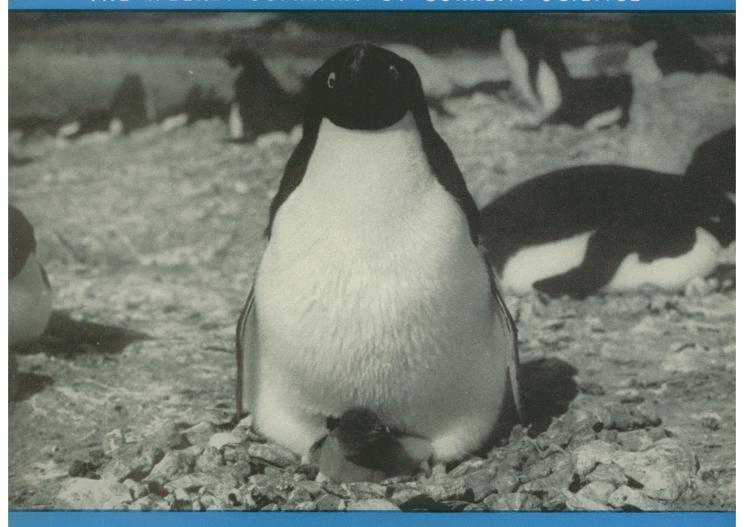
SCIENCE NEWS LETTER





THE WEEKLY SUMMARY OF CURRENT SCIENCE

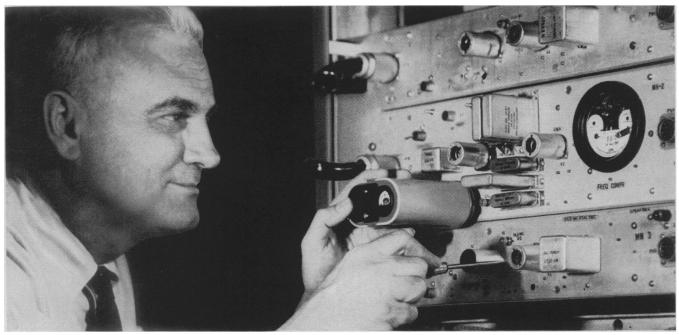


Mother Penguin

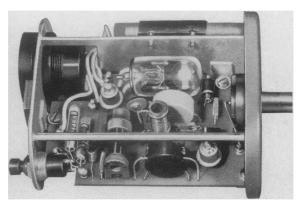
See page 148

A SCIENCE SERVICE PUBLICATION

Bell Laboratories Announces Pocket-Sized Frequency Standard for Microwave Systems



Lawrence Koerner, who developed the portable frequency standard, demonstrates how the device can be plugged in at a radio relay station to supply a checking frequency. Battery-powered, the device maintains precision calibration for several months.



Inside the portable frequency standard. Four Laboratories-developed devices make it possible: (1) transistor, which converts the power from a battery to radio frequency oscillations; (2) voltage reference diode, which maintains constant voltage; (3) piezoelectric crystal unit of superlative stability; (4) thermistor, which corrects for temperature variations.

Microwave radio relay systems depend critically on the accuracy of their "carrier" frequencies. At scores of relay stations along a route, carrier frequency oscillators must be checked periodically against a signal from a precise standard.

In the past, the maintenance man has had to obtain his checking frequency by picking up a standard radio signal from a government station. This operation takes time—and requires elaborate equipment.

With a new *portable* frequency standard developed by Bell Laboratories engineers, the job is much simplified. To check an oscillator, the portable standard is plugged in, and a button is pressed. In seconds, it supplies a checking frequency accurate to one part in a million.

Until now, such precision in a frequency standard has been obtainable only in a laboratory. The new portable standard makes it available for routine use in the Bell System. First use of the standard will be to maintain frequency control in a new microwave system for telephone and TV, now under development at Bell Laboratories.



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• PORTABLE . . . weighs only 13 ozs., fits in pocket!

ONE HAND OPERA-TION .

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plus 50¢ pp. & hdlg. Ask any expert and he'll always say "RAM for Heavy Duty Work." Not just an ordinary 2, 2¼ or 2½ amp unit, but a powerful full 2.9 AMP. drill to do Built to the state of the state plus 50¢ pp. & hdlg.



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Protects from dust, dirt, moisture, rust, moths, heat, cold, ctc. Transparent! Stains wipe off! Lightweight, strong, inexpensive!

strong, inexpensive!

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Questions

ASTROPHYSICS—What processes are involved in the life history of a normal star? p. 149.

BIOCHEMISTRY—How does Vitamin K play an important role in photosynthesis? p. 150.

BIOLOGY—What is the possible reason for raw fish causing anemia in mink? p. 153.

PUBLIC HEALTH—What is the estimated percentage of present stratospheric fallout that continues to sift to earth? p. 151.

DEMOGRAPHY—How does the population density of the Middle East compare with that of the U. S.? p. 153.

Photographs: Cover, U. S. Navy; p. 147, Unesco; p. 149, U. S. Army; p. 151, Merck & Co., Inc.; p. 154, New York State Department of Mental Hygiene; p. 160, Du Pont Co.

Do You Know?

One *sponge*, about a yard across, that came from Florida waters, harbored some 17,120 other animals, including a number of fishes.

A *hive* of bees in summer may contain 60.000 bees.

Gravity is greater near the poles than at the equator and normally is greater at low elevations than at high.

A protein's nutritional value is determined chiefly by the quantity and proportion of its essential *amino acids*.

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These are the same features you
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 Measures only 3 3 4" x 2 1/8" x 1". Smaller than a pack of cigarettes.

 Weighs only 4 oz. complete with battery. Comes complete with battery costs 15¢, gives 2000 hours of radio reception.

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 Lowest cost transistor radio ever sold.
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TRY IT FOR 10 DAYS!

TRY IT FOR 10 DAYS!

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