

.MAIN. MACRO V05.02 Tuesday 23-Apr-85 14:52

.REM #C

IDENTIFICATION

PRODUCT CODE: AC-U109A-MC
PRODUCT NAME: CZRQCA0 RQDX3 FORMATTER
PRODUCT DATE: APRIL 24, 1985
MAINTAINER: DIAGNOSTIC ENGINEERING
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1.0 ABSTRACT

This formatter was written to format Winchester drives attached to a RQDX3 disk controller. All new drives being attached to the RQDX3 disk controller must be formatted so that the drive can be brought online for use by a MSCP server or in simpler terms be used by an operating system. This disk formatter is similar to the RQDX1/2 disk formatter in that the same standard DUP dialog is used and similar standard formatter questions are passed by the controller to the host user. The formatter is different from the RQDX1/2 disk formatter because a table of formatting parameters is passed to the controller. The RQDX1/2 disk controller already has these tables in its firmware.

The UIT, Unit Information Table is picked by the host user formatting his Winchester on a RQDX3 according to the drive name. Example RD51, RD52, RD53. The program then passes the UIT to the controller and the table is written on the disk. Every time the drive is brought online after being formatted the UIT is read in by the disk controller from the drive. As long as the UIT still exists on the drive it does not have to be passed in by the host user. Only if the user requests to "Down line load" information to the controller will the host user have to pick a UIT table to pass to the controller.

The UIT table contains information about the drive such as size, number of tracks per surface, etc. This information is already known for certain DEC acquired Winchester drives. These tables are usually different for the different drives manufactured. If a new or unlisted drive is to be formatted, the UIT table can be built by answering about twenty questions. Simply choose the UIT # that refers to the drive "other". This will go through all the questions that make up the UIT.

All though not a goal of the diagnostic this program can be used to run standard DUP dialog local programs such as "DIRECT". These local programs are stored in the firmware.

2.0 HOW TO RUN IT?

2.1 HARDWARE REQUIREMENTS

A RQDX3 disk controller and one or more Winchester drives configured into a Q-bus PDP-11 system.

2.2 SOFTWARE REQUIREMENTS

This diagnostic was written using DRS the Diagnostic Supervisor. The diagnostic is expected to be run under XXDP diagnostic operating system. The diagnostic uses a lot of manual intervention. Answering DUP format questions send by the RQDX3 firmware. For this reason the diagnostic is APT loadable but not APT controllable.

2 3 QUESTIONS ASKED AND THEIR ANSWERS
2.3.1 HARDWARE QUESTIONS FROM DIAGNOSTIC SOFTWARE

The diagnostic is a standard DRS program with the standard DRS commands. Below I have a script of the questions asked and the answers to the initial DRS questions. The Default value for the IP address is 172150. This is standard configuration address for the first MSCP controller on a system. Any other MSCP controllers on the system will have to be in the floating address space of the IO page. The default vector address is 154 any other value between 0 777 could be used but is not suggested. If you want the default answers then just hit the "return" key on the keyboard.

Typical Diagnostic Script:

```
boot up XXDP
.RUN ZRQC??
ZRQCA0.BIN

DRSXM-A0
ZRQC-A-0
RQDX3 Disk Format Utility
Unit is RD51,RD52,RD53,or RQDX3 Proto-type Winchester drive
Restart Address is 141656
DR>START

Change HW ? Y
# Units ? 1

IP Address 172150 ? <rtm>
Vector address 154 ? <rtm>
```

After these questions have been answered more questions will be asked as long as manual intervention is allowed on the system. If no manual intervention is allowed the diagnostic will return without formatting the drive.

2.3.2 MANUAL QUESTIONS FROM CONTROLLER FIRMWARE

Manual Questions are asked from inside the diagnostic and are not part of the P table as described in the DRS programmers guide. The first question and the UIT table questions are asked by the host program all other questions are asked by the RQDX3's firmware. For purposes of international support these questions given by the controller are not used but a message number return along with the question is used to look up the translated question contained in this diagnostic. If the message number is unknown the ASCII data is printed out as is in English. To turn off controller reported messages just set the IXE flag in the diagnostic monitor. Below is a script of the manual questions asked. Depending on how certain questions are answered will depend on what questions will be asked.

Text printed, Questions asked ,and replies:

```
MSCP Controller model # : 019
Microcode version # : 001
```

175
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Every MSCP controller has a model number. The RQDX3s model number is 19. The RQDX1 model number is 7. This also reports the microcode revision number.

What local program do you want to run (A) FORMAT ?

This question asks what controller local program you want to run. Usually if not always we will want to run FORMAT. If you get curious you can write DIRECT which is a controller local program which list all the controller local programs. The default is to run the local program FORMAT. At the prompt just hit "return".

Enter date <MM-DD-YYYY>: (A) ? current date

There is no default to the date question. You must use the appropriate form to answer the date. If not the question will be asked again until it is in the correct form.
EXAMPLE 12-12-1985

Enter unit number to format <u>: (A) ?

The default unit number is unit or physical drive zero. If the drive you want to format is other than drive 0 then make sure you type the number followed by a carriage return.

Use existing Bad Block Information <N> ?

The default is no which is probable the best choice. To use the existing information would only clean the drive up and not possible correct all the problems.

Use Down Line Load <N> ? Y

If this is a drive straight from the manufactures or taken from an old RQDX1/2 system then you want to answer Y to this question. If this is a reformat of a drive that was already formatted on a RQDX3 system before then a N maybe answered to this question.

If a N is answered no UIT questions will appear. However if a Y is answered then a UIT table must be chosen according to the drive name or a UIT table built by answering about 20 questions on the drive's parameters. This questions will described in the next section.

Continue if Bad Block Information is inaccessible <N>? Y

The default to this question is N. I always answer Y. If the bad block information can not be found you still want to format your drive. For this reason I always pick Y. In most cases the manufacturing tables should be there unless you have a Proto-type drive.

Enter serial number <9 digits> ? 123456789

This question has no default. A serial number should be picked for the drive that is different then another drive on the system. This number

should be non-zero.

2.3.3 UIT TABLES

The UIT tables are stored in this program. There are 7 large data tables formed in this diagnostic that contain the drive parameters for certain DEC drives. There are only 4 RQDX3 Winchester drive manufactures. So only 4 of the tables contain any information. The others are there for future drives. If Yes is answered to the Down Line Load question then a table will be DMAed to the disk controller. The User will pick from a table the UIT number that represents the disk drive to be formatted as shown below. If the user chooses "other" then the user will have to answer all the parameter questions on his own.

Unit Information Tables listed:

Enter UIT:

UIT Drive Name

```

0: -----
1: RD51
2: RD52 part # 30 21721-02 (1 light on front panel)
3: RD52 part # 30-23227-02 (2 lights on front panel)
4: RD53
5:
6:
7:
10: other

```

Enter Unit Identifier Table (UIT) (0) ?

If you know the name of the drive then just enter the number representing the drive name. If you have a proto type drive then enter "10" representing OTHER.

Unit Information/parameter questions, used to build a UIT:

If you entered 10 in the above question you will have to answer the following questions. Note all the values entered

```

289 Media (lo wrd) (0) value ?
290 Media (hi wrd) (0) value ?
291 Sector Interleave (n-to-1) (0) value ?
  92 Surface to Surface Skew (0) value ?
293 Cylinder to Cylinder Skew (0) value ?
294 Gap size 0 (0) value ?
295 Gap size 1 (0) value ?
296 Gap size 2 (0) value ?
297 Gap size 3 (0) value ?
298 Sync size (0) value ?
299 MSCP cylinders per Unit (0) value ?
300 MSCP Groups per Cylinder (0) value ?
301 MSCP Tracks per Group (0) value ?
302 Max allowed bad spots per surface (0) value ?
303 Bad spot tolerance (bytes) (0) value ?
304 -----BLANK0----- (0) value ?
305 -----BLANK1----- (0) value ?
306 -----BLANK2----- (0) value ?
307 -----BLANK3----- (0) value ?
308 -----BLANK4----- (0) value ?
309 -----BLANK5----- (0) value ?
310 -----BLANK6----- (0) value ?
311 -----BLANK7----- (0) value ?
312
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330
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345

```

There are many questions to build a UIT table. These questions were added mainly to help the engineers use new drives and come up with proper parameters that would optimize the drive to the controller. I would not suggest using this option unless you know MSCP and disk geometry very well. It is possible to patch in the default parameters into the table. The tables address is a UITDF: Once the defaults are patched in, parameters can be changed very easily.

2.4 PROGRAM MESSAGES AND FORMAT COMPLETION

When the format finally starts a "Format Beg

xxx Bad Blocks in the XBN area due to data errors
 xxx Blocks retired on check pass
 FCT was not used
 TEST UNIT xxxx was dropped
 pass aborted for this unit
 ZRQC EOP 1
 0 Cumulative errors

Note that every time the disk formats successfully the program drops the UNIT. This is purposely done so one doesn't reformat it twice.

2.5 EXECUTION TIME

The execution time for this diagnostic varies greatly according to the size of the drive being formatted. If an error in the drive configuration or state such as a write protect switch being on, an error will occur right after all the questions have been answered. If there are no errors the formatter will take between 5 minutes to 30 minutes depending on the drive being formatted. A RD51 takes between 5 & 13 minutes to format depending on the way questions are answered. A RD52 take between 10 & 25 minutes to format and a RD53 a very long time to format. The program checks continuously to make sure the controller is still working. If no progress is indicated by the progress indicator a timeout error will occur. If the disk controller goes off line for some unapparent reason the formatter will know. Either way if one checks the light on the Winchester to see if it is lite or check the READY light of the drive for a flickering light, this will tell the user that the formatter is working. When the formatter completes a "Format complete" message will appear on the terminal.

3. ERRORS

There are many types of errors possible while formatting a drive. First the system has to be configured right. The drives have to be jumpered right along with the disk controller. If you get an error read the entire error message carefully. See if there is something simple wrong such as loss and misconfigured drives before calling FS. This is usually the case very seldom do the drive or controller break. So check the cables, check the jumpers, try several times and if you still can't format then call Field Service.

403 3,SFT0 : "already active will do an ABORT cmd"
 404 Wrong controller or bad microcode controller error.
 405
 406 4,DF2 ;wrong step bit set after interrupt
 407 Controller initialization error. Controller is broken or at
 408 wrong address and something is in its place.
 409
 410 5,DF1 ;controller timeout during hard init
 411 Controller error, controller is slow or it can't interrupt the
 412 Q bus. Controller is dead.
 413
 414 6,SFT1 ;wrong model #,wrong controller
 415 This is not really an error. You are using the wrong formatter
 416 program to for the wrong disk controller. It still might work
 417 but no guarantees.
 418
 419 ,,DF4 ;NXM trap at controller IP address
 420 Wrong configuration address of the controller check for
 421 wrong jumper settings.
 422
 423 8,SF100 ;Unexpected interrupt
 424 Something in system interrupting or late interrupt. This
 425 could be the system clock or an interrupt from an IO port.
 426 If the interrupt is at address 4,10 probable a software error
 427 Try again.
 428
 429 9,DF12 ;Fatal SA error
 430 Controller crashed check detailed error message either dead
 431 controller or configuration error.
 432
 433 10,DF11 Bad response packet
 434 Inappropriate command or soft controller error check
 435 detail message for more info.
 436
 437 11,DF13 ;no progress shown after cmd timeout
 438 Format program crashed check drive & controller. The
 439 error is probable in the drive. Check drive, drive cables and
 440 connections. try again. If still a time out controller could
 441 have corrupt RAM or ROM memory.
 442
 443 1

program the INIT sequence brings the controller into the higher protocol state of running DUP commands. Once initialized the controller executed a GET DUST STATUS command to make sure the controller is in an Idle state. If idle which it should be the program asks for a program name to run. The EXECUTE LOCAL PROGRAM command is executed which should start the program into the DUP dialog loop. This dialog is described in the DUP spec. Here several SEND DATA and RECEIVE DATA commands are executed to ask questions and supply information on the success and completion of the local FORMAT program running in the RQDX3.

A pass will occur when the formatter has completed formatting all the logical units. If an error arises the program loops until either the formatter works successfully or a the disk controller is considered broken.

5. MODIFICATION OF UIT FOR ADDITIONAL DRIVES

If the user is interested in using there own drives they may patch this diagnostic by filling some of the spare tables with there own drive parameters for there own winchester drive. This is not suggested and DEC is not responsible for data lost on the drives because of incorrect parameters being submitted to the disk controller. The DRVTEXT location contains the ASCII data asking for the UIT number and the UIT0: thru UIT7: contain the actual UIT tables.

6.0 GLOSSARY

ZRQC follows the module name format described in the XXDP Programmer's Guide.

- RQ-- Identifies the hardware and thus the module.
- C Distiguishes between two or more different modules for the same generic device. The sequence A, B, C, ETC. must be used for each additional example.
- A Specifies the module revision.

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517

518

)s

```
520
521      .MCALL SVC
522 000000 SVC
523 000000 .ENABLE ABS,AMA
524      002000 .=2000
525 002000 BGNMOD MOD1
526 002000 POINTER BGNDU,BGNCLN,BGNPROT
527 002000 HEADER TRQC,A,0,600,0
528 002122 DISPATCH 1
529 002126 DESCRIPT <RQDX3 D sk Format Utility>
530 002160 DEVTYPE <RD51,RD52,RD53,or Proto-type Winchester drive>
531
```

N1

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SEQ 0013

```
533 002236          BGNHW DFPTBL
534 002240 172150      .WORD 172150
535 002242 000154      .WORD 154
536 002244 100002      .WORD 100002
537
538 002246          ENDHW
539
```

```
;IP address
;Vector address
;Unit identifier number rd51=1 rd52=2 rd53=3
;bit 15 says it is from the Unit Identifier table
```

541 002246

EQUALS

; BIT DEFINITIONS

```

100000 BIT15== 100000
040000 BIT14== 40000
020000 BIT13== 20000
010000 BIT12== 10000
004000 BIT11== 4000
002000 BIT10== 2000
001000 BIT09== 1000
000400 BIT08== 400
000200 BIT07== 200
000100 BIT06== 100
000040 BIT05== 40
000020 BIT04== 20
000010 BIT03== 10
000004 BIT02== 4
000002 BIT01== 2
000001 BIT00== 1

```

```

001000 BIT9== BIT09
000400 BIT8== BIT08
000200 BIT7== BIT07
000100 BIT6== BIT06
000040 BIT5== BIT05
000020 BIT4== BIT04
000010 BIT3== BIT03
000004 BIT2== BIT02
000002 BIT1== BIT01
000001 BIT0== BIT00

```

; EVENT FLAG DEFINITIONS

; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION

```

000040 EF.START== 32. ; BIT POSITION IN SECOND STATUS WORD
000037 EF.RESTART== 31. ; (100000) START COMMAND WAS ISSUED
000036 EF.CONTINUE== 30. ; (040000)
```

```

000010      LOT==      10
000020      ADR==      20
000040      IDU==      40
000100      ISR==     100
000200      UAM==     200
000400      BOE==     400
001000      PNI==    1000
002000      PRI==    2000
004000      IXE==    4000
010000      IBE==   10000
020000      IER==   20000
040000      LOE==   40000
100000      HOE==  100000
542          .bttl Literals
543
544          ;*
545          ; Mask values to mask out specified flags
546          ;--
547      000010      UITothr = 10          ;UIT other
548                                     ;if UIT doesn't exist
549
550      000144      UIIsiz  = 144         ;UIT size
551
552          ;*
553          ; Misc.
554          ;--
555      000004      MaxDrv  = 4           ;Maximum Number of drives
556      000002      DUP.id  = bit1       ;DUP connection ID
557      000007      Mrqdx1  = 7.         ;model number for RQDX1
558      000023      Mrqdx3  = 19.        ;model number for RQDX3
559      000001      stdaln  = bit0
560
561          ;*
562          ; Opcodes for DUP commands
563          ;--
564      000001      op.gds   = 1
565      000006      op.abrt  = 6
566      000004      op.en   = 4
567      000005      op.rec   = 5
568      000003      op.elp   = 3
569      000002      op.esr   = 2
570      000200      op.end  
```

Macro

```

582      .sbt1 Macro
583      ;
584      ; Execute a GET DUST STATUS command and the check the response.
585      ;
586      A=0
587      B=1
588      .MACRO GETDUST      ;Execute a GET DUST STATUS command
589      B=B+1              ;increment the CRN number
590      gdstmp \B          ;call variable B as if it where a number (\)
591      .ENDM
592
593      .MACRO GDSTMP B
594      .list
595      GDS'B: bit    #bit15,cmdlen+2      ;test ownership of ring make sure we own it
596      bne    GDS'B      ;if we don't own it wait until we do
597      mov    #14.,cmdlen      ;load lenght of packet to be send
598      movb   #0,cmdlen+2      ;load msg type and credit
599      movb   #dup.id,cmdlen+3  ;load DUP connection ID
600      inc    cmdpak          ;load new CRN
601      clr    cmdpak+2
602      clr    cmdpak+4
603      clr    cmdpak+6
604      mov    #op.gds,cmdpak+10      ;load up opcode
605      clr    cmdpak+12      ;no modifiers
606
607      mov    #RFD'B,@vector      ;NEW VECTOR PLACE
608      mov    #rsppek,rsprng      ;load response packet area into ring
609      mov    #cmdpak,cmdrng      ;load command packet area into ring
610      mov    #140000,RSPRNG+2    ;PORT OWNERSHIP BIT.
611      mov    #bit15,CMDRNG+2
612      jsr    pc,POLL.WT          ;GO TO POLL AND WAIT ROUTINE.
613      ;*****
614      RFD'B:      ;INTR TO HERE.
615      mov    #intsrvc,@vector    ;CHANGE VECTOR
616      jsr    pc,R
```

Macro

```

639          inc      cmdpak          ;load new CRN
640          clr      cmdpak+2
641          clr      cmdpak+4
642          clr      cmdpak+6
643          mov      #op.abrt,cmdpak+10 ;load up opcode
644          clr      cmdpak+12        ;no modifiers
645
646          mov      #RFD'B,@vector   ;NEW VECTOR PLACE
647          mov      #rsppak,rsprng   ;load response packet area into ring
648          mov      #cmdpak,cmdrng   ;load command packet area into ring
649          mov      #140000,RSPRNG+2 ;PORT OWNERSHIP BIT.
650          mov      #bit15,CMDRNG+2
651          jsr      pc,POLLWT        ;GO TO POLL AND WAIT ROUTINE.
652          ;*****
653          RFD'B:                    ;INTR TO HERE.
654          mov      #intsrv,@vector   ;CHANGE VECTOR
655          jsr      pc,RSPCHK
656
657          ;GO TO ROUTINE THAT WILL CHECK ON
658          ;THE RESPONSE RECVD FROM THE MUT.
659          ;IT WILL CHECK THE CMD REF
660          ;NUM, THE ENDCODE AND STATUS.
661          .nlist
662          .ENDM
663
664          ;+
665          ; Execute a Send data cmd in dup and then check the response for the proper info
666          ; -
667
668          .MACRO SENDDAT SPLACE,SBYTCN ;Execute a Send Data command
669          B=B+1                       ;increment the CRN number
670          sendtmp \B,SPLACE,SBYTCN    ;call variable A,B as if it where a number (\)
671          .ENDM
672
673          .MACRO SENDTMP B,SPLACE,SBYTCN
674          .list
675          SDT'B: bit      #bit15,cmdlen+2 ;test ownership of ring make sure we own it
676                  bne    
```

Macro

```

696      mov      #rsppak,rsprng      ;load response packet area into ring
697      mov      #cmdpak,cmdrng      ;load command packet area into ring
698      mov      #140000,RSPRNG+2    ;PORT OWNERSHIP BIT.
699      mov      #bit15,CMDRNG+2
700      jsr      pc,POLLWT            ;GO TO POLL AND WAIT ROUTINE.
701      ;*****
702      RFD'B:                          ;INTR TO HERE.
703      mov      #intsrv,@vector      ;CHANGE VECTOR
704      jsr      pc,RSPCHK
705      ;GO TO ROUTINE THAT WILL CHECK ON
706      ;THE RESPONSE RECVD FROM THE MUT.
707      ;IT WILL CHECK THE CMD REF
708      ;NUM, THE ENDCODE AND STATUS.
709      .nlist
710      .ENDM
711
712      ;+
713      ;      Execute a Receive Data command and the check the response.
714      ;-
715      .MACRO  RECVDAT Rplace,Rbytcnt ;Execute a Send Data command
716      B=B+1                          ;increment the CRN number
717      recvtmp \B,Rplace,Rbytcnt      ;call variable A,B as if it where a number (\)
718      .ENDM
719
720      .MACRO  RECVTMP B,Rplace,Rbytcnt
721      .list
722      RCD'B:  bit      #bit15,cmdlen+2      ;test ownership of ring make sure we own it
723      bne     RCD'B      ;if we don't own it wait until we do
724      mov     #34,cmdlen      ;load lenght of packet to be send
725      movb    #0,cmdlen+2      ;load msg type and credit
726      movb    #dup.id,cmdlen+3    ;load DUP connection ID
727      inc     cmdpak          ;load new CRN
728      clr     cmdpak+2
729      clr     cmdpak+4
730      clr     cmdpak+6
731      mov     #op.rec,cmdpak
```

Macro

```

753                                     ;GO TO ROUTINE THAT WILL CHECK ON
754                                     ;THE RESPONSE RECVD FROM THE MUT.
755                                     ;IT WILL CHECK THE CMD REF
756                                     ;NUM, THE ENCODE AND STATUS.
757                                     .nlst
758                                     .ENDM
759
760
761
762                                     ;+
763                                     ; Execute a Receive Data command and the check the response.
764                                     ;-
765                                     .MACRO EXLCPRG Enamadr          ;Execute a Send Data command
766                                     B=B+1                        ;increment the CRN number
767                                     elptmp \B,Enamadr            ;call variable A,B as if it where a number (\)
768                                     .ENDM
769
770                                     .MACRO ELPTMP B,Enamadr
771                                     .list
772                                     ELP'B: bit #bit15,cmdlen+2      ;test ownership of ring make sure we own it
773                                     bne ELP'B                    ;if we don't own it wait until we do
774                                     mov #22,cmdlen              ;load lenght of packet to be send
775                                     movb #0,cmdlen+2            ;load msg type and credit
776                                     movb #dup.id,cmdlen+3        ;load DUP connection ID
777                                     inc cmdpak                  ;load new CRN
778                                     clr cmdpak+2
779                                     clr cmdpak+4
780                                     clr cmdpak+6
781                                     mov #op.elp,cmdpak+10        ;load up opcode
782                                     mov #stdaln,cmdpak+12        ;stand alone modifier
783                                     mov #6,r0                   ;6 letters transfer
784                                     mov #cmdpak+14,r1            ;starting address to place program name
785                                     mov #Enamadr,r2             ;start of Program Name
786                                     rfdj'B: movb (r2)+,(r1)+      ;add 2 to bycnt then store
787                                     sob r0,rfdj'B
788
789                                     mov
```

Word & Buffer definitions

```

807      .sbt1 Word & Buffer definitions
808
809 002246 000000 LOGUNIT: .WORD ;logunit number
810 002250 000000 LOCAL: .WORD ;
811 002252 000000 PLOC: .WORD ;p table address
812 002254 000000 ptbl: .WORD ;p table address
813 002256 000000 UITadr: .word
814
815      ;+
816      ; These next locations may be altered to supply the correct IP & SA address
817      ; If only 1 jumper is to be placed on the MUT the locations should be filled
818      ; with addresses 177770 and 177772 respectively.
819      ;-
820 002260 000000 IPreg: .WORD 0 ;ADDRESS OF THE SA AND IP
821 002262 000000 Vector: .word 0
822 002264 000000 UIN: .word 0
823
824 002266 RSP1: .BLKW 2 ;RESPONSE PACKET LENGTH
825 002272 RSPPAK: .BLKW 30. ;RESPONSE PACKET
826 002366 CMDLEN: .BLKW 2 ;COMMAND PACKET LENGTH
827 002372 CMDPAK: .BLKW 20. ;COMMAND PACKET
828
829 002442 000000 CINTR: .WORD 0 ;COMMAND INTERRUPT INDICATOR
830 002444 000000 RINTR: .WORD 0 ;RESPONSE INTERRUPT INDICATOR
831 002446 002272 RSPRNG: .word rsppak ;MESSAGE RING
832 002450 140000 .word 140000
833 002452 002372 CMDRNG: .word cmdpak ;COMMAND RING
834 002454 100000 .word 100000
835 002456 177777 .WORD -1
836
837 
```

Word & Buffer definitions

	002571	062	063	064	
	002574	065	066	067	
	002577	070	071	060	
	002602	061	062	063	
	002605	064	065	066	
	002610	067	070	071	
	002613	060	000		
844					.even
845	002616	106	117	122	PRGnam: .ascii /FORMAT/ ;address of local format program name
	002621	115	101	124	
846	002624	000			.byte 0 ;null for asciz
847					.even
848					

DISK UNIT INFORMATION TABLE

```

850 .sbt1 DISK UNIT INFORMATION TABLE
851 ;*
852 ; The following tables are made up of disk drive parameters which will be
853 ; feed to the FORMAT controller local program which will then use the
854 ; information to format the drives.
855 ;-
856 .=3000
857 003000
858
859 Unit Information table RD51 Seagate
860 ;-
861
862 003000 000071 .word 57. ;/*Top of Unit Information table (UIT)
863 003002 000000 .word 0 ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
864 003004 000127 .word 87. ;/XBN size (hi wrd)/
865 003006 000000 .word 0 ;/DBN size (lo wrd)/
866 003010 052360 .word 21744. ;/DBN size (hi wrd)/
867 003012 000000 .word 0 ;/LBN size (lo wrd)/
868 003014 000220 .word 144. ;/LBN size (hi wrd)/
869 003016 000000 .word 0 ;/RBN size (lo wrd)/
870 003020 000022 .word 18. ;/RBN size (hi wrd)/
871 003022 000004 .word 4. ;/Sectors per track/
872 003024 000462 .word 306. ;/Surfaces per unit/
873 003026 000156 .word 110. ;/Cylinders per unit/
874 003030 000462 .word 306. ;/Write precomp cylinder/
875 003032 000000 .word 0 ;/Reduce write current cylinder /
876 003034 000001 .word 1 ;/Seek Rate/
877 003036 000044 .word 36. ;/Use CRC or ECC/
878 003040
```


DISK UNIT INFORMATION TABLE

1249	004464	001000	.word	512.	;/Cylinders per unit/
1250	004466	000400	.word	256.	;/Write precomp cylinder/
1251	004470	001000	.word	512.	;/Reduce write current cylinder /
1252	004472	000000	.word	0	;/Seek Rate/
1253	004474	000001	.word	1	;/Use CRC or ECC/
1254	004476	000004	.word	4	;/RCT Size/
1255	004500	000003	.word	3	;/Number of RCT copies/
1256	004502	040064	.word	†B0100000000110100	;/Media (lo wrd)/
1257	004504	022544	.word	†B0010010101100100	;/Media (hi wrd)/
1258	004506	000001	.word		

FORMAT Messages

```
1538
1539 020522 effcrt: ;.byte 17...a.fat ; FCT read error (fat #17)
1540 020522 .asciz 'N%AFCT read error'
1541
1542 020545 effcnt: ;.byte 18...a.fat ; FCT nonexistent error (fat #18)
1543 020545 .asciz 'N%AFCT nonexistent'
1544
1545 020571 effcdt: ;.byte 19...a.fat ; FCT downline load error (fat #19)
1546 020571 .asciz 'N%AFCT Down-line load error'
1547
1548 020626 eftmot: ;.byte 20...a.fat ; Drive timeout error (fat #20)
1549 020626 .asciz 'N%ADrive init timeout'
1550
1551 020655 efillt: ;.byte 21...a.fat ; Illegal response error (fat #21)
1552 020655 .asciz 'N%AIlegal response to start-up question'
1553
1554 020727 efwart: ;.byte 22...a.fat ; Head error (fat #22)
1555 020727 .asciz 'N%AWARNING - possible head addressing problem - run diagnostics'
1556
1557 021030 efinpt: ;.byte 23...a.fat ; Input error (fat #23)
1558 021030 .asciz 'N%AINPUT Error '
1559
1560 021051 efmedt: ;.byte 24...a.fat ; Media error (fat #24)
1561 021051 .asciz 'N%AMedia degraded'
1562 .list bin
1563 .EVEN
```


Global subroutines

```
2068 025770          ENDAUTO
2069
2070 025772          BGNCLN
2071 025772 005077 154262      clr      @IPreg      ;get controller into know state
2072 025776          Break      ;waste some time
2073 026000          ENDCLN
2074
2075 026002          BGNDU
2076 026002          printf #DRPunt,LOGUNIT
2077 026026          ENDDU
2078
```


Global subroutines

```

2515 032410      BGNHRD
2516
2517 032412      GPRMA ip.adr,0,0,170000,177776,YES ;GET IP REG ADDR (170000 177776)
2518                                           ;PLACE IN WORD 2 OF THE TABLE
2519                                           ;DEFAULT VALUE IS FROM DEFAULT
2520                                           ;TABLE.
2521
2522 032422      GPRMA vec.adr,2,0,0,776,YES ;GET THE VECTOR ADDR (OCTAL 0-776)
2523                                           ;PLACE IN WORD
2524                                           ;DEFAULT VALUE IS FROM DEFAULT
2525                                           ;TABLE.
2526
2527
2528 032432      hrdbtm:
2529 032432      ENDHRD
2530
2531
2532 032432      LASTAD
2533 032436      L$LAST::
2533 032436      BGNSETUP      1      ;number of default P-tables used 4 incase of running setup with all
units
2534 032436      BGNPTAB      ;Ptable default number 0
2535 032442      172150      .WORD      172150      ;JP address
2536 032444      000154      .WORD      154      ;Vector address
2537 032446      100002      .WORD      100002      ;Unit indentifier number rd51=1 rd52=2 rd53=3
2538                                           ;bit 15 says it is from the Unit Identifier table
2539 032450      ENDPTAB
2540 032450      ENDMOD
2541      000001      .END

```


