



FIG. 12. Typhoon Simulator. [Courtesy of RCA Laboratories]

2. Computer Systems

The types of problems that may be solved with analog computers will be described in part IV of this article. The present section will be concerned with the equipment that is available, and with the instrumentation for a specific example. A detailed description of a large number of computing systems can be found in the books by Korn (27) and Soroka (28).

Analog computers may be divided into specialized computers, which solve one family of problems, and general purpose computers. The general purpose computers have become more known in the last few years and a number of these are now commercially available. A picture of a computer of this type is shown in Fig. 13. Most commercial computers are d.c. instruments using feedback amplifiers as their main computing components. A difference is being made in the literature between fast computers (29), for which the results are commonly displayed on a cathode ray tube, and slower computers, whose outputs are given as paper recordings. The difference between these two classes lies in the accuracy obtainable with each type. For some typical differential equations, the fast computer may give results good to $\pm 5\%$, whereas the slower ones can give the same results to better than 1%.

A different approach to the solution of differential equations is used in the network computers as described by Harder and McCann (30).

In this case, differential equations are solved by electrical network analogs made up of resistors, condensers, and coils. Network computers have been used for the solution of partial differential equations (31). These equations are written in the form of finite difference equations to enable

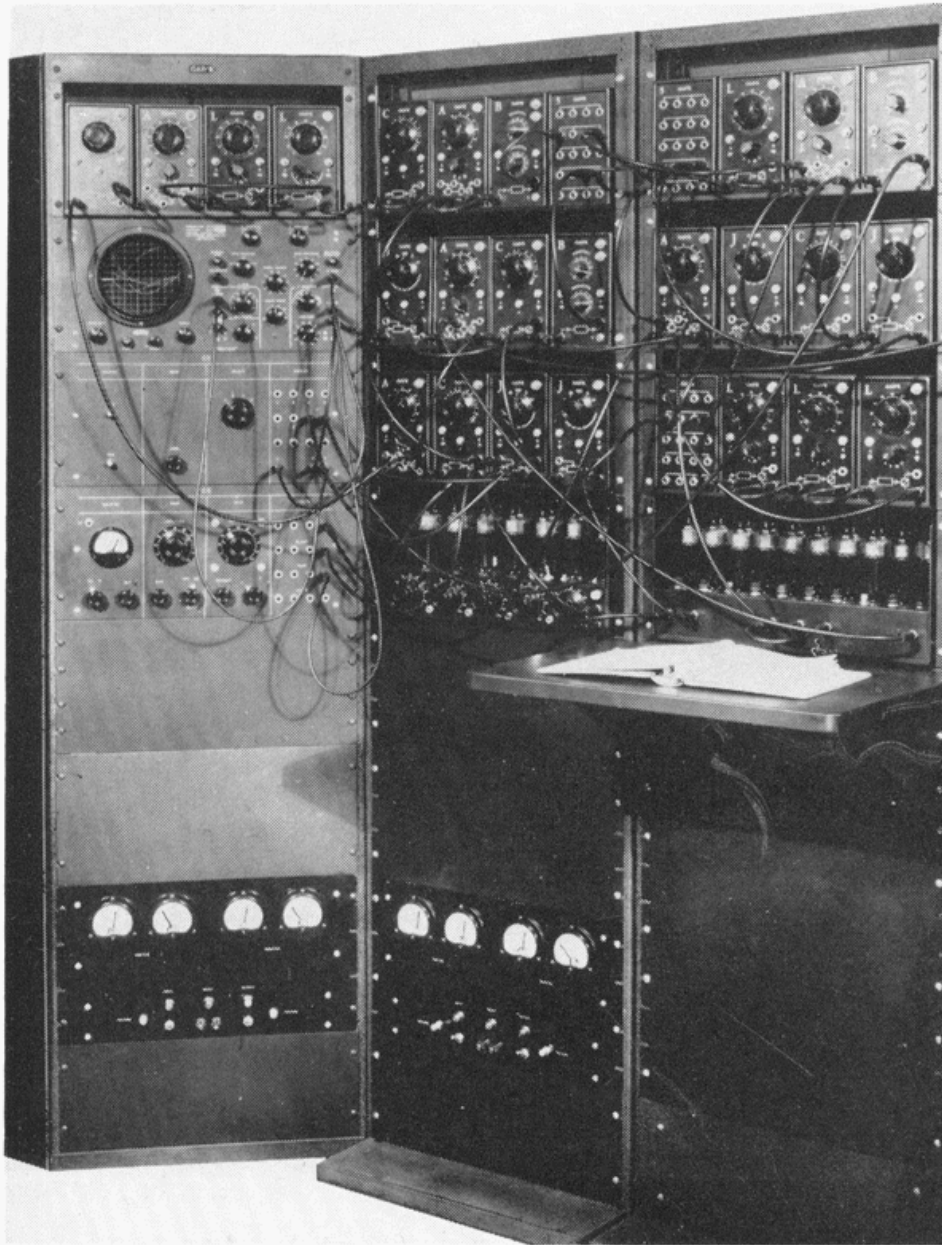


FIG. 13. An analog computer. [Courtesy of Geo. A. Philbrick Researches, Inc.]

the use of lumped circuit components. Finite difference equations have also been solved with d.c. analog computers, and Howe and Hanneman (32) have shown that very good accuracies can be obtained.

Resistor network computers have been described in Volume II of