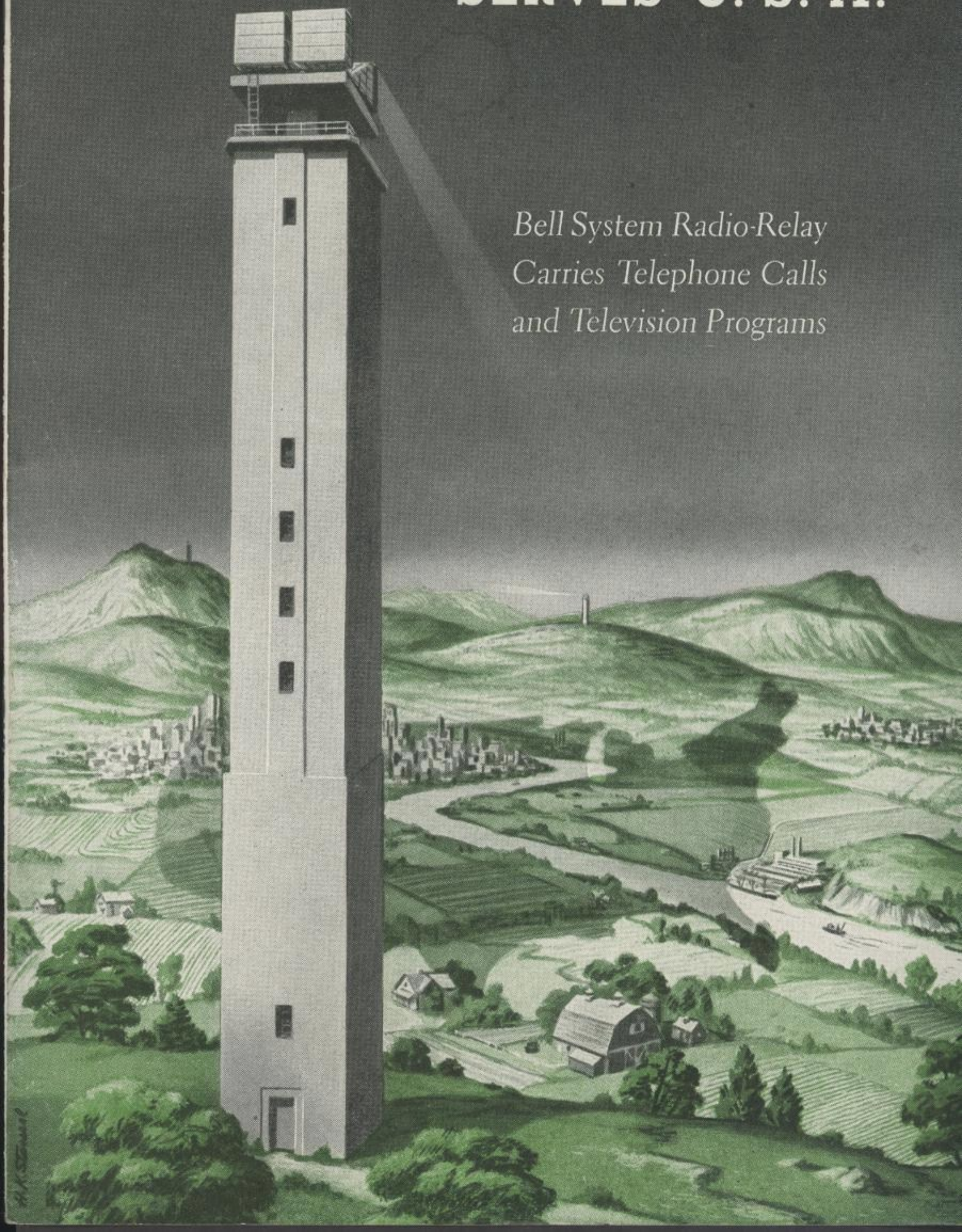
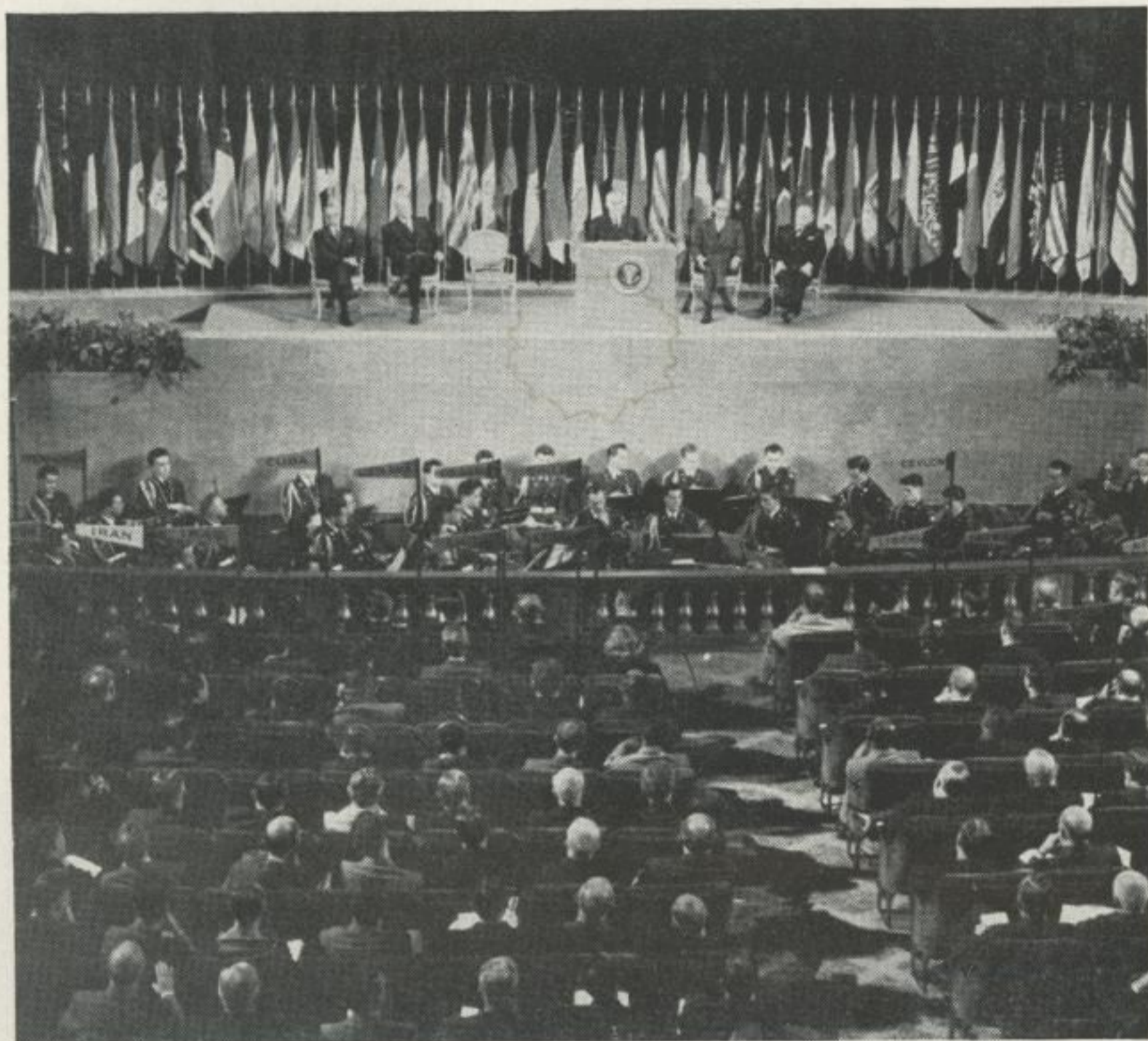


NEW TELEPHONE SKYWAY SERVES U. S. A.

*Bell System Radio-Relay
Carries Telephone Calls
and Television Programs*



H. K. ...



PRESIDENT TRUMAN greets delegates to Japanese Peace Treaty Conference in San Francisco on September 4. Millions of people all over the country "attended" the Conference when it was televised over the new radio-relay system.

Voice and Vision Across the Nation *by Radio-Relay*

When President Truman addressed the opening session of the Japanese Peace Treaty Conference in San Francisco on September 4, millions of Americans from the Pacific to the Atlantic were able to see as well as hear him. They were able to "attend" other sessions, too. This historic conference was the first event to be televised across the nation over the Bell System's new radio-relay "skyway," in conjunction with coaxial cables and other radio-relay routes. Regular television programs are scheduled to begin September 28.

The beaming of television pictures through space is a dramatic example of radio-relay's usefulness. However, the

primary job of the relay network is to help handle the increasing volume of long distance telephone calls. The new system was opened for telephone use on August 17. At that time President Cleo F. Craig of the American Telephone and Telegraph Company said, "To tie together the telephones in this country we now have more varied and more flexible facilities than ever before. Coast-to-coast radio-relay has been built at a cost of 40 million dollars — money that has been supplied by thousands of people in all walks of life who have invested savings in the telephone business. To keep the confidence of investors, we must employ their money promptly and profitably."

At the same ceremonies, Wayne Coy, Chairman of the Federal Communications Commission, said, "This quick application of microwave techniques to our telephone system is impressive testimony to the vision, ingenuity and enterprise that have given America its present position of world leadership."

To demonstrate what the new system can do, Bell System engineers, at the opening ceremonies, looped a telephone call back and forth over the transcontinental route so that the voices were clearly heard over a distance of nearly 27,000 miles — more than the earth's circumference at the equator, and the longest distance that the human voice has ever traveled by telephone.



OPENING the new radio-relay system on August 17 for telephone use are (l. to r.) Wayne Coy, Chairman of Federal Communications Commission, Vice President H. T. Killingsworth of A. T. & T., and Cleo F. Craig, President of A. T. & T.



MAP SHOWS HOW transcontinental radio-relay system connects with radio-relay and coaxial cable systems over other routes. Solid lines show other routes already in service; dotted lines show radio-relay and coaxial cable facilities now being built or planned for construction in the future. For simplicity, map does not show where certain radio-relay and coaxial routes parallel each other. All these facilities interconnect with other cable and wire lines of the nation's telephone system.

What Radio-Relay Is

For thousands of years men have relayed messages — by sending smoke signals, beating tom-toms, and so on. The modern application of this principle — beaming electrical waves from tower to tower along a relay route — has greatly increased the capacity of the nation's long distance telephone network and helped to make cross-country television possible.

In the new system the relay points are spaced 30 miles apart, on the average, stretching across America. From tower to tower the messages are carried on a radio beam of super-high frequency called a microwave. The beam vibrates 4 billion times a second and each wave is about as long as the average man's little finger. A single radio-relay channel can carry hundreds of telephone messages at the same time, or a television program.

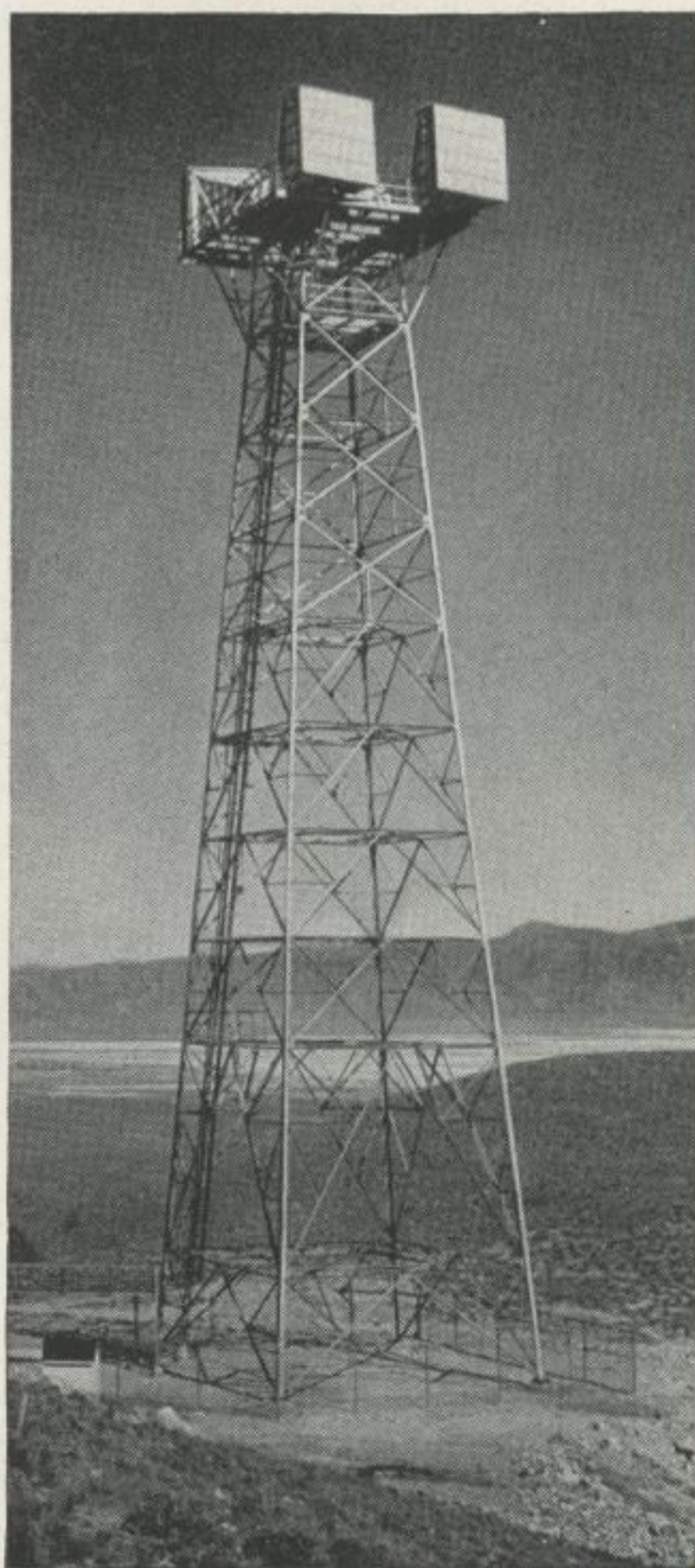
Like light waves, microwaves travel in straight lines and do not follow the curve of the earth. That is why they must be relayed from tower to tower — otherwise they would shoot off into space, taking telephone and television signals with them.

How Radio-Relay Works

Here's how a coast-to-coast telephone call "rides" the relay beam: From a caller's telephone, the message is carried by wire and cable to a relay tower, where it is beamed by microwave to another tower some 30 miles away. There a receiving antenna picks the message out of the air and sends it to powerful amplifying equipment which gives the weakened signal a ten-million-fold boost. Ready for the "road" again, the amplified voice-carrying signal is returned to the tower-top and beamed once again on its journey through space. This process is repeated at each tower — more than 100 times on a transcontinental call.

At the distant end, special equipment in a telephone building separates the call from hundreds of other conversations which might be riding the same microwave signal. The call is then placed on wire lines again and carried to its destination.

WEST OF CHICAGO most towers in new coast-to-coast relay system look like this one at Cedar Mt., Utah. Ten-foot-square "horn" antennas stand on top.



A Vital Communications Highway



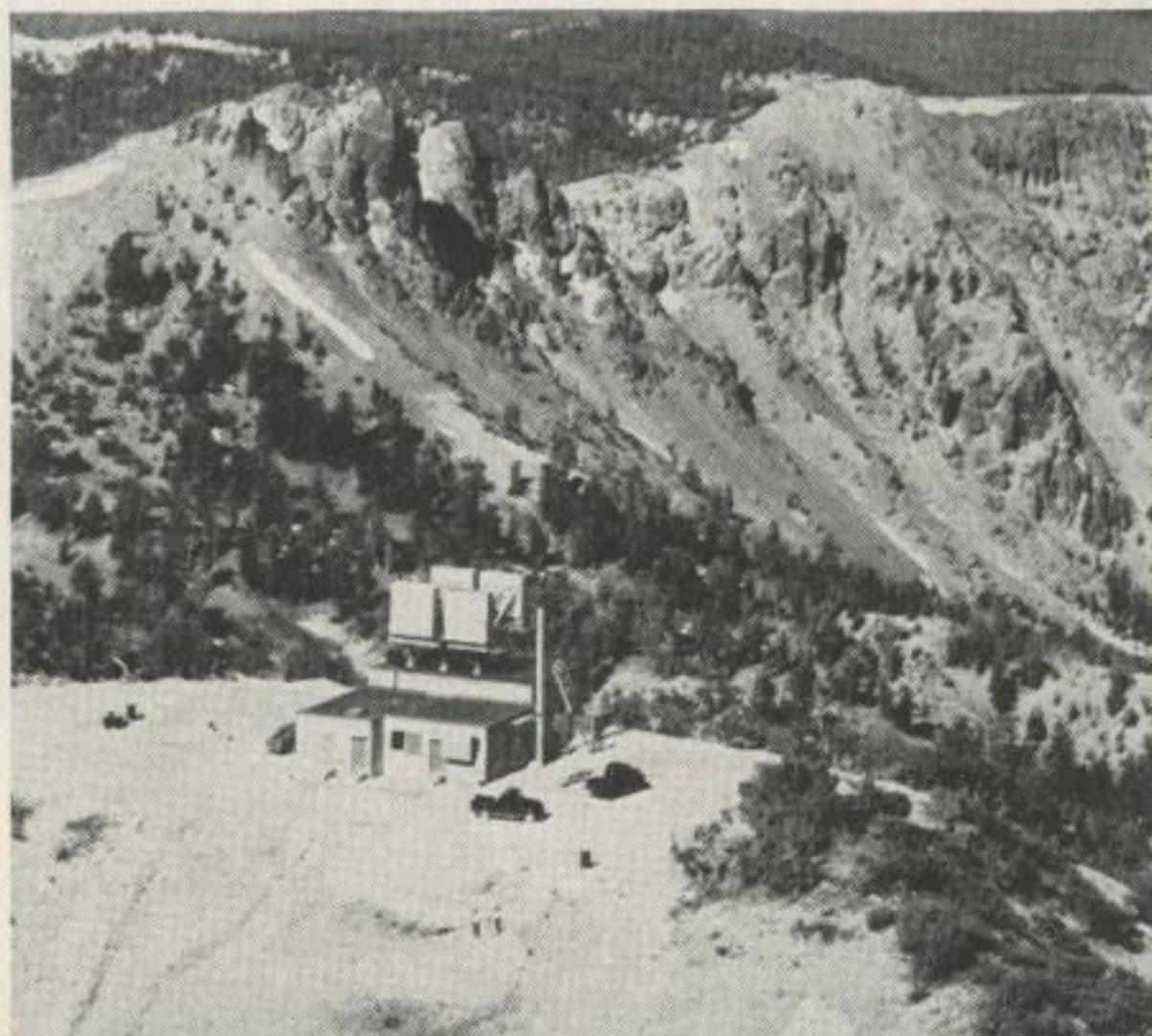
LONG DISTANCE CALLS have increased three times as much in the past ten years as they did in the entire previous history of the telephone. Radio-relay plays an important part in meeting the ever-growing need for more circuits between cities.

Once again the country is mobilizing its resources for defense and the telephone fills a vital role in this effort. To answer this urgent and growing demand for long distance telephone service, thousands of miles of additional circuits are needed. Radio-relay offers one more quick and efficient means of providing them.

When the system was opened in August, it provided 46,000 miles of telephone circuits. Within a short time this total is expected to reach 500,000 miles, and this is only a small portion of the potential capacity. Additional television channels can be provided in the future as the need arises.

The new radio-relay system is the seventh transcontinental telephone highway. Long distance telephone calls can use any or all of three types of facilities now available—wire, cable and radio-relay—and can be switched from one to another instantly.

RADIO-RELAY TOWER on top of 10,075-foot Mount Rose in Nevada is at the highest elevation in the transcontinental system.

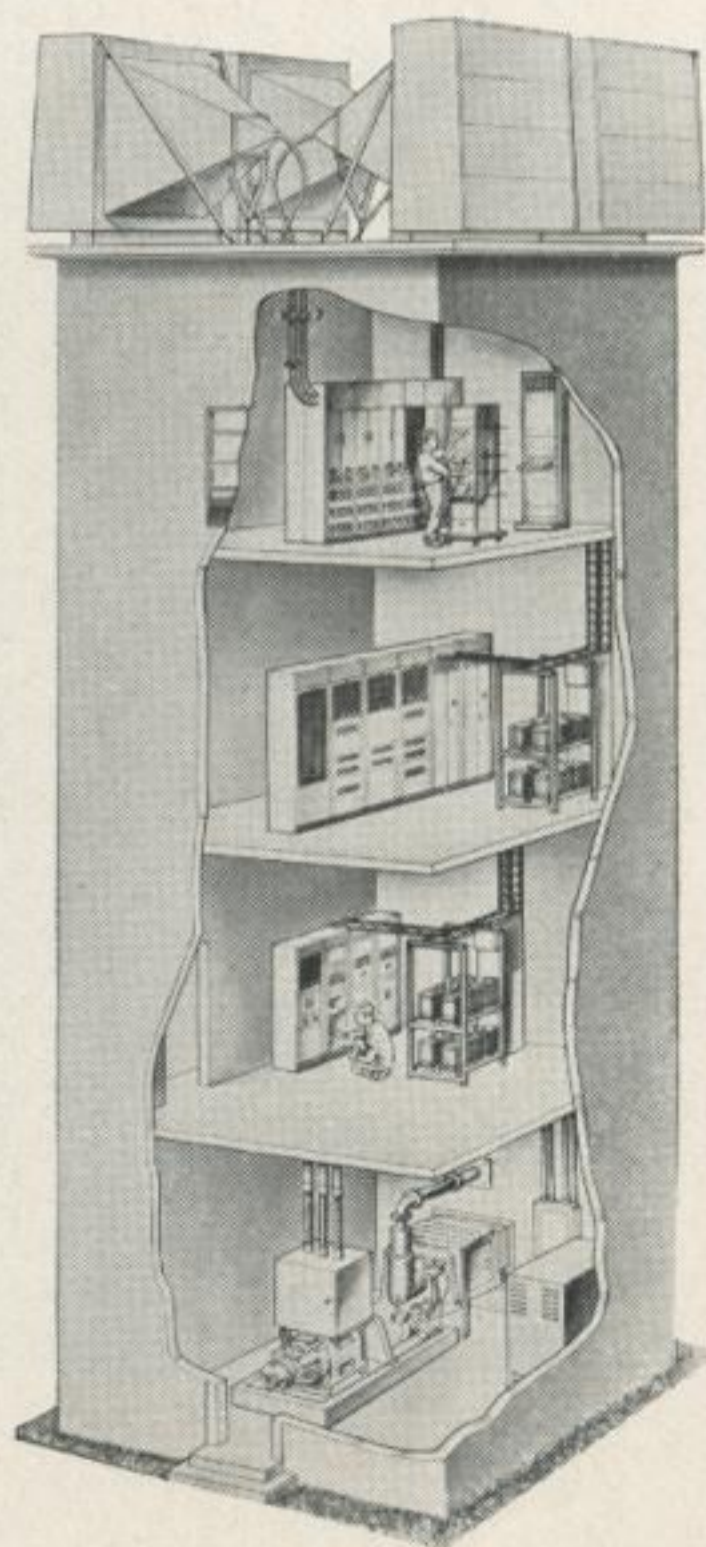


Construction work on the transcontinental system started late in 1947. To build a 3,000-mile chain of steel and concrete towers, Bell System engineers and construction crews blazed a new communication trail from coast to coast in 106 giant leaps. Starting at New York, the route swings down near Philadelphia to Pittsburgh and on to Chicago. Then it journeys westward to Omaha, through Denver and over the Rockies to Salt Lake City and finally across the mountains to San Francisco.

Any great construction job involves problems. Radio-relay was no exception. "Old Man Weather" kept up a constant campaign of harassment. In Wyoming the winds blew so strongly during the day that hoisting the heavy antennas to their platforms was undertaken only in the early morning and late afternoon. On lofty Mount Rose, Nevada, snow drifts forced construction men to use a ski-tow to move up to the mountain-top site. Several sites were in such rugged country that special roads had to be built to permit construction men to reach them.

Despite all difficulties the job moved steadily ahead. By late last spring a high-flying observer could have seen the last tower nearing completion. This tower, located at Crow Creek, Wyoming, was completed in April and extensive equipment installation and tests on the new route got under way to prepare for its August opening.

INSIDE a typical radio-relay tower: Amplifying equipment is on top floor, storage batteries and associated power apparatus on 2nd and 3rd floors, emergency power equipment on 1st floor. Similar apparatus for steel towers is housed in separate buildings.





"Constantly **GROWING,**
Constantly **IMPROVING..."**

The new transcontinental radio-relay system is the result of years of intensive engineering and close teamwork among research and development, manufacturing and operating units of the Bell System.

It is a typical story of American achievement and progress — the story of free people working together harmoniously with vigorous enterprise and research opening new business and scientific frontiers.

With continuing financial good health — and with continuing freedom, under regulation, to search for a better way — new arts and opportunities will come to life. These have given America the best telephone service in the world — and for tomorrow they hold out the promise of still greater things to come.



NEW HORIZONS are viewed by a construction worker from top of relay tower overlooking San Francisco Bay. The Bell System's constant search for new and better ways of meeting the nation's communications needs promises still greater progress in the future.