

DESIGNS DEPARTMENT

DESIGNS DEPARTMENT HANDBOOK

No. 3.250(80)

AM5/33 Mixer Amplifier

**BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION**

DESIGNS DEPARTMENT HANDBOOK

No. 3.250(80)

AM5/33 Mixer Amplifier

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(I.D.B. Millar)
for Head of Designs Department

Written by: K.J. Conie

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AM5/33 Mixer Amplifier

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AM5/33 Mixer Amplifier

1. INTRODUCTION

The AM5/33 contains two identical circuits each of which consists of three differential input amplifiers whose outputs are mixed and taken to a non-inverting amplifier output stage.

Input 1, which is designed to be fed from a microphone channel has unity gain but inputs 2 and 3, which are fed with Echo Return signal have an overall loss of -15 dB.

The amplifier is contained on a 3U BMM unsupported card. The card is designed for use in the PA6/87 module of the EP10/18 Radio Continuity Suite.

2. PERFORMANCE SPECIFICATION

2.1 Power Supplies

±12 volt at 60 mA.

2.2 A.C. Performance

Maximum output	0 dB		
Gain	Input 1	Input 2	Input 3
	0 dB	-15 dB	-15 dB
Input impedance	20 kΩ		
Frequency response	40 Hz-15 kHz ±0.03 dB w.r.t. 1 kHz		
Noise	-80 dB ₄		
Distortion	Less than 0.1% T.H.D. at 0 dB		

3. CIRCUIT DESCRIPTION

The AM5/33 carries two identical circuits. In this circuit description only one half will be referred to.

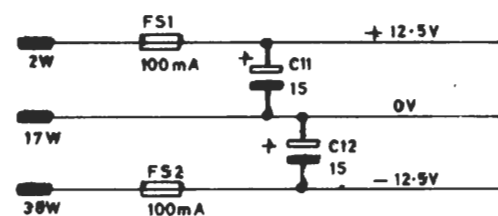
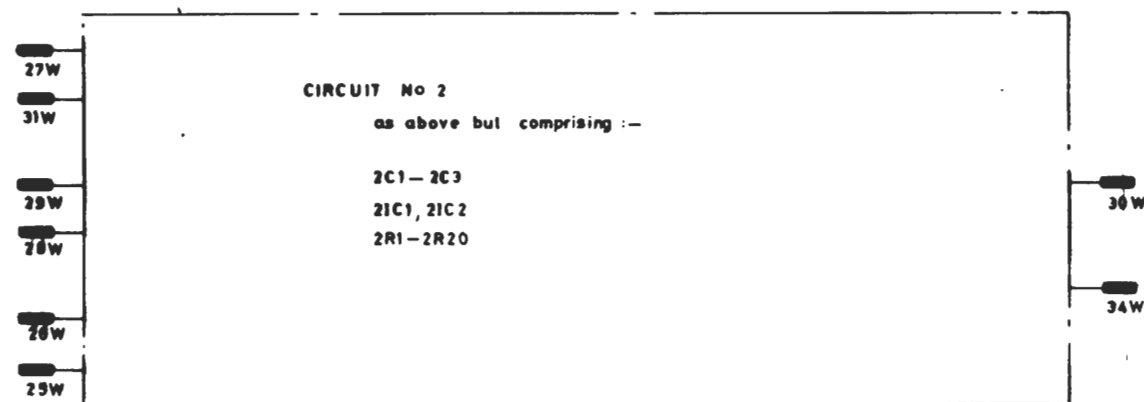
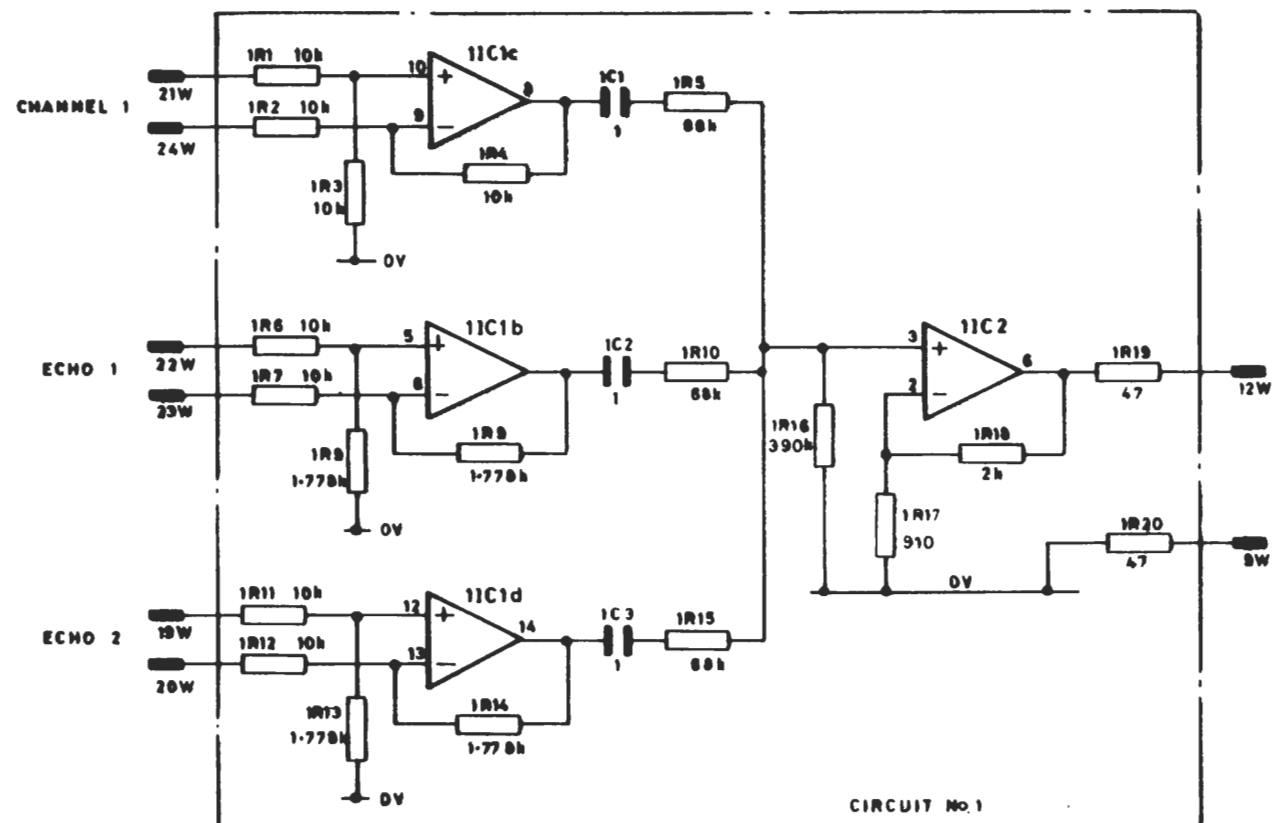
IC1b, c and d form three differential input amplifiers. Amplifier 1 has unity gain and amplifiers 2 and 3 have a gain of -15 dB. The outputs of these amplifiers are mixed and fed to IC2a, a non-inverting

output amplifier with a gain of 12 dB.

4. MAINTENANCE

If a fault occurs the d.c. conditions should be checked first. The supply currents should not exceed those given in 2.1 The output pin of each integrated circuit amplifier should be at 0V \pm 20 mV.

D49837A2



CIRCUIT REF.	SUPPLY PINS		No OF PARTS	TYPE
	+12.5V	-12.5V		
11C1 21C1	4	11	4	HA1-4741-5
11C2 21C2	7	4	1	LF356N

PARTS LIST D49838A4

SCALE - 0

THIRD ANGLE PROJECTION

ORIGINAL FRAME SIZE
400mm x 574mm

CHANGE
1 30.10.80

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DS/A2 1

AM5/33

MIXER AMPLIFIER
CIRCUIT

All dimensions in millimetres unless otherwise stated
Normal tolerances
no decimal place - 1 mm unless
one decimal place - 0.3 mm otherwise
two decimal places - 0.1 mm stated

DRN	GRD	DESIGNS DEPARTMENT
TCD		
CKD		
APPD		

D49837A2

CHANGE

30-10-80

AMS/33, AMPLIFIER, MIXER PARTS LIST

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ITEM No.	No OFF	DESCRIPTION	CCT REF.	BBC REF. OR DRG. No.
<u>DRAWING NUMBERS</u>				
		CIRCUIT	D49837A2	
		PARTS LIST	D49838A4	
		ASSEMBLY	D49839A2	
		DETAIL 1	D49840A4	
		P.B. ROUND	D49841A2	
		P.B. WIRING	D49842A2	
		P.B. COMP. LOCATION	D49843A2	
		P.B. DRILLING	D49844A3	
<u>FURTHER INFORMATION REQUIRED FOR MANUFACTURE</u>				
		UNIT ASSEMBLY INFORMATION	EA10484	
		UNIT WIRING INFORMATION	EA10140	
1	1	PRINTED BOARD MANUFACTURED TO		D49841A2, D49842A2 D49843A2, D49844A3
2	1	CODING PLATE, 3U MODIFIED TO		S52253 - 0351637 D49840A4 DET.1
3	1	SCREEN PLATE ASSY		S52255 - 0367154
4	1	HANDLE, NATURAL, VERO 21-1884E		S53920 - 0388150
5	2	SPACER, 5mm LG X 5mm DIA TAPPED M2.5		S58285 - 020740
6				
7				
8				
9	6	CAPACITOR, 1.0UF, ±20%, CERAMIC FILM	1C1-3 2C1-3	S20648 - 0389813
10	2	CAPACITOR, 15UF, 20V, TANTALUM	C11,12	S21124 - 020937
11				
12				
13	2	FUSE, 100mA, QUICK ACTING	FS1,2	S22424 - 0345169
14	2	FUSEHOLDER, PRINTED BOARD		S22252 - 0345142

BBC

DS/PLA4

AM 5/33
AMPLIFIER, MIXER
PARTS LIST

DRN. GRB
TPD.
CKD.
APPD.

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D49838A4

SHEET 1 OF 2 SHEETS

CHANGE

30-10-80

AM5/33 PARTS LIST

ITEM No.	No OFF	DESCRIPTION	CCT REF.	BBC REF OR DRG. No.
15	2	INTEGRATED CIRCUIT MAI-4741-5	12C1 21C1	0184061
16	2	INTEGRATED CIRCUIT LF356N	12C2 21C2	0194930
17				
18				
19				
20				
21				
		<u>RESISTORS METAL FILM, 0.4W</u>		
22	4	47Ω ±2%	1R19,20 2R19,20	S26877 - 0099291
23	2	910Ω ±2%	1R17 2R17	S26877 - 0227988
24	2	2KΩ ±2%	1R16 2R16	S26877 - 0099137
25	2	390KΩ ±2%	1R16 2R16	S26877 - 0228295
26				
27				
28				
29	8	RESISTOR 1.778K ACI COMPONENTS LTD EEO-1-1.778K-B-C1	1R8,9,13,14 2R8,9,13,14	
30	16	RESISTOR 10KΩ ACI COMPONENTS LTD EEO-1-10K-B-C1	1R1-4,5,7,11,12 2R1-4,6,7,11,12	
31	6	RESISTOR 68KΩ ACI COMPONENTS LTD EEO-1-68K-B-C1	1R5,10,15 2R5,10,15	
32				
33				
34				
35	A/R	WIRE PUN 1/1M YELLOW		
36				
37				
38				
		<u>SCREWS</u>	<u>FOR FIXING HOLES</u>	
39	2	M2.5 X 12 LG. CSK HD. M.S. ZN.P		2,5
40	6	M2.5 X 6 LG. PAN HD. M.S. ZN.P		3
41				
42				
		<u>NUTS</u>		
43	2	M2.5 HEX. FULL. M.S. ZN.P		2
44				
		<u>WASHERS</u>		
45	8	M2.5 PLAIN M.S. ZN.P		2,3,5
46				
47				

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BBC
DS/PLA4

AM5/33
PARTS LIST

DRN.	GRB	DESIGNS DEPARTMENT
TPD.		
CKD.		
APPD.	CR	

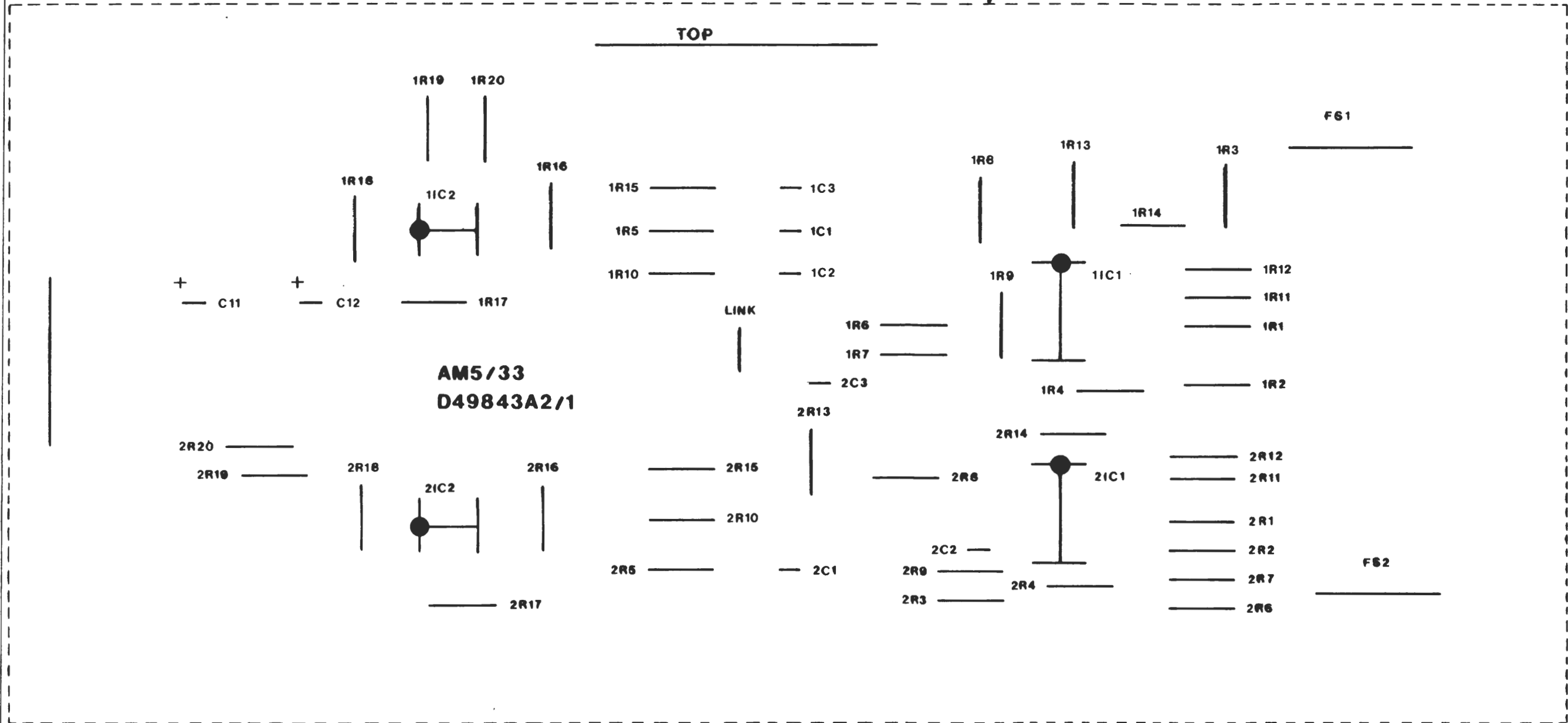
D49838A4

SHEET 2 OF 2 SHEETS

D49843A2

MINIMUM SIZE TO CUT NEGATIVE

TOP



**AM5/33
D49843A2/1**

CHARACTERS & LINES TO BE PRINTED IN WHITE
PRINTED WIRING ON REVERSE SIDE OF BOARD IS D49843A2

SCALE 2:1

SCALE: 0

THIRD ANGLE
PROJECTION

ORIGINAL
FRAME SIZE
400mm x 574mm

CHANGE
30.10.80

BBC

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DS/A2.1

ISS

AM5/33

PRINTED BOARD
COMPONENT LOCATION

All dimensions in millimetres unless otherwise stated
Normal tolerances
no decimal place — 1 mm unless
one decimal place — 0.3 mm otherwise
two decimal places — 0.1 mm stated

DRN	GRB
TCD	
CKD	
APPD	

DESIGNS DEPARTMENT

D49843A2

