

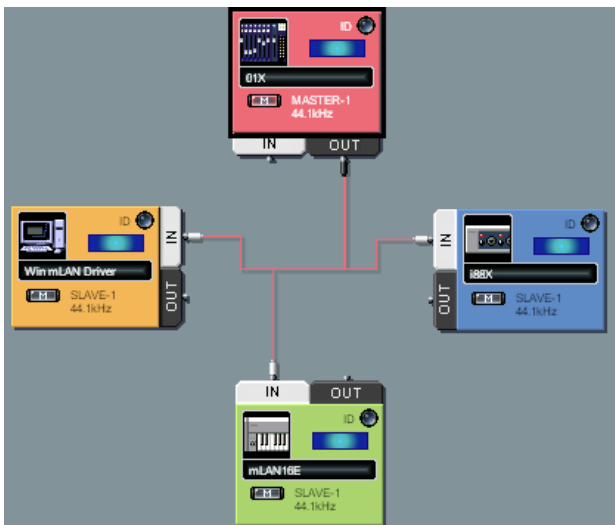


mLAN System Setup

A Getting Started Power User Guide

(Windows)

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mLAN System: Music Local Area Network

This is an example setup for education purposes and by no means is the only configuration. For this article our example mLAN system:

- **Motif ES** with **mLAN16E** installed
- **i88X** – high-quality mLAN I/O expander
- **O1X** – moving-fader mLAN digital mixer
- **Motif Rack** (as our non-mLAN module)
- Pair of **MSP5** monitors
- Windows XP Computer (Sonar, CubaseSL/SX, SQ01)
- Multi-Part Editor for Motif ES
- Multi-Part Editor for Motif Rack
- Graphic Patchbay Software
- Studio Manager Software
- VST Plug-ins: Pitch Fix, Vocal Rack, Final Master, (O1X Channel Module) – included with O1X
- High quality microphone (not shown)

Four 1/4" cables (2 for the Monitor Outs of the O1X to the MSP5s, 2 for the analog outs of the Motif Rack); you will need 2 MIDI cables (in/out of the Motif Rack to the O1X). Connect these in/out of MIDI "B" on the back of the O1X.

Three Firewire cables (one comes with the i88X, another with the O1X) you will need a third for the mLAN16E. Connect the computer to the O1X, the O1X to the mLAN16E, the mLAN16E to the i88X. The units can be connected in any order, by the way, but the point is it is just a "daisy chain". The firewire connections simply need to go from one device to another. The order is insignificant. When you see two Firewire Ports on a product (like on the O1X, mLAN16E, and i88X) these are not IN and OUT. Each single Port is *both* IN and OUT. The order will not matter because all routing within the network is done digitally with the "Graphic Patchbay".

The **Motif ES** should be set as follows:

- Press UTILITY

- Press F4 CTL ASN
- Press SF4 REMOTE
- Set Mode A = **OFF** = Port **4** (not used in this setup – because we will be using the O1X to remote control the digital audio workstation sequencer)
- Set Mode B = **GENERAL** = Port **3** (the Motif ES's Port 3 will be used to remote control the Motif Rack)
- Press ENTER to make settings
- Press F5 MIDI
- Press SF2 SWITCH
- Set the Local Ctrl = **OFF***
- Press SF4 OTHER
- Set MIDI IN/OUT = **mLAN**
- Set the Thru Port = **2** (This will make the MIDI OUT jack of the Motif ES available for routing tracks to yet another module or synthesizer)
- Press STORE to lock in settings

*In this setup with Local Control OFF you would typically route signal back to the selected tone generator via track assignment in your sequencing software.

The **Motif Rack** should be set as follows:

- Press UTILITY
- PAGE to MIDI screen
- Cursor down to MIDI IN/OUT = **MIDI** (The Motif Rack will be connected to the MIDI In and Out of the O1X...In this setup we will use MIDI-B. Connect the MIDI Out of the Rack to MIDI-B IN on the O1X and MIDI-B OUT to the Motif Rack MIDI IN).
- Press MULTI to select Multi mode and write the settings to Flash ROM
- Connect the audio outputs of the Motif Rack to inputs 3 and 4 of the O1X with two 1/4" cables.
- Audio for the Motif ES will be handled by mLAN.

The **O1X** should be set as follows:

- Press UTILITY to view the UTILITY SETUP MENU
- Press Knob 1 REMOTE – select your desired software; press Knob 8 Yes to lock it in

We will discuss the setup of the Wordclock Master a bit later.

Getting Started

Make sure you have the latest version driver

You will need to have installed:

- The mLAN Driver (this will install mLAN Manager, Auto Connector and the Graphic Patchbay)
- Studio Manager; VST Plug-ins: Pitch Fix, Vocal Rack, Final Master, (O1X Channel Module)
- Multi-Part Editor for Motif Rack (on the mLAN CDROM)
- Multi-Part Editor for Motif ES (on the Motif ES Tools CDROM)

ACTIVATE the mLAN Driver

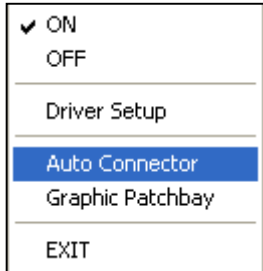
To activate the mLAN driver you can right click on the mLAN Manager icon in the computer's System Tray - Select ON.

Alternatively, you can use the Windows launch routine.

- To start the **mLAN Driver**:
Press START> mLAN TOOLS> mLAN Start

It will take a few seconds to launch.

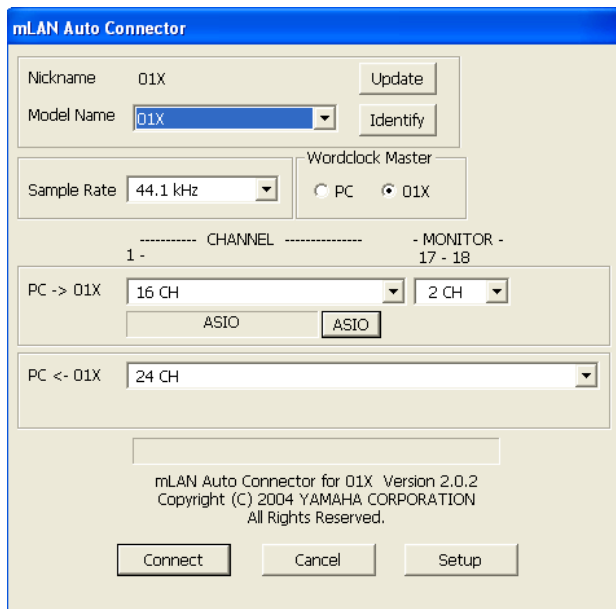
AUTO CONNECTOR



AUTO CONNECTOR is used when you are using a single connected device - in a scenario where you are using just an 01X <-> computer, for example. We will open it here just because we can learn some interesting things from it.

Right Click on the mLAN Manager icon in the System Tray and select "AUTO CONNECTOR". Making the initial settings:

- Model Name **01X**
- Sampling Rate **44.1kHz**
- Master Clock = **01X** * *(see Troubleshooting for details)
- PC -> 01X **16 channels** + **2 CH** Monitor (17&18)
Please note: [There are 16 channels coming from the computer back to the 01X via the mLAN cable plus the 17th and 18th arrive direct to the STEREO monitor bus.]
- ASIO **ASIO**
- PC <- 01X **24 channels** [There are 24 channels going from the 01X to the computer DIRECT OUT]



- Click **CONNECT**

The computer will take a few more seconds to negotiate the setup. If you get a warning that says activate WORDCLOCK on the 01X - do so. This may happen the first time an 01X is powered

up within a network. Or this may happen if the 01X was last running on a different clock setting. If this happens follow these simple steps:
On the front panel of the **01X** –

- Press UTILITY
- Press Knob 3 W.CLK
- Press Knob 1 ENABLE
- Press Knob 8 YES
- If necessary, DISPLAY DOWN to page 2/2 and set the Clock to "INTERNAL" and "44.1kHz"
- Press [SHIFT] + [BACK UP]
- Click OK on the computer.

This will configure the 01X as the "Master Clock" running at 44.1kHz.

LAUNCH the DIGITAL PATCHBAY

You would use the DIGITAL PATCHBAY in a system setup where more than one mLAN device is being connected.

- Right click on the mLAN Manager icon and select the Graphic Patchbay



You may not be familiar with what a patchbay is or does in an audio studio. In the analog world, literally the input and output jacks of every piece of gear is connected to the patch points in the patchbay – this makes it convenient to re-patch when necessary to accommodate a specific goal. Usually filled with spaghetti-like cabling, routing *this* input to *that* output and *that* output to *this* input. In the analog world there was no way to memorize the connections made during a session except by attempting to write it down on paper. In the digital domain the Digital Patchbay will allow you not only to memorize for instant recall but it allows you to connect gear within the network without ever having to pull a physical cable. You define the connections between NODES (devices) here in this patchbay.

The Patchbay is not only educational but on a fundamental level is at the core of what makes mLAN the powerful innovation that it is. There is an icon for each mLAN device in the network -

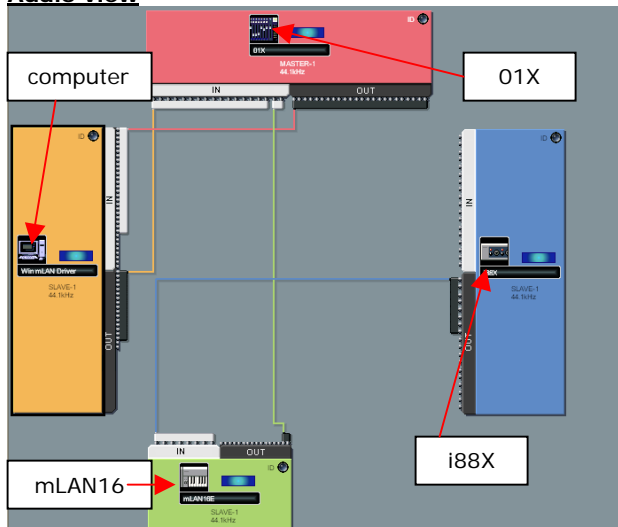
Place the cursor arrow on the icon itself - click on it and see the NODE INFORMATION dialog box for that item. Each device in the Network is technically called a 'Node'. There are three main graphic views you should become familiar with: AUDIO, MIDI, and WORDCLOCK. There are icons for each one on the tool bar.



How connections are made and broken

- Select the AUDIO graphic view...you can click on the Audio icon in the toolbar or you can use your QWERTY keyboard: CTRL + 7

Audio view



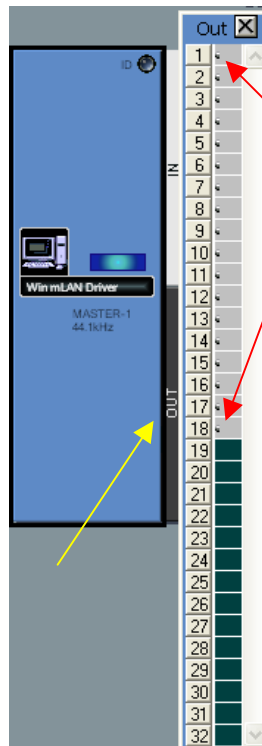
Breaking a connection: Place the cursor arrow on the connecting line that runs from the 01X to the computer, it will turn into cross hairs... Right Click and select DISCONNECT ALL or any one of the connections as necessary. If you break a single connection the graphic will adjust and redraw the connections as necessary. Alternatively, when you need to disconnect all – you can click on it and press DELETE.

- Break the connection that runs from the computer to the 01X.

Making a connection: Connections are made by routing signal OUTPUT to INPUT (follow the signal flow). Click on the word OUT on the COMPUTER node (shown below by the yellow arrow) – a box showing the potential OUTS will open. There are 18 OUTPUTS from the computer. You can select a single connector by clicking in the empty space to the right of the number – a small jack will appear.

Let's connect 18 outputs to 18 inputs in one operation by using the SHIFT button on your

QWERTY:



- Click on the word "OUT" of the NODE you are sending from (yellow arrow at left) – the computer. The long OUT cable list opens
- Click on the empty space to the right of the first cable jack to be routed. (red arrow above)
- Hold SHIFT and click on the last cable to be routed.

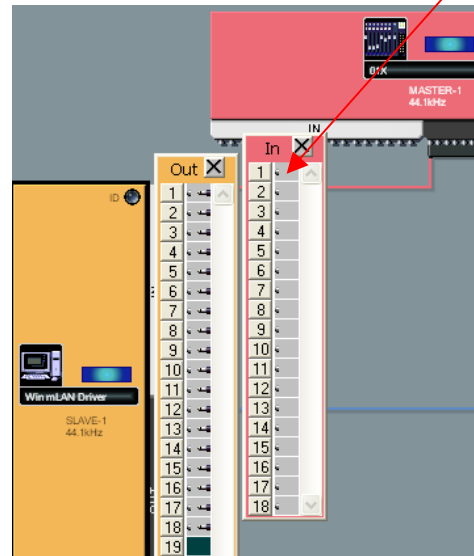
This will prep 18 Cables to be plugged in. Always route OUTPUT to INPUT. The graphic will show 18 cables ready to be connected.

Next we will connect them: Click on the word IN on the 01X node. The 18 possible inputs will be shown. If you click on the empty space to the right of cable 1, the Graphic Patchbay will make a connection. It is only necessary to select a single input – we have selected 18

outputs so it will automatically look for 18 inputs in to which to connect our selection.

- Simply click next to IN number 1 to make the 18 connections – shown below:

Click here in the space



Although only a single line appears to connect the OUT of the computer to the IN of the 01X – it contains all eighteen audio connectors (much like

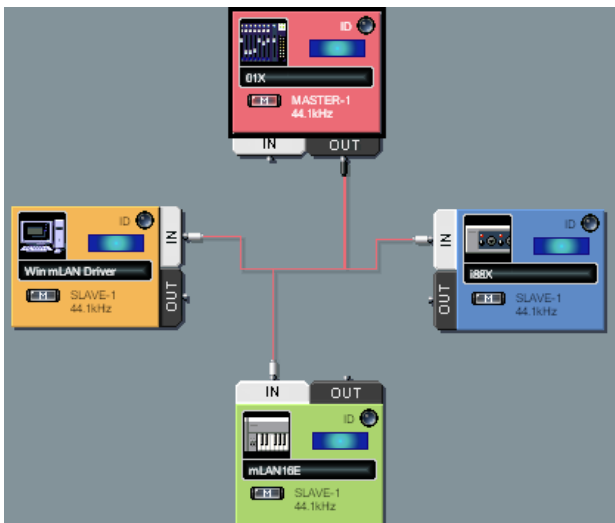
an audio “snake”). You can make and break individual connections or entire selections as necessary. Spend some time making group connections and single connections. The skill of using the patchbay is an important one in any studio environment and is extremely powerful in the world of mLAN. You can configure almost anything you can dream up. It is basic signal routing but on a network scale. The Graphic Patchbay makes routing a much easier task.

Relate the connections to regular analog cables. We will load Voices, recall sounds by their name and control our entire studio via mLAN. Notice also that all of this will be accomplished prior to opening the Digital Audio Workstation software sequencer. Once you understand how the Yamaha components in this particular setup are interacting it will, theoretically, make clearer how to route signal to tracks of the software sequencer and return them back to the hardware. The applications (Graphic Patchbay, Studio Manager, and the Multi-Part Editors) are capable of running in the background of your selected sequencer software...and eventually will be able to be stored right within your software. Yamaha, Steinberg and other manufacturers are currently working on a new protocol “Studio Connections” – that will make just such total integration possible – and give you real “total recall”.

Setting up a Network

When you are going to start configuring your Graphic Patchbay it is a good idea to establish the Wordclock connections first. This will eliminate clocking errors before you connect outputs to inputs. Next you will want to make your audio connections and finally your MIDI connections.

• **Network Wordclock Connections**

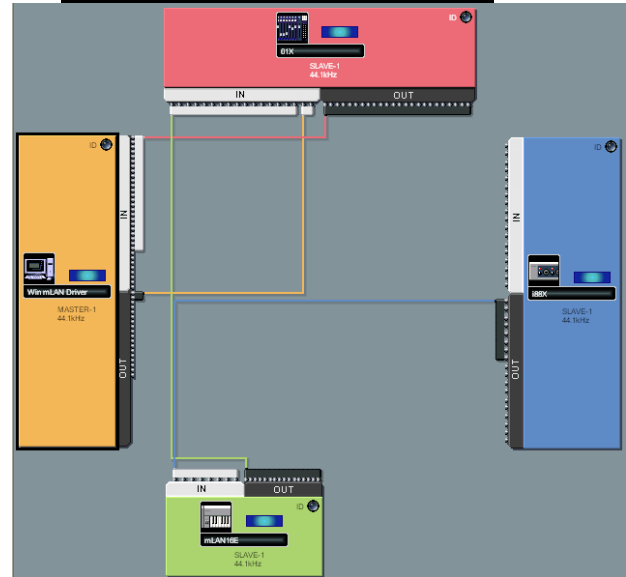


In our setup the 01X is the Master clock. In the diagram above you see the 01X at the top center of the screen shot. It is highlighted (black line outlines the node). You can highlight a node by clicking any where in the colored background within it. To set it as the Master Wordclock:

- Click on the “m” or Master box within it
- Click on the “1 Mstr” icon on the toolbar



• **Network AUDIO Connections**



In this particular example we will be setting up as if we are preparing to do a tracking session: Recording the Motif ES and the Rack through the 01X - sending audio and/or MIDI data to the computer.

Setup the following Audio view connections:

OUT [channels]→ IN [channels]

- 01X Audio Out [1-24]→ Computer Audio In [1-24]
- Computer Audio Out [1-2]→ 01X Audio In [17-18]
- mLAN16E Audio Out [1-16]→ 01X Audio In [1-16]
- i88X Audio Out [1-8]→ mLAN16E Audio In [1-8]
- (Shown above)

Audio connections in this setup will allow the 24 mLAN outputs of the 01X to arrive at the Computer. This will allow you to connect any channel of the 01X to your digital audio workstation’s inputs. These 24 are made up of the 8 AD Inputs plus the 16-mLAN channels. How many tracks you are able to record simultaneously will depend on your software and your computer’s capability.

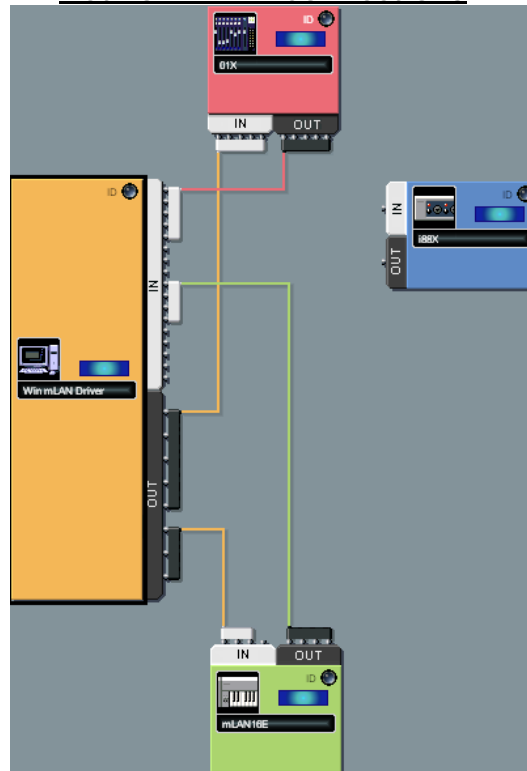
There are 18 outputs from the Computer back to the 01X. These are subdivided into 16 bus channels plus monitor channels 17&18 - which will be used for stereo monitoring. How you take advantage of the 16 bus returns to the 01X will depend on exactly what you are attempting to do. In many cases a stereo return will be sufficient. However, in a situation where you are mixing down you might find it convenient to combine tracks in your DAW software into more convenient groupings (see example at the end of the article). For example, you may have 6 or 8 tracks of backing vocals that you want to bus down to a stereo pair. Or you might have 8 drum tracks that you want to combine down to kick-snare-left and right. You can utilize these 16 channel inputs as you see fit.

There are 16 audio outs from the Motif ES going to the 01X. These are divided 14+2 – fourteen individual outputs (assignable in the MIXING area of the Motif ES: as1 ~ as14) plus the L&R stereo output. L&R are the 15th & 16th outputs.

In the AUDIO routing diagram we have the i88X with 8 outputs going to the inputs of the mLAN16E. This can bring in additional analog audio inputs on to the network and/or it can bring in SPDIF and/or ADAT inputs. This means it is a powerful expansion tool. When you are putting together a studio you must be prepared for all kinds of inputs and all kinds of scenarios. SPDIF inputs are digital stereo inputs – this can bring in a mix from a hardware DAW like the AW16G or AW4416 running in sync with your computer. The ADAT input can bring in 8 digital channels via a myriad of gear that utilizes the ADAT light pipe standard. The i88X also features 8 analog outputs – these could be used to feed elaborate headphone mix setups as necessary for your session. Having an i88X as a weapon in your arsenal will mean you have a Swiss-Army knife type device that can be more than just a world-class pair of mic preamps and 6 line inputs.

Note on AUDIO CONNECTIONS: Typically at the start of a session you will plan ahead and target the goal to be accomplished. This is when you will be working with the Audio connections in the Graphic Patchbay. Once you have “cabled” the hardware, you can open the software and connect the tracks of your Digital Audio Workstation’s sequencer to the inputs and outputs you have made available. Since these setups can be named and stored on your computer, you can easily create setups that you use often as Templates for quick access. For example, you might create a Template for “tracking”, another for “mixing down”, and another for “live performance” or for “sampling” and so on. Use your imagination. The Digital Patchbay is used to setup connections between the hardware items in your network.

• **Network MIDI Connections**



Setup the following MIDI view connections:

01X MIDI OUT:

- Port 1 > 1 DAW Sequencer Remote
- Port 2 > 2 MIDI A (back panel of 01X)
- Port 3 > 3 MIDI B (back panel of 01X)
- Port 4 > 4 Studio Manager
- Port 5 > 5 Remote for Motif ES Editor

mLAN16E MIDI OUT:

- Port 1 > computer’s Port 9: Motif ES (Controller)
- Port 2 > computer’s Port 10 PLG Boards or ext
- Port 3 > computer’s Port 11 Multi-Part (Rack)
- Port 4 > not used in this particular setup

Computer MIDI OUT:

- Port 1 > 01X: DAW Remote
- Port 2 > 01X: MIDI A (back panel of 01X)
- Port 3 > 01X: MIDI B (back panel of 01X)
- Port 4 > 01X: Studio Manager
- Port 5 > 01X: Remote Motif ES Editor
- Port 6 > mLAN16E: Internal Motif ES (TG)
- Port 7 > mLAN16E: PLG150 Boards
- Port 8 > mLAN16E: Remote for Motif Rack

01X MIDI IN:

- Port 1 < Computer: DAW Remote
- Port 2 < Computer: MIDI A (back panel of 01X)
- Port 3 < Computer: MIDI B (back panel of 01X)
- Port 4 < Studio Manager
- Port 5 < Remote for Motif ES Editor

mLAN16E MIDI IN:

- Port 1 < Computer 9 Internal Motif ES
- Port 2 < Computer 10 PLG150 Boards or external device
- Port 3 < Computer 11 Remote for Motif Rack

Computer MIDI IN:

- Port 1 < 01X: DAW Remote
- Port 2 < 01X: MIDI A (back panel of 01X)
- Port 3 < 01X: MIDI B (back panel of 01X)
- Port 4 < 01X: Studio Manager
- Port 5 < 01X: Remote Motif ES Editor
- Port 6 (not available)
- Port 7 (not available)
- Port 8 (not available)
- Port 9 < mLAN16E: Motif ES (Controller)
- Port 10 < mLAN16E: PLG150 Boards or external device
- Port 11 < mLAN16E: Remote for Motif Rack
- Port 12 < mLAN16E: not used in this setup example

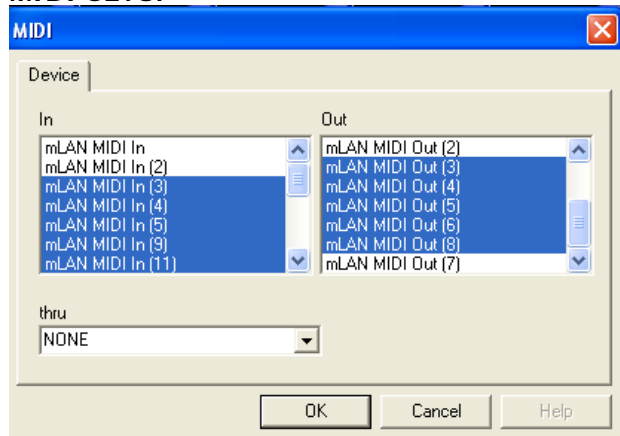
What we are doing here is setting up so that we can (via MIDI) ...

- 1) ...remote control the 01X via Studio Manager software. "Studio Manager" can be thought of as mirror of the internal digital mixer.
- 2) ...remote control the Digital Audio Workstation (DAW) sequencer from the front panel of the 01X (when the 01X's red Remote is lit) – there are an unlimited number of control channels in Remote mode in banks of 8 channels.
- 3) ...remote control the Motif ES via the "Multi-Part Editor for Motif ES" from the 01X (when the red Remote is flashing [SHIFT] + [REMOTE]). Motif ES parameters will be shown in the 01X screen.
- 4) ...remote control the Motif Rack via Multi-Part Editor for Motif Rack from the Motif ES front panel – this will be using the Motif ES's ability to act as a general remote control device.

Studio Manager: Mirror image of the Internal 01X

- Open the STUDIO MANAGER program.
- Find the MIDI SETUP box ("floats" outside the main program). Click on it to see MIDI Setup.

MIDI SETUP



Above is a screen shot of the MIDI SETUP dialog box.

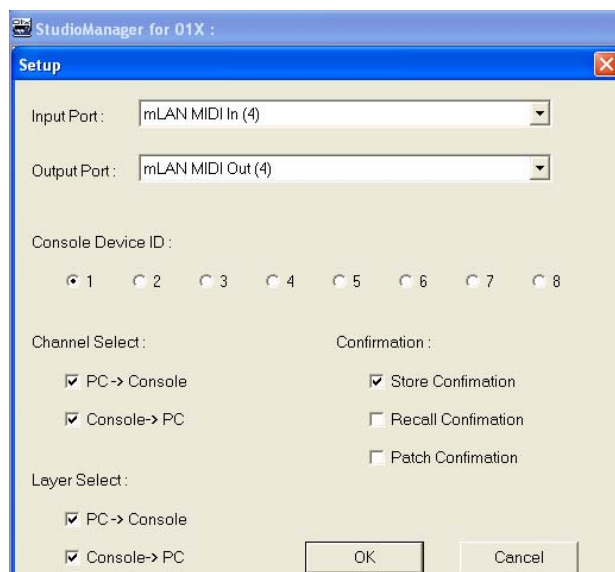
We will be using the following MIDI IN and OUT devices:

- mLAN MIDI In (3) Motif Rack to 01X's MIDI-B
- mLAN MIDI In (4) Studio Manager
- mLAN MIDI In (5) Remote Motif ES Editor
- mLAN MIDI In (9) Motif ES Controller (kbd) to Computer
- mLAN MIDI In (11) Remote Motif Rack Editor

- mLAN MIDI Out (3) Motif Rack from 01X's MIDI-B
- mLAN MIDI Out (4) Studio Manager
- mLAN MIDI Out (5) Remote Motif ES Editor
- mLAN MIDI Out (6) Motif ES (TG)
- mLAN MIDI Out (8) Remote Motif Rack Editor

STUDIO MANAGER System Setup

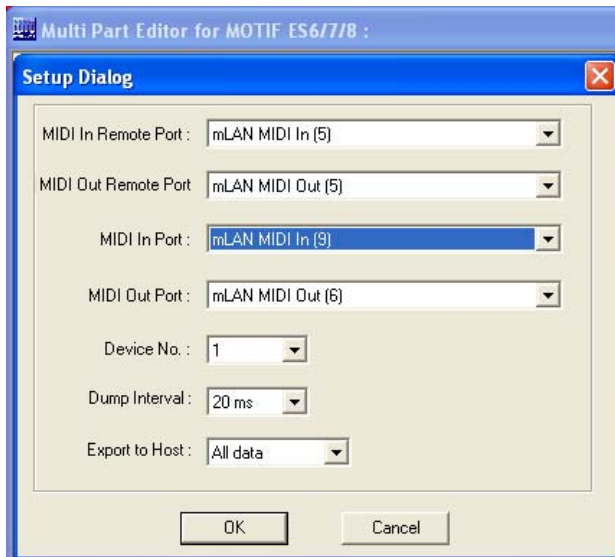
- Under the FILE menu find SYSTEM SETUP.



Studio Manager SYSTEM SETUP shown above – remote control is on mLAN PORT 4. The function of Studio Manager is to be a **bi-directional** and **simultaneous** control over the internal 01X digital mixer. This will become clearer as you begin to work. When you make a change on the front panel of the 01X it will be immediately reflected on the Studio Manager software and vice versa. Studio Manager will also save all your Libraries: Input/Output Patch library, EQ library, Dynamics library and Effects library. The beauty of Studio Manager is it is a representation of exactly what you are doing on the hardware 01X. Studio Manager files (.x1x) will contain not only a snapshot of the initial condition of the 01X for each session – it can contain all the Library files. That is, all your Effect setups, EQ library, Dynamic Processor library, Scenes and Input/Output Patch library. [See the Power User on "Studio Manager" for more details].

Multi Part Editor for Motif ES: MIDI Setup

- Open the “Multi-Part Editor for Motif ES 6/7/8”
- On the toolbar of the Editor you will find SETUP



In the MIDI Setup for the Multi-Part Editor for Motif ES 6/7/8, Remote Control parameters of the Motif ES will be shown in the screen of the 01X (when you press [SHIFT] + [REMOTE]; Red LED flashes). You will be able to select Voices and work the Motif ES' EQ, sends, volumes, pan, etc., of the current MIX. While in this GENERAL REMOTE mode you can use the DISPLAY UP and DISPLAY DOWN arrows to change to the various Motif ES Remote screens. When you make a change here on the 01X it will be reflected in the Multi-Part Editor and in the Motif ES MIX.

Port 5 is used as both in and out of the 01X – this is the connection between the 01X and the computer concerning General Remote (Motif ES Editor); While regular MIDI communication to and from the computer sequencer is accomplished on IN (9) and OUT (6) – this is communication between the computer and the Motif ES.

Port Explanation:

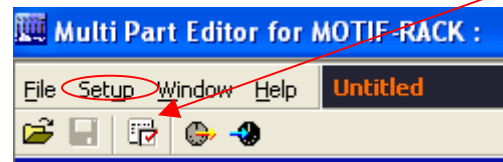
- You may be puzzled here as to why Port 9 and Port 6 – let's clear this up... The Motif ES has four possible Ports - Port 1, 2, 3 and 4. **Port 1** is for the **internal Motif ES** (the Motif ES keyboard sending data; the tone generator receiving data)/ Port 2 could be for any PLG150 Boards or for external modules via the back panel MIDI OUT jack/ Port 3 would be the General Remote port/ and Port 4 could be available as a second control surface to your DAW mixer. So in this scenario, the computer 'sees' the Motif ES coming in on its Ports 9, 10, 11 and 12. So the *first* port IN to the computer from the Motif ES is Port 9 (IN). The computer is sending back out to the Motif ES on its 6th,

7th and 8th Ports. So the *first* port out is Port 6 (OUT). That's why Ports 9 IN and 6 OUT.

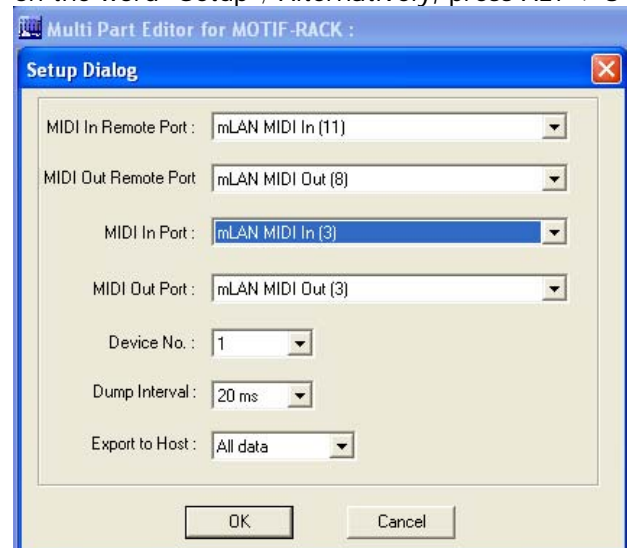
This double handshake communication is at the heart of the interface: you have the 01X and Computer communicating **and** you have the Computer and the Motif ES communicating. Therefore, when you wish to make a MIDI recording using the Motif ES keyboard sending **to** the computer sequencer, you would set the track to “IN Port 9” and “OUT Port 6”. When you are selecting sounds for the Motif ES you can use the 01X front panel or the Multi-Part Editor to dial up sounds. This type of interface will be very useful in studio environments where the synthesizer may not be conveniently located ...picture a facility with multiple rooms networked via mLAN – you can, as we will see, load Voice data, select sounds and completely control and setup your Motif ES from the console of the 01X. True 21st century control!

Multi Part Editor for Motif Rack: MIDI Setup

- Open the Multi-Part Editor for Motif Rack
- On the toolbar of the Editor you will find SETUP



You can either use the Setup icon (arrow) or click on the word “Setup”; Alternatively, press ALT + U



Shown above is the MIDI Setup for the Motif Rack's Multi-Part Editor. The REMOTE Control Ports are IN 11 and OUT 8 (when thinking about these Ports remember this is what the computer is 'seeing' – it is seeing information coming IN on its PORT 11 and is sending this data out of its PORT

8) – this allows the Motif ES’s front panel to control the Motif Rack.

Port Explanation:

- You may be puzzled here as to why Port 11 and Port 8 – If it were a simpler setup with just the Motif ES controlling the Motif Rack Editor – the Motif ES has 4 possible Ports 1, 2, 3 and 4. Port 1 is for the internal Motif ES (the Kbd sending/TG receiving)/ Port 2 could be for any PLG150 Boards or external devices/ **Port 3** would be the **General Remote** port/ and Port 4 would be available to control an external DAW mixer. So in this simpler setup Port 3 out of the Motif ES and Port 3 back to the Motif ES would be used to remote control the Rack. The computer sees the Motif ES coming in on its Ports 9, 10, 11 and 12. So the *third* port is 11 (IN). The computer is sending back out to the Motif ES on its 6, 7 and 8. So the *third* port out is 8. That’s why Ports 11 and 8.

You will be able to control the Motif Rack when REMOTE (green) mode is selected on the Motif ES. This allows you to recall Voices, edit volumes, pan position, EQ, etc., the current MIX and see all the pertinent parameters in the screen of the Motif ES. The MIDI IN and OUT Ports are set to Port 3 (Port 3 is MIDI-B on the back panel of the 01X). Any track assigned in your computer sequencer to IN PORT 9 (comes from the Motif ES keyboard) **and** OUT PORT 3 will playback on the Motif Rack.

It should be mentioned here that MIDI A, of course, is available for MIDI communication with yet another MIDI module/synth and would be addressed as PORT 2 in this particular setup.

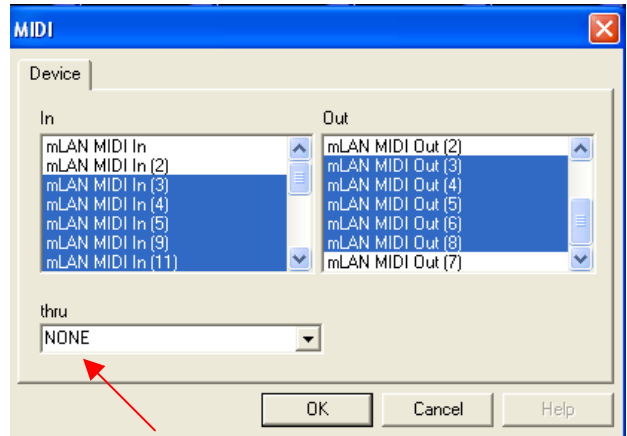
Other MIDI Setup Notes:

Each track of the Digital Audio Workstation software will be setup to receive (IN) MIDI data and to *echo back* (send OUT) the data to the selected tone engine. For example, if you wanted to play Part 14 of the Motif Rack Multi, you would need to set your software sequencer to receive MIDI input from the Motif ES’s keyboard controller - that would be coming into the computer via **PORT 9**. And you would need to send the signal OUT by assigning the track to send OUT to **PORT 3/ MIDI channel 14**. Each software sequencer will allow you to select a PORT and a MIDI channel on a per track basis. Spend some time on routing and getting comfortable with this networking of data. It is just MIDI data and MIDI routing – but is at the core of getting the ‘Network’ to work for you.

A note on working with **Local Control OFF**: this is a very typical method to work when working in a setup with multiple MIDI modules and a computer sequencer. The sequencer “echoes back”

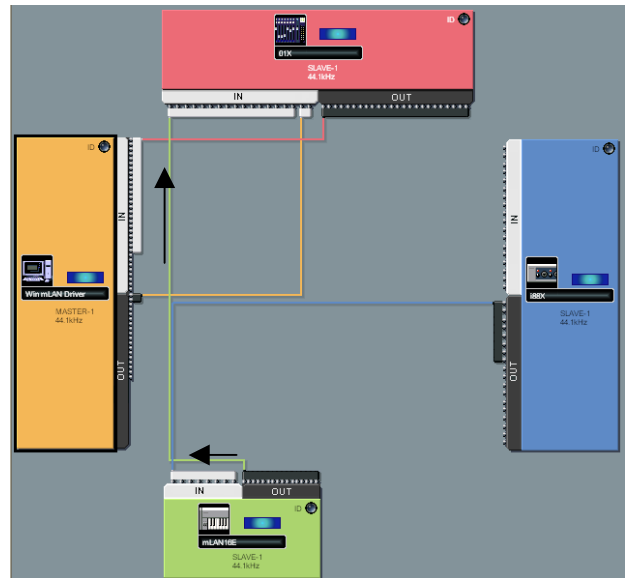
(sometimes called “Thru” or “Soft Thru”) the signal and targets a specific module on a per track basis.

The MIDI THRU Port parameter in the device setup should remain at “NONE”. The software sequencer will handle all MIDI Channel re-routing. If you find that pressing buttons is triggering MIDI note-on events, this “error” is usually caused by a MIDI loop. If this happens go over your setup carefully to track down the problem.



AUDIO Setup between mLAN16E and 01X

Audio setups should be changed as necessary to accomplish what you want to accomplish at the time. One setup will not necessarily suffice for every task.



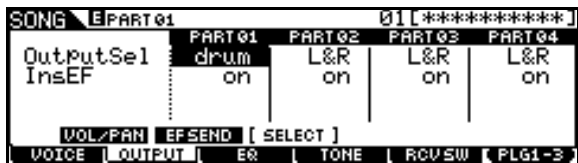
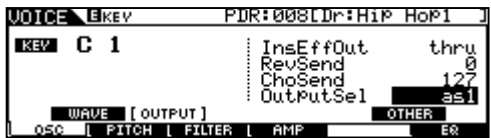
In the above setup we are set to show how the **mLAN16E** can be routed to the 01X on 16 buses (14 + 2). Notice that to follow signal flow the output signal is always the same color as the

node. In the screen shot above the mLAN16E node is lime green and so is its output snake. It is a bus carrying 16 cables. What is a bus? If you need to get across town – you might get on the bus – a bus moves one or more things from one place to another. The idea is it can carry more than just 1 person, and here it can carry more than just 1 signal. Following OUT to IN...the mLAN16E is set to send 16 buses to the 01X. These will arrive as mLAN 1 ~ mLAN16. It is important to know that the signal is divided like this: assignable 1-14 and L&R (15-16). Output assignment is handled in the Motif ES in MIXING mode:

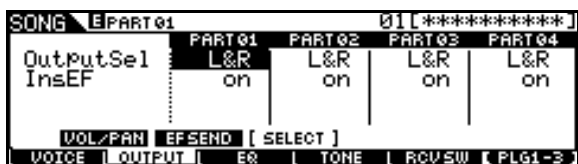
- Press EDIT
- Touch the Track to be assigned
- Press F2 OUTPUT
- Press SF3 SELECT

Assignable 1-14 – Any PART while in “MIXING” mode on the Motif ES set to Output Select “as1” through “as14” will be routed out via mLAN as an individual output. It will arrive in the 01X on the corresponding mLAN Input. The assignable outputs from the Motif ES can be setup as individuals or as ODD/EVEN pairs. You also will see an Output Select setting for “DRUM” – (when a drum kit has been edited in Voice mode, individual drum sounds can be routed to any of the assignable outputs, as necessary). In the next screen shot, a Kick drum on Key C1 is being routed to ‘as1’. When this Drum kit is saved as a

USER Kit and then placed in a MIXING PART, you can select “Drum” as the OUTPUT SELECT setting. This will allow the assignments made in Voice mode to be respected in the MIX. Very cool...



L&R (Stereo Out) 15&16 – Any Motif ES PART set to Output Select “L&R” (the normal default) will arrive at the 01X via mLAN Inputs 15&16 (in this setup).



The Motif ES *assignable outputs* are the equivalent to individual outputs. The stereo L&R mix is sent on mLAN audio channels 15 and 16. At first you may question why not **16** individual outputs instead of 14. But you do not send everything via an individual output...of course you need the stereo output as well. The stereo output is also referred to as the SYSTEM OUTPUT. The System Effects (Reverb and Chorus) will be applied as normal to the L&R outputs. Any Part set to an assignable output will not have the System Effects, obviously. However, if you have applied the Dual Insertion Effect to a Part (and its INSERTION SWITCH is activated), it will accompany the signal assigned to the individual output.

So there are 14 individual outputs plus the stereo output that all travel down the single mLAN 'patch' cable that connects the mLAN16E to the 01X in the Graphic Patchbay.

Summary: All of the MIDI and Audio setup data we create here can be saved in a nice, neat Graphic Patchbay file. Other setups will concentrate on mixdown – as mentioned, this particular setup is for when you are *recording tracks* for your Motif ES and Motif Rack. This is a **tracking setup**. Later you can setup the Graphic Patchbay setup for when you have tracks recorded and wish to send them back through the 01X for mixdown. The idea (and its very important) is to be aware that the patchbay is a “living” thing- you do not have just one setup that works for everything. You must become comfortable with it because you will be patching when you decide what you are going to do at the current session. The more you know and the more comfortable you are with the Graphic Patchbay the more you will be able to be *creative* in the network. Remember when you start a particular session is when you will be configuring your patchbay.

There are 24 OUTPUTS from the 01X that connect to the computer. This means the 8 analog inputs and the 16-mLAN inputs can be simultaneously sent **directly** to the computer in this particular setup. Making ideal for both transferring MIDI tracks to the computer, and for recording audio from the synthesizers or from the 8 AD inputs.

The computer is set to send OUT its mLAN 1&2 into the 01X to inputs mLAN 17&18 (Monitor). mLAN 17&18 are returned directly to the 01X Monitor and is sufficient for you to playback a stereo mix from the computer to the 01X. Mentally here you can consider the computer outputs as those coming from the DAW software of choice. All you need to know is the concept – if

I send tracks out to mLAN 1&2 of the software, I can monitor them on the 01X. (Substitute the "software" for "computer". You could in other setups route the return to any mLAN channels.

Eventually, in a mixdown scenario you would naturally return more channels to the 01X. But here we are only monitoring the signal in stereo. Connecting outputs from the hardware to tracks of the digital audio workstation software can now be understood. The software (depending on which one) will see the inputs coming from the 01X as 24 inputs. It will refer to them as mLAN inputs 1 through mLAN inputs 24. Don't let this throw you. The computer only 'knows' what it can 'see'. In other words, you might be addressing a signal in the 01X on mLAN1 (which is really the 9th channel of the 01X), well... the DAW might refer to this as mLAN(9). When you are routing signal to the DAW via Direct outs (a common situation) where after you EQ and process through the dynamics processor you send the signal "direct" to the DAW. The DAW then naturally sees the AD1 as mLAN1, AD2 as mLAN2, and therefore, the 01X's mLAN1 becomes mLAN9 to the DAW. Not a problem if you understand the routing. Also not a problem because you can name the tracks – and the names will be reflected in the screen of the 01X. This is a good reason to name your tracks – and use a system that works for you to do this. Once you have named the tracks it is easy for you to know what is arriving where.

In our setup the **i88X** has 8 of its potential 18 outputs connected to the 8-mLAN INPUTS of the mLAN16E. The Motif ES can receive 4 stereo pairs of inputs as AUDIO INPUTS – you can monitor and/or send on to the 01X and on to the computer any signal plugged into the i88X.

- Plug a microphone into input 1 of the i88X
- It will arrive in the Motif ES as an AUDIO IN: Press EDIT/ Press COMMON/ Press F5 AUDIO IN/ Use the SF5 button to toggle between AD, mLAN1, mLAN2, mLAN3 and mLAN4. The currently selected AUDIO INPUT will be indicated in the upper left corner of the screen.
- You can monitor it (as it is returned to the L&R outs by default)
- You can assign this to any one of the assignable outputs (as1-as14) – it will arrive in the 01X on that mLAN input.
- You can add effects (these effects will be routed to the monitors, only) – the signal that you send to the DAW will be post 01X EQ, post 01X Dynamics, but pre the EFFECTS – so you can print the track *without* reverb but *with* EQ and a Compressor...this is very cool.

Of course you could use the patchbay to send the i88X input directly to the 01X or directly to the

computer...it is your choice. This is just one particular setup. In this setup you could use the i88X to bring signal into the Motif ES for a high-end sampling session. Part of what you want to do is understand what you have and then start to think about all the possibilities. There is no 'one way' to setup and work. If you have a professional recording console, a multi-track recorder, a patchbay with 50 audio patch cables and a couple of racks full of high quality gear – there are so many ways to make it all work – trying to describe every setup would be impossible...and so it is here – because that is just what you have. The mLAN system opens the possibilities to the *creative* user that never existed before. As you can see from this setup, not all gear has to be mLAN to exist in the network – this is a key point. mLAN is designed to work with gear that connects via standard XLR, ¼" jacks, and 5-pin DIN MIDI jacks.

Why use the Multi-Part Editors instead of the DAW's mixer map or definition list? The typical script list or definition in software sequencers will only memorize the Voice that you used per Part. They do not memorize the entire Motif ES/Motif Rack MIX. The Yamaha Multi-Part Editors will archive all the User Voices currently in the Motif ES/Motif Rack – so you can select even User Voices by name, and it will let you access the entire MIX> Voice, pan, volume, effects, effect sends, insertion effect assignments, note shift, pitch bend range, output assignment, etc., etc. When you recall the Multi-Part Editor for Motif ES 6/7/8 file (.m2e) and the Multi-Part Editor for Motif Rack file (.m1e), it is an archive of what is happening in your Motif ES and Motif Rack, including all the User Voices.

Remote Control: When you want to adjust the Mix of the Motif ES you can use the 01X General Remote function to access the synth.

- Press [SHIFT]+[REMOTE] on the 01X (red flashing Remote)
- DISPLAY UP/DOWN arrows to move between screens

When you want to adjust the Mix of the Motif Rack, you can use the Motif ES General Remote functions to access the synth.

- Press [REMOTE], then [F6]+[REMOTE] to select the MODE B (green) functions.
- Use the Knob Control Function buttons and the [F] and [SF] buttons to navigate between screens

When you wish to control the track (audio and/or MIDI) of your software sequencer of choice you will need to select it for control on. On the 01X:

- Press UTILITY
- Press Knob 1 REMOTE and select the software
- Press REMOTE on the 01X to activate control. Use the Bank [<]/[>] buttons to and the DISPLAY buttons to navigate screens.

Booting up the software DAW

Digital Audio Workstation or DAW for short, are software sequencers that will allow the user to record audio and MIDI to their computer. We have until now, not been interfacing with it. It is important to understand the items separately. Notice we have setup this entire network without the DAW software. mLAN is all about routing of MIDI and AUDIO so that it is convenient and becomes a powerful tool in the arsenal of the home project studio. One of the main things that mLAN brings to the table is HARDWARE ACCELERATED DSP. You can process the signal prior to recording, or post the recording. You now have a clear choice. You can process with EQ and Compression on the way to the recorder, yet add reverb that does not get recorded (for monitoring). It is bringing greater flexibility to the computer-recording environment.

Sonar (PC), Cubase SL/SX (both), Nuendo (both), Digital Performer (Mac) and Logic (Mac) are the principal Digital Audio Workstation software that the mLAN system addresses directly. We are talking about 'Total Integration' – where parameters and functions are specifically controlled by the mLAN hardware. There is no guesswork necessary because parameters and functions are identified in the screens of your controlling products. This kind of integration is beyond most typical control surfaces that only allow a minimum of control. We are talking direct parameter level control. Which includes parameter level control of any VST plugins. AU plugins or instruments you may have within your DAW. That's correct...the parameters and names will show up in your mLAN-controlling product. This means no guesswork about what is controlling what, when.

Troubleshooting:

01X: How to set the Wordclock to 44.1kHz and select it as Master Wordclock:

When making the 01X the Master for Wordclock (there are certain advantages to using it) you can follow these steps:

- Press UTILITY
- Press Knob 3 W.CLK
- Press ENABLE
- Press YES
- Press the DISPLAY Down arrow to select page 2/2
- Press INTERNAL
- Press 44.1kHz

With mLAN Wordclock you have an extremely stable source for digital synchronization (i.e., extremely low jitter). The advantage to using the 01X as the Master Wordclock is that if you decide to boot the system up **without** the computer, you can still pass audio from the Motif ES to the 01X via mLAN. (Try that with a USB based system!). That means you can take the 01X, the Motif w/mLAN16E and the i88X to the gig and leave the computer home...the network will be able to establish and you can work without the computer.

The word on Wordclock: Wordclock is a necessity when you are using more than one digital device in a setup. Basically it allows you to make one of the devices the Master clock – and although all your digital devices may be set to run at 44.1kHz (44,100 cycles per second), 48kHz, 88.2kHz or 96kHz – you need to have them agree on what is a "1" and what is a "0" otherwise you will get these seemingly random clicks and pops (errors). It wasn't 10 years ago that a multiple word clock interface device would have cost you over a thousand dollars. Clocking multiple devices was extremely expensive. Wordclock negotiation is built in to mLAN. Do not confuse Wordclock Synchronization with MIDI clock or other types of *musical* synchronization – word clock is all about the zeros and ones of digital data. The extremely tight wordclock of mLAN is one of the best in the world of professional audio.

01X: How do you lock-in the settings you make for the 01X?

- Press [SHIFT] + [BACK UP]

Motif ES: How do you lock-in the settings you make for the Motif ES?

You can write Motif ES UTILITY mode settings to its battery-backed Flash ROM if you follow these steps:

- Make settings as necessary in UTILITY mode
- Press ENTER if instructed in the screen (like when setting Remote Control functions: F4 CTL ASN/ SF4 REMOTE)
- Press STORE. When any changes are made to UTILITY settings you should follow this by pressing STORE. When you make an ALL (.w7a) file these settings will be backed up. But your UTILITY settings last stored even after power down and will be recalled when you boot up next time.

Working with Digital Audio Workstations

Once you have started the mLAN Driver, you will be preparing the system to work with ASIO drivers. If you open a sequence that was previously stored with a different audio setup then you will not be successful. The software will need

to be set to expect to receive via ASIO. What is meant here is the following...if you setup the mLAN Driver as instructed here, then open an audio project that was created using "WDM/KS" as the audio device – it is possible that the computer will crash. Or at least you will need to make new settings to the software and then you will have to restart the DAW.

What to do with a Graphic Patchbay "ERROR" that will not go away:

From time to time you will discover you have a red "ERROR" illuminated on one or more of the Node devices in the Graphic Patchbay (by the way: make it a habit to check all three graphic views: Audio, MIDI and Wordclock – because the error could be in one view and not the others).

First thing to try is the UPDATE icon (it is the next to the last of the toolbar icons). This has the Graphic Patchbay go and re-scan the mLAN devices. You will see a progress bar but give the system a few seconds after it disappears to sort itself out. Remember mLAN is working on the kernel level of your computer. Be patient – sometimes it can take several seconds for the system to sort itself out. Give it time and see if the error disappears on it own.

If there is still no resolution to the error, you can click on the red error box and have the error identified. Sometimes it may appear that you have done everything correctly and still you get an error. In this case, shut down the software (saving if necessary), shut down the Editors, Graphic Patchbay and all other programs running. Then turn OFF the mLAN Driver and reboot the computer. Sometimes this is the best strategy and will most often solve that curious, persistent "error".

Final Word: The examples given in this article are for the purpose of learning about the system and by no means are meant to suggest you have to work like this. mLAN is a very flexible system. Your understanding of the tools will dictate the way that you will work. Enjoy!

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