

New designs for the coin slot, coin release lever, coin return mechanism, and shelf, let handicapped people dial with much greater ease. The new features are aimed at handicapped people that have limited use in either their legs, their arms, or their hands.

Helping the Handicapped To Dial Easier

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MANY OF US ARE UNAWARE of the extraordinary difficulties that handicapped people face every day in performing tasks that are very simple and routine for an able person. This may be due partly to a misconception of the types of disabilities handicapped people have. We often imagine that handicapped people are confined to wheelchairs without the use of their legs, but with the upper part of the body functioning normally. Yet this image is largely untrue, especially for people who have incurred injuries of the spine. Spinal injuries resulting from automobile accidents, or industrial and athletic falls are, unfortunately, increasing. For a person with a spinal injury, a simple routine, such as lifting a telephone handset from the cradle or placing a coin in a slot, can demand a monumental effort.

With this in mind, Bell Laboratories, AT&T,

and New York Telephone people, pooled their talents and, with the help of the New York University Medical Center's Institute of Rehabilitation Medicine, developed a public telephone facility which makes it easier, even for severely handicapped people, to place calls. A public telephone console has been built that has been undergoing field trials since late 1970. This unit will satisfy the request made by local and federal government agencies to install public telephone facilities for the handicapped in new government buildings and in buildings financed in part by government funds. These newly designed telephone facilities and the recognition of such needs will help handicapped people adjust to society more readily.

Before the special telephones were built, many human factors and problems confronting handicapped people in using public telephones were

studied under the direction of an occupational therapist with the New York University Medical Center to determine what design objectives were appropriate. This work was done at Goldwater Memorial Hospital in New York City.

In the process of working with handicapped people, we were surprised at their incredible determination and ingenuity in operating public telephones, even those mounted at wheelchair height. One patient lacked the use of both her arms. Using her mouth and a stick with a hook at the end, she pulled the handset off the cradle and dragged it onto a board in her lap. With a coin attached to a piece of resin on the end of the stick, she then maneuvered the stick with her teeth until she dropped the coin in the slot. Again, with the stick clutched between her teeth, she dialed the telephone number. After she completed the call, however, someone else had to return the handset to the cradle.

Another patient could not raise his arm high enough to remove the handset from the cradle. He would try and flip the cord until the handset came free. Other times the handset would fall to the floor and he would have to retrieve it by a hand-over-hand method similar to raising a bucket from a well. After he completed his call, someone else had to return the handset to the cradle.

Thus, from these and other observations the following design objectives were finally agreed upon:

- The slot where coins are deposited should be a large target easily reached by a person seated in a wheelchair and should require only a minimum amount of dexterity with the fingers to insert coins.
- TOUCH-TONE® telephone buttons should be mounted on a surface nearly horizontal with sufficient space around the buttons to rest the customer's hands.
- The handset and cradle should be mounted on a low, nearly horizontal surface so it can be easily removed and replaced.
- Coins should be returned on a horizontal surface in a shallow recessed tray, which is approximately the height of the table.
- The coin return mechanism should have a large actuator requiring a minimum amount of force to operate.
- The complete unit should be convenient to use by both the physically handicapped and the able person.

Using a prototype model based on these suggestions, the woman with the mouthstick found it much easier to place a call. The coin entrance guide



To minimize difficult arm and hand movements, a public telephone for the handicapped is being tested at hospitals in several states. Besides hospitals, it is intended for government buildings.

was helpful; horizontal Touch-Tone telephone buttons were easy and convenient to use; and with a hook at the end of the stick, she was able to pull the coin return lever forward, depositing the returned coins in the recessed dish, and then lifting or dragging them out.

The new telephone works in a simple way. A call is made by lifting the handset and depositing a coin in the special coin entrance slot. After receiving a dial tone, the party dials the appropriate number and talks, as with a standard telephone. If the party that is called does not answer or the customer wishes to abandon the call before it is completed, he can retrieve his coin by first placing the handset on the cradle and then pulling the coin return lever forward. The coins drop into the depressed area (well) at the front edge of the unit. In the unlikely event the coins become jammed in the coin chute, the customer can retrieve them by first operating the coin release lever and then pulling the coin return mechanism forward. The coin release lever is wide enough to operate not only with the fingers but with the heel of the hand, forearm, or elbow. The depressions on both sides of the coin return are aids for persons with artificial limbs. Coins can be pushed to one side of the recessed tray where they stand on edge for easy grasping.

The telephone console was designed around a standard single-slot coin telephone. The dial and

handset were removed from the telephone. A control cable connects the coin release lever on the front panel of the console. A new coin return mechanism lifts change from the bottom of the telephone up to the level of the horizontal shelf for easy retrieval. Thus, the coin entrance slot can be located at a height that reduces the customer's reach, yet lifts the returned coins to a convenient level for retrieval.

The coin return mechanism incorporates several innovations in design. The force needed to operate it had to be minimal. To accomplish this, a special spring-and-arm assembly was devised. Although the spring holds the arm back in the nonoperated position, as the arm is pulled forward the tension on the spring remains nearly uniform.

A prototype model of a telephone for the handicapped is being built that can be wheeled to a patient's bedside, adjusted to the appropriate height, and plugged into a telephone jack. The unit should be especially helpful in hospitals where bedside phones are not normally available and coin phones are the only means of telephone communication. The wall-mounted telephone and the portable console will soon be available on a system-wide basis.



Even the most routine movements in dialing telephone calls can be difficult to accomplish for a person who is physically handicapped. Here, Roberta Wailes of the New York University Medical Center's Institute of Rehabilitation Medicine demonstrates the new telephone console (A through F) designed to help the handicapped dial. Coins are inserted more easily because the position of the coin slot (B) is lower than on standard public telephones, and the slot projects from the front panel so a customer can steady his fingers. (C) The TOUCH-TONE® buttons are located on the horizontal shelf so that the handicapped can rest their hand and dial with minimum effort. (D) If the party that is called cannot be reached or coins become jammed in the coin chute, the coins can be retrieved by actuating a coin release or a coin return mechanism. The coin release lever (E) and coin return mechanism (F) need only a minimum amount of force to operate. The coin release is flat and is located above the shelf. The coin return on the shelf operates by pulling the handle toward the customer to discharge the coins into the small basin in front. The telephone handset rests horizontally so it can be easily removed and replaced.



