Singapore Polytechnic
School of Electrical and Electronics Engineering
ET0104 Embedded Computer Systems DECC 3FT/4EO

Tutorial 3 Address Decoding with I/O Devices

1. What is memory foldover and how can it be eliminated?

2. The system BIOS resides at the *highest* 64K of an Intel microprocessor running in Real Mode when it boots up. The address bus size at this point is only 20 bits. Using 16K memory devices, design a decoding scheme. In your solution: (hint: What is the highest 20 bit address).
Design a decoding circuit using the 74LS688 and a 74138.

3. An I/O board for a PC/104 bus needs 4 buffers and 4 latches. Its base address is 240H. Design a suitable decoding scheme for this board.

4. What is an advantage of using the 74LS688 in decoding?

5. Compare and contrast the differences between memory and I/O decoding on the PC/104 bus.

6. An I/O board for a PC/104 bus is to be interfaced to 14 switches and two 7 segment LEDs. Select a suitable address range, justifying your answer. What is the base address of this card?