



Neotek Corporation

Élan Console

Operator's Overview

System Overview

The Élan architecture is a modern evolution of the American style in-line monitoring console. The monitoring mix controls are included on Input/Output modules to achieve a compact and efficient layout. Refinements allow the channel fader and monitor to provide simultaneous access to the stereo mix bus so as to double the number of console mix inputs. The monitor may also follow the main fader for use as an effects send master and provide a total of thirty effects buses when mixing.

The Élan is especially efficient and friendly to use. There are no annoying quirks that must be worked around when engineers would rather concentrate on the music. The isolation between fader and monitor functions, microphone and tape inputs, and multitrack buses is often 20 dB more than higher priced consoles, allowing greater freedom to reconfigure the console's signal flow. For example, the Élan allows vocals to be recorded without concern for leakage from synthesizer tracks. The full power of the console can be freely exploited in complex patches, effect mixes, and subgrouping.

A Brief Introduction To Signal Flow In The Élan

Always remember that there are two separate audio paths through the Élan input module. Each path has an input, a level control, and an output. One path is called the Fader path and the other the Monitor path. They each have two possible sources, INPUT or TAPE. INPUT refers to the microphone preamplifier, and TAPE refers to the balanced line input, which is normally the return from the multitrack tape machine. Each has either of two possible outputs: the multitrack buses or the stereo mix bus. The Fader path feeds the logic mutes and then the Fader pan before it travels to either multitrack bus assignments or to the main stereo mix. The Monitor path feeds the MONITOR PAN, and its associated ON switch which ultimately feeds the stereo bus or the multitrack

buses. The outputs of the Fader and Monitor can be interchanged with the REV switch.

Each path has its own pre-fader SOLO switch for separate soloing. Phase reversal, a high pass filter, and peak sensing LED (labeled by !) are located in the signal flow at the output of the microphone preamplifier. The equalizer can be switched into the Fader path, but is otherwise hardwire bypassed. The six auxiliary sends are assignable to either signal path and are selectable either post or pre either path's fader. It has always been a self-imposed requirement of Neotek console designs that the operator should be required to do very little in order to make the console function. The design of the Élan is such that pressing the monitor ON switch is the only action necessary to set up the normal signal flow for tracking and overdubbing. The microphone preamplifier feeds the main fader which then feeds the multitrack buses, and the tape return feeds the rotary monitor level, which then feeds the main stereo mix which is heard on the control room speakers.

Input/Output Module

Microphone Preamplifier

The Elan's microphone preamplifier is the same as used in our top of the line Elite. It is a hybrid circuit using special discrete transistors for the critical performance determining input stage. The amplifier is servoed to eliminate electrolytic capacitors. A gain range between 20 dB and 60 dB is provided by the Microphone Preamplifier trimpot. The associated PAD switch provides approximately 25 dB of reduction to the input of the preamplifier. Most synthesizers may be plugged directly into the mic pre without use of a direct box due to the input impedance of the preamplifier.

48V Switch

Provides approximately 25 dB of input attenuation. Very useful for bringing outputs of tape machines, effects processors, and other line level devices into the Mic Preamplifier. Both -10 and +4 levels can be accommodated.

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The polarity of the input signal can be reversed, as a corrective or creative technique.

Roll Off Switch

Activates a high pass filter after the microphone preamp, with an effect that starts at 75 Hz with a 12 dB per octave slope.

! LED

When lit, this indicates input levels which are close to clipping. The sensitivity is factory adjusted so that the LED indicates signals which are 12 dB over 4.0 dBu. At this sensitivity they indicate that about half the dynamic range of the module is being exceeded and that, if lighted steadily, the engineer is in danger of running into clipping, but if lighted occasionally, then levels are normal.

Auxiliary Sends

There are 6 auxiliary sends available for effects or cue purposes. The A-B send is a stereo, pre-monitor send, with an associated pan control. This is configured to be used as a cue send, with no other button pressing required. This send can be made post-monitor by pressing its POST switch. Sends 1,2,3, and 4 are mono, post monitor sends. These sends can become pre-monitor in pairs, (1-2, 3-4) by pressing their associated PRE switches.

All sends can be derived from the fader channel by pressing their associated FADER switches.

Equalizer

The Élan EQ is a version of the state variable parametric topology which has been highly regarded in previous Neotek console designs. It employs state variable circuit design, rather than the common Wein bridge circuit, to eliminate interactions between frequency, boost/cut, and bandwidth functions and to achieve maximum sonic quality. This topology also results in greatly reduced sensitivity to control tolerances, keeps the noise floor very low, and allows complete control of internal node signal amplitudes. The equalizer can be inserted in the Fader path by depressing the IN switch.

The high and low bands response modes are shelving type, for which Neotek engineers chose a Bessel response curve rather than the more common Butterworth for reasons of improved sonic quality. Full tuning range is available, (1 kHz - 20 kHz high band, 20 Hz - 400 Hz low band), and the boost/cut setting is not affected by the frequency setting. There are two overlapping mid bands, which have peak response with a moderate Q. The high mid starts at 400 Hz and goes upward to 8 kHz, the low mid starts at 50 Hz and goes to 2 kHz. The versatility of this EQ and high pass filter, in combination with well chosen bandwidths, continue Neotek's tradition of having the most musical and flexible EQ on the market.

Monitor Section

Monitor feed to the stereo mix is enabled by depressing the ON switch adjacent to the monitor level control pot; a green LED at the right of the switch lights when the monitor channel is on. In its normal mode with no switches except the ON switch pressed, the

Monitor section sends the channel's line input to the stereo mix through the rotary LEVEL control and Monitor PAN pot. The channel line input is normally the output from the corresponding track of the multitrack tape machine, which just means that monitoring is done through the tape machine. By depressing the INPUT switch, the input signal to the Monitor path is taken from the microphone preamplifier. This can be convenient for last minute overdubs, or for use as effects returns or additional line inputs from synthesizers, doubling the number of inputs during mixdown and accommodating -10 or other non-standard signal levels with a variable gain control. Another convenient feature is made available by depressing the Monitor section's FADER switch to select the output of the Fader channel as the source for the Monitor fader. The Monitor pot then becomes a convenient local master for selected effects sends. These sends would be post-fader as well as post monitor, and could be any of the six auxiliary sends as well as any of the multitrack buses. This provides level control, pan, and solo for a total of 30 separate echo send buses from each input channel.

The SOLO switch provides a pre-monitor mono solo to the control room speakers. This is a non-destructive function and will not interrupt feeds to the mix, musicians' cue, or any tape machine.

The Fader Section

With no switches pressed, the input to the module's Fader channel is taken from the microphone preamplifier. This is the normal mode for tracking. Level control for the Fader channel is through the linear fader on the panel below the input module. A mute switch located on this panel provides muting to the assignment buses or to the stereo mix during mixing operations. The PAN pot provides odd and even track assignment through the switches located at the top of the module. These buses are normaled to the inputs of the multitrack tape machine at the patchbay. There is also a L/R assignment switch which places the signal on the stereo bus, making it possible to access the stereo mix from both the Monitor and Fader simultaneously. The TAPE switch takes the output of the multitrack tape machine, or whatever is inserted in the line input of the module and places it in the Fader channel. This would be the likely configuration for mixdown.

The SOLO switch provides a mono, pre-fader solo of the Fader signal to the control room speakers only. This is a non-destructive function and will not interrupt tape machine or headphone feeds, thereby allowing you to solo a microphone during tracking without worry.

Mute Logic Groups

After mixing functions, the most important convenience features which a console provides are grouping functions. The most useful of these is the provision to group the individual channel mutes and then manipulate those groups from master controls. The Élan provides elaborate and comprehensive provisions to group input channel mutes.

Logic Mute Functions

In order to allow for grouping of mutes, the mutes themselves must be logic controlled. The Élan uses the most recent version of Neotek's discrete solid state mute circuit in which FETS are driven in voltage control mode by CMOS circuits operating on a secondary power supply. The FET mute/on action is ramped, DC isolated, and totally silent even with low frequency signals, unlike relay mutes which cause snaps as the result of abruptly chopping the signal. The entire console can be simultaneously muted without clicks, thumps, or pops. Furthermore, the Neotek circuit achieves attenuation that is as good or better than relays, contributes no noise or coloration as CMOS IC switches do, and offers solid state reliability.

Mute Groups

The Fader section of each input channel on Élan consoles can be assigned to any of three overlapping mute groups. When a master section mute is pressed, all input channels assigned to that bus will mute the Fader channel as well as the post fader auxiliary sends. Individual input modules course can also remain in a "local" mode. Describing the details of mute group functions is far more arcane than actually using them.

Mute Group Assignment

Input channels are assigned to mute groups by latching the GROUP switch on the Mute Master panel and then pressing the master button for the group, A, B, or C, to be programmed. This will cause the associated group LED on the master panel to flash. By pressing a channel's Fader MUTE switch, the channel will toggle in or out of the flashing mute group. Inclusion of a channel in a group is indicated by the red A, B, and C LEDs on each Fader panel when the group mute master is flashing in setup mode. Pressing the GROUP switch again exits the setup mode; the master for the group being programmed will then become active in the unmuted condition. All mute group assignments can be eliminated by pressing GROUP to enter the setup mode and pressing CLEAR ALL.

When no group master is in setup mode, illuminated red Fader LEDs indicate whether or not a channel is muted by one of the three mute group masters, whose red LED will also light continuously. A lighted green LED on a Fader panel indicates that

the local mute function has turned the channel on. If a red LED is lighted on the Fader panel, the channel is muted by a master, but the green LED indicates whether or not the channel will turn on if the master mute is released.

Group Mutes

The most basic use of the Mute Groups and Master functions is achieved simply by pressing one of the switches labeled MUTE A, MUTE B, or MUTE C on the Mute Master panel. This will cause all of the channels assigned to these buses to mute and illuminate their associated red LEDs. Overlapping mute groups mean that a channel can be muted by more than one master. Each channel may be assigned to more than one group, and will not turn on unless each master mute is released and the channel's own Fader mute is switched on.

MASTER SECTION SUMMARY

Meter Selects

These switches allow the stereo program meters which are normally showing the main stereo mix to meter additional signals, as labeled to the left of the METER SELECT switch. When MONITOR is selected they will show the levels of the signals on the solo bus when a solo switch is pressed. Note that signals panned hard left or right will appear 6 dB down when summed in mono. These meters can also be switched to meter the two mults, permitting them to be patched around the console for critical monitoring purposes or to be used for signal tracing or troubleshooting without additional equipment.

Oscillator

An amplitude leveled sine wave oscillator is provided with a selection of preset frequencies. This assures exact frequency and amplitude resetability when aligning equipment or slating master tapes for cutting. The TONES switch turns on the oscillator continuously but does not add the talkback microphone signal, in contrast to the momentary SLATE switch. Pressing the SLATE switch provides a 30 Hz tone irrespective of frequency selection settings.

Auxiliary Send Masters

There are six auxiliary send master level controls, each with its own SOLO switch providing post-level, mono solo to the control room monitors. A green LED to the right of the switch indicates Solo activation.

Control Room Monitoring

The Control Room LEVEL control of the Élan is custom made for Neotek with an element specifically designed for premium audio quality and accurate tracking at all levels. Four switches provide

selection for control room monitor source. MIX L-R selects the output of the stereo mix bus and is the normal control room monitor mode. TAPE 1 and TAPE 2 provide balanced stereo inputs from 2 two-track machines. An additional source may be patched in using the MONITOR EXTRA jacks in the patchbay and pressing the EXTRA switch. Any sources wired to aux gear jacks may be monitored in this manner.

Direct Stereo Inputs

The two Direct Stereo Inputs provide a pair of balanced inputs which can feed the stereo mix. Each stereo input has an ON and SOLO switch and LEVEL control to change the amount of an effects return device or any other stereo source into the stereo mix.

Studio Level And Related Switches

This section provides speaker monitoring to the studio area and its source may be either the current control room monitor selection or the A/B auxiliary bus output. Unless the ON switch is pressed, the outputs to the studio amplifier are shorted to ground to prevent any leakage from the console or pick up of radio frequency interference.

Speaker Select, Solo Lockout, Mono, and DIM Functions

The speaker select switches allow selection from three different monitor speaker amplifiers. The unselected control room amp/speaker combinations are shorted to ground. The MONO MONITOR switch effects only the control room signal and will reduce the level of mono left or mono right signals by 6 dB but will not effect the level of phase coherent left and right signals, making it useful in checking for mono compatibility and phase coherency in multi-microphone setups. The DIM switch, which is also logic actuated by TALKBACK, SLATE, or TONES functions, reduces the level of the control room signal to prevent acoustical feedback or to allow conversations without loss of monitoring reference.

The SOLO LOCKOUT switch is useful, for example when a number of inputs are soloed together, such as a drum group within the main mix. Frequent reference to this group with the solo function is easily made by using the SOLO LOCKOUT switch to disable the effects of all SOLO switches. Then any SOLO switches that are pressed will cause the SOLO LED to come on at half intensity but the monitor mix will not be effected. Releasing the SOLO LOCKOUT switch allows the solo effect to occur, bringing all soloed signals into the monitor mix simultaneously. Pressing the SOLO LOCKOUT switch will in effect un-solo the entire group at once.

The TALKBACK switch dims the control room monitors and routes the signal from the talkback microphone to the Aux A-B bus, the studio speakers, and to the Slate bus.
