Foldback and Digi-out monitors carry a left and a right channel each, they can all be set in the same manor. The explanation below concerns the headphones, but it is applicable to the three others.

Tracks to monitors

Rotate the [monitor] crown to {Ph}. 'Ph' shows on the left circular screen. Rotate the [config] crown to get 'd' on the middle circular screen. The black blinking cursor now pinpoints an audio source. [jog] the blinking cursor to the T5 square on the left circular screen, press the [black] button to confirm, Track5 is now linked to the headphones left side ([red] button to reject), the blinking frequency increases to acknowledge the link. Then [jog] to T1 on the middle circular screen, press the [black] button to confirm you are linking Track1 to both the left and right sides of the headphones (same for Track2). Then [jog] to T6 on the right circular screen, press the [black] button to confirm you are linking Track6 to the right side of the headphones.

Inputs to monitors

You can connect any input, *even if it is not routed to a track*, to the monitor outputs. While the blinking black cursor runs on the inner ring of the circular screen, it points out the input (Mic 1 to Mic5, Line-in 1 to Line-in 4, Digi-in 1 to Digi-in 6) to be possibly routed to the left/middle/right ears. [jog] the cursor throughout the ring and 'link' the facing input to an 'ear' by pressing the [black] button.

Check / Select a monitor map

check

In {TEST}, {PPR} and {REC}, [SoloMixPan] slider pulled-Out (see 'verbatim' below), press the [routing] button with the thumb and rotate the black [monitor] crown to check the currently active map of each monitor output, it instantly shows on the three circular screens.

select

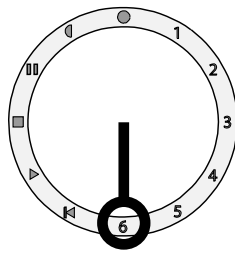
In the same way you can on-the-fly select a different pre-set map. While on a given monitor output, rotate the silver [config] crown to browse its available maps. The selected map is the one displayed when releasing the [routing] button.

Note: you can select a different monitor maps while you are in {REC}, this doesn't affect the integrity of the recording.

Verbatim

The [SoloMixPan] is a three position slider but Cantar currently uses only the {Solo} and {Pan} positions. The Mix position is kept for a future software version allowing the correction of the original Xa/Xb mixdown during playback. Here is a memotechnic proposition to help you memorize the [SoloMixPan] slider position for routing purposes. **PUSH-IN** the [SoloMixPan] slider bAttery side to **PUSH** the Inputs to the trAcks.

PULL-OUT the [SoloMixPan] slider on **SOLO**, Operator side, to **PULL** the signals to the Outputs.



Map banks

Grouped in banks accessible from the black [monitor] crown, twenty six maps are stored for the Digi-out, Fold-back, Line-out, and Phones pairs.



The eight tracks, nine analog inputs and six digi-inputs (recorded or not) are independantly routed to these output pairs.

Rotate the black [monitor] crown over the {Do}, {Fb}, {Lo}, {Ph} positions, and rotate the silver [config] crown over 'MX, A, B, to Z': all the stored maps are instantly and logically accessible (p.8).

Digi7/8-out {Do}

Do Mx Do R to Do Z

Do Mx = Xa/Xb in stereo, plus nine user created R to Z maps. The digital-out signals go to the 7&8 AES ports. *Connect these ports to a video camera featuring AES inputs (such as the Sony HD-Cam F900-SR), or to an SDI camera equipped with a miniature AES-to-Analog converter.*

Foldback {Fb}

Fb Mx Fb R to Fb Z

Fb Mx = Xa/Xb in stereo, plus nine user created R to Z maps. *The level of this pair can be controlled offline by AUDIO/TC.06 or online by a CantaRem slider.*

Line-out {Lo}

Lo Mx Lo R to Lo Z

Lo Mx = Xa/Xb in stereo, plus nine user created R to Z maps. *The level of this pair can be controlled offline by AUDIO/TC.05 or online by a CantaRem slider.*

Phones {Ph}

Ph MX Ph XA Ph Xb Ph XC Ph D to Ph Q

The headphones get four favorite settings: Ph Mx = Xa/Xb in stereo, Ph Xa = Xa only, Ph Xb = Xb only, Ph Xc = both Xa/Xb in the center, plus twelve user created maps: Ph D to Ph Q.

Solos {So}

So M1 So M2 etc. So L3 So d1

This particular position is not concerned with the mapping since it opens a direct connection in SOLO mode to ALL of Cantar's in and out ports. It is placed near the Phones monitor position since the last verified port, kept in memory, is immediately dispatched to the phones when coming back to the Solo position.

Note: As an alternative to the Solo position the **Mic-inputs** can be instantly solo-ed by pressing their [so-fil-tom] button, and the **Tracks** by pressing their mix fader button.

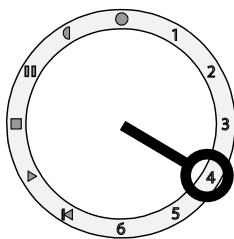
The Digi AES outputs

The eight AES outputs are separated into two groups: the 7&8 pair is 'map' routed as seen above in {Do}, and the 1/2, 3/4, 5/6 pairs are routed in AUDIO/TC.21 'Digi 1-6 outs'. These six outputs can either transmit **Mic 1 to Mic 5+Line-in 1** or **T1 to T6**.

The '**Mic 1-5+Lin 1**' selection lets you take advantage of the Cantar preamplifiers/limiters high quality, by sending their signals to an external mixer, re-entering them into Cantar through the Digi 1 to Digi 6 inputs, then routing, recording and monitoring them like any other input.

Digi in/out power

The AES converters of the Digi-in/out circuits consume 110mA at 48kHz and 200mA at 96kHz. It is wise to turn them 'OFF' if they are not in use (AUDIO/TC.22). As soon as you select a Digi-input or output in a routing configuration, the Digi 1 to Digi 6 input icons and the track icons start flashing in the circular screens to remind you to turn 'ON' the digi circuits.

**4 AUDIO/TC**

- 01 Sample rate
- 02 Bit-depth
- 03 Reference Tone level
- 04 Talkback mic routing
- 05/06 Line-out / Foldback level
- 07 Max mixer gain
- 08 Pre-record duration

- 09 Balance fader lock
- 10 Mic fader linking
- 11 Scene & Take templates
- 12 AutoSlate trigger channel
- 13 Record by LTC
- 14 TC source
- 15 Camera TC fps
- 16 LTC generator output

- 17 Ltc User-bits
- 18 Record-Run TC initialization
- 19 Operator TC initialization
- 20 T7/T8 inputs
- 21 Digi 1 to Digi6 outputs
- 22 Digi Power
- 23 CantaRem com
- 24-31 CantaRem Slider assign

01 SampleRate

44.1k 47952 48k 48048 88200 96k 96096

For Wordlock slaving, select the **Wclk** prefixed values e.g. **Wclk 48k**, **Wclk 48048**. See Paralleled Recorders (p.25).

02 BitDepth

16-bit 24-bit

Select 16-bit if you know the final mix will be done in 16-bit. Dither or truncate to 16-bit from native 24-bit tracks is available when backing-up the mixdown (see BACKUP.05, p.37).

03 ToneLevel (reference tone)

-20dBFS -18dBFS Off

04 TalkbackMic (routing of the talkback mic)

Off Line-out Foldback Lo+Fb

Press the [MainSelector] [black] button → left channel, [shift] [black] → left & right channels to tracks in {REC}.

05 LineOutLvl

0 to -94dB Mute

The Line-out level is [jog] adjusted from 0 to -94dB and mute. The track modulometer being at 0dBFS, the line-out delivers a +8dBu signal; this means that a -18dBFS reference tone delivers a -10dBu output. This is 10dBu lower than common practice in order to be compliant with the HD cameras line-input acceptable levels. A Line-out two track, +12dBu gain, transformer-isolated accessory is available (p.46).

06 FoldbackLvl

0 to -94dB Mute

Both Line-out and Foldback gains can be controlled from the Cantarem sliders (p.42).

07 MixGainMax

0dB +6dB

In +6dB mode the 0dB is on the fader separator indentation.

08 PreRecrdDur

1 to 35 sec.

Up to 35 sec of audio @ 8 tracks, 24-bit, 48kHz.

Up to 17 sec of audio @ 8 tracks, 24-bit, 96kHz.

09 BalanceLock (slaved faders)

Unlocked Locked

See 'Mic Coupling' (p.17).

10 MicLinks

1+2 3+4 1+2+3 1+2+3+4 1+2+3+4+5

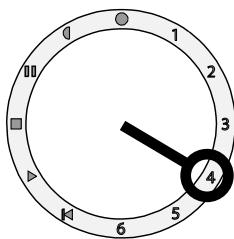
These are the four mic-preamp ganging types.

Default is '1+2 3+4' of which the linkage can be (de)activated with the two in-between fader buttons. Mic 1 becomes the master, the other(s) the ±12dBu balance.

11 ScTkTemplat

nnnA/nnA.tnn CCCCCCCC.tnn

The nnnA/nnA.tnn template fits the mostly used 'Sequence/Scene' system. The other one leaves entire freedom to the operator.



12 SlateChanl (AutoSlate detection channel)

Mic1 Mic2 Mic3 Mic4 Mic5

AutoSlate continuously analyses the signal and detects slates on the selected channel (p.21).

Line-in 1 to Line-in 4, T1 to T8 (not the Digi-inputs) will be available on Cantars equipped with CM3+ motherboards.

13 RecordByLtc

Non-active Active

In {PPR}, LTC-in frozen: no recording. LTC-in running, Cantar checks the TC coherence for 3 seconds then goes to record. While checking the TC, the sound is kept in a buffer, the audio file begins right on the running TC. If the LTC-in disappears, record is maintained, no risk of interruption on radio transmission drops out (p.18).

14 TcSource

Int.Clock Ext.Clock

On internal clock; Cantar becomes a master-clock. On external clock, it is slaved to another timecode source (p.13).

15 LtcRate

24fps 25fps 23.98ndf -B etc.

In the NTSC lazy-second world, a -0.1% A, B or C time stamping method must be selected depending on the type of editing machine that will be used (p.15).

16 LtcGenOut

On Off

See 'LTC fps output' in PLAY (p.22).

17 LtcUbitsOut

Date Filetag TapeRef Freeform

Filetag, TapeRef, and Freeform entries are not enabled.

18 RecRunInit

01h00m00s

Time jumps one hour at each rectangular screen bottom line opening. Record-run '**Rtc**' is activated for the recording session and stays there until another TC source is selected, in this case the clock goes back to its default free-run mode.

19 OperTcInit

01h00m00s

The operator entered TC becomes the next recording session time reference. '**Otc**' shows in the rectangular screen. It is disabled as soon as a Free-Run TC from an external source jams the internal clock.

20 T7/T8Input

None Mix Xa/Xb Digi-in 7/8 Line-in 3/4 Mic 3/4

None saves disk space. The signals sent to tracks T7/T8 are coming from either the Xa/Xb outputs of the internal mixer (the '**mix**' icon is displayed on the right of the T7/T8 black squares), or directly from Digi-in 7/8, Mic 3/4, or Line-in 3/4.

21 Digi 1-6 outs

T1-T6 Mic 1-5+Lin 1

AES outputs 1 to 6. On top of their individual Input-to-track routings, the Mic 1<>Mix5+Lin 1 signals can be sent to the Digi-out also. After treatment by a digital mixer/router, they may be sent back to Cantar and routed as standard Digi-inputs.

22 DigiPower

Off On

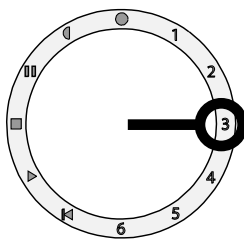
'OFF' for saving power (110mA), 'ON' if the Digi-in/outs are to be used. If these in/outs are routed but not powered, the Digi 1 to Digi6 input icons of the circular screens blink to remind you to turn them 'ON'.

23 CantaRemCom

Not active Auto Forced

'Auto' gives CantaRem control over the Cantar faders assigned to its sliders. Cantar recovers its autonomy as soon as it no longer receives a signal through the SubD 15 ASCII port, e.g. CantaRem disconnection. Cantar being on the {PPR} physical position, '**Forced**' makes CantaRem able to impose {STOP} {TEST} {PPR} {REC} (p.42).

24-31 CantaRem's assignments can be performed either from the CantaRem keys or from these positions.



3 TECH

- 01 Disk (dis)mount
- 02 Backlight
- 03 View Fader dB
- 04 Record beeps
- 05 Clip detection beep
- 06 Lack of external clock beep
- 07/08 Beep routing / Beep level

- 09 Meter ballistics
- 10 Peak hold duration
- 11/12 Batt1/Batt2 alert level
- 13 HDD Power Down
- 14 External communication
- 15 Factory Reset
- 16 Save User's Setup
- 17 Load User's Setup

- 18 Max File Size
- 19 Temperature Control
- 20 System Time
- 21 System Date
- 22 Equipement IDs
- 23 License key
- 24 Software version info
- 25 Software install

01 DiskStatus

Dismount Mount

Two CPUs can't simultaneously control the Cantar internal drives. Dismounting the internal HDD and DVD-RAM drives puts them out of Cantar's control while keeping them powered by its batteries.

A Firewire connected PC or Mac sees the Cantar HDD and internal DVD-RAM burner as standard devices. You can edit the audio files and transfer software updates.

In a Mac laptop you must install 'WriteUDF' (www.softarch.com) to be able to modify the metadata on the DVD-RAM disc running in the Cantar burner (see Majax Q/A, p.45).



MAC-OS



Ejecting the Cantar Disk

WINDOWS

Warning: before disconnecting the Firewire cable, **FIRST** eliminate the 'disc' icon from the PC or Mac desktop, **THEN** disconnect the Firewire cable. Ignoring this rule will trigger a warning message, but it will be too late. The audio files may already be corrupted.

02 Backlight

Off 0% to 100%

Brightness adjustment of the screens. In bright sunlight, save power by turning 'OFF' the backlight.

03 ViewFaderDb

On Off

Each time a fader is adjusted, its dBFS value shows as well as the others faders in the same Mic, Line or Mixer bank.

04 RecordBeep

No beep Start beep Start/stop beep

Single beep on 'start' (double beep on 'stop'. Sept. 2007).

05 ClipBeep

Beep On Beep Off

06 NoExtTcBeep

Beep On Beep Off

Activated if the external clock is missing while in External Clock mode. The beep is auto disabled when recording a wild sound, 'w' take-type.

07 BeepRouting

Phones, Ph+Line-out, Ph+Foldback, Ph+Lo+Fb

08 BeepLevel

0 dB to -60 dB

09 MeterSpeed

1 Fast 2 3 Med 4 5 Slow

Select '5 Slow' in low temperature conditions.

10 PeakHoldDur

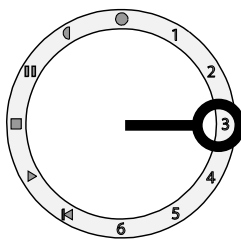
0.5 sec to 5 sec.

11 / 12 Bat1AlrtLvl / Bat2AlrtLvl

10.8 to 14.8 Volt

Each battery can be set to its own alert level.

Auto switch-over happens 300mV below the battery alert level. NiMH battery alert should be set to **10.8V** (10.5V switch-over), and Li-Ion alert to **12.7V** (12.4V switch-over).



13 HddPwrDown

Aft.01min to Aft.250min

In {STOP} the HDD eats half the Cantar power, it is wise to put it to sleep. While in sleep the 'three platter' icon blinks. Go to {TEST} to awake the HDD, it will be up to speed within 3 to 10 seconds, the pre-record buffer hides this speed ramp-up. Cantar's cold start from a totally unpowered machine to record is a blazing 2 to 3 sec.

Note: during IdleCopy the HDD doesn't go to sleep.

14 ExternalCom

Factory Bluetooth Wifi

'Factory' is made for maintenance technicians, 'Bluetooth' for PDAs. The 'Wifi' option will be available October 2007.

15 FactoryReset

No Yes

All menu parameters are reset to their factory default.

16 SaveSetup

No Yes

Cantar physical setups (in and out routing configurations, TECH and AUDIO/TC preferences, mic settings, etc.) can be saved in XML files on the external HDD (or the internal HDD if there is no external drive connected). To automatically insure the unicity of the files, each one is named by the filetag of the last recorded take, e.g. AB1234+A.xml. As many snapshots as desired can be saved, keep them for later use in the internal HDD.

Copy them onto a laptop before bringing your Cantar back to the rental house. Next time you rent a Cantar, you can re-import those snapshots and be ready to go. A great time saving operation!

Note 1: snapshots can be viewed by dragging them onto an internet browser; provided you keep the .xml suffix, you can replace the 'filetag-made' names with more descriptive ones.

Note 2: if you encounter an operational problem, *immediately* make a snapshot of the setup in use. Before calling the factory, send it to cantar-support@aaton.com, this will save time in finding the reason.

17 LoadSetup (users' settings)

No Yes

Open the 'LoadSetup' screen, [ok]. Cantar first looks for XML files in the external HDD. Select the file you want to load, [ok]. Press [shift] to reboot.

18 MaxFileSize

206MB 690MB 2GB 4GB

The current file is closed and the next one opened when the set limit is reached, without losing a single sample. Four lengths are available: 260MB (30min at 24-Bit, 48kHz), 690MB (for 700MB CD-Rs), 2GB (FAT32 basic limit), 4GB (Indaw max file size). You also have the choice of triggering the jump yourself by swiftly changing from {REC} to {PPR} and back to {REC}.

19 TempControl

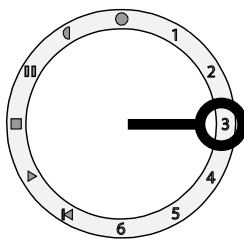
• 'Lcd+02'

The heater option shows the circular screens' LCD temperature that the heaters control. It takes about fifteen minutes to reach the +2°C to +4°C equilibrium in a -15°C environment. To save power, Cantar should be in a carrying bag. TECH.09 'MeterSpeed' '5 Slow' is recommended.

• 'Hdd-12'

This is the Cantar internal temperature. Below -5°C, it is recommended to replace the standard Travelstar HDD with a low temp disk such as the 40GB Hitachi Endurastar or an SSD (p.39).

Below -15°C (and higher than 5,000m altitude, or very bumpy environments), use a solid state disk such as the Samsung MCAQE32G5APP-0XA 32Gbyte 2.5" SSD mounted on an Aaton Firewire-IDE bridge and shuttle tailored for it.



20 SystemTime

00h32m24s

Enter the time from your watch (± 5 minutes), especially if you just started working in a new time zone. The system's date (which relies upon hour and minutes around midnight) is used to sort the working days, and should not be confused with the timecode which is used for syncing picture and audio.

21 SystemDate

2004y04m22d

The system date is used to give the YYYY MM DD name to the folder containing the files of a work day. Note that the work day folder can contain hours past midnight, if the recording session is not interrupted (e.g. turning 'OFF' the Cantar). The work day is also used to give its MMDD name to the TapeRef field stored in the iXML metadata of each file.

22 EquipIDs

SN 0456 CM3.n SL2

Factory serial number, then mother board and A/D card types.

23 LicenseKey

Unlimited 24 Days

Protection against unauthorized use: Cantar goes to 'general freeze' after a given number of calendar days. The key can be activated or deactivated by a CMU software key emailed by Aaton. If 'Unlimited' shows, do not go further into this menu, your Cantar is set to work forever.

24 SftwVersion

v1.78 v1.86 v2.01b (beta)

The working software version is stored in the Cantar EEPROM, no need to keep it in the HDD. You should not keep more than three versions on your drive, erase the old ones. To install a new version, see below.

25 SftwInstall (software installation)

No Yes

As a registered Cantar owner get the latest version from <http://soft.aaton.com/swcantar/>. Put the file can-xxx.flb on your Mac/PC desktop.

1 Connect a cable to the Cantar Firewire socket while it is unpowered (p.5).

2 To avoid any power interruption during the following operations, *activate both on-board fully charged batteries* by simultaneously pressing the [batt 1] and [batt 2] buttons.

A loss of power would prevent Bios re-installation; ERROR Num 1B XLINX would show, meaning 'Cantar back to the factory'.

3 Dismount the HDD in TECH.01 then connect the Firewire cable to the computer. The Cantar HDD icon will be displayed on the computer's screen.

4 Copy the can-xxx.flb file to the root of the Cantar HDD. *NEVER install a version lower than 1.66.*

5 Dump the Cantar HDD icon out of the computer, then disconnect the Firewire cable (see the warning in TECH.01 'DiskStatus', p.30).

6 Go to TECH.01, and 'Mount' the Cantar internal HDD; this is done when the 'three platter' icon is no longer blinking.

7 Go to TECH.25 'SftwInstall', [ok], Yes, sure, [ok].

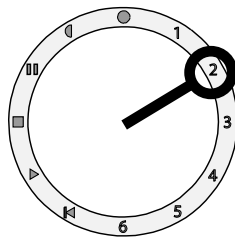
8 Select the desired version, [ok]. *Do NOT touch* anything until 'SUCCESS' is displayed. All controls are disabled during this one minute operation.

9 Press [shift] to close the installation and shut down Cantar. Put the [MainSelector] on {STOP}, and restart.

10 Cantar is protected from the installation of corrupted software, go to TECH.24 'SftwVersion', if the new version doesn't show up, re-download it from the Aaton site.

Software Installation from an external disk

Connect a go-between disk to your laptop and copy can-xxx.flb to the disk root. Unplug it and hook it up to the Cantar Firewire port. *Activate both on-board fully charged batteries* by simultaneously pressing the [batt 1] and [batt 2] buttons. Then follow steps **7** through **10** above. This works because Cantar, while installing software, first looks for .flb files in the root of an attached external disk..



2 SESSION

01 Project Name

02 New Project

03 HDD in Use

04 Disk Formatting

05 Scan Disk

06 Clean Poly Store

07 Delete files

08-14 Sound-Report headers

15 Column layout selection

16-30 Column 02 to 16

31 Long Note enable

32 Print size

33 Report Type

01 ProjectName

AACANTAR

A factory preloaded AACANTAR project is stored on the internal HDD. If the disk has been emptied by the rental facility, 'No Project' is displayed. Going directly to {REC} creates a provisional AACANTAR folder.

02 NewProject

SHADOWS EDEN

A HDD must be connected. The bottom line of the rectangular screen shows the various projects stored. Press [ok] to create a NEW project. Once the name has been entered, press [ok].

03 DrivesInUse

Int.HDD Ext.HDD Int+Ext.HDD

Audio files can be recorded on internal or external HDD or on both simultaneously. When listening to recorded files, only the internal drive is playing. To listen to files on the external drive, switch to 'Ext.HDD' and don't forget to switch back afterward.

If external and internal HDDs are simultaneously recording, the message panel shows the MBytes of the disk with the lowest remaining space.

Q: I connect an external HDD and wait for its activity LED to turn green. I selected SESSION.03 'Int+Ext.HDD' but the external HDD doesn't mount!

A: Wait for the external 'three platter' icon to stop blinking in the middle circular screen, then go to 'Int+Ext.HDD'. If Cantar still doesn't see the disk, most probably it is not formatted with a FAT32 primary partition. Format it with Cantar (see below).

04 DiskFormat

HDD DVD-RAM

Almost identical operations for HDD and DVD-RAM.

HDD erasing/formatting (auto-FAT32)

Since Cantar HDDs do not use a proprietary format, they are directly accessible by both Mac and PC. Each disk must be formatted as 'One primary partition' under FAT32.

Internal HDD: Open the internal HDD compartment (a ten second operation) and disconnect it. Following the instructions below, re-connect it to Cantar as an external HDD. This is protection from accidental erasure by idle fingers.

External HDDs: Firewire connected, Cantar will format them up to 127GB which is Microsoft's marketing limit for FAT32. To format a larger disk, see 'tutorial: disks' (p.39).

Instructions, please read completely before proceeding

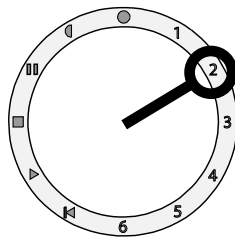
1 No external HDD plugged-in, go to SESSION.04 'DiskFormat', [ok], 'Shift+Red' is displayed.

2 Press the [shift] [red] buttons together while connecting the external HDD to Cantar, keep these two buttons pressed until 'Formatting' is displayed on the rectangular screen, then release them.

To avoid connection mishaps, plug the Firewire cable into the Firewire socket and hold it with the retaining screw while Cantar is not powered (p.5), then, at the last minute, carefully plug the other end of the cable into the HDD.

3 'Done' shows when finished. A 'three platter' icon is displayed on the right circular screen. Go to {STOP}.

Note Formatting a disk doesn't protect you from dead clusters. Regularly scan your disk(s), see SESSION.05 below. Even if it only detects **one** defective cluster, immediately discard the drive. Be warned, an HDDs' life span goes from one to three years.



DVD-RAM formatting (auto-UDF 1.5)

Cantar can record onto FAT32 DVD-RAMs but for Mac/PC interchangeability, it only offers to format them under UDF 1.5.

Instructions, please read completely before proceeding

- 1 Cantar powered, go to SESSION.04 'DiskFormat', press [ok], 'Shift+Red' is displayed.
 - 2 Insert a DVD-RAM in either the external or internal burner. Before the 'one platter' icon is displayed, press [shift] [red] together. Keep them pressed until the 'Formatting' message is displayed on the rectangular screen.
 - 3 Done' will be displayed when the format has finished. The 'one platter' icon appears on the right circular screen to indicate the DVD-RAM is ready for use. Go to {STOP}.
- Note:** To work with a DVD-RAM on a Mac, see p.39. To play it on a DV40/824, see www.soft.aaton.com/swcantar/.

05 ScanDisk

Int.HDD Ext.HDD

Scanning an 80 GB HDD may require two hours to complete. The end of scan message should be 'Zero error'. If 'One error' shows, immediately copy all of your files and discard the disk. Remember that a hard jolt can force the disk heads to crash and scratch the surface resulting in a dead cluster.

If for some reason you must perform an urgent {REC} while scanning the internal disk, abort the scan by pressing [esc] for a few seconds until 'aborted' is displayed.

06 CleanStore

No Yes

Select 'Yes', [ok]. This erases all of the previous day's 'treatments' stored in the internal HDD. Obviously if for some reason you later have to deliver another backup copy, the backup@call will take longer since it will not have access to these 'treatments' any more.

07 DeleteFiles

No Yes

To reduce disk fragmentation, file deletion only works on full working days (use a laptop to perform the -not recommended- erasure of individual files).

Select the day with [<] [>], [ok]. The black triangle goes back to 'Day to del.', [jog] to 'Del. Int HD' or 'Del. Ext HD' [ok] 'No 120Mo' shows, with [>], switch to 'Yes 120Mo' [ok]. 'Original 31 to 00' or 'Mix 31 to 00' shows, this is the volume of the remaining files to delete. Then 'No 0.0MB' shows again, [ok] puts you back on 'Day to del.', etc. [esc] returns you to SESSION.01 where you can select another project.

DELETE FILES
Del. Int. HDD
Yes 31MB

Sound-Report preparation

Each page of the PDF Sound-Report is made of two parts:

- The **headers** hold the semi-static session settings.
- The user configurable **columns** and **comment line** carry the event specific dynamic data.

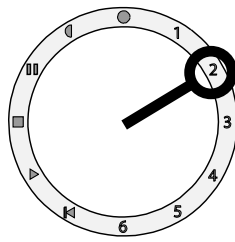
Title: [AACANTAR] Film AATON						Cantar # 1313			SOUND REPORT # 070201AR					
Prod: AB Prod						Pic. Format: FDB			TC fps: 24.00					
Director: Julie F.						Day's topic: Nel			Digit: 48K/24 bit			Media: Hard Drive		
Sound Mixer: AA						Location: GRENOBLE			Tone level: -18 dB			Type: Polyphonic		
									Tape Ref: 0201					
ID	Filetag	Scene	Take	TC start	Duration	T1	T2	T3	T4	T5	T6	T7	T8	TC state A
1	NY010PR	1/1	18	14:23:05	00:00:08	Mx left	Mx right	AAAA3	T2	T3	T4			24:23:11-12
2	NY010PR	1/1	19	14:23:15	00:00:10	Mx left	Mx right	AAAA3	T2	T3	T4			14:23:20:19
3	NY010PR	1/1	10	14:23:25	00:00:07	Mx left	Mx right	AAAA3	T2	T3	T4			24:23:29-33
4	NY010PR	1/1	11	14:23:32	00:00:10	Mx left	Mx right	AAAA3	T2	T3	T4			14:23:38:05
5	NY010PR	1/1	12	14:27:22	00:00:13	Mx left	Mx right	AAAA3	T2	T3	T4			24:27:35-04
6	NY010PR	1/1	13	14:27:36	00:00:08	Mx left	Mx right	AAAA3	T2	T3	T4			24:27:44-03
7	NY010PR	1/1	14	14:28:08	00:00:13	Mx left	Mx right	AAAA3	T2	T3	T4			14:28:15:13
8	NY010PR	1/1	15	14:28:21	00:00:05	Mx left	Mx right	AAAA3	T2	T3	T4			24:28:23-14
9	NY010PR	1/1	16	14:28:26	00:00:08	Mx left	Mx right	AAAA3	T2	T3	T4			14:28:29:14

08 to 14 Sound-Report headers

08 FullTitle (see note) 09 Production 10 Director
11 SoundMixer 12 Locations 13 TopicOfDay
14 PicFormat

All other headers (i.e. FileType, TapeRef, ToneLevel Digit (sample rate and bit-depth), Fps, Date and Media) are auto-filled by the values used for the recording session. Multiple header entries per day are allowed, new ALE and PDF pages are opened at each header item modification.

Note: for consistency the 'Project' folder name (8 char) is added to this title.



15 ColLayout

Layout-A Layout-B Layout-C

Three operator created custom layouts are permanently available, they are stored in the Cantar memory and can be modified by [jog]ing through the column/field linking positions (see below).

16 Column-02 to 30 Column-16

[INS field] [DEL field] Blank Filetag
Scene Take TC Start TC End Duration
TC Slate A TC Slate B TC Slate C Trackrank
Nb of Trcks FileSize Userbits Take Type

Column '01' is not open to operator's choice since it carries the file recording order, used by default to sort the list. Scrolling through columns 2 to 16 allows for their modification. To assign a different field, press [ok] and use the arrows to select the new one.

[DEL field] eliminates the field assigned to the selected column and shuffles the fields on the rightside to the left; 'none' shows on the last column. If you want to activate a 'none' column press [ok] to change it to 'blank' then select any field for it.

[INS field] inserts an empty placeholder ('blank') that can be filled with a specified field; other fields are pushed to the right... provided there is at least one 'none' column on the far right.

Trackrank represents Track 1 through Track 8.

31 LongNotes

None 200CharNote

The sound-report can carry a note, up to 200 characters, with each take. This note is stored in the iXML chunk, and is always added to the ALE lists (see note). It can be inserted or not in the PDF report.

Note: the iXML chunk is still not read by the Avid MCs, they only have access to the first 40 characters stored as 'aNote' in the BWF descriptor line.

32 PaperSize

Letter A4

On a Mac, open the PDFs with 'Aperçu', they can't be printed by Adobe Reader nor Acrobat.

33 ReportType

All Wild All+Wild

All contains all events, *Wild* the 'w' tagged sounds only; *All+Wild* creates two independant reports. It takes a little more than one minute to build a twelve page PDF report. A tab-delimited text report for spreadsheet applications is generated as well as ALE files for editing machines (one ALE per identical headers).

Sound-Report creation

name

In order for the latest metadata entries of the day to be taken into account, the latest report erases the former one.

Its **name** shows the treatment applied to the Cantar files.

As an example, **071224AR** is made of

- **071224**, the yymmdd of the calendar day.
- **A** = All files, **W** = Wild sound files.
- **D** = Direct multi-mono, **N** = Native poly, **R** = Rotated poly, **X** = miXer poly.

generation (also, see BACKUP chapter)

- **Any time**

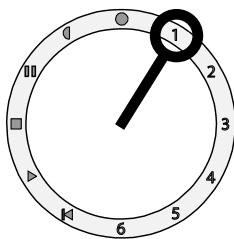
Go to BACKUP.11 'SnapSndRpt', select Int.HDD (Dir, Nat, Rot, miX) to immediately build a PDF and send it to the yymmdd.AA\$ folder, (§ = D, N, R, or X) folder. If you want to send the report to the 'Ext.HDD' or 'Int+Ext.HDD', make that selection in SESSION.03.

- **After 'IdleCopy' is finished**

Before [eject]-ing the DVD-RAM or removing the external HDD, go to BACKUP.12 'IdleSndRpt' and select 'BackupDisk'. The Sound-Report carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the yymmdd.AA\$ folder, (§ = D, N, R, or X).

- **During 'Backup@call'**

Go to BACKUP.13 'RunBackup', select 'Yes w/Rprt'. The Sound-Report carries the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. It is sent to the yymmdd.AA\$ folder, (§ = D, N, R, or X).



1 BACKUP

- 01 Save mode
- 02 Day to copy
- 03 Track selection
- 04 T1-T8 treatment

- 05 T7/T8 treatment
- 06 Media type selection
- 07 Burn and Check
- 08 Files to copy
- 09 File name length selection

- 10 Media label
- 11 Snap Sound-Report
- 12 Idle Sound-Report
- 13 Run Backup

01 SaveMode

IdleCopy Backup@Call (IdleStore)

• **IdleCopy** can be activated any time, the earlier in the day, the better. Parameters excluded by a preceding choice are flagged as 'N.A.' (not applicable). When the internal HDD is not occupied by any other task, i.e. in {TEST} or {STOP}, Cantar incrementally copies the files of the day into a DVD-RAM (external or internal) or an external HDD. By the end of the day most audio files are copied. This is an alternative to the simultaneous recording on both the internal HDD and external HDD. IdleCopy auto-updates archived files: if you modify the metadata of an internal HDD file, its copy is erased and stored again.

To interrupt the process, go to {PPR} or press [esc] until 'Idle Op.Stop' is displayed in the rectangular screen; the unfinished file copy is deleted. The operation will resume as soon as you go to {TEST} or {STOP}. Once IdleCopy has completed, the backup disk goes back to sleep.

DO NOT remove the external HDD or DVD-RAM until the IdleCopy job is completed, see 'Pazienza!' (p.19).

Toggling between {TEST} and {STOP} displays the remaining disk space in Gigabytes. If at the end of your next recording the file is too large to be idle copied on the remaining backup disk space, 'Full' is displayed on the rectangular screen. [eject] the DVD-RAM and insert a new one, the backup continues from where it previously stopped.

• **Backup@Call** opens access to parameters requested for BACKUP.13 'RunBackup'. ONLY use this mode *at the end of the day* to copy the files onto the external HDD. Metadata modifications made after a 'mini-runbackup' of a sequence are not taken into account during the last 'RunBackup' in the evening, do prefer IdleCopy which permanently updates the archived files.

• **(IdleStore)** To speed-up the end of day 'RunBackup', (IdleStore) provisionally stores on the internal HDD the files resulting from the treatments done during idle periods.

Note: To clean the HDD of all previously stored 'treatments', go to SESSION.07. As a precaution only the IdleStored files of the preceding working days can be erased.

02 DayToCopy

2007-02-18 2007-02-26

The current day is selected by default. Previous days can be selected too. To simplify archive creation and retrieval, Cantar only copies one day per CD/DVD. Several days can be copied on an external HDD, each day in turn.

03 TrackSelect

BACKUP	03	T1-T8 T1-T8+T7/T8 T7/T8
TrackSelect		T1-T6
T1-T8 +T7T8		• T1-T8 handles all the tracks. • T1-T8+T7/T8 is of interest

only if the T7/T8 tracks carry the mixdown to be independently interleaved and added to the monophonic tracks.

- T7/T8 is of interest if these tracks carry the mixdown.

04 T1-T8Trtmnt

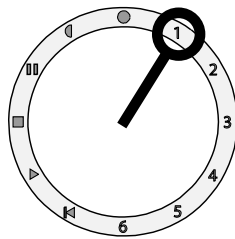
mono-Direct poly-Native poly-Rotate

Obviously the treatment is only applicable if **T1-T8** is present in BACKUP.03 'TrackSelect'.

• **mono-Direct** leaves the monophonic tracks in their original form (AB1234_1, AB1234_2, etc.), and puts them in the

BACKUP	04	20061125.AAD folder identical to the Cantar HDD one.
T1-T8Trtmnt		
poly-Native		• poly-Native makes long poly files AB1234.PN by interleaving

the native monofiles while keeping their rank, then stores them in the 20061125.AAN folder.



- **poly-Rotate** moves the T7/T8 tracks to the T1/T2 position while pushing T1—T6 to T3—T8, and makes a poly file AB1234.PR stored in the 20061125.AAR folder.

BACKUP 04
T1-T8Trtmnt
poly-Rotate

The *Poly-Rotate* treatment solves the Avid composer inability to put tracks where the editor wants them. For example, the mixdown

stereopair goes to positions 1 & 2 of the audio timeline while the T1/T2 tracks of a multitrack recording are automatically put there too! If during the course of his work the editor decides to import the T1 to T6 original tracks, his machine will kill the mixdown tracks he has been working with from day one. Thanks to 'Rotate' the original mixdown tracks, moved to T1/T2, replace the 16-bit stereo mixdown with the 24-bit originals, and the T1—T6 originals, pushed to T3—T8, gracefully land underneath.

05 T7/T8Trtmnt

Mono24/16 Poly24/16 Poly16trunc Poly16dith

Obviously this treatment is only applicable if T7/T8 shows in BACKUP.03 'TrackSelect'. It performs the reduction from 24-bit to 16-bit, and the conversion of the T7/T8 monofiles into a polyphonic file.

BACKUP 05
T7/T8Trtmnt
Poly16dith

- Mono24/16: does nothing to the files.
- Poly24/16: interleaves T7/T8 at native bit-depth.

- Poly16trunc: interleaves T7/T8, 24-bit truncated to 16-bit.
- Poly16dith: interleaves T7/T8, 24-bit dithered to 16-bit (16-bit dithering offers a slightly better audio quality than 16-bit truncation but the 24-bit to 16-bit reduction requires twice as much time. Treatments convert 96kHz to 48kHz.

Note: The 'treatment' choices (04/05) associated to a given track selection (03) are memorized from a recording session to the next; they are lost as soon as the (03) menu bottom line is opened.

06 MediaType

CD±R 700MB Ext.HDD DVD-RAM
DVD±R 4.7GB DVD+R 8.5GB

It can take more than twenty seconds for a DVD or DVD-RAM media to be checked before its 'one-platter' icon appears in the right circular screen, be patient.

Cantar can copy audio files on both FAT32 and UDF1.5 formatted DVD-RAM disks; UDF is a better choice for compatibility, see SESSION.04 (p.33) and 'tutorial: disks' (p.39).

07 Burn+Check

Burn Only Burn+Check Check Only (v2.01)

Checking a DVD takes just as much time as burning it.

08 FilesToCopy

Unarchived Copy All

The default is 'Copy All'. Select 'Unarchived' before starting a CD/DVD mid-day copy, this causes the software to look at the 'Archived' flag on the files. Previously copied/archived files flagged as such will not be copied again. 'Copy All' is used to make a second batch of DVDs carrying all files, previously saved or not.

09 FileNamLgth

Short Long w/ScTk

A short name shows **BA1234_1.wav**. A long name shows **BA1234==123A 12R w14==_1.wav**, it brings the scene and take on desktops.

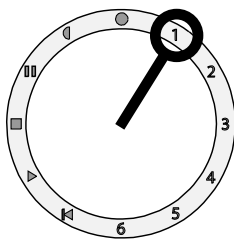
If you backup on CD/DVD, you can select long filenames since they are supported by ISO and UDF1.5 formats.

But if you backup on an external HDD, the filenames are forced to 'short' since long filenames are not supported by the basic FAT32 disk format. Under Windows or MacOS-X, Majax can also extract the 'scene and take IDs' from the metadata contained in the file's iXML and add them to the filename, between the [==], en route to the post-chain on FAT32 formatted HDDs.

10 MediaLabel

CD 1 of 2

Here is displayed the number of disks needed for the backup. Press [ok], select the one to burn. [shift] [eye] displays the Media Label created for the disk. CD_MXD_2/5 means: CD-R – Mixdown Xa/Xb – Disk #2 in a 5 disk group. The remaining data volume to be burned is displayed.



The large file case

The length of a take can make it impossible to copy it entirely onto one CD. For instance if a 200MB long file comes in with its five brothers (a six track take), a 1.2GB CD is required. In this case Cantar separates the take into its individual tracks while minimizing the number of CDs. The label becomes CD_2_D072, where [CD] is the media; [_2] the track #; and [D072] the last four characters of the filename.

Example of a CD/DVD label

An ISO volume label is limited to 31 characters

Cantar#	Project	Date	Archiv	Tag type1 or 2
099	AAAAAAA	YYYYMMDD	*	CD_T1-6_001

The archive flag (*) is either a (sp) space or a (#) to show if a not-yet archived files have been burned only; a way to know why some files are missing in the media (probably burned on another one).

Tag type1: CD_T1-6_001 general mode for DVD burning.

T1-6: six mono tracks from AAD folder, T1-8: eight mono tracks from AAD folder. MXDN: monophonic stereo mixdown from AAD folder. MXBN: poly stereo mixdown from AAX folder. MXBC: poly stereo mixdown w./24-bit to 16-bit reduc. 001 to 999 (media rank)

Tag type2: CD_TK-1_001 used if the files must be separated because their group is too large to be burned on a single 690MB CD. TK-1 is the track number and 001 the media name rank.

11 SnapSndRpt

None Int.HDD Ext.HDD

First go to SESSION.03 to select 'Int.HDD' or 'Ext.HDD'. Snap immediately stores the day's PDF into a yymmdd.AA\$ folder.

12 IdleSndRpt

None BackupDisk

Before [eject]-ing the DVD-RAM or removing the external HDD, select 'BackupDisk' and [ok]. This copies the Sound-Report to a yymmdd.AA\$ folder folder (§= 'Dir', 'Nat', 'Rot' or 'miX') which carries the same status as the files recorded on the backup disk (see 'Report creation', p.35).

13 RunBackup

No, nnnnMB Yes w/PDF Yes w/o PDF

The default is 'No' with the size of the files to be saved. This allows you to quickly visit and immediately leave using the same [Ok] button. 'Yes w/PDF' builds a Sound-Report

carrying the same 'Dir' 'Nat' 'Rot' 'miX' status as the files recorded on the backup disk. The PDF builder adds about one minute to the backup process. While generating a PDF, both a tab delimited CSV file for spreadsheets, and an ALE file for Avid editing machines are created.

Example of a standard backup

Select 'T1-T8+T7/T8' in .03, 'mono-Direct' in .04, 'Poly16trunc' in .05, 'Ext.HDD' or 'DVD-RAM' in .06; you get a Poly16-bit mix-down plus all the native 24-bit monophonic tracks on an external HDD or a DVD-RAM.

The several disk case

Go to BACKUP.10 'MediaLabel', choose the disk you wish to start with, [ok], BACKUP.13 'RunBackup', [ok], 'Yes', [ok]. Go back to 'MediaLabel', choose the next one and so on. You can interrupt the process between two disks and return to it later. Don't forget to write Cantar ID, Project name, Date, and Media label onto the CD/DVD as it comes out, so as not to waste time looking for the ones you haven't done yet! Upon completion of writing, the disk will need to be manually ejected. When the green indicator starts blinking, press the burner [eject] button.

Direct backup from a Mac or PC

Once TECH.01 has 'Dismount'-ed, the internal HDD is no longer under the Cantar CPU control but is still powered; a Firewire connected MAC or PC sees the Cantar HDD as any other HDD, and can copy the files, perform selective erasure, and edit the metadata with Majax.

Warning: To avoid the Firewire input destruction (max: 16.6 V) by the Mac GX (33 V), open the disk compartment, disconnect the HDD and connect it to the GX; its Firewire input handles up to 40 V. (Mac laptops & PC computers supply a safe 12 V).

Corrupted File Retrieval

Cantar saves the disc's FAT every ten sec. but In case of power interruption, the files are left open and unplayable. Also, if by accident, you erase important file(s), do NOT continue to use the HDD. IMMEDIATELY remove it and send it to Aaton. Do NOT use any standard recovery programs or procedures, this is guaranteed to DESTROY any audio that could have been otherwise saved.

Hard Disk Drives

Internal The Cantar HDD is a PTA/IDE 2.5", 80GB longitudinal magnetization disk running at a low 5400rpm for minimum power consumption and heat dissipation.

If you replace it with a larger one (and higher rpm), be sure it doesn't get hotter, and verify that the static electricity elimination path between the disk housing and the Cantar chassis is still within factory specs (100k ohm).

External When selecting an external drive, the tendency is to choose larger vertical magnetization 160GB/250GB disks. But if the FAT32 can handle up to 2TB, MS lets it be 'universal' below 127GB only. To get access to the full disk capacity under FAT32, you must use *Partition-Magic* (www.symantec.com/home_homeoffice/products/system_performance/pm80/index.html) and make **one primary** partition, not logical partitions.

Hot HDDs can become temperamental and trigger 'Bus Hangs'; preferably use ventilated Firewire enclosures like the G-Drive www.g-technology.com/Products/G-DRIVE-mini.cfm

Solid State 'Disk'

SSDs are a must below -15°C, higher than 5,000m altitude and very bumpy environments. The currently available PATA 32GB Samsung MCAQE32G5APP-0XA (see pict.) is compatible with the Firewire-to-PATA/IDE shuttle of Cantar; the PATA 128GB PNY (Jan 2008) will be too. The SATA 64GB Sandisk (Nov 2007) will have to be mounted on a Firewire-to-SATA shuttle.

Because they feature a smart-dispatcher which spreads the workload to all memory cells in turn (insuring the front cells are not always under fire), SSDs are much more reliable than CF cards which can't survive many read/write cycles.

Enclosed with an Aaton Firewire bridge in a waterproof DataCellar®, SSDs will make for the most rugged backup system one can find.

Compact Flash

4GB or 8GB CF cards connected to Cantar through a Sandisk Firewire-to-CF converter makes a good 'dailies' go-between... provided you don't reuse them too many times.



CD/DVD Burners

CD/DVD burners such as LiteOn tray SW431/ SW852S, Pioneer tray DVRK14, NEC tray ND6500A (a good burner

which only accepts now hard to find x8 disks), should all be replaced by the Panasonic-Matshita slot UJ-846B which burns DVD-RAM and accepts the latest 16x DVD±R.

Internal To install or replace an internal CD/DVD burner see p.5. When Cantar abruptly goes to {REC}, the DVD-RAM burner closes its unfinished idle-copy task and generates magnetic interference for a few seconds. That is why it must carry an Aaton mu-metal shield plate (p.46).

Note: *TECH.01 'Dismount' opens access to the Cantar internal DVD-RAM burner through the Firewire external socket; quite useful to edit metadata with a Mac (see below).*

External Cantar determines whether an external burner is Firewire connected, if it contains a blank disk, and if the internal burner is empty. If all of this is true, it will choose the external burner to run the backup.

CD/DVD Disks *never use supermarket branded media*

CD-R Made by Taiyo Yuden, Maxell 'Pros' are the best.

DVD±R Ask the post-prod supervisor what is his preferred flavor (+ or -). Taiyo Yuden 8x are the best but difficult to find; to print labels, use their "Watershield" disks, they are more water resistant than normal white printables. To improve DVDs' lifespan, Cantar burns them all at 4x.

DVD-RAM Panasonic 3x LM-AF-120LE.

CD/DVD Disk Handling

98% of all failures come from bad handling. A dirty DVD can be played but finger marked it is unusable for recording. Open your thumb and index-finger in a U-shape and hold the blank disk by its opposite edges. Do NOT clean an optical disk with a cloth in a rotary motion (best way to destroy a complete track) but by successive radial strokes.

DVD-RAM & the MAC *(see Majax Q/A p.45)*

DVD-RAM disks are read-only on Macs, which prevents modification of the files' metadata. To compensate for this infirmity first install 'WriteUDF' (www.softarch.com), then replace the 'super-drive' with a Matshita UJ-846, or buy a Panasonic standalone burner. Or use the Cantar DVD-RAM burner in its TECH.01 'Dismount'-ed state.

Example 1: Surround 5.1 (double M/S)

When using SoundField or Schoeps mics, there is no need for a special decoder, Cantar has it all, built-in!

Microphone wiring

With the Schoeps double M/S l-c-r-sl-sr head made of two cardioid and one figure-of-eight microphones, a decoding accessory is not needed. Schoeps delivers an XLR7 extension cable to which a home made XLR7 to XLR5/XLR3 Y cable should be connected.

- **XLR7(F)** 1 = gnd 2 = +Mfront 3 = -Mfront
4 = +Sfront 5 = -Sfront 6 = +Mrear 7 = -Mrear
- **XLR5(M)** 1 = gnd 2 = +Mfront 3 = -Mfront
4 = +Sfront 5 = -Sfront (yellow, red labels)
- **XLR3(M)** 1 = gnd 2 = +Mrear 3 = -Mrear (grey)

Track routing

The **XLR5** goes to Mic3/4 inputs routed to Track3 and Track4 which should be M/S declared; the output is automatically left/right decoded for monitoring. The Track3 and Track4 digi-faders being at 100%, the front stereo is heard.

The **XLR3** goes to the Mic5 input routed to T5; the pan pot of this track should be put in central position (mono listening). The T3 digi-fader being at 0% and the T5 digi-fader at 100%, the monitor output becomes the sum of the S figure-of-eight mic on Track4 (a+ a-) and the M rear mic on Track5, the rear stereo is heard. It is thus easy to alternately listen to the front or rear M/S; or both with 5.1 double capsule headphones.

Mixing stage

Launch Pyramix and make two M/S strips, one for the front, one for the rear: lay down the three track media on the M/S Tracks (the Pyramix CW center width), copy the Track2 «S front» onto Track4, which becomes «S rear». Reinject the M front onto the surround of the M/S front. You can also make an extraction for the 'sub': here is your 5.1 sound!

This is a proposition of Francois Musy and Gabriel Hafner, NSM Switzerland.



Example 2: Over the shoulder M/S and mix

The boom on Mic5 routed to Track1 (the Mic5 button is the one which

naturally falls under the right hand), the 'calm' RF mic on Line-in1 routed to Track2: you get the boom and the calm RF mic on the left circular screen. The 'active' RF mics on Mic1 and Mic2 are under the control of the two front faders; routed to T3/T4 they are together displayed on the middle circular screen. The stereo pair connected to the coupled Mic3/4 inputs (only one XLR5 to XLR5 cable) are routed to T5/T6 and displayed on the right circular screen; they momentarily let you replace them ([eye] button) with the T7/T8 (Xa/Xb) mixdown tracks.

Boom	>	Mic5	>	T1
RF mic, calm	>	Lin1	>	T2
RF1 active	>	Mic1	>	T3
RF2 active	>	Mic2	>	T4
Stereo-L or M	>	Mic3	>	T5
Stéreo-R or S	>	Mic4	>	T6

Example 3: Mixdown as 'reference sound'

The guide mix

The mixer faders and panpots feed the Xa/Xb tracks. The inputs are routed to the six tracks; an M/S couple is connected to prefaders 3&4 and routed to Track5 and Track6, M/S declared. The M and S signals are recorded as metered on the T5/T6 modules and stereo decoded into the Xa/Xb mixdown output. If the editor prefers not to get stereo signals in his reference sound, suffice to pan the MTrack to one side or the other, and the STrack disappears from the mix.

The boom and RF mics

Boom is connected to Mic5 routed to Track5. Track5 is disarmed (if you don't want to record it), panpoted to the left it goes to Xa (Track7). The RF mics routed to Tracks T1 T2 T3 T4 T6, all panpoted to the right, go to Xb (Track8).

Cantar & video cameras

Practice 1: Real-time Audio-TC in both machines.

To sync Cantar to SD & HD cameras, the best method is to install a small real-time LTC generator such as an Aaton GMT-u on the camera instead of the use of a radio link transmitting the Video-TC from the camera to the Cantar slaved in External Clock mode.

The GMT-u *time* and *date* is recorded on an audio track of the tape (don't forget to switch-off the automatic-gain). This LTC is later extracted by the Avid composer (see pict.) which correlates the continuous record-run Video-TC of the camera with this discontinuous free-run Audio-TC. Thanks to their common audio timecode, the Avid can 'autosync' the Cantar audio files to the Audio-TC indexed images. This method is the one used for syncing telecine transferred AatonCode films. Please read the Avid 'autosync' instructions about the track VA1A2 rules in 'The PostChain' document (p.45).

Compared to the radio transmission of record-run TC plus TC break detection by Cantar, the **real-time syncing** has two advantages: it works in multicamera shooting, and it is low power and fail safe. Compared to the '*free-run discontinuous Audio-TC as Video-LTC reference*', it has the superiority to let each video camera use its own record-run continuous Video-TC, something much appreciated by video-post facilities.

Practice 2: Video-TC in both machines, DayStamp used as TapeRef (Reel ID)

How to auto-conform the Cantar original audio files if the Avid editor only works from the videotapes carrying the mixdown sent to the video camera?

There is neither a FileTag to ensure a link between the original tracks and the EDL reference nor usable date in the user-bits; so every day the same undistinguishable Video-TC shows in the audio files. The only way to conform the original audio files to the EDL is either to insert the VideoTapeID in the audio files (the old method which no longer works, see 'Request to be refused' below), or to use the **day** (like on AatonCoded shots) by another means than the userbits: that is the **DayStamp**. Give special attention to the difference between the Cantar 'AudioTapeRef' which stores the DayStamp into each and



AvidXpressPro v4.6 or later.

every audio file, and the 'VideoTapeID' label which is not recorded on the video media but entered by the assistant-editor during the image import. Here is how it works:

- Using the 'work day' rule which organizes the audio folders, Cantar stores the 'Month-Day' DayStamp into the 'AudioTapeRef' iXML metadata. Alternately you can overwrite the Cantar 'Month-Day' by the 'Day Rank', e.g. day one D001, day sixty two D062 (see PPR).

- The video camera operator writes the "Month-Day + Camera ID + Cassette number" on the videotape box for the digitizing assistant-editor to enter this label in the six character 'TapeID' column of the Avid NLE.

April 18, camera-A, cassette 3= 0418A3

April 18, camera-B, cassette 2 = 0418B2

(one 0 to 9 figure or A to Z letter to identify the cassette makes for 35 cassettes per day per camera...)

- To auto-conform the original Cantar files, Titan-3 first sorts them by comparing the leading four characters (0418 or D062) of the Avid EDL 'VideoTapeID' column with the 'AudioTapeRef' found in the audio file iXML metadata, then it uses the timecode in- and out-points to finish the job.

The TC can be free-run or record-run, provided Cantar and cameras share the same time.

A demand to be resisted

The confusion between 'AudioTapeRef' and 'VideoTapeID' induces editors to ask sound recordists to enter the camera/ cassette IDs in the 'AudioTapeRef' field. This is NG, 1- quite often the sound recordist is warned too late of the camera cassette change-over, 2- in a multi camera shoot, there is no provision to enter double or triple camera cassette IDs into the metadata, 3- how on a film stage could you enter the video cassette ID of a transfer to be performed the day after?

Nevertheless, if you have to replace the default MMDD DayStamp with a TapeRef, do it on Cantar (field close to PPR's comments) or with Majax by highlighting the concerned files and batch modifying the 'AudioTapeRef' field. This insures that whatever happens to your files, e.g. mono to poly conversion, mixdown, gathering in a different folder, copy to DVD, flying through the internet..., they will forever carry your given reference.

CantaRem

Connections

If the Cantar mother-board is CM2.6+ (ID shows under the white sheet in the HDD housing), the CantaRem to Cantar ASCII connection is insured through the Cantar's SubD15 pin-2. Use a 'SubD15 to Lemo8' cable (ref. 594 4090).

If the mother board is earlier than CM2.6, the SubD15 pin-2 is not internally connected to the ASCII port. Use a 'SubD15 to Lemo8+Lemo5' Y cable (ref. 594 4191), and connect the Lemo5 to the Cantar timecode-in socket.

- To gang two CantaRems, use the Fischer4-Lemo8 cable (ref. 594 4092). The Fischer4 plug goes to the first CantaRem, the Lemo8 plug goes to the second one.
- The CantaRem USB socket (max: 80mA, +5V) can't power a PDA; it is made to feed a PS2 keyboard only. But you can use the +12V delivered by the Fischer4 socket, terminate the PDA car-lighter +12V to +5V voltage converter cable with a Fischer4 plug (pin-1: Gnd, pin-4: +12V).

Sliders' assignment

- Set AUDIO/TC.23 'CantaRemCom' to 'Auto'. Press one of the two CantaRem [ctrl] keys, '**Assign**' shows on the top row of the Cantar rectangular screen. Press and hold a 1 to 8 key, the slider number shows on the middle row. [jog] to browse the Cantar faders which successively show on the bottom row: **unassigned** - **mic n** - **linen** - **line 1+2** - **line 3+4** - **track n** - **line-out** - **foldback**. The assigned fader is the one displayed when releasing the key.
- The new assignment of a CantaRem slider already linked to another Cantar fader cancels the former link. All Cantar faders are re-enabled as soon as CantaRem is disabled by setting AUDIO/TC.23 'CantaRemCom' to 'Not active', or by unplugging the cable. Stored assignments are displayed on AUDIO/TC.24 to 31.



- To control several mic input faders from the same actuator, couple them in the usual Cantar way and assign the actuator to the master only. The slaved rotary faders are used for the 'balance'
- Press a slider key to activate the solo monitoring of the Mic, Line-in or Track fader under its control.

- The 0.6 sec. latency of Cantar's Line-in faders is more apparent when they are driven by linear actuators which, unlike the small Cantar on-board buttons, can be swept from 0 to -60dBFS in a wink.

- Put Cantar on {STOP} to initialize its clock by ASCII from an OriginC.

- Cantar remote control: [MainSelector] on {PPR}, simultaneously press the two [ctrl] keys, then press 2-> {TEST}, 3->{PPR}, 4-> {REC}.

Design considerations

- Since Cantar is the only audio recorder featuring a wireless PDA link, there is no need for a 'replica' display nor a built-in keyboard on CantaRem.
- CantaRem's Penny+Gilles actuators are feather-smooth, but not as impervious to the elements as the Cantar's magnetically driven ones. That is why CantaRem is built with structural transparency, allowing sand and water to flow through freely.
- The precise gain value of each fader is displayed on Cantar's rectangular screen, the actuators' 0 to 9 scale is only a quick positioning aid.

A Lemo 5	ASCII – LTC In/Out
B USB	PS2 keyboard
C Fischer 4	PDA power (or CantaRem '1' to '2')
D Lemo 8	Connection to Cantar (or CantaRem '2' to '1')



Arcan-w

- remotely controls Cantar in TEST PPR REC
- sets input and output routings
- displays modulometers and fader gains
- edits

scenes, takes, notes and track-names

NOTE: Arcan-p for Palm-OS is no longer supported, the remote-record function will never be implemented.

Installation

The Win-Mobile 5 PDA must feature a VGA screen (640x480), not a QVGA screen (320x240), and an MS Bluetooth stack, not a Broadcom stack, e.g. Qtek 9000, iMATE Jasjar, DELL Axim-51v; HTC X7500 / T-Mobile Ameo.

Download 'rcan-xxx.cab' from the Aaton web site in a PC or Mac and copy it through USB into a folder of the PDA. Then open this folder and execute 'rcan-xxx.cab'.

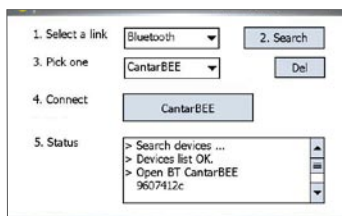
Connection to Cantar

Cantar side

Set TECH.14 'ExternalCom' to 'Bluetooth'. The 3m range Cantar transmitter is low power (Idle: 0.1mA, Connecting: 4mA) and may remain active at all times.

PDA side

Click Arcan's icon in the PDA 'programs' screen.



1 Select a Link Bluetooth.

2 Search Found Bluetooth devices are shown in the 'Pick one' pulldown. Click the ID for the Cantar you want

to store in the PDA memory.

3 Pick one The list of Cantar IDs in memory is shown. Click the desired one.

4 Connect The latest Cantar ID will show at next connection.

5 Status For maintenance engineers.

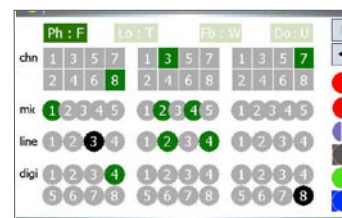
Working Screens

Arcan displays the modulometer bargraphs, prefader and mixer gains, plus the mic-preamp settings. It sets the ins and outs routings, and enters/edits scene, take, track-names and comments.



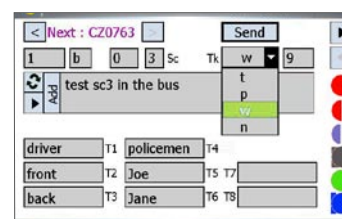
1 Inputs routes

armed tracks (file rank # becomes light grey), MS status, modulometers, Inputs routings can be modified in {STOP} position.



2 Outputs maps

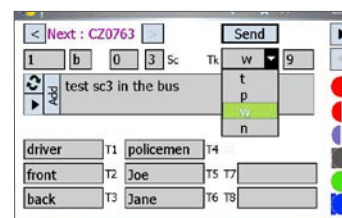
the recorded signals show in green; the non-recorded, directly sent to outputs, show in black. Outputs mapping can be modified in {STOP} position.



3 Physical parameters

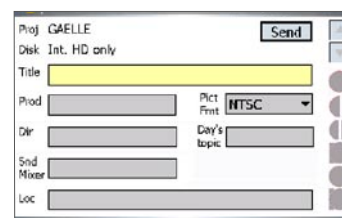
top: battery voltage, sample rate and bit-depth, internal/external disk recording time.

middle: phantom, limiter, phase, high-pass filter in {STOP} position. Prefader/mixer gains in {TEST} {PPR} {REC}. *bottom:* filetags, scene, take, day and time.



4 Metadata editing

Scene, take, notes and tracknames with auto completion, and memorized text insertion, are edited in {REC} {PPR} and {BROWSE}.



5 Sound-report headers

Arcan is a great helper to enter and modify the sound-report headers. Several entries per day are allowed. A new ALE or PDF page is opened on each new header item.

See the complete Arcan-w user's instructions on: www.aaton.com/products/sound/arcan/index.php



OriginC master-clock sets cameras and recorders TC

Start OriginC by pressing the [#] key. Enter *all* of the Prod ID digits, Date and Time. Press [#] to scan through the display. All fields being set, press [*] to start the clock. To shut-down, press [#] for five seconds until 'Stopped' appears.

To ASCII initialize Cantar, cameras or other machines with ASCII (an fps agnostic protocol), plug the Lemo 5

into the TC socket of the machine, press [#]. OriginC's answer back should be «good 00.0».

To ASCII check if a camera clock is within drift limits, connect it to OriginC once in a while, press [#]. OriginC displays 'good' 'fair' 'bad' or 'diff-time', followed by the amount of drift in frame tenths.

To LTC init a machine with SMPTE LTC, simultaneously press [#] [0].

To get or check LTC generated by a IVS-TC, Fostex PD6, etc. or to simply read an external LTC timecode, press [*] [2].

To send continuous LTC to a non-TC recorder, press [*] [1], OriginC generates

an SMPTE LTC signal to be recorded on an unused audio track.

To select 24, 25, 30fps SMPTE LTC out, press [*] [4], then [#] to confirm.

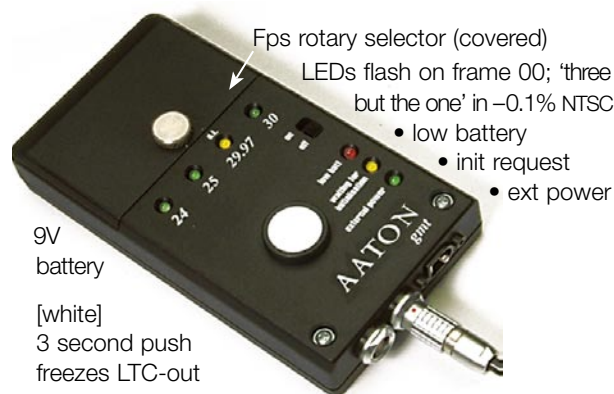
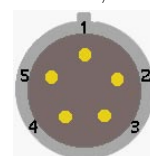
Technical Specifications

- 1 ppm TCXO $\pm 1/2$ frame shift after four hours
- Six hour auto-shut off
- 150 hours on a Li-Ion 9V battery.
- 180x90x20mm. 375gr.

Order an Aaton L5SLR3-SCH cable for LTC connection to recorders' XLR TC-socket.

Lemo 5 plug (ref: PHG OB-305-CLLD42)

- 1-Gnd 2-LTC out
- 3-ASCII in/out
- 4-NC
- 5- LTC in



GMT-u is a 1 ppm low-power LTC generator for SD or HD cameras, audio recorders and digi-slates.

- GMT-u is momentarily initialized from an ASCII master-clock or from an Audio LTC source, whatever its normalized frame rate.

Permanently installed on a video camera, its (internally adjustable) line-level LTC-out is recorded on an audio track of the camera; this bonds the record-run Video-TC of the camera to the free-run Audio-TC which is also running in the other machines on the set. During image digitization, the NLE will read the Audio-TC and «autosync»

images and BWF sounds by this common TC. As opposed to Video-TC radio transmission from camera to recorder, this method works for multicamera shoots.

- **GMT-u** is also an emergency master-clock. Turn it 'On' then press the [white] button to initialize its

clock from hour 01. The date generated by a new GMT starts at Y92/M01/D01, it is incremented by one day at each power 'Off' then 'On' followed by a [white] button initialization. The "Year/Month/Day" is stored in a non-volatile memory, resulting in a *never-twice-the-same date* from a given GMT.

GMT-u remote REC by LTC

- Whatever the initialization mode, pressing the [white] button for more than three seconds makes the LTC-out freeze on the last TC value (the four frame-rate LEDs blink).

A short push on the [white] button unfreezes the LTC. Sent by wire or radio, this signal stops and starts the Cantar recording (p.18).

Technical Specifications

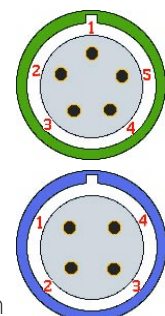
- 150 gr • 63x123x26mm • 9V battery (150 hours working) • 7 to 18 VDC ext. supply • 6mA consumption • 1 ppm clock
- LTC-out: -20 to -60dBu & TTL
- Fps selector: 1 = 24, 2 = 25, 3 = 29.97DF, 4 = 30 ; selected fps LED flashes.
- 5 = 23.98NDF [24 -0.1%], 6 = 29.97NDF [30 -0.1%]; three LEDs, other than the selected fps, flash.

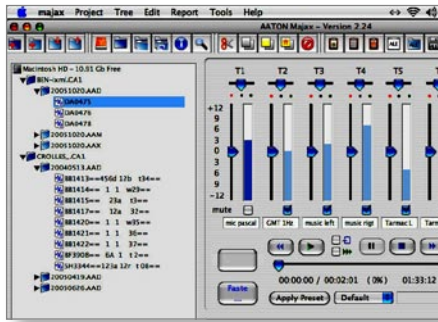
Lemo5 socket

- 1 Gnd 2 LTC in
- 3 ASCII in/out
- 4 LTC out, adj. level
- 5 LTC out, TTL level

Fischer4 socket

- 1 Gnd 2 [White] button
 - 3 LTC out adj. 4 Power in
- (Fischer4 plug ref: S102A053130)





Cantar recorded files.

Plays ten tracks, edits metadata

- * Through the laptop built-in audio card, Majax plays ten tracks with ± 12 dBu level and pan adjustments, with M/S to AB decoding and solo listening.
- * Majax edits the scene, take, track-names, DayStamp (audio tape ref) and recordist's notes within the BWF metadata iXML field.
- * Majax mixes eight monophonic tracks into two, and inter-leaves them into polyphonic files.

Generates frame-accurate Sound-Reports

Gathering the iXML metadata generated by Cantar and the operator, Majax builds a Sound-Report under your edited metadata entries. It is saved in PDF format to be printed and mailed to the post-prod team, and in the Avid list format (.ALE) which can be opened by any spreadsheet application.

Q: Impossible to get audio out of my Mac-Intel.

A: Go to Root disk → Library → Preferences in which you delete the file 'com.AATON.Majax.plist'.

If you re-open the menu in which you see 'Built-in Mic', immediately get out by 'Cancel'! Clicking [ok] would again corrupt the clean 'com.AATON.Majax.plist' that Majax just rebuilt after the deletion of the corrupted one.

Q: How to edit DVD-RAM discs with my Mac?

A: Apple is not DVD-RAM friendly! First install SoftArch 'WriteUDF' (www.softarch.com), then if you use a laptop equipped with an 'E' (economic) SuperDrive (sic), you must either discard it and install a genuine Matshita UJ 846, or connect a standalone DVD-RAM burner with patchburn (www.patchburn.de), or use the (TECH.01 'Dismount'-ed) Cantar internal burner.

Majax

A free Aaton software package for Mac-OS X and Windows 2000 and XP, exclusively devoted to the post-treatment of the

IndawPass

Tell your post-prod manager that Aaton's IndawPass is the **fastest Tape-to-Tape and Audio/Video Sync** machine in the industry when it comes to syncing audio files to DPX, HD and SD images.

Fps agnostic

IndawPass solves all the problems post-prod facilities may encounter in the maze of audio-video-film speeds and standards

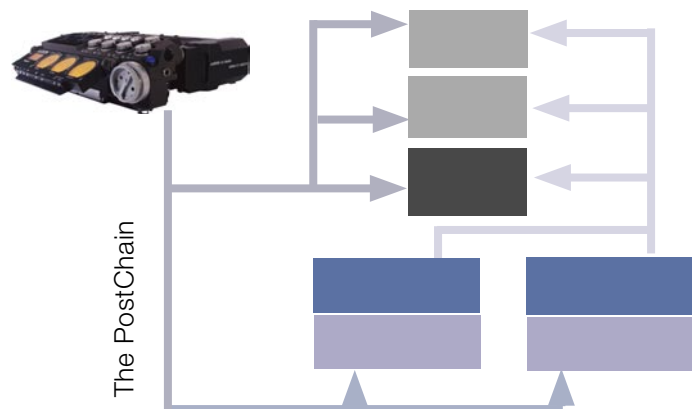
Transfer-list cleaner

IndawPass also rejuvenates the ALE transfer lists sent to the Avid with better Keycode matching than the telecine originals.

The PostChain

Read 'The PostChain' on:

www.aaton.com/files/cantar-post-chain-20.pdf

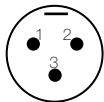


Titan

For autocorforming with Titan-3 and the Cantar Filetags, get the **cantar.tsc** rules on

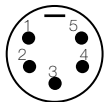
www.soft.aaton.com/swcantar/

Connectors



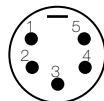
Mic-in XLR3(F)

Symetrical, transformer isolated (0dBu/+24dBu w/pad)
Mic 1, Mic 2, Mic 5 on XLR3:
1 = Gnd 2 = Hot 3 = Cold



Mic-in XLR5(F)

Symetrical, transformer isolated (0dBu/+24dBu w/pad)
Mic 3 (Left or M): 1 = Gnd 2 = Hot 3 = Cold
Mic 4 (Right or S): 1 = Gnd 4 = Hot 5 = Cold



Line-in XLR5(F)

Assymetrical (4.4k ohm, +10dBu)
Line-in 1 (3): 1 = Gnd 2 = Hot 3 = Cold
Line-in 2 (4): 1 = Gnd 4 = Hot 5 = Cold

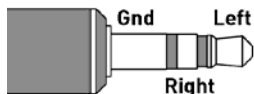
Line-out XLR5(M)

Symetrical, -10dBu out @ -18dBFS on track.
Note: HD camera Line-in practice is -20dBu, not 0dBu.
Line-out 1: (stereo Left)
1 = Gnd, 2 = Hot, 3 = Cold
Line-out 2: (stereo Right)
1 = Gnd, 4 = Hot, 5 = Cold



Foldback TA-3(M) Mini-XLR3

1 = Gnd, 2 = Left, 3 = Right
(3.5mm Mini-jack socket on earlier Cantars)



Phones 1/4" jack

8 ohm speakers up to 2Vrms



Time in-out LEMO5(F)

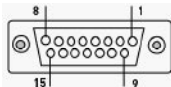
1 = Gnd 2 = LTC-In 3 = ASCII 4 = nc
5 = LTC-Out



Power XLR4(M) (max: +16.6V)

1 = Gnd 3 = Li-Ion* 4 = NiMh (Li-Ion w/. diode)
*Cantars over # 268 directly receive Aaton R-Cell Li-Ion battery power through pin-3.

Remote & Sync SubD15



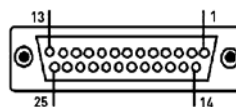
socket as seen from the outside

April 2006

1	2	3	4	5	6	7	8
GND	ASCII	LTC OUT	WORD CLK	RESERVED	RESERVED	RX	TX
9	10	11	12	13	14	15	
BATTERY+	LTC IN	REC TALLY	RESERVED	RESERVED	GND	GND	

2 ASCII-in with mother board CM2.6+
3 LTC-Gen if 'active' in 'AUDIO/TC.16'
4 Wordclock with mother board CM3+
9 Batt+ Out 13±3V, polyfused @250mA
11 Record Tally closure to ground (p.21)

AES in-out SubD25



socket seen from the outside.
Tascam TD88 standard

AES inputs				AES outputs			
CHANNEL PAIR	HOT +	COLD -	GND	CHANNEL PAIR	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

Accessories

Line-out Booster+12

Ref 59.681.91: two 12dB gain transformers make the Line-out deliver 0dBu at -18dBFS track level.

Line-out Booster +12



USB-PS2 to SubD15



USB-PS2 to SubD15

Ref : 59-681-91: converter featuring a regulator (max 60mA, +5V), and an RS232 translator for PS2 keyboards w/ USB-like plug. Only use a QWERTY US/English PS2 compliant keyboard such as the Cherry G84-4100 PTM EU: www.cherry.de/english/advanced-line/advanced_g84-4100.htm

8to8 bridge

Eight 26dBu /10k ohm transformer isolated balanced line inputs to Cantar mic & line inputs.
see: www.soft.aaton.com/swcantar



Internal DVD-RAM burner

Note the position of the loctite fastened mu-metal shield to be installed on a consumer DVD-RAM burner (p.39).

