

## AN ULTRA-LOW DISTORTION DIRECT-CURRENT AMPLIFIER

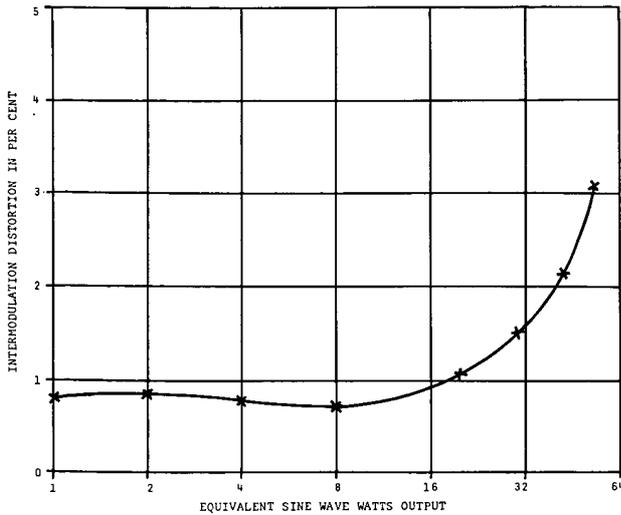


Fig. 7. Intermodulation distortion of the complete power amplifier without feedback, 60 and 7,000 Hz 4:1, 8 ohm load.

figures would be expected to be about three times greater than harmonic distortion measurements. Since the measured IM distortion values are nearly the same as the indicated harmonic distortion, it is likely that figures

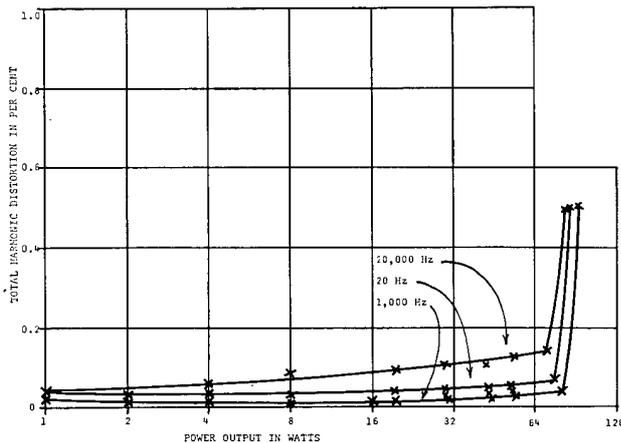


Fig. 8. Total harmonic distortion of the complete power amplifier with feedback, 4 ohm load.

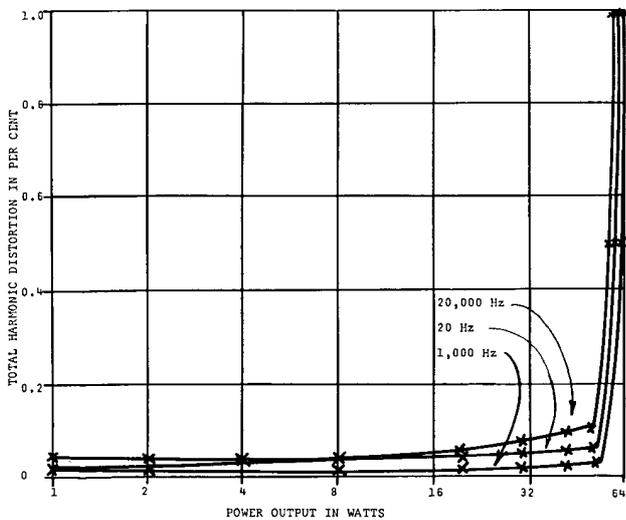


Fig. 9. Total harmonic distortion of the complete power amplifier with feedback, 8 ohm load.

listed for harmonic distortion really represent the test equipment rather than the amplifier.

Figures 8, 9 and 10 show measured harmonic distortion vs power output at three different load impedances and three different frequencies, with the negative feedback loop connected. These data are accurate to about  $\pm 0.02\%$  and the distortion measurements are of the order of 0.05%; thus, the measurement accuracy is  $\pm 40\%$ .

Figure 11 summarizes intermodulation distortion measurements as a function of power output into three load

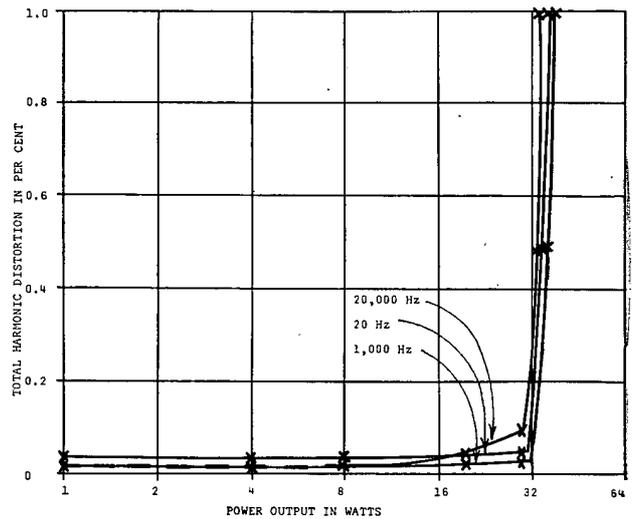


Fig. 10. Total harmonic distortion of the complete power amplifier with feedback, 16 ohm load.

impedances. Into a 16 ohm load, IM distortion measures less than 0.05% at about 30 watt. At lower power levels the distortion gradually falls to the residual level of the measuring instruments, or about 0.01%. Into an 8 ohm rated load impedance, IM distortion is less than 0.1% at 50 w, and is probably nearer to 0.05%. Into a 4 ohm load, the IM distortion is less than 0.1% at 84 w.

Figure 12 shows the frequency response of the complete amplifier with negative feedback, at three different output power levels. Note that open-circuit response exactly matches response at 1 w output, showing that the open-circuit stability of the circuit is excellent.

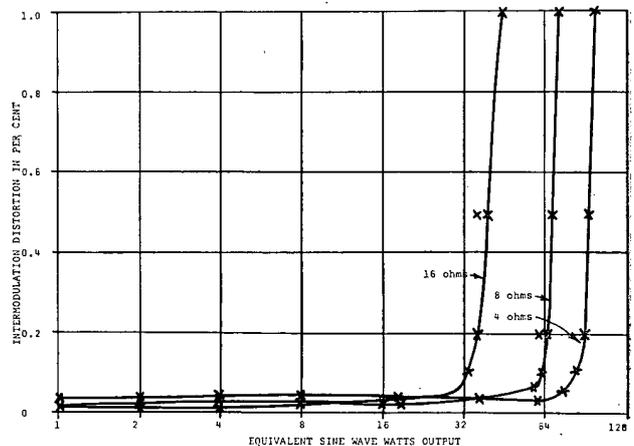


Fig. 11. Intermodulation distortion of the complete power amplifier with feedback, 60 and 7,000 Hz 4:1.