

puter. To achieve this with a computer this small and inexpensive is highly significant in the economics of hospital operation and disease detection.

In addition to clerical work, there are 12 analog input lines that reach from the computer directly to the automated analytical equipment. While it processes other data as previously described, the computer actually takes readings directly from the various pieces of analytical equipment, interprets these readings, calculates the values and records these values as test results in patient files stored on magnetic tape. This portion of the computer activity we call "on line" operation.

A display on the video screen allows us to select which test the computer should perform. By depressing the E key, for instance, an electrophoresis program is called into the computer. Briefly to explain, Senators, the electrophoresis test represents the separation of some proteins in the serum. This test can detect disease such as cirrhosis, some cancers and other diseases. A variation of this test can be helpful in early detection of heart damage. A display on the screen shows the actual electrophoretic pattern as it would show on the computer screen. As the next step, I instruct the computer to analyze the pattern, give certain qualitative information and print out a complete report. To give you a firsthand look at this test report, later I will generate a report in the caucus room on the teletypewriter via the Data-Phone.

A routine physician's report formerly took at least 14 different slide rule calculations by a medical technologist, the time of the secretary to type it, and a considerable amount of time for the pathologist to review the pattern and arrive at some sort of diagnostic statement. We have programed our computer to do all of this including differential diagnosis. This computer will "diagnose" by matching the pattern for the present specimen against standard patterns programed into the memory. Reports are reviewed by the pathologist for validity and sent to the wards for placement on the patients' charts. Of course, you recognize that one could generate these reports on the hospital wards by the telephone lines as well as anywhere else in the world.

If we have requests for laboratory tests on a given day, we do these tests, and the computer puts information in the patient's file. When it is time to generate reports we add this data to all previous data on the patient, and prepare a new cumulative report. Patient information is provided on the heading and the test groups. We print out the normal values for each of the test procedures. We obtained these normal values in our own laboratory. Values are arranged in 12 different categories of sex and age. By doing this, every patient's test values can be compared against normal values for his sex and age. Senators, a 55-year-old male doesn't look like a 20-year-old student nurse. Why should we expect his blood chemistry values to be the same?

A program written exclusively by our team is for retrieval of data from our surgical pathology files. Several similar reports have been printed there previously and are available for examination. The output you will see is real data although we have deleted every other character to obscure the patient's name for this demonstration.

We are beginning to offer this type of data retrieval to various pathology and hospital laboratories. Soon we will handle the surgical