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THE SIMULATION AND ANALYSIS OF A
MODEL OF THE MOTOROLA MC68000
MICROPROCESSOR WITH N.MPC

THESIS
(3 of 3)

Charles A. Baxley Jr.
Captain, USAF

AFIT/GCS/ENG/84D-2

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AFIT/GCS/ENG/84D-2

①

THE SIMULATION AND ANALYSIS OF A RTL
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MICROPROCESSOR WITH N.MPC

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Appendix H: Simulation Output

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MOVE.W D1,D2

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
```

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
```

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      1
>># examine :PHI1
```

```

    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN

```

```

0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
11010000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      11010000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      11010000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
      4
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN

```

```
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
11010000000001
```

MOVE.W D1,(A1)

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

1

>># examine :PHI1

```

    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN

```



```

0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DRUS
      11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DRUS
      11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN

```

```

    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1

```

```

>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      0

```

```

>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
7
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      8
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      9
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1

```

```
>># examine :RW
0
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IRUS
101010101010101
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 9 after :IR eq1 031201)
```


MOVE.L D1,A1

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T
0

>># examine :PHI1
1

>># base 2

>># examine :FC
10

>># examine :DTACKN
1

>># examine :RW
1

>># examine :LDSN
1

>># examine :UDSN
1

>># examine :ASN
1

>># examine :DBUS
1111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T
0

>># examine :PHI2
1

>># base 2

>># examine :FC
10

>># examine :DTACKN
1

>># examine :RW
1

>># examine :LDSN
1

>># examine :UDSN
1

>># examine :ASN
1

>># examine :DBUS
1111111111111111

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T
1

>># examine :PHI1

```

      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IRUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IRUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN

```

```

0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
10001001000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10001001000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10001001000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN

```

```
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IRUS
10001001000001
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq 0 after :T eq 4 after :IR eq 0h2241)
```

MOVE.W D1,(A1)+

trigger of signals1 by 1 repeat bkpt :PHI1 eq 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```



```

>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      10000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      10000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :I
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN
      0
>># examine :IBUS
      101010101010101
>># examine :ABUS
      100000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      101010101010101
>># examine :ABUS
      100000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    100000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    100000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW

```

```

0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># examine :ABUS
100000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># examine :ABUS
100000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0

```

```

>># examine :ASN
    0
>># examine :IRUS
    101010101010101
>># examine :ARUS
    100000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IRUS
    101010101010101
>># examine :ARUS
    100000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IRUS
    101010101010101
>># examine :ARUS

```

10000000000000000000
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq 0 after :T eq 9 after :IR eq 0h32c1)

MOVE.W D1,04(A1)

trigger of signals1 by 1 repeat bkpt :PHI1 eq 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :ITACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :ITACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq 1

```

>># base 10
>># examine :T
      1
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      3
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0

```

```

>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN

```

```

0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># examine :ABUS
      111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW

```



```

1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1

```

```

>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS

```

```

1000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
0
>># examine :DBUS
101010101010101
>># examine :ABUS
1000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    1000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    1000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    10000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    10000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    0

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
101010101010101
>># examine :ARUS
1000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
13
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
101010101010101
>># examine :ARUS
1000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
14
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN

```

```
0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    100000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    101010101010101
>># examine :ABUS
    100000000000000
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 14 after :IF eq1 0h3341)
```

MOVE.W D1,04(A1,D7)

```
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
```



```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0

```

```

>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN

```

```

0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
      111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111111111111
>># examine :ABUS
      111111111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111111111111
>># examine :ABUS
      111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW

```

```

1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0

```



```

>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS

```

```

100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI? eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0

```

```

>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
14
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
15
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN

```

```

0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    1000000000011

```

```

>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DEUS
    1010101010101
>># examine :ARUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DEUS
    1010101010101
>># examine :ARUS
    1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    16

```

```
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      101010101010101
>># examine :ABUS
      10000000000011
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq 0 after :T eq 16 after :IR eq 0h3381)
```


MOVE.W D1,\$2004

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PH12 eq1 1
>># base 10
>># examine :T
4
>># examine :PH12
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PH11 eq1 1
>># base 10
>># examine :T
5
>># examine :PH11
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
      11111111111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      11111111111111111111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      11111111111111111111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
    6
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1
>># base 2

```

```

>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      0
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW

```



```

1
>># examine :LUSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LUSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LUSN
1
>># examine :UDSN
1

```

```

>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># examine :ABUS
1111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># examine :ABUS

```

```

0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    0

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
101010101010101
>># examine :ABUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
13
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
101010101010101
>># examine :ABUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
14
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0

```

```
0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FHI2 eq1 1
>># base 10
>># examine :T
    14
>># examine :FHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UDISN
    1
>># examine :ASN
    1
>># examine :IBUS
    101010101010101
>># examine :ABUS
    0
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 14 after :IR eq1 0h31c1)
```

MOVE.W A1,D3

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
```

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      1
>># examine :PHI1
```



```

1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># baquit
se 10
>># examine :T
1
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
11011000001001
>># run from trigger

```

```

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    11011000001001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    11011000001001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10

```

```
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
11011000001001
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 4 after :IR eq1 0h3609)
```

MOVE.W (A1),D2

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

1

>># examine :PHI1

```

      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN

```

```

0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
11010000010001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    11010000010001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    11010000010001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN

```



```

1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
11010000010001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1

```

```

>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1

```

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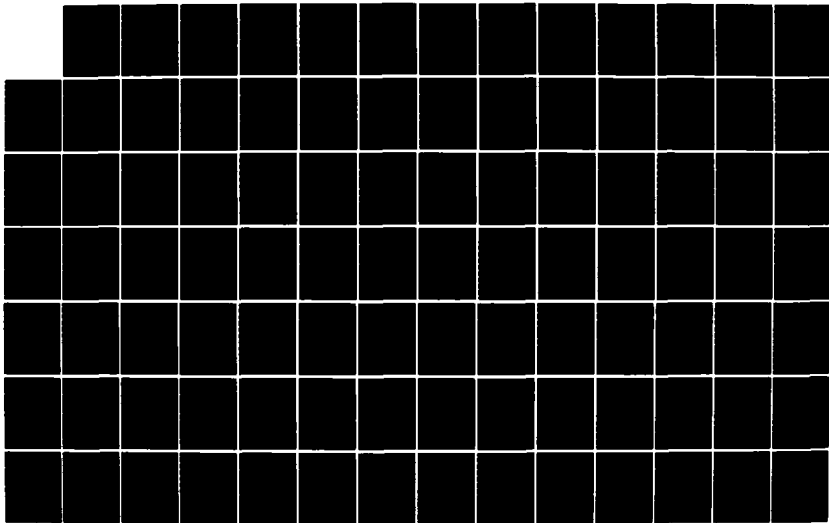
THE SIMULATION AND ANALYSIS OF A RTL MODEL OF THE
MOTOROLA MC68000 MICROP. (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF ENGI. C A BAXLEY
1984 AFIT/GCS/ENG/84D-2

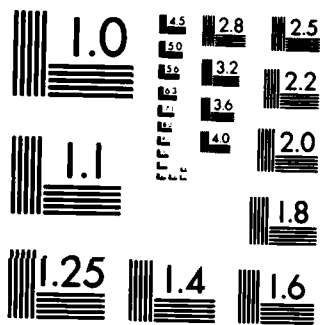
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NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```

>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0

```

```

>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```
>># examine :T
      9
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      101010101010101
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 9 after :IR eq1 0h3411)
```

MOVE.W (A1)+,D6

```
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
```



```

>># base 10
>># examine :T
      1
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1quit

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0

```

```

>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS

```

```

1111111111111111
>># examine :ABUS
11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    6
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1

```

```

>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LUSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IRUS
    1111111111111111
>># examine :ABUS
    10000000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LUSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IRUS
    1001111100
>># examine :ABUS
    10000000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0

```

```

>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1001111100
>># examine :ABUS
100000000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1001111100
>># examine :ABUS
100000000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN

```



```
1
>># examine :ASN
1
>># examine :IBUS
1001111100
>># examine :ABUS
100000000000
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 9 after :IR eq1 0h3c19)
```

MOVE.W -(A1),D4

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACNN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACNN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN

```

```

0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    6
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```



```

>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW

```

```

1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0

```

```

>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111100111000
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111100111000
>># examine :ABUS

```

```

1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LBSN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
111111100111000
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LBSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
111111100111000
>># examine :ABUS
1000000000011
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 11 after :IR eq1 0h3B21)

```

MOVE.W 04(A1),D1

trigger of signal\$1 by 1 repeat bkpt :PHI1 eq 1

```
>># base 10
>># examine :T
0
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000000000
```

>># run from trigger

trigger of signal\$2 by 2 repeat bkpt :PHI2 eq 1

```
>># base 10
>># examine :T
0
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000000110
```

>># run from trigger

trigger of signal\$1 by 1 repeat bkpt :PHI1 eq 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
100
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
100
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN

```



```

0
>># examine :ASN
0
>># examine :IBUS
100
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
100
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
      1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    11010000101001
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW

```

```

    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    11010000101001
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    11010000101001
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UISN
    1

```

```

>># examine :ASN
1
>># examine :DBUS
11010000101001
>># examine :ABUS
1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS

```

```

10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```



```

    1
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10.
>># examine :T
    14
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    1

```

```
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
101010101010101
>># examine :ABUS
10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FH12 eq1 1
>># base 10
>># examine :T
14
>># examine :FH12
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
101010101010101
>># examine :ABUS
10000000000100
```

MOVE.W 04(A1,D7),D2

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LUSN

1

>># examine :USN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LUSN

1

>># examine :USN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

>># base 10
>># examine :T
      1
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IRUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IRUS
      1111111111111111
>># examine :ARUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
      2
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
      3
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0

```

```

>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :BTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :BTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LBSN
1
>># examine :UBSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LBSN
1
>># examine :UBSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```



```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UNSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UNSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LBSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LBSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW

```

```

1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IRUS
1111111111111111
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IRUS
1111111111111111
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0

```

```

>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PH11 eq1 1
>># base 10
>># examine :T
    10
>># examine :PH11
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PH12 eq1 1
>># base 10
>># examine :T
    10
>># examine :PH12
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS

```

```

100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IRUS
0
>># examine :ARUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IRUS
0
>># examine :ARUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UBSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
13
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UBSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
14
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
14
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
1000000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
15
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
quit
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0

```



```

>># examine :ASN
0
>># examine :IBUS
111111100110100
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FHI2 eq1 1
>># base 10
>># examine :T
15
>># examine :FHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
111111100110100
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :FHI1 eq1 1
>># base 10
>># examine :T
16
>># examine :FHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
111111100110100
>># examine :ABUS

```

```
1000000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
16
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UNSN
1
>># examine :ASN
1
>># examine :IBUS
1111111100110100
>># examine :ABUS
1000000000011
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 16 after :IR eq1 0h3431)
```

MOVE.W \$2004,I5

```
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
```

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UIDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UIDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UIDSN

```

```

0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```



```

>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW

```

```

1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1

```

```

>># examine :ASN
    1
>># examine :DBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS

```

```

0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

      1
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      0
>># examine :ABUS
      0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
      13
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      Quit

>># examine :IBUS
      0
>># examine :ABUS
      0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PH11 eq 1
>># base 10
>># examine :T
      14
>># examine :PH11
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW

```

```

    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IRUS
    0
>># examine :ARUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :IRUS
    0
>># examine :ARUS
    0
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 14 after :IR eq1 0h3a38)

```


MOVE.W \$2004,\$2008

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :ITACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IRUS

1111111111111111

>># examine :ARUS

10000000000000

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :ITACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IRUS

1111111111111111

>># examine :ARUS

1000000000110

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```

```

>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :I
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :I
4
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN

```

```

>># examine :ABUS
      1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      111111111111111
>># examine :ABUS
      1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
0
>># examine :ABUS
1000000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># examine :T
6
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
7
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
7
>># examine :PHI2
1
>># base 2

```

```

>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :FHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :FHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    10000000000100
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :FHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW

```



```

1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000000100
>># examine :ABUS
10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000000100
>># examine :ABUS
10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1

```

```

>># examine :ASN
    1
>># examine :DBUS
    10000000000100
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS

```

```

1000000001010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LUSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LUSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1

```

```

>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
    14
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    0
>># examine :ABUS
    1000000001010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
    15
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN

```

```

1
>># examine :DBUS
1111111111111111
>># examine :ABUS
1000000001010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1 .
>># base 10
>># examine :T
15
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
16
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000000100

```

```

>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    17

```



```

>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    18
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    101010101010101
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    18
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1

```

```

>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    19
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    19
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN

```

```

      1
>># examine :UISN
      1
>># examine :ASN
      1
>># examine :DBUS
      101010101010101
>># examine :ABUS
      10000000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      20
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UISN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111
>># examine :ABUS
      10000000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      20
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UISN
      1
>># examine :ASN
      1

```

```

>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001100
>># run from trigger

```

```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    22
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    22
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1000000001100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    23
>># examine :PHI1

```

```

1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000001000
>># examine :ABUS
1000000001100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
23
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000001000
>># examine :ABUS
1000000001100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
24
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN

```

```

0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000001000
>># examine :ABUS
10000000001100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
24
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
10000000001000
>># examine :ABUS
10000000001100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
25
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1

```

```

>># examine :UDSN
1
>># examine :ASN
1
>># examine :IRUS
1111111111111111
>># examine :ARUS
1000000001100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
25
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IRUS
1111111111111111
>># examine :ARUS
10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
26
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
0
>># examine :IRUS

```



```

      1111111111111111
>># examine :ARUS
      10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      26
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN
      0
>># examine :IBUS
      101010101010101
>># examine :ARUS
      10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      27
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      101010101010101
>># examine :ARUS
      10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    27
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    28
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    101010101010101
>># examine :ABUS
    10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    27
>># examine :PHI2
    1

```

```

>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># examine :ABUS
      10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      28
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      0
>># examine :RW
      0
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># examine :ABUS
      10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      28
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      0

```

```

>># examine :RW
      0
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IRUS
      101010101010101
>># examine :ABUS
      10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      29
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      0
>># examine :RW
      0
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IRUS
      101010101010101
>># examine :ABUS
      10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      29
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UISN

```

AD-A151 962

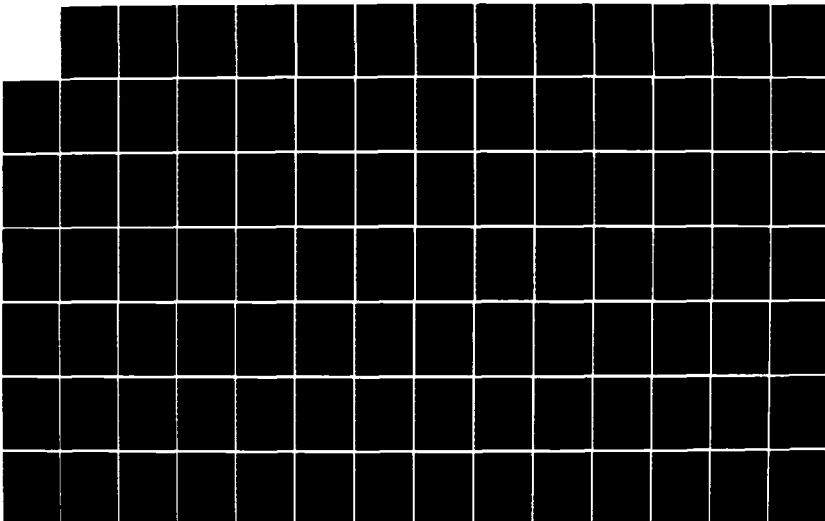
THE SIMULATION AND ANALYSIS OF A RTL MODEL OF THE
MOTOROLA MC68000 MICROP. (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF ENGI. C A BAXLEY
1984 AFIT/GC5/ENG/84D-2

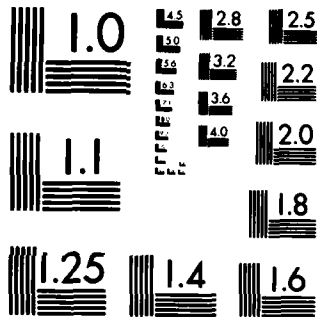
3/5

UNCLASSIFIED

F/G 9/2

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```

1
>># examine :ASN
1
>># examine :DBUS
101010101010101
>># examine :ABUS
10000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
30
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
10000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
30
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># examine :ARUS
      1000000001110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      31
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      111111111111111
>># examine :ARUS
      1000000001110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      31
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      111111111111111
>># examine :ARUS
      1000000001110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10

```



```

>># examine :T
    32
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DRUS
    1111111111111111
>># examine :ARUS
    1000000001110
>># run from trigger
trigger of signal$2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    32
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DRUS
    1111111111111111
>># examine :ARUS
    1000000001110
>># run from trigger
trigger of signal$1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    33
>># examine :PHI1
    1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    100111011010000
>># examine :ABUS
    1000000001110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    33
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    100111011010000
>># examine :ABUS
    1000000001110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    34
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW

```

```
1
>># examine :LDSN
0
>># examine :UIDSN
0
>># examine :ASN
0
>># examine :IBUS
100111011010000
>># examine :ABUS
1000000001110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
34
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UIDSN
1
>># examine :ASN
1
>># examine :IBUS
100111011010000
>># examine :ABUS
1000000001110
```

MOVE.W #\$5555,D1

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

11111111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># examine :ABUS

100000000011

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DRUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DRUS
    1111111111111111
>># examine :ABUS
    100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      3
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0

```

```

>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      0
>># examine :ABUS
      100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LISN
      0
>># examine :UISN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000011
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```



```

>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      5
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
    6
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW

```

```

    1
>># examine :LDSN
    0
>># examine :UUSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :AKUS
    100000000100
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UUSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :AKUS
    100000000100
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UUSN
    1

```

```
>># examine :ASN
      1
>># examine :IBUS
      0
>># examine :AKUS
      100000000100
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 9 after :IR eq1 0h323c)
```

ADD.W D3,D5

```
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UIDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UIDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    1
```

```

>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1

```

```

>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
11010010000101
>># run from trigger

```



```

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
quit
>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      11010010000101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      11010010000101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI2
      1
>># base 2
>># examine :FC

```

```
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
11010010000101
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 4 after :Ik eq1 0155103)
```

BEG START

(Branch Not Taken)

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IBUS

1111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :IBUS

1111111111111111

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

```

>># examine :T
      1
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      1

```

```

>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS

```

```

11011000000010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IRBUS
11011000000010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IRBUS
11011000000010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2

```

```

>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    11011000000010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    quit
1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1

```

```

>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
6
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
6
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10

```



```

>># examine :T
7
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
7
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1

```

```

>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
8
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger

```

(Branch Taken)

```

trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
0
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1

```

```

>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
0
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
1
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
1

```

511

```

>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
100111011010000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
100111011010000
>># run from trigger

```

```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :BRUS
    10011011010000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    4
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :BRUS
    10011011010000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10

```

```

>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LUSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LUSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LUSN
    1
>># examine :UDSN
    1
>># examine :ASN

```

```

1
>># examine :DRUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACNN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DRUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACNN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DRUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI2

```



```

1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
12
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
12
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN

```

```

0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
13
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
13
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```

```

>># base 10
>># examine :T
    14
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IRUS
    11011000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    14
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IRUS
    11011000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN

```

```
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IRUS
11011000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FHI2 eq1 1
>># base 10
>># examine :T
15
>># examine :FHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IRUS
11011000000001
```

BTST II1, (A1)

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
```

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```
>># base 10
>># examine :T
      0
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
```

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      1
>># examine :PHI1
```

```

    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN

```

```

0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
11011000000010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      11011000000010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      11011000000010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN

```



```

1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
11011000000010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1

```

```

>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    6
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    6
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0

```

```

>># examine :UDSN
1
>># examine :ASN
0
>># examine :IBUS
111111101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
6
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UISN
1
>># examine :ASN
0
>># examine :IBUS
111111101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UISN
1
>># examine :ASN
0
>># examine :IBUS
111111101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1111111101010101
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 9 after :IR eq1 0h0311)
```

Illegal Instruction Exception

```
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :LTACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat LKpt :PHI2 eq1 1
>># base 10
>># examine :T
    0
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
```

```

>># base 10
>># examine :T
    1
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    1
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI1
    1

```

```

>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    100000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    0

```



```

>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000110
>># run from trigger
trigger of signals1 by 1*repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UDSN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
100000000110
>># run from trigger
trigger of signals2 by 2 repeat bkpt :FHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :FHI2
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># examine :ABUS
100000000110
>># run from trigger
trigger of signals1 by 1 repeat bkpt :FHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :FHI1
1
>># base 2
>># examine :FC
10
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111

```

```

>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    5
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    6
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
    6
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IRUS
    1111111111111111
>># examine :ARUS
    11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IRUS
    1111111111111111
>># examine :ARUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1
>># base 2

```

```

>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signal1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signal2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :DTACKN
    1
>># examine :RW

```

```

1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
11111111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PH11 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PH12 eq1 1
>># base 10
>># examine :T
9
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1

```

```

>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      10
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UISN
      1
>># examine :ASN
      0
>># examine :IBUS
      1111111111111111
>># examine :ABUS
      10001110010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      10
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UISN
      1
>># examine :ASN
      0
>># examine :IBUS
      1000000001010
>># examine :ABUS

```

```

    10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```



```

    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001010
>># examine :ABUS
    10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0

```

```

>># examine :LISN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :IBUS
      1000000001010
>># examine :ABUS
      10001110010
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      13
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN
      1
>># examine :IBUS
      1000000001010
>># examine :ABUS
      10001110010
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      14
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      1
>># examine :UISN
      1
>># examine :ASN

```

```

1
>># examine :DBUS
1000000001010
>># examine :ABUS
11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
14
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
10001110000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
15
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># examine :ABUS
10001110000

```

```

>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    16

```

```

>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101

```

```

>># examine :BTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :BTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    100
>># examine :ABUS
    10001110000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :BTACKN
    0
>># examine :RW
    0
>># examine :LDSN

```

```

0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
100
>># examine :ABUS
10001110000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
18
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
100
>># examine :ABUS
10001110000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
18
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1

```



```

>># examine :DBUS
    100
>># examine :ABUS
    1000111 000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    19
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    100
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    19
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    10001110001
>># run from trigger

```

```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    20
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    20
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI1

```

```

    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    22
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN

```

```

    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
    21
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
    22
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0

```

```

>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
10001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
22
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
10001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
23
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0

```

```

0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    23
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :IBUS
    0
>># examine :ABUS
    10001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    24
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :nSN
    1
>># examine :IBUS
    0
>># examine :ABUS
    11111111111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    24
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    25
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    25
>># examine :PHI2
    1

```

```

>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    26
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    26
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1

```



```

>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    1000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    27
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># examine :ABUS
    1000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    27
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN

```

```

0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
28
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
28
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0

```

```

>># examine :ABUS
      1000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      29
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      29
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># examine :ABUS
      1001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10

```

```

>># examine :T
    30
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    30
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    31
>># examine :PHI1
    1
>># base 2

```

```

>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    31
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    1001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    32
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW

```

```

1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
32
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
1001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
33
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LISN
0
>># examine :UISN
0

```

```

>># examine :ASN
    0
>># examine :DBUS
    0
>># examine :ABUS
    1001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    33
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :DBUS
    0
>># examine :ABUS
    1001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    34
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UISN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS

```

```

      111111111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      34
>># examine :PHI2
      1
>># base 2
>># examine :FC
      110
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UISN
      1
>># examine :ASN
      1
>># examine :DRUS
      1111111111111111
>># examine :ARUS
      0
>># run from trigger
trigger of signals3 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      35
>># examine :PHI1
      1
>># base 2
>># examine :FC
      110
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UISN
      0
>># examine :ASN
      0
>># examine :DRUS
      1111111111111111
>># examine :ARUS
      0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T

```



```

    35
>># examine :PHI2
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    36
>># examine :PHI1
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># examine :ABUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    36
>># examine :PHI2
    1
    # base 2
    # examine :FC

```

```

110
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># examine :ABUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
37
>># examine :PHI1
1
>># base 2
>># examine :FC
110
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
37
>># examine :PHI2
1
>># base 2
>># examine :FC
110
>># examine :ITACKN
0
>># examine :RW
1

```

```

>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># examine :ABUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
38
>># examine :PHI1
1
>># base 2
>># examine :FC
110
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># examine :ABUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
38
>># examine :PHI2
1
>># base 2
>># examine :FC
110
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN

```

```

1
>># examine :DBUS
0
>># examine :ABUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
39
>># examine :PHI1
1
>># base 2
>># examine :FC
110
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
39
>># examine :PHI2
1
>># base 2
>># examine :FC
110
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># examine :ABUS
11111111111111111111

```

```

>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    40
>># examine :PHI1
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    40
>># examine :PHI2
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :DBUS
    1111111111111111
>># examine :ABUS
    11111111111111111111
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 40 after :IR eq1 0h4afc)

```

Address Error Exception

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI1

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

>># base 10

>># examine :T

0

>># examine :PHI2

1

>># base 2

>># examine :FC

10

>># examine :DTACKN

1

>># examine :RW

1

>># examine :LDSN

1

>># examine :UDSN

1

>># examine :ASN

1

>># examine :DBUS

1111111111111111

>># run from trigger

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

>># base 10

>># examine :T

1

>># examine :PHI1

```

      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      2
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN

```

```

    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    2
>># examine :PHI2
    1
>># base 2
>># examine :FC
    10
>># examine :BTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    3
>># examine :PHI1
    1
>># base 2
>># examine :FC
    10
>># examine :BTACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    100111001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```



```

>># base 10
>># examine :T
      3
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      100111001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI1
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN
      0
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :IBUS
      100111001110001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      4
>># examine :PHI2
      1
>># base 2
>># examine :FC
      10
>># examine :ITACKN

```

```

1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
100111001110001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
10
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1

```

```

>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :ITACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      7
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DRUS
    101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    7
>># examine :PHI2
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DRUS
    101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    8
>># examine :PHI1
    1
>># base 2
>># examine :FC
    1
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0

```

```

>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DRUS
      101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      8
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LISN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DRUS
      101010101010101
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      6
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LISN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      101010101010101
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
      0
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI1
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      1
>># examine :PHI2
      1
>># base 2
>># examine :FC
      1
>># examine :DTACKN
      1

```

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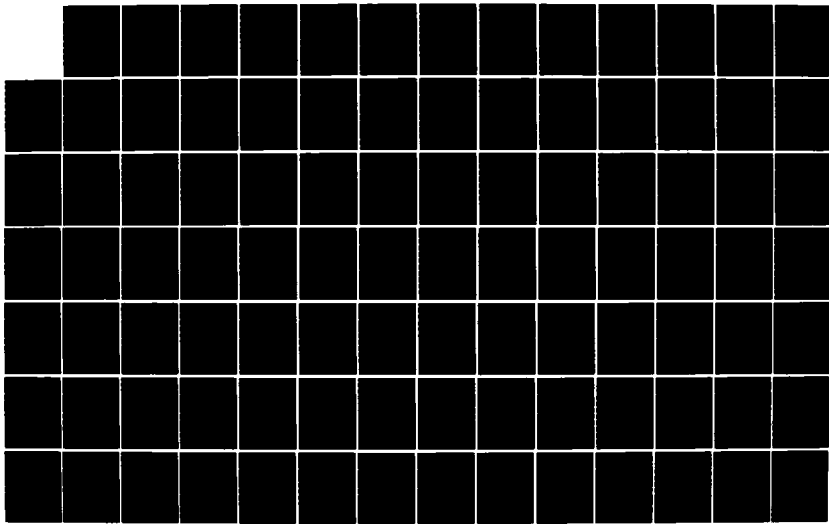
THE SIMULATION AND ANALYSIS OF A RTL MODEL OF THE
MOTOROLA MC68000 MICROP. (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF ENGI.. C A BAXLEY
1984 AFIT/GCS/ENG/84D-2

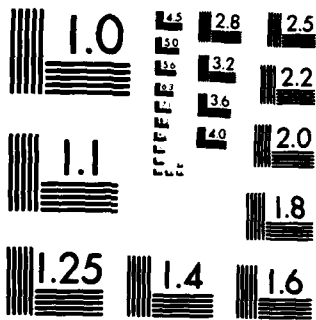
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F/G 9/2

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


```

>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
2
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS

```

```

1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
3
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI1
1
>># base 2

```

```

>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
4
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN

```

```

1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
5
>># examine :PHI2
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
6
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T

```

```

        6
>># examine :PHI2
        1
>># base 2
>># examine :FC
        1
>># examine :DTACKN
        1
>># examine :RW
        1
>># examine :LDSN
        1
>># examine :UDSN
        1
>># examine :ASN
        1
>># examine :IBUS
        1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
        7
>># examine :PHI1
        1
>># base 2
>># examine :FC
        1
>># examine :DTACKN
        1
>># examine :RW
        1
>># examine :LDSN
        1
>># examine :UDSN
        1
>># examine :ASN
        1
>># examine :IBUS
        1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
        7
>># examine :PHI2
        1
>># base 2
>># examine :FC
        1
>># examine :DTACKN
        1
>># examine :RW

```

```

1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI1
1
>># base 2
>># examine :FC
1
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
8
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111

```

```

>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    9
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN
    0
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    10
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    11
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0

```



```

>># examine :ASN
0
>># examine :IBUS
1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
10
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :BTACKN
1
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
11
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :BTACKN
0
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
11

```

```

>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    12
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0

```

```

>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1000000001000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    13
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    1
>># examine :IBUS
    1111111111111111
>># run from trigger

```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      14
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
```

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```
>># base 10
>># examine :T
      14
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      0
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      0
>># examine :DBUS
      0
>># run from trigger
```

trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```
>># base 10
>># examine :T
      15
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
```

```

>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN

```

```

    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    15
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    16
>># examine :PHI2

```

```

    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    17
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN

```

```

1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
18
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
18
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1

```



```

>># base 10
>># examine :T
    19
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    19
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    20
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN

```

```

1
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
20
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
21
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0

```

```

>># examine :IBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    20
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    21
>># examine :PHI2
    1

```

```

>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    22
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    22
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1

```

```

>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      23
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      23
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10

```

```

>># examine :T
    24
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    24
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    25
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1

```

```

>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    25
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    26
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS

```

```

11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
25
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
26
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
26
>># examine :PHI2
1
>># base 2

```



```

>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    27
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    27
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN

```

```

1
>># examine :ASN
1
>># examine :IBUS
11001010000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
28
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
11001010000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
28
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T

```

```

    29
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    29
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :IBUS
    10000000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    30
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW

```

```

0
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
30
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
31
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
10000000000001

```

```

>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    30
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10000000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    31
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10000000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    31
>># examine :PHI2
    1
>># base 2
>># examine :FC

```

```

    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10000000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    32
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    10000000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    32
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1

```

```

>># examine :ASN
1
>># examine :DBUS
10000000000001
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
33
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
10000000000001
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
33
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
34

```

```

>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    34
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :IBUS
    1
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    35
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0

```



```

>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    35
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    36
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger

```

```

trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    35
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    36
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    36
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101

```

```

>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    37
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    37
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LISN
    1
>># examine :UISN
    1
>># examine :ASN

```

```

1
>># examine :IBUS
1
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
38
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
38
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
39
>># examine :PHI1

```

```

    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    39
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    40
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN

```

```

0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
40
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
41
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
1
>># examine :RW
0
>># examine :LISN
0
>># examine :UISN
0
>># examine :ASN
0
>># examine :IBUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1

```

```

>># base 10
>># examine :T
    40
>># examine :PH12
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PH11 eq1 1
>># base 10
>># examine :T
    41
>># examine :PH11
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    0
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :IBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PH12 eq1 1
>># base 10
>># examine :T
    41
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN

```

```

    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    42
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    0
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    42
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    0
>># examine :LDSN
    1
>># examine :UDSN
    1
>># examine :ASN
    1

```



```

>># examine :DBUS
      0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      43
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      43
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      44
>># examine :PHI1
      1

```

```

>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      44
>># examine :PHI2
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0
>># examine :UDSN
      0
>># examine :ASN
      0
>># examine :DBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      45
>># examine :PHI1
      1
>># base 2
>># examine :FC
      101
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      0

```

```

>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
45
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
46
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :DBUS
0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10

```

```

>># examine :T
    46
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    47
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :DBUS
    0
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    47
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1

```

```

>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS
0
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
48
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :nSN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
48
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :DBUS

```

```

1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    49
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    49
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    50
>># examine :PHI1
    1
>># base 2

```

```

>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    50
>># examine :PHI2
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    1
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN
    0
>># examine :ASN
    0
>># examine :DBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    51
>># examine :PHI1
    1
>># base 2
>># examine :FC
    101
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LISN
    0
>># examine :UISN

```

```

0
>># examine :ASN
0
>># examine :IRUS
10000001000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
51
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UIDSN
0
>># examine :ASN
0
>># examine :IRUS
10000001000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
52
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :ITACKN
0
>># examine :RW
1
>># examine :LDSN
0
>># examine :UIDSN
0
>># examine :ASN
0
>># examine :IRUS
10000001000000
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T

```



```

52
>># examine :PHI2
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
10000001000000
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
53
>># examine :PHI1
1
>># base 2
>># examine :FC
101
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :DBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
53
>># examine :PHI2
1
>># base 2
>># examine :FC
110
>># examine :DTACKN
1
>># examine :RW

```

```

1
>># examine :LDSN
1
>># examine :UDSN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
54
>># examine :PHI1
1
>># base 2
>># examine :FC
110
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
54
>># examine :PHI2
1
>># base 2
>># examine :FC
110
>># examine :DTACKN
1
>># examine :RW
1
>># examine :LDSN
0
>># examine :UDSN
0
>># examine :ASN
0
>># examine :IBUS
1111111111111111

```

```

>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    55
>># examine :PHI1
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    55
>># examine :PHI2
    1
>># base 2
>># examine :FC
    110
>># examine :ITACKN
    1
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    56
>># examine :PHI1
    1
>># base 2
>># examine :FC

```

```

    110
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    101100010001111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
    56
>># examine :PHI2
    1
>># base 2
>># examine :FC
    110
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0
>># examine :ASN
    0
>># examine :IBUS
    101100010001111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
    57
>># examine :PHI1
    1
>># base 2
>># examine :FC
    110
>># examine :DTACKN
    0
>># examine :RW
    1
>># examine :LDSN
    0
>># examine :UDSN
    0

```

```

>># examine :ASN
      0
>># examine :DBUS
      101100010001111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      57
>># examine :PHI2
      1
>># base 2
>># examine :FC
      110
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      101100010001111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq1 1
>># base 10
>># examine :T
      58
>># examine :PHI1
      1
>># base 2
>># examine :FC
      110
>># examine :DTACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :DBUS
      111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq1 1
>># base 10
>># examine :T
      58

```

```

>># examine :PHI2
      1
>># base 2
>># examine :FC
      110
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
trigger of signals1 by 1 repeat bkpt :PHI1 eq 1
>># base 10
>># examine :T
      59
>># examine :PHI1
      1
>># base 2
>># examine :FC
      110
>># examine :ITACKN
      1
>># examine :RW
      1
>># examine :LDSN
      1
>># examine :UDSN
      1
>># examine :ASN
      1
>># examine :IBUS
      1111111111111111
>># run from trigger
trigger of signals2 by 2 repeat bkpt :PHI2 eq 1
>># base 10
>># examine :T
      59
>># examine :PHI2
      1
>># base 2
>># examine :FC
      110
>># examine :ITACKN
      1
>># examine :RW
      1

```

```
>># examine :LISN
1
>># examine :UISN
1
>># examine :ASN
1
>># examine :IBUS
1111111111111111
>># run from trigger
simulation halted by bkpt 3
(bkpt :T eq1 0 after :T eq1 59 after :IR eq1 0h3281)
```

Appendix I: MC68000 CDL Models

The CDL descriptions for each of the modeled MC68000 instructions or exception sequences appear in this appendix. They are:

CDL Model	Page
1. MOVE.W D1,D2	I-3
2. MOVE.W D1,(A1)	I-4
3. MOVE.L D1,A1	I-5
4. MOVE.W D1,(A1)+	I-6
5. MOVE.W D1,04(A1)	I-8
6. MOVE.W D1,04(A1,D7)	I-12
7. MOVE.W D1,\$2004	I-15
8. MOVE.W A1,D3	I-18
9. MOVE.W (A1),D2	I-19
10. MOVE.W (A1)+,D6	I-21
11. MOVE.W -(A1),D4	I-23
12. MOVE.W 04(A1),D1	I-25
13. MOVE.W 04(A1,D7),D2	I-28
14. MOVE.W \$2004,D5	I-31
15. MOVE.W \$2004,\$2008	I-34
16. MOVE.W #\$5555,D1	I-39
17. JMP (A0)	I-41
18. ADD.W D3,D5	I-43
19. BEQ START	I-44
20. BTST D1,(A1)	I-47

21. ILLEGAL INSTRUCTION EXCEPTION

I-49

22. ADDRESS ERROR EXCEPTION

I-55

LEVEL 01, L2

/ctrl*K(0)*P(1)/ RW<-1, ADENABLE<-0, DBENABLE<-0,
IABUS<-PC, IBUS<-D1(LWORD)

/ctrl*K(0)*P(2)/ ADENABLE<-1, EXABUF<-IABUS,
FC(MODE)<-SR(MODE), FC(SPACE)<-2,
K<-countupk, D2(LWORD)<-IDBUS,
SR(CARRY)<-0, SR(OVER)<-0, SR(ZERO)<-0,
SR(NEG)<-0

/ctrl*K(1)*P(1)/ ASN<-0, LDSN<-0, UDSN<-0, DBENABLE, -1,
IF(D2(LWORD)=8)THEN(SR(ZERO)<-1

/ctrl*K(1)*P(2)/ T<-countupT, IF(D2(15))THEN(SR(NEG)<-1)

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN(T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN(T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS, K<-countupk

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1, LDSN<-1, UDSN<-1, T<-0, IR<-PFR,
PC<-PCadd2

Y. 1. 1, (1)

/ctrl*K(0)*P(1)/ RW<-1, ADENABLE<-0, DBENABLE<-0, IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1, EXABUF<-IABUS,
FC(MODE)<-SR(MODE), FC(SPACE)<-2,
T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0, LDSN<-0, UDSN<-0, DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN(T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN(T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS, T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1, LDSN<-1, UDSN<-1, T<-countupT

/ctrl*K(5)*P(1)/ ADENABLE<-0, DBENABLE<-0, IABUS<-A1, RW<-1

/ctrl*K(5)*P(2)/ ADENABLE<-1, EXABUF<-IABUS,
FC(MODE)<-SR(MODE), FC(SPACE)<-1,
IDBUS<-D1(LWORD), T<-countupT

/ctrl*K(6)*P(1)/ ASN<-0, RW<-0, EXDBUF<-IDBUS,
SR(CARRY)<-0, SR(OVER)<-0, SR(ZERO)<-0,
SR(NEG)<-0

/ctrl*K(6)*P(2)/ IF(EXDBUF=0)THEN(SR(ZERO)<-1),
DBUS<-EXDBUF, DBENABLE<-1, T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN(T<-countupT),
IF(EXDBUF(15)=1)THEN(SR(NEG)<-1),
UDSN<-0, LDSN<-0)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN(T<-countdnT)

/ctrl*K(8)*P(2)/ T<-countupT

/ctrl*K(9)*P(1)/

/ctrl*K(9)*P(2)/ UDSN<-1, LDSN<-1, ASN<-1, IR<-PFR,
PC<-PCadd2, T<-0

10.1.11.1

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0,      (prefetch), place
                  IABUS<-PC,         data from D1 to
                  IDBUS<-D1          internal data bus

/ctrl*K(0)*P(2)/ ADENABLE<-1, $move data from
                  EXABUF<-IABUS,     internal data bus
                  FC(MODE)<-SR(MODE), into A1, clear
                  FC(SPACE)<-2,      . flags
                  T<-countupT,
                  A1<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0, $check for zero
                  UDSN<-0,
                  DBENABLE<-1,

                  IF(A1=0)THEN
                    (SR(ZERO)<-1)

/ctrl*K(1)*P(2)/ T<-countupT, $check for negative
                  IF(A1(31)=1)THEN
                    (SR(NEG)<-1)

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, $reset T, increment
                  UDSN<-1,PC<-PCadd2, PC, transfer next
                  IR<-PFR,T<-0      instruction to IR,
                                      end of read cycle
                                      and instruction
                                      execution
```

MOVE.W D1, (A1)+

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,        (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1,    $end of read cycle
                  UDSN<-1,
                  T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,IABUS<-A1,    $begin write cycle
                  ADENABLE<-0,        (move data)
                  DBENABLE<-0

/ctrl*K(5)*P(2)/ IDBUS<-D1(LWORD),  $get data from D1
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT
```

```

/ctrl*K(6)*P(1)/ RW<-0,ASN<-0,           $clear flags
                  EXDBUF<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(6)*P(2)/ DBUS<-EXDBUF,           $check for zero
                  DBENABLE<-1,
                  IF(EXDBUF=0)THEN
                    (SR(ZERO)<-1),
                  T<-countupT

/ctrl*K(7)*P(1)/ UDSN<-0,LDSN<-0,       $check for negative
                  IF(DTACKN=0)THEN
                    (T<-countupT),
                  IF(EXDBUF(15)=1)THEN
                    (SR(NEG)<-1)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ T<-countupT

/ctrl*K(9)*P(1)/ A1<-A1add2             $increment A1

/ctrl*K(9)*P(2)/ ASN<-1,UDSN<-1,       $end of write cycle
                  LDSN<-1,T<-countupT

```

....., (4(-1))

```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle  
                   DBENABLE<-0,    (extension word  
                   IAEUS<-PC        fetch)  
  
/ctrl*K(0)*P(2)/  ADENABLE<-1,  
                   EXABUF<-IABUS,  
                   FC(MODE)<-SR(MODE),  
                   FC(SPACE)<-2,  
                   T<-countupT  
  
/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,  
                   UDSN<-0,  
                   DBENABLE<-1  
  
/ctrl*K(1)*P(2)/  T<-countupT  
  
/ctrl*K(2)*P(1)/  IF(DTACKN=0)THEN  
                   (T<-countupT)  
  
/ctrl*K(2)*P(2)/  T<-countupT  
  
/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN  
                   (T<-countdnT)  
  
/ctrl*K(3)*P(2)/  EXDBUF<-DBUS,  
                   T<-countupT  
  
/ctrl*K(4)*P(1)/  DISREG(LWORD)<-EXDBUF,  
                   IF(EXDBUF(15)=1)THEN $store displacement  
                   (DISREG(HWORD)<-    in register DISREG  
                   65535)ELSE          and sign extend to  
                   (DISREG(HWORD)<-0)  32 bits  
  
/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,  $end of read cycle  
                   UDSN<-1,PC<-PCadd2,  
                   T<-countupT,  
                   DISREG<-DISREGaddA1 $add address  
                                       register contents  
                                       to displacement  
  
/ctrl*K(5)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle  
                   DBENABLE<-0,    (prefetch)  
                   IABUS<-PC  
  
/ctrl*K(5)*P(2)/  ADENABLE<-1,  
                   EXABUF<-IABUS,  
                   FC(MODE)<-SR(MODE),  
                   FC(SPACE)<-2,  
                   T<-countupT
```

```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(9)*P(1)/ PFR<-EXDBUF

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle
                  UDSN<-1,
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-1,IABUS<-DISREG $begin write cycle
                  ADENABLE<-0,        (store data at
                  DBENABLE<-0        address in DISREG)

/ctrl*K(10)*P(2)/ IDEBUS<-D1(LWORD),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(11)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(11)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  IF(EXDBUF=0)THEN
                    (SR(ZERO)<-1),
                  T<-countupT

```



```
/ctrl*K(12)*P(1)/ UDSN<-0,LDSN<-0,  
IF(DTACKN=0)THEN  
  (T<-countupT),  
IF(EXDBUF(15)=1)THEN  
  (SR(NEG)<-1)
```

```
/ctrl*K(12)*P(2)/ T<-countupT
```

```
/ctrl*K(13)*P(1)/ IF(DTACKN=1)THEN  
  (T<-countdnT)
```

```
/ctrl*K(13)*P(2)/ T<-countupT
```

```
/ctrl*K(14)*P(1)/
```

```
/ctrl*K(14)*P(2)/ ASN<-1,UDSN<-1,      $end of write cycle  
LDSN<-1,T<-0,  
IR<-PFR,  
PC<-PCadd2
```

Control 1, 2, 3, 4, 5, 6

```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,    $begin read cycle
                   DBENABLE<-0,    (extension word
                   IABUS<-PC        fetch)

/ctrl*K(0)*P(2)/  ADENABLE<-1,
                   EXAEUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT

/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(1)*P(2)/  T<-countupT

/ctrl*K(2)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*K(2)*P(2)/  T<-countupT

/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(3)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

/ctrl*K(4)*P(1)/  DISREG(LWORD)<-EXDBUF,
                   IF(EXDBUF(7)=1)THEN $store displacement
                   (DISREG(HWORD)<-    in register DISREG
                   65535)ELSE         and sign extend
                   (DISREG(HWORD)<-0)   the lower 8 bits

/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,    $end of read cycle
                   UDSN<-1,PC<-PCadd2,
                   T<-countupT,
                   DISREG(8-15)<-
                   DISREG(16-23)

/ctrl*K(5)*P(1)/  DISREG<-DISREGaddA1 $add contents of A1
                   to DISREG

/ctrl*K(5)*P(2)/  T<-countupT,        $add low order word
                   DISREG<-DISREGadd  of index register
                   D7(LWORD)          to DISREG

/ctrl*K(6)*P(1)/  IF(D7(15)=1)THEN   $add sign extended
                   (DISREG<-DISREGadd part of index
                   (FF00hex))        register to DISREG
```

```

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0,      (prefetch)
                  IABUS<-PC

/ctrl*K(7)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(8)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(8)*P(2)/ T<-countupT

/ctrl*K(9)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(9)*P(2)/ T<-countupT

/ctrl*K(10)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(10)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(11)*P(1)/ PFR<-EXDBUF

/ctrl*K(11)*P(2)/ ASN<-1,LDSN<-1, $end of read cycle
                  UDSN<-1,
                  T<-countupT

/ctrl*K(12)*P(1)/ RW<-1,IABUS<-DISREG $begin write cycle
                  ADENABLE<-0,      (store data at
                  DBENABLE<-0,      address in DISREG)

/ctrl*K(12)*P(2)/ IDBUS<-D1(LWORD),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

```

```

/ctrl*K(13)*P(1)/ RW<-0,ASN<-0,           $clear flags
                   EXDBUF<-IDBUS,
                   SR(CARRY)<-0,
                   SR(OVER)<-0,
                   SR(ZERO)<-0,
                   SR(NEG)<-0

/ctrl*K(13)*P(2)/ DBUS<-EXDBUF,           $check for zero
                   DBENABLE<-1,
                   IF(EXDBUF=0)THEN
                     (SR(ZERO)<-1),
                   T<-countupT

/ctrl*K(14)*P(1)/ UDSN<-0,LDSN<-0,       $check for negative
                   IF(DTACKN=0)THEN
                     (T<-countupT),
                   IF(EXDBUF(15)=1)THEN
                     (SR(NEG)<-1)

/ctrl*K(14)*P(2)/ T<-countupT

/ctrl*K(15)*P(1)/ IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(15)*P(2)/ T<-countupT

/ctrl*K(16)*P(1)/

/ctrl*K(16)*P(2)/ ASN<-1,UDSN<-1,       $end of write cycle
                   LDSN<-1,T<-0,
                   IR<-PFR,
                   PC<-PCadd2

```

Microsequencing

```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (extension word
                   IABUS<-PC      fetch)

/ctrl*K(0)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT

/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(1)*P(2)/  T<-countupT

/ctrl*K(2)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*K(2)*P(2)/  T<-countupT

/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(3)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

/ctrl*K(4)*P(1)/  DISREG(LWORD)<-EXDBUF,
                   IF(EXDBUF(15)=1)THEN $store 16 bit
                   (DISREG(HWORD)<-    address in DISREG
                   65535)ELSE         and sign extend to
                   (DISREG(HWORD)<-0)  32 bits

/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,  $end of read cycle
                   UDSN<-1,PC<-PCadd2,
                   T<-countupT

/ctrl*K(5)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (prefetch)
                   IABUS<-PC

/ctrl*K(5)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT
```

```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(9)*P(1)/ PFR<-EXDBUF

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle
                  UDSN<-1,
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-1,IABUS<-DISREG $begin write cycle
                  ADENABLE<-0,        (store data at
                  DBENABLE<-0        address in DISREG)

/ctrl*K(10)*P(2)/ IDBUS<-D1(LWORD),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(11)*P(1)/ RW<-0,ASN<-0,      $clear flags
                  EXDBUF<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(11)*P(2)/ DBUS<-EXDBUF,      $check for zero
                  DBENABLE<-1,
                  IF(EXDBUF=0)THEN
                    (SR(ZERO)<-1),
                  T<-countupT

/ctrl*K(12)*P(1)/ UDSN<-0,LDSN<-0,   $check for negative
                  IF(DTACKN=0)THEN
                    (T<-countupT),
                  IF(EXDBUF(15)=1)THEN
                    (SR(NEG)<-1)

```

/ctrl*K(12)*P(2)/ T<-countupT

/ctrl*K(13)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(13)*P(2)/ T<-countupT

/ctrl*K(14)*P(1)/

/ctrl*K(14)*P(2)/ ASN<-1,UDSN<-1, \$end of write cycle
LDSN<-1,T<-0,
IR<-PFR,
PC<-PCadd2

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0,      (prefetch), place
                  IABUS<-PC,         data from A1 to
                  IDBUS<-A1(LWORD)   internal data bus
```

```
/ctrl*K(0)*P(2)/ ADENABLE<-1, $move data from
                  EXABUF<-IABUS,   internal data bus
                  FC(MODE)<-SR(MODE), into D3, clear
                  FC(SPACE)<-2,     flags
                  T<-countupT,
                  D3(LWORD)<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0
```

```
/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0, $check for zero
                  UDSN<-0,
                  DBENABLE<-1,
                  IF(D3(LWORD)=0)THEN
                      (SR(ZERO)<-1)
```

```
/ctrl*K(1)*P(2)/ T<-countupT, $check for negative
                  IF(D3(15)=1)THEN
                      (SR(NEG)<-1)
```

```
/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)
```

```
/ctrl*K(2)*P(2)/ T<-countupT
```

```
/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)
```

```
/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT
```

```
/ctrl*K(4)*P(1)/ PFR<-EXDBUF
```

```
/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, $reset T, increment
                  UDSN<-1,PC<-PCadd2, PC, transfer next
                  IR<-PFR,T<-0      instruction to IR,
                                      end of read cycle
                                      and instruction
                                      execution
```


M 77.2 (11), 12

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,          (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1,        $end of read cycle,
                  UDSN<-1,PC<-PCadd2,   increment PC
                  T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,          (fetch data)
                  IABUS<-A1

/ctrl*K(5)*P(2)/ ADENABLE<-1,          $set function codes
                  EXABUF<-IABUS,        to user data mode,
                  FC(MODE)<-SR(MODE),    clear flags
                  FC(SPACE)<-1,
                  T<-countupT,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0
```

```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,          $latch data into
                  T<-countupT          buffer

/ctrl*K(9)*P(1)/ IDBUS<-EXDBUF,        $check if data is
                  IF(EXDBUF=0)THEN     zero or negative
                  (SR(ZERO)<-1),        and set flags if
                  IF(EXDBUF(15)=1)THEN  needed
                  (SR(NEG)<-1)

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,      $place data in D2,
                  UDSN<-1,T<-0,        reset T, put next
                  IR<-PFR,D2<-IDBUS    instruction in IR

```

PCV .# (11)+,10

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0,      (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle,
                  UDSN<-1,PC<-PCadd2, increment PC
                  T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0,      (fetch data)
                  IABUS<-A1

/ctrl*K(5)*P(2)/ ADENABLE<-1,      $set function codes
                  EXABUF<-IABUS,    to user data mode,
                  FC(MODE)<-SR(MODE), clear flags
                  FC(SPACE)<-1,
                  T<-countupT,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0
```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
UDSN<-0,
DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS, \$latch data into
A1<-A1add2, buffer, increment
T<-countupT register A1

/ctrl*K(9)*P(1)/ IDBUS<-EXDBUF, \$check if data is
IF(EXDBUF=0)THEN zero or negative
 (SR(ZERO)<-1), and set flags if
IF(EXDBUF(15)=1)THEN needed
 (SR(NEG)<-1)

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1, \$place data in D6,
UDSN<-1,T<-0, reset T, put next
IR<-PFR,D6<-IDBUS instruction in IR

101.1 - (A1).2

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0, (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, $end of read cycle,
                  UDSN<-1,PC<-PCadd2, increment PC
                  T<-countupT

/ctrl*K(5)*P(1)/ A1<-A1sub2 $decrement address
                               in A1 before
                               fetching the
                               operand

/ctrl*K(5)*P(2)/ T<-countupT

/ctrl*K(6)*P(1)/

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0, (fetch data)
                  IABUS<-A1
```

```

/ctrl*K(7)*P(2)/ ADENABLE<-1,          $set function codes
                  EXABUF<-IABUS,        to user data mode,
                  FC(MODE)<-SR(MODE),    clear flags
                  FC(SPACE)<-1,
                  T<-countupT,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(8)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(8)*P(2)/ T<-countupT

/ctrl*K(9)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(9)*P(2)/ T<-countupT

/ctrl*K(10)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(10)*P(2)/ EXDBUF<-DBUS,        $latch data into
                  T<-countupT          buffer

/ctrl*K(11)*P(1)/ IDBUS<-EXDBUF,       $check if data is
                  IF(EXDBUF=0)THEN     zero or negative
                  (SR(ZERO)<-1),        and set flags if
                  IF(EXDBUF(15)=1)THEN needed
                  (SR(NEG)<-1)

/ctrl*K(11)*P(2)/ ASN<-1,LDSN<-1,     $place data in D4,
                  UDSN<-1,T<-0,        reset T, put next
                  IR<-PFR,D4<-IDBUS    instruction in IR

```

MODE.4 (04(11),11

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0, (fetch extension
                  IABUS<-PC      word)

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ DISREG(LWORD)<-EXDBUF,
                  IF(EXDBUF(15)=1)THEN $sign extend the
                  (DISREG(HWORD)<- displacement to
                  65535)ELSE 32 bits
                  (DISREG(HWORD)<-0)

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, $end of read cycle,
                  UDSN<-1,PC<-PCadd2, increment PC
                  T<-countupT,
                  DISREG<-DISREGaddA1 $add address
                                      register contents
                                      to displacement

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0, (prefetch)
                  IABUS<-PC
```

```

/ctrl*K(5)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(9)*P(1)/ PFR<-EXDBUF

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle,
                  UDSN<-1,PC<-PCadd2,  increment PC
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-1,ADENABLE<-0,  $begin read cycle
                  DBENABLE<-0,         (fetch data from
                  IABUS<-DISREG        address in DISREG)

/ctrl*K(10)*P(2)/ ADENABLE<-1,        $set function codes
                  EXABUF<-IABUS,        to user data mode,
                  FC(MODE)<-SR(MODE),    clear flags
                  FC(SPACE)<-1,
                  T<-countupT,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(11)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(11)*P(2)/ T<-countupT

/ctrl*K(12)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

```


/ctrl*K(12)*P(2)/ T<-countupT

/ctrl*K(13)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(13)*P(2)/ EXDBUF<-DBUS, \$slatch data into
T<-countupT buffer

/ctrl*K(14)*P(1)/ IDBUS<-EXDBUF, \$check if data is
IF(EXDBUF=0)THEN zero or negative
 (SR(ZERO)<-1), and set flags if
IF(EXDBUF(15)=1)THEN needed
 (SR(NEG)<-1)

/ctrl*K(14)*P(2)/ ASN<-1,LDSN<-1, \$place data in D1,
UDSN<-1,T<-0, reset T, put next
IR<-PFR,D1<-IDBUS instruction in IR

17.2 (1), 2

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle  
DBENABLE<-0, (fetch extension  
IABUS<-PC word)  
  
/ctrl*K(0)*P(2)/ ADENABLE<-1,  
EXABUF<-IABUS,  
FC(MODE)<-SR(MODE),  
FC(SPACE)<-2,  
T<-countupT  
  
/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,  
UDSN<-0,  
DBENABLE<-1  
  
/ctrl*K(1)*P(2)/ T<-countupT  
  
/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN  
(T<-countupT)  
  
/ctrl*K(2)*P(2)/ T<-countupT  
  
/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN  
(T<-countdnT)  
  
/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,  
T<-countupT  
  
/ctrl*K(4)*P(1)/ DISREG(LWORD)<-EXDBUF,  
IF(EXDBUF(15)=1)THEN $sign extend the  
(DISREC(HWORD)<- displacement to  
65535)ELSE 32 bits  
(DISREG(HWORD)<-0)  
  
/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, $end of read cycle,  
UDSN<-1,PC<-PCadd2, increment PC  
T<-countupT,  
DISREG<-DISREGaddA1 $add address  
register contents  
to displacement  
  
/ctrl*K(5)*P(1)/ DISREG<-DISREGaddD7 $add index (D7)  
value to  
displacement and  
address  
  
/ctrl*K(5)*P(2)/ T<-countupT
```

```

/ctrl*K(6)*P(1)/
/ctrl*K(6)*P(2)/ T<-countupT
/ctrl*K(7)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
DBENABLE<-0, (prefetch)
IABUS<-PC
/ctrl*K(7)*P(2)/ ADENABLE<-1,
EXABUF<-IABUS,
FC(MODE)<-SR(MODE),
FC(SPACE)<-2,
T<-countupT
/ctrl*K(8)*P(1)/ ASN<-0,LDSN<-0,
UDSN<-0,
DBENABLE<-1
/ctrl*K(8)*P(2)/ T<-countupT
/ctrl*K(9)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)
/ctrl*K(9)*P(2)/ T<-countupT
/ctrl*K(10)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)
/ctrl*K(10)*P(2)/ EXDBUF<-DBUS,
T<-countupT
/ctrl*K(11)*P(1)/ PFR<-EXDBUF
/ctrl*K(11)*P(2)/ ASN<-1,LDSN<-1, $send of read cycle,
UDSN<-1,PC<-PCadd2, increment PC
T<-countupT
/ctrl*K(12)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
DBENABLE<-0, (fetch data from
IABUS<-DISREG address in DISREG)
/ctrl*K(12)*P(2)/ ADENABLE<-1, $set function codes
EXABUF<-IABUS, to user data mode,
FC(MODE)<-SR(MODE), clear flags
FC(SPACE)<-1,
T<-countupT,
SR(CARRY)<-0,
SR(OVER)<-0,
SR(ZERO)<-0,
SR(NEG)<-0

```

```

/ctrl*K(13)*P(1)/ ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(13)*P(2)/ T<-countupT

/ctrl*K(14)*P(1)/ IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*k(14)*P(2)/ T<-countupT

/ctrl*K(15)*P(1)/ IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(15)*P(2)/ EXDBUF<-DBUS,           $latch data into
                   T<-countupT           buffer

/ctrl*K(16)*P(1)/ IDBUS<-EXDBUF,         $check if data is
                   IF(EXDBUF=0)THEN      zero or negative
                   (SR(ZERO)<-1),        and set flags if
                   IF(EXDBUF(15)=1)THEN  needed
                   (SR(NEG)<-1)

/ctrl*K(16)*P(2)/ ASN<-1,LDSN<-1,       $place data in D2,
                   UDSN<-1,T<-0,        reset T, put next
                   IR<-PFR,D2<-IDBUS    instruction in IR

```

MOVING REGISTER

```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (fetch extension
                   IABUS<-PC      word)

/ctrl*K(0)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT

/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(1)*P(2)/  T<-countupT

/ctrl*K(2)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*K(2)*P(2)/  T<-countupT

/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(3)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

/ctrl*K(4)*P(1)/  DISREG(LWORD)<-EXDBUF,
                   IF(EXDBUF(15)=1)THEN $store the 16 bit
                   (DISREG(HWORD)<-    address in DISREG
                   65535)ELSE        and sign extend
                   (DISREG(HWORD)<-0)  to 32 bits

/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,  $end of read cycle,
                   UDSN<-1,PC<-PCadd2,  increment PC
                   T<-countupT

/ctrl*K(5)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (prefetch)
                   IABUS<-PC

/ctrl*K(5)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT
```

```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(9)*P(1)/ PFR<-EXDBUF

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,          $end of read cycle,
                  UDSN<-1,PC<-PCadd2,    increment PC
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-1,ADENABLE<-0,     $begin read cycle
                  DBENABLE<-0,          (fetch data from
                  IABUS<-DISREC        address in DISREG)

/ctrl*K(10)*P(2)/ ADENABLE<-1,          $set function codes
                  EXABUF<-IABUS,        to user data mode,
                  FC(MODE)<-SR(MODE),    clear flags
                  FC(SPACE)<-1,
                  T<-countupT,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(11)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(11)*P(2)/ T<-countupT

/ctrl*K(12)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(12)*P(2)/ T<-countupT

/ctrl*K(13)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

```

/ctrl*K(13)*P(2)/ EXDBUF<-DBUS, T<-countupT	\$latch data into buffer
/ctrl*K(14)*P(1)/ IDBUS<-EXDBUF, IF(EXDBUF=0)THEN (SR(ZERO)<-1), IF(EXDBUF(15)=1)THEN (SR(NEG)<-1)	\$check if data is zero or negative and set flags if needed
/ctrl*K(14)*P(2)/ ASN<-1,LDSN<-1, UDSN<-1,T<-0, IR<-PFR,D5<-IDEUS	\$place data in D5, reset T, put next instruction in IR

M.

/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, \$begin read cycle
DBENABLE<-0, (extension word
IABUS<-PC fetch)

/ctrl*K(0)*P(2)/ ADENABLE<-1,
EXABUF<-IABUS,
FC(MODE)<-SR(MODE),
FC(SPACE)<-2,
T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
UDSN<-0,
DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
T<-countupT

/ctrl*K(4)*P(1)/ TEMPADR(HI)<-EXDBUF \$put high order word
of source address
in temporary
register

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1, \$end of read cycle
UDSN<-1,PC<-PCadd2,
T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0, \$begin read cycle
DBENABLE<-0, (extension word
IABUS<-PC fetch)

/ctrl*K(5)*P(2)/ ADENABLE<-1,
EXABUF<-IABUS,
FC(MODE)<-SR(MODE),
FC(SPACE)<-2,
T<-countupT


```

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(9)*P(1)/ TEMPADR(LOW)<-EXDBUF $put low order word
                                     of source address
                                     in temporary
                                     register

/ctrl*K(9)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle
                  UDSN<-1,PC<-PCadd2,
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-1,ADENABLE<-0,  $begin read cycle
                  DBENABLE<-0,        (extension word
                  IABUS<-PC           fetch)

/ctrl*K(10)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(11)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(11)*P(2)/ T<-countupT

/ctrl*K(12)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(12)*P(2)/ T<-countupT

/ctrl*K(13)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(13)*P(2)/ EXDBUF<-DEUS,
                  T<-countupT

```

```

/ctrl*K(14)*P(1)/
/ctrl*K(14)*P(2)/ ASN<-1,LDSN<-1,      $end read cycle
                  UDSN<-1,PC<-PCadd2,
                  T<-countupT

/ctrl*K(15)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,          (fetch data from
                  IABUS<-TEMPADR        source address)

/ctrl*K(15)*P(2)/ TEMPADR(HI)<-EXDBUF,  $put high order
                  ADENABLE<-1,          word of
                  EXABUF<-IABUS,        destination in
                  FC(MODE)<-SR(MODE),    temporary register
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(16)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(16)*P(2)/ T<-countupT

/ctrl*K(17)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(17)*P(2)/ T<-countupT

/ctrl*K(18)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(18)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(19)*P(1)/ DTEMP<-EXDBUF        $put data in
                                          temporary register

/ctrl*K(19)*P(2)/ ASN<-1,LDSN<-1,
                  UDSN<-1,T<-countupT

/ctrl*K(20)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,          (extension word
                  IABUS<-PC              fetch)

/ctrl*K(20)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

```

```

/ctrl*K(21)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(21)*P(2)/ T<-countupT

/ctrl*K(22)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(22)*P(2)/ T<-countupT

/ctrl*K(23)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnt)

/ctrl*K(23)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(24)*P(1)/ TEMPADR(LOW)<-EXDBUF

/ctrl*K(24)*P(2)/ ASN<-1,LDSN<-1,          $end of read cycle
                  UDSN<-1,PC<-PCadd2,
                  T<-countupT

/ctrl*K(25)*P(1)/ IABUS<-TEMPADR,         $begin write cycle
                  ADENABLE<-0,RW<-1,      (store data at
                  DBENABLE<-0            destination
                                          address)

/ctrl*K(25)*P(2)/ IDBUS<-DTEMP,          $get data from
                  EXABUF<-IABUS,         temporary register
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(26)*P(1)/ RW<-0,ASN<-0,          $clear flags
                  EXDBUF<-IDBUS,
                  SR(CARRY)<-0,
                  SR(OVER)<-0,
                  SR(ZERO)<-0,
                  SR(NEG)<-0

/ctrl*K(26)*P(2)/ DBUS<-EXDBUF,         $check for zero
                  DBENABLE<-1,
                  IF(EXDBUF=0)THEN
                    (SR(ZERO)<-1),
                  T<-countupT

```

```

/ctrl*K(27)*P(1)/ UDSN<-0,LDSN<-0,      $check for negative
                  IF(DTACKN=0)THEN
                    (T<-countupT),
                  IF(EXDBUF(15)=1)THEN
                    (SR(NEG)<-1)

/ctrl*K(27)*P(2)/ T<-countupT

/ctrl*K(28)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(28)*P(2)/ T<-countupT

/ctrl*K(29)*P(1)/

/ctrl*K(29)*P(2)/ ASN<-1,UDSN<-1,      $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(30)*P(1)/ RW<-1,ADENABLE<-0,   $begin read cycle
                  DBENABLE<-0,        (prefetch)
                  IABUS<-PC

/ctrl*K(30)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SK(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(31)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(31)*P(2)/ T<-countupT

/ctrl*K(32)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(32)*P(2)/ T<-countupT

/ctrl*K(33)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(33)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(34)*P(1)/ PFR<-EXDBUF

/ctrl*K(34)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle
                  UDSN<-1,PC<-PCadd2,
                  IR<-PFR,T<-0

```

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```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (fetch extension
                   IABUS<-PC      word which is
                                   immediate data)

/ctrl*K(0)*P(2)/  ADENABLE<-1,  $clear flags
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT,
                   SR(CARRY)<-0,
                   SR(OVER)<-0,
                   SR(ZERO)<-0,
                   SR(NEG)<-0

/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(1)*P(2)/  T<-countupT

/ctrl*K(2)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*K(2)*P(2)/  T<-countupT

/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(3)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

/ctrl*K(4)*P(1)/  IDBUS<-EXDBUF,  $check if data is
                   IF(EXDBUF=0)THEN  zero or negative
                   (SR(ZERO)<-1),    and set flags if
                   IF(EXDBUF(15)=1)THEN  needed
                   (SR(NEG)<-1)

/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,  $end of read cycle,
                   UDSN<-1,PC<-PCadd2,  increment PC,
                   D1<-IDBUS,    place data in D1
                   T<-countupT

/ctrl*K(5)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle
                   DBENABLE<-0,  (prefetch)
                   IABUS<-PC
```

```

/ctrl*K(5)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT

/ctrl*K(6)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

/ctrl*K(6)*P(2)/  T<-countupT

/ctrl*K(7)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

/ctrl*K(7)*P(2)/  T<-countupT

/ctrl*K(8)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

/ctrl*K(8)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

/ctrl*K(9)*P(1)/  PFR<-EXDBUF

/ctrl*K(9)*P(2)/  ASN<-1,LDSN<-1,      $end of read cycle,
                   UDSN<-1,PC<-PCadd2,  increment PC,
                   T<-0,IR<-PFR        reset T

```

JEP (10)

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,
                  IABUS<-PC

/ctrl*K(0)*P(2)/ EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,        $place jump address
                  UDSN<-0,IABUS<-A0,    from A0 to internal
                  DBENABLE<-1          address bus

/ctrl*K(1)*P(2)/ PC<-IABUS,            $place jump address
                  T<-countupT          in program counter

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnt)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1,
                  UDSN<-1,T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle,
                  DBENABLE<-0,        fetch instruction
                  IABUS<-PC          from new address

/ctrl*K(5)*P(2)/ ADENABLE<-1,
                  FC(SPACE)<-2,
                  FC(MODE)<-SR(MODE),
                  EXABUF<-IABUS,
                  T<-countupT

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,DBENABLE<-1

/ctrl*K(6)*P(2)/ T<-countupT
```

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
T<-countupT

/ctrl*K(9)*P(1)/ PFR<-EXDBUF

/ctrl*K(9)*P(2)/ ASN<-1,UDSN<-1,
LDSN<-1,IR<-PFR,
PC<-PCadd2,T<-0

\$end of read cycle

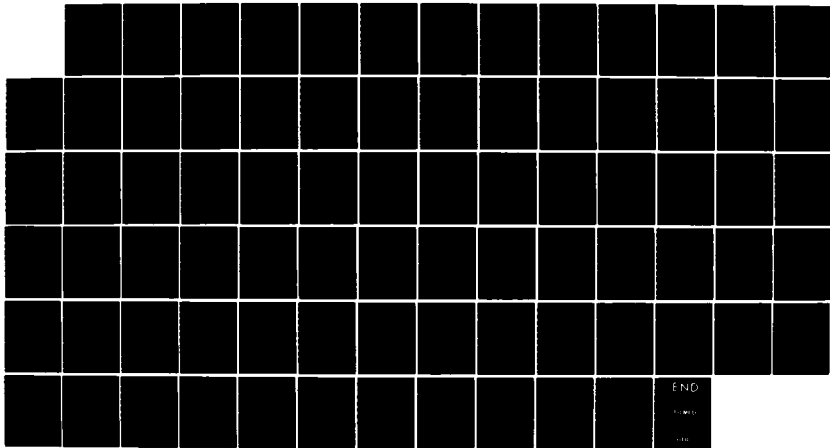
AD-A151 962

THE SIMULATION AND ANALYSIS OF A RTL MODEL OF THE
MOTOROLA MC68000 MICROP. (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF ENGI. . C A BAXLEY
1984 AFIT/GCS/ENG/84D-2

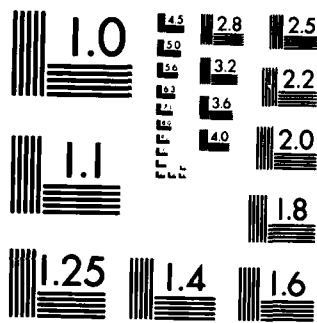
5/3

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END



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```

/ctrl*K(0)*P(1)/ IDBUS<-D3(LWORD), RW<-1, ADENABLE<-0,
DBENABLE<-0, IABUS<-PC

/ctrl*K(0)*P(2)/ ALUBUF1<-IDBUS, ADENABLE<-1,
EXABUF<-IABUS, FC(MODE)<-SR(MODE),
FC(SPACE)<-2, T<-countupT

/ctrl*K(1)*P(1)/ IDBUS<-D5(LWORD), ASN<-0, LDSN<-0,
UDSN<-0, DBENABLE<-1

/ctrl*K(1)*P(2)/ ALUBUF2<-IDBUS, T<-countupT

/ctrl*K(2)*P(1)/ IDBUS<-ALUBUF1addALUBUF2, SR(CARRY)<-0,
SR(OVER)<-0, SR(ZERO)<-0, SR(NEG)<-0,
SR(EX)<-0, IF(DTACKN=0)THEN(T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN(T<-countdnT)

/ctrl*K(3)*P(2)/ D5(LWORD)<-IDBUS, EXDBUF<-DBUS,
T<-countupT

/ctrl*K(4)*P(1)/ IF(D5(LWORD)=0)THEN(SR(ZERO)<-1),
IF(COUT=1)THEN(SR(CARRY)<-1, SR(EX)<-1),
IF(D5(15)=1)THEN(SR(NEG)<-1),
SR(OVER)<-D5(15)'*ALUBUF1(15)*ALUBUF2(15)+
D5(15)*ALUBUF1(15)'*ALUBUF2(15)',
PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1, LDSN<-1, UDSN<-1, IR<-PFR,
PC<-PCadd2, T<-0

```

PC1 START

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0, $begin read cycle
                  DBENABLE<-0, (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ IF(SR(ZERO)=1)THEN $test condition
                  (T<-Tadd5)ELSE (zero flag, if
                  (T<-countupT) true, skip to K(9)
                  ASN<-1,LDSN<-1, and execute branch
                  UDSN<-1,PC<-PCadd2

/ctrl*K(5)*P(1)/ ADENABLE<-0, $branch not taken,
                  DBENABLE<-0 executes the next
                               four clock cycles,
                               address and data
                               lines to high
                               impedance state

/ctrl*K(5)*P(2)/ T<-countupT

/ctrl*K(6)*P(1)/

/ctrl*K(6)*P(2)/ T<-countupT
```

```

/ctrl*K(7)*P(1)/
/ctrl*K(7)*P(2)/ T<-countupT
/ctrl*K(8)*P(1)/
/ctrl*K(8)*P(2)/ IR<-PFR,T<-0           $place next
                                           instruction in IR,
                                           reset T, end of BEQ
                                           if branch not taken

/ctrl*K(9)*P(1)/ PC<-PCaddIR(0-7)       $branch taken,
ADENABLE<-0,                                       executes the
DBENABLE<-0                                       remaining clock
                                                    cycles, add
                                                    displacement to the
                                                    PC, address and
                                                    data lines to high
                                                    impedance state.

/ctrl*K(9)*P(2)/ T<-countupT
/ctrl*K(10)*P(1)/
/ctrl*K(10)*P(2)/ T<-countupT
/ctrl*K(11)*P(1)/ RW<-1,ADENABLE<-0,       $begin read cycle
DBENABLE<-0,                                       (fetch instruction
IABUS<-PC                                         branched to)

/ctrl*K(11)*P(2)/ ADENABLE<-1,
EXABUF<-IABUS,
FC(MODE)<-SR(MODE),
FC(SPACE)<-2,
T<-countupT

/ctrl*K(12)*P(1)/ ASD<-0,LDSN<-0,
UDSN<-0,
DBENABLE<-1

/ctrl*K(12)*P(2)/ T<-countupT
/ctrl*K(13)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)
/ctrl*K(13)*P(2)/ T<-countupT

```

/ctrl*K(14)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(14)*P(2)/ EXDBUF<-DBUS,
T<-countupT

/ctrl*K(15)*P(1)/ PFR<-EXDBUF

/ctrl*K(15)*P(2)/ ASN<-1,LDSN<-1, \$end of BEQ (branch
UDSN<-1,PC<-PCadd2, taken), increment
T<-0 PC, reset T

BTSP 21, (11)

```
/ctrl*K(0)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle
                  DBENABLE<-0,        (prefetch)
                  IABUS<-PC

/ctrl*K(0)*P(2)/ ADENABLE<-1,
                  EXABUF<-IABUS,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-2,
                  T<-countupT

/ctrl*K(1)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,
                  DBENABLE<-1

/ctrl*K(1)*P(2)/ T<-countupT

/ctrl*K(2)*P(1)/ IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(2)*P(2)/ T<-countupT

/ctrl*K(3)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(3)*P(2)/ EXDBUF<-DBUS,
                  T<-countupT

/ctrl*K(4)*P(1)/ PFR<-EXDBUF

/ctrl*K(4)*P(2)/ ASN<-1,LDSN<-1,
                  UDSN<-1,PC<-PCadd2,
                  T<-countupT

/ctrl*K(5)*P(1)/ RW<-1,ADENABLE<-0,    $begin read cycle,
                  DBENABLE<-0,        fetch data byte
                  IABUS<-A1           from address in A1

/ctrl*K(5)*P(2)/ ADENABLE<-1,          $set function code
                  EXABUF<-IABUS,       to user data space
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(6)*P(1)/ ASN<-0,LDSN<-0,    $assert only the
                  DBENABLE<-1         lower data strobe
                                      since only fetching
                                      a byte of data
```

/ctrl*K(6)*P(2)/ T<-countupT

/ctrl*K(7)*P(1)/ IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(7)*P(2)/ T<-countupT

/ctrl*K(8)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(8)*P(2)/ EXDBUF<-DBUS,
T<-countupT

/ctrl*K(9)*P(1)/

/ctrl*K(9)*P(2)/ IF(D1(0-2)=0)THEN \$test the bit
(IF(EXDBUF(0)=1)THEN specified by the
(SR(ZERO)<-1)ELSE three low order
(SR(ZERO)<-0)ELSE bits of D1, reset
(IF(D1(0-2)=1)THEN T, end of
(IF(EXDBUF(1)=1)THEN instruction
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=2)THEN
(IF(EXDBUF(2)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=3)THEN
(IF(EXDBUF(3)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=4)THEN
(IF(EXDBUF(4)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=5)THEN
(IF(EXDBUF(5)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=6)THEN
(IF(EXDBUF(6)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)ELSE
(IF(D1(0-2)=7)THEN
(IF(EXDBUF(7)=1)THEN
(SR(ZERO)<-1)ELSE
(SR(ZERO)<-0)))))))))
ASN<-1, LDSN<-1,
IR<-PFR, T<-0

INTERNAL STATE TRANSITION TABLE

```
/ctrl*K(0)*P(1)/  RW<-1,ADENABLE<-0,  $begin read cycle,  
                  DBENABLE<-0,    prefetch of next  
                  IABUS<-PC        instruction  
  
/ctrl*K(0)*P(2)/  ADENABLE<-1,  
                  FC(MODE)<-SR(MODE),  
                  FC(SPACE)<-2,  
                  EXABUF<-IABUS,  
                  T<-countupT  
  
/ctrl*K(1)*P(1)/  ASN<-0,LDSN<-0,  
                  UDSN<-0,DBENABLE<-1  
  
/ctrl*K(1)*P(2)/  IDBUS<-SR,      $place SR contents  
                  PC<-PCsub4,    on internal  
                  T<-countupT    address bus,  
                                  decrement PC back  
                                  to illegal  
                                  instruction address  
  
/ctrl*K(2)*P(1)/  SRTEMP<-IDBUS  $store contents of  
                  IF(DTACKN=0)THEN  SR in temporary  
                  (T<-countupT)     register  
  
/ctrl*K(2)*P(2)/  T<-countupT    $wait state  
  
/ctrl*K(3)*P(1)/  IF(DTACKN=1)THEN $wait state  
                  (T<-countdnT)  
  
/ctrl*K(3)*P(2)/  SR(MODE)=1,    $set to supervisor  
                  SR(TRACE)=0,    mode, turn off  
                  EXDBUF<-DBUS,   trace function  
                  T<-countupT  
  
/ctrl*K(4)*P(1)/  SA7<-SA7sub2,  $set stack pointer  
                  PFR<-EXDBUS     to location for low  
                                  word of PC  
  
/ctrl*K(4)*P(2)/  ASN<-1,LDSN<-1,  
                  UDSN<-1,T<-countupT
```

```

/ctrl*K(5)*P(1)/  VECADR=4,          $put the exception
                  ADENABLE<-0,      vector number in a
                  DBENABLE<-0       register, set
                                      address and data
                                      buses to high
                                      impedance

/ctrl*K(5)*P(2)/  T<-countupT

/ctrl*K(6)*P(1)/  VECADR<-2shlVECADR $multiply vector
                                      number by 4 to
                                      create vector
                                      address (using a
                                      shift left)

/ctrl*K(6)*P(2)/  T<-countupT

/ctrl*K(7)*P(1)/

/ctrl*K(7)*P(2)/  T<-countupT

/ctrl*K(8)*P(1)/

/ctrl*K(8)*P(2)/  T<-countupT

/ctrl*K(9)*P(1)/  RW<-1,IABUS<-SA7,  $begin write cycle
                  ADENABLE<-0,      to store low word
                  DBENABLE<-0       of PC on the
                                      supervisor stack
                                      (SA7)

/ctrl*K(9)*P(2)/  IDBUS<-PC(LOW),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE);
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(10)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(10)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(11)*P(1)/ UDSN<-0,LDSN<-0
                  IF(DTACKN=0)THEN
                      (T<-countupT)

```

```

/ctrl*K(11)*P(2)/ T<-countupT

/ctrl*K(12)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(12)*P(2)/ SA7<-SA7sub4,          $set stack pointer
                  T<-countupT           to location for
                                          status register
                                          contents

/ctrl*K(13)*P(1)/

/ctrl*K(13)*P(2)/ ASN<-1,UDSN<-1,        $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(14)*P(1)/ RW<-1,IABUS<-SA7,      $begin write cycle
                  ADENABLE<-0,         to store status
                  DBENABLE<-0         register contents
                                          on the supervisor
                                          stack

/ctrl*K(14)*P(2)/ IDBUS<-SRTEMP,
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(15)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(15)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(16)*P(1)/ UDSN<-0,LDSN<-0,
                  IF(DTACKN=0)THEN
                  (T<-countupT)

/ctrl*K(16)*P(2)/ T<-countupT

/ctrl*K(17)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(17)*P(2)/ SA7<-SA7add2,        $set stack pointer
                  T<-countupT           to location for
                                          high word of PC

/ctrl*K(18)*P(1)/

/ctrl*K(18)*P(2)/ ASN<-1,UDSN<-1,        $end of write cycle
                  LDSN<-1,T<-countupT

```

```

/ctrl*K(19)*P(1)/ RW<-1,IABUS<-SA7,      $begin write cycle
                  ADENABLE<-0,          to store high word
                  DBENABLE<-0          of PC on the
                                          supervisor stack

/ctrl*K(19)*P(2)/ IDBUS<-PC(HI),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(20)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(20)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(21)*P(1)/ UDSN<-0,LDSN<-0,
                  IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(21)*P(2)/ T<-countupT

/ctrl*K(22)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(22)*P(2)/ T<-countupT

/ctrl*K(23)*P(1)/

/ctrl*K(23)*P(2)/ ASN<-1,UDSN<-1,      $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(24)*P(1)/ RW<-1,ADENABLE<-0,   $begin read cycle
                  DBENABLE<-0,          to fetch high
                  IABUS<-VECADR        order word of the
                                          address for the
                                          exception handler
                                          routine

/ctrl*K(24)*P(2)/ ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  EXABUF<-IABUS,
                  T<-countupT

/ctrl*K(25)*P(1)/ ASN<-0,LDSN<-0,
                  UDSN<-0,DBENABLE<-1

/ctrl*K(25)*P(2)/ T<-countupT

```

```

/ctrl*K(25)*P(1)/ IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(26)*P(2)/ T<-countupT

/ctrl*K(27)*P(1)/ IF(DTACKN=1)THEN
                    (T<-countdnT)

/ctrl*K(27)*P(2)/ EXDBUF<-DBUS,
                    T<-countupT

/ctrl*K(28)*P(1)/ HANADR(LOW)<-EXDBUF $latch data into low
                                         word of the handler
                                         routine address
                                         register

/ctrl*K(28)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle,
                    VECADR<-VECADRadd2, increment vector
                    UDSN<-1,T<-countupT address register to
                                         fetch low word of
                                         address

/ctrl*K(29)*P(1)/ RW<-1,ADENABLE<-0,   $begin read cycle
                    DBENABLE<-0,       to fetch low order
                    IABUS<-VECADR,     word of address
                    IDBUS<-HANADR(LOW) for exception
                                         handler routine,
                                         move data in
                                         HANADR(LOW) to
                                         internal data bus

/ctrl*K(29)*P(2)/ HANADR(HI)<-IDBUS,   $move data (high
                    ADENABLE<-1,       order word of
                    EXABUF<-IABUS,     handler address)
                    FC(MODE)<-SR(MODE), to HANADR(HI)
                    TC(SPACE)<-1,
                    T<-countupT

/ctrl*K(30)*P(1)/ ASN<-0,LDSN<-0,
                    UDSN<-0,DBENABLE<-1

/ctrl*K(30)*P(2)/ T<-countupT

/ctrl*K(31)*P(1)/ IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(31)*P(2)/ T<-countupT

/ctrl*K(32)*P(1)/ IF(DTACKN=1)THEN
                    (T<-countdnT)

/ctrl*K(32)*P(2)/ EXDBUF<-DBUS,
                    T<-countupT

```

/ctrl*K(33)*P(1)/ HANADR(LOW)<-EXDBUF \$slatch data into low
 order word of the
 exception handler
 address register

/ctrl*K(33)*P(2)/ ASN<-1,LDSN<-1, \$send of read cycle
 UDSN<-1,T<-countupT

/ctrl*K(34)*P(1)/ RW<-1,ADENABLE<-0, \$begin read cycle,
 DBENABLE<-0, prefetch of first
 IABUS<-HANADR instruction in
 handler routine

/ctrl*K(34)*P(2)/ ADENABLE<-1, \$place handler
 PC<-IABUS, address in program
 EXABUF<-IABUS, counter
 FC(MODE)<-SR(MODE),
 FC(SPACE)<-2,
 T<-countupT

/ctrl*K(35)*P(1)/ ASN<-0,LDSN<-0,
 UDSN<-0,DBENABLE<-1

/ctrl*K(35)*P(2)/ T<-countupT

/ctrl*K(36)*P(1)/ IF(DTACKN=0)THEN
 (T<-countupT)

/ctrl*K(36)*P(2)/ T<-countupT

/ctrl*K(37)*P(1)/ IF(DTACKN=1)THEN
 (T<-countdnT)

/ctrl*K(37)*P(2)/ EXDBUF<-DBUS,
 T<-countupT

/ctrl*K(38)*P(1)/ PFR<-EXDBUF

/ctrl*K(38)*P(2)/ ASN<-1,LDSN<-1, \$send of read cycle
 UDSN<-1,T<-countupT,
 IR<-PFR,PC<-PCadd2

/ctrl*K(39)*P(1)/ ADENABLE<-0,
 DBENABLE<-0,ASN<-1,
 LDSN<-1,UDSN<-1

/ctrl*K(39)*P(2)/ T<-countupT

/ctrl*K(40)*P(1)/

/ctrl*K(40)*P(2)/ T<-0 \$send of illegal
 instruction

```

.....*K(0)*P(1)/  RW<-1,ADENABLE<-0,    $begin read cycle
                   DBENABLE<-0,    (prefetch)
                   IABUS<-PC

.....*K(0)*P(2)/  ADENABLE<-1,
                   EXABUF<-IABUS,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-2,
                   T<-countupT

.....*K(1)*P(1)/  ASN<-0,LDSN<-0,
                   UDSN<-0,
                   DBENABLE<-1

.....*K(1)*P(2)/  T<-countupT

.....*K(2)*P(1)/  IF(DTACKN=0)THEN
                   (T<-countupT)

.....*K(2)*P(2)/  T<-countupT

.....*K(3)*P(1)/  IF(DTACKN=1)THEN
                   (T<-countdnT)

.....*K(3)*P(2)/  EXDBUF<-DBUS,
                   T<-countupT

.....*K(4)*P(1)/  PFR<-EXDBUF

.....*K(4)*P(2)/  ASN<-1,LDSN<-1,
                   UDSN<-1,PC<-PCadd2,
                   T<-countupT

.....*K(5)*P(1)/  RW<-1,IABUS<-A1,    $begin write cycle
                   ADENABLE<-0,    (address error
                   DBENABLE<-0,    write cycle)

.....*K(5)*P(2)/  IDBUS<-D1(LWORD),
                   EXABUF<-IABUS,
                   ADENABLE<-1,
                   FC(MODE)<-SR(MODE),
                   FC(SPACE)<-1,
                   T<-countupT

.....*K(6)*P(1)/  RW<-0,ASN<-0,
                   EXDBUF<-IDBUS,
                   SR(CARRY)<-0,
                   SR(OVER)<-0,
                   SR(ZERO)<-0,
                   SR(NEG)<-0

```

/....*K(6)*P(2)/	DBUS<-EXDBUF, DBENABLE<-1, T<-countupT	
/....*K(7)*P(1)/	UDSN<-0,LDSN<-0,	
/....*K(7)*P(2)/	IRTEMP<-IR, ACTYPE(0-2)<-FC, EXCEPT<-1, ACTYPE(4)<-RW, T<-countupT	\$address error is identified by this time so a short bus cycle is run; IR contents and access type information is saved in temporary registers
/....*K(8)*P(1)/	ACTYPE(3)<-EXCEPT	
/....*K(8)*P(2)/	ASN<-1,UDSN<-1, LDSN<-1,T<-0, IR<-(4AFDhex)	\$LDS', UDS', and AS' are negated; T is reset; and control expression is changed (end of short bus cycle)
/ctrl*K(0)*P(1)/	RW<-1	
/ctrl*K(0)*P(2)/	ADENABLE<-0, DBENABLE<-0, T<-countupT	\$address and data buses to high impedance
/ctrl*K(1)*P(1)/	IDBUS<-SR	\$place SR contents on internal data bus
/ctrl*K(1)*P(2)/	SRTEMP<-IDBUS, T<-countupT	\$store contents of SR in temporary register
/ctrl*K(2)*P(1)/	SR(MODE)<-1, SR(TRACE)<-0	\$set to supervisor mode, turn off trace function
/ctrl*K(2)*P(2)/	T<-countupT	
/ctrl*K(3)*P(1)/	SA7<-SA7sub2	\$set stack pointer to location for low word of PC
/ctrl*K(3)*P(2)/	T<-countupT	


```

/ctrl*K(4)*P(1)/  VECADR<-3          $put the exception
                                     vector number in a
                                     register

/ctrl*K(4)*P(2)/  T<-countupT

/ctrl*K(5)*P(1)/  VECADR<-2shlVECADR  $multiply vector
                                     number by 4 to
                                     create vector
                                     address (using a
                                     shift left)

/ctrl*K(5)*P(2)/  T<-countupT

/ctrl*K(6)*P(1)/  TEMPADR<-EXABUF     $store current cycle
                                     address in a
                                     temporary register

/ctrl*K(6)*P(2)/  T<-countupT

/ctrl*K(7)*P(1)/

/ctrl*K(7)*P(2)/  T<-countupT

/ctrl*K(8)*P(1)/  RW<-1,IABUS<-SA7,   $begin write cycle
ADENABLE<-0,      to store low word
DBENABLE<-0       of PC on the
                  supervisor stack
                  (SA7)

/ctrl*K(8)*P(2)/  IDBUS<-PC(LOW),
EXABUF<-IABUS,
ADENABLE<-1,
FC(MODE)<-SR(MODE),
FC(SPACE)<-1,
T<-countupT

/ctrl*K(9)*P(1)/  RW<-0,ASN<-0,
EXDBUF<-IDBUS

/ctrl*K(9)*P(2)/  DBUS<-EXDBUF,
DBENABLE<-1,
T<-countupT

/ctrl*K(10)*P(1)/ UDSN<-0,LDSN<-0
IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(10)*P(2)/ T<-countupT

/ctrl*K(11)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

```

```

/ctrl*K(11)*P(2)/ SA7<-SA7sub4,      $set stack pointer
                  T<-countupT        to location for
                                      status register
                                      contents

/ctrl*K(12)*P(1)/

/ctrl*K(12)*P(2)/ ASN<-1,UDSN<-1,      $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(13)*P(1)/ RW<-1,IABUS<-SA7,    $begin write cycle
                  ADENABLE<-0,        to store status
                  DBENABLE<-0        register contents
                                      on the supervisor
                                      stack

/ctrl*K(13)*P(2)/ IDBUS<-SRTEMP,
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(14)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(14)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(15)*P(1)/ UDSN<-0,LDSN<-0,
                  IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(15)*P(2)/ T<-countupT

/ctrl*K(16)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(16)*P(2)/ SA7<-SA7add2,      $set stack pointer
                  T<-countupT        to location for
                                      high word of PC

/ctrl*K(17)*P(1)/

/ctrl*K(17)*P(2)/ ASN<-1,UDSN<-1,      $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(18)*P(1)/ RW<-1,IABUS<-SA7,    $begin write cycle
                  ADENABLE<-0,        to store high word
                  DBENABLE<-0        of PC on the
                                      supervisor stack

```

```

/ctrl*K(18)*P(2)/ IDBUS<-PC(HI),
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(19)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(19)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(20)*P(1)/ UDSN<-0,LDSN<-0,
                  IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(20)*P(2)/ T<-countupT

/ctrl*K(21)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(21)*P(2)/ SA7<-SA7sub4           $set stack pointer
                  T<-countupT           to location for
                                          instruction
                                          register contents

/ctrl*K(22)*P(1)/

/ctrl*K(22)*P(2)/ ASN<-1,UDSN<-1,       $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(23)*P(1)/ RW<-1,IABUS<-SA7,    $begin write cycle
                  ADENABLE<-0,         to store contents
                  DBENABLE<-0         of the instruction
                                          register on the
                                          superviscr stack

/ctrl*K(23)*P(2)/ IDBUS<-IR,
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(24)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(24)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

```

/ctrl*K(25)*P(1)/ UDSN<-0,LDSN<-0,
IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(25)*P(2)/ T<-countupT

/ctrl*K(26)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

/ctrl*K(26)*P(2)/ SA7<-SA7sub2,
T<-countupT

\$set stack pointer
to location for low
order word of
current cycle
address (the odd
address which
caused the
exception in this
case)

/ctrl*K(27)*P(1)/

/ctrl*K(27)*P(2)/ ASN<-1,UDSN<-1,
LDSN<-1,T<-countupT

\$end of write cycle

/ctrl*K(28)*P(1)/ RW<-1,IABUS<-SA7,
ADENABLE<-0,
DBENABLE<-0

\$begin write cycle
to store low word
of current cycle
address on the
supervisor stack
(SA7)

/ctrl*K(28)*P(2)/ IDBUS<-TEMPADR(LOW),
EXABUF<-IABUS,
ADENABLE<-1,
FC(MODE)<-SR(MODE),
FC(SPACE)<-1,
T<-countupT

/ctrl*K(29)*P(1)/ RW<-0,ASN<-0,
EXDBUF<-IDBUS

/ctrl*K(29)*P(2)/ DBUS<-EXDBUF,
DBENABLE<-1,
T<-countupT

/ctrl*K(30)*P(1)/ UDSN<-0,LDSN<-0
IF(DTACKN=0)THEN
(T<-countupT)

/ctrl*K(30)*P(2)/ T<-countupT

/ctrl*K(31)*P(1)/ IF(DTACKN=1)THEN
(T<-countdnT)

```

/ctrl*K(31)*P(2)/ SA7<-SA7sub4,      $set stack pointer
                  T<-countupT        to location for
                                      access type word

/ctrl*K(32)*P(1)/

/ctrl*K(32)*P(2)/ ASN<-1,UDSN<-1,     $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(33)*P(1)/ RW<-1,IABUS<-SA7,   $begin write cycle
                  ADENABLE<-0,       to store access
                  DBENABLE<-0        type information on
                                      the supervisor
                                      stack

/ctrl*K(33)*P(2)/ IDBUS<-ACTYPE,
                  EXABUF<-IABUS,
                  ADENABLE<-1,
                  FC(MODE)<-SR(MODE),
                  FC(SPACE)<-1,
                  T<-countupT

/ctrl*K(34)*P(1)/ RW<-0,ASN<-0,
                  EXDBUF<-IDBUS

/ctrl*K(34)*P(2)/ DBUS<-EXDBUF,
                  DBENABLE<-1,
                  T<-countupT

/ctrl*K(35)*P(1)/ UDSN<-0,LDSN<-0,
                  IF(DTACKN=0)THEN
                    (T<-countupT)

/ctrl*K(35)*P(2)/ T<-countupT

/ctrl*K(36)*P(1)/ IF(DTACKN=1)THEN
                  (T<-countdnT)

/ctrl*K(36)*P(2)/ SA7<-SA7add2,      $set stack pointer
                  T<-countupT        to location for
                                      high word of
                                      current cycle
                                      address

/ctrl*K(37)*P(1)/

/ctrl*K(37)*P(2)/ ASN<-1,UDSN<-1,     $end of write cycle
                  LDSN<-1,T<-countupT

/ctrl*K(38)*P(1)/ RW<-1,IABUS<-SA7,   $begin write cycle
                  ADENABLE<-0,       to store high word
                  DBENABLE<-0        of current cycle

```

address on the
supervisor stack

```
/ctrl*K(38)*P(2)/ IDBUS<-TEMPADR(HI),  
EXABUF<-IABUS,  
ADENABLE<-1,  
FC(MODE)<-SR(MODE),  
FC(SPACE)<-1,  
T<-countupT  
  
/ctrl*K(39)*P(1)/ RW<-0,ASN<-0,  
EXDBUF<-IDBUS  
  
/ctrl*K(39)*P(2)/ DBUS<-EXDBUF,  
DBENABLE<-1,  
T<-countupT  
  
/ctrl*K(40)*P(1)/ UDSN<-0,LDSN<-0,  
IF(DTACKN=0)THEN  
  (T<-countupT)  
  
/ctrl*K(40)*P(2)/ T<-countupT  
  
/ctrl*K(41)*P(1)/ IF(DTACKN=1)THEN  
  (T<-countdnT)  
  
/ctrl*K(41)*P(2)/ T<-countupT  
  
/ctrl*K(42)*P(1)/  
  
/ctrl*K(42)*P(2)/ ASN<-1,UDSN<-1,      $send of write cycle  
LDSN<-1,T<-countupT  
  
/ctrl*K(43)*P(1)/ RW<-1,ADENABLE<-0,  $begin read cycle  
DBENABLE<-0,      to fetch high  
IABUS<-VECADR     order word of the  
                    address for the  
                    exception handler  
                    routine  
  
/ctrl*K(43)*P(2)/ ADENABLE<-1,  
FC(MODE)<-SR(MODE),  
FC(SPACE)<-1,  
EXABUF<-IABUS,  
T<-countupT  
  
/ctrl*K(44)*P(1)/ ASN<-0,LDSN<-0,  
UDSN<-0,DBENABLE<-1  
  
/ctrl*K(44)*P(2)/ T<-countupT  
  
/ctrl*K(45)*P(1)/ IF(DTACKN=0)THEN  
  (T<-countupT)
```

```

/ctrl*K(45)*P(2)/ T<-countupT
/ctrl*K(46)*P(1)/ IF(DTACKN=1)THEN
                    (T<-countdnT)
/ctrl*K(46)*P(2)/ EXDBUF<-DBUS,
                    T<-countupT
/ctrl*K(47)*P(1)/ HANADR(LOW)<-EXDBUF $latch data into low
                                         word of the handler
                                         routine address
                                         register
/ctrl*K(47)*P(2)/ ASN<-1,LDSN<-1,      $end of read cycle,
                    VECADR<-VECADRadd2, increment vector
                    UDSN<-1,T<-countupT address register to
                                         fetch low word of
                                         address
/ctrl*K(48)*P(1)/ RW<-1,ADENABLE<-0,   $begin read cycle
                    DBENABLE<-0,       to fetch low order
                    IABUS<-VECADR,     word of address
                    IDBUS<-HANADR(LOW)  for exception
                                         handler routine,
                                         move data in
                                         HANADR(LOW) to
                                         internal data bus
/ctrl*K(48)*P(2)/ HANADR(HI)<-IDBUS,    $move data (high
                    ADENABLE<-1,       order word of
                    EXABUF<-IABUS,     handler address)
                    FC(MODE)<-SR(MODE), to HANADR(HI)
                    FC(SPACE)<-1,
                    T<-countupT
/ctrl*K(49)*P(1)/ ASN<-0,LDSN<-0,
                    UDSN<-0,DBENABLE<-1
/ctrl*K(49)*P(2)/ T<-countupT
/ctrl*K(50)*P(1)/ IF(DTACKN=0)THEN
                    (T<-countupT)
/ctrl*K(50)*P(2)/ T<-countupT
/ctrl*K(51)*P(1)/ IF(DTACKN=1)THEN
                    (T<-countdnT)
/ctrl*K(51)*P(2)/ EXDBUF<-DBUS,
                    T<-countupT
/ctrl*K(52)*P(1)/ HANADR(LOW)<-EXDBUF $latch data into low

```

		order word of the exception handler address register
/ctrl*K(52)*P(2)/	ASN<-1,LDSN<-1, UDSN<-1,T<-countupT	\$end of read cycle
/ctrl*K(53)*P(1)/	RW<-1,ADENABLE<-0, DBENABLE<-0, IABUS<-HANADR	\$begin read cycle, prefetch of first instruction in handler routine
/ctrl*K(53)*P(2)/	ADENABLE<-1, PC<-IABUS, EXABUF<-IABUS, FC(MODE)<-SR(MODE), FC(SPACE)<-2, T<-countupT	\$place handler address in program counter
/ctrl*K(54)*P(1)/	ASN<-0,LDSN<-0, UDSN<-0,DBENABLE<-1	
/ctrl*K(54)*P(2)/	T<-countupT	
/ctrl*K(55)*P(1)/	IF(DTACKN=0)THEN (T<-countupT)	
/ctrl*K(55)*P(2)/	T<-countupT	
/ctrl*K(56)*P(1)/	IF(DTACKN=1)THEN (T<-countdnT)	
/ctrl*K(56)*P(2)/	EXDBUF<-DBUS, T<-countupT	
/ctrl*K(57)*P(1)/	PFR<-EXDBUF	
/ctrl*K(57)*P(2)/	ASN<-1,LDSN<-1, UDSN<-1,T<-countupT, IR<-PFR,PC<-PCadd2	\$end of read cycle
/ctrl*K(58)*P(1)/	ADENABLE<-0, DBENABLE<-0,ASN<-1, LDSN<-1,UDSN<-1	
/ctrl*K(58)*P(2)/	T<-countupT	

/ctrl*K(59)*P(1)/

/ctrl*K(59)*P(2)/ T<-0

end of address
error exception
processing; normal
processing
continues with the
handler routine
instructions

Appendix J: Logic Analyzer Data

The logic analyzer data from each of the tested MC68000 instructions or exception sequences appear in this appendix. They are:

Instruction Tested	Page
1. MOVE.W D1,D2	J-3
2. MOVE.W D1,(A1)	J-3
3. MOVE.L D1,A1	J-5
4. MOVE.W D1,(A1)+	J-5
5. MOVE.W D1,04(A1)	J-6
6. MOVE.W D1,04(A1,D7)	J-7
7. MOVE.W D1,\$2004	J-9
8. MOVE.W A1,D3	J-10
9. MOVE.W (A1),D2	J-10
10. MOVE.W (A1)+,D6	J-11
11. MOVE.W -(A1),D4	J-12
12. MOVE.W 04(A1),D1	J-13
13. MOVE.W 04(A1,D7),D2	J-14
14. MOVE.W \$2004,D5	J-15
15. MOVE.W \$2004,\$2008	J-16
16. MOVE.W #\$5555,D1	J-18
17. JMP (A0)	J-19
18. ADD.W D3,D5	J-20
19. BEQ START	J-20
20. BTST D1,(A1)	J-22

21. ILLEGAL INSTRUCTION EXCEPTION

J-23

22. ILLEGAL ADDRESS EXCEPTION

J-25

MOVE.W D1,D2

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1111 1111 1111 1010 \$Data bus (8-15) in high
K(0) P(2) 1111 1111 1111 1010 \$impedance state, R/W'
\$signal (4) indicates a
\$read cycle, function codes
\$(0-2) identify user
\$program mode.
K(1) P(1) 1111 1111 0001 1010 \$AS' (7) indicates a
K(1) P(2) 1111 1111 0001 1010 \$valid address on address
\$bus; UDS', LDS' (5-6) for
\$a word size operation.
K(2) P(1) 1111 1111 0001 1010 \$DTACK' (3) not asserted
K(2) P(2) 1111 1111 0001 1010 \$by peripheral device (data
\$not ready) so processor
\$runs a wait cycle.
K(3) P(1) 0000 0001 0001 0010 \$Data applied to data bus
K(3) P(2) 0000 0001 0001 0010 \$(8-15), DTACK' (3) asserted
\$indicating to processor
\$that data is on the bus.
\$The data on the bus is
\$code for MOVE.W D1,D2
\$instruction indicating
\$that this is a prefetch.
K(4) P(1) 0000 0001 0001 0010
K(4) P(2) 0000 0001 1111 1010 \$AS', UDS', LDS' (5-7)
\$change to notify
\$peripheral device that
\$transfer is complete.

MOVE.W D1,(A1)

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

K(0)	P(1)	1111	1111	1111	1010	\$Data bus (8-15) in high
K(0)	P(2)	1111	1111	1111	1010	\$impedance state, R/W'
						\$signal (4) indicates a
						\$read cycle, function codes
						\$(0-2) identify user
						\$program mode.
K(1)	P(1)	1111	1111	0001	1010	\$AS' (7) indicates a
K(1)	P(2)	1111	1111	0001	1010	\$valid address on address
						\$bus; UDS', LDS' (5-6) for
						\$a word size operation.
K(2)	P(1)	1111	1111	0001	1010	\$DTACK' (3) not asserted
K(2)	P(2)	1111	1111	0001	1010	\$by peripheral device (data
						\$not ready) so processor
						\$runs a wait cycle.
K(3)	P(1)	1000	0001	0001	0010	\$Data applied to data bus
K(3)	P(2)	1000	0001	0001	0010	\$(8-15), DTACK' (3) asserted
						\$indicating to processor
						\$that data is on the bus.
						\$The data on the bus is
						\$code for MOVE.W D1, (A1)
						\$instruction indicating
						\$that this is a prefetch.
K(4)	P(1)	1000	0001	0001	0010	
K(4)	P(2)	1000	0001	1111	1010	\$AS', UDS', LDS' (5-7)
						\$change to notify
						\$peripheral device that
						\$transfer is complete.
K(5)	P(1)	1111	1111	1111	1010	\$Begin write cycle.
						\$Data bus (8-15) in
						\$high impedance state.
K(5)	P(2)	1111	1111	1111	1001	\$Function code (0-2)
						\$is user data mode.
K(6)	P(1)	1111	1111	0110	1001	\$AS' (7) asserted to
						\$indicate valid address on
						\$ bus, R/W' (4) changes
						\$to write cycle.
K(6)	P(2)	0101	0101	0110	1001	\$Data put on data bus
						\$(8-15). Data is 55 hex
						\$which is same as data
						\$stored in D1.
K(7)	P(1)	0101	0101	0000	1001	\$UDS', LDS' (5-6) identify
K(7)	P(2)	0101	0101	0000	1001	\$word size, DTACK' (3) not
						\$asserted by peripheral
						\$so wait cycle run by
						\$processor.
K(8)	P(1)	0101	0101	0000	1001	\$DTACK' (3) not asserted
K(7)	P(2)	0101	0101	0000	1001	\$so T is decremented and
						\$another wait cycle run.
K(8)	P(1)	0101	0101	0000	0001	\$DTACK' (3) is asserted
K(8)	P(2)	0101	0101	0000	0001	\$indicating peripheral has
						\$successfully stored data.
K(9)	P(1)	0101	0101	0000	0001	
K(9)	P(2)	0101	0101	1110	1001	\$AS', UDS', LDS' (5-7)
						\$change to signal

\$peripheral that write
\$cycle is complete.

MOVE.L D1,A1

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1111 1111 1111 1010 \$Data bus (8-15) in high
K(0) P(2) 1111 1111 1111 1010 \$impedance state, R/W'
\$signal (4) indicates a
\$read cycle, function codes
\$(0-2) identify user
\$program mode.
K(1) P(1) 1111 1111 0001 1010 \$AS' (7) indicates a
K(1) P(2) 1111 1111 0001 1010 \$valid address on address
\$bus; UDS', LDS' (5-6) for
\$a word size operation.
K(2) P(1) 1111 1111 0001 1010 \$DTACK' (3) not asserted
K(2) P(2) 1111 1111 0001 1010 \$by peripheral device (data
\$not ready) so processor
\$runs a wait cycle.
K(3) P(1) 0100 0001 0001 0010 \$Data applied to data bus
K(3) P(2) 0100 0001 0001 0010 \$(8-15), DTACK' (3) asserted
\$indicating to processor
\$that data is on the bus.
\$The data on the bus is
\$code for MOVE.L D1,A1
\$instruction indicating
\$that this is a prefetch.
K(4) P(1) 0100 0001 0001 0010
K(4) P(2) 0100 0001 1111 1010 \$AS', UDS', LDS' (5-7)
\$change to notify
\$peripheral device that
\$transfer is complete.

MOVE.W D1,(A1)+

15-12 11-8 7--4 3--0 (columns)
AAAA DDDD AULR DFFF (signals)
4321 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1110 1111 1111 1010 \$Begin read cycle.
K(0) P(2) 0011 1111 1111 1010 \$Address lines (12-15)

\$are 1006, location of
 K(1) P(1) 0011 1111 0001 1010 \$instruction being
 K(1) P(2) 0011 1111 0001 1010 \$prefetched

 K(2) P(1) 0011 1111 0001 1010
 K(2) P(2) 0011 1111 0001 1010

 K(3) P(1) 0011 0001 0001 0010 \$Data applied to data bus
 K(3) P(2) 0011 0001 0001 0010 \$(8-11). Data is code
 \$for MOVE.W D1,(A1)+.

 K(4) P(1) 0011 0001 0001 0010
 K(4) P(2) 0011 0001 1111 1010 \$End read cycle

 K(5) P(1) 1111 1111 1111 1010 \$Begin write cycle.
 K(5) P(2) 0000 1111 1111 1001 \$Address lines (12-15)
 \$are 2000.

 K(6) P(1) 0000 1111 0110 1001
 K(6) P(2) 0000 0101 0110 1001 \$Data put on data bus
 \$(8-11). Data is 5 hex
 \$data being moved.

 K(7) P(1) 0000 0101 0000 1001
 K(7) P(2) 0000 0101 0000 1001

 K(8) P(1) 0000 0101 0000 1001
 K(7) P(2) 0000 0101 0000 1001

 K(8) P(1) 0000 0101 0000 0001
 K(8) P(2) 0000 0101 0000 0001

 K(9) P(1) 0000 0101 0000 0001
 K(9) P(2) 0000 0101 1110 1001 \$End write cycle.

MOVE.W D1,04(A1)

15-12 11-8 7--4 3--0 (columns)
 AAAA DDDD AULR DFFF (signals)
 4321 3210 SDD/ TCCC
 SSW A210
 C
 K

 K(0) P(1) 1110 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 0011 1111 1111 1010 \$Address lines (12-15)
 \$are 1006, location of
 K(1) P(1) 0011 1111 0001 1010 \$instruction being
 K(1) P(2) 0011 1111 0001 1010 \$prefetched

 K(2) P(1) 0011 1111 0001 1010
 K(2) P(2) 0011 1111 0001 1010

 K(3) P(1) 0011 0100 0001 0010 \$Data applied to data bus
 K(3) P(2) 0011 0100 0001 0010 \$(8-11). Data is 04,

```

                                $the displacement.
K(4) P(1) 0011 0100 0001 0010
K(4) P(2) 0011 0100 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 0100 1111 1111 1010 $Address lines (12-15)
                                $are 1008, location of
K(6) P(1) 0100 1111 0001 1010 $instruction being
K(6) P(2) 0100 1111 0001 1010 $prefetched.

K(7) P(1) 0100 1111 0001 1010
K(7) P(2) 0100 1111 0001 1010

K(8) P(1) 0100 0001 0001 0010 $Data applied to data bus
K(8) P(2) 0100 0001 0001 0010 $(8-11). Data is code
                                $for MOVE.W D1,08(A1).

K(9) P(1) 0100 0001 0001 0010
K(9) P(2) 0100 0001 1111 1010 $End read cycle.

K(10) P(1) 1100 1111 1111 1010 $Begin write cycle.
K(10) P(2) 0010 1111 1111 1001 $Address lines (12-15)
                                $are 2004.

K(11) P(1) 0010 1111 0110 1001
K(11) P(2) 0010 0101 0110 1001 $Data put on data bus
                                $(8-11). Data is 5 hex,
K(12) P(1) 0010 0101 0000 1001 $data being moved.
K(12) P(2) 0010 0101 0000 1001

K(13) P(1) 0011 0101 0000 1001
K(12) P(2) 0011 0101 0000 1001

K(13) P(1) 0011 0101 0000 0001
K(13) P(2) 0010 0101 0000 0001

K(14) P(1) 0010 0101 0000 0001
K(14) P(2) 0010 0101 1110 1001 $End write cycle.

```

MOVE.W D1,04(A1,D7)

```

15-12 11-8 7--4 3--0 (columns)
AAAA DDDD AULR DFFF (signals)
4321 3210 SDD/ TCCC
          SSW A210
          C
          K

```

```

-----
K(0) P(1) 1110 1111 1111 1010 $Begin read cycle.
K(0) P(2) 0011 1111 1111 1010 $Address lines (12-15)
                                $are 1006, location of
K(1) P(1) 0011 1111 0001 1010 $instruction being
K(1) P(2) 0011 1111 0001 1010 $prefetched

```


K(2)	P(1)	0011	1111	0001	1010	
K(2)	P(2)	0011	1111	0001	1010	
K(3)	P(1)	0011	0100	0001	0010	\$Data applied to data bus
K(3)	P(2)	0011	0100	0001	0010	\$(8-11). Data is 04, \$the displacement.
K(4)	P(1)	0011	0100	0001	0010	
K(4)	P(2)	0011	0100	1111	1010	\$End read cycle.
K(5)	P(1)	1111	1111	1111	1010	\$Address and data
K(5)	P(2)	1111	1111	1111	1010	\$buses (8-15) go high.
K(6)	P(1)	1111	1111	1111	1010	
K(6)	P(2)	1111	1111	1111	1010	
K(7)	P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(7)	P(2)	0100	1111	1111	1010	\$Address lines (12-15) \$are 1008, location of \$instruction being
K(8)	P(1)	0100	1111	0001	1010	\$prefetched.
K(8)	P(2)	0100	1111	0001	1010	
K(9)	P(1)	0100	1111	0001	1010	
K(9)	P(2)	0100	1111	0001	1010	
K(10)	P(1)	0100	0001	0001	0010	\$Data applied to data bus
K(10)	P(2)	0100	0001	0001	0010	\$(8-11). Data is code \$for MOVE.W D1,08(A1,D7).
K(11)	P(1)	0100	0001	0001	0010	
K(11)	P(2)	0100	0001	1111	1010	\$End read cycle.
K(12)	P(1)	1100	1111	1111	1010	\$Begin write cycle.
K(12)	P(2)	0101	1111	1111	1001	\$Address lines (12-15) \$are 200A.
K(13)	P(1)	0101	1111	0110	1001	
K(13)	P(2)	0101	0101	0110	1001	\$Data put on data bus \$(8-11). Data is 5 hex, \$data being moved.
K(14)	P(1)	0101	0101	0000	1001	
K(14)	P(2)	0101	0101	0000	1001	
K(15)	P(1)	0101	0101	0000	1001	
K(15)	P(2)	0101	0101	0000	1001	
K(16)	P(1)	0101	0101	0000	0001	
K(16)	P(2)	0101	0101	1110	1001	\$End write cycle.

MOVE.W D1,\$2004

15-12 11-8 7--4 3--0 (columns)
 AAAA DDDD AULR DFFF (signals)
 4321 3210 SDD/ TCCC
 SSW A210
 C
 K

```

-----
K(0) P(1) 1110 1111 1111 1010 $Begin read cycle.
K(0) P(2) 0011 1111 1111 1010 $Address lines (12-15)
                                     $are 1006, location of
K(1) P(1) 0011 1111 0001 1010 $instruction being
K(1) P(2) 0011 1111 0001 1010 $prefetched

K(2) P(1) 0011 1111 0001 1010
K(2) P(2) 0011 1111 0001 1010

K(3) P(1) 0011 0100 0001 0010 $Data applied to data bus
K(3) P(2) 0011 0100 0001 0010 $(8-11). Data is 04,
                                     $the displacement.

K(4) P(1) 0011 0100 0001 0010
K(4) P(2) 0011 0100 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 0100 1111 1111 1010 $Address lines (12-15)
                                     $are 1008, location of
K(6) P(1) 0100 1111 0001 1010 $instruction being
K(6) P(2) 0100 1111 0001 1010 $prefetched.

K(7) P(1) 0100 1111 0001 1010
K(7) P(2) 0100 1111 0001 1010

K(8) P(1) 0100 0001 0001 0010 $Data applied to data bus
K(8) P(2) 0100 0001 0001 0010 $(8-11). Data is code
                                     $for MOVE.W D1,$2008.

K(9) P(1) 0100 0001 0001 0010
K(9) P(2) 0100 0001 1111 1010 $End read cycle.

K(10) P(1) 1100 1111 1111 1010 $Begin write cycle.
K(10) P(2) 0010 1111 1111 1001 $Address lines (12-15)
                                     $are 2004.

K(11) P(1) 0010 1111 0110 1001
K(11) P(2) 0010 0101 0110 1001 $Data put on data bus
                                     $(8-11). Data is 5 hex,
K(12) P(1) 0010 0101 0000 1001 $data being moved.
K(12) P(2) 0010 0101 0000 1001

K(13) P(1) 0010 0101 0000 1001
K(12) P(2) 0010 0101 0000 1001

K(13) P(1) 0010 0101 0000 0001
  
```

K(13) P(2) 0010 0101 0000 0001
 K(14) P(1) 0010 0101 0000 0001
 K(14) P(2) 0010 0101 1110 1001 \$End write cycle.

MOVE.W A1,D3

15-12 11-8 7--4 3--0 (columns)
 DDDD DDDD AULR DFFF (signals)
 7654 3210 SDD/ TCCC
 SSW A210
 C
 K

 K(0) P(1) 1111 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 1111 1111 1111 1010

 K(1) P(1) 1111 1111 0001 1010
 K(1) P(2) 1111 1111 0001 1010

 K(2) P(1) 1111 1111 0001 1010
 K(2) P(2) 1011 1111 0001 1010

 K(3) P(1) 0000 1001 0001 0010 \$Data applied to data bus
 K(3) P(2) 0000 1001 0001 0010 \$(8-15). Data is code
 \$for MOVE.W A1,D3.

 K(4) P(1) 0000 1001 0001 0010
 K(4) P(2) 0000 1001 1111 1010 \$End read cycle.

MOVE.W (A1),D2

15-12 11-8 7--4 3--0 (columns)
 DDDD DDDD AULR DFFF (signals)
 7654 3210 SDD/ TCCC
 SSW A210
 C
 K

 K(0) P(1) 1111 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 1111 1111 1111 1010

 K(1) P(1) 1111 1111 0001 1010
 K(1) P(2) 1111 1111 0001 1010

 K(2) P(1) 1111 1111 0001 1010
 K(2) P(2) 1111 1111 0001 1010

 K(3) P(1) 0001 0001 0001 0010 \$Data applied to data bus
 K(3) P(2) 0001 0001 0001 0010 \$(8-15). Data is code

						\$for MOVE.W (A1),D2.
K(4)	P(1)	0001	0001	0001	0010	
K(4)	P(2)	0001	0001	1111	1010	\$End read cycle.
K(5)	P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(5)	P(2)	1111	1111	1111	1001	\$Function codes (0-2) \$change to user data
K(6)	P(1)	1111	1111	0001	1001	\$mode.
K(6)	P(2)	1111	1111	0001	1001	
K(7)	P(1)	1111	1111	0001	1001	
K(7)	P(2)	1111	1111	0001	1001	
K(8)	P(1)	0101	0101	0001	0001	\$Data applied to data bus
K(8)	P(2)	0101	0101	0001	0001	\$(8-15). Data is 55 hex, \$data being moved.
K(9)	P(1)	0101	0101	0001	0001	
K(9)	P(2)	0101	0101	1111	1001	\$End read cycle.

MOVE.W (A1)+,D6

15-12	11-8	7--4	3--0	(columns)
AAAA	DDDD	AULR	DFFF	(signals)
4321	3210	SDD/	TCCC	
		SSW	A210	
		C		
		K		

K(0)	P(1)	1110	1111	1111	1010	\$Begin read cycle.
K(0)	P(2)	0011	1111	1111	1010	\$Address lines (12-15) \$are 1006, location of \$instruction being \$prefetched
K(1)	P(1)	0011	1111	0001	1010	
K(1)	P(2)	0011	1111	0001	1010	
K(2)	P(1)	0011	1111	0001	1010	
K(2)	P(2)	0011	1111	0001	1010	
K(3)	P(1)	0011	1001	0001	0010	\$Data applied to data bus
K(3)	P(2)	0011	1001	0001	0010	\$(8-11). Data is code \$for MOVE.W (A1)+,D7.
K(4)	P(1)	0011	1001	0001	0010	
K(4)	P(2)	0011	1001	1111	1010	\$End read cycle.
K(5)	P(1)	1011	1111	1111	1010	\$Begin read cycle.
K(5)	P(2)	0000	1111	1111	1001	\$Address lines (12-15) \$are 2000 hex, location of \$of data. Function codes \$(0-2) change to user \$data mode.
K(6)	P(1)	0000	1111	0001	1001	
K(6)	P(2)	0000	1111	0001	1001	
K(7)	P(1)	0000	1111	0001	1001	
K(7)	P(2)	0000	1111	0001	1001	

K(8) P(1) 0000 0101 0001 0001 \$Data applied to data bus
 K(8) P(2) 0000 0101 0001 0001 \$(8-11). Data is 5 hex,
 \$data being moved.
 K(9) P(1) 0000 0101 0001 0001
 K(9) P(2) 0000 0101 1111 1001 \$End read cycle.

MOVE.W -(A1),D4

15-12 11-8 7--4 3--0 (columns)
 AAAA DDDD AULR DFFF (signals)
 4321 3210 SDD/ TCCC
 SSW A210
 C
 K

K(0) P(1) 1110 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 0011 1111 1111 1010 \$Address lines (12-15)
 \$are 1006, location of
 K(1) P(1) 0011 1111 0001 1010 \$instruction being
 K(1) P(2) 0011 1111 0001 1010 \$prefetched

 K(2) P(1) 0011 1111 0001 1010
 K(2) P(2) 0011 1111 0001 1010

 K(3) P(1) 0011 0001 0001 0010 \$Data applied to data bus
 K(3) P(2) 0011 0001 0001 0010 \$(8-11). Data is code
 \$for MOVE.W -(A1),D3.
 K(4) P(1) 0011 0001 0001 0010
 K(4) P(2) 0011 0001 1111 1010 \$End read cycle.

 K(5) P(1) 1011 1111 1111 1010 \$Address and data
 K(5) P(2) 1111 1111 1111 1010 \$buses (8-15) go high.

 K(6) P(1) 1111 1111 1111 1010
 K(6) P(2) 1111 1111 1111 1010

 K(7) P(1) 1111 1111 1111 1010 \$Begin read cycle.
 K(7) P(2) 0011 1111 1111 1001 \$Address lines (12-15)
 \$are 2006, location of
 K(8) P(1) 0011 1111 0001 1001 \$data. Function codes
 K(8) P(2) 0011 1111 0001 1001 \$(0-2) change to user
 \$data mode.
 K(9) P(1) 0011 1111 0001 1001
 K(9) P(2) 0011 1111 0001 1001

 K(10) P(1) 0011 0101 0001 0001 \$Data applied to data bus
 K(10) P(2) 0011 0101 0001 0001 \$(8-11). Data is 5 hex,
 \$data being moved.
 K(11) P(1) 0011 0101 0001 0001
 K(11) P(2) 0011 0101 1111 1001 \$End read cycle.

MOVE.W 04(A1),D1

15-12 11-8 7--4 3--0 (columns)
 DDDD DDDD AULR DFFF (signals)
 7654 3210 SDD/ TCCC
 SSW A210
 C
 K

K(0) P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(0) P(2)	1111	1111	1111	1010	
K(1) P(1)	1111	1111	0001	1010	
K(1) P(2)	1111	1111	0001	1010	
K(2) P(1)	1111	1111	0001	1010	
K(2) P(2)	1011	1111	0001	1010	
K(3) P(1)	0000	0100	0001	0010	\$Data applied to data bus
K(3) P(2)	0000	0100	0001	0010	\$(8-15). Data is 4 hex, \$the displacement.
K(4) P(1)	0000	0100	0001	0010	
K(4) P(2)	0000	0100	1111	1010	\$End read cycle.
K(5) P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(5) P(2)	1111	1111	1111	1010	
K(6) P(1)	1111	1111	0001	1010	
K(6) P(2)	1111	1111	0001	1010	
K(7) P(1)	1111	1111	0001	1010	
K(7) P(2)	1111	1111	0001	1010	
K(8) P(1)	0010	1001	0001	0010	\$Data applied to data bus
K(8) P(2)	0010	1001	0001	0010	\$(8-15). Data is code \$for MOVE.W 08(A1),D2.
K(9) P(1)	0010	1001	0001	0010	
K(9) P(2)	0010	1001	1111	1010	\$End read cycle.
K(10) P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(10) P(2)	1111	1111	1111	1001	\$Function codes (0-2) \$change to user data \$mode.
K(11) P(1)	1111	1111	0001	1001	
K(11) P(2)	1111	1111	0001	1001	
K(12) P(1)	1111	1111	0001	1001	
K(12) P(2)	1111	1111	0001	1001	
K(13) P(1)	0101	0101	0001	0001	\$Data applied to data bus
K(13) P(2)	0101	0101	0001	0001	\$(8-15). Data is 55 hex, \$data being moved.
K(14) P(1)	0101	0101	0001	0001	

K(14) P(2) 0101 0101 1111 1001 \$End read cycle.

MOVE.W 04(A1,D7),D2

15-12 11-8 7--4 3--0 (columns)
AAAA DDDD AULR DFFF (signals)
4321 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1110 1111 1111 1010 \$Begin read cycle.
K(0) P(2) 0011 1111 1111 1010 \$Address lines (12-15)
\$are 1006, location of
K(1) P(1) 0011 1111 0001 1010 \$instruction being
K(1) P(2) 0011 1111 0001 1010 \$prefetched

K(2) P(1) 0011 1111 0001 1010
K(2) P(2) 0011 1111 0001 1010

K(3) P(1) 0011 0100 0001 0010 \$Data applied to data bus
K(3) P(2) 0011 0100 0001 0010 \$(8-11). Data is 4 hex,
\$the displacement.

K(4) P(1) 0011 0100 0001 0010
K(4) P(2) 0011 0100 1111 1010 \$End read cycle.

K(5) P(1) 1111 1111 1111 1010 \$Address and data
K(5) P(2) 1111 1111 1111 1010 \$buses (8-15) go high.

K(6) P(1) 1111 1111 1111 1010
K(6) P(2) 1111 1111 1111 1010

K(7) P(1) 1111 1111 1111 1010 \$Begin read cycle.
K(7) P(2) 0100 1111 1111 1010 \$Address lines (12-15)
\$are 1008, location of
K(8) P(1) 0100 1111 0001 1010 \$instruction being
K(8) P(2) 0100 1111 0001 1010 \$prefetched.

K(9) P(1) 0100 1111 0001 1010
K(9) P(2) 0100 1111 0001 1010

K(10) P(1) 0100 0001 0001 0010 \$Data applied to data bus
K(10) P(2) 0100 0001 0001 0010 \$(8-11). Data is code
\$for MOVE.W 04(A1,D7),D3.

K(11) P(1) 0100 0001 0001 0010
K(11) P(2) 0100 0001 1111 1010 \$End read cycle.

K(12) P(1) 1100 1111 1111 1010 \$Begin read cycle.
K(12) P(2) 0101 1111 1111 1001 \$Address lines (12-15)
\$are 200A, location of
K(13) P(1) 0101 1111 0001 1001 \$of data. Function codes
K(13) P(2) 0101 1111 0001 1001 \$(0-2) change to user

\$data mode.

```

K(14) P(1) 0101 1111 0001 1001
K(14) P(2) 0101 1111 0001 1001

K(15) P(1) 0101 0101 0001 0001 $Data applied to data bus
K(15) P(2) 0101 0101 0001 0001 $(8-11). Data is 5 hex,
                                     $data being moved.

K(16) P(1) 0101 0101 0001 0001
K(16) P(2) 0101 0101 1111 1001 $End read cycle.

```

MOVE.W \$2004,D5

```

15-12 11-8 7--4 3--0 (columns)
AAAA DDDD AULR DFFF (signals)
4321 3210 SDD/ TCCC
          SSW A210
          C
          K

```

```

-----
K(0) P(1) 1110 1111 1111 1010 $Begin read cycle.
K(0) P(2) 0011 1111 1111 1010 $Address lines (12-15)
                                     $are 1006, location of
K(1) P(1) 0011 1111 0001 1010 $instruction being
K(1) P(2) 0011 1111 0001 1010 $prefetched

K(2) P(1) 0011 1111 0001 1010
K(2) P(2) 0011 1111 0001 1010

K(3) P(1) 0011 0100 0001 0010 $Data applied to data bus
K(3) P(2) 0011 0100 0001 0010 $(8-11). Data is 4 hex,
                                     $low byte of operand
K(4) P(1) 0011 0100 0001 0010 $address.
K(4) P(2) 0011 0100 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 0100 1111 1111 1010 $Address lines (12-15)
                                     $are 1008, location of
K(6) P(1) 0100 1111 0001 1010 $instruction being
K(6) P(2) 0100 1111 0001 1010 $prefetched.

K(7) P(1) 0100 1111 0001 1010
K(7) P(2) 0100 1111 0001 1010

K(8) P(1) 0100 1000 0001 0010 $Data applied to data bus
K(8) P(2) 0100 1000 0001 0010 $(8-11). Data is code
                                     $for MOVE.W $2004,D6.

K(9) P(1) 0100 1000 0001 0010
K(9) P(2) 0100 1000 1111 1010 $End read cycle.

K(10) P(1) 0100 1111 1111 1010 $Begin read cycle.
K(10) P(2) 0010 1111 1111 1001 $Address lines (12-15)
                                     $are 2004, location of

```



```

K(11) P(1) 0010 1111 0001 1001 $of data. Function codes
K(11) P(2) 0010 1111 0001 1001 $(0-2) change to user
                                $data mode.

K(12) P(1) 0010 1111 0001 1001
K(12) P(2) 0010 1111 0001 1001

K(13) P(1) 0010 0101 0001 0001 $Data applied to data bus
K(13) P(2) 0010 0101 0001 0001 $(8-11). Data is 5 hex,
                                $data being moved.

K(14) P(1) 0010 0101 0001 0001
K(14) P(2) 0010 0101 1111 1001 $End read cycle.

```

MOVE.W \$2004,\$2008

```

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
        SSW A210
        C
        K

```

```

-----
K(0) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1011 1111 0001 1010

K(3) P(1) 0000 0000 0001 0010 $Data applied to data bus
K(3) P(2) 0000 0000 0001 0010 $(8-15). Data is high
                                $word of source address.

K(4) P(1) 0000 0000 0001 0010
K(4) P(2) 0000 0000 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 1111 1111 1111 1010

K(6) P(1) 1111 1111 0001 1010
K(6) P(2) 1111 1111 0001 1010

K(7) P(1) 1111 1111 0001 1010
K(7) P(2) 1011 1111 0001 1010

K(8) P(1) 0000 0100 0001 0010 $Data applied to data bus
K(8) P(2) 0000 0100 0001 0010 $(8-15). Data is low
                                $word of source address.

K(9) P(1) 0000 0100 0001 0010
K(9) P(2) 0000 0100 1111 1010 $End read cycle.

K(10) P(1) 1111 1111 1111 1010 $Begin read cycle.

```

K(10)	P(2)	1111	1111	1111	1010	
K(11)	P(1)	1111	1111	0001	1010	
K(11)	P(2)	1111	1111	0001	1010	
K(12)	P(1)	1111	1111	0001	1010	
K(12)	P(2)	1011	1111	0001	1010	
K(13)	P(1)	0000	0000	0001	0010	\$Data applied to data bus
K(13)	P(2)	0000	0000	0001	0010	\$(8-15). Data is high \$word of destination.
K(14)	P(1)	0000	0000	0001	0010	
K(14)	P(2)	0000	0000	1111	1010	\$End read cycle.
K(15)	P(1)	1111	1111	1111	1010	\$Begin read cycle.
K(15)	P(2)	1111	1111	1111	1001	\$Function codes (0-2) \$change to user data \$mode.
K(16)	P(1)	1111	1111	0001	1001	
K(16)	P(2)	1111	1111	0001	1001	
K(17)	P(1)	1111	1111	0001	1001	
K(17)	P(2)	1111	1111	0001	1001	
K(18)	P(1)	0101	0101	0001	0001	\$Data applied to data bus
K(18)	P(2)	0101	0101	0001	0001	\$(8-15). Data is 55 hex, \$data being moved.
K(19)	P(1)	0101	0101	0001	0001	
K(19)	P(2)	0101	0101	1111	1001	\$End read cycle.
K(20)	P(1)	1111	1111	1111	1001	\$Begin read cycle.
K(20)	P(2)	1111	1111	1111	1010	\$Function codes (0-2) \$change to user program \$mode.
K(21)	P(1)	1111	1111	0001	1010	
K(21)	P(2)	1111	1111	0001	1010	
K(22)	P(1)	1111	1111	0001	1010	
K(22)	P(2)	1011	1111	0001	1010	
K(23)	P(1)	0000	1000	0001	0010	\$Data applied to data bus
K(23)	P(2)	0000	1000	0001	0010	\$(8-15). Data is low word \$of destination.
K(24)	P(1)	0000	1000	0001	0010	
K(24)	P(2)	0000	1000	1111	1010	\$End read cycle.
K(25)	P(1)	1111	1111	1111	1010	\$Begin write cycle.
K(25)	P(2)	1111	1111	1111	1001	\$Function codes (0-2) \$change to user data mode.
K(26)	P(1)	1111	1111	0110	1001	
K(26)	P(2)	0101	0101	0110	1001	\$Data put on data bus \$(8-15). Data is 55 hex, \$data being moved.
K(27)	P(1)	0101	0101	0000	1001	
K(27)	P(2)	0101	0101	0000	1001	
K(28)	P(1)	0101	0101	0000	1001	
K(27)	P(2)	0101	0101	0000	1001	

K(28) P(1) 0101 0101 0000 0001
 K(28) P(2) 0101 0101 0000 0001

 K(29) P(1) 0101 0101 0000 0001
 K(29) P(2) 0101 0101 1110 1001 \$End write cycle.

 K(30) P(1) 0101 0101 1111 1001 \$Begin read cycle.
 K(30) P(2) 1111 1111 1111 1010 \$Function codes (0-2)
 \$change to user program
 \$mode.
 K(31) P(1) 1111 1111 0001 1010
 K(31) P(2) 1111 1111 0001 1010

 K(32) P(1) 1111 1111 0001 1010
 K(32) P(2) 1111 1111 0001 1010

 K(33) P(1) 1101 0000 0001 0010 \$Data applied to data bus
 K(33) P(2) 1101 0000 0001 0010 \$(8-15). Data is code
 \$for JMP, so this is
 \$a prefetch.
 K(34) P(1) 1101 0000 0001 0010
 K(34) P(2) 1101 0000 1111 1010 \$End read cycle.

MOVE.W #S5555,D1

15-12 11-8 7--4 3--0 (columns)
 AAAA DDDD AULR DFFF (signals)
 4321 3210 SDD/ TCCC
 SSW A210
 C
 K

 K(0) P(1) 1110 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 0011 1111 1111 1010 \$Address lines (12-15)
 \$are 1006, location of
 \$immediate data.
 K(1) P(1) 0011 1111 0001 1010
 K(1) P(2) 0011 1111 0001 1010

 K(2) P(1) 0011 1111 0001 1010
 K(2) P(2) 0011 1111 0001 1010

 K(3) P(1) 0011 0101 0001 0010 \$Data applied to data bus
 K(3) P(2) 0011 0101 0001 0010 \$(8-11). Data is 5 hex,
 \$immediate data.
 K(4) P(1) 0011 0101 0001 0010
 K(4) P(2) 0011 0101 1111 1010 \$End read cycle.

 K(5) P(1) 1111 1111 1111 1010 \$Begin read cycle.
 K(5) P(2) 0100 1111 1111 1010 \$Address lines (12-15)
 \$are 1008, location of
 \$instruction being
 \$prefetched.
 K(6) P(1) 0100 1111 0001 1010
 K(6) P(2) 0100 1111 0001 1010

```

K(7) P(1) 0100 1111 0001 1010
K(7) P(2) 0100 1111 0001 1010

K(8) P(1) 0100 1100 0001 0010 $Data applied to data bus
K(8) P(2) 0100 1100 0001 0010 $(8-11). Data is code
                                        $for MOVE.W #$5555,D1.

K(9) P(1) 0100 1000 0001 0010
K(9) P(2) 0100 1000 1111 1010 $End read cycle.

```

JMP (A0)

```

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
          SSW A210
          C
          K

```

```

-----
K(0) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1111 1111 0001 1010

K(3) P(1) 1111 1111 0001 0010 $Data applied to data bus
K(3) P(2) 1111 1111 0001 0010 $(8-15). Data is all ones
                                        $because this a prefetch
K(4) P(1) 1111 1111 0001 0010 $and there are no instruct-
                                        $ions following the JMP
K(4) P(2) 1111 1111 1111 1010 $(unused memory is all 1's).

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 1111 1111 1111 1010

K(6) P(1) 1111 1111 0001 1010
K(6) P(2) 1111 1111 0001 1010

K(7) P(1) 1111 1111 0001 1010
K(7) P(2) 1111 1111 0001 1010

K(8) P(1) 0000 0001 0001 0010 $Data applied to data bus
K(8) P(2) 0000 0001 0001 0010 $(8-15). Data is code for
                                        $MOVE.W D1,D2, so this is a
K(9) P(1) 0000 0001 0001 0010 $fetch.
K(9) P(2) 0000 0001 1111 1010 $End read cycle.

```

ADD.W D3,D5

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1111 1111 1111 1010 \$Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1111 1111 0001 1010

K(3) P(1) 1000 0101 0001 0010 \$Data applied to data bus
K(3) P(2) 1000 0101 0001 0010 \$(8-15). Data is code for
\$MOVE.W D5,(A2).

K(4) P(1) 1000 0101 0001 0010
K(4) P(2) 1000 0101 1111 1010 \$End read cycle.

BEO START

Analyzer output (condition true, branch taken):

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

K(0) P(1) 1111 1111 1111 1010 \$Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1111 1111 0001 1010

K(3) P(1) 1101 0000 0001 0010 \$Data applied to data bus
K(3) P(2) 1101 0000 0001 0010 \$(8-15). Data is code
\$for JMP (A0).

K(4) P(1) 1101 0000 0001 0010
K(4) P(2) 1101 0000 1111 1010 \$End read cycle.

```

K(9) P(1) 1111 1111 1111 1010 $Data bus (8-15)
K(9) P(2) 1111 1111 1111 1010 $goes high.

K(10) P(1) 1111 1111 1111 1010
K(10) P(2) 1111 1111 1111 1010

K(11) P(1) 1111 1111 0001 1010 $Begin read cycle.
K(11) P(2) 1111 1111 0001 1010

K(12) P(1) 1111 1111 0001 1010
K(12) P(2) 1111 1111 0001 1010

K(13) P(1) 1111 1111 0001 1010
K(13) P(2) 1011 1111 0001 1010

K(14) P(1) 0000 0001 0001 0010 $Data applied to data bus
K(14) P(2) 0000 0001 0001 0010 $(8-15). Data is code for
$MOVE.W D1,D3, so this is a
$fetch.
K(15) P(1) 0000 0001 0001 0010 $fetch.
K(15) P(2) 0000 0001 1111 1010 $End read cycle.

```

Analyzer output (condition false, branch not taken):

```

15-12 11-8 7--4 3--0 (columns)
DDDD DDDD AULR DFFF (signals)
7654 3210 SDD/ TCCC
SSW A210
C
K

```

```

-----
K(0) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1011 1111 0001 1010

K(3) P(1) 0000 0010 0001 0010 $Data applied to data bus
K(3) P(2) 0000 0010 0001 0010 $(8-15). Data is code
$for MOVE.W D2,D3.

K(4) P(1) 0000 0010 0001 0010
K(4) P(2) 0000 0010 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Data bus (8-15)
K(5) P(2) 1111 1111 1111 1010 $goes high.

K(6) P(1) 1111 1111 1111 1010
K(6) P(2) 1111 1111 1111 1010

K(7) P(1) 1111 1111 1111 1010
K(7) P(2) 1111 1111 1111 1010

```

K(8) P(1) 1111 1111 1111 1010
 K(8) P(2) 1111 1111 1111 1010 \$End BEQ.

BTST DL, (A1)

15-12 11-8 7--4 3--0 (columns)
 DDDD DDDD AULR DFFF (signals)
 7654 3210 SDD/ TCCC
 SSW A210
 C
 K

```

-----
K(0) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(0) P(2) 1111 1111 1111 1010

K(1) P(1) 1111 1111 0001 1010
K(1) P(2) 1111 1111 0001 1010

K(2) P(1) 1111 1111 0001 1010
K(2) P(2) 1011 1111 0001 1010

K(3) P(1) 0000 0010 0001 0010 $Data applied to data bus
K(3) P(2) 0000 0010 0001 0010 $(8-15). Data is code
                                $for MOVE.W D2,D3 so this
                                $is a prefetch.
K(4) P(1) 0000 0010 0001 0010 $is a prefetch.
K(4) P(2) 0000 0010 1111 1010 $End read cycle.

K(5) P(1) 1111 1111 1111 1010 $Begin read cycle.
K(5) P(2) 1111 1111 1111 1001

K(6) P(1) 1111 1111 0101 1001 $UDS' (6) not asserted
K(6) P(2) 1111 1111 0101 1001 $so only the low byte
                                $is read from memory.

K(7) P(1) 1111 1111 0101 1001
K(7) P(2) 1111 1111 0101 1001

K(8) P(1) 0101 0101 0101 0001 $Data applied to data bus
K(8) P(2) 0101 0101 0101 0001 $(8-15). Data is 55 hex.

K(9) P(1) 0101 0101 0101 0001
K(9) P(2) 0101 0101 1111 1001 $End read cycle.
  
```

Illegal Instruction Exception

19-16	15-12	11-8	7--4	3--0	(columns)
AAAA	DDDD	DDDD	AULR	DFFF	(signals)
4321	7654	3210	SDD/	TCCC	
			SSW	A210	
				C	
				K	

K(0)	P(1)	0101	1111	1111	1111	1010	\$K(0) thru K(4) is a \$read cycle just like \$the one described
K(0)	P(2)	0110	1111	1111	1111	1010	
K(1)	P(1)	0110	1111	1111	0001	1010	\$for the MOVE.W Dn,Dn \$instruction.
K(1)	P(2)	0110	1111	1111	0001	1010	
K(2)	P(1)	0110	1111	1111	0001	1010	
K(2)	P(2)	0110	1111	1111	0001	1010	
K(3)	P(1)	0110	0000	0001	0001	0010	\$Data (8-15) is \$code for \$for MOVE.W D1,D2.
K(3)	P(2)	0110	0000	0001	0001	0010	
K(4)	P(1)	0110	0000	0001	0001	0010	\$End read cycle
K(4)	P(2)	0110	0000	0001	1111	1010	
K(5)	P(1)	0110	1111	1111	1111	1010	\$Data Bus (8-15) \$and address bus \$(16-19) go high.
K(5)	P(2)	1111	1111	1111	1111	1010	
K(6)	P(1)	1111	1111	1111	1111	1010	
K(6)	P(2)	1111	1111	1111	1111	1010	
K(7)	P(1)	1111	1111	1111	1111	1010	
K(7)	P(2)	1111	1111	1111	1111	1010	
K(8)	P(1)	1111	1111	1111	1111	1010	
K(8)	P(2)	1111	1111	1111	1111	1010	
K(9)	P(1)	1111	1111	1111	1111	1010	\$Begin a write cycle \$just like the one \$described for the
K(9)	P(2)	0010	1111	1111	1111	1101	
K(10)	P(1)	0010	1111	1111	0110	1101	\$MOVE.W Dn,(An) \$instruction, except \$for function codes \$and data. Function \$code (0-2) is \$supervisor data \$mode.
K(10)	P(2)	0010	0000	1010	0110	1101	
K(11)	P(1)	0010	0000	1010	0000	1101	\$Data (8-15) is low \$word of the PC.
K(11)	P(2)	0010	0000	1010	0000	1101	
K(12)	P(1)	0010	0000	1010	0000	1101	

K(11)	P(2)	0010	0000	1010	0000	1101	
K(12)	P(1)	0010	0000	1010	0000	0101	
K(12)	P(2)	0010	0000	1010	0000	0101	
K(13)	P(1)	0010	0000	1010	0000	0101	
K(13)	P(2)	0010	0000	1010	1110	1101	\$End Write Cycle.
K(14)	P(1)	1010	0000	1010	1111	1101	\$Begin write cycle
K(14)	P(2)	0000	1111	1111	1111	1101	\$just like preceding \$one except for data.
K(15)	P(1)	0000	1111	1111	0110	1101	
K(15)	P(2)	0000	0000	0100	0110	1101	\$Data (8-15) is SR \$contents.
K(16)	P(1)	0000	0000	0100	0000	1101	
K(16)	P(2)	0000	0000	0100	0000	1101	
K(17)	P(1)	0000	0000	0100	0000	1101	
K(16)	P(2)	0000	0000	0100	0000	1101	
K(17)	P(1)	0000	0000	0100	0000	0101	
K(17)	P(2)	0000	0000	0100	0000	0101	
K(18)	P(1)	0000	0000	0100	0000	0101	
K(18)	P(2)	0000	0000	0100	1110	1101	\$End write cycle.
K(19)	P(1)	1101	0000	0100	1111	1101	\$Begin write cycle
K(19)	P(2)	0001	1111	1111	1111	1101	\$just like preceding \$one except for data.
K(20)	P(1)	0001	1111	1111	0110	1101	
K(20)	P(2)	0001	0000	0000	0110	1101	\$Data (8-15) is high \$word of PC.
K(21)	P(1)	0001	0000	0000	0000	1101	
K(21)	P(2)	0001	0000	0000	0000	1101	
K(22)	P(1)	0001	0000	0000	0000	1101	
K(21)	P(2)	0001	0000	0000	0000	1101	
K(22)	P(1)	0001	0000	0000	0000	0101	
K(22)	P(2)	0001	0000	0000	0000	0101	
K(23)	P(1)	0001	0000	0000	0000	0101	
K(23)	P(2)	0001	0000	0000	1110	1101	\$End write cycle.
K(24)	P(1)	1101	0000	0000	1111	1101	\$Begin read cycle
K(24)	P(2)	1000	1111	1111	1111	1101	\$just like above \$except data and \$function codes.
K(25)	P(1)	1000	1111	1111	0001	1101	
K(25)	P(2)	1000	1111	1111	0001	1101	
K(26)	P(1)	1000	1111	1111	0001	1101	
K(26)	P(2)	1000	1111	1111	0001	1101	
K(27)	P(1)	1000	0000	0000	0001	0101	\$Data (8-15) is high
K(27)	P(2)	1000	0000	0000	0001	0101	\$word of the address

K(28)	P(1)	1000	0000	0000	0001	0101	\$of the exception
K(28)	P(2)	1000	0000	0000	1111	1101	\$handler routine.
K(28)	P(2)	1000	0000	0000	1111	1101	\$End read cycle.
K(29)	P(1)	1000	1111	1111	1111	1101	\$Begin read cycle
K(29)	P(2)	1001	1111	1111	1111	1101	\$just like
K(29)	P(2)	1001	1111	1111	1111	1101	\$preceding one
K(30)	P(1)	1001	1111	1111	0001	1101	\$except for data.
K(30)	P(2)	1001	1111	1111	0001	1101	
K(31)	P(1)	1001	1111	1111	0001	1101	
K(31)	P(2)	1001	1111	1111	0001	1101	
K(32)	P(1)	1001	0000	0010	0001	0101	\$Data (8-15) is low
K(32)	P(2)	1001	0000	0010	0001	0101	\$word of address of
K(32)	P(2)	1001	0000	0010	0001	0101	\$exception handler
K(33)	P(1)	1001	0000	0010	0001	0101	\$routine.
K(33)	P(2)	1001	0000	0010	1111	1101	\$End read cycle.
K(34)	P(1)	1001	1111	1111	1111	1101	\$K(34) thru K(38) is
K(34)	P(2)	0001	1111	1111	1111	1110	\$a read cycle just
K(34)	P(2)	0001	1111	1111	1111	1110	\$like preceding one
K(35)	P(1)	0001	1111	1111	0001	1110	\$except data and
K(35)	P(1)	0001	1111	1111	0001	1110	\$function codes.
K(35)	P(2)	0001	1111	1111	0001	1110	\$Function code (0-2)
K(35)	P(2)	0001	1111	1111	0001	1110	\$supervisor program
K(36)	P(1)	0001	1111	1111	0001	1110	\$mode.
K(36)	P(2)	0001	1111	1111	0001	1110	
K(37)	P(1)	0001	0111	0011	0001	0110	\$Data (8-15) is
K(37)	P(2)	0001	0111	0011	0001	0110	\$return from
K(37)	P(2)	0001	0111	0011	0001	0110	\$exception used as
K(38)	P(1)	0001	0111	0011	0001	0110	\$exception handler
K(38)	P(1)	0001	0111	0011	0001	0110	\$routine
K(38)	P(2)	0001	0111	0011	0001	0110	\$End read cycle.
K(39)	P(1)	1001	1111	1111	1111	1110	\$Data bus (8-15)
K(39)	P(2)	1111	1111	1111	1111	1110	\$and address bus
K(39)	P(2)	1111	1111	1111	1111	1110	\$go high.
K(40)	P(1)	1111	1111	1111	1111	1110	
K(40)	P(2)	1111	1111	1111	1111	1110	\$End exception
K(40)	P(2)	1111	1111	1111	1111	1110	\$processing

Address Error Exception

15-12 11-8 7--4 3--0 (columns)
 DDDD DDDD AULR DFFF (signals)
 7654 3210 SDD/ TCCC
 SSW A210
 C
 K

K(0) P(1) 1111 1111 1111 1010 \$Begin read cycle.
 K(0) P(2) 1111 1111 1111 1010

 K(1) P(1) 1111 1111 0001 1010
 K(1) P(2) 1111 1111 0001 1010

 K(2) P(1) 1111 1111 0001 1010
 K(2) P(2) 1111 1111 0001 1010

 K(3) P(1) 0111 0001 0001 0010 \$Data applied to data bus
 K(3) P(2) 0111 0001 0001 0010 \$(8-15). Data is code for
 \$NOP, so this is a
 \$prefetch.
 K(4) P(1) 0111 0001 0001 0010 \$prefetch.
 K(4) P(2) 0111 0001 1111 1010 \$End read cycle.

 K(5) P(1) 1111 1111 1111 1010 \$Begin a write cycle.
 K(5) P(2) 1111 1111 1111 1001

 K(6) P(1) 1111 1111 0110 1001
 K(6) P(2) 0101 0101 0110 1001 \$Data put on data bus
 \$(8-15). data is 55 hex,
 \$data being moved.
 K(7) P(1) 0101 0101 0000 1001 \$data being moved.
 K(7) P(2) 0101 0101 0000 1001

 K(8) P(1) 0101 0101 0000 1001
 K(8) P(2) 0101 0101 1110 1001

 K(0) P(1) 0101 0101 1111 1001 \$Write cycle terminated
 K(0) P(2) 1111 1111 1111 1001 \$because of address error.
 \$Data bus (8-15) goes
 \$high.
 K(1) P(1) 1111 1111 1111 1001 \$high.
 K(1) P(2) 1111 1111 1111 1001

 K(2) P(1) 1111 1111 1111 1001
 K(2) P(2) 1111 1111 1111 1001

 K(3) P(1) 1111 1111 1111 1001
 K(3) P(2) 1111 1111 1111 1001

 K(4) P(1) 1111 1111 1111 1001
 K(4) P(2) 1111 1111 1111 1001

 K(5) P(1) 1111 1111 1111 1001
 K(5) P(2) 1111 1111 1111 1001

 K(6) P(1) 1111 1111 1111 1001
 K(6) P(2) 1111 1111 1111 1001

 K(7) P(1) 1111 1111 1111 1001
 K(7) P(2) 1111 1111 1111 1001

 K(8) P(1) 1111 1111 1111 1001 \$Begin write cycle
 K(8) P(2) 1111 1111 1111 1101 \$Function code's (0-2)
 \$change to supervisor
 \$data mode.
 K(9) P(1) 1111 1111 0110 1101 \$data mode.

K(9)	P(2)	0000	1000	0110	1101	\$Data put on data bus
						\$(8-15). Data is low
K(10)	P(1)	0000	1000	0000	1101	\$word of PC.
K(10)	P(2)	0000	1000	0000	1101	
K(11)	P(1)	0000	1000	0000	1101	
K(10)	P(2)	0000	1000	0000	1101	
K(11)	P(1)	0000	1000	0000	0101	
K(11)	P(2)	0000	1000	0000	0101	
K(12)	P(1)	0000	1000	0000	0101	
K(12)	P(2)	0000	1000	1110	1101	\$End write cycle.
K(13)	P(1)	0000	1000	1111	1101	\$Begin write cycle.
K(13)	P(2)	1111	1111	1111	1101	
K(14)	P(1)	1111	1111	0110	1101	
K(14)	P(2)	0000	0000	0110	1101	\$Data put on data bus
						\$(8-15). Data is SR
K(15)	P(1)	0000	0000	0000	1101	\$contents.
K(15)	P(2)	0000	0000	0000	1101	
K(16)	P(1)	0000	0000	0000	1101	
K(15)	P(2)	0001	0000	0000	1101	
K(16)	P(1)	0001	0000	0000	0101	
K(16)	P(2)	0001	0000	0000	0101	
K(17)	P(1)	0001	0000	0000	0101	
K(17)	P(2)	0001	0000	1110	1101	\$End write cycle.
K(18)	P(1)	0000	0000	1111	1101	\$Begin write cycle.
K(18)	P(2)	1111	1111	1111	1101	
K(19)	P(1)	1111	1111	0110	1101	
K(19)	P(2)	0000	0000	0110	1101	\$Data put on data bus
						\$(8-15). Data is high
K(20)	P(1)	0000	0000	0000	1101	\$word of PC.
K(20)	P(2)	0000	0000	0000	1101	
K(21)	P(1)	0000	0000	0000	1101	
K(20)	P(2)	0000	0000	0000	1101	
K(21)	P(1)	0000	0000	0000	0101	
K(21)	P(2)	0000	0000	0000	0101	
K(22)	P(1)	0000	0000	0000	0101	
K(22)	P(2)	0000	0000	1110	1101	\$End write cycle.
K(23)	P(1)	0000	0000	1111	1101	\$Begin write cycle
K(23)	P(2)	1111	1111	1111	1101	
K(24)	P(1)	1111	1111	0110	1101	
K(24)	P(2)	1000	0001	0110	1101	\$Data put on data bus

K(25)	P(1)	1000	0001	0000	1101	\$ (8-15). Data is code
K(25)	P(2)	1000	0001	0000	1101	\$for instruction being
						\$executed when interrupt
						\$occurred.
K(26)	P(1)	1000	0001	0000	1101	
K(25)	P(2)	1000	0001	0000	1101	
K(26)	P(1)	1000	0001	0000	0101	
K(26)	P(2)	1000	0001	0000	0101	
K(27)	P(1)	1000	0001	0000	0101	
K(27)	P(2)	1000	0001	1110	1101	\$End write cycle.
K(28)	P(1)	1000	0001	1111	1010	\$Begin a write cycle.
K(28)	P(2)	1111	1111	1111	1101	
K(29)	P(1)	1111	1111	0110	1101	
K(29)	P(2)	0000	0001	0110	1101	\$Data put on data bus
						\$ (8-15). Data is low
K(30)	P(1)	0000	0001	0000	1101	\$word of memory being
K(30)	P(2)	0000	0001	0000	1101	\$used when interrupt
						\$occurred.
K(31)	P(1)	0000	0001	0000	1101	
K(30)	P(2)	0000	0001	0000	1101	
K(31)	P(1)	0000	0001	0000	0101	
K(31)	P(2)	0000	0001	0000	0101	
K(32)	P(1)	0000	0001	0000	0101	
K(32)	P(2)	0000	0001	1110	1101	\$End Write Cycle.
K(33)	P(1)	0000	0001	1111	1101	\$Begin write cycle.
K(33)	P(2)	1111	1111	1111	1101	
K(34)	P(1)	1111	1111	0110	1101	
K(34)	P(2)	1000	0001	0110	1101	\$Data put on data bus
						\$ (8-15). Data is cycle
K(35)	P(1)	1000	0001	0000	1101	\$type (R/W) and function
K(35)	P(2)	1000	0001	0000	1101	\$codes when interrupt
						\$occurred.
K(36)	P(1)	1000	0001	0000	1101	
K(35)	P(2)	1000	0001	0000	1101	
K(36)	P(1)	1000	0001	0000	0101	
K(36)	P(2)	1000	0001	0000	0101	
K(37)	P(1)	1000	0001	0000	0101	
K(37)	P(2)	1000	0001	1110	1101	\$End write cycle.
K(38)	P(1)	1000	0001	1111	1101	\$Begin write cycle.
K(38)	P(2)	1111	1111	1111	1101	
K(39)	P(1)	1111	1111	0110	1101	
K(39)	P(2)	0000	0000	0110	1101	\$Data put on data bus
						\$ (8-15). Data is high

K(40)	P(1)	0000	0000	0000	1101	\$word of memory being
K(40)	P(2)	0000	0000	0000	1101	\$used when interrupt
						\$occurred.
K(41)	P(1)	0000	0000	0000	1101	
K(40)	P(2)	0000	0000	0000	1101	
K(41)	P(1)	0000	0000	0000	0101	
K(41)	P(2)	0000	0000	0000	0101	
K(42)	P(1)	0000	0000	0000	0101	
K(42)	P(2)	0000	0000	1110	1101	\$End write cycle.
K(43)	P(1)	0000	0000	1111	1101	\$Begin read cycle.
K(43)	P(2)	1111	1111	1111	1101	
K(44)	P(1)	1111	1111	0001	1101	
K(44)	P(2)	1111	1111	0001	1101	
K(45)	P(1)	1111	1111	0001	1101	
K(45)	P(2)	1011	1111	0001	1101	
K(46)	P(1)	0000	0000	0001	0101	\$Data applied to data bus
K(46)	P(2)	0000	0000	0001	0101	\$(8-15). Data is high
						\$word of address of
K(47)	P(1)	0000	0000	0001	0101	\$exception handler routine.
K(47)	P(2)	0000	0000	1111	1101	\$End read cycle.
K(48)	P(1)	1111	1111	1111	1101	\$Begin read cycle.
K(48)	P(2)	1111	1111	1111	1101	
K(49)	P(1)	1111	1111	0001	1101	
K(49)	P(2)	1111	1111	0001	1101	
K(50)	P(1)	1111	1111	0001	1101	
K(50)	P(2)	1111	1111	0001	1101	
K(51)	P(1)	0100	0000	0001	0101	\$Data applied to data bus
K(51)	P(2)	0100	0000	0001	0101	\$(8-15). Data is low
						\$word of address of
K(52)	P(1)	0100	0000	0001	0101	\$exception handler routine.
K(52)	P(2)	0100	0000	1111	1101	\$End read cycle.
K(53)	P(1)	1111	1111	1111	1101	\$Begin read cycle.
K(53)	P(2)	1111	1111	1111	1110	\$Function codes (0-2)
						\$change to supervisor
K(54)	P(1)	1111	1111	0001	1110	\$program mode.
K(54)	P(2)	1111	1111	0001	1110	
K(55)	P(1)	1111	1111	0001	1110	
K(55)	P(2)	1011	1111	0001	1110	
K(56)	P(1)	1000	1111	0001	0110	\$Data applied to data bus
K(56)	P(2)	1000	1111	0001	0110	\$(8-15). Data is code for
						\$first instruction of
K(57)	P(1)	1000	1111	0001	0110	\$exception handler routine.

K(57) P(2) 1000 1111 1111 1110 \$End read cycle.
K(58) P(1) 1111 1111 1111 1110 \$Data bus goes high.
K(58) P(2) 1111 1111 1111 1110
K(59) P(1) 1111 1111 1111 1110
K(59) P(2) 1111 1111 1111 1110 \$End exception
\$processing

Appendix K: ISP' Model of the RISC 1

```

/*****
/*
/*          RISC 1 MICROPROCESSOR
/*
/*  This model of the RISC 1 was developed from the article 'A VLSI
/* RISC' by Patterson and Sequin that appeared in the Sept '82 issue
/* of IEEE Computer. It incorporates RISC's 31 instructions, its over-
/* lapped register windowing scheme with overflow into memory, and its
/* instruction prefetch. All instructions are executed in 2 microsec-
/* onds with the exception of the Load and Store instructions. They
/* require 4 microseconds. This model also includes a hypothesized
/* 4-bit Processor Status Word with the traditional C,N,V and Z bits.
/* A 1 Kbyte internal memory has been provided.
/*
/*          AUTHOR: Chuck Buxley
/*          DATE: 15 Aug 84
/*          Class: EE 7.92
/*
*****/

```

state

```

REG<111:31:0>,      ! 112 32-Bit Registers
PC<31:0>,           ! 32-Bit Program Counter
PSW<3:0>,           ! 4-Bit Processor Status Word
CWP<5:0>,           ! 4-Bit Window Pointer
SWP<11:0>,          ! Overflow Window Pointer
RWP<8:0>,           ! Register Window Pointer
IR<31:0>,           ! 32-Bit Instruction Register
IEN<0>,             ! Interrupt Enable Flip-Flop
NDEST<7:0>,         ! 8-Bit Register To Enable Addressing Of 112 Registers
NSOURCE1<7:0>,     ! Ditto
ONCE<0>,            ! Used To Control Initialization Of CWP
CARRYREG<32:0>,    ! Extended 33-bit Register To Enable Carry Bit Examination
X<10:0>,            ! 3 registers To Support Stack Operations
Y<7:0>,             ! On Register Windows
W<7:0>;

```

format

```

OPCODE = IR<31:25>, ! 7-bit Opcode Field
SCC     = IR<24>,   ! Set Condition Code Bit
DEST    = IR<23:19>, ! 5-bit Destination Register Field
SOURCE1 = IR<18:14>, ! 5-bit Source Register Field
IMM     = IR<13>,   ! Immediate Operand Bit
SOURCE2 = IR<12:0>, ! 13-bit Source Register Or Constant Field
RELADDR = IR<16:0>, ! 19-bit Relative Address For Jumps/Calls

Z = PSW<0>,        ! PSW Zero Bit
N = PSW<1>,        ! PSW Negative Bit

```



```

C = PSW<2>,          ! PSW Carry Bit
V = PSW<3>;          ! PSW Overflow Bit

memory
ME0:1023<7:0>;      ! 1 Kbyte Internal memory

macro
hi = 1 !,           ! High State
lo = 0 !;           ! Low State

prefetch :=
(
IR<31:24> = MEPC;    ! Fetch byte 1 Of Instruction
IR<23:16> = MEPC + 1; ! Fetch byte 2 Of Instruction
IR<15:8>  = MEPC + 2; ! Fetch byte 3 Of Instruction
IR<7:0>   = MEPC + 3; ! Fetch byte 4 Of Instruction
next;
PC = PC + 4          ! Increment Program Counter
)

dup :=              ! Save Register Window To Memory Upon Window Overflow
(
while Y leq W
(
MEX = REY<31:24>;
MEX + 1 = REY<23:16>;
MEX + 2 = REY<15:8>;
MEX + 3 = REY<7:0>;
next;
X = X + 4;
Y = Y + 1
)
)

clear :=            ! Clear Register Window To be Reused
(
while Y leq W
(
REY = 0;
Y = Y + 1
)
)

moveregbt :=       ! Window 4 Must Receive Window 5's
                   ! Low Registers When Called (Wraparound)
(
RE111 = RE153;
RE110 = RE143;
RE109 = RE133;
RE108 = RE123;
RE107 = RE113;
RE106 = RE103
)

```

```

moveregtb :=
(
    RC15J = RC111J;
    RC14J = RC110J;
    RC13J = RC109J;
    RC12J = RC108J;
    RC11J = RC107J;
    RC10J = RC106J
)

```

```

! Window 5 Must Receive Window 4's
! High Registers Upon Return(Wraparound)

```

```

recover :=
(
    while Y leq W
    (
        R[Y]<31:24> = MEXJ;
        R[Y]<23:16> = MEX + 1J;
        R[Y]<15:8> = MEX + 2J;
        R[Y]<7:0> = MEX + 3J;
        next;
        X = X + 4;
        Y = Y + 1
    )
)

```

```

! Restore Registers When A Window
! Is Popped From Memory

```

```

restore :=
(
    if SWP leq 936
    (
        X = SWP;
        Y = RWP;
        next;
        if SWP eq 1 936
            W = RWP + 21
        else
            W = RWP + 15;
        next;
        if RWP eq 1 90
            moveregtb;
        recover
    )
)

```

```

! Each Register Window Is
! Popped From Its designated

```

```

save :=
(
    if SWP leq 936
    (
        X = SWP;
        Y = RWP;
        next;
        if SWP eq 1 936
            W = RWP + 21
        else
            W = RWP + 15;
    )
)

```

```

! Each Register Window Is
! Pushed Into A Designated

```

```

next;
dump;
Y = RWP;
clear;
if RWP eq 90
  moveregbt
)
)

```

```

poverflowcheck :=                                ! Overflow Occurs When Two Operands
(                                                  ! Have Same Sign And Result Does Not
  case IMM
  0:(
    if (R[RESOURCE1] geq 0) and (R[RESOURCE2] geq 0) and (R[RDDEST] lss 0)
      V = hi;
    if (R[RESOURCE1] lss 0) and (R[RESOURCE2] lss 0) and (R[RDDEST] geq 0)
      V = hi
    )
  1:(
    if (R[RESOURCE1] geq 0) and (SOURCE2 geq 0) and (R[RDDEST] lss 0)
      V = hi;
    if (R[RESOURCE1] lss 0) and (SOURCE2 lss 0) and (R[RDDEST] geq 0)
      V = hi
    )
  esac
)

```

```

noverflowcheck :=                                ! Overflow Occurs When Two Operands
(                                                  ! Have Same Sign And Result Does Not
  case IMM
  0:(
    if (R[RESOURCE1] geq 0) and (-R[RESOURCE2] geq 0) and (R[RDDEST] lss 0)
      V = hi;
    if (R[RESOURCE1] lss 0) and (-R[RESOURCE2] lss 0) and (R[RDDEST] geq 0)
      V = hi
    )
  1:(
    if (R[RESOURCE1] geq 0) and (-SOURCE2 geq 0) and (R[RDDEST] lss 0)
    if (R[RESOURCE1] lss 0) and (-SOURCE2 lss 0) and (R[RDDEST] geq 0)
      V = hi
    )
  esac
)

```

```

opcode0 :=                                       ! ADD (Integer Add)
(
  PSW = 0;
  next;
  case IMM
  0: CARRYREG = ((R[RESOURCE1] sxt 33) + R[RESOURCE2])
  1: CARRYREG = ((R[RESOURCE1] sxt 33) + SOURCE2)
  esac;
  next;

```

```
RENDEST) = CARRYREG;
```

```
next;
```

```
if SCC
```

```
(
```

```
if CARRYREG<32> eq1 hi
```

```
  C = hi;
```

```
powerflowcheck;
```

```
if RENDEST) eq1 0
```

```
  Z = hi;
```

```
if RENDEST) lss 0
```

```
  N = hi;
```

```
next;
```

```
);
```

```
prefetch
```

```
)
```

```
opcode1 :=
```

```
! ADDC (Add With Carry)
```

```
(
```

```
PSW = 0;
```

```
next;
```

```
case IMM
```

```
  0: CARRYREG = ((R[NSOURCE1]) sxt 33) + R[RESOURCE2] + (C ext 2)
```

```
  1: CARRYREG = ((R[NSOURCE1]) sxt 33) + SOURCE2 + (C ext 2)
```

```
esac;
```

```
next;
```

```
if CARRYREG<32> eq1 hi
```

```
  C = hi;
```

```
RENDEST) = CARRYREG;
```

```
next;
```

```
powerflowcheck;
```

```
if RENDEST) eq1 0
```

```
  Z = hi;
```

```
if RENDEST) lss 0
```

```
  N = hi;
```

```
next;
```

```
prefetch
```

```
)
```

```
opcode2 :=
```

```
! SUB (Integer Subtract)
```

```
(
```

```
PSW = 0;
```

```
next;
```

```
case IMM
```

```
  0: CARRYREG = ((R[NSOURCE1]) sxt 33) - R[RESOURCE2]
```

```
  1: CARRYREG = ((R[NSOURCE1]) sxt 33) - SOURCE2
```

```
esac;
```

```
next;
```

```
RENDEST) = CARRYREG;
```

```
next;
```

```
if SCC
```

```
(
```

```
if CARRYREG<32> eq1 hi
```

```
  C = hi;
```

```

noverflowcheck;
if R[NDDEST] eq 0
    Z = hi;
if R[NDDEST] lss 0
    N = hi;
next
);
prefetch
)

```

```

opcode3 :=                                ! SUBC (Subtract With Carry)
(
PSW = 0;
next;
case IMM
    0: CARRYREG = ((R[NSOURCE1]) sxt 33) - R[NSOURCE2] - (C ext 2)
    1: CARRYREG = ((R[NSOURCE1]) sxt 33) - SOURCE2 - (C ext 2)
esac;
next;
R[NDDEST] = CARRYREG;
next;
if SCC
    (
    if CARRYREG<32> eq 1 hi
        C = hi;
noverflowcheck;
if R[NDDEST] eq 0
    Z = hi;
if R[NDDEST] lss 0
    N = hi;
next
);
prefetch
)

```

```

opcode4 :=                                ! SUBR (Integer Subtract)
(
PSW = 0;
next;
case IMM
    0: CARRYREG = R[NSOURCE2] - ((R[NSOURCE1]) sxt 33)
    1: CARRYREG = SOURCE2 - ((R[NSOURCE1]) sxt 33)
esac;
next;
if CARRYREG<32> eq 1 hi
    C = hi;
R[NDDEST] = CARRYREG;
next;
noverflowcheck;
if R[NDDEST] eq 0
    Z = hi;
if R[NDDEST] lss 0

```

```

        N = hi;
    next;
    prefetch
)

opcode5 :=                                ! SUBCR (Subtract With Carry)
(
    PSM = 0;
    next;
    case IMM
        0: CARRYREG = R[RESOURCE2] - ((R[RESOURCE1]) sxt 33) - (C ext 2)
        1: CARRYREG = SOURCE2 - ((R[RESOURCE1]) sxt 33) - (C ext 2)
    esac;
    next;
    if CARRYREG<32> eq1 hi
        C = hi;
    R[DEST] = CARRYREG;
    next;
    noverflowcheck;
    if R[DEST] eq1 0
        Z = hi;
    if R[DEST] lss 0
        N = hi;
    next;
    prefetch
)

opcode6 :=                                ! AND (Logical And)
(
    PSM = 0;
    next;
    case IMM
        0: R[DEST] = R[RESOURCE1] and R[RESOURCE2]
        1: R[DEST] = R[RESOURCE1] and SOURCE2
    esac;
    next;
    if SCC
    (
        if R[DEST] eq1 0
            Z = hi;
        if R[DEST] lss 0
            N = hi;
        next
    );
    prefetch
)

opcode7 :=                                ! OR (Logical Or)
(
    PSM = 0;
    next;
    case IMM
        0: R[DEST] = R[RESOURCE1] or R[RESOURCE2]

```

```

1: R[DEST] = R[RESOURCE1] or SOURCE2
esac;
next;
if SCC
(
if R[DEST] eq 0
Z = hi;
if R[DEST] lss 0
N = hi;
next
);
prefetch
)

```

```

opcode8 :=                                ! XOR (Logical Exclusive Or)
(
PSW = 0;
next;
case IMM
0: R[DEST] = R[RESOURCE1] xor RESOURCE2
1: R[DEST] = R[RESOURCE1] xor SOURCE2
esac;
next;
if SCC
(
if R[DEST] eq 0
Z = hi;
if R[DEST] lss 0
N = hi;
next
);
prefetch
)

```

```

opcode9 :=                                ! SLL (Shift Left)
(
PSW = 0;
next;
case IMM
0: CARRYREG = R[RESOURCE1] *logical RESOURCE2
1: CARRYREG = ((R[RESOURCE1]) ext 33) *logical SOURCE2
esac;
next;
R[DEST] = CARRYREG;
next;
if SCC
(
if CARRYREG<32> eq hi
C = hi;
if R[DEST] eq 0
Z = hi;
if R[DEST] lss 0
N = hi;

```

```

    next
  );
  prefetch
)

```

```

opcode10 :=                                ! SRL (Shift Right Logical)
(
  PSW = 0;
  next;
  case IMM
    0: CARRYREG = R[RESOURCE1] /:logical R[RESOURCE2]
    1: CARRYREG = ((R[RESOURCE1]) ext 33) /:logical SOURCE2
  esac;
  next;
  R[DEST] = CARRYREG;
  next;
  if SCC
  (
    if CARRYREG<32> eq1 hi
      C = hi;
    if R[DEST] eq1 0
      Z = hi;
    if R[DEST] lss 0
      N = hi;
    next
  );
  prefetch
)

```

```

opcode11 :=                                ! SRA (Shift Right Arithmetic)
(
  PSW = 0;
  next;
  case IMM
    0: CARRYREG = R[RESOURCE1] /:arith R[RESOURCE2]
    1: CARRYREG = R[RESOURCE1] /:arith SOURCE2
  esac;
  next;
  if CARRYREG<32> eq1 hi
    C = hi;
  R[DEST] = CARRYREG;
  next;
  if R[DEST] eq1 0
    Z = hi;
  if R[DEST] lss 0
    N = hi;
  next;
  prefetch
)

```

```

opcode12 :=                                ! LLIL (Load Long)
(
  PSW = 0;

```



```

next;
case IMM
0: (
    R[DEST]<31:24> = M[R[SOURCE1]] + R[RESOURCE2];
    R[DEST]<23:16> = M[R[RESOURCE1]] + R[RESOURCE2] + 1;
    R[DEST]<15:8> = M[R[RESOURCE1]] + R[RESOURCE2] + 2;
    R[DEST]<7:0> = M[R[RESOURCE1]] + R[RESOURCE2] + 3;
)
1: (
    R[DEST]<31:24> = M[R[RESOURCE1]] + SOURCE2;
    R[DEST]<23:16> = M[R[RESOURCE1]] + SOURCE2 + 1;
    R[DEST]<15:8> = M[R[RESOURCE1]] + SOURCE2 + 2;
    R[DEST]<7:0> = M[R[RESOURCE1]] + SOURCE2 + 3;
)

```

```

esac;
next;
if SCC
(
    if R[DEST] eq 0
        Z = hi;
    if R[DEST] lss 0
        N = hi;
    next;
);
prefetch;
delay(1)
)

```

opcode13 := ! LDSU (Load Short Unsigned)

```

(
    PSW = 0;
    next;
    case IMM
    0: (
        R[DEST]<31:8> = M[R[RESOURCE1]] + R[RESOURCE2] ext 24;
        R[DEST]<7:0> = M[R[RESOURCE1]] + R[RESOURCE2] + 1;
    )
    1: (
        R[DEST]<31:8> = M[R[RESOURCE1]] + SOURCE2 ext 24;
        R[DEST]<7:0> = M[R[RESOURCE1]] + SOURCE2 + 1;
    )
)

```

```

esac;
next;
if R[DEST] eq 0
    Z = hi;
if R[DEST] lss 0
    N = hi;
next;
prefetch;
delay(1)
)

```

opcode14 := ! LSS (Load Short Signed)

```

(
PSW = 0;
next;
case IMM
0: (
    R[DEST]<31:8> = M[R[SOURCE1] + R[RESOURCE2]] sxt 24;
    R[DEST]<7:0> = M[R[RESOURCE1] + R[RESOURCE2] + 1]
    )
1: (
    R[DEST]<31:8> = M[R[RESOURCE1] + SOURCE2] sxt 24;
    R[DEST]<7:0> = M[R[RESOURCE1] + SOURCE2 + 1]
    )
esac;
next;
if R[DEST] eq 0
    Z = hi;
if R[DEST] lss 0
    N = hi;
next;
prefetch;
delay(1)
)

```

opcode15 := ! LUBU (Load Byte Unsigned)

```

(
PSW = 0;
next;
case IMM
0: R[DEST] = M[R[RESOURCE1] + R[RESOURCE2]] ext 32
1: R[DEST] = M[R[RESOURCE1] + SOURCE2] ext 32
esac;
next;
if R[DEST] eq 0
    Z = hi;
if R[DEST] lss 0
    N = hi;
next;
prefetch;
delay(1)
)

```

opcode16 := ! LUBS (Load Byte Signed)

```

(
PSW = 0;
next;
case IMM
0: R[DEST] = M[R[RESOURCE1] + R[RESOURCE2]] sxt 32
1: R[DEST] = M[R[RESOURCE1] + SOURCE2] sxt 32
esac;
next;
if R[DEST] eq 0
    Z = hi;
if R[DEST] lss 0

```

```

        N = hi;
    next;
    prefetch;
    delay(1)
)

opcode17 :=                                ! STL (Store Long)
(
    case IMM
        0: (
            M[R[NSOURCE1]] + R[RESOURCE2] = R[NDST]<31:24>;
            M[R[NSOURCE1]] + R[RESOURCE2] + 1] = R[NDST]<23:16>;
            M[R[NSOURCE1]] + R[RESOURCE2] + 2] = R[NDST]<15:8>;
            M[R[NSOURCE1]] + R[RESOURCE2] + 3] = R[NDST]<7:0>
        )
        1: (
            M[R[NSOURCE1]] + SOURCE2] = R[NDST]<31:24>;
            M[R[NSOURCE1]] + SOURCE2 + 1] = R[NDST]<23:16>;
            M[R[NSOURCE1]] + SOURCE2 + 2] = R[NDST]<15:8>;
            M[R[NSOURCE1]] + SOURCE2 + 3] = R[NDST]<7:0>
        )
    esac;
    next;
    if SCC
    (
        if R[NDST] eq 0
            Z = hi;
        if R[NDST] lss 0
            N = hi;
        next
    );
    prefetch;
    delay(1)
)

```

```

opcode18 :=                                ! STS (Store Short)
(
    case IMM
        0: (
            M[R[NSOURCE1]] + R[RESOURCE2] = R[NDST]<15:8>;
            M[R[NSOURCE1]] + R[RESOURCE2] + 1] = R[NDST]<7:0>
        )
        1: (
            M[R[NSOURCE1]] + SOURCE2] = R[NDST]<15:8>;
            M[R[NSOURCE1]] + SOURCE2 + 1] = R[NDST]<7:0>
        )
    esac;
    next;
    if R[NDST] eq 0
        Z = hi;
    if R[NDST] lss 0
        N = hi;
    next;

```

```

    prefetch;
    delay(1)
)

opcode19 :=                                ! STB (Store Byte)
(
    case IMM
        0: R[RENSOURCE1] + RESOURCE2] = R[NDDEST]<7:0>
        1: R[RENSOURCE1] + SOURCE2] = R[NDDEST]<7:0>
    esac;
    next;
    if R[NDDEST] eq 0
        Z = hi;
    if R[NDDEST] lss 0
        N = hi;
    next;
    prefetch;
    delay(1)
)

opcode20 :=                                ! JMP (Jump Conditional)
(
    case NDDEST
        0: if not Z
            case IMM
                0: PC = R[RENSOURCE1] + RESOURCE2]
                1: PC = R[RENSOURCE1] + SOURCE2
            esac
        1: if Z
            case IMM
                0: PC = R[RENSOURCE1] + RESOURCE2]
                1: PC = R[RENSOURCE1] + SOURCE2
            esac
        2: if not N or Z
            case IMM
                0: PC = R[RENSOURCE1] + RESOURCE2]
                1: PC = R[RENSOURCE1] + SOURCE2
            esac
        6: case IMM
            0: PC = R[RENSOURCE1] + RESOURCE2]
            1: PC = R[RENSOURCE1] + SOURCE2
        esac
        4: if N and not Z
            case IMM
                0: PC = R[RENSOURCE1] + RESOURCE2]
                1: PC = R[RENSOURCE1] + SOURCE2
            esac
        5: if not N and not Z
            case IMM
                0: PC = R[RENSOURCE1] + RESOURCE2]
                1: PC = R[RENSOURCE1] + SOURCE2
            esac
        3: if N or Z

```

```

        case IMM
          0: PC = R[RESOURCE1] + R[RESOURCE2]
          1: PC = R[RESOURCE1] + SOURCE2
        esac
      esac;
    next;
    prefetch
  )

opcode21 :=                                ! JMPR (Conditional Jump Relative)
(
  case RDEST
    0: if not Z
      PC = PC + RELADDR
    1: if Z
      PC = PC + RELADDR
    2: if not N or Z
      PC = PC + RELADDR
    6: PC = PC + RELADDR
    4: if N and not Z
      PC = PC + RELADDR
    5: if not N and not Z
      PC = PC + RELADDR
    3: if N or Z
      PC = PC + RELADDR
  esac;
  next;
  prefetch
)

opcode22 :=                                ! CALL
(
  R[DEST] = PC;
  next;
  case IMM
    0: PC = R[RESOURCE1] + R[RESOURCE2]
    1: PC = R[RESOURCE1] + SOURCE2
  esac;
  CWP = CWP - 1;                                ! CWP Must Not Be Less Than 1
  SWP = SWP - 64;
  RWP = RWP - 16;
  next;
  if RWP lss 10
    RWP = 90;
  next;
  save;
  prefetch
)

opcode23 :=                                ! CALLR (Call Relative)
(
  R[DEST] = PC;
  next;

```

```

PC = PC + RELADDR;
CMP = CMP - 1;           ! CMP Must Not Be Less Than 1
SWP = SWP - 64;
RWP = RWP - 16;
next;
if RWP lss 10
    RWP = 90;
next;
save;
prefetch
)

opcode24 :=             ! RET (return)
(
    case IMM
        0: PC = R[NSOURCE1] + RESOURCE2;
        1: PC = R[NSOURCE1] + SOURCE2
    esac;
    CMP = CMP + 1;       ! CMP Must Not Exceed 10
    next;
    restore;
    SWP = SWP + 64;
    RWP = RWP + 16;
    next;
    prefetch
)

opcode25 :=             ! CALLINT (Disable Interrupts)
(
    R[NDST] = PC - 6;
    CMP = CMP - 1;
    SWP = SWP - 64;
    RWP = RWP - 16;
    next;
    if RWP lss 10
        RWP = 90;
    next;
    save;
    prefetch
)

opcode26 :=             ! RETINT (Enable Interrupts)
(
    case IMM
        0: PC = R[NSOURCE1] + RESOURCE2;
        1: PC = R[NSOURCE1] + SOURCE2
    esac;
    CMP = CMP + 1;
    next;
    restore;
    SWP = SWP + 64;
    RWP = RWP + 16;
    next;
)

```

```

    if RWP gtr 90
        RWP = 10;
    prefetch
    )

opcode27 :=                                ! LHI (Load Immediate High)
(
    R(NDSTJ)<31:13> = RCLADD6;
    R(NDSTJ)<12:0> = 0;
    next;
    prefetch
)

opcode28 :=                                ! GYLPC (Get Last PC)
(
    R(NDSTJ) = PC - 8;
    next;
    prefetch
)

opcode29 :=                                ! GETPSW (Get PSW)
(
    R(NDSTJ) = PSW;
    prefetch
)

opcode30 :=                                ! PUTPSW (Put PSW)
(
    PSW = R(NDSTJ);
    prefetch
)

execute :=
(
    CARRYREG = 0;                            ! Initialize Carry Register
    next;
    case OPCODE
        0: opcode0                            ! ADD
        1: opcode1                            ! ADDC
        2: opcode2                            ! SUB
        3: opcode3                            ! SUBC
        4: opcode4                            ! SUBR
        5: opcode5                            ! SUBCR
        6: opcode6                            ! AND
        7: opcode7                            ! OR
        8: opcode8                            ! XOR
        9: opcode9                            ! SLL
        10: opcode10                          ! SRL
        11: opcode11                         ! SRA
        12: opcode12                          ! LD
        13: opcode13                         ! LDSU
        14: opcode14                         ! LDSS
        15: opcode15                         ! LDBU
    end case
)

```

```

16: opcode16      ! LDBS
17: opcode17      ! STL
18: opcode18      ! STS
19: opcode19      ! STB
20: opcode20      ! JMP
21: opcode21      ! JMPR
22: opcode22      ! CALL
23: opcode23      ! CALLR
24: opcode24      ! RET
25: opcode25      ! CALLINT
26: opcode26      ! RETINT
27: opcode27      ! LIMI
28: opcode28      ! GLPC
29: opcode29      ! GETPSW
30: opcode30      ! PUTPSW

```

```

esac
)

```

```

/*****
/*
/* This routine maps a program module's 32 addressable logical regist-
/* ers into its corresponding window's physical registers. It provides
/* 10 overlapping window registers. All modules use global registers
/* 0 - 9. A module using windows 4 or 10 have their logical registers
/* mapped into physical registers 90 - 111. Any modules using windows
/* 3 or 9 have their logical registers mapped into physical registers
/* 74 - 95. Physical registers used by the other 6 windows are describ-
/* within the module itself. Registers that are shared by two windows
/* (i.e. 4&10, 3&9, 2&8, and 1&7) are saved to memory by the CALLR,
/* CALL, and CALLINT instructions before being used by the sharing
/* window. They are restored by the RET and RETINT instructions. This
/* action is accomplished within the instruction routines themselves.
/*
/*
*****/

```

```

window :=
(
  NDEST = DEST ext 8;          ! Expand 5-Bit Instruction Fields
  NSOURCE1 = SOURCE1 ext 8;    ! Into 8-Bit Field To Address 112 Registers
  next;
  case CWP
    4,10: (                   ! Windows 4 and 10 Use Registers 90-111
      if NDEST gtr 9
        NDEST = NDEST + 80;
      if NSOURCE1 gtr 9
        NSOURCE1 = NSOURCE1 + 80;
      ! Don't Modify SOURCE2 Field For Instructions Using Relative Address Field
      if (OPCODE neq 21) and (OPCODE neq 23) and (OPCODE neq 27)
      ! Don't Modify SOURCE2 Field If It Contains An Immediate Operand
      if (IMM eq 0) and (SOURCE2 gtr 9)
        SOURCE2 = SOURCE2 + 80
    )
    3,9: (                     ! Windows 3 and 9 Use Registers 74-95

```



```

    if NDEST gtr 9
        NDEST = NDEST + 64;
    if NSOURCE1 gtr 9
        NSOURCE1 = NSOURCE1 + 64;
    if (OPCODE neq 21) and (OPCODE neq 23) and (OPCODE neq 27)
        if (IMM eq 0) and (SOURCE2 gtr 9)
            SOURCE2 = SOURCE2 + 64
    )
2,8: (                                     ! Windows 2 and 8 Use Registers 58-79
    if NDEST gtr 9
        NDEST = NDEST + 48;
    if NSOURCE1 gtr 9
        NSOURCE1 = NSOURCE1 + 48;
    if (OPCODE neq 21) and (OPCODE neq 23) and (OPCODE neq 27)
        if (IMM eq 0) and (SOURCE2 gtr 9)
            SOURCE2 = SOURCE2 + 48
    )
1,7: (                                     ! Windows 1 and 7 Use Registers 42-63
    if NDEST gtr 9
        NDEST = NDEST + 32;
    if NSOURCE1 gtr 9
        NSOURCE1 = NSOURCE1 + 32;
    if (OPCODE neq 21) and (OPCODE neq 23) and (OPCODE neq 27)
        if (IMM eq 0) and (SOURCE2 gtr 9)
            SOURCE2 = SOURCE2 + 32
    )
6: (                                       ! Window 6 Uses Registers 26-47
    if NDEST gtr 9
        NDEST = NDEST + 16;
    if NSOURCE1 gtr 9
        NSOURCE1 = NSOURCE1 + 16;
    if (OPCODE neq 21) and (OPCODE neq 23) and (OPCODE neq 27)
        if (IMM eq 0) and (SOURCE2 gtr 9)
            SOURCE2 = SOURCE2 + 16
    )
esac
)

main :=
(
    if not ONCE
    (
        CWP = 10;           ! Initialize Window Pointer
        SWP = 1320;
        RWP = 186;
        ONCE = hi;        ! Do Not Execute This Instruction Group Again
        prefetch          ! Fetch Initial Instruction
    );
    window;              ! Determine Current Register Window
    execute;             ! Execute Instruction
    delay(1)            ! Delay 2 microseconds
)

```

Appendix L: Metamicro Description of the RISC 1

```

instr IC[4,4]<8>$          !Constant length 4-byte instruction
format                    !Instruction fields
  OPCODE = IC[0]<7:1>,     !7-bit opcode
  SCC    = IC[0]<0>,       !Condition codes set or not
  DEST   = IC[1]<7:3>,     !Destination operand
  SOURCE1A = IC[1]<2:0>,   !Source operand
  SOURCE1B = IC[2]<7:6>,   !one (5 bits)
  IMM    = IC[2]<5>,       !Immediate operand?
  SOURCE2A = IC[2]<4:0>,   !Source operand
  SOURCE2B = IC[3]<7:0>,   !two (5-13 bits)
  RELADDRA = IC[1]<2:0>,   !19-bit
  RELADDRB = IC[2]<7:0>,   !relative
  RELADDRC = IC[3]<7:0>,   !address
  I0 = IC[0]<7:0>,        !Instruction
  I1 = IC[1]<7:0>,        !byte
  I2 = IC[2]<7:0>,        !mnemonics
  I3 = IC[3]<7:0>$

macro                    !Conditions
  ne = 0 &,              !Not equal
  eq = 1 &,              !Equal
  le = 2 &,              !Less than or equal
  ge = 3 &,              !Greater than or equal
  gt = 4 &,              !Greater than
  ls = 5 &,              !Less than
  un = 6 &,              !Unconditional

  con = 1 &,             !Condition codes on
  coff = 0 &,           !Condition codes off

  r0 = 0 &,              !Macros for 32 registers
  r1 = 1 &,
  r2 = 2 &,
  r3 = 3 &,
  r4 = 4 &,
  r5 = 5 &,
  r6 = 6 &,
  r7 = 7 &,
  r8 = 8 &,
  r9 = 9 &,
  r10 = 10 &,
  r11 = 11 &,
  r12 = 12 &,
  r13 = 13 &,
  r14 = 14 &,
  r15 = 15 &,
  r16 = 16 &,
  r17 = 17 &,
  r18 = 18 &,

```

```

r19 = 19 &,
r20 = 20 &,
r21 = 21 &,
r22 = 22 &,
r23 = 23 &,
r24 = 24 &,
r25 = 25 &,
r26 = 26 &,
r27 = 27 &,
r28 = 28 &,
r29 = 29 &,
r30 = 30 &,
r31 = 31 &,

```

```

immi (s2) = !Immediate SOURCE2 operand
SOURCE2A = s2^8; !SOURCE2A gets 5 MSB of s2
SOURCE2B = s2 &, !SOURCE2B gets 8 LSB of s2

```

```

indx (rx) = !Operand is index register
SOURCE1A = rx^2; !SOURCE1A gets 3 MSB of rx
SOURCE1B = rx &, !SOURCE1B gets 2 LSB of rx

```

```

src2 (s2) = !Process SOURCE2 operand
if 's2 eq1 '^1.*' then !Immediate mode?
{
IMM = 1; !Then set IMM
if 1 then (imm)s2 !and call immi (s2)
}
else
{
IMM = 0; !No
SOURCE2A = s2^8; !Do not set IMM
SOURCE2B = s2 !Fill SOURCE2 field
} &,

```

```

srcdstreg (rs,s2,rd,cc) = !Process instruction operands
SOURCE1A = rs^2; !Fill SOURCE1 field
SOURCE1B = rs;
SCC = cc; !Set condition codes?
DEST = rd; !Fill DEST field
if 's2 eq1 '^1.*' then !Immediate mode?
{
IMM = 1;
if 1 then (imm)s2
}
else
{
IMM = 0;
SOURCE2A = s2^8;
SOURCE2B = s2
} &,

```

```

idxsrcdst (rx,s2,rd,cc) = !Process operands containing index

```

```

        if 1 then (indx)rx;          !Call indx (rx)
        DEST = rd;
        SCC = cc;
        src2 (s2) &,              !Call src2 and pass SOURCE2

ADD (rs,s2,rd,cc) =              !ADD leads off the instructions
    OPCODE = 0;                  !Assign 0000000 as opcode
    srcdstreg (rs,s2,rd,cc)$ &, !Evaluate operands and
                                !assign to instruction fields

ADDI (rs,s2,rd,cc) =
    OPCODE = 1;
    srcdstreg (rs,s2,rd,cc)$ &,

SUB (rs,s2,rd,cc) =
    OPCODE = 2;
    srcdstreg (rs,s2,rd,cc)$ &,

SUBC (rs,s2,rd,cc) =
    OPCODE = 3;
    srcdstreg (rs,s2,rd,cc)$ &,

SUBR (rs,s2,rd,cc) =
    OPCODE = 4;
    srcdstreg (rs,s2,rd,cc)$ &,

SUBRC (rs,s2,rd,cc) =
    OPCODE = 5;
    srcdstreg (rs,s2,rd,cc)$ &,

AND (rs,s2,rd,cc) =
    OPCODE = 6;
    srcdstreg (rs,s2,rd,cc)$ &,

OR (rs,s2,rd,cc) =
    OPCODE = 7;
    srcdstreg (rs,s2,rd,cc)$ &,

XOR (rs,s2,rd,cc) =
    OPCODE = 8;
    srcdstreg (rs,s2,rd,cc)$ &,

SLL (rs,s2,rd,cc) =
    OPCODE = 9;
    srcdstreg (rs,s2,rd,cc)$ &,

SRL (rs,s2,rd,cc) =
    OPCODE = 10;
    srcdstreg (rs,s2,rd,cc)$ &,

SRA (rs,s2,rd,cc) =
    OPCODE = 11;
    srcdstreg (rs,s2,rd,cc)$ &,

```

```
LDL (rx,s2,rd,cc) =
  OPCODE = 12;
  idxsrcdst (rx,s2,rd,cc)$ &,
```

```
LDSU (rx,s2,rd,cc) =
  OPCODE = 13;
  idxsrcdst (rx,s2,rd,cc)$ & ,
```

```
LISS (rx,s2,rd,cc) =
  OPCODE = 14;
  idxsrcdst (rx,s2,rd,cc)$ & ,
```

```
LDBU (rx,s2,rd,cc) =
  OPCODE = 15;
  idxsrcdst (rx,s2,rd,cc)$ & ,
```

```
LDBS (rx,s2,rd,cc) =
  OPCODE = 16;
  idxsrcdst (rx,s2,rd,cc)$ & ,
```

```
STL (rm,rx,s2,cc) =
  OPCODE = 17;
  idxsrcdst (rx,s2,rm,cc)$ & ,
```

```
STS (rm,rx,s2,cc) =
  OPCODE = 18;
  idxsrcdst (rx,s2,rm,cc)$ & ,
```

```
STB (rm,rx,s2,cc) =
  OPCODE = 19;
  idxsrcdst (rx,s2,rm,cc)$ & ,
```

```
JMP (cond,s2,rx) =
  OPCODE = 20;
  DEST = cond;
  if 1 then {indx}rx;
  src2 (s2)$ & ,
```

```
JMPR (cond,y) =
  OPCODE = 21;
  DEST = cond;
  RELADDRA = y^-16;
  RELADDRB = y^-8;
  RELADDRC = y$ & ,
```

!DEST field now receives
!condition value
!RELADDRA gets bits 16-18
!of displacement
!RELADDRB gets bits 8-15
!RELADDRC gets bits 0-7

```
CALL (rd,s2,rx) =
  OPCODE = 22;
  DEST = rd;
  if 1 then {indx}rx;
  src2 (s2)$ & ,
```

```
CALLR (rd,y) =
  OPCODE = 23;
  DEST = rd;
  RELADDRa = y^-16;
  RELADDRb = y^-8;
  RELADDRc = y$ 8,
```

```
RET (rm,s2) =
  OPCODE = 24;
  DEST = 0;
  SOURCE1A = rm^-2;
  SOURCE1B = rm;
  SRC2 (s2)$ 8,
```

```
CALLINT (rd) =
  OPCODE = 25;
  DEST = rd$ 8,
```

```
RETINT (rm,s2) =
  OPCODE = 26;
  SOURCE1A = rm^-2;
  SOURCE1B = rm;
  SRC2 (s2)$ 8,
```

```
LDHI (rd,y) =
  OPCODE = 27;
  DEST = rd;
  RELADDRa = y^-16;
  RELADDRb = y^-8;
  RELADDRc = y$ 8,
```

```
GTLPFC (rd) =
  OPCODE = 28;
  DEST = rd$ 8,
```

```
GETPSW (rd) =
  OPCODE = 29;
  DEST = rd$ 8,
```

```
PUTPSW (rm) =
  OPCODE = 30;
  SOURCE1A = rm^-2;
  SOURCE1B = rm$ 8,
```

```
DATA (const) =          !32-bit stored constant
  I0 = const^-24;       !I0 gets bits 24-31
  I1 = const^-16;       !I1 gets bits 16-23
  I2 = const^-8;        !I2 gets bits 8-15
  I3 = const$ 8 $      !I3 gets bits 0-7
```

VITA

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