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; FORMAT FOR THE SBX-218 ON AN SBC-80/24.
; COPYRIGHT JAMES R. GRIER
; MARCH 20, 1981
; STATUS DISPLAY ADDED JULY 29, 1981
; REVISED FOR NEW BIOS 01-SEP-81

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1
FORMAT.PRN

```

0100      ORG      100H
0002 =    NUMDSK EQU      2
000D =    CR      EQU     13
000A =    LF      EQU     10
F209 =    CONIN  EQU     0F209H
F20C =    CONOUT EQU     0F20CH
FE80 =    FRMAT  EQU     0FE80H      ; SPECIALIZED FORMATTING INSTRUCTION

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START:

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; FIRST, MOVE THE FORMAT ROUTINE INTO ON-BOARD RAM.
; THE FORMAT ROUTINE (FORMATX.ASM) MUST BE ASSEMBLED AND LOADED INTO
; MEMORY WITH AN OFFSET OF 800H TO BRING ITS START FROM FE80 TO 680.

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0100 118006      LXI      D,680H
0103 2180FE      LXI      H,0FE80H
0106 0680        MVI      B,80H

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MVFMT:

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0108 1A         LDAX      D
0109 77         MOV      M,A
010A 13         INX      D
010B 23         INX      H
010C 05         DCR      B
010D C20801     JNZ      MVFMT

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0110 21EE01     LXI      H,SIGNON      ; PRINT SIGNON MESSAGE
0113 CDB901     CALL     PRINT

```

FORMAT:

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0116 211602     LXI      H,DSQUES      ; ASK WHICH DISK TO DO
0119 CDB901     CALL     PRINT
011C CDAD01     CALL     ECHO          ; GET INPUT
011F FE0D      CPI      CR          ; BOOT IF CR
0121 CA0000     JZ       0

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0124 329602     STA      RDYDRV      ; SAVE FOR CONFIRMATION MESSAGE
0127 D641       SUI      'A'
0129 DA1601     JC       FORMAT      ; LOOP IF < 'A'
012C FE02      CPI      NUMDSK
012E D21601     JNC      FORMAT      ; CHECK FOR BEYOND SYSTEM CAPACITY

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0131 32E801     STA      FDDIPB+1
0134 32E201     STA      FSDIPB+1      ; SETUP PROPER DRIVE FOR EITHER IOPB
0137 32ED01     STA      DISKX

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CHOICE:

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013A 214602     LXI      H,STQUES      ; ASK WHAT DENSITY
013D CDB901     CALL     PRINT
0140 CDAD01     CALL     ECHO
0143 FE53      CPI      'S'
0145 CA5501     JZ       SINGLE      ; IF 'S', DO SINGLE DENSITY
0148 FE44      CPI      'D'
014A CA6F01     JZ       DOUBLE      ; IF 'D', DOUBLE DENSITY
014D FE0D      CPI      CR
014F CA1601     JZ       FORMAT      ; IF CR, RESTART FORMAT
0152 C33A01     JMP      CHOICE      ; ANYTHING ELSE, TRY AGAIN

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\$EJECT

; IF SINGLE DENSITY, FORMAT ALL 77 TRACKS AS SINGLE DENSITY
SINGLE:

0155 21B202 LXI H,SING
0158 CDC401 CALL CHKRDY
015B 21BE02 LXI H,NUMBERS
015E CDB901 CALL PRINT
0161 0E00 MVI C,0 ; TRACK NUMBER

SLOOP:

0163 CD8C01 CALL FSD ; PERFORM FORMAT
0166 79 MOV A,C
0167 FE4D CPI 77
0169 DA6301 JC SLOOP ; LOOP FOR ALL TRACKS
016C C31601 JMP FORMAT

; IF DOUBLE DENSITY, FORMAT TRACK 0 AS SINGLE, ALL OTHERS DOUBLE.
DOUBLE:

016F 21B802 LXI H,DOUB
0172 CDC401 CALL CHKRDY
0175 21BE02 LXI H,NUMBERS
0178 CDB901 CALL PRINT
017B 0E00 MVI C,0
017D CD8C01 CALL FSD ; FORMAT TRACK 0 AS SINGLE

DLOOP:

0180 CD9801 CALL FDD
0183 79 MOV A,C
0184 FE4D CPI 77
0186 DA8001 JC DLOOP ; LOOP FOR ALL TRACKS
0189 C31601 JMP FORMAT

; FORMAT IN SINGLE DENSITY.

FSD:

018C 3AED01 LDA DISKX
018F 47 MOV B,A
0190 21E101 LXI H,FSDIPB ; POINT TO SINGLE DENSITY IOPB
0193 1E00 MVI E,0 ; SET N VALUE
0195 C3A101 JMP GOFORM

; FORMAT IN DOUBLE DENSITY.

FDD:

0198 3AED01 LDA DISKX
019B 47 MOV B,A
019C 21E701 LXI H,FDDIPB ; POINT TO DOUBLE DENSITY IOPB
019F 1E01 MVI E,1 ; SET N VALUE

GOFORM:

01A1 CD80FE CALL FRMAT ; CALL SINGLE TRACK FORMATTER
01A4 0C INR C ; INCREMENT TRACK NUMBER
01A5 C5 PUSH B
01A6 0E46 MVI C,'F'
01A8 CD0CF2 CALL CONOUT
01AB C1 POP B
01AC C9 RET

; GET A CHARACTER, CONVERT LOWER TO UPPER, ECHO TO CONSOLE, AND RETURN DATA
ECHO:

01AD CD09F2 CALL CONIN ; GET CHARACTER
01B0 E65F ANI 5FH ; CONVERT LOWER CASE TO UPPER
01B2 F5 PUSH PSW ; SAVE
01B3 4F MOV C,A
01B4 CD0CF2 CALL CONOUT ; ECHO

\$EJECT

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01B7 F1 POP PSW
01B8 C9 RET

; PRINT STRING AT HL UNTIL NULL FOUND.
PRINT:

01B9 7E MOV A, M
01BA B7 ORA A
01BB C8 RZ
01BC 4F MOV C, A
01BD CD0CF2 CALL CONOUT
01C0 23 INX H
01C1 C3B901 JMP PRINT

; CHKRDY:
; MOVE IN APPROPRIATE DENSITY

01C4 119B02 LXI D, RDYFRM
01C7 0606 MVI B, 6

CKLP:

01C9 7E MOV A, M
01CA 12 STAX D
01CB 13 INX D
01CC 23 INX H
01CD 05 DCR B
01CE C2C901 JNZ CKLP

01D1 217E02 LXI H, READY
01D4 CDB901 CALL PRINT ; PRINT COMPLETED MESSAGE
01D7 CDAD01 CALL ECHO ; TEST FOR RESPONSE
01DA FE59 CPI 'Y'
01DC C8 RZ
01DD E1 POP H
01DE C31601 JMP FORMAT ; POP STACK AND RESTART IF NOT YES

01E1 0D00001A1BFSDIPB: DB 0DH, 0, 0, 1AH, 1BH, 0E5H
01E7 4D00011A36FDDIPB: DB 4DH, 0, 1, 1AH, 36H, 0E5H

01ED 00 DISKX: DB 0

01EE 4861727665SIGNON: DB 'HARVEY FORMAT V2.0 (REVISED 01-SEP-81)', 0
0216 0D0A456E74DSGUES: DB CR, LF, 'ENTER DRIVE TO FORMAT (OR RETURN TO REBOOT): ', 0
0246 0D0A576861STGUES: DB CR, LF, 'WHAT DENSITY - SINGLE, DOUBLE, OR RET TO START OVER: ', 0
027E 0D0A526561READY: DB CR, LF, 'READY TO FORMAT DRIVE '
0296 0020617320RDYDRV: DB 0, ' AS '
029B 5858585858RDYFRM: DB 'XXXXXX DENSITY (Y/N)? ', 0
02B2 73696E676CSING: DB 'SINGLE'
02B8 646F75626CDOUB: DB 'DOUBLE'

NUMBERS:

02BE 0D0A0D0A DB CR, LF, CR, LF
02C2 2020202020 DB ' CURRENT TRACK', CR, LF
02EF 3030303030 DB '00000000001111111112222222223333333333'
0317 3434343434 DB '44444444445555555555666666666677777777', CR, LF
033E 3031323334 DB '0123456789012345678901234567890123456789'
0366 3031323334 DB '0123456789012345678901234567890123456', CR, LF
038D 00 DB 0
END

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; COPYDISK FOR THE SBX-218 ON AN SBC-80/24.
; COPYRIGHT JAMES R. GRIER
; MARCH 19, 1981
; MAY 6, 1981 - EXTENDED AND COMMENTED
; MAY 24, 1981 - COPYDISK
; JUNE 23, 1981 - COPY WITH VERIFY
; JULY 21, 1981 - SCREEN DISPLAY AND AUTO-FORMAT
; SEPT 1, 1981 - REVISED FOR NEW BIOS V2.0
; SEPT 2, 1981 - USES SNIFF ROUTINE TO DETERMINE SOURCE DENSITY
;

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0100      ORG      100H
0002 =    NUMDSK EQU      2
000D =    CR      EQU     13
000A =    LF      EQU     10
F200 =    BIOS   EQU     OF200H
F209 =    CONIN  EQU     BIOS + 09H
F20C =    CONOUT EQU     BIOS + 0CH
FF00 =    DRDISK EQU     OFF00H
FF06 =    SNIFF  EQU     OFF06H
FE80 =    BIOFRM EQU     OFE80H
;

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START:

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0100 210B03      LXI      H, SIGNON
0103 CD9F02      CALL     PRINT      ; PRINT SIGNON MESSAGE
;
0106 217103      LXI      H, FMTQUE   ; CHECK IF FORMATTING DESIRED
0109 CD9F02      CALL     PRINT
010C CDB302      CALL     ECHO      ; GET ANSWER
010F F5          PUSH     PSW      ; SAVE
0110 0E00        MVI     C, 0      ; SNIFF DRIVE 0 FOR DENSITY
0112 CD06FF      CALL     SNIFF
0115 3E44        MVI     A, 'D'     ; SETUP FOR DOUBLE DENSITY
0117 CA1C01      JZ      ISDBL     ; ZERO FLAG IS SET IF DISK DOUBLE DENSITY
011A 3E53        MVI     A, 'S'     ; IF NOT SET, ASSUME SINGLE
;
011C 321705      STA     DNSITY   ; SAVE VALUE
;
011F F1          POP     PSW      ; RECOVER ANSWER
0120 FE59        CPI     'Y'
0122 C28C01      JNZ     NOFMT    ; IF NOT Y, SKIP FORMATTING
;

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REFORM:

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0125 21DF03      LXI      H, NUMBERS
0128 CD9F02      CALL     PRINT      ; PRINT THE HEADER
012B CDAA02      CALL     CRLF
; NOW MOVE THE FORMAT ROUTINE INTO THE BUFFER SPACE IN BIOS
012E 118006      LXI      D, 680H
0131 2180FE      LXI      H, BIOFRM
0134 0680        MVI     B, 80H
;
0136 1A          LDAX   D
0137 77          MOV   M, A
0138 13          INX   D
0139 23          INX   H
013A 05          DCR   B
013B C23601      JNZ   MVFMT
;

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MVFMT:

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013E 3A1705      LDA     DNSITY
0141 FE53        CPI     'S'
0143 C25401      JNZ     INQUIRY

```

```

;
; IF SINGLE DENSITY, FORMAT ALL 77 TRACKS AS SINGLE DENSITY
SINGLE:
0146 0E00      MVI    C,0          ; TRACK NUMBER
SLOOP:
0148 CD6501    CALL    FSD          ; PERFORM FORMAT
014B 79        MOV     A,C
014C FE4D      CPI     77
014E DA4801    JC     SLOOP      ; LOOP FOR ALL TRACKS
0151 C3B601    JMP     NOWCOPY

;
; IF DOUBLE DENSITY, FORMAT TRACK 0 AS SINGLE, ALL OTHERS DOUBLE.
DOUBLE:
0154 0E00      MVI    C,0
0156 CD6501    CALL    FSD          ; FORMAT TRACK 0 AS SINGLE

;
DLOOP:
0159 CD6D01    CALL    FDD
015C 79        MOV     A,C
015D FE4D      CPI     77
015F DA5901    JC     DLOOP      ; LOOP FOR ALL TRACKS
0162 C3B601    JMP     NOWCOPY

;
; FORMAT IN SINGLE DENSITY.
FSD:
0165 218001    LXI    H,FSDIPB      ; POINT TO SINGLE DENSITY IOPB
0168 1E00      MVI    E,0          ; SET N VALUE
016A C37201    JMP     GOFORM

;
; FORMAT IN DOUBLE DENSITY.
FDD:
016D 218601    LXI    H,FDDIPB      ; POINT TO DOUBLE DENSITY IOPB
0170 1E01      MVI    E,1          ; SET N VALUE

;
GOFORM:
0172 0601      MVI    B,1          ; DISK 1
0174 CD80FE    CALL    BIOFRM      ; CALL SINGLE TRACK FORMATTER.
0177 0C        INR     C          ; INCREMENT TRACK NUMBER.
0178 C5        PUSH   B
0179 0E46      MVI    C,'F'
017B CD0CF2    CALL    CONOUT      ;
017E C1        POP     B
017F C9        RET

;
0180 0D01001A1BFSDIPB: DB    0DH, 1, 0, 1AH, 1BH, 0E5H
0186 4D01011A36FDDIPB: DB    4DH, 1, 1, 1AH, 36H, 0E5H

;
NOFMT:
;
018C 0E01      MVI    C,1
018E CD06FF    CALL    SNIFF      ; CHECK DESTINATION
0191 0E44      MVI    C,'D'
0193 CA9801    JZ     ISDDBL
0196 0E53      MVI    C,'S'

ISDDBL:
0198 3A1705    LDA     DNSITY
019B B9        CMP     C
019C CAB001    JZ     DNSMATCH

;
019F 21A603    LXI    H,NOMATCH
01A2 CD9F02    CALL    PRINT
01A5 CDB302    CALL    ECHO

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01A8 FE59      CPI      'Y'
01AA CA2501    JZ       REFORM
01AD C30000    JMP      0
;
DNSMATCH:
01B0 21DF03    LXI     H, NUMBERS
01B3 CD9F02    CALL    PRINT
;
NOWCOPY:
01B6 CDAA02    CALL    CRLF
;
01B9 3E00      MVI     A, 0          ; TRACK 1
COPYLOOP:
01BB 321605    STA     TRAK
01BE 32D702    STA     LSIOPB+2
01C1 32E002    STA     LDIOPB+2
01C4 32E902    STA     SSIOPB+2
01C7 32F202    STA     SDIOPB+2
01CA 32FB02    STA     CKSIPB+2
01CD 320403    STA     CKDIPB+2
;
01D0 AF        XRA     A
01D1 321805    STA     ERRCNT
;
01D4 3A1705    LDA     DENSITY      ; TEST DENSITY
01D7 FE53      CPI     'S'
01D9 CA4802    JZ      LDLSGL       ; JUMP IF SINGLE DENSITY DRIVE
;
01DC 3A1605    LDA     TRAK
01DF FE00      CPI     0
01E1 CA4802    JZ      LDLSGL       ; ALWAYS SINGLE IF TRACK 0
;
; DOUBLE DENSITY LOAD
DDLOAD:
01E4 11DE02    LXI     D, LDIOPB
01E7 01001A    LXI     B, 1A00H     ; LOAD DISK I/O PARAMETERS
01EA 210009    LXI     H, 900H
01ED CD00FF    CALL    DRDISK
;
01F0 0E00      MVI     C, 0          ; NUMBER OF SECTORS
01F2 210009    LXI     H, 900H     ; START OF MEMORY
DDD:
01F5 C5        PUSH    B
01F6 79        MOV     A, C
01F7 21FC04    LXI     H, TRNTBL
01FA 0600      MVI     B, 0
01FC 09        DAD     B
01FD 7E        MOV     A, M          ; READ TRANSLATE TABLE
01FE 32F402    STA     SDIOPB+4
0201 57        MOV     D, A
0202 1E00      MVI     E, 0
0204 210008    LXI     H, 900H - 100H
0207 19        DAD     D
0208 11F002    LXI     D, SDIOPB
020B 010001    LXI     B, 0100H
020E CD00FF    CALL    DRDISK
0211 C1        POP     B
0212 110001    LXI     D, 100H
0215 19        DAD     D
0216 0C        INR     C
0217 79        MOV     A, C

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0218 FE1A      CPI      26
021A C2F501    JNZ      DDD

```

```

;
021D 110203    LXI      D,CKDIPB
0220 01001A    LXI      B,1A00H
0223 210029    LXI      H,2900H      ; VERIFY BUFFER
0226 CD00FF    CALL     DRDISK      ; REREAD WRITTEN DATA

```

```

;
0229 110009    LXI      D,900H
022C 210029    LXI      H,2900H
022F 01001A    LXI      B,1A00H

```

CHLP2:

```

0232 1A        LDAX     D
0233 BE        CMP     M
0234 CA3D02    JZ      LPOK2
0237 CDC402    CALL    ERRCHK
023A C3E401    JMP     DDLOAD

```

LPOK2:

```

023D 13        INX     D
023E 23        INX     H
023F 0B        DCX     B
0240 79        MOV     A,C
0241 B0        ORA     B
0242 C23202    JNZ     CHLP2
0245 C38802    JMP     LDNXT

```

; LOAD SINGLE DENSITY DISK

LDLSGL:

```

0248 11D502    LXI      D,LSIOPB
024B 01801A    LXI      B,1A80H      ; DISK I/O PARAMETERS
024E 210009    LXI      H,900H
0251 CD00FF    CALL     DRDISK      ; READ TRACK

```

```

;
0254 11E702    LXI      D,SSIOPB
0257 01801A    LXI      B,1A80H
025A 210009    LXI      H,900H
025D CD00FF    CALL     DRDISK

```

```

;
0260 11F902    LXI      D,CKSIPB
0263 01801A    LXI      B,1A80H
0266 210029    LXI      H,2900H      ; VERIFY BUFFER
0269 CD00FF    CALL     DRDISK      ; REREAD WRITTEN DATA

```

```

;
026C 110009    LXI      D,900H
026F 210029    LXI      H,2900H
0272 01000D    LXI      B,0D00H

```

CHLP1:

```

0275 1A        LDAX     D
0276 BE        CMP     M
0277 CA8002    JZ      LPOK1
027A CDC402    CALL    ERRCHK
027D C34802    JMP     LDLSGL

```

LPOK1:

```

0280 13        INX     D
0281 23        INX     H
0282 0B        DCX     B
0283 79        MOV     A,C
0284 B0        ORA     B
0285 C27502    JNZ     CHLP1

```

LDNXT:

```

0288 0E2A      MVI   C, '3'
028A CD0CF2    CALL  CONOUT
028D 3A1605    LDA   TRAK
0290 3C        INR   A
0291 FE4D      CPI   77
0293 C2BB01    JNZ   COPYLOOP

```

```

0296 21E804    LXI   H, DONEMSG
0299 CD9F02    CALL  PRINT
029C C30000    JMP   0

```

```

;
PRINT:

```

```

; PRINT STRING AT HL UNTIL NULL FOUND.

```

```

029F 7E        MOV   A, M
02A0 B7        ORA   A
02A1 C8        RZ
02A2 4F        MOV   C, A
02A3 CD0CF2    CALL  CONOUT
02A6 23        INX   H
02A7 C39F02    JMP   PRINT

```

```

;
CRLF:

```

```

02AA 21B002    LXI   H, CRLFST
02AD C39F02    JMP   PRINT

```

```

;
02B0 0D0A00    CRLFST: DB   CR, LF, 0

```

```

;
ECHO:

```

```

02B3 CD09F2    CALL  CONIN
02B6 E65F      ANI   5FH
02B8 F5        PUSH  PSW
02B9 4F        MOV   C, A
02BA CD0CF2    CALL  CONOUT
02BD F1        POP   PSW
02BE FE03      CPI   3
02C0 CA0000    JZ    0
02C3 C9        RET

```

```

;
ERRCHK:

```

```

02C4 211805    LXI   H, ERRCNT
02C7 34        INR   M
02C8 7E        MOV   A, M
02C9 FE03      CPI   3
02CB C0        RNZ
02CC 21AD04    LXI   H, BOMB
02CF CD9F02    CALL  PRINT
02D2 C30000    JMP   0

```

```

02D5 0600000001LSIOPB: DB   6, 0, 0, 0, 1, 0, 1AH, 7, 80H      ; IOPB FOR SD READ
02DE 4600000001LDIOPB: DB   46H, 0, 0, 0, 1, 1, 1AH, 14, 0FFH   ; IOPB FOR DD READ

```

```

02E7 0501000001SSIOPB: DB   5, 1, 0, 0, 1, 0, 1AH, 7, 80H      ; IOPB FOR SD WRITE
02F0 4501000001SDIOPB: DB   45H, 1, 0, 0, 1, 1, 1AH, 14, 0FFH   ; IOPB FOR DD WRITE

```

```

02F9 0601000001CKSIOPB: DB   6, 1, 0, 0, 1, 0, 1AH, 7, 80H      ; IOPB TO VERIFY SD
0302 4601000001CKDIOPB: DB   46H, 1, 0, 0, 1, 1, 1AH, 14, 0FFH   ; IOPB TO VERIFY DD

```

```

030B 0D0A486172SIGNON: DB CR, LF, 'HARVEY COPYDISK V2.1 (REVISED 02-SEP-81)'
0336 0D0A4C6F61LDPROC: DB CR, LF, 'LOAD SOURCE DISK IN DRIVE A, DESTINATION DISK IN DRIVE B', 0
0371 0D0A446F20FMTQUE: DB CR, LF, 'DO YOU WISH TO FORMAT DESTINATION DISKETTE (Y/N)? ', 0
03A6 0D0A446573NOMATCH: DB CR, LF, 'DESTINATION NOT SAME DENSITY AS SOURCE. FORMAT (Y/N)? ', 0

```


NUMBERS:

03DF 0D0A0D0A DB CR, LF, CR, LF
 03E3 2020202020 DB ' CURRENT TRACK', CR, LF
 0410 3030303030 DB '0000000000111111111122222222223333333333'
 0438 3434343434 DB '444444444455555555556666666666777777', CR, LF
 045F 3031323334 DB '0123456789012345678901234567890123456789'
 0487 3031323334 DB '0123456789012345678901234567890123456', 0

04AD 0D0A43616EBOMB: DB CR, LF, 'CAN NOT VERIFY WRITTEN DATA ON DESTINATION. REBOOTING...', 0

04E8 0D0A446973DONEMSG: DB CR, LF, 'DISK COPY DONE...', 0

TRNTBL:

04FC 0103050709 DB 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25
 0509 020406080A DB 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26

0516 TRAK: DS 1
 0517 DENSITY: DS 1
 0518 ERRCNT: DS 1

0519 END