## Lab Report 3.C - More Addressing Modes

# **Description:**

In this lab, we were asked to initialize some registers and parts of memory. Then we were asked to run a piece of code and observe the changes it made using trace mode. The program also uses new addressing modes and instructions that were not used in any previous labs.

## **Equipment Used:**

• EASy 68K simulator

## **Procedure:**

I started by initializing parts of memory using MOVE.L to copy up to four bytes of data, starting at memory address \$2100. The values I copied are listed in a table below:

Table 1 A list of values to be placed at \$2100 in memory.

44434241
00000000
25530000
01EF0000
FFFFCCCC
87652222
BBBB3333
ABCDEF00

Next, I initialized the address register A1 and data registers D0-D7 with \$00000000

Then I copied the code from the project document and pasted it into the simulator. Finally, I assembled the source code, enabled log mode, traced my output, and ran the program.

## **Program Description:**

This program starts by storing a list of bytes starting at address \$2100 (seen in table 1). Then it stores values in address register A1 and data registers D0-D7. Finally, the program modifies the registers using several addressing modes and instructions, including MOVE, MOVEQ, PC indirect addressing mode, address register indirect with index addressing mode, and immediate addressing mode.

### **Results:**

The results of initialization can be seen in figure 2. As you can see, the program seems to affect the registers, but not memory. After the program ran and everything was initialized, I observed several changes, which are described below:

- A1 is loaded with \$2100
- D7 holds a value of 10
- D0 and D1 hold a value of 27 (D0 uses MOVEQ and D1 uses MOVE)
- D2 holds a value of -28 (uses 2's complement)
- D3 holds a value of 1001
- D4 holds a value of \$01010101 (uses an immediate hexadecimal value)
- D5 holds a value of \$33 (I believe it uses address register indirect with index to choose which memory location to copy from)
- D6 holds a value of \$FF (I believe this uses PC indirect with displacement to choose which memory location to copy from)

Before and after photos of memory are also provided below.

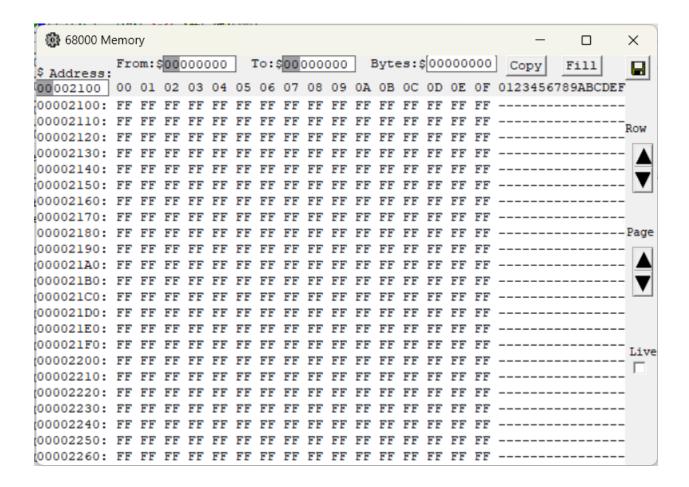


Figure 1 The memory window before running the program.

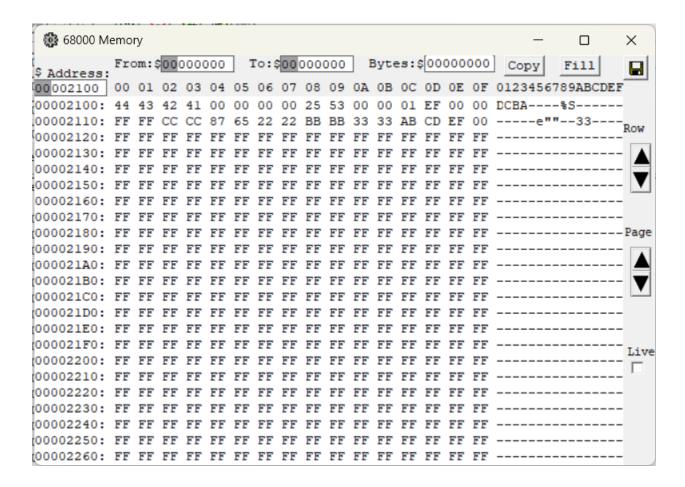


Figure 2 The memory window after initializing the registers and memory.

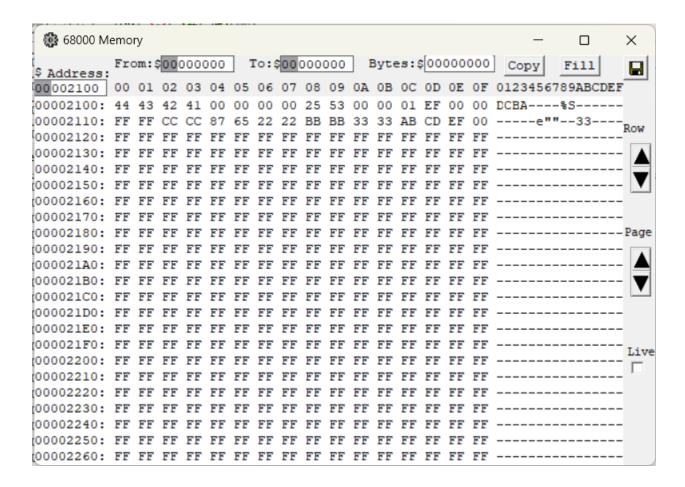


Figure 3 The memory window after executing the full program.

#### **Conclusions:**

This lab helped me learn more about some of the advanced addressing modes in 68K assembly. In particular, the address register indirect with index and PC relative addressing modes will be very useful in future labs. It also helped me learn about the MOVEQ instruction, which moves a byte of immediate data into a data register. An interesting aspect of this lab is that it didn't seem to change memory at all. However, that should be expected since the program only copied values into registers after it was done initializing.

## **Code Listing:**

```
START: ; first instruction of program MOVE.L \#$44434241,\$2100
```

```
MOVE.L #$0000000, $2104
MOVE.L #$25530000,$2108
MOVE.L #$01EF0000,$210C
MOVE.L #$FFFFCCCC, $2110
MOVE.L #$87652222,$2114
MOVE.L #$BBBB3333,$2118
MOVE.L #$ABCDEF00,$211C
LEA.L $0000000, A1
MOVE.L #$0000000, D0
MOVE.L #$0000000, D1
MOVE.L #$0000000, D2
MOVE.L #$0000000, D3
MOVE.L #$0000000, D4
MOVE.L #$0000000, D5
MOVE.L #$0000000, D6
MOVE.L #$0000000, D7
LEA $002100,A1
MOVE.L #10,D7
MOVEQ #27, D0
MOVE.B #27, D1
MOVE.B #-28,D2
MOVE.W #1001,D3
MOVE.L #$01010101, D4
MOVE.B 16(A1, D7), D5
MOVE.B $002110 (PC), D6
SIMHALT
                   ; halt simulator
             ; last line of source
END START
```

## **RunLog:**

EASy68K execution log file: 2/17/2023 3:04:28 PM

000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INT_XNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=0010000000000000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000000 Code=21FC 44434241 2100 Line= 2 MOVE.L #\$44434241,\$2100
00002100: 44 43 42 41 FF DCBA
00002110: FF
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
$00002180: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
$000021F0: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INT_XNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000008 Code=21FC 00000000 2104 Line= 3 MOVE.L #\$00000000,\$2104
00002100: 44 43 42 41 00 00 00 00 FF FF FF FF FF FF FF FF DCBA
00002110: FF

00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
$000021E0: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
$000021F0: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INT_XNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF FF FF DCBA%S
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF FF FF FF DCBA%S  00002110: FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF FF FF FF FF DCBA%S  00002110: FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=00000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF
PC=0000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF FF FF FF DCBA%S  00002110: FF
PC=0000010 Code=21FC 25530000 2108 Line= 4 MOVE.L #\$25530000,\$2108  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 FF

D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000 D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000 PC=00000018 Code=21FC 01EF0000 210C Line= 5 MOVE.L #\$01EF0000,\$210C 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000 D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000 PC=00000020 Code=21FC FFFFCCCC 2110 Line= 6 MOVE.L #\$FFFFCCCC,\$2110 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----

00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000001000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000028 Code=21FC 87652222 2114 Line= 7 MOVE.L #\$87652222,\$2114
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC <mark>87 65 22 22</mark> FF FF FF FF FF FF FF FFe""
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000001000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000030 Code=21FC BBBB3333 2118 Line= 8 MOVE.L #\$BBBB3333,\$2118

00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 FF FF FF FFe""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INT_XNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000001000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF
PC=00000038 Code=21FC ABCDEF00 211C Line= 9 MOVE.L #\$ABCDEF00,\$211C  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S  00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33  00002120: FF

D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000001000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000040 Code=43F8 0000 Line= 11 LEA.L \$00000000,A1

00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S------

D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC

D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000001000

D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000

D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000

PC=00000044 Code=7000 Line= 13 MOVE.L #\$00000000,D0

00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000046 Code=7200 Line= 14 MOVE.L #\$0000000,D1
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000048 Code=7400 Line= 15 MOVE.L #\$0000000,D2

00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
B0-0000000 B1-0000000 H0-0000000 H1-0000000 H2-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$00000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=0010000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100  D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000  D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000  PC=0000004A Code=7600 Line= 16 MOVE.L #\$0000000,D3  00002100: 44 43 42 41 00 00 00 02 5 53 00 00 01 EF 00 00 DCBA%S 00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33 00002120: FF

D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100 D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000 D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000 PC=0000004C Code=7800 Line= 17 MOVE.L #\$00000000,D4 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00 -----e""--33----D0=00000000 D4=00000000 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=001000000000100 D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000 D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000 PC=0000004E Code=7A00 Line= 18 MOVE.L #\$00000000,D5 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00 -----e""--33----

00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=00100000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000050 Code=7C00 Line= 19 MOVE.L #\$0000000,D6
00002100: 44 43 42 41 00 00 00 025 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=00100000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000052 Code=7E00 Line= 20 MOVE.L #\$0000000,D7

00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVO
D1=00000000 D5=00000000 A1=00000000 A5=00000000 SR=0010000000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000054 Code=43F8 2100 Line= 22 LEA \$002100,A1
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021AO. IT
000021B0: FF

$000021E0: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00002100 A5=00000000 SR=001000000000100
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=00000000 A3=00000000 A7=01000000 SS=01000000
PC=00000058 Code=7E0A Line= 23 MOVE.L #10,D7
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=00000000 D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00002100 A5=00000000 SR=0010000000000000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000
PC=0000005A Code=701B Line= 24 MOVEQ #27,D0
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF

00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=0000001B D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=00000000 D5=00000000 A1=00002100 A5=00000000 SR=0010000000000000
D2=00000000 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=00000000 D7=0000000A A3=00000000 A7=01000000 SS=01000000
PC=0000005C Code=123C 001B Line= 25 MOVE.B #27,D1
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF

00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00 -----e""--33----D0=0000001B D4=00000000 A0=00000000 A4=00000000 T S INT XNZVC D1=0000001B D5=00000000 A1=00002100 A5=00000000 SR=001000000001000 D2=000000E4 D6=00000000 A2=00000000 A6=00000000 US=00FF0000 D3=00000000 D7=0000000A A3=00000000 A7=01000000 SS=01000000 PC=00000064 Code=363C 03E9 Line= 27 MOVE.W #1001,D3 00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA----%S-----00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00 ----e""--33----

000021D0: FF
000021E0: FF
000021F0: FF
D0=0000001B D4=00000000 A0=00000000 A4=00000000 T_S_INTXNZVC
D1=0000001B D5=00000000 A1=00002100 A5=00000000 SR=0010000000000000
D2=000000E4 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=000003E9 D7=0000000A A3=00000000 A7=01000000 SS=01000000
PC=00000068 Code=283C 01010101 Line= 28 MOVE.L #\$01010101,D4
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
$00002140: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
00002150: FF
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=0000001B
D1=0000001B D5=00000000 A1=00002100 A5=00000000 SR=0010000000000000
D2=000000E4 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=000003E9 D7=0000000A A3=00000000 A7=01000000 SS=01000000
PC=0000006E Code=1A31 7010 Line= 29 MOVE.B 16(A1,D7),D5
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF

$00002150: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
00002160: FF
00002170: FF
00002180: FF
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF
D0=0000001B D4=01010101 A0=00000000 A4=00000000 T_S_INT_XNZVC
D1=0000001B D5=00000033 A1=00002100 A5=00000000 SR=0010000000000000000000000000000000000
D2=000000E4 D6=00000000 A2=00000000 A6=00000000 US=00FF0000
D3=000003E9 D7=0000000A A3=00000000 A7=01000000 SS=01000000
PC=00000072 Code=1C3A 209C Line= 30 MOVE.B \$002110(PC),D6
00002100: 44 43 42 41 00 00 00 00 25 53 00 00 01 EF 00 00 DCBA%S
00002110: FF FF CC CC 87 65 22 22 BB BB 33 33 AB CD EF 00e""33
00002120: FF
00002130: FF
00002140: FF
00002150: FF
00002160: FF
00002170: FF
$00002180: FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF\ FF$
00002190: FF
000021A0: FF
000021B0: FF
000021C0: FF
000021D0: FF
000021E0: FF
000021F0: FF

D0=0000001B D4=01010101 A0=00000000 A4=00000000 T\_S\_INT\_\_XNZVC

D1=0000001B D5=00000033 A1=00002100 A5=00000000 SR=001000000001000

D2=000000E4 D6=000000FF A2=00000000 A6=00000000 US=00FF0000

## D3=000003E9 D7=0000000A A3=00000000 A7=01000000 SS=01000000

PC=00000076 Code=FFFF FFFF Line= 32 SIMHALT ; halt simulator