Simple noise generator

Phase-lock loop techniques, for the recovery of low level information from noisy signals, have become increasingly important. This note describes a simple noise generator in which both signal and noise levels are continuously and independently variable from zero to maximum. The only point requiring care is the positioning of the transformer to avoid 50Hz hum. The voltage doubler supply may be replaced by any convenient configuration. The input impedance is approximately 500Ω. Four stages of gain have been used to minimize instabilities and provide the maximum noise amplitude without reaching the limits of output excursion. The a.c. coupling between stages eliminates offset compensation and provides low frequency roll-off. High frequency roll-off is determined by the gain of each stage and varies slightly with the noise level control. Output noise is essentially "white" from below 50Hz to above 5kHz. This range was selected as appropriate to demonstrate the recovery of a 500Hz signal from noise of similar frequencies. The circuit will operate at maximum noise output into a load of 1.5kΩ. For smaller load impedances, the noise level must be reduced or the 1000μF power supply capacitors increased to prevent oscillation.

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J. E. Morris,
University of Wellington,
New Zealand.