

LETTERS TO THE EDITOR

The Editor does not necessarily endorse the opinions expressed by his correspondents

Is Distortion Unpleasant?

AS A. J. Hickman points out (December, 1956, issue), one can get used to anything: vibrato, dominant seventh chords, even deliberately mistuned "jazz" pianos, are sought after and give pleasure if not overworked.

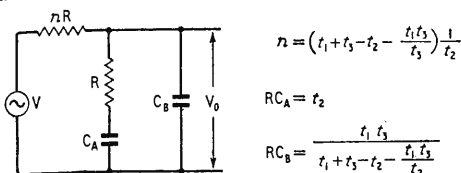
The point is that all these effects are under the control of the musician, but the products of non-linearity are not.

Hindhead.

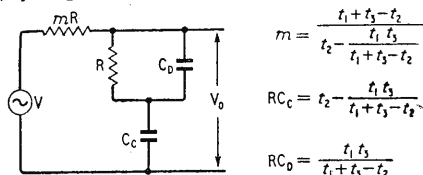
HENRY MORGAN.

Disc Replay Equalizers

THE article by J. D. Smith on "Disc Recording Characteristics" in the November 1956 issue gives incorrect formulæ for the components of the combined network in Fig. 3. It can be shown that the correct formulæ should be as follows:—

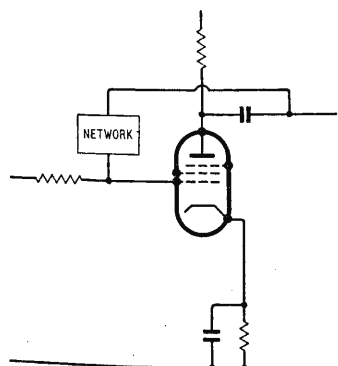


Another network which will give an identical frequency response curve is:—

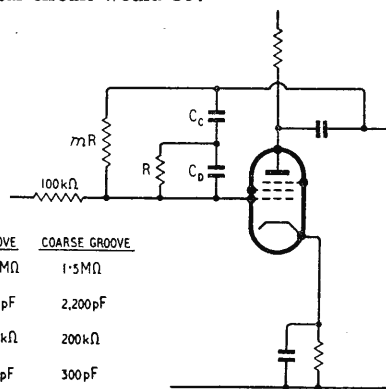


The error in Mr. Smith's formulæ may explain why his feedback circuit shown in Fig. 4 does not appear to conform to the combined network diagram.

It can be easily demonstrated that the frequency response V_0/V of the combined networks above is exactly the same as the variation with frequency of the impedance seen looking back into the output terminals of the network, so that these networks can be used directly in the feedback loop of an amplifier to get the desired replay characteristic. A third network is also available giving the same impedance variation.



A practical circuit would be:—



FINE GROOVE	COARSE GROOVE
$mR = 3.5M\Omega$	$1.5M\Omega$
$C_C = 860pF$	$2,200pF$
$R = 270k\Omega$	$200k\Omega$
$C_D = 300pF$	$300pF$

If the gain of the valve is not enough to prevent the bass response from flattening off due to the feedback becoming inoperative, then the value of mR may be increased or even omitted.

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W. H. LIVY.

The Author Replies :

YOUR correspondent is quite right in taking me to task for misquoting the formulæ in Fig. 3. It will be noted that the expressions I gave are in fact approximations to the correct ones, since that for n may be rewritten as

$$n = \left(\frac{t_3 - t_2}{t_2} \right) \left(1 - \frac{t_1}{t_2} \right) \text{ which reduces to } \frac{t_3 - t_2}{t_2}, \text{ as given,}$$

when $t_1 \ll t_2$. In either case $RC_B = \frac{t_1 t_3}{nt_2}$. Since Fig. 3.

is intended to illustrate formal networks, I must apologise for quoting the approximate formulæ.

The approximation is valid when pre-emphasis is applied sparingly, as has been the practice in the past but which is scarcely true with the B.S.S. characteristics: the approximation is fair for the coarse groove case but somewhat gross for fine groove. The major inaccuracy is in the limitation of bass boost and does not exceed 2 dB, which for many purposes is sufficiently accurate.

The circuit of Fig. 4 of my article is not derived

$n = \left(t_1 + t_3 - t_2 - \frac{t_1 t_3}{t_2} \right) \frac{1}{t_2}$	$m = \frac{t_1 + t_3 - t_2}{t_2 - \frac{t_1 t_3}{t_1 + t_3 - t_2}}$	$l = \frac{t_3 - t_2}{t_2 - t_1}$
$RC_A = t_2$	$RC_C = t_2 - \frac{t_1 t_3}{t_1 + t_3 - t_2}$	$RC_E = t_1$
$RC_B = \frac{t_1 t_3}{t_1 + t_3 - t_2 - \frac{t_1 t_3}{t_2}}$	$RC_D = \frac{t_1 t_3}{t_1 + t_3 - t_2}$	$RC_F = \frac{t_3 (t_2 - t_1)}{t_3 - t_2}$