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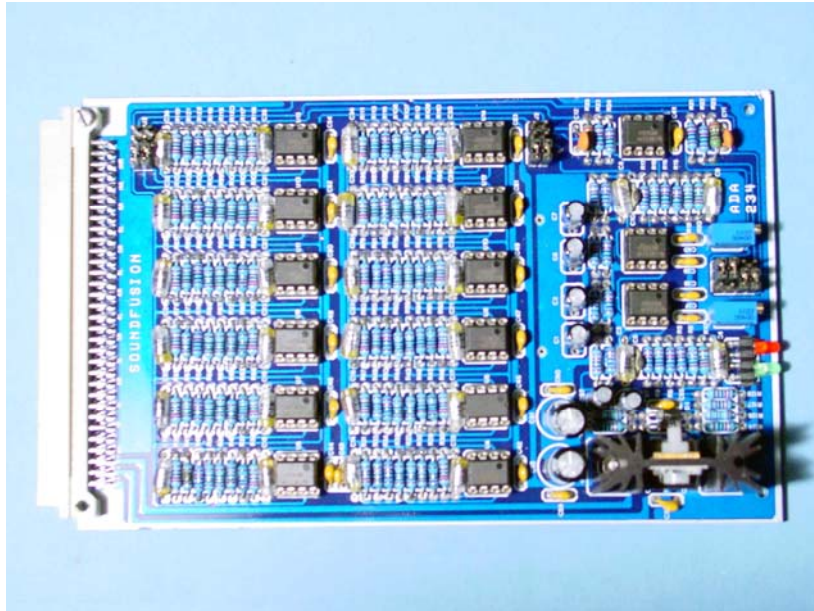
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## **TECHNICAL MANUAL**

### **STEREO AUDIO DISTRIBUTION AMPLIFIER**

#### **MODULE E-234**



## GENERAL DESCRIPTION

The E234 audio distribution card has been developed to complement the Soundfusion range of audio distribution amplifiers. The card evolved from the local industry standard, the Sound fusion E230.

The card is essentially a one stereo input and 6-output distribution amplifier, but can be configured by means of jumpers to provide the following options:

- a) One stereo input, six stereo outputs.
- b) One stereo input, five stereo outputs, 2 mono outputs.
- c) One stereo input, twelve mono outputs.
- d) One mono input, twelve mono outputs.

The two inputs are balanced, high impedance and feed through to the twelve output stages, which are each driven by a dual operational amplifier capable of driving

600  $\Omega$  loads. There is a level adjustment for left and right channels at the front of the card. Individual outputs are not adjustable. The circuit is fully balanced throughout and is powered by on board DC regulation as indicated by two LED's at the front of the card.



## Stereo Audio Distribution Amplifier – Module E-234

### CIRCUIT DESCRIPTION

#### Input:

The two input stages consist of U1, U2 that provide a symmetrically balanced input. The low frequency roll-off point of 4Hz is determined by C1, C2, R2, and R3. The high frequency roll-off is set by C3, R4 and C4, R5 at 80KHz. This point can be altered by increasing or decreasing C3 and C4. Output level is adjusted by P1 and P2. The output of this stage appears at J1 where it can be routed to the distribution buses, left or right. The left and right signals also feed U3 that acts as a virtual earth-mixing amplifier. This creates a mono signal that can be linked via J2 and J3 to outputs 6, or all outputs.

#### Output:

Each output stage consists of a dual op amp which is capable of driving reactive loads, as occur in long cable runs, to greater than +12dBu. The input stages are directly coupled to the output stages, thus eliminating blocking capacitors, which are detrimental to the sound quality of the signal. This is possible due to the low offset of the devices used. There is no individual adjustment of the output stages but R29 (CH1L) may be changed to obtain a different output level if necessary. The output impedance is set at 20  $\Omega$  by R32, R33.

#### Power:

The card is supplied with unregulated  $\pm 22$  VDC at pins 2 and 3, which is fed to the adjustable voltage regulators Q1 Q2. There is pre-regulation decoupling with C55, C56. The regulated voltage  $\pm 16$  VDC is determined by R123, R124, R125, and R126 and smoothed by C59 - C62. The LEDs LDI, L2 give on board indication of the DC condition.



**Stereo Audio Distribution Amplifier – Module E-234**

**STEREO  
AUDIO DISTRIBUTION AMPLIFIER**

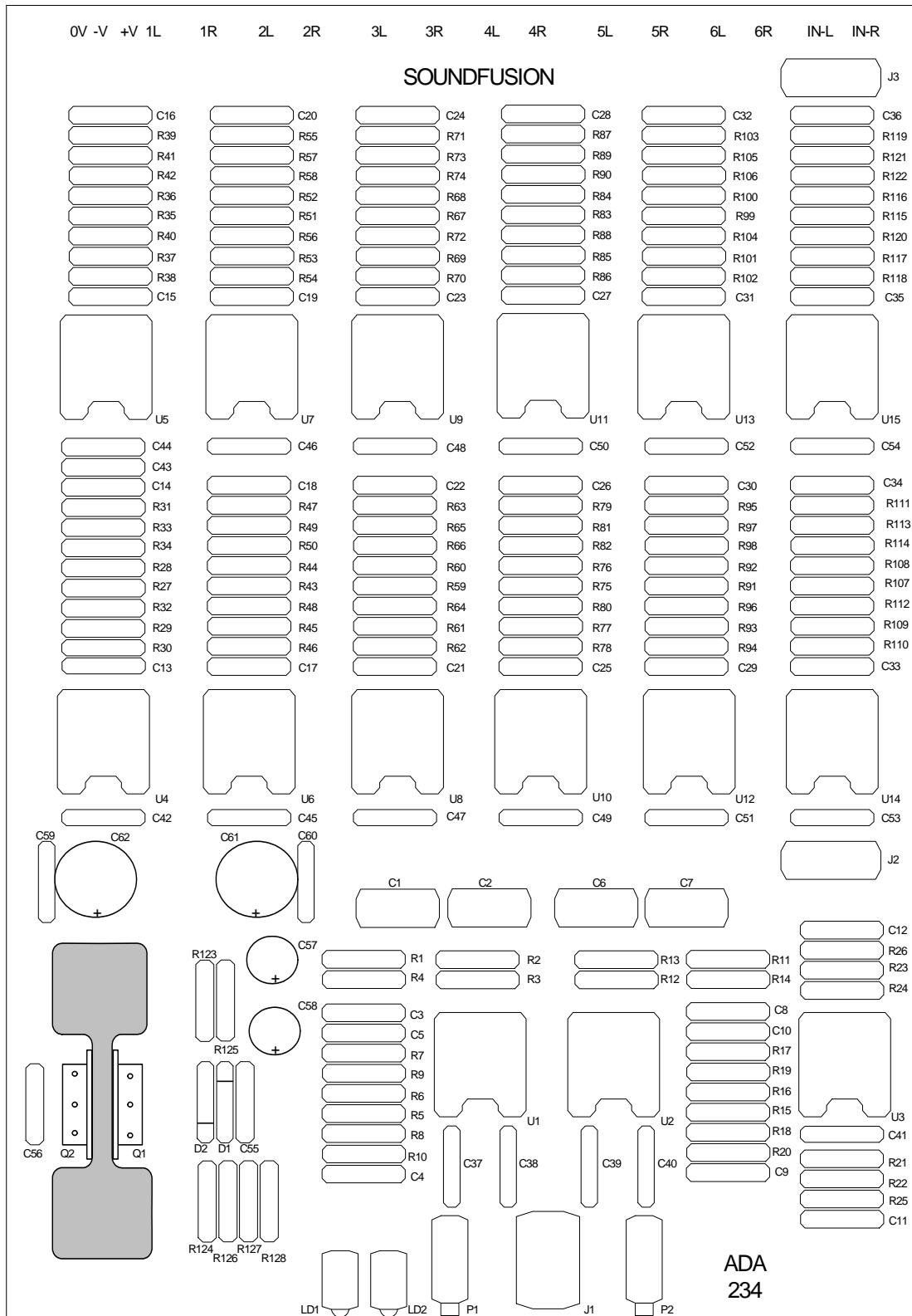
**MODULE E-234**

**COMPONENT LAYOUT**



# Stereo Audio Distribution Amplifier Module E-234

## Component Layout





**Stereo Audio Distribution Amplifier Module E-234**

**STEREO  
AUDIO DISTRIBUTION AMPLIFIER**

**MODULE E-234**

**PARTS LIST**

**PARTS LIST****Audio Distribution Amplifier Module E-234**

Reference		Value	Description
R	1	20k	1/4 W 1 % metal film
R	2-7	10k	1/4 W 1 % metal film
R	8-9	1k	1/4 W 1 % metal film
R	10	120R	1/4 W 1 % metal film
R	11	20K	1/4 W 1 % metal film
R	12-17	10k	1/4 W 1 % metal film
R	18-19	1k	1/4 W 1 % metal film
R	20	120R	1/4 W 1 % metal film
R	21-24	10k	1/4 W 1 % metal film
R	25-26	5k1	1/4 W 1 % metal film
R	27-28	100R	1/4 W 1 % metal film
R	29	1k2	1/4 W 1 % metal film
R	30-31	2k2	1/4 W 1 % metal film
R	32-33	10R	1/4 W 1 % metal film
R	34	10K	1/4 W 1 % metal film
R	35-36	100R	1/4 W 1 % metal film
R	37	1k2	1/4 W 1 % metal film
R	38-39	2k2	1/4 W 1 % metal film
R	40-41	10R	1/4 W 1 % metal film
R	42	10k	1/4 W 1 % metal film
R	43-44	100R	1/4 W 1 % metal film
R	45	1k2	1/4 W 1 % metal film
R	46-47	2k2	1/4 W 1 % metal film
R	48-49	10R	1/4 W 1 % metal film
R	50	10K	1/4 W 1 % metal film
R	51-52	100R	1/4 W 1 % metal film
R	53	1k2	1/4 W 1 % metal film
R	54-55	2k2	1/4 W 1 % metal film
R	56-57	10R	1/4 W 1 % metal film
R	58	10K	1/4 W 1 % metal film
R	59-60	100R	1/4 W 1 % metal film

**PARTS LIST****Audio Distribution Amplifier Module E-234**

Reference		Value	Description
R	61	1k2	1/4W 1% metal film
R	62-63	2k2	1/4W 1% metal film
R	64-65	10R	1/4W 1% metal film
R	66	10k	1/4W 1% metal film
R	67-68	100R	1/4W 1% metal film
R	69	1k2	1/4W 1% metal film
R	70-71	2k2	1/4W 1% metal film
R	72-73	10R	1/4W 1% metal film
R	74	10k	1/4W 1% metal film
R	75-76	100R	1/4W 1% metal film
R	77	1k2	1/4W 1% metal film
R	78-79	2k2	1/4W 1% metal film
R	81-81	10R	1/4W 1% metal film
R	82	10K	1/4W 1% metal film
R	83-84	100R	1/4W 1% metal film
R	85	1k2	1/4W 1% metal film
R	86-87	2k2	1/4W 1% metal film
R	88-89	10R	1/4W 1% metal film
R	90	10K	1/4W 1% metal film
R	91-92	100R	1/4W 1% metal film
R	93	1k2	1/4W 1% metal film
R	94-95	2k2	1/4W 1% metal film
R	96-97	10R	1/4W 1% metal film
R	98	10K	1/4W 1% metal film
R	99-100	100R	1/4W 1% metal film
R	101	1k2	1/4W 1% metal film
R	102-103	2k2	1/4W 1% metal film
R	104-105	10R	1/4W 1% metal film
R	106	10K	1/4W 1% metal film
R	107-108	100R	1/4W 1% metal film
R	109	1k2	1/4W 1% metal film



<b>PARTS LIST</b>			
<b>Audio Distribution Amplifier Module E-234</b>			
<b>Reference</b>		<b>Value</b>	<b>Description</b>
R	110-111	2k2	1/4W 1% metal film
R	112-113	10R	1/4W 1% metal film
R	114	10K	1/4W 1% metal film
R	115-116	100R	1/4W 1% metal film
R	117	1k2	1/4W 1% metal film
R	118-119	2k2	1/4W 1% metal film
R	120-121	10R	1/4W 1% metal film
R	122	10K	1/4W 1% metal film
R	123-124	120R	1/4W 1% metal film
R	125-126	1k5	1/4W 1% metal film
R	127-128	2k2	1/4W 1% metal film
C	1-2	10 $\mu$ F	25V Electrolytic NP 2.5mm spacing
C	3-4	220pF	1 % Polystyrene axial 160V
C	5	6.8pF	63V Ceramic 5mm spacing
C	6-7	10 $\mu$ F	25V Electrolytic NP 2.5mm spacing
C	8-9	220pF	1 % Polystyrene axial 160V
C	10	6.8pF	63V Ceramic 5mm spacing
C	11-12	10pF	63V Ceramic 5mm spacing
C	13-36	150pF	1 % Polystyrene axial 160V
C	37-56	0.1 $\mu$ F	63V Ceramic 5mm spacing
C	57-58	10 $\mu$ F	25V Electrolytic 2.5mm spacing
C	59-60	0.1 $\mu$ F	63V Ceramic 5mm spacing
C	61-62	220 $\mu$ F	25V Electrolytic 5mm spacing
D	1-2	1N4007	Silicon diode
P	1-2	10k	Bourns 3296P Trimpot
Q	1	LM317	Positive Adjustable Voltage Regulator
Q	2	LM337	Negative Adjustable Voltage Regulator

**PARTS LIST****Audio Distribution Amplifier Module E-234**

Reference		Value	Description
U	1-15	NE5532	Dual Low Noise Operational Amplifier
J	1-3	Jumper	2.54mm Molex
CON	1	64 way Edge Conn.	DIN41612 90° male (AB row)



## **Stereo Audio Distribution Amplifier – Module E-234**

### **STEREO AUDIO DISTRIBUTION AMPLIFIER**

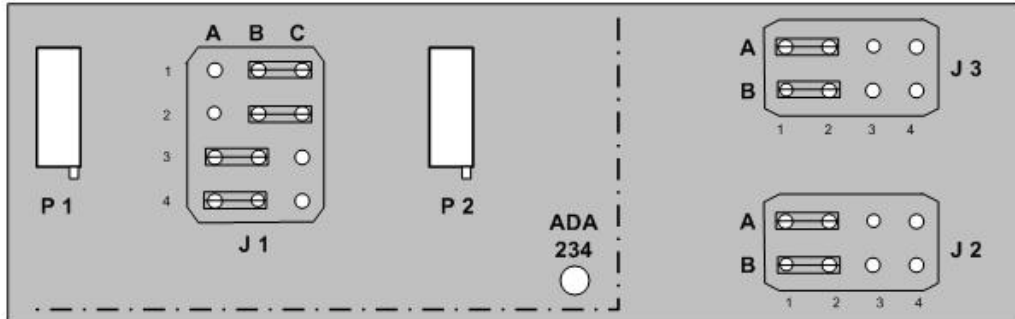
#### **MODULE E-234**

#### **JUMPER CONFIGURATIONS**

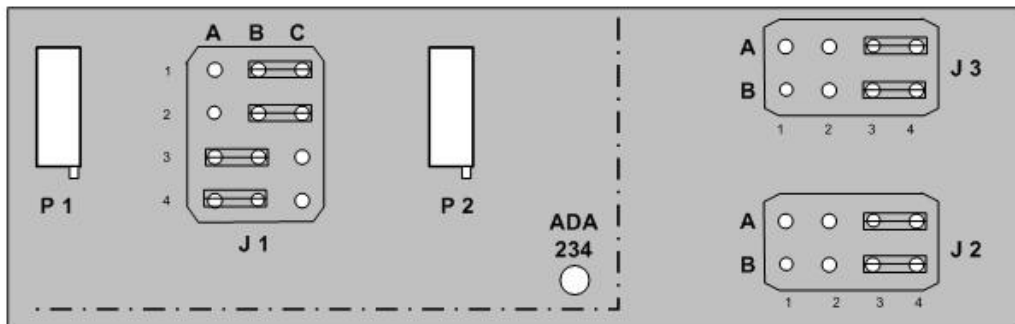


## Stereo Audio Distribution Amplifier Module E 234 Jumper Configuration Settings

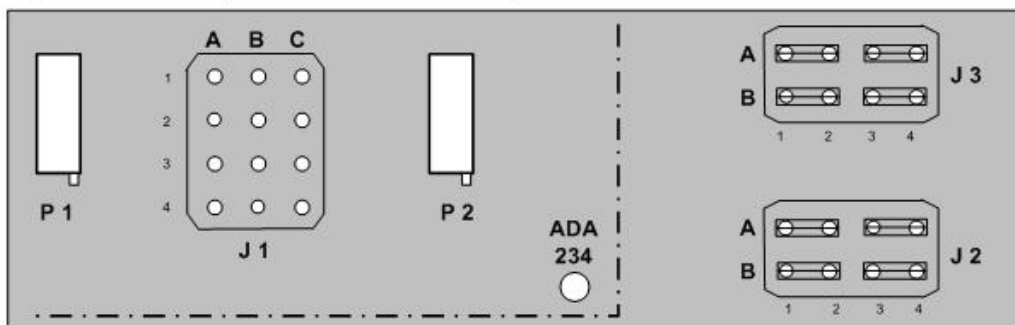
### A) One Stereo Input, Six Stereo Outputs



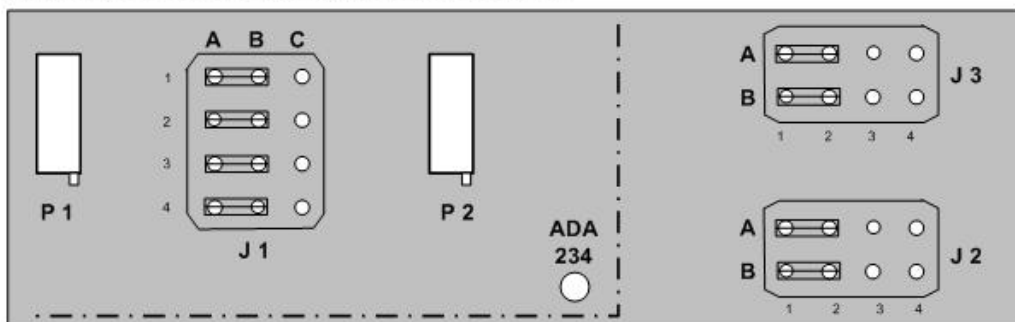
### B) One Stereo Input, Five Stereo Outputs, Two Mono Outputs



### C) One Stereo Input, Twelve Mono Outputs



### D) One Mono Input (Left), 12 Mono Outputs





**Stereo Audio Distribution Amplifier – Module E-234**

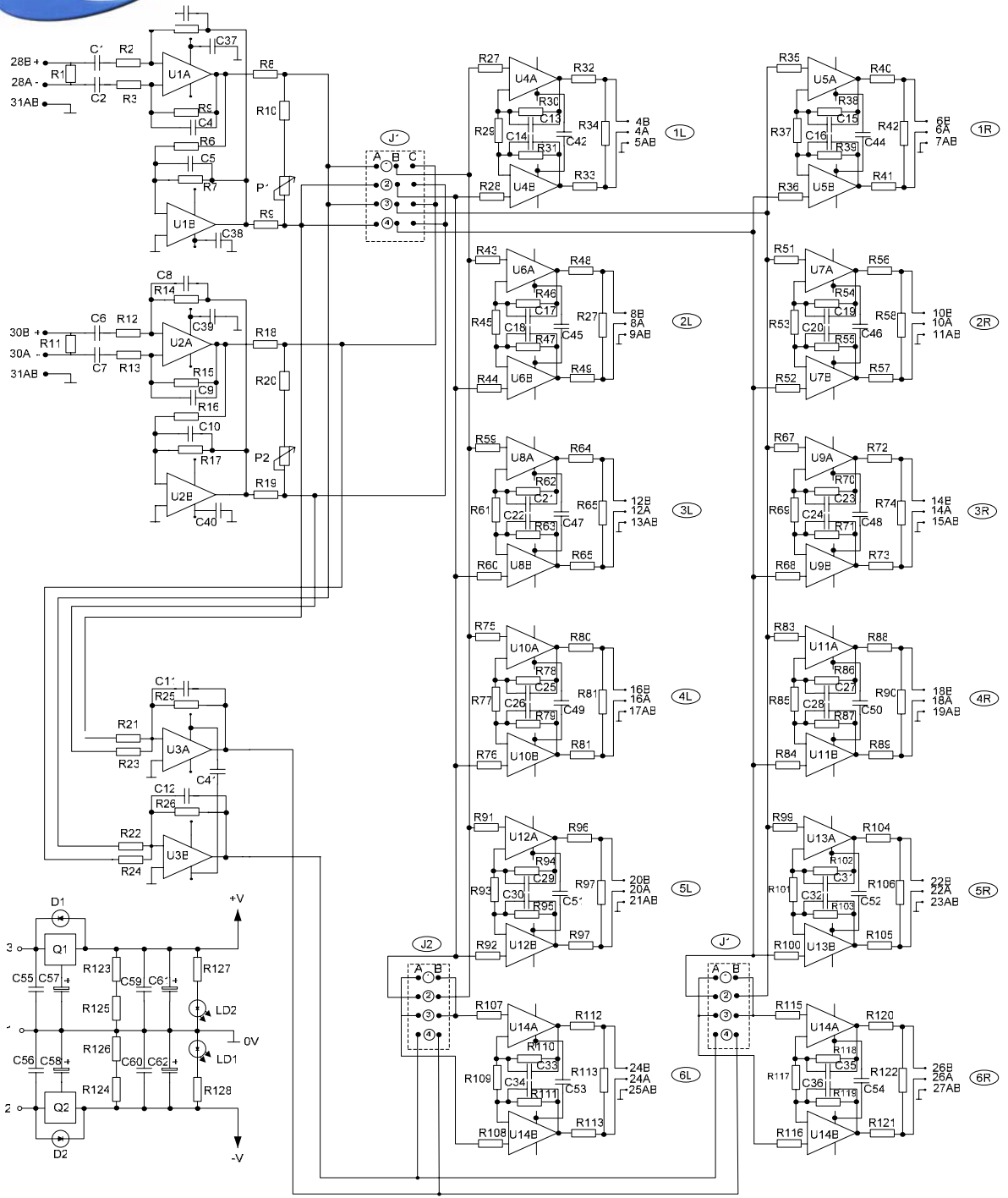
**STEREO  
AUDIO DISTRIBUTION AMPLIFIER**

**MODULE E-234**

**CIRCUIT DIAGRAM**



# Stereo Audio Distribution Amplifier – Module E-234



TITLE		REVISIONS	
Stereo Audio Distribution Amplifier Module E-234		NO	DATE DESCRIPTION
DATE ORIGINAL	SCALE		
24 August 1994			
LATEST REVISION	USER NO	CHECKED	DRAWN
2 July 2003	E234-Diagram.vsd		Ferdie Brendgen



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**Stereo Audio Distribution Amplifier – Module E-234**

**SPECIFICATIONS**

Input impedance		> 10k
Output impedance		> 20 Ohms
Gain range (pot)		-12dB to +12dB
C.M.R.R. (ref + 6 dBu input)	100 Hz 1 kHz 10kHz 20kHz	> 60dB > 62dB > 62dB > 62dB
Signal to Noise (ref + 6 dBu input)	Unweighted (30 kHz BW) “A” weighted	< -90dB  < -100dB
Frequency Response Maximum Output (unity gain/ <0.1%THD) Amplifier driving 500 meters screened cable terminated in 10kOhms.	10 Hz to 20 kHz    20 Hz - 20 KHz	< -0.05dB    > +22dBu
Amplifier driving 500 metres screened cable terminated in 600 Ohms	20 Hz -20 kHz	> +18 dBu
Total Harmonic Distortion 10 k Ohms and 600 Ohm load at +6 dBu (Unity gain)	20 Hz - 50 KHz	< 0.004 %
Total Harmonic Distortion. Amplifier driving 500 meters screened cable terminated in 10 kOhms and 600 Ohm load at+18dBu (Unity gain)	20 Hz -20 kHz	< 0.006 %
Intermodulation Distortion 600 Hz and 7 kHz	20 Hz - 50 kl-fz	< 0.003 %
Cross talk 10Hz > - 130dBu	50 kHz	> -75 dBu