M-16DX 16-Channel Digital Mixer



The M-16DX Effects

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M16DXWS14

About the Workshop Booklets

The EDIROL M-16DX 16-Channel Digital Mixer delivers the power of digital mixing to musicians at an incredibly affordable price. This crystal-clear 24-bit digital mixer supports sample rates up to 96 kHz, and it's extremely flexible, with a wide range of analog and digital inputs and outputs, and effects. The M-16DX's USB connectivity makes it an ideal partner for a computer-based digital audio workstation, and features such its pro EQ and the innovative Room Acoustic Control make it an excellent live mixer as well.

Each M-16DX Workshop Series booklet focuses on one M-16DX topic, and is intended as a companion to the *M-16DX Owner's Manual*.

The M-16DX Workshop booklets require M-16DX O.S. Version 2.00 or higher. You can download the latest O.S. for free from *www.RolandUS.com/EDIROL*.

About This Booklet

An effect is an audio process of some sort that enhances the sound of an audio signal. The M-16DX offers onboard digital effects you're likely to find useful no matter how you're using the M-16DX. It's also easy to apply external effect processing to your M-16DX audio signals. This booklet discusses the use of both internal and external effects with the M-16DX.

Understanding the Symbols in This Booklet

Throughout this booklet, you'll come across information that deserves special attention—that's the reason it's labeled with one of the following symbols.

A note is something that adds information about the topic at hand.

A tip offers suggestions for using the feature being discussed.

Warnings contain important information that can help you avoid possible damage to your equipment, your data, or yourself.

Hot Links

Each Workshop booklet is meant to be read in order from beginning to end. However, if we mention an upcoming section—and you see this arrow—you can click the arrow to jump there immediately.

Audio Examples

You can click a speaker button like the one shown here to play an example of what's being discussed, in your default Web browser. (An active Internet connection is required for audio examples.)

Insert and Loop Effects

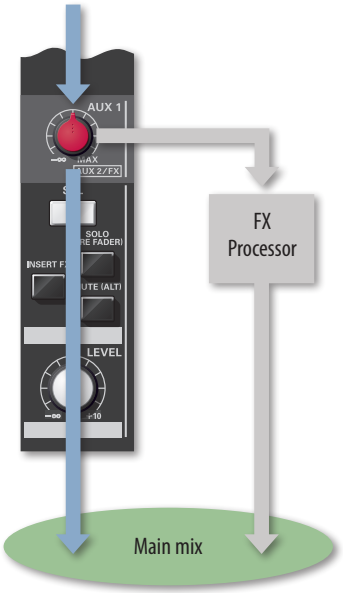
In any mixer, there are essentially two types of effects:

- *loop effects*
- *insert effects*

Let's take a moment to discuss what they are. If you're experienced with effects, and would like to skip ahead over the next few explanatory sections, click here.

Loop Effects

A loop effect allows you to add an effect—such as echo or reverb—to a signal in your mix. With a loop effect, a copy of the signal is sent to an effect, or "FX," processor for processing, and the processed signal is then returned to the main mix alongside the original signal. (A loop effect may also be called a "send-and-return" effect.)



Since the M-16DX is an all-digital mixer, the copy of a signal sent to a loop effect is a perfect copy, identical to the original, "dry," signal. As the copy goes to the effect, the original continues along its way to the main mix and anywhere else you want to send it as shown above.

A signal travels to a loop effect processor along a pathway, or "bus." Since you can assign any number of signals to a bus, you can add the same loop effect to as many signals in your mix as you like. In the M-16DX, signals are sent to the built-in loop effect processor—referred to as the "FX" processor—via the Aux 2 bus. Signals are typically sent to external effects, on the other hand, using the Aux 1 bus, as we'll see. Both of these busses carry signals to effects in mono—the effects themselves typically generate a processed, stereo version of the original signal.

The loop effects produced by the M-16DX's internal FX processor are:

- *SHORT ECHO*
- *ECHO*
- *ROOM*
- *SMALL HALL*
- *LARGE HALL*

The first two effects, the echo effects, produce a repeating, delayed version of the original signal. The reverb effects create an ambience around the dry signal.

To hear the difference between the M-16DX's loop effects, click here.

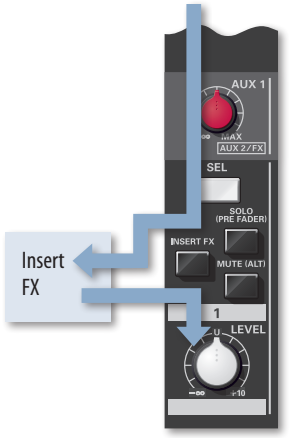
Add the loop effect to the main mix by pressing the FX button just above the MAIN MIX LEVEL knob.



If you'd like to listen to the effect without actually adding it to the mix going to the M-16DX's MAIN OUT or DIGITAL OUT jacks, press the FX button just above the PHONES/CTRL ROOM knob instead.

Insert Effects

Insert effects don't operate on a copy of a signal—they grab the signal itself as it passes through its channel strip, send it to the M-16DX's insert effect processor for processing, and then return the effected signal back to the channel strip, replacing the original signal altogether.



Insert effects are good for adding things like compression or EQ to a signal, since you always want the processed version of the signal to completely replace the original version.

In the M-16DX, you can use the internal insert effect processor—the "Insert FX" processor—on signals going through Input Channels 1 and/or 2. (The two channels share the same insert effect.)

The Insert FX processor produces the following effects:

- *Power Cmp1*
- *Power Cmp2*
- *Power Cmp3*
- *Vocal Enh.*
- *Narration*

The "Cmp" insert effects are compressors that help smooth out a signal's level fluctuations, and generally tighten-up the signal—they can also add distortion if you want it. The Vocal Enhancer and Narration effects are EQs optimized for voice.

In addition to the Channel 1/2 insert effect, the M-16DX also contains a specialized insert effect called a "finalizer." This insert effect, which processes the entire mix as a final stage of the mixing process, is discussed in its own Workshop booklet, *Using the M-16DX's Finalize Tools*.

Why Use Effects?

The M-16DX can be used in a variety of situations, and effects can often play a key role.

Recording In a DAW



When you're doing a multitrack DAW session, an M-16DX reverb or delay loop effect can make it easier to get a great performance, simply by making the recording experience more musical and fun for your performer. The effect is part of the M-16DX main mix, which isn't recorded in a multitrack DAW session—the effect is just for listening purposes. You can use the M-16DX internal effects in this way, or external effects.

In a two-track DAW recording session, you *are* recording the entire M-16DX mix, and you can use the M-16DX effects to make your mix sound the way you want it to.

In either type of session, you can polish signals going to your DAW from M-16DX Input Channels 1 and 2 with the built-in insert effects.

Live Mixing and Audio/Video Production



When you're creating a stereo mix on the M-16DX, you can use its insert effect on signals going through Input Channels 1 and 2. You can add the internal loop effect, or an external loop effect, to signals from Input Channels 1-12.

Submixer

If you're using the M-16DX as a submixer onstage or in a studio, you can use its effects the same way you'd use them in live mixing or audio/video production.

Working with The M-16DX's Internal Effects

Selecting and Editing Internal Effects

Whether you're selecting and/or editing an internal loop or an insert effect on the M-16DX, the process is essentially the same.



You can store effect selections and edits in scenes. To learn about scenes, see the *Using Scenes on the M-16DX* Workshop booklet.

Selecting Loop and Insert Effects.

1 Press

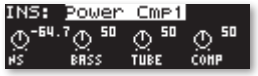
- *FX*—so it lights to display the loop effect's FX screen.





- *INSERT FX•COSM*—to display the insert effect's Ins screen.





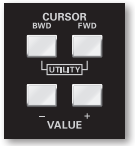


COSM is the Roland-exclusive effect-modeling system the Insert FX processor uses to produce its effects.

2 Press CURSOR BWD, if necessary, to highlight the effect name on the top line of the display.

3 Use the - and/or + VALUE buttons to select the desired effect.

4 To turn off either effect, press its button again to un-light it.



Editing Loop and Insert Effects

1 Navigate to the effect's screen as described above.

2 Use the CURSOR BWD and/or FWD button to highlight the setting you'd like to adjust.



3 Use the - and/or + VALUE buttons to adjust the setting as desired.

Using Internal Loop Effects



To add an internal loop effect to an input channel's signal:

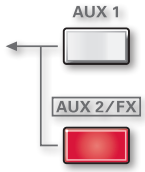
1 Press in the black FX button just above the MAIN MIX LEVEL knob to add the output of the loop effect into the M-16DX's main mix.

2 Press the FX button so it lights—thus turning on the loop effect—and select the desired echo or delay effect, as described earlier.

3 Set the AUX 2 MASTER knob straight up as a starting position.



4 Press the AUX 2/FX button so it lights—this assigns all of the channel strips' AUX 1 knobs to the sending of signals to the Aux 2 bus and to the loop effect. The AUX2/FX screen appears.





5 As you listen to signal coming into the channel with which you're working, adjust the channel's AUX 1 knob until you hear the desired amount of loop effect on the signal.



6 Press the FX button to return to the FX screen where you can adjust the effect's settings as desired. (They're listed below.)

These steps describes setting up an effect. You can adjust an input channel's AUX 2 send level at any time by simply turning its AUX 1 knob when the AUX 2/FX button is lit.

Likewise, you can edit an effect at any time by pressing the FX button to return to the FX screen. In cases where pressing FX turns off the effect, simply press the button again to turn it back on.

When you're done adding the loop effect to your channels' signals, you can adjust the overall level of the effect in your mix using the AUX 2 MASTER knob.

Loop Effect Parameters

Short Echo

This effect creates an adjustable short repeating delay/echo.

Parameter:	*This parameter*
DELY range: 10-200 milliseconds	sets length of the delay.
REPT range: 0.0-6.0 seconds	sets the length of time the delay continues to repeat.

Echo

This effect creates a long repeating delay/echo.

Parameter:	*This parameter*
TIME range: 0.0-6.0 seconds	sets the length of time the delay continues to repeat.
DAMP range: 315-8k, BYP	sets the frequency above which the high end of the delays are reduced in volume to create a trailing-off effect. With the BYP (Bypass) setting, no high end is rolled-off.

Reverbs: Room, Small Hall, Large Hall

- *Room*—This reverb creates a room-like acoustic space around the signal.
- *Small Hall*—This reverb places the signal in a simulated concert-hall space.
- *Large Hall*—This reverb makes the signal sound as if it's in a large concert hall.

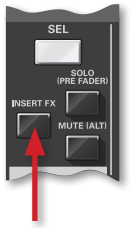
The three reverbs share the same parameters.

Parameter:	*This parameter*
P DLY range: 0.0-160 milliseconds	sets the amount of time that passes before the reverb begins, to imply the distance between the signal and the walls of the simulated space.
TIME range: 0.0-6.0 seconds	adjusts the length of the reverb and thus the size of the simulated space.
DAMP range: 315-8k, BYP	sets the frequency above which the high end of the reverb is reduced as it trails away. With the BYP (Bypass) setting, no high-end is rolled-off.

Using Insert Effects

To insert an effect on Input Channel 1 and/or 2:

1. Press the INSERT FX•COSM button so it lights—thus turning on the insert effect—and select the desired effect, as described earlier.
2. Press the channel's INSERT FX button so it stays depressed.
3. Press the INSERT FX•COSM button to return to the INS screen where you can adjust the effect's settings as desired.



Power Cmp1

This compressor simulates the effect of a vaccum-tube amp, and is good for beefing-up electric guitars and basses.

Parameter:	*This parameter*
NS range: -90 to -440dB	sets the threshold below which unwanted quieter sounds are reduced in volume to generate a cleaner signal.
BASS range: 0-100	adjusts the level of the signal's low-frequency content. A setting of 50 leaves it in its original state.
TUBE range: 0-100	sets the amount of vacuum tube-like distortion applied to the signal.
COMP range: 0-100	sets the amount of compression applied by lowering the level threshold above which signals are compressed, and at the same time raising the overall level of the signal as you increase the parameter's value.

Power Cmp2

Power Cmp3 is for vocals, making them tighter and more up-front.

Parameter:	*This parameter*
NS range: -90 to -440dB	sets the threshold below which unwanted, quieter sounds are cut in volume to generate a cleaner signal.
TONE range: 0-100	adjusts the level of the signal's mid-frequency content. A setting of 50 leaves it in its original state.
TUBE range: 0-100	sets the amount of vacuum tube-like distortion applied to the signal.
COMP range: 0-100	sets the amount of compression applied by lowering the level threshold above which signals are compressed, and at the same time raising the overall level of the signal as you increase the parameter's value.

Power Cmp3

This compressor is best for acoustic instrument sounds.

Parameter:	*This parameter*
NS range: -90 to -440dB	sets the threshold below which unwanted, quieter sounds are cut in volume to generate a cleaner signal.
BRIGHT range: 0-100	adjusts the level of the signal's high-frequency content. A setting of 50 leaves it in its original state.
TUBE range: 0-100	sets the amount of vacuum tube-like distortion applied to the signal.
COMP range: 0-100	sets the amount of compression applied by lowering the level threshold above which signals are compressed, and at the same time raising the overall level of the signal as you increase the parameter's value.

Vocal Enh.

This effect provides a four-band EQ for clarifying a vocal signal and bringing it forward in a mix.

Parameter:	*This parameter*
NS range: -90 to -440dB	sets the threshold below which unwanted quieter sounds are cut in volume to generate a cleaner signal.
TONE range: 0-100	adjusts the level of the signal's mid-frequency content. A setting of 50 leaves it in its original state.
BRIGHT range: 0-100	adjusts the level of the signal's high-frequency content. A setting of 50 leaves it in its original state.

Narration

The effect allows you to add clarity to a vocal signal, and supplies a de-esser to suppress any sibilant ("s") sounds that are too loud.

Parameter:	*This parameter*
NS range: -90 to -440dB	sets the threshold below which unwanted quieter sounds are cut in volume to generate a cleaner signal.
ATTACK range: 0-100	allows you to change the intensity of the voice.
CLARITY range: 0-100	sets the amount of enhancer applied to the signal.
DESSER	adds de-essing (sibilance reduction) as you raise its value.

Adding External Loop Effects

You may want to use external effects with the M-16DX if you have an external device that offers effects the M-16DX doesn't have onboard. You can use external effect processors that have either analog or digital connections with the M-16DX. We'll discuss each type of device separately.

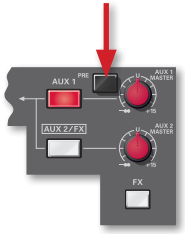
If Your External Effect Has Analog Connectors

Typically, you'll use the Aux 1 bus for sending M-16DX signals to an external effect processor.

Note that when you use the Aux 1 bus as an external effect send, the bus is no longer available for use as a monitoring feed for performers.

If you want to use multiple external effect processors—or wish to dedicate Aux 1 as a monitor feed—you can use the Aux 2 bus as an external effect send. When you do this, of course, Aux 2 is no longer available for use as a send to the internal M-16DX loop effect.

Pre or Post



The Aux 1 bus can operate in your choice of "pre" or "post" mode. When it's set to

- *pre*—each input channel's signal is sent to Aux 1 before it goes through its channel strip. ("Pre" is short for "pre-fader.") Adjustments you make to the signal using its channel EQ, insert effect, or LEVEL knob have no effect on the sound sent to your external effect processor. To configure Aux 1 as a pre send, press down the AUX 1 PRE button so it locks in.
- *post*—each input channel's signal is sent to Aux 1 after going through its channel strip. ("Post" is short for "post-fader.) Changes you make with channel EQ, insert effects, and LEVEL knob will be used by the external effect. To configure Aux 1 as a post send, set the AUX 1 PRE switch to its up position. This is the standard setting when you're sending signals to an loop effect. (The Aux 2 bus is therefore always post-fader.)

Setup

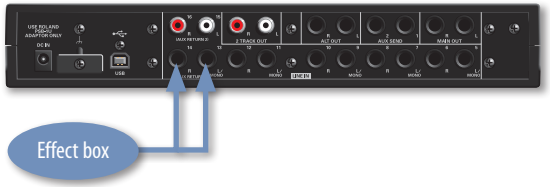
Here's how to set up your external effect loop using Aux 1:

1 Connect the AUX SEND 1 jack on the rear panel of the M-16DX's I/O module to the input jack of your external effect processor.



2 Connect the stereo outputs of your external effect processor to the M-16DX Aux Return Channels 15 and 16. If your effect processor has:

- *1/4" connectors*—connect them to the 1/4" L and R AUX RETURN 1 jacks on the rear panel of the M-16DX's I/O module.



- *Phono connectors*—connect them to the phono L and R AUX RETURN 2 jacks on the rear panel of the M-16DX's I/O module.



3 Select the desired effect on the external effect processor and set the processor's output level.

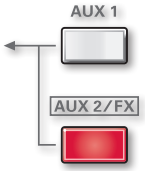
In Use

To add the external effect to an M-16DX channel's signal:

1 On the M-16DX, set Channel 15/16's LEVEL knob straight up as a starting point.



2 Press the AUX 1 button so it lights—this assigns the channel strips' AUX 1 knob to the sending of signals to the Aux 1 bus and on to the external effect. The AUX1 screen appears.





3 As you listen to signal coming into the channel, adjust the channel's AUX 1 knob until you hear the desired amount of the external effect on the signal.



You can adjust a channel's AUX 1 send level at any time by simply turning its AUX 1 knob when the AUX 1 button is lit.



When you're done adding the external effect to your channels' signals as desired, you can adjust the overall level of the external effect in your mix using Channel 15/16's LEVEL knob.

If Your External Effect Has Digital Connectors

Since the M-16DX's DIGITAL OUT jacks carry the entire main mix, you can use an digital external effect processor for the adding of mastering effects to the mix when you don't want to use the M-16DX's internal Finalize effect.

Connect the digital input connector on your external effect to the corresponding DIGITAL OUT jack on the front of the M-16DX's I/O module. You can connect the M-16DX digitally to devices that use phono or optical S/P DIF digital connections.



Connect the output of the external processor to the device you'll be using as a recorder, or to power amps in a live performance setting.

The End

We hope you've found this workshop helpful. You'll find other M-16DX Workshop booklets available for downloading at *www.RolandUS.com/EDIROL.*