



Chapter 5

Software's Design

To enable the testing of the hardwares developed in chapter 4. The following softwares are developed.

1. Display Station Software
2. Coaxial Data Capture Software
3. IBM 3278 Communication Software
4. IBM 3274 Communication Software
5. Microcomputer to microcomputer Communication Software

5.1 Display Station Software

A program is developed in Pascal on an 8 bit microcomputer under the CP/M operating system to enable screen editing according to the IBM 3278 specification, but it is later found that this concept could not be used by the IBM 3278, the IBM 3274 handles all the IBM 3278 screen editing functions. So this program is abandoned later.

5.2 Coaxial Data Capture Software

Program is developed to control 3270CIB, to capture the data transmitted in coaxial cable. Two programs are developed, first, the program to capture

data without data bit 10 and bit 11, second, to capture data with data bit 10 and 11. Appendix N, and Appendix O illustrates the program listing. The program logic for first program is illustrated in Figure 5.1, and the program logic for another program is illustrated in Figure 5.2. Both programs were written in 8086 Assembly Language because the personal computer used has a 80286 CPU (80286 CPU is upward compatibled to 8086 CPU). The data captured will be stored in resident memory, and can be restored by using a debug program on the personal computer. The data segment of the resident memory is the same as the code segment of INT 73, and the offset is 103H.

5.3 IBM 3278 Communication Software

Two programs are developed to enable both hardwares described in chater 4 to communicate with IBM 3278.

1. Program is developed to enable the communication between personal computer and 3278, using the 3270CIB. The character of key pressed on the personal computer is displayed on both the personal computer and IBM 3278, and character of key pressed on the IBM 3278 is displayed on both the IBM 3278 and personal computer. The program listing is illustrated in Appendix P. It is written in 8086 Assembly Language, because the controlling CPU is 80286.

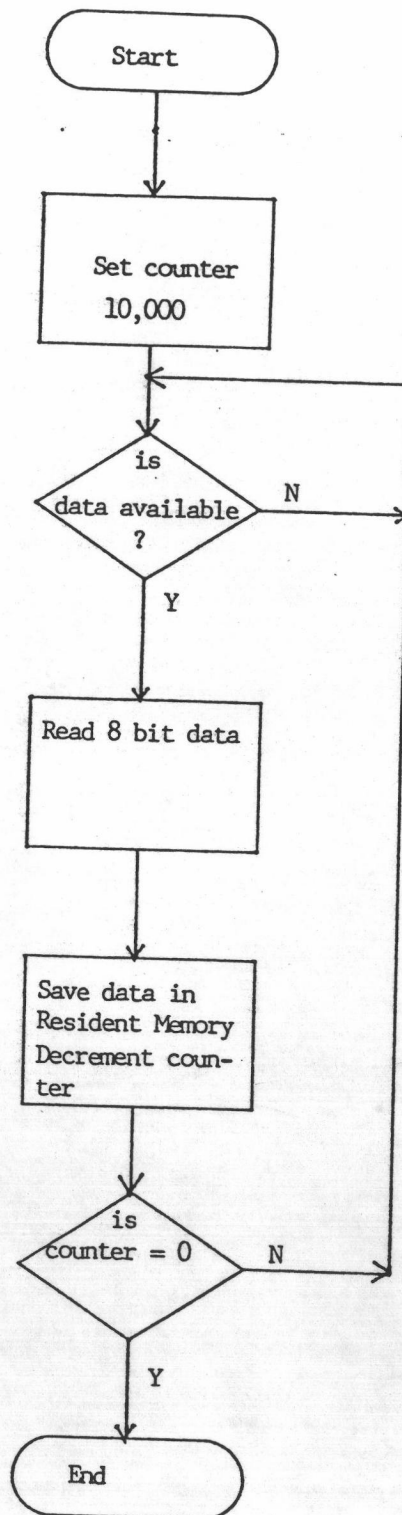


Figure 5.1 Program logic for capturing data without data bit 10, and bit 11.

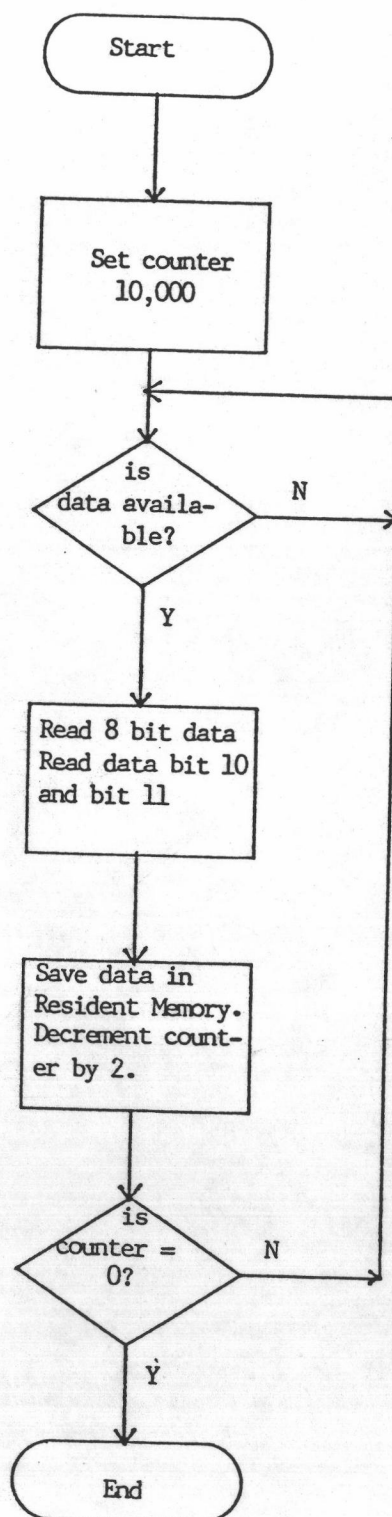


Figure 5.2 Program logic for capturing data with data bit 10, and bit 11.

The program constantly polls the IBM 3278 for scan code, and also polls personal computer for any key pressed. If scan code is received from the IBM 3278, then it is converted to buffer code and transmitted back to IBM 3278 for displayed, and also the scan code is converted to ASCII code and displayed on the personal computer. If there is a key pressed on the personal computer, it is displayed on the personal computer and the ASCII code is converted to buffer code and transmitted to IBM 3278 for displayed. The program logic is illustrated in Figure 5.3.

2. Program is developed to enable the communication between microcomputer and IBM 3278, using 3270CAB. The data received from RS-232C input is echo back and displayed on the IBM 3278, and character of key pressed on the IBM 3278 is displayed on the IBM 3278 and transmitted to the microcomputer. The program listing is illustrated in Appendix S. It is written in Z80 Assembly Language, because the controlling CPU is Z80A.

The program constantly polls the IBM 3278 for scan code, and also polls the RS-232C for any data input. If scan code is received from the IBM 3278, then it is converted to buffer code and transmitted back to IBM 3278 for displayed, and also the scan code is converted to ASCII code and transmitted to the microcomputer. If there is data from RS-232C, it is echoed back, and the ASCII code is converted to buffer code and transmitted to IBM

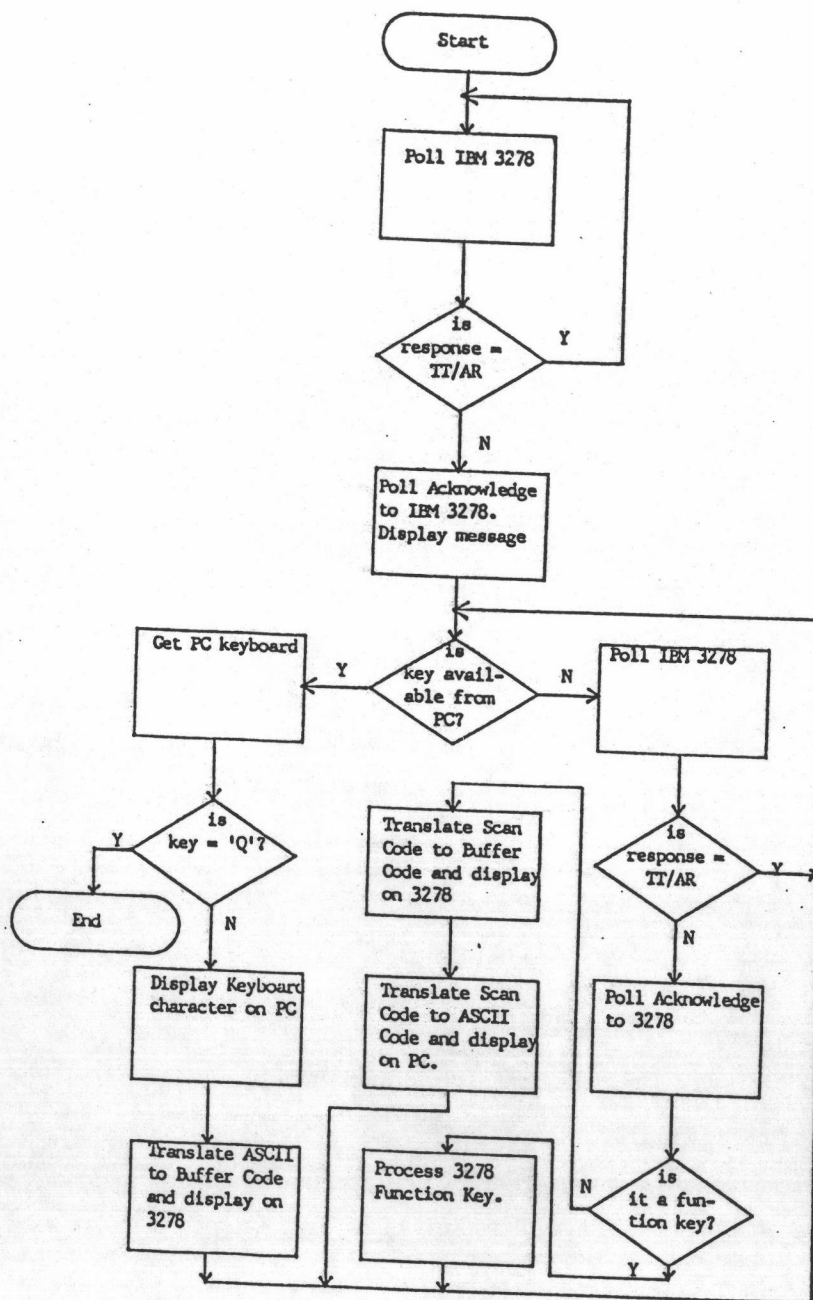


Figure 5.3 Program logic for interfacing 3270CIB to IBM 3278.

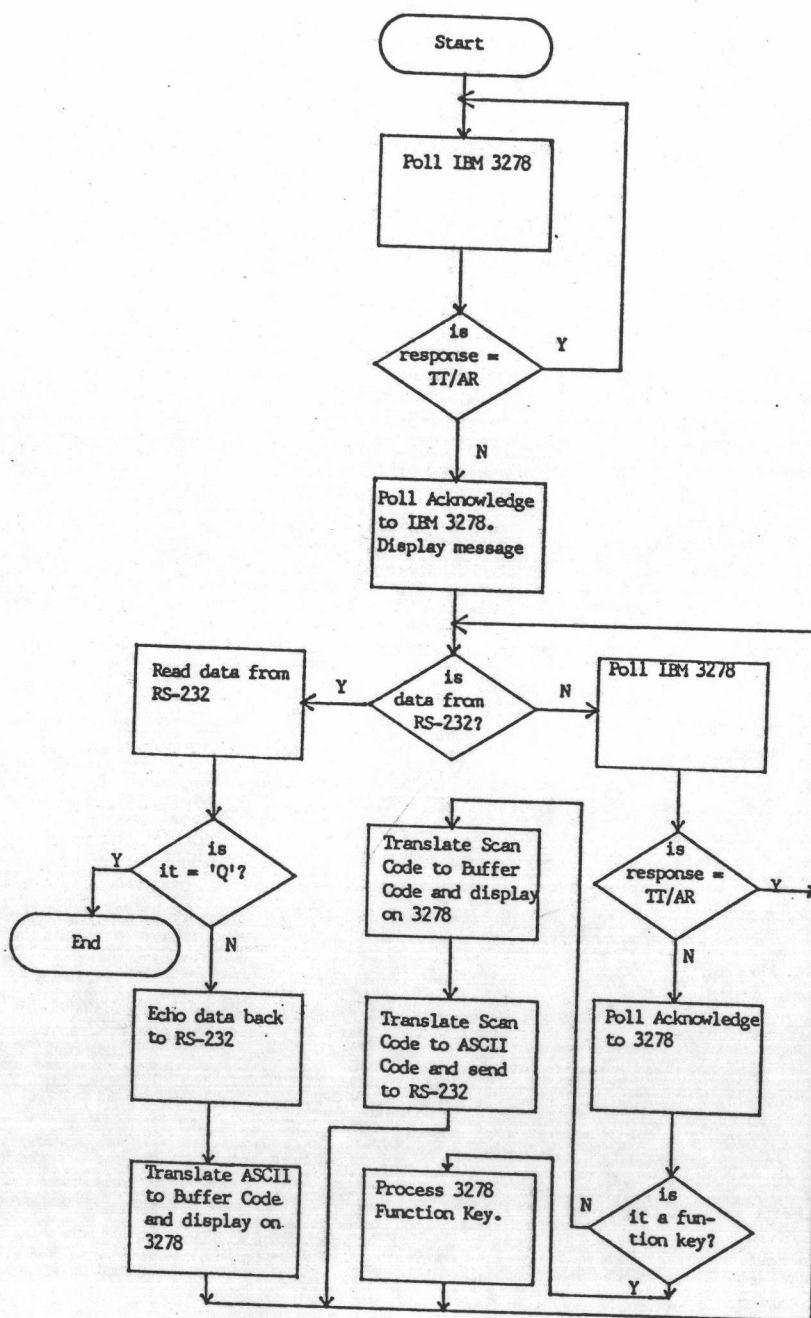


Figure 5.4 Program logic for interfacing 3270CAB to IBM 3278.

3278 for displayed. The program logic is illustrated in Figure 5.4.

5.4 3274 Communication Software

Program was developed to enable the communication between microcomputer and IBM 3274, using the 3270CIB emulating as IBM 3278. It will respond the the polling from IBM 3274. If there is a key pressed on the personal computer, the ASCII code received is converted to scan code and transmitted to the IBM 3274 in response to the poll command. The program logic is illustrated in Figure 5.5. and the program listing is illustrated in Appendix Q. The program is written in 8086 Assembly Language, because the controlling CPU is 80286.

5.5 Microcomputer to Microcomputer Communication Software

Program is developed to enable the communication between two microcomputer, using the 3270CAB. Data received from the RS-232C is buffered and transmitted to another RS-232C, upon receiving of ASCII code 0DH. The program logic is illustrated in Figure 5.6 and the program listing is illustrated in Appendix R. The program was written in Z80 Assembly Language, because the controlling CPU is Z80A.

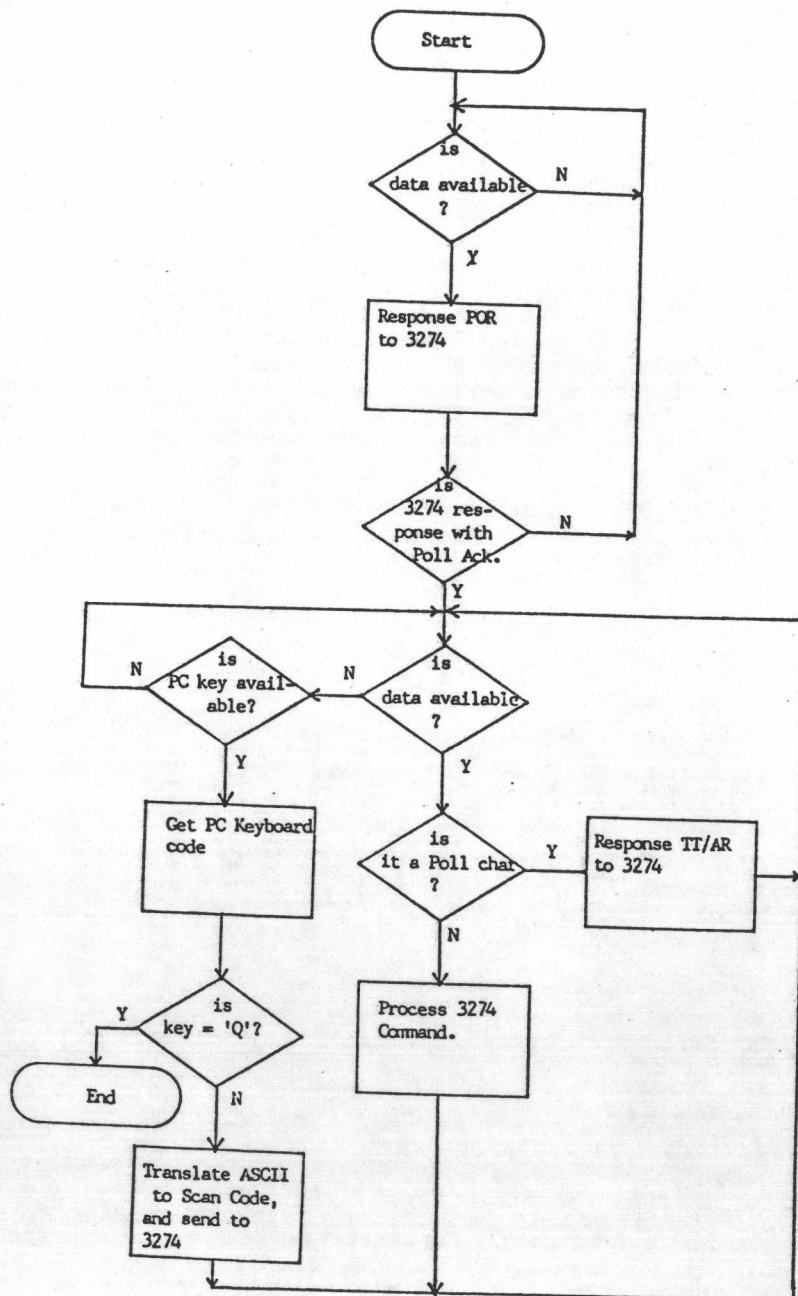
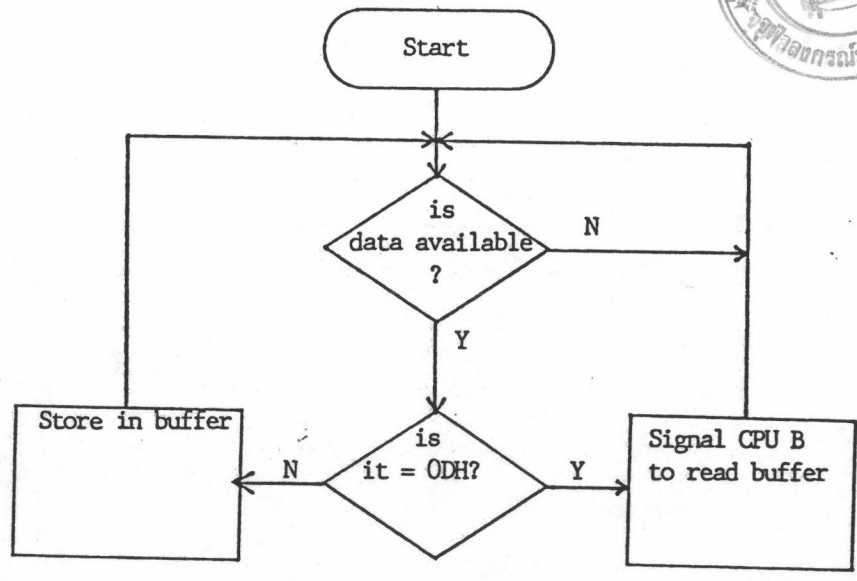
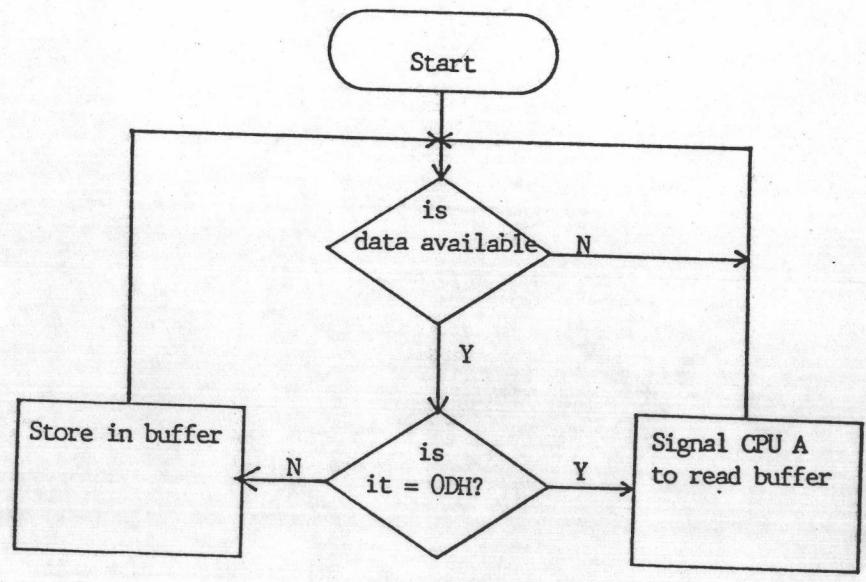


Figure 5.5 Program logic for interfacing 3270CIB to IBM 3274.



a. Program logic for CPU A.



b. Program logic for CPU B.

Figure 5.6 Program logic for microcomputer to microcomputer communication.