

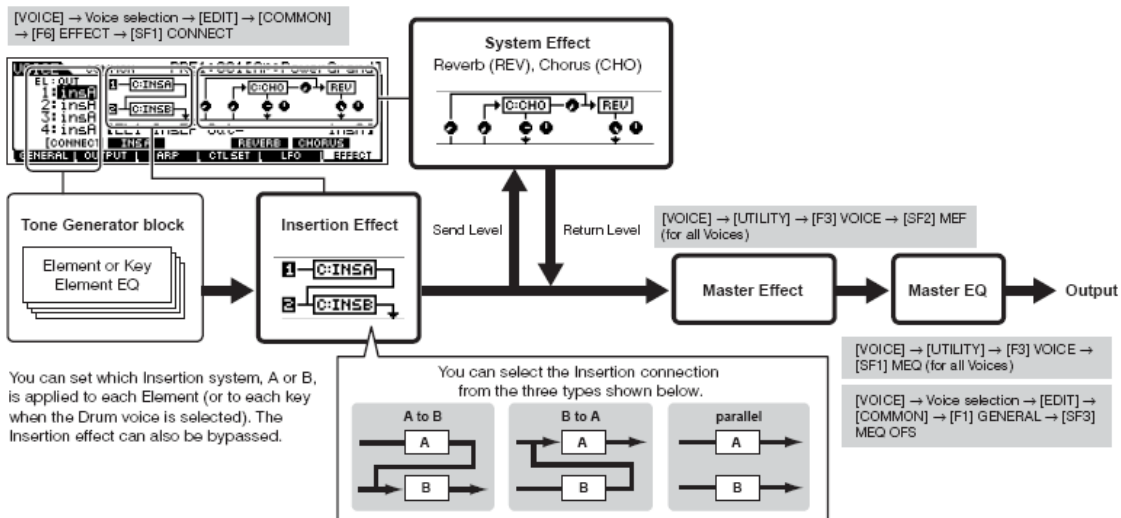


# POWER USER

## MUSIC PRODUCTION and PERFORMANCE With the MOTIF ES

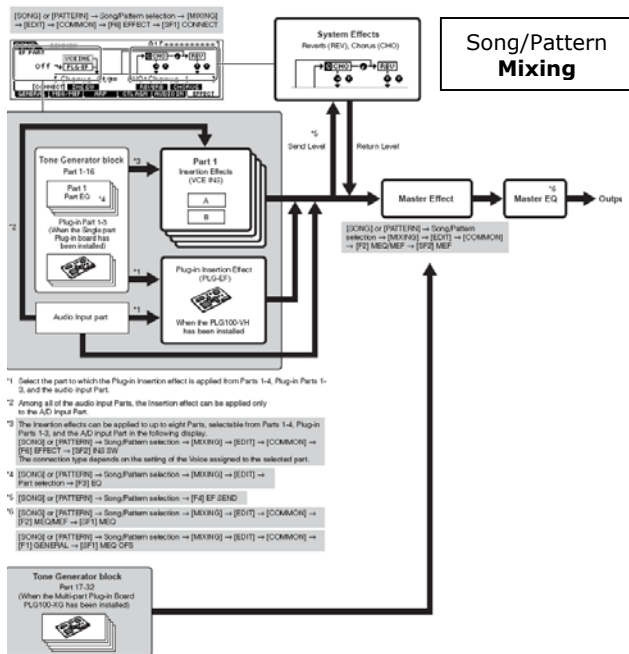
### Introducing Motif ES EFFECTS

Phil Clendeninn  
Senior Product Specialist  
Technology Products  
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Master EFFECT, the Master EQ and then on to the stereo outputs.



## Background

The algorithms (a fancy word for recipe or specific arrangement) in the Motif ES Effects are deep. Please refer to the DATA LIST booklet to see the individual parameters and effect types. On page 26-27 of the DATA LIST you will see a list of the different Effect Categories and Effect Names. Page 28-35 will list the parameters available in a convenient form to see them all and the ranges of control. This is worth a look. The TABLE Number heading is for those that need to know the exact value of each setting – refer to the charts on pages 36-41 for exact values for each parameter setting. Basically settings are made to taste (by ear). However, knowing what is subjective and what is objective is what separates a bogus mix from a brilliant mix.

So much of working with sound is subjective (meaning it is up to you) but some of it is very objective (meaning there is a right and wrong). Sorry, it's true. Knowing the difference between these two concepts is the key to greatness in the audio business. For example, when routing signal to an effect do you return more than you send or send more than you return? Gain staging is the objective part of audio. Making sure that you work on the side of SIGNAL when dealing with the SIGNAL-to-NOISE ratio. The rule of thumb: Send up to the limit of clean audio and return just enough to taste. If you are sending signal to an effect processor that you have configured as an EQ, how much signal do you send? Again this is not subjective, there is a right and wrong. Send all the signal through the EQ. If you were to

return dry signal from certain routing scenarios you can cause phase cancellation – a situation where you will be adversely affecting the signals integrity. Knowing what you are doing with effects can mean confident utilization with stunning results. Just experimenting willy-nilly can lead to bogus results. Of course, you could eventually wind up with something useable but knowledge is power. In most instances the Motif ES will not let you get in too much trouble – sometimes you are prevented from controlling certain things because it would be illogical or lead to bogus results...those decisions are made by the designers. For example, you will see where a subjective return is allowable a DRY/WET balance so that you can mix your amount of effect return, but from a device like an EQ there is no balance control.

## The Processors

The **REVERB** processor has 20 algorithms available. When working with a reverb algorithm you can select it by size environment: HALL, ROOM, STAGE, PLATE, WHITE ROOM, TUNNEL, BASEMENT and CANYON. Yamaha was the first company to introduce digital DSP based effects that were based on the actual dimensions of the great concert halls of the world. Rooms have a definite size factor to the space. A Stage is usually a loud reverberant environment. A PLATE is a brilliant emulation of the old 10-foot boxes that used to contain these reverb chambers that used a transducer (driver) at one end and second transducer (microphone) at the other...in between was a large aluminum plate 1/64<sup>th</sup> of an inch thick. You sent signal from the mixing board's aux sends and returned up to a maximum of 5 seconds of cool reverb. This was the standard for drums and percussion "back in the day". The WHITE ROOM will help you design your own environment and can teach you about how the other presets were made. The WHITE ROOM lets you set width-height-depth of the walls and the 'wall vary' lets you set the reflective texture of the surface from rug to steel. Also important in working with reverb is an understanding of how it works in the real world. In most listening situations you are hearing a certain amount of signal, directly from the source, while the rest of the signal bounces off the environment you are standing in. If, for example, you are 30 feet from the stage you will hear a portion of the sound direct from the stage but most of it will bounce off of the walls, floor and ceiling to arrive at your position. Because we often record and/or amplify musical signal with a technique called "close-miking", reverb became a necessary evil (if you will). Close-miking allows us to *isolate* a particular sound from others in the environment but there is a trade off...we lose that sense of distance and environment. To regain some of the distancing we use artificial reverb to do the trick. Recognize that

when you put a different amount of reverb on the snare than you do on the flute this does not occur in nature. All the musicians in the same room would naturally have the same reverberant environment with very subtle differences due to positioning in the room. This gets back to the subjective part of the audio business. SO WHAT? You can use effects to taste. There is no rule that says everyone has good taste. An important parameter in all the reverbs is the INITIAL DELAY this is the time before the reverb receives the signal and can help position the listener near-far from the instrument source. The HPF and LPF are there to help you shape the reverb signal itself. There is a rule of thumb here: low frequencies reverberate less than high frequencies. Low frequencies tend to hit a surface like a wall and spread out while high frequencies hit a wall and bounce back into the room. This is why when you are sitting next door to the party you only hear the bass through the wall – all the high frequency content ‘reverberates’ and stays in the source room. So use the HPF (high pass filter) to allow the highs to pass through to the reverb and block the lows from reverberating. Reverb on bass just adds MUD. MUD is not a subjective term but if it is what you want go for it (but yuck, it is mud). Low frequencies don’t bounce back they tend to hug the walls and spread out. If you want cutting, punchy bass leave the bass “dry” (without reverb).

The Motif ES Reverb processor features a brand new effect algorithm set based on the heralded Yamaha “Rev-X” technology. “REV-X” is a whole new generation of Yamaha Reverb with the richest reverberation tone and smoothest decay. There are “Hall”, “Room” and “Plate” algorithms. Newly introduced parameters like ROOM SIZE and DECAY envelope also bring much higher definition and finer nuances. Check out the LARGE HALL, MEDIUM HALL, WARM ROOM, WOODY ROOM and RICH PLATE algorithms to hear these new reverbs.

The **CHORUS** processor has 49 algorithms available. These are short time period delays from flanging, to chorusing/phasing and on out to multiple repeats and echoes. There are also tempo control delays that can be synchronized to the BPM of the music. Flanging is a very short time delay. If two identical signals arrive at your ear-brain, you will not be able to perceive them as two separate signals until one is delayed slightly. Imagine 2 turntables in perfect synchronization playing the same record. You would perceive the second one as just making the first signal louder until you delayed one of them a bit. If one slips 1ms behind the other you will perceive what we call flanging. The actual name comes from two reel-to-reel tape decks playing the same 2-track

material. This was used as a real time effect, “back in the day”. You would have 2 identical 2-track decks running in sync (no, there were no protocols to sync them – you pressed the buttons at the same time!!!) The engineer would slow one down by placing his thumb momentarily on the *flange* (reel holder). The resulting swirling sound is called flanging. Any delay between exact sync and 4ms is considered flanging. Delays of 4ms-20ms are considered chorusing and somewhere beyond 20ms the ear-brain starts to perceive two separate events, called doubling or echo. Among the ‘time-delay’ algorithms in the Chorus processor you will find: Chorus, Celeste, Symphonic, Ensemble Detune, Flanger, Tempo Flanger, Phaser, Tempo Phaser, Delay L/R, Echo, Cross Delay, Cross Delay Mono, Cross Delay Stereo, Tempo Delay Mono, Tempo Delay Stereo, and Tempo Cross Delay.

The **DUAL INSERTION EFFECT** is made up of two identical units (INS A and INS B), and each has 116 innovative effects. The effect types can be the subjects of intense study. We will try and introduce you to some of the more unusual and unique ones in this article. In addition to all the reverbs, delays, echoes, cross delays, tempo delays, etc., you get some that are available nowhere else. The V-Flangers, for example, are a simulation of the classic vintage flanger devices. The Vintage Mono and Vintage Stereo Phasers faithfully reproduce the response of the old guitar stomp box of the ‘70’s. The Early Reflections and Gate Reverb/Reverse Gate are great to recreate classic drum sounds. The Karaoke delays (basically cheesy repeats for that sing-along sound) should not be overlooked. The Auto Pan has settings for front-rear as well as left-right to give a circular “feel” to a stereo panorama. There are many combination and multiple effect algorithms.

- Distortion + Rotary Speaker
- Overdrive + Rotary Speaker
- Amp Simulator + Rotary Speaker
- Distortion + 2-way Rotary Speaker
- Overdrive + 2-way Rotary Speaker
- Amp Simulator + 2-way Rotary Speaker
- Distortion + Delay
- Overdrive + Delay
- Compressor + Distortion + Delay
- Compressor + Overdrive + Delay
- Auto wah + Distortion
- Auto wah + Overdrive
- Touch wah + Distortion
- Touch wah + Overdrive
- Wah + Distortion + Delay
- Wah + Overdrive + Delay
- 2-way Rotary Speaker
- Dual Rotary Speaker

Among the innovative effects from the Yamaha Samplers A4000/5000 are the Lo-Fi, Low Resolution, Noisy Delay, Attack Lo-Fi, Digital Turntable, Digital Scratch, Auto Synth, Tech Modulation, Jump, Isolator, Slice, Voice Cancel, Ambience, Talking Modulator, Beat Change, Ring Modulator, Dynamic Ring Modulator and Dynamic Filter.

There are two different Multi-band Compressor algorithms that are great for fixing and punching up specific frequency ranges. Multi-band compressors are used to finalize mixes and bring out (punching up) specific frequency bands without raising overall gain. These are ideal when importing a stereo sample audio clip or when you are resampling within the Motif ES. The Digital Turntable algorithm adds "record surface noise" to your mix. You can program the tone of the noise, the frequency and randomness of the clicks and pops, and you can even program how much dust on the stylus. Digital Scratch creates ripping scribbles and wild panning effects. Jump takes wild panning effects to the **n**th degree. Voice Cancel is a vocal eliminator that can remove center information from a stereo input – you set the frequency range. Does it really work? Well, yes, but it must be applied to a stereo signal. It works by canceling data between 300-3,000Hz in the center of the signal. So the lead vocal is greatly reduced but so is the snare drum. Your mileage will vary. Slice is also the name of one of the effect algorithms in addition to being a sample edit process. This Slice effect can divide the audio into musical timed packets that it can pan left and right in tempo. You can select a quarter note, eighth note or sixteenth note slice and there are 5 different pan envelopes and some 10 different pan types.

A new features added to the Motif ES, is the ability to sample through the Dual Insertion Effects. This means when you are sampling Vocals or guitars and the like you can use a Compressor during the recording. Please see the Power User article "[Sampling in Sequencer Mode](#)" for complete details on how to setup and sample via the Compressor found in the Dual Insertion Effects. It will bring your sampling recording sessions up to 'pro' level.

### **Why is it called "Insertion Effect" and what is the difference between it and a "System Effect"?**

On an audio console you have a series of channels. Channels carry **input** or **returns** from a multi-track (we refer to them as Input Channels or Track Channels depending on their role). Each channel has an on/off button, EQ, a fader, and a set of auxiliary sends. These 'aux' sends allow each channel to send a **portion** of the signal on

what is called a bus (a group of wires carrying like signal). That bus can then be connected to an offsite effect processor in a rack. The return comes back to the board and is mixed to the stereo signal. That scenario is an example of what happens in Motif ES with the SYSTEM EFFECTS. That is, when you are in a Song or Pattern and on the MIXING screens, the REVERB, and the CHORUS Effects are arranged so that access is just like the auxiliary sends of a console – each channel (Part) has an individual send amount to the system effects. There is a composite return signal that is mixed to the stereo output.

An Insertion Effect on an audio console is usually accessed via 'patch points' (interruption points in the channel's signal flow) that allow you to reroute **all** of the channel's signal via a patch bay through the desired effect or device. You are, literally, inserting a processor on that specific channel alone. This is how the INSERTION EFFECT block works on the Motif ES.

Examples: Typically, when a reverb effect is setup, just a portion of each sound is sent to it. This is the perfect example of what a System effect is about. However, things like rotary speaker (organ) or amp simulator (guitar) are effects that you might want to isolate on a specific channel. Therefore these type effects are usually accessed as an Insertion Effect. One **key** advantage of the Insertion Effect is that it can be controlled in real time, during the playing performance. Since the Insertion Effects are programmed at the VOICE level you can use the Control Sets (there are 6) to route your physical controllers to manipulate the parameters of the Insertion effect in real time. You can change the speed of the rotary speaker, or you can manipulate the Guitar Amp simulation setting while performing the guitar sound. This type of control is beyond just the send level (you are given access to System Effect send level only from the Voice mode Controller assignment). In the real world, the size of the room does not change (hopefully) so System effects like reverb are pretty much "set it/forget it". However, changing the speed of the rotary speaker effect is something that you may want to perform during the song.

Just how are you able to control certain parameters in an Insertion Effect? ...via MIDI commands, of course. In the hierarchy of modes in the Motif ES VOICE mode is the most important when it comes to programming. This is where Yamaha spent hours and hours developing the sounds you play. The programmer's, with great care assembled the multi-samples into waveforms, and combined the waveforms into the Voice and worked with the envelopes, the response to velocity, the pitch, the tuning, the

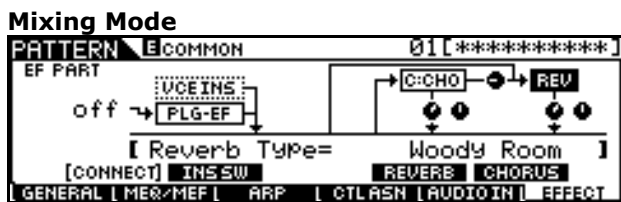
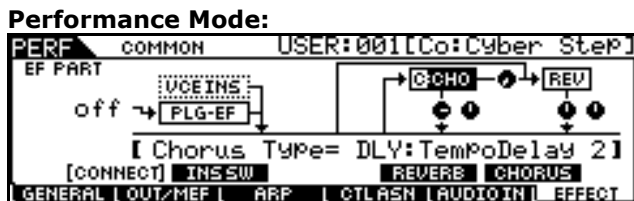
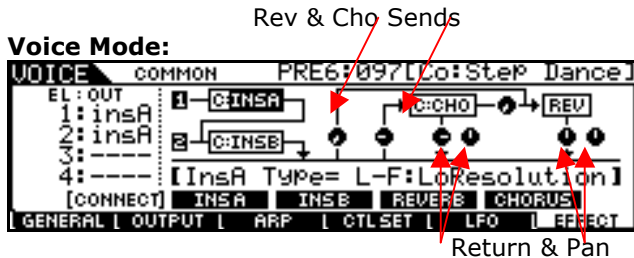
filters and so on. Each sample in the Motif ES has its own EQ, the meticulous programming goes on for months at a time. Of course part of the arsenal available to the programmers were the Effects. Take a close look at a Voice and its effect structure (again the graphic on the top of page 179 makes the routing clear). Notice the Insertion Effect block, the System Effect block, the Master Effect block and the Master EQ block. Contrast this to the graphic on page 180, which shows the blocks during a MIX in Song/Pattern mode. The Dual Insertion Effect is available for any eight Motif ES (PART 1-16 or P1, P2 P3 part, if they contain a PLG150 series board).

**How do the diagrams on page 179-180 relate to the EFFECT/CONNECT screen?**

Navigate to the Motif ES Effect connection screen.

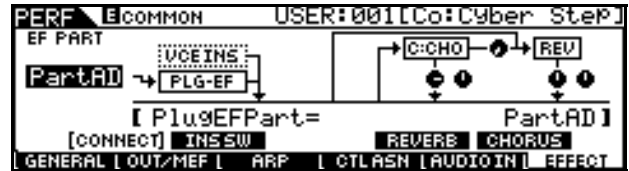
- Press MIXING
- Press EDIT
- Press COMMON
- Press F6 EFFECT
- Press SF1 CONNECT

This screen shows you an overview of the connections.



In both the Performance Mode and Mixing Mode screens shown above connected to the EFF PART box is the word "off" (unless you have a Insert Effect board) this is where you would make the selection for the external audio source for the PLG100-VH board. The source here can be any Part01-Part16, the plug-in boards P2 or P3<sup>2</sup> or the A/D input.

<sup>2</sup> Never P1 because the PLG100-VH must be in the P1 slot.

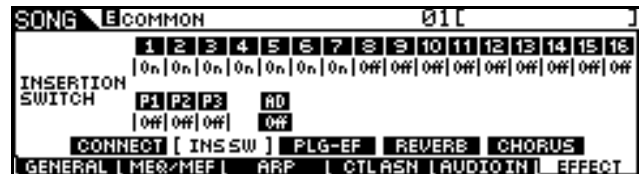


Notice also that both the Performance and Mixing screens do not have send level controls **to** the Reverb and Chorus. This is because the send level is not a 'common' parameter but is on a per PART basis. Each Part will have its own control for the amount of signal sent to the System Effect on the Part Edit level. While in Edit, you can select the PART to edit by touching the Track buttons 1-16 – corresponding to Parts 01-16.

Notice that between the Chorus processor and the Reverb processor you have a level Send control knob: Chorus-to-Reverb Send. This can be used to create a situation where the System effects are used in series (one after the other) rather than in parallel (side by side). An example of how this can make a difference is when you select a DELAY as the effect for the Chorus and a HALL for the Reverb...when parallel routing is selected, you could send a signal independently to the delay and to the reverb. Only the initial note will have reverb, each repeat would be dry. By routing "0" send to the Reverb, but send the signal through the Chorus first, then through the Chorus-to-Reverb send, on to the reverb, you will now have a signal where *each* repeat of the Delay will have reverb.

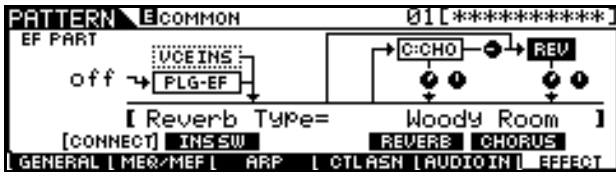
- Press SF2 INS SW

The screen below shows which Parts of a MIX are recalling their Dual Insertion Effect setups from Voice mode. It initially defaults to the first eight Parts of a MIX and all four Parts of a Performance.



In order to turn ON an INSERTION EFFECT on an external AD signal you may have to turn it OFF on another PART before you can activate it.

As you move your cursor to the right in the CONNECT screen (shown below) you can highlight the CHO or REV effect and select from among the different algorithms. The letter "C" can be highlighted and denotes "category" allowing you to search the effects by category.



You can drop into edit any of these via the associated SF (Sub Function) button. For example, in the screen above SF4 is Reverb and SF5 is Chorus. So where do you edit the Insertion Effects? Notice the VCE INS box is a dotted line – denoted it is “grayed out” or unavailable from this screen. The Dual Insertion Effects are simply activated from Voice mode. When you go to this same CONNECT screen in VOICE mode you will see SF buttons available to access the INSERTION EFFECT parameters. The Insertion Effects do not appear in the MIXING CONNECT screen because the Insertion Effects are part of the VOICE mode edit parameters. If you need to radically change an Insertion Effect from the original programming then you will need to create a USER Voice with your new Insertion Effect edits and STORE it.



New to the Motif ES is the ability to edit a Voice directly while still in a Song Mix or Pattern Mix. Press EXIT to leave EDIT mode but press MIXING to view the MIX screen shown above. The Motif ES allows you to drop into **full** Voice Edit for any Normal (non-drum) Voice while still in the MIXING mode. While in MIXING Quick Access view press the F5 VCE ED (Voice Edit) button to drop into edit (shown above).

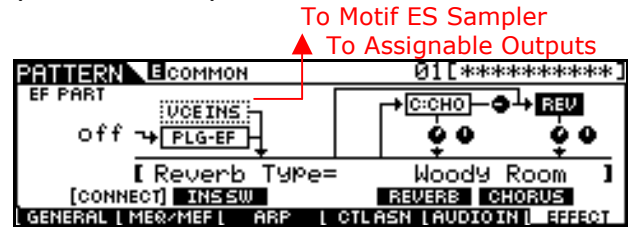
This allows you to edit a Voice and its Dual Insertion Effects while you are using the sequencer so that edits can be done in the context of the music sequence. When you STORE this edited Voice it will automatically replace the Voice in your MIX in a special “MIX VOICE” bank (63/60) which is “local” to the current Pattern or Song. What this means is the Mix Voice will automatically load when you load the Pattern or Song, even if you load just the individual Pattern or Song. Each Pattern Mix and Song Mix has 16 Mix Voice locations total. Due to complexity, Drum Voices cannot be stored in Mix Voice location.

In Voice edit you have 6 Control Sets that allow you to customize how the available effect parameters (and others) are controlled. When you are editing a PLG150 Series board you will have 2 Control Sets within the Motif ES Voice and as many as the particular PLG board has on its own (this varies per PLG150). Choose your assigned

MIDI controls wisely, they will be available when you go to Song or Pattern Mixing.

### Assignable Outputs and Expandable Outputs

If you can follow the routing then you can know what is possible. Any Part of a Performance or Mix can be routed to an Assignable Output. The assignable output would be just after the VCE INS (Insertion Effect).



See diagram above for the position of Assignable output. Therefore a Part going to an individual output could have its Dual Insertion Effect active and its Part EQ active but obviously it cannot have the Chorus, the Reverb, the Master Effects or the Master EQ applied to it. When you know where the connection is you don't have to ask why! As in “Why can't I send the sound with Reverb to an assignable output?” The main reason is the routing doesn't allow it and secondly you wouldn't want it. Signal sent to an assignable output is sent there to *isolate* it from the main stereo signal. Any signal sent to the System Effects (reverb and chorus processors) is summed and returned to the stereo mix and is a *composite* signal – a sum total of all the signals sent in. This defeats the purpose of sending it to an assignable out (isolation). If you want reverb on the assignable out signal, you can use one of the two Insertion Effects set to a Reverb. That Voice will be the only sound in that reverb chamber – it will have the room to itself. It will not have to share it with the snare drum, the piano, the synth lead, etc., etc.

### Output expansion and how it affects Effects:

The **AIEB2** adds six additional analog outputs (1/4” cables) and two forms of digital Input/output (coaxial and optical) to the Motif ES' arsenal of outputs. The six analog outputs can be configured as individuals: as1, as2, as3, as4, as5 and as6. Or they can be configured in odd/even pairs: as1&2, as3&4, as5&6... or any combination, as necessary. When a signal is routed via the AIEB2 can use the Insertion Effects if they are activated for the PART in the Performance or Mix. This means you can apply the powerful Dual Insertion Effects and the 3-band Part EQ to that Part prior to routing out the individual output.

The **mLAN16E** adds sixteen 24-bit digital outputs and allows direct connection to computers or other mLAN devices (mixers, etc.), delivering the highest quality and integrity of signal via a single connector cable. The sixteen digital outputs can

be configured as individuals: as1, as2, as3, as4...through...as14 plus the L&R stereo. Or they can be configured in odd/even pairs: as1&2, as3&4, as5&6, as7&8, as9&10, as11&12, as13&14, plus the L&R stereo... or any combination, as necessary. mLAN connectivity will finally make possible the dream of multiple individual outputs from your synth workstation to your Digital Audio Workstation software in your computer. The truly powerful Workstation→Laptop Studio is now a reality. Getting 16 cables from the back of your synthesizer and connecting them to your computer without mLAN just was just not a pretty picture, until now...mLAN. This will change everything. A simple single Firewire cable between the Motif ES and your computer gets it all, 16 out, 8 inputs (oh yeah, you can have 8 channels – 4 stereo pairs – coming into the Motif ES via the mLAN connection) and you can use the Motif ES System Effects, Master Effects and Master EQ on those inputs. mLAN can also be the source when you sample into the Motif ES' Integrated Sampler. All this can happen simultaneously down the single cable. When a signal is routed via mLAN to your computer it has all the integrity of an assignable out...this means you can apply the powerful Dual Insertion Effects and the 3-band Part EQ to that Part prior to routing out to the computer or external mixer. Think of the possibilities!!!

The first and most important thing you can learn about mLAN is this: **While all mLAN is Firewire, not all Firewire is mLAN.** mLAN is a special protocol that uses Firewire connectivity for use in a music local area network. Initially, connection from device to device will be the thrust of mLAN, eventually larger configurations will be possible. New gear, gear that is designed from the ground up to utilize mLAN is due to start rolling out over the next couple of months and years and this will only get more and more exciting, and the possibilities will only increase exponentially as time goes on.

### Master Effects

The Master Effects are "post" everything but the Master EQ. So they are applied to the overall System signal (stereo). These are 8 effect algorithms that you will also find in the Dual Insertion Effects. If you want to apply them to a single sound, you can create a Voice and find the algorithm within the 116 Dual Insertion Effects.

These are:

- Control Delay2 (stereo)
- LO-FI
- V-Distortion
- Isolator
- Dynamic Filter
- Slice
- Ring Modulator

- Multi-Band Compressor1

These are typically called "DJ"-type effects, for lack of a better term, because like a DJ would, they are applied to the entire recording. DJ's are either playing back a record or CD that is a finished mix. So the effects that they add are always *post*, they cannot put a Dynamic Filter on just the snare drum, if you get my meaning, so "DJ-style effects". These Effects are applied to the entire SYSTEM signal. Don't be afraid to use your imagination with these Master Effects – they are radical. Things like putting a Control Delay on the final hit of the song so that it repeats and fades...or using a frequency Isolator to roll out all the bass for a section of a song, then bringing it back in for dynamic impact...or wacky panning effects with the Slice algorithm where you can pan signal left and right in tempo with the groove. Also on the normal side, you are given a powerful Multi-band Compressor for pumping up the frequency bands of the final mix. Awesome tools...experiment!!!

### Master EQ

Although not technically an effect (EQ is an essential utility for any mixer), the Master EQ is the last process the signal goes through prior to the outputs.

In Voice mode, the Master EQ is setup and is global for the mode (applies to all Voices). While in Voice mode:

- Press UTILITY
- Press F3 VOICE
- Press SF1 MEQ

Here you find the full 5-band parametric EQ. Parametric means you can select the Frequency, the Gain and the Q (or width of the bands). Within each VOICE you will find the MEQ OFS or Master EQ Offset. This allows you to add to or subtract from the overall global setting made in Utility on a per Voice basis. The MEQ OFS (offset) is available via the KNOB CONTROL FUNCTIONS for the two lowest and two highest bands for quick tweaks.

In PERFORMANCE mode or in Song/Pattern MIXING modes you can setup the Master EQ on a per program basis

- Press EDIT
- Press COMMON
- Press F2 OUT/MEF
- Press SF2 MEQ

There is also an MEQ OFS (offset) available via the KNOB CONTROL FUNCTIONS for the two lowest and two highest bands for quick tweaks.



**Audio In Options**

The potential for routing external devices through the effects and EQ of the Motif ES will expand when the mLAN16E is added to the synthesizer. Out of the box you have a stereo analog input – which is used for live signal or for sampling; with an mLAN16E you add an additional 4 pair of inputs. There will be more details about the mLAN16E in a future Power User installment. Your Motif ES is about to get a lot more powerful!

Phil Clendeninn  
Senior Product Specialist  
Technology Products  
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