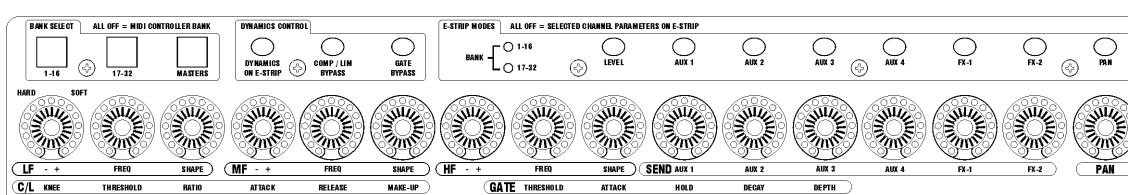


## Part 3

### The E-Strip as a Dynamics Processor



### Dynamics Processor Overview

Each of the 328XD's 32 input channels, STE-1 and STE-2, FX Return 1 and FX Return 2, Group outputs and Mix Bus offers a compressor/gate dynamics processor. Where applicable, the dynamics processors act pre-EQ.

Descriptions of the compressor / limiter and noise gate stages of the 328XD dynamics processors are below.

### Compressor / Limiter

A compressor is designed to control the level of a signal automatically. You could think of it as having an invisible hand that will automatically pull down a fader very quickly if a signal suddenly gets a little too loud.

### Threshold

The compressor / limiter threshold setting determines the level in dB which the input signal level must reach in order for the compressor / limiter to begin to apply gain reduction. Signals above the threshold level will be attenuated according to the ratio setting (see below). When the signal drops below the threshold level, it will pass through the compressor / limiter stage of the dynamics processor unaffected.

The 328XD dynamics processors allow the threshold level to be set between - 60dB to 0dB.

### Knee

The knee setting can be set to either a hard or soft setting. With a hard knee setting selected, the compressor / limiter will begin to operate immediately the input signal reaches the threshold level.

With soft knee selected the compressor / limiter will begin to have an effect on the input signal slightly before the threshold level is reached, generating a smoother, more natural sounding transition from the uncompressed to compressed signal.

## Ratio and the Compressor as a Limiter

The ratio setting determines by how much the signal is reduced once the level is greater than that set as the threshold. For a ratio setting of 5:1, an increase of the input signal by 10dB above the threshold setting will result in the output level being attenuated by 10 - (10 ÷ 5 : 8dB. Similarly, with a ratio setting of 2:1, a 10dB increase in input level above the threshold setting will result in the output level being attenuated by 10 - (10 ÷ 2) = 5dB. The higher the ratio setting, the more noticeable the compression effect will be.

The 328XD dynamics processors allow the compression ratio to be set from 1:1 through to 15:1. A setting of infinity:1 can also be set, at which point the compressor acts as a limiter.

## Attack

The attack setting determines the time taken for the compressor / limiter to apply full gain reduction to the signal (as set by the ratio, above) after the input signal raises above the threshold. Fast attack time settings cause the compressor to act almost instantly. Slow attack times instruct the compressor to apply gain reduction more gradually.

The attack time of the 328XD compressors can be adjusted from 480µs to 500ms.

## Release

The release setting determines the time taken for the compressor / limiter to stop applying the level attenuation once the input signal has sunk below the threshold again. A fast release time setting instructs the compressor to stop taking effect almost instantaneously, whereas a slow release time removes the compression effect more gradually.

The release time of the 328XD compressors can be adjusted from 11.0ms to 11.0s.

## Makeup

When a signal is compressed, the louder passages are of course reduced in level, causing the peak level of the signal to be reduced. The makeup control can be used to return the compressor output signal to its previous maximum level.

The makeup control can also be used to attenuate the signal if required.

The makeup control of the 328XD compressors have a range of -12dB to +12dB.

## Noise Gate

The primary use of a noise gate is to mute moments of unwanted low level noise in an input signal, although it can also be used for creative purposes.

When a noise gate allows the input signal through, it is referred to as being 'open'. When a noise gate mutes the input signal it is referred to as being 'closed'. This terminology is similar to that used in describing a gate designed to prevent cows from escaping, although more is offered in the way of editable control.

The controls of the noise gate available to each input channel are described below.

## Threshold

The threshold setting determines the level in dB at which the input signal must be in order for the noise gate to open and allow the signal fully through, so that gain reduction can be applied to moments of an input signal that fall beneath the threshold.

The 328XD dynamics processor noise gate threshold can be adjusted from -60dB to 0dB.

## Attack

The attack, hold and decay settings (see below) together govern the level of the signal through time.

The attack time determines how quickly the noise gate will open once the signal rises above the set threshold level. Attack times will sound very different depending on what type of signal is being processed. Fast attack times work well on percussive instruments such as snare drums, but not so well on less percussive sounds. Adjust the attack time to get the most natural result for the signal being processed.

The 328XD noise gate attack time is adjustable from 260µs to 140ms.

## Hold

The hold time determines how long the noise gate remains open after the signal has fallen below the threshold level. A longer hold time should be used to allow a reverb tail on a gated signal to be heard, for example.

The 328XD noise gate offers a hold time adjustable from 480µs to 500ms.

## Decay

During the decay stage, the level of the signal will fade to the value specified in the depth setting (see below). The decay time setting determines how quickly the fade will take after the hold time has passed.

Note that if the noise gate closes too quickly, the end of a signal may feel 'chopped' off (think of the cows...). A longer decay time will allow the natural decay of a signal to pass through the gate before it shuts.

The 328XD decay time is adjustable from 11.0ms to 11.0s.

## Depth

The depth setting determines the level which the input signal is attenuated by when the noise gate is closed. A higher setting (towards 0dB) can be used to reduce the level of the signal slightly instead of cutting it completely. A setting of -80dB has the effect of muting the signal completely. A setting between the two extremes can be used to reduce the signal progressively without cutting it completely.

The 328XD noise gate depth is adjustable from -80dB to 0dB.

## The Compressor/Limiter and Noise Gate together

In practice, an input signal is processed firstly by the compressor and then the noise gate, as illustrated below, but with the compressor makeup gain taking effect post-noise gate.



## Using the Dynamics Processors

The 328XD offers full control over the parameters of the dynamics processors available to the input and output channels using the encoders of the E-Strip. To put the E-Strip into dynamics mode, press (wait for it...) the DYNAMICS ON E-STRIP switch above E-strip encoder 4. Encoders 1-6 now represent the controls of the compressor / limiter, while the noise gate is controlled with encoders 8-12. Encoders 7 and 13-16 are unused. The black on white legending below the encoders indicates the encoders' functionality when in this mode.

With the use of the DYNAMICS ON METERBANK switch, the 16 input meters can be quickly and easily set to display the compressor gain reduction levels and noise gate open/closed status for each of BANK SELECT 1-16, 17-32 and MASTERS.

Both the compressor/limiter and noise gate have a dedicated BYPASS On/Off switch and by default both bypass switches are set to ON. The switch is lit to indicate BYPASS=ON.

## Dynamics On E-Strip

To edit a channel's dynamics processor, press the DYNAMICS ON E-STRIP switch located in the Dynamics Control panel on the E-Strip so that it is illuminated. All encoder LEDs will be unlit. Now SELECT the input channel to which you wish apply some dynamics processing. The SELECT switch for the chosen channel will light. The E-Strip encoders are now set to control the channel's dynamic processor.

Note that by pressing the SELECT switches for Stereo Inputs 1 and 2 and FX Returns 1 and 2 the E-Strip can be used to edit the dynamics processors for these channels.

Functionality of the encoders when in DYNAMICS ON E-STRIP mode is as follows:

| Encoder | Processor Stage      | Parameter |
|---------|----------------------|-----------|
| 1       | Compressor / Limiter | Knee Type |
| 2       | Compressor / Limiter | Threshold |
| 3       | Compressor / Limiter | Ratio     |
| 4       | Compressor / Limiter | Attack    |
| 5       | Compressor / Limiter | Release   |
| 6       | Compressor / Limiter | Makup     |
| 7       | No function          |           |
| 8       | Noise gate           | Threshold |
| 9       | Noise gate           | Attack    |
| 10      | Noise gate           | Hold      |
| 11      | Noise gate           | Decay     |
| 12      | Noise gate           | Depth     |
| 13      | No function          |           |
| 14      | No function          |           |
| 15      | No function          |           |
| 16      | No function          |           |

Refer to the black on white legending below the E-Strip for encoder functionality when in DYNAMICS ON E-STRIP mode.

Note that encoder 1, which represents the compressor knee switch, should be turned anti-clockwise for a hard knee setting and clockwise for a soft knee setting. The hard knee setting is represented with lit encoder LEDs to the left of centre and the soft knee setting is represented with lit encoder LEDs to the right of centre.

Simply adjust the parameters of the dynamics processor as you wish, using the active encoders.

To adjust a dynamics processor for another channel / bus, simply SELECT the new channel. The E-Strip will instantly reset to indicate the current parameter settings of the newly selected channel.

To return the E-Strip to its previous mode of operation, simply deselect the DYNAMICS ON E-STRIP switch.

Note that with DYNAMICS ON E-STRIP active and with the LCD display in SELECT mode, the cursor keys can be used to navigate through channel properties such as EQ, using the PARAM encoder to make adjustments.

## Dynamics on the Mix and Group buses

Note that, while in DYNAMICS ON E-STRIP mode, the MIX and GRP 1-8 switches located in the Select Panel act as the SELECT switches for these buses. To adjust the parameters of the dynamics processor for the Mix, press the DYNAMICS ON E-STRIP switch so that it is lit and press the MIX switch in the Select Panel - it will light, indicating that the E-Strip dynamics processor controls are currently active for the Mix bus. To adjust the parameters of the dynamics processor for Group output 1, press the DYNAMICS ON E-STRIP switch so that it is lit and press the GRP 1 switch in the Select Panel. It will light, indicating that the E-Strip dynamics processor controls are now active for Group output 1. Similarly, press the GRP 2-8 switches to adjust the parameters of the corresponding dynamics processors.

Operation for all other Select Panel switches is as normal when in DYNAMICS ON E-STRIP mode (see **Section 3C**).

## Bypass

The compressor / limiter and noise gate stages of the dynamics processors can also be bypassed (disabled) individually. To bypass a dynamics processor stage for any of input channels 1-32, simply SELECT the relevant channel whether in DYNAMICS ON E-STRIP mode or under normal E-Strip operation. The COMP/LIM BYPASS and GATE BYPASS switches located in the Dynamics Control panel will indicate the current state of the processor. With the switch lit, the processor stage is bypassed (off) and when unlit the processor is active. To enable or disable bypass for either dynamics processor stage, simply press the relevant switch. The factory default state for both bypass switches is ON (lit).

To enable or disable bypass for either the compressor / limiter or noise gate of Groups 1-8 or the Mix bus, DYNAMICS ON E-STRIP must first be the active E-Strip mode. The relevant output can then be selected by pressing the MIX or GRP 1-8 switches in the Select Panel, so that the E-Strip and bypass switches become active for that channel. Enable or disable bypass by pressing the relevant switch in the Dynamics Control panel.

Note that when not in DYNAMICS ON E-STRIP mode, the compressor and gate bypass switches can be independently held to indicate the bypass status of all channels. Bypass can also be enabled / disabled for multiple channels in this way. For example, to check which channels have bypass activated for their associated compressors, while not in Dynamics On E-Strip mode, press and hold the COMP/LIM BYPASS switch. The relevant channel SELECT LEDs will light to indicate that the compressor bypass is active for that channel. While continuing to hold the COMP/LIM BYPASS switch, hit the SELECT switches for the channels for which you wish to change the COMP/LIM BYPASS state.

## Dynamics On LCD

Pressing the DYNAMICS switch to the left of the LCD will put the display into a mode allowing you to view adjustments made to any dynamics processor control as a precise value. While in DYNAMICS ON E-STRIP mode, press the DYNAMICS switch. The LCD will now automatically jump to display whichever dynamics parameter you adjust, for whichever channel you have selected.

With the LCD in DYNAMICS mode, the PARAM encoder beneath the LCD will also assume the functionality of whichever dynamics parameter you are currently adjusting or last adjusted. The ◀ and ▶ cursor keys also allow navigation through the processor controls as they appear on the E-Strip.

Note that the LCD and PARAM encoder can also be put into DYNAMICS mode to make adjustments to the dynamics processor even when the E-Strip is not in DYNAMICS ON E-STRIP mode. The cursor keys allow navigation and the PARAM encoder allows parameter adjustment.

## Linked dynamics processors

For linked channels and Groups, the dynamics processors can also be linked (see **Section 3J Part 5.18** for more information on stereo linking input channels and Groups). If 2 adjacent input channels or 2 adjacent Group outputs have been linked to form stereo

pairs, adjustments made to the dynamics processor parameters for either the odd or even channel or Group will adjust the parameters of the linked channel. By default, control of dynamics processor parameters is linked for linked channels, but the option can be disabled in the Chan Link Setup menu.

Note that, with dynamics set to 'on' in the Chan Link Setup menu, linking adjacent channels will link the dynamics processors immediately, copying the current dynamics parameters of the odd channel to the even channel. To disable this feature and read more about channel / group linking, refer to **Section 3J Part 5.18**.

Similarly, the parameter values of one dynamics processor can be copied to that of another input channel. See **Section 3J Part 5.17** for more information.

## Dynamics On Input Meters

The effect of the noise gates and compressors can be monitored visually on the 16 bargraph input meters. By pressing the DYNAMICS ON INPUT METERS switch, all 16 input meters switch to reflect the gain reduction for all channels which have the compressor active. Three banks of compressor gain reduction meters can be accessed using the BANK SELECT switches.

The three banks reflect gain reduction of the following:

|                                                              |                                              |
|--------------------------------------------------------------|----------------------------------------------|
| Input channels 1-16                                          | accessed with the BANK SELECT 1-16 switch    |
| Input channels 17-32                                         | accessed with the BANK SELECT 17-32 switch   |
| Group outputs 1-8,<br>Stereo Inputs 1/2, FX returns 1/2, Mix | accessed with the BANK SELECT Masters switch |

When monitoring the gain reduction of the Group outputs, Stereo Inputs 1 and 2 and the Mix bus, by pressing the BANK SELECT Masters switch, the meters indicate the following signals:

|                              |                        |
|------------------------------|------------------------|
| Gain reduction meters 1-8    | Group outputs 1-8      |
| Gain reduction meters 10, 11 | Mix bus L/R*           |
| Gain reduction meters 12, 13 | Stereo Inputs 1 and 2* |
| Gain reduction meters 14, 15 | FX Returns 1 and 2*    |

\* Refer to the black on white legending above meters 10-15.

The REC ARM / GATE LEDs immediately beneath the 16 meters indicate the noise gate open / closed status so that when the noise gate is open, the LED is off and when closed, the LED is on.

The main stereo output meters continue to indicate the output level of the selected monitor path.

To return the meters to their normal signal level monitoring, press the DYNAMICS ON INPUT METERS switch again so that it is unlit. The REC ARM / GATE LEDs will also return to displaying remote record arm status.

Note that it is not necessary for the E-Strip to be in DYNAMICS ON E-STRIP mode to access the DYNAMICS ON INPUT METERS switch, enabling you to see a channel's compression gain reduction or gate open / closed status while adjusting the EQ, for example.



Pressing and holding the DYNAMICS ON INPUT METERS switch will display the level meters of the Master Bank for the duration of the hold.