

Lab Report #4

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20P-0051

In this lab we learn direct and indirect addressing, Registers + Offsets Addressing

Direct Addressing:

In direct addressing, we simply give the address of our memory location i.e. our variable.

For example:

Code:

```
ASM ex1.asm  X

coal > ASM ex1.asm
1  [org 0x0100]
2
3  mov ax, [num1]
4  mov bx, [num2]
5  add ax, bx
6  mov [sum], ax
7
8  mov ax , 0x4c00
9  int 0x21
10
11 num1: dw 5
12 num2: dw 15
13 sum: dw 0
14
15
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX - X

EX5      ASM          206 13-10-2021 16:20
HISTORY  TXT          2,672 07-04-1999 15:43
LAB1     COM           26 13-10-2021 19:10
LAB1     LST           3,823 13-10-2021 19:10
MASM    EXE          259,638 12-09-2003 10:36
NDISASM EXE          128,460 12-09-2003 10:36
R01-01.S S            371 02-09-2021 12:42
R01-02.S S            371 02-09-2021 12:42
RSX     EXE          111,900 19-02-1999 15:45
RSXNT   DLL          80,896 19-02-1999 15:46
RTN     ASM          1,038 06-11-1998 15:15
RTN     RC            402 06-11-1998 15:16
RTN     RES           384 06-11-1998 15:13
SETUP   TXT           99 05-10-2021 14:42
TCOFF   ASM           591 16-11-1998 10:11
TEST    ASM           508 26-10-1998 10:12
TEST    COM           18 24-09-2021 22:41
TEST    LST          1,216 24-09-2021 22:39
TEST    OBJ           405 26-10-1998 10:12
58 File(s)        936,304 Bytes.
3 Dir(s)         262,111,744 Bytes free.

C:\>nasm ex1.asm -o ex1.com
C:\>afld EX1.COM
```

Debugger:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0000	SI 0000	CS 19F5	IP 0100	Stack +0 0000	Flags 7202
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 0017	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0

CMD > [] 0005

0100 A11101	MOV AX,[0111]	DS:0000 CD 20 FF 9F 00 EA F0 FE
0103 8B1E1301	MOV BX,[0113]	DS:0010 18 01 10 01 18 01 92 01
0107 01D8	ADD AX,BX	DS:0018 01 01 01 00 02 FF FF FF
0109 A31501	MOV [0115],AX	DS:0020 FF FF FF FF FF FF FF
010C B8004C	MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11
010F CD21	INT 21	DS:0030 A2 01 14 00 18 00 F5 19
0111 05000F	ADD AX,0F00	DS:0038 FF FF FF FF 00 00 00 00
0114 0000	ADD [BX+S1],AL	DS:0040 05 00 00 00 00 00 00 00
		DS:0048 00 00 00 00 00 00 00 00

Z 0 1 2 3 4 5 6 7 8 9 A B C D E F = f. R= i. +...
DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00 .. f. R= i. +...
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF f.
DS:0020 FF FF FF FF FF FF FF FF FF EB 19 C0 11 FF FF FF FF FF FF FF f. L.
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00 6..... J.
DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX	0005	SI	0000	CS	19F5	IP	0103	Stack	+0	0000	Flags	7200
BX	0000	DI	0000	DS	19F5				+2	20CD		
CX	0017	BP	0000	ES	19F5	HS	19F5		+4	9FFF	OF DF IF SF ZF AF FF CF	
DX	0000	SP	FFFE	SS	19F5	FS	19F5		+6	EA00	0 0 1 0 0 0 0 0 0 0 0 0 0	

CMD >

	000F	
0100 A11101	MOV AX,[0111]	
0103 8B1E1301	MOV BX,[0113]	
0107 01D8	ADD AX,BX	
0109 A31501	MOV [0115],AX	
010C B8004C	MOV AX,4C00	
010F CD21	INT 21	
0111 05000F	ADD AX,0F00	
0114 0000	ADD [BX+SI],AL	
0116 0000	ADD AL,AL	

1	0	1	2	3	4	5	6	7
DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00						
DS:0010	18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF						
DS:0020	FF FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11						
DS:0030	A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00						
DS:0040	05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00						

Z 0 1 2 3 4 5 6 7 8 9 A B C D E F

DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f. #≡ = 4 .. + ...
DS:0010	18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF f.
DS:0020	FF FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11 f.
DS:0030	A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.
DS:0040	05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0005 SI 0000 CS 19F5 IP 0107 Stack +0 0000 Flags 7200	BX 000F DI 0000 DS 19F5 +2 20CD	CX 0017 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD >	1 0 1 2 3 4 5 6 7
0103 8B1E1301 MOU BX,[0113]	DS:0000 CD 20 FF 9F 00 EA F0 FE
0107 01D8 ADD AX,BX	DS:0008 AD DE 1B 05 C5 06 00 00
0109 A31501 MOU [0115],AX	DS:0010 18 01 10 01 18 01 92 01
010C B8004C MOU AX,4C00	DS:0018 01 01 01 00 02 FF FF FF
010F CD21 INT 21	DS:0020 FF FF FF FF FF FF FF FF
0111 65000F ADD AX,0F00	DS:0028 FF FF FF EB 19 C0 11
0114 0000 ADD [BX+SII],AL	DS:0030 A2 01 14 00 18 00 F5 19
0116 00C0 ADD AL,AL	DS:0038 FF FF FF FF 00 00 00 00
0118 8956E4 MOU [BP-1C],DX	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F = f.Ω≡≡ i|..+...
 DS:0000 CD 20 FF 9F 00 EA F0 FE,fl.
 DS:0010 18 01 10 01 18 01 92 01δ. L.
 DS:0020 FF FF FF FF FF FF FF FF
 DS:0030 A2 01 14 00 18 00 F5 19 6.....J.
 DS:0040 05 00 00 00 00 00 00 00

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 ? up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0014 SI 0000 CS 19F5 IP 0109 Stack +0 0000 Flags 7214	BX 000F DI 0000 DS 19F5 +2 20CD	CX 0017 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 1 1 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	---------------------------------------------------------

CMD > 0000	1 0 1 2 3 4 5 6 7
0107 01D8 ADD AX,BX	DS:0000 CD 20 FF 9F 00 EA F0 FE
0109 A31501 MOU [0115],AX	DS:0008 AD DE 1B 05 C5 06 00 00
010C B8004C MOU AX,4C00	DS:0010 18 01 10 01 18 01 92 01
010F CD21 INT 21	DS:0018 01 01 01 00 02 FF FF FF
0111 65000F ADD AX,0F00	DS:0020 FF FF FF FF FF FF FF
0114 0000 ADD [BX+SII],AL	DS:0028 FF FF FF EB 19 C0 11
0116 00C0 ADD AL,AL	DS:0030 A2 01 14 00 18 00 F5 19
0118 8956E4 MOU [BP-1C],DX	DS:0038 FF FF FF FF 00 00 00 00
011B 8946E6 MOU [BP-1A],AX	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F = f.Ω≡≡ i|..+...
 DS:0000 CD 20 FF 9F 00 EA F0 FE,fl.
 DS:0010 18 01 10 01 18 01 92 01δ. L.
 DS:0020 FF FF FF FF FF FF FF
 DS:0030 A2 01 14 00 18 00 F5 19 6.....J.
 DS:0040 05 00 00 00 00 00 00 00

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 ? up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0014	SI 0000	CS 19F5	IP 010C	Stack +0 0000	Flags 7214
BX 000F	DI 0000	DS 19F5		+2 20CD	
CX 0017	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 1 0

CMD >		1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0109 A31501	MOV [0115],AX	DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f. R≡■ i .+...											
010C B8004C	MOV AX,4C00	DS:0008	AD DE 1B 05 C5 06 00 00	DS:0010 18 01 10 01 18 01 92 01fl.											
010F CD21	INT 21	DS:0018 01 01 01 00 02 FF FF FF	DS:0020 FF FF FF FF FF FF FF FF FF	DS:0028 FF FF FF FF EB 19 C0 11	δ. L.											
0111 05000F	ADD AX,0F00	DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00	DS:0040 05 00 00 00 00 00 00 00	6.....J.											
0114 0014	ADD [SI],DL	DS:0048 00 00 00 00 00 00 00 00													
0116 00C0	ADD AL,AL															
0118 8956E4	MOV [BP-1C],DX															
011B 8946E6	MOV [BP-1A],AX															
011E C746F60000	MOV [BP-0A],0000															

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 4000	SI 0000	CS 19F5	IP 010F	Stack +0 0000	Flags 7214
BX 000F	DI 0000	DS 19F5		+2 20CD	
CX 0017	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 1 0

CMD > 1		1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
010C B8004C	MOV AX,4C00	DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f. R≡■ i .+...											
010F CD21	INT 21	DS:0008	AD DE 1B 05 C5 06 00 00	DS:0010 18 01 10 01 18 01 92 01fl.											
0111 05000F	ADD AX,0F00	DS:0018 01 01 01 00 02 FF FF FF	DS:0020 FF FF FF FF FF FF FF FF	DS:0028 FF FF FF FF EB 19 C0 11	δ. L.											
0114 0014	ADD [SI],DL	DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00	DS:0040 05 00 00 00 00 00 00 00	6.....J.											
0116 00C0	ADD AL,AL	DS:0048 00 00 00 00 00 00 00 00													
0118 8956E4	MOV [BP-1C],DX															
011B 8946E6	MOV [BP-1A],AX															
011E C746F60000	MOV [BP-0A],0000															
0123 8B46F6	MOV AX,[BP-0A]															

2		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
DS:0000	CD 20 FF 9F 00 EA F0 FE	DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f. R≡■ i .+...												
DS:0010	18 01 10 01 18 01 92 01	DS:0010	18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFfl.												
DS:0020	FF FF FF FF FF FF FF FF	DS:0020	FF FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.												
DS:0030	A2 01 14 00 18 00 F5 19	DS:0030	A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.												
DS:0040	05 00 00 00 00 00 00 00	DS:0040	05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00												

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

Indirect Addressing:

In indirect addressing, we use registers instead of variables. It's mainly used when the data we want to work on is large and not just four to five values.

For example:

Code:

```
ASM ex3.asm  X  
coal > ASM ex3.asm  
1 [org 0x0100]  
2  
3 mov bx, num1  
4 mov cx, 5  
5 mov ax, 0  
6  
7 outerloop:  
8     add ax , [bx]  
9     add bx , 2  
10    sub cx , 1  
11  
12    jne outerloop  
13  
14 mov [sum] , ax  
15  
16 mov ax , 0x4c00  
17 int 0x21  
18  
19 num1: dw 1,2,3,4,5  
20 sum: dw 0  
21
```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX - ×

EX5	ASM	206	13-10-2021 16:20
HISTORY	TXT	2,672	07-04-1999 15:43
LAB1	COM	26	13-10-2021 19:10
LAB1	LST	3,823	13-10-2021 19:10
NASM	EXE	259,638	12-09-2003 10:36
NDISASM	EXE	128,460	12-09-2003 10:36
R01-01.S	S	371	02-09-2021 12:42
R01-02.S	S	371	02-09-2021 12:42
RSX	EXE	111,900	19-02-1999 15:45
RSXNT	DLL	80,896	19-02-1999 15:46
RTN	ASM	1,038	06-11-1998 15:15
RTN	RC	402	06-11-1998 15:16
RTN	RES	384	06-11-1998 15:13
SETUP	TXT	99	05-10-2021 14:42
TCOFF	ASM	591	16-11-1998 10:11
TEST	ASM	508	26-10-1998 10:12
TEST	COM	18	24-09-2021 22:41
TEST	LST	1,216	24-09-2021 22:39
TEST	OBJ	405	26-10-1998 10:12
60	File(s)	936,368	Bytes.
3	Dir(s)	262,111,744	Bytes free.

C:\>nasm ex3.asm -o ex3.com
C:\>afld EX3.COM_

Debugger:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0100 Stack +0 0000 Flags 7202	BX 0000 DI 0000 DS 19F5 +2 20CD	CX 0029 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD >			
0100 BB1D01 MOV BX,011D	DS:0000 CD 20 FF 9F 00 EA F0 FE	1 0 1 2 3 4 5 6 7	
0103 B90500 MOV CX,0005	DS:0008 AD DE 1B 05 C5 06 00 00	DS:0010 18 01 10 01 18 01 92 01	
0106 B80000 MOV AX,0000	DS:0018 01 01 01 00 02 FF FF FF	DS:0020 FF FF FF FF FF FF FF FF	
0109 0307 ADD AX,[BX]	DS:0028 FF FF FF FF EB 19 C0 11	DS:0030 A2 01 14 00 18 00 F5 19	
010B 81C30200 ADD BX,0002	DS:0038 FF FF FF FF 00 00 00 00	DS:0040 05 00 00 00 00 00 00 00 00	
010F 81E90100 SUB CX,0001	DS:0048 00 00 00 00 00 00 00 00 00		
0113 75F4 JNZ 0109			
0115 A32701 MOV [0127],AX			

2 0 1 2 3 4 5 6 7 8 9 A B C D E F			
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Q≡■ i ...+...	
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFR.	
DS:0020 FF FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.	
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6....J.	
DS:0040 05 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0103 Stack +0 0000 Flags 7200	BX 011D DI 0000 DS 19F5 +2 20CD	CX 0029 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD >			
0100 BB1D01 MOV BX,011D	DS:0000 CD 20 FF 9F 00 EA F0 FE	1 0 1 2 3 4 5 6 7	
0103 B90500 MOV CX,0005	DS:0008 AD DE 1B 05 C5 06 00 00	DS:0010 18 01 10 01 18 01 92 01	
0106 B80000 MOV AX,0000	DS:0018 01 01 01 00 02 FF FF FF	DS:0020 FF FF FF FF FF FF FF	
0109 0307 ADD AX,[BX]	DS:0028 FF FF FF FF EB 19 C0 11	DS:0030 A2 01 14 00 18 00 F5 19	
010B 81C30200 ADD BX,0002	DS:0038 FF FF FF FF 00 00 00 00	DS:0040 05 00 00 00 00 00 00 00 00	
010F 81E90100 SUB CX,0001	DS:0048 00 00 00 00 00 00 00 00 00		
0113 75F4 JNZ 0109			
0115 A32701 MOV [0127],AX			
0118 B8004C MOV AX,4C00			

2 0 1 2 3 4 5 6 7 8 9 A B C D E F			
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Q≡■ i ...+...	
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFR.	
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.	
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6....J.	
DS:0040 05 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0106 Stack +0 0000 Flags 7200	+2 20CD
BX 011D DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0005 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	
0103 B90500 MOV CX,0005	1 0 1 2 3 4 5 6 7
0106 B80000 MOV AX,0000	DS:0000 CD 20 FF 9F 00 EA F0 FE
0109 0307 ADD AX,[BX]	DS:0008 AD DE 1B 05 C5 06 00 00
010B 81C30200 ADD BX,0002	DS:0010 18 01 10 01 18 01 92 01
010F 81E90100 SUB CX,0001	DS:0018 01 01 01 00 02 FF FF FF
0113 75F4 JNZ 0109	DS:0020 FF FF FF FF FF FF FF FF
0115 A32701 MOV [0127],AX	DS:0028 FF FF FF EB 19 C0 11
0118 B8004C MOV AX,4C00	DS:0030 A2 01 14 00 18 00 F5 19
011B CD21 INT 21	DS:0038 FF FF FF FF 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	= f. R≡■ i .+...
DS:0010 18 01 10 01 18 01 92 01fl.
DS:0020 FF FF FF FF FF FF FF FFd.L.
DS:0030 A2 01 14 00 18 00 F5 19	6.....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0109 Stack +0 0000 Flags 7200	+2 20CD
BX 011D DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0005 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > -0001-	
0106 B80000 MOV AX,0000	1 0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF
0115 A32701 MOV [0127],AX	DS:0020 FF FF FF FF FF FF FF
0118 B8004C MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF FF 00 00 00
	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	= f. R≡■ i .+...
DS:0010 18 01 10 01 18 01 92 01fl.
DS:0020 FF FF FF FF FF FF FFd.L.
DS:0030 A2 01 14 00 18 00 F5 19	6.....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 010B Stack +0 0000 Flags 7200	+2 20CD	+4 9FFF OF DF IF SF ZF AF PF CF
BX 011D DI 0000 DS 19F5	+6 EA00 0 0 1 0 0 0 0 0	
CX 0005 BP 0000 ES 19F5 HS 19F5		
DX 0000 SP FFFE SS 19F5 FS 19F5		

CMD >	1	0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE	
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00	
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01	
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF	
0115 A32701 MOV [0127],AX	DS:0020 FF FF FF FF FF FF FF FF	
0118 B8004C MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11	
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19	
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF 00 00 00 00 00	
011F 0200 ADD AL,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2	0 1 2 3 4 5 6 7	8 9 A B C D E F
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡ i .+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFfl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 010F Stack +0 0000 Flags 7200	+2 20CD	+4 9FFF OF DF IF SF ZF AF PF CF
BX 011F DI 0000 DS 19F5	+6 EA00 0 0 1 0 0 0 0 0	
CX 0005 BP 0000 ES 19F5 HS 19F5		
DX 0000 SP FFFE SS 19F5 FS 19F5		

CMD > 1	0 1 2 3 4 5 6 7	
010B 81C30200 ADD BX,0002	DS:0000 CD 20 FF 9F 00 EA F0 FE	
010F 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00	
0113 75F4 JNZ 0109	DS:0010 18 01 10 01 18 01 92 01	
0115 A32701 MOV [0127],AX	DS:0018 01 01 01 00 02 FF FF FF	
0118 B8004C MOV AX,4C00	DS:0020 FF FF FF FF FF FF FF	
011B CD21 INT 21	DS:0028 FF FF FF EB 19 C0 11	
011D 0100 ADD [BX+SI],AX	DS:0030 A2 01 14 00 18 00 F5 19	
011F 0200 ADD AL,[BX+SI]	DS:0038 FF FF FF 00 00 00 00	
0121 0300 ADD AX,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2	0 1 2 3 4 5 6 7	8 9 A B C D E F
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡ i .+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFfl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 0113 Stack +0 0000 Flags 7200	+2 20CD
BX 011F DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0004 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	
010F 81E90100 SUB CX,0001	1 0 1 2 3 4 5 6 7
0113 75F4 JNZ 0109	DS:0000 CD 20 FF 9F 00 EA F0 FE
0115 A32701 MOV [0127],AX	DS:0008 AD DE 1B 05 C5 06 00 00
0118 B8004C MOV AX,4C00	DS:0010 18 01 10 01 18 01 92 01
011B CD21 INT 21	DS:0018 01 01 01 00 02 FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0020 FF FF FF FF FF FF FF FF
011F 0200 ADD AL,[BX+SI]	DS:0028 FF FF FF EB 19 C0 11
0121 0300 ADD AX,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0123 0400 ADD AL,00	DS:0038 FF FF FF 00 00 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F		
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ...+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFfl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step | 2 ProcStep | 3 Retrieve | 4 Help ON | 5 BRK | Menu | 6 | 7 up | 8 dn | 9 le | 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 0109 Stack +0 0000 Flags 7200	+2 20CD
BX 011F DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0004 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > 0002	
0113 75F4 JNZ 0109	1 0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF
0115 A32701 MOV [0127],AX	DS:0020 FF FF FF FF FF FF FF
0118 B8004C MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF 00 00 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F		
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ...+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFfl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step | 2 ProcStep | 3 Retrieve | 4 Help ON | 5 BRK | Menu | 6 | 7 up | 8 dn | 9 le | 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0003 SI 0000 CS 19F5 IP 010B	Stack +0 0000 Flags 7204
BX 011F DI 0000 DS 19F5	+2 20CD
CX 0004 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 1 0

CMD > []		1 0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE	- f.Ω≡≡ i ...+...
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00ft.
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
0113 75F4 JNZ 0109	DS:0020 FF FF FF FF FF FF FF FF	DS:0028 FF FF FF EB 19 C0 11
0115 A32701 MOV [0127],AX	DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
0118 B8004C MOV AX,4C00	DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00
011B CD21 INT 21		
011D 0100 ADD [BX+SI],AX		
011F 0200 ADD AL,[BX+SI]		

2 0 1 2 3 4 5 6 7 8 9 A B C D E F		
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	- f.Ω≡≡ i ...+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFft.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0003 SI 0000 CS 19F5 IP 010F	Stack +0 0000 Flags 7214
BX 0121 DI 0000 DS 19F5	+2 20CD
CX 0004 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 1 1 0

CMD > []		1 0 1 2 3 4 5 6 7
010B 81C30200 ADD BX,0002	DS:0000 CD 20 FF 9F 00 EA F0 FE	- f.Ω≡≡ i ...+...
010F 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00ft.
0113 75F4 JNZ 0109	DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
0115 A32701 MOV [0127],AX	DS:0020 FF FF FF FF FF FF FF	DS:0028 FF FF FF EB 19 C0 11
0118 B8004C MOV AX,4C00	DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
011B CD21 INT 21	DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00
011D 0100 ADD [BX+SI],AX		
011F 0200 ADD AL,[BX+SI]		
0121 0300 ADD AX,[BX+SI]		

2 0 1 2 3 4 5 6 7 8 9 A B C D E F		
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	- f.Ω≡≡ i ...+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFft.
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0003 SI 0000 CS 19F5 IP 0113 Stack +0 0000 Flags 7204	+2 20CD
BX 0121 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0003 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 1 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	1 0 1 2 3 4 5 6 7
010F 81E90100 SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE
0113 75F4 JNZ 0109	DS:0008 AD DE 1B 05 C5 06 00 00
0115 A32701 MOV [01271],AX	DS:0010 18 01 10 01 18 01 92 01
0118 B8004C MOV AX,4C00	DS:0018 01 01 01 00 02 FF FF FF
011B CD21 INT 21	DS:0020 FF FF FF FF FF FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0028 FF FF FF FF EB 19 C0 11
011F 0200 ADD AL,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0121 0300 ADD AX,[BX+SI]	DS:0038 FF FF FF FF 00 00 00 00
0123 0400 ADD AL,00	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.?= i...+...
DS:0000 CD 20 FF 9F 00 EA F0 FE	DS:0010 18 01 10 01 18 01 92 01
DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	DS:0028 FF FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	DS:0030 A2 01 14 00 18 00 F5 19
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0003 SI 0000 CS 19F5 IP 0109 Stack +0 0000 Flags 7204	+2 20CD
BX 0121 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0003 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 1 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > 0003	1 0 1 2 3 4 5 6 7
0113 75F4 JNZ 0109	DS:0000 CD 20 FF 9F 00 EA F0 FE
0109 0307 ADD AX,[BX]	DS:0008 AD DE 1B 05 C5 06 00 00
010B 81C30200 ADD BX,0002	DS:0010 18 01 10 01 18 01 92 01
010F 81E90100 SUB CX,0001	DS:0018 01 01 01 00 02 FF FF FF
0113 75F4 JNZ 0109	DS:0020 FF FF FF FF FF FF FF
0115 A32701 MOV [01271],AX	DS:0028 FF FF FF FF EB 19 C0 11
0118 B8004C MOV AX,4C00	DS:0030 A2 01 14 00 18 00 F5 19
011B CD21 INT 21	DS:0038 FF FF FF FF 00 00 00 00
011D 0100 ADD [BX+SI],AX	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.?= i...+...
DS:0000 CD 20 FF 9F 00 EA F0 FE	DS:0010 18 01 10 01 18 01 92 01
DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	DS:0028 FF FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	DS:0030 A2 01 14 00 18 00 F5 19
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0006 SI 0000 CS 19F5 IP 010B	Stack +0 0000 Flags 7204
BX 0121 DI 0000 DS 19F5	+2 20CD
CX 0003 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 1 0

CMD > []	
0109 0307 ADD AX,[BX]	1 0 1 2 3 4 5 6 7
010B 81C30200 ADD BX,0002	DS:0000 CD 20 FF 9F 00 EA F0 FE
010F 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00
0113 75F4 JNZ 0109	DS:0010 18 01 10 01 18 01 92 01
0115 A32701 MOV [0127],AX	DS:0018 01 01 01 00 02 FF FF FF
0118 B8004C MOV AX,4C00	DS:0020 FF FF FF FF FF FF FF FF
011B CD21 INT 21	DS:0028 FF FF FF EB 19 C0 11
011D 0100 ADD [BX+SI],AX	DS:0030 A2 01 14 00 18 00 F5 19
011F 0200 ADD AL,[BX+SI]	DS:0038 FF FF FF 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0006 SI 0000 CS 19F5 IP 010F	Stack +0 0000 Flags 7200
BX 0123 DI 0000 DS 19F5	+2 20CD
CX 0003 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0

CMD > []	
010B 81C30200 ADD BX,0002	1 0 1 2 3 4 5 6 7
010F 81E90100 SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE
0113 75F4 JNZ 0109	DS:0008 AD DE 1B 05 C5 06 00 00
0115 A32701 MOV [0127],AX	DS:0010 18 01 10 01 18 01 92 01
0118 B8004C MOV AX,4C00	DS:0018 01 01 01 00 02 FF FF FF
011B CD21 INT 21	DS:0020 FF FF FF FF FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0028 FF FF FF EB 19 C0 11
011F 0200 ADD AL,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0121 0300 ADD AX,[BX+SI]	DS:0038 FF FF FF 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF 00 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0006 SI 0000 CS 19F5 IP 0113 Stack +0 0000 Flags 7200	+2 20CD
BX 0123 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0002 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	1	0 1 2 3 4 5 6 7
010F 81E90100 SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE	
0113 75F4 JNZ 0109	DS:0008 AD DE 1B 05 C5 06 00 00	
0115 A32701 MOV [0127],AX	DS:0010 18 01 10 01 18 01 92 01	
0118 B8004C MOV AX,4C00	DS:0018 01 01 01 00 02 FF FF FF	
011B CD21 INT 21	DS:0020 FF FF FF FF FF FF FF FF	
011D 0100 ADD [BX+SI],AX	DS:0028 FF FF FF FF EB 19 C0 11	
011F 0200 ADD AL,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19	
0121 0300 ADD AX,[BX+SI]	DS:0038 FF FF FF FF 00 00 00 00	
0123 0400 ADD AL,00	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2	0 1 2 3 4 5 6 7	8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ..+...	
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFff.	
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.	
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.	
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0006 SI 0000 CS 19F5 IP 0109 Stack +0 0000 Flags 7200	+2 20CD
BX 0123 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0002 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > 0001	1	0 1 2 3 4 5 6 7
0113 75F4 JNZ 0109	DS:0000 CD 20 FF 9F 00 EA F0 FE	
0109 0307 ADD AX,[BX]	DS:0008 AD DE 1B 05 C5 06 00 00	
010B 81C30200 ADD BX,0002	DS:0010 18 01 10 01 18 01 92 01	
010F 81E90100 SUB CX,0001	DS:0018 01 01 01 00 02 FF FF FF	
0113 75F4 JNZ 0109	DS:0020 FF FF FF FF FF FF FF	
0115 A32701 MOV [0127],AX	DS:0028 FF FF FF FF EB 19 C0 11	
0118 B8004C MOV AX,4C00	DS:0030 A2 01 14 00 18 00 F5 19	
011B CD21 INT 21	DS:0038 FF FF FF FF 00 00 00 00	
011D 0100 ADD [BX+SI],AX	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2	0 1 2 3 4 5 6 7	8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ..+...	
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFff.	
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.	
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.	
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 000A SI 0000 CS 19F5 IP 010B Stack +0 0000 Flags 7204	+2 20CD
BX 0123 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0002 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 1 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	1 0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF
0115 A32701 MOV [01271],AX	DS:0020 FF FF FF FF FF FF FF FF
0118 B8004C MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF FF 00 00 00 00
011F 0200 ADD AL,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f. . . i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEff.
DS:0010 18 01 10 01 18 01 92 01
DS:0020 FF FF FF FF FF FF FF FF	delta L.
DS:0030 A2 01 14 00 18 00 F5 19	delta J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 000A SI 0000 CS 19F5 IP 010F Stack +0 0000 Flags 7200	+2 20CD
BX 0125 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0002 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 0 0 0 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD >	1 0 1 2 3 4 5 6 7
010B 81C30200 ADD BX,0002	DS:0000 CD 20 FF 9F 00 EA F0 FE
010F 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00
0113 75F4 JNZ 0109	DS:0010 18 01 10 01 18 01 92 01
0115 A32701 MOV [01271],AX	DS:0018 01 01 01 00 02 FF FF FF
0118 B8004C MOV AX,4C00	DS:0020 FF FF FF FF FF FF FF
011B CD21 INT 21	DS:0028 FF FF FF EB 19 C0 11
011D 0100 ADD [BX+SI],AX	DS:0030 A2 01 14 00 18 00 F5 19
011F 0200 ADD AL,[BX+SI]	DS:0038 FF FF FF FF 00 00 00 00
0121 0300 ADD AX,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f. . . i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEff.
DS:0010 18 01 10 01 18 01 92 01
DS:0020 FF FF FF FF FF FF FF	delta L.
DS:0030 A2 01 14 00 18 00 F5 19	delta J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 000A SI 0000 CS 19F5 IP 0113	Stack +0 0000 Flags 7200
BX 0125 DI 0000 DS 19F5	+2 20CD
CX 0001 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD >	
010F 81E90100 SUB CX,0001	1 0 1 2 3 4 5 6 7
0113 75F4 JNZ 0109	DS:0000 CD 20 FF 9F 00 EA F0 FE
0115 A32701 MOU [0127],AX	DS:0008 AD DE 1B 05 C5 06 00 00
0118 B8004C MOU AX,4C00	DS:0010 18 01 10 01 18 01 92 01
011B CD21 INT 21	DS:0018 01 01 01 00 02 FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0020 FF FF FF FF EB 19 C0 11
011F 0200 ADD AL,[BX+SI]	DS:0028 FF FF FF FF EB 19 C0 11
0121 0300 ADD AX,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0123 0400 ADD AL,00	DS:0038 FF FF FF FF 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00 = f.Q≡≡ i ..+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF,fl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11 δ,L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00 6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00,

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 000A SI 0000 CS 19F5 IP 0109	Stack +0 0000 Flags 7200
BX 0125 DI 0000 DS 19F5	+2 20CD
CX 0001 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD > 0005	
0113 75F4 JNZ 0109	1 0 1 2 3 4 5 6 7
0109 0307 ADD AX,[BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF
0115 A32701 MOU [0127],AX	DS:0020 FF FF FF FF EB 19 C0 11
0118 B8004C MOU AX,4C00	DS:0028 FF FF FF FF EB 19 C0 11
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF FF 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00 = f.Q≡≡ i ..+...
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF,fl.
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11 δ,L.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00 6.....J.
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00,

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 000F SI 0000 CS 19F5 IP 010B	Stack +0 0000 Flags 7204
BX 0125 DI 0000 DS 19F5	+2 20CD
CX 0001 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 1 0

CMD >															
0109 0307 ADD AX,[BX]	1 0 1 2 3 4 5 6 7	DS:0000 CD 20 FF 9F 00 EA F0 FE													
010B 81C30200 ADD BX,0002	DS:0008 AD DE 1B 05 C5 06 00 00														
010F 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01														
0113 75F4 JNZ 0109	DS:0018 01 01 01 00 02 FF FF FF														
0115 A32701 MOU [0127],AX	DS:0020 FF FF FF FF FF FF FF FF														
0118 B8004C MOU AX,4C00	DS:0028 FF FF FF FF EB 19 C0 11														
011B CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19														
011D 0100 ADD [BX+SI],AX	DS:0038 FF FF FF FF 00 00 00 00														
011F 0200 ADD AL,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00														
	DS:0048 00 00 00 00 00 00 00 00														

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i .+...ff.δ. L. 6.....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 000F SI 0000 CS 19F5 IP 010F	Stack +0 0000 Flags 7204
BX 0127 DI 0000 DS 19F5	+2 20CD
CX 0001 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 1 0

CMD >															
010B 81C30200 ADD BX,0002	1 0 1 2 3 4 5 6 7	DS:0000 CD 20 FF 9F 00 EA F0 FE													
010F 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00														
0113 75F4 JNZ 0109	DS:0010 18 01 10 01 18 01 92 01														
0115 A32701 MOU [0127],AX	DS:0018 01 01 01 00 02 FF FF FF														
0118 B8004C MOU AX,4C00	DS:0020 FF FF FF FF FF FF FF														
011B CD21 INT 21	DS:0028 FF FF FF FF EB 19 C0 11														
011D 0100 ADD [BX+SI],AX	DS:0030 A2 01 14 00 18 00 F5 19														
011F 0200 ADD AL,[BX+SI]	DS:0038 FF FF FF FF 00 00 00 00														
0121 0300 ADD AX,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00														
	DS:0048 00 00 00 00 00 00 00 00														

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i .+...ff.δ. L. 6.....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 000F SI 0000 CS 19F5 IP 0113 Stack +0 0000 Flags 7244	+2 20CD
BX 0127 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0000 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 1 0 1 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > []	1 0 1 2 3 4 5 6 7
010F 81E90100 SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE
0113 75F4 JNZ 0109	DS:0008 AD DE 1B 05 C5 06 00 00
0115 A32701 MOV [0127],AX	DS:0010 18 01 10 01 18 01 92 01
0118 B8004C MOV AX,4C00	DS:0018 01 01 01 00 02 FF FF FF
011B CD21 INT 21	DS:0020 FF FF FF FF FF FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0028 FF FF FF EB 19 C0 11
011F 0200 ADD AL,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0121 0300 ADD AX,[BX+SI]	DS:0038 FF FF FF FF 00 00 00 00
0123 0400 ADD AL,00	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEft.
DS:0010 18 01 10 01 18 01 92 01	δ. L.
DS:0020 FF FF FF FF FF FF FF FF	6.....J.
DS:0030 A2 01 14 00 18 00 F5 19
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 000F SI 0000 CS 19F5 IP 0115 Stack +0 0000 Flags 7244	+2 20CD
BX 0127 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0000 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 1 0 1 0
DX 0000 SP FFFE SS 19F5 FS 19F5	

CMD > []	1 0 1 2 3 4 5 6 7
0113 75F4 JNZ 0109	DS:0000 CD 20 FF 9F 00 EA F0 FE
0115 A32701 MOV [0127],AX	DS:0008 AD DE 1B 05 C5 06 00 00
0118 B8004C MOV AX,4C00	DS:0010 18 01 10 01 18 01 92 01
011B CD21 INT 21	DS:0018 01 01 01 00 02 FF FF FF
011D 0100 ADD [BX+SI],AX	DS:0020 FF FF FF FF FF FF FF
011F 0200 ADD AL,[BX+SI]	DS:0028 FF FF FF EB 19 C0 11
0121 0300 ADD AX,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0123 0400 ADD AL,00	DS:0038 FF FF FF FF 00 00 00 00
0125 050000 ADD AX,0000	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEft.
DS:0010 18 01 10 01 18 01 92 01	δ. L.
DS:0020 FF FF FF FF FF FF FF	6.....J.
DS:0030 A2 01 14 00 18 00 F5 19
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 000F SI 0000 CS 19F5 IP 0118	Stack +0 0000 Flags 7244
BX 0127 DI 0000 DS 19F5	+2 20CD
CX 0000 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 1 0 1 0

```

CMD >[REDACTED]
0115 A32701 MOV [0127],AX
0118 B8004C MOV AX,4C00
011B CD21 INT 21
011D 0100 ADD [BX+SI],AX
011F 0200 ADD AL,[BX+SI]
0121 0300 ADD AX,[BX+SI]
0123 0400 ADD AL,00
0125 05000F ADD AX,0F00
0128 00E0 ADD AL,AH

```

1	0 1 2 3 4 5 6 7	8 9 A B C D E F	
DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ..+...
DS:0010	18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFff.
DS:0020	FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ.L.
DS:0030	A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6....J.
DS:0040	05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 [REDACTED] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 4C00 SI 0000 CS 19F5 IP 011B	Stack +0 0000 Flags 7244
BX 0127 DI 0000 DS 19F5	+2 20CD
CX 0000 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 1 0 1 0

```

CMD >[REDACTED]
0118 B8004C MOV AX,4C00
011B CD21 INT 21
011D 0100 ADD [BX+SI],AX
011F 0200 ADD AL,[BX+SI]
0121 0300 ADD AX,[BX+SI]
0123 0400 ADD AL,00
0125 05000F ADD AX,0F00
0128 00E0 ADD AL,AH
012A C55ED8 LDS BX,[BP-28]

```

1	0 1 2 3 4 5 6 7	8 9 A B C D E F	
DS:0000	CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ i ..+...
DS:0010	18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFff.
DS:0020	FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ.L.
DS:0030	A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6....J.
DS:0040	05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 [REDACTED] 7 up 8 dn 9 le 10 ri

Register + Offset Addressing:

In register + offset addressing, different combinations of direct and indirect addressing are used.

For example:

Code:

```
ASM ex4.asm  X
coal > ASM ex4.asm
1  [org 0x0100]
2
3  mov bx, 0
4  mov cx, 5
5  mov ax, 0
6
7  looop:
8  |    add ax, [num1+bx]
9  |    add bx, 2
10 |
11 |    sub cx, 1
12 |    jne looop
13
14 mov ax ,0x4c00
15 int 0x21
16
17 num1: dw 1, 2, 3, 4, 5
18 sum: dw 0
19
```

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX - ×
EX5      ASM          206 13-10-2021 16:20
HISTORY  TXT          2,672 07-04-1999 15:43
LAB1     COM          26 13-10-2021 19:10
LAB1     LST          3,823 13-10-2021 19:10
MASM     EXE          259,638 12-09-2003 10:36
NDISASM  EXE          128,460 12-09-2003 10:36
R01-01.S S            371 02-09-2021 12:42
R01-02.S S            371 02-09-2021 12:42
RSX      EXE          111,900 19-02-1999 15:45
RSXNT    DLL          80,896 19-02-1999 15:46
RTN      ASM          1,038 06-11-1998 15:15
RTN      RC           402 06-11-1998 15:16
RTN      RES          384 06-11-1998 15:13
SETUP    TXT          99 05-10-2021 14:42
TCOFF    ASM          591 16-11-1998 10:11
TEST     ASM          508 26-10-1998 10:12
TEST     COM          18 24-09-2021 22:41
TEST     LST          1,216 24-09-2021 22:39
TEST     OBJ          405 26-10-1998 10:12
60 File(s)          936,368 Bytes.
3 Dir(s)           262,111,744 Bytes free.

C:\>nasm ex4.asm -o ex4.com
C:\>afd EX4.COM_
```

Debugger:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0100 Stack +0 0000 Flags 7202	BX 0000 DI 0000 DS 19F5 +2 20CD	CX 0028 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD >	1 0 1 2 3 4 5 6 7
0100 BB0000 MOV BX,0000	DS:0000 CD 20 FF 9F 00 EA F0 FE
0103 B90500 MOV CX,0005	DS:0008 AD DE 1B 05 C5 06 00 00
0106 B80000 MOV AX,0000	DS:0010 18 01 10 01 18 01 92 01
0109 03871C01 ADD AX,[011C+BX]	DS:0018 01 01 01 00 02 FF FF FF
010D 81C30200 ADD BX,0002	DS:0020 FF FF FF FF FF FF FF FF
0111 81E90100 SUB CX,0001	DS:0028 FF FF FF EB 19 C0 11
0115 75F2 JNZ 0109	DS:0030 A2 01 14 00 18 00 F5 19
0117 B8004C MOV AX,4C00	DS:0038 FF FF FF FF 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i .+...fl. δ. l.j.
DS:0000 CD 20 FF 9F 00 EA F0 FE	DS:0010 18 01 10 01 18 01 92 01
DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF FF	DS:0028 FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 up 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0103 Stack +0 0000 Flags 7200	BX 0000 DI 0000 DS 19F5 +2 20CD	CX 0028 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD >	1 0 1 2 3 4 5 6 7
0100 BB0000 MOV BX,0000	DS:0000 CD 20 FF 9F 00 EA F0 FE
0103 B90500 MOV CX,0005	DS:0008 AD DE 1B 05 C5 06 00 00
0106 B80000 MOV AX,0000	DS:0010 18 01 10 01 18 01 92 01
0109 03871C01 ADD AX,[011C+BX]	DS:0018 01 01 01 00 02 FF FF FF
010D 81C30200 ADD BX,0002	DS:0020 FF FF FF FF FF FF FF
0111 81E90100 SUB CX,0001	DS:0028 FF FF FF EB 19 C0 11
0115 75F2 JNZ 0109	DS:0030 A2 01 14 00 18 00 F5 19
0117 B8004C MOV AX,4C00	DS:0038 FF FF FF FF 00 00 00 00
011A CD21 INT Z1	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i .+...fl. δ. l.j.
DS:0000 CD 20 FF 9F 00 EA F0 FE	DS:0010 18 01 10 01 18 01 92 01
DS:0010 18 01 10 01 18 01 92 01	DS:0018 01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	DS:0028 FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 up 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0106	Stack +0 0000 Flags 7200
BX 0000 DI 0000 DS 19F5	+2 20CD
CX 0005 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD >	1 0 1 2 3 4 5 6 ?
0103 B90500 MOV CX,0005	DS:0000 CD 20 FF 9F 00 EA F0 FE
0106 B80000 MOV AX,0000	DS:0008 AD DE 1B 05 C5 06 00 00
0109 03871C01 ADD AX,[011C+BX]	DS:0010 18 01 10 01 18 01 92 01
010D 81C30200 ADD BX,0002	DS:0018 01 01 01 00 02 FF FF FF
0111 81E90100 SUB CX,0001	DS:0020 FF FF FF FF FF EB 19 C0 11
0115 75F2 JNZ 0109	DS:0028 FF FF FF EB 19 C0 11
0117 B8004C MOV AX,4C00	DS:0030 A2 01 14 00 18 00 F5 19
011A CD21 INT 21	DS:0038 FF FF FF 00 00 00 00 00 00
011C 0100 ADD [BX+SI],AX	DS:0040 05 00 00 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 ?	8 9 A B C D E F	- f.Q≡≡ i ..+...
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00fl.
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF	δ. L.
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	6.....J.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 up 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0109	Stack +0 0000 Flags 7200
BX 0000 DI 0000 DS 19F5	+2 20CD
CX 0005 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD >	1 0 1 2 3 4 5 6 ?
0106 B80000 MOV AX,0000	DS:0000 CD 20 FF 9F 00 EA F0 FE
0109 03871C01 ADD AX,[011C+BX]	DS:0008 AD DE 1B 05 C5 06 00 00
010D 81C30200 ADD BX,0002	DS:0010 18 01 10 01 18 01 92 01
0111 81E90100 SUB CX,0001	DS:0018 01 01 01 00 02 FF FF FF
0115 75F2 JNZ 0109	DS:0020 FF FF FF FF FF EB 19 C0 11
0117 B8004C MOV AX,4C00	DS:0028 FF FF FF EB 19 C0 11
011A CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19
011C 0100 ADD [BX+SI],AX	DS:0038 FF FF FF 00 00 00 00 00 00
011E 0200 ADD AL,[BX+SI]	DS:0040 05 00 00 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 ?	8 9 A B C D E F	- f.Q≡≡ i ..+...
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00fl.
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF	δ. L.
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	6.....J.
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 up 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 010D	Stack +0 0000 Flags 7200
BX 0000 DI 0000 DS 19F5	+2 20CD
CX 0005 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD > []	
0109 03871C01 ADD AX,[011C+BX]	
0110 81C30200 ADD BX,0002	
0111 81E90100 SUB CX,0001	
0115 75F2 JNZ 0109	
0117 B8004C MOV AX,4C00	
011A CD21 INT 21	
011C 0100 ADD [BX+SI],AX	
011E 0200 ADD AL,[BX+SI]	
0120 0300 ADD AX,[BX+SI]	

1 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00	
DS:0008 AD DE 1B 05 C5 06 00 00	
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF	
DS:0018 01 01 01 00 02 FF FF FF	
DS:0020 FF	
DS:0028 FF FF FF FF EB 19 C0 11	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00	
DS:0038 FF FF FF FF 00 00 00 00	
DS:0040 05 00 00 00 00 00 00 00	
DS:0048 00 00 00 00 00 00 00 00	

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00	
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF	
DS:0020 FF	
DS:0028 FF FF FF FF EB 19 C0 11	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00	
DS:0038 FF FF FF FF 00 00 00 00	
DS:0040 05 00 00 00 00 00 00 00	
DS:0048 00 00 00 00 00 00 00 00	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001 SI 0000 CS 19F5 IP 0111	Stack +0 0000 Flags 7200
BX 0002 DI 0000 DS 19F5	+2 20CD
CX 0005 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD > []	
010D 81C30200 ADD BX,0002	
0111 81E90100 SUB CX,0001	
0115 75F2 JNZ 0109	
0117 B8004C MOV AX,4C00	
011A CD21 INT 21	
011C 0100 ADD [BX+SI],AX	
011E 0200 ADD AL,[BX+SI]	
0120 0300 ADD AX,[BX+SI]	
0122 0400 ADD AL,00	

1 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00	
DS:0008 AD DE 1B 05 C5 06 00 00	
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF	
DS:0018 01 01 01 00 02 FF FF FF	
DS:0020 FF	
DS:0028 FF FF FF FF EB 19 C0 11	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00	
DS:0038 FF FF FF FF 00 00 00 00	
DS:0040 05 00 00 00 00 00 00 00	
DS:0048 00 00 00 00 00 00 00 00	

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00	
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF	
DS:0020 FF	
DS:0028 FF FF FF FF EB 19 C0 11	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00	
DS:0038 FF FF FF FF 00 00 00 00	
DS:0040 05 00 00 00 00 00 00 00	
DS:0048 00 00 00 00 00 00 00 00	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0001	SI 0000	CS 19F5	IP 0115	Stack +0 0000	Flags 7200
BX 0002	DI 0000	DS 19F5		+2 20CD	
CX 0004	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0000	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 0 0 0

CMD >		1 0 1 2 3 4 5 6 7
0111 81E90100	SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE
0115 75F2	JNZ 0169	DS:0008 AD DE 1B 05 C5 06 00 00
0117 B8004C	MOV AX,4000	DS:0010 18 01 10 01 18 01 92 01
011A CD21	INT 21	DS:0018 01 01 01 00 02 FF FF FF
011C 0100	ADD [BX+SI],AX	DS:0020 FF FF FF FF FF FF FF FF
011E 0200	ADD AL,[BX+SI]	DS:0028 FF FF FF FF EB 19 C0 11
0120 0300	ADD AX,[BX+SI]	DS:0030 A2 01 14 00 18 00 F5 19
0122 0400	ADD AL,00	DS:0038 FF FF FF FF 00 00 00 00
0124 050000	ADD AX,0000	DS:0040 05 00 00 00 00 00 00 00
		DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	- f.Ω≡≡ i .+...ft.δ. L. 6.....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF	FF FF FF EB 19 C0 11
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 up 7 up 8 dn 9 le 10 ri

Code for Sorting:

```
[org 0x0100]

jmp start

data: dw 6, 4, 5, 2

start:
    mov cx, 4

    outerloop:
        mov bx, 0

        innerloop:
            mov ax, [data + bx]
            cmp ax, [data + bx + 2]

            jbe noswap
                ; the swap potion
                mov dx, [data + bx + 2]
                mov [data + bx + 2], ax
                mov [data + bx], dx

            noswap:
                add bx, 2
                cmp bx, 6
                jne innerloop
                ; check outer loop termination
                sub cx, 1
                jnz outerloop

            ; exit system call
            mov ax, 0x4c00
            int 0x21
```

Debugger:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 0100 Stack +0 0000 Flags 7202	+2 20CD	+4 9FFF OF DF IF SF ZF AF PF CF	+6 EA00 0 0 1 0 0 0 0 0 0
BX 0000 DI 0000 DS 19F5			
CX 003C BP 0000 ES 19F5 HS 19F5			
DX 0000 SP FFFE SS 19F5 FS 19F5			

CMD > []	1 0 1 2 3 4 5 6 7
0100 E90800 JMP 010B	DS:0000 CD 20 FF 9F 00 EA F0 FE
0103 06 PUSH ES	DS:0008 AD DE 1B 05 C5 06 00 00
0104 0004 ADD [SI],AL	DS:0010 18 01 10 01 18 01 92 01
0106 0005 ADD [DI],AL	DS:0018 01 01 01 00 02 FF FF FF
0108 0002 ADD [BP+SI],AL	DS:0020 FF FF FF FF FF FF FF FF
010A 00B90400 ADD [0004+BX+DI],BH	DS:0028 FF FF FF EB 19 C0 11
010E BB0000 MOU BX,0000	DS:0030 A2 01 14 00 18 00 F5 19
0111 BB870301 MOU AX,[0103+BX]	DS:0038 FF FF FF FF 00 00 00 00
	DS:0040 05 00 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	DS:0000 CD 20 FF 9F 00 EA F0 FE = f.Ω≡≡ i ..+...
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF,fl.	
DS:0020 FF EB 19 C0 11,J.	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00 00 6.....J.	
DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00,	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 0000 SI 0000 CS 19F5 IP 010B Stack +0 0000 Flags 7200	+2 20CD	+4 9FFF OF DF IF SF ZF AF PF CF	+6 EA00 0 0 1 0 0 0 0 0 0
BX 0000 DI 0000 DS 19F5			
CX 003C BP 0000 ES 19F5 HS 19F5			
DX 0000 SP FFFE SS 19F5 FS 19F5			

CMD > []	1 0 1 2 3 4 5 6 7
0100 E90800 JMP 010B	DS:0000 CD 20 FF 9F 00 EA F0 FE
010B B90400 MOU CX,0004	DS:0008 AD DE 1B 05 C5 06 00 00
010E BB0000 MOU BX,0000	DS:0010 18 01 10 01 18 01 92 01
0111 BB870301 MOU AX,[0103+BX]	DS:0018 01 01 01 00 02 FF FF FF
0115 3B870501 CMP AX,[0105+BX]	DS:0020 FF FF FF FF FF FF FF
0119 760C JNA 0127	DS:0028 FF FF FF EB 19 C0 11
011B BB970501 MOU DX,[0105+BX]	DS:0030 A2 01 14 00 18 00 F5 19
011F 89870501 MOU [0105+BX],AX	DS:0038 FF FF FF FF 00 00 00 00
0123 89970301 MOU [0103+BX],DX	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	DS:0000 CD 20 FF 9F 00 EA F0 FE = f.Ω≡≡ i ..+...
DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF,fl.	
DS:0020 FF EB 19 C0 11,J.	
DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00 00 00 00 00 00,	
DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00,	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0000 SI 0000 CS 19F5 IP 010E	Stack +0 0000 Flags 7200
BX 0000 DI 0000 DS 19F5	+2 20CD
CX 0004 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD >	1 0 1 2 3 4 5 6 7
010B B90400 MOV CX,0004	DS:0000 CD 20 FF 9F 00 EA F0 FE
010E BB0000 MOV BX,0000	DS:0008 AD DE 1B 05 C5 06 00 00
0111 88870301 MOV AX,[0103+BX]	DS:0010 18 01 10 01 18 01 92 01
0115 3B870501 CMP AX,[0105+BX]	DS:0018 01 01 01 00 02 FF FF FF
0119 760C JNA 0127	DS:0020 FF FF FF FF FF FF FF FF
011B 8B970501 MOV DX,[0105+BX]	DS:0028 FF FF FF EB 19 C0 11
011F 89870501 MOV [0105+BX],AX	DS:0030 A2 01 14 00 18 00 F5 19
0123 89970301 MOV [0103+BX],DX	DS:0038 FF FF FF FF 00 00 00 00
0127 81C30200 ADD BX,0002	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f. R≡■ i . +ft. δ. L. 6....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	= f. R≡■ i . + ...
DS:0010 18 01 10 01 18 01 92 01ft.
DS:0020 FF FF FF FF FF FF FF FF	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	6....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0000 SI 0000 CS 19F5 IP 0111	Stack +0 0000 Flags 7200
BX 0000 DI 0000 DS 19F5	+2 20CD
CX 0004 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0000 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 0 0 0 0 0

CMD >	1 0 1 2 3 4 5 6 7
010E BB0000 MOV BX,0000	DS:0000 CD 20 FF 9F 00 EA F0 FE
0111 88870301 MOV AX,[0103+BX]	DS:0008 AD DE 1B 05 C5 06 00 00
0115 3B870501 CMP AX,[0105+BX]	DS:0010 18 01 10 01 18 01 92 01
0119 760C JNA 0127	DS:0018 01 01 01 00 02 FF FF FF
011B 8B970501 MOV DX,[0105+BX]	DS:0020 FF FF FF FF FF FF FF FF
011F 89870501 MOV [0105+BX],AX	DS:0028 FF FF FF EB 19 C0 11
0123 89970301 MOV [0103+BX],DX	DS:0030 A2 01 14 00 18 00 F5 19
0127 81C30200 ADD BX,0002	DS:0038 FF FF FF FF 00 00 00 00
012B 81FB0600 CMP BX,0006	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f. R≡■ i . +ft. δ. L. 6....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	= f. R≡■ i . + ...
DS:0010 18 01 10 01 18 01 92 01ft.
DS:0020 FF FF FF FF FF FF FF FF	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	6....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0006 SI 0000 CS 19F5 IP 0115 Stack +0 0000 Flags 7200	BX 0000 DI 0000 DS 19F5 +2 20CD	CX 0004 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0000 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 0 0 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	-----------------------------------------------------------

CMD > []	0004- []	1 0 1 2 3 4 5 6 7
0111 8B870301 MOU AX,[0103+BX]	DS:0000 CD 20 FF 9F 00 EA F0 FE	
0115 3B870501 CMP AX,[0105+BX]	DS:0008 AD DE 1B 05 C5 06 00 00	
0119 760C JNA 0127	DS:0010 18 01 10 01 18 01 92 01	
011B 8B970501 MOU DX,[0105+BX]	DS:0018 01 01 01 00 02 FF FF FF	
011F 89870501 MOU [0105+BX],AX	DS:0020 FF FF FF FF FF FF FF FF	
0123 89970301 MOU [0103+BX],DX	DS:0028 FF FF FF EB 19 C0 11	
0127 81C30200 ADD BX,0002	DS:0030 A2 01 14 00 18 00 F5 19	
012B 81FB0600 CMP BX,0006	DS:0038 FF FF FF FF 00 00 00 00	
012F 75E0 JNZ 0111	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2 0 1 2 3 4 5 6 7 8 9 A B C D E F = f.Ω≡≡ i|...+...
 DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00f.
 DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FFδ. L.
 DS:0020 FF EB 19 C0 11
 DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00 6.....J.
 DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0006 SI 0000 CS 19F5 IP 012B Stack +0 0000 Flags 7204	BX 0000 DI 0000 DS 19F5 +2 20CD	CX 0004 BP 0000 ES 19F5 HS 19F5 +4 9FFF OF DF IF SF ZF AF PF CF	DX 0002 SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 0 1 0
----------------------------------------------------------	---------------------------------	-----------------------------------------------------------------	---------------------------------------------------------

CMD > []	0004- []	1 0 1 2 3 4 5 6 7
0127 81C30200 ADD BX,0002	DS:0000 CD 20 FF 9F 00 EA F0 FE	
012B 81FB0600 CMP BX,0006	DS:0008 AD DE 1B 05 C5 06 00 00	
012F 75E0 JNZ 0111	DS:0010 18 01 10 01 18 01 92 01	
0131 81E90100 SUB CX,0001	DS:0018 01 01 01 00 02 FF FF FF	
0135 75D7 JNZ 010E	DS:0020 FF FF FF FF FF FF FF FF	
0137 B8004C MOU AX,4C00	DS:0028 FF FF FF EB 19 C0 11	
013A CD21 INT 21	DS:0030 A2 01 14 00 18 00 F5 19	
013C C746DC0000 MOU [BP-24],0000	DS:0038 FF FF FF FF 00 00 00 00	
0141 8E5EFC MOU DS,[BP-04]	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2 0 1 2 3 4 5 6 7 8 9 A B C D E F = f.Ω≡≡ i|...+...
 DS:0000 CD 20 FF 9F 00 EA F0 FE AD DE 1B 05 C5 06 00 00f.
 DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FFδ. L.
 DS:0020 FF EB 19 C0 11
 DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00 6.....J.
 DS:0040 05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 [] 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0005 SI 0000 CS 19F5 IP 012F Stack +0 0000 Flags 7244	+2 20CD
BX 0006 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0001 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 1 0 1 0
DX 0002 SP FFFE SS 19F5 FS 19F5	

CMD >	1 0 1 2 3 4 5 6 7
012B 81FB0600 CMP BX,0006	DS:0000 CD 20 FF 9F 00 EA F0 FE
012F 75E0 JNZ 0111	DS:0008 AD DE 1B 05 C5 06 00 00
0131 81E90100 SUB CX,0001	DS:0010 18 01 10 01 18 01 92 01
0135 75D7 JNZ 010E	DS:0018 01 01 01 00 02 FF FF FF
0137 B8004C MOU AX,4C00	DS:0020 FF FF FF FF FF FF FF FF
013A CD21 INT 21	DS:0028 FF FF FF EB 19 C0 11
013C C746DC0000 MOU [BP-24],0000	DS:0030 A2 01 14 00 18 00 F5 19
0141 8E5EFC MOU DS,[BP-04]	DS:0038 FF FF FF FF 00 00 00 00
0144 837D0E00 CMP [DI+0E],0000	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡■ i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEf. ..
DS:0010 18 01 10 01 18 01 92 01
DS:0020 FF FF FF FF FF FF FF FF	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	6.....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0005 SI 0000 CS 19F5 IP 0131 Stack +0 0000 Flags 7244	+2 20CD
BX 0006 DI 0000 DS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
CX 0001 BP 0000 ES 19F5 HS 19F5	+6 EA00 0 0 1 0 1 0 1 0
DX 0002 SP FFFE SS 19F5 FS 19F5	

CMD >	1 0 1 2 3 4 5 6 7
012F 75E0 JNZ 0111	DS:0000 CD 20 FF 9F 00 EA F0 FE
0131 81E90100 SUB CX,0001	DS:0008 AD DE 1B 05 C5 06 00 00
0135 75D7 JNZ 010E	DS:0010 18 01 10 01 18 01 92 01
0137 B8004C MOU AX,4C00	DS:0018 01 01 01 00 02 FF FF FF
013A CD21 INT 21	DS:0020 FF FF FF FF FF FF FF
013C C746DC0000 MOU [BP-24],0000	DS:0028 FF FF FF EB 19 C0 11
0141 8E5EFC MOU DS,[BP-04]	DS:0030 A2 01 14 00 18 00 F5 19
0144 837D0E00 CMP [DI+0E],0000	DS:0038 FF FF FF FF 00 00 00 00
0148 7409 JZ 0153	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡■ i . + ...
DS:0000 CD 20 FF 9F 00 EA F0 FEf. ..
DS:0010 18 01 10 01 18 01 92 01
DS:0020 FF FF FF FF FF FF FF	δ. L.
DS:0030 A2 01 14 00 18 00 F5 19	6.....J.
DS:0040 05 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0005 SI 0000 CS 19F5 IP 0135	Stack +0 0000 Flags 7244
BX 0006 DI 0000 DS 19F5	+2 20CD
CX 0000 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0002 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 1 0 1 0

CMD > █	1 0 1 2 3 4 5 6 7
0131 81E90100 SUB CX,0001	DS:0000 CD 20 FF 9F 00 EA F0 FE
0135 75D7 JNZ 010E	DS:0008 AD DE 1B 05 C5 06 00 00
0137 B8004C MOV AX,4C00	DS:0010 18 01 10 01 18 01 92 01
013A CD21 INT 21	DS:0018 01 01 01 00 02 FF FF FF
013C C746DC0000 MOV [BP-24],0000	DS:0020 FF FF FF FF FF FF FF FF
0141 8E5EFC MOV DS,[BP-04]	DS:0028 FF FF FF FF EB 19 C0 11
0144 837D0E00 CMP [DI+0E],0000	DS:0030 A2 01 14 00 18 00 F5 19
0148 7409 JZ 0153	DS:0038 FF FF FF FF 00 00 00 00
014A 8B46F2 MOV AX,[BP-0E]	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i ..+...ff.δ. L. 6.....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF
DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD -

AX 0005 SI 0000 CS 19F5 IP 0137	Stack +0 0000 Flags 7244
BX 0006 DI 0000 DS 19F5	+2 20CD
CX 0000 BP 0000 ES 19F5 HS 19F5	+4 9FFF OF DF IF SF ZF AF PF CF
DX 0002 SP FFFE SS 19F5 FS 19F5	+6 EA00 0 0 1 0 1 0 1 0

CMD > █	1 0 1 2 3 4 5 6 7
0135 75D7 JNZ 010E	DS:0000 CD 20 FF 9F 00 EA F0 FE
0137 B8004C MOV AX,4C00	DS:0008 AD DE 1B 05 C5 06 00 00
013A CD21 INT 21	DS:0010 18 01 10 01 18 01 92 01
013C C746DC0000 MOV [BP-24],0000	DS:0018 01 01 01 00 02 FF FF FF
0141 8E5EFC MOV DS,[BP-04]	DS:0020 FF FF FF FF FF FF FF FF
0144 837D0E00 CMP [DI+0E],0000	DS:0028 FF FF FF FF EB 19 C0 11
0148 7409 JZ 0153	DS:0030 A2 01 14 00 18 00 F5 19
014A 8B46F2 MOV AX,[BP-0E]	DS:0038 FF FF FF FF 00 00 00 00
014D 48 DEC AX	DS:0040 05 00 00 00 00 00 00 00
	DS:0048 00 00 00 00 00 00 00 00

2 0 1 2 3 4 5 6 7 8 9 A B C D E F	= f.Ω≡≡ i ..+...ff.δ. L. 6.....J.
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FF
DS:0020 FF FF FF FF FF FF FF FF	FF FF FF FF FF FF FF FF
DS:0030 A2 01 14 00 18 00 F5 19	DS:0038 FF FF FF FF 00 00 00 00
DS:0040 05 00 00 00 00 00 00 00	DS:0048 00 00 00 00 00 00 00 00

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD - X

AX 4C00	SI 0000	CS 19F5	IP 013A	Stack +0 0000	Flags 7244
BX 0006	DI 0000	DS 19F5		+2 20CD	
CX 0000	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 0002	SP FFFE	SS 19F5	FS 19F5	+6 EA60	0 0 1 0 1 0 1 0 1 0

CMD >	1	0 1 2 3 4 5 6 7
0137 B8004C MOU AX,4C00	DS:0000 CD 20 FF 9F 00 EA F0 FE	
013A CD21 INT Z1	DS:0008 AD DE 1B 05 C5 06 00 00	
013C C746DC0000 MOU [BP-24],0000	DS:0010 18 01 10 01 18 01 92 01	
0141 8E5EFC MOU DS,[BP-04]	DS:0018 01 01 01 00 02 FF FF FF	
0144 837D0E00 CMP [DI+0E],0000	DS:0020 FF FF FF FF FF FF FF FF	
0148 7409 JZ 0153	DS:0028 FF FF FF FF EB 19 C0 11	
014A 8B46F2 MOU AX,[BP-0E]	DS:0030 A2 01 14 00 18 00 F5 19	
014D 48 DEC AX	DS:0038 FF FF FF FF 00 00 00 00	
014E 3B46F6 CMP AX,[BP-0A]	DS:0040 05 00 00 00 00 00 00 00	
	DS:0048 00 00 00 00 00 00 00 00	

2	0 1 2 3 4 5 6 7	8 9 A B C D E F	
DS:0000 CD 20 FF 9F 00 EA F0 FE	AD DE 1B 05 C5 06 00 00	= f.Ω≡■ + . + ...	
DS:0010 18 01 10 01 18 01 92 01	01 01 01 00 02 FF FF FFf.	
DS:0020 FF FF FF FF FF FF FF	FF FF FF FF EB 19 C0 11	δ. L.	
DS:0030 A2 01 14 00 18 00 F5 19	FF FF FF FF 00 00 00 00	6.....J.	
DS:0040 05 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00	

1 Step 2 ProcStep 3 Retrieve 4 Help ON 5 BRK Menu 6 7 up 8 dn 9 le 10 ri

Note: Some of screenshots are not given as there was a loop so it was quite time consuming to take the screenshots.