harmonic distortion as a function of power output into an 8-ohm load for frequencies of 20, 1,000, and 20,000 Hz. At very low levels, the distortion becomes constant at about 0.25% and then increases to about 2.5% at

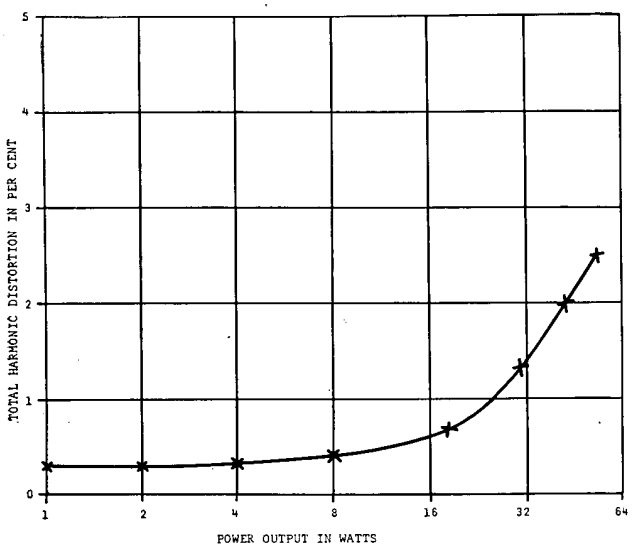

Fig. 3. Total harmonic distortion of the T-circuit without feedback. Measurements at 20, 1,000 and 20,000 Hz are essentially equal.

50 w. This by itself may not seem particularly impressive, but with a wide power bandwidth a great deal can be done with negative feedback.

Figure 4 shows intermodulation distortion as a function of power output up to 50 w equivalent sinewave power, measured with 60 and 7,000 Hz mixed 4:1. The source impedance was zero ohm and the load was 8 ohm.

Figure 5 indicates frequency response at one w and

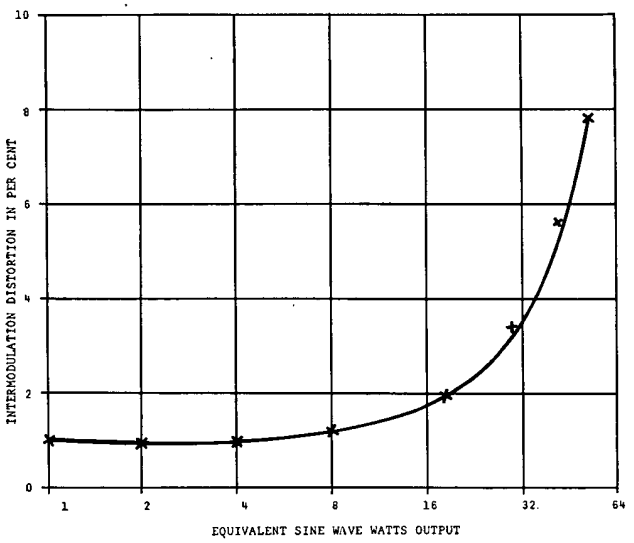

Fig. 4. Intermodulation distortion of the T-circuit without feedback, 60 and 7,000 Hz 4:1, 8 ohm load, 0 ohm source.

at 40 w into 8 ohm. Note that while the response at higher power levels is somewhat degraded, it is not more than 3 dB down at 120 kHz. (Again, Figs. 3, 4 and 5 refer to the T-circuit only, without feedback.)

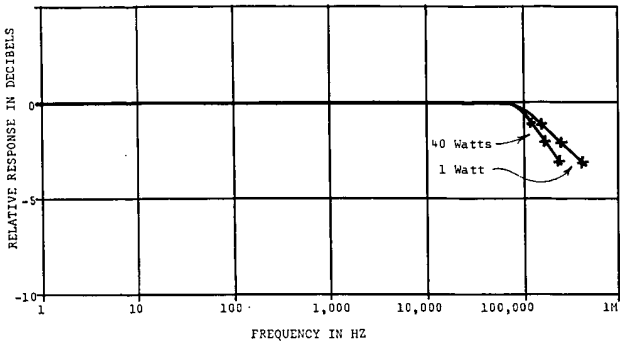

Fig. 5. Frequency response of the T-circuit without feedback, 8 ohm load, 0 ohm source.

Figure 6 shows the performance of the complete amplifier when the differential DC driver amplifier is added to the T-circuit, still without feedback. Notice that distortion at 50 w for both 20 Hz and 1,000 Hz is less than 1%, rising only to about 1.5% at 20 kHz. The

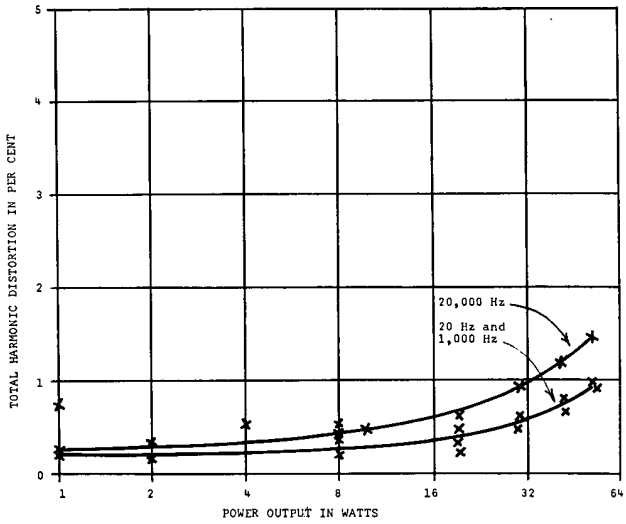

Fig. 6. Total harmonic distortion of the complete power amplifier without feedback, 8 ohm load.

distortion is lower than that of the basic T-circuit alone, presumably mainly because the T-circuit is now being driven with a partial current generator; it is possible that distortions of individual stages are slightly complementary as well. In any case, the distortion of the complete amplifier is nearly a factor of two *less* than that of the output circuit alone.

Figure 7 shows intermodulation distortion *vs* power output for the complete amplifier, still without feedback. At 50 w, IM distortion is only about 3%.

A consideration of how these measurements are affected by the inclusion of negative feedback involves one difficulty: the measured data approaches the limitations of the test instruments used, and results are therefore ambiguous at best.

To get the highest accuracy possible, an English-made Radford low-distortion oscillator was used which has less than 0.01% harmonic distortion at 20 kHz. The distortion analyzer used was a Hewlett Packard 333A which has a residual of the order of 0.01%.

Even with this equipment, distortion figures are only accurate to about ± 0.02%. For example, IM distortion