

TIE LINE EQUALISER EQ5/525

Introduction

The EQ5/525 is a fixed equaliser used to correct the frequency response of coaxial-cable tie lines having a loss between 2 dB and 3 dB at 4.43 MHz. It is of the constant-resistance bridged-T type and includes a pad to make the total l.f. insertion loss (tie line plus equaliser) equal to 6 dB.

The equaliser is housed in a light metal box which mounts on the PN3A/18 connection block of an associated gain-correcting amplifier so that its input and output Musa connectors face to the rear of the bay.

It extends the facilities of the EQ5/520 and has a similar form of construction. The circuit is given in Fig. 1.

General Specification

<i>Type</i>	4 section bridged-T
<i>Range of Equalisation</i> (at 4.43 MHz)	400 ft to 600 ft of [*] PSF1/2 cable i.e. 2 to 3 dB
<i>Insertion Loss</i> (tie line plus equaliser at l.f.)	6 dB
<i>Input Impedance</i>	75 ohms
<i>Output Termination Required</i>	75 ohms
<i>Dimension</i>	2 $\frac{5}{8}$ in x 3 $\frac{1}{8}$ in x $\frac{1}{8}$ in

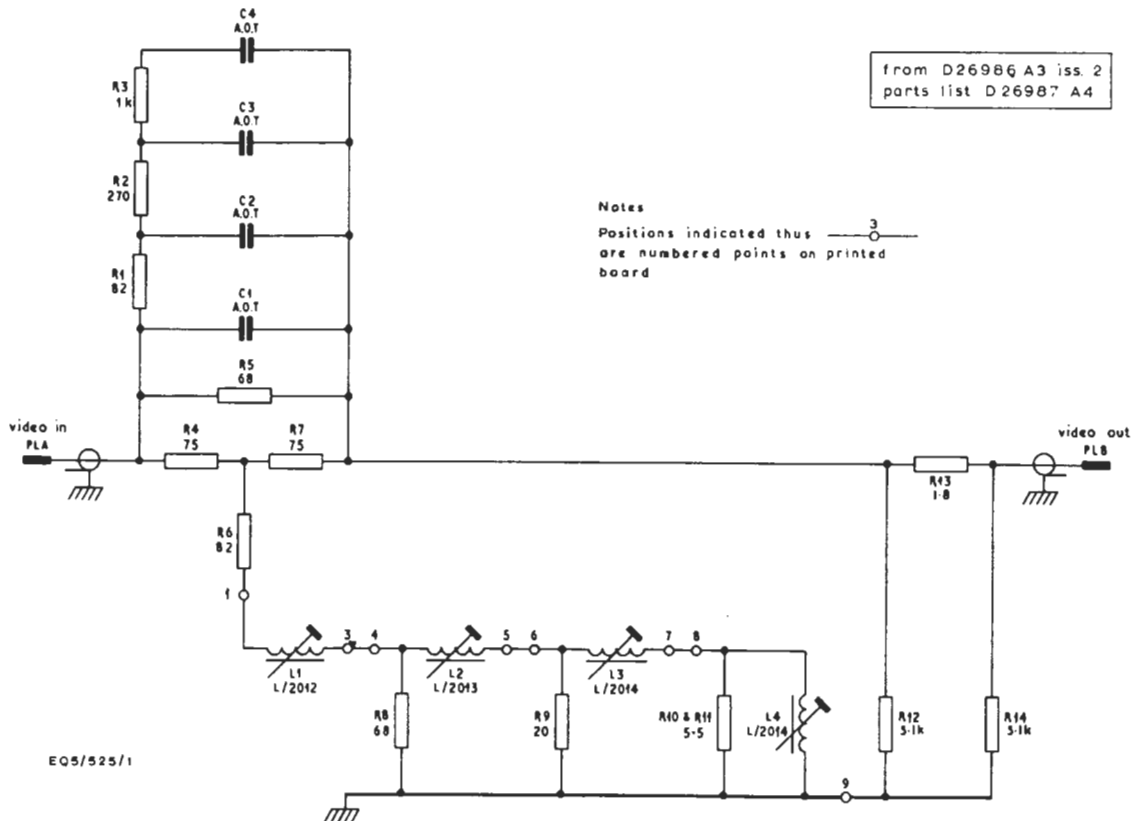


Fig. 1. Tie-line Equaliser EQ5/525

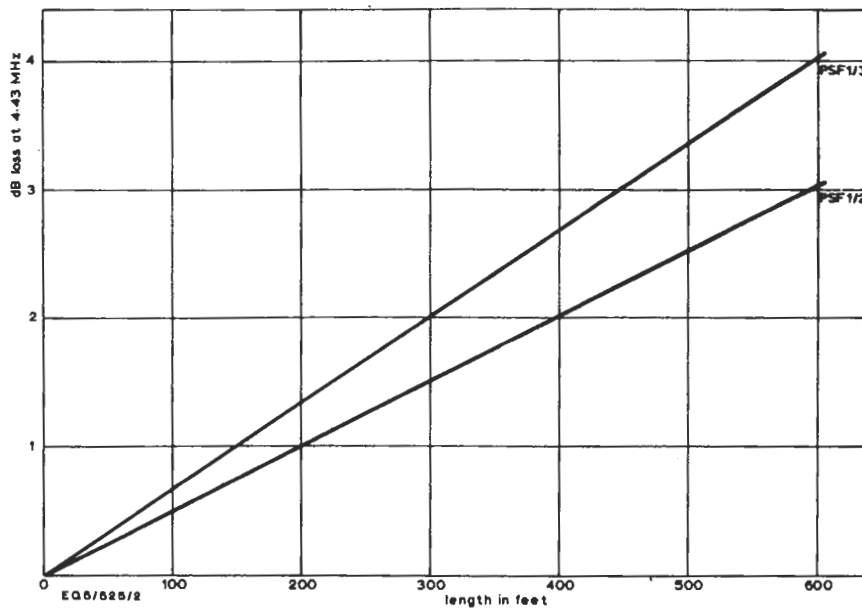


Fig. 2. Co-axial Cable Losses at 4.43 MHz

Equalising a Line

Equipment Required

Chrominance/luminance Pulse-and-bar Generator
GE2M/599 (preferred)

or

Augmented Pulse-and-bar Generator GE2M/543
Return Loss Measurement Set UN1/524 (desirable
but not essential)

Tektronix Oscilloscope 545 (or equivalent)

Oscilloscope Equaliser EQ1/510 or EQ1/520
(not always needed)

Equalisation Procedure

- Fig. 2 gives loss figures for co-axial cables at 4.43 MHz and, if the length of the line is known, can be used to determine the loss.
- Before measuring the loss of the line, check the output of the generator on the oscilloscope to ensure that the chrominance/luminance ratio of the combination is unity and that no undue distortions are present. Use an Oscilloscope Equaliser EQ1/510 to correct any chrominance/luminance gain deficiencies in the oscilloscope.
- If the loss of the line has not been determined by reference to Fig. 2; feed the generator output to line and measure the chrominance/luminance ratio at the terminating end. Refer to Table 1 to convert the figures obtained to dB's loss.
- Use the graph on Fig. 3 to determine the values of capacitors C1 to C4. Use only tubular polystyrene capacitors with a tolerance of $\pm 2\%$, such as Salford type PF.

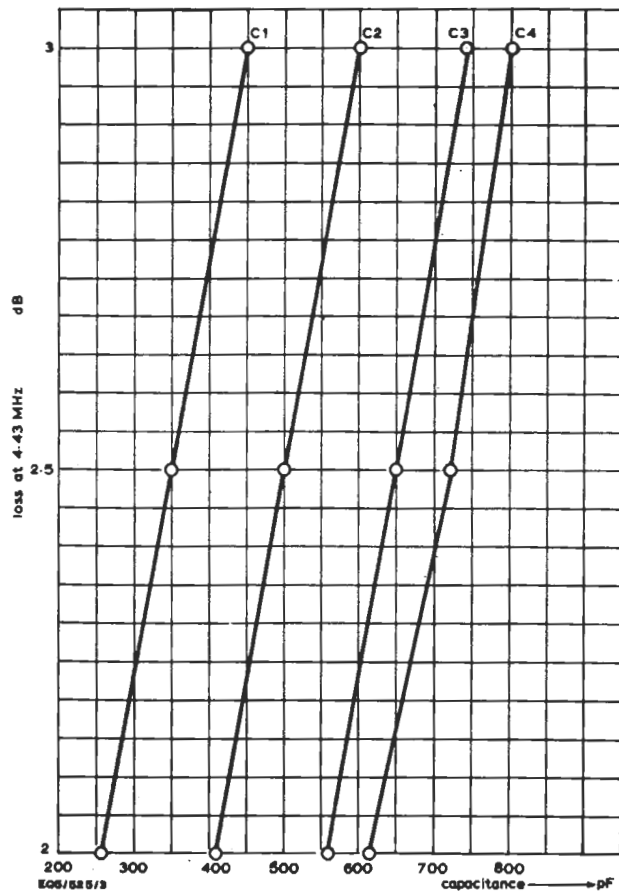


Fig. 3. Values of Capacitors C1 and C4

- Connect the equaliser to the gain amplifier which it normally feeds. Arrange the test equipment for return-loss measurement as shown in Fig. 4. Adjust the inductors for a return loss of better than 40 dB over the video band; L1, L2 and L3 are adjusted for high frequencies and L4 for middle frequencies. The adjustments are carried out through holes in the top of the equaliser box; the trimming tool must fit a 3.4 mm core slot.

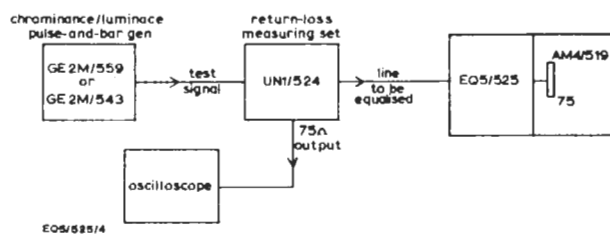


Fig. 4. Return Loss Measurement and Adjustment of Inductors

Note that the inductor cores are very brittle. Adjust with care. If a return-loss measurement set is not available, the inductors can be adjusted by monitoring the output of the amplifier and adjusting for best equalisation. This method requires experience and skill to obtain good results and the return-loss method should be used whenever possible.

- Connect the generator to the sending end of the line and check the overall response at the output of the amplifier which follows the equaliser. The subcarrier amplitude (modulated bar) should be correct to within $\pm 1\%$ and the

1T and 2T pulse-to-bar ratios should be within $\pm 5\%$ of unity. Any small errors in response can be corrected by slight adjustment of inductors L1 to L4, but if major discrepancies exist it is advisable to check for faults and re-measure the un-equalised loss of the line.

Table 1

% Chrom./Lum.	dB Loss	% Chrom./Lum.	dB Loss
100	0	83.18	1.6
98.86	0.1	82.22	1.7
97.72	0.2	81.28	1.8
96.61	0.3	80.35	1.9
95.50	0.4	79.43	2.0
94.41	0.5	78.52	2.1
93.33	0.6	77.62	2.2
92.26	0.7	76.74	2.3
91.20	0.8	75.86	2.4
90.16	0.9	74.99	2.5
89.13	1.0	74.13	2.6
88.10	1.1	73.28	2.7
87.10	1.2	72.44	2.8
86.10	1.3	71.61	2.9
85.11	1.4	70.79	3.0
84.14	1.5		

References

- Designs Department Specification No. 8.392(70)
- Designs Department Technical Memorandum No. 8.288(70)

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