

The Yamaha Digital Mixing Console

What's the difference between a console and a mixer? It's really about how they are integrated into the studio. Any gadget that will combine signals is a mixer, and they are very useful for synthesis, PA and general audio operations¹. Every studio has one, probably more. The word console implies that the machine is the center of operations for a room, that all signals are managed by it, and that mixing is the main purpose of the room. Such is the case in room 189.

The Yamaha 02R96 is a top quality console, equal in performance to any found in commercial studios today. Look at the specs:

Sonic Spec

- Linear 24-bit, 128-times oversampling A/D converters
- Linear 24-bit, 128-times oversampling D/A converters
- 20 Hz–40 kHz (0.5, –1.5 dB) frequency response at 96 kHz sampling rate
- 105 dB typical dynamic range (AD Input to Stereo Out)
- 32-bit internal signal processing (58-bit accumulator)

Channel Architecture

- 56 Input Channels, with Direct Outs
- 8 Bus Outs, with to Stereo Out routing for subgrouping
- 8 Aux Sends
- Stereo Out

I/O Architecture

- 16 analog mic inputs (with 48 V phantom power)
- 24 analog line inputs
- 16 analog inserts
- 32 inputs, 32 digital multi-track outputs.
- 8 assignable Omni outputs
- 1 AES/EBU, 2 Coaxial 2-track digital input, with sampling rate converters
- 1 AES/EBU, 2 Coaxial 2-track digital output
- 2 analog 2-track inputs
- XLR and phono connector stereo outputs
- Control room monitor outputs
- Dedicated studio monitor outputs

The flexible architecture and compact size make the 02R series popular in film/video post production. Recording palaces like the Record Plant will have larger consoles in the main room, but would also have consoles like these in secondary rooms.

Digital vs. Analog consoles

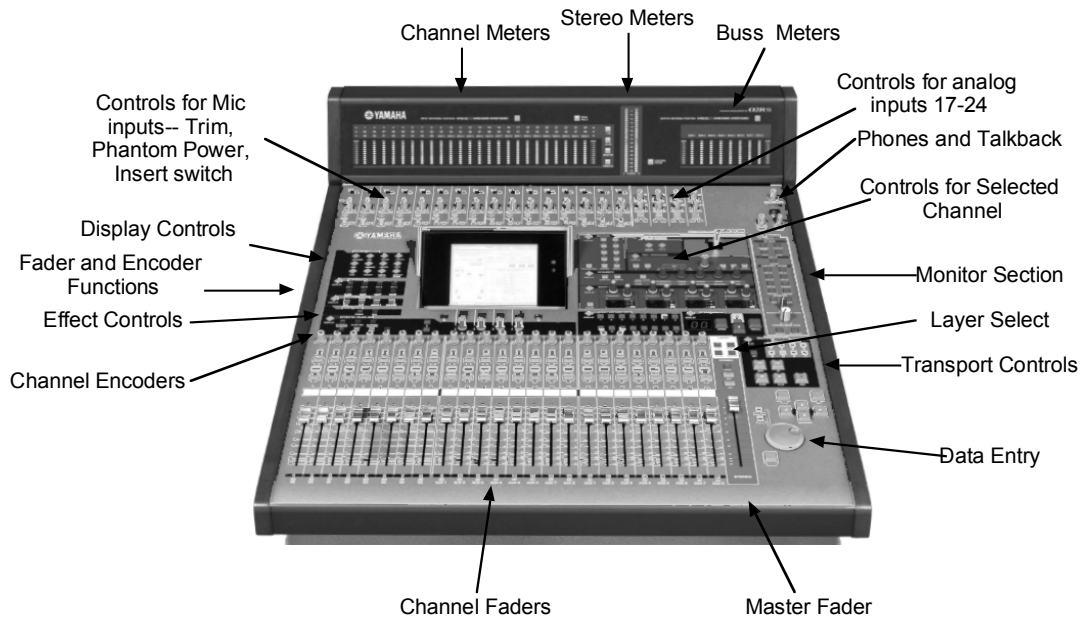
There's little difference in audio quality between analog and digital consoles². All consoles are analog at the most critical circuit, the mic preamps, and the output is

¹ I've always been puzzled that home stereo systems don't have a mixer, but are based on a complicated switch.

² Cost difference for given size and quality, yes.

probably going to be converted to digital eventually. The main feature digital consoles offer is flexibility. A relatively few controls and connections can be re-routed and redirected to make the most efficient use of hardware³. Almost as important, a digital board can remember and restore complex setups. On the 02R, this storage is in the console's own somewhat limited memory, but that can be augmented with a program called Studio Manager on the G5.

Overview:



The layout of the console is deceptively compact. If every function had a dedicated control, the unit would probably be eight feet wide and five feet front to back. There are two tricks that save all of the space:

Channel Selection

The concept of the "selected channel" is key to understanding the use of most digital mixers. There is a select button for each visible channel, and certain displays, controls and operations will apply to the selected channel. On the 02R, channels may also be selected by simply touching the fader handle. The sel button lights up when a channel is selected, and the number of the currently selected channel is shown in the upper right of the display.

Layer Selection

Also key is the concept of the "visible layer". The channel controls apply to 24 out of 96 possible channels. These are grouped as layers for

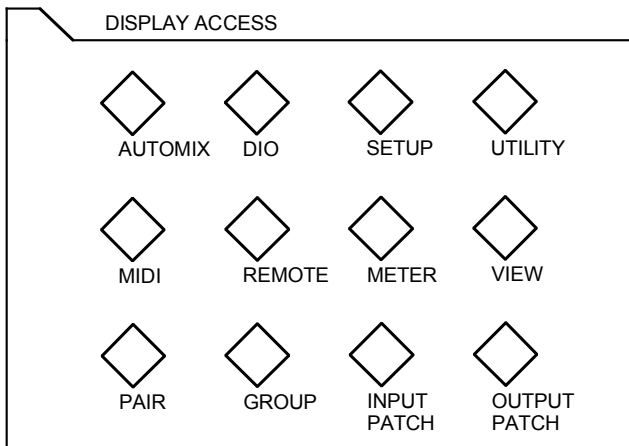
- Inputs 1-24

³ Since the hardware is the most expensive part of any console, this is the basis for cost savings.

- Inputs 25-48
- Master, with inputs 49 -56, Busses and Aux sends
- Remote (for control of Logic or Pro Tools)

If you wanted to make an adjustment to channel 32, you would first press a button to show the 25-48 layer, then press the select button (or touch the fader) on the eighth channel from the left. The controls are numbered in different colors for each layer to make finding the correct control easy. An important fact to keep in mind is that the selected channel might not currently show on the visible layer.

Display Selection



There is a display screen in the center of the console that gives information about the selected channel or any data operation you are performing. What you see is picked by first pressing a display access button (most are left of the display, but some are scattered around the board.), then a tab button below the display. (Left and right arrow buttons may bring more tabs into view.) The display options are:

- View-- information about selected channel
- Routing-- routing options for selected channel
- Dynamics-- compression and gate settings for selected channel
- Equalizer-- EQ settings for selected channel
- Phase-- for selected channel
- Delay-- for selected channel
- Aux Select-- set all aux sends
- Encoder mode-- settings for channel encoders
- Pan/Surround-- set pan for multiple channels
- Effects-- edit effects settings
- Meter-- various signal levels
- Pair-- for linking adjacent channels as stereo pairs
- Group-- for linking channels in other ways
- Input Patch-- Allows rerouting of signals from the patch bay.
- Output Patch-- Allows rerouting of signals to the patch bay.
- Automix-- accesses automated mixing features

- Setup--- various board preferences and settings
- DIO-- digital in/out settings like sample rate and dither
- MIDI-- settings and bulk dumps
- Remote-- settings for the remote layer
- Utility-- an oscillator, among other things.
- Monitor-- additional monitor features, such as mono
- Scene Memory-- for storing and recalling snapshots
- User defined keys-- sets functions for a bunch of spare buttons.
- Machine control-- sets what the transport buttons do.

One parameter in the display will have a box around it to indicate it is selected for editing. The box is moved by the cursor arrows above the big data wheel. Values can be changed by the data wheel or the increment and decrement keys. Some changes must be confirmed by pressing the enter key-- the value will flash if that is the case. You will occasionally see a confirmation request after hitting enter. You have to arrow to yes and hit enter again. (The operations that require confirmation messages can be changed by preferences.)

Signal Flow

Routing

There are two types of channel, input and output. Input channels are (usually) connected to the world outside the console and allow the modification of individual signals before any mixing. Output channels accept signals from assorted input channels and send a mix somewhere. Any signal processing applied at an output channel affects the mix, not the original input. The process of connecting input channels to output channels is called routing, and usually is the first thing to set when beginning a session. Digital mixers have very flexible routing capabilities, and the Yamaha boards are the most versatile I have seen. Here are the possible destinations:

- Direct out. All channels can be sent to any of the output connectors, including the slot outputs (I/O cards, which go to the 24 track recorder or Digi 003), omni outs (on the patch bay) or the various tape outs. Direct patching for input channels is so common that the destination can be set from the fader view display per channel, or with an out patch page that shows all channels together. Note that direct outs are assigned to a destination, and turned on. This is convenient, because a channel may be repeatedly connected to the same destination but you don't always want signal going there. Stereo mix, auxes and busses are patched on the output patch display. It's possible for any channel to be routed to several destinations, but direct connections can only accept one signal at a time.
- Stereo Mix -- this is what we think of as the grand mix of everything. The routing of any channel to stereo mix is controlled by buttons labeled L and R. The pan setting affects the relative levels to left and right sides of the stereo mix. Stereo mix has a dedicated output connector, but can be routed to others.

- Buss 1-8 -- Buses give independent mixes, which may be used for surround mixing, or for stems⁴ in complex mixes. Channels are connected to busses with numbered buttons. If the follow pan option is on for a channel, the pan will control relative levels of odd and even busses. Busses may be routed to stereo mix or to any output connector.
- Aux 1-8-- these mixes are only available to the input channels. They are set up via the aux send controls, which allow variable amounts of signal to each send. (This can be changed to an on/off mode if desired). The sends also have pre/post switches to choose if the signal to aux is affected by the channel fader. The classic reason not to (pre fade) is for monitor feeds to musicians during studio recording. Setting aux send can be done with channel encoders or the channel faders-- in either case, you must initially select which aux mix you want for the destination. The aux mixes have their own channel control, which can be routed to outputs or the effects processors, but not to stereo or buss mixes.

Inserts

Inserts are an odd type of routing, in which the signal is sent out of the channel (typically for processing) and returned to the same point. There are two types of insert:

- Hardware inserts are found on the first 16 inputs. These are simply wires to the patch bay and back. You may connect processors such as the limiter or exciter. because these wires cause a subtle audio degradation, there is a switch to bypass them when no in use.
- All channels have software inserts for effects processors. There are only four such processors (each of which can only be inserted in one spot), but since all channels have dedicated EQ and dynamics processors, four is enough. Since you connect the insert send (where the signal leaves the channel) and return independently, some pretty weird things can be done here, but it's best to simply connect the send to an effects processor input and the return to the effects processor output.
- The software inserts can be connected to the patch bay via omni outs and inputs 17-24.

Input Patching

The source of the signal for any input channel can be changed. The default is for channels 1-24 to be analog (mic and patch bay)⁵ inputs and channels 25-48 to be the 24 track recorder (slot 1 1-16 and slot 2 1-8), but you may wish to remap these to a more convenient scheme. For instance, if an effects processor is used as the target of an aux mix (as you would do with reverb) the effect output must be patched to an input channel to be routed to the stereo mix. If you are mixing only 20 tracks, the reverb return may as well be inputs 21 and 22.

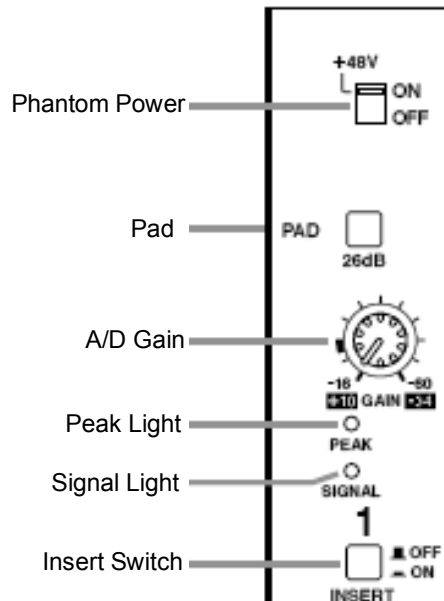
⁴ Stems are intermediate mixes, such as drums or sound effects, that will be combined later.

⁵ Since inserting a jack in the line in for analog inputs 1-16 disconnects the mic preamps, you will only find line in 17-24 on the patch bay. If you need to connect more than 8 line sources, patch to insert returns.

You should develop the habit of checking the input patch page at the start of each session to see how the previous user left things. You can restore the initial patch with the library tab of the input patch display.

Analog Controls

These affect the signal from the associated physical connection, regardless of any software patching. Inputs 1-16 are connected via mic lines to the studio and insert lines to the patch bay. Inputs 17-24, which are simpler than this, are on the patch bay.



Phantom Power

Provides power to condenser microphones. Do not turn on for dynamic microphones⁶. Connecting a mic when this is on will cause a loud pop.

AD Gain

The level of the signal hitting the A/D converters is critical. You should adjust the gain knob so the signal light is lit a lot and the peak light is only lit occasionally (peak lights at 3 dB below clipping). The gain knobs are marked for input sensitivity, or the typical level of the input signal. For mic inputs this is -16 (least gain) to -60 dB. If the signal peaks a lot at a low gain setting, the -26 dB pad should be used.

Insert Switch

Bypasses hardware insert on the patch bay. Leave off unless you are using it.

⁶ Don't turn it on for anything that is not a microphone, either. Phantom power can damage the output circuitry of processors and synthesizers.

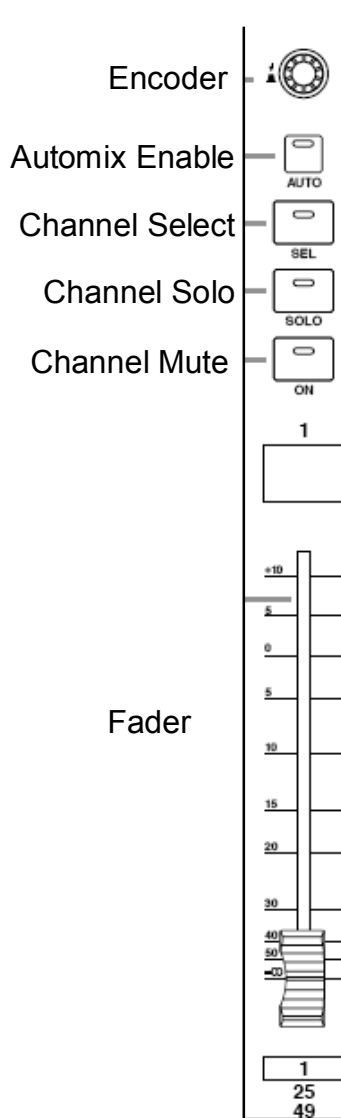
Channel Parameters

Attenuator

Each channel, input and output, has a digital attenuator, which is reached via the EQ display. These will seldom need to be changed from the 0dB setting. The exception is when you are applying extreme EQ boost which can lead to overload distortion.

Phase

Phase of an input channel can be inverted. This is set on the phase/insert page of display access, or in the parameter view display.



Channel Buttons

Automix Enable-- to add this channel to automix recording or playback.

Channel Select-- Press to make this the selected channel for most operations.

Channel Solo-- Press to place this channel in the control room monitor.

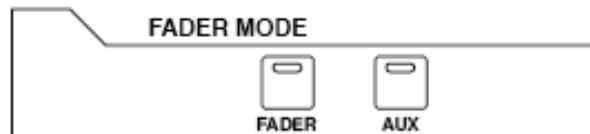
Channel Mute-- to turn channel on

Fader

The fader is the control most associated with the act of "mixing". The long slider provides a smooth precise control of signal level. You should have gain set so the entire length of the fader is in use. If the fader is barely on, reduce the AD gain or attenuator.

Since the fader settings must change when layers are selected, the 02R96 faders have motors to change them to new positions as needed.

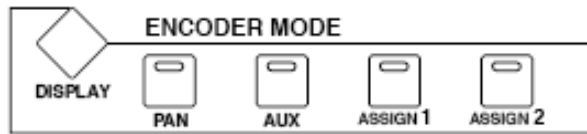
Fader mode-- on digital mixers the faders can control parameters other than signal level.



When aux fader mode is engaged, the faders control the send to the selected aux mix.

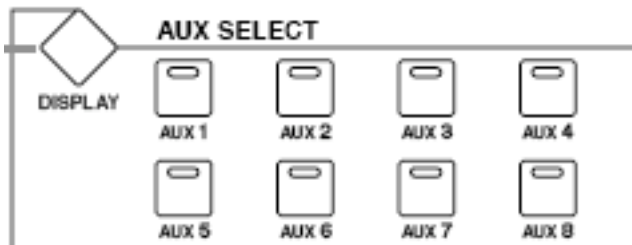
Encoder

The 02R96 has an encoder⁷ knob where most mixers have a pan control, but this does not have to control pan.



If aux mode is selected, the encoder will control the aux send for the selected aux mix. The other two choices can be assigned to nearly any parameter via the display button.

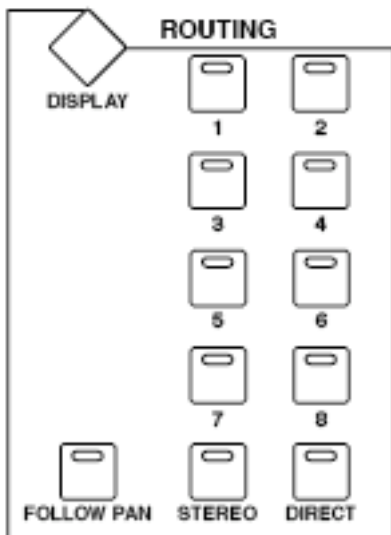
Aux Send



To set aux sends with faders or encoders, the target aux mix must be selected by pressing one of these buttons. The display button brings up a set of windows that allow more ways of setting aux sends, looking at 48 channels at time, or changing some options such as fixed or variable mode. You can see and set all of the aux settings for a particular channel in the view/aux display.

Aux channels can be paired, and when they are, new panning controls appear that direct the input signal to odd or even aux. This can be linked to the channel pans or made independent.

Routing

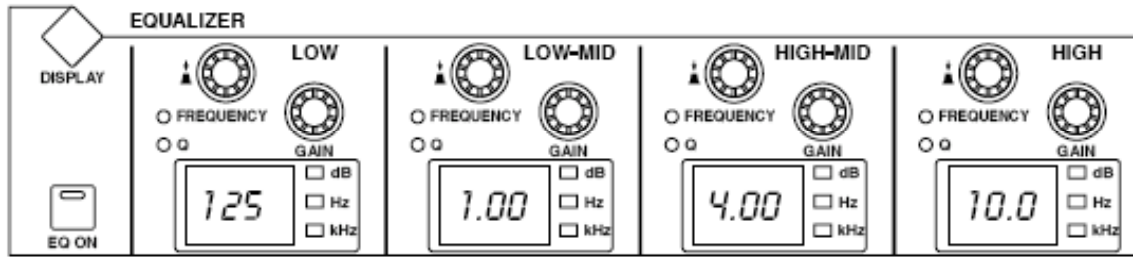


Most routing is done with the panel buttons. Select the channel to assign, then press appropriate buttons. The routing group shows the 8 buss destinations plus direct, stereo and follow pan. Routing should be carefully planned so you don't get a signal output twice. The most complex situation is multitrack recording, where you will be bringing in mics and direct sources to the 24 track recorder while sending recorded tracks back to the musicians (along with their own signal) and listening to some sort of mix. A very common mistake in that operation is to route the mic input channels direct to the recorder and to the stereo mix while also routing the track outputs to stereo. This will give strange delay effects because of the few milliseconds it takes the signal

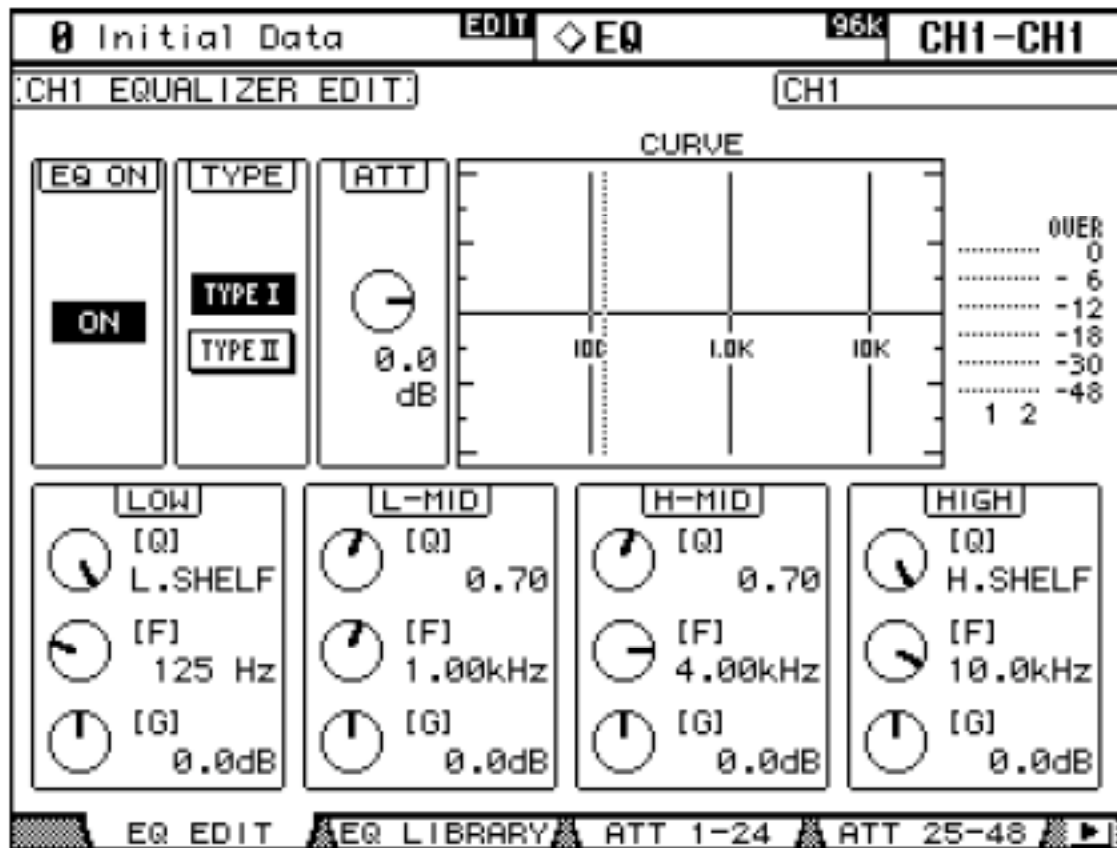
⁷ An encoder is a knob that goes around forever. These are used where different values might be assigned without turning the knob.

to get in and out of the recorder.

EQ



Each input and output channel has EQ. Most EQ should be applied at inputs, unless you want to make several versions of a mix with different overall EQ. There are four sections, each with three parameters, Frequency, Q (similar to bandwidth) and Gain. Frequency and Q are controlled with the same knob-- press to change modes. The last Q step will be Low Shelf⁸ on the bottom section and High Shelf on the top. The most recently changes parameter will be displayed in a readout. The display button will bring up a window that shows the curve you are getting, plus some options:

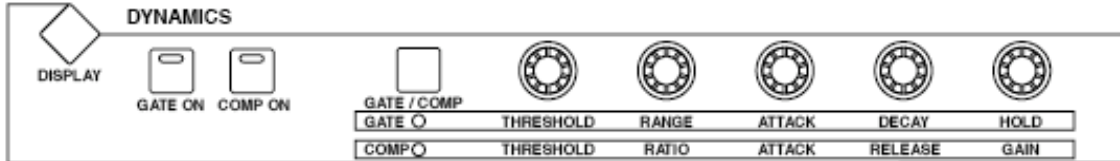


⁸ Everything below the frequency is cut or boosted.

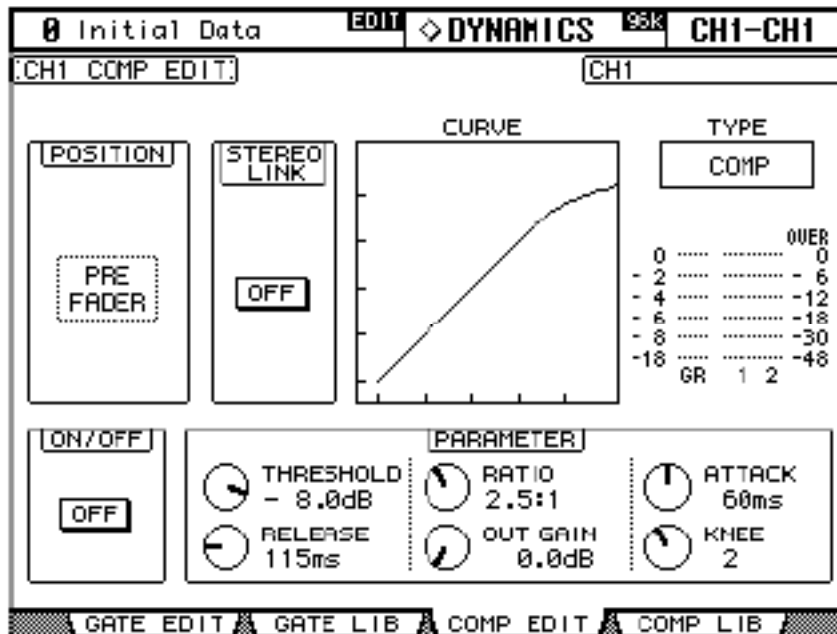
You can also use the cursor and data entry keys to set the EQ. Type I is the algorithm used in the older Yamaha products, type II is the new improved version. The library page lets you store this EQ setting (so you can easily copy it to other channels) and recall some made by other people.

Channels that are paired share the same EQ. Outputs can be grouped specifically for EQ.

Dynamics



Each channel has an independent compressor and gate. They are enabled and set up with these controls when the channel is selected. The knobs set parameters for either compression or gating, the gate/comp button selects which. The display button brings up a screen for more detailed editing:



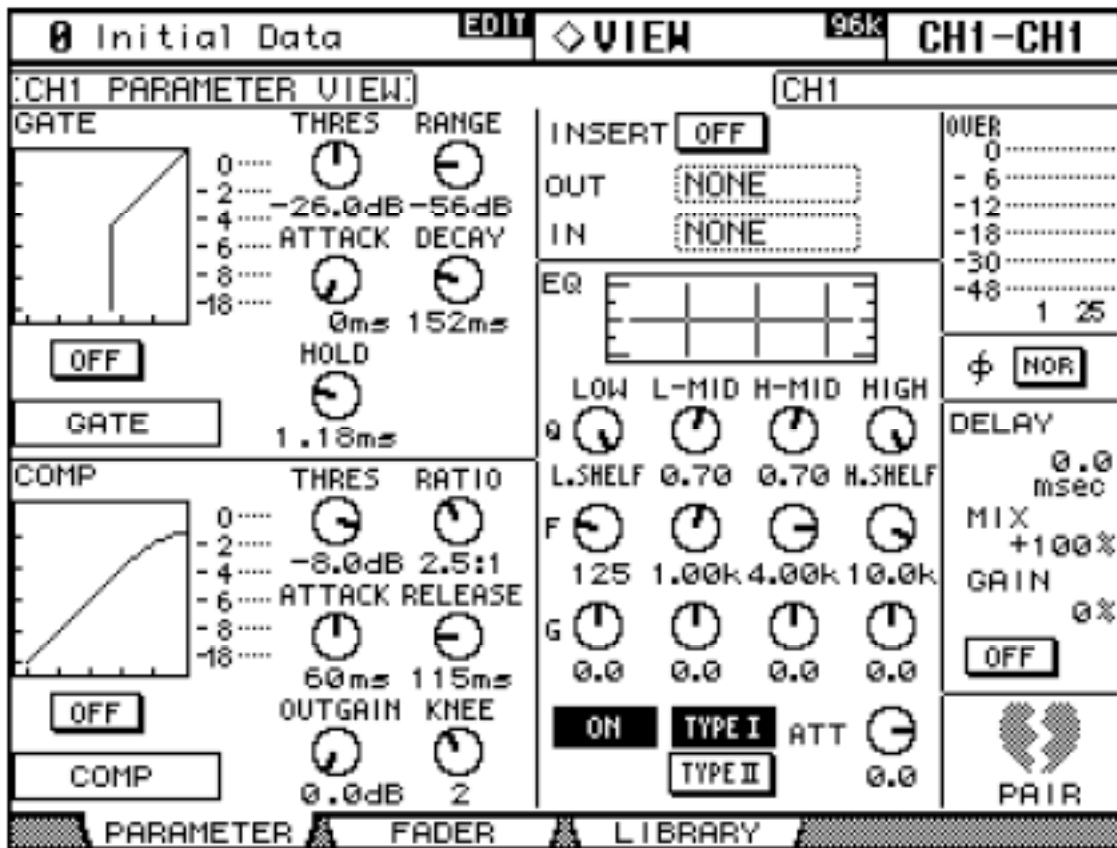
The vital parameters are:

- Threshold-- the level at which the compression begins. Signals above this are attenuated.
- Ratio-- the amount of compression.
- Attack-- how quickly the attenuation kicks in once the threshold is exceeded.
- Release-- how quickly attenuation goes away after the signal falls below the threshold again.
- Out Gain-- a boost to compensate for the average level reduction.
- Knee-- the manner in which signals only slightly above threshold are affected.

The position of the compression in the signal chain can be changed, a very nice feature. Pre EQ, Pre-Fade (post EQ) and Post Fade will all give different results. Stereo Link sets companion channels (1 and 2, 3 and 4, etc.) to get identical attenuation based on the louder of the two. This maintains stereo image when compression kicks in. Type may be COMP-S for a soft knee type, COMP-H for a hard knee type, or plain COMP for adjustable knee. Another option is EXPAND where signals below the threshold are attenuated. The types represent different algorithms and can't just be chosen-- you must load an existing setup from the library to start from.

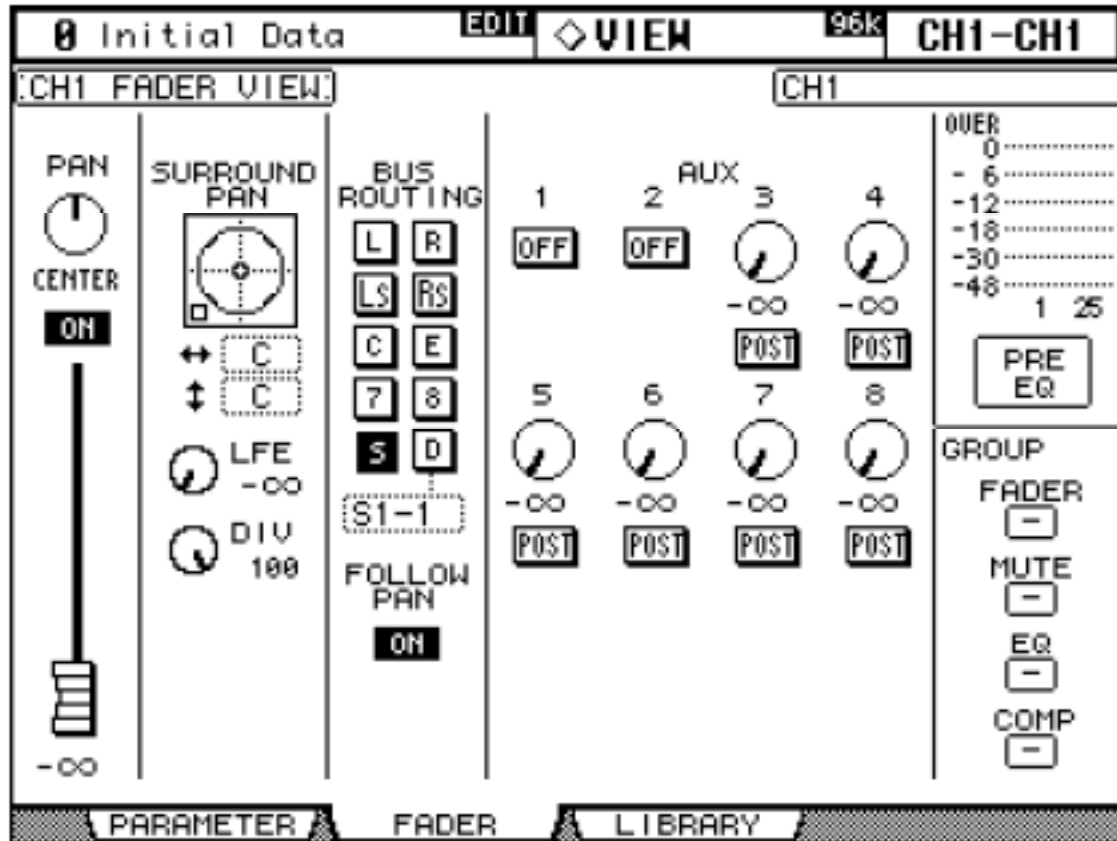
The gate edit page is quite similar, except gating is an either/or proposition. There is no signal at all, unless it exceeds the threshold.

Parameter View



Most settings for the currently selected channel are visible in the view/parameter display.

The others, including routing and aux sends are on the view/fader display.



Fader view-- this is the version you see when surround mixing is on. Normally, Surround is hidden and the busses are numbered 1-8. This example has aux 1 and 2 set to on/off mode.

Other Channel Functions

Pairing

In pairing, two companion channels (1 and 2, 3 and 4, etc.) are linked so controlling one controls both. The faders will move together, editing parameters will affect both, and so forth. Pairing is set up with the pairs window under display access. When you set a pair, you will be asked which one to use for current settings. When a paired channel is selected, the sel light of its companion blinks.

Grouping

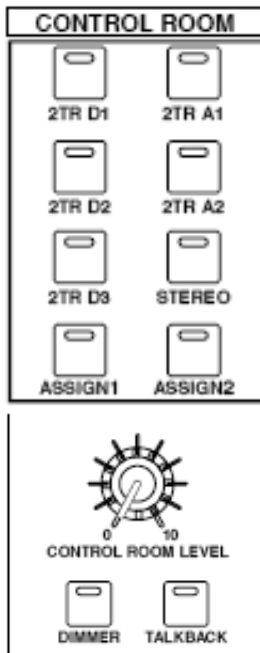
Channel faders can be assigned to one of eight groups (A-H) in the Groups display. If you move one fader in a group, they all move, keeping their relative levels from their initial assignment. If you hold the sel button while moving a fader, the rest of the group will not move and a new balance will be established. Output channels can only be grouped under E-H.

Channel mutes can also be grouped, from a different tab on the groups display. A channel that is off when it is assigned to a mute group will toggle backwards from the others.

Delay

Each channel can have an independent delay. This is mostly useful for PA applications, but a tiny delay can sometimes fix a two mic interference problem in recording. The delay setup includes feed forward and feedback, so you can do special effects delays too.

Monitoring



The Monitor section of the 02R96 controls what is heard through the speakers⁹. The source is chosen with buttons: various recorders in the studio (you can repatch the analog connections A1 and A2), the stereo mix, or sources chosen with either assign button. The assign buttons are set up in the monitor display.

The Control Room Level knob adjusts the loudness of the speakers. The dimmer button reduces that level by 20 dB, or another values set in the monitor display.

The chosen monitor signal is also sent to the headphone jack, which has its own level control.

Solo

When a solo button is pressed on a channel strip, that channel replaces the signal in the monitors. You can solo several channels, if they are all inputs or all outputs. There is a light that indicates a solo is on, and a button to turn all solos off¹⁰.

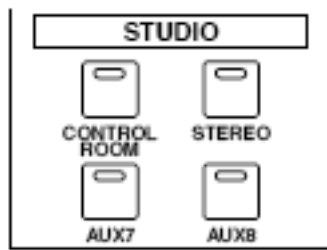
There are some very elaborate setups to solo that can be made on the solo tab of the Monitor display.

- Status-- sets either Recording mode, where soloed channels are sent to the speakers and other outputs are unaffected, and Mixdown mode where the soloed channels are sent to the stereo out and other channels are muted.
- Sel Mode-- sets either Mix Solo mode, where several channels can be soloed together, or Last Solo mode, limited to one channel at a time.
- Listen-- in recording mode, solo can be Pre Fader or After Pan. If you solo a channel that is off, it will be soloed pre fader.
- Solo safe-- sets channels so they are not muted in Mixdown mode when other channels are soloed.

⁹ The speakers are normalled to the console CR out on the patch bay. This lets you use ProTools (which has its own monitor function) without turning the console on.

¹⁰ There are ghastly stories about what can happen when an unused channel is soloed.

Studio Monitor and Talkback



The studio monitor section sends signals to the stereo set on the Furman headphone mixing system. (Eventually there will be working studio monitor speakers, too.) The signal may be Aux 7, Aux 8, Stereo mix, or whatever the control room monitor is getting. There is an independent volume control for studio monitor.



The console operator can speak to people in the studio by pressing the talkback button. His voice is picked up by a microphone on the board and sent to the studio monitor, and the control room speakers are turned down to prevent feedback through studio mics. A short tap on the button latches talkback on or turns it off again. There is a knob to set talkback level. The talkback tab on the monitor display page allows talkback to be patched to a slot or omni output. Slot outputs go to the recorder, and allow slate comments to be recorded. You can also choose some other input for talkback¹¹.

Metering

Levels for the visible layer and the buss and stereo outputs are shown on the meter bridge. Buttons on the bridge allow you to see other layers without bringing them up. Other buttons choose the point in the channel that is metered: Pre EQ, Pre Fader, or Post Fader.

Metering can also be done with display pages-- you may find it useful to display Master meters while watching Input meters on the bridge to keep an eye on aux send levels.

When the peak hold function is on, the highest segment ever lit on a meter will remain on, showing the peak level in a track.

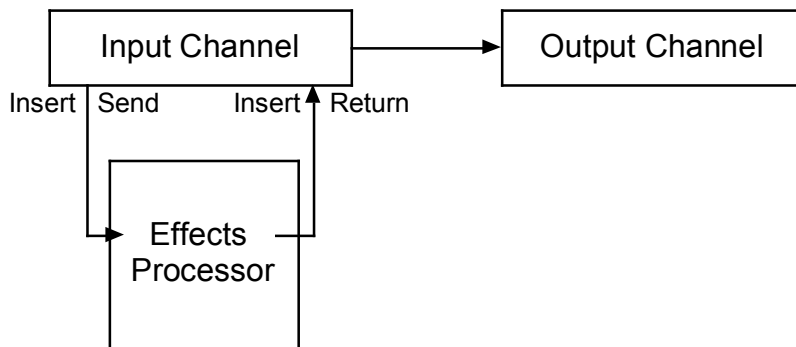
¹¹ Handy if someone other than the engineer wants to do the talking.

Using Effects

Since this is a digital system, effects can be built right in to the board. The quality of these is comparable to Yamaha's top of the line outboard processors. There are four effects processors, referred to by number: Effects 1-4. These are patched to input and output modules to get signals to process. There are also 128 effects, which are routines and settings that can be loaded into a processor. So effect 12 can be loaded into effects processor 2. Get it?

Patching Effects

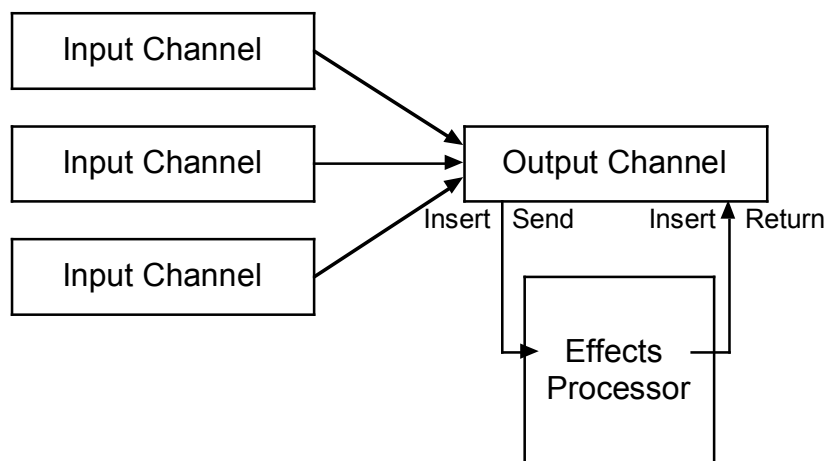
There are three typical ways to use effects. If only a single signal is to be modified, patch the effects processor to the insert of an input channel:



Single Channel Processing

This is appropriate for delays, gated reverb, and similar tricks.

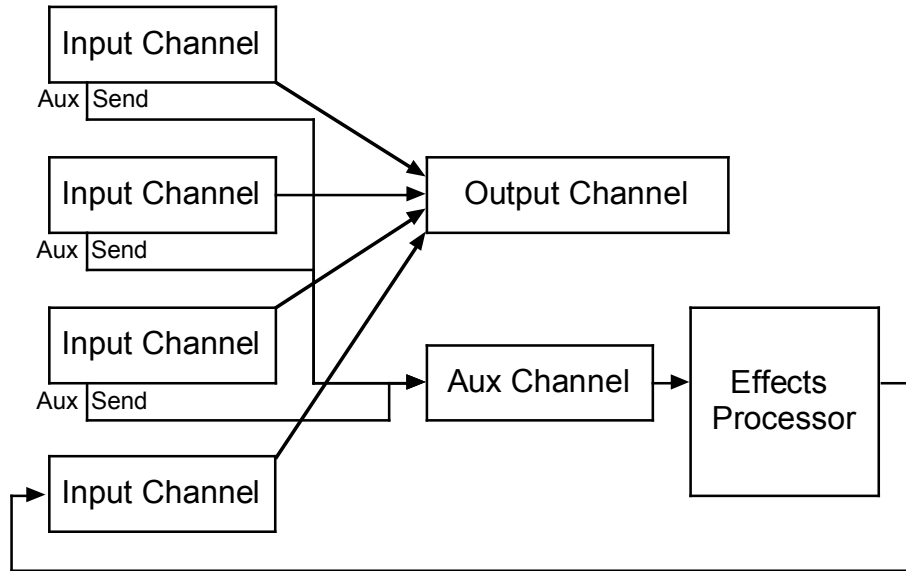
To process the final mix or a submix use the insert of the output channel.



Mix Processing

This would be most useful for an optimizer or multi band compressor.

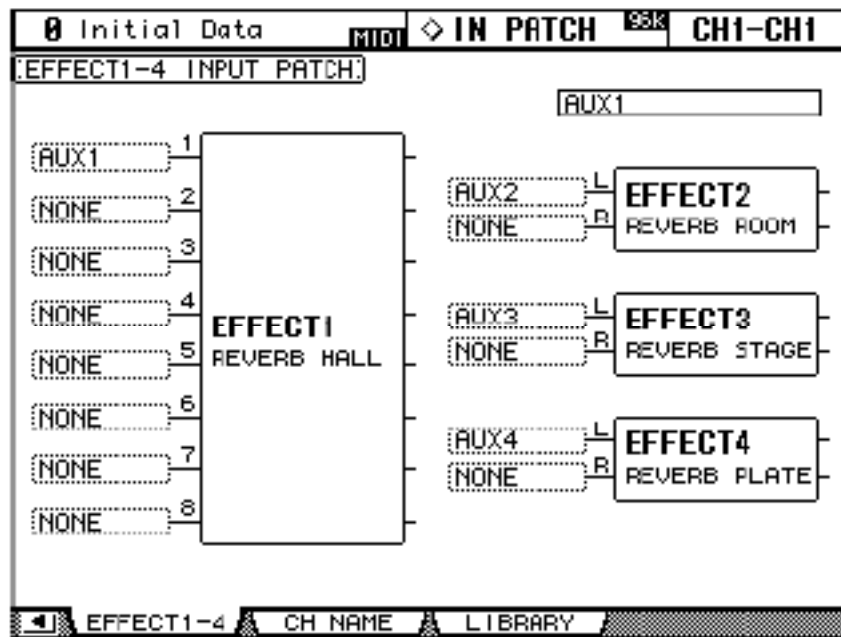
When you need to process a lot of channels, with independent control the the signal from each source to the processor use Aux Sends:



Aux Processing

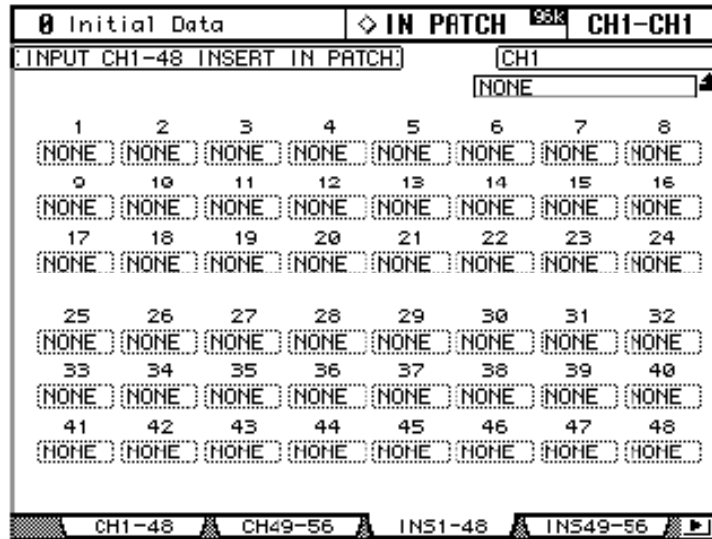
This is appropriate for reverb, where you need detailed control of the amount each signal contributes to reverberation as well as level (and possibly EQ) of the effect returned to the mix. When you use effects this way, always set them to 100% wet.

To make the connections use the input patch/ effects page:



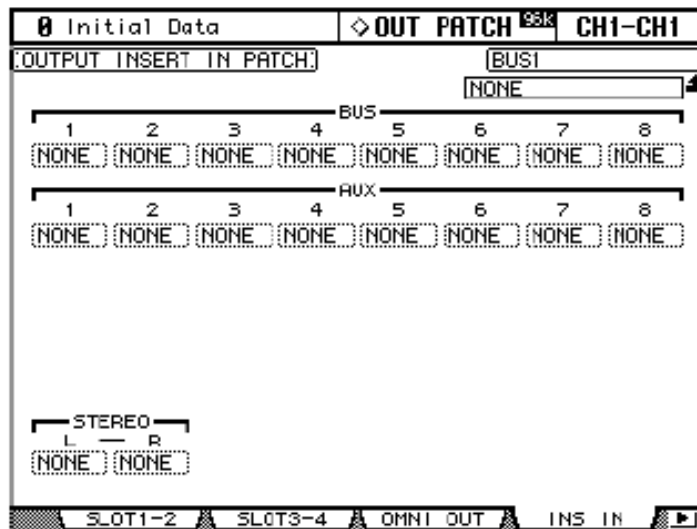
You will notice from this display that effects processor 1 has 8 inputs and the others are stereo. The choices for each input include channel inserts, aux outputs or output from another processor when you want to chain effects. Remember, the input of a processor can only be one signal, so when you make this connection, you are breaking any others already patched here.

To patch the effects output, go to the Insert In patch display or the Channel In patch display.



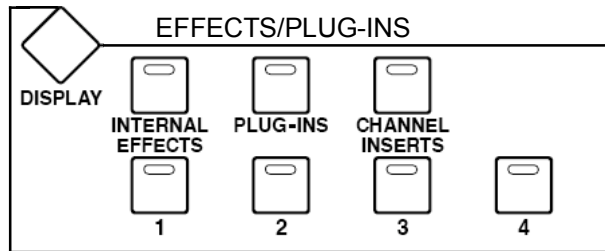
The output of a processor can go to as many places as you want, so you have to deliberately remove connections that are no longer needed.

Patching back to the inserts of output channels is found in the Output Patch display:

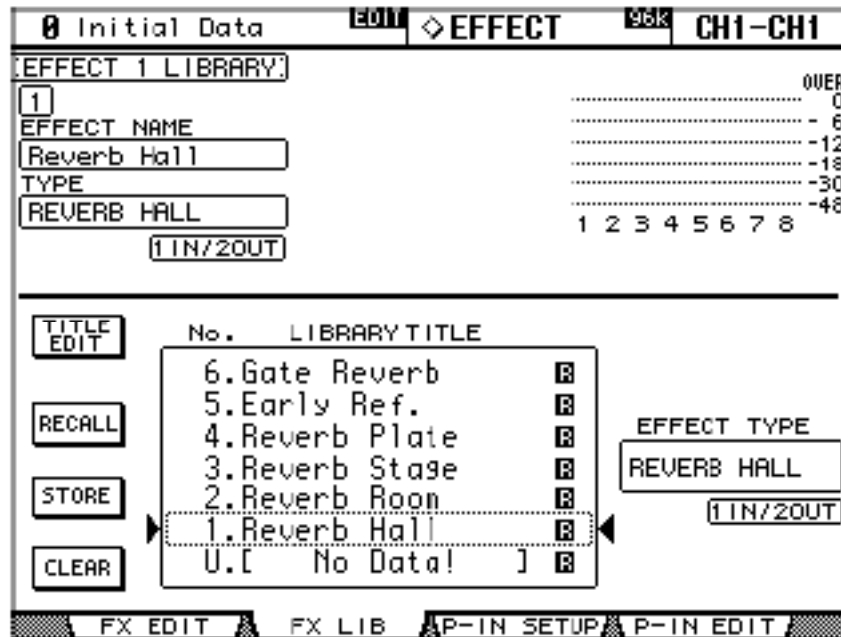


Setting up Effects

Once a processor is patched, the desired effect should be loaded in. Select the pertinent processor with the effect select buttons: press Internal Effects, then a numbered button.



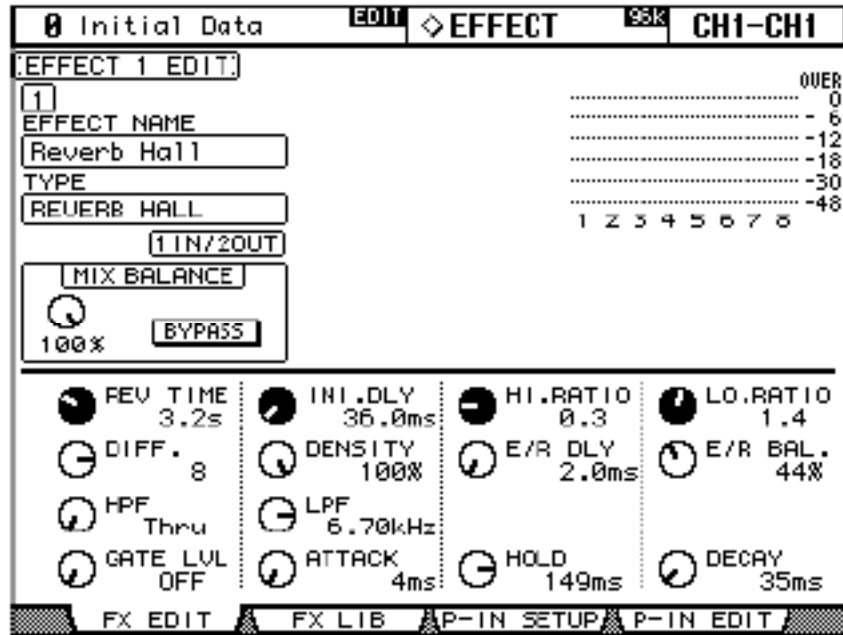
Choose a basic effect from the effects display in the library tab:



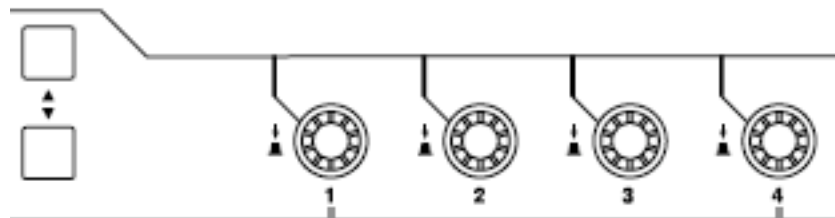
The full list is in the manual starting on page 131 (144 in Acrobat). In general the types are:

- Reverbs of various sizes
- Delays and Echos
- Modulated delays like chorus and pitch shift
- Distortion and amp simulator
- Dynamic effects
- Combinations
- Others (actually new things since version 1-- includes a better stereo reverb and a multi-band compressor.)

Once an effect is loaded in, adjust it to your needs in the edit tab:



The meaning of parameters is listed in the 02R96 manual starting on page 223 (236 in Acrobat). Note that a row of knob icons are dark. These can be controlled immediately with a set of real knobs below the display:



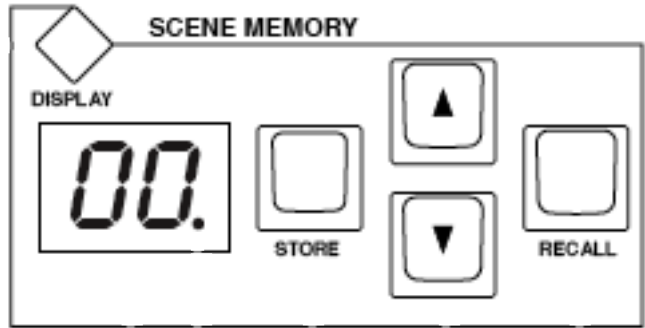
The buttons change the selected row. This is in addition to the box selection, which is moved and set by the data entry controls.

Effects setups can be stored in the effects library.

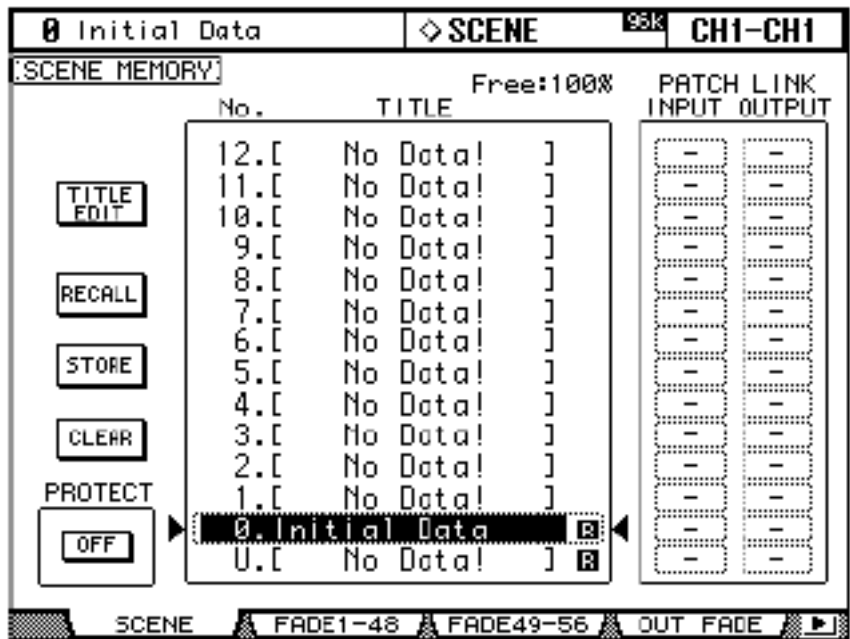
Scene Memories

Scene memories store a snapshot of all settings on the board. There are 99 memory locations-- the number of the current scene will show in the LED numerals. As soon as any settings are changed, a dot will appear in the LED indicating the scene has been edited. The current settings can be captured with buttons in the scene memory section

- Use the up and down arrows to select a target
- Press Store



Scenes are recalled much the same way. The display button brings up a more complete mechanism:



Here, the data entry wheel lets you scroll through the available scenes. When you store this way, you are prompted for a scene title. Title entry is a bit tedious, but an excellent habit to develop.

You can link patch libraries to scenes-- that's not usually necessary, because patches are not changed as often as scenes are.

Scene 0 is protected, and is basically everything off.

Scene U is an undo setting. It will contain the state of the board just before the last scene recall.

The Fade tabs let you set a gradual transition from one scene to another. This can be fader by fader if you like. The transition time is saved as part of the scene, and happens when the scene is recalled.

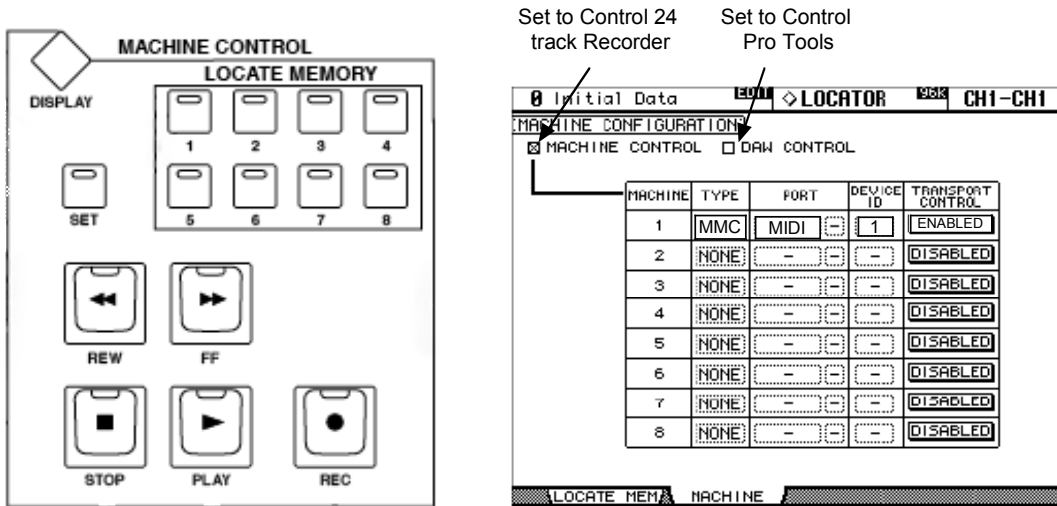
Auto Updates to Scenes

When a preference called Scene MEM Auto Update is on, pressing the restore button (without changing the scene number) will alternate between the scene as loaded in and the most recent state. (The altered version is indicated by the dot in the LED display). These updates to a scene are automatically stored. When you recall a different scene, you get the tweaked version of the scene (as you left it when you recalled something else), and the original version is available by hitting restore again.

Machine Control

There are transport control buttons on the console that can be set to control either the Radar 24 track recorder or Pro Tools running on the G5 computer. Since both will be used a lot, it is important to know how to set the 02R for one or the other.

The display button in the machine controls group brings up a configuration screen:



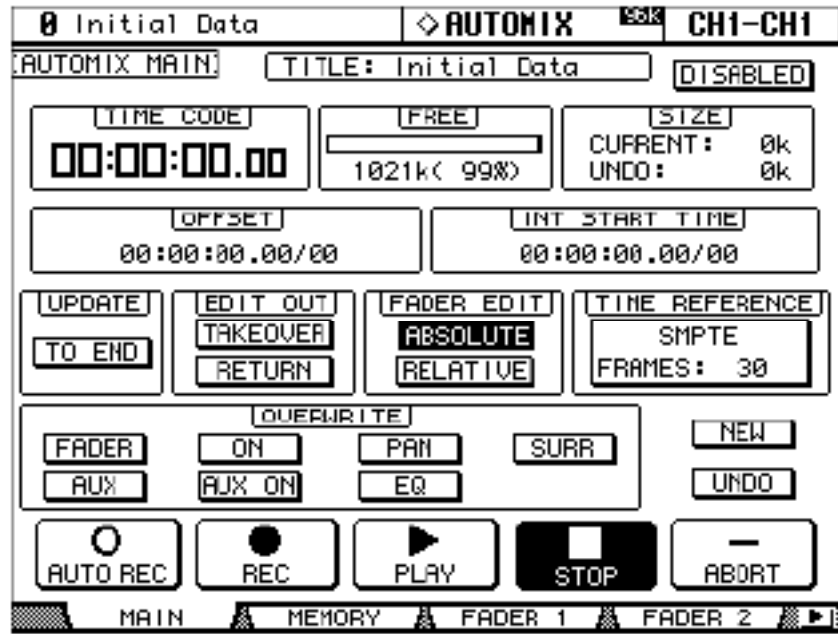
The Radar 24 track is machine 1, which is a MIDI machine control (MMC) type connected to the MIDI port. These settings should never need changing, but occasionally the machine control checkbox will need to be set.

Once the configuration is set, the transport buttons will operate the Radar recorder. (Note that channels must be armed for recording on the Radar itself.)

You can capture eight locations in memory: hold set and press a numbered button. if you press a numbered button by itself, the Radar recorder will locate to the stored time. Locate points persist in memory, but cannot be saved in any way. You will need to reenter them each time you set up a session. Locate times can be directly entered in the Locate Mem tab of this display.

AutoMix

All of the actions you take when mixing down can be recorded in sync with the 24 track recorder. Then when you play the recording again, the faders will move themselves. This lets you fine tune a mix before burning it on CD. A common approach is to slowly build up a mix, adding a couple of tracks at a time.



The automix window is reached from the display access button. These fields need to be explained in some detail:





- **TITLE:** when you save an automix, you should title it with your initials and song name. The board will only store 16 automixes, so you will need to back up your mix on the G5 using Studio Manager.
- **Disabled/Enabled--** turns the auto mix on and off.
- **Time Code--** the current location in the recorder should show here.¹²
- **Offset--** allows the mix to be synced with a source that does not start with 00:00:00:00. Not a problem with the Radar, as each song should be one a unique project.
- **Internal Start Time.** This would only be used if the Console needs to generate time code. It does not-- time code comes from the Radar.
- **Update--** this determines what happens at the end of a mix recording pass if data has already been recorded. If To End is enabled all fader moves after the stop point are erased.
- **Edit Out--** If you think of the automix as a recording medium like tape, it makes sense. It is constantly recording the position of all of the controls and erases whatever is passed over. If nothing is selected, the faders will stay where you left them until the next recorded move (or forever, if To End was enabled). If this mode is Return, if you only record over a part of a longer recording, the faders

¹² If it does not, open the Time Reference tab under Setup display and set it to SMPTE.

will move to the original positions when you punch out. If Takeover is selected, recording continues after punch out until you move the fader to match existing data. (Look at page 147 acrobat 160) in the manual.


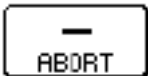

- Fader Edit--in Relative mode, fader moves are added to data already recorded. This is useful when you want to make general adjustments to a complex track.
- Overwrite-- select all of the types of controls you want to record. Events not on the list, like scene changes, are always recorded.

Before recording an auto mix, store your initial settings in a scene. Next select New in the Automix window and hit enter. The automix will always begin by loading in the current scene. The recording process is pretty straightforward:

- Rewind the Radar.
- Set desired overwrite targets in the automix window.
-  Select record and hit enter.¹³
-  Arm each channel you want to record with the auto buttons.
-  Press the transport Play Button. Recording will start as the Radar plays.
- Do your Mix.
-  When the song has played all the way through, stop the Radar. Select Stop in the automix window and hit enter.
- Rewind the Radar and play again. The faders will move exactly as you did before.

It is important that the first pass covers the entire song. Don't stop if you make mixing mistake, it will be easy to fix.

To change the mix, do the process again. There are several features that make it easy to focus on a specific operation:

-  If you select Auto Rec instead of Record, recording will occur every time the Radar plays. This makes it easy to run multiples passes.
-  The abort icon stops recording and throws away the new data.
-  The undo icon backs up to the end of the previous recording pass.

¹³ This is a good function to tie a user assignable key to.

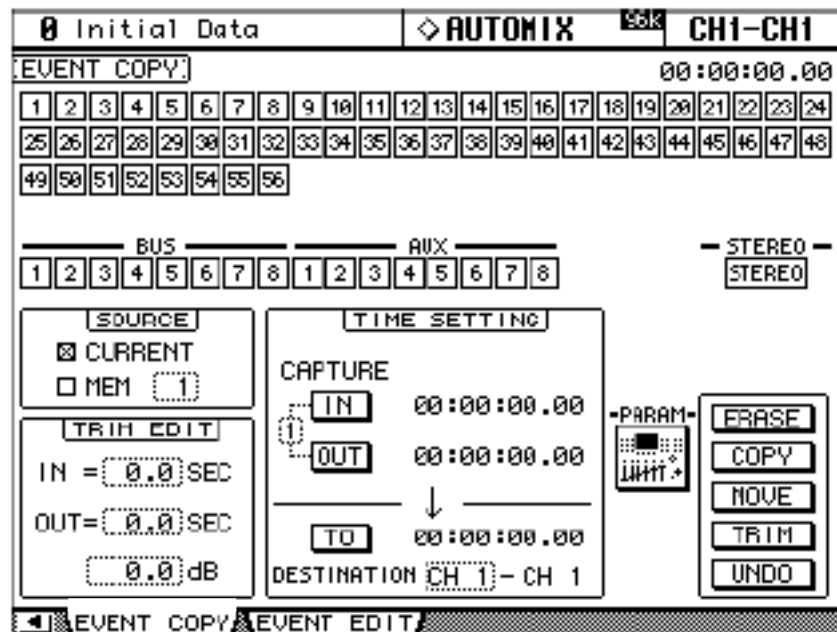
- You can punch in on a channel in the middle of recording. Hit the auto button after the moves you want to keep, hit it again when you have made the new move. Experiment with the Update and Edit Out settings to get the effect you want.
- The Fader tabs have icons for touch sensitive punch in and out. When enabled, you don't need to hit the auto button, just touch the fader handle.
- The encoders can be pressed down slightly. This will punch in the parameter controlled by the encoder (Pan, Aux Send, ect.) with out punching in for any others. Press again to punch out.
- If faders are grouped, the entire group is recorded together.
- The Fader tabs have a field for setting transition time for the Edit Out action.
- The Fader tabs have numbered icons that mark a channel "Record Safe". When this is set, the channel will not go into record.
- If you press an auto button when neither Rec or Auto Rec are engaged, that channel will revert to manual mode. and recorded moves will not occur.

Editing Mixes

There is a mechanism for editing automixes. It's a bit clunky (compared to Pro Tools) but it gets the job done.

- To edit an automix, automix must be disabled in the main automix tab.

Most editing is done in the event copy window. (Hit the right tab arrow to find it.)



- Source chooses which mix to get events from: the current one or one of the 16 stored mixes. You may have several versions for a song, this lets you pick the best features of each mix.

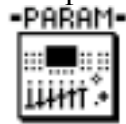
- The numbered squares choose the channels for the source data.



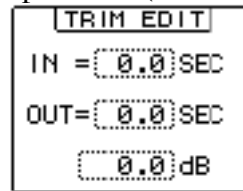
- The In and Out Time Settings are the beginning and end of the source data. You can grab these times by selecting and entering while the Radar is playing. They can also be hand edited. The small number in the dotted box is the memory location these times are captured to. There are eight capture memory locations.



- The To time setting is the target time of a copy or move. The associated destination channel is the lowest numbered channel for the results. If you are copying or moving multiple channels, they must be adjacent. You can not change the speed of a fader change on this page.



- The param icon brings up a list of parameters to include in the operation. (Double click to select all or just one.)



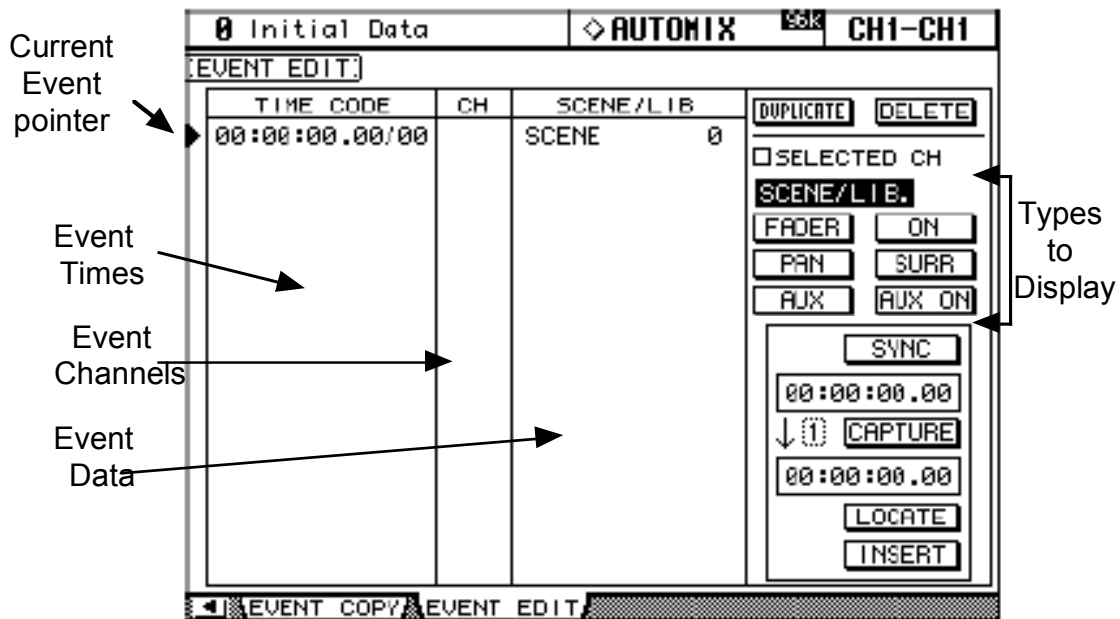
- Trim edit sets parameters for a trim operation. The in and out times are crossfade times (before and after Time Setting). The dB value is the amount of trim.



Once the parameters are set, the operation is executed with one of the icons on the lower right.

- Erase clears the actions in the source range.
- Copy puts a copy of the actions in the source range at the destination.
- Move clears the actions in the source range and puts a copy of the actions at the destination. (If the source was a stored mix in memory, the stored mix is not affected.)
- Trim adjusts the faders in the source range.

More Editing



The event edit window shows all automix data. If you can find the action you are looking for, you can edit it with great precision. To see data, click the data type. There's usually a ton of events, checking selected ch will let you look through one channel at a time. The data wheel scrolls through the list, unless you are editing a value. The sync icon will scroll the event list to match the current time code position. You can also capture 8 locations to memory (these can be the same as the transport locate positions is a preference is set.) Then the Locate icon scrolls the list to the position that is showing.

You can change any value by cursoring to it, using the data wheel, and hitting enter. If you change a time, the list will be resorted, so mistakes in time can be hard to fix. (The undo icon on the event copy page will revert to the last edit.)

The action I edit most often is the speed of a fade. This is tricky, because fades are recorded as a series of values with a transition time of 0, like this:

00:00:03.13/40	CH17	-84.00	0.0
00:00:03.14/60	CH17	-69.00	0.0
00:00:03.16/00	CH17	-43.00	0.0
00:00:03.17/20	CH17	-37.00	0.0
00:00:03.19/00	CH17	-30.00	0.0
00:00:03.20/20	CH17	-26.90	0.0
00:00:03.20/60	CH17	-25.40	0.0
00:00:03.21/20	CH17	-23.50	0.0
00:00:03.22/00	CH17	-22.00	0.0
00:00:03.22/60	CH17	-17.65	0.0

Rather than change the forty or so events that a single fade will produce, I delete all of the intermediate steps:¹⁴

00:00:03.13/40	CH17	-84.00	0.0
00:00:04.08/20	CH17	0.25	0.0

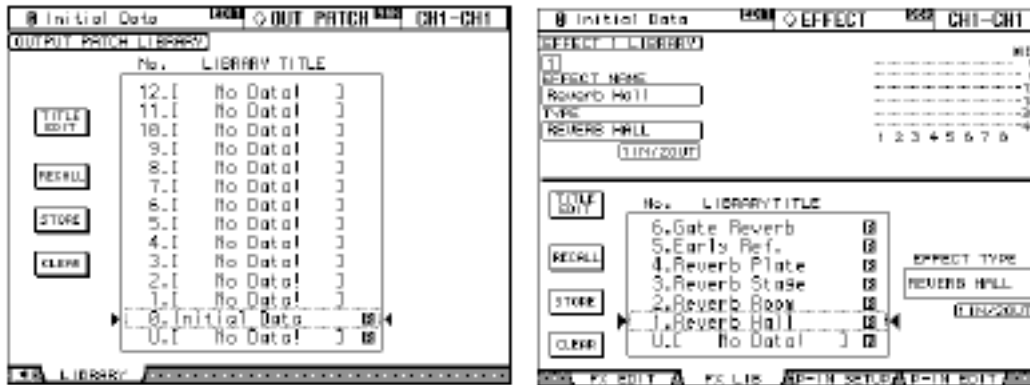
Finally I edit the start time and duration of the second fade:

00:00:03.13/40	CH17	-84.00	0.0
00:00:03.14/20	CH17	0.25	1.0

Duplicating and inserting new events is easy, although you may fuss more getting them in the right place than you would just by recording them.

Library Operations

Many sets of parameters can be saved in various libraries. Those Libraries can in turn be saved to the G5 Macintosh with Studio Manager. All libraries work much the same way and are accessed by a tab in the related display.



There are two styles, a simple list of names, or a shorter list embedded with some information about the current state. You navigate through the list with the data wheel, and use the icons to store and recall items.

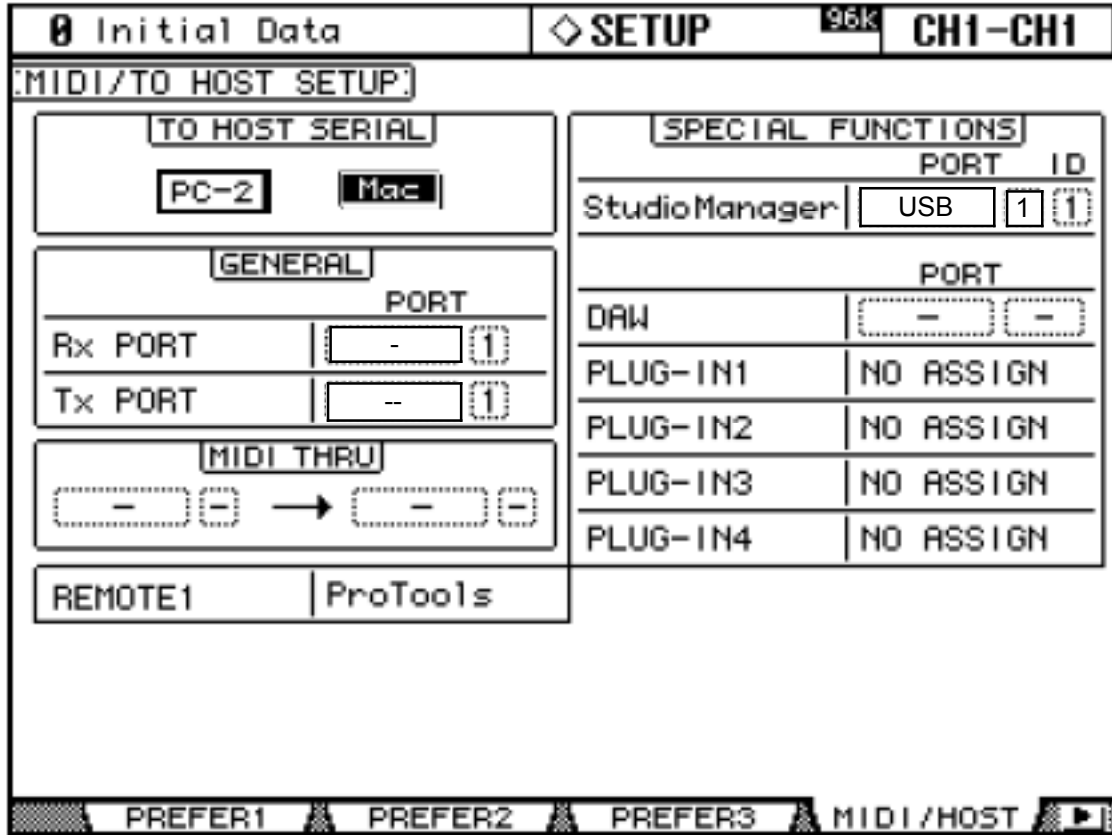
- STORE** Store saves the current settings. You are prompted for a name.¹⁵
- RECALL** Recall brings a set back.
- TITLE EDIT** Title Edit to change a name
- CLEAR** Deletes a saved setup.

¹⁴ It's quick enough-- put the pointer on the second line and start deleting.

¹⁵ Include your initials.

Working with Studio Manager.

Studio manager is a Macintosh program designed to save and restore setups for sessions. There is one setting that has to be made in the 02R setup MIDI port display before Studio Manager is launched.



Specifically, the Studio Manager port must be set to USB 1. This will be changed any time the board is used to control Pro Tools (You can't run Studio Manager and Pro Tools at the same time.)

Controlling ProTools

To use the 02R as a user interface for Pro Tools, two items must be set.

SPECIAL FUNCTIONS	
PORT	ID
StudioManager	- 1
PORT	
DAW	USB 1-3

In setup MIDI/Host the DAW port must be set to USB 1-3

MACHINE CONFIGURATION	
<input type="checkbox"/> MACHINE CONTROL	<input checked="" type="checkbox"/> DAW CONTROL

In Transport/Machine configuration, control must be set to DAW. This means the 02R transport controls will operate Pro Tools instead of the 24 track recorder. (You can still use the 24 track, but you have to press its own buttons.)

In pro tools, set peripherals/ MIDI Controllers

MIDI Controllers				
	Type	Receive From	Send To	# Ch's
#1	HUI	Port 1	Port 1	8
#2	HUI	Port 2	Port 2	8
#3	HUI	Port 3	Port 3	8
#4	none	none	none	

Pro Tools is now controlled by the remote Layer of the 02R.