Cadac Live 1

Mixing Console

Reviews : Mixer

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Cadac's large-format consoles are legendary in touring theatre circles, but their Live 1 range aims to clean up in the compact-mixer market...

Hugh Robjohns

The Cadac mixing-console brand has been associated with live-sound applications — and theatre sound, in particular — since the company's inception in 1967, and Cadac have built an enviable record in those marketplaces. Now under Chinese ownership, the company's current range includes both analogue and digital products, with the huge and totally customisable J-Type automated console being their analogue flagship. Cadac's S-type is a more modest (but still very sophisticated) fixed frame-size console, available in 17-, 25- and 33-channel versions, all with fully balanced bussing to eight groups, plus stereo main outputs, 10 auxes and eight DC masters! The company also make two digital console variants; the compact 16-channel CDC Four (which loosely resembles Yamaha's DM1000), and the very much larger CDC Eight, which can accommodate up to 128 input channels!

These are all seriously high-end consoles, of course, and built to a specification rather than a price. Total reliability over long and arduous working lives is designed in as an essential quality. Naturally, the prices reflect this level of engineering, and so the biggest 128 channel CDC Eight digital console can be yours for a cool £96,000, while the S-Type analogue consoles cost from £44,400 down to £26,400. Even the 'baby' CDC Four digital console costs around £7000 — so still pretty serious money. Nonetheless, the customer base is very loyal, because they know that they are paying for world-class engineering and getting exactly that.

As you can see, Cadac have never really produced a 'compact' analogue mixer before — their previous designs have all been highly sophisticated and relatively large modular constructions, all carefully optimised for the demands and rigours of large-scale theatre and touring markets. So the announcement of the new Cadac Live 1 series of compact, non-modular analogue consoles at the Pro Light & Sound Association exhibition last year garnered a lot of interest and excitement.

Cadac Live 1

pros

Properly engineered design, mechanically and electronically.
Very high input count for its size.
Very good technical performance.
Nice sounding EQ.
Plenty of aux sends and returns.
Useful stereo mix bus direct input and output.

cons

Channel direct outputs are fixed post-fader, and unbalanced.
Lamp power on three-pin XLRs with 12V between pins 2 and 3!
Monitoring section is very basic.
Preamp gain very bunched towards end of range.
No matrix facilities.

summary

The Cadac Live 1 is a well-designed, well-built live-sound console with relatively simple but very competent facilities. It is a joy to use, it sounds superb, and it feels extremely rugged and reliable.

information

1642 model $5200. 2442 model $7200. 3242 model $9300. Prices exclude import tax.

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The company say that the Live 1 has been developed using the most modern computer-aided design and manufacturing techniques available, and it is that approach that has enabled them to produce the new Live 1 console with "unrivalled quality and performance" for the price — which ranges from just under £7000 in the UK for the range-topping 3242 model, down to a little below £4000 for the base 1642 version. The mid-range 2442 channel console reviewed here costs around £5400. So we're still not talking bargain budgets, but the price is directly comparable to many similarly sized and specified high-end consoles.

Overview

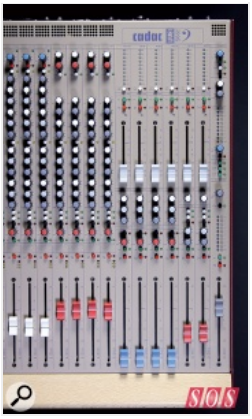
The Live 1 is very obviously designed as an FOH or monitor console for live-sound and theatre applications, although it would also make a great tracking console for location recording duties. It could be employed in a recording studio environment at a push, but it lacks some essential monitoring features for that market and isn't ideally suited.

From first sight, the console is unmistakably a Cadac design, with its very solid construction and light-brown, one-piece control panel, covered with a dense collection of small but elegant knobs and 100mm, long-throw faders. The console's compact wedge profile is slightly extended at the front to incorporate a traditional wooden armrest, which adds to the classic British design styling.

I was able to manhandle the 2442 console single-handed without too much huffing and puffing, as it weighs 25kg (the 1642 desk is 18kg and the 3242 is a two-person lift at 28kg). The back of the Live 1 console rises 180mm above the mounting surface and the desk measures 560mm front-to-back. The overall width ranges from 436mm for the small 1642 model to 784mm for the big 3242 version, with the 2442 console being a surprisingly compact 610mm wide.

Only the number of mono mic/line input channels varies between the three models: the output side of the console is the same for all frame sizes. The baby 1642 model features eight mono mic channels, the 2442 has 16 and the 3242 has 24 — but, in addition, all three versions also include four stereo line-input channels and it's these that provide the missing '8' channel count which provides the basis for each model's identifying number!

Cadac's long-established and well-regarded standard four-band EQ is provided on all inputs, with two swept mid-range bands on the mono channels and two fixed-frequency bell sections for the stereo channels. All input channels can be routed directly to the stereo master bus or to four mono groups, which can themselves be panned into the stereo master bus. The Live 1 features a new high-performance mic preamp, with individually switchable phantom power and high-pass filter, and every channel is equipped with a direct output and an unbalanced insert point, as well as being able to access six mono auxiliary sends (switched globally in pairs between pre/post-fader modes).



Here you can see the layouts for the mono and stereo input channel strips (with white and red fader caps, respectively), the four mono buses (blue caps), the two stereo aux returns (red caps) and the master section (grey cap). Unusually, the six aux masters are controlled via faders, rather than knobs.

Unusually, the six aux masters are controlled via short-throw faders — which is useful for monitor console duties — and six mono auxiliary returns are provided (feeding equally into the left and right stereo master bus), with the first four having send controls for aux 5/6 to enable effects to be routed into foldback, if required. There are also two stereo returns (with their own 100mm faders), routable to the groups as well as the stereo master bus, and again with send controls for aux 5/6.

All the usual talkback, PFL/AFL and metering facilities are included and, ignoring the dedicated talkback-mic input, these Live 1 consoles provide a total of 26, 34 or 42 usable input channels, depending on version — which is a lot, given their physically compact frames. The two larger consoles employ an external, 2U, rackmounting power unit (100V-240V AC) with a two-metre linking cable, while the 1642 model's universal power supply is an internal design. Every console ships complete with two LED gooseneck lamps, and as the 16-channel model is small enough to be rackmounted, that model is supplied with a pair of 19-inch rackmounting brackets, too.

Input Channels

Mono input channels are equipped with a 'combi' XLR/jack socket on the rear panel, accepting microphone

signals on the XLR terminals or line-level signals via the TRS terminals. Both are electronically balanced, with input impedances of 1.2kΩ and 10kΩ, respectively. Phantom power only appears on the XLR terminals, and the line input is 16dB less sensitive than the mic input, which can accommodate a maximum level of +21dBu. Two more TRS sockets associated with each channel provide an unbalanced direct output (post-fader and post-mute), and an unbalanced insert point (post-EQ but pre-fader/mute, and wired tip-send, ring-return). Both operate with a nominal 0dBu signal level.

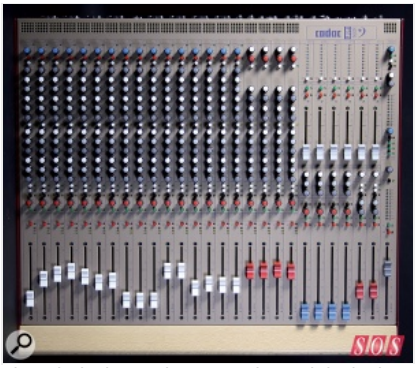
The stereo line channels have dual, electronically balanced input TRS sockets for the left and right signals, as have the two stereo aux returns. The desk's six mono aux returns also connect via balanced TRS sockets. All balanced line inputs can accommodate signal levels up to +21dBu, and all insert returns and unbalanced inputs up to +10dBu, while all balanced outputs can deliver up to +21dBu.

The Live 1's channel strip is arranged fairly conventionally, although the rotary controls are actually installed upside down compared to most consoles. This means that the rotary 'off' position on gain and send controls is at 2 o'clock instead of 7 o'clock, and the centre-detent unity positions of EQ gains and pan pots are at 6 o'clock instead of 12 o'clock. This obviously takes a bit of getting used to, especially when panning, but actually I think it is a more ergonomic way of working, since the knob pointers and scale legends are actually much easier to see through the most critical part of the range when you're looking obliquely down on the desk.

Starting at the top of the channel strip, a blue input-gain control sweeps a 60dB range, and two push-buttons with status LEDs apply phantom power (red button, red LED) and a fixed, 80Hz, second-order, high-pass filter (white button, yellow LED). A green 'signal present' LED at the very top of the strip illuminates when the post-EQ (pre-insert) signal level exceeds -36dBu.

The four stereo line-input channels have a different input-gain configuration, using two rotary knobs to provide independent level setting for each side of the stereo input, with unity gain at the fully clockwise position. A white button (with status LED) sums the two input channels to mono, if required.

The next six rotary knobs control the four-band equaliser, with ±18dB gain ranges on each of the high (12kHz) and low (80Hz) shelving sections (dark-grey knobs), and the two swept, bell-shaped mid-range sections (white knobs). The latter are of symmetrical constant-Q design, and span 400Hz-4kHz and 60Hz-600Hz (light-grey knobs), with a useful overlap in their ranges. Another white push-button, complete with a yellow status LED, switches on the entire EQ section. The stereo line-input channels have only four EQ gain controls. The two shelving sections have the same turnover frequencies as the mono channels (12kHz and 80Hz), but the two mid-range sections have fixed centre frequencies of 4kHz and 600Hz.



Though designated as a 24-channel desk, the Live 1 2442 can actually accommodate a total of 34 analogue inputs.

Moving on, the bottom part of the channel strip accommodates six individual mono aux-send controls. These are allocated pre- or post-fader, in pairs that are assigned globally via buttons in the master section. All aux sends mute if the channel is muted, regardless of their pre/post mode.

Finally, the usual pan and routing facilities lie at the base of the channel strip. Two white push-buttons (with green status LEDs) route the panned channel output between groups 1/2 and 3/4, while a black push-button (with red LED) sends the panned channel output to the master stereo mix bus. Below the red pan-pot (which introduces 4.5dB of attenuation at the centre position) is a latching green AFL/PFL button (with green LED). The mono PFL or stereo AFL mode is selected for the desk globally from the master section.

A scribble-strip space is provided below the PFL button, with a red mute button (and red status LED) located just below it. As already mentioned, the mute button kills not only the channel output to the groups and master stereo bus, but also all the aux sends and the direct output. Two yellow LEDs and one red LED located between the mute button and fader illuminate when the post-EQ, pre-insert signal level reaches -12, 0 and +12 dBu, respectively. The fader is a light-action, 100mm, long-throw, conductive-plastic type, with a white fader cap, and calibrated with 10dB of gain above the unity mark.

Groups & Auxes

The four 100mm mono group faders are identified by their blue caps, and each one has associated with it a red pan-pot, a red mute button, a green PFL/AFL button and a black stereo-bus routing button (all with status LEDs). Electronically balanced group outputs appear on rear-panel TRS sockets, along with unbalanced pre-fader TRS insert sockets.

Two red-capped faders arranged between the blue group and grey master stereo fader control the two stereo aux-return channels. As before, red and green push-buttons (with status LEDs) control mute and PFL/AFL functions, while three more buttons provide signal routing to the groups (in stereo pairs) and to the master stereo bus. In place of the groups' pan control are two aux controls, which send a mono sum of the stereo return signal to Auxes 5 and/or 6 for foldback purposes.

Six 10-segment LED bar-graph meters located at the top of the Group section can be switched individually to show either the corresponding pre-fade group and stereo aux-return levels, or the six pre-fade aux-send master output levels. The bottom LEDs of these meters illuminate when the signal exceeds -36dBu, and the top ones at +18dBu (3dB below clipping).

All of the Live 1's input and output sockets reside on the rear panel.

The six auxiliary send masters are arranged below the meters and, most unusually, are controlled with short-throw 60mm faders. Each Aux master also has its own mute and PFL/AFL buttons, and their balanced line outputs are presented on TRS sockets on the console's rear panel. Located below the aux masters are the six mono aux returns, each with a rotary input level control that routes the signal equally into both sides of the stereo master bus. The first four returns are also equipped with individual send-level controls for auxes 5 and 6, so that returned effects can be routed into the foldback buses. Aux returns 5 and 6 are only equipped with input-level controls.

Master Section

Crammed into the final control strip on the right-hand side of the console are the master-section facilities. The master stereo output level is controlled via a long-throw fader with a grey cap, and mute and PFL/AFL buttons are provided with status LEDs. A dedicated 10-segment stereo LED meter shows the post-fader (pre-mute) master output signal level at all times, and zero on the meter means 0dBu at the balanced outputs. Directly above the meter is a black button which sums the left and right channels together to provide a mono output, while a blue rotary control adjusts the input level of a direct stereo mix-bus input (via a rear-panel unbalanced TRS socket). This is intended for pre-show music from a CD player or similar, and avoids wasting a stereo input or return channel fader on something that won't be required during the show itself.

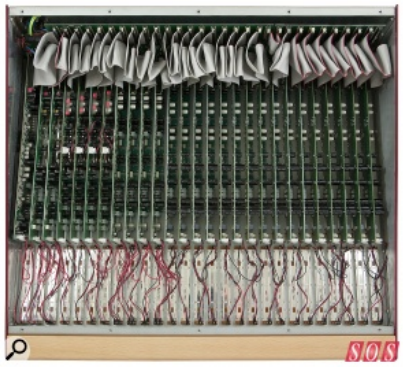
The master stereo mix is made available on the rear channel on a pair of balanced output XLRs, and also as a separately buffered unbalanced stereo output on a single TRS socket (for feeding a recorder, for example). The stereo mix bus is also provided with unbalanced pre-fader insert points.

Dedicated monitoring facilities are minimal on the Live 1 consoles, but a separate 10-segment LED bar-graph meter is provided for checking PFL/AFL levels, and individual volume controls are available for the rear-panel headphone output (via a quarter-inch stereo TRS socket) and the main stereo monitor line outputs (balanced TRS sockets). A black button with associated status LED switches the console globally between PFL and AFL modes, with the PFL function being provided for checking individual channel levels during setup, and the AFL facility for auditioning multiple channels to assess the balance of sub-sections of the mix.

Obviously, several combined AFL channels will produce a significantly louder output than an individual PFL signal, so a separate rotary control is provided to turn down the AFL level feeding into the monitoring section — although this doesn't affect the meter display. There is no provision to monitor the master stereo bus directly, other than via the master output's own PFL/AFL button, and since the PFL/AFL buttons are always additive, there is no monitoring PFL-override function. This is entirely proper for a live-sound desk, of course, but wouldn't really be appropriate for studio recording applications.

Located between the stereo master bus controls and the monitor section, three red-push buttons (and status LEDs) configure pairs of aux sends between pre- and post-fade modes, while at the very top of the strip are some simple talkback facilities. An XLR on the rear panel (with permanent phantom power) accepts the signal from an external talkback microphone, using the same preamp design as the mono channels. A rotary control adjusts the gain over a 60dB range, and three non-latching push-buttons (again,

each with its own status LED) route the talkback signal to the six aux buses, the four group buses, and the main stereo bus.



A peak underneath the bottom panel reveals the neat, PCB-per-channel construction.

In Use

Stepping up to the Live 1 is a very pleasant experience. The console exudes professionalism and quality, assisted by the dense but well thought-out control surface, the closely spaced faders (22mm pitch), the calm colour scheme, and the presence of status LEDs for every push button. The upside-down rotary controls do take a bit of getting used to, and I will admit to panning channels the wrong way once or twice, but familiarity is quickly established, and thereafter the Live 1 is a complete joy to use.

Sonically, the Live 1 is a great-sounding desk. The preamps are clean and reasonably quiet, with plenty of gain for normal applications (although the control exhibits the all-too-familiar gain bunching at the top end). The EQ is very musical and easy to use, with the two swept mids complementing each other well, and the gain controls being smooth and progressive. The inclusion of four stereo line-input channels reflects modern mix source requirements nicely, and having so many aux sends and returns available makes the desk remarkably flexible.

There are a couple of things that I'm not so happy about, though, and chief amongst those is the use of three-pin XLR sockets for the gooseneck lamps. The Live 1's channel socketry is arranged in separate blocks comprising two horizontal sets of four channels. However, the left-hand 'Littlite' lamp power XLR sits directly in line midway between the input XLRs for channels 7 and 9. This seems complete madness to me, because it would be incredibly easy, if plugging audio connectors 'blind' while leaning over the desk from the front, to accidentally insert an audio cable into the lamp's DC socket (assuming the lamps weren't already plugged in, of course). The second lamp XLR is in the output section of the rear panel, close to the talkback mic-input XLR!

These lamp power sockets are wired with +12V DC on pin 2 and the return 0V on pin 3 — the Littlite standard — and can provide 1 amp of current. So if a microphone were inadvertently plugged in, the chances are that it would be damaged or destroyed! In the broadcast industry, DC power is always connected via four-pin XLRs, to avoid exactly this kind of potential disaster, and I can't think of any good reason why the same common sense hasn't been adopted here; this just feels like a catastrophe waiting to happen, to me. I put my concerns to Cadac and they are currently considering their options to eliminate this risk.

My second issue is with the channel Direct Outputs, which are fixed as post-fader sends. This is fundamentally a live-sound desk intended for FOH and monitor duties, and if it's used as an FOH desk, the direct outputs will surely typically be used for multitrack recording. In monitor applications, they might be used to feed the stage signals at line level to the FOH console. In both cases, a clean, post-preamp feed is required, unaffected by local EQ, inserted signal processing, or fader moves. Most desks include user-configurable jumpers to enable the direct out take-off point to be selected to suit the application, but that is not an option here, which I think is a great shame. Apparently, Cadac originally planned an external switch, but this was lost as the design developed, and they say that no one else has complained about the issue. However, they are considering ways of dealing with this, should there be sufficient demand.

I've mentioned the monitoring section's limitations already, but the inability to monitor the desk's main out as a 'sustaining feed', with PFL/AFL selections overriding it, is a frustration for location recording and some theatre applications, and makes it a non-starter for studio use. However, it isn't a problem for live-sound applications, and that has clearly been prioritised in the design, which is fair enough.

The Live 1's feature set is relatively basic compared to some similarly priced (and some less expensive) live-sound consoles. It has no mute groups, VCA faders or output matrix facilities, for example. However, being able to control 34 inputs so easily in a console only slightly over 0.5m wide is just fabulous, everything works extremely well, the signal paths are well thought out, the technical performance is very good, the ergonomics are excellent, and the provision of status lights everywhere guarantees operational confidence.

The desk radiates quality in every aspect of its design, and it gives the impression that it would look as

good and work just as well after years of hard use. I currently use a chunky old DDA Interface console for some of my location recording and very occasional live-sound work, and while it is a great-sounding desk, I'd gladly trade it in without a moment's thought if I had the cash to splash on a Live 1 console — I'm that impressed... and covetous!

Alternatives

The obvious analogue live-sound console competitors for the Cadac Live 1 include the likes of Allen & Heath's GL-series consoles, Midas' Venice F, Venice U and Verona desks, and Soundcraft's GB4, GB8 and MH2 consoles. However, these all have quite widely differing feature sets and facilities, so direct comparisons are difficult.

Built To Last

I still clearly remember sitting, several decades ago, in an APRS Studio Engineer's course lecture given by Clive Green, one of Cadac's founders. I was completely enthralled as he discussed myriad aspects of analogue console design in detail, including the importance of the mechanical construction. He had previously removed a huge channel strip from a large Cadac console in the room, in order to point at various elements of the electronic circuitry, but to illustrate his point about the mechanical design, he casually offered the module into the open space in the console, and just dropped it, allowing it to fall back under its own (considerable) weight into the console — to the shocked gasps of most of the audience! Of course, the module dropped perfectly smoothly straight back into the underlying motherboard sockets, because the console's mechanical design guided it so precisely. With an impish grin, Clive then challenged an awestruck SSL engineer to do the same with a channel strip from the (then new) 4000E series console that was also in the room... but was rather sheepishly declined! Although Clive Green was made a Fellow of the APRS at the start of this year, he retired from Cadac long ago — but the very high engineering standards he instilled in the company are still an important part of Cadac's ethos today.

Technical Performance

I performed a range of tests on the Live 1 console using an Audio Precision measurement system. You can read about the results, as well as seeing detailed graphs of the desk's frequency response under various operating conditions, at /sos/jan13/articles/cadac-live1-media.htm.

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