



DESIGNS DEPARTMENT

DESIGNS DEPARTMENT HANDBOOK

No. 3.275(82)

Continuity Clean Feed Equipment EP5M/18

**BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION**

Issue 1
4.6.82

DESIGNS DEPARTMENT HANDBOOK

No. 3.275(82)

Continuity Clean Feed Equipment EP5M/18

.....
(W.T. Shelton)
for Head of Designs Department

Written by: K.J. Conie

D.D. Handbook No. 3.275(82)
Title Sheet

DESIGNS DEPARTMENT HANDBOOK

No. 3.275(82)

Continuity Clean Feed Equipment EP5M/18

C O N T E N T S

1. INTRODUCTION
2. OPERATION

D R A W I N G S

EP5M/18

Block Schematic	DSK 22435 A2
Circuit	D 51485 A1

SUB UNITS

MX3/3 and 3A	Circuit	D 48390 A2
MX3/4	Circuit	D 48598 A1
SE2/23	Circuit	D 51210 A2
UN23/140	Circuit	D 51507 A1

DESIGNS DEPARTMENT HANDBOOK

No. 3.275(82)

Continuity Clean Feed Equipment EP5M/18

1. INTRODUCTION

Equipment EP5M/18 is a 4U BMM card frame containing all the 4U card sub-assemblies which comprise the Clean Feed mixer for the London Continuity EP10/19.

The Continuity desk has 5 Groups and 2 Outputs. Group 1 is Studio Mics., Group 2 is Studio Grams and Group 3 is Studio Carts. These groups may be switched to either or both outputs. Groups 4 and 5 are Cubicle tapes and/or Outside Sources, as both can be switched to either group; these two groups can also be switched to either or both outputs. Because of these requirements there are two stereo Clean Feed mixers in the EP5M/18, each with its associated Outside Source input and output switching. When an Outside Source is required in both outputs then the two Clean Feed mixer outputs are combined. A Mono Output is also provided.

The equipment contains the following coded items.

		<u>Circuit</u>
MX3/3	Stereo to Mono Converter (1 off)	D 48390 A2
MX3/3A	A.F. Mixer (2 off)	D 48390 A2
MX3/4	Clean Feed Mixer (4 off)	D 48598 A1
SE2/23	Analogue Switch (8 off)	D 51210 A2
UN23/140	Control Unit (1 off)	D 51507 A2

Associated Equipment

		<u>Circuit</u>
PA6/85	Group and Echo Panel	D 44684 A1
PA6/90A	Outside Source Panel	D 48312 A1
EP5M/16	Channel Grouping Equipments	D 51064 A1

2. GENERAL DESCRIPTION

The EP5M/18 contains 4 MX3/4 Clean Feed mixer cards. These provide facilities for 2 Stereo Clean Feed outputs. The 4 MX3/4 cards comprise MX3/4 (SKD) L.H. Output 1, MX3/4 (SKE) R.H. Output 1, MX3/4 (SKP) L.H. Output 2 and MX3/4 (SKN) R.H. Output 2. Each MX3/4 has associated with it 2 SE2/23 audio switch cards. One on the input side and one on the output, to switch the Outside Source inputs into the mixer, and the Clean Feeds out. As the SE2/23 audio switch cards have 5 stereo circuits their left and right hand circuits are wired between the left and right hand mixers. The switched outputs from the Clean Feed Mixer cards are taken to MX3/3A Mixer cards. The function of these cards (left and right hand) is to mix the two Clean Feed mixer outputs which would be required if an Outside Source was feeding both outputs. The outputs from the MX3/3A cards are fed to plugs on the back of the equipment and also to a MX3/3 Mono to Stereo Converter. The output of this card is also fed to a plug on the back of the unit to provide a Mono Clean Feed.

3. OPERATION

The controls which set the switching of the EP5M/18 are mounted on the Group Panel PA6/85 and the Outside Source Panel PA6/90A.

The controls on the Group Panel PA6/85 select which groups are switched to each output and to which group the Cubicle tapes are switched. The group select switches on the Outside Source Panel PA6/90A select to which group that particular Outside Source is required to be switched.

The outputs from these switches are fed to the UN23/140, a sub-unit of the EP5M/18, which performs all the logic functions of the Clean Feed equipment.

Block Schematic DSK 22435 A2 gives a complete picture of the Clean Feed unit and should be read in conjunction with the associated switch function table. This table gives the condition for which a particular switch will be operated.

4. CIRCUIT OPERATION

4.1 Mics, Grams and Carts Input Switching

Operation of the appropriate switch on the PA6/85 to route the Mics (Group 1) to Output 1 causes a logic 1 signal to be connected to the UN23/140 via PL2A where it appears on an AND gate, (IC1a). The other input to the AND gate comes from the Trans/Rehearsal switch on the Cubicle desk and provided this is a logic 1, i.e., on transmission, then a logic 1 signal will be present on the output of IC1c. This signal then passes via PL3 'A' to the EP5M/16 where it will operate the switch 'mx1' (DSK 22435 A2) and cause the Mics (Group 1) to be switched into Clean Feed Mixer 1. If the Mics are switched to Output 2 then the logic signal from the PA6/85 will arrive on PL2 'C' switching AND gate (IC1b). The output logic 1 from IC1b passes via PL3 'R' to the EP5M/16 where it will operate the switch 'my1' and cause the Mics group to be switched into Clean Feed Mixer 2.

Similar circuits are provided for the Grams and Carts (Groups 2 and 3).

4.2 Tape Inputs Switching

Tape inputs may be either Group 4 or Group 5 and originating from the cubicle are not dependent on the Trans/Rehearsal switch. Operation of the appropriate switch on the PA6/85 to route Tapes to Group 4, Output 1 causes a logic 1 to appear on PL2 'R' where it is connected to the UN23/140 and IC2c. IC2c is an 'AND' gate with both inputs strapped, therefore logic 1 appears on its output which is connected via PL3 'J' to the EP5M/16 where it will operate the switch 'tx4' (DSK 22435 A2) and cause the Cubicle tape output to be switched to Clean Feed Mixer 1. Similar circuits are for switching the tape output to Group 5, Output 1. Group 4, Output 2 and Group 5, Output 2. These are:-

	Group 5 Output 1	Group 4 Output 2	Group 5 Output 2
Input from PA6/85	PL2 V	PL2 T	PL2 W
Output to EP5M/16	PL3 L	PL3 W	PL3 Z

4.3 Mic, Grams, Carts and Tapes - Signal Input

As described in paragraphs 4.1 and 4.2 the switching for the above inputs takes place in the EP5M/16. The switched signals are mixed and the resultant output fed to the EP5M/18 via PL11 pins A, B, C, D (Output 1 Clean Feed) and pins E, F, J, K (Output 2, Clean Feed) on the EP5M/16, to PL4 (same pin designation) on the EP5M/18. From PL4 they are wired directly into the clean Feed Mixer cards (MX3/4).

4.4 Outside Source Switching

Assume Outside Source 1 is switched to Group 4 and Group 4 is switched to Output 1. The Outside Source programme signal will appear on plug PL5 pins, A, B, C, D.

A logic 1 signal will be on PL7 'A' from the Outside Source Panel (PA6/90A (1)). Also from the Grouping Panel (PA6/85) a logic 1 signal will be on PL2 'BB'. Both these logic signals are fed to the UN23/140. The signal from the PA6/90A causes a logic 1 to appear on pin 3 of IC9 and the signal from the PA6/85 causes a logic 1 to appear on pin 14 of IC9. This results in a logic 1 signal on pin 12 which is connected to IC12c, an inverter, causing logic 0 to be present on pin 36C of the UN23/140. This pin is wired to pins 26W and 28W of audio switch cards SKB and SKF and causes the switches to operate in both cards. Audio switch card (SE2/23 - SKB) connects the Outside Source 1 into the Clean Feed Mixer and SE2/23 - SKF connects the Outside Source 1 Clean Feed into an MX3/3A mixer. (The function of this mixer (MX3/3A) is to mix together the outputs from the two Clean Feed networks when an Outside Source is feeding both outputs). The input to the mixer from the other Clean Feed network will not be switched in this case.

The outputs from the MX3/3A mixer are fed
(i) to socket PL9 as a stereo output and
(ii) to the MX3/3 (Stereo to Mono mixer) as a mono output.

Note the Clean Feed to Outside Source 1 will not include the Outside Source programme signal.

5. SIGNAL LEVELS

Nominal input levels to the Clean Feed equipment will be -3 dB. Output levels depend on the output switching of the continuity.

O.S. input	Clean Feed Outputs (Stereo)
-3 dB	-3 dB switched to outputs 1 or 2.
	+3 dB switched to outputs 1 & 2.

	Clean Feed Outputs (Mono)
	0 dB switched to outputs 1 or 2.
	+6 dB switched to outputs 1 & 2.

6. CIRCUIT OPERATION OF CODED SUB-UNITS

6.1 The detailed circuit operations of the coded sub-units are described in the handbooks listed below.

MX3/3 and 3A	Handbook No. 3.259(81)
MX3/4	Handbook No. 3.260(81)
SE2/23	Handbook No. 3.266(81)
UN23/140	Handbook No. 3.274(81)

SWITCH FUNCTIONS TABLE

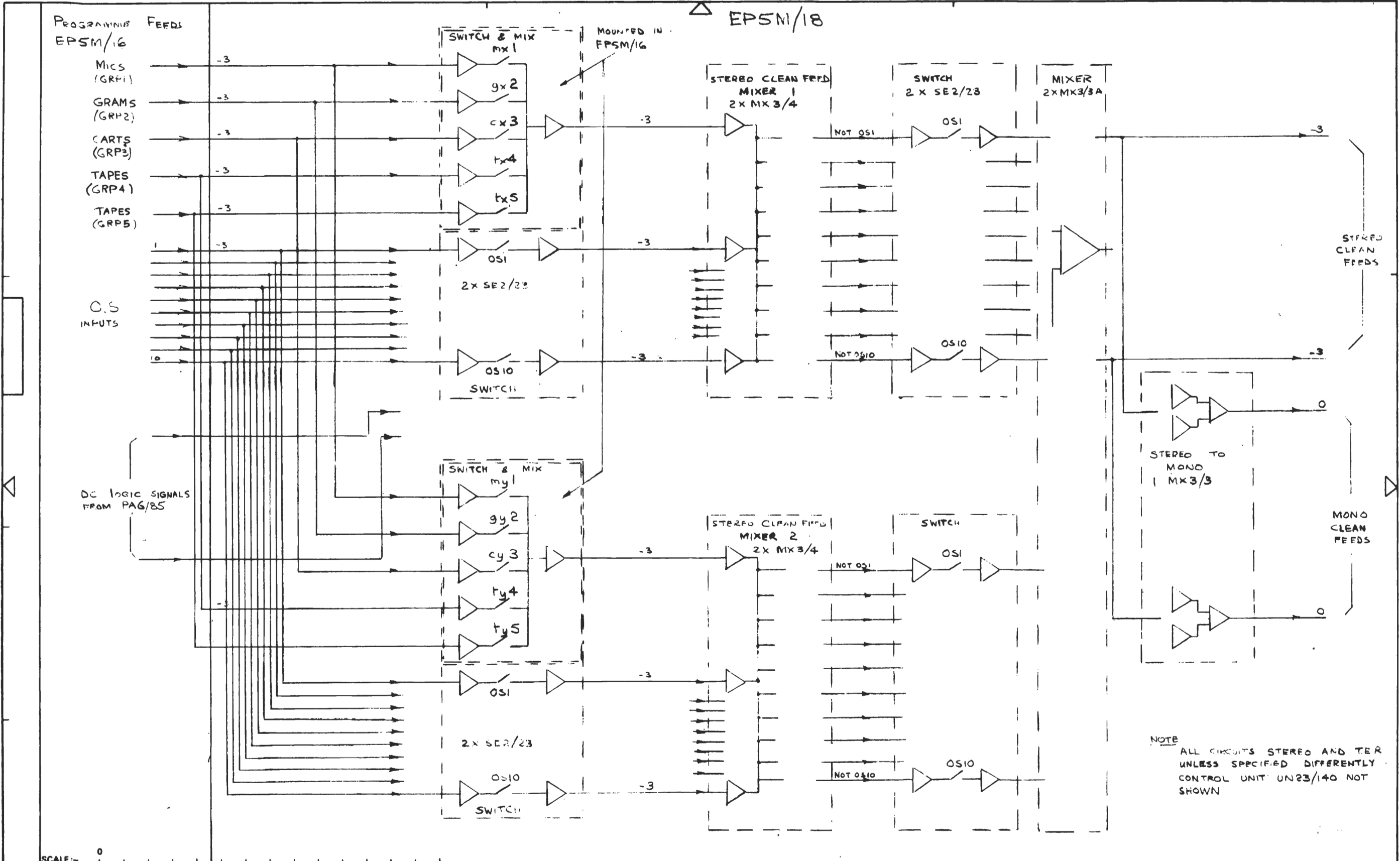
mx1 - operated if Mics. (GRP1) are switched to output 1)
) AND STUDIO REH/TRANS
gx2 - operated if Grams. (GRP2) are switched to output 1) SWITCH ON TRANS
)
cx3 - operated if Carts. (GRP3) are switched to output 1)
tx4 - operated if Tapes (GRP4) are switched to output 1
tx5 - operated if Tapes (GRP5) are switched to output 1

my1 - operated if Mics. (GRP1) are switched to output 2)
) AND STUDIO REH/TRANS
gy2 - operated if Grams. (GRP2) are switched to output 2) SWITCH ON TRANS
)
cy3 - operated if Carts. (GRP3) are switched to output 2)
ty4 - operated if Tapes (GRP4) are switched to output 2
ty5 - operated if Tapes (GRP5) are switched to output 2

OS1x - operated if Outside Source 1 is switched to group which is switched to
 Output 1.

OS1Y - operated if Outside Source 1 is switched to group which is switched to
 Output 2.

To be read in conjunction with Block Schematic DSK 22435 A2.



NOTE
 ALL CIRCUITS STEREO AND TER
 UNLESS SPECIFIED DIFFERENTLY
 CONTROL UNIT UN23/140 NOT
 SHOWN

THIRD ANGLE PROJECTION

ORIGINAL FRAME SIZE
 400mm x 574mm

BBC

QS/A2/1

This drawing/specification is the property of the British Broadcasting Corporation and may not be reproduced or disclosed to a third party in any form without the written permission of the Corporation.

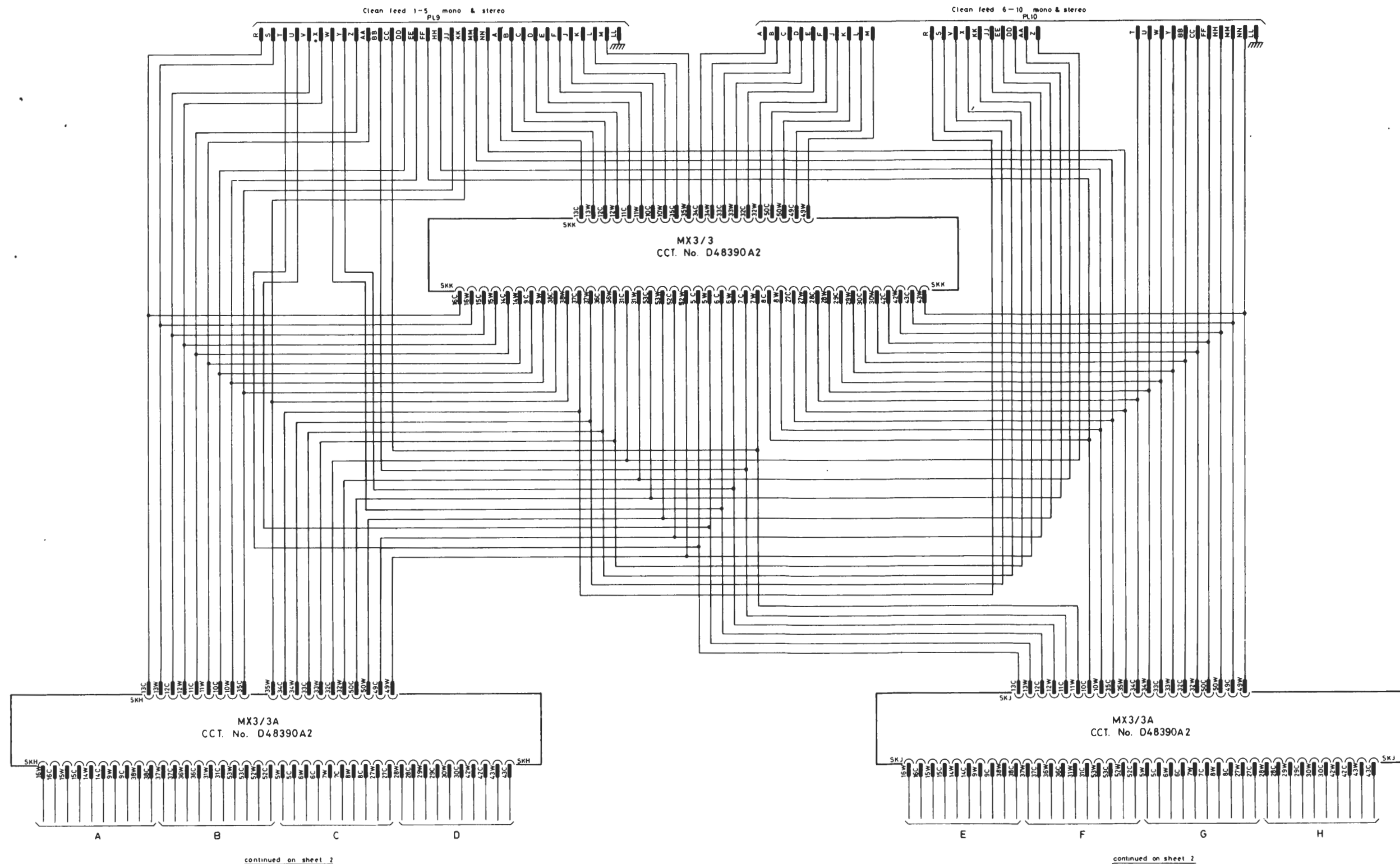
CHANGE	17.1.81
	30.3.81
	18.5.82
	2.7

LONDON CONTINUITY
 PROGRAMME SCHEMATIC - CLEAN FEED

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

DRN.	
TCD.	(Signature)
CKD.	
APPD.	

DSK22435A2



NOTES
 1 All wiring in twisted pairs
 2 Wiring from plugs to beads short & direct as possible

continued on sheet 2

continued on sheet 2

D51485A1 SHT 1 OF 3 SHTS

THIRD ANGLE PROJECTION

ORIGINAL FRAME SIZE
574mm x 821mm

BBC

This drawing specification is the property of the British Broadcasting Corporation and may not be reproduced or disclosed to a third party in any form without the written permission of the Corporation.

D5/AV1

CHANGE	DATE	BY	REASON
1	3 9 68		

Parts list D51486A4

EP5M/18
CLEAN FEED PROGRAMME CIRCUIT

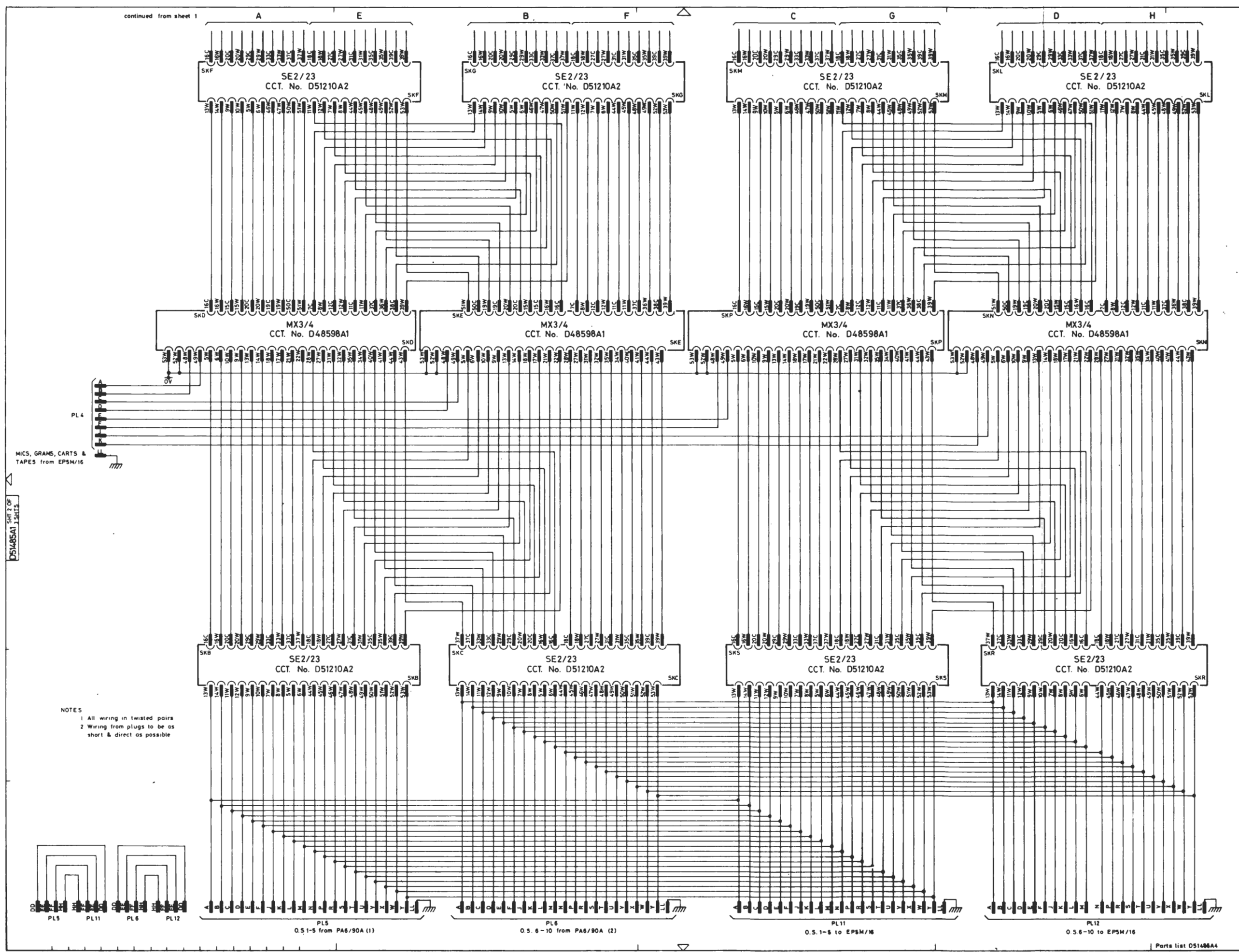
DRN	CC	DESIGNS DEPARTMENT
TCD		
CKD		D51485A1
APPO		SHEET 1 OF 3 SHEETS

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

S. B. H. LTD LONDON

continued from sheet 1

3 9 01



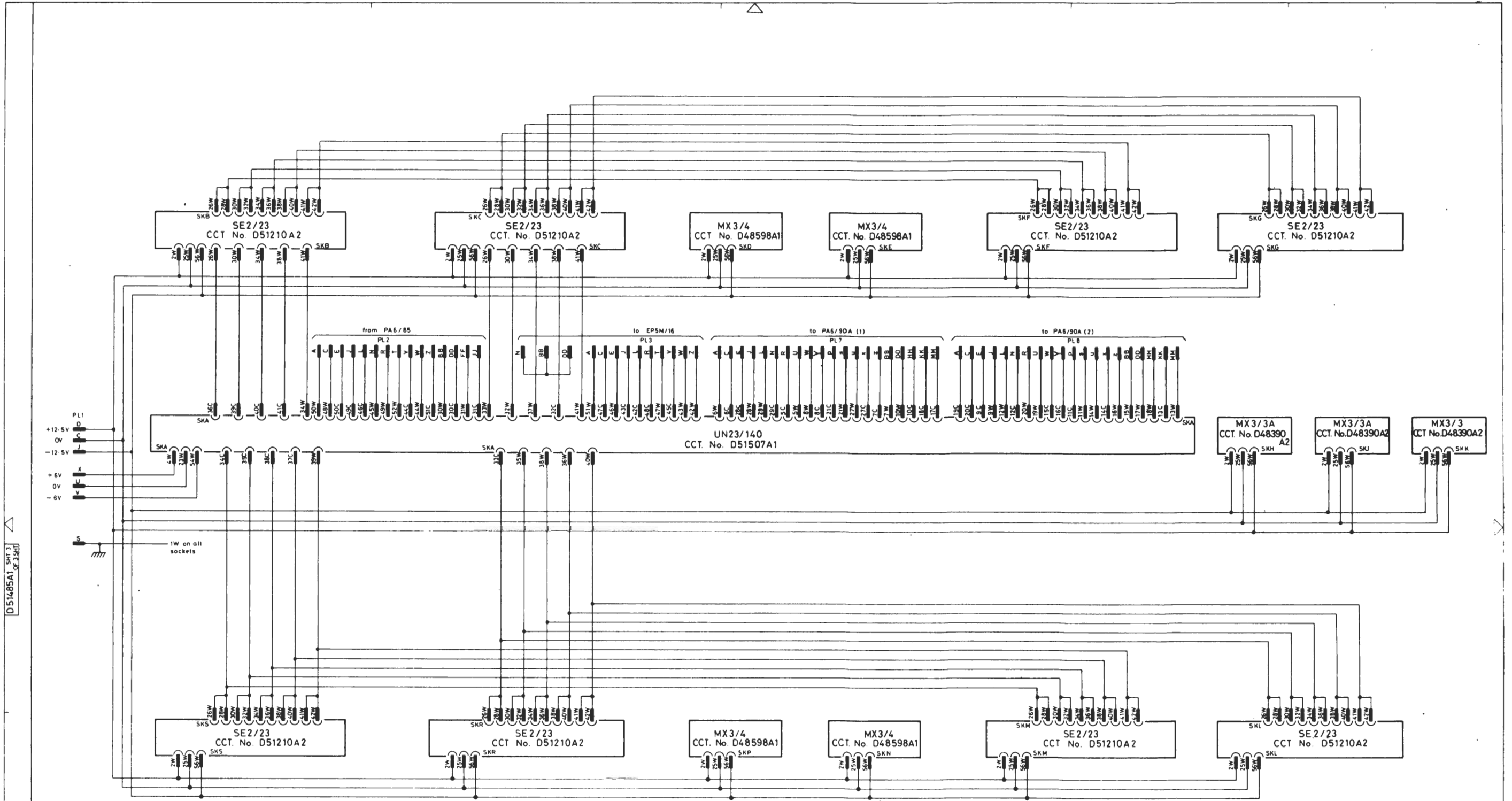
NOTES
 1 All wiring in twisted pairs
 2 Wiring from plugs to be as short & direct as possible

THIRD ANGLE PROJECTION
 All dimensions in millimetres unless otherwise stated
 Normal tolerances to the nearest 0.1mm unless otherwise stated
 This drawing specification is the property of the British Broadcasting Corporation and may not be reproduced or distributed to third parties in any form without the permission of the Corporation

EP5M/18
CLEAN FEED
PROGRAMME
CIRCUIT

DRN	TCO	CKD	APPD
CC			

DESIGNS DEPARTMENT
D51485A1
 SHEET 2 OF 3 SHEETS



NOTES
 1 1W frame earth all cards
 2 PL2 & 3 pin LL to frame earth
 PL7 & 8 pin T to frame earth

THIRD ANGLE PROJECTION

ORIGINAL FRAME SIZE
574mm x 821mm

CHANGE
1 3 8 8
2 2 2 82

BBC
 This drawing/specification is the property of the British Broadcasting Corporation and may not be reproduced or disclosed to a third party in any form without the written permission of the Corporation.

DS/AV1

Parts list D51485A4

EP5M/18
 CLEAN FEED — LOGIC & POWER CIRCUIT

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

DRN	CC	DESIGNS DEPARTMENT
TCD		
CKD		D51485A1
APPO		SHEET 3 OF 3 SHEETS

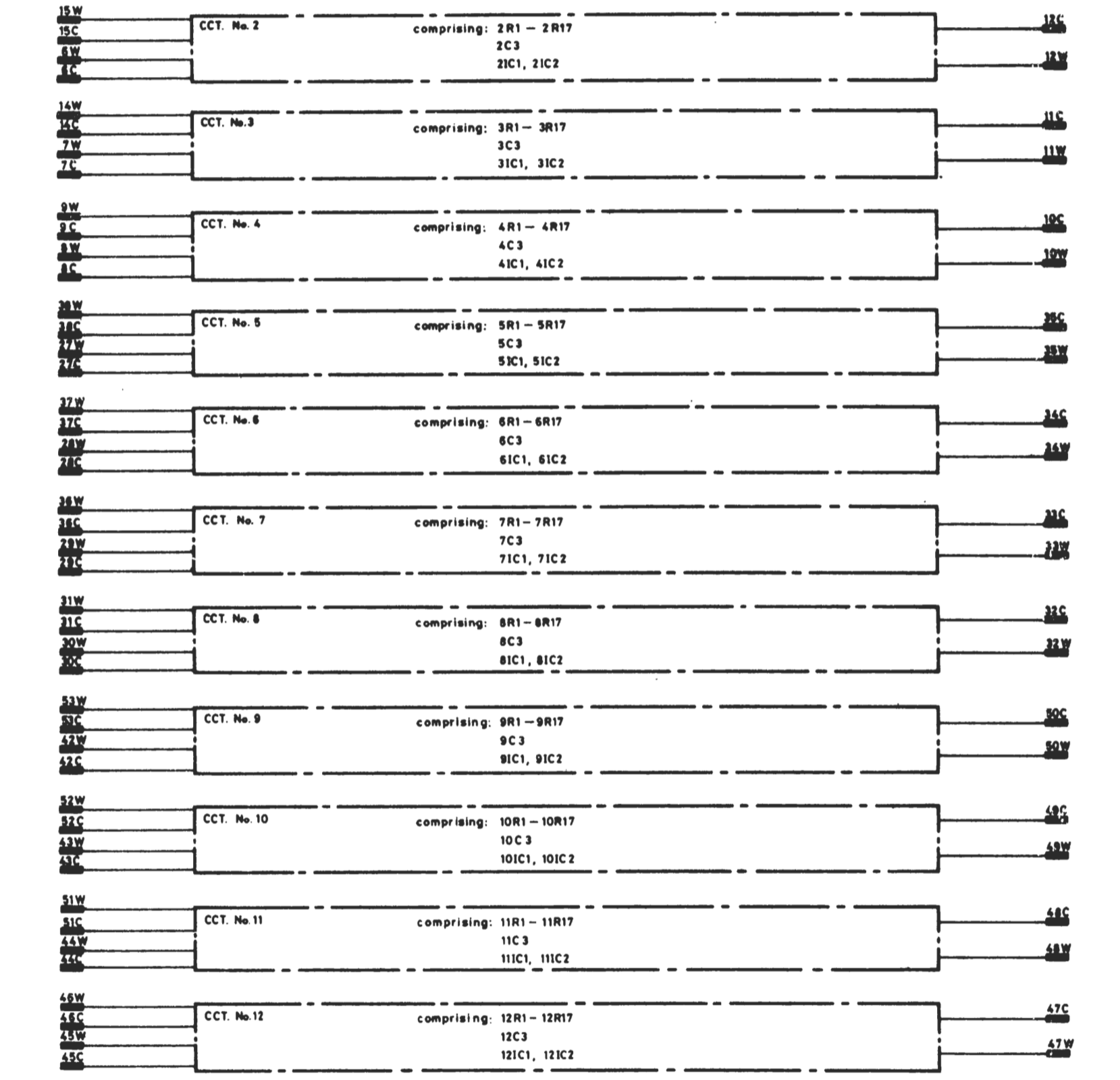
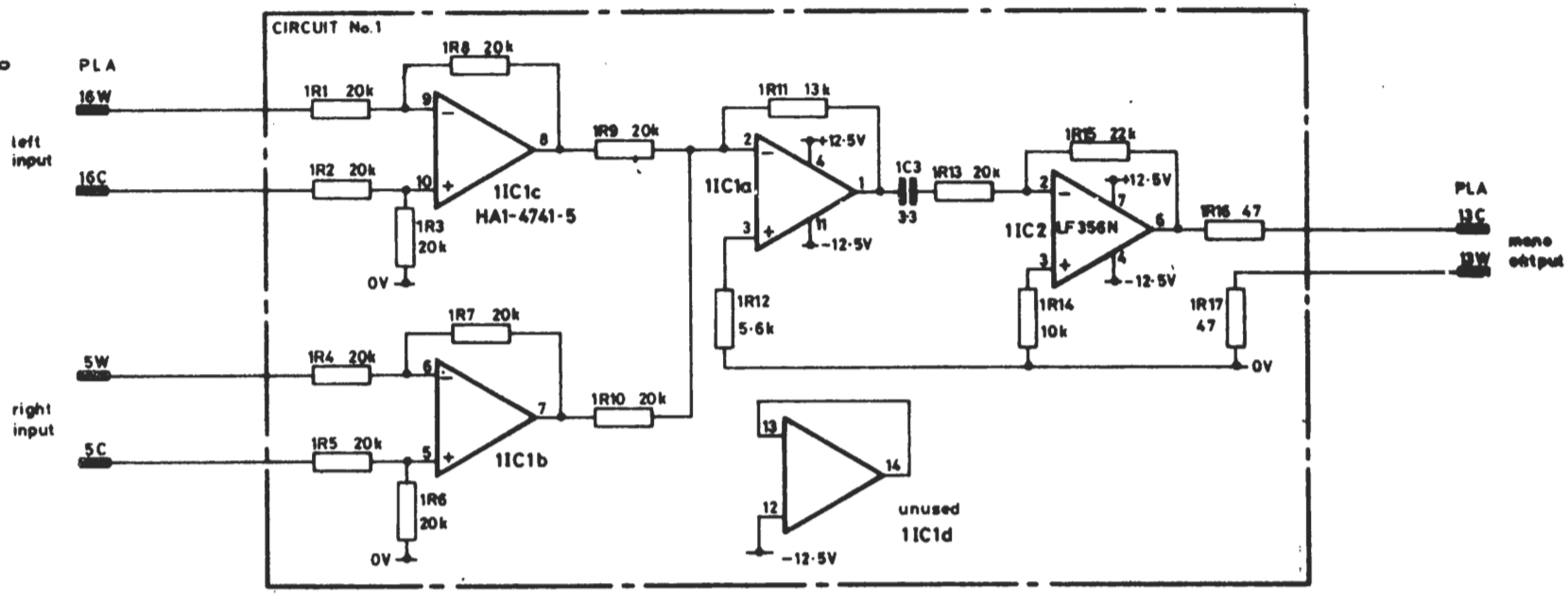
SHEET 3 OF 3 SHEETS

BB
08/7/71

The drawing/production is the property of the British Broadcasting Corporation and shall remain the property of the Corporation unless otherwise stated in writing.

SCALE: 0
THIRD ANGLE PROJECTION
ORIGINAL FRAME SIZE 400mm x 574mm

CHANGE
1 27-7-81

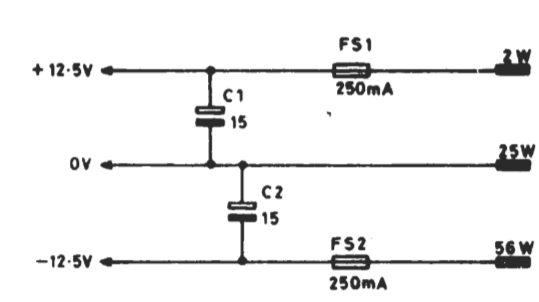


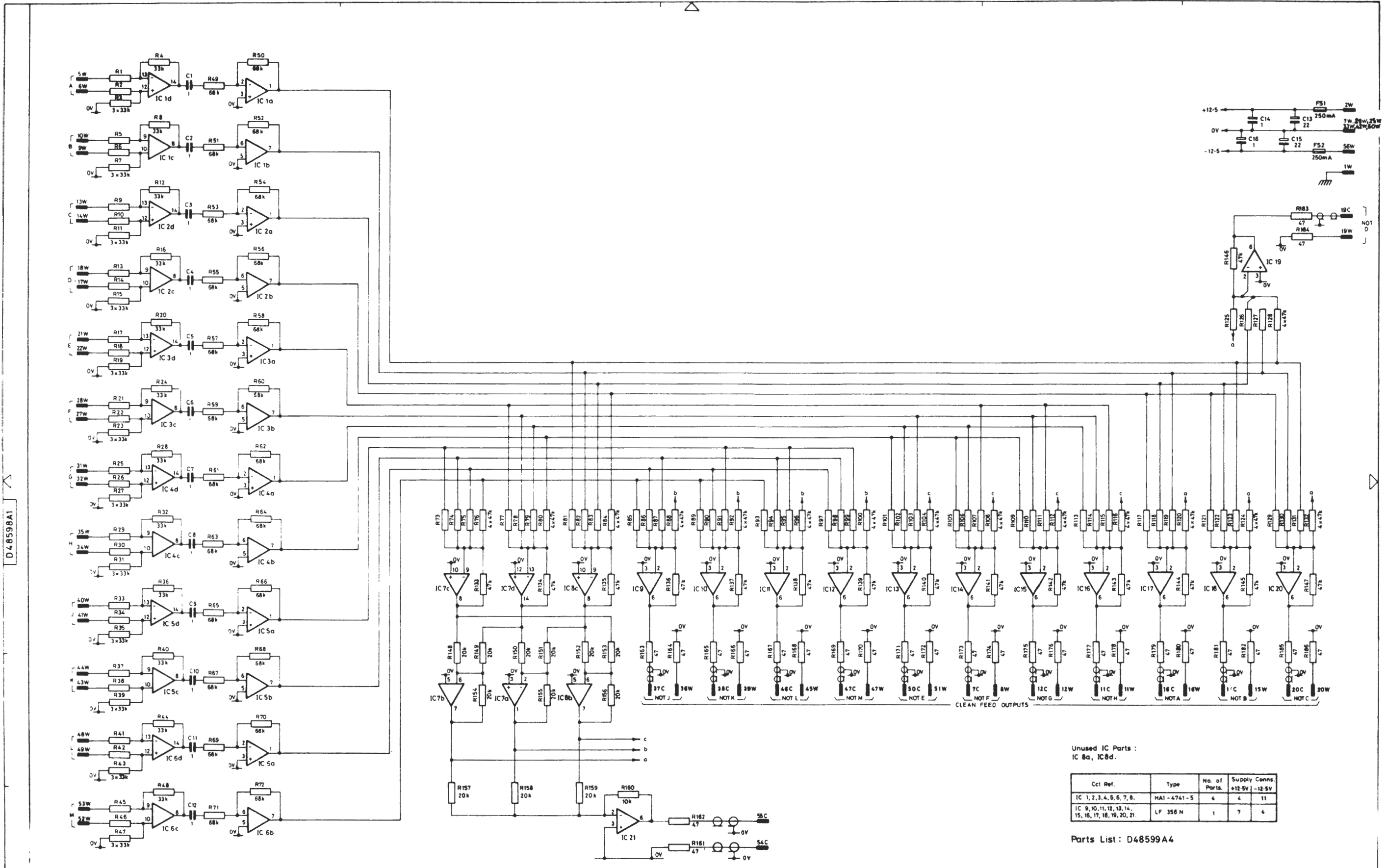
MX3/3 STEREO TO MONO CONVERTER CIRCUIT

DESIGNS DEPARTMENT

D48390A2

Parts list: D48391A4





D48598A1

Unused IC Parts :
IC 8a, IC 8d.

Ckt Ref.	Type	No. of Parts.	Supply Conns.
IC 1, 2, 3, 4, 5, 6, 7, 8.	HA1-4741-5	4	4 11
IC 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21.	LF 356 N	1	7 4

Parts List : D48599A4

THIRD ANGLE PROJECTION

ORIGINAL FRAME SIZE
574mm x 821mm

CHANGE

87-3-81

BBC
BS AV1

This drawing is the property of the British Broadcasting Corporation and may not be reproduced or disseminated in any form without the written permission of the Corporation.

MX 3/4
CLEAN FEED CARD.
CIRCUIT.

All dimensions in millimetres unless otherwise stated
Nominal tolerances
no dim'l plus
no dim'l plus
10% dim'l plus

DESIGNS DEPT.

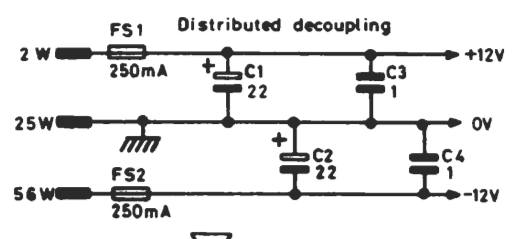
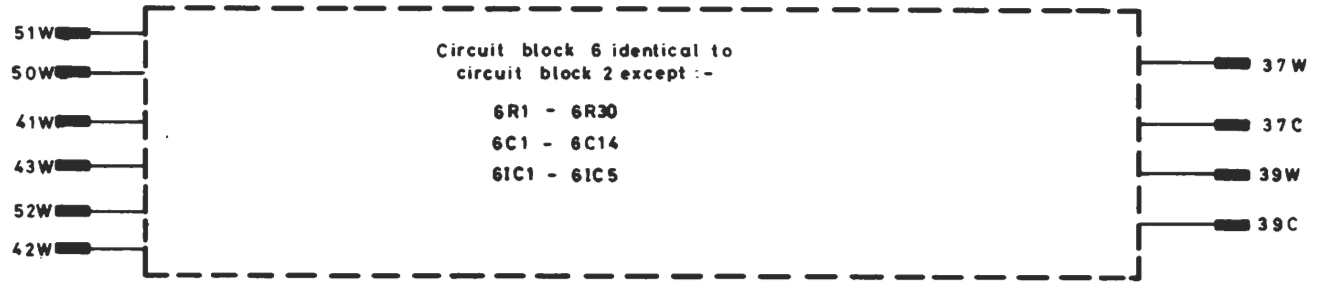
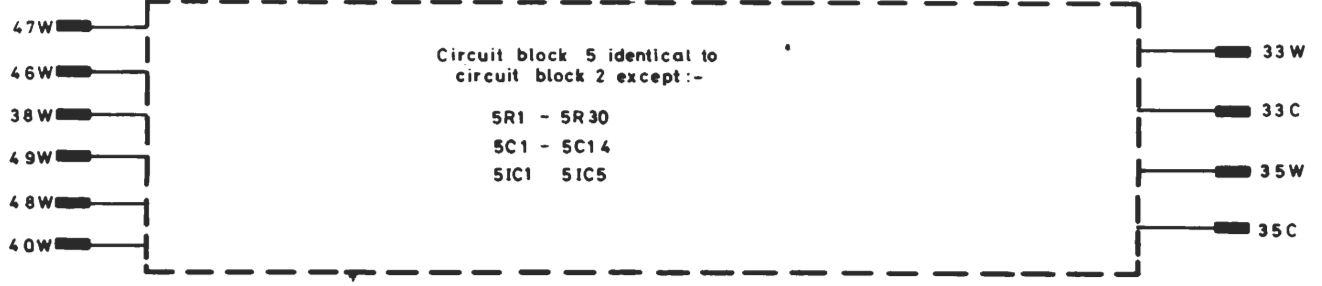
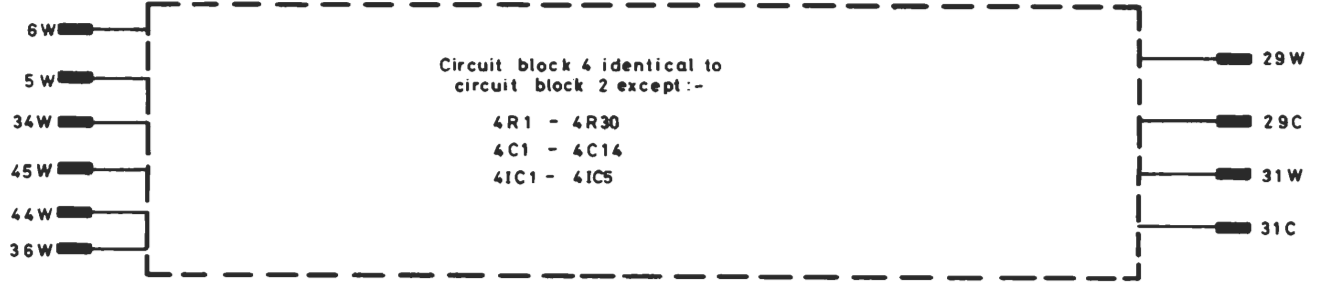
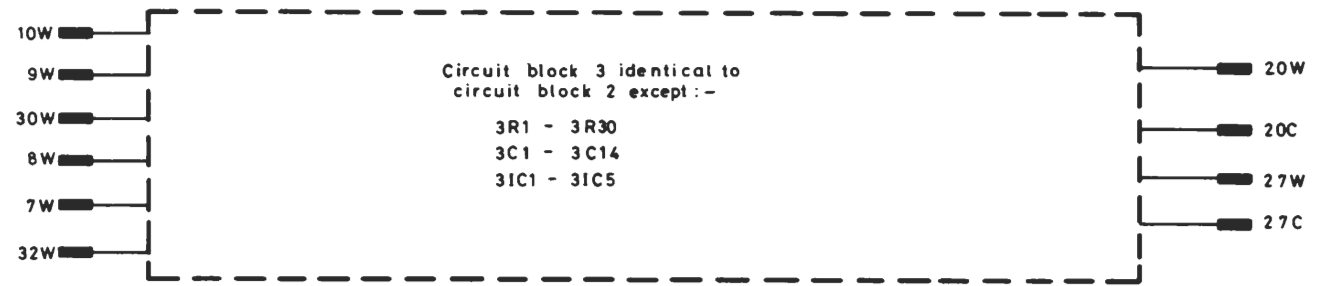
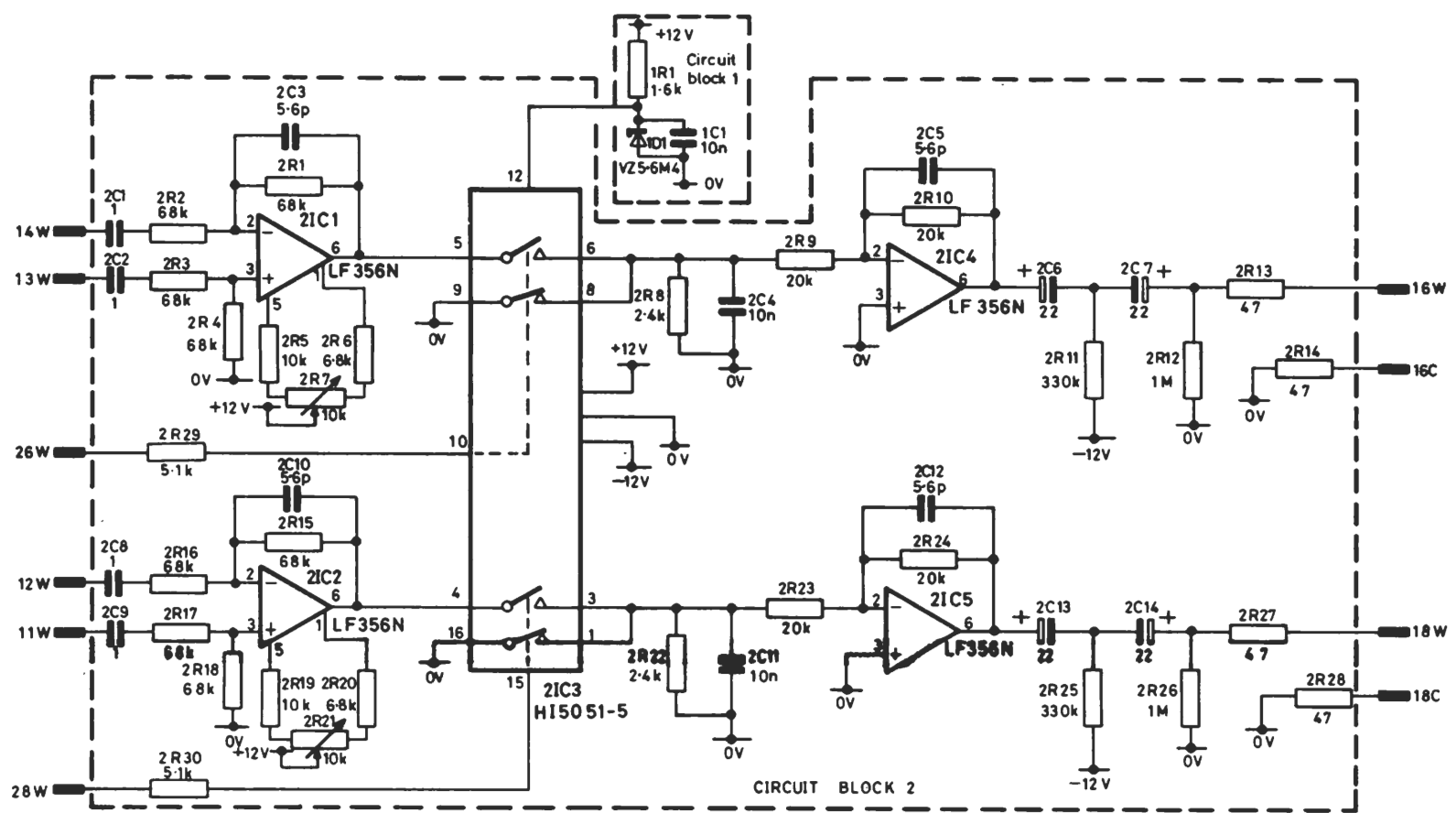
D48598 A1

80 H 170 LEMMA

SCALE: 1:1
 THIRD ANGLE PROJECTION
 ORIGINAL FRAME SIZE 400mm x 574mm

BBC
 DS/A2/1
 This drawing/specification is the property of the British Broadcasting Corporation and may not be reproduced or disclosed to a third party in any form without the written permission of the Corporation.

NO	CHANGE
1	6, 10, 81
2	4, 10, 81



A.F. SWITCH CIRCUIT
 SE 2/23

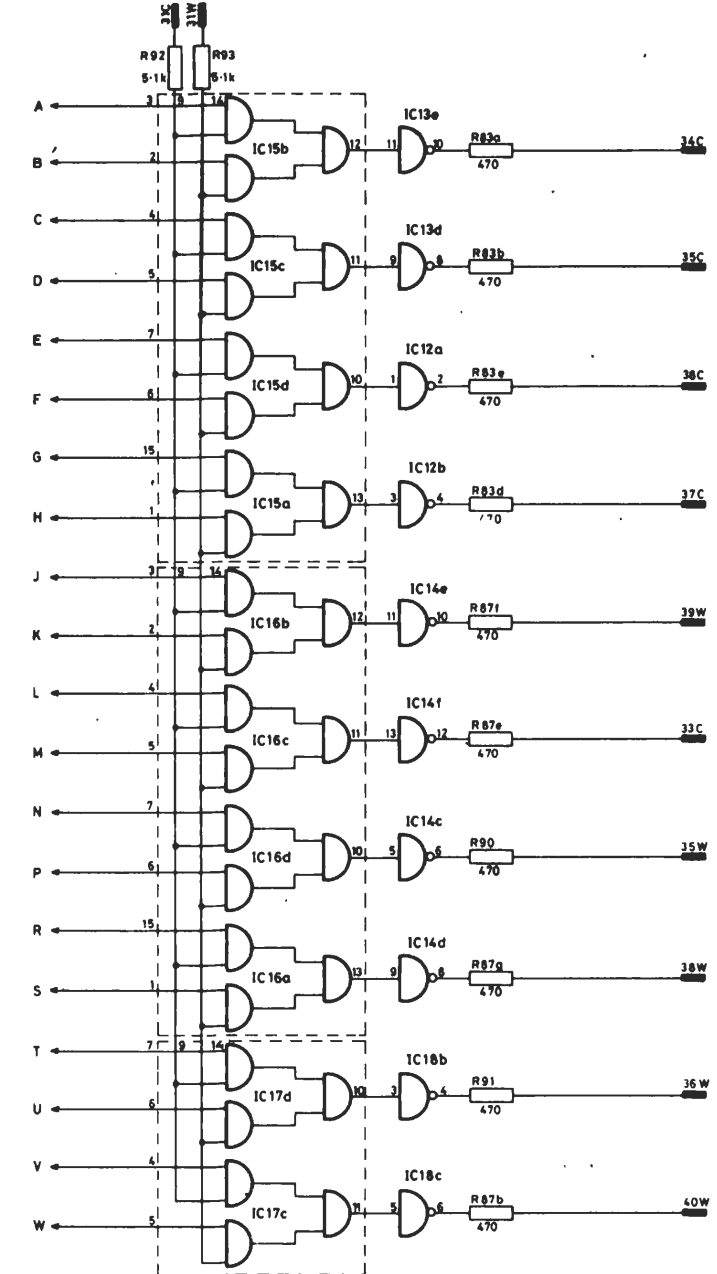
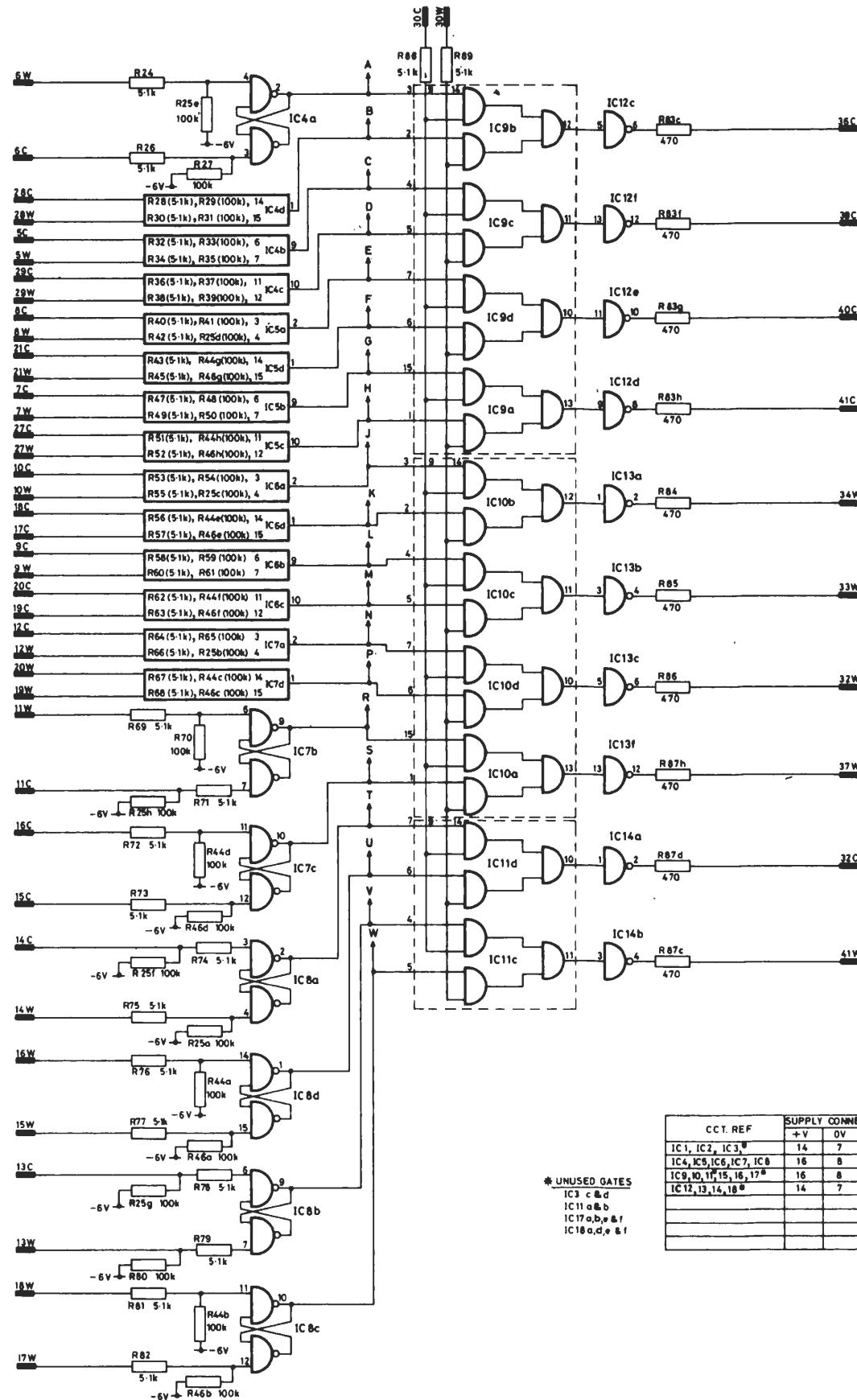
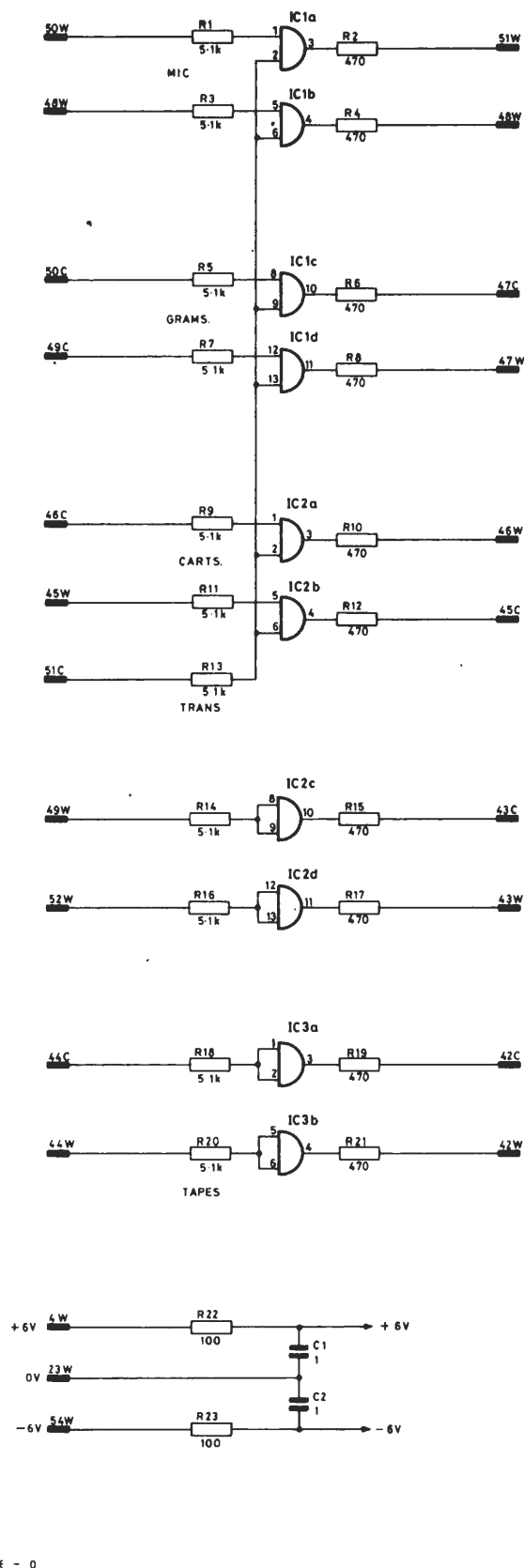
PARTS LIST: D51211A4

DESIGNS DEPARTMENT
 D51210A2
 S.M. LTD. JAPAN

All dimensions in millimetres unless otherwise stated.
 Normal tolerances: ± 0.1 mm unless otherwise stated.
 No decimal places: ± 0.2 mm unless otherwise stated.
 One decimal place: ± 0.1 mm unless otherwise stated.
 Two decimal places: ± 0.05 mm unless otherwise stated.

DRN: T.C.D. A.R.T.
 CKD: A.P.T.
 APPD: 8

D51507A1



CCT. REF	SUPPLY CONNECTIONS			No OFF PARTS	TYPE
	+V	0V	-V		
IC1, IC2, IC3*	14	7	4	4	MOS/DIC4081BN
IC4, IC5, IC6, IC7, IC8	16	8	4	4	MOS/DIC4043BN
IC9, IC10, IC11, IC12, IC13, IC14, IC15, IC16, IC17*	16	8	4	4	MOS/DIC4019BN
IC12, IC13, IC14, IC18*	14	7	6	6	MOS/DIC4069BN
* UNUSED GATES					
IC3 c & d					
IC11 a & b					
IC17 a, b, e & f					
IC18 a, d, e & f					

SCALE - 0

THIRD ANGLE PROJECTION

 BBC
 DS/AV

ORIGINAL FRAME SIZE
 574mm x 821mm

CHANGE
 7-10-81

CLEAN FEED SWITCHING CONTROL UNIT CIRCUIT UN23/140

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

DRN	ILL	DESIGNS DEPARTMENT
TCD		
CKD		
APPD		

D51507A1

Parts list: D51508A4

© H L T LONDON

