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14.9.77

DESIGNS DEPARTMENT MANUFACTURING INFORMATION

NO. 6.310(77)

O.B. Line Equaliser EQ3/25 and EQ3/25A

.....J.O'Clarey.....

(J.W.H. O'Clarey)
for Head of Designs Department

Written by: M.T. Ellen

D.D.M.I. No. 6.310(77)
Title Sheet

BBC

DS/SPA4

Issue 2
13.1.77

DESIGNS DEPARTMENT MANUFACTURING INFORMATION

NO. 6.310(77)

O.B. Line Equaliser EQ3/25 and EQ3/25A

C O N T E N T S

1. Introduction

2. Specification

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DESIGNS DEPARTMENT MANUFACTURING INFORMATION NO.6.310(77)

O.B. Line Equaliser EQ3/25 and EQ3/25A

1. INTRODUCTION

This unit was designed to meet the requirement for a cheap, quick and easily adjustable equaliser for use at Local Radio Stations. It will cope adequately with the average temporary O.B. music circuits used in Local Radio. These are nearly always less than ten miles in length, without intermediate amplification, so they can generally be corrected by a resonant type equaliser to within 2dB, the permitted tolerance.

The original equaliser in the series (EQ3/25) only had one resonant circuit but the EQ3/25A and the EQ3/34 (BMM version) each have two resonant circuits, one of which may be selected by a switch on the front panel. The two circuits have the same resonant frequency of 10kHz but different L/C ratios.

2. SPECIFICATION

Performance Data

Input:	Output from temporary O.B. music circuit.
Maximum input level	+20dBm
Source impedance:	75Ω
Output:	Depends on equaliser settings.
Load impedance:	600Ω

Mechanical Data

Chassis:	CH1/65A
Weight:	0.4Kg.

Installation Data

Input pins:	PLA5 and PLA6
Output pins:	PLA11 and PLA12
Earth pin:	PLA15
Indexing positions:	5 and 30

Issue 1
14.9.77

DESIGNS DEPARTMENT MANUFACTURING INFORMATION NO.6.310(77)

O.B. Line Equaliser EQ3/24 and EQ3/24A

PRODUCTION TEST SCHEDULE

1. Description

This is an adjustable equaliser for correcting the frequency response of temporary O.B. music circuits used at Local Radio Stations. It consists of a tuned circuit with a resonant frequency of 10kHz in parallel with the signal path. The damping and basic loss of the circuit may be varied and there is a choice of two different L/C ratios on the EQ3/25A, but the EQ3/25 has one fixed L/C ratio. A 10dB attenuator may be switched into circuit, but as it is terminated by the tuned circuit in parallel with 600Ω its effective attenuation is only 10dB at 10kHz.

2. Information

a)	Design Section:	Transmission Section, D.D.
b)	Designer:	M.T. Ellen (Circuit supplied by Communications Department).
c)	Engineer responsible:	M.T. Ellen.
d)	Handbook:	Not available 1/8/77.
e)	Technical Instruction:	Not available 1/8/77.
f)	Other information:	A BMM version of the EQ3/25A is available, it is coded EQ3/34 and it is built in chassis type CH1/65A.
g)	Pre-production batch:	This Production Test Schedule has not been tested on a pre-production batch.

3. Manufacturing Performance Specification

a)	Input requirements:	Low distortion sine wave.
b)	Output:	Low distortion sine wave (for amplitude see section d)).
c)	Power supply:	None, passive circuit.

d) Performance:

The output levels in Table I should be obtained (±2dB) when the source, load and controls are as follows:

1) Source: TS10 oscillator with internal attenuator set to -20dB and its output level control set to +18dB. Its output must be shunted with 600Ω and 100Ω resistors in parallel to provide a source impedance of 75Ω.

2) Load: ATM/1 with 600Ω input impedance.

3) Controls: Basic loss and damping at minimum resistance.

TABLE I

Frequency Hz	Slope 1, att. 0dB	Slope 1, att. 10dB	Slope 2, att. 0dB	Slope 2, att. 10dB
250	-67.5dBm	-	-64	
1,000	-59	-	-53	-66.5
1,700	-54	-66 5	-48.5	-63.5
2,000	-52.5	-66	-47.5	-62
4,000	-46.5	-60 5	-42	-56
8,000	-39.5	-51	-38	-48.5
10,000	-37.5	-47.5	-37	-47.5
12,000	-36.5	-50	-37	-48.5
15,000	-38.5	-55	-37	-51

With the Damping control at minimum resistance and the attenuator set to 0dB the output levels given in Table II should be obtained ±2dB, with the same source and load conditions.

TABLE II

Basic loss setting	Slope 1		EQ3/25A only Slope 2	
	100Hz	8kHz	100Hz	8kHz
0		-39		-39
2	-46dBm	-40	-46	-38
4	-41.5	-40	-41.5	-38
6	-40	-39.5	-40	-38
8	-39	-39	-39	-38
10	-39	-39	-39	-38

With the Basic Loss control at minimum resistance and the attenuator set to 0dB the output levels given in Table III should be obtained ±2dB, with the same source and load conditions.

TABLE III

Damping setting	Slope 1		EQ3/25A only Slope 2	
	100Hz	8kHz	100Hz	8kHz
0		-39		-38
2	-55dBm	-40	-55	-38
4	-50	-41.5	-50	-38.5
6	-47	-42	-47	-39
8	-45.5	-42	-45.5	-39.5
10	-44.5	-42	-44.5	-39.5

4. Warning

No voltages above 50 volts d.c. or 30 volts a.c. are connected to this unit.

5. Test Apparatus Required

Variable audio frequency oscillator (e.g. TS/10).

Amplifier detector (e.g. ATM/1).

600Ω MR25 resistor.

100Ω MR25 resistor.

6. Inspection

a) Check that the unit has been satisfactorily manufactured in accordance with the drawings.

b) No mains voltages are connected to this unit. Check the wiring to the input transformer T1 and the components on the front panel.

c) Check that the following components are correctly inserted:

EQ3/25

Capacitors C1 to C2

Resistors R1 to R14

Inductor L1

Transformer T1

EQ3/25A

Capacitors C1 to C4

Resistors R1 to R14

Inductors L1 to L2

Transformer T1

7. Test Procedure

7.1 To Check the Frequency Response

a) Connect a TS/10 in parallel with 600Ω and 100Ω resistors to PLA5 and PLA6. Set the output attenuator to -20dB and the output level control to +18dB. Connect an ATM/1 (600 input impelance) to PLA11 and PLA12 and adjust its attenuators as required to measure the output level. Set the frequency and adjust the controls as given in Tables I, II and III and compare the readings obtained with those given in the Tables.

b) The readings should be within ±2dB of those given in the Tables.

c) If the frequency response is not within the specifications check all the component values.

BBC

DS/SPA4

DS/A4

BBC

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

THIRD ANGLE PROJECTION

Original Frame Size
190mm × 277mm

CHANGE	ISS
REVISED & REDRAWN SEE DD/CF/12280 25.8.76 GARN	3

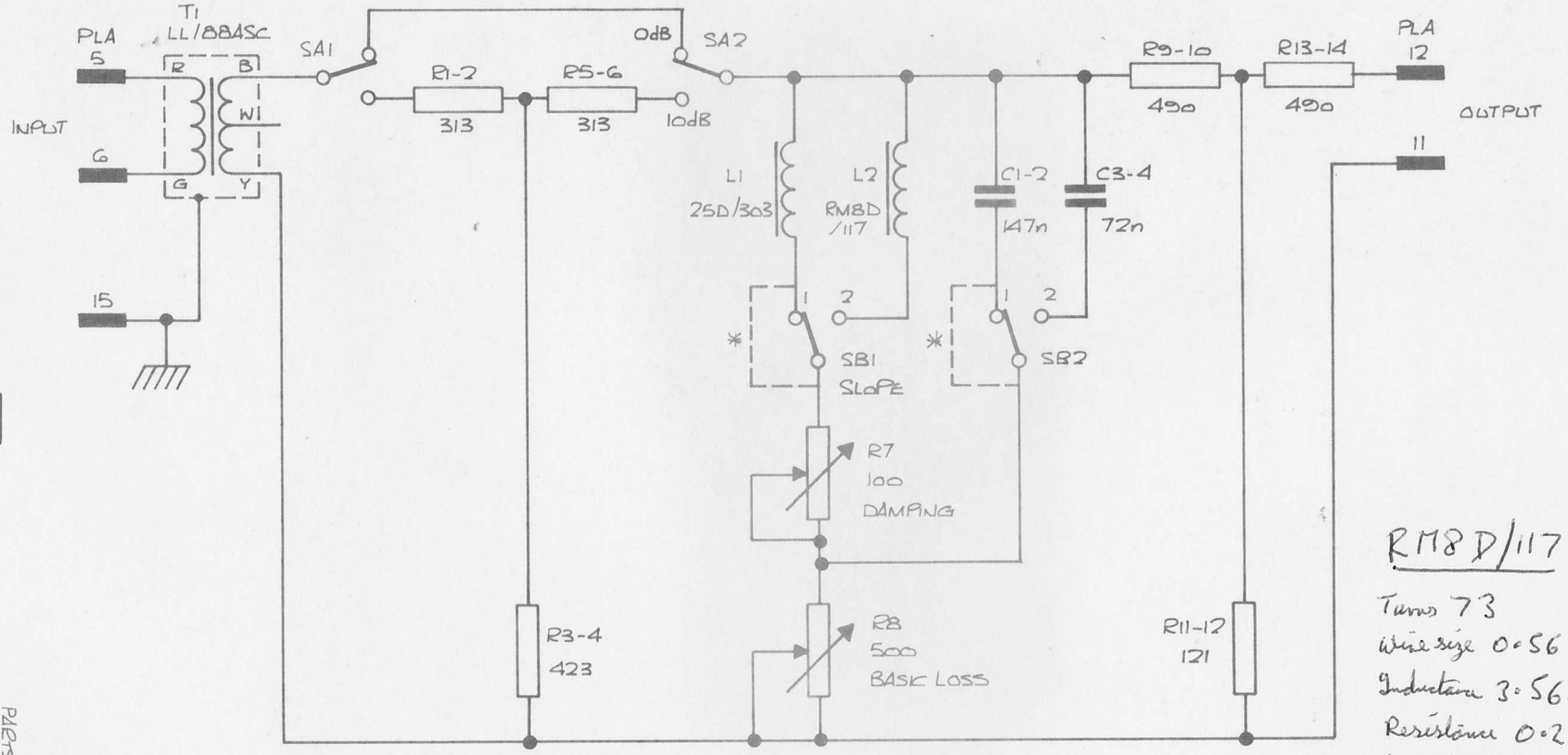
APPD
CKD
TCD
DRN

DESIGNS DEPARTMENT

EQ3/25 & 25A
O.B. LINE EQUALISER
CIRCUIT

D267994

PARTS LIST D268004



RM8D/117

Turns 73
Wire size 0.56 mm
Inductance 3.56 mH
Resistance 0.21 Ω
Core LA4344
Adjuster LA1430
Wire type – self fluxing BS3188

NOTES

1. DOTTED LINES MARKED THUS * SHOW CIRCUIT VARIATION FOR EQ3/25
2. SB, L2, C3 & C4 FITTED ON EQ3/25A ONLY.

S & H LTD L 3932

ISS.	1	1A	2	3	4
CHANGE	3-4-70	ITEM 15 WAS 25A/281. & CONTRACTORS NOTE ADDED. S.F.C. 6.6.74 CF79624)	ITEM 1 REVISED. LL/88ASC WAS LL88/ASC B.W.M. 14-6-74	SPEC. ADDED TO ITEM G L.F.M. 22.7.76	REVISED 25.8.76 SEE DD/CF/12280

ITEM No.	25 QTY.	25A		DESCRIPTION	C'C'T REF.	BBC REF. OR DRG. No.
				DRAWING NUMBERS.		
				Circuit D26799A4		
				Parts List D26800A4		
				Assy & Wiring D26801A2		
				Details D26802A2		
				P.B. Wiring D26803A2		
				P.B. Comp.Loc. D26804A4		
				P.B. Drilling D26805A4		
				P.B. WIRING BOARD Nº 2 D41449A4		
				P.B. COMP. LOC " " D41450A4		
				P.B. DRILLING " " D41451A4		
				FURTHER INFORMATION REQUIRED FOR MANUFACTURE		
				Unit assembly information EA10434		
				Unit wiring information EA10139		
				Unit wiring information EA10140		
				Inductor 25D/303, RM8D/117		
				Transformer LL/88ASC		
1	1	–		Chassis, CH1/18C, modified as follows :-		
				Chassis frame drilled to		D26802A2 Det.1
				Escutcheon, drilled and engraved to		" " 2
			*	SEE PARTS LIST DA 9115 FOR EMBODIMENT LOAN ITEMS		
2	–	1		CHASSIS CH1/18C MODIFIED AS FOLLOWS :-		
				CHASSIS FRAME DRILLED TO		D26802A2 DET 1A
				ESCUTCHEON DRILLED FINISHED & ENGRAVED TO		" " 2A
			*	SEE PARTS LIST DA9115 FOR EMBODIMENT LOAN ITEMS		
6	1	1	*	Printed board wiring TO SPEC ED/PB/EQ3/25.		D26803A2, D26804A4 D26805A4
7	–	1		PRINTED BOARD BOARD Nº 2		D41449A4, D41450A4 D41451A4
9						
				CAPACITORS		
10	1	1	*	0.047μF ± 2% 125V Polystyrene, Salford type PF	C1	
11	1	1	*	0.1μF " " " " " "	C2	
12	–	1	*	0.036μF " " " " " "	C3	
13	–	1	*	0.036μF " " " " " "	C4	
14						
15	1	1	*	Inductor 25D/303	L1	25D/303
16	–	1	*	"	L2	RM8D/117
17						
18						
19	2	2	*	Knob, Painton Type K20/330871		
20						
21						
22						
23						
24	1	1	*	Plug, Fixed, 15pole, Painton type 73/10/150/10	PLA	
25						
26						
27						

BBC DS PLA4

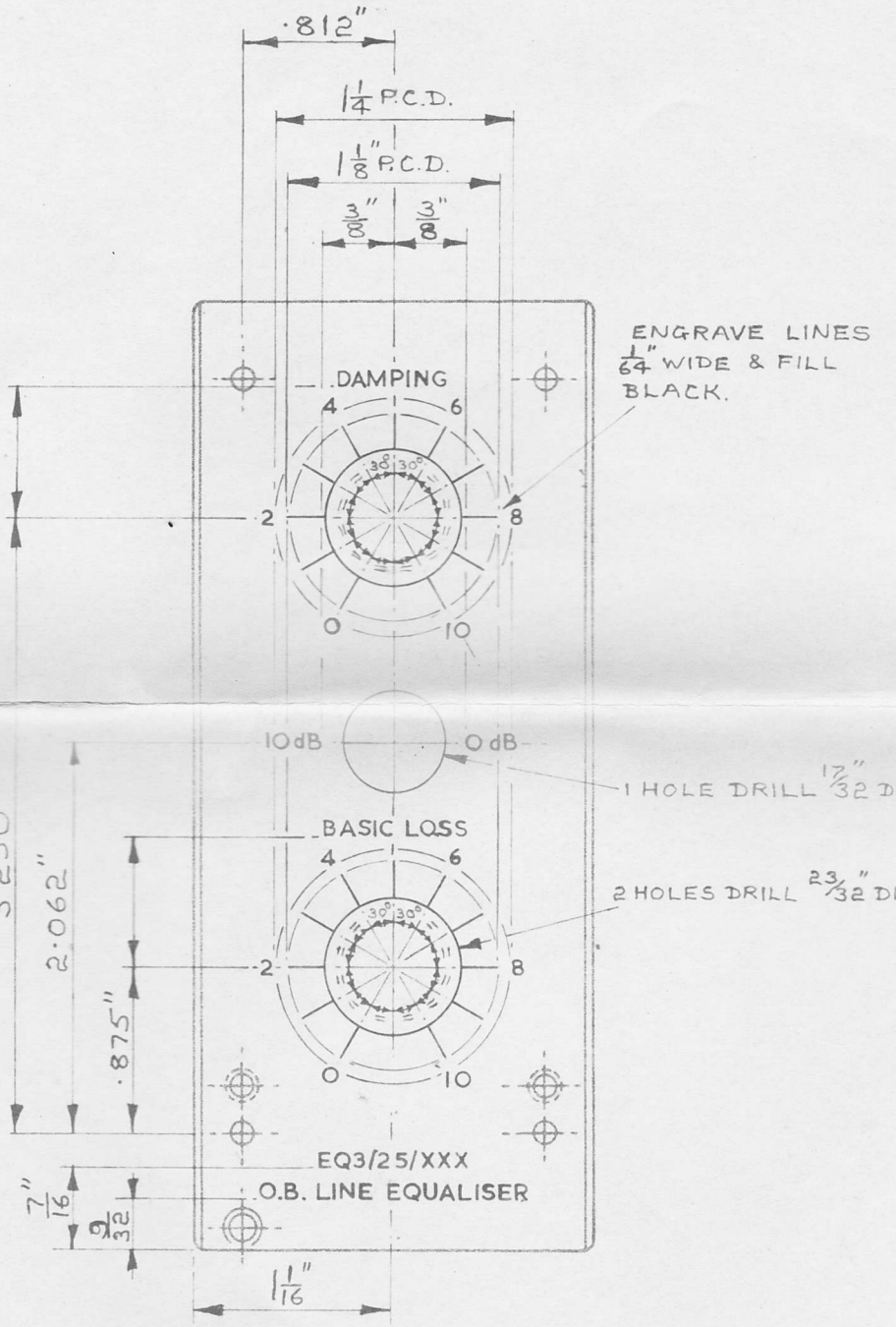
DRN.	
TPD.	AG
CKD.	PBW

DESIGNS DEPARTMENT

D26800A4

AFTER FINISHING
ENGRAVING TO BE IN No. 10 (·075") HIGH CHARACTERS FILLED BLACK
SERIAL No. TO BE ENGRAVED WHERE MARKED THUS: XXX. SEE INDIVIDUAL ORDER.

CHANGE
3-4-70
REVISED 25.8.76 SEE DD/CF/12280



DETAIL 2. ESCUTCHEON
MATERIAL. PART OF CHI/18C CHASSIS
FINISH. FRONT FACE AND EDGES ONLY TO E.D. 41.

…S CENTRALLY DISPOSED
…E & FILLED BLACK.
…BE ENGRAVED APPROX
…MENSIONS NOT TO
…XX, SEE INDIVIDUAL ORDER.

APPLICATION FOR EQUIPMENT CODE AND DESIGNATION

Please complete Section A when applying for a Code and send form to Drawing Office Manager, Room 408, Western House. Section C will be completed by the Drawing Office and the form returned to you. You should complete Section B when the design of the coded item is complete.

C.A. No. 7506

Code . EQ3/28

A ~~From~~ TO M.T. ELLEN Department . DESIGNS

To: H.D.D. (Attn. Drawing Office Manager) Date . 8/12/75

Will you please allocate a code and designation to the following apparatus in accordance with D.D. Specification No. 4.16(65) – Guide to Coding of Equipment:–

Suggested code . EQ3/ Suggested Designation . EQUALISER, LINE O.B.

(1) **Function and Description** (This information will form initial entry in R.D. and C.E.)

O.B. line equaliser for local lines not exceeding 16 Km in length. Simple resonant type with fixed frequency 10 KHz and adjustable loss and damping. Redesign of EQ3/25 on BTM chassis CH1/65A.

(2) **Other relevant information, including mechanical details affecting coding (e.g. L- or M-codes)**

B **Please complete this section when job is completed and send form to Liaison Engineer, Designs Department**

(1) Function and Description

(2) Other relevant details

(3) Principal coded items within apparatus, if any. (Give codes only) .....

.....

(4) Proposed first use as sub-unit in (code) .....
(designation) .....

(5) Chassis type (or size/construction) .....

Indexing positions ..... Weight (if relevant) .....

Power requirements: mains supply/internal battery/powered by parent equipment/ separate supply requires as follows:-

(6) D.D.M.I. No ..... Handbook No .....

C **This section to be completed by Drawing Office, Designs Department, and form returned to applicant**

Allocated Code . EQ3/28 Designation . EQUALISER, LINE, O.B.

E/681. Signature ..... Date . - 8 DEC 1975