```
011012 333 362          2510        IN   <R2 READ THE DATA
011014 057              2520        CPL
011015 356 376          2530        XOR  OFEH IS IT AN ID ADDRESS MARK?
011017 040 105          2540        JR   NZ,RIM IF NOT JUMP TO ERROR SUBROUTINE
011021 323 367          2550        OUT  WAIT
011023                  2560 *WAITING FOR TRACK ADDRESS
011023                  2570 *WAITTNG FOR TRACK ADDRESS
011023 333 362          2580        IN   <R2 READ THE TRACK NUMBER
011025 057              2590        CPL
011026 256              2600        XOR  M COMPARE WITH DESIRED TRACK
011027 022              2610        LD   (DE),A WIRK=00 FOR OK
011030 023              2620        INC  DE DE POINTS TO ZERO1 BYTE
011031 323 367          2630        OUT  WAIT
011033                  2640 *WAITING FOR FIRST ZERO BYTE
011033 333 362          2650        IN   <R2 READ THE ZERO BYTE
011035 057              2660        CPL
011036 022              2670        LD   (DE),A ZERO1=00FOR OK
011037 023              2680        INC  DE DE POINTS TO ZERO2
011040 043              2690        INC  HL HL POINTS TO SECTR
011041 323 367          2700        OUT  WAIT
011043                  2710 *WAITING FOR SECTOR ADDRESS
011043 333 362          2720        IN   <R2 READ SECTOR ADDRESS BYTE
011045 057              2730        CPL
011046 256              2740        XOR  M COMPARE WITH DESIRED SECTOR
011047 107              2750        LD   B,A B=00 FOR OK
011050 076 041          2760        LD   A,W3STT+W3CCW
011052 323 363          2770        OUT  <W3 THIS COMMAND SENT TO W3 SETS CCW.(STT BIT
011054                  2780 *MUST ALSO BE SET TO AVOID RESETTING STT.) THE BIT RING
011054                  2790 *PULSE (BRP) FOLLOWING THE SETTING OF CCW WILL START A
011054                  2800 *BIT BY BIT COMPARISON OF THE DATA READ FROM THE DISC
011054                  2810 *WITH THE DATA READ FROM THE CRC REGISTER. THE CPU WILL
011054                  2820 *READ THE COMPLETED SECOND ZERO BYTE AT THE NEXT BRP,BUT
011054                  2830 *THE DRIVE HEAD WILL BEGIN READING THE FIRST CRC BYTE
011054 323 367          2840        OUT  WAIT
011056                  2850 *WAITING FOR SECOND ZERO BYTE
011056 333 362          2860        IN   <R2 READ SECOND ZERO BYTE
011060 057              2870        CPL
011061 022              2880        LD   (DE),A ZERO2=00 FOR OK
011062 023              2890        INC  DE
011063 323 367          2900        OUT  WAIT
011065                  2910 *WAITING FOR CRC BYTE #1
011065 076 040          2920        LD   A,W3STT TURN OFF CCW
011067 323 363          2930        OUT  <W3 STT=1; CCW=0; CCW IS RESET AT NEXT BRP
011071                  2940 *BIT-BY-BIT CRC COMPARISON WILL END
011071 323 367          2950        OUT  WAIT
011073                  2960 *WAITING FOR CRC BYTE #2
011073 333 361          2970        IN   R1 GET STATUS
011075 057              2980        CPL
011076 346 040          2990        AND  R1&1N WAS THERE A CRC ERROR ON THE READ?
```


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```
011100 022              3000        LD   (DE),A CRCID=00 FOR OK
011101 170              3010        LD   A,B B HAS COMPARISON OF DESIRED SECTOR WITH
011102                  3020 *THE SECTOR READ
011102 267              3030        OR   A SECTOR OK?
011103 040 021          3040        JR   NZ,RIM ERROR HERE
011105                  3050 *PROPER SECTOR ID READ WITHOUT ERROR
011105 323 367          3060        OUT  WAIT
011107                  3070 *WAITING FOR FIRST GAP BYTE
011107 353              3080        EX   DE,HL HL POINTS TO CRCID, A=00
011110 266              3090        OR   M TEST CRCID
011111 053              3100        DEC  HL
011112 000              3110        NOP   SHOULD BE OR,M TO TEST ZERO BYTE #2
011113 053              3120        DEC  HL
011114 266              3130        OR   M TEST ZERO1
011115 323 367          3140        OUT  WAIT
011117                  3150 *WAITING FOR SECOND GAP BYTE
011117 053              3160        DEC  HL
011120 266              3170        OR   M TEST WTRK; TRACK ADDRESS=TRACK POINTER
011121 040 003          3180        JR   NZ,RIM ERROR IF ANY BITS SET IN THE ABOVE
011123 323 367          3190        OUT  WAIT
011125                  3200 *WAITING FOR THIRD GAP BYTE
011125 311              3210        RET  NORMAL RETURN, ZERO FLAG=1
011126                  3220 *
011126                  3230 *ERROR PROCESSING ROUTINE FOR READ ID RECORD ROUTINE
011126 333 360          3240 RIM    IN   <R0 READ STATUS
011130 057              3250        CPL
011131 346 002          3260        AND  R0IRQ WAS INTERRUPT AN INDEX REQUEST?
011133 312 372 010      3270        JP   Z,RIA NO, WAIT FOR NEXT MARK
011136 323 366          3280        OUT  <W6 YES, AN IRQ RESET TO W6
011140 015              3290        DEC  C DECREMENT REVOLUTION LIMIT COUNTER
011141 302 372 010      3300        JP   NZ,RIA WAIT FOR NEXT MARK IF NOT THIRD REV
011144 257              3310        XOR  A THIRD REV WITHOUT SUCCESS SO QUIT
011145 323 363          3320        OUT  <W3 RESET STT
011147 076 001          3330        LD   A,01H ERROR CODE
011151 062 274 014      3340        LD   (NOGO),A COULD NOT FIND REQUESTED ID
011154 267              3350        OR   A CLEAR THE ZERO FLAG
011155 311              3360        RET   AND TAKE THIS ERROR RETURN
011156                  3370 ************************************************************
011156                  3380 *READ DATA RECORD COMMAND ROUTINE
011156                  3390 *READ DATA RECORD ROUTINE
011156                  3400 *CALLS READ ID RECORD FIRST
011156 315 362 010      3410 READ   CALL RID READ THE ID RECORD
011161 300              3420        RET  NZ IF ERROR FOUND IN READ, RETURN
011162 076 140          3430        LD   A,<W3WCS+<W3STT WRITE CLOCK SET AND START
011164 323 363          3440        OUT  <W3 SET WRITE CLOCK, LEAVE STT SET
011166 006 011          3450        LD   B,09H PASS GAP BYTES 4-12
011170 323 367          3460 RGAP   OUT  WAIT
011172                  3470 *.WAITING FOR GAP BYTES 4 THROUGH 12
011172 005              3480        DEC  B
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```
011173 040 373          3490        JR   NZ,RGAP
011175 323 367          3500        OUT  WAIT WAIT FOR GAP BYTE 13 HEAD PAST AREA
011177                  3510 *IN GAP THAT CONTAINS UNKNOWN INFORMATION GENERATRED WHEN
011177                  3520 *WRITE CURRENT WAS TURNED ON TO WRITE DATA RECORD.
011177                  3530 *
011177                  3540 *WAITING FOR GAP BYTE 13
011177 076 100          3550        LD   A,<W3WCS RESET STT, SET WRITE CLOCK, PREVENTS
011201 323 363          3560        OUT  <W3 INTERRUPTS UNTIL THE FOLLOWING IS DONE
011203 052 261 014      3570        LD   HL,(BUFFR) HL POINTS TO FIRST BYTE OF DATA
011206 026 041          3580        LD   D,W3STT+W3CCW COMMAND TO SET CCW IN D
011210 016 373          3590        LD   C,0FBH DATA ADDRESS MARK CODE TO C
011212 072 267 014      3600        LD   A,(SCTSZ) SET SECTOR SIZE IN ACC
011215 326 003          3610        SUB  03H
011217 107              3620        LD   B,A SAVE THE COUNT IN B
011220 076 240          3630        LD   A,W3RCS+W3STT SET READ CLOCK AND STT
011222 323 363          3640        OUT  <W3
011224 323 367          3650        OUT  WAIT
011226                  3660 *WAITING FOR ADDRESS MARK
011226 333 362          3670        IN   <R2
011230 057              3680        CPL
011231 271              3690        CP   C IS IT A DATA ADDRESS MARK?
011232 040 076          3700        JR   NZ,MARK IF NOT JUMP TO MARK
011234 323 367          3710        OUT  WAIT
011236                  3720 *WAITING FOR DATA BYTE #1
011236 333 362          3730        IN   <R2 IT WAS AN ADDRESS MARK, GET DATA BYTE 1
011240 057              3740        CPL
011241 167              3750        LD   M,A STORE FIRST DATA BYTE
011242 043              3760 RLOOP  INC  HL READ AND STORE DATA BYTES
011243 323 367          3770        OUT  WAIT
011245                  3780 *WAITING FOR DATA BYTES 2 THROUGH SECTOR SIZE-2
011245 333 362          3790        IN   <R2
011247 057              3800        CPL
011250 167              3810        LD   M,A
011251 005              3820        DEC  B
011252 302 242 011      3830        JP   NZ,RLOOP RELATIVE ADDRESSING TOO SLOW!
011255 043              3840        INC  HL
011256 323 367          3850        OUT  WAIT
011260                  3860 *WAITING FOR DATA BYTE # SECTOR SIZE-1
011260 333 362          3870        IN   <R2
011262 057              3880        CPL
011263 167              3890        LD   M,A
011264 172              3900        LD   A,D SET CCW TO ACCUMULATOR
011265 323 363          3910        OUT  <W3
011267 323 367          3920        OUT  WAIT
011271                  3930 *WAITING FOR DATA BYTE # SECTOR SIZE
011271 043              3940        INC  HL
011272 333 362          3950        IN   <R2
011274 057              3960        CPL
011275 167              3970        LD   M,A
```


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```
011276 323 367          3980        OUT  WAIT
011300                  3990 *WAITING FOR FIRST CRC BYTE
011300 076 040          4000        LD   A,W3STT
011302 323 363          4010        OUT  <W3 RESET CCW
011304 323 367          4020        OUT  WAIT
011306                  4030 *WAITING FOR THE SECOND CRC BYTE
011306 333 361          4040        IN   R1 READ THE STATUS
011310 057              4050        CPL
011311 107              4060        LD   B,A SAVE STATUS IN B
011312 257              4070        XOR  A 00 TO ACC
011313 323 363          4080        OUT  <W3 RESET STT. CHIP GOES TO WRITE CLOCK
011315 170              4090        LD   A,B RECALL STATUS
011316 346 040          4100        AND  R1DER IS THERE A CRC ERROR?
011320 062 301 014      4110        LD   (CRCDR),A SET CRC DATA RECORD FLAG
011323 050 003          4120        JR   Z,RD010 TAKE THIS EXIT IF ALL OK
011325 303 360 011      4130        JP   MK030 A CRC ERROR FOUND
011330 000              4140 RD010  NOP   LD (BUFFR),HL HERE SAVES UPDATED POINTER
011331 311              4150        RET
011332                  4160 *READ DATA RECORD ERROR SERVICE ROUTINE
011332 257              4170 MARK   XOR  A
011333 323 363          4180        OUT  <W3 RESET STT
011335 333 362          4190        IN   <R2 READ MARK AGAIN
011337 057              4200        CPL
011340 326 370          4210        SUB  0F8H IS IT A DELETED DATA MARK?
011342 062 302 014      4220        LD   (ILLMK),A SET ILLEGAL MARK FLAG
011345 302 354 011      4230        JP   NZ,MK010 ILLEGAL MARK
011350 074              4240        INC  A DELETED DATA MARK
011351 303 355 011      4250        JP   MK020
011354                  4260 *ILLEGAL MARK SERVICE ROUTINE
011354 257              4270 MK010  XOR  A ILLEGAL MARK
011355 062 303 014      4280 MK020  LD   (DELMK),A SET DELETED DATA MARK FLAG
011360 041 305 014      4290 MK030  LD   HL,RRTRY CHECK FOR A RETRY
011363 065              4300        DEC  M
011364 302 156 011      4310        JP   NZ,READ TRY AGAIN
011367 257              4320        XOR  A
011370 323 363          4330        OUT  <W3 RESET STT
011372 074              4340        INC  A CLEAR ZERO FLAG TO INDICATE ERROR CONDITION
011373 311              4350        RET
011374                  4360 ************************************************************
011374                  4370 *WRITE DATA RECORD COMMAND ROUTINE
011374                  4380 *PARAMETER AREA HAS THE #'S CONTROLLING THIS WRITE
011374 315 017 013      4390 WRITE  CALL FUR
011377 315 362 010      4400        CALL RID READ ID RECORD FIRST
012002 300              4410        RET  NZ EXIT IF ERROR IN ID RECORD READ
012003 006 011          4420        LD   B,09H WE WILL COUNT 9 INTERRUPTS FROM ID
012005 323 367          4430 WGAP   OUT  WAIT
012007                  4440 *WAITING FOR DRIVE TO BEGIN READING THE 10TH BYTE
012007 005              4450        DEC  B
012010 040 373          4460        JR   NZ,WGAP
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```
012012 076 270          4470        LD   A,W1CBS+W1CBN SET CLOCK BITS AND STROBE
012014 323 361          4480        OUT  <W1 SET THE WRITE CLOCK TO WRITE ALL POSSIBLE
012016                  4490 *CLOCK BITS (FF) FOR DATA
012016 257              4500        XOR  A
012017 323 362          4510        OUT  <W2 SET WRITE DATA REGISTER TM 00
012021 323 367          4520        OUT  WAIT
012023                  4530 *WAITING FMR 10TH INTERRUPT SINCE ID RECORD. HEAD IS
012023                  4540 *READING GAP BYTE 11
012023 076 160          4550        LD   A,<W3WCS+W3STT+<W3WES  WCS=STT=WES=1
012025 323 363          4560        OUT  <W3 WRITE CURRENT & WRITE CLOCK WILL START
012027                  4570 *AT NEXT BRP
012027 333 361          4580        IN   R1 READ STATUS
012031 057              4590        CPL
012032 346 004          4600        AND  R1WFT WRITE FAULT PRESENT?
012034 312 052 012      4610        JP   Z,WR010 IF NOT CONTINUE
012037 315 017 013      4620        CALL FUR RESET FILE UNSAFE
012042 076 001          4630        LD   A,01H
012044 062 304 014      4640        LD   (WRITF),A SET THE WRITE FAULT FLAG
012047 303 315 010      4650        JP   ERROR AND TAKE THE ERROR EXIT
012052 323 367          4660 WR010  OUT  WAIT
012054                  4670 *
012054 323 367          4680        OUT  WAIT HEAD BEGINS WRITING 00 IN GAP BYTE 12
012056                  4690 *
012056 323 367          4700        OUT  WAIT 12TH INTERRUPT; 00 TO BYTF 13
012060                  4710 *
012060 323 367          4720        OUT  WAIT 13TH INTERRUPT; 00 TO BYTE 14
012062                  4730 *
012062 052 261 014      4740        LD   HL,(BUFFR) SET HL TO START OF WRITE DATA
012065 323 367          4750        OUT  WAIT 14TH INTERRUPT 00 TO BYTE 15
012067                  4760 *
012067 006 373          4770        LD   B,0FBH LOAD A DATA MARK IN B
012071 323 367          4780        OUT  WAIT 15TH INTERRUPT; 00 TO BYTE 16
012073                  4790 *
012073 016 062          4800        LD   C,W3STT+W3CCG+W3WES SET CCG COMMAND TO C
012075 026 270          4810        LD   D,W1CBS+W1CBN STORE FF CLOCK PATTERN COMMAND
012077 036 060          4820        LD   E,W3STT+W3WES RESET CCG COMMAND TO E
012101 076 200          4830        LD   A,W1CBS+W1CBD STORE C7 DATA MARK CLOCK
012103                  4840 *PATTERN COMMAND IN A
012103 323 367          4850        OUT  WAIT
012105                  4860 *16TH INTERRUPT, HEAD IS WRITING 17TH AND LAST GAP BYTE
012105 323 361          4870        OUT  <W1 SET C7 DATA MARK CLOCK PATTERN. 16TH
012107 170              4880        LD   A,B SET FB DATA BITS FOR DATA MARK
012110 323 362          4890        OUT  <W2
012112 171              4900        LD   A,C SET CCG CAUSING CRC CALCULATION TO BEGIN
012113                  4910 *AT THE NEXT BRP
012113 323 363          4920        OUT  <W3
012115 172              4930        LD   A,D GET FF DATA BIT CLOCK PATTERN IN A
012116 323 367          4940        OUT  HALT
012120                  4950 *HEAD STARTS DATA MARK NEXT
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