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Ph.D.

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(a) Biochemistry Ph.D.; immunology minor; toxic compound actions, communicable disease experience; seeks clinical appointment. (b) Human Genetics Ph.D. 1965; available for research or academic position. Write Woodward Medical Personnel Bureau, 185 North Wabash, Chicago 60601.

Business Administrator, federal government experience with biomedical research grant agency. Seeks opportunity in university, college, hospital or research organization. Box 242, SCIENCE. X

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Report from

### BELL LABORATORIES

### **Programmed Measuring Set for High-Quality Communications**

In a Long Distance telephone office, hundreds and often thousands of circuits must be maintained at prescribed levels of transmission quality. Test equipment and test procedures therefore must be such that preventive maintenance will ensure high-quality communications channels whenever customers need them.

At Bell Telephone Laboratories there is a continuing program under way to improve such test procedures and equipment by taking advantage of the latest advances in technology. One of the results of this program is a new test set developed by Bell Laboratories for

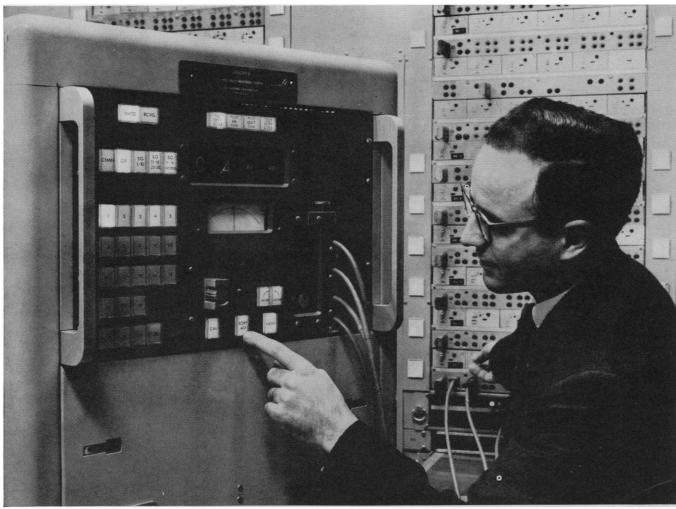
use in the Bell System. Much of the memory and logic required for the tests has been built into this push-button programmed set. With it, a man can make accurate measurements at speeds ten times faster than possible with earlier test equipment. It also greatly simplifies equipment alignment when necessary.

The tests are performed by measuring transmission "pilots"—special tones interspersed throughout the frequency band containing the channels. Instead of following a complicated series of tuning and measuring steps involving several pieces of equipment, the crafts-

man now rapidly sets up the test to be made by pushing buttons, performs simple balancing steps, and receives a digital readout of any deviation from prescribed values.

The entire test, including connections, takes only a few seconds. The test can be performed—and any required adjustment made—with the telephone equipment in service, without disturbing any conversations under way.





T. L. Maione demonstrating use of new measuring set developed at Bell Laboratories. He is about to adjust the in-service loss of transmitting group No. 1. The message displayed in the digital readout above the meter indicates that the loss of this group is 0.4 db higher than

prescribed value. The testing is programmed so that buttons and lights operate only if the correct procedure is followed. The set permits very narrow bandwidth measurements (.003% at 3 mcps, for example) of pilots as low as -63 dbm (0.5 nanowatt) with 0.1 db (1%) accuracy.



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6445-WO5. Micro Carbon-Hydrogen Analyzer, Thomas, as above described, complete with supply of absorption tubes, sample capsules, absorbents, materials for packing combustion tube, calculator, etc. For 115 volts, 60 cycles, a.c.

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