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VOICE-OVER UNIT – INTRODUCTION & BLOCK DIAGRAM

INTRODUCTION

The Voice-over Unit, UN4/4, enables the gain of a main programme chain to be reduced by up to 20 dB in response to a second (voice-over) input signal. The voice-over signal is not mixed with the main programme chain signal. The UN4/4 is connector-compatible with the AM6/7 and the AM6/14.
The UN4/4 may be ganged for stereo operation.
The UN4/4 is constructed on a CH1/26B chassis with index coding-peg positions 50 and 69 aligned with plug A.

SPECIFICATION

MAIN CHAIN		
Input:	Source impedance	300 ohms (the UN4/4 normally bridges a 600-ohms circuit, or under test it should be terminated in 600 ohms).
	Volume	−30 dB to −10 dB
	Impedance	11 kilohms
Output:	Load impedance	600 ohms
	Volume	−10 dB
	Self-limiting level	+10 dB
	Distortion	Less than 0.2 per cent
	Noise	Less than −67 dB, measured broadband and peaked to 6 on a T.P.M. (e.g. EP14/1)
	Frequency response	±0.5 dB with respect to 1 kHz from 20 Hz to 20 kHz.
	Impedance	less than 60 ohms
	Gain reduction range	20 dB
	Gain recovery rate	40 ms to 300 ms.
VOICE-OVER		
	Threshold	−12 dB or +8 dB

CONTENTS

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Illustrator *D.J. Morys*
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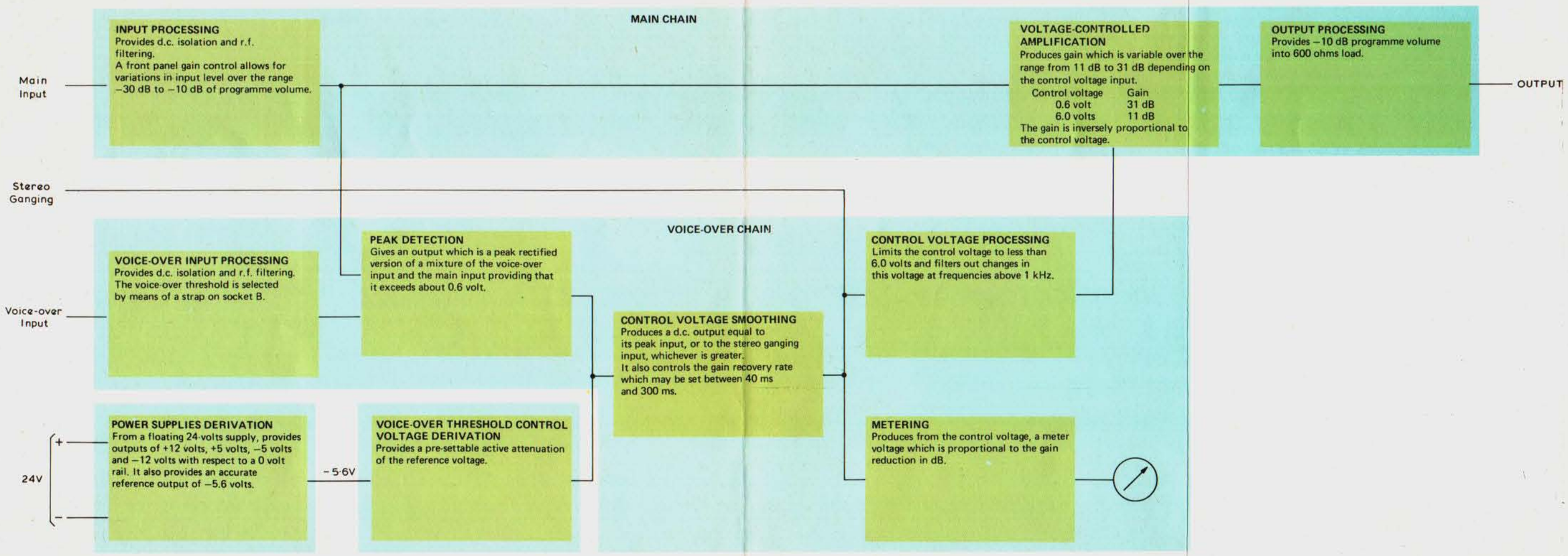

LAYOUT & ALIGNMENT

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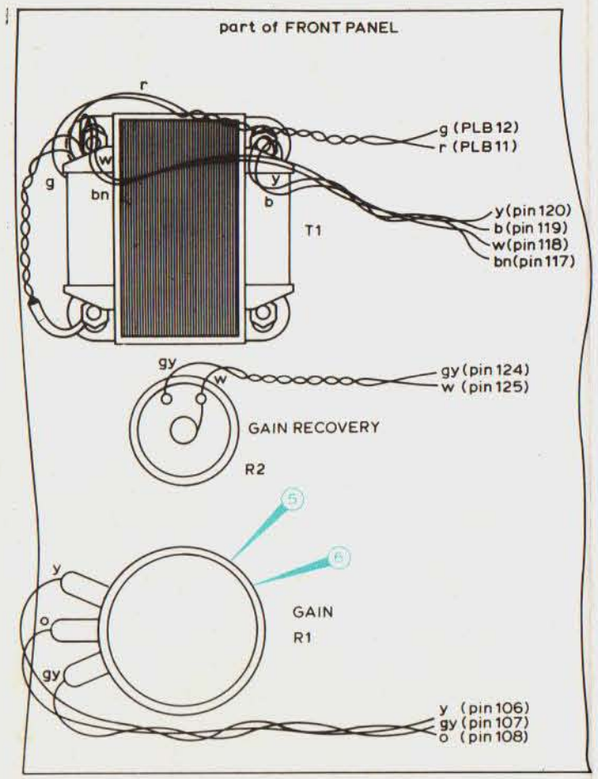

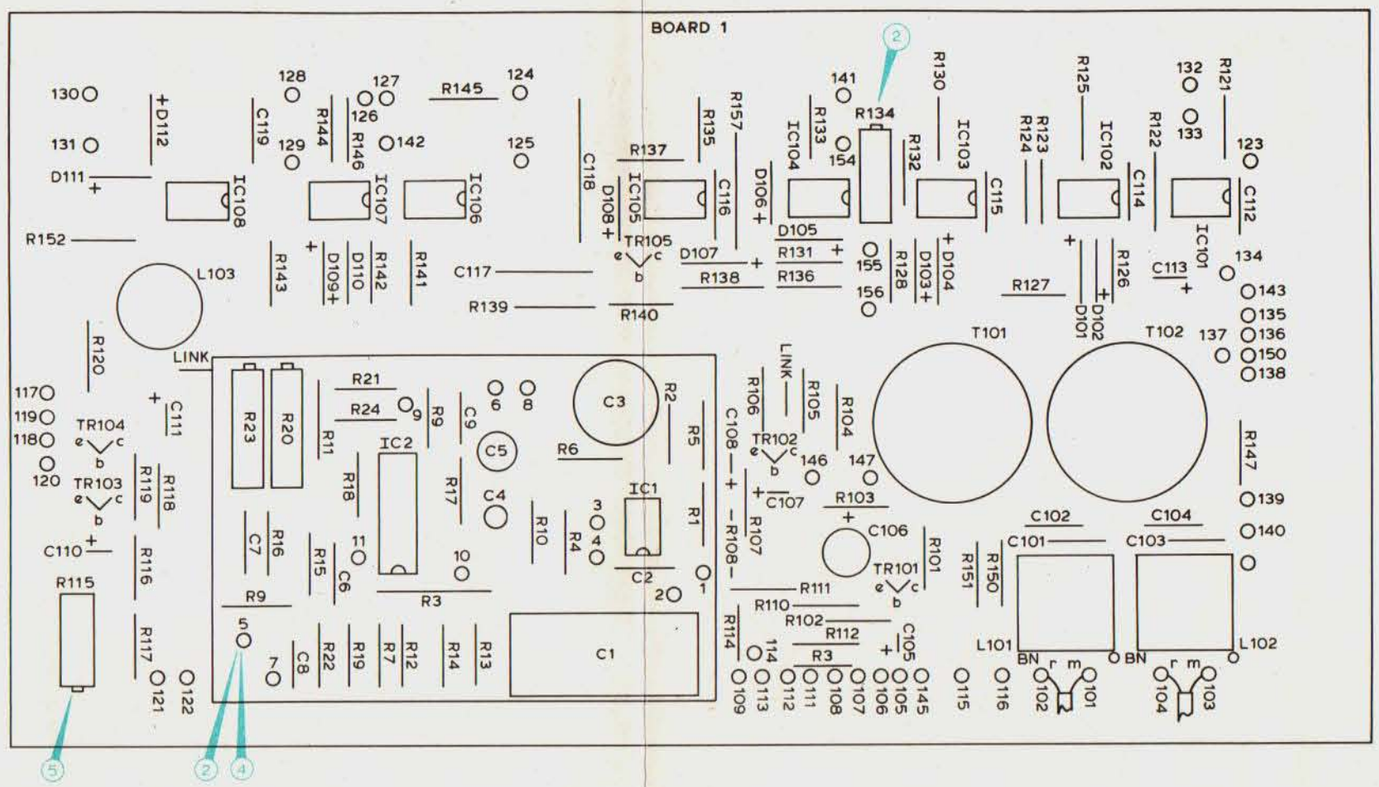

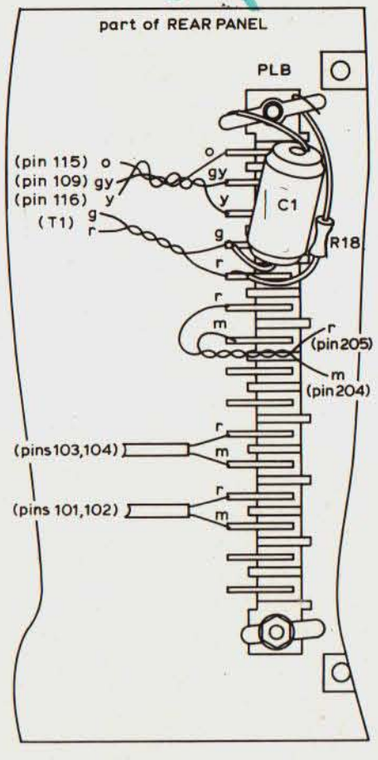

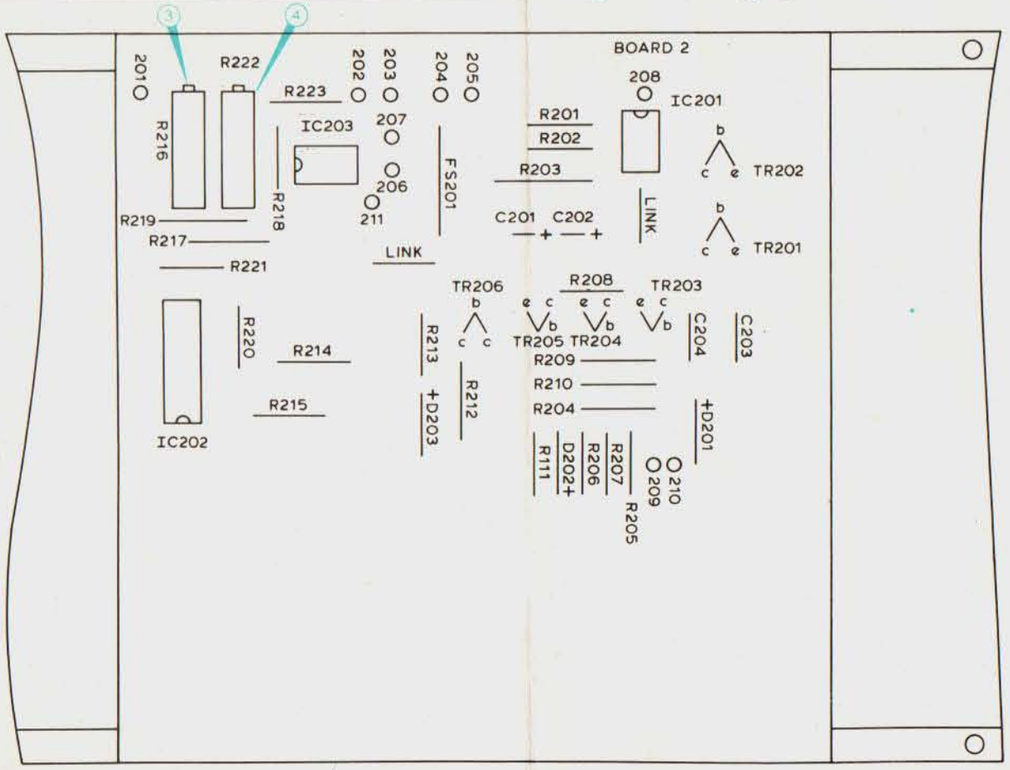

ALIGNMENT

1. Check strapping for voice-over threshold.
   SKB14 – SKB15 = + 8 dB
   SKB13 – SKB14 = –12 dB
2. With no input signals, set R134 to give + 0.60 volt at pin 5 on the AM1/50.
   i.e. pin 131 w.r.t. pin 130
3. Set R216 to give a reading of 0 dB on the meter.
4. Apply a 1-kHz signal to the voice-over input at 18 dB above the selected voice-over threshold.
   Check that there is 4.8 volts at pin 5 of the AM1/50 and set R222 to give a reading of 18 dB on the meter.
5. Remove the voice-over input signal and apply a 1-kHz signal at –10 dB to the main chain input which should be terminated in 600 ohms.
   Set R1, the front panel GAIN control, to minimum and set R115 to give –10 dB into 600 ohms.
6. With the main input level set to its normal working value, set R1 to give an output of –10 dB.

Note: numbered blue arrows refer to numbered steps in alignment

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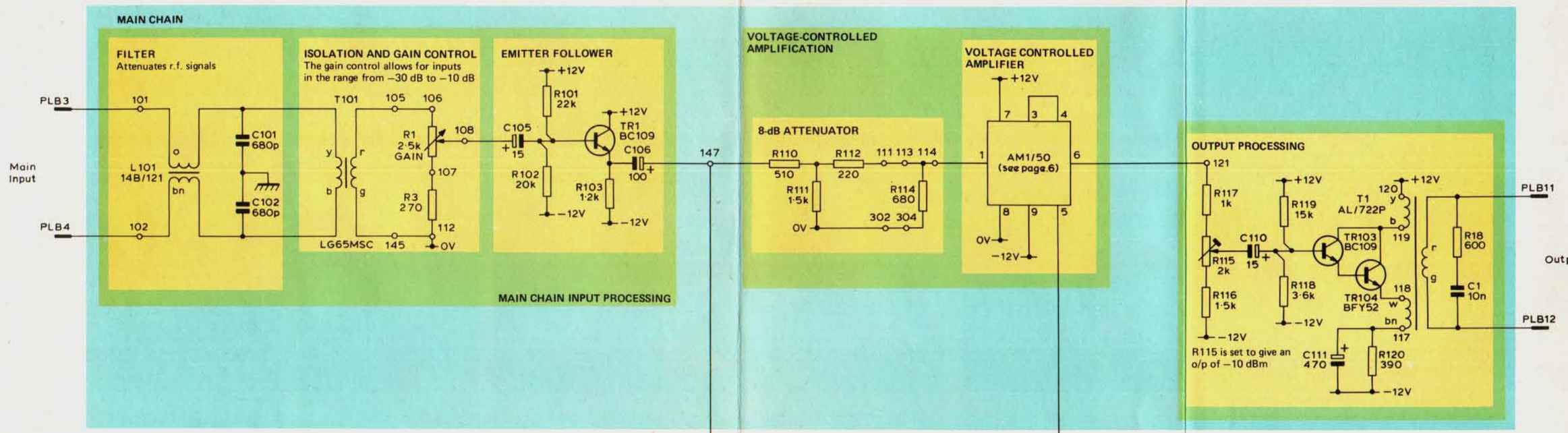
MAIN CHAIN – CIRCUIT



Main Input to Control Chain (see page.4)

Control Voltage from Control Chain (see page.5)

REF	TYPE	BASE
TR101 TR103	BC109	
TR104	BFY52	view on leads

VOICE-OVER – CIRCUIT (i)

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from Main Input Processing (page 3)

VOICE-OVER INPUT PROCESSING

FILTER
Attenuates r.f. signals

PLB5 103 — L102 14B/121 — C103 680p — C104 680p — PLB4 104

Voice-Over Input

VOICE-OVER THRESHOLD SELECTION

PLB13 PLB15 PLB14

T102 116 109 115

R150 2·2k

R151 240

LG65MSC

Threshold	Strap pins on PLB
−12 dB	13–14
+ 8 dB	14–15

EMITTER FOLLOWER

+12V — R104 22k — C107 15 — R105 20k — T102 BC109 — C108 15 — R106 1·2k — −12V

PEAK DETECTION

MIXING
A portion of the main chain signal is added to provide limiting.

R160 18k — R107 15k — 146 — R108 1·5k — 0V

123 — C112 5·6p — IC101 LIC748CS — C113 100

R122 130k — R121 3·9k — 0V

FULL-WAVE RECTIFICATION (see page 7)

HALF-WAVE RECTIFICATION

R126 15k — R123 15k — D102 1N916 — D101 1N916 — IC102 LIC748CS — R125 7·5k — C114 5·6p — 0V

SUMMING

R124 15k — R127 7·5k — R159 155 A.O.T. 156 — R128 33k — D104 1N916 — D103 1N916 — IC103 LIC748CS — R130 3·6k — C115 6·8p — 0V

POWER SUPPLIES DERIVATION

PLB10 +ve — 205 — +12V

PLA9 — 150 — 208

24 volts

PLB9 −ve — 204 — FS 201 250mA

0-VOLT RAIL DERIVATION

R201 2k — IC201 LIC741CS — TR201 BFY52 — +12V — R203 47 — TR202 BFX87 — −12V — R202 2k

C202 15 — C203 0·1 — C201 15 — C204 0·1 — 203 204 206

−5·6 VOLTS DERIVATION

R205 10k — R206 200 — R207 10k — D202 VZ5·6M4 — R208 12k — TR203 BCY71 — TR204 BC109 — R204 12k — D201 VZ5·6M4 — R210 10k — R209 200

±5 VOLTS DERIVATION

R213 510 — TR206 BC109 — D203 VZ5·6 M4 — R212 3k — R211 3k — TR205 BCY71 — 209 — 210

+12V — +5V — 0V — −5V — −5·6V — −12V

REF	TYPE	BASE
TR102 TR204 TR206	BC109	view on leads
TR203 TR205	BCY71	
TR201	BFY52	
TR202	BFX87	
IC101 IC102 IC103	LIC748CS	view on top
IC104 IC201	LIC741CS	

VOICE-OVER THRESHOLD CONTROL VOLTAGE DERIVATION

R131 3·9k — R134 20k — 154 — 141 0V — R132 27k — D106 1N916 — D105 1N916 — IC104 LIC741CS — R133 3·6k — 0V

R134 is set to give 0.60 volt at pin 5 on the AM1/50 with no input signals.

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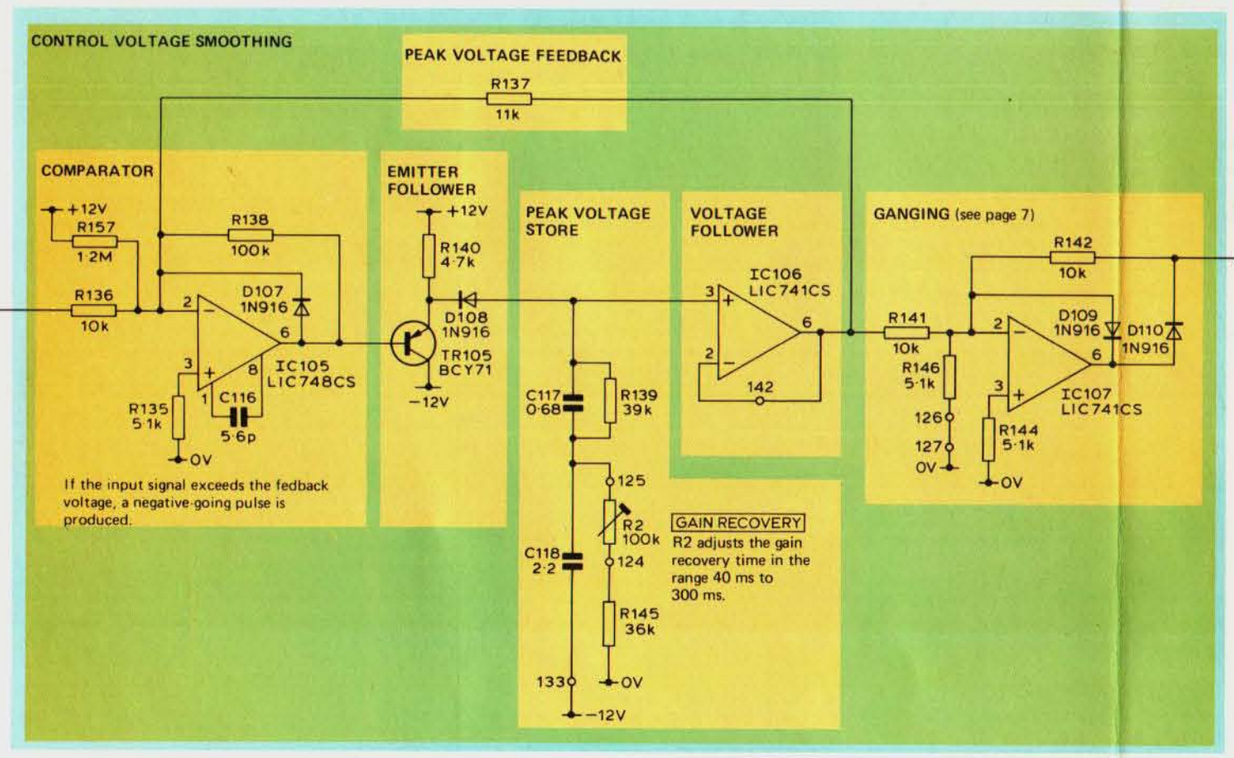
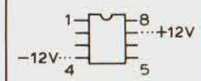
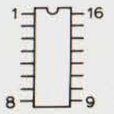
VOICE-OVER – CIRCUIT (ii)



REF	TYPE	BASE
TR105	BCY71	 view on leads
IC105 IC106 IC107 IC108 IC203	LIC748CS LIC741CS	
IC202	SN76502N	 view on top

AM1/50 VOLTAGE CONTROLLED AMPLIFIER

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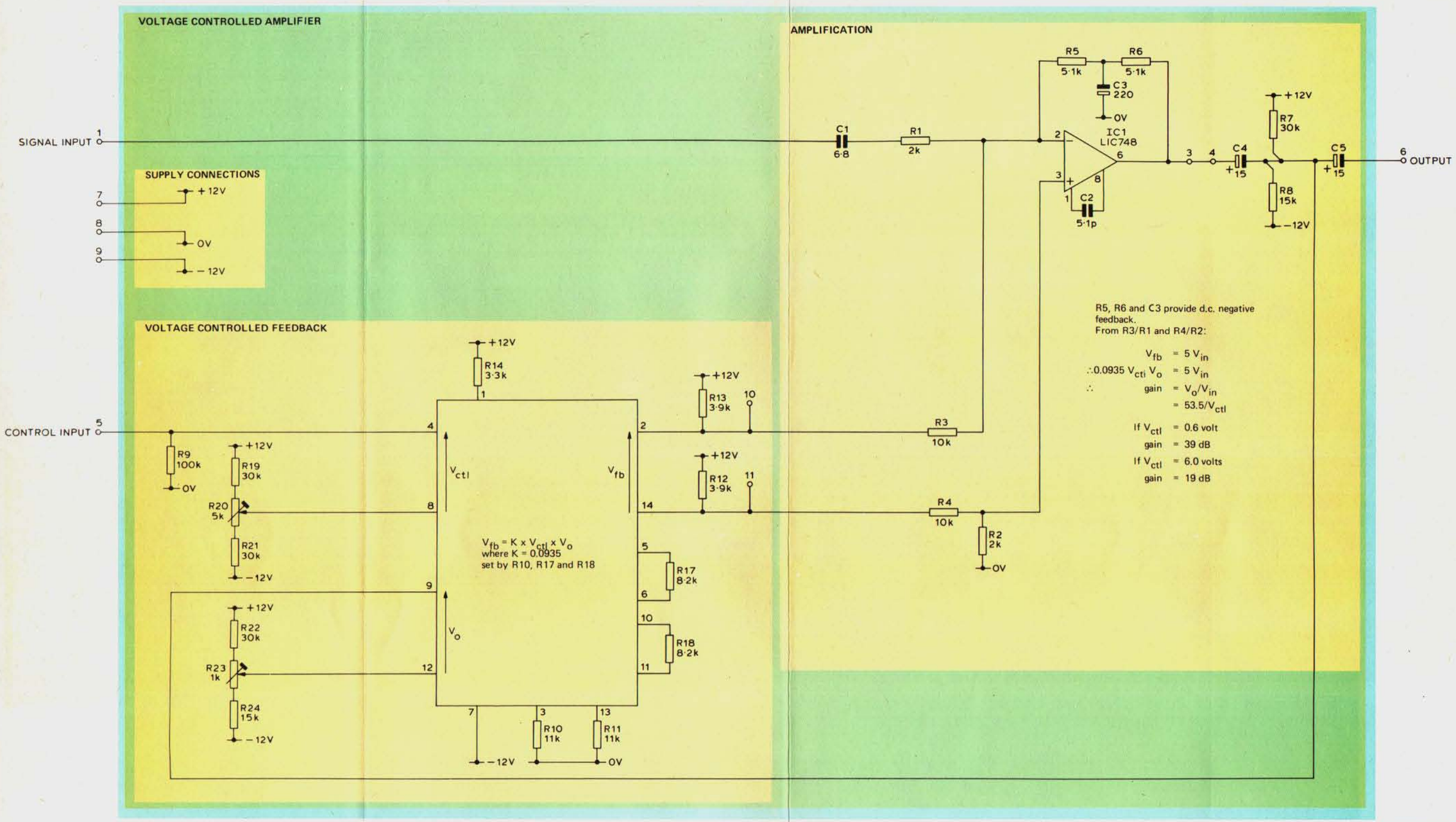
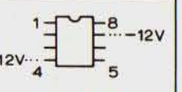
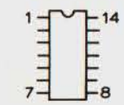


REF	TYPE	BASE
IC1	LIC748	
IC2	LIC795	

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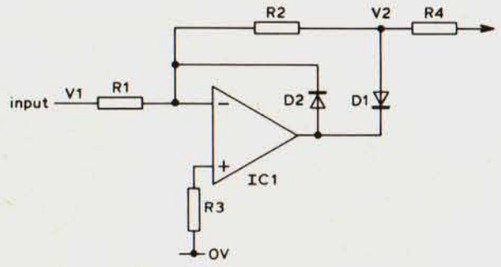
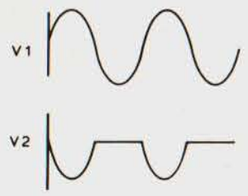
DESCRIPTION OF RECTIFICATION AND GANGING CIRCUIT

HALF-WAVE RECTIFICATION

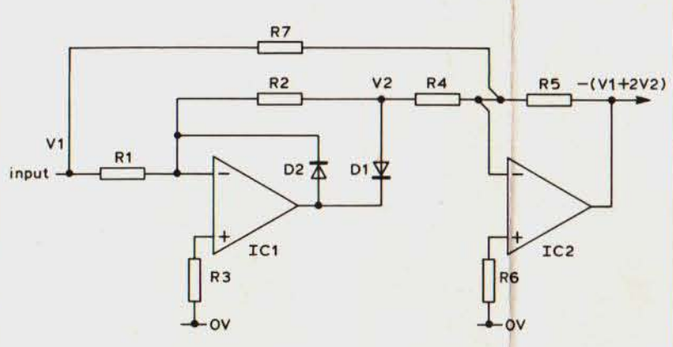
The gain of an operational amplifier is the ratio of its feedback impedance to its input impedance.



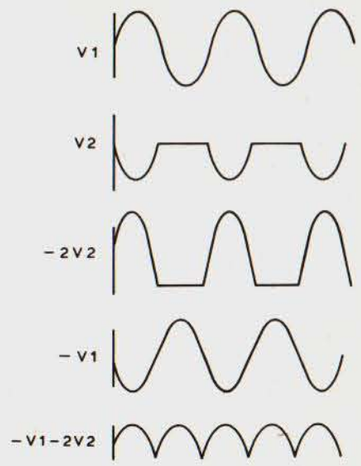
In this configuration, the feedback is split into two by means of diodes D1 and D2. The gain on positive input half-cycles is zero and on negative input half-cycles is R2/R1. It should be noted that the effect on the gain of the amplifier of the impedance of the diodes is cancelled by taking the output V2 from the junction of R2 and D1.



FULL-WAVE RECTIFICATION

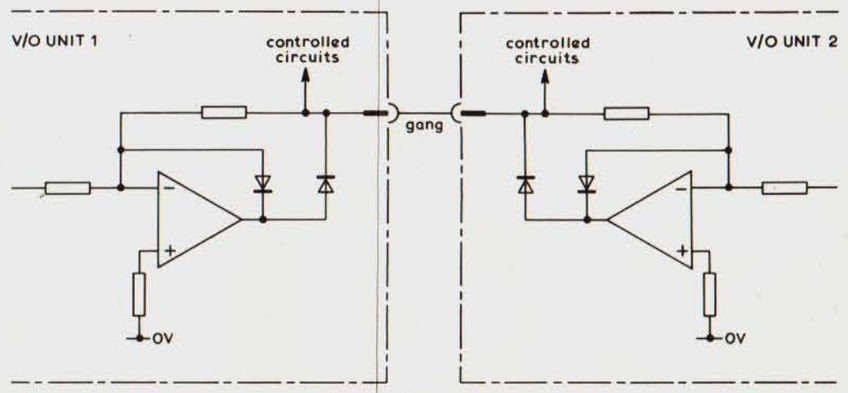


This is formed by adding 2 V2 + V1 as shown below.



GANGING

If voice-over units are used in a stereo chain they must both limit by the same amount. Ganged circuits are connected as shown below.



The diodes ensure that both outputs are a composite of the more positive portions of what would be the two outputs if the circuits were not ganged.