

Low distortion oscillator

I have recently built (from an Altronics kit) the Ultra Low Distortion Oscillator as described in EA, December 1986 — January 1987. Although it was a simple matter to adjust all frequencies for equal output level, I found the job of adjusting each frequency range so that the frequency scale calibrations are correct to be impossible.

On feeding the output of the oscillator into the EA 7-digit 500MHz Frequency Meter and adjusting the trim-pots VR1 to VR4 so that the frequencies for each range were correct at the "100" position on the scale, I found that all other frequencies were crowded from both ends of the scale towards a position centred between the 20 and 25 positions. After adding 470Ω resistors in series with the 150k resistors across both sections of VR5, I was able to get correct scale alignment at the centre of the pot's travel — that is at the 18 position. At the 10 position, with the range switch set to the x1 position, the frequency meter read 11.4Hz and remained at this frequency until the pot was moved above the 11 position from where the frequency began to increase to the 12 position where it was correct. From here up to the 18 position there was a gradual crowding of frequencies.

At the high end of the scale the crowding was more severe, so that at the 50 position the frequency meter read 97.8Hz. From there down to the 100 position the frequency only alters by 2.2Hz. From the 50 position to the

18 position the crowding gradually diminishes.

These discrepancies are the same on all ranges (x1, x10, x100, x1000).

I tried changing the dual ganged 50k linear pot to no avail. I also transposed IC1 and IC2 for IC3 and IC4, thinking that one of the integrator IC's may have been faulty. This also proved fruitless. Could you suggest a possible cure for this problem, other than the construction of another scale. (N.V. Kirra-wee, NSW.)

● *Your problems with the Low Distortion Oscillator appear to be unique to your kit, for we have had no other correspondence of this nature. One would expect small tracking errors between various potentiometer manufacturers, but nothing like the extent of your problems.*

An integrator (or capacitor) behaving in a non-linear manner is extremely unlikely, therefore the frequency scaling is dependent on

the variable resistance. It sounds like the ganged pot(s) you have used are not what they seem. We would suggest disconnecting the pot and checking the linearity of both halves with a multimeter. If the operation seems suspicious try acquiring one from a different source.

If the pot checks out OK, have a careful inspection of the whole integrator phase shifting network. But we're most suspicious of that pot!