

Mr. CALLAHAN. Yes; the need to maintain someone on duty at all times. In the beginning of such a system, it doesn't make much difference economically. But as traffic grows and the number of tapes to which access is available continues to increase and runs into hundreds and ultimately into thousands, possibly, then this ability to select any one of those tapes at random becomes very valuable.

The second application of Touch-Tone phone service I would like to demonstrate relates to the computer demonstration we had earlier. As you are aware, Mr. Chairman, computers today have the ability not only to generate signals to a teletypewriter to type out information, they also have voice-answer-back capability or can be equipped with voice-answer-back capabilities so they can in effect converse by telephone with a human being.

In order to demonstrate this feature and the ability of the Touch-Tone telephone to communicate with a computer, I would like to demonstrate how you can do some simple mathematics with the computer and the Touch-Tone telephone.

I will call the computer at the Bell System Data Training Center in Cooperstown, N.Y.

(Whereupon, Mr. Callahan demonstrated to the subcommittee the computer technique described.)

Senator NELSON. What is the purpose of this? I mean what particular aspect of it, the mathematics aspect?

Mr. CALLAHAN. As an actual fact last year, under the auspices of the IBM Corp. and New York Telephone, some high school students in New York City used the Touch-Tone telephone and a computer to do their mathematics homework.

Senator NELSON. Very practical.

Mr. CALLAHAN. The student sets up the problem, and instead of having to go through all the trouble of working it out, he sets up the problem and puts it into the computer. If he did it right, the answer will be right. So what it does, with the computation capability of the computer, it will relieve from professional people the necessity of doing the burdensome labor of mathematical calculations.

Senator NELSON. How would you use that in medicine?

Mr. CALLAHAN. May I defer that question to Dr. Meyer?

Dr. MEYER. We spend a fair amount of time doing physiological calculations. The one that drives me mad is the calculations that we were following of cardiac catheterizations where we calculate the flows and the resistances across valves or in holes in the heart and various physiological data like this. We get a certain amount of data and then it has to be processed in several different ways. Now, there are many, many types of uses where things are reduced to numerical figures, where physiological data is reduced to numbers and must be manipulated in the form of numbers to come out with some understanding, some understandable type of result. This is the type of thing that we would use it for in medicine.

Senator NELSON. All right.

Mr. CALLAHAN. Thank you, Dr. Meyer.

The impact of Touch-Tone telephone, Mr. Chairman, in medicine or in any other profession we believe is not very clear. It is a new service and like all other communications services it is going to have