RC 4000 COMPUTER®

SPECIFICATION

SOFTWARE

DIAGNOSTIC PROGRAMS

The diagnostic programs supplied with the RC 4000 enable rapid repair of the computer system. Many of these hardware test programs not only detect failures, but isolate them in specific modules as well.

There are two groups of programs, the one for the central processor, the other for the peripheral devices. A major difference between the two types of programs is that those for the peripherals presuppose that the central processor itself is working correctly; this cannot of course be assumed with regard to programs of the first type, for which reason diagnostic programs for the central processor are often referred to as self-check programs.

Diagnostic Program for the Central Processor

The self-check programs are oriented toward the checking of hardware failures in micro-commands, decoding networks, arithmetic registers, and the like. If these tests indicate that the central processor is working correctly, an O. K. message is typed on the operator's typewriter. If an error is found, relevant information is typed out whenever possible; it should be noted, however, that some errors have the effect of destroying the programs completely, thereby preventing further communication between the operator and the self-check program. Under these circumstances the operator must resort to the simple diagnostic programs, which can be executed manually from the maintenance panel.

The self-check programs are normally controlled by the monitor system, which executes them at regular intervals. A special version of the programs, which can be loaded by means of the autoload key, is also supplied.

Special programs for testing the core store are available as well. One of these programs, for example, generates a worst-case bit pattern and writes it into the core store, after which the program begins to read and check the store word by word. In the event of an error, the erroneous word and its location are indicated.

Diagnostic Programs for the Peripheral Devices

A set of diagnostic programs has been designed for each type of peripheral. The prime objective of this assembly of programs is to minimize the tedious task of manual error detection and location. The programs are normally stored on paper tape or magnetic tape, from which they can be loaded into the computer ready for use. All of the programs are controlled from the operator's typewriter in a conversational manner.

One group of programs checks, for each device, the four input/output commands (sense, control, read, write), status bits, local/remote status, interrupt signals, and watchdog timer, performing additional tests depending on the device in question. A second group of programs has been developed especially for locating errors detected by the first group of programs.

Automatic Error Indication

The computer system is constantly supervised for gross failures, even when the diagnostic programs are not being run. This automatic error indication, made possible by additional hardware, includes the following:

core store:	check for parity error
read-only store:	check for parity error
power supply:	check of current and voltage levels
temperature:	check of temperature in cabinets
blower assembly:	check that fans are operating

SOFTWARE

4000 COMPUTER®