CHAPTER III

CONVERSION OF MOSTPROSIT

Conversion of MOSTPROSIT for use on an IBM 370/138 computer was necessary because of the different special features between it and a CDC Series 6000 computer. Various special features had been incorporated into MOSTPROSIT when it was first developed on a CDC computer in order to minimize time consumption. Other minor changes stemmed from such seemingly trivial things as the name length of a variable or subroutine (8 letters vs. 6 on IBM), the sign for hollerith statement (* vs. ' on IBM) the usage of multiple equal-signs in a statement (allowed on CDC but not on IBM), etc.. On a CDC Series 6000 data may also be entered into a labelled COMMON via a DATA statement, our IBM 370/138 still did not allow this. To enter data into a labelled COMMON it was necessary to use a BLOCK DATA subprogram, which must not contain any executable statements.

Since we had no intention at all to carry out any stochastic (Monte-Carlo) simulation with the aid of MOSTPROSIT, the present conversion did not cover this important aspect of it. For example , executable statements associated solely with stochastic simulation are made into comment statements.

Furthermore, subprograms for manipulating disk files, such as READPF, RENAME and SAVEPF available on the CDC computer system at the University of Texas at Austin, were simply replaced with their do-nothing namesakes.

A test of the validity of the converted program was carried out with an example of " A Simple Solar Water Heating ". The test system consisted of a flat-plate collector (module 15), an on/off controller (module 14) which activated the circulation pump (module 6), and a constant-temperature water supply, as shown in FIGURE 3.1. Two other modules that were required are:

a) Data reader (module 13) to read the necessary meteorological data (in this case only 24 hours).

b) Solar radiation processor (module 9) to estimate from the read-in data the solar radiation incidental on the inclined flat-plate collector.

FIGURE 3.2 shows some histograms for the control variable of the controller (module 14) (top histogram) and the instantaneous solar radiation normal to the ground (bottom one), respectively. It is clear from the top histogram that the pump is operated for 9.9 hours. The bottom one shows that the solar flux at 6 o'clock in the morning is 5.05 kJ/m^2 hr and the total solar fux is 18130 kJ/m^2 day.

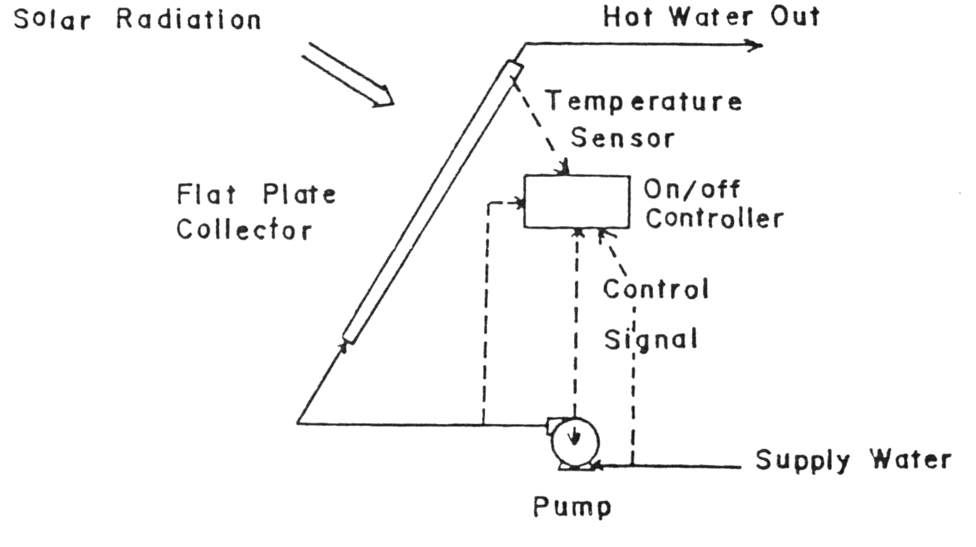

FIGURE 3.1A SIMPLE SOLAR WATER HEATING SYSTEM

```
        HISTOGRAMS OF FREQUENCY DISTRIBUTIONS AT TIME =      24.000

   OUTPUT NO.  1      MIN = -0.5000E 00     XMAX =  0.1500E 01
 INTERVAL ENDING              HOURS IN INTERVAL
  0.5000E 00       0.1410E 02     I
  0.1500E 01       0.9900E 01     I
           TOTAL = 0.2400E 02


        HISTOGRAMS OF TIME INTEGRALS AT TIME =      24.000

   OUTPUT NO.  1      MIN =   0.0              XMAX =  0.2400E 02
 TIME INT ENDING        SUM OF INTEGRALS OVER TIME INTERVAL
  0.1000E 01       0.0              I
  0.2000E 01       0.0              I
  0.3000E 01       0.0              I
  0.4000E 01       0.0              I
  0.5000E 01       0.0              I
  0.6000E 01       0.5050E 01       I
  0.7000E 01       0.1070E 03       I*
  0.8000E 01       0.6770E 03       I
  0.9000E 01       0.1530E 04       I
  0.1000E 02       0.2210E 04       I
  0.1100E 02       0.2635E 04       I
  0.1200E 02       0.2783E 04       I
  0.1300E 02       0.2737E 04       I
  0.1400E 02       0.2516E 04       I
  0.1500E 02       0.1302E 04       I
  0.1600E 02       0.3499E 03       I
  0.1700E 02       0.2530E 03       I
  0.1800E 02       0.1695E 02       I
  0.1900E 02       0.5173E-04       I
  0.2000E 02       0.0              I
  0.2100E 02       0.0              I
  0.2200E 02       0.0              I
  0.2300E 02       0.0              I
  0.2400E 02       0.0              I
           TOTAL = 0.1813E 05
```

FIGURE 3.2 HISTOGRAM OF FREQUENCY DISTRIBUTIONS OF CONTROL VARIABLE AND HISTOGRAM OF TIME INTEGRALS OF THE INSTANTANEOUS SOLAR RADIATION NORMAL TO THE GROUND

The reasonable results from the test example and the fact that no more compilation errors had been detected led us to conclude that the conversion of MOSTPROSIT was finally successful.