

TASK 1

1. 8 BIT DIRECT ADDRESSING:

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — □ X
Z:\>d:
D:\>cd MASM\MASM611\BIN
D:\MASM\MASM611\BIN>debugx
-r
AX=0000 BX=0000 CX=0000 DX=0000 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NU UP EI NG NZ NA PE NC
0859:0100 C3          RET
-a
0859:0100 mov al,[0200]
0859:0103 mov bl,[0210]
0859:0107 mov [0200],bl
0859:010B mov [0210],al
0859:010E
-d 200
0859:0200 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0210 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ...
-s
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
0859:011C 0000      ADD    [BX+SI],AL
0859:011E 0000      ADD    [BX+SI],AL
-e 200
0859:0200 00.24 00.56 00.
-e 210
0859:0210 00.67 00.ae 00.
-d 200
0859:0200 24 56 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $U.....
0859:0210 67 AE 00 00 00 00 00-00 00 00 00 00 00 00 00 g.....
0859:0220 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0230 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0240 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0250 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0260 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0270 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
0859:0280 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .
-d 210
0859:0210 67 AE 00 00 00 00 00 00-00 00 00 00 00 00 00 00 g.....
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
0859:0280 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .
-s
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
DS=0859 ES=0859 SS=0859 CS=0859 IP=0308 NU UP EI NG NZ NA PE NC
0859:0308 0000      ADD    [BX+SI],AL                         DS:0067=B4
-r ip
IP 0308 :100
-r
AX=0024 BX=0067 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NU UP EI NG NZ NA PE NC
0859:0100 A00002      MOV    AL,[0200]                         DS:0200=67
-t
AX=0067 BX=0067 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0103 NU UP EI NG NZ NA PE NC
0859:0103 8A1E1002      MOV    BL,[0210]                         DS:0210=24
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0107 NU UP EI NG NZ NA PE NC
0859:0107 881E0002      MOV    [0200],BL                         DS:0200=67
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010B NU UP EI NG NZ NA PE NC
0859:010B A21002      MOV    [0210],AL                         DS:0210=24
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010E NU UP EI NG NZ NA PE NC
0859:010E 0000      ADD    [BX+SI],AL                         DS:0024=CD
-s
```

```

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
DS=0859 ES=0859 SS=0859 CS=0859 IP=0308 NU UP EI NG NZ NA PE NC
0859:0308 0000 ADD [BX+SI],AL DS:0067=B4
-r ip
IP 0308 :100
-r
AX=0024 BX=0067 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NU UP EI NG NZ NA PE NC
0859:0100 A00002 MOV AL,[0200] DS:0200=67
-t
AX=0067 BX=0067 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0103 NU UP EI NG NZ NA PE NC
0859:0103 8A1E1002 MOV BL,[0210] DS:0210=24
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0107 NU UP EI NG NZ NA PE NC
0859:0107 881E0002 MOV [0200],BL DS:0200=67
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010B NU UP EI NG NZ NA PE NC
0859:010B A21002 MOV [0210],AL DS:0210=24
-t
AX=0067 BX=0024 CX=0000 DX=0000 SP=FFFC BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010E NU UP EI NG NZ NA PE NC
0859:010E 0000 ADD [BX+SI],AL DS:0024=CD
-S_

```



```

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
AX=0024 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0103 NU UP EI NG NZ NA PE NC
0859:0103 8A1E1002 MOV BL,[0210] DS:0210=67
-
AX=0024 BX=0067 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0107 NU UP EI NG NZ NA PE NC
0859:0107 881E0002 MOV [0200],BL DS:0200=24
-t
AX=0024 BX=0067 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010B NU UP EI NG NZ NA PE NC
0859:010B A21002 MOV [0210],AL DS:0210=67
-t
AX=0024 BX=0067 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010E NU UP EI NG NZ NA PE NC
0859:010E 0000 ADD [BX+SI],AL DS:0067=20
-d 200
0859:0200 67 56 00 00 00 00 00-00 00 00 00 00 00 00 gU.....
0859:0210 24 AE 00 00 00 00 00-00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
-S_

```

2. 8 BIT REGISTER RELATIVE ADDRESSING:

D:\MASM\MASM611\BIN>debugx
-r
AX=0000 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NV UP EI NG NZ NA PE NC
0859:0100 C3 RET
-d 200
0859:0200 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0210 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
-d 210
0859:0210 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0280 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
-s

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — □ X
0859:0280 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
-a
0859:0100 mov al,[bx+200]
0859:0104 mov bl,[bx+210]
0859:0108 mov [bp+210],al
0859:010C mov [bp+200],bl
0859:0110
-e 200
0859:0200 00.24 00.56 00.
-e 210
0859:0210 00.fe 00.dc 00.
-u
0859:0100 8A870002 MOV AL,[BX+0200]
0859:0104 8A9F1002 MOV BL,[BX+0210]
0859:0108 88861002 MOV [BP+0210],AL
0859:010C 889E0002 MOV [BP+0200],BL
0859:0110 0000 ADD [BX+SI],AL
0859:0112 0000 ADD [BX+SI],AL
0859:0114 0000 ADD [BX+SI],AL
0859:0116 0000 ADD [BX+SI],AL
0859:0118 0000 ADD [BX+SI],AL
0859:011A 0000 ADD [BX+SI],AL
0859:011C 0000 ADD [BX+SI],AL
0859:011E 0000 ADD [BX+SI],AL
-S

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — □ X
0859:011C 0000 ADD [BX+SI],AL
0859:011E 0000 ADD [BX+SI],AL
-d 200
0859:0200 24 56 00 00 00 00 00 00-00 00 00 00 00 00 00 00 \$U..
0859:0210 FE DC 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
-d 210
0859:0210 FE DC 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
0859:0280 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ..
-t=100
AX=0024 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0104 NV UP EI NG NZ NA PE NC
0859:0104 8A9F1002 MOV BL,[BX+0210] DS:0210=FE
-S

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

```
AX=0024 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0104 NV UP EI NG NZ NA PE NC
0859:0104 8A9F1002      MOV     BL,[BX+0210]          DS:0210=FE
-t
AX=0024 BX=00FE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0108 NV UP EI NG NZ NA PE NC
0859:0108 88861002      MOV     [BP+0210],AL        SS:0210=FE
-t
AX=0024 BX=00FE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010C NV UP EI NG NZ NA PE NC
0859:010C 889E0002      MOV     [BP+0200],BL        SS:0200=24
-t
AX=0024 BX=00FE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0110 NV UP EI NG NZ NA PE NC
0859:0110 0000          ADD     [BX+SI],AL          DS:00FE=00
-d 200
0859:0200 FE 56 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .U.....
0859:0210 24 DC 00 00 00 00 00 00 00 00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
-s
```

3. 8 BIT BASE INDEXED ADDRESSING:

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — ×
AX=0000 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NU UP EI NG NZ NA PE NC
0859:0100 C3          RET
-a
0859:0100
-r si
SI 0000 :200
-r di
DI 0000 :210
-a
0859:0100 mov al,[bx+si]
0859:0102 mov bl,[bx+di]
0859:0104 mov [bp+di],al
0859:0106 mov [bp+sil],bl
0859:0108
-d 200
0859:0200 FE 56 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .U.....
0859:0210 24 DC 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
-S_
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — ×
-d 200
0859:0200 FE 56 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .U.....
0859:0210 24 DC 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
-u
0859:0100 8A00        MOV     AL,[BX+SI]
0859:0102 8A19        MOV     BL,[BX+DI]
0859:0104 8803        MOV     [BP+DI],AL
0859:0106 881A        MOV     [BP+SI],BL
0859:0108 88861002    MOV     [BP+0210],AL
0859:010C 889E0002    MOV     [BP+0200],BL
0859:0110 0000        ADD     [BX+SI],AL
0859:0112 0000        ADD     [BX+SI],AL
0859:0114 0000        ADD     [BX+SI],AL
0859:0116 0000        ADD     [BX+SI],AL
0859:0118 0000        ADD     [BX+SI],AL
0859:011A 0000        ADD     [BX+SI],AL
0859:011C 0000        ADD     [BX+SI],AL
0859:011E 0000        ADD     [BX+SI],AL
-S_
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — ×
-e 200
0859:0200 FE.24 56.67 00.
-e 210
0859:0210 24.ae DC.b2 00.
-t=100
AX=0024 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0102 NU UP EI NG NZ NA PE NC
0859:0102 8A19        MOV     BL,[BX+DI]           DS:0210=AE
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0104 NU UP EI NG NZ NA PE NC
0859:0104 8803        MOV     [BP+DI],AL           SS:0210=AE
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0106 NU UP EI NG NZ NA PE NC
0859:0106 881A        MOV     [BP+SI],BL           SS:0200=24
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0108 NU UP EI NG NZ NA PE NC
0859:0108 88861002    MOV     [BP+0210],AL          SS:0210=24
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=010C NU UP EI NG NZ NA PE NC
0859:010C 889E0002    MOV     [BP+0200],BL          SS:0200=AE
-S_
```

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

```
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0106 NU UP EI NG NZ NA PE NC
0859:0106 881A          MOV     [BP+SI],BL           SS:0200=24
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0108 NU UP EI NG NZ NA PE NC
0859:0108 88861002      MOV     [BP+02101],AL        SS:0210=24
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=010C NU UP EI NG NZ NA PE NC
0859:010C 889E0002      MOV     [BP+02001],BL        SS:0200=AE
-t
AX=0024 BX=00AE CX=0000 DX=0000 SP=FFFE BP=0000 SI=0200 DI=0210
DS=0859 ES=0859 SS=0859 CS=0859 IP=0110 NU UP EI NG NZ NA PE NC
0859:0110 0000          ADD     [BX+SI],AL           DS:02AE=00
-d 200
0859:0200 AE 67 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .g.....
0859:0210 24 B2 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 .....
-s
```

4. 16 BIT DIRECT ADDRESSING:

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
D:\MASM\MASM611\BIN>debugx
-r
AX=0000 BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0100 NV UP EI NG NZ NA PE NC
0859:0100 C3          RET
-a
0859:0100 mov ax,[0200]
0859:0103 mov bx,[0210]
0859:0107 mov [0200],bx
0859:010B mov [0210],ax
0859:010E
-d 200
0859:0200 AE 67 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .g.....
0859:0210 24 B2 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $.....
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
-t 100
AX=67AE BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0103 NV UP EI NG NZ NA PE NC
0859:0103 8B1E1002      MOV     BX,[0210]           DS:0210=B224
-S
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
AX=67AE BX=0000 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0103 NV UP EI NG NZ NA PE NC
0859:0103 8B1E1002      MOV     BX,[0210]           DS:0210=B224
-t
AX=67AE BX=B224 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=0107 NV UP EI NG NZ NA PE NC
0859:0107 891E0002      MOV     [0200],BX           DS:0200=67AE
-t
AX=67AE BX=B224 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010B NV UP EI NG NZ NA PE NC
0859:010B A31002      MOV     [0210],AX           DS:0210=B224
-t
AX=67AE BX=B224 CX=0000 DX=0000 SP=FFFE BP=0000 SI=0000 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=010E NV UP EI NG NZ NA PE NC
0859:010E 0002          ADD     [BP+SI],AL           SS:0000=CD
-d 200
0859:0200 24 B2 00 00 00 00 00 00-00 00 00 00 00 00 00 00 $.....
0859:0210 AE 67 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .g.....
0859:0220 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0230 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0240 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0250 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0260 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0859:0270 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
-S
```

5. 32 BIT DIRECT ADDRESSING:

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

```
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
-q  
  
D:\MASM\MASM611\BIN>debugx  
-rx  
386 regs on  
-r  
EAX=00000000 EBX=00000000 ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000  
ESI=00000000 EDI=00000000 EIP=00000100 EFL=00007286 NU UP EI NG NZ NA PE NC  
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000  
0859:0100 C3 RET  
-d 200  
0859:0200 24 B2 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 $ . . . . .  
0859:0210 AE 67 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 .g . . . . .  
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 . . . . .  
-e 200  
0859:0200 24.12 B2.34 00.56 00.78 00.  
-e 210  
0859:0210 AE.ab 67.cd 00.ef 00.98 00.  
-S  
  
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
```

-e 200
0859:0200 24.12 B2.34 00.56 00.78 00.
-e 210
0859:0210 AE.ab 67.cd 00.ef 00.98 00.
-d 200
0859:0200 12 34 56 78 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .4Ux
0859:0210 AB CD EF 98 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
-a
0859:0100 mov eax,[0200]
0859:0104 mov ebx,[0210]
0859:0108 mov [0200],ebx
0859:010E mov [0210],eax
0859:0112
-t=100
EAX=78563412 EBX=00000000 ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000
ESI=00000000 EDI=00000000 EIP=00000104 EFL=00007286 NU UP EI NG NZ NA PE NC
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000
0859:0104 668B1E1002 MOV EBX,[0210] DS:0210=98EFCDAB
-S

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

-t
EAX=78563412 EBX=98EFCDAB ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000
ESI=00000000 EDI=00000000 EIP=00000109 EFL=00007286 NU UP EI NG NZ NA PE NC
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000
0859:0109 66891E0002 MOV [0200],EBX DS:0200=78563412
-t
EAX=78563412 EBX=98EFCDAB ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000
ESI=00000000 EDI=00000000 EIP=0000010E EFL=00007286 NU UP EI NG NZ NA PE NC
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000
0859:010E 66A31002 MOV [0210],EAX DS:0210=98EFCDAB
-t
EAX=78563412 EBX=98EFCDAB ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000
ESI=00000000 EDI=00000000 EIP=00000112 EFL=00007286 NU UP EI NG NZ NA PE NC
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000
0859:0112 0000 ADD [BX+S1],AL DS:CDAB=00
-d 200
0859:0200 AB CD EF 98 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00 .4Ux
0859:0210 12 34 56 78 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0220 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0230 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0240 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0250 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0260 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
0859:0270 00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 00
-S

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

```
0859:0128 0000      ADD    [BX+SI],AL
0859:012A 0000      ADD    [BX+SI],AL
0859:012C 0000      ADD    [BX+SI],AL
0859:012E 0000      ADD    [BX+SI],AL
0859:0130 0000      ADD    [BX+SI],AL
-u 100
0859:0100 66A10002  MOV    EAX,[0200]
0859:0104 668B1E1002 MOV    EBX,[0210]
0859:0109 66891E0002 MOV    [0200],EBX
0859:010E 66A31002  MOV    [0210],EAX
0859:0112 0000      ADD    [BX+SI],AL
0859:0114 0000      ADD    [BX+SI],AL
0859:0116 0000      ADD    [BX+SI],AL
0859:0118 0000      ADD    [BX+SI],AL
0859:011A 0000      ADD    [BX+SI],AL
0859:011C 0000      ADD    [BX+SI],AL
0859:011E 0000      ADD    [BX+SI],AL
-r ip
IP 0100 :100
-g 112
EAX=98EFCDA8 EBX=78563412 ECX=00000000 EDX=00000000 ESP=0000FFFF EBP=00000000
ESI=00000000 EDI=00000000 EIP=00000112 EFL=00007286 NV UP EI NG NZ NA PE NC
DS=0859 ES=0859 SS=0859 CS=0859 FS=0000 GS=0000
0859:0112 0000      ADD    [BX+SI],AL
-S
DS:3412=00
```

TASK 2

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
For supported shell commands type: HELP
To adjust the emulated CPU speed, use ctrl-F11 and ctrl-F12.
To activate the keymapper ctrl-F1.
For more information read the README file in the DOSBox directory.

HAVE FUN!
The DOSBox Team http://www.dosbox.com

Z:\>SET BLASTER=A220 I7 D1 H5 T6
Z:\>mount D D:\\
Drive D is mounted as local directory D:\\
Z:\>d:\\
D:\>cd MASM\MASM611\BIN>debugx
-n test.txt
-l 100
-s 500 1 32 "virus"
-s 000 500 "virus"
0059:0100
-S_
```

TASK 3

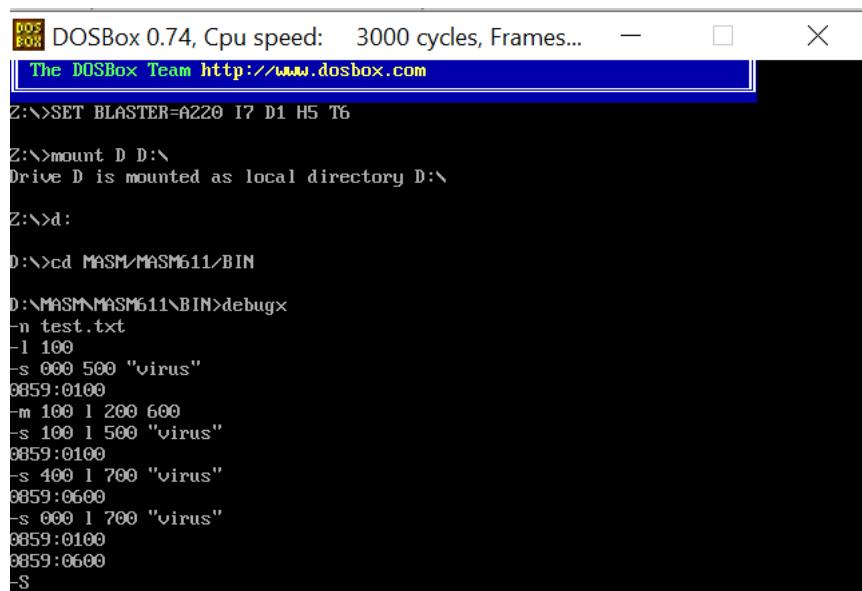
```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
Z:\>d:
D:\>cd MASM\MASM611
D:\MASM\MASM611>cd BIN
D:\MASM\MASM611\BIN>debugx
-e 200
0859:0200 00.12 00.34 00.
-a
0859:0100 mov ax,[0200]
0859:0103 mov bx,[0200]
0859:0107 mov cx,[0200]
0859:010B mov dx,[0200]
0859:010F mov si,[0200]
0859:0113 mov di,[0200]
0859:0117
-n task3.com
-r bx
BX 0000 :0
-r cx
CX 0000 :17
-w 100
Writing 0017 bytes
-S
```

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X
DS=0863 ES=0863 SS=0863 CS=0863 IP=0117 NV UP EI PL ZR NA PE NC
0863:0117 0000          ADD     [BX+SI],AL           DS:0000=CD
-q
D:\MASM\MASM611\BIN>debugx task3.com
-e 200
0863:0200 00.12 00.34 00.
-d 200
0863:0200 12 34 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .4.....
0863:0210 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0220 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0230 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0240 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0250 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0260 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
0863:0270 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 00 .....
-t
AX=3412 BX=0000 CX=0017 DX=0000 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0863 ES=0863 SS=0863 CS=0863 IP=0103 NV UP EI PL ZR NA PE NC
0863:0103 8B1E0002      MOV     BX,[0200]           DS:0200=3412
-t
AX=3412 BX=3412 CX=0017 DX=0000 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0863 ES=0863 SS=0863 CS=0863 IP=0107 NV UP EI PL ZR NA PE NC
0863:0107 8B0E0002      MOV     CX,[0200]           DS:0200=3412
-S
```

DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

```
-t
AX=3412 BX=3412 CX=0017 DX=0000 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=0107 NV UP EI PL ZR NA PE NC
0B63:0107 8B0E0002      MOV     CX,[0200]          DS :0200=3412
-t
AX=3412 BX=3412 CX=3412 DX=0000 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=010B NV UP EI PL ZR NA PE NC
0B63:010B 8B160002      MOV     DX,[0200]          DS :0200=3412
-t
AX=3412 BX=3412 CX=3412 DX=3412 SP=FFFFE BP=0000 SI=0000 DI=0000
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=010F NV UP EI PL ZR NA PE NC
0B63:010F 8B360002      MOV     SI,[0200]          DS :0200=3412
-t
AX=3412 BX=3412 CX=3412 DX=3412 SP=FFFFE BP=0000 SI=3412 DI=0000
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=0113 NV UP EI PL ZR NA PE NC
0B63:0113 8B3E0002      MOV     DI,[0200]          DS :0200=3412
-t
AX=3412 BX=3412 CX=3412 DX=3412 SP=FFFFE BP=0000 SI=3412 DI=3412
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=0117 NV UP EI PL ZR NA PE NC
0B63:0117 0000          ADD     [BX+SI],AL        DS :6824=00
-r
AX=3412 BX=3412 CX=3412 DX=3412 SP=FFFFE BP=0000 SI=3412 DI=3412
DS=0B63 ES=0B63 SS=0B63 CS=0B63 IP=0117 NV UP EI PL ZR NA PE NC
0B63:0117 0000          ADD     [BX+SI],AL        DS :6824=00
-s_
```

TASK 4

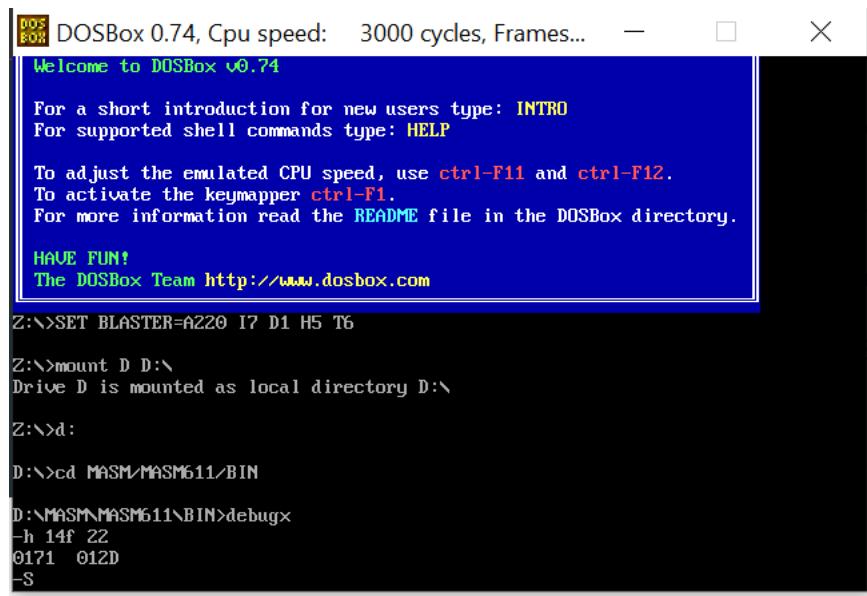


DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

The DOSBox Team <http://www.dosbox.com>

```
Z:\>SET BLASTER=A220 I7 D1 H5 T6
Z:\>mount D D:\n
Drive D is mounted as local directory D:\n
Z:\>d:
D:\>cd MASM\MASM611\BIN
D:\MASM\MASM611\BIN>debugx
-n test.txt
-l 100
-s 000 500 "virus"
0059:0100
-m 100 l 200 600
-s 100 l 500 "virus"
0059:0100
-s 400 l 700 "virus"
0059:0600
-s 000 l 700 "virus"
0059:0100
0059:0600
-S
```

TASK 5



DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

Welcome to DOSBox v0.74

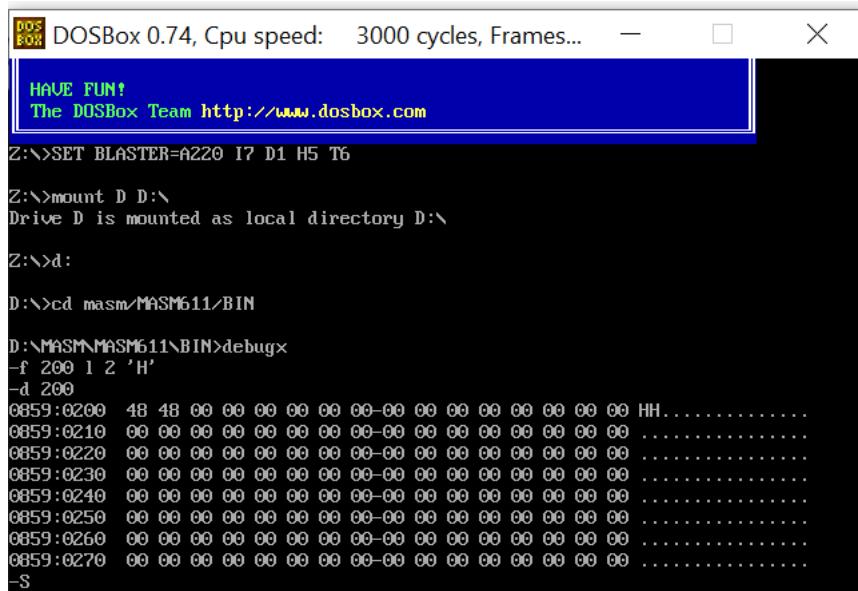
For a short introduction for new users type: INTRO
For supported shell commands type: HELP

To adjust the emulated CPU speed, use **ctrl-F11** and **ctrl-F12**.
To activate the keymapper **ctrl-F1**.
For more information read the **README** file in the DOSBox directory.

HAVE FUN!
The DOSBox Team <http://www.dosbox.com>

```
Z:\>SET BLASTER=A220 I7 D1 H5 T6
Z:\>mount D D:\ 
Drive D is mounted as local directory D:\ 
Z:\>d:
D:\>cd MASM\MASM611\BIN
D:\MASM\MASM611\BIN>debugx
-h 14f 22
0171 012D
-S
```

TASK 6



DOSBox 0.74, Cpu speed: 3000 cycles, Frames... — X

HAVE FUN!
The DOSBox Team <http://www.dosbox.com>

```
Z:\>SET BLASTER=A220 I7 D1 H5 T6
Z:\>mount D D:\ 
Drive D is mounted as local directory D:\ 
Z:\>d:
D:\>cd masm\MASM611\BIN
D:\MASM\BIN>debugx
-f 200 1 2 'H'
-d 200
0859:0200  48 48 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 HH.....
0859:0210  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0220  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0230  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0240  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0250  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0260  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
0859:0270  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00 ..
-S
```