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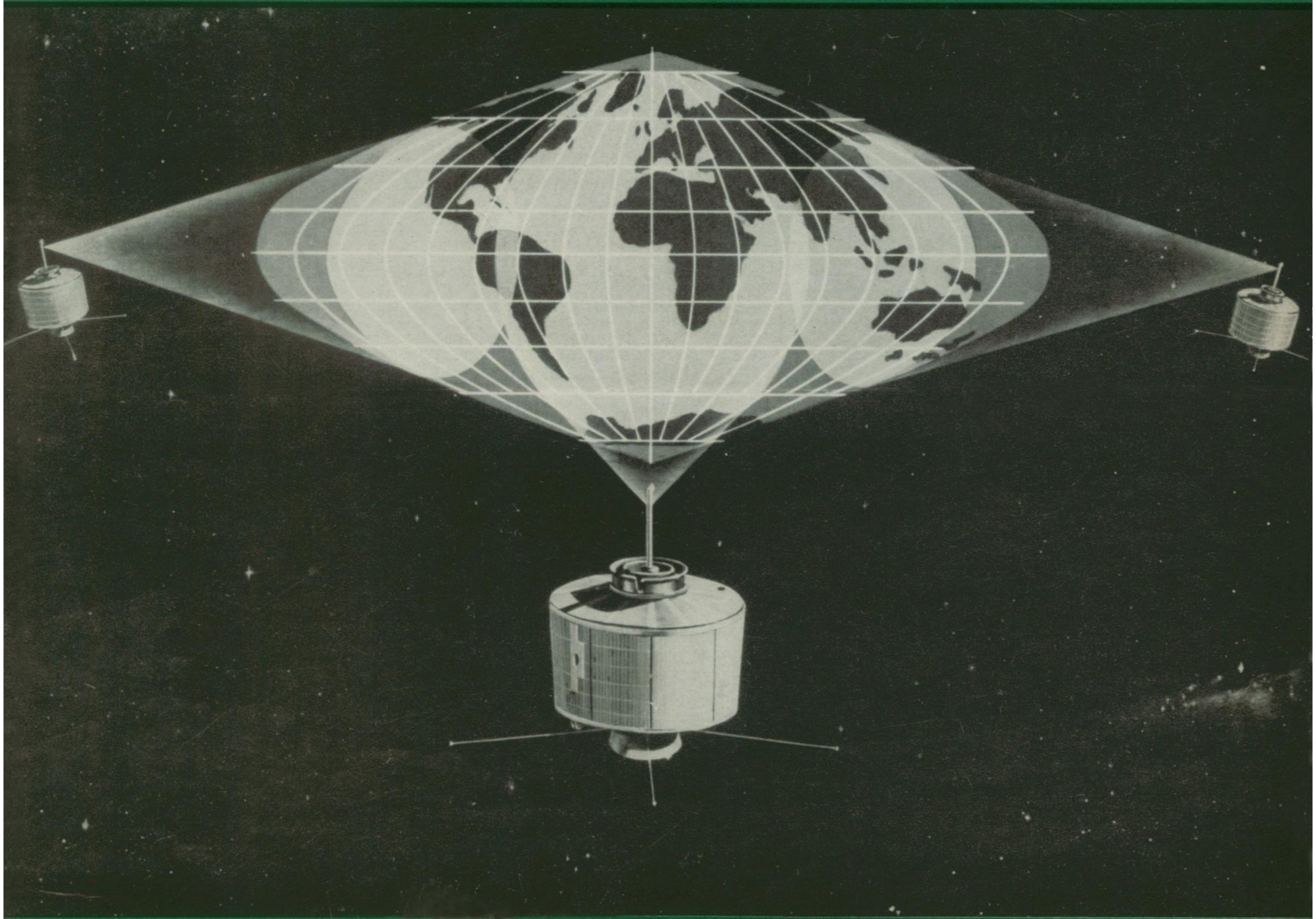
THE WEEKLY SUMMARY OF CURRENT SCIENCE



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One of a series briefly describing GM's research in depth

Breakthrough in Ferroelectrics

The spirit of science is tentative, experimental, skeptical. Thus we have been cautioned by our research colleagues here at the Laboratories of the naiveté of pinning a "breakthrough" label on a discovery they made in ferroelectric materials. We're not convinced.

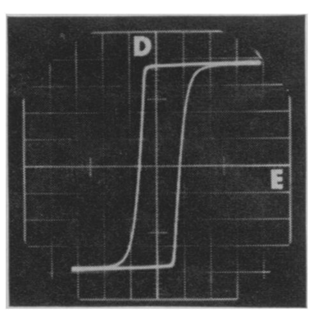
Ferroelectrics have remained on the scientist's workshelf as curious crystal analogs of ferromagnetic materials . . . as intriguing insulators whose dielectric "constant" isn't, but varies with changes in electric field intensity much in the hysteresis loop fashion of magnetic materials.

Recently, two members of our research staff reported they had observed ferroelectric behavior *at room temperature* in a polycrystalline form of ordinary saltpeter. Furthermore, this ferroelectric phase in potassium nitrate has nearly ideal electrical characteristics. Apparent true coercivity. Dielectric hysteresis loops that are really square (ratios of 600:1 and more). Here then is an inexpensive, easily prepared material that may perform the much sought after memory and switching functions in capacitive circuits—functions similar to those handled by their ferromagnetic brethren in inductive circuits.

This discovery is expected to stimulate the development of practical, compact electronic devices of interest to the computer, control, and communication sciences. It is only one of the avenues of science and engineering being opened by GM's research in depth.

General Motors Research Laboratories

Warren, Michigan



Room temperature 60-cps hysteresis loop (above) of KNO_3 melted on copper substrate with the simplest of tools (left).