

CABLE EQUALISERS EQ5/520A AND EQ5/520B

General

The EQ5/520A and EQ5/520B are fixed equalisers used to correct the frequency response of coaxial lines having a loss of up to 2 dB at 4.43 MHz.

The equalisers are of the constant resistance bridged-T type and include pads to make the total insertion loss equal to 6 dB. The value of the capacitors C1, C2 and C3 are set on site to match site conditions. The equalisers are built into metal boxes 2 3/8 in x 2 3/8 in x 1 1/2 in.

The EQ5/520A will equalise lines having a loss of up to 1 dB at 4.43 MHz (equivalent to 200 ft of PSF1/2 cable or 150 ft of PSF1/3 cable). Equalisation is in two ranges selected by adjustment of taps on the inductor board. The EQ5/520B will equalise lines having a loss of between 0.75 dB and 2 dB at 4.43 MHz (equivalent to between 150 ft and 400 ft of PSF1/2 or between 110 ft and 300 ft of PSF1/3).

The input connections are made via P.O. No. 1 Musa plugs and the output connections either by means of flying leads through the bottom of the box or by means of a P.O. No. 1 Musa plug.

The input impedance is 75 ohms and the output termination required is 75 ohms. A circuit diagram is given in Fig. 1.

Equalising a Line

Equipment Required

Chrominance/Luminance Pulse-and-bar Generator GE2M/559 (preferred)

or

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

Tektronix Oscilloscope 543 (or equivalent)

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

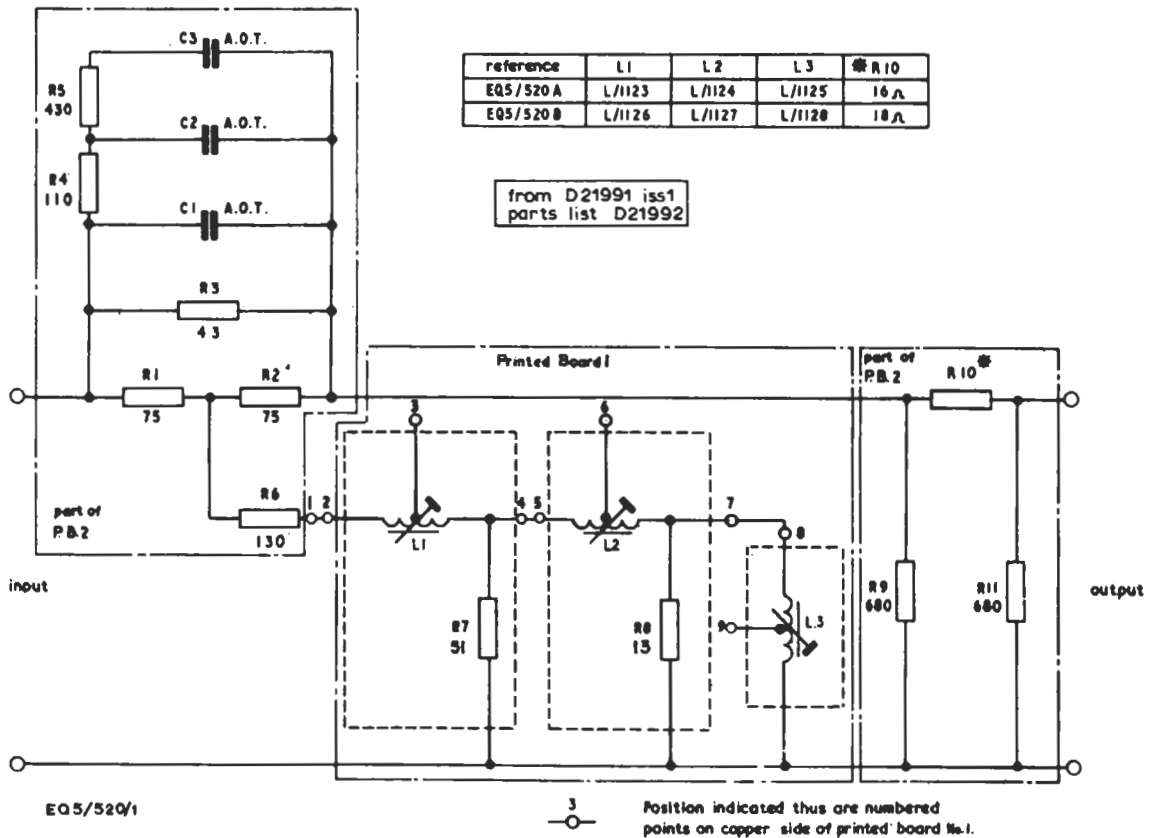


Fig. 1. Circuit of Equalisers EQ5/520A,B

Equalisation Procedure

1. Fig. 2 gives loss figures for co-axial cable at 4.43 MHz and, if the appropriate length of the line to be equalised is known, can be used to determine the version of equaliser required.
2. 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.

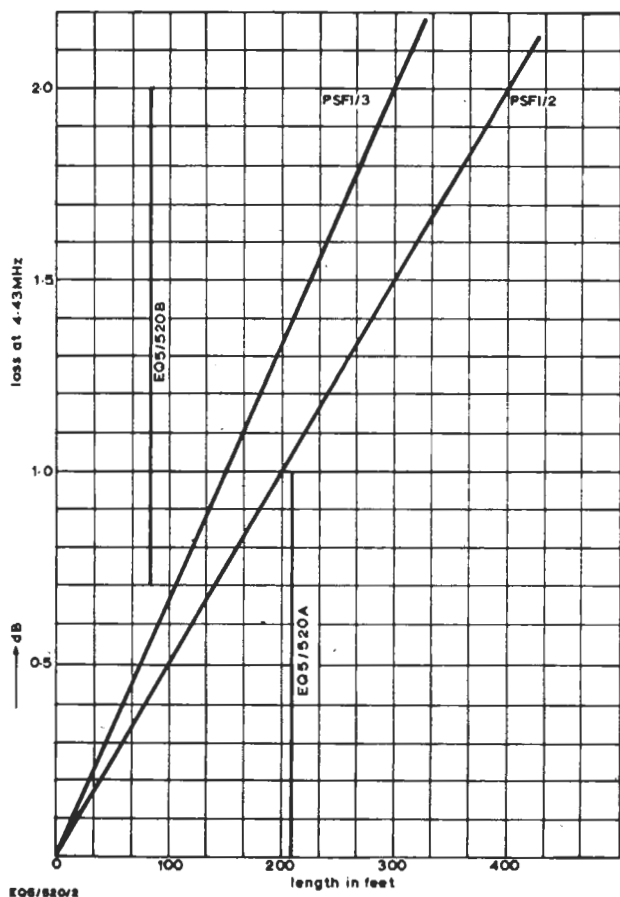


Fig. 2. Co-axial Cable Losses at 4.43 MHz

3. If the line loss 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. For a loss of between 1 and 2 dB use an EQ5/520B, for a loss of between 0.5 dB and 1 dB use an EQ5/520A. If the loss is less than 0.5 dB, use an EQ5/520A with the straps on the inductor board altered so that point 1 is connected to 3, 4 to 6 and 7 to 9.

Use the graph on Fig. 3 to determine the value of capacitors C1, C2 and C3. Fit only tubular polystyrene capacitors, such as Salford type P.F.

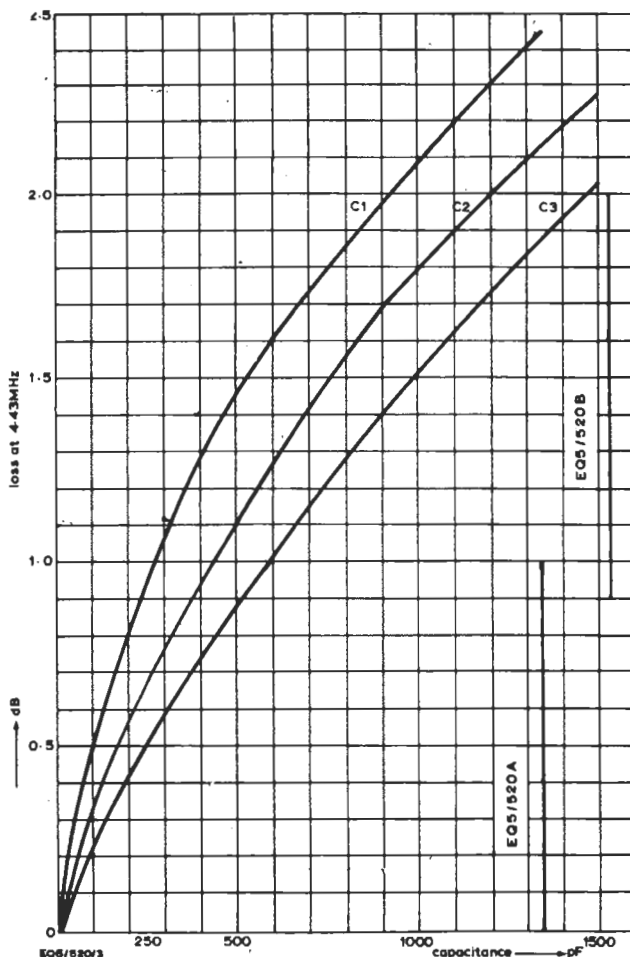


Fig. 3. Values of C1, C2 and C3

4. Connect the equaliser to the gain amplifier which it normally feeds. With the equipment connected as shown in Fig. 4 adjust inductors L1, L2 and L3 for a return loss of better than 40 dB. The adjustments are carried out through holes in the mounting surfaces of the equaliser. If a return-loss measurement set is not available, the inductors can be adjusted by observing the

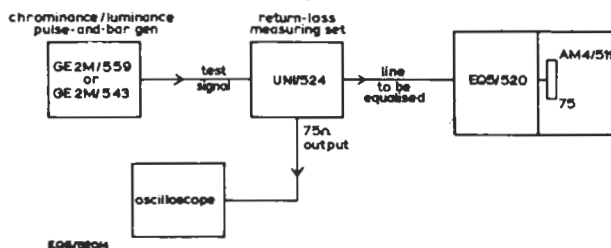


Fig. 4. Return Loss Measurement and Adjustment of Inductors

amplifier output and adjusting for best equalisation.

This method requires a certain amount of skill to obtain good results and so the return-loss method should be used if possible.

5. Connect the pulse-and-bar generator to the sending end of the line and check the output of the amplifier which follows the equaliser. The subcarrier amplitude should be correct to within 1% and the 1T and 2T pulse-to-bar ratios should be within 0.5% of unity. Small errors can be corrected by slight adjustment of L1, L2 and L3, but if any major discrepancies exist it is advisable to check for faults and re-measure the unequalised loss of the line.

References

1. Designs Department Specification No. 8.290(68)
2. Designs Department Technical Memorandum No. 8.255(68)

Table 1

% Chrom./Lum.	dB loss	% Chrom./Lum.	dB loss
100	0	88.10	1.1
98.86	0.1	87.10	1.2
97.72	0.2	86.10	1.3
96.61	0.3	85.11	1.4
95.50	0.4	84.14	1.5
94.41	0.5	83.18	1.6
93.33	0.6	82.22	1.7
92.26	0.7	81.28	1.8
91.20	0.8	80.35	1.9
90.16	0.9	79.43	2.0
89.13	1.0		

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