MERLIN

SALES

MANUAL

D&R

Merlin's Sales Manual

Introduction and Product Overview

MERLIN

Merlin Recording Console

The D&R Merlin is a balanced, 24 buss, dual path in-line format recording and mixing console designed to take the central role in a recording facility. With up to 12 functions addressable with Merlin's automation, the wasted time between sessions is a thing of the past. An essential part of Merlin is his ARM (Advanced Routing Multiplex). With ARM you can digitally route any input in Merlin to a number of places and be able to recall all stored setups by a couple of key strokes. This feature alone saves valuable time between sessions.

Completely modular, Merlin can be configured precisely to suit your particular system requirements. Merlin can be ordered with the internally wired patchbay on the left or right end and interfaces with all external equipment using 25 pin sub D connectors, Elco connectors (for mics), and chassis mount XLR connectors.

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MERLIN
CHASSIS SYSTEM

1.0 Merlin's Chassis

The Merlin is available in two frame sizes; 40 and 56. The basic frame has three blank modules, two are located on the extreme left and right of the frame and the third is on the input module side of the patchbay. These blanks cannot be replaced with input modules as they conceal mechanical constructions. Included with Merlin's frame are; the master section with associated metering, patchbay, all internal cable harnessing, and rack mount power supplies.

Frame 40
The frame 40 will fit 40 dual path mono or dual path stereo modules (or any mixture of either), the master section, and patchbay.

Frame 40 standard configuration A:
From left to right; 24 dual path mono modules, master section, 8 blank modules, 4 dual path stereo return modules (8 stereo returns), and pacthbay.

Frame 40 standard configuration B:
From left to right; 24 dual path mono modules, master section, 8 dual path mono modules, 6 dual path stereo return modules (12 stereo returns), and pacthbay.

Frame 56
The frame 56 will fit 56 dual path mono or dual path stereo modules, master section and patchbay.

Frame 56 standard configuration A:
From left to right; 24 dual path mono modules, master section, 8 dual path modules, 16 blank modules, and 6 dual stereo return modules (16 stereo returns), 2 blank modules, and patchbay.

Frame 56 standard configuration B:
From left to right; 24 dual path mono modules, master section, 24 dual path modules, 8 dual stereo return modules (16 stereo returns), and patchbay.

Note: Merlin's patchbay can be ordered on either end of the frame. Custom configurations are available at no extra charge.
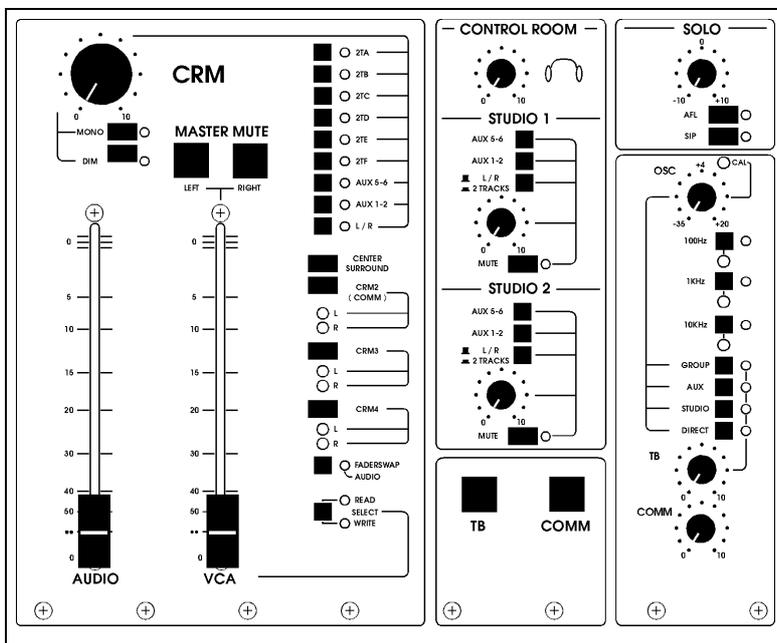
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THE MASTER MODULES

2.0 Master section - description

Merlin's master section is equivalent (in width) to 8 input modules. All CRM outputs are located on the rear of the console below the meter bridge. The following paragraphs give a brief description of each section.

2.1 CRM Section

The CRM (control room module) section contains the electronics for monitoring all signal paths in Merlin as well as source switching for six stereo machines, and Aux 1 - 2 & 5 - 6.

The large CRM knob controls the total outgoing level to the control room monitor power amps. This control is a quad device. The Merlin has four CRM systems intended for use with large monitors and several nearfield monitors which are switchable via the CRM 2, 3, and 4 switches. Each alternate speaker system has their own trimmer controls on the frontpanel which allows for individual adjustment of left and right outputs.

Also fitted is a Center Surround input selector which enables you to monitor a Center and Surround output from an external decoder. Inputs and outputs are on the rear of the console below the meter bridge.

We advise that the most used nearfield monitors be wired to the CRM 2 output, as the studio communication takes place over this monitor while dimming the main monitor.

MONO
The Mono switch allows the user to check for any out-of-phase signals or simply monitoring your mix in mono.

DIM
The dim switch temporarily dims Merlin's CRM level by 20 dB. This dimming circuitry is also driven by the oscillator circuitry as well as the communication circuitry.

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SOURCE SWITCHING

Six two track return source switches are fitted to allow pre or post monitoring of a stereo mix from up to six stereo machines such as Dat, reel to reel, cassette, and CD players. Also switchable are two selections of **Aux** pairs (**5-6** and /or **1-2**) plus a **L / R** source select switch which selects between monitoring the main stereo mix output signal and the previously mentioned source switches.

The L/R output is the stereo main output which is the sum of all the Channel and Mix sections when the **L / R** is routed via the ARM system. Two track A through E are +4dBu and two track F is -10dbV (2TF is for consumer level equipment). All of these sources can be summed if necessary.

Aux 1-2 and **5-6** is monitored in stereo (to allow the building-up of a stereo cue mix for the headphone system) on the control room monitor speakers. These stereo sources can be summed as well.

Note: With all source switches in the up position, the CRM will NOT monitor any source!

FADERS

Located in the bottom of the master section are two 100mm faders. The left fader is a stereo audio-track fader and the right fader is a linear fader controlling a stereo VCA. Merlin gives you the choice of which fader you prefer to use for the final stereo mix level. For the audio purist, we recommend using the left (audio) fader. In the case where a PowerVCA automated master fade is required, the automated VCA fader fitted on the right would be used. A faderswap switch to choose the preferable fader is located to the right of the faders.
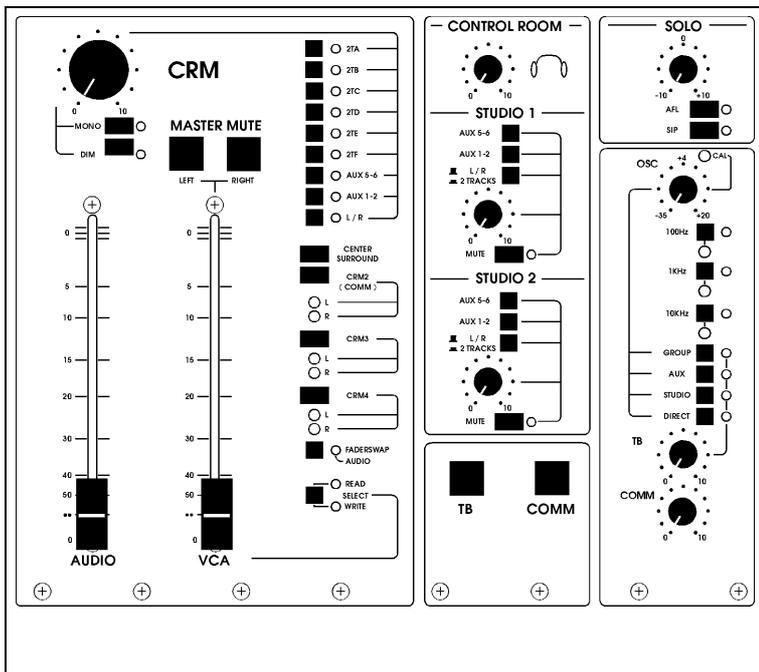
The master Mute switches can be controlled by PowerVCA automation and are programmable with either Audio or VCA faders in the signal path. The master mute switches are completely independent and mute either master fader left or right channels.
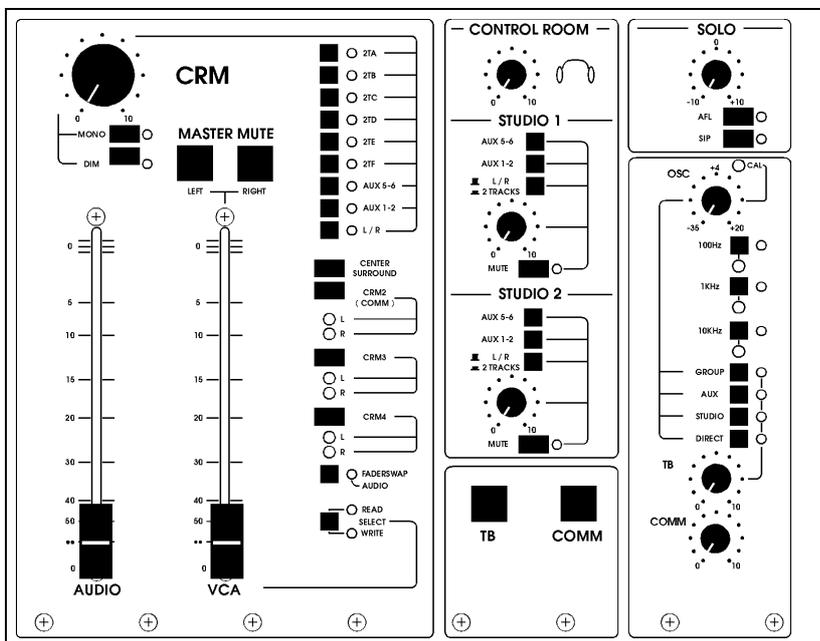
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2.2 CONTROL ROOM PHONES & STUDIO 1 - 2 SECTION

The **CONTROL ROOM** Phones control is a stereo pot feeding a stereo phones output in the master section of the patchbay. The Headphone output gets its signal from the CRM output. The **STUDIO 1** and **STUDIO 2** sections get their signal from several different places and feeds two sets of stereo outputs which are also located in the master section of the patchbay. The 2 studio outputs can source the **Aux 5-6** and /or **Aux 1-2**. The **L/R - 2 TRACKS** switch needs a little more explanation. With Merlin, you can listen to stereo machines in the studio while listening to the stereo mix outputs in the control room by pressing one of the 2 track source switches and the **L/R - 2 Tracks** switch. By having all the source switches in their up position the L/R signal is fed to the Studio systems. Aux 5-6 and Aux 1-2 can be mixed (from the input modules) and fed to the **Studio 1, 2**, or both outputs. With the **L/R - 2 TRACKS** switch in the down position, a selection can be made from any or all two track source switches in the CRM section. At the same time the **L/R** switch in the CRM section can be selected to feed the CRM monitors the main output mix.
If you would like to build

up a mix from one of the stereo Aux pairs, press the **L/R - 2 TRACKS** switch and make sure no stereo machine is routed in the stereo source switches. Both studio outputs can be muted. Studio 1, 2, or both can be used for stereo headphone feeds or studio playback speakers.

2.3 COMMUNICATIONS SECTION

A two way communication system is built into Merlin. The built-in talkback mic can feed the Groups, Auxes, Studio, or direct (patchbay), and into the CRM 2 output. The momentary **TB** talkback switch activates the internal electret microphone while dimming the main CRM monitor speakers.

The latching COMM switch activates the talkback system to create a two way communication between the control room (CRM 2) and studio. To prevent feedback, levels should be adjusted.

2.4 SOLO / OSCILLATOR SECTION

The Solo section has a solo master volume control, **AFL** (after fade listen) switch, and **SIP** (solo in place) switch. A center detent (for nominal level) is built-in to the volume control. With both switches in their up position, the Channel and Mix solo switches function in the **PFL** (pre fade listen) mode. A blinking solo led at the end of Merlin's magic wand indicates a SOLO switch is depressed. If the **AFL** switch is depressed, any solo switches function in the non destructive after fade listen mode. When the **SIP** switch is pressed, a destructive Solo In Place system is active, muting all non selected channels except those isolated by the **SFE** (safe) switch on the modules.

The three frequency, low distortion oscillator is a phase shift design. The frequencies are: 100Hz, 1kHz, and 10kHz. Each frequency has its own front panel alignment trimmer. A master level control is fitted to adjust the output of the oscillator for precise alignment of the console and tape machines. The level ranges from -35 dB to +20 dB with a detented mid-position of +4 dBu which can be trimmed by the CAL trimmer.
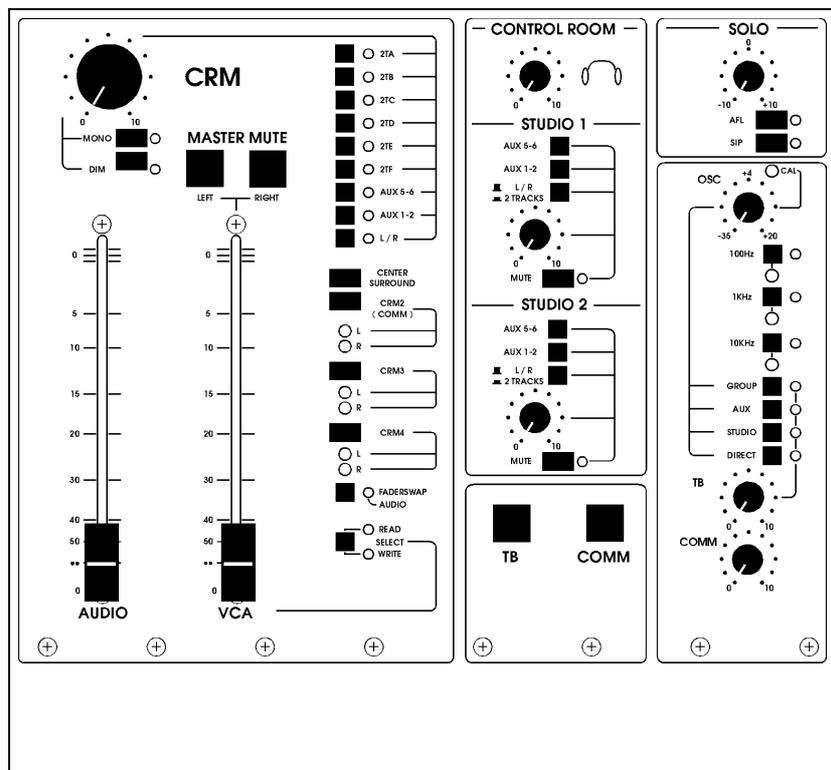
The oscillator can be assigned to the Group busses, Aux busses, Studio outputs, as well as the direct output (in the patchbay). Each of the oscillator assignment switches have an led indicator. The CRM will dim 20dB when the oscillator is active.

The channel meters are a peak reading design and read -6dB when a oscillator sine wave with a +4 dB output level is sent to the meter. Measuring the +4 dB output level of the channel or master with a AC voltmeter would give a 1.22 AC volt reading. When monitoring the oscillator on analog VU meters, the VU meters should read "0" when the channel meters are reading -6dB. After all alignment procedures have been performed, playing program material will make both types of meters agree more.
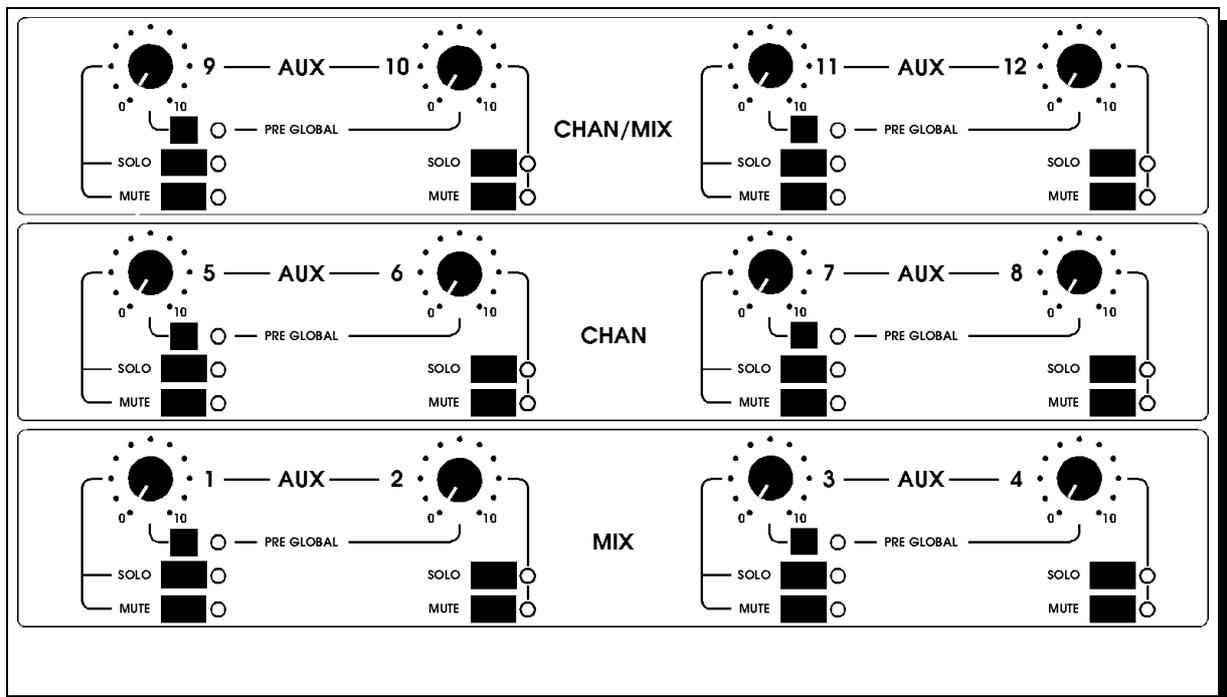
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AUXILIARY MASTERS

2.5 AUX MASTER SECTION

The Aux master section is located at the top of the master module and houses the 12 Aux masters controlling the output level of the Aux sends. Every pair of aux pots have a combined global pre/post switch. The global pre/post switch will switch a complete Aux buss from post to pre fader. The pre global switch is a "soft" switch and when pressed, switches every associated aux in the input modules.

Aux 1 through 4 are fixed in the Mix path and Aux 5 through 8 in the Channel path. Aux 9-12 can be fed per pair/per module from either the channel path or the mix path.

Each Aux master has its own solo switch. All Aux master solo switches are **AFL** (after fade listen) switches independent of the selection made in the SOLO control section. All mutes are soft mutes and under control of the automation section. The Aux outputs are balanced and normalled in the patchbay to the tie-lines.

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2.6 MASTER INPUTS/OUTPUTS

Merlin interfaces easily with external equipment such as two track master machines, signal processors, headphone amps, and power amps. Interfacing is possible using the connectors on the master back panels, and through 25 pole sub D male connectors. Listed below are all inputs and outputs for the master modules.
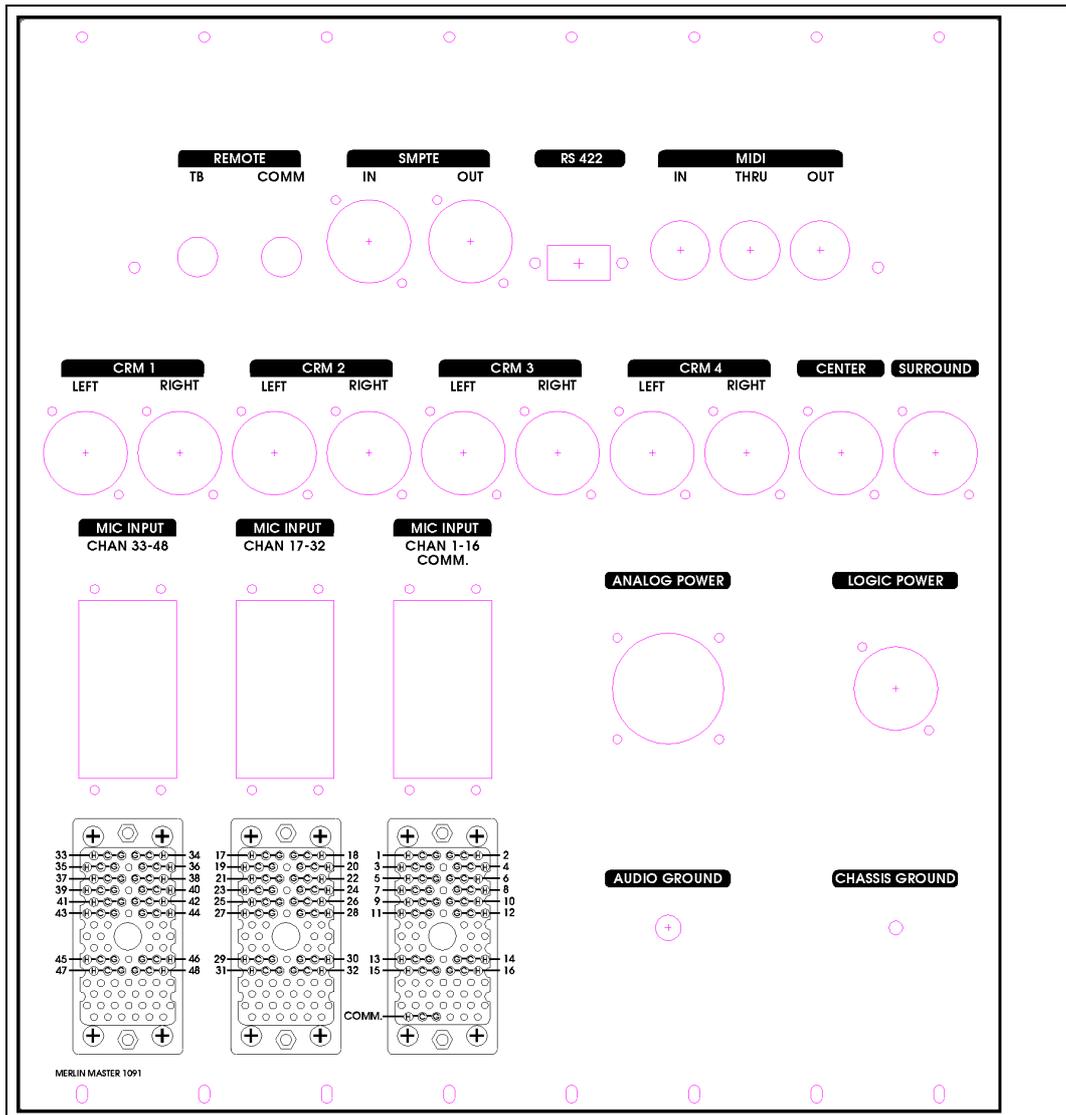
The master backpanel houses the remote connectors for the Talkback and Communication mics, balanced SMPTE in and out XLR's, an RS 422 computer connector and the Midi in, thru, and out din type connectors.

The second row is completely filled with Monitor XLR's such as CRM 1 through 4 and the Center and Surround outputs. Also mounted are 56 pole Elco/Edac type connectors for up to 48 balanced microphone inputs. Speakon type connectors are used for powering up the Merlin and separate Audio and chassis grounds are provided. A detailed connection diagram will be shown in the installation section of the manual.
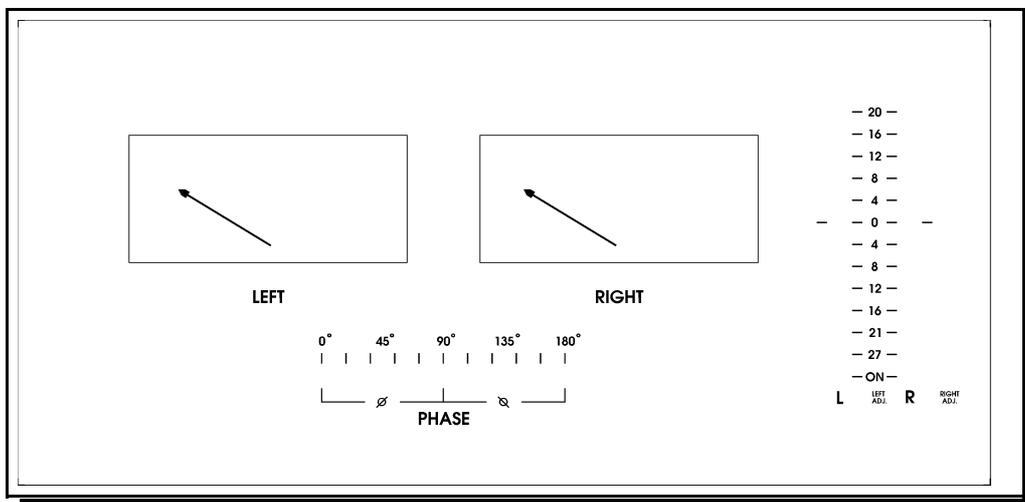
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2.7 METERING

Master metering

The Merlin has 25 segment peak reading meters in parallel with analog **VU** meters above the master section in the meterbridge. Due to Merlin's **peak** meters high scale (-35dB up to +20dB), extreme transients can be seen as they happen. Merlin opted for a yellow section of the display to show the "work area" without loosing the actual output level. Especially for digital equipment, it is essential to be informed about the <u>real</u> level at the output of your console. Analog VU meters will indicate the average level while Peak reading LED bargraph meters display the absolute peaks in the signal paths.

A separate **Phase** meter indicates any phase shift between the left and right signals. In most cases, switching the phase switch on selected input modules can correct the phase shift.


Mono and Stereo module meters

Due to the extreme transients in digital recordings, Merlin's "**Peak**" reading meters have an extended range of up to a reading of +20dB. The bottom LED on all D&R LED bargraph meters is an indicator that the associated module is on. When first powering up, always check all "**ON**" LEDs under each meter. If any "**ON**" LED is not lite, turn off the power supplies and call D&R for service advice. Both mono and stereo input module meters have peak balistics with 25 segments. Merlin's meters can be switched (individually) to read the **CHAN**nel section or **MIX** section of each module via ARM.

2.9 RECALL / AUTOMATION

If you would like to set-up for your first Merlin session, read the following simple steps. It is most important to understand that the **Recall** Automation is static and **PowerVCA** (fader, Mute, & switching) automation is dynamic and completely separate. We will first discuss **Recall** Automation.
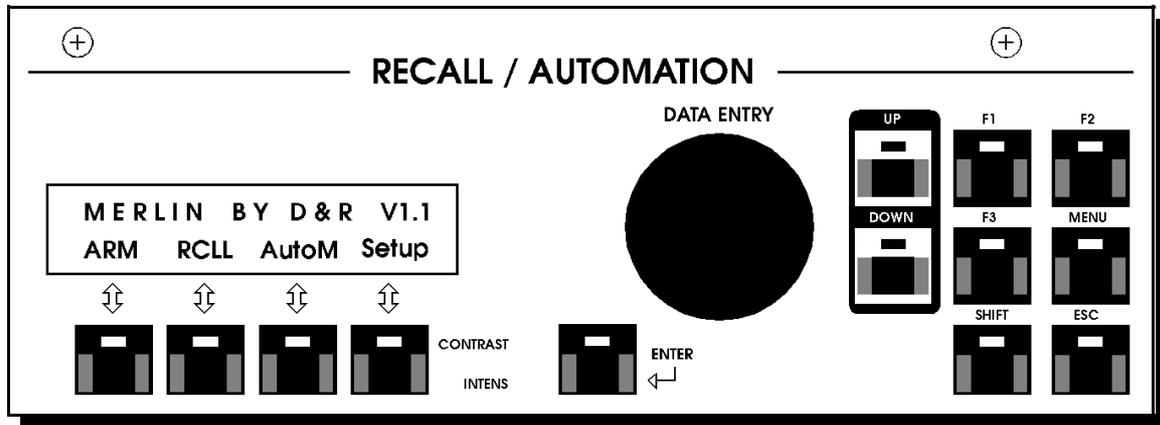
The LCD display boots up with the same information it had when it was powered down. Press ESC until it reads as follows:
In order to start a project we first need to name the project. A suggestion is to name the project your customer's name or initials with the date of the recording. The next time that customer returns, it will take just a couple of key strokes to recall his setup. If you name each file the song or session title, it will allow you to recall the digital setup without any confusion.

PROJ. (Project) **Naming your Project**.
The four yellow Switches (below the LCD display) toggle the text in the LCD display. For now let's call these four sw
itches (from left to right) **S1**, **S2**, **S3** and **S4**.
After pressing **S2** (Project), you can enter the project number (from 1 to 56).
Next enter the name of the project by pressing the name switch (**S3**). Now the LCD display changes to:

The text can be entered using the following method: The up and down switches dispense the alphabet and numbers by pressing either **UP** or **DOWN**.
The << (S3) and >> (S4) switches move to the next position in a word or number. The **Store** button stores the name or number associated to that project.

You can Call, Copy, and Store projects in the same manner. The **St: 1** is to indicate which Status the selected module is in from the LCD display.
Switching the **STATUS 2** switch on any module will change in the LCD display as you press the switch.

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Merlin's Reset

When you press Merlin's Reset (S4) switch,
the LCD display reads as follows:

```
Merlin's Reset
Mute     Insert     AuxM     Status
```

If any modules are muted anywhere and you
press **Mute** (S1) twice, all **MUTE** switches will mute. Press it again and all
mute switches will un-mute. Pressing Insert (S2) will net the same results for
all **INSERT** switches. Pressing AuxM (S3) will net the same results for all
AUX MUTE switches and pressing the Status (S4) will net the same results
for the **STATUS** switches.

ARM

Press the ESC switch until the LCD display
reads as follows:

```
Proj.      1      (Your file name)
ARM      Proj.              Reset
```

By pressing **ARM** (S1), the ARM software
will become active and the following changes
take place in the LCD display:

```
Merlin's ARM        Mod:    48
Call      Copy      Store    St:  2
```

You could then turn the **DATA ENTRY** wheel until the desired module's

ARM switch is lite. The LCD display changes
and the **ARM** switches switch lights change to
the adjacent module (in either direction) as you
turn the wheel.

```
Merlin's ARM        Mod:    48
Call      Copy      Store    St:  2
```

In most cases it is faster to go to the module you would like to route from and
press the **ARM** switch. The **ARM** switch in the selected module lights up. By
pressing any **ARM** switch, new information in the LCD will appear and the
corresponding routing settings will be shown by the LEDs in the **ARM** section
of that module.

The ESC switch will take you out of the **ARM** menu. You can press an active
ARM switch to achieve the same results. The **ARM** mode will show the
routing settings of the selected module.

ROUTING INPUT MODULES

Although a more detailed explanation of input module routing is described in
section 3.4 of this manual, we will discuss simplified version now (this makes it
easier to understand other functions being discussed in this section).

Step 1: Press an **ARM** switch on any desired input module.
Step 2: If you would like this module's **CHAN**nel section routed to track 24,
press the **CHAN** switch under the four switches labeled 17-18   19-20
21-22   23-24 and then press the 23-24 switch.
Step 3: Press the Store (S3) switch. Now the routing you made is
stored in memory.
Step 4: If you would like this same module's **MIX** section to be
routed to the stereo mix buss so you could monitor that track,

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press the **CHANNEL** - **TO L/R** switch, then press store
(S3). Now you have two different things from that input
module stored.

You can assign Aux 9-10 and/or 11-12 in the same manner. In order to have
more aux send busses, you can route **AUX 11 - 12** to the 24 busses.
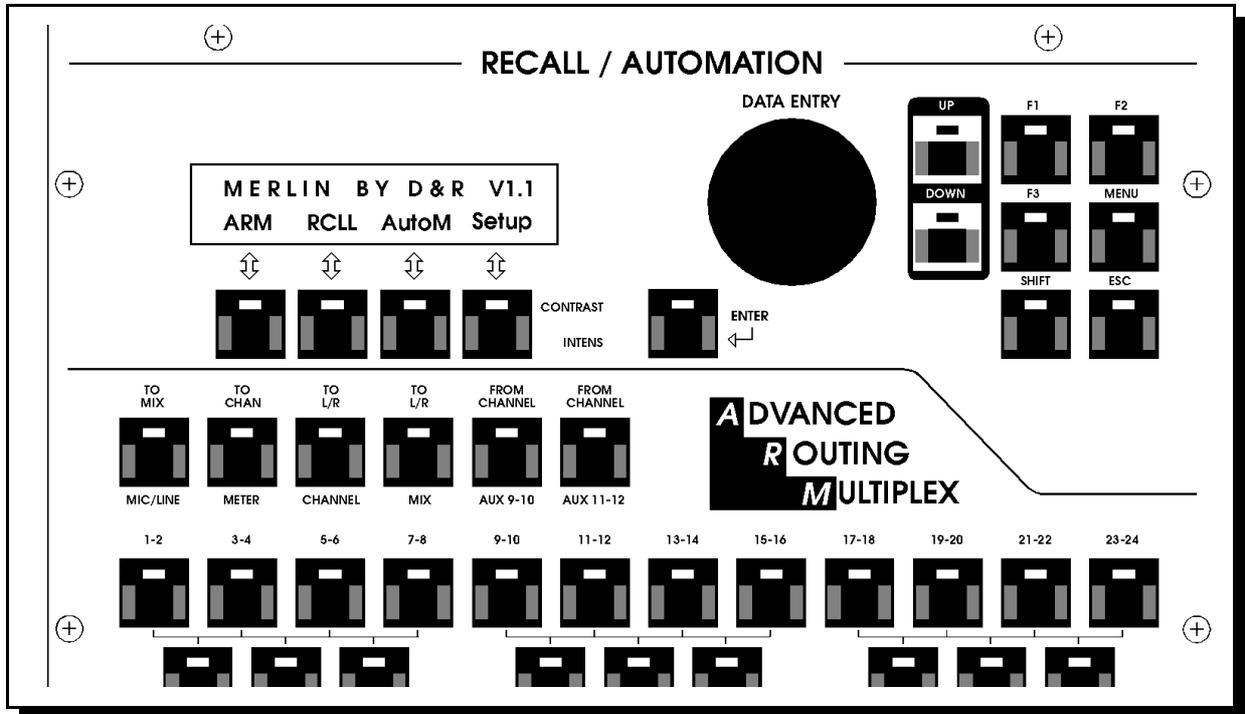

STATUS 2
The module has a second level of settings which can be recalled by pressing the
STATUS switch in the selected module. When you press Merlin's **STATUS 2**
switch, he gives you the opportunity to store a completely different setup for
that module without changing the first setup.
The **STATUS 2** switch toggles between the
two (stored) module setups.

```
Proj:    1              D&R

     Store      <<      >>
```
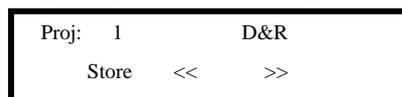
The **ST:1** or **ST:2** status is indicated in the LCD display. By pressing S4, you
can see what the module's other status is by looking at the routing LED's in the
master ARM switches without actually changing the status. *Note: this will not
change any module setting!* Pressing a module's **STATUS 2** switch will
change your settings as stored in the memory. In order to setup a new
STATUS 2 routing assignment, press the
STATUS 2 switch and go to the master
module **ARM** section. At this point, you
simply route the **CHANNEL**, **MIX**, **AUX
9-10**, **AUX 11-12** (or all) associated switches
to where you would like them to go or in the case of the auxes, where you
would like for them to get their signal from.

```
Proj:      1              D&R         Call
    Copy      Store    St: 1
```
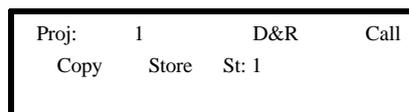
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CHANGING CHANNEL DATA.
In the **ARM** section of the master module you can assign all module routing settings by pressing the associated switches. These settings will <u>not</u> be stored in real time.
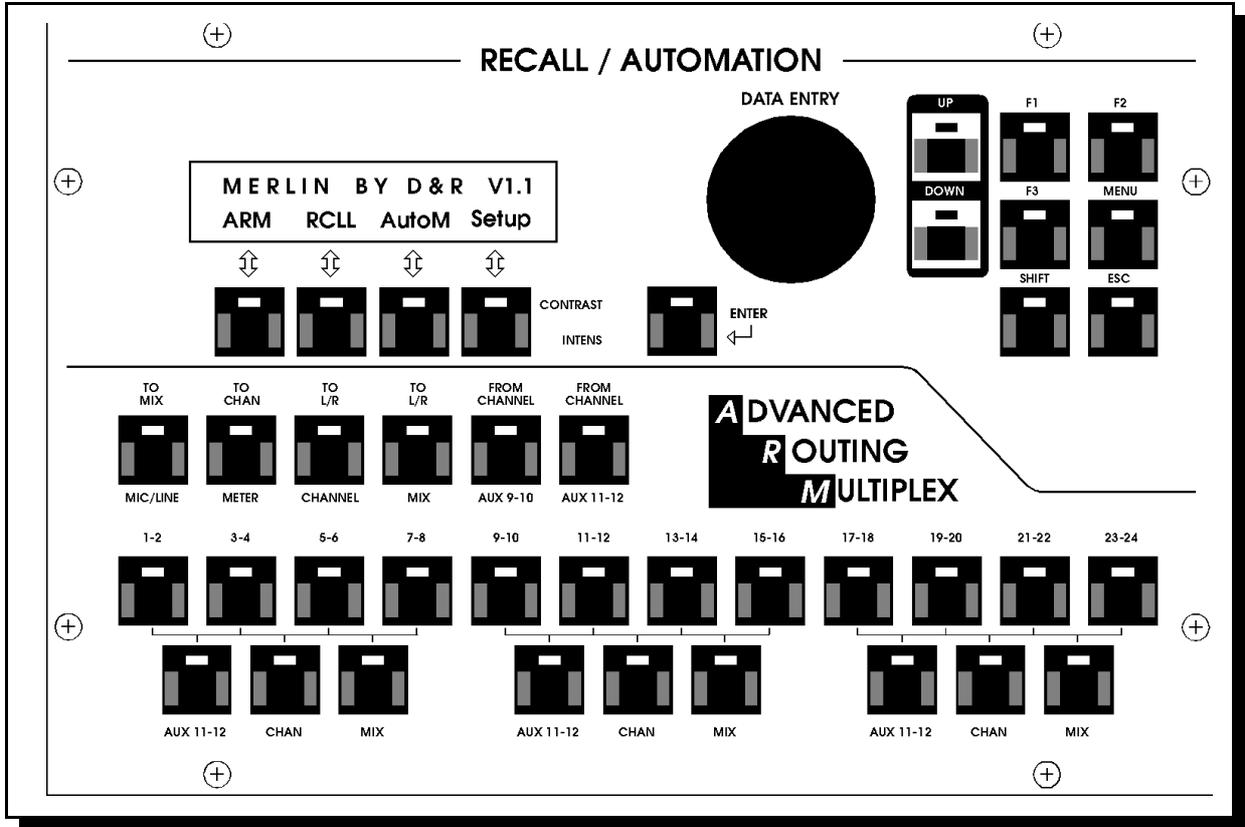
If you press the **S3** switch below the LCD (when it's showing **STORE**) these settings will be stored for the module that has its' **ARM** light on.
If new data is entered in the **ARM** section and you're not pleased press, the **S1** switch (**Call**) which will restore the "old" data. Once you press **Store**, it now has new data.

The **UP** and **Down** switches as well as the **DATA ENTRY** (encoder) knob will allow you to select another module. A faster method is to hit the **ARM** switch in the module that needs routing changes.

MODULE SETUP COPYING
The **S2** (**Copy**) switch allows you to copy a selected module's setup to another module or to as many modules you would prefer. The following are easy steps describing this operation.
Step 1: Select a module, press the **S2** (**Copy**) switch and select another module by the **UP - DOWN** switches or **DATA ENTRY** (encoder) control knob.
Step 2: Pressing the **F1** switch allows you to copy the module settings to another or all other modules.
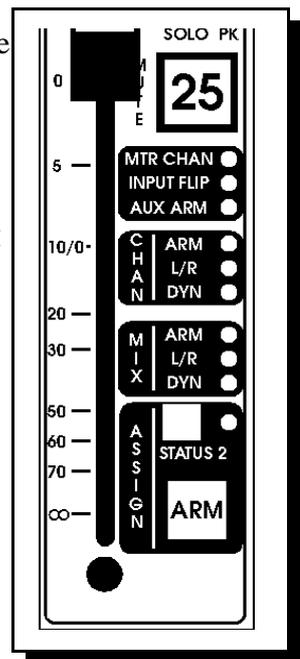
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Step 3: As soon as you hit **ENTER** all data will be copied to the selected module (or modules via **F1**) and the data from these modules will be stored in Merlin's brain (onboard microprocessor).
Note: Press ESC to leave the copy menu.

PROJECT
All settings related to a project are made in "**Merlin's Soul Set-up**" display. **S2** (**Proj**) selects the project. In the project menu you can select a project number by pushing the **UP** and **DOWN** or turning the **DATA ENTRY** encoder control.

```
Merlin's ARM      Mod:   48
Call      Copy      Store    St:  2
```

The **S3** switch allows you to name the project by the same **UP / DOWN** switches or rotary **DATA ENTRY** encoder control.
The routing switches can also be used to write a project name into the memory. The **S1** (**CALL**) switch **Recalls** a project.

AutoMation
When you press (**S3**) **AutoM,** the display shows the **SMPTE** time code and when your **PC** is not active, the **LCD** display will show **SMPTE**. When your PC software is active, the LCD will show the **START, STOP, REWIND**, and **FAST FORWARD** nomenclature.

SET-UP
The Display shows **"Merlin's Soul Set-up"** plus the text **Config** and **CLM**. By pressing the **Config (configuration)** switch it is now possible to tell the memory how many channels your Merlin has. Use the **UP** and **DOWN** switches or the rotary **DATA ENTRY** encoder knob to dial up the amount of channels you wish to automate. By pressing the **ENTER** switch, Merlin's memory (onboard microprocessor) is loaded with this new information.

CLM (Clear Memory) allows you to totally clear Merlin's memory. When you press **CLM**, Merlin asks; Yes or No giving you a second chance. If you press Yes, Merlin becomes a real airhead.
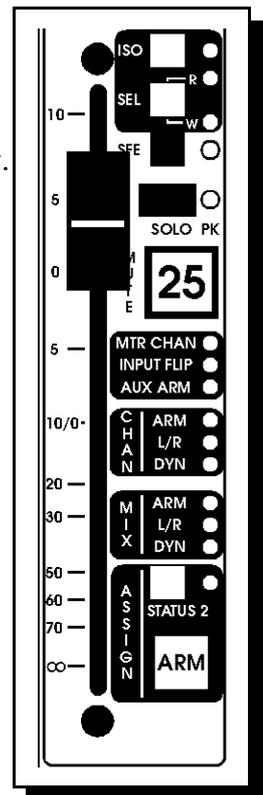
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3.0 DUAL PATH MONO MODULE - DESCRIPTION

Merlin's Dual Path mono input module is a basic input / output design whereby all signal flow takes place from the microphone to the multitrack. Each dual path mono module is shipped with **PowerVCA** Automation and a 25 segment LED bargraph meter. The mic/line inputs are in the **CHANNEL** section of the module while the **TAPE** machine outputs are in the **MIX** section.
The following sections explain the many functions and features of each section of the dual path input module.

3.1 CHANNEL SECTION

The input section controls all incoming signals from microphone, line, and multitrack outputs. A **48V** phantom power switch for condenser microphones or direct boxes can be silently switched in or out of the circuit. The **Line** switch converts the Channel input from a balanced mic input into a balanced line input. Merlin has separate electronics for each input. The top knob of the dual concentric **GAIN** control adjusts the mic/line levels in the **CHAN**nel path and the bottom control adjusts the (**tape**) input of the **MIX** path. When the **GAIN** control is accurately set, it is possible to achieve the very best signal to noise ratio and maximum headroom Merlin was designed to achieve. The **PHASE** switch is used to reverse the p
hase of any mike or line input. A successful method of checking for out of phase signals is to press the mono switch on the master section and listen closely to the mix. If an unexpected sound is heard or if something appears to be missing from the mix, press the phase switch on the channel suspected to be in error. If the sound improves, then that channel was out of phase with the others.

3.2 AUX 9 - 12 SECTION

Aux 9 through 12 are 4 individual aux sends that can be fed (in pairs) from either the Channel path or the Mix path. Sourcing, assigning and **PRE/POST** switching is controlled from the **ARM** section. An adjacent LED indicates whether the Aux sends get their signals from either the **MIX** path (no LED active) or the **CHAN**nel path (LED active).

Sourcing the Aux 9 - 10 and/or 11 - 12
Step 1: Press the **ARM** switch on a desired module.
Step 2: Press **Aux 9 - 10 FROM CHANNEL** in the master section.
Step 3: Now press **STORE** (switch S3).
On the module you chose to press **ARM**, AUX 9 - 10 are now getting their signal from the **CHAN**nel section of that module. If you wanted **AUX 9 - 10** to get their signal from the **MIX** section of that or any module, repeat the same steps above replacing **9 - 10 FROM CHANNEL** with **AUX 9 - 10 FROM MIX. AUX 11 - 12** assign the same as above.

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Aux 11-12 can be assigned to any of the 24 Digital Routing busses in the **ARM** section. By Digitally routing the AUX 11 - 12 sends to any of the 24 multitrack busses, you have up to 24 more aux send busses available. The **status indicator** section in the input module shows if routing is active when the **LED** is on adjacent to **"AUX ARM"**.

Routing AUX 11 - 12 to the Multitrack Busses.
Step 1: Press **ARM** on the module you would like to route auxes from.
Step 2: Press the AUX 11-12 switch below the buss switches in the master section (you have three choices; 1 thru 8 or 9 thru 16 or 17 thru 24).
Step 3: Press the Buss switch or switches you would prefer to buss to.
Step 4: Press STORE (switch 3).
Step 5: From Merlin's patchbay, patch the group outputs to your choice of signal processing equipment's inputs.

AUX 9 through 12 PRE / POST switching.
All aux sends can be switched (in pairs) **PRE** or **POST** from the **AUX** masters section of the master section. See Section 2.5 of this manual for more details.

AUX 5 - 8
Aux 5 through **8** are dedicated aux sends for the **CHAN**nel path. Both Aux sends can be selected to be **PRE** or **POST** per pair in the Aux master section. **Aux 5-6** were designed with level and pan to easily build up a stereo mix for headphones. The **MUTE** on **Aux 5 - 6** is programmable and under automation control.

3.3 EQUALIZER SECTION - CHANNEL PATH

This four-band parametric equalizer is unique in its design. There are four bands, the high and low bands are sweepable frequency, shelving characteristics type with a boost or cut of 16 dB. The two mid bands each sweepable frequency peak/dip type with a boost or cut of 16 dB.

The **HF** (high frequency) section is a variable frequency shelving type, sweepable from 4,000 Hz to 20,000 Hz with a maximum boost or cut of 16 dB.
The **LF** (low frequency) section is a variable frequency shelving type, sweepable from 20 Hz to 500 Hz with a maximum boost or cut of 16 dB.
The **HMF** (High / Mid Freq.) section has level and frequency controls with variable frequency ranges from 700 Hz to 15,000 Hz and has a maximum boost or cut of 16 dB. The bandwidth has a Q factor of 1.5.
The **LMF** (Low / Mid Freq.) section has level and frequency controls with variable ranges from 50 Hz to 1000 Hz and has a maximum boost or cut of 16 dB. The bandwidth has a Q factor of 1.5.
All level controls are center detented making neutral positions easy to establish. All frequency ranges have been carefully selected following extensive examination of all types of music (and noise).
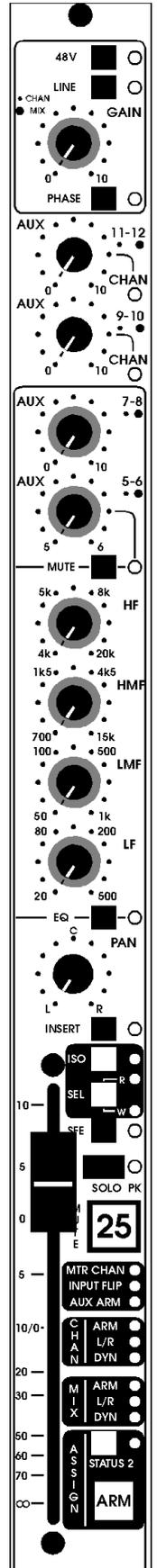
Merlin

Test comparisons of other equalizers helped the D&R design team create an equalizer that sounds very musical , but at the same time, raising the standard in specs and sound quality. Noise and distortion are kept to an absolute minimum. An equalizer on - off switch is fitted to allow easy comparisons.

PANPOT
Merlin's panpot is built with special crosstalk canceling circuitry to achieve minimum crosstalk between two selected busses. A center detent with -4.5 dB attenuation is standard.

INSERT
The insert switch is automated and silently switches a signal processor in or out of the channel path. The automation will control this switch with time code.

ISO
The ISO switch removes the VCA from the signal path and replaces its' functions with the audio taper of the 100 mm channel fader. When the ISO switch is pressed, the automated fader level is no longer working on this section (manual use only).

SEL
The SEL switch determines the automation mode of the automated fader. Either off (no LED's on) read (R), write (W) or update/trim both Read and Write LED's on.
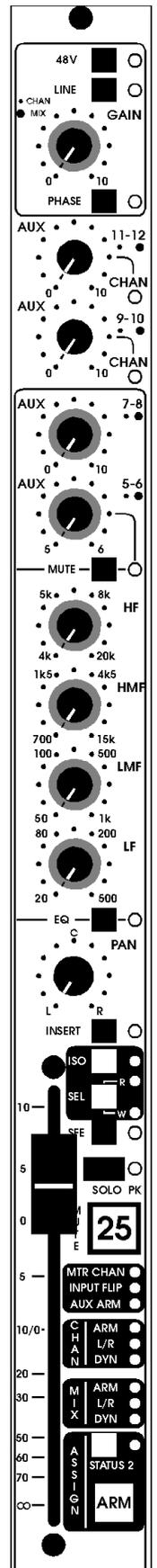
SFE
The **SFE** (safe) switch bypasses the mute circuitry in a channel. When you solo any other input while in the **SIP** (solo in place) mode, any place that has the **SFE** switch pressed will solo as well. This feature is used when you need to solo a vocal and want to hear the effect as well.

SOLO/PK
The **SOLO** switch has an adjacent LED that doubles as an indicator for the solo and is also an input peak indicator. When the SOLO switch is not on, the LED will come on when input signals reach a +18dBu input level. The **SOLO** system has three modes, **PFL** (pre fade listen), **AFL** (after fade listen), or a destructive stereo solo-in-place solo. Master status switching (located in the master section) selects the solo-in-place or **PFL/AFL** mode for the entire console. Activating the solo switch in the **PFL** mode will send the prefader signal of the Channel section to the CRM speakers. In the **AFL** mode (non destructive) and solo-in-place mode (destructive), the post channel panpot signal is heard, and all other modules are muted within the stereo mix buss (unless their SFE switches are pressed).

MUTE
The **MUTE** system is a special soft-muting circuit, click-free and associated with the automation circuitry. A **MUTE** indicator (bulb) is fitted inside the **MUTE** switch.

FADER

The 100 mm linear fader controls either the internal VCA or the audio signal. The **ISO** switch removes the VCA from the signal path when preferred for extremely low distortion recordings. When automation is needed in mixdown, the VCA can be inserted individually per channel when needed. Although today's VCA's have very low distortion and very impressive specs, many audio purists would rather not add anything into the signal path. When the VCA is in circuit, noise is kept to an absolute minimum and distortion is of the second harmonic type which many engineers and producers like.
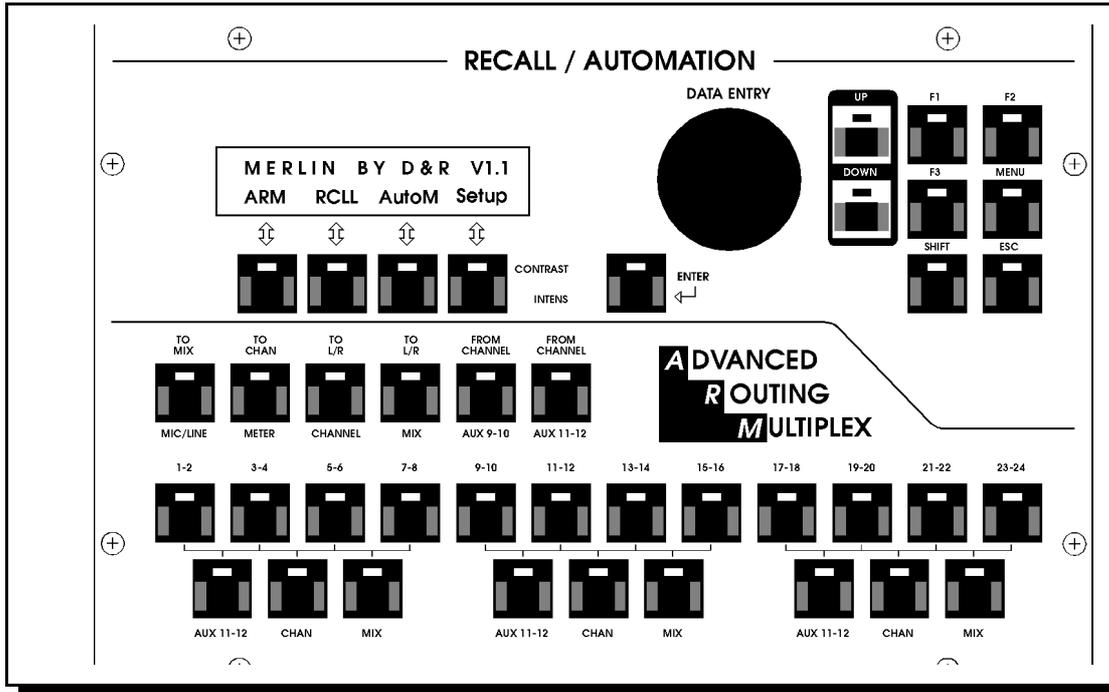
3.4 CHANNEL / MIX STATUS SECTION - USING ARM

There are four white sections with LED's that indicate when the **ARM** system is active and let you know what is routed. The first section has three LED's; red green and yellow. These three function indicators are associated with the input section and auxes 9 through 12 on each module.
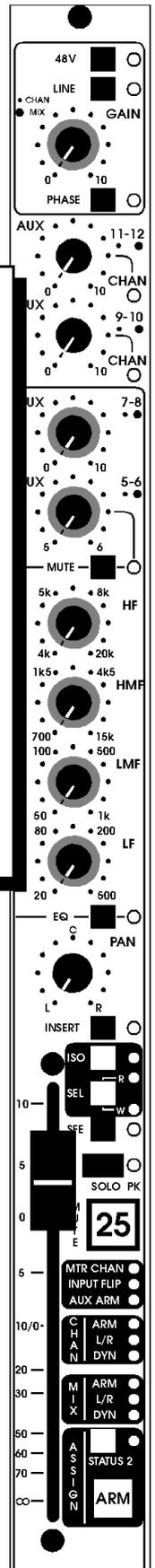
MTR CHAN

The **MTR CHAN** LED indicates that the channel meter (which normally follows the tape switch) is switched to follow the input (mic or line) section.

INPUT FLIP

When this LED is on, the mic or line signals are directed to the **MIX** path of the module and the tape signal is connected to the **CHAN**nel path of the module.

AUX ARM

This LED indicates when **AUX 11-12** is assigned to one or more of the digital routing busses.

CHANNEL & MIX ARM

The next two white indicator sections are for **CHAN**nel and **MIX.** Since both are identical, we will discuss only the **CHAN**nel section. The **ARM** LED lights when the **CHAN**nel (or **MIX**) path is assigned to one or more digital routing busses. Pressing the **ARM** switch shows you in the Merlin's master section what digital buss is connected to the **CHAN**nel (or **MIX**) path. If you would like to buss the **CHAN**nel and **MIX** sections from the same module - to the same busses - at the same time, there is no problem. If you wish to buss the **CHAN**nel to multitrack buss 1 and the **MIX** to multitrack buss 3, you have a problem, both **CHAN**nel and **MIX** would go to both tracks 1 and 3. However, if you want the **MIX** section to buss to track 4, there is no problem. The only time you have a problem is when you wish to buss to the same group of eight tracks from the **CHAN**nel and **MIX** sections at the same time and both are panned odd (left) or even (right). If you wish to buss both **CHAN**nel and **MIX** within the same group of eight (1 - 8 or 9 - 16 or 17 - 24), as long as they are panned opposite, there is no problem.

The **L/R** LED indicates that the **CHAN**nel (or **MIX**) path is routed to the main left/right mix busses.

DYNamics

When the **DYN** LED is on, an optional compressor, limiter, gate, or other effects / signal processors will be inserted into the signal path. This option will be available in early '96. The optional **DYN**amics' master control will be mounted above the RECALL / AUTOMATION section.

ASSIGN

In the fourth white section is the **ARM** switch and **STATUS 2** switch. The **ARM** switch assigns a module to the **ARM** section in the master where assignments can be made and stored. A second level of assignments can be stored under **STATUS 2**. **STATUS 2** can be immediately recalled on the module. Toggling between the two modes is possible in every module. Both settings are stored.

3.5 MIX PATH

The **MIX** section is the second signal path in the Merlin dual path mono module. It has a full 4 band eq, up to 8 aux sends, panpot, a **Group** switch, and mute & solo switches. In record mode (non activated input flip), the **MIX** section is fed by either the tape return or group output.
The **GRP** (group) switch inserts the **MIX** fader into the multitrack summing amps of that particular channel. This allows the **MIX** fader to become a subgroup fader for that buss. All relevant functions of the monitor section are also inserted. The stereo solo-in-place or pfl system and mute can be used on this group fader as well as auxiliary sends and equalizer, but the mix signal path is obviously lost, however it is still monitored.
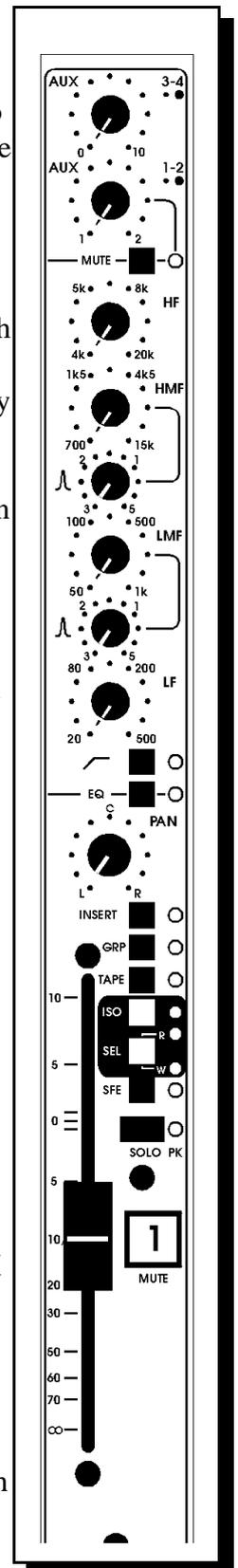
3.6 AUX SENDS - MIX PATH

Aux 1 through 4 are dedicated aux sends for the **MIX** path. Both Aux sends can be selected to be PRE or POST per pair in the Aux master section.
Aux 3 & 4 were designed with a level and pan to easily build up a stereo mix for headphones. The **MUTE** on **Aux 3 - 4** is programmable and under automation control.

3.7 Equalizer Section - MIX path

This four-band parametric equalizer is unique in its design. There are four bands, the high and low are sweepable frequency with shelving characteristics with a boost or cut of 16 dB and the two mid bands each sweepable with a boost or cut of 16 dB and a variable bandwidth control.

The **HF** (high frequency) section is a variable frequency shelving type, sweepable from 4,000 Hz to 20,000 Hz with a maximum boost or cut of 16 dB.

The **LF** (low frequency) section is a variable frequency shelving type, sweepable from 20 Hz to 500 Hz with a maximum boost or cut of 16 dB.

The **HMF** (High / Mid Freq.) section has level and frequency and bandwidth controls with variable frequency ranges from 700 Hz to 15,000 Hz and maximum boost or cut of 16 dB. The bandwidth of the variable que has a range of 0.5 to 3 octaves.

The **LMF** (Low / Mid Freq.) section has level and frequency and bandwidth controls with variable frequency ranges from 50 Hz to 1000 Hz and maximum boost or cut of 16 dB. The bandwidth of the variable que has a range of 0.5 to 3 octaves.
All level controls are center detented making neutral positions easy to establish. All frequency ranges have been carefully selected following extensive examination of all types of music (and noise). Test comparisons of other equalizers helped the D&R design team create an equalizer that sounds very musical , but at the same time, raising the standard in specs and sound quality. Noise and distortion are kept to an absolute minimum. An equalizer in - out switch is fitted to allow easy comparisons.
A **High Pass Filter** in / out switch with indicator is fitted to roll off the low frequencies at 100 Hertz.

3.8 MIX PATH FUNCTIONS

PANPOT
Merlin's panpot is built with special crosstalk canceling circuitry to achieve minimum crosstalk between two selected busses. A center detent with -4.5 dB attenuation is standard.

INSERT

The insert switch is automated and silently switches a signal processor in or out of the **MIX** path. The automation will control this switch with time code.

ISO

The ISO switch removes the VCA from the signal path and replaces its' functions with the audio taper of the 100 mm channel fader. When the ISO switch is pressed, the automated fader level is no longer working on this section (manual use only).

SEL

The **SEL** switch determines the automation mode of the automated fader. Either off (no LED's on) read (**R** LED on), write (**W** LED on) or update/trim both **Read** and **Write** LED's on.

SFE

The **SFE** (safe) switch bypasses the mute circuitry in the **MIX** section. When you solo any other input while in the **SIP** (solo in place) mode, any place that has the **SFE** switch pressed will solo as well. This feature is used when you need to solo a vocal and want to hear the effect as well.
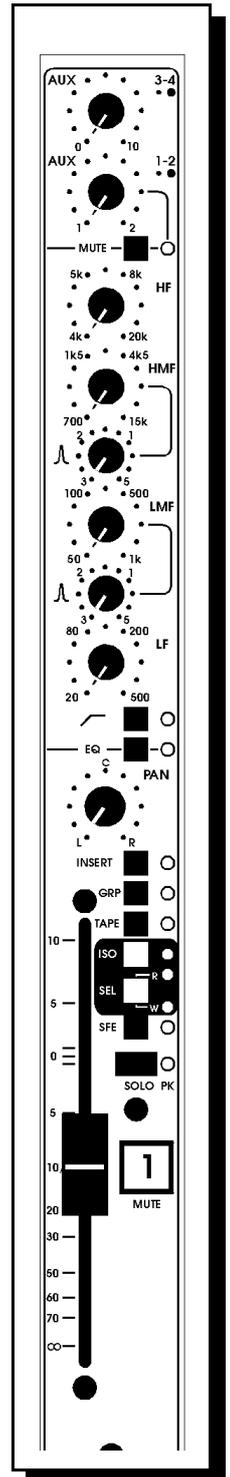
SOLO/PK

The **SOLO** switch has an adjacent LED that doubles as an indicator for the solo and also an input peak indicator. When the SOLO switch is not on, the LED will come on when input signals reach a +18dBu input level. The **SOLO** system has three modes, **PFL** (pre fade listen), **AFL** (after fade listen), or a destructive stereo solo-in-place solo. Master status switching (located in the master section) selects the solo-in-place or **PFL/AFL** mode for the entire console. Activating the solo switch in the **PFL** mode will send the prefader signal of the **MIX** section to the CRM speakers. In the **AFL** mode (non destructive) and solo-in-place mode (destructive), the post **MIX** panpot signal is heard, and all other modules are muted within the stereo mix buss (unless their SFE switches are pressed).

MUTE

The **MUTE** system is a special soft-muting circuit, click-free and associated with the automation circuitry. A **MUTE** indicator (bulb) is fitted inside the **MUTE** switch.

FADER

The 100 mm linear fader controls either the internal VCA or the audio signal. The **ISO** switch removes the VCA from the signal path when preferred for extremely low distortion recordings. When automation is needed in mixdown, the VCA can be inserted individually per channel when needed. Although today's VCA's have very low distortion and very impressive specs, many audio purists would rather not add anything into the signal path.
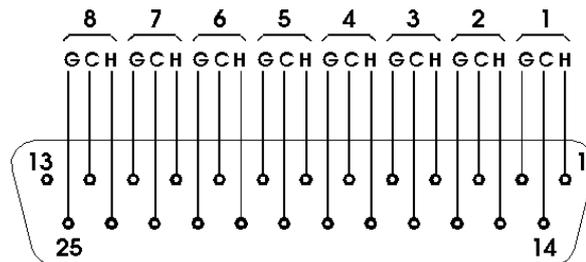
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3.9 CHANNEL & MIX PATH INPUTS / OUTPUTS

All mic inputs are interfaced via Elco/Edac 56 pin connectors located on the master backpanels. All other module inputs and outputs are located in the patchbay and accessible via 25 pin sub "D" connectors on the back of the patchbay.
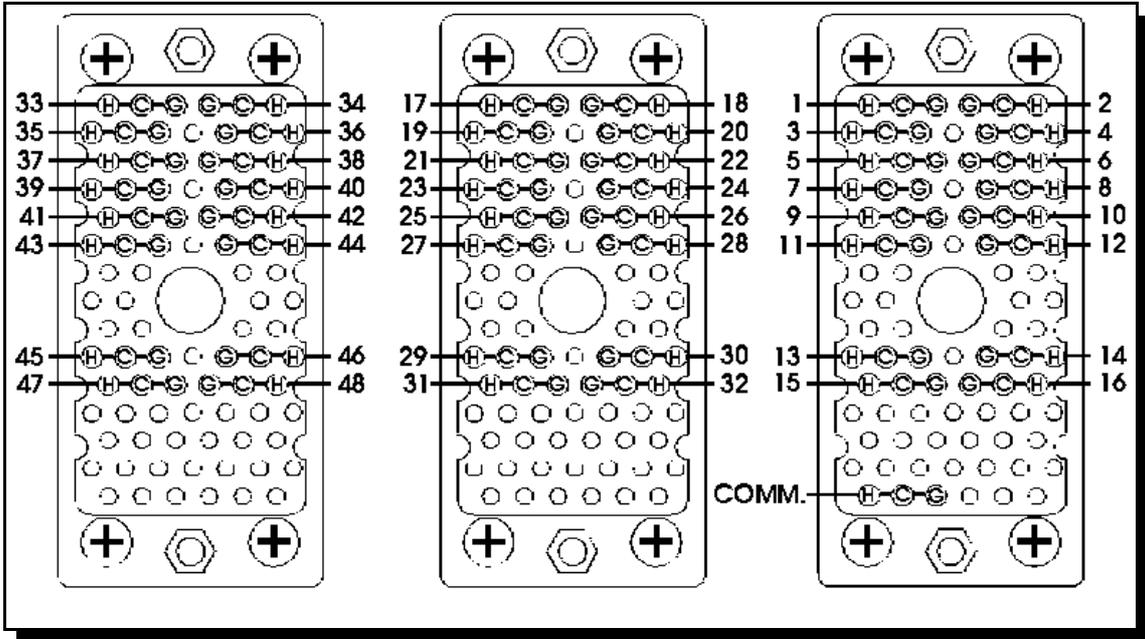

56 Pin Elco Connectors

25 Pin Sub "D" Connector

4.0 THE DUAL STEREO RETURN MODULE

Merlin's Dual Stereo Module is one of the most comprehensive products the D&R design team has developed yet. Two completely separate stereo modules (four inputs) are fitted on the same medal strip. Although designed for effects returns, this module can be used for stereo keyboards, drum machines, stereo tape machines, or any other device needing both inputs on one fader. As with all D&R products, you have the choice of how many Dual Stereo Return modules and where you would like them placed in the frame.

4.1 Input section

The input section consists of two stereo gain controls. The gain control is a dual pot (with one knob) used to adjust the gain of two line amps, **STEREO A** and **STEREO B**. The adjustment range is from -20dB to +20dB.
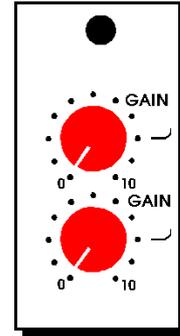
4.2 AUX Send Section

Aux sends 9 - 10 and 11 - 12 are all PRE / POST switchable in pairs in the aux master section and aux sends 11 - 12 can be digitally routed to the multitrack busses via ARM. Aux 9 - 10 and / or 11 - 12 can be programmed in the ARM section to get their signal from the CHANnel or MIX sections of each module. Aux 9 - 10 and 11 - 12 are dual concentric controls with aux 9 (11) being the top knob and aux 10 (12) the bottom knob.
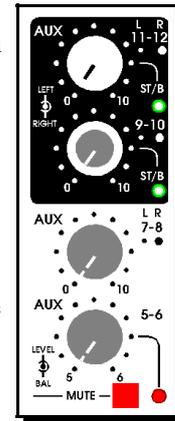
Aux 5 through 8 are always in the CHANnel path. Aux 7 - 8 are dual concentric controls with 7 being the top knob and 8 the bottom knob. The top knob on Aux 5 - 6 is a level control and the bottom knob is a balance control. The balance control is used to balance the stereo signal and not a pan pot.

4.2 Equalizer section

The D&R design team opted for a four band fixed frequency equalizer on the STEREO B input path. The selected frequencies produced the most musical sounding results.

HF 10kHz
The **HF** (high frequency) section has shelving characteristics with a boost or cut of 16dB at a fixed frequency of 10kHz
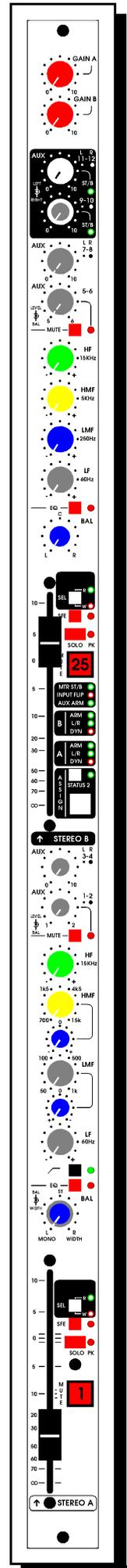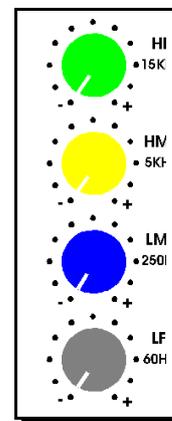
HMF 5kHz
The **HMF** (high mid frequency) section has bell curve chacteris- tics with a boost or cut of 16dB at a fixed frequency of 5kHz.

LMF 250Hz
The LMF (low mid frequency) section has bell curve chacteris- tics with a boost or cut of 16dB. This band has a fixed frequency of 250 Hz.

LF 60Hz
The LF (low frequency) section has shelving characteristics with a boost or cut of 16dB at a fixed frequency of 60Hz.

All level controls are center detented making neutral positions easy to establish. All frequency ranges have been carefully selected following extensive examination of all types of music (and noise). Test comparisons of other equalizers helped the D&R design team create an equalizer that sounds very musical , but at the same time, raising the standard in specs and sound quality. Noise and distortion are kept to an absolute minimum.

Balance control
Just below the equalizer is a stereo balance control. On Merlin's stereo module, the balance control balances the left and right signals in the stereo image.
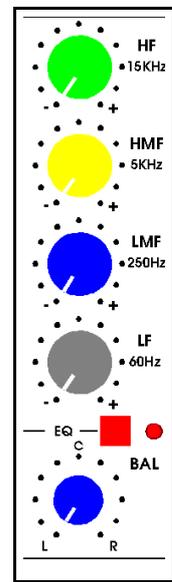
3.4 CHANNEL / MIX STATUS SECTION - USING ARM

There are four white sections with LED's that indicate when the **ARM** system is active and let you know what is routed. The first section has three LED's; red green and yellow. These three function indicators are associated with the input section and auxes 9 through 12 on each module.
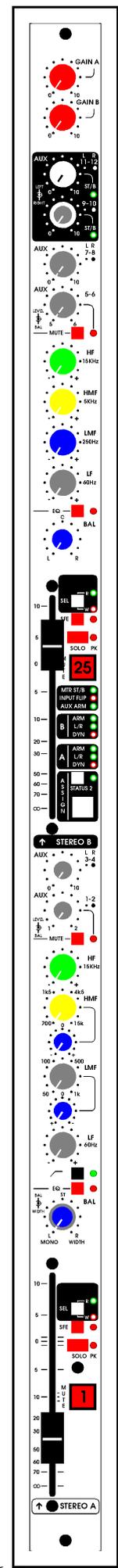
MTR CHAN
First being the **MTR CHAN** LED indicating that the channel meter (normally following the tape switch) is switched to follow the input (mic or line) section.

INPUT FLIP
When this LED is on, the mic or line signals are directed to the **MIX** path of the module and the tape signal is connected to the **CHAN**nel path of the module.

AUX ARM
This LED indicates when **AUX 11-12** is assigned to one or more of the digital routing busses.
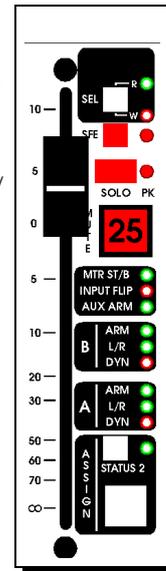
CHANnel & MIX ARM

The next two white indicator sections are for **CHAN**nel and **MIX.** Since both are identical, we will discuss only the **CHAN**nel section. The **ARM** LED lights when the **CHAN**nel (or **MIX)** path is assigned to one or more digital routing busses. Pressing the **ARM** switch shows you in the Merlin's master section what digital buss is connected to the **CHAN**nel (or **MIX)** path. If you would like to buss the **CHAN**nel and **MIX** sections from the same module - to the same busses - at the same time, there is no problem. If you wish to buss the **CHAN**nel to multitrack buss 1 and the **MIX** to multitrack buss 3, you have a problem, both **CHAN**nel and **MIX** would go to both tracks 1 and 3.However, if you want the **MIX** section to buss to track 4, there is no problem. The only time you have a problem is when you wish to buss to the same group of eight tracks from the **CHAN-** nel and **MIX** sections at the same time and both are panned odd (left) or even (right). If you wish to buss both **CHAN**nel and **MIX** within the same group of eight (1 - 8 or 9 - 16 or 17 - 24), as long as they are panned opposite, there is no problem. The **L/R** LED indicates that the **CHAN**nel (or **MIX)** path is routed to the main left/right mix busses.
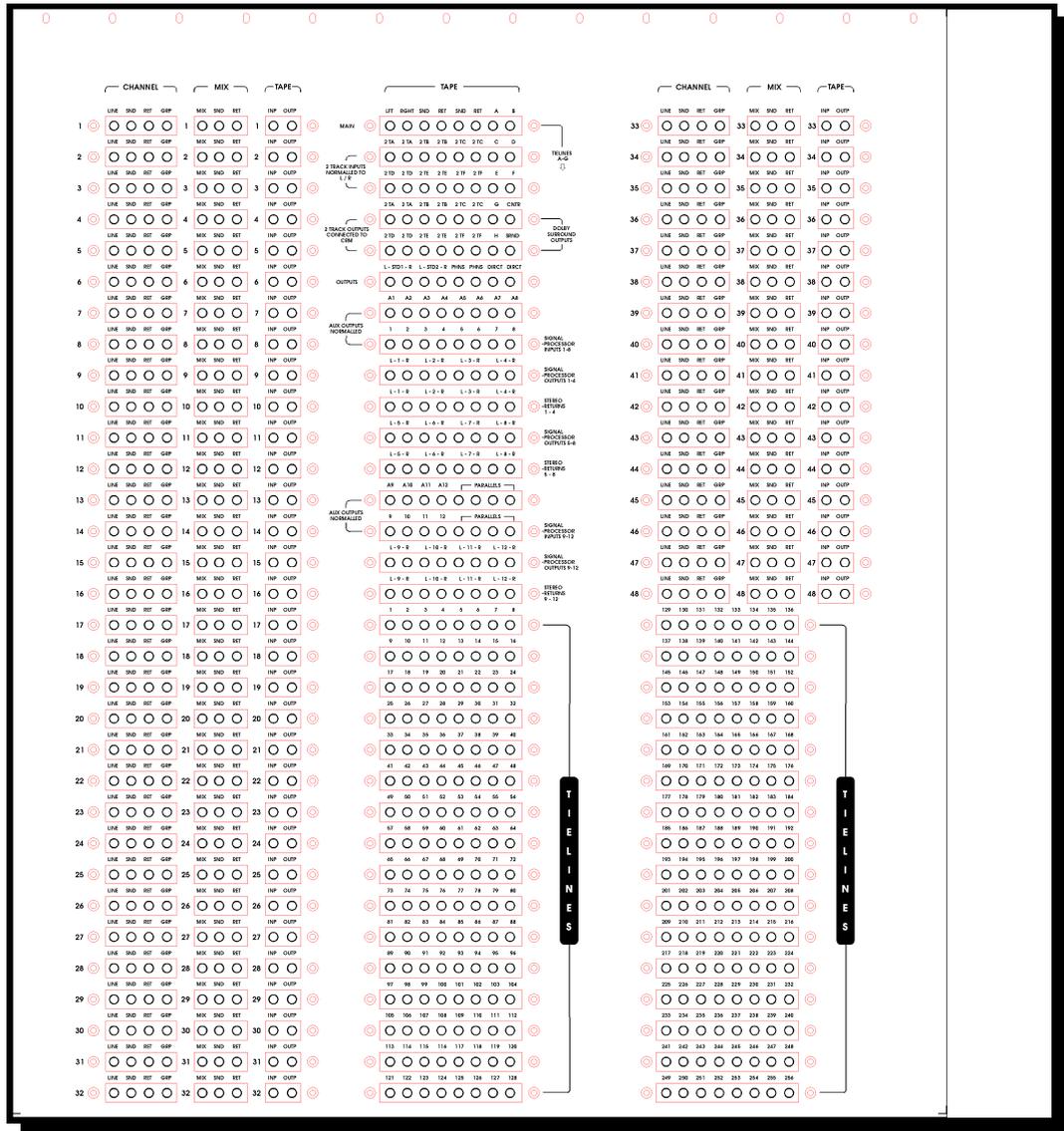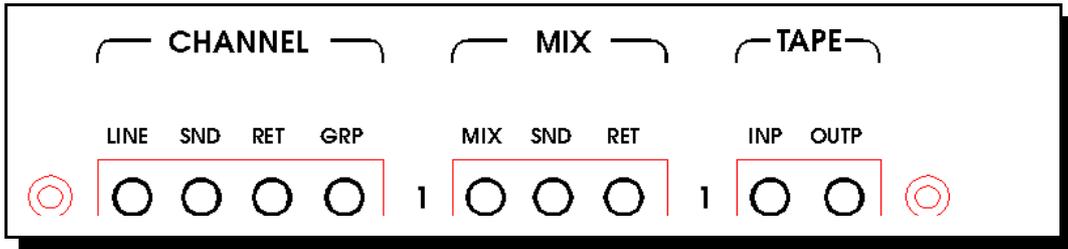
DYNamics

When the **DYN** LED is on, an optional compressor, limiter, gate, or other effects / signal processors will be inserted into the signal path. This option will be available in early '96. The optional **DYN**amics' master control will be mounted above the RECALL / AUTOMATION section.

ASSIGN

In the fourth white section is the **ARM** switch and **STATUS 2** switch. The **ARM** switch assigns a module to the **ARM** section in the master where assignments can be made and stored. A second level of assignments can be stored under **STATUS 2**. **STATUS 2** can be immediately recalled on the module. Toggling between the two modes is possible in every module. Both settings are stored.

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5.00 PATCHBAY SECTION

5.0 Patchbay description

The recessed patchbay section is built around Bantam type tiny telephone jack sockets. Merlin's patchbay is completely modular and can be expanded as your budget allows. If you order a large frame down-loaded with less modules, the patchbay can be expanded as you order more input modules or ordered complete. All master inputs / outputs and 256 tie lines (for signal processing) are standard when you order the patchbay. The entire patchbay is wired balanced and internally "star-ground" wired. Each row of CHANNEL and MIX patch points are followed by the TAPE inputs and outputs.

5.1 Patchbay - points

Channel patch points from left to right are: **Line** input - **CHAN**nel insert send & return - **Grp** (group) output - **MIX** (from tape) input - and **Mix** insert send & return . The tape input and outputs are normalized to Group outputs and MIX inputs.

The master section contains sixteen rows of Bantam type jacks.

Row 1: Left/Right master outputs, insert send & returns, and two tie lines.

Row 2: Tape or mastering machines A, B, C, left & right inputs, and two tie lines.

Row 3: Tape or mastering machines D, E, F, outputs left & right inputs and two tie lines

Row 4: 2 Track A/B/C left & right outputs normalized to CRM input source selectors plus Tie-line G and the Center input for surround sound monitoring.

Row 5: 2 Track D/E/F left & right outputs normalized to CRM input source selectors plus Tie line H and the Surround input for surround sound monitoring.

Row 6: Studio 1 and 2 and Phones outputs plus 2 direct outputs from the TB/Oscillator section.

Row 7: Auxiliary outputs 1-8.

Row 8: 8 signal processor input tie lines normalized to Aux outputs 1-8.
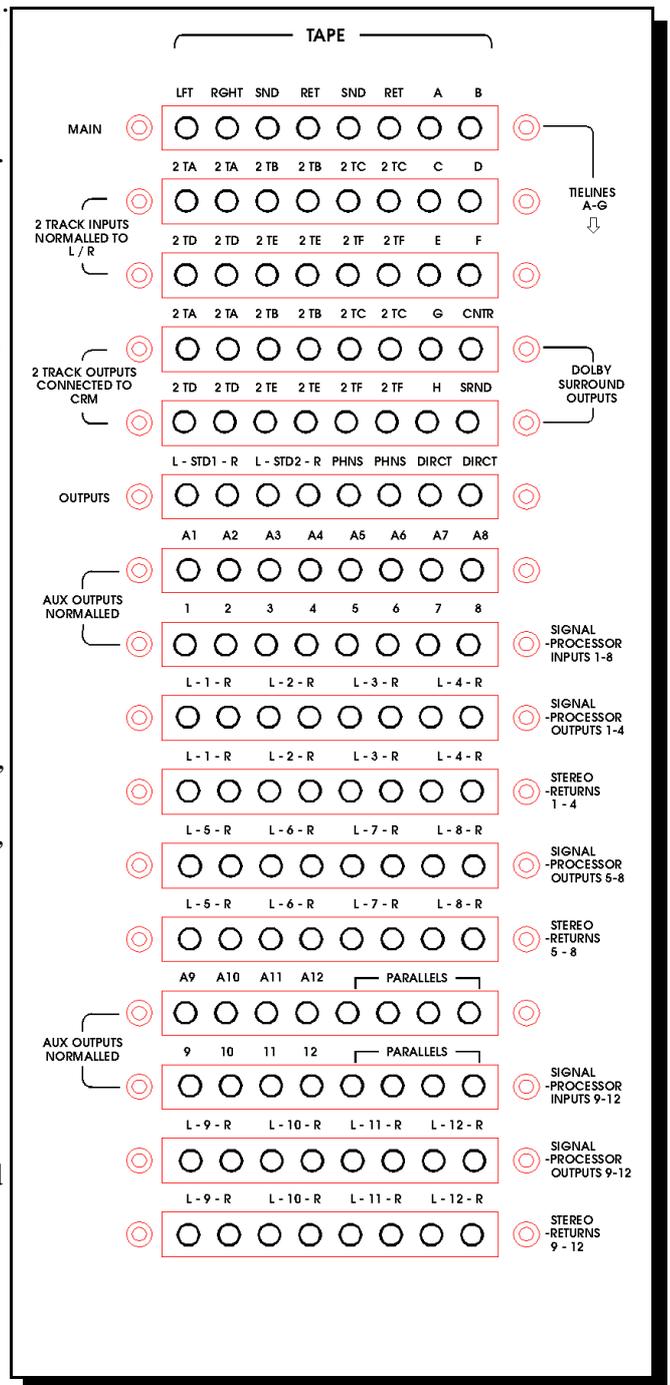
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Row 9: Four stereo signal processor outputs normalized to 4 stereo return inputs.

Row 10: Four stereo return inputs internally connected to two dual return modules.

Row 11: Four stereo signal processor output tie lines 5-8 normalized to Stereo returns 5-8.

Row 12: Four stereo returns 5-8, internally connected to dual stereo return modules.

Row 13: Aux 9-12 outputs normalized to signal processor Tie-lines 9-12 plus 4 paralleled jack sockets.

Row 14: Signal processor inputs 9-12 plus 4 paralleled jack sockets

Row 15: Signal processor output tie lines 9-12 normalled to stereo returns 9-12.

Row 16: Dual stereo return inputs 9-12 internally connected to dual stereo return modules 9-12.

Merlin has 256 tie lines mounted in 32 rows of eight. The tie lines are patching the inputs and outputs of any signal processing equipment. For ease of use, all outputs are blue sockets, and all inputs are black sockets. The blue and black jack sockets can be interchanged for use with any equipment other than normal stereo (two inputs and two outputs) devices.

All interfacing with external machines, effects processors, or amplifiers can be accomplished via the connector panel (rear of master section) and via the 25 pin sub "D" connectors on the patchbay connector panel. The wiring from the 25 pin sub "D" connector to the jack sockets are identical for inputs and outputs.

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10.0 SPECIFICATIONS

INPUTS

Mic inputs	2kOhm balanced -129 dBr input noise A weighted, gain 84 dB
Line inputs	10kOhm balanced +/- 20dB gain control, max 34 dB gain
Tape inputs	10kOhm balanced +4dBu, unbalanced -10dBV
Insert retruns	10kOhm balanced 0 dBu

OUTPUTS

Tape outputs (selectable).	47 Ohm	+4dBu balanced /-10dBV unbalanced
Insert sends	47 Ohm	ground compensated 0 dBu level.
All other outputs	47 Ohm balanced +4dBu, max. +26dBu.	

OVERALL

Headroom:	no less than 22 dB
Frequency response:	10-200,000 Hz -2dB (VCA out) 10-30,000 Hz -2dB (VCA in)
Harmonic distortion	0.007% (VCA out) 0.016% (VCA in, second (even) harmonic distortion.)
Noise	32 channels assigned -89dBr
Crosstalk	No less than 90dBr

MERLIN

Dear potential Merlin owner,

In this sales manual we have tried to give you an overview of all that the Merlin
has to offer. If you have any questions, do not hesitate to contact us.
With the Merlin series there is no limit to your creativity.

Best regards,

Duco de Rijk
PRESIDENT D&R, HOLLAND