

ECE186, CLASS EXAMPLE PROBLEM ON A/D. SPRING '02, 4/10/02

A 68000-based remote sensing instrument incorporates an 8-bit analog-to-digital converter (A/D), a Centronics-type parallel printer, and other circuitry. The system operate as follows. The A/D IS NOT MICROPROCESSOR COMPATIBLE. The 68000 commands conversion of the A/D, and polls for end of conversion. At the end of each conversion, the 68000 reads the byte from the A/D and sends it to memory buffer. The process is repeated until a total of 16 bytes have been converted, read, and stored in memory. Next, all 16 bytes are sent to a printer according to the following procedure. The processor polls the printer for a ready signal. When printer is ready, one byte is sent to the printer. This process is repeated until all 16 bytes have been printed. Provide the hardware and assembly language program for accomplishing the task described above. Choose whatever addresses you need and decode them for selecting/controlling appropriate devices/peripherals.

Use the SIMPLEST OF PARTIAL DECODING TO SIMPLIFY THE ADDRESS DECODER.

SOFTWARE SOLUTION:

; A/D ROUTINE

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                ORG        $000400
EOC             EQU        $800001
SOC            EQU        $400001
A/DREAD        EQU        $200001
PRINT          EQU        $100001
BUFFER         EQU        $002000
                MOVE.W    #15,D0
                LEA.L     BUFFER,A0
A/DCON         MOVE.B    #00,SOC
POLL_A/D       BTST.B    #0,EOC
                BNE      POLL_A/D
                MOVE.B    ADREAD,(A0)+
                DBF      D0,A/DCON ;PRINTING ROUTINE
                MOVE.W    #15,D1
                LEA.L     BUFFER,A1
POLL_PT        BTST.B    #0,BUSY/READY
                BNE      POLL_PT
```

```
MOVE.B    PRINT,(A1)+  
DBF       D1,POLL_PT
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