ELEC 464 : MICROCOMPUTER SYSTEM DESIGN
FALL 1995

Assignment 6 - Solutions

Question 1

The design can be simplified by breaking down the problem into a number of smaller parts. In this case, part of the design is the detection of an IACK cycle and part is detecting interrupt vectors less than 64. These can be combined into something that detects IACK cycles with bad exception vectors.

The final part of the design can best be approached using a truth table:

badiack	BERRIN	DTACKIN	BERROUT	DTACKOUT
0	0	0	0	0
0	0	1	0	1
0	1	0	1	0
0	1	1	1	1
1	0	0	0	0
1	0	1	1	0
1	1	0	1	0
1	1	1	1	0

See the attached listings for the CUPL design.

Question 2

See the attached program listings for the solution.

Question 3

1. The vector at $020, privilege violation, is initialized to $500.

   The vector at $07C, level 7 autovector interrupt, is initialized to $500.

   The vector at $080, trap number 0, is initialized to $600.

2. The start-up code does not leave the CPU in supervisor mode because the S bit in SR is set to 0.

3. The SSP (A7 when in supervisor mode) has been set to $1000.

4. the interrupt mask has been set to $7.

5. The clock signal will cause an interrupt every second, only on the falling edge since level 7 interrupts are edge (not level) sensitive.

6. The level 7 autovector interrupt handler, at $500 will be executed.

7. The LS byte of what was in the pushed SR (the pushed CCR) will be written to the output port. This byte is composed of the bits corresponding to the `000X NZVC` flags. This value will be $04 since the bits in the CCR were set by `MOVE.W #$0704,SR` and not changed by either `MOVEA` or `BRA LOOP`.