New PICTUREPHONE Set "Zooms" and Shows Graphics

News of Customer Equipment Development

The Bell System's PICTUREPHONE® see-while-you-talk set has been completely redesigned to incorporate additional features that trials have shown the public wants in a videotelephone. The improved "Model II" PICTUREPHONE sets will succeed the first generation PICTUREPHONE sets—now providing limited commercial service between New York, Chicago, and Washington, D. C. Trials of the new set will be conducted next year at the Westinghouse Electric Corporation. The service will link selected offices of the corporation's locations in Pittsburgh and New York.

With the Model II PICTUREPHONE set, the user can change the size of the field of view to close-up or wide-angle by "zooming" electronically, display drawings and printed matter (in a "graphics mode" of operation), move more freely from side to side while remaining "on camera," and change the camera focus to transmit larger scenes up to 20 feet away.

The display unit of the new PICTUREPHONE set—a tapered, cube-shaped unit with rounded corners—swivels through nearly a full circle on a pedestal slanting up from a frosted chrome, ring-shaped base. The Model II PICTUREPHONE set was developed by Bell Laboratories with industrial design collaboration by Henry Dreyfuss and Associates.

A new silicon-target television camera tube (see *A "Solid-State" Electron Tube for the PICTUREPHONE Set,* RECORD, June 1967) makes the "electronic zoom" practical and provides a better picture under both poor and normal lighting conditions. An important feature of the new camera tube is that it is not damaged by direct exposure to bright lights. In addition, an iris in the camera automatically compensates for a wide range of ambient light intensities.

The screen of the Model II set, measuring 5½ inches wide by 5 inches high, is larger than the screen of the first PICTUREPHONE sets. This larger screen, along with a new camera lens with a wider field of view, gives the viewer more freedom to move from side to side.

The user can set the focus of the camera to one foot for the graphics mode, three feet for normal viewing, or 20 feet for a distant field. A built-in mirror automatically swings to a 45 degree angle in front of the lens when the graphics mode is chosen. When the material to be transmitted is placed in front of the base of the PICTUREPHONE set, its image is reflected into the camera tube.

The three-foot focus, used for normal face-to-face communications, has a deep field in which the user is in sharpest focus between 24 and 40 inches from the set. For distant, wide-angle viewing—of a blackboard drawing, or of two or more persons, for example—the camera focus is set at 20 feet. During either normal or distant viewing, the user can change the field of view of the scene over more than a two to one ratio simply by turning a knob.

The PICTUREPHONE station set is comprised of a display unit, a control unit, and a service unit. A standard TOUCH-TONE® telephone set equipped with a 12-button dial is used for dialing and for providing regular telephone service. The compact control unit contains four knobs and four pushbuttons, and can be placed in a convenient position in front of the PICTUREPHONE display unit. One knob electronically adjusts the height of the center of the camera's field of

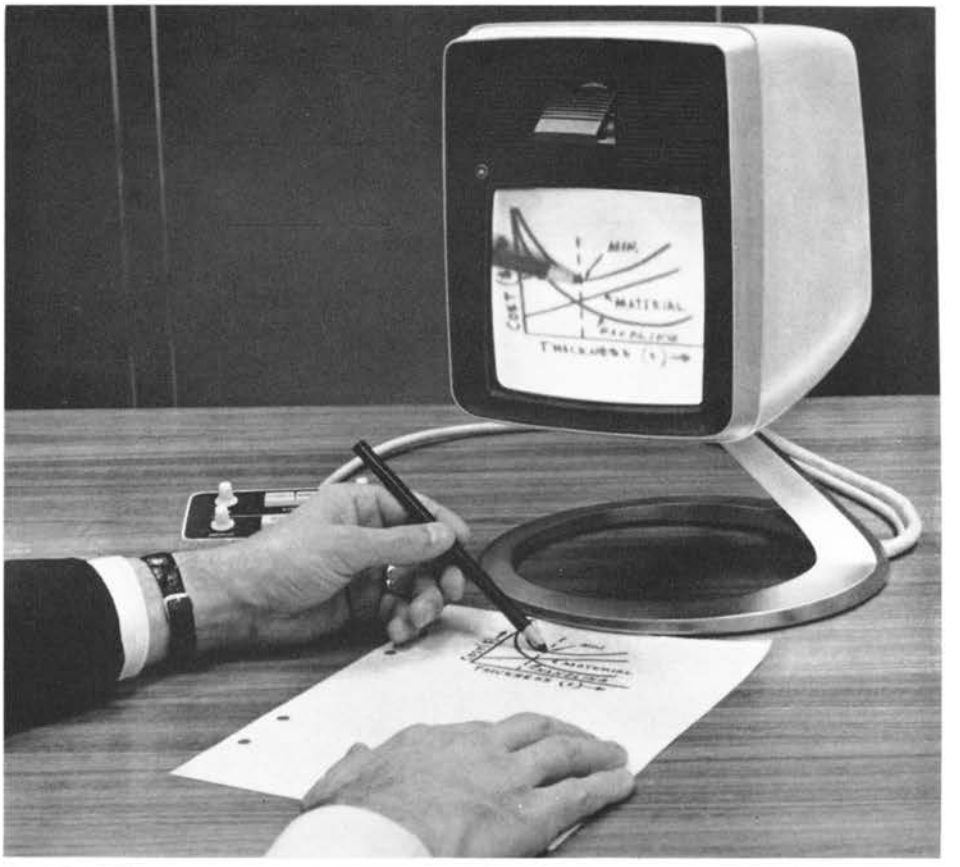
view. Another knob regulates the camera electronic zoom, a third controls the brightness of the displayed image, and a fourth knob is the volume control for the speakerphone. The microphone for the speakerphone is also contained in the control unit.

The four pushbutton controls enable the user (1) to initiate or answer a PICTUREPHONE or voice-only speakerphone call; (2) to see the picture he is sending out; (3) to prevent his picture from being transmitted (a pattern of three horizontal bars is sent instead); and (4) to end the call. The speakerphone microphone can be turned off, for momentary privacy if desired, by pressing the first pushbutton.

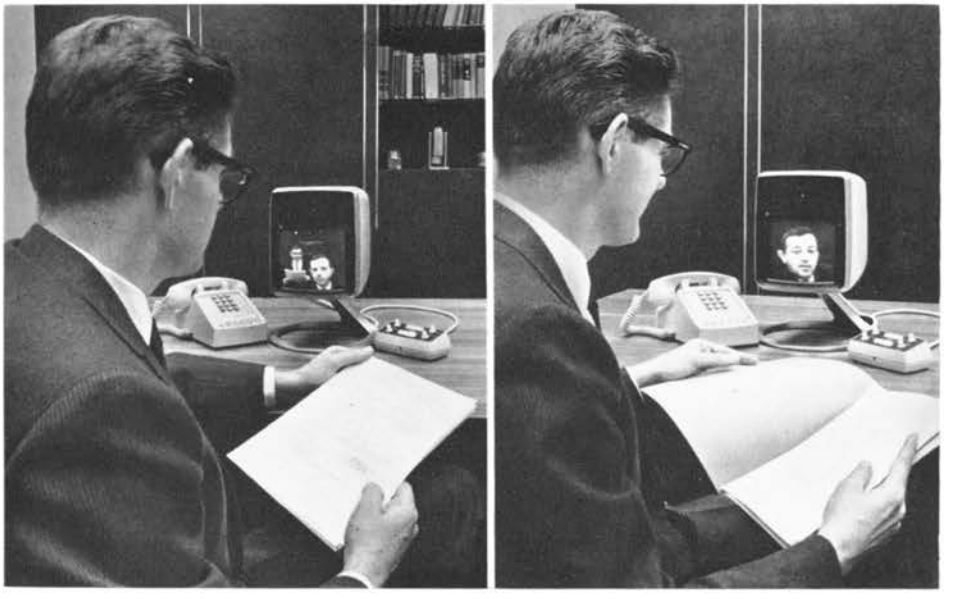
The compact service unit contains the power supply and control circuitry. It can be remotely located up to 85 feet away from the PICTUREPHONE display unit.

Modern electronic components, such as silicon integrated circuits and thin film circuits, are used throughout the PICTUREPHONE station set. Vacuum tube technology is used only in the picture tube and in the camera tube, both part of the display unit. However, integrated circuit technology is used to fabricate the silicon target in the camera tube. The display unit also contains the speakerphone speaker and some of the video controls. PICTUREPHONE station sets for the Bell System will be manufactured by the Western Electric Company.

PICTUREPHONE capability will be added to the telephone plant as an augmentation rather than a replacement for existing local and long distance telephone facilities. Regular telephone circuits with amplifiers added will be used to serve the customer from the central office. The central office and PBX switching will be accomplished by added video switching matrices under the control of existing switching machines. The voice portion of a PICTUREPHONE call will be switched through the same arrangements as for today's telephone service. Long haul transmission of PICTUREPHONE calls will utilize the same facilities designed for voice telephone service.



The Bell System's new Model II PICTUREPHONE set can be used to transmit drawings or charts by setting the camera focus at one foot. In the photograph, the "self-view" option is being used to position the graph while it is transmitted.



The electronic zoom feature of the Bell System's Model II PICTUREPHONE set enables the user to enlarge the field of view of the camera simply by turning a knob on the control unit. A camera iris automatically adjusts the lens aperture to compensate for any difference in the light intensity between the two scenes.