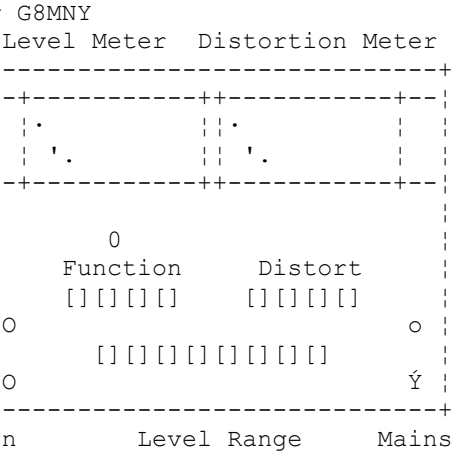
Title : Marconi Distortion Meter TF2337

By G8MNY (Dec 08)



I have been working on one of these old AF automatic distortion meters. It is quite different to the usual fiddly variable Wien Bridge deep notch type. So it is ideally suited for setting up tape machines, where the playback level & frequency will never be that steady.

Level Ranges:- 30V, 10V, 3V, 1V, 300mV, 100mV, 30mV, 10mV.
:- 30, 20, 10, 0, -10, -20, -30, -40 dBV

Response :- 10Hz - 250kHz @ -3dB

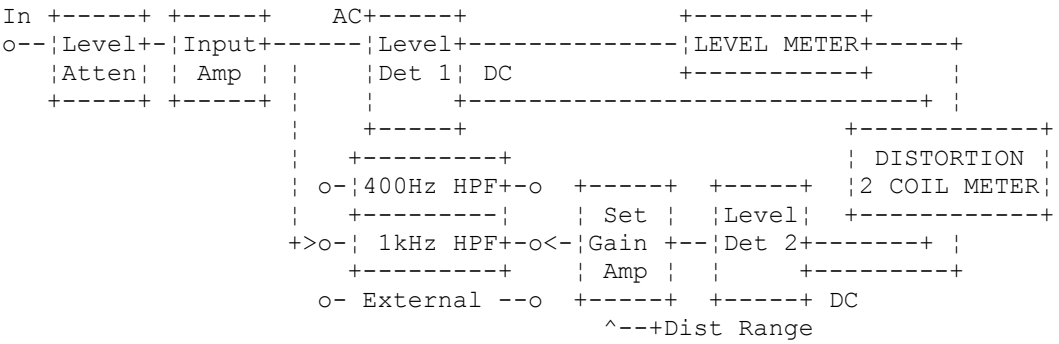
Distortion Filters 400Hz, 1kHz & External.

Distortion Ranges: 30%, 10%, 3%, 1% min to 0.2%
& dBs -10 -20 -40 -40 min to -55dB

Harmonic Response: 1.5x Filter to 130kHz @ -3dB

Mains 230V. odd 3 pin 1cm square socket.

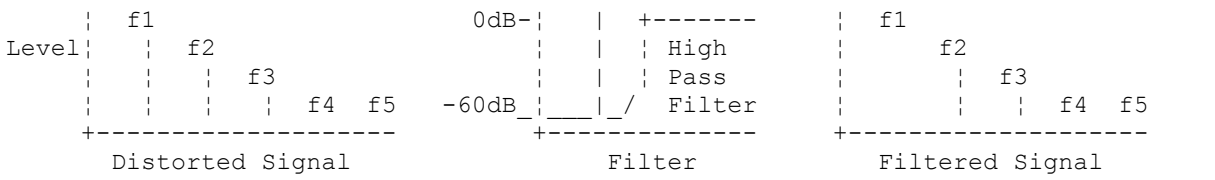
The automatic refers to the distortion measurement does not need the zero level reference level to be set first. (But is must be reading 30-100% on the level meter scale.) This is done not by a very low distortion AGC system as you might think, but a cleaver meter movement with 2 coils & no return springs. One coil is fed with rectified DC from the input level detector 1 & acts as the return spring & the other is fed from an 2nd detector from a high pass filter that removes all of the fundamental, so it just the harmonics. The resultant meter deflection is the distortion fraction.



It just uses simple RC transistor Amps & bridge diodes for the electronics. The notches are sealed LC high Q units. (M derived?)

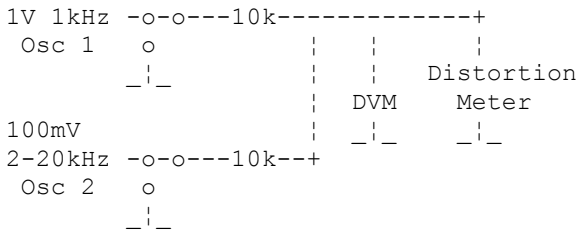
There are only 3 presets:- Level gain, Distortion gain, & input amp Bias.

DISTORTION MEASURING PRINCIPLES

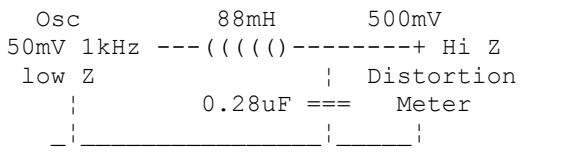


The high pass filter must completely remove the fundamental & ale LF hums etc. but leave all the harmonics intact. The detectors (especially the distortion one) should be a true RMS type, as the waveform will generally be very complex & nothing like a sine wave. The ratio of f1 to all the harmonics f2+++ is the distortion factor.

Calibration is done by adding in a 2nd tone (e.g. 3-10x freq) via high value Rs at say 10% of the level to indicate 10% distortion. The distortion meter bandwidth can also be checked with this circuit.



To check the HPF filter is working OK a very pure sine wave is needed, so an LC tuned circuit after a signal generator is used. But I did find that > 0.5V @ resonance on the meter did make the inductor distortion rise > 0.01% !



MODERN ANSWER
Of course with a good quality PC sound card & a Furrier analysis program that can add up the harmonics distortion measurement should be easy.

See my bul "Simple 1kHz AF osc".

Why don't U send an interesting bul?

73 de John, G8MNY @ GB7CIP