

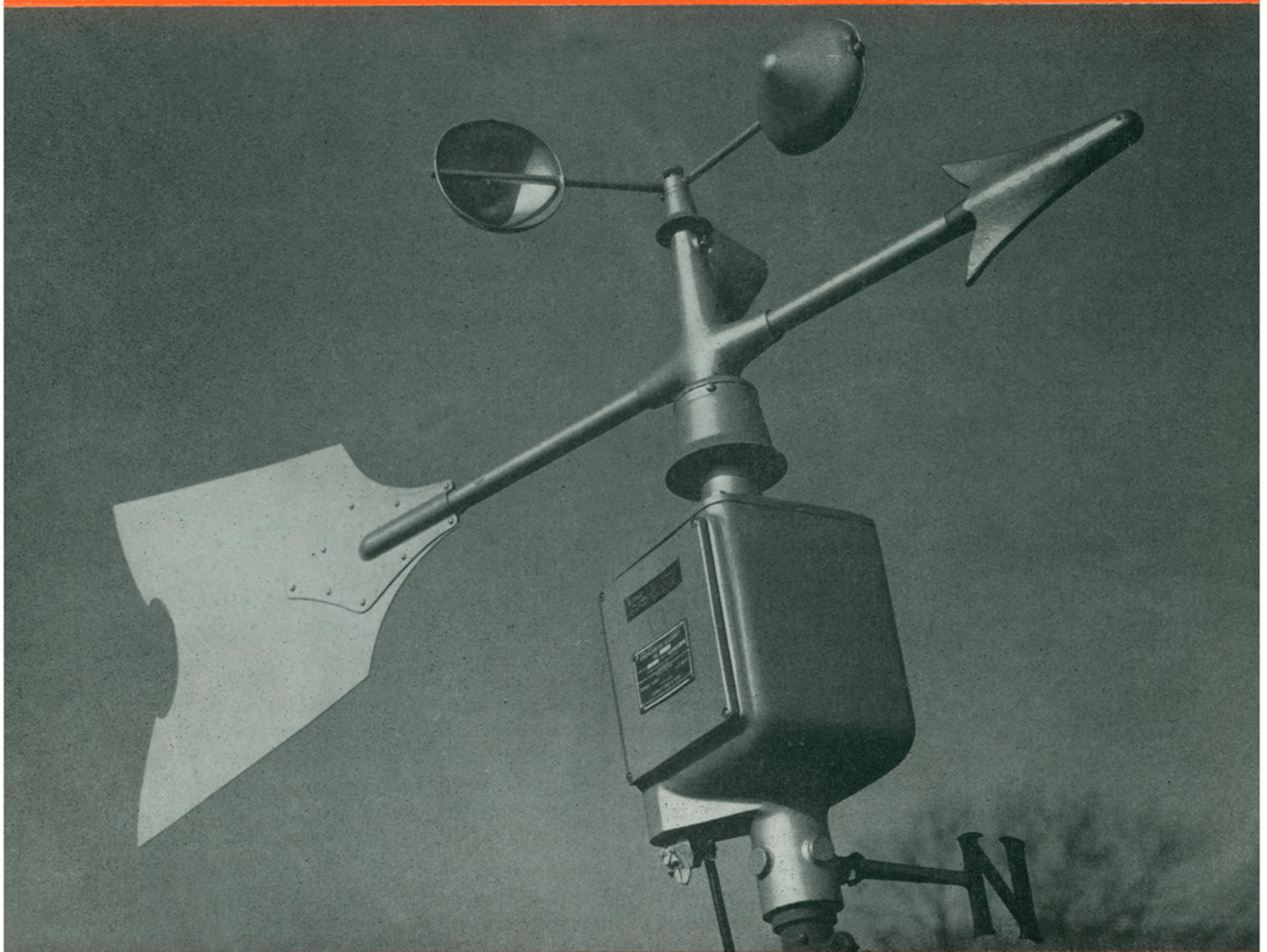
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SCIENCE NEWS LETTER

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Inanimate Observers

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A SCIENCE SERVICE PUBLICATION



YOUR TELEPHONE TRANSMITTER AND RECEIVER, voice gateways to the telephone plant, are so essential to satisfactory service that they have been under study in Bell laboratories for seven decades.



A TELEPHONE RECEIVER is a complex system of electrical and mechanical elements. Its coils, magnets, diaphragm and cap react on each other as they convert the electrical waves of your voice to sound waves. What is the best size for the holes in the ear cap? Will $1/1000$ th inch greater thickness help a receiver diaphragm to carry your telephone voice more clearly? One way to find out is to build numerous experimental receivers and test them.

But Bell Laboratories have found a shorter way. They built an all-electrical replica, an "equivalent circuit" in which electrical resistance stands for air friction in the

cap holes; capacitance corresponds inversely to the stiffness of the diaphragm. Performance of this circuit can be quickly measured and design changes economically explored. Later, a model can be built and checked.

The "equivalent circuit" was pioneered by Bell Telephone Laboratories 25 years ago. It is a useful tool in many Laboratories developments—saving time, saving the cost of machine-tooled models, encouraging experimentation. It is one more example of the way Bell scientists get down to fundamentals as telephone progress continues—and service keeps on improving for all subscribers.



BELL TELEPHONE LABORATORIES

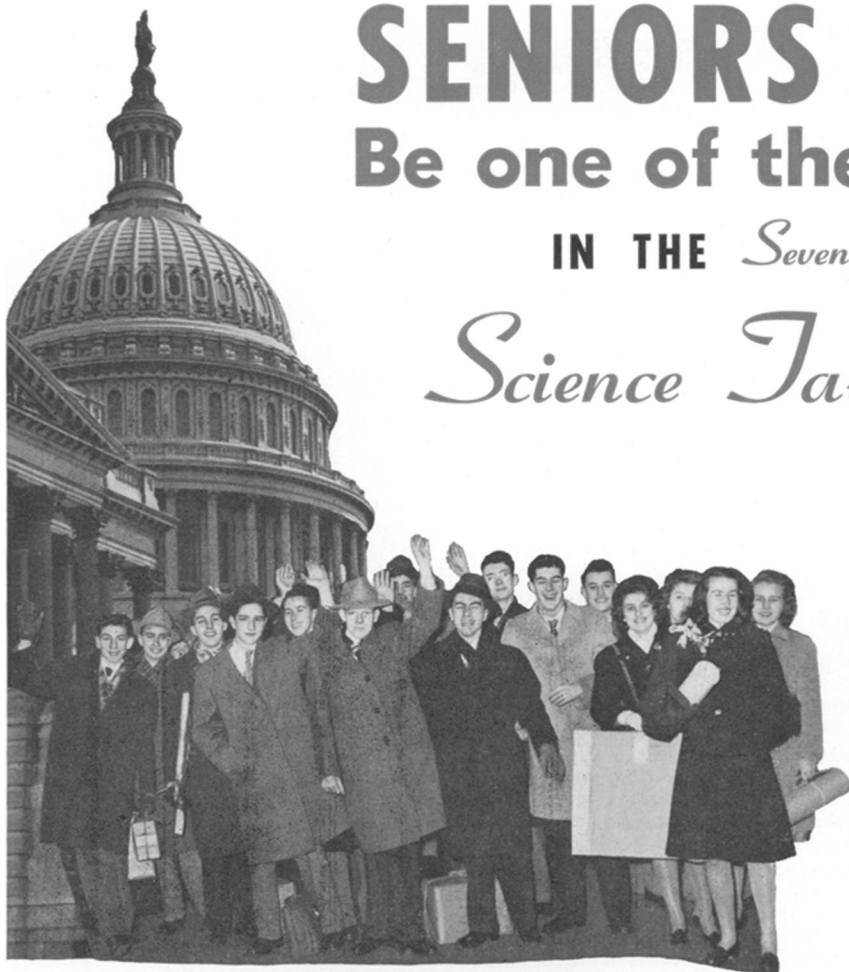
EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

SENIORS OF 1948

Be one of the Forty Stars

IN THE *Seventh* ANNUAL

Science Talent Search...



Conducted by SCIENCE CLUBS OF AMERICA, a SCIENCE SERVICE activity and sponsored by the WESTINGHOUSE EDUCATIONAL FOUNDATION, an organization endowed by the WESTINGHOUSE ELECTRIC CORPORATION for the purpose of promoting education and science.

**You have a chance to share in
FOURTEEN THOUSAND DOLLARS**

**in WESTINGHOUSE SCIENCE
SCHOLARSHIPS PLUS
TRIPS TO WASHINGTON**

Write an essay of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your essay should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. On or after December 1 take the examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your essay and examination papers.

Do these three things and you may be among the forty boys and girls who will win all-expense trips to the Science Talent Institute and compete for Westinghouse Science Scholarships for the continuation of your education. Of the forty, one boy and one girl will be selected as winners of the

two \$2,400 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIPS; eight more of the forty boys and girls will be selected to receive WESTINGHOUSE SCHOLARSHIPS of \$400 each; and \$3,000 more in WESTINGHOUSE SCHOLARSHIPS will be awarded at the discretion of the judges. Every one of the forty boys and girls will, when in Washington, be awarded the GOLD EMBLEM OF SCIENCE CLUBS OF AMERICA.

If you are planning A CAREER IN SCIENCE, you will want to take advantage of the opportunities offered by the Science Talent Search. In the past six years more than 1,600 high school students, because of their standing in this competition, have been offered scholarships in addition to the Westinghouse Science Scholarships.

SEE YOUR SCIENCE TEACHER

or write SCIENCE CLUB OF AMERICA, 1719 N Street, N. W., Washington 6, D. C.