

(c) Doze : Z80 clock running and the LCD display off
(ie programming the plug-in EPROM).

(d) Coma : Z80 clock stopped and LCD display off
(ie Z88 shut down).

4. Z80 CPU

- 4.1 The CPU is CMOS version of the Z80 microprocessor, chosen for its low working and standby power consumption. The standby power mode is selected by the CPU whenever possible (eg when it is waiting for a keyboard input) by executing the HALT instruction. The HALT output, sensed by the gate array results in the latter stopping the 3.2768 MHz CPU clock, in turn inducing the standby power mode. Normal CPU working is resumed when the clock is restored and the gate array requests an interrupt.
- 4.2 The CPU has a standard three bus input/output arrangement comprising the data bus, address bus and control bus.
- 4.3 **Data Bus.** D7 - D0 constitutes an 8-bit bi-directional data bus with active high, tri-state input/outputs. It is used during keyboard scanning, for exchanges with the gate array (in particular with the memory over the memory data bus MDH-MDA) and is available on the peripheral expansion connector PL8.
- 4.4 **Address Bus.** A15 - A0 constitutes a 16-bit address bus with active high tri-state outputs. It is used to set up addresses for the gate array (in particular with the memory on memory address bus MA19 - MA0), for keyboard scanning (A15 - A8 only) and is available on the peripheral expansion connectors PL8 and PL9.
- 4.5 **Control Bus.** The control bus is a collection of individual signals which generally organise the flow of data between the CPU and the gate array on the address and data buses. All signals are available on the peripheral expansion connectors and are described below:
- (a) Maskable Interrupt (INT) - active low signal generated by the gate array to call the CPU's maskable interrupt routine. As part of this routine the CPU reads the interrupt register in the gate array to determine the cause of the interrupt and therefore what action to take. Two machine states trigger this interrupt, battery low, signalled by the power supply, and the keyboard scan request. Battery low simply causes the LCD to display the BAT LOW legend, the keyboard scan request causes the CPU to scan the keyboard lines to detect whether any keys are pressed.