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SERVICE MANUAL FOR
16 INPUT STEREO SWITCHER
32 INPUT MONO SWITCHER
CONTROL PANEL

PREFACE

This manual is intended for qualified technical personnel seeking technical information about David M. Reid Services products.

Notice

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WARNING

Electrical shock can cause severe personal injury or death. All major units of this equipment are powered by mains voltage. Unless specifically advised otherwise, DISCONNECT the mains supply before carrying out any maintenance or repair tasks.

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DESCRIPTION

Control Circuit

The Control Panel consists of two separate encoders on one PCB that are powered individually from their respective Switchers.

16x1 Encoder

The push buttons feed a keyboard Encoder IC (74C922), in a 4 x 4 key array of XY co-ordinates. The Encoder produces a binary output depending on which key is pushed. E.g. Key 1-I/P 1 is "0000" and Key 16 -I/P 16 is "1111" the O/P of the Encoder chip feeds a Decoder (UCN5816) to illuminate the corresponding switch Led and a buffer (4050) which feeds the actual switcher via a Cable. At the Switcher the data is decoded (4514) and fed to individual Audio Switching IC's (SSM2404). The connector also supplies links to another connector on the board for the external Dim/Cut/Mono switches and volume pots.

32x1 Encoder

The 32 I/P version is basically two 16x1 Encoders with some extra circuitry to produce the fifth bit of Data. The Data available from the first Encoder (this goes high when a button is pushed) is sent via an inverter (4011) to the set data pin of a flip flop (74LS74) the Q O/P then feeds the O/P enable pins of its Encoder and Decoder chips so as to place Data on its O/P this also becomes the fifth data bit .The Data Available from The second Encoder is sent via an inverter (4011) to the Clear Data input of the Flip Flop (74LS74) the NOT Q O/P then feeds the O/P enable pins of its Encoder and Decoder chips so as to place Data on its O/P. E.g. Key 1-I/P 1 is "00000" , Key 16 -I/P 16 is "01111" Key 32-I/P 32 is "11111" At the Switcher the data is decoded by feeding Two (4514) of which the fifth bit feeds the first decoder IC's output enable pin and is inverted (4049) to feed its output enable pin thus creating the 32 Data lines which feed to individual Audio Switching IC's (SSM2404)

Audio Path

The audio inputs come from screw terminals on the unit to the main PCB via two IDC50 ribbon cables each input feeds a Line Receiver IC (SSM2143). The SSM2143 offers high CCMR and low distortion even at high levels. The O/P of each Line Receiver IC is then fed via a 27K resistor to an Audio Switching IC (SSM2404), which is a Quad device. In the case of the Mono version each IC switches four individual inputs and in the Stereo version each IC switches a left and a right input simultaneously. The outputs of all the switching ICs (SSM2404) are bussed together to the input of a op-amp (LM833) with gain trim which then feed a Balance Line Driver (SSM2142) that feeds the back plane Direct O/Ps via a shielded cable.

In the case of the Stereo version, the O/P of the LM833 is also fed to a VCA IC (THAT2150A) so level can be remotely controlled. The O/P of the VCA IC feeds the input of a op-amp (LM833) with gain trim which then feed a Balance Line Driver (SSM2142), which feeds the back plane VCA O/Ps via a shielded cable.

Note : If there is no control panel present the VCA o/p will be at full level

The Stereo has a facility to mono the VCA O/Ps by combining the two VCA busses together via a remotely controlled relay.

TECHNICAL SPECIFICATIONS

Audio Inputs

Bridging > 18K

Level +4db nom +23db max 600 ohm balanced

Audio Outputs

Impedance 50 Ohm

Level +4db nom +23db max 600 ohm balanced

Audio Specification

Frequency response +/- .02db 20 Hz-20 KHz

THD <0.005% @ +23db DIR output

THD <0.01% @ +23db VCA output

Clipping +23db

Cross talk > -90db

Signal to Noise > -90db

Gain trim 10db

CCMR 90db typical

Connections

Audio - screw terminals

Control - DB 9 Female

Power - IEC

Remote Control

Powered from switcher

Active low BCD code output

4 Pair Shielded cable recommended

Electrical

IEC power connection with fuse 500 mA Slo

240 Volts

Mechanical

16 I/P Switcher 1 Rack Unit x 340mm Deep required

32 I/P Switcher 1 Rack Unit x 340mm Deep required

Control Unit 2 Rack Unit x 160mm Deep required

CONTROL CABLE PIN CONNECTIONS

16 I/P STEREO CONTROL CABLE

DB 9	Function	IDC 10
1	BCD 1	1
2	BCD 2	3
3	BCD 3	5
4	BCD 4	7
5	+12 VOLTS	9
6	VCA + VOLTS	2
7	VCA WIPER	4
8	MONO CONTROL	6
9	GROUND	8
	GROUND	10

32 I/P MONO CONTROL CABLE

DB 9	Function	IDC 10
1	BCD 1	1
2	BCD 2	3
3	BCD 3	5
4	BCD 4	7
5	+12 VOLTS	9
6		2
7		4
8	BCD 5	6
9	GROUND	8
	GROUND	10

IDC RIBBON AUDIO INTERCONNECT 16 X 1 STEREO

LEFT

IDC 50/1	FUNCTION
1.	I/P 1 +
2.	I/P 1 -
3.	GND
4.	I/P 2 +
5.	I/P 2 -
6.	GND
7.	I/P 3 +
8.	I/P 3 -
9.	GND
10.	I/P 4 +
11.	I/P 4 -
12.	GND
13.	I/P 5 +
14.	I/P 5 -
15.	GND
16.	I/P 6 +
17.	I/P 6 -
18.	GND
19.	I/P 7 +
20.	I/P 7 -
21.	GND
22.	I/P 8 +
23.	I/P 8 -
24.	GND
25.	I/P 9 +
26.	I/P 9 -
27.	GND
28.	I/P 10 +
29.	I/P 10 -
30.	GND
31.	I/P 11 +
32.	I/P 11 -
33.	GND
34.	I/P 12 +
35.	I/P 12 -
36.	GND
37.	I/P 13 +
38.	I/P 13 -
39.	GND
40.	I/P 14 +
41.	I/P 14 -
42.	GND
43.	I/P 15 +
44.	I/P 15 -
45.	GND
46.	I/P 16 +
47.	I/P 16 -
48.	GND
49.	GND
50.	GND

RIGHT

IDC 50/2	FUNCTION
1.	I/P 1 +
2.	I/P 1 -
3.	GND
4.	I/P 2 +
5.	I/P 2 -
6.	GND
7.	I/P 3 +
8.	I/P 3 -
9.	GND
10.	I/P 4 +
11.	I/P 4 -
12.	GND
13.	I/P 5 +
14.	I/P 5 -
15.	GND
16.	I/P 6 +
17.	I/P 6 -
18.	GND
19.	I/P 7 +
20.	I/P 7 -
21.	GND
22.	I/P 8 +
23.	I/P 8 -
24.	GND
25.	I/P 9 +
26.	I/P 9 -
27.	GND
28.	I/P 10 +
29.	I/P 10 -
30.	GND
31.	I/P 11 +
32.	I/P 11 -
33.	GND
34.	I/P 12 +
35.	I/P 12 -
36.	GND
37.	I/P 13 +
38.	I/P 13 -
39.	GND
40.	I/P 14 +
41.	I/P 14 -
42.	GND
43.	I/P 15 +
44.	I/P 15 -
45.	GND
46.	I/P 16 +
47.	I/P 16 -
48.	GND
49.	GND
50.	GND

IDC RIBBON AUDIO INTERCONNECT 32 X 1 MONO

1-16

IDC 50/1	FUNCTION
1.	I/P 1 +
2.	I/P 1 -
3.	GND
4.	I/P 2 +
5.	I/P 2 -
6.	GND
7.	I/P 3 +
8.	I/P 3 -
9.	GND
10.	I/P 4 +
11.	I/P 4 -
12.	GND
13.	I/P 5 +
14.	I/P 5 -
15.	GND
16.	I/P 6 +
17.	I/P 6 -
18.	GND
19.	I/P 7 +
20.	I/P 7 -
21.	GND
22.	I/P 8 +
23.	I/P 8 -
24.	GND
25.	I/P 9 +
26.	I/P 9 -
27.	GND
28.	I/P 10 +
29.	I/P 10 -
30.	GND
31.	I/P 11 +
32.	I/P 11 -
33.	GND
34.	I/P 12 +
35.	I/P 12 -
36.	GND
37.	I/P 13 +
38.	I/P 13 -
39.	GND
40.	I/P 14 +
41.	I/P 14 -
42.	GND
43.	I/P 15 +
44.	I/P 15 -
45.	GND
46.	I/P 16 +
47.	I/P 16 -
48.	GND
49.	GND
50.	GND

17-32

IDC 50/2	FUNCTION
1.	I/P 17+
2.	I/P 17 -
3.	GND
4.	I/P 18 +
5.	I/P 18 -
6.	GND
7.	I/P 19 +
8.	I/P 19 -
9.	GND
10.	I/P 20 +
11.	I/P 20 -
12.	GND
13.	I/P 21 +
14.	I/P 21 -
15.	GND
16.	I/P 22 +
17.	I/P 22 -
18.	GND
19.	I/P 23 +
20.	I/P 23 -
21.	GND
22.	I/P 24 +
23.	I/P 24 -
24.	GND
25.	I/P 25 +
26.	I/P 25 -
27.	GND
28.	I/P 26 +
29.	I/P 26 -
30.	GND
31.	I/P 27 +
32.	I/P 27 -
33.	GND
34.	I/P 28 +
35.	I/P 28 -
36.	GND
37.	I/P 29 +
38.	I/P 29 -
39.	GND
40.	I/P 30 +
41.	I/P 30 -
42.	GND
43.	I/P 31 +
44.	I/P 31 -
45.	GND
46.	I/P 32 +
47.	I/P 32 -
48.	GND
49.	GND
50.	GND