AMS NEVE

88R

Product Profile

Issue 3

As part of our policy of continual product improvement, we reserve the right to alter specifications without notice but with due regard to all current legislation.

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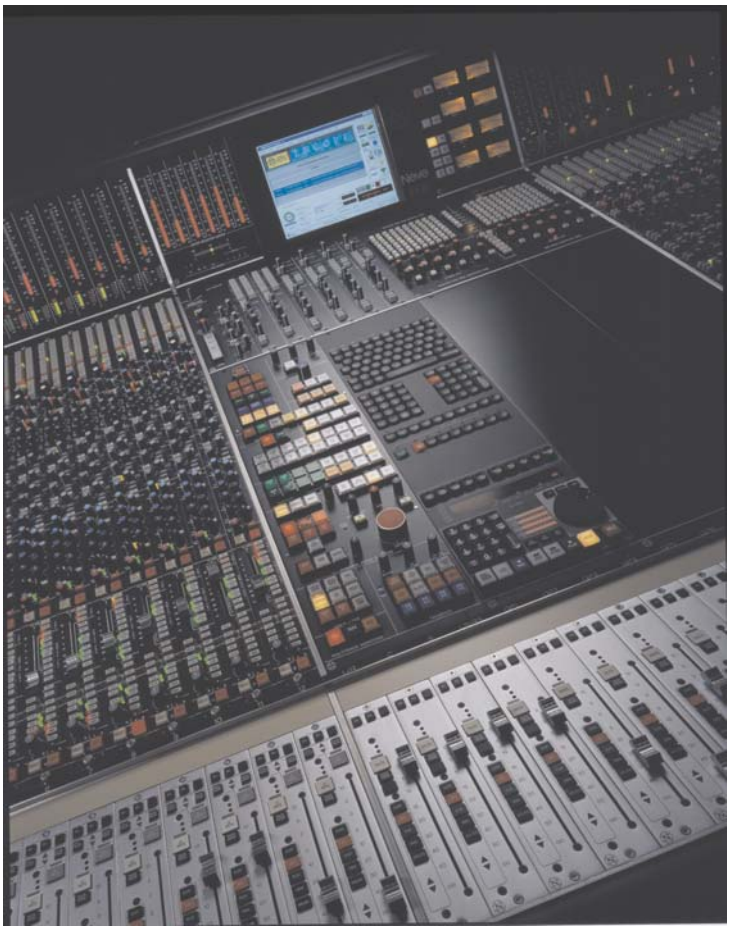
Contents



Introduction

The 88R embodies the Neve tradition of being simply the best tool for the job. Designed by engineers who have crafted many of the Neve analogue consoles over the last three decades, the 88R offers the classic Neve sound in a full surround format. High quality analogue circuitry is combined with practical ergonomics and state-of-the-art automation in a console that is ideally suited for music recording and mixing as well as scoring for TV, DVD and film.

The 88R is supplied with the Encore automation system as standard. Encore brings the best of Flying Faders for music together with the Logic automation system for post-production, creating the ultimate music and music-for-picture automation system.

Design Features

In-line architecture

48, 60, 72 and 96 channel frame sizes

Straight and angled frames

Integral or remote patch

Mic/line or line/line input modules

48 track mix busses

5 stereo and 1 LCR main mix busses

Splittable main and aux busses permitting film-style stems

Stereo and 5.1/LCRS surround monitoring as standard

Optional monitoring expansion to 7.1 and other 8 way formats

LCR panning with selectable divergence

Stereo or LCR SOLO

Integral or remote microphone amplifiers

8 auxiliaries, any pair of which can be made stereo

Full dynamics in every channel

Neve 4 band Formant EQ

Overdub facility inc track arming from each channel

Pre-fader direct input for minimal signal path

Encore Automation

Encore Recall

Automated panning optional

Automated mini-fader

Automated aux send on/off

Integrated multi-machine transport control

Full multitrack, surround mix, stems and aux metering

VU, PPM and flying spot metering

No VCAs in signal path and a passive monitor volume control

Optional Joysticks Module

Redundant PSU option

Choice of 1081 or Air Monserrat style remote mic amps

Technology

The 88R is a completely new electronic and mechanical design. Though based on classic Neve attention to audio quality, ergonomics and mechanical detail, the 88R takes advantage of the latest analogue technology.

All busses are balanced, Including auxiliary and solo busses, reducing crosstalk and noise.

Neve high performance microphone amplifier design.

High resolution PPM/VU LED bargraph meters with programmable bright-up and peak hold modes.

High quality, polarised and non-polarised de-coupling capacitors that don't dry out.

All switches use LED illumination, eliminating the maintenance task of replacing filament bulbs.

As standard, all switches are silver-plated giving a long-lasting, clean switching life. Gold-plated switches are optional.

All potentiometers use a conductive plastic track with gold plated wipers, giving super-smooth, silent operation.

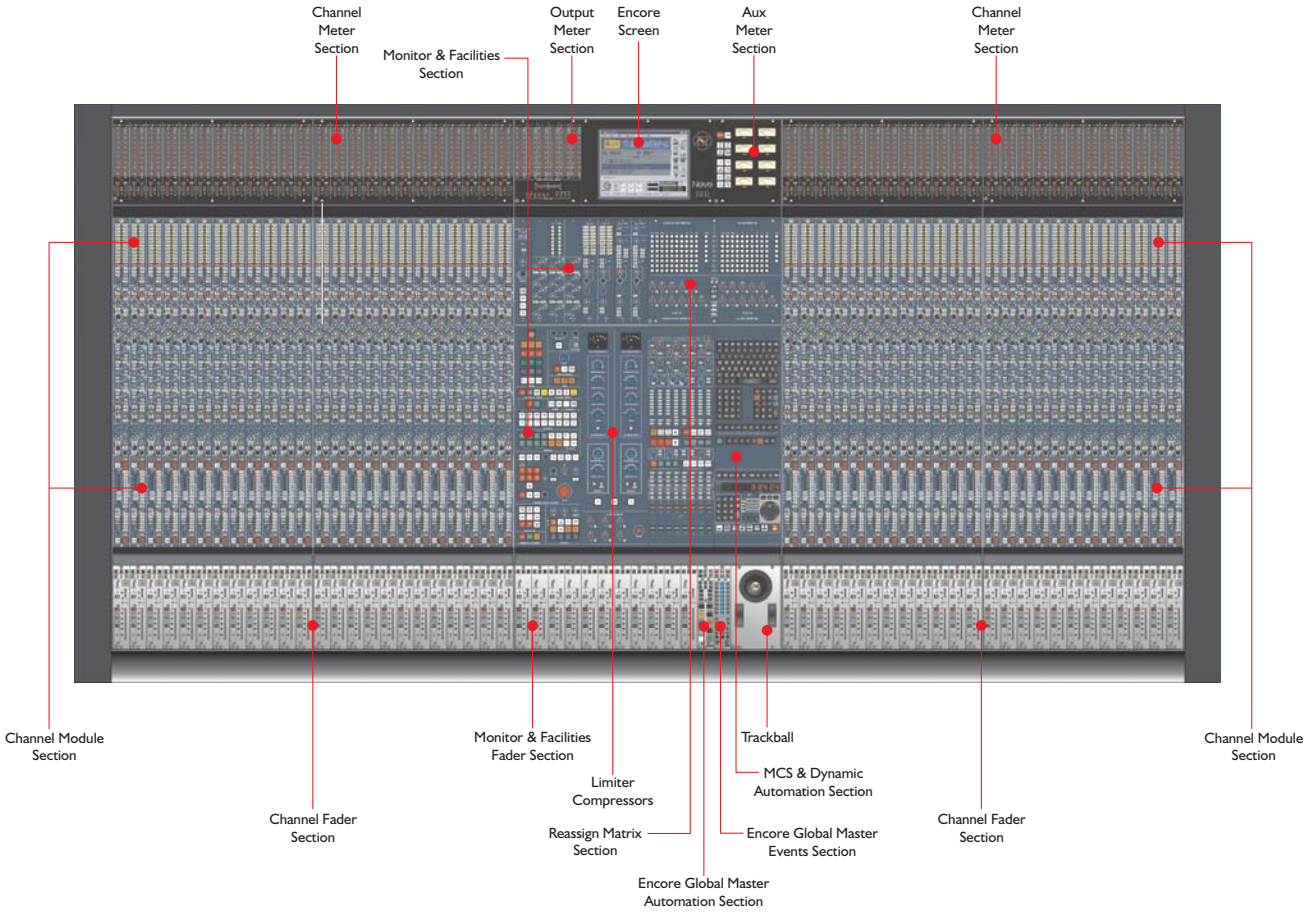
All channel modules and fader modules are hot-pluggable, with the power supply 0v wiring for each module going direct to the bus bars, enhancing LF performance and improving cross-talk.

High performance output stages deliver +27dBu distortion free into 600 Ohms.

Traditional, high quality mechanical frame, with rigid, well protected channel modules.

New high performance microphone amplifier design in the channel module.

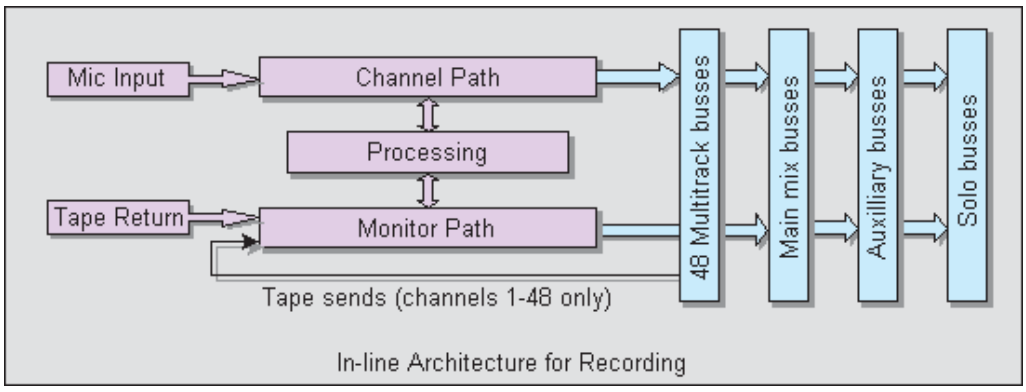
Console Layout



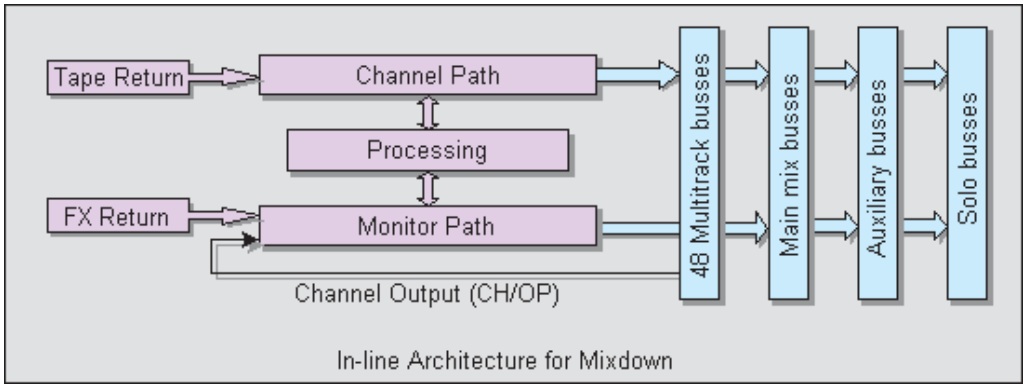
Architecture

The 88R uses a conventional in-line recording console architecture extended to address the evolving needs of the 21st century studio, in particular those of surround sound production. Users of the Neve V-Series and other high-end analogue consoles will immediately be at home with the control surface.

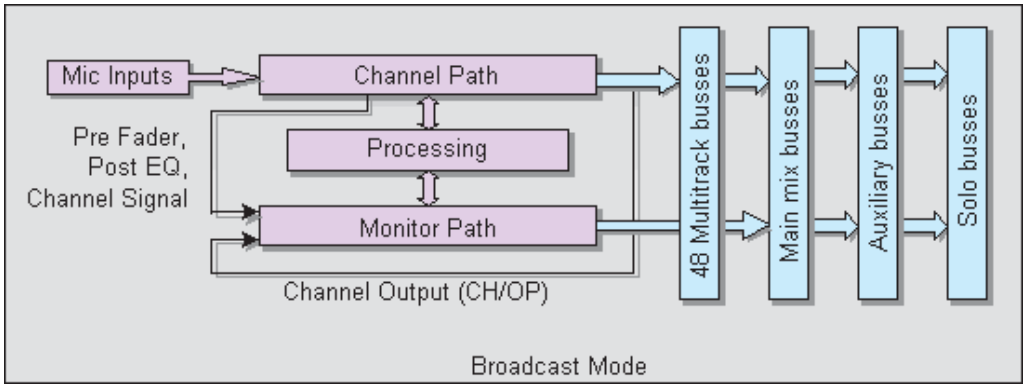
Using centrally located master switches the signal flow can be optimised for the task in hand at the press of a button. Local mode buttons on each channel strip give additional flexibility.



Record mode: - Shows the basic 88R signal flow in Record mode. The mic inputs are on the large faders, routing to the multitrack busses. The tape return is on the small fader, routing to the main mix busses.



Mixdown mode: - Switches the tape returns to the channel path which is routed to the main mix busses. The monitor path can be used for effects returns etc. but can also be routed to the multitrack busses for use as additional aux sends. Both the small fader and large fader have moving fader automation which is associated with the path, not the physical fader. This means that it is possible to swap faders without losing the mix.



Broadcast mode: - The monitor path source is taken from the channel path, pre fader. This allows EQ and dynamics to be preserved with level optimised for tape. Alternatively the CH/OP switch sends a post fade signal to the multitrack, so that mix levels are also recorded.

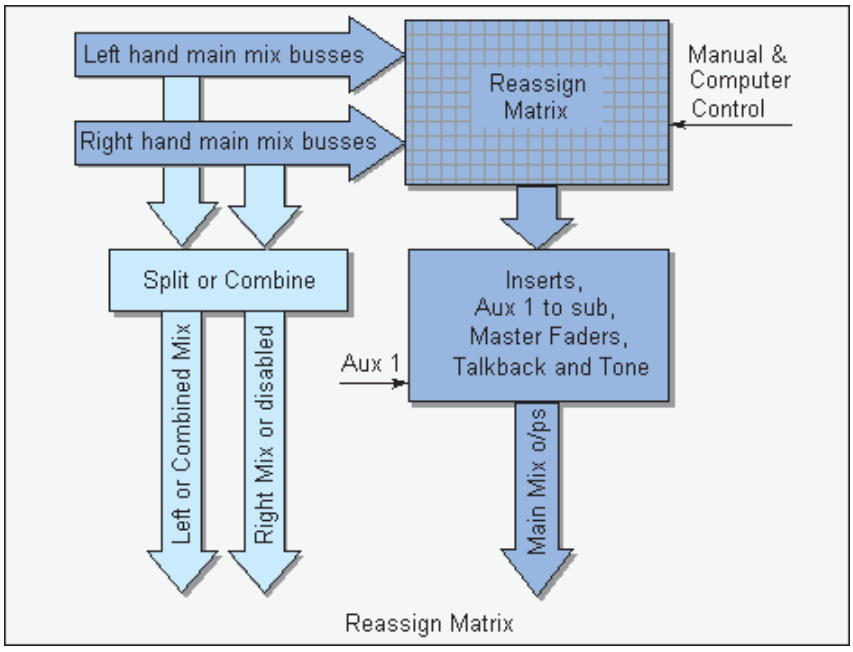
The master switches can operate across the whole console, or independently for the left and right sides of the console. This feature can be used (for example) to easily configure the 88R as a split monitoring console – mixing on monitors to the left and recording through channels to the right.

Independently of the mode, the signal paths on the large and small fader path can be swapped over, either locally or globally. Traditionally it was useful to record through the small faders with the monitors on the automated large faders to get a rough mix in place whilst recording. With both small and large faders automated on the 88R, the operator is free to lay out recording channels and monitors as he wishes.

Main Mix Busses

Both the channel and monitor paths can route to the main output mix busses via pan pots that generate simultaneous stereo and LCR pan laws. There are five stereo busses and one LCR bus, all re-assignable. Available as an option, using switches on the re-assign panel, stereo busses 1&2 can be combined to create a second LCR bus. (This may be useful if mixing for Dolby EFX cinema format that uses both LCR front and LCR rear speakers, or just for creating alternate front mixes).

The mix busses from the left and right side of the console can be combined into a single multi-format console output, or they can be can be split, allowing independent left and right side console outputs. The mix busses also go to a computer assisted re-assign system that allows the operator to choose the main console output format .



The outputs of the re-assign matrix are the console's main mix outputs and these are available on the monitoring system. The computer assistance makes it quick and easy to create and recall different mix formats on the main mix output. The computer provides snapshot and macro facilities, but is not essential to the operation – the matrix can also be fully controlled manually.

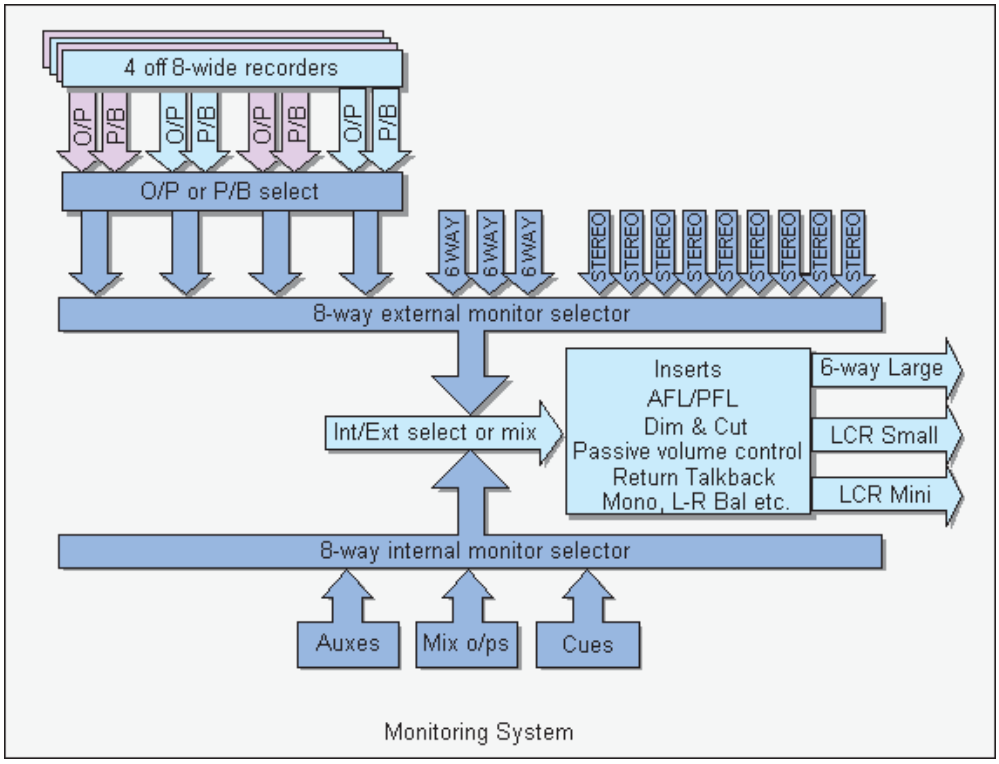
The standard 88R Series main output is six signals wide, suitable for formats up to 6.1 (inc LFE on aux 1. Fitting the optional scoring panel expands this to 8 main outputs, for 7.1 format mixing.

The 'Aux 1 to Sub' facility allows auxiliary 1 to be used to create the LFE (Low Frequency Extension, or sub-woofer) mix. The aux 1 output is re-introduced to the console via a normalised jack point before the master fader in a 5.1 mix. This allows complete control of the LFE mix. There is also an insert provision on the main mix output for an external filter, or low frequency synthesizer.

The re-assign panel has trim controls for the left and right mix bus outputs, the main mix outputs are controlled by the master faders. Also on the re-assign panel are buttons that set the overall mode of the console for stereo, 7.1 (requires scoring panel option), 5.1 or 4-TRK (LCRS).

Monitoring

The 88R comes with comprehensive surround monitoring support for LCRS and 5.1 formats as standard. This can be extended to full support, including PEC/direct switching and monitoring for 8-way formats by fitting the optional, industry standard Scoring Panel.



The monitoring system incorporates a 6 signal-wide passive volume control, of which up to 6 (5.1) signals are used on the standard console. An in/ext switch toggles the monitoring between preset internal and external selectors.

The source selectors can either be interlocked, or put into mix mode. In mix mode the internal and external selector outputs can be mixed (allowing "in context" monitoring) and any combination of external sources can be mixed (allowing the monitoring of multiple stems), but a logical degree of interlocking is kept, eg between auxes, to simplify selection.

The monitoring system supports up to 4, patchable, external 8-track recorders (or one multitrack recorder, with the tracks arranged as 4 stems). A single pair of Group/Tape switches control monitoring of track sends (mix output) or track returns. In addition there are patchable facilities for three 6-way and 9 stereo external inputs.

There is provision for a switchable 6-way insert after the int/ext selector and before the mono & AFL systems, eg for a Dolby encoder/decoder. There is a separate switch (STEREO COMP) for monitoring the LtRt output of the encoder when in 4T mode (LCRS).

When the monitoring is switched to mono there is also provision for an Academy filter to be inserted. The mono signal is a mix of left and right appearing on both left and right speakers when the console is

switched to stereo mode, but is a mix of the whole surround signal that appears on just the centre speaker when any of the surround modes is selected.

There is provision for 3 sets of front speakers, with independent level trims for the small and mini speakers. When the large speakers are selected, Return Talkback is routed to the mini and small speakers. Double clicking the Large speaker selector switch will lock the surround speakers on, allowing them to be used in conjunction with the mini and small speakers. A headphone output with level control is also fitted.

As can be seen from the panel layout, there is a full set of monitoring controls, including independent speaker cuts and solos, L/R balance, AFL/PFL level etc.

Solo Modes

The 88R has three solo modes: AFL /PFL (using Chan safe and/or Mon safe), and destructive SOLO. The modes are selected centrally, but destructive solo can be inhibited by linking the system to the tape machines' record tallies: a safe mode is then selected on the channels when the multitrack is in record, or on the monitors when the 4T (stereo or surround) tape machine is in record.

The AFL system is normally LCR with the option of switching left and right AFL to the surround speakers. The AFL system also a features a mixed solo mode, where the soloed signal (AFL or PFL) can be balanced against the monitor source on a control that has full monitor and no solo at one end and full solo and no monitor at the other.

Talkback

The 88R has support for engineer's talkback, producer's talkback, 2 return talkback inputs and slate. There is routing for the engineer and producers' talkback to cues, foldback, studio loudspeakers, and switched and non-switched dedicated outputs. Auto TB will ensure that the cue outputs will always get talkback when the tape machine isn't playing or recording, so that the artists don't feel cut off from the control room between takes. There are full red-light with record and rehearse states, and control room dim facilities linked into the talkback system.

Overdub System

The 88R's overdub system differs from previous Neve consoles', reflecting input from many users. The overdub system controls what is heard on the artists' headphones, on the control room speakers and also controls the track arming of the multitrack recorder. It is affected by the console central status, cues and multitrack monitor controls.

Remote Mic Amps

Remote mic amps allow the engineer to bring fragile mic level signals to line level as close to the microphone as possible, optimising audio acquisition. The 88R remote system offers the choice of two classic 70's designs: the 1081 and the circuit designed for the renowned Air Monserrat consoles. Both of these modules use modern construction techniques, but rely on the same component types as the original amps to faithfully recreate their sound. Switches have been replaced with relays, but the transformers and discrete op-amps of the 1081 and the tantalum capacitors of the Air Monserrat console are still there. Although these designs are well known for their sound quality, they are also technically excellent with low noise and distortion. The two module types have the same functionality and control system, the choice of which modules to fit is down to personal preference.

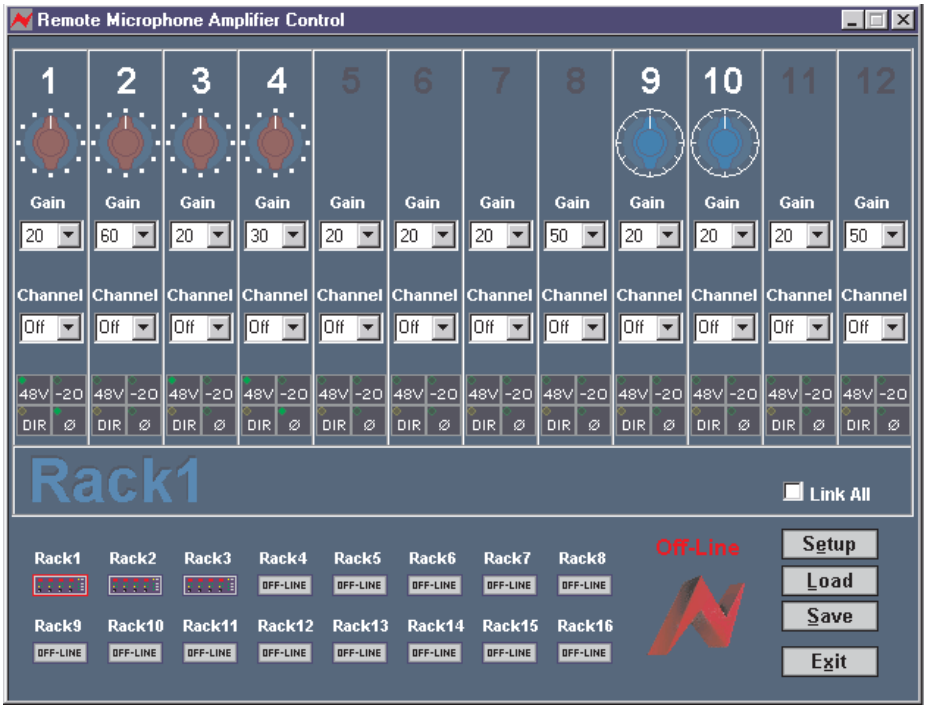
Each 88R mic amp rack will take up to 12 modules in any combination and up to 16 racks can be controlled from the console via Encore. The line level signals from the remote rack are brought to the line level inputs of channel modules via the patch. The Encore based software allows any module to be controlled from any console channel, giving freedom in how the console is laid out.

The 88R remote mic amp based on the original 1081 microphone amplifier and identified by the red knob

The 88R remote mic amp based on the Air Monserrat microphone amplifier and identified by the blue knob

The mic amps can also be fully controlled from their front panels when not assigned to a console channel. In this mode the display shows the gain of the amp in dB. When the modules are controlled from the console, the display shows which channel is controlling the module and the gain can be interrogated by using the INT button. If control from the Encore computer is removed, control returns to local front panel control.

Remote Microphone Amplifier Control Software



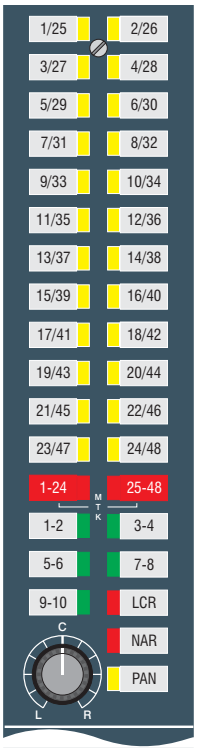
The picture above is of Encore's remote mic amps' control screen showing three attached racks and rack 1's control settings. Rack 1 is shown fitted with four 1081 modules and two "Air Monserrat" modules. The modules can be fully controlled from this screen, or using the Channel selector they can be assigned to 88R channel strips for control through real knobs and switches. The Load and Save buttons launch standard Windows dialogues for saving and recalling snapshots of the mic amp settings. Recalling a snapshot for mic amps not under control of a channel module will automatically reset the mic amp settings to the stored values. Modules that are assigned to 88R channels will also be indirectly stored and recalled by Encore's console-wide Recall system.

The Setup utility allows the communications between Encore and microphone amplifiers to be tested.

Module Descriptions

Channel Module

Input and Multitrack Output

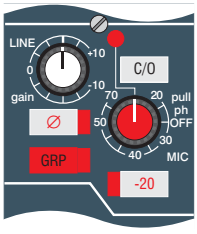


There are two versions of the channel module, one with an integral microphone amplifier, and one with dual line level inputs that will support an optional remote microphone amplifier. Apart from the input section, both versions have identical facilities.

At the top of the module there are the routing buttons for the 48 multitrack busses, the 5 stereo and the main LCR bus. The switchable pan control automatically delivers an L-R pan law to stereo busses and an LCR pan to LCR busses.

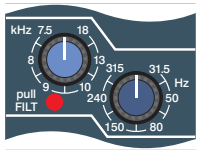
The narrow button changes the width or size of the panned source within the stereo picture from standard to more of a point source.

The multitrack routing is fed from either the channel path or the monitor path, depending on the mode of the channel. When recording, the multitrack routing comes from the channel path, but when mixing the source is normally the monitor path, allowing the busses to be used as additional auxiliary sends. MTK switches in the auxiliary send section also allow the aux sends to be diverted to multitrack busses during mixdown.



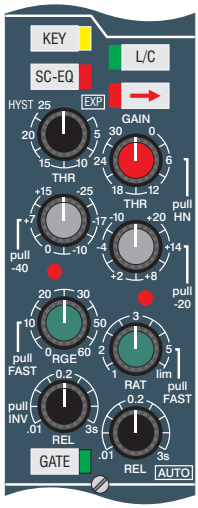
Below the routing section, the input section allows mic or line level inputs to be selected. In the case of a dual line input module, there are two LEDs to indicate whether the LINE A or LINE B input is selected. Both modules have a mic input trim control, in the case of the dual line input module this is for the optional remote mic amplifier.

The GRP group switch allows the channel input to be switched to the multitrack bus output corresponding to the channel number. For example if several channels are routed to multitrack bus 6, then pressing GRP on channel 6 will make channel 6 the group master for these channels.



Below the input section are switchable high and low pass filters.

Dynamics



Full limiter/compressor and gate/expander facilities are available, each of which can be individually switched in or out of circuit.

The compressor has soft knee characteristics as standard with hard knee available at the pull of a button.

The gate/expander has rotary controls for a 60dB gate range, a 70dB threshold range, release from 10ms to 3s, switchable attack time 500ms/50ms and variable hysteresis.

Hysteresis makes the threshold level different for signals which are rising or falling in level and allows precise triggering on the wanted signal while still allowing the correct amount of signal 'tail' through.

The expander has a 2:1 expansion ratio. Switched controls are provided for an external key input and for inserting the EQ into the side-chain. The external key input is accessed from the patchbay.

The limiter/compressor has rotary controls for release times from 10ms to 3s, a 50dB threshold range, a ratio of 1:1 to limiting and up to 30dB of gain make-up.

Attack time is program dependent with a switch for fast impulse response ranging from 4ms to 1.2 ms.

The Release control incorporates a switch for automatic programme dependent release.

Anti pumping and breathing circuitry allows the unit to operate on the source musically whilst retaining absolute control over the dynamic range.

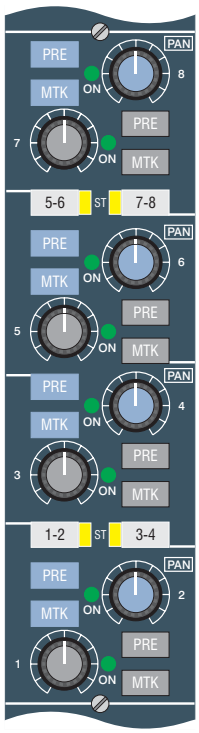
Auxiliary Sends

The eight auxiliary sends can be configured as eight mono sends with either the channel or monitor path as the signal source.

Each pair of sends can be switched to operate as a stereo aux with level and pan controls.

Operationally, the pre-fade auxiliaries are usually used to send signals to the artists in the studio in tracklaying mode and to effects in mixdown mode. The channel pick-off point in these two modes is arranged so that when tracklaying the signal is taken pre-cut to enable cut solos to be performed in the control room and still retain cue sends. In Mixdown mode the signal is taken post-cut so that the effects send is cut with the source.

In Mixdown mode the multitrack returns are routed to the stereo buses via the large fader and the small fader output is routed to the multitrack routing matrix - allowing as many as 48 fully mixable extra auxiliary sends. Alternatively the aux section MTK buttons can be used to divert one or more of the auxes to the multitrack busses with the advantage that they have independent level control over the contributions.



EQ and Inserts

Inserts can be positioned in either the channel or monitor path independently of the equaliser. Pre-equaliser and pre-dynamics configuration is also possible.

Formant Spectrum Equalisers

The unique sound of AMS Neve equalisers is the result of years of research and extensive studio experience.

The equaliser provides 4-band parametric equalisation, with overlapping frequency ranges.

HF	1.5kHz - 18kHz
M2	0.8kHz - 8.7kHz
M1	120Hz - 2kHz
LF	33Hz - 440Hz

The two mid-bands have variable controls for Q (from 0.4 to 10), gain (20dB cut and boost) and frequency.

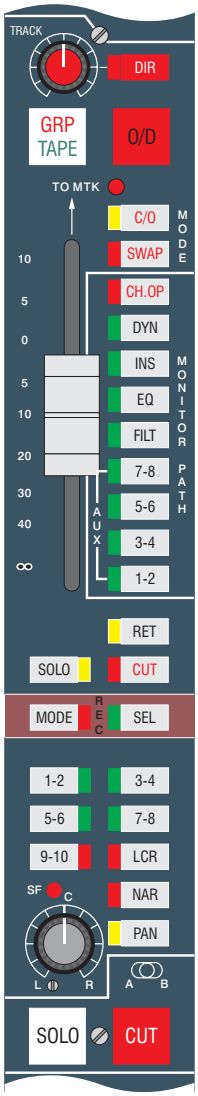
The high and low frequency EQ controls provide variable gain (20dB cut and boost) and frequency controls with switchable Q (either 0.7 or 2) and a peak or shelf characteristic.

The equaliser section can be switched before or after the dynamics section.

Faders Section

Track Send

The track level trim allows the multitrack bus output level for the bus corresponding to the channel number to be adjusted between -10dB and +10dB.



The channel signal can be routed directly to the corresponding track send, bypassing the multitrack routing matrix. In this mode, signals from other channels cannot be routed to this track send.

Small fader

The small fader uses a Penny and Giles conductive plastic moving fader and is automated in the same way as the large fader. The small fader is normally in the monitor path, but can be swapped with the large fader.

Either the channel path or the monitor path may be feeding the multitrack routing at the top of the channel strip depending on the global status (record/mixdown) and the local C/O switch. The TO MTK LED indicates when it is the monitor path.

The CH/OP button allows the input to the monitor path to come from the channel path output allowing the small fader to be used an additional aux send to the multitrack busses during mixdown.

The SWAP button reverses the roles of the small and large faders.

Automation that was written on the small fader gets transferred to the large fader and vice versa. i.e. the automation stays with the path, not the fader.

The monitor path selectors assign the module's dynamics, insertion, equaliser, filters and auxiliaries to the monitor signal path.

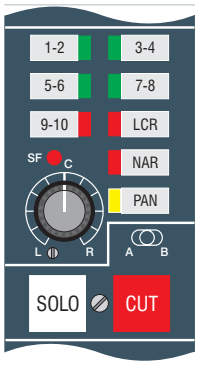
The RET switch makes the path safe from solo mutes, allowing it to be used as an effects return input.

The console has a sophisticated monitoring system allowing monitoring freedom in the control room while the correct cue sends are retained. The system uses the GRP/TAPE and OD switches in conjunction with master monitor selection to achieve this. The OD (overdub) switch also allows the multitrack tape machine to be record armed/punched in from the channel strip.

Mode & Sel

Are used to set the automation modes for the channel switches.

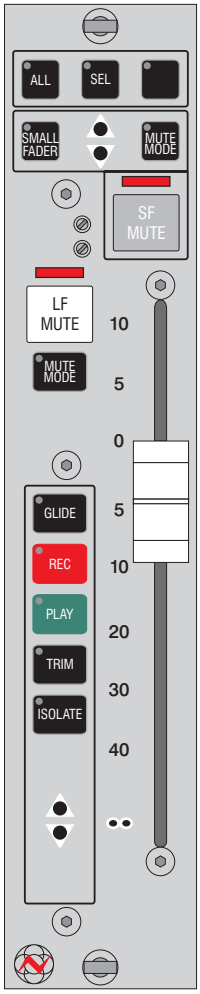
Large Fader Section



At the bottom of the channel strip are the routing buttons for the main mix busses. The pan control creates both LCR and L-R pans for the different bus types. As well as an on/off switch, the pan control can be set to give a the signal a NARROW width in the LCR field.

The channel path can be included in one of two cut groups, A and B, which have master controls in the centre section.

Fader Module



The large fader module has automation controls for the both the large fader and small fader, and both mute buttons. The automated mute button for the small fader is also on this module.

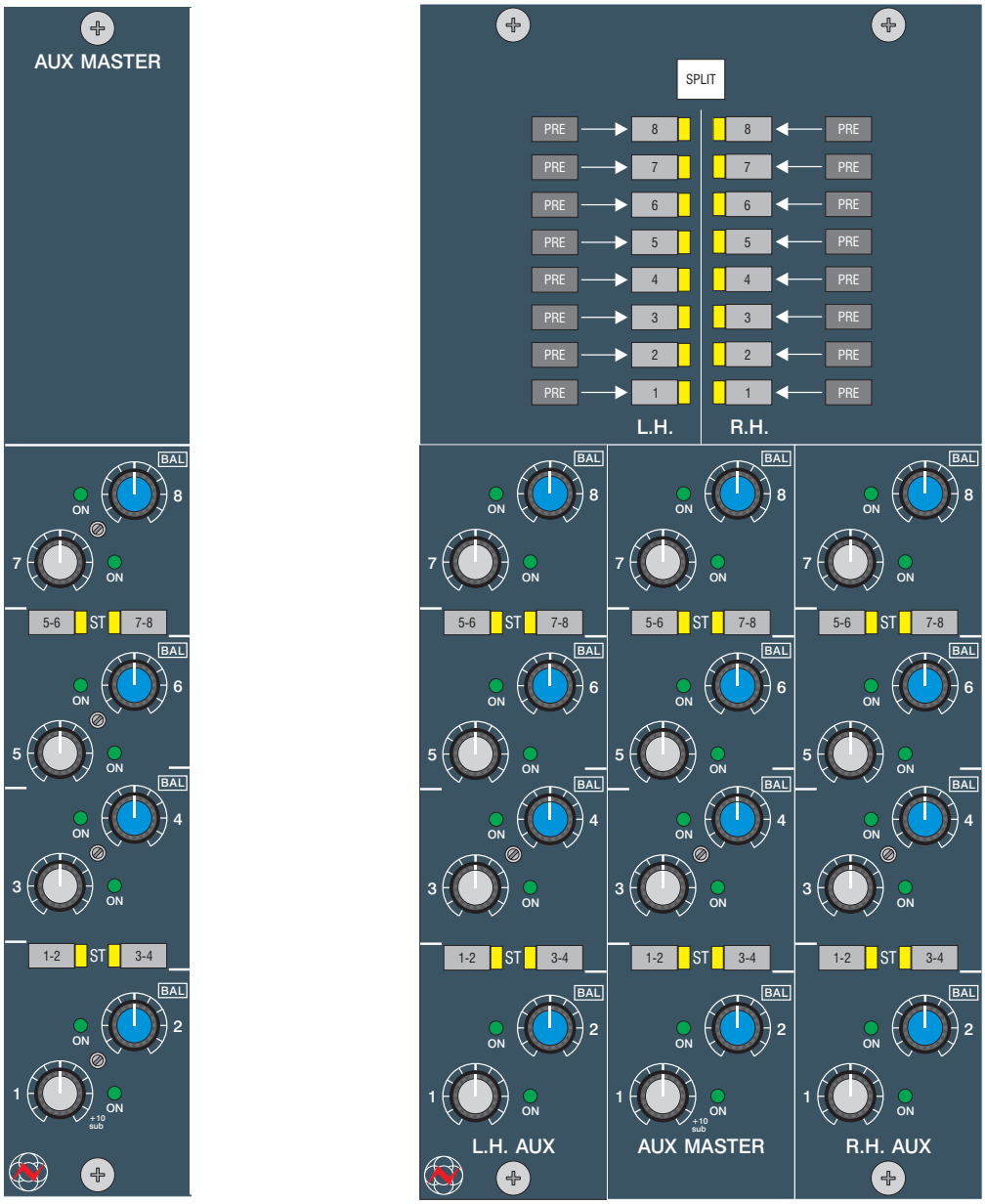
Monitor and Facilities Section

Oscillator and Signal Threshold

The Signal threshold is the level at which the signal indicators in the meter bridge come on. This indicator can either be used as a signal present or a signal overload indicator depending on the level set.

The 7 frequency oscillator is also available on the patch field, independently of the slate oscillator. Pink noise, or other external sources can also be patched in for routing to the various outputs.

Auxiliary Master Section

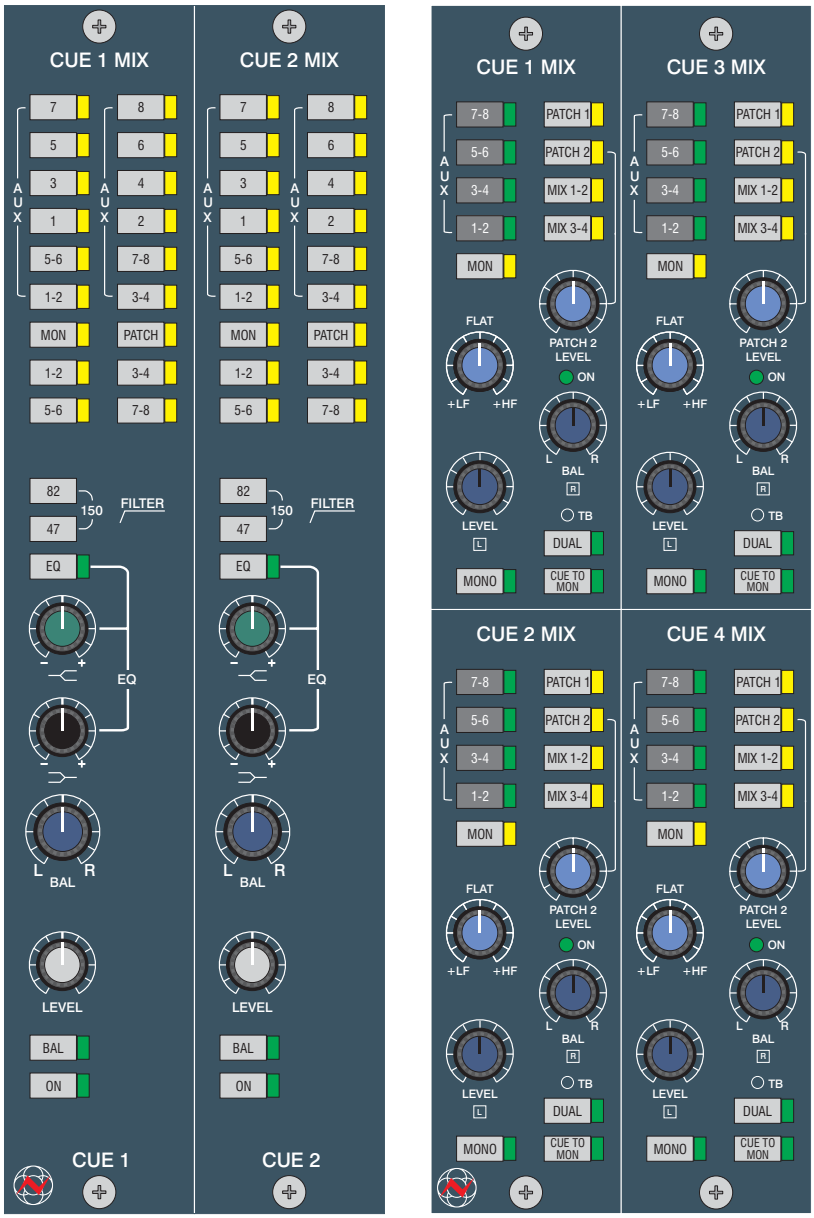


There two alternative auxiliary master panels. The single panel provides output controls for the 8 console-wide busses. Each pair of auxiliary sends can be configured as two mono sends with independent level controls, or as one stereo send with a level and balance control.

The split aux panel allows independent outputs for the left and right side of the console, or the busses can be combined across the console on an individual basis.

Cue Mix System

There are two alternative cue mix systems – either two stereo cue mix outputs with high and low frequency shelving, or four stereo mix outputs with a spectrum tilt control.



Each stereo cue mix is made of the auxiliary, control room monitor output, main output or patch-field sources selected on the buttons at the top of the section.

The 88R channel module, together with the centre section controls, allow the engineer to set up the pre-fade auxiliaries to provide intelligent mixes for the artist independently of the control room monitoring. This includes sending a mix of multitrack send and return with automatic level compensation when the track is dropped into record during an overdub.

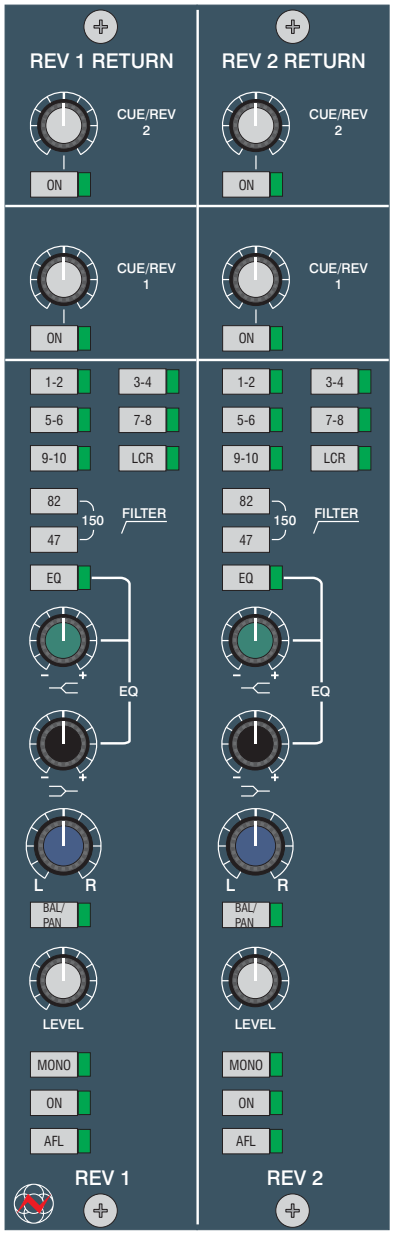
Quad Cue Mix Panel

The optional Quad Cue Mix Panel provides 4 stereo or up to 8 single ear mono mixes.

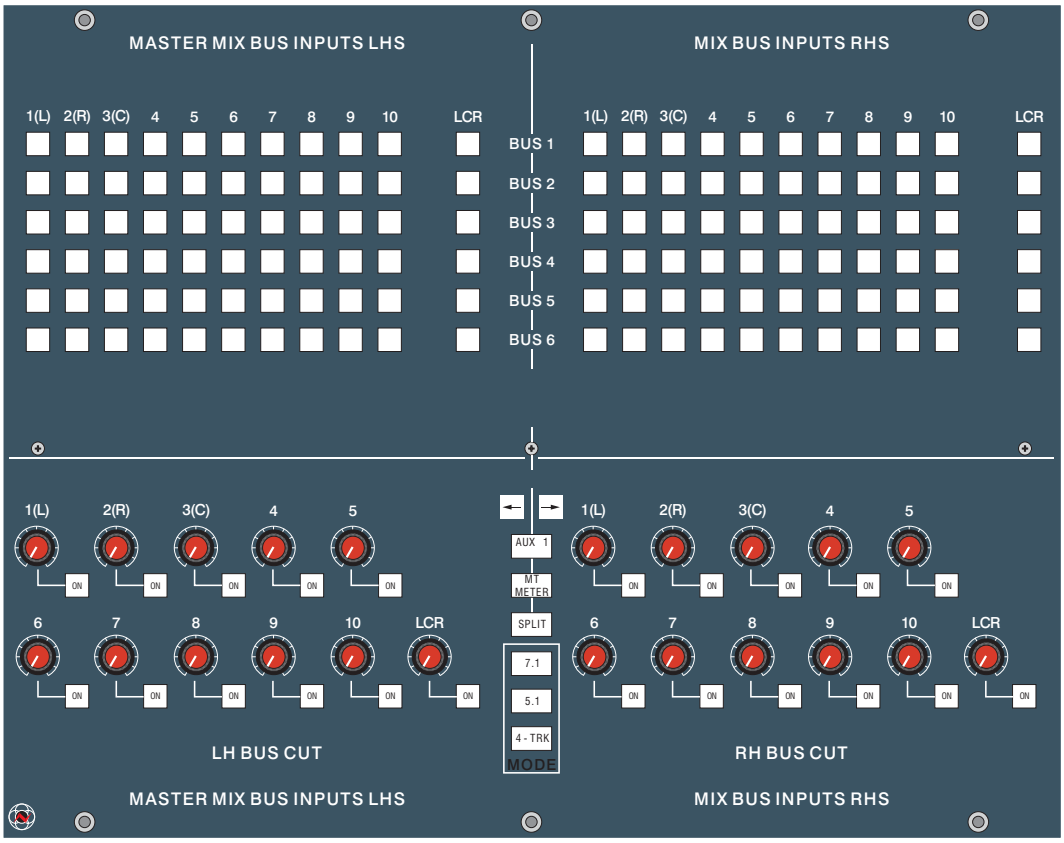
Rev Returns

The Rev returns provide facilities for up to four stereo, reverberation/effects returns with stereo equalisation, filtering, level and balance control. The rev returns can be routed to any of the main mix busses and can also be mixed into the cue sends to the artist's headphones.

Rev returns can also be automated by patching one of the six Encore group master faders (if fitted with the optional audio boards) in series with the Rev return. This gives both an automated fader and automated mute.



Re-assign Matrix



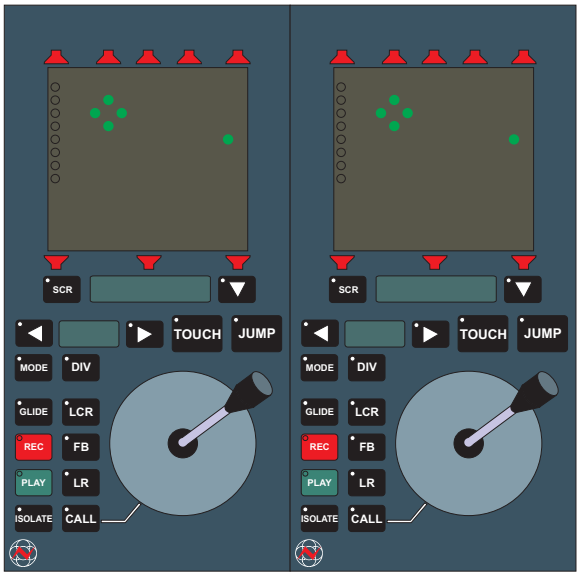
The reassign matrix controls the main mix format. It configures the main mix busses for the desired combination of stereo (LR) and LCR outputs. As standard, the left side of the reassign matrix governs both sides of the console. Using Split Mode, each side of the console uses it's own independent reassign matrix allowing separate LHS/RHS surround stems to be printed separately yet monitored simultaneously. The 3 mode switches 7.1, 5.1 and 4-TRK set the matrix, monitor and output meters into standard configurations.

The console wide mix busses enter from the bottom of the panel via the switchable trims and are selected to the main output mix busses (BUS 1 to BUS 8) using the upper section matrix buttons. Busses 1-8 are nominally L, R, C, S, LS, RS, LE, and RE respectively. (The LFE can be derived from the aux 1 bus). The optional Dual LCR buttons can be used to convert console busses 1-3 into an additional LCR bus, affecting how the channel pan pots route the signal.

A single re-assign panel without the facility to split the mix busses is also available.

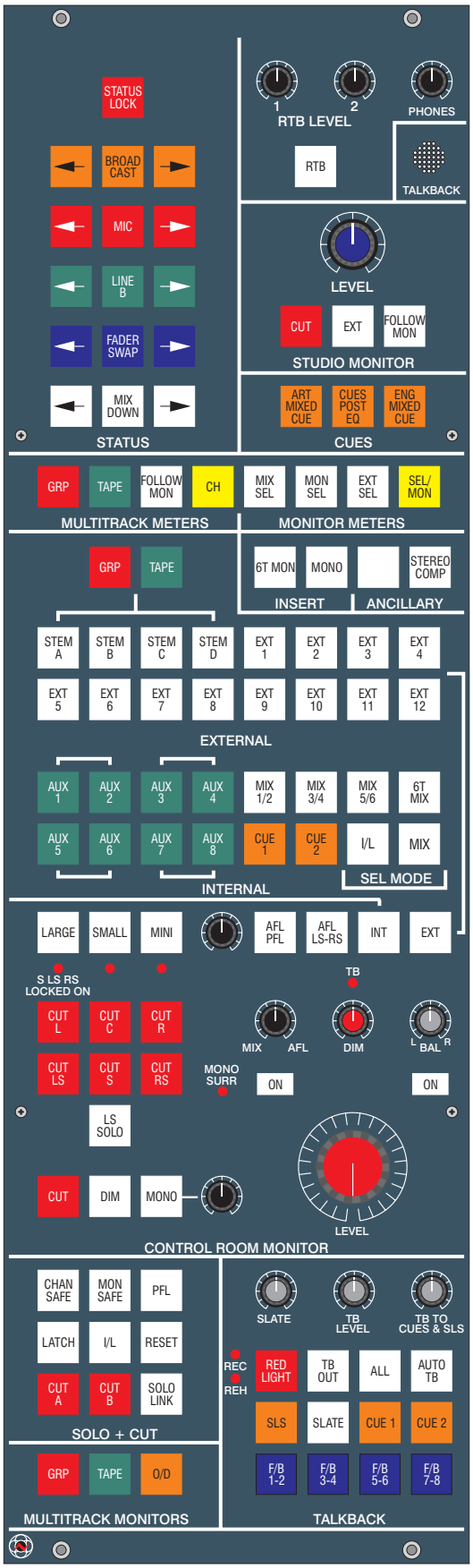
Optional Joystick Module

The two optional joysticks are able to pan any channel across the mix-busses in a stereo, LCR, 5.1, 6.1 or 7.1 format. It does this by remotely controlling a set of small faders (the pan set) that control the level sent to each bus in the chosen format. Each small fader controls the individual left, centre, right, left-surround, right surround, left-extra, right-extra or sub-woofer contribution to the mix. This approach couples the flexibility and power of the automated joysticks with the sonic purity of passive gain elements of faders in the signal path.



Master Status Section

The master status switches in the top left of the master section control the basic modes and input selection of the console. They are protected by a status lock switch to prevent inadvertent operation.



Talkback

A talkback microphone is built into the control surface and there is also provision for an external producer's talkback mic, both are equipped with limiters. The routing is close to hand at the bottom of the module and includes auto talkback to the studio (whenever the tape machine is stopped, so the artist doesn't feel cut-off).

Control Room Monitoring

The standard 88R monitoring system is comprehensive and should provide all the surround facilities required for the majority of users. An optional scoring panel is available for specialist film scoring applications.

The 88R has outputs for 3 sets of loudspeakers. There are facilities for all 3 sets to be surround format, sharing the same rear speakers. The large speakers can be any format up to 7.1 and the small and mini speakers can be up to 5.1. Each speaker in each set can be individually level trimmed.

In normal monitoring mode there are no VCAs in the signal path; the volume control is a 24 step switched passive control. VCAs only get switched into the path for dim and AFL/PFL monitoring.

PFL is mono/stereo and AFL is mono, stereo or LCR. AFL can also be switched to the LS and RS rear speakers to check the surround image. A mixed solo control allows AFL to be mixed with the main monitor signal and the relative levels adjusted, so the solo can be heard in context.

There is provision in the monitor path for a surround encode/decode insert and also the ability to monitor the encoded stereo signal (LtRt). There is also a mono summing amplifier with a switchable insert for an academy filter. The mono signal can be monitored on both the left and right speakers, or the centre speaker and has its own level control.

The MONO SURR trim sets the level that a mono surround signal is fed to the LS and RS rear speakers.

The internal and external groups of monitor sources can be interlocked or mixed. The auxiliaries are always interlocked, but can be chosen singly as mono sources or in pairs as stereo. Similarly, the 6T button is also always interlocked with the mix buttons and cue ½ are always interlocked.

Of the external sources, stems A-D (GRP and Tape) are 6-wide inputs, EXTS 1-3 are 6-wide and the remaining EXT4-12 are stereo.

If the console is fitted with the optional Scoring Panel then the external stems A-D are 8-wide.

Optional Scoring Panel

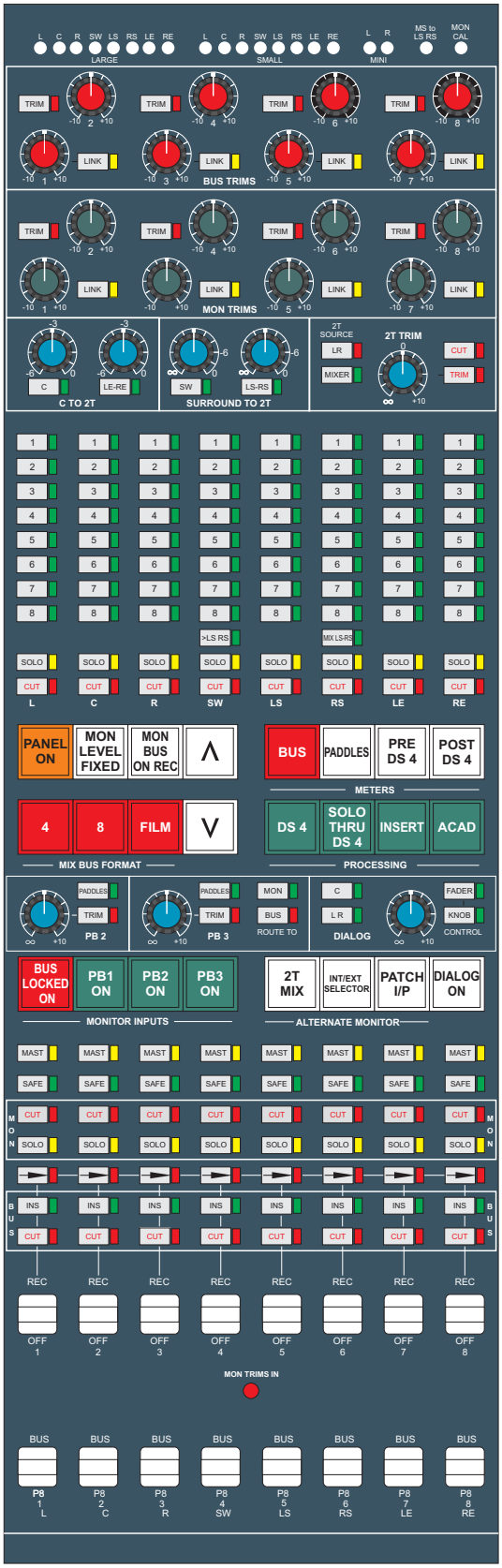
The scoring panel provides additional film-oriented surround sound monitoring and machine control facilities beyond the standard monitor panel.

At the bottom of the panel are PEC/Direct (BUS/PB) and track arming switches together with bus and monitor control switches associated with the master record machine.

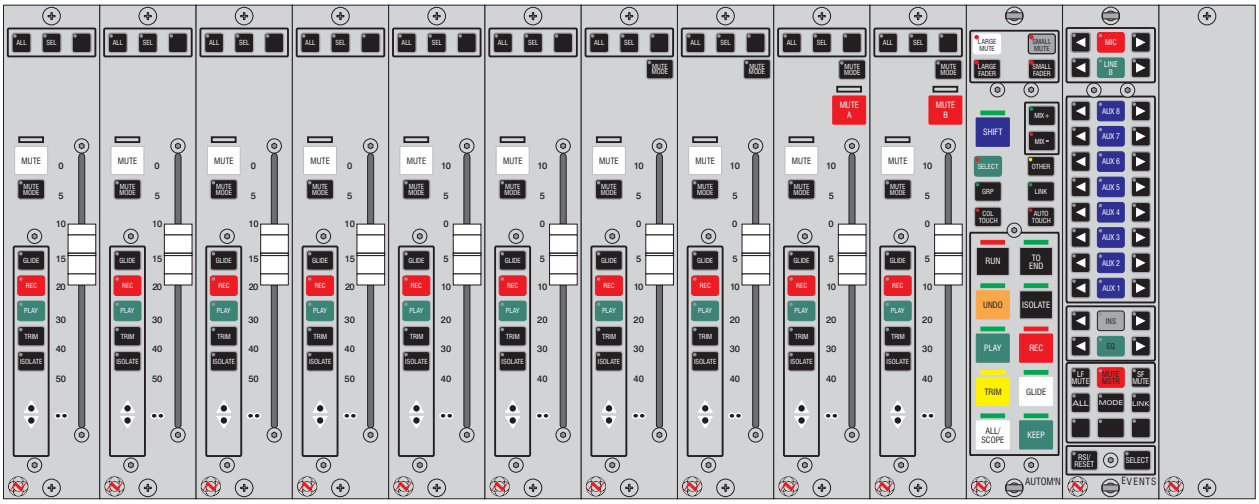
Above this area is the monitor area with format selection, insert control, mix levels for additional playback machines and a bus re-assign matrix.

At the top of the panel are the bus trims to the recorder and the monitor trims for the individual speakers, together with controls for the surround to 2track fold down.

Full details of the scoring panel option are available separately.



Monitor and Facilities Fader Area



This is the fit shown in the layout drawing at the back of the profile. The actual output fader fit is optional. If the scoring panel option (which expands the output capability to 7.1) is fitted, an additional stereo fader for left- and right- extra may be included, or all the output faders can be configured as stereo or mono (except for busses 7&8 which always have a stereo fader).

This area is 16 fader widths wide and is normally fitted (from left to right) with the following:

1 Stereo Main Output Fader used for left and right mix output.

2 Mono Main Faders used for centre and mono surround or LFE.

1 Stereo Fader used for stereo surround.

1 optional Stereo Fader if Scoring Panel is fitted for LE, RE.

6 Group Faders which are master faders, normally without audio passing through them. As an option audio boards may be fitted with inputs and output on the patch. This allows the level of external devices, eg rev returns to be automated. A and B Mute master faders are also an option.

Automation Masters which include the Automation Master panel and Events Master panel.

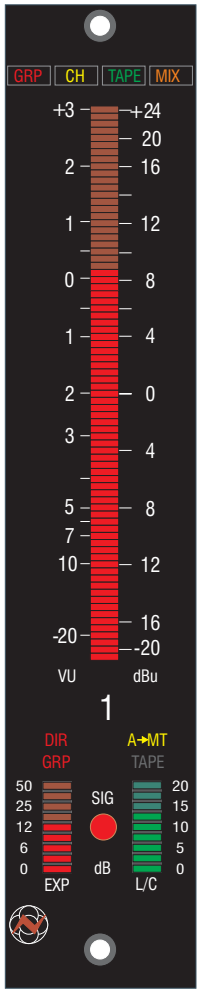
1 Blank Fader Panel if the optional LE/RE fader is not fitted.

The remaining area is taken up with the Encore trackerball.

Meters

The 88R features high resolution multi-mode bargraph meters on channels and meter selector outputs and 8 VU meters on the auxiliary outputs.

The main channel meters are switchable from the monitor section to tape sends (GRP), tape returns (TAPE), Channel input (CH) or to follow the individual modules' monitor path input selection (GRP/TAPE). When switched to channel input, the meter point will normally be after the mic/line selection (before the group switch), but if the direct-input-to-fader facility is used, the meter point will automatically switch to this input. On the re-assign panel, the MT meter option will switch the mix stems (before the re-assign matrix) on to thirteen multitrack meters either side of the console (MIX).



Below the channel meters a hidden till lit display gives key channel status information – Direct input to fader (DIR I/P), one of the auxiliaries routed to the multitrack busses (A→MT) and the monitor input selection (GRP or TAPE).

Two 9-segment LED level indicators show gain reduction for the limiter/compressor and expander/gate. A SIGnal LED with adjustable threshold (-30to+26dBu) simultaneously monitors the channel and monitor path signal levels pre cut switches, together with the channel signal post the group switch. This is normally used to indicate potential overload conditions at key points in the module.

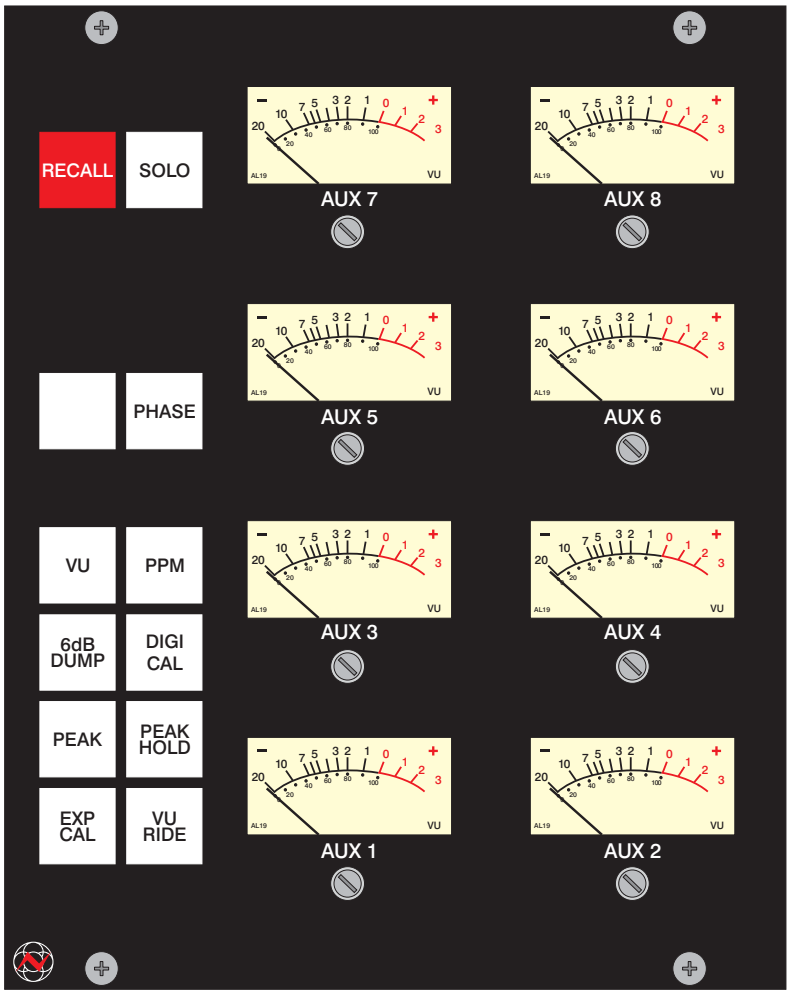
Global status switches next to the auxiliary VU meters control the meter ballistics.

VU & PPM set the ballistics accordingly, using the scales to the left and right of the meters respectively.

6dB DUMP drops the signal to the VU meters by 6dB allowing the metering of louder signals, e.g. when working with digital multitracks.

DIGI CAL changes the bright up point of the meters in the PPM mode to a higher preset level (typically +18dBu) to allow easier monitoring of potentially clipping signals when working with a digital multitrack.

PEAK allows easy monitoring of transients by holding the most recent peak on a single LED for about a second before decay (unless superceded by a greater peak).

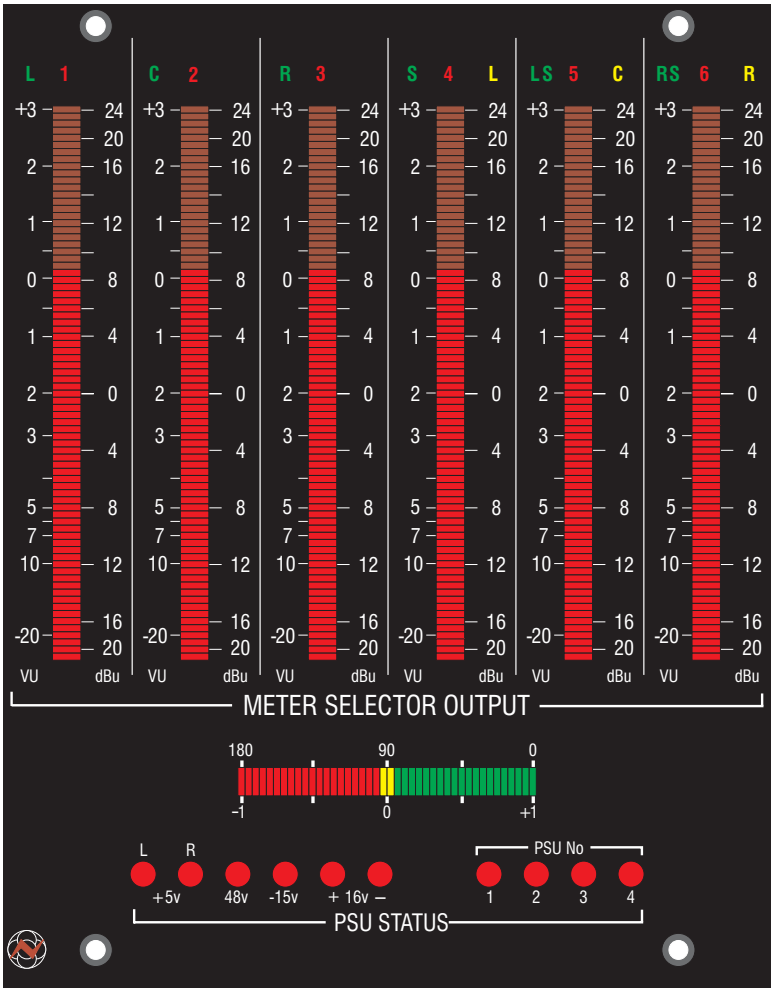


PEAK HOLD is the same as Peak, but the peak level is displayed indefinitely, or until Peak Hold or another mode button is pressed.

EXP CAL changes the scale of the meters during tape machine alignment to show signal level plus or minus 1.2dB of 0 using the –12 to +12 dB region of the PPM meters with clear indication of whether the signal is below or above zero.

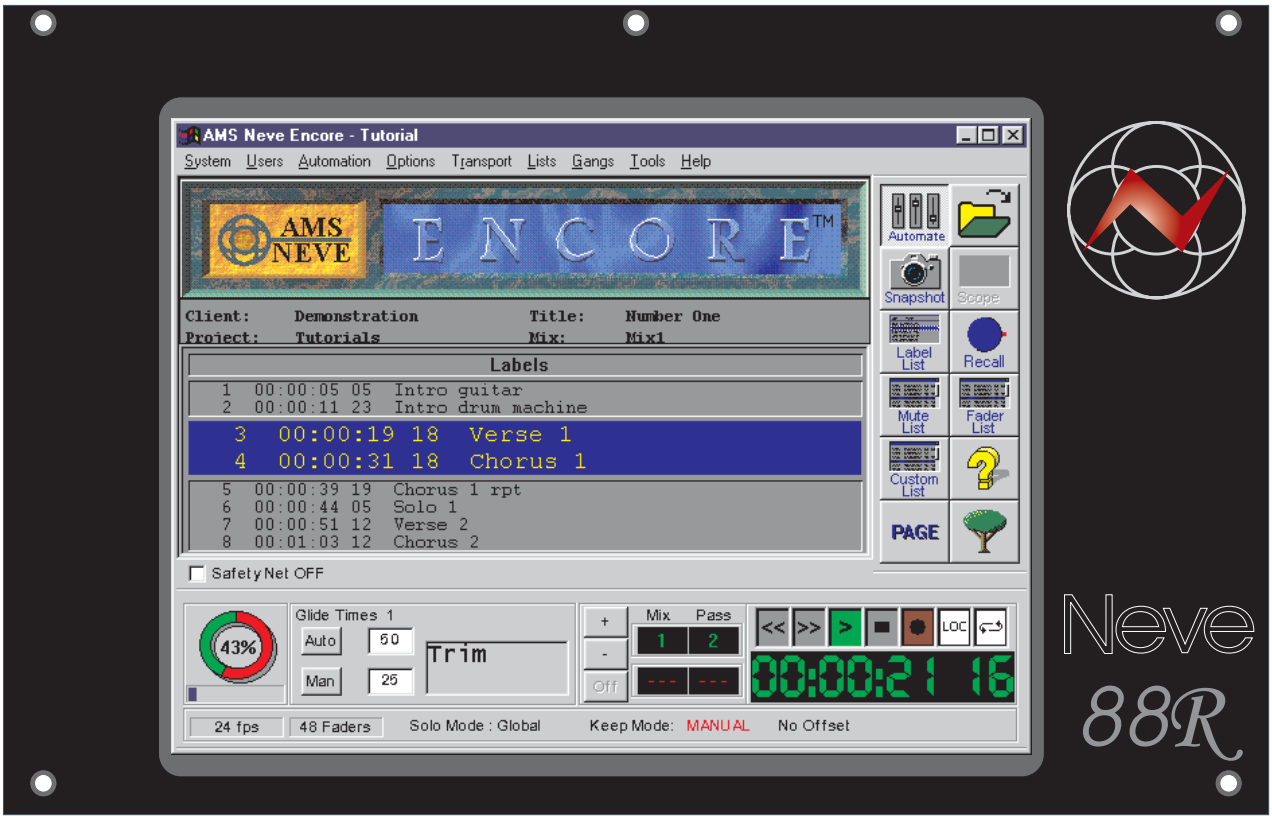
PEAK/VU displays the VU level as a solid bar up to the 0VU mark with the peak level as a flying dot above the VU level. Using the 6dB dump on the VU scale normally allows the VU display to fit comfortably below the 0 mark.

In the centre section 6 additional output meters are provided, 8 meters are provided if the console is fitted with the optional Scoring Panel. These can be switched to the mix selector (i.e. the mix busses after the re-assign panel) , the monitor selector (before the volume control), the external monitor source selector, using the centre section monitor panel switches. The 4th switch, SEL/MON, displays the LR or LCR components of the selected source (mix, mon or ext) on the left and the monitor output on the right for comparison. Hidden-till-lit indicators above the meters clearly identify the format.



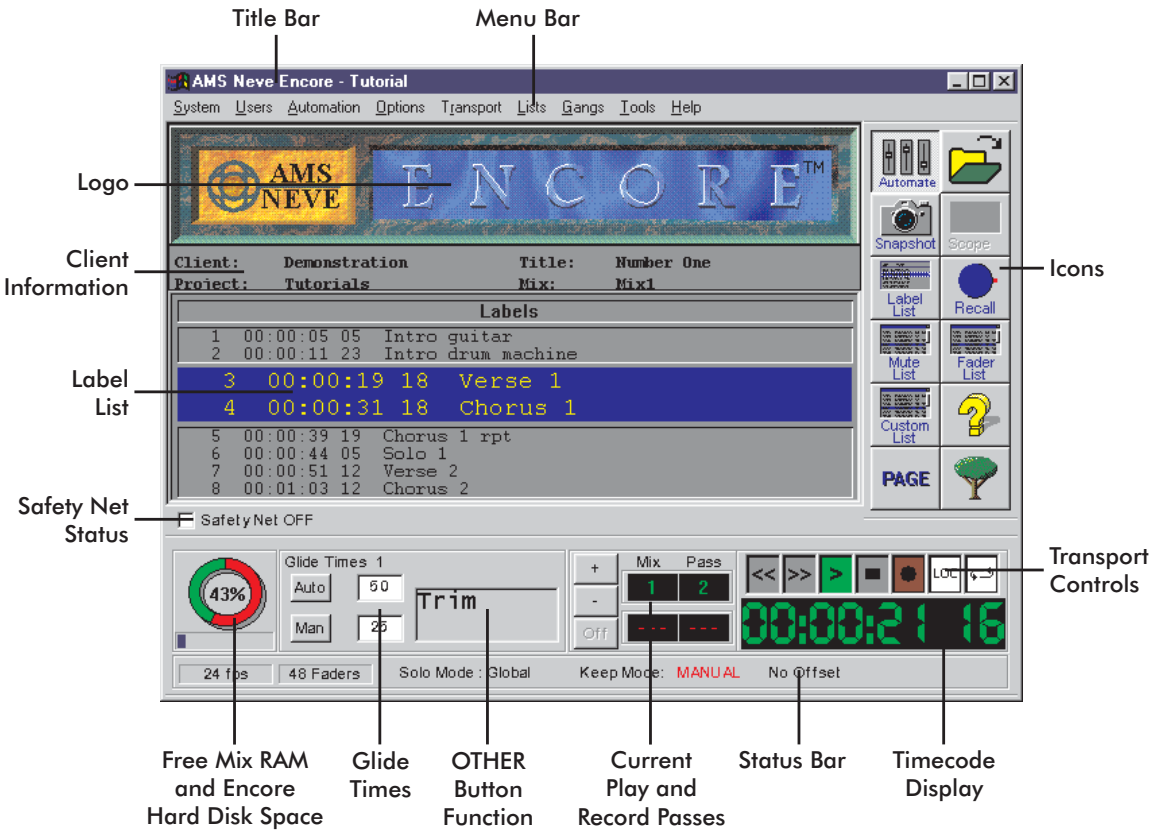
Below the output meters there is a phase meter (which follows the left and right monitor output) and PSU indicators.

TFT Screen



The Encore screen is used to display information about Automation and to run the Recall Software.

Encore Automation



Encore Automation has been developed from Flying Faders

Although the automation system runs within the high-speed, parallel processor architecture of the 88R, a Windows NT workstation is used for configuration and administration. Tasks such as conforming mixes, modifying automation and archiving projects are all carried out within a familiar Windows environment.

The use of a Windows NT workstation as part of the automation system provides many advantages. They can readily be networked, allowing automation data to be passed from room to room, even to an off-line workstation where tasks such as re-conforming mix automation can be carried out, without tying up an entire studio.

The Encore automation system uses Mix/Passes to store timecoded control changes as they are made on the console surface.

A control change is recorded as an Automation Event and is initially stored in a Record Pass. A control change is recorded when a suitable Automation Record Mode is selected for a control, the system is in play and the control is adjusted. When the system is taken out of play, the Record Pass is complete and can be saved (kept) as a Mix/Pass in the current Mix/Pass Tree.

Mix/Passes are organised in a Mix/Pass Tree. The Mix/Pass Tree stores the structure of dependence between Mix/Passes - this means that it shows the order in which Mix/Passes were created and the

lines of revision used to create each Mix/Pass. The Mix/Pass Tree is displayed graphically so that Mix/Pass dependencies can be seen clearly.

A new Mix/Pass starts to record when timecode is running at play speed (i.e. the system is in play) and a recordable control change is made. The new Mix/Pass is called the Record Pass. The Mix/Pass that is playing back is called the Play Pass.

The Record Pass is a revision of the Play Pass. If the Record Pass is kept to the Mix/Pass Tree then it will become the Play Pass. The dependence between these two Mix/Passes can be seen by displaying the Mix/Pass Tree.

Mix/Pass Trees and individual Mix/Passes can also be transferred to a separate computer that has Offline Encore installed on it. This allows offline automation functions to be performed without interrupting work on the console.

Overview of Automation Modes

The automation modes determine whether a control will:

Have moves recorded

Have moves played back

Use a combination of record and play back

Be ignored by the automation system

Automation modes are controlled locally on the Fader Modules and globally by the Master Module.

Automation modes are selected when RSI (Ready, Safe, Isolate) is enabled. A control must be set to Ready in order to select a record mode (Lock Record, Touch Record or Auto Match).

The automation modes are:

Isolate	The control will not have automation recorded or played back.
Safe	The control will only play back previously recorded moves. This is also called Play.
Lock Record	The control will replay previously recorded moves until it is touched or used. The control will then Record until the mode is changed manually, glide is initiated (faders only) or timecode stops.
Touch Record	Faders, fader mutes and channel events can use Touch Record. A control will replay previously recorded moves until it is touched or used. The control will then Record until it is released. When a fader is released, it will be left with an offset from the play pass position and further play back will be the play pass plus the offset. When a fader mute is released, it will maintain its state until its next automation event is played back.

Auto Match	Only faders can use Auto Match. The fader will replay previously recorded moves until it is touched or used. The fader will then Record until it is released, at which point it will Glide back to the Play Pass position and resume replay. The fader uses the Auto Glide Time to match back to the Play Pass.
Trim	Only faders can use Trim. This is a global mode where offsets to the fader position are added from the current fader position. The + and - buttons can also be used for incrementing global trim. Trim amounts are coalesced when timecode stops.

Snapshots

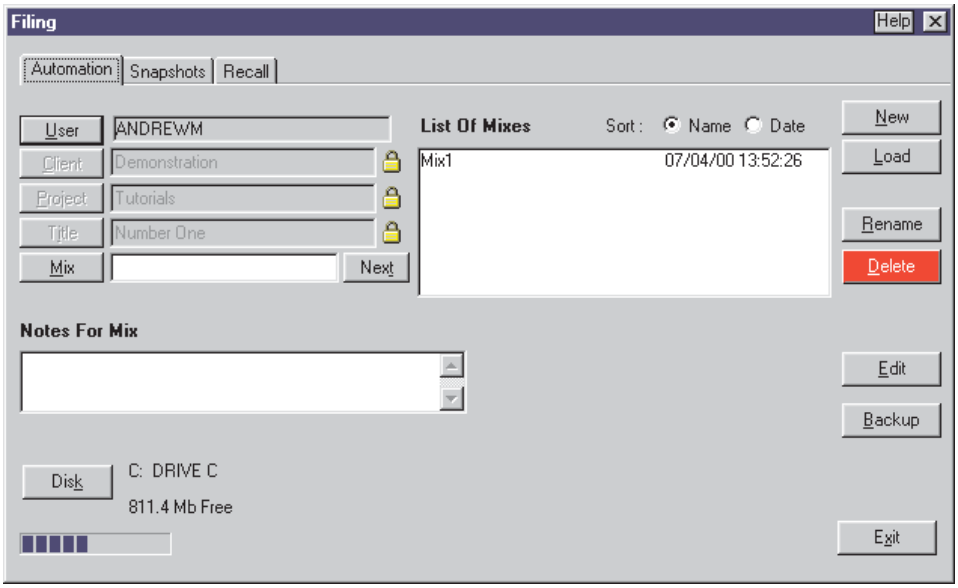
Snapshots are records of the control settings on the console automated controls. These can be used outside automation to recall desired settings instantaneously without the need to manually recall them. They are also used within automation to set different "scenes".

A "scope" feature is used to determine which controls will be included within the snapshot. Scope can be set for one control on one channel through to all controls on all channels.

Snapshot files are independent of the mix file (although they are "attached" to the mix in terms of filing). This means that a snapshot file from a different mix can be temporarily or permanently loaded into the current mix.

Filing

The Filing utility is used to manage automation data, Snapshot files and Recall Stores, and there is a separate filing page for each category.



Offline Editing

Encore provides a full range of offline automation editing functions. All the offline editing functions are non-destructive, so that a new Mix/Pass is created, leaving the existing Mix/Pass intact.

Copy Path Data

Used to copy automation data from one Channel to other Channels. The copy is selective, so just fader moves can be copied, for instance.

Erase Path Data

Used to delete automation data from a selection of Channels. The deletion is selective, so just fader moves can be erased, for instance.

Merge Path Data

Used to splice a selected section of one mix into another mix. The merge is selective, so just fader moves from a few Channels can be merged, for instance.

Mix Conform

Used to adjust a mix so that it matches edits to film or video. The operations available are:

Move	Take a section of a mix and move it to a different time, such as when the scene order is changed.
Delete	Completely remove a section of a mix and move all following material so there is no gap, such as when a scene is dropped.
Insert Stock	Insert a blank section in the mix, such as when a scene is added.

Extract Path Data

This is used to select a section of a mix and create a new Mix/Pass. For instance, only moves over a selected timecode range for a few Channels could be extracted.

Label List Editing

Labels can be added, deleted and modified as required.

Mute List, Fader Moves List and Custom Event List

This displays the Event List with either mute events, fader moves or a custom selection of automation events. Automation events can be added, deleted and modified individually.

✍ *An automation event is a control reference (e.g. Fader 3), a timecode and the control setting (e.g. -5dB). Automation events should not be confused with Event Automation, which is automation of the Channel Buttons.*

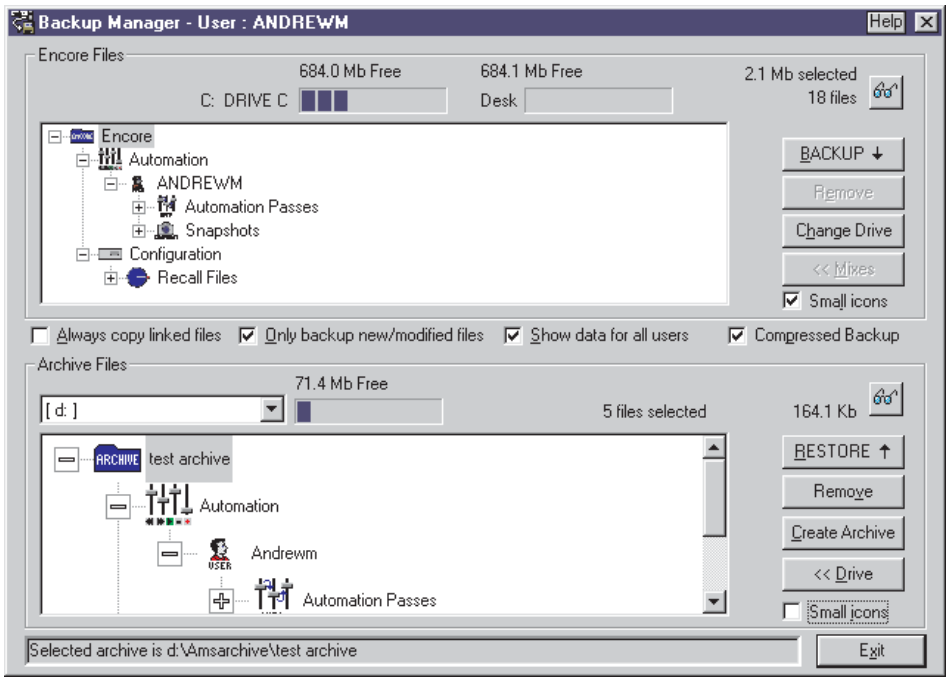
Backup and Restore

Encore incorporates a utility called Backup Manager which is used to make safety backups and restore data. All the data files that are created by using Encore and Recall can be backed up:

Mix Trees

Snapshots

Recall Stores



Backup Manager works by creating an Archive, and then data files are copied to the Archive. Archives are normally created on iomega Zip disks, but can also be created on floppy disks or additional hard disks that may be available to the Encore computer (e.g. via networking).

Archives can be compressed, which increases the effective storage capacity by up to 8 times. This means that a single Zip disk can store up to 800Mb. The increase in capacity is variable, according to the complexity of data that is compressed.

More than one Archive can be created on a single disk. This can be useful, for instance, if you want to backup two versions of the same Mix Tree.

Backups can be done at any level of the filing hierarchy. For instance, selecting a User will back up everything within the User, selecting a Client will back up everything within that Client, and so on.

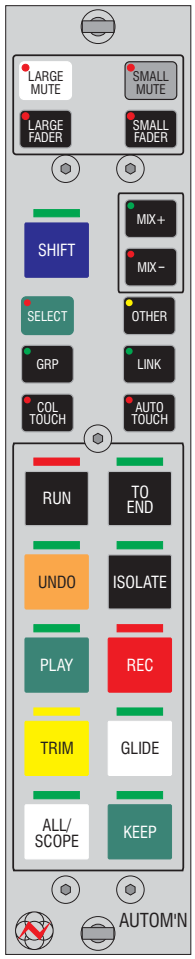
A whole Mix Tree or individual passes from a Mix Tree can be selected for backup.

If any automation is selected then the associated information linked Snapshot and Recall files can also be backed up.

The Snapshot and Recall files can also be backed up independently.

Encore Global Master Automation Panel

Global Automation Modes



Global automation modes are set using the mode buttons (ISOLATE, PLAY, REC, TRIM, GLIDE, ALL/SCOPE) in association with the LARGE FADER, LARGE MUTE, SMALL FADER and SMALL MUTE buttons.

RUN

Pressing the RUN button starts automation. At any stage in a mixdown, automation can be temporarily disconnected by turning off the RUN button.

UNDO

This will abort a new record pass, to save the operator from saving the mix and then loading the previous mix.

KEEP

There are two ways to keep a mix (set by preferences within Encore):

Autokeep	A new record pass will start when a control is touched/changed. On stopping the tape, this pass will be automatically saved to disk.
Manual Keep	On stopping the tape, the mix will not be saved. Therefore several passes can be combined into one pass. When this pass is to be saved, the KEEP button should be pressed.

TO END

If new values are chosen during a mix, they can be written to the end of the mix by pressing the TO END button. This will overwrite all previous data.

If these values are required:

By Pressing SHIFT and then TO END, these new values will be written, backwards and forwards throughout the mix creating a brand new static value.

MIX + and MIX -

Pressing either of these buttons will launch the Mix Tree on the screen. These buttons are then used to step up and down mixes. When the required mix is reached, the SELECT button can be pressed to load it.

COLLECT TOUCH

This feature is useful for “scene change” automation or real time snapshot value auditioning and recording.

Once Collect Touch is entered, any controls that are touched will be placed in isolate, therefore not recording any automation. New values can be auditioned, (while tape is rolling) and then by pressing the Master Touch Record button can be recorded against timecode.

Two "buffers" are available, using the associated buttons, so for example in music, they could be used to hold verse and chorus values, and then dropped in throughout the whole song in one pass.

AUTO TOUCH

This is useful for dropping controls directly into record.

With this button pressed, any controls that are moved into automation record mode will immediately start recording.

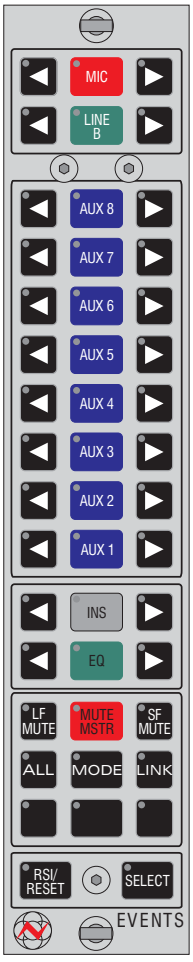
GRP

By pressing this, group master and slaves can be created using the channel select buttons.

LINK

By pressing this, links can be created by pressing the channel select buttons.

Encore Global Master Events Panel



This is a global expansion of the "Mode" and "Sel" buttons on the Channel Strip.

The 88R has comprehensive facilities to setup automation modes and options ranging from one control on one channel to all of the console.

By pressing the individual function button (AUX 2, EQ etc), the whole console, or a split console (using the < and > keys) can be set.

By pressing the "ALL" button the entire console can be set.

Links of the same parameter on several channels can also be set.

By pressing the "MUTE MSTR" button together with the enable switch for either (or both) the small fader or large fader mutes enables the automated A/B mute system. The mutes are then controlled by using the MUTE A and MUTE B buttons on the Mute Master Group faders. This system requires Encore to be running (even for manual operation).

Dynamic Automation

Encore Keyboard

The Encore keyboard has five groups of keys: the QWERTY keyboard, a numeric keypad, an edit keypad, automation/Recall keys and transport control keys.

QWERTY Keyboard

This is functionally the same as a standard QWERTY keyboard on a modern computer. The S1 to S10 keys are the same as the F1 to F10 keys on a computer keyboard.

Numeric Keypad

The numeric keypad has additional keys for selecting and entering timecodes, and two keys for working with Snapshots.

Edit Keypad

The edit keypad has cursor control keys, and keys for text editing functions such as delete, home and end.

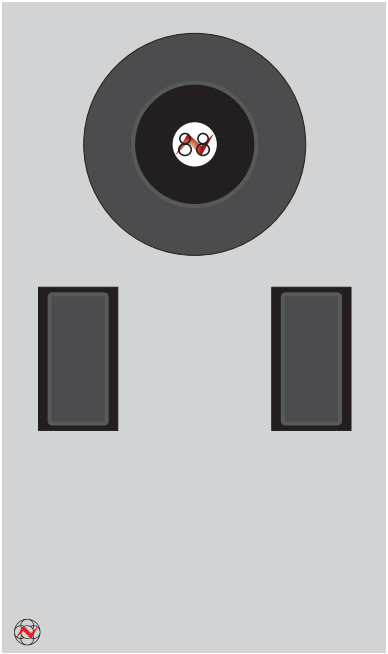
Automation/Recall Keys

These keys are used by the automation system for quick access to the Mute List, Label List, Mix/Pass Tree, etc. The Keep Mix key is used to add a Record Pass to the Mix/Pass Tree when AutoKeep is disabled.

When Recall is active, some of the keys are used for quick access to Recall functions.

Trackball

The Trackball is used to control the pointer on the Encore screen and operate the system using the left and right hand buttons.



Recall

The 88R Recall system is integrated with Encore and offers a new graphical interface, power and speed.

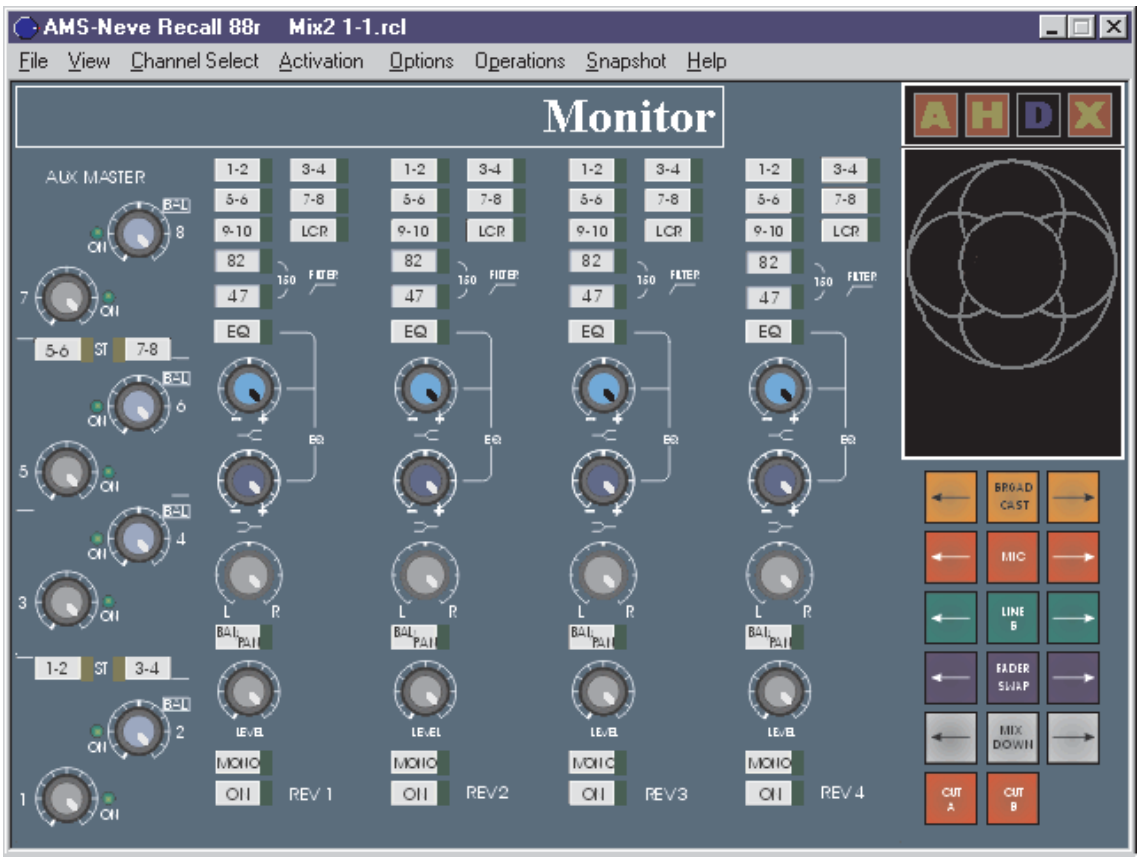
The additional automated controls offered on the 88R can be immediately recalled from a snapshot, which is saved with the Recall file. This saves time, as many controls do not have to be reset manually.

The Recall screens feature an “ExpandaView” control, which will always represent the control being touched. This expandable control is very easy to see on a large console.

The Recall screen will show on any given channel any control which need to be adjusted to regain their stored position.

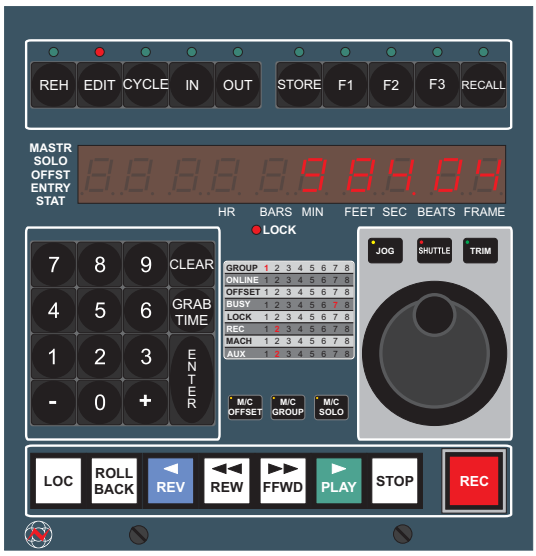
The Recall program is launched from the Recall button on the console or from within Encore. A Recall file can now be saved or loaded.

Once a Recall is active, the console can be activated into “Auto” or “Hold” mode. “Auto” will scan through every channel on the console. When the channel is set it will automatically go to the next channel. “Hold” will allow an individual channel to be selected by pressing the SOLO button on the channel strip.



Machine Control

AMS Neve's integrated Machine Control System (MCS) provides a comprehensive solution for the management of a wide variety of machine transports direct from the console.



The Machine Control System enables the synchronisation of up to 8 independent transports, selected from a pool of up to 33 machines. Any combination of machines may be configured as a group, allowing the user to rapidly switch multiple transports 'on-' and 'off-line'. Machine types are displayed automatically, enabling machines to be identified easily even when large numbers of transports are connected. Any machine may be designated as master, and slaves may be offset either while parked or 'on the fly' during playback.

Six serially-controlled machines can be connected directly via Sony protocol using six RS422 ports (5 x 9 pin, 1 x 15 pin). The system can be extended up to 33 machines, including parallel and bi-phase controlled devices, via additional AMS Neve ES2 synchroniser modules. Direct support for the ES Bus protocol enables any machine to be controlled independently and gives access to an enormous library of supported machines. The system also supports the Lynx (VPR3) protocol.

Physical Information

Console Data

See Console Layout drawings ML40802 sheets 1 to 4 at the back of this profile.

Frame Size	Approx. console weight including modules kg (lbs)
48 Channel - remote patch	976 (2147)
60 Channel - remote patch	1130 (2486)
72 Channel - remote patch	1274 (2802)

Weights are approximate only.

Rack Data

Rack Type	U	Depth mm (inches)	Height mm (inches)	Approx. Weight kg (lbs)
8U Main PSU1	8	490 (19.5)	356 (14)	42 (93)
8U Main PSU2	8	490 (19.5)	356 (14)	42 (93)
8U Main PSU3	8	490 (19.5)	356 (14)	42 (93)
4U Automation PSU Right	4	490 (19.5)	178 (7)	20 (44)
4U Automation PSU Left	4	490 (19.5)	178 (7)	20 (44)
Encore Computer	4	520 (20.5)	178 (7)	30 (66)
Machine Control Unit	1	370 (15)	45 (1.75)	6.5 (15)
Remote Mic Amp Rack	4	265 (10½)	178 (7)	21 (46) *

* Fully populated rack

Power Supply Units

The console power supply units (PSUs) normally supplied with the console are fitted into standard 19" racks supplied by the customer. For noise and heat dissipation reasons, they should be positioned outside the control room.

Performance Specifications

Microphone Inputs (Transformer Balanced)	
Input Impedance	>1k ohms
Input Balance	>70dB at 1kHz
Input Gain Range	Continuously variable between -70dB to +0dB
Input Headroom	+26dB above nominal input level referred to 0dBu
Mic Input Pad	20dB

High Level Line Inputs (Electronically Balanced)	
Input Impedance	>10 k ohms
Input Balance	>50dB
Line Input Gain Range	Continuously variable between -10dB to +10dB
Input Headroom	+26dB above nominal input level referred to 0dBu

Track Outputs (Electronically Balanced)	
Maximum Output	+26dBu into 600 ohms
Output Impedance	<55 ohms
Output Balance	>35dB

Main & Auxiliary Outputs	
Maximum Output	+26dBu into 600 ohms
Output Impedance	<55 ohms
Output Balance	>35dB

Gate	
Input Threshold	+15dBu to -65dBu
Attack Time	Normal: 500ms Fast: 50ms
Release Time	10ms to 3s
Hysteresis	Up to 25dB
Attenuation Depth	Up to -60dB

Compressor/Limiter	
Input Threshold	+20dBu to -30dBu
Attack Time	Programme dependent - Normal: 3ms/20ms Fast: 1ms/7ms
Release Time	10ms to 3s with automatic 'hold' and impulse release circuit. Also with automatic release giving programme dependent release time.
Compression Ratio	Variable between 1:1 and limiting

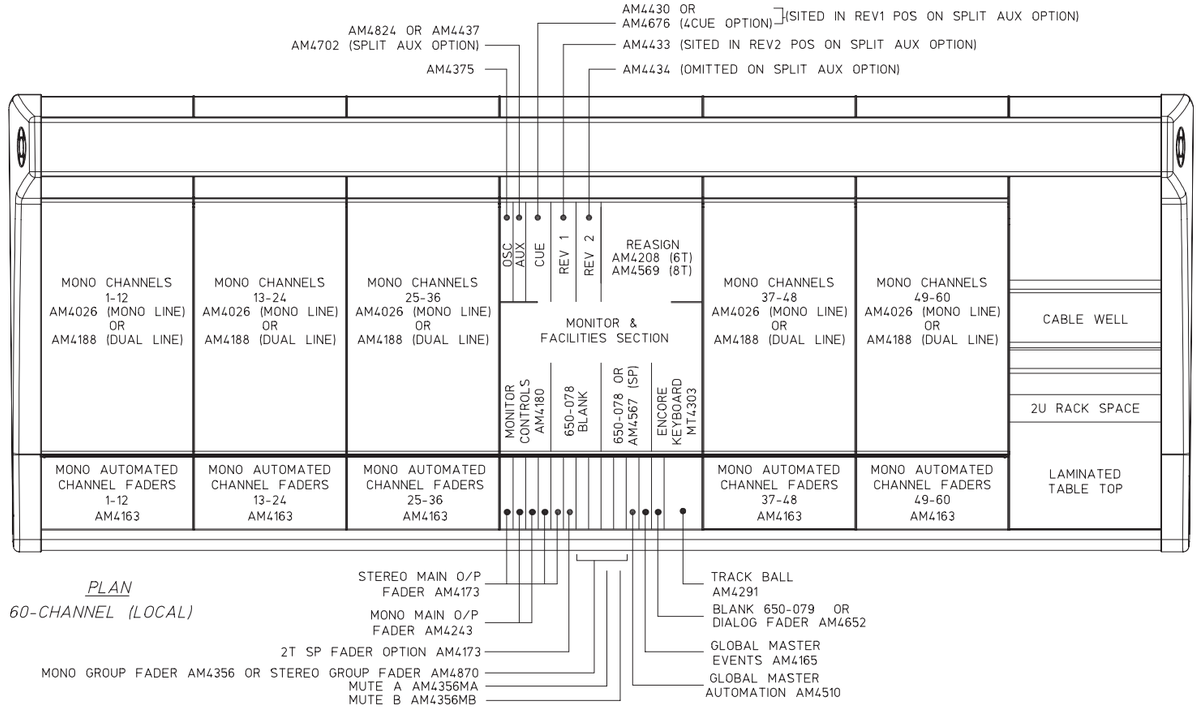
Equaliser	
High Frequency	Peaking/Shelving 1.5kHz to 18kHz
Mid 2 Frequency	0.8kHz to 9.0kHz
Mid 1 Frequency	120Hz to 2kHz
Low Frequency	33Hz to 440Hz

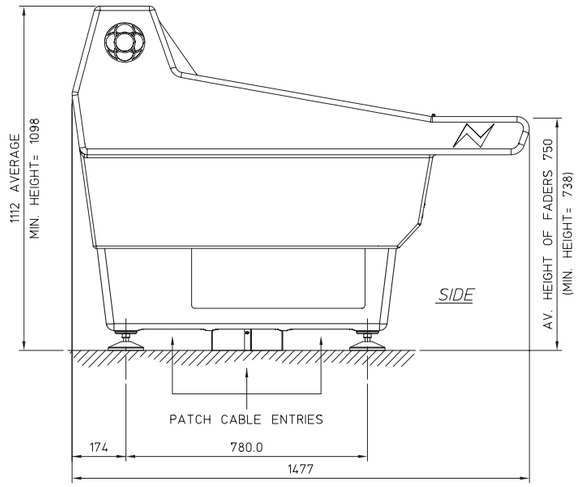
Remote Mic Amps Specifications

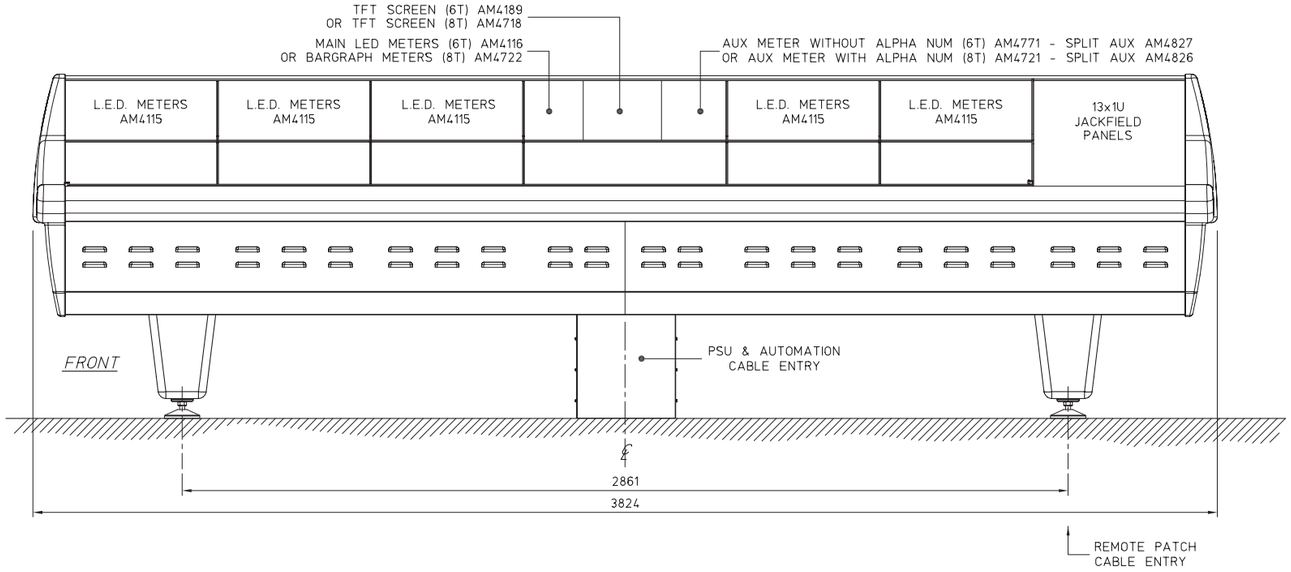
Microphone Modules	
1081 Microphone Input	XLR inputs, Zin 1Kohm @ 1kHz, gain +20 to +70 in 5dB steps
Air Microphone Input	XLR inputs, Zin 900ohms @1kHz , gain +20 to +70 in 5dB steps
Max Input Level (with 'pad' in)	+24dB
1081 and Air Outputs	Max +26dB into 600 ohms Zout 50 ohms +/-5% @ 1kHz, balanced
1081 Distortion	Not more than 0.07% for 20dBm output from 50Hz to 10kHz @ 60dB gain
Air Distortion	Not more than 0.025% for 20dBm output from 20Hz to 20kHz @ 60dB gain
1081 and Air EIN	> -123dBm 20Hz to 20kHz @ 60dB gain

NOTES

1. CONSOLE FINISH:
   CONSOLE TOP & END TRIMS IN EITHER PAINT FINISH (TEXTURED BLACK) OR GRAINED WOOD (CUSTOMER'S CHOICE), BLACK LEATHER FRONT BUFFER.
   ALL CLADDING PANELS ARE MEDIUM TEXTED BLACK PAINT.
   WHITE GRAVOPLY SCRIBBLE STRIPS WITH BLACK LETTERING.
2. 48CH & 60CH CONSOLES HAVE INTEGRAL PATCH OR REMOTE MTG OPTION.
   72CH CONSOLES HAVE REMOTE PATCH FOR CUSTOMER RACK MOUNTING ON 10 MTRS LOOM FROM RH CONSOLE LEG (SEE SHT.3 FOR LAYOUT CONFIGURATIONS).
3. FOR BLOCK DIAGRAM SEE EB11706.
4. PSU'S FOR REMOTE CUSTOMER RACK MOUNTING:
   (PSU CABLE LENGTH -CONSOLE 10 MTRS)
5. HEADPHONES SOCKETS IN CAST LEGS -3 POLE GAUGE "A" 1/4" TYPE).
6. LED METERS FITTED TO ALL CHANNELS.
7. A REMOTE PATCH HAS REMOTE MOUNTED CUSTOMER CONNECTION PANEL ON 1 MTR LOOM FROM PATCH -CUSTOMER PANEL IS OTHERWISE MOUNTED UNDER WELL PANEL IN IN-LINE PATCH.
8. PATCH LAYOUTS:
   48 CHANNEL SEE AM4309 SHT.2
   60 CHANNEL SEE AM4309 SHT.3
   72 CHANNEL SEE AM4309 SHT.4
   84 CHANNEL SEE AM4574 SHT.2
   48 CHANNEL (SP) SEE AM4604 SHT.2
   60 CHANNEL (SP) SEE AM4604 SHT.3
   72 CHANNEL (SP) SEE AM4604 SHT.4
9. "ENCORE" CONSOLE AUTOMATION FITTED AS STANDARD.







NAME	MOD. No.	DATE	ISS.
D.R.H.	----	18.11.02	6
SMW	----	11.7.02	5
KB	----	27.3.02	4
D.R.H.	----	20.12.00	3
D.R.H.	----	7.6.00	2
JHH	----	25.11.99	1

THIRD ANGLE PROJECTION
DRAWN TO B.S.308

SCALE 1:10

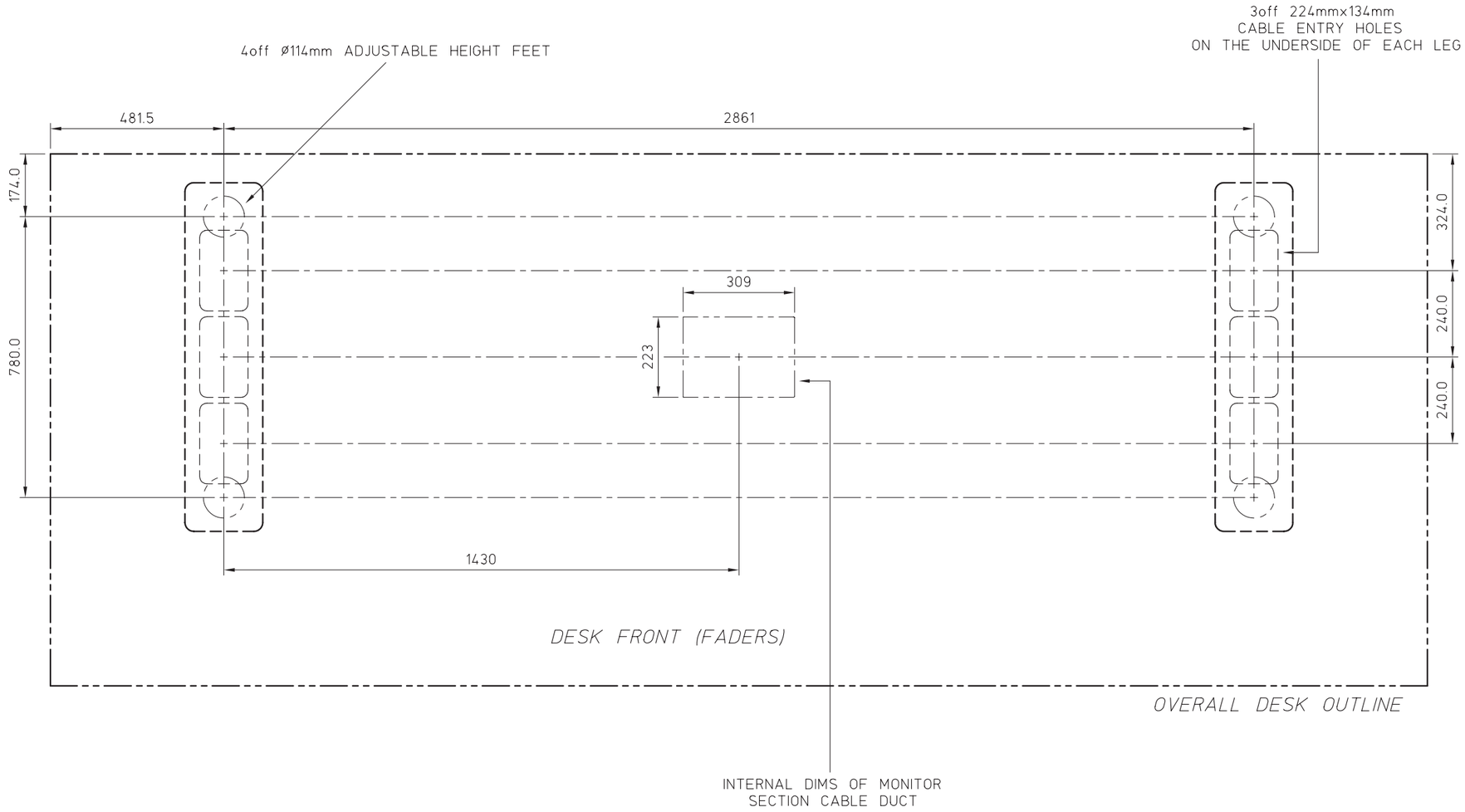
TITLE: NEVE 88-SERIES CONSOLE LAYOUT (60CH WITH LOCAL PATCH)

DRAWN	APP'D	DATE
D.R.H.		7.6.00

AMS NEVE PLC. BILLINGTON ROAD, BURNLEY. LANCS. BB11 5UB. ENGLAND.
TEL. (01282) 457011 FAX. (01282) 417282.

AMS NEVE

DRG No.	SHT
ML40802	1of4



PLAN VIEW LOOKING THROUGH CONSOLE

NAME	MOD. No.	DATE	ISS.
KB	----	27.3.02	4
D.R.H.	----	20.12.00	3
D.R.H.	----	7.6.00	2
JHH	----	25.11.99	1

THIRD ANGLE PROJECTION

DRAWN TO B.S.308

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(60CH WITH LOCAL PATCH)

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BURNLEY. LANCS. BB11 5UB. ENGLAND.
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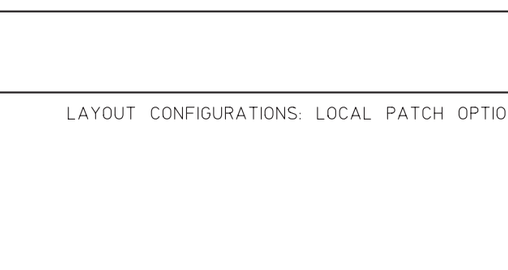
AMS NEVE

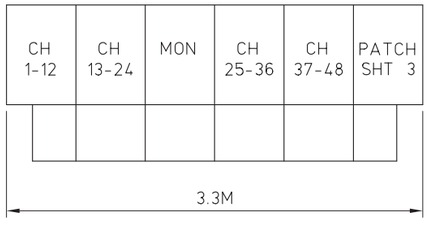
DRG No.	SHT
ML40802	2of4

LAYOUT CONFIGURATIONS: LOCAL PATCH OPTION

60 CHANNEL

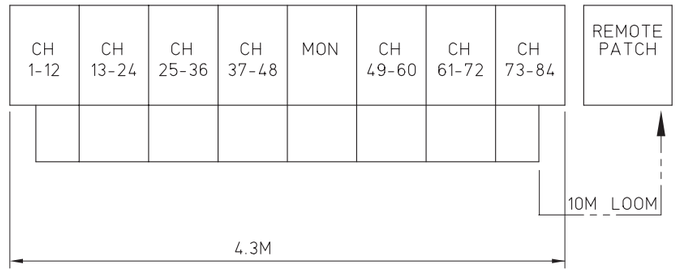


48 CHANNEL

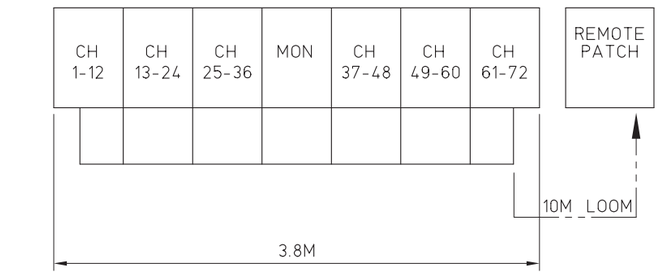


LAYOUT CONFIGURATIONS: REMOTE PATCH OPTION

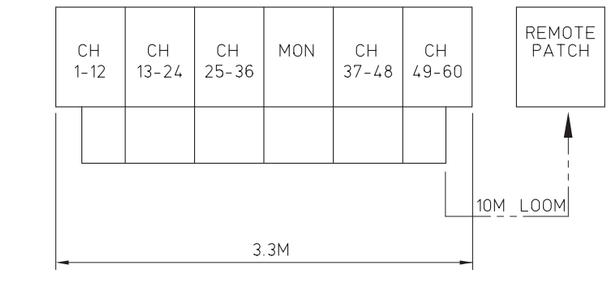
84 CHANNEL



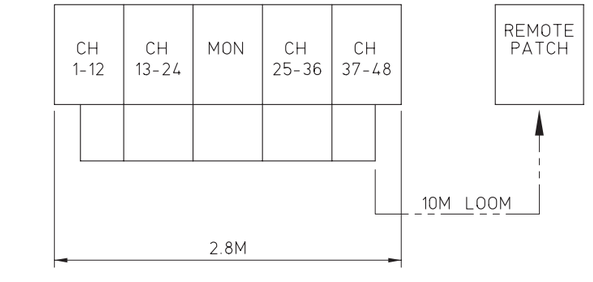
72 CHANNEL



60 CHANNEL



48 CHANNEL



STANDARD WEDGE SECTION

7.5 DEGREE INCLUSIVE ANGLE

17 DEGREE INCLUSIVE ANGLE

KB	----	27.3.02	4
D.R.H.	----	20.12.00	3
D.R.H.	----	7.6.00	2
JHH	-----	25.11.99	1
NAME	MOD. No.	DATE	ISS.

LENGTH CALCULATION

JACKFIELD = 494mm
CHAN = 494mm
MONITOR = 656.6mm
TRIMS = 204mm

THIRD ANGLE PROJECTION

DRAWN TO B.S.308

SCALE 1:10

TITLE: NEVE 88-SERIES STANDARD CONSOLE LAYOUT (48,60,72,84 CHANNEL)

DRAWN	APP'D	DATE
JHH		25.11.99

AMS NEVE PLC. BILLINGTON ROAD, BURNLEY. LANCS. BB11 5UB. ENGLAND.
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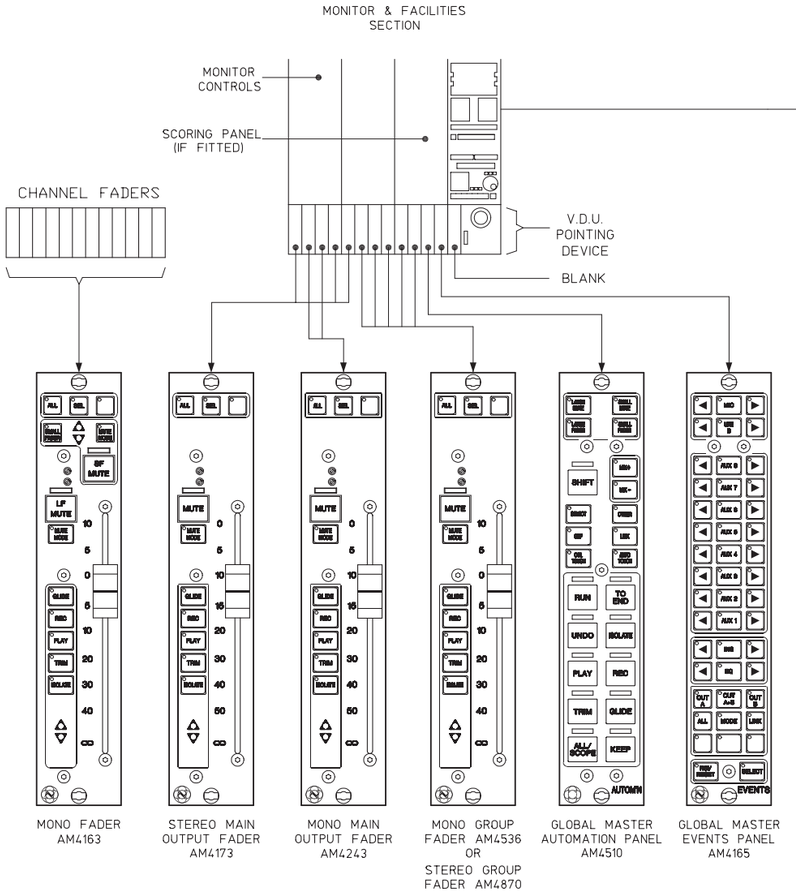
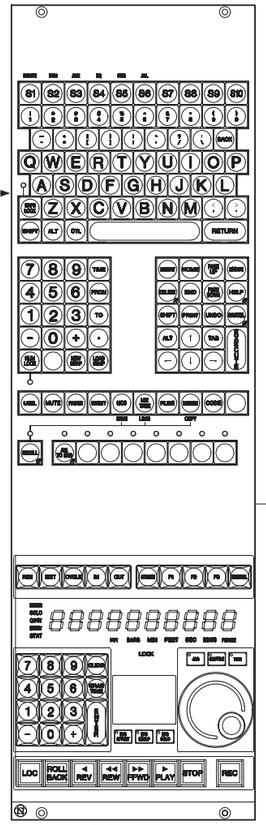
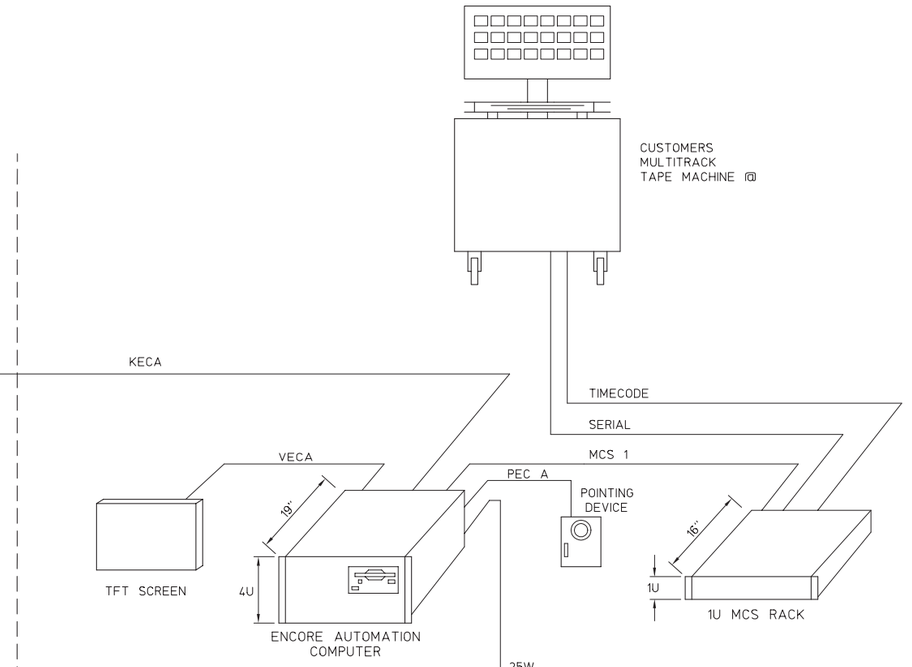
AMS NEVE

DRG No.	SHT
ML40802	3 of 4







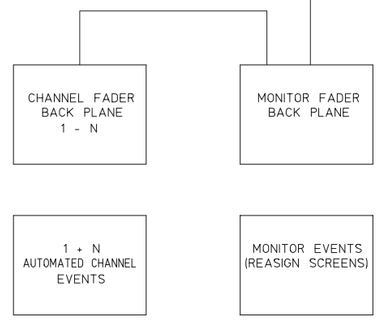
AUTOMATED SYSTEM:

(A) AUTOMATED MASTER MONITOR A/B CUT
(B) AUTOMATED CONTROL OF THE FOLLOWING CHANNEL BUTTONS:-
1. MONITOR CUT
2. CHANNEL CUT
3 EQ IN/OUT
4 INSERTION IN/OUT
5 AUXILIARY 1-8
6 MIC LINE
7. LINE AB

THE BASIC SYSTEM CONFIGURATION FOR 48,60,72 OR N-CHANNEL 80 SERIES CONSOLES:-

N - MONO ACTIVE FADERS
2 - MONO O/P FADERS
2 - STEREO O/P FADERS (STD) OR 3 STEREO O/P FADERS (SP)
6 - MONO GROUP FADERS (CONTROL ONLY)
2 - SPARE MONO ACTIVE FADERS
2 - SPARE STEREO ACTIVE OUTPUT FADERS (STANDARD)
1 - COMPUTER & AUTOMATION CO-PROCESSOR #
1 - GLOBAL MASTER AUTOMATION PANEL
1 - GLOBAL MASTER EVENTS PANEL
1 - SET OF INTERCONNECTING CABLES. (STANDARD CABLE LENGTH = 10M)
1 - CONSOLE MOUNTED KEYBOARD
1 - CONSOLE MOUNTED POINTING DEVICE
1 - TFT SCREEN
1 - OPERATORS HANDBOOK
1 - TECHNICAL MANUAL
1 - SPARES KIT

- THESE ITEMS ARE 19" RACK MOUNTING FOR CUSTOMER INSTALLATION.



EXTERNAL SYSTEM CONNECTIONS

NAME	DESCRIPTION	PART No	CABLE LENGTH
PECA	POINTER EXTENSION CABLE ASSEMBLY	CE18915	10M
VECA	VIDEO EXTENSION CABLE ASSEMBLY	CE18901	10M
TRAM LINK	CABLE ASSEMBLY		10M
KECA	KEYBOARD EXTENSION CABLE ASSEMBLY	PL77459/10	10M
MCS	MACHINE CONTROL CABLE No1		10M
MCS	MACHINE CONTROL CABLE No2		10M

NAME	MOD. No.	DATE	ISS.
D.R.H.	----	18.11.02	5
KB	----	27.3.02	4
D.R.H.	----	20.12.00	3
D.R.H.	----	7.6.00	2
JHH	-----	30.6.99	1

THIRD ANGLE PROJECTION
DRAWN TO B.S.308

TITLE: NEVE 88-SERIES STANDARD CONSOLE AUTOMATION SYSTEM CONFIGURATIONS

DRAWN	APP'D	DATE
JHH		30.7.99

SCALE N.T.S.

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DRG No. ML40802 | SHT 4 of 4