

NASA TECH BRIEF

Lewis Research Center

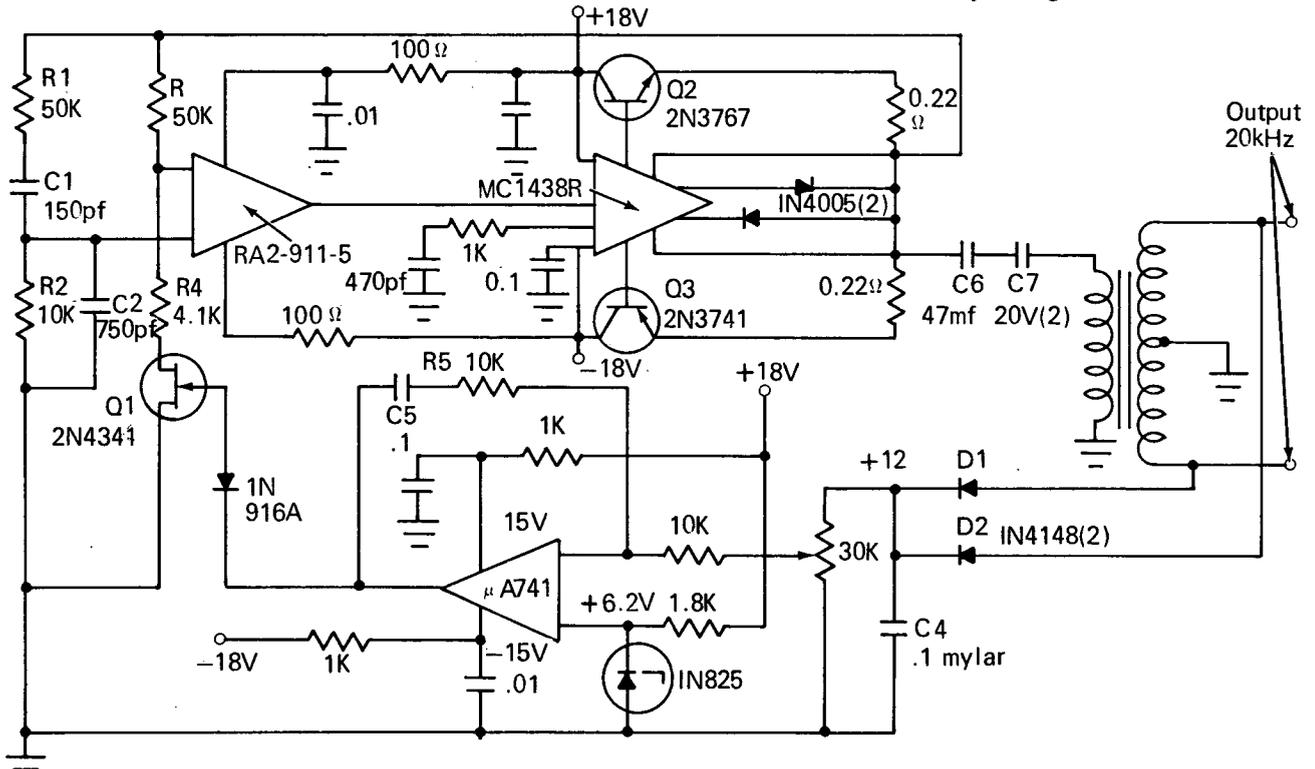


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20 kHz Power Oscillator

A circuit designed to provide stable sine-wave power up to 10 W can be used to supply relatively small amounts of power at a frequency other than 60 Hz. Rotary converters and electronic oscillators,

Current limit and short circuit protection are provided by circuitry, internal to the booster amplifier, which senses the voltage drop across the 0.22 Ω emitter resistors in the output stage.



which can be used for this purpose, are too large, complex, and expensive for applications involving power in the range of 5 to 10 W.

The circuit (see fig.) consists of a Wien bridge oscillator which uses an operational amplifier to feed a power amplifier stage. The power amplifier stage uses a booster amplifier and two discrete transistors to provide the required power output.

The oscillation amplitude is regulated by a feedback loop in which the ac output is full-wave rectified by diodes D1 and D2, and is compared with a 6.2 V reference voltage by an operational amplifier connected as an integrator. The voltage output from the integrator varies the channel conductance of Q1, which controls the gain of the oscillator.

(continued overleaf)

The circuit produces up to 9 W of 20 kHz sine-wave power. Additional power can be obtained by increasing the power output of the oscillator amplifier and increasing the supply voltages. The circuit can be modified to operate at other frequencies by changing the frequency of the tuning network which consists of R1, R2, C1, C2. Large changes in operating frequency also require changing the integrator time constant (R5C5), the feedback filter capacitor C4, the output transformer and the blocking capacitors C6 and C7. The modified circuit has been successfully operated at frequencies as low as 40 Hz.

Notes:

1. Designation of commercial company products is only indicative, not exclusive, and is not a recommendation of one company over another.
2. No additional documentation is available. Specific questions, however, may be directed to:
Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: B71-10174

Patent status:

No patent action is contemplated by NASA.

Source: J. C. Sturman
Lewis Research Center
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