

```

0000 EQU = BASE EQU 0E000H ;ASSEMBLY ADDRESS
0000 EQU = PR EQU 0E000H ;PROM/RAM ADDRESS
0000 LINK 'M6'
*****
* * * * *
* * * * * VECTOR MZ MONITOR - VERSION 4.3
* * * * * R. S. HARP 7/16/79 MODIFIED 1/12/81
* * * * *
* * * * *
* * * * * SYSTEM EQUATES
CONS = CONS EQU 0 ;CONS STATUS PRT
0001 = COND EQU 1 ;CONS DATA PRT
0040 = RDA EQU 40H ;RECEIVE FLAG
0000 = STPOL EQU 0 ;STATUS POLARITY
FFD0 = SPTR EQU PR+01FD0H ;STACK POINTER
E800 = DESBOOT EQU 0E800H ;DUALSTOR BOOTSTRAP
E802 = RESBOOT EQU 0E802H ;MEGASTOR BOOTSTRAP
E80C = FLBOOT EQU 0E80CH ;FLOPPY BOOTSTRAP
FF10 = DEBUSY EQU 0FF10H ;CONTROLLER BUSY
*****
* * * * * COMMAND FORMAT *****
A SSSS FFFF ASCII DUMP OF MEMORY
B JUMP TO BOOTSTRAP LOADER
C SSSS FFFF COCC COMPARE BLOCKS
D SSSS FFFF DUMP MEMORY IN HEX & ASCII
E EXTERNAL COMMUNICATIONS
F SSSS FFFF DD DD TWO BYTE SEARCH
G SSSS GO TO AND EXECUTE
H JUMP TO HIGH RAM AT FC00
I PP INPUT FROM PORT
J JUMP TO DOS
K LLLL SET A BREAKPOINT
L JUMP TO LOW RAM AT 0
M SSSS FFFF DDDD MOVE BLOCK
N NON DESTRUCTIVE MEMORY TEST
O PP DD OUTPUT TO PORT
P LLLL PROGRAM MEMORY
Q SSSS FFFF QMPCUM CHECKSUM
R DUMP 2-80 REGISTERS
S SSSS FFFF DD SEARCH FOR SINGLE BYTE
T SSSS FFFF TEST MEMORY
U JUMP TO USER AREA AT 100H
V BOOT FROM 8 INCH DISK
W BOOT WINCHESTER DISK
X SSSS FFFF DDDD EXCHANGE BLOCK
Y KEYBOARD ECHO
Z SSSS FFFF DD ZERO OR FILL MEMORY
*****
* * * * *
* * * * * JUMP TABLE OF ENTRY POINTS
MONIT JMP INIT ;INITIALIZE ALL
KEYTST JMP KEYSTAT ;TEST KEYBOARD
KEYDATA JMP CONVERT ;INPUT KEYBOARD
CRT JMP VIDEO ;OUTPUT TO SCREEN
ESC JMP ESCAPE ;KEYBOARD INPUT

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E00F EQU 00000040
E00F INITABLE
E013 CE27
E015
E015 31D0FF LXI SP,SPTR ;INIT STACK
E018 CD2FE1 ESCAPE ;DUMP LATCH
E01B AF XRA A
E01C 32EAFB XYFLAG
E01F 3210FF STA DEBUSY
E022 INITIALIZE USARTS AT PORTS 3,5,7
E022 3E03 MVI A,3 ;CLEAR CONTROLLER FLAG
E024 4F MOV C,A ;STARTING PORT
E025 0606 MVI B,6 ;NO OF COMMANDS
E027 210FE0 LXI H,INITABLE ;OUTPUT A BYTE
E02C E3 CUI ;DELAY FOR 6 MIZ.
E02D E3 XTHL ;SEND NEXT BYTE
E02E 20FA JRNZ OUTLOOP
E030 0C INR C
E031 0C INR C
E032 3D DCR A
E033 20F0 JRNZ INILOOP ;DO 3 PORTS IN ALL
E035
E035 3EC3 MVI A,0C3H ;JUMP
E037 323800 STA 38H ;RST 7
E03A 21CEB6 LXI H,DUMPPRES
E03D
E03D CDCE4 CALL SIGN
E040
E040 2AE7FF BKPTLOC
E043 11E9FF LXI D,BKCODE
E046 ED53E7FF SDEB BKPTLOC
E04A 1A LDAX D
E04B 77 MOV M,A
E04C 31D0FF LXI SP,SPTR ;INITIALIZE STRCK
E04F 210F0 LXI H,PAGE ;FULL SCREEN SCROLL
E052 22DFFF SHLD TOSCN
E055 CD2EE5 CALL PROMPT
E058 CD2FE1 CALL ESCAPE
E05B 28FB JRZ KEYPOL ;READ KEYBOARD
E05D E65F ANI 5FH ;UPPER AND LOWER
E05F 214CE0 LXI H,START
E062 E5 H ;
E063 FE04 CPI 'D'-64
E065 CC7BE3 CZ VIDEO
E068 FE41 CPI 'A'
E06A D8 RC
E06B FE5B RC
E06D D0 CPI 05BH
E06E 21F9E0 RNC H,CMD/IB+7EH
E071 E5 LXI PSW
E072 87 PUSH A
E073 85 ADD L
E074 6F MOV L,A
E075 3E MOV E,M
E076 23 INR H

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| Address       | Op              | Comments | Address     | Op   | Comments                            |
|---------------|-----------------|----------|-------------|------|-------------------------------------|
| E077 56       | MOV             | D,M      | E0D6 C2C260 | JNZ  | AHE1                                |
| E078 EB       | XCHG            |          | E0D9 EB     | XCHG |                                     |
| E079 F1       | POP             | PSW      | E0DA 3E20   | MVI  | A,20H                               |
| E07A E9       | PCHL            |          | E0DC C37B63 | JMP  | VIDEO                               |
| E07B 7E5      | * COMMAND TABLE |          | E0DF 3E0D   | MVI  | A,0DH                               |
| E07C 0CF8     | DW              | MASCII   | E0E1 CD0CE0 | CALL | PTCN                                |
| E07D E2E2     | DW              | FLBOOT   | E0E4 3E0A   | MVI  | A,0AH                               |
| E07E 0E7      | DW              | COMPR    | E0E6 1B74   | JR   | PTCN                                |
| E081 B8E5     | DW              | HEXRUI   | E0E8        |      | VIDEO                               |
| E083 D0E7     | DW              | EXTCOM   | E0E8 CD7B63 | CALL | VIDEO                               |
| E085 05E3     | DW              | EXTCOM   | E0EB 196C   | JR   | SPCE-1                              |
| E087 AF50     | DW              | EXEC     | E0ED FE30   |      | CONVERT                             |
| E089 56E2     | DW              | RAM      | E0EF D8     | CPI  | HEX                                 |
| E08B 53E3     | DW              | PIRPT    | E0F0 FE3A   | RC   | <0                                  |
| E08F B5E7     | DW              | WARI     | E0F2 3B09   | CPI  | >9                                  |
| E091 62E2     | DW              | SEIBRK   | E0F4 E65F   | JRC  | NUM                                 |
| E093 96E2     | DW              | LORAM    | E0F6 FE41   | ANI  | 5FH                                 |
| E095 BEE2     | DW              | MOVBE    | E0F8 D8     | CPI  | 'A'                                 |
| E097 65E3     | DW              | NLWT     | E0F9 FE47   | RC   | 'G'                                 |
| E099 08E6     | DW              | FOUPT    | E0FB 3F     | CPI  | 'G'                                 |
| E09B 79E1     | DW              | PROGRAM  | E0FC D8     | CMC  | >F                                  |
| E09D BFE5     | DW              | DRECS    | E100 D630   | RC   | NUM                                 |
| E09F 12E3     | DW              | SIRCI    | E102 FE0A   | CALL | VIDEO                               |
| E0A1 C3E1     | DW              | TMEM     | E104 3802   | SUI  | 48                                  |
| E0A3 47E2     | DW              | USER     | E106 D607   | CPI  | 10                                  |
| E0A5 00E8     | DW              | DSEBOOT  | E108 A7     | JRC  | ALFA                                |
| E0A7 02E8     | DW              | MSBOOT   | E109 C9     | SUI  | 7                                   |
| E0A9 87E2     | DW              | EXCHG    | E10A        | ANA  | A                                   |
| E0AB AEE1     | DW              | ECHO     | E10A 0E02   | RET  |                                     |
| E0AD 6EE2     | DW              | ZERM     | E10C 18B1   |      | * READ 2 DIGITS FROM THE CONSOLE    |
| E0AF          |                 |          | E10E        | MVI  | C,2                                 |
| E0AF          |                 |          | E10E        | JR   | AHE0                                |
| E0AF C7C4E4   | CALL            | PTSTNG   | E10E CDBE0  |      | * SHORT ROUTINE TO SAVE CODE        |
| E0B2 474F2054 | DTH             | 'GO TO'  | E111 18AA   | CALL | AHEX                                |
| E0B6 4FA0     |                 |          | E113        | JR   | AHEX                                |
| E0B8 CDBE0    | CALL            | AHEX     | E113        |      | * ** READ FROM CONSOLE TO REG A *** |
| E0BB EB       | XCHG            |          | E113        |      | * ** READ FROM CONSOLE TO REG A *** |
| E0BC E9       | PCHL            |          | E113 CD2FE1 | CALL | ESCAPE                              |
| E0BD          |                 |          | E116 28FB   | JRZ  | RXCN                                |
| E0BD          |                 |          | E118 FE60   | CPI  | 60H                                 |
| E0BD 0E04     | MVI             | C,4      | E11A 38C0   | JRC  | PTCN                                |
| E0BF 210000   | LXI             | H,0      | E11C E65F   | ANI  | 5FH                                 |
| E0C2 CD2FE1   | CALL            | ESCAPE   | E11E 18BC   | JR   | PTCN                                |
| E0C5 FE20     | CPI             | 1        | E120        |      | * PAUSE                             |
| E0C7 CAEBE0   | JZ              | SPOVR    | E120 CD2FE1 | CALL | ESCAPE                              |
| E0CA CDEDE0   | CALL            | HEX      | E123 FE20   | CPI  | 20H                                 |
| E0CD 38F3     | JRC             | AHE1     | E125 C0     | RNZ  |                                     |
| E0CF 29       | DAD             | H        | E126 CD2FE1 | CALL | ESCAPE                              |
| E0D0 29       | DAD             | H        | E129 FE20   | CPI  | 20H                                 |
| E0D1 29       | DAD             | H        | E12B C226E1 | JNZ  | PLOOP                               |
| E0D2 29       | DAD             | H        | E12E C9     | RET  |                                     |
| E0D3 85       | DAD             | L        | E12F        |      | * ESCAPE                            |
| E0D4 6F       | MOV             | L,A      | E12F CD3CE1 | CALL | KEYSTAT                             |
| E0D5 0D       | DCR             | C        |             |      |                                     |



|               |      |          |                             |
|---------------|------|----------|-----------------------------|
| E20C 17       | RAL  | B,A      | ; ROTATE CY IN              |
| E20D 47       | MOV  |          | ; RESTORE B                 |
| E20E C9       | RET  |          | ; RETURN W NEW B,C          |
| E20F          |      |          |                             |
| E20F          |      |          | *** ERROR PRINT OUT ROUTINE |
| E20F          | CALL | CRLF     | ; PRINT CR,LF               |
| E212 CD20E1   | CALL | PAUSE    |                             |
| E215 7C       | MOV  | A,H      | ; PRINT                     |
| E216 CD26E2   | CALL | PT2      | ; ASCII                     |
| E219 7D       | MOV  | A,L      | ; CODES                     |
| E21A C31FE7   | JMP  | PT2S     | ; FOR ADDRESS               |
| E21D          |      |          |                             |
| E21D F5       | PUSH | PSW      | ; SAVE ACC                  |
| E21E CD0FE2   | CALL | PTAD     | ; PRINT ADD.                |
| E221 78       | MOV  | A,B      | ; DATA                      |
| E222 CD1FE7   | CALL | PT2S     | ; WRITTEN                   |
| E225 F1       | POP  | PSW      | ; DATA READ                 |
| E226 F5       | PUSH | PSW      |                             |
| E227 CD20E2   | CALL | BINH     |                             |
| E22A F1       | POP  | PSW      |                             |
| E22B 1804     | JR   | BINL     | ; SHIPT RMT 4 BITS          |
| E22D 1F       | RAR  |          |                             |
| E22E 1F       | RAR  |          |                             |
| E22F 1F       | RAR  |          |                             |
| E230 1F       | RAR  |          |                             |
| E231 B50F     | ANI  | 0FH      | ; LOW 4 BITS                |
| E233 C630     | ADI  | 48       | ; ASCII BIAS                |
| E235 FE3A     | CPI  | 58       | ; DIGIT 0-9                 |
| E237 DADCE0   | JC   | PTCN     |                             |
| E23A C607     | ADI  | 7        | ; DIGIT A-F                 |
| E23C C3DCE0   | JMP  | PTCN     |                             |
| E23F          |      |          |                             |
| E23F 7B       | MOV  | A,E      |                             |
| E240 95       | SUB  | L        |                             |
| E241 2002     | JRNZ | GOON     |                             |
| E243 7A       | MOV  | A,D      |                             |
| E244 9C       | SBB  | H        |                             |
| E245 23       | INX  | H        |                             |
| E246 C9       | RET  |          |                             |
| E247          |      |          |                             |
| E247          |      |          |                             |
| E247 CDC4E4   | CALL | PT5ING   | ; USER AREA                 |
| E24A 55534552 | DTH  |          |                             |
| E24E 20415245 |      |          |                             |
| E252 C1       |      |          |                             |
| E253 C30001   | JMP  | 0100H    |                             |
| E256          |      |          |                             |
| E256          |      |          |                             |
| E256 CDC4E4   | CALL | PT5ING   |                             |
| E259 48492052 | DTH  |          | ; HI RAM                    |
| E25D 41CD     |      |          |                             |
| E25F C300FC   | JMP  | PR+1C00H |                             |
| E262          |      |          |                             |
| E262          |      |          |                             |
| E262 CDC4E4   | CALL | PT5ING   |                             |

|               |       |              |                      |
|---------------|-------|--------------|----------------------|
| E265 4C4F2052 | DTH   | 'LO RAM'     |                      |
| E269 41CD     | JMP   | 0            |                      |
| E26B C30000   |       |              |                      |
| E26E          |       |              |                      |
| E26E CDC4E4   | CALL  | PT5ING       |                      |
| E271 46494C4C | DTH   | 'FILL '      |                      |
| E275 A0       | CALL  | TRHEX        | ; READ ADDRESSES     |
| E276 CD0EE1   | PUSH  | H            | ; SAVE H             |
| E279 E5       | CALL  | AHE2         | ; READ 2 DIGITS      |
| E27A CD0AE1   | XCHG  | XTHL         | ; RESTORE H,L        |
| E27D EB       | POP   | B            |                      |
| E27E E3       | MOV   | M,C          | ; WRITE INTO MEM     |
| E27F C1       | CALL  | IMP          | ; COMP ADD, INCR H   |
| E280 71       | RR    | ZLOOP        | ; RETURN IF DONE     |
| E281 CD3FE2   | JR    | ZLOOP        | ; CONTINUE TILL DONE |
| E284 C8       | MOV   | B,A          |                      |
| E285 18F9     | EXCHG | PT5ING       |                      |
| E287          | DTH   | 'EXCHANGE '  |                      |
| E287 47       | MOV   | B,A          |                      |
| E288 CDC4E4   | CALL  | PT5ING       |                      |
| E28B 45584348 | DTH   | 'EXCHANGE '  |                      |
| E28F 414E4745 |       |              |                      |
| E293 A0       | JR    | MOVEVTR      |                      |
| E294 1809     | MOV   | B,A          |                      |
| E296 47       | CALL  | PT5ING       | ; SAVE CODE          |
| E297 CDC4E4   | DTH   | 'MOVE '      |                      |
| E29A 4D4F5645 |       |              |                      |
| E29E A0       | CALL  | TRHEX        |                      |
| E29F CD0EE1   | PUSH  | H            |                      |
| E2A2 E5       | CALL  | AHEX         |                      |
| E2A3 CDDE0    | XCHG  | XTHL         |                      |
| E2A6 EB       | MOV   | C,M          |                      |
| E2A7 E3       | XTHL  | XTHL         |                      |
| E2A8 4E       | MOV   | A,B          |                      |
| E2A9 E3       | MOV   | 'M'          |                      |
| E2AA 78       | CPI   | 0FH          |                      |
| E2AB FE4D     | JRZ   | NEXCH        |                      |
| E2AD 2804     | MOV   | A,M          |                      |
| E2AF 7E       | MOV   | M,A          |                      |
| E2B0 E3       | XTHL  | XTHL         |                      |
| E2B1 77       | MOV   | M,C          |                      |
| E2B2 E3       | MOV   | H            |                      |
| E2B3 71       | INX   | XTHL         |                      |
| E2B4 23       | CALL  | IMP          |                      |
| E2B5 E3       | JZ    | START        |                      |
| E2B6 CD3FE2   | CALL  | MLOOP        |                      |
| E2B9 CAACE0   | JR    | MLOOP        |                      |
| E2BC 18EA     | JR    | MLOOP        |                      |
| E2BE          |       |              |                      |
| E2BE CDC4E4   | CALL  | PT5ING       |                      |
| E2C1 4D454D20 | DTH   | 'MEM CHECK ' |                      |
| E2C5 43484543 |       |              |                      |
| E2C9 CB       |       |              |                      |
| E2CA 210000   | LXI   | H,0          |                      |
| E2CD 4E       | MOV   | C,M          |                      |
| E2CE 06FF     | MVI   | H,0FFH       |                      |

| Address       | Instruction  | Comments                 |
|---------------|--------------|--------------------------|
| E336 7E       | MOV A,M      |                          |
| E337 B8       | COMP B       | ;READ MEMORY             |
| E338 2012     | JRNZ SKP     | ;COMPARE TO CODE         |
| E33A F1       | POP FSW      | ;SKIP IF NO COMP         |
| E33B FE53     | CPI 'S'      | ;FETCH CONTROL           |
| E33D F5       | PLSH         |                          |
| E33E 2806     | JRZ OBCEP    |                          |
| E340 23       | INX H        |                          |
| E341 7E       | MOV A,M      |                          |
| E342 2B       | DCX H        |                          |
| E343 B9       | OMP C        |                          |
| E344 2006     | JRNZ SKP     |                          |
| E346 23       | INX H        |                          |
| E347 7E       | MOV A,M      |                          |
| E348 2B       | DCX H        |                          |
| E349 CD1DE2   | CALL ERR     |                          |
| E34C CD3FE2   | CALL BMP     |                          |
| E34F 20E5     | JRNZ CONT    |                          |
| E351 F1       | POP PSW      |                          |
| E352 C9       | RET          |                          |
| E353          |              |                          |
| E353 CDC4E4   | CALL PTSTNG  | * INPUT DATA FROM A PORT |
| E356 494E5055 | DTH 'INPUT'  |                          |
| E35A 54A0     | CALL AHE2    |                          |
| E35C CD0AE1   | MOV C,E      |                          |
| E35F 4B       | INP A        |                          |
| E360 ED78     | INP A        |                          |
| E362 C326E2   | JMP PT2      |                          |
| E365          |              |                          |
| E365          |              |                          |
| E365 CDC4E4   | CALL PTSTNG  | * OUTPUT TO A PORT       |
| E368 4F555450 | DTH 'OUTPUT' |                          |
| E36C 5554A0   | CALL AHE2    |                          |
| E36F CD0AE1   | CALL AHE2    |                          |
| E372 CD0AE1   | MOV C,L      |                          |
| E375 4D       | OUTP E       |                          |
| E376 ED59     | RET          |                          |
| E378 C9       |              |                          |
| E379          |              |                          |

  

|               |                |                                |
|---------------|----------------|--------------------------------|
| E2D0 70       | MOV M,B        |                                |
| E2D1 7E       | MOV A,M        |                                |
| E2D2 B8       | COMP B         |                                |
| E2D3 C2DBE2   | JRNZ ERRUP     | ;PRINT ERROR                   |
| E2D6 0600     | MVI B,0        |                                |
| E2D8 70       | MOV M,B        |                                |
| E2D9 7E       | MOV A,M        |                                |
| E2DA B8       | COMP B         |                                |
| E2DB C21DE2   | JRNZ ERR       |                                |
| E2DE 71       | MOV M,C        |                                |
| E2DF 23       | INX H          |                                |
| E2E0 18EB     | JR NDLCP       |                                |
| E2E2          |                | * COMPARE TWO BLOCKS OF MEMORY |
| E2E2 CDC4E4   | CALL PTSTNG    |                                |
| E2E5 434F4D50 | DTH 'COMPARE'  |                                |
| E2E9 415245A0 | CALL TRAHX     |                                |
| E2ED CD0EE1   | PUSH H         |                                |
| E2F0 E5       | CALL AHX       |                                |
| E2F1 CD0E0    | XORG           |                                |
| E2F4 EB       | MOV A,M        |                                |
| E2F5 7E       | INX H          |                                |
| E2F6 23       | XTHL           |                                |
| E2F7 E3       | OMP M          |                                |
| E2F8 BE       | MOV B,M        |                                |
| E2F9 46       | ONZ ERR        |                                |
| E2FA CA1DE2   | CALL BMP       |                                |
| E2FD CD3FE2   | XTHL           |                                |
| E300 E3       | JRNZ VMLOP     |                                |
| E301 20F2     | POP PSW        |                                |
| E303 F1       | RET            |                                |
| E304 C9       |                |                                |
| E305          |                | * SEARCH FOR SPECIFIC CODES    |
| E305 F5       | FIND           |                                |
| E306 CDC4E4   | PUSH PSW       |                                |
| E309 46494E44 | CALL PTSTNG    |                                |
| E30D 2D32A0   | DTH 'FIND-2'   |                                |
| E310 1800     | JR SRCHENT     |                                |
| E312 F5       | PUSH PSW       |                                |
| E313 CDC4E4   | CALL PTSTNG    |                                |
| E316 53454152 | DTH 'SEARCH-1' |                                |
| E31A 43482D31 |                |                                |
| E31E A0       |                |                                |
| E31F CD0EE1   | CALL TRAHX     |                                |
| E322 E5       | PUSH H         |                                |
| E323 CD0AE1   | CALL AHE2      |                                |
| E326 EB       | XORG           |                                |
| E327 45       | MOV B,L        |                                |
| E328 E1       | POP PSW        |                                |
| E329 F1       | POP PSW        |                                |
| E32A FE53     | CPI 'S'        |                                |
| E32C F5       | PUSH PSW       |                                |
| E32D 2807     | JRZ CONT       |                                |
| E32F E5       | PUSH H         |                                |
| E330 CD0AE1   | CALL AHE2      |                                |
| E333 EB       | XORG           |                                |
| E334 4D       | MOV C,L        |                                |
| E335 E1       | POP H          |                                |



| Address       | Instruction                       | Comment                      | Address       | Instruction | Comment                                  |
|---------------|-----------------------------------|------------------------------|---------------|-------------|--|
| E3E3 32DBFF   | STA                               | CURPOS                       | E442 CD60E4   | CALL        | LIFTOURS                                 |
| E3E6          | * MOVE DN 1 LINE                  |                              | E445 E1       | POP         | H  |
| E3E6 3ADCFF   | LINP                              | LINENO                       | E446 D1       | POP         | D  |
| E3E9 FE17     | CPI                               | VERT-1                       | E447 C1       | POP         | B  |
| E3EB 2023     | JRNZ                              | NOSCRL                       | E448 F1       | POP         | PSW                                      |
| E3ED 215000   | JRNZ                              | H,HORIZ                      | E449 C9       | RET         |  |
| E3ED 215000   | LXI                               | TOSCN                        | E44A 3ADDF    | LDA         | VFL                                      |
| E3FO ED5B0FFF | LDGD                              | D                            | E44D EE80     | XRI         | 80H                                      |
| E3F4 19       | DAD                               |                              | E44F 32DDFF   | STA         | VFL                                      |
| E3F5 EDA0     | LDI                               |                              | E452 18EE     | JR          | RET                                      |
| E3F7 EDA0     | LDI                               |                              | E454          |             |  |
| E3F9 7C       | MOV                               | A,H                          | E454 3ADCFF   | CURSUP      | * MOVE THE CURSOR UP                     |
| E3FA FEF7     | CPI                               | HORIZ*VERT+PAGE/256          | E457 A7       | ANA         | LINENO                                   |
| E3FC 20F7     | JRNZ                              | SCR                          | E458 28E8     | JRZ         | RET                                      |
| E3FE 7D       | MOV                               | A,L                          | E45A 3D       | DCR         | A  |
| E3FF FE80     | CPI                               | HORIZ*VERT+PAGE&OFFH         | E45B 32CFF    | STA         | LINENO                                   |
| E401 20F2     | JRNZ                              | SCR                          | E45E 18E2     | JR          | RET                                      |
| E403 3ADCFF   | LDA                               | LINENO                       | E460 2180F7   | LXI         | * CALCULATE MEM ADD FROM CURSOR POSITION |
| E406          | * ERASE BOTTOM LINE               |                              | E460 2180F7   | LXI         | LIFTOURS                                 |
| E406 EB       | EBOU/L                            |                              | E463 1180FF   | LXI         | H,HORIZ*VERT+PAGE                        |
| E407 0650     | MVI                               | B,HORIZ                      | E466 3ADCFF   | LDA         | D,-HORIZ                                 |
| E409 3620     | MVI                               | M,SPACE                      | E469 3C       | INR         | LINENO                                   |
| E40B 23       | INX                               | H                            | E46A 19       | DAD         | A  |
| E40C 05       | DCR                               | B                            | E46B FE18     | CPI         | D  |
| E40D 20FA     | JRNZ                              | ELOP                         | E46D 20FA     | JRNZ        | VERT                                     |
| E40F 3D       | DCR                               | A                            | E46F ED5BDBFF | LDGD        | CLOP                                     |
| E410 3C       | INR                               | A                            | E473 1600     | MVI         | CURPOS                                   |
| E411 32CFF    | STA                               | LINENO                       | E475 19       | DAD         | D,0                                      |
| E414 182C     | JR                                | RET                          | E476          |             | D  |
| E416          | * ERASE BEFORE BACKSPACING        |                              | E476 7E       | MOV         | A,M                                      |
| E416 3620     | DEACKSP                           | M,20H                        | E477 EE80     | XRI         | 80H                                      |
| E418 3ADBFF   | LDA                               | CURPOS                       | E479 77       | MOV         | M,A                                      |
| E41B A7       | ANA                               | A                            | E47A C9       | RET         |  |
| E41C 2B24     | JRZ                               | RET                          | E47B CD96E4   | CALL        | WRSPC                                    |
| E41E 3D       | DCR                               | A                            | E47E 18C2     | JR          | RET                                      |
| E41F 2B       | DCX                               | H                            | E480          |             |  |
| E420 3620     | MVI                               | M,20H                        | E480 3ADBFF   | LDA         | CURPOS                                   |
| E422 181B     | JR                                | TABRET                       | E483 3620     | MVI         | M,20H                                    |
| E424          | * MOVE THE CURSOR BACK            |                              | E485 23       | INX         | H  |
| E424 3ADBFF   | BACKSP                            | LDA                          | E486 3C       | INR         | A  |
| E427 3D       | DCR                               | A                            | E487 FE50     | CPI         | 50H                                      |
| E428 F23FB4   | JP                                | TABRET                       | E489 20F8     | JRNZ        | CLLINE+3                                 |
| E42B 1811     | JR                                | CRET                         | E48B 18B5     | JR          | RET                                      |
| E42D          | * TAB OVER TO THE NEXT 8 MULTIPLE |                              | E48D          |             |  |
| E42D 3ADBFF   | TAB                               | LDA                          | E48D 2100F0   | LXI         | H,PAGE                                   |
| E430 F607     | ORI                               | 7                            | E490 22DFFF   | SHLD        | TOSCN                                    |
| E432 18A9     | JR                                | EOL+3                        | E493 22EAF    | SHLD        | XYFLAG                                   |
| E434 CD8DE4   | FORN                              | CLEAR THE SCREEN AND HOME UP | E496 3620     | MVI         | M,20H                                    |
| E437 AF       | HOME                              | CALL CLEAR                   | E498 23       | INX         | H  |
| E438 32CFF    | XHA                               | A                            | E499 7C       | MOV         | A,H                                      |
| E43B 32D0FF   | STA                               | LINENO                       | E49A FEF8     | CPI         | PAGE+2048/256                            |
| E43E          | * CARRIAGE RETURN                 |                              | E49C 20F8     | JRNZ        | WRSPC                                    |
| E43E AF       | CRET                              | XRA                          | E49E C9       | RET         |  |
| E43F 32DBFF   | TABRET                            | STA                          | E49F          |             |  |
| E442          | * RETURN TO THE CALLING ROUTINE   |                              | E49F          |             |  |

OPTIMIZED AT BOTTOM

CLR VID FLAG

\* PROCESS LEAD IN CODE

|             |                                |             |               |           |                      |
|-------------|--------------------------------|-------------|---------------|-----------|----------------------|
| E49F 3E02   | LEDIN                          | MVI A,2     | E49E CDC4E4   | CALL      | PTSTNG               |
| E4A1 32EAF  |                                | XFLAG RET   | E4F1 1B       | DB        | 27                   |
| E4A4 189C   |                                |             | E4F2 2007     | DD        | 2007H ;FSC ;X=32 Y=7 |
| E4A6        |                                |             | E4F4 20564543 | DT        | ' VECTOR GRAPHIC     |
| E4A6        |                                |             | E4F8 544F5220 |           |                      |
| E4A6 79     |                                |             | E500 48494320 |           |                      |
| E4A7 FE50   | * SET X AND Y CURSOR POSITIONS |             | E504 1B       |           |                      |
| E4A9 3802   | XPOS                           | MV A,C      | E505 2008     | DB        | 27 ;ESC ;X=32 Y=8    |
| E4AB 3E4F   |                                | CPI 80      | E507 20202020 | DD        | 2008H MONITOR        |
| E4AD 1890   | XINRG                          | JRC XINRG   | E50B 4D4F4E49 | DT        |                      |
| E4AF        |                                | MVI A,79    | E50F 544F5220 |           |                      |
| E4AF 79     |                                | JR TABRET   | E513 20202020 |           |                      |
| E4B0 FE18   |                                |             | E517 1B       |           |                      |
| E4B2 3802   |                                |             | E51A 20205645 | DB        | 27 ;ESC ;X=32 Y=9    |
| E4B4 3E17   |                                |             | E51E 5253494F | DD        | 2009H                |
| E4B6 18A3   |                                |             | E522 4E20342F | DT        | ' VERSION 4.3        |
| E4B8        |                                |             | E526 33202020 |           |                      |
| E4B8 AF     |                                |             | E52A 1B       | DB        | 27 ;ESC ;X=0 Y=13    |
| E4B9 32DBFF |                                |             | E52B 0080     | DD        | 8EH                  |
| E4BC CD60E4 |                                |             | E52D C9       | RET       |                      |
| E4BF 18BF   |                                |             | E52E CDC1E4   | CALL      | RPTSTNG              |
| E4C1 E4C1 = | * CURSOR STORAGE LOCATIONS     |             | E531 4D6F6E3E | DTH       | 'Mon>'               |
| E4C1        |                                |             | E535 A0       |           |                      |
| E4C1        |                                |             | E536 C9       | RET       |                      |
| E4C1        |                                |             | E537          |           |                      |
| FFDB        | CURVOS                         | DS 1        | E537          |           |                      |
| FFDC        | LINENO                         | DS 1        | E537 CDC4E4   | CALL      | PTSTNG               |
| FFDD        | VEL                            | DS 1        | E53A 41534349 | DTH       | 'ASCII DUMP'         |
| FFDE        | WIDTH                          | DS 1        | E542 4D50A0   |           |                      |
| FFDF        | IOSON                          | DS 2        | E545 CDDEE1   |           |                      |
| FFE1        | ICUROSO                        | DS 2        | E548 CD8BE5   |           |                      |
| FFE3        | * ADDITIONS TO 4.0 MONITOR     | LINK 'M5'   | E54B 78       | CALL      | TAHEC                |
| FFE3        |                                |             | E54C FE40     | CALL      | HOMEK                |
| FFE3        |                                |             | E54E 281A     | MOV A,B   |                      |
| FFE3        |                                |             | E550 E60F     | CPI 64    |                      |
| FFE3        |                                |             | E552 2810     | JRZ       | TERMLIN              |
| FFE3        |                                |             | E554 E603     | ANI       | OFH                  |
| E4C1 CD0FE0 | * PRINT A STRING               | ORG MSEND   | E555 2808     | ANI 3     | NUMBER               |
| E4C4 E3     | RPTSTNG                        |             | E558 3E20     | JRZ       | MARKER               |
| E4C5 7E     | PTSTNG                         |             | E55A CD7BE3   | MVI A,''  | MARKER               |
| E4C6 23     |                                |             | E55D 04       | CALL      | VIDEO                |
| E4C7 E3     |                                |             | E55E 18EB     | INR       | B                    |
| E4C8 A7     |                                |             | E560 3E6C     | JR        | RUJELP               |
| E4C9 CD7BE3 |                                |             | E562 18F6     | MVI A,'1' |                      |
| E4CC F8     |                                |             | E564 78       | JR        | REENTR               |
| E4CD 18F5   |                                |             | E566 18F3     | MOV A,B   |                      |
| E4CF        |                                |             | E56A          | CALL      | BINH                 |
| E4CF 223900 | * SIGN ON MESSAGE              |             | E56A CD79E3   | CALL      | REENTR+3             |
| E4D2 3E04   | SIGN                           | 39H         | E56D CD7F85   | INR       | B                    |
| E4D4 CD7BE3 |                                | A,4         | E570 CD0FE2   | JR        | RUJELP               |
| E4D7 2150F1 |                                | VIDEO       | E573 0E3F     | MVI A,'1' |                      |
| E4DA E5     |                                | H,PAGE+150H | E575 CD7CE5   | JR        | REENTR               |
| E4DB 1151F1 |                                | H           |               |           |                      |
| E4DE 013000 |                                | D,PAGE+151H |               |           |                      |
| E4E1 3612   |                                | B,30H       |               |           |                      |
| E4E3 EDB0   |                                | M,12H       |               |           |                      |
| E4E5 E1     |                                | H           |               |           |                      |
| E4E6 11A0F1 |                                | D,PAGE+1A0H |               |           |                      |
| E4E9 018002 |                                | B,640       |               |           |                      |
| E4EC EDB0   |                                |             |               |           |                      |



|      |          |      |              |      |          |      |            |
|------|----------|------|--------------|------|----------|------|------------|
| E578 | PAGE5    | JM   | WIMP1        | E586 | D1       | POP  | D          |
| E579 | CB       | RZ   | A,M          | E587 | E1       | POP  | H          |
| E57C | 7E       | MOV  | B,A          | E588 | 0E0P     | MVI  | C,15       |
| E57D | 47       | MOV  | A,'E'-64     | E5EA | 0DAE0    | CALL | SPACE      |
| E57E | 3E05     | MVI  | A,'E'-64     | E5D3 | 0DAE0    | CALL | SPACE      |
| E580 | 0378E3   | CALL | VVIDEO       | E5F0 | 07CE5    | CALL | WIMP2      |
| E583 | 033FE2   | CALL | BMP          | E5F3 | FA3E5    | JM   | HLP1-3     |
| E586 | CB       | RZ   | C            | E5F6 | C9       | RET  |            |
| E587 | 0D       | DCR  |              | E5F7 | 3ADEFF   | LIA  | WIDTH      |
| E588 | F8       | RM   |              | E5FA | 3D       | LCR  | A          |
| E589 | 18F1     | JR   | WIMP2        | E5FB | 32DEFF   | STA  | WIDTH      |
| E58B | 0DC1E4   | CALL | PRINT "ADDR" | E5FE | 2007     | JRZ  | CTSCRLL    |
| E58E | 14       | CALL | RTSTING      | E600 | 0150F0   | LXI  | B,PAGE+50H |
| E58F | 41444452 | DB   | "'E'-64      | E603 | ED43DEFF | SHD  | TOSON      |
| E591 | A0       | DTH  | "ADDR"       | E607 | C9       | RET  |            |
| E593 | A0       | MVI  | B,0          | E608 |          |      |            |
| E594 | 0600     | MVI  | A,24         | E608 | 0XC4F4   | CALL | PTSTING    |
| E596 | 3E18     | STA  | WIDTH        | E60B | 50524F47 | DTH  | "PROGRAM"  |
| E598 | 32EFFF   | RET  |              | E60F | 52414DA0 | CALL | PTSTING    |
| E59C |          | CALL | FOR HEX DUMP | E613 | 0DBE0    | CALL | AHEX       |
| E59C | 78       | MOV  | A,B          | E616 | ED53E1FF | SOED | "TURPOS    |
| E59D | FE10     | CPI  | 16           | E61A | 0DBE5    | CALL | HOMEPC     |
| E59E | 2806     | JRZ  | HEXRCT       | E61D | 09CE5    | CALL | HEXRUJER   |
| E5A1 | 0D1FE7   | CALL | PT2S         | E620 | 0D79E3   | CALL | "VVIDEO    |
| E5A4 | 04       | INR  | B            | E623 | AF       | XRA  | A          |
| E5A5 | 18F5     | JR   | HEXRUJER     | E624 | 32EFFF   | STA  | WIDTH      |
| E5A7 |          | CALL | FOR ASCII    | E627 | 091E6    | CALL | PRUJLINE   |
| E5A7 | 0DAE0    | CALL | SPACE        | E62A | 0D2EE1   | CALL | ESCAPE     |
| E5AA | 0DAE0    | CALL | SPACE        | E62D | 0DEE0    | CALL | HEX        |
| E5AD | 0600     | MVI  | B,0          | E630 | 2AE1FF   | LJLD | "TURPOS    |
| E5AF | 78       | MOV  | A,B          | E633 | 301A     | JRNC | MOUNEM     |
| E5B0 | FE10     | CPI  | 16           | E635 |          |      |            |
| E5B2 | CB       | RZ   |              | E635 | FE20     | CPI  |            |
| E5B3 | E60F     | MVI  | ORH          | E637 | 2846     | JRZ  | CSRT       |
| E5B5 | 0D31E2   | CALL | SINL         | E639 | FE08     | CPI  | 8          |
| E5B8 | 04       | INR  | B            | E63B | 2845     | JRZ  | CSLT       |
| E5B9 | 18F4     | JR   | HEXRLP       | E63D | FE12     | CPI  | "R'-64     |
| E5BB |          | CALL | ROUTINE      | F63F | 2839     | JRZ  | CSJN       |
| E5BB | 0DC4E4   | CALL | HEXRL1,      | E641 | FE15     | CPI  | "U'-64     |
| E5BE | 48455820 | DTH  | "HEX DUMP"   | E643 | 282F     | JRZ  | CSJP       |
| E5C2 | 44554D50 |      |              | E645 | FE17     | CPI  | "W'-64     |
| E5C6 | A0       |      |              | E647 | 2839     | JRZ  | CSLT       |
| E5C7 | 0D0EE1   | CALL | TAHEX        | E649 | FE1A     | CPI  | "Z'-64     |
| E5CA | 0DBE5    | CALL | HOMEPC       | E64B | 2832     | JRZ  | CSRT       |
| E5CD | 09CE5    | CALL | HEXRUJER     | E64D | 18D8     | JR   | ROLLOO     |
| E5D0 | 0D79E3   | CALL | VVIDEO       | E64F |          |      |            |
| E5D3 | 0DF7E5   | CALL | SETSCHRLL    | E64F | 2AE1FF   | LJLD | "TURPOS    |
| E5D6 | 0D0FE2   | CALL | PTAD         | E652 | 4F       | MVI  | C,A        |
| E5D9 | E5       | PUSH | H            | E653 | 3ADEFF   | LDA  | WIDTH      |
| E5DA | D5       | PUSH | D            | E656 | A7       | ANA  | A          |
| E5DB | 0E10     | MVI  | C,16         | E657 | 7E       | MOV  | A,M        |
| E5DD | 7E       | MOV  | A,M          | E658 | 2800     | JRZ  | LSNHL      |
| E5DE | 0D1FE7   | CALL | PT2S         | E65A | E6F0     | MVI  | 0F0H       |
| E5E1 | 23       | INX  | H            | E65C | B1       | ORA  | C          |
| E5E2 | 0D       | DCR  | C            | E65D | 77       | MVI  | M,A        |
| E5E3 | C2DDE5   | JNZ  | HLP2         |      |          |      |            |

\* CHECK TO SET SCROLL POINT  
 SETSCRLL  
 LIA WIDTH  
 LCR A  
 STA WIDTH  
 JRZ CTSCRLL  
 LXI B,PAGE+50H  
 SHD TOSON  
 RET

CTSCRLL  
 \* PROGRAM MEMORY  
 PROGRAM  
 CALL DTH  
 CALL AHEX  
 SOED "TURPOS  
 CALL HOMEPC  
 CALL HEXRUJER  
 CALL "VVIDEO  
 XRA A  
 STA WIDTH  
 CALL PRUJLINE  
 CALL ESCAPE  
 CALL HEX  
 LJLD "TURPOS  
 JRNC MOUNEM  
 . . .  
 \* CONTROL CODE TABLE  
 CPI  
 JRZ CSRT  
 CPI 8  
 JRZ CSLT  
 CPI "R'-64  
 JRZ CSJN  
 CPI "U'-64  
 JRZ CSJP  
 CPI "W'-64  
 JRZ CSLT  
 CPI "Z'-64  
 JRZ CSRT  
 JR ROLLOO  
 \* MODIFY A MEMORY LOCATION  
 LJLD "TURPOS  
 MVI C,A  
 LDA WIDTH  
 ANA A  
 MOV A,M  
 JRZ LSNHL  
 MVI 0F0H  
 ORA C  
 MVI M,A  
 RMEM

;PRINT LINE CONT H

;ADDR IN HL

;PRINT "ADDR"



\* DISPLAY REGISTER HEADER ON SCREEN  
 DISPRDSS CALL REPUSNG  
 DB 'T'-64  
 DT 'ADDR FLAGS AP BC DE'

DT ' HL IX IY SP '

DT ' AP'  
 DB 27H  
 DT ' BC'  
 DB 27H  
 DT ' DE'  
 DB 27H  
 DT ' HL'  
 DB 27H  
 DT ' 8D 8I 8SP '  
 DB 'T'-164  
 NET

\* PRINT FLAGS  
 PRFFLAGS  
 LXI B,405AH  
 CALL MASKFLG  
 LXI B,143H  
 CALL MASKFLG  
 LXI B,8049H  
 CALL MASKFLG  
 LXI B,445H  
 CALL MASKFLG  
 LXI B,1048H  
 CALL MASKFLG  
 JMP SPCE

\* PRINT DC DE HL IN ORDER  
 PTTHREE  
 PUSH H  
 PUSH B  
 POP B  
 CALL PTAD+3  
 PUSH D  
 POP H  
 CALL PTAD+3  
 POP H  
 JMP PTAD+3

\* MASKFLG  
 MOV A,J  
 AWA B  
 MVI A,20H

E725 CDC184  
 E728 14  
 E729 41444452  
 E72D 20468C41  
 E731 47532020  
 E735 41462020  
 E739 20424320  
 E73D 20204445  
 E741 20202048  
 E745 4C202020  
 E749 49582020  
 E74D 20495920  
 E751 20205350  
 E755 20  
 E756 20204146  
 E75A 27  
 E75B 20204243  
 E75F 27  
 E760 20204445  
 E764 27  
 E765 2020484C  
 E769 27  
 E76A 20404220  
 E76E 40442040  
 E772 48204053  
 E776 5020  
 E778 94  
 E779 C9  
 E77A  
 E77A 015A40  
 E77D CDAAE7  
 E780 014301  
 E783 CDAAE7  
 E789 014090  
 E789 CDAAE7  
 E78C 014504  
 E78F CDAAE7  
 E792 014810  
 E795 CDAAE7  
 E798 CDAE0  
 E798  
 E798 E5  
 E79C C5  
 E790 E1  
 E79E CD12E2  
 E7A1 D5  
 E7A2 E1  
 E7A3 CD12E2  
 E7A6 E1  
 E7A7 C312E2  
 E7AA  
 E7AA 7D  
 E7AB AD  
 E7AC 3E20

E7AE C47BE3  
 E7B1 79  
 E7B2 C37BE3  
 E7B5  
 E7B5  
 E7B5 CDC4E4  
 E7B8 42524541  
 E7BC 4B204154  
 E7C0 A0  
 E7C1 C4DDE0  
 E7CA 7A  
 E7C5 32E9FF  
 E7C8 8D53E7FF  
 E7CC 3EFF  
 E7CE 12  
 E7CF C9  
 E7D0  
 E7D0 CDC4E4  
 E7D3 45585420  
 E7D7 434F4DA0  
 E7DB DB05  
 E7DD B602  
 E7DF 2B05  
 E7E1 DB04  
 E7E3 CD78E3  
 E7E6 CD2FE1  
 E7E9 2BF0  
 E7EB D304  
 E7ED 18BC  
 E7EF  
 E7EF  
 E7EF  
 E7F3  
 E7F5  
 E7F7  
 E7F9  
 E7FA

JZ VIDEO  
 MOV A,C  
 JMP VIDEO

\* SET BREAKPOINT  
 CALL PUSNG  
 DTH 'BRENK AT '

CALL AHEX  
 LDAX D  
 STA BRKCODE  
 SDED BKPTLOC  
 MVI A,0FFH  
 STAX D  
 RET

\* EXTERNAL COMMUNICATIONS  
 EXTCOM CALL PUSNG  
 DTH 'EXT COM '

RECEIVE IN 5  
 MVI 2  
 JNZ NEXCHR  
 IN 4  
 CALL VIDEO  
 CALL ESCAPE  
 JNZ RECEIVE  
 OUT 4  
 JR RECEIVE

NEXCHR  
 CALL VIDEO  
 CALL ESCAPE  
 JNZ RECEIVE  
 OUT 4  
 JR RECEIVE

\* TEMPORARY STORAGE LOCATIONS FOR REGISTERS, ETC.  
 ONG 'CURPOS+2  
 DS 2  
 DS 2  
 DS 2  
 DS 1  
 DS 1

HI:TRAP DS 2  
 SPTMP DS 2  
 BKPTLOC DS 1  
 BRKCODE DS 1  
 XYFLAG DS 1

;BREAKPT LOCATION  
 ;CODE AT BREAKPT  
 ;COUNSOR XY FLAG