



KIDS LOVE HOWDY DOODY PROGRAM, WHICH IS A COMBINATION CIRCUS, JAMBOREE AND PUPPET SHOW.

Is inter-continental TV next?

FOR YEARS, science fiction writers have been describing a telephone of the future which would allow people to see as well as hear each other. For just as many years their readers have speculated about the embarrassment such an invention might cause. For example, you might be in your bathtub when a friend would call you on the video-telephone. Unthinkingly, you'd rush to answer, lift the receiver and stand exposed before the camera eye.

With television developed to the extent it is nowadays, engineers could design such a phone-video easily. In several cities television programs are now carried for short distances over modified telephone lines. This makes it obvious that a phone-video system is perfectly practical—technologically. But economically, that's another matter. Probably no such system could pay for itself for another century.

But today television has uses which seem just as fantastic. Right now in several plants scattered through the country, television cameras are aiding in remote control of machinery. At the Hell Gate Power Station of the Consolidated Edison Company in New York, engineers watch a television screen in a control room, see dials on a boiler that is eight floors above them. This suggests that some future factories will be completely automatic with technicians controlling all machinery from a television observation booth.

The Farnsworth Television and Radio Corporation, which developed the equipment used at the Hell Gate station, has other novel plans for its TV cameras. Farnsworth thinks they make ideal burglar alarms. The company has been mulling this over for some time, but recently it was scooped by Dick Tracy, the comic-strip detective. Dick Tracy showed how a television camera could be set up in a store as a visual burglar alarm.

The futuristic phone-video system mentioned at the beginning of this page, incidentally, should not be confused with phone vision, a scheme the Zenith Radio Corporation advocates. Zenith believes television as organized today can never provide topnotch entertainment. The company suggests, instead, that owners of television sets pay for some of the programs sent to their homes. The telephone company would handle the billing for this kind of broadcasting.

The television camera responsible for the appearance of these marvels before Buck Roger's time is an instrument with two jobs. It takes pictures and it breaks the pictures up so they can be broadcast as a series of varying radio waves.

The process of taking television pictures is just like making snapshots with a Brownie. Light is brought to a focus on a surface with a lens. In this case the surface is made of a special photo-electric substance, not of film. This substance throws off electrons (particles of negative electricity) whenever light strikes it. The more light, the more electrons bouncing off.

Electrons flying off this picture surface strike a glass plate; and each picture electron in turn knocks several other electrons off the glass. This leaves a pattern of positive charges spread over the plate in the shape of the picture.

At this point the television camera performs its picture-breaking function. It shoots a stream of electrons at the glass plate in a peculiar manner. The electrons, moving at the speed of light, sweep across the picture in horizontal lines—525 lines every 1/30 of a second, and one line after another from top to bottom. It is this scanning of the picture in separate lines which makes television possible.

When the scanning electrons strike the glass plate, many are attracted into

the glass wherever it is strongly positive, few where it is almost neutral. This creates a current on the glass varying with the picture's characteristics.

This current is drawn off the glass, amplified, and broadcast. Picked up by a set, this signal controls the strength of the electron beam in the picture tube (see pages 22 and 23) as it shoots electrons at the screen.

Ultrafax is one of the newest uses for the complex TV camera. It is a communications system developed by RCA (with the aid of Eastman Kodak) which allows long-distance transmission of about 1,000,000 written words a minute. A special camera televises pages from books, letters or newspapers, and sends them any distance over microwave relay; as it comes in, the Ultrafax receiver prints this material on photographic film.

More startling perhaps than Ultrafax is a serious suggestion by Brigadier General David Sarnoff, president of RCA, about international television. Sarnoff believes a television airlift of 12 to 14 planes could relay TV broadcasts from plane to plane across the Atlantic Ocean. It is doubtful, however, that such a plane relay system will come soon. But there are other ways of initiating international television. One would require special ocean cables. Engineers might be able to sheath coaxial cables so they could be laid under water. But this, too, is a long way off.

Another theoretically possible way of getting international TV involves use of a space station circling the earth. Such a satellite would receive television waves, reflect them back to earth. Waves aimed from New York would bounce back at an angle to London. Unbelievable? Well, if there are such satellites out around the earth in a few years (SI, November, 1948) wait and see what the electronics engineers will try next.