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# NASA TECH BRIEF



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## Improved Frequency Divider Employs Transistor Avalanche Effect

A frequency divider circuit that has been developed can be synchronized over a much wider input control frequency range, has greater phase stability, and is less sensitive to temperature changes than conventional synchronized oscillators used to perform frequency division. The new circuit depends on the avalanche breakdown mode of operation of transistors. Typical characteristics of a divider circuit using the synchronized avalanche oscillator design for a frequency ratio of 57/221 are:

Input frequency, 21.9792 MHz

Output frequency, 5.6688 MHz

Bandwidth (controlled by crystal filter),  $\pm 33$  kHz  
(-1 db)

Lock range, > 2 percent

Phase instability, approximately 0.01 deg rms

### Note:

Inquiries concerning this circuit may be directed to:

Technology Utilization Officer  
NASA Pasadena Office  
4800 Oak Grove Drive  
Pasadena, California 91103  
Reference: B67-10575

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Carl E. Johns  
Jet Propulsion Laboratory  
(NPO-10008)

Category 01

# NASA TECH BRIEF

The following information is being furnished to you for your information and is not to be distributed outside your organization.

## Improved Propaganda Division Employee Transport System

A program of research and development has been completed by the Propaganda Division of the Federal Bureau of Investigation (FBI) to improve the transport system for its employees. The new system, which is being installed in the Division's headquarters building, will provide a more efficient and economical means of transporting employees to and from work. The system consists of a fleet of vans which will be used to transport employees to and from work. The vans will be operated by a fleet of drivers who will be trained in the use of the vans. The system will be installed in the Division's headquarters building in the near future.

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