Installation of CDC 3600 Computer

July 17, 1964

A new, high speed, Control Data 3600 Computer System, which will be the fastest large general purpose computer system in Southern California, is scheduled for installation at the San Diego campus of the University of California, Monday, July 20.

The CDC 3600 is being shipped to San Diego in a special truck from the Control Data Corporation headquarters in Minneapolis, Minnesota. It will replace the present Control Data 1604 computer, in operation at the University's computer center since the center was established in 1961. The CDC 3600 will be one of the largest computer systems on any university campus. It will be housed on the third floor of Building B at the UCSD campus.

The new $2-3 million machine will be paid for on a monthly basis. However, owing to major educational grants forwarded by Control Data Corporation, cost to UCSD will be substantially lower than the value of the computer. The new UCSD computer will be the only CDC 3600 computer system in Southern California although the University operates two other CDC 3600s at its Lawrence Radiation Laboratory at Livermore.

The CDC 3600 is, for most scientific problems, 3.3 times faster than the CDC 1604. On certain problems it is over six times faster than the older machine.

Dr. Clay Perry, Director of the Computer Center since its inception, said the great number of scientific projects requiring use of the computer center have made the faster machine a necessity. He singled out the recent $1.2 million Air Force contract for an important research project on basic seismic detection problems as a primary reason for the need of the larger machine. In addition, the new Institute of Radiation Physics and Aerodynamics at UCSD and nuclear physics projects supported by the Atomic Energy Commission will require extensive use of the new computer, he said.

The first computer system at UCSD was established mainly through grants from the Atomic Energy Commission to explore computation problems in theoretical and high energy physics, Dr. Keith Brueckner, Dean of the First College, and Professors Carl Eckart and Walter Munk comprised the committee that established the first center. Since its start, the computer committee has been expanded to include representation in space science by Professor Carl McIlwain, in geophysical science by Professor Freeman Gilbert, and in mathematical science by Professor Stefan Warschawski.

There are currently a total of 66 large scientific projects involving large amounts of computer time scheduled at the UCSD computer center. The projects involve every department from oceanography to physics and cover a wide range of subjects from "Theory of Solids" to "Study of Earth Noise On Land and Sea Bottom."

Since 1961, the computer center has handled over 100 University projects, plus projects established by the United States Bureau of Commercial Fisheries, and by several government agencies and contractors in this area. This research has been described in over 100 papers published in scientific journals.

The new CDC 3600 has a capacity for 1.6 million memory cells, the tiny circular magnetic cores which store the basic information of the machine. Although this is the sane number of cells contained by the older 1604,

the greater speed of the 3600 makes it a much more versatile and useful machine. The new 3600 is capable of storing 262,144 alphabetical, numerical, or special characters in its fast memory system. It is able to store 32,768 words of eight characters and can retrieve any one of them in .7 microseconds or 1/1,500,000 of a second.

In addition, the computer can store 20 million characters on each of 14 magnetic tapes in its slow memory system. Here the recovery time depends upon the location of the word on the tape. Information can be read from the tapes at a rate of 120,000 characters per second.

In the field of numerical calculations, the CDC 3600 can add or subtract in 1.5 microseconds, can multiply numbers in an average time of from 1 to 6 microseconds, and can divide in an average time of from 1 to 14 microseconds. It can multiply two eleven digit numbers in 6 microseconds and can automatically perform computations with up to 25 decimal digits of accuracy in scientific notation.

Some of the circuits of the new computer have a total reaction time of only 9 billionths of a second. Reaction time for the main computation circuit is 62 billionths of a second.

In addition to superior speed, the CDC 3600 has what Dr. Perry calls "very versatile" input-output connections. It has special provisions for connecting experimental apparatus to the computer allowing an operator to feed information from the apparatus, such as a seismic data reader, directly into the computer without having to go through intermediate machinery. There will be connections from the large computer in input-output centers in Scripps Institution of Oceanography, the School of Medicine, the high-energy nuclear physics group, and other units of the expanding University.

Another new feature of the machine is its ability to check itself for errors in the memory and other units.

The UCSD computer center not only supplies a computing service for the University research and educational projects, but also carries-on research itself in computing methods and numerical analysis, and conducts courses in computer use for students and staff at the University.

A five-member research staff operates the computer center with an additional 20-man technical and operating staff working on the formulation of problems for the computer and operation of the machines.

Mr. Earl H. Ferguson and Mr. William G. Holsten, both programmers in the computer center, have been directing teams. working for nearly a year preparing the programming and operation systems for the new computer. Working with Mr. Ferguson and Mr. Holsten are: Mrs. Eva Clark, Miss Faith McCollough, Mr. Dave Newman, Mr. Michael Pierce, Mr. Robert Seid, Mrs. Jamie Swanson, and Mr. John Wild. Drs. Anthony Hassitt, Darrell High, Manuel Rotenberg and Miss Florence Oglebay have also helped in the planning for the new computer.