



THE D&R 4000 SERIES IN-LINE SYSTEM

THE D&R 4000 SERIES IN-LINE SYSTEM

INTRODUCTION

The D & R 4000 series is distinguishable from the other desks, employing in-line mixing in various ways. Firstly a word about how we've achieved such technical excellence for such a competitive price.

We have employed a plug and flatcable wiring system which means that the individual channels are interchangeable with each other thus making the desk fully modular. Another technical innovation which helps hold the price of the 4000 series down is a completely new way of routing which eliminates the need for the complicated switching and wiring circuits found on conventional desks leading to a saving of 150 switches on a 32 channel mixer.

A simple patch-bay which facilitates very easy patching is also the result of our cost conscious design efforts. The console itself is of a superb design, the modules are mounted individually in aluminium "U" profiles with clear unerasable lettering protected by a polycarbonate film. These profiles are set into the sturdy metal housing which has attractive wooden sides.

DESIGN HIGHLIGHTS

A completely new approach to limiting of above audio range frequencies, through passive filtering (instead of the standard active filtering) gives this console as all our other designs an incredible transparency through its absence of transient distortion. By critically damping every integrated circuit at 40 KHz square waves we have achieved complete elimination of overshoot and/or ringing and slewing.

At the mic inputs all the amplification is performed by discrete low noise transistors and throughout the signal path by Bi-Fet op-amp (series TL 070), while the mixing amp utilise the reknowned industrial standard low noise audio op-amp NE 5534AN.

We have chosen for a minimum audiopath to achieve total transparency. Due to an excellent circuit design there is a minimum of crosstalk, control interaction and this combined with the superb printed circuit board layout contributes to a very stable and low noise product.

A rundown of the series 4000 possibilities

- 11 segment positive/negative reading peak-bargraph meter per in/output channel
- 48V phantom powering, switchable per channel
- click free phase reverse switch for mic/line and remix signals entering the console
- extremely low noise electronically R.F. screened, balanced mic amps
- simultaneous sync/remix inputs for + 4 dBu as well as - 10 dBV
- 100 Hz high-pass filter

- 4 band sweep eq. of novel design without interacting control functions
- 6 aux sends pre/post switchable and selectable from channel and monitor signals paths
- completely new free floating in/outputs from subgroup amps making subgrouping to any multitrack channel possible with a minimum of switches
- simultaneous routing to master, direct output and group summing amps possible
- sync and effect inputs per channel, changing a 24 console into a 48 line input remix console
- monitor mute and p.f.l.
- channel mute and p.f.l.
- 100 mm channel fader, 60 mm monitor fader
- 2 inserts per channel
- simultaneous multitrack feed outputs for + 4 dBu and - 10 dBV available
- master section with 25 segment led bars and phase correlation meter
- low distortion 1 KHz line up oscillator
- talkback with built in electret and routing
- communication system switchable via the a.f.l./p.f.l. system
- 6 master aux sends with individual selectable a.f.l. switches
- comprehensive control room monitor section with alternative monitor loudspeaker switching, mono switch and mute switching
- two stereo master recorders can be played back (+ 4 dBu/- 10 dBV inputs available)
- modular 64 point patchbay modules
- all connections via XLR and jackplugs
- sub mstr in groups possible





LEDBAR

The 11 segment ledbar (the first led indicates only that the power supply is on) is a peakreading instrument indicating both positive and negative peaks which is absolutely necessary in modern recording.

MIC

Below the ledbar section are the input circuit controls and switches. The first being the, per channel, switchable +48V phantom power supply. Below this is the -20 dB pad, necessary for extremely high input signals on the mic input.

LINE

The line switch changes the XLR input to line level sensitivity and also changes the balanced mic input connection into an unbalanced line input. The input sensitivity ranges from -10 dBu to +20 dBu.

REMIX

The remix switch, which also activates a line level input has priority over the line switch. The remix input is combined with the sync input on the back of the console.

GAIN

The gain control acts for the mic amplifier as a feedback control and in the line/remix mode as an input attenuator. The mic gain ranges from -20 dB to -64 dB whilst providing an enormous headroom with a minimum of 40 dB.

PHASE

This phase reversal switch is active on both mic and line/remix inputs which proves handy in all sorts of recording situations.

HIGH PASS FILTER

The high-pass filter is a fixed frequency filter with a -3dB turn over frequency at 100 Hz. The slope is 9 dB per octave.

EQUALIZERS

The equalizer stands out by virtue of its simple yet effective design, with a minimum audiopath which guarantees a good signal to noise ratio. It is of a parametric 4 band design which spans the whole audio spectrum. The high shelves at 12 KHz and the low at 60 Hz. The high midranges from 1 KHz to 11 KHz and the low midranges from 100 Hz to 1 KHz. The lift and cut range of all 4 equalizer sections is ± 16 dB. The point of turnover frequencies in this equalizer will pleasantly surprise you. In the eventuality of still further equalisation being necessary there follows an insertion point which makes insertion of additional e.q. units possible. The whole e.q. section is by-passable with a silent switch.

AUX

The 4000 series offers in total 6 individual aux sends which easily allows for the most extensive remix sessions. The aux sends are per pair switchable pre/post the monitor/channel fader. Basically the 6 sends are wired pre/post the monitor fader which makes it possible to have foldback as well as effect pre and post the multitrack machine.

AUX TO CHANNEL

This switch connects all the 6 sends pre/post the channel fader this being necessary in the remix mode.

SUBGROUPING

Subgrouping in the 4000 console is done in a new way and demands a new way of thinking from the engineer. The basic idea is to have subgroup amplifiers only where you need them. This means that there is no group amplifier preceding every multitrack channel as you might have been used to in conventional in-line designs.

In the 4000 console there are only 8 subgroup amplifiers, only 8? Yes only 8, but these 8 subgroups are fully floating. You can switch them to the inputs as well as to the outputs anywhere in the console.

Imagine, routing from channel 1 to channel 28 without patching, this is possible in the 4000 series in the following way.

There are 8 switches for this novel routing system, 4 for going to the subgroups and 4 for coming from the subgroups, called "to sub" and "from sub". If you are not subgrouping, the signal coming from the channel fader goes directly to the multitrack machine. But let's say you want to stereo subgroup channel 1 to 8 to multitrack channel 1 and 2. This means that you need 2 subgroups because you want to do it in stereo. The first thing you have to do is to bring the signals to the subgroups by pushing the switch marked "to sub 1/2" (you are using now subgroup 1 and 2). The pan-pot determines the signal level sent to subgroup 1 and/or 2, depending on its position, left, right or central. The signals coming from channel 1 to 8 are now brought to subgroup 1 and 2 (physically located in the master section). But, now, you need them on multitrack channel 1 and 2. You only have to connect the multitrack inputs to the outputs of the subgroup amps. This is done by switching the "from sub 1/2" switches.

PAN-POT

As already described above, this control (with a -4.5 dB attenuation when set central) pans the signal between the odd and even subgroups as well as left/right master buss, if selected.

MONITOR SECTION

SYNC

In the on-position, the monitor section in the channel is switched from the input to the output of the multitrack machine.

SUBMASTER

If it is necessary to control the overall level going to the multitrack, the submaster switch inserts the monitor fader in the signal path.

EFFECT

The switch "effect" makes it possible to use the monitor sections as effect returns. In this manner you have control over as many effect returns as the console has channels.



series 4000 in-line

OSCILLATOR 1 kHz

slate
 aux 1
 aux 2

0° 10° talkback

0° 10° comm.

0° 10° aux 1

0° 10° aux 2

0° 10° aux 3

0° 10° aux 4

0° 10° aux 5

0° 10° aux 6

aux 1

aux 2

aux 3

aux 4

aux 5

aux 6

stereo 1

stereo 2

0 10 C.R.M.

mono

mute

alt. mon.

comm.

talkback

pfl afl on

P.F.L. AND MUTE (MONITOR)

The p.f.l. switch enables you to prefade listen to the signal coming from the channel or from the multitrack as well as from the effect input.

Muting is done by cancelling the signal coming from the channel, sync or effect inputs. The p.f.l. is not affected by muting.

FADER MONITOR

This small fader, 58 mm travel, is of the carbontrack type.

P.F.L. AND MUTE (CHANNEL)

The p.f.l. and mute switches in the channels have the same functions as the monitor sections. The p.f.l. does not interrupt the signal path. The mute function has a led to indicate its function.

FADER (CHANNEL)

The channel fader is of the carbontrack type with a 100 mm length. Standard is the J.P. fader. Options are A.L.P.S. and Penny and Giles.

INPUTS/OUTPUTS CHANNEL

On the back of the console you will find the in/outputs of the channels. On the top there is the XLR type input connector for the mic and Line amp. Next there is the combined sync/remix input which accepts two levels, +4 dBu (the professional standard) and the -10 dBV which is the semi-professional standard. Multitrack Feed is the output of the channel which has to be plugged into the input of the multitrack machine. On this socket also there are +4 dBu and -10 dBV levels available. The channel insert is the jack into which you can insert ancillary equipment such as compressors noise gates and other frequently used effect devices. The effect jack is there as an extra line input in the remix situation. The monitor insert is there to make possible extra equalizing or the insertion of other ancillary equipment in the monitoring section of the channel.

MASTER SECTION

First there are the extremely precise 25 segment peak reading ledbars with both a po-

sitive and negative reading display. Below this ledbars is the phase correlation meter which is wired in parallel with the ledbar meters. The oscillator is of the phase shift type which produces a low distortion 1 KHz sinewave. The 4000 series offers the possibility of comprehensive communication from the studio to the control room at all times and in all stages of a session. It is also possible to speak from the control room to the studio via all outgoing lines by means of the aux outputs. The slate switch makes it possible to put information on tape. By use of the talkback switch the C.R.M. is attenuated by 20 dB. There is a high quality, built in, electret microphone for talkback purposes. A high pass filter further increases the clarity.

AUX MASTERS

The 6 aux masters with their a.f.l. switches control the total outgoing level of the aux sends.

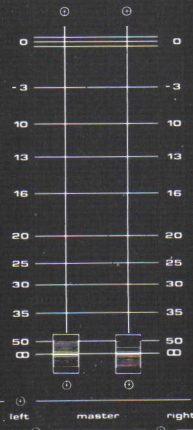
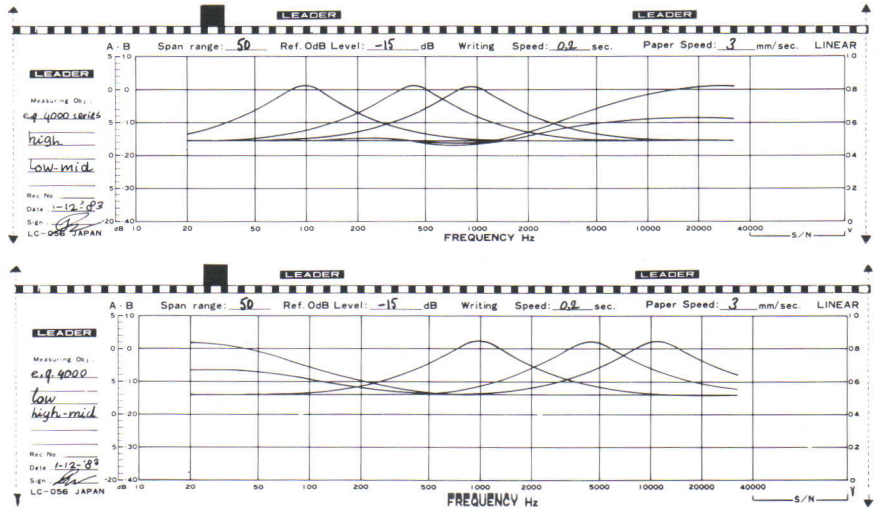
C.R.M.

C.R.M. stands for Control Room Monitor and regulates the level of all the signals going to the control monitor. The stereo 1 and 2 switch make it possible to select from 2 stereo sources instead of the master mix down. The mono switch makes comparison between stereo and mono possible. Mute cancels the monitor completely. Alt. mon. stands for alternative monitoring. It is possible with this switch to bring in another monitor system if one is connected. Noble faders are standard but A.L.P.S. or Penny and Giles are available optionally.

PATCHBAY

The patchbay is modular and has provision for 64 break patch-points per module. The connections between the patch-points and the socket at the rear of the console are made via two printed circuit boards which have at the back molex pin connectors. In this way you can bring any in/output jack to the patchbay by means of simple external wiring and further it is an economical method which saves time.

TYPICAL EQUALIZER AND FILTER CURVES



SPECIFICATIONS

Notes: Nominal operating level throughout the console is 0 dBu (0.775 v)—Nominal output level is +4 dBu/ -10dBu.

MICROPHONE PREAMPLIFIER

electronically balanced R.F. suppressed.
input impedance 2 kOhm
gain +64 dB to +0 dB (44 dB variable gain with 20 dB "pad")
headroom min. 40 dB Max input +20 dB
noise -126 dB (A weighting)

LINE/REMIX AMPLIFIER

input impedance 10 kOhm
gain from -10 dBu to infinity
headroom 22 dB
Equivalent input noise
-96.5 dB (20-20,000Hz)
frequency response referred to
0 dB at 1 kHz / -0.5 dB at 8 Hz
-0.5 dB at 140 kHz / -3 dB at 400 kHz

EQUALIZER SECTION

± 16 dB at 12 kHz
± 16 dB from 1 kHz to 11 kHz with Q factor 1.5
± 16 dB from 100 Hz to 1 kHz with Q factor 1.5
± 16 dB at 60 Hz
high pass 100 Hz
slope 9 dB per octave

OVERALL PERFORMANCE

sync/effect input impedance 10 kOhm
sync sens. +4 dBu/-10 dBu. Effect sens 0 dBu.
Output impedance 100 ohm on all outputs
max output +22 dB into 1 kOhm and above

MIX MODE

frequency response -0.5 dB at 17 Hz
from line inputs to stereo mix buss outputs
ref to 0 dB at 1 kHz / -0.5 dB at 40 kHz / -3 dB at 135 kHz
distortion no more than 0.009% at 1 kHz
headroom +22 dB, output amp +18 dB
Noise -84 dB below +4 dBu (20-20,000 Hz) measured at the stereo buss outputs with stereo master fader at max. all channel faders at full attenuation panpots at their center positions
-83 dB below +4 dBu (20-20,000 Hz) with one channel fader at unity gain

RECORD MODE

Test condition; One channel, assigned to and from groupbuss output, microphone input loaded with a 150 ohm source, mic preamp set for 30 dB gain, group output +4 dBu frequency response referred to
0 dB at 1 kHz -0.5 dB at 20 Hz and 20 kHz
Noise -84dBu below +4 dBu output

CROSSTALK

Record mode
Direct Assign between two channels both at 30 dB gain +4 dBu out of channel 1, 150 ohm source on channel 2 input.

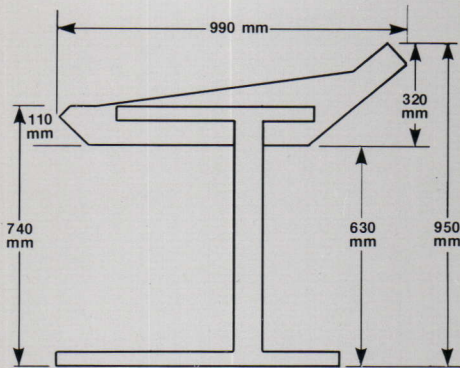
Crosstalk on channel 2 (referred to +4 dBu)

100 Hz better than -88 dB
1 kHz better than -90 dB
10 kHz better than -74 dB

MIX MODE

Channel 1 is fed with +4 dB, fader at unity panned to left. Stereo master fader at maximum. Channel 2 is terminated with a 20 ohm source. Fader at unity, panned to right stereo master. Crosstalk on right master output: 100 Hz better than -77 dB / 1 kHz better than -70 dB / 10 kHz better than -63 dB

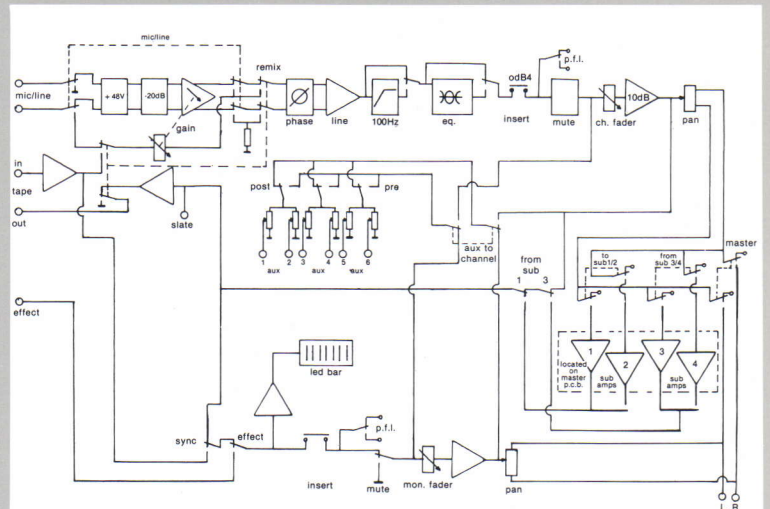
DIMENSIONS



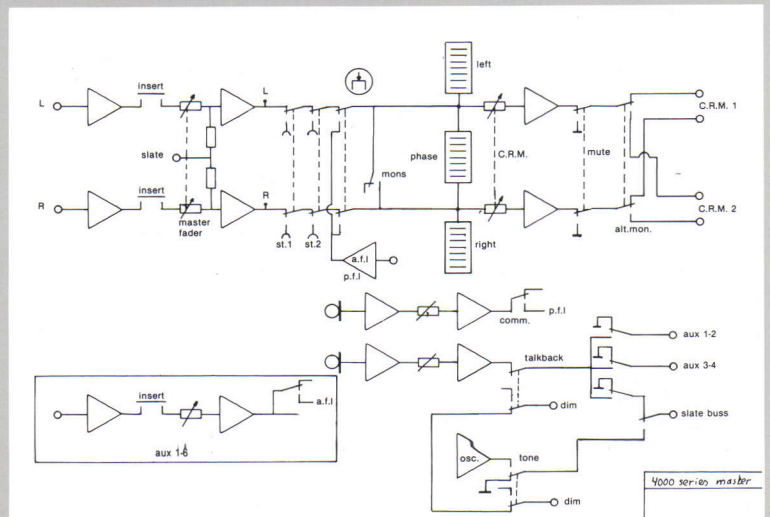
WIDTH

20 modules 1060 mm
30 modules 1530 mm
40 modules 2000 mm

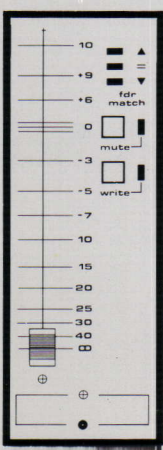
IN/OUTPUT CHANNEL



MASTER



FADER AUTOMATION READY



4000 series master



D&R Electronica b.v.
Rijnkade 15b - 1382 GS Weesp-Holland
Tel. 02940-18014* - Telex 18503 dr nl