

## THE SYSTEM BOARD

Please check if your COMPUTER OPU which is not V-20, skip this chapter, and refer the attached manual at the appendix system board.

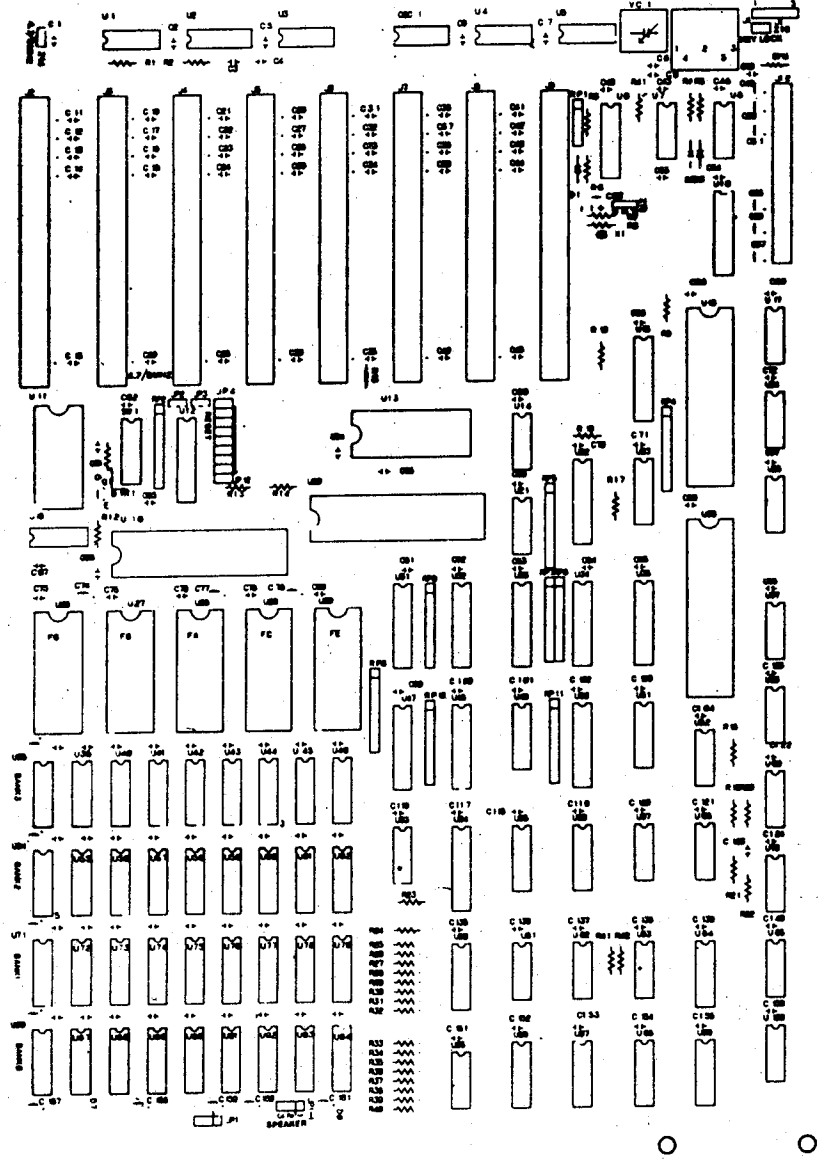
- A) Seven jumpers
- B) One DIP switch
- C) An V-20 microprocessor
- D) TURBO mode (8MHz) that can be switched by hardware or software.
- E) TURBO mode (14MHz) that can be switched by software when E14 jump connected.

The user may :

- i) Increase or decrease amount of RAM to fit his needs.
- ii) Extend ROM by use of EPROM, chips added in the ROM expansion sockets.
- iii) Access TURBO mode, through, either software or hardware.
- iv) Select display type and screen size.

In order that the user may familiarize himself with the physical location of the components making up the system board, diagram 5.1 has been provided. This will help the user to locate and make any changes that he may desire.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25



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## **MICROPROCESSOR**

The system board used an NEC V-20 microprocessor, which supports 16-bit operations, including multiplication and division. These 16-bit operations allow the addition of an 8087 co-processor. The microprocessor is software compatible with the 8088 and can run in TURBO mode.

## **RAM**

The RAM space of the system is divided into four memory banks, numbered 0 to 3. They are four parallel rows of RAM chips. Each of these rows is comprised of nine RAM cells. There are nine blank spaces on a memory bank that can be filled with nine RAM cells. Eight of these cells are active memory and the last one is the parity chip for the bank. Therefore, the bank 0.1 is for 41256 memory chips. Bank 2.3 for 4164 memory chips.

## **TURBO MODE**

TURBO mode is obtained by either connecting Z14 (hardware switch) or JP12 (software switch). In TURBO mode, the processor's speed is 8MHz.

If the pins of JP12 are connected together with E14 then 14MHz TURBO mode is obtainable through software can be executed through the keyboard.

and < ALT > keys, then press the < - > (KEYPAD minus) key. The cursor on the screen will then appear as a "■" (BOX). To return to Standard mode repeat the steps above, and the cursor will appear as a "—" (UNDER-LINE).

Standard mode is always the default mode. Since there are two settings for TURBO mode, one with a faster clock speed than the other, it is recommended that the slower of the two settings be used.

## **JUMPERS**

The system board has five jumper connections. Listed below are the jumper connections and their functions.

### **J1: KEYBOARD CONNECTOR SOCKET.**

J1 is located near the keyboard socket on the system board and uses six pins. The pin assignments are as follows:

- PIN 1: — RESET DRIVE
- PIN 2: + 5 Volts DC
- PIN 3: KEYBOARD DATA
- PIN 4: GROUND
- PIN 5: KEYBOARD CLOCK

## **Z13: HARDWARE RESET AND POWER INDEX LED CONNECTOR**

The HARDWARE RESET jumper is an added feature that serves as a backup to the software reset (this is operated by pushing the < Ctrl > , < Alt > and < Del > keys simultaneously.) The purpose for this jumper is to allow the user a means of restarting the machine in case of system jam.

The circuit between pins G and R is the HARDWARE RESET and the circuit between pins G and R is the LED indicator for power. The LED will light up when the system is power on.

The following is a list of pin assignments for jumper 8

Pin P: POWER ON

Pin G: GROUND

Pin R: RESET

## **Z14: CPU SPEED SELECT JUMPER**

This jumper is used in the selection of the TURBO mode.

- A) If none of the pins are connected, then a standard speed of 4.77MHz is being used.
- B) If both pins are connected, then the processors is in the TURBO mode of 8MHz.

## **Z15: KEYBOARD LOCK CONNECTOR**

When the circuit is closed, the key board cannot transmit data to the CPU. It has, essentially locked the keyboard out of the computer. The switch on this circuit is a locking spring switch.

Pin 1: KEYBOARD INHIBIT INPUT

Pin 2: GROUND

## **JP-1: SPEAKER CONNECTOR**

This jumper simply incorporates the system's speaker.

Its pin assignments are as follows:

Pin 1: SPEAKER OUT

Pin 2: +5 Volts DC

Pin 3: +5 Volts DC

## **SWITCHES**

There is one DIP (dual in-line package) switch on the main system board. On this switch is a set of eight slide switches that can be set either ON or OFF. This switch can be adjusted to allow the microprocessor to access the devices connected directly or indirectly to it (RAM or any peripheral devices).

The location of the DIP switch is shown in diagram 5.1, between jumper 2 and jumper 4. The following list is a summary of the slide switch settings. This summary provides the user with an overview of the functions of the switch.

Below explains the functions of the DIP switch.

SW - 1: The normal position of this slide switch is OFF.

SW - 2: This switch is for the 8087 co-processor installation.

SW - 3 and 4: Is the number of Memory Banks that are enabled.

SW - 5 and 6: Monitor Type.

SW - 7 and 8: Number of Floppy Disk Drives.

The following are the examples of all the slide switches on the DIP switch, when they are both ON and OFF.

SW – 2

OFF – The system operates with the 8087 co-processor  
ON – The system operates without the 8087 co-processor

OFF OFF – memory size at least 256KB

SW – 5 SW – 6

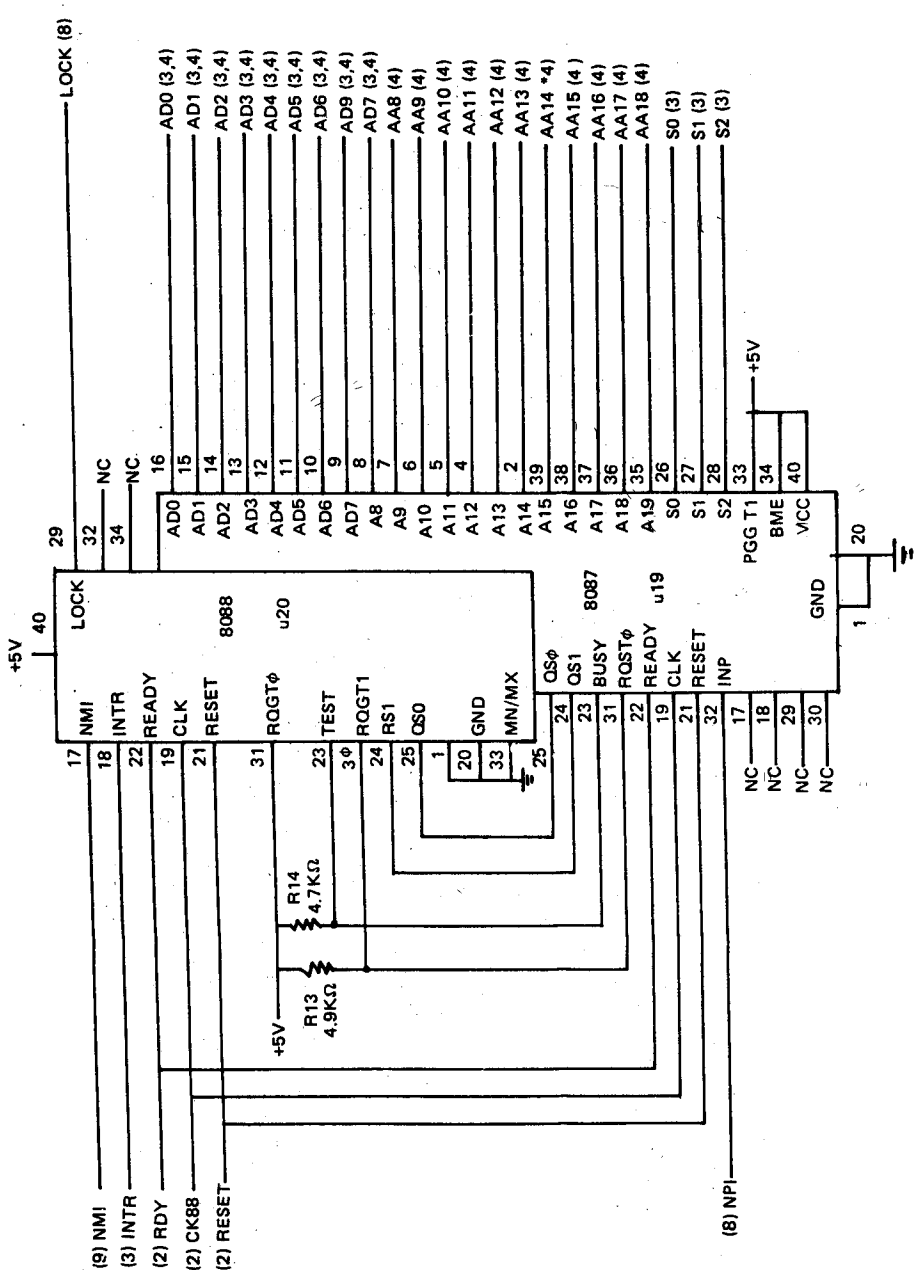
ON ON – The display is Enhanced Graphics Adapter (EGA)  
ON OFF – The display is colour with an 80 x 25 screen dimension  
OFF ON – The display is colour with a 40 x 25 screen dimension  
OFF OFF – The display is monochrome with an 80 x 25 screen dimension

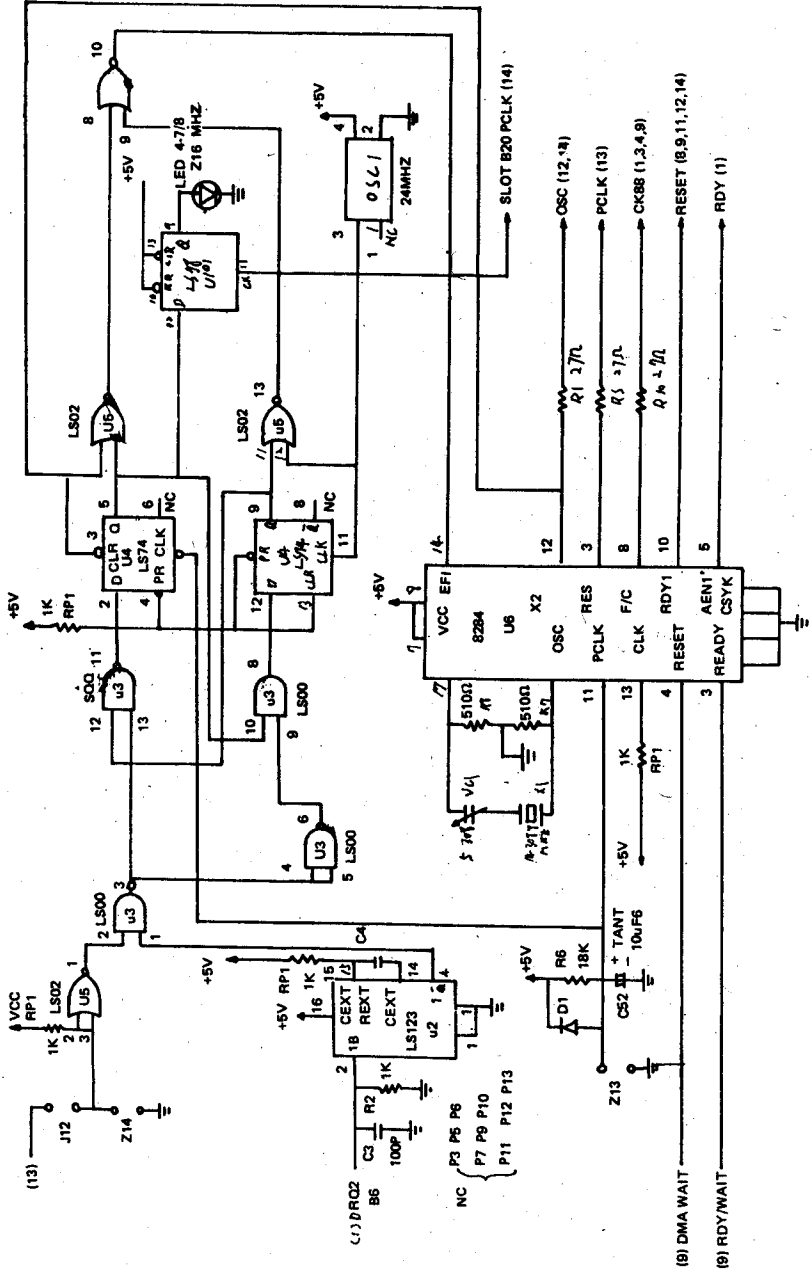
SW – 7 SW – 8

ON ON – Enables 1 floppy drive  
ON OFF – Enables 2 floppy drives  
OFF ON – Enables 3 floppy drives  
OFF OFF – Enables 4 floppy drives

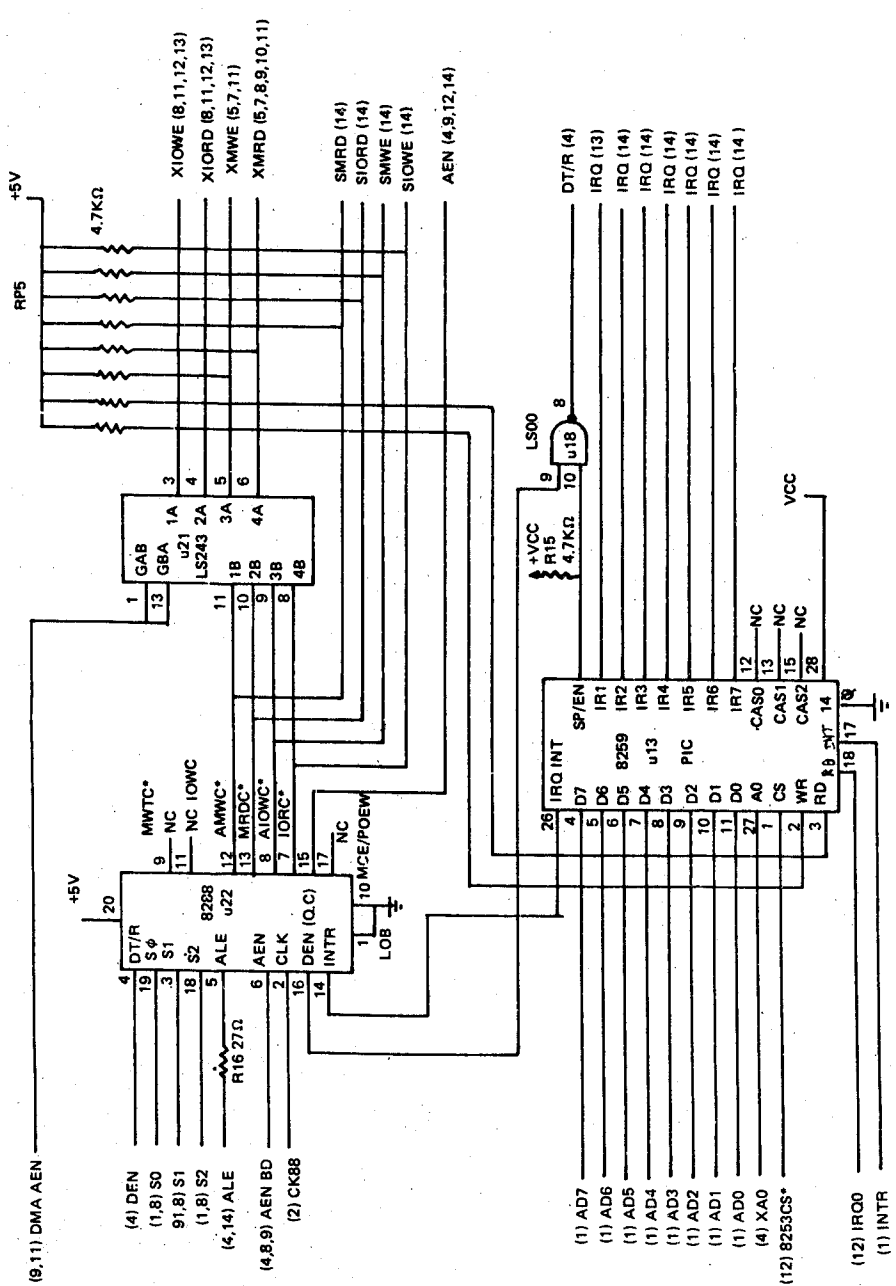
**WARNING: DONT COUNT HARD DISK (WINCHESTER) DRIVES**

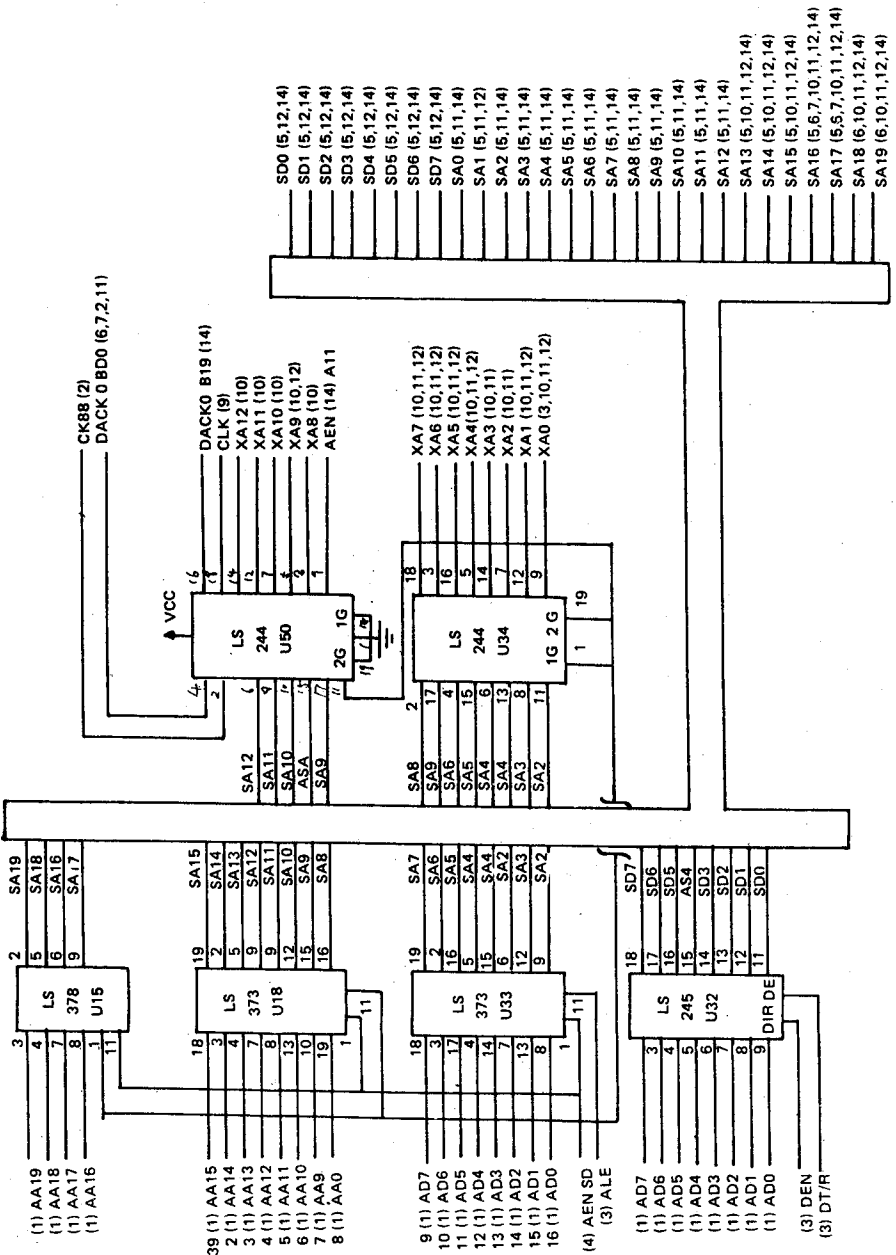


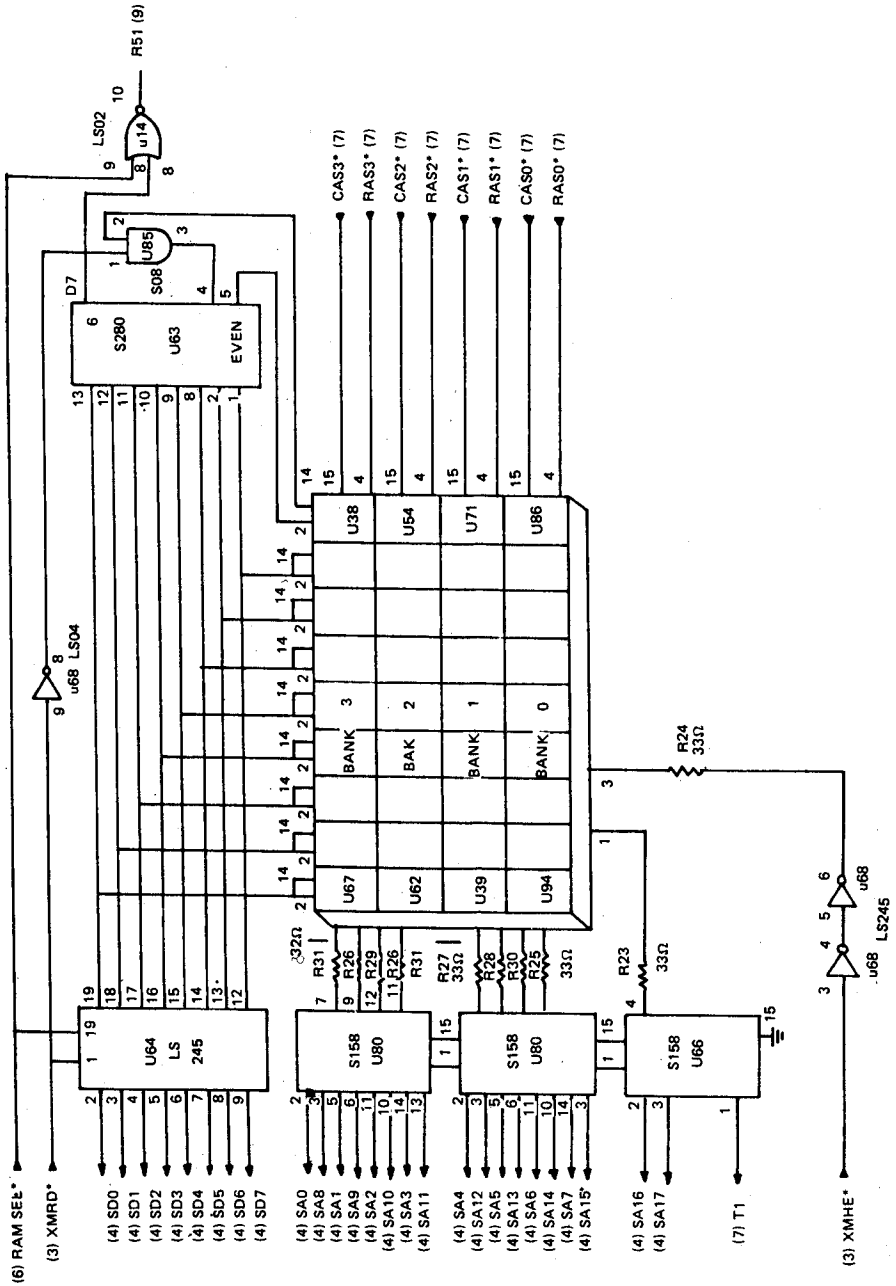


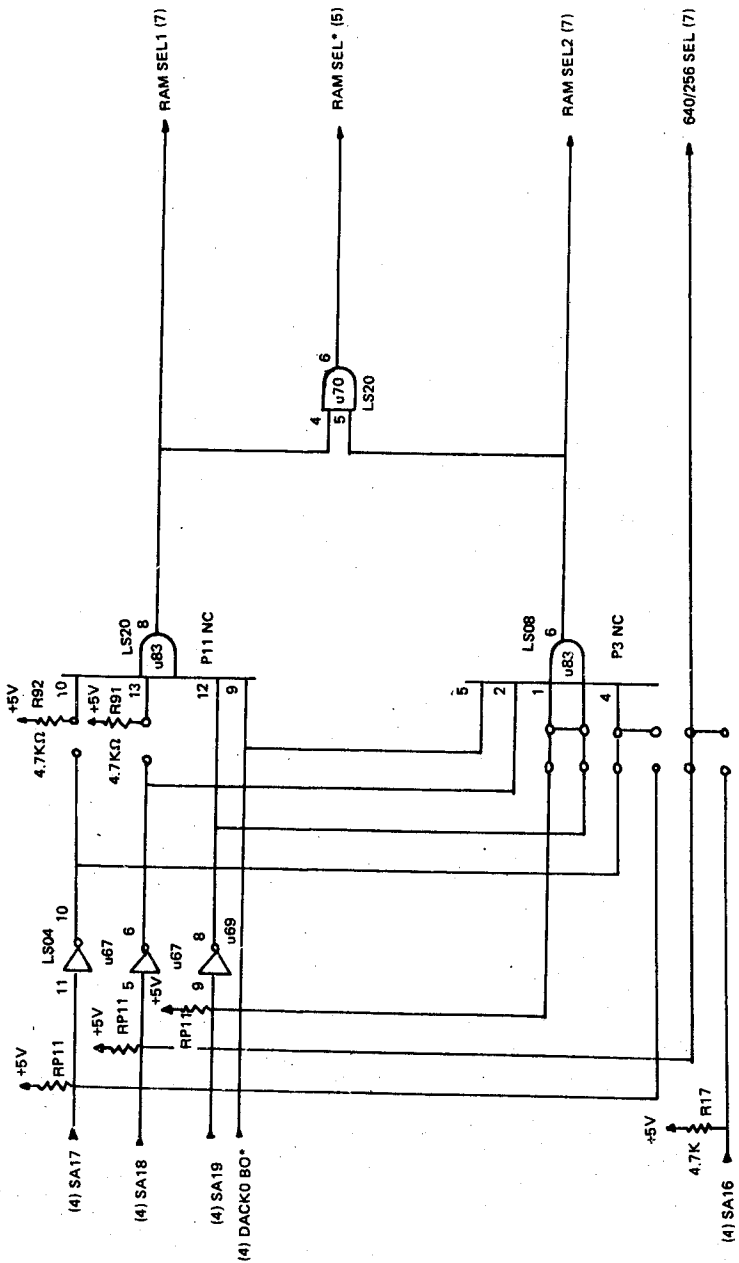


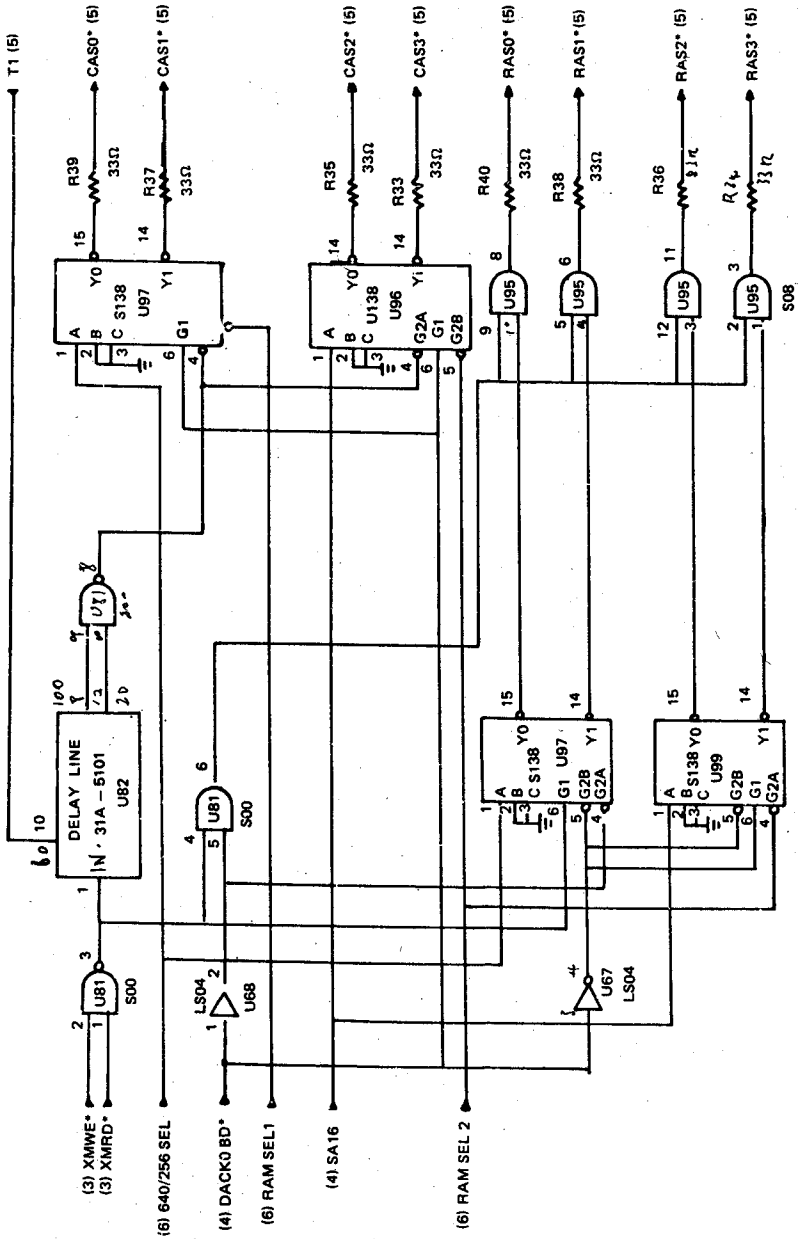
(9) DMA WAIT  
 (8) RDY/WAIT

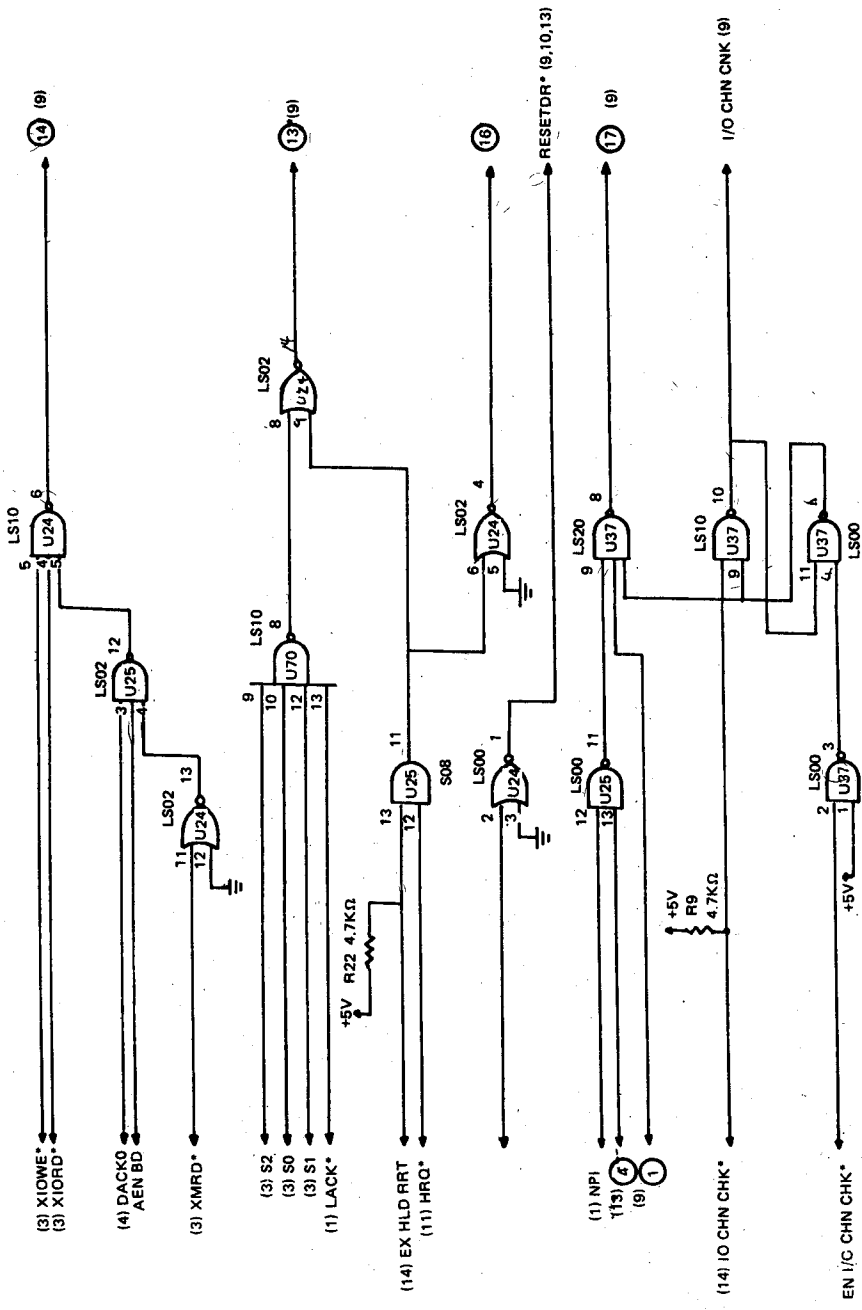




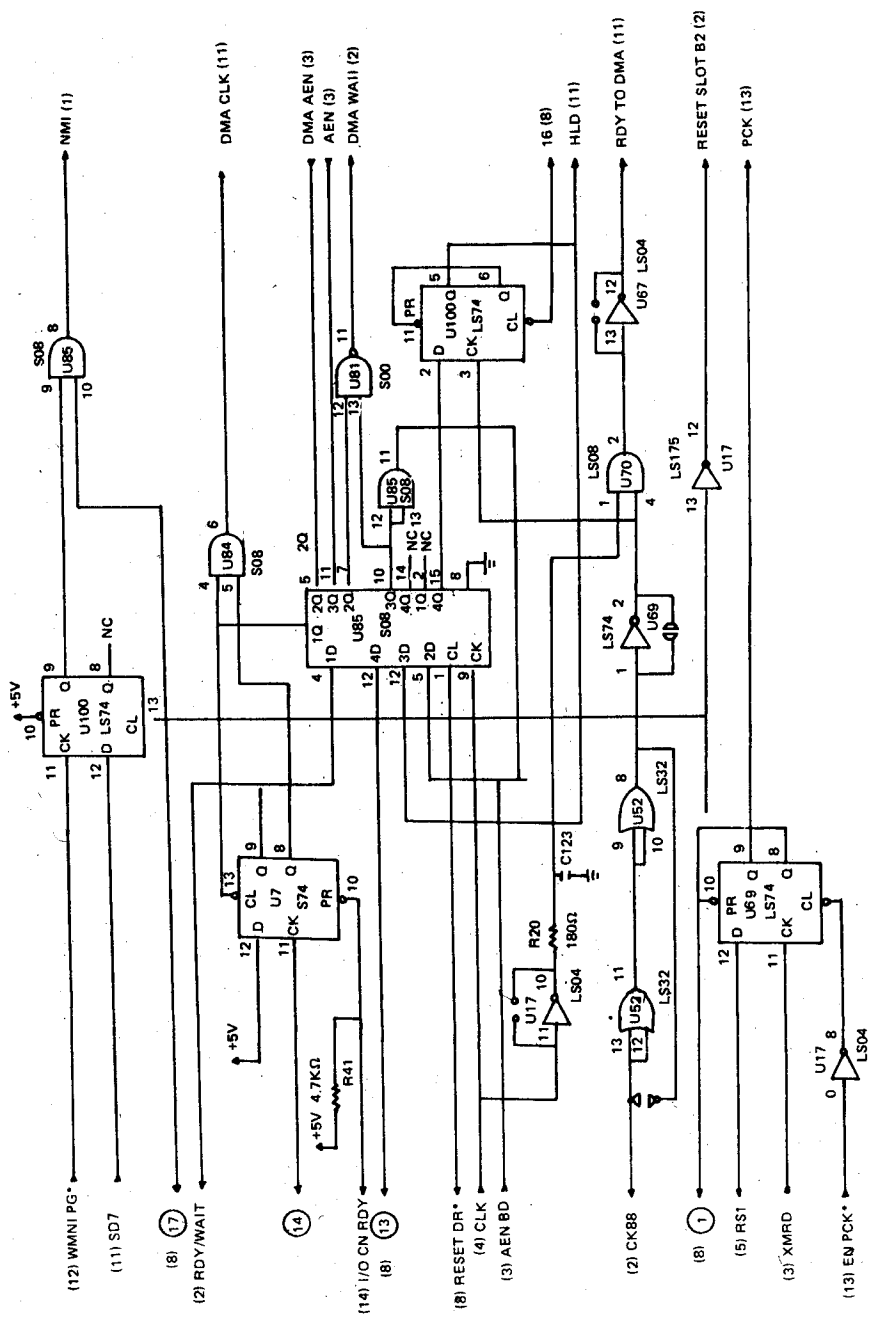


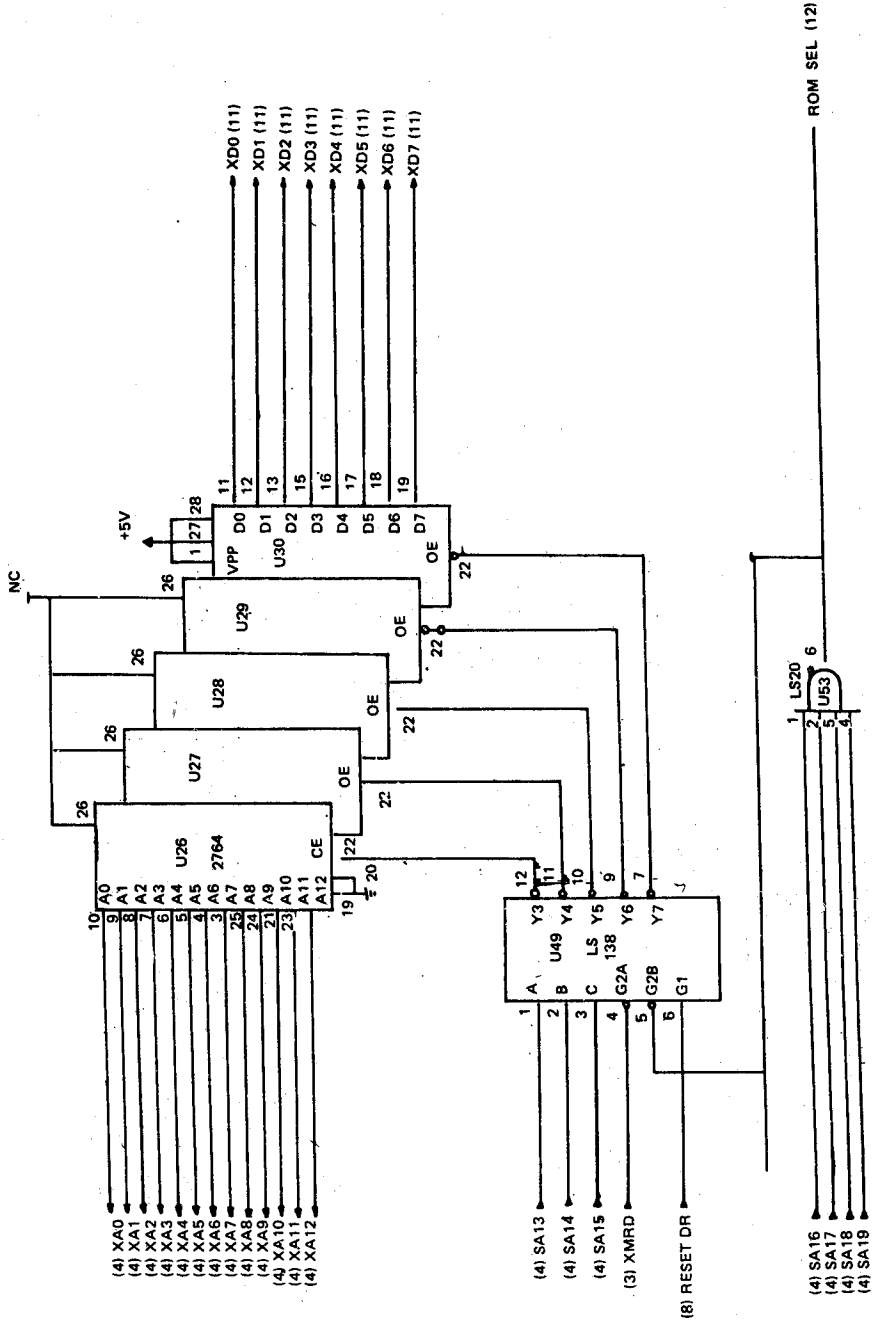


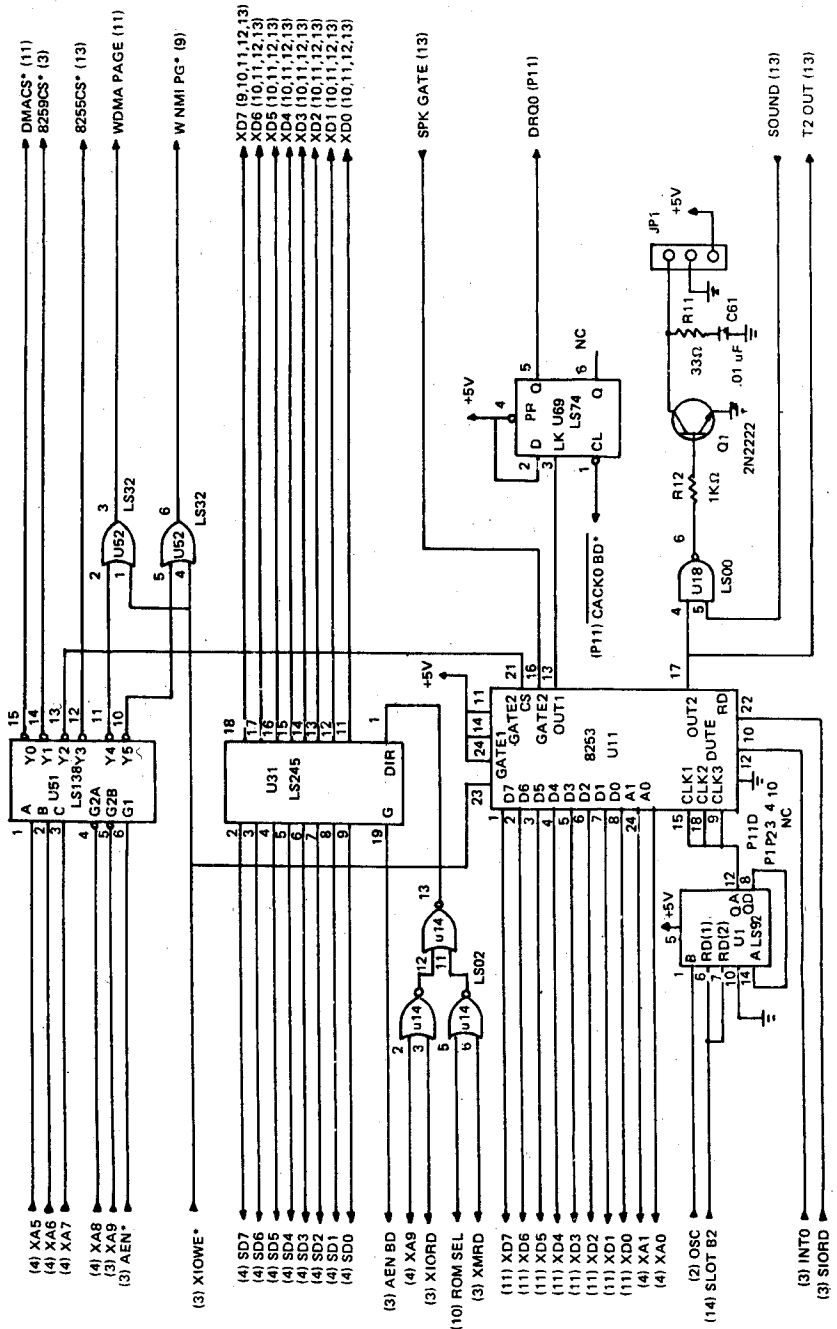


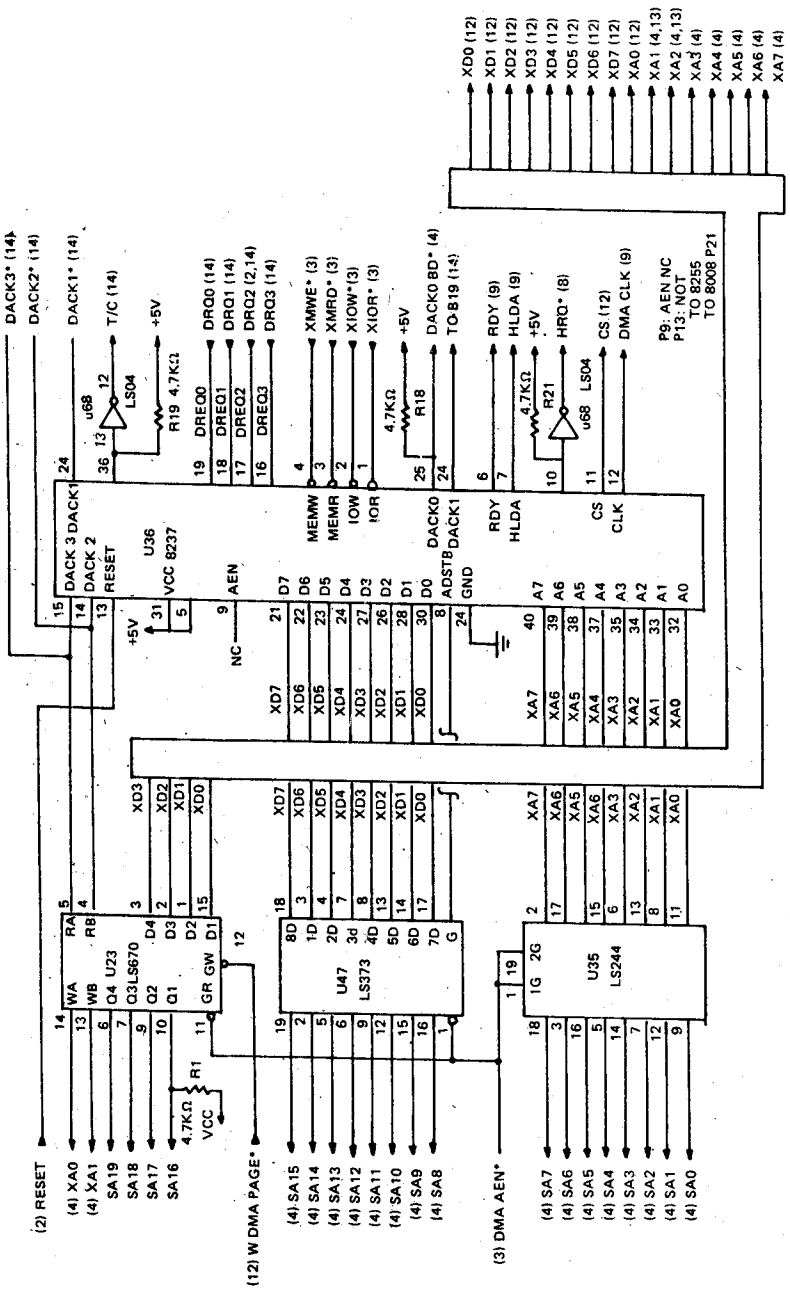


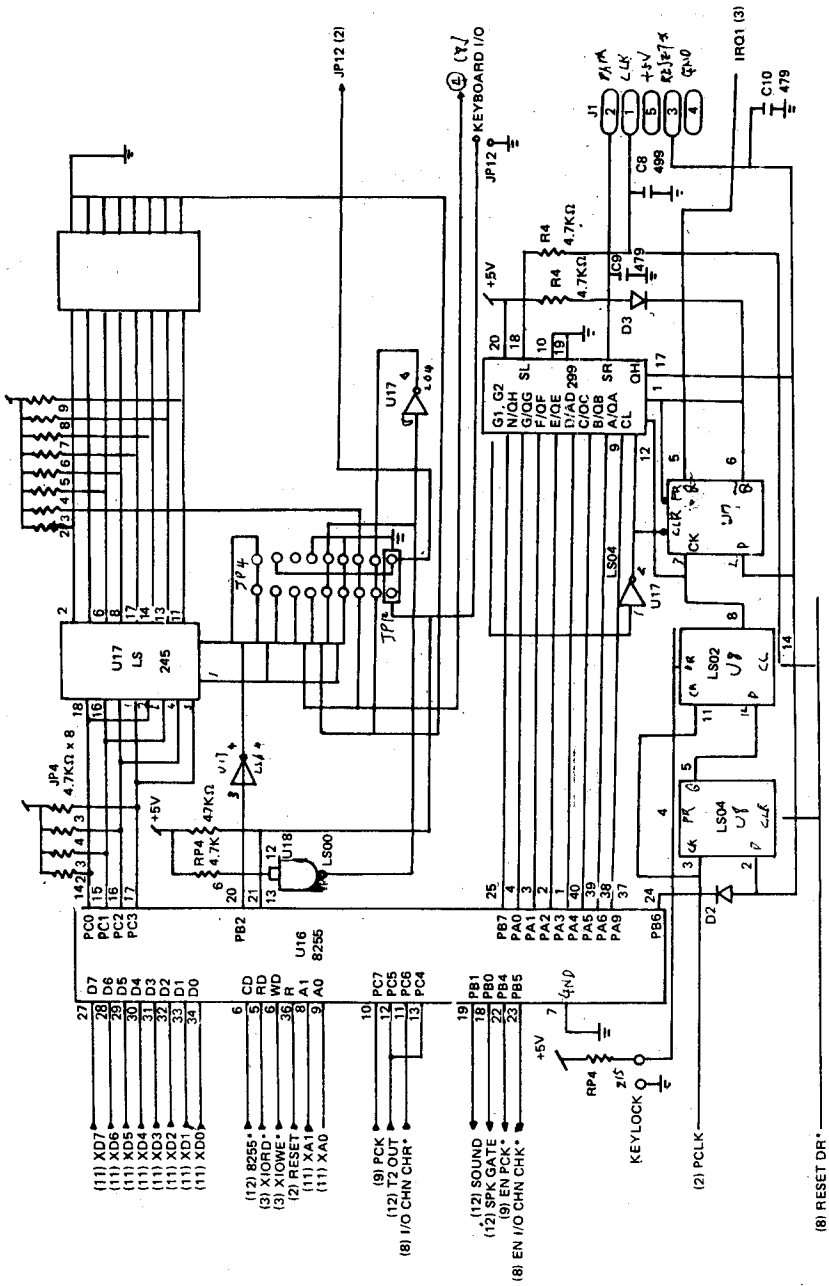




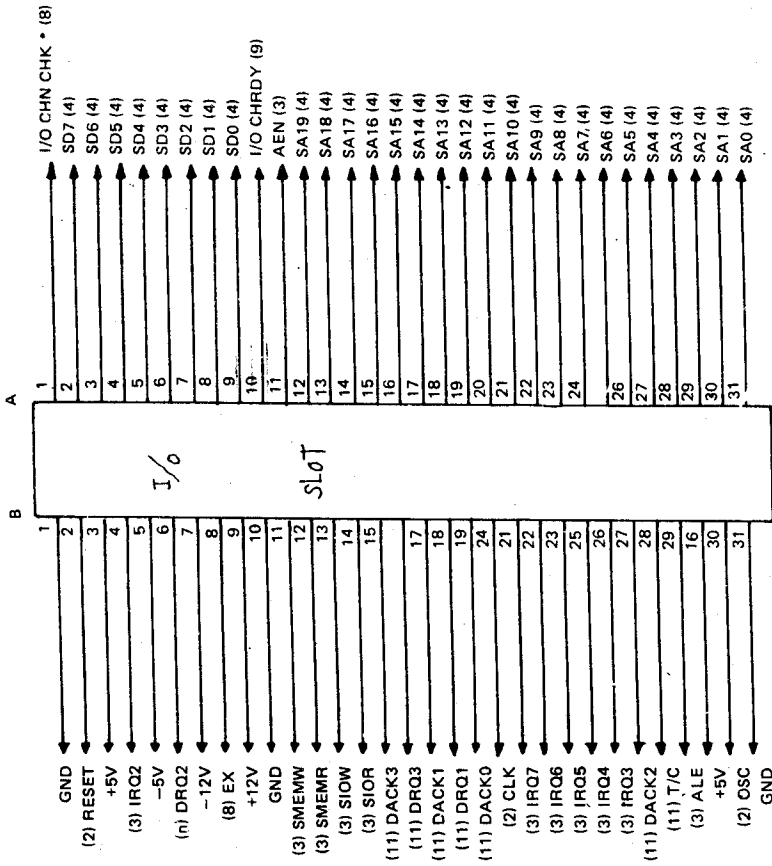




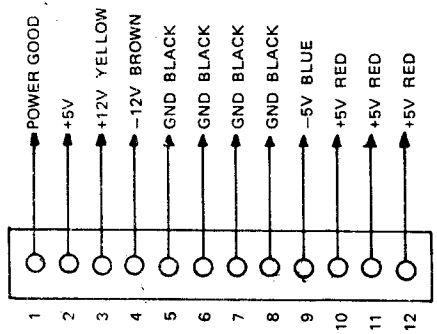




(8) RESET DR.



POWER CONNECTOR J10



J10

J1 → J8