

Micro Fiche Scan

Name of device(s) tested:

RD31/51/52/53/54,RQDX3,RX33

Test description:

RQDX3 FORMATTER

MAINDEC Number or Package Identifier (after SEP 1977):

CZRQCC0

Fiche Document Part Number:

AH-U110C-MC

Fiche preparation date unknown, using copyright year:

1986

Image resolution:

8-bit gray levels, max. quality for archiving

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.REM #C

IDENTIFICATION

PRODUCT CODE: AC-U109C-MC
PRODUCT NAME: CZRQCC0 RQDX3 FORMATTER
PRODUCT DATE: JUNE 6, 1986
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: Richard Dietz

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1.0 ABSTRACT

This formatter was written to format Winchester drives attached to the RQDX3 disk controller. All new drives being attached to the RQDX3 controller must be formatted so that the drive can be brought online for use by a MSCP server or in simpler terms to 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 disk formatting parameters is passed to the controller. The RQDX1/2 disk controller already has these tables in its firmware.

The format program actual has 2 controller run programs in it. If the controller is an RQDX3, the program will down line load a program into the controller which will identify the drive according to its cylinder size. Since each of the DEC drives have a differnt cylinder size it will know which drive it is and therefore which parameter or UIT table to pass to the controller. The second program is already contained in the microcode. This program called "FORMAT" does the actual formatting of the drive. The host program just passes information back and forth to the controller local program.

The UIT, Unit Information Table is picked by the down line loaded auto sizer program (AUTOSZ). After the drive is known the format program will be run on the controller. This format program (FORMAT) is very similiar to the RQDX1/2 format program. The only difference as stated before is that the UIT will be down line loaded into the drive if the down line load question is asked. Every time the drive is brought on line the UIT table which was placed on the drive by this formatter program will be transfered into the controller with all the drive parameters. 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 UIT table be passed to the drive. Note the RX33 floppy drive does not use the UIT tables. The RX33 drive parameters are stored in the firmware so a table wasn't necessary.

The UIT table contains information about the drive such as size, number of tracks per surface, etc. This information is already know for certain DEC acquired Winchester drives. These tables are usually different for the different drives manufactured. CAUTION - do not use non DEC drives you are liable to destroy Format and Data stored on them.

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

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An RQDX3 disk controller and one or more Winchester or RX33 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. It is also possible to run the formatter under APT.

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 0-774 could be used but is not suggested. If you want the default answers then just hit the "return" key on the keyboard. The Formatter will run an auto sizer to determine the proper drive characteristic table to give to the controller. This auto sizer will figure out how many cylinders on the drive and through a small look up table we decide which table to down-line load to the RQDX3 controller. The user will have to enter a drive number and a serial number. After this a warning message will appear asking if the user wants to proceed. The default is no so the/ user must type "Y" in order to format his drives.

Typical Diagnostic Script:

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

DRSXM-A0
ZRQC-C-0
RQDX3 Disk Park\Format Utility
Unit is RD51,RD52,RD53,RD54,RX33,RD31           Please type yes to "Change HW?"
Restart Address is 141656
DR>START

Change HW ? Y
# Units ? 1

IP Address 172150 ? <rtn>
Vector Address 154 ? <rtn>
Just Park heads N ? <rtn>
Logical Drive (0-255) 0 ? <rtn>
Drive Serial Number(1-32000) 12345 ? <rtn>

***** WARNING all the data on this drive will be DESTROYED *****

Proceed to format the drive N ? <Y><rtn>
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2.3.2 UIT TABLES

The UIT tables are stored in this program. There are 10 large data tables formed in this diagnostic that contain the drive parameters for certain DEC drives. There are only 6 RQDX3 Winchester drive manufactures. So only 6 of the tables contain any information. The others are there for future drives. The AUTOSZ program ran previous to the FORMAT program will determine what type of drive is to be formatted and which table to pass to the disk controller. Once in the disk controller the table will be written to the disk drive. This table should never be erased unless the drive is broken or format is run again.

NOTE this is only for the RQDX3 disk controller and NOT for the RQDX1/2.

Unit Information Tables listed:

Enter UIT:
UIT Drive Name

UIT	Drive Name
0:	RD51
1:	RD52 part # 30-21721-02 (1 light on front panel)
2:	RD52 part # 30-23227-02 (2 lights on front panel)
3:	RD53
4:	RD31
5:	RD54
6:	
7:	
10:	

2.4 PROGRAM MESSAGES AND FORMAT COMPLETION

When the format finally starts a "Format Begun" message will appear and in the end a "Format Complete" message will appear. There may be 60+ minutes between the messages. If the extended messages are allowed 3 "Verification Pass XXXXXX Begun" messages may appear. These messages tell when the controller checks the blocks for bad spots in the disk surface. These passes take several minutes each and touch all the cylinders on the drive. At the end of the format if extended messages are on a table will be printed out reporting the results of the format. Usually there are several bad spots on a disk. This is very common and is NOT a mistake. These bad blocks are revectorred to new areas on the disk. If the manufactures bad block information is used which is usually the case. There will only be 1 verification pass. After the drive formats the autosizer program will be run again. This will park the heads on the inner most cylinder. Some manufactures have a parking area where the heads are placed before the drive is physically moved or shipped to the customer. If you plan on moving your system you should backup your system and run the formatter to put the heads on the parking area. This will help prevent damage to the heads and formatted data surfaces.

Completion Report:

xxx Revectorred LBNS
xxx Primary revectorred LBNS

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xxx Secondary/tertiary revectorred LBNs
xxx Bad Blocks in the RCT area due to data errors
xxx Bad Blocks in the DBN area due to data errors
xxx Bad Blocks in the XBN area due to data errors
xxx Blocks retired on check pass

FCT was not used
Format Completed

RQDX Drive xxxx finished
PLEASE wait Parking drive heads

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.

RX33 diskette formatting is a little varied in that several extra questions will be asked. These questions were installed mainly to protect the person trying to format a diskette on the same drive as their boot media. If the drive doing the formatting is not the boot drive then please ignore the warnings.

WARNING - Remove boot diskette if in drive.
Insert a diskette to be formatted & press <RETURN>.

Format Complete
FCT was not used
Format completed

Do you want to format another diskette?

If boot drive, reinsert boot diskette & press <RETURN>.

RQDX Drive xxxx finished
pass aborted for this unit
ZRQC EOP 1
0 Cumulative errors

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 60 minutes depending on the drive being formatted. A RD51 takes between 10 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

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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.

error #	Comment	Problem
0,SF0	;unkown response	Not a DUP standard local program or Data Error in local program execution.
1,HRD0	;Fatal DUP type returned	Error with Format program check detailed error message more then likely this will be a drive error or drive configuration error. If the detailed message has a GET STATUS error. This means that the drive you asked to format had the wrong status. Example offline,write protected, RX50 instead of an RDxx, power plug us loose, jumpers are wrong.
2,DF3	;Can't do remote programs"	Wrong controller or bad microcode controller error.
3,SFT0	;"already active will do an ABORT cmd"	Wrong controller or bad microcode controller error. The controller was expected to be in an idle state but was found in an active state. Try again and if still there check for ECOs and new Microcode.
4,DF2	;wrong step bit set after interrupt	Controller initialazation error. Controller is broken or at wrong address and something is in its place.
5,DF1	;controller timeout during hard init	Controller error, controller is slow or it can't interrupt the Q bus. Controller is dead.
6,SFT1	;wrong model #,wrong controller	This is not really an error. You are using the wrong formatter program to for the wrong disk controller. It still might work but no guarantees.
7,DF4	;NXM trap at controller IP address	Wrong configuration address of the controller check for wrong jumper settings.
8,SF100	;Unexpected interrupt	

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Something in system interrupting or late interrupt. This could be the system clock or an interrupt from an IO port. If the interrupt is at address 4,10 probable a software error Try again.

- 9,DF12 ;Fatal SA error
Controller crashed check detailed error message either dead controller or configuration error.
- 10,DF11 ;Bad response packet
Inapropriate command or soft controller error check detail message for more info.
- 11,DF13 ;no progress shown after cmd timeout
The controller didn't indicate progress which means that it is working very slow or is stuck. Leave the program running for a couple minutes. If this message repeats then the drive is likely broken. If you just get 1 message it is possible the controller took to long to revector a block. This is probable a drive error or a drive with many revector blocks.
- 12,DF14 ;no iterrupt after get dust status command controller dead
The controller got lost. The program running in the controller got out of synch with the host program. This could mean several things. Check for a loose controller board loose cables. Try running again after rebooting the system. If you still get the error check the controller.

4. PROGRAM DESIGN AND FLOW

The program is kind of simple. There is only 1 command ring and 1 response ring. For every command send there is expected 1 response. If the command sent times out a "Get DUST Status" command is sent to check on the controllers progress. This usually happens when the actual format is being done. The rest of the commands pass information back and forth from the user to the controller and back with out ever timing out. This program is written according to UQSSP and DUP specs. This specs can be acquired from NEWTON::ARCH\$FILES:. At the start of the 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.

5.0 GLOSSARY

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ZRQCc0 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
diagnostics for the same generic device. The
sequence A, B, C, ETC. must be used for
each additional diagnostic.

---c- Specifies the module revision.

----0 Specifies the number of patches.

7.0 BIBLIOGRAPHY

UQSSP (NEWTON::ARCH\$FILES:)

MSCP (NEWTON::ARCH\$FILES:)

DUP (NEWTON::ARCH\$FILES:)

DRS programmers manual (JON::disk\$user1:[diaglib.drs])

XXDP programmer guide (JON::disk\$user1:[diaglib.xxdp])

8.0 REVISION HISTORY

Revision B contains an autosizing routine which will
size the drive instead of having the user pick the drive table.
This will keep people out of the systems and lower the changes
of loose cables etc. Also added a AUTO mode which allows no manual
interventions. Set up the default p-table to format drive 0-3.
Since floppies are always the last drive in the system this is
gauranteed to format all the drive in the system and error when it
gets to the floppy.

Revision C contains several changes. First RX33,RD31,RD54 support was
added. The RX33 boot device questions where added. The autosizer was
fixed to also size for floppies. The Autosizer errors are now reported
to the host along with what drives are located on what units and there
drive size or floppy type. The default question in manual mode was
changed so that if an FCT (factory control table) is not present
"Bad Block Information" it will not continue on. This was changed for
all drives except the RD51 which doesn't have a FCT table. Also there
was a small change to the autosizer which affects version C1 hardware
etched RQDX3 boards specially the ones without the LUN ECO. The autosizer
now run in the beginning and the end. A head parking feature was added
so that RD31 and RD32 heads would be parked in the inner most cylinder
upon completion of the program. The autosizer utility was updated to
displays a little more information.

)*

K1

```
454  
455 .MCALL SVC  
456 000000 SVC  
457 000000 .ENABLE ABS,AMA  
458 000052 000052 .=52  
459 000052 010000 .word bit12 ;extended monitor in XXDP  
460 002000 002000 .=2000  
461 002000 BGNMOD MOD1  
462 002000 POINTER BGNDU,BGNCLN,BGNPROT,BGNSETUP  
463 002000 HEADER ZRQC,C,0,600,0  
464 002122 DISPATCH 1  
465 002126 DESCRIPT <RQDX3 Format\Park Disk Utility>  
466 002166 DEVTYPE <RD51,RD52,RD53,RD31,RD54,RX33 *** Answer "Y" to "Change HW (L) ?" ***>  
467
```

L1

469 002274
470 002276 172150
471 002300 000154
472 002302 000000
473 002304 030071
474 002306 100000
475 002310
476

BGNHW DFPTBL
.WORD 172150
.WORD 154
.WORD 000000
.WORD 012345.
.word 100000
ENDHW

;IP address
;Vector address
;unit zero as default drive
;serial number
;auto sizer="yes", warning="no" or don't continue

478 002310

```

                                EQUALS
                                ;
                                ; BIT DIFINITIONS
                                ;
                                BIT15== 100000
                                BIT14== 40000
                                BIT13== 20000
                                BIT12== 10000
                                BIT11== 4000
                                BIT10== 2000
                                BIT09== 1000
                                BIT08== 400
                                BIT07== 200
                                BIT06== 100
                                BIT05== 40
                                BIT04== 20
                                BIT03== 10
                                BIT02== 4
                                BIT01== 2
                                BIT00== 1
                                ;
                                BIT9== BIT09
                                BIT8== BIT08
                                BIT7== BIT07
                                BIT6== BIT06
                                BIT5== BIT05
                                BIT4== BIT04
                                BIT3== BIT03
                                BIT2== BIT02
                                BIT1== BIT01
                                BIT0== BIT00
                                ;
                                ; EVENT FLAG DEFINITIONS
                                ; EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                ;
                                ;
                                ; BIT POSITION IN SECOND STATUS WORD
                                ; (100000) START COMMAND WAS ISSUED
                                ; (040000) RESTART COMMAND WAS ISSUED
                                ; (020000) CONTINUE COMMAND WAS ISSUED
                                ; (010000) A NEW PASS HAS BEEN STARTED
                                ; (004000) A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
                                PRI07== 340
                                PRI06== 300
                                PRI05== 240
                                PRI04== 200
                                PRI03== 140
                                PRI02== 100
                                PRI01== 40
                                PRI00== 0
                                ;
                                ; OPERATOR FLAG BITS
                                ;
                                EVL== 4

```

```

000010      LOT==      10
000020      ADR==      20
000040      IDU==      40
000100      ISR==     100
000200      UAM==     200
000400      BOE==     400
001000      PNT==    1000
002000      PRI==    2000
004000      IXE==    4000
010000      IBE==   10000
020000      IER==   20000
040000      LOE==   40000
100000      HOE==  100000
479          .sbttl Literals
480
481          ;+
482          ; Mask values to mask out specified flags
483          ;-
484          000010      UITothr = 10          ;UIT other
485                                     ;if UIT doesn't exist
486
487          ;+
488          ; Misc.
489          ;-
490          000004      MaxDrv = 4          ;Maximum Number of drives
491          000002      DUP.id = bit1      ;DUP connection ID
492          000007      Mrqdx1 = 7.        ;model number for RQDX1
493          000023      Mrqdx3 = 19.       ;model number for RQDX3
494          000001      stdaln = bit0      ;stand-alone modifier
495          000367      retry = 367        ;Number of retries UDC
496
497          ;+
498          ; Opcodes for DUP commands
499          ;-
500          000001      op.gds = 1
501          000006      op.abrt = 6
502          000004      op.sen = 4
503          000005      op.rec = 5
504          000003      op.elp = 3
505          000002      op.esp = 2
506          000200      op.end = 200
507
508          ;+
509          ; Message type masks
510          ;-
511          000001      Question = 1
512          000002      DefQuest = 2
513          000003      inform = 3
514          000004      terminat = 4
515          000005      ftlerr = 5
516          000006      specl = 6
517
518          type = 177760
519          msgnbr = 170000
520
521          ;+
522          ;Auto sizer literals
523          ;-
524          ; Interrupt Service Routines and Priority Levels

```

Literals

```

523
524      100002      ;$udc = 100002      ; Pointer to UDC interrupt handler
525      100006      ;$clk = 100006      ; Pointer to Clock interrupt handler
526      100016      ;$sec = 100016      ; Pointer to Sector Done Interrupt handler
527      000000      ps0 = 0              ; Allow Any Interrupts
528      000340      ps7 = 340           ; Inhibit Interrupts
529
530      ; CSRs
531
532      140002      rw$pll = 140002      ;
533      140004      w$fpl = 140004      ;
534      140006      r$fps = 140006      ;
535      140010      r$dat = 140010      ;
536      140012      r$cmd = 140012      ;
537      140020      w$dat = 140020      ;
538      140022      w$cmd = 140022      ;
539
540      ; RECEIVE DATA ASCII reply message types:
541
542      000020      .a.typ = 20           ; ASCII Message Type Multiplier
543      000020      .a.que = 1*.a.typ    ; Question
544      000040      .a.def = 2*.a.typ    ; Default question
545      000060      .a.inf = 3*.a.typ    ; Information
546      000100      .a.ter = 4*.a.typ    ; Termination
547      000120      .a.fat = 5*.a.typ    ; Fatal error
548
549      ; RECEIVE DATA binary message types.
550
551      000140      .b.spl = 6*.a.typ     ; Special
552
553      ; Status Codes returned by SIZER (Success is zero)
554
555      000001      erudon = 1            ; UDC Never Done
556      000002      eruint = 2           ; UDC Never Interrupted
557      000003      ersek0 = 3           ; Couldn't Restore to Cyl 0
558
559      ; UDC Commands
560
561      000000      op.res = 0            ; Reset 9224
562      000001      op.dd = 1            ; Deselect Drive
563      000003      op.rd = 3            ; Restore Drive
564      000005      op.sil = 5           ; Step In One Cylinder
565      000007      op.sol = 7           ; Step Out One Cylinder
566      000044      op.srd = 44         ; Select Winchester Drive
567      000054      op.srx = 54         ; Select Floppy Drive
568      000100      op.srp = 100        ; Set Register Pointer
569      000300      rd.mode = 300       ; RD Mode
570
571

```

Macro Definitions

```

573      .sbttl Macro Definitions
574
575
576      ;+
577      ; Execute a GET DUST STATUS command and the check the response.
578      ;-
579
580
581      000000
582      000001
583      .MACRO GETDUST
584      B=B+1
585      gdstmp \B
586      .ENDM
587
588      .MACRO GDSTMP B
589      .list
590      GDS'B: bit #bit15,cmdrng+2 ;test ownership of ring make sure we own it
591             bne GDS'B ;if we don't own it wait until we do
592             mov #14.,cmdlen ;load lenght of packet to be send
593             movb #0,cmdlen+2 ;load msg type and credit
594             movb #dup.id,cmdlen+3 ;load DUP connection ID
595             inc cmdpak ;load new CRN
596             clr cmdpak+2
597             clr cmdpak+4
598             clr cmdpak+6
599             mov #op.gds,cmdpak+10 ;load up opcode
600             clr cmdpak+12 ;no modifiers
601
602             mov #RFD'B,@vector ;New vector place
603             mov #rsppak,rsprng ;load response packet area into ring
604             mov #cmdpak,cmdrng ;load command packet area into ring
605             mov #140000,RSPRNG+2 ;Port ownership bit.
606             mov #bit15,CMDRNG+2
607             jsr pc,POLLWT ;Go to poll and wait routine.
608
609      ;*****
610
611      RFD'B: ;Intr to here.
612             add #6,sp ;fix stack for interrupt (4), pollwt subrtn (2)
613             mov #intsrv,@vector ;Change vector
614             jsr pc,RSPCHK ;Go to routine that will check on
615             ;the response recvd from the mut.
616             ;it will check the cmd ref
617             ;num, the endcode and status.
618
619      .nlist
620      .ENDM

```


Macro Definitions

```

621
622
623      ;+
624      ;      Execute an ABORT command and then checks the response.
625      ;-
626
627      .MACRO ABRT
628      B=B+1
629      abrttmp \B
630      .ENDM
631
632      .MACRO ABRTTMP B
633      .list
634      ABRT'B: bit #bit15,cmdrng+2      ;test ownership of ring make sure we own it
635      bne ABRT'B      ;if we don't own it wait until we do
636      mov #14.,cmdlen      ;load lenght of packet to be send
637      movb #0,cmdlen+2      ;load msg type and credit
638      movb #dup.id,cmdlen+3      ;load DUP connection ID
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      ;*****
654
655      RFD'B:
656      add #6,sp      ;Intr to here.
657      mov #intsrvc,@vector      ;fix stack for interrupt (4), pollwt subrtn (2)
658      jsr pc,RSPCHK      ;Change vector
659
660      ;Go to routine that will check on
661      ;the response recvd from the mut.
662      ;it will check the cmd ref
663      ;num, the endcode and status.
664      .nlist
        .ENDM

```

Macro Definitions

```

666
667
668      ;+
669      ;      Execute a Send data cmd in dup and then check the response for the proper info
670      ;-
671
672
673      .MACRO SENDDAT SPLACE,SBYTCN      ;Execute a Send Data command
674      B=B+1      ;increment the CRN number
675      sendtmp \B,SPlace,Sbytcn      ;call variable A,B as if it where a number (\)
676      .ENDM
677
678      .MACRO SENDTMP B,Splace,Sbytcnt
679      .list
680      SDT'B: bit #bit15,cmdrng+2      ;test ownership of ring make sure we own it
681      bne SDT'B      ;if we don't own it wait until we do
682      mov #34,cmdlen      ;load lenght of packet to be send
683      movb #0,cmdlen+2      ;load msg type and credit
684      movb #dup.id,cmdlen+3      ;load DUP connection ID
685      inc cmdpak      ;load new CRN
686      clr cmdpak+2
687      clr cmdpak+4
688      clr cmdpak+6
689      mov #op.sen,cmdpak+10      ;load up opcode
690      clr cmdpak+12      ;no modifiers
691      mov Sbytcnt,cmdpak+14
692      clr cmdpak+16
693      mov Splace,cmdpak+20      ;load address of buffer desribtor
694      clr cmdpak+22
695      clr cmdpak+24
696      clr cmdpak+26
697      clr cmdpak+30
698      clr cmdpak+32
699
700      mov #RFD'B,@vector      ;New vector place
701      mov #rsppak,rsprng      ;load response packet area into ring
702      mov #cmdpak,cmdrng      ;load command packet area into ring
703      mov #140000,RSPRNG+2      ;Port ownership bit.
704      mov #bit15,CMDRNG+2
705      jsr pc,POLLWT      ;Go to poll and wait routine.
706
707      ;*****
708
709      RFD'B:      ;Intr to here.
710      add #6,sp      ;fix stack for interrupt (4), pollwt subrtn (2)
711      mov #intsv,@vector      ;Change vector
712      jsr pc,RSPCHK      ;Go to routine that will check on
713      ;the response recvd from the mut.
714      ;it will check the cmd ref
715      ;num, the endcode and status.
716
717      .nlist
      .ENDM

```

Macro Definitions

```

719
720
721      ;+
722      ;      Execute a Receive Data command and the check the response.
723      ;-
724
725      .MACRO RECVDAT Rplace,Rbytcnt      ;Execute a Send Data command
726      B=B+1                              ;increment the CRN number
727      recvtmp \B,Rplace,Rbytcnt        ;call variable A,B as if it where a number (\)
728      .ENDM
729
730      .MACRO RECVTMP B,RPlace,Rbytcnt
731      .list
732      RCD'B: bit      #bit15,cmdrng+2      ;test ownership of ring make sure we own it
733      bne      RCD'B      ;if we don't own it wait until we do
734      mov      #34,cmdlen      ;load lenght of packet to be send
735      movb     #0,cmdlen+2      ;load msg type and credit
736      movb     #dup.id,cmdlen+3      ;load DUP connection ID
737      inc      cmdpak          ;load new CRN
738      clr      cmdpak+2
739      clr      cmdpak+4
740      clr      cmdpak+6
741      mov      #op.rec,cmdpak+10      ;load up opcode
742      clr      cmdpak+12      ;no modifiers
743      mov      Rbytcnt,cmdpak+14
744      clr      cmdpak+16
745      mov      Rplace,cmdpak+20      ;load address of buffer descriptor
746      clr      cmdpak+22
747      clr      cmdpak+24
748      clr      cmdpak+26
749      clr      cmdpak+30
750      clr      cmdpak+32
751
752      mov      #RFD'B,@vector      ;New vector place
753      mov      #rspak,rsprng      ;load response packet area into ring
754      mov      #cmdpak,cmdrng      ;load command packet area into ring
755      mov      #140000,RSPRNG+2      ;Port ownership bit.
756      mov      #bit15,CMDRNG+2
757      jsr      pc,POLLWT          ;Go to poll and wait routine.
758
759      ;*****
760
761      RFD'B:      ;Intr to here.
762      add      #6,sp      ;fix stack for interrupt (4), pollwt subrtn (2)
763      mov      #intsrv,@vector      ;Change vector
764      jsr      pc,RSPCHK          ;Go to routine that will check on
765      ;the response recvd from the mut.
766      ;it will check the cmd ref
767      ;num, the endcode and status.
768
769      .nlist
770      .ENDM

```

Macro Definitions

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```

;+
; Execute a Execute Local Program command and the check the response.
;-

.MACRO EXLCPRG Enamadr          ;Execute a Send Data command
B=B+1                          ;increment the CRN number
elptmp \B,Enamadr              ;call variable A,B as if it where a number (\)
.ENDM

.MACRO ELPTMP B,Enamadr
.list
ELP'B: bit #bit15,cmdrng+2      ;test ownership of ring make sure we own it
      bne ELP'B                ;if we don't own it wait until we do
      mov #22,cmdlen           ;load lenght of packet to be send
      movb #0,cmdlen+2         ;load msg type and credit
      movb #dup.id,cmdlen+3    ;load DUP connection ID
      inc cmdpak               ;load new CRN
      clr cmdpak+2
      clr cmdpak+4
      clr cmdpak+6
      mov #op.elp,cmdpak+10    ;load up opcode
      mov #stdaln,cmdpak+12    ;stand alone modifier
      mov #6,r0                ;6 letters transfer
      mov #cmdpak+14,r1        ;starting address to place program name
      mov #Enamadr,r2          ;start of Program Name
rfdj'B: movb (r2)+,(r1)+       ;add 2 to bycnt then store
      sob r0,rfdj'B

      mov #RFD'B,@vector      ;New vector place
      mov #rsppak,rsprng      ;load response packet area into ring
      mov #cmdpak,cmdrng      ;load command packet area into ring
      mov #140000,RSPRNG+2    ;Port ownership bit.
      mov #bit15,CMDRNG+2
      jsr pc,POLLWT           ;Go to poll and wait routine.

;*****
RFD'B:
      add #6,sp                ;Intr to here.
      mov #intsrv,@vector     ;fix stack for interrupt (4), pollwt subrtn (2)
      jsr pc,RSPCHK           ;Change vector
                                ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.

.list
.ENDM

```

Macro Definitions

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```

;+
; Execute a Eexecute Supplied Program command and the check the response.
;-

.MACRO EXCSUPPRG ;Execute a Supplied program command
B=B+1 ;increment the CRN number
esptmp \B ;call variable A,B as if it where a number (\)
.ENDM

.MACRO ESPTMP B
.list
ESP'B: bit #bit15,cmdrng+2 ;test ownership of ring make sure we own it
; if we don't own it wait until we do
bne ESP'B ;load lenght of packet to be send
mov #50,cmdlen ;load msg type and credit value
movb #0,cmdlen+2 ;load DUP connection ID
movb #dup.id,cmdlen+3
clr CMDpak+2
clr CMDpak+4
clr CMDpak+6
mov #op.esp,CMDpak+10 ;load up opcode
mov #0,CMDpak+12 ;no stand alone modifier
mov #<autoend-autosz>,cmdpak+14 ;load length of prg into buffer
clr cmdpak+16
mov #autosz,cmdpak+20 ;starting address of downline load prg
clr CMDpak+22
clr CMDpak+24
clr CMDpak+26
clr CMDpak+30
clr CMDpak+32
clr CMDpak+34 ;overlay buffer descriptor
clr CMDpak+36
clr CMDpak+40
clr CMDpak+42
clr CMDpak+44
clr CMDpak+46
mov #RFD'B,@vector ;New vector place
mov #rsppak,rsprng ;load response packet area into ring
mov #cmdpak,cmdrng ;load command packet area into ring
mov #140000,RSPRNG+2 ;Port ownership bit.
mov #bit15,CMDRNG+2
jsr pc,POLLWT ;Go to poll and wait routine.
;*****
RFD'B: ;Intr to here.
add #6,sp ;fix stack for interrupt (4), pollwt subrtn (2)
mov #intsrv,@vector ;Change vector
jsr pc,RSPCHK ;Go to routine that will check on
;the response recvd from the mut.
;it will check the cmd ref
;num, the endcode and status.
.list
.ENDM

```

Word & Buffer definitions

```

877      .sbtll Word & Buffer definitions
878
879 002310 000000 LOGUNIT: .WORD ;logunit number
880 002312 000000 LOCAL: .WORD ;
881 002314 000000 PLOC: .WORD ;p table address
882 002316 000000 ptbl: .WORD ;p table address
883 002320 000000 UITadr: .word ;
884 002322 000000 BOOT: .word ;bootable media
885
886 ;*
887 ; These next locations may be altered to supply the correct IP & SA address
888 ; If only 1 jumper is to be placed on the MUT the locations should be filled
889 ; with addresses 177770 and 177772 respectively.
890 ;-
891
892 002324 000000 IPreg: .WORD 0 ;Address of the SA and IP registers
893 002326 000000 Vector: .word 0 ;
894 002330 000000 Unit: .word 0 ;unit number
895 002332 000123 .word 123 ;
896 002334 177777 sernbr: .word 177777 ;serial number
897 002336 000000 UNTflgs: .word 0 ;flags, bit15 =auto mode
898 ;bit13 =unknown model number,bit12 =park heads only
899 002340 000000 mdlnbr: .word 0 ;model number of the controller as returned in step 4
900 002342 000000 mcdnbr: .word 0 ;micorcode number of the controller as returned in step 4
901 002344 000000 UIN: .word 0 ;this is a pointer to the correct UIT table
902
903 002346 RSP1: .BLKW 2 ;Response packet length
904 002352 RSPPAK: .BLKW 30. ;Response packet
905 002446 CMDLEN: .BLKW 2 ;Command packet length
906 002452 CMDPAK: .BLKW 20. ;Command packet
907
908 002522 000000 CINTR: .WORD 0 ;Command interrupt indicator
909 002524 000000 RINTR: .WORD 0 ;Response interrupt indicator
910 002526 002352 RSPRNG: .word rsppak ;Message ring
911 002530 140000 .word 140000 ;
912 002532 002452 CMDRNG: .word cmdpak ;Command ring
913 002534 100000 .word 100000 ;
914 002536 177777 .WORD -1 ;
915
916 002540 000000 LSTCRN: .word 0 ;storage for unreturned command CRN
917 002542 000000 LSTCMD: .word 0 ;storage for unreturned command opcode
918 002544 000000 LSTVCT: .word 0 ;storage for unreturned command interrupt vector address
919 002546 000000 LOPRGI: .word 0 ;Low word of the progress indicator
920 002550 000000 HIPRGI: .word 0 ;High word of progress indicator
921
922 .nlist bin ;data area
923 002552 DATARE: .asciz /*A1234567890123456789012345678901234567890123456789012345678901234567890/
924 .even
925 002676 PRGnam: .ascii /FORMAT/ ;address of local format program name
926 002704 .byte 0 ;null for asciz
927 002705 XBN: .ASCIZ /0123456789/
928 002720 DBN: .ASCIZ /0123456789/
929 002733 LBN: .ASCIZ /0123456789/
930 002746 RBN: .ASCIZ /0123456789/
931 .even
932 .list bin

```

Word & Buffer definitions

```

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940
941      002776      002776
942      002776      177777
943      003000      003000
944
945
946
947
948
949
950      003000
951
952      003000      000071
953      003002      000000
954      003004      000127
955      003006      000000
956      003010      052360
957      003012      000000
958      003014      000220
959      003016      000000
960      003020      000022
961      003022      000004
962      003024      000462
963      003026      000156
964      003030      000462
965      003032      000000
966      003034      000001
967      003036      000044
968      003040      000004
969      003042      040063
970      003044      022544
971      003046      000002
972      003050      000002
973      003052      000001
974      003054      000020
975      003056      000020
976      003060      000005
977      003062      000020
978      003064      000015
979      003066      000001
980      003070      000001
981      003072      000001
982      003074      000002
983      003076      000151
984      003100      000463
985      003102      000463
986      000104
987      003104
988
989
990

```

.sbt1 DISK UNIT INFORMATION TABLES

```

;+
; The following tables are made up of disk drive parameters which will be
; feed to the FORMAT controller local program which will then use the
; information to format the drives.
;-

```

```

.=2776
.word      -1      ;back door for custom table build
.=3000

```

```

;+
;      Unit Information table RD51 Seagate
;-

```

UIT0:

```

; /*Top of Unit Information table (UIT)
;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
;/XBN size (hi wrd)/
;/DBN size (lo wrd)/
;/DBN size (hi wrd)/
;/LBN size (lo wrd)/
;/LBN size (hi wrd)/
;/RBN size (lo wrd)/
;/RBN size (hi wrd)/
;/Sectors per track/
;/Surfaces per unit/
;/Cylinders per unit/
;/Write precomp cylinder/
;/Reduce write current cylinder /
;/Seek Rate/
;/Use CRC or ECC/
;/RCT Size/
;/Number of RCT copies/
;+B0100000000110011 ;+H4033;/Media (lo wrd)/
;+B0010010101100100 ;+H2564;/Media (hi wrd)/
;/Sector Interleave (n-to-1)/
;/Surface to Surface Skew/
;/Cylinder to Cylinder Skew/
;/Gap size 0/
;/Gap size 1/
;/Gap size 2/
;/Gap size 3/
;/Sync size/
;/MSCP cylinders per Unit/
;/MSCP Groups per Cylinder/
;/MSCP Tracks per Group/
;/Max allowed bad spots per surface/
;/Bad spot tolerance (bytes)/
;/auto recal cylinder
;/auto recal cylinder

```

```

UITsiz = .-UIT0
.=3000+ UITsiz

```

```

;+

```

DISK UNIT INFORMATION TABLES

```

991 ; Unit Information table RD52 Quantum drive
992 ; -
993
994
995 003104 UIT1:
996 ;/*Top of Unit Information table (UIT)
997 003104 000066 .word 54. ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
998 003106 000000 .word 0 ;/XBN size (hi wrd)/
999 003110 000122 .word 82. ;/DBN size (lo wrd)/
1000 003112 000000 .word 0 ;/DBN size (hi wrd)/
1001 003114 166140 .word 60512. ;/LBN size (lo wrd)/
1002 003116 000000 .word 0 ;/LBN size (hi wrd)/
1003 003120 000250 .word 168. ;/RBN size (lo wrd)/
1004 003122 000000 .word 0 ;/RBN size (hi wrd)/
1005 003124 000021 .word 17. ;/Sectors per track/
1006 003126 000010 .word 8. ;/Surfaces per unit/
1007 003130 001000 .word 512. ;/Cylinders per unit/
1008 003132 000400 .word 256. ;/Write precomp cylinder/
1009 003134 001000 .word 512. ;/Reduce write current cylinder /
1010 003136 000000 .word 0 ;/Seek Rate/
1011 003140 000001 .word 1 ;/Use CRC or ECC/
1012 003142 000004 .word 4 ;/RCT Size/
1013 003144 000010 .word 8. ;/Number of RCT copies/
1014 003146 040064 .word +B0100000000110100 ;+H4034;/Media (lo wrd)/
1015 003150 022544 .word +B0010010101100100 ;+H2564;/Media (hi wrd)/
1016 003152 000001 .word 1 ;/Sector Interleave (n-to-1)/
1017 003154 000002 .word 2 ;/Surface to Surface Skew/
1018 003156 000015 .word 13. ;/Cylinder to Cylinder Skew/
1019 003160 000020 .word 16. ;/Gap size 0/
1020 003162 000020 .word 16. ;/Gap size 1/
1021 003164 000005 .word 5. ;/Gap size 2/
1022 003166 000050 .word 40. ;/Gap size 3/
1023 003170 000015 .word 13. ;/Sync size/
1024 003172 000001 .word 1 ;/MSCP cylinders per Unit/
1025 003174 000001 .word 1 ;/MSCP Groups per Cylinder/
1026 003176 000001 .word 1 ;/MSCP Tracks per Group/
1027 003200 000012 .word 10. ;/Max allowed bad spots per surface/
1028 003202 000151 .word 105. ;/Bad spot tolerance (bytes)/
1029 003204 001000 .word 512. ;/auto recal cylinder
1030 003206 001000 .word 512. ;/auto recal cylinder
1031
1032 003210 . =3000+UITsiz+UITsiz
1033
1034
1035 ;+
1036 ; Unit Information table RD52 Atasi
1037 ; -
1038
1039
1040 003210 UIT2:
1041 ;/*Top of Unit Information table (UIT)
1042 003210 000066 .word 54. ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1043 003212 000000 .word 0 ;/XBN size (hi wrd)/
1044 003214 000101 .word 65. ;/DBN size (lo wrd)/
1045 003216 000000 .word 0 ;/DBN size (hi wrd)/
1046 003220 166140 .word 60512. ;/LBN size (lo wrd)/
1047 003222 000000 .word 0 ;/LBN size (hi wrd)/

```


DISK UNIT INFORMATION TABLES

```

1048 003224 000250 .word 168. ;/RBN size (lo wrd)/
1049 003226 000000 .word 0 ;/RBN size (hi wrd)/
1050 003230 000021 .word 17. ;/Sectors per track/
1051 003232 000007 .word 7. ;/Surfaces per unit/
1052 003234 001205 .word 645. ;/Cylinders per unit/
1053 003236 000500 .word 320. ;/Write precomp cylinder/
1054 003240 001205 .word 645. ;/Reduce write current cylinder /
1055 003242 000000 .word 0 ;/Seek Rate/
1056 003244 000001 .word 1 ;/Use CRC or ECC/
1057 003246 000004 .word 4 ;/RCT Size/
1058 003250 000010 .word 8. ;/Number of RCT copies/
1059 003252 040064 .word †B0100000000110100 ;†H4034;/Media (lo wrd)/
1060 003254 022544 .word †B0010010101100100 ;†H2564;/Media (hi wrd)/
1061 003256 000001 .word 1 ;/Sector Interleave (n-to-1)/
1062 003260 000002 .word 2 ;/Surface to Surface Skew/
1063 003262 000007 .word 7. ;/Cylinder to Cylinder Skew/
1064 003264 000020 .word 16. ;/Gap size 0/
1065 003266 000020 .word 16. ;/Gap size 1/
1066 003270 000005 .word 5. ;/Gap size 2/
1067 003272 000050 .word 40. ;/Gap size 3/
1068 003274 000015 .word 13. ;/Sync size/
1069 003276 000001 .word 1 ;/MSCP cylinders per Unit/
1070 003300 000001 .word 1 ;/MSCP Groups per Cylinder/
1071 003302 000001 .word 1 ;/MSCP Tracks per Group/
1072 003304 000024 .word 20. ;/Max allowed bad spots per surface/
1073 003306 000151 .word 105. ;/Bad spot tolerance (bytes)/
1074 003310 001206 .word 646. ;/auto recal cylinder
1075 003312 001206 .word 646. ;/auto recal cylinder
1076
1077 003314 . =3000+UITsiz+UITsiz+UITsiz
1078
1079 ;+
1080 ; Unit Information table RD53 Micropolis
1081 ;-
1082
1083
1084 003314 UIT3:
1085 ;/*Top of Unit Information table (UIT)
1086 003314 000066 .word 54. ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1087 003316 000000 .word 0 ;/XBN size (hi wrd)/
1088 003320 000122 .word 82. ;/DBN size (lo wrd)/
1089 003322 000000 .word 0 ;/DBN size (hi wrd)/
1090 003324 016730 .word 7640. ;/LBN size (lo wrd)/
1091 003326 000002 .word 2. ;/LBN size (hi wrd)/
1092 003330 000430 .word 280. ;/RBN size (lo wrd)/
1093 003332 000000 .word 0 ;/RBN size (hi wrd)/
1094 003334 000021 .word 17. ;/Sectors per track/
1095 003336 000010 .word 8. ;/Surfaces per unit/
1096 003340 002000 .word 1024. ;/Cylinders per unit/
1097 003342 002000 .word 1024. ;/Write precomp cylinder/
1098 003344 002000 .word 1024. ;/Reduce write current cylinder /
1099 003346 000000 .word 0 ;/Seek Rate/
1100 003350 000001 .word 1 ;/Use CRC or ECC/
1101 003352 000005 .word 5 ;/RCT Size/
1102 003354 000010 .word 8. ;/Number of RCT copies/
1103 003356 040065 .word †B0100000000110101 ;†H4035;/Media (lo wrd)/
1104 003360 022544 .word †B0010010101100100 ;†H2564;/Media (hi wrd)/

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DISK UNIT INFORMATION TABLES

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1105 003362 000001 .word 1 ;/Sector Interleave (n-to-1)/
1106 003364 000002 .word 2 ;/Surface to Surface Skew/
1107 003366 000010 .word 8. ;/Cylinder to Cylinder Skew/
1108 003370 000020 .word 16. ;/Gap size 0/
1109 003372 000020 .word 16. ;/Gap size 1/
1110 003374 000005 .word 5. ;/Gap size 2/
1111 003376 000050 .word 40. ;/Gap size 3/
1112 003400 000015 .word 13. ;/Sync size/
1113 003402 000001 .word 1 ;/MSCP cylinders per Unit/
1114 003404 000001 .word 1 ;/MSCP Groups per Cylinder/
1115 003406 000001 .word 1 ;/MSCP Tracks per Group/
1116 003410 000040 .word 32. ;/Max allowed bad spots per surface/
1117 003412 000156 .word 110. ;/Bad spot tolerance (bytes)/
1118 003414 002000 .word 1024. ;/auto recal cylinder
1119 003416 002000 .word 1024. ;/auto recal cylinder
1120
1121 003420 . =3000+UITsiz+UITsiz+UITsiz+UITsiz
1122
1123
1124 ;+
1125 ; Unit Information table RD31 Seagate
1126 ;-
1127
1128
1129 003420 UIT4:
1130 ;/*Top of Unit Information table (UIT)
1131 003420 000066 .word 54. ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1132 003422 000000 .word 0 ;/XBN size (hi wrd)/
1133 003424 000016 .word 14. ;/DBN size (lo wrd)/
1134 003426 000000 .word 0 ;/DBN size (hi wrd)/
1135 003430 121160 .word 41584. ;/LBN size (lo wrd)/
1136 003432 000000 .word 0 ;/LBN size (hi wrd)/
1137 003434 000144 .word 100. ;/RBN size (lo wrd)/
1138 003436 000000 .word 0 ;/RBN size (hi wrd)/
1139 003440 000021 .word 17. ;/Sectors per track/
1140 003442 000004 .word 4. ;/Surfaces per unit/
1141 003444 001147 .word 615. ;/Cylinders per unit/
1142 003446 000400 .word 256. ;/Write precomp cylinder/
1143 003450 001147 .word 615. ;/Reduce write current cylinder /
1144 003452 000000 .word 0 ;/Seek Rate/
1145 003454 000001 .word 1 ;/Use CRC or ECC/
1146 003456 000003 .word 3 ;/RCT Size/
1147 003460 000010 .word 8. ;/Number of RCT copies/
1148 003462 040037 .word †B0100000000011111 †H401F;/Media (lo wrd)/
1149 003464 022544 .word †B0010010101100100 †H2564;/Media (hi wrd)/
1150 003466 000001 .word 1 ;/Sector Interleave (n-to-1)/
1151 003470 000002 .word 2 ;/Surface to Surface Skew/
1152 003472 000004 .word 4. ;/Cylinder to Cylinder Skew/
1153 003474 000020 .word 16. ;/Gap size 0/
1154 003476 000020 .word 16. ;/Gap size 1/
1155 003500 000005 .word 5. ;/Gap size 2/
1156 003502 000050 .word 40. ;/Gap size 3/
1157 003504 000015 .word 13. ;/Sync size/
1158 003506 000001 .word 1 ;/MSCP cylinders per Unit/
1159 003510 000001 .word 1 ;/MSCP Groups per Cylinder/
1160 003512 000001 .word 1 ;/MSCP Tracks per Group/
1161 003514 000010 .word 8. ;/Max allowed bad spots per surface/

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DISK UNIT INFORMATION TABLES

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1162 003516 000151      .word 105.      ;/Bad spot tolerance (bytes)/
1163 003520 001147      .word 615.      ;/auto recal cylinder
1164 003522 001150      .word 616.      ;/auto recal cylinder
1165
1166      003524      .=3000+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz
1167
1168
1169      ;+
1170      ;      Unit Information table RD54 Maxtor Drive
1171      ;-
1172
1173
1174 003524      UIT5:
1175
1176 003524 000066      .word 54.      ;/*Top of Unit Information table (UIT)
1177 003526 000000      .word 0        ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1178 003530 000711      .word 201.     ;/XBN size (hi wrd)/
1179 003532 000000      .word 0        ;/DBN size (lo wrd)/
1180 003534 137730      .word 137730   ;/DBN size (hi wrd)/
1181 003536 000004      .word 4        ;/LBN size (lo wrd)/
1182 003540 001141      .word 609.     ;/LBN size (hi wrd)/
1183 003542 000000      .word 0        ;/RBN size (lo wrd)/
1184 003544 000021      .word 17.      ;/RBN size (hi wrd)/
1185 003546 000017      .word 17.      ;/Sectors per track/
1186 003550 002311      .word 15.      ;/Surfaces per unit/
1187 003552 002311      .word 1225.    ;/Cylinders per unit/
1188 003554 002311      .word 1225.    ;/Write precomp cylinder/
1189 003556 000000      .word 0        ;/Reduce write current cylinder /
1190 003560 000001      .word 0        ;/Seek Rate/
1191 003562 000007      .word 1        ;/Use CRC or ECC/
1192 003564 000010      .word 7        ;/RCT Size/
1193 003566 040066      .word 8.       ;/Number of RCT copies/
1194 003570 022544      .word +B0100000000110110 ;+H4036;/Media (lo wrd)/
1195 003572 000001      .word +B0010010101100100 ;+H2564;/Media (hi wrd)/
1196 003574 000002      .word 1        ;/Sector Interleave (n-to-1)/
1197 003576 000010      .word 2        ;/Surface to Surface Skew/
1198 003600 000020      .word 8.       ;/Cylinder to Cylinder Skew/
1199 003602 000020      .word 16.     ;/Gap size 0/
1200 003604 000005      .word 16.     ;/Gap size 1/
1201 003606 000050      .word 5.       ;/Gap size 2/
1202 003610 000015      .word 40.     ;/Gap size 3/
1203 003612 000001      .word 13.     ;/Sync size/
1204 003614 000001      .word 1        ;/MSCP cylinders per Unit/
1205 003616 000001      .word 1        ;/MSCP Groups per Cylinder/
1206 003620 000040      .word 1        ;/MSCP Tracks per Group/
1207 003622 000151      .word 32.     ;/Max allowed bad spots per surface/
1208 003624 002311      .word 105.    ;/Bad spot tolerance (bytes)/
1209 003626 002312      .word 1225.   ;/auto recal cylinder
1210      ;/auto recal cylinder possible on this vendor's
1211      ;/drive mmm
1212      003630      .=3000+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz
1213
1214
1215      ;+
1216      ;      Unit Information table
1217      ;-
1218

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DISK UNIT INFORMATION TABLES

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1219
1220 003630          UIT6:
1221
1222 003630 000066      .word 54.      ;/*Top of Unit Information table (UIT)
1223 003632 000000      .word 0        ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1224 003634 000057      .word 47.      ;/XBN size (hi wrd)/
1225 003636 000000      .word 0        ;/DBN size (lo wrd)/
1226 003640 016677      .word 016677   ;/DBN size (hi wrd)/
1227 003642 000002      .word 2        ;/LBN size (lo wrd)/
1228 003644 000524      .word 340.     ;/LBN size (hi wrd)/
1229 003646 000000      .word 0        ;/RBN size (lo wrd)/
1230 003650 000021      .word 17.      ;/RBN size (hi wrd)/
1231 003652 000010      .word 8.       ;/Sectors per track/
1232 003654 002000      .word 1024.    ;/Surfaces per unit/
1233 003656 002000      .word 1024.    ;/Cylinders per unit/
1234 003660 002000      .word 1024.    ;/Write precomp cylinder/
1235 003662 000000      .word 0        ;/Reduce write current cylinder /
1236 003664 000001      .word 1        ;/Seek Rate/
1237 003666 000005      .word 5        ;/Use CRC or ECC/
1238 003670 000003      .word 3        ;/RCT Size/
1239 003672 040065      .word +B0100000000110101 ;+H4035;/Media (lo wrd)/
1240 003674 022544      .word +B0010010101100100 ;+H2564;/Media (hi wrd)/
1241 003676 000001      .word 1        ;/Sector Interleave (n-to-1)/
1242 003700 000002      .word 2        ;/Surface to Surface Skew/
1243 003702 000010      .word 8.       ;/Cylinder to Cylinder Skew/
1244 003704 000020      .word 16.      ;/Gap size 0/
1245 003706 000020      .word 16.      ;/Gap size 1/
1246 003710 000005      .word 5.       ;/Gap size 2/
1247 003712 000050      .word 40.      ;/Gap size 3/
1248 003714 000015      .word 13.      ;/Sync size/
1249 003716 000001      .word 1        ;/MSCP cylinders per Unit/
1250 003720 000001      .word 1        ;/MSCP Groups per Cylinder/
1251 003722 000001      .word 1        ;/MSCP Tracks per Group/
1252 003724 000040      .word 32.      ;/Max allowed bad spots per surface/
1253 003726 000156      .word 110.     ;/Bad spot tolerance (bytes)/
1254 003730 002000      .word 1024.    ;/auto recal cylinder
1255 003732 002000      .word 1024.    ;/auto recal cylinder
1256
1257          003734      .=3000+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz
1258
1259
1260          ;+
1261          ;      Unit Information table
1262          ;-
1263
1264
1265 003734          UIT7:
1266
1267 003734 000066      .word 54.      ;/*Top of Unit Information table (UIT)
1268 003736 000000      .word 0        ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1269 003740 000057      .word 47.      ;/XBN size (hi wrd)/
1270 003742 000000      .word 0        ;/DBN size (lo wrd)/
1271 003744 016677      .word 016677   ;/DBN size (hi wrd)/
1272 003746 000002      .word 2        ;/LBN size (lo wrd)/
1273 003750 000524      .word 340.     ;/LBN size (hi wrd)/
1274 003752 000000      .word 0        ;/RBN size (lo wrd)/
1275 003754 000021      .word 17.      ;/RBN size (hi wrd)/
                    ;/Sectors per track/

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DISK UNIT INFORMATION TABLES

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1276 003756 000010 .word 8. ;/Surfaces per unit/
1277 003760 002000 .word 1024. ;/Cylinders per unit/
1278 003762 002000 .word 1024. ;/Write precomp cylinder/
1279 003764 002000 .word 1024. ;/Reduce write current cylinder /
1280 003766 000000 .word 0 ;/Seek Rate/
1281 003770 000001 .word 1 ;/Use CRC or ECC/
1282 003772 000005 .word 5 ;/RCT Size/
1283 003774 000003 .word 3 ;/Number of RCT copies/
1284 003776 040065 .word †B0100000000110101 †H4035;/Media (lo wrd)/
1285 004000 022544 .word †B0010010101100100 †H2564;/Media (hi wrd)/
1286 004002 000001 .word 1 ;/Sector Interleave (n-to-1)/
1287 004004 000002 .word 2 ;/Surface to Surface Skew/
1288 004006 000010 .word 8. ;/Cylinder to Cylinder Skew/
1289 004010 000020 .word 16. ;/Gap size 0/
1290 004012 000020 .word 16. ;/Gap size 1/
1291 004014 000005 .word 5. ;/Gap size 2/
1292 004016 000050 .word 40. ;/Gap size 3/
1293 004020 000015 .word 13. ;/Sync size/
1294 004022 000001 .word 1 ;/MSCP cylinders per Unit/
1295 004024 000001 .word 1 ;/MSCP Groups per Cylinder/
1296 004026 000001 .word 1 ;/MSCP Tracks per Group/
1297 004030 000040 .word 32. ;/Max allowed bad spots per surface/
1298 004032 000156 .word 110. ;/Bad spot tolerance (bytes)/
1299 004034 002000 .word 1024. ;/auto recal cylinder
1300 004036 002000 .word 1024. ;/auto recal cylinder
1301
1302 004040 . =3000+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz+UITsiz
1303
1304
1305 ;+
1306 ; DEFAULT Unit Information table
1307 ;-
1308
1309
1310 004040 UITdf:
1311 ;/*Top of Unit Information table (UIT)
1312 004040 000066 .word 54. ;/XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1313 004042 000000 .word 0 ;/XBN size (hi wrd)/
1314 004044 000311 .word 201. ;/DBN size (lo wrd)/
1315 004046 000000 .word 0 ;/DBN size (hi wrd)/
1316 004050 137710 .word 137710 ;/LBN size (lo wrd)/
1317 004052 000004 .word 4 ;/LBN size (hi wrd)/
1318 004054 001161 .word 625. ;/RBN size (lo wrd)/
1319 004056 000000 .word 0 ;/RBN size (hi wrd)/
1320 004060 000021 .word 17. ;/Sectors per track/
1321 004062 000017 .word 15. ;/Surfaces per unit/
1322 004064 002311 .word 1225. ;/Cylinders per unit/
1323 004066 002311 .word 1225. ;/Write precomp cylinder/
1324 004070 002311 .word 1225. ;/Reduce write current cylinder /
1325 004072 000000 .word 0 ;/Seek Rate/
1326 004074 000001 .word 1 ;/Use CRC or ECC/
1327 004076 000007 .word 7 ;/RCT Size/
1328 004100 000010 .word 8. ;/Number of RCT copies/
1329 004102 040066 .word †B0100000000110110 †H4034;/Media (lo wrd)/
1330 004104 022544 .word †B0010010101100100 †H2564;/Media (hi wrd)/
1331 004106 000001 .word 1 ;/Sector Interleave (n-to-1)/
1332 004110 000002 .word 2 ;/Surface to Surface Skew/

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D3

DISK UNIT INFORMATION TABLES

1333	004112	000015	.word	13.	;/Cylinder to Cylinder Skew/
1334	004114	000020	.word	16.	;/Gap size 0/
1335	004116	000020	.word	16.	;/Gap size 1/
1336	004120	000005	.word	5.	;/Gap size 2/
1337	004122	000050	.word	40.	;/Gap size 3/
1338	004124	000015	.word	13.	;/Sync size/
1339	004126	000001	.word	1	;/MSCP cylinders per Unit/
1340	004130	000001	.word	1	;/MSCP Groups per Cylinder/
1341	004132	000001	.word	1	;/MSCP Tracks per Group/
1342	004134	000012	.word	10.	;/Max allowed bad spots per surface/
1343	004136	000151	.word	105.	;/Bad spot tolerance (bytes)/
1344	004140	002000	.word	1024.	;/auto recal cylinder
1345	004142	002000	.word	1024.	;/auto recal cylinder
1346					

DISK PARAMETER QUESTIONS

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1348                                     .sbt1 DISK PARAMETER QUESTIONS
1349     .nlist bin
1350
1351     ;+
1352     ; P table Questions
1353     ;-
1354
1355 004144 IP.adr: .ASCIZ /IP Address/
1356 004157 vec.adr: .ASCIZ /Vector Address/
1357 004176 prk.hds: .ASCIZ /Just park the heads/
1358 004222 drv.nbr: .ASCIZ /Logical Drive (0-255)/
1359 004250 ser.nbr: .ASCIZ /Drive Serial Number(1-32000)/
1360 004305 auto.md: .ASCIZ /Auto Format Mode/
1361 004326 warning: .ASCIZ /***** WARNING all the data on this drive will be DESTROYED ****/
1362 004425 .byte 0
1363
1364 004426 do.cont: .ASCIZ /Proceed to format the drive/
1365
1366 004462 DrvTxa: .asciz /%N%AUIT# Drive Names%N/
1367 004511 DrvTxb: .asciz /%A ----- %N/
1368 004605 DrvTx0: .asciz /%A 0 RD51 %N/
1369 004701 DrvTx1: .asciz /%A 1 RD52 part # 30-21721-02 (1 light on front panel) %N/
1370 004775 DrvTx2: .asciz /%A 2 RD52 part # 30-23227-02 (2 lights on front panel) %N/
1371 005071 DrvTx3: .asciz /%A 3 RD53 %N/
1372 005165 DrvTx4: .asciz /%A 4 RD31 %N/
1373 005261 DrvTx5: .asciz /%A 5 RD54 %N/
1374 005355 DrvTx6: .asciz /%A 6 %N/
1375 005450 DrvTx7: .asciz /%A 7 %N/
1376 005543 DrvTxc: .asciz /%A 10 %N/
1377 005637 ASMSGr: .ASCIZ /%A Unrecognized Drive %N/
1378
1379 005733 ASMSG1: .ASCII /%N%AAUTOSIZER FOUND:/
1380 005757 .ASCIZ /%N%AUnt Cyls UIT# Drive Names%N/
1381 006021 ASMSG7: .ASCIZ /%A %D1%A Nonexistent%N/
1382 006066 ASMSG8: .ASCIZ /%A %D1%A RX50 Floppy (UNFORMATABLE)%N/
1383 006152 ASMSG9: .ASCIZ /%A %D1%A RX33 Floppy (FORMATABLE)%N/
1384 006234 ASMSG2: .ASCIZ /%A %D1%A %D4%A /
1385 006257 ASMSG3: .ASCIZ /%N%AAUTOSIZER RETURNED FAILURE STATUS CODE %D1%A:/
1386 006341 ASMSG4: .ASCIZ /%N%A CONTROLLER CHIP NEVER WENT DONE/
1387 006411 ASMSG5: .ASCIZ /%N%A CONTROLLER CHIP NEVER INTERRUPTED/
1388 006463 ASMSG6: .ASCIZ /%N%A SEEK FAILED/
1389 006507 ASMSGT: .ASCIZ /%N/
1390 006512 parkdrv: .ASCIZ /%N%PLEASE wait .... parking disk heads./
1391
1392 006563 Unt.nbr: .ASCIZ /Enter Unit Identifier Table (UIT)/
1393 006625 ask.prg: .ASCIZ /What local program do you want to run/
1394 006673 ask.xbn: .ASCIZ /Enter XBN size in decimal (upto 10 digits)/
1395 006746 ask.dbn: .ASCIZ /Enter DBN size in decimal (upto 10 digits)/
1396 007021 ask.lbn: .ASCIZ /Enter LBN size in decimal (upto 10 digits)/
1397 007074 ask.rbn: .ASCIZ /Enter RBN size in decimal (upto 10 digits)/
1398
1399
1400 007147 bot.dev: .ASCII <15><12>/WARNING - If FLOPPY remove boot diskette if in drive to be formatted and/
1401 007261 .ASCII <15><12>/ insert a diskette to be formatted./
1402 007351 .ASCII <15><12>/ If WINCHESTER check if wrt protect switch (off) & ready switch (on)./
1403 007471 .ASCIZ <15><12>/WARNING - All data on drive will be DESTROYED, do you want to continue?/
1404 007603 bot.rep: .ASCIZ /If boot drive, reinsert boot diskette & press <RETURN>./

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DISK PARAMETER QUESTIONS

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1405 007673 bot.con: .ASCIZ <15><12>/Do you want to format another diskette?/
1406
1407 ; Top of Unit Information table (UIT)
1408
1409 007745 TBQ0: .ASCIZ /XBN size (lo wrd) XBN size = 3*(1+sectors_per_track)/
1410 010032 TBQ1: .ASCIZ /XBN size (hi wrd)/
1411 010054 TBQ2: .ASCIZ /DBN size (lo wrd)/
1412 010076 TBQ3: .ASCIZ /DBN size (hi wrd)/
1413 010120 TBQ4: .ASCIZ /LBN size (lo wrd)/
1414 010142 TBQ5: .ASCIZ /LBN size (hi wrd)/
1415 010164 TBQ6: .ASCIZ /RBN size (lo wrd)/
1416 010206 TBQ7: .ASCIZ /RBN size (hi wrd)/
1417 010230 TBQ8: .ASCIZ /Sectors per track/
1418 010252 TBQ9: .ASCIZ /Surfaces per unit/
1419 010274 TBQ10: .ASCIZ /Cylinders per unit/
1420 010317 TBQ11: .ASCIZ /Write precomp cylinder/
1421 010346 TBQ12: .ASCIZ /Reduce write current cylinder /
1422 010405 TBQ13: .ASCIZ /Seek Rate/
1423 010417 TBQ14: .ASCIZ /Use CRC or ECC/
1424 010436 TBQ15: .ASCIZ /RCT Size/
1425 010447 TBQ16: .ASCIZ /Number of RCT copies/
1426 010474 TBQ17: .ASCIZ /Media (lo wrd)/
1427 010513 TBQ18: .ASCIZ /Media (hi wrd)/
1428 010532 TBQ19: .ASCIZ /Sector Interleave (n-to-1)/
1429 010565 TBQ20: .ASCIZ /Surface to Surface Skew/
1430 010615 TBQ21: .ASCIZ /Cylinder to Cylinder Skew/
1431 010647 TBQ22: .ASCIZ /Gap size 0/
1432 010662 TBQ23: .ASCIZ /Gap size 1/
1433 010675 TBQ24: .ASCIZ /Gap size 2/
1434 010710 TBQ25: .ASCIZ /Gap size 3/
1435 010723 TBQ26: .ASCIZ /Sync size/
1436 010735 TBQ28: .ASCIZ /MSCP cylinders per Unit/
1437 010765 TBQ29: .ASCIZ /MSCP Groups per Cylinder/
1438 011016 TBQ30: .ASCIZ /MSCP Tracks per Group/
1439 011044 TBQ31: .ASCIZ /Max allowed bad spots per surface/
1440 011106 TBQ32: .ASCIZ /Bad spot tolerance (bytes)/
1441
1442 011141 DF1: .ASCIZ /Controller Initialization Timeout/
1443 011203 DF2: .ASCIZ /Controller never advanced to next step/
1444 011252 DF3: .ASCIZ /Controller can not execute local programs or non STD DUP dialog program/
1445 011362 DF4: .ASCIZ /NXM Trap at controllers IP address/
1446 ;DF10: .ASCIZ /No Interrupt occurred after SA polled/
1447 011425 DF11: .ASCIZ /Bad Response Packet returned/
1448 011462 DF12: .ASCIZ /Fatal SA error ctrl offline/
1449 011516 DF13: .ASCIZ /No progress shown after a cmd had timed out/
1450 011572 DF14: .ASCIZ /GET DUST CMD time_out after another CMD time_out/
1451 011653 DF15: .ASCIZ /*N*AFatal error was reported when running local program/
1452 011743 DF16: .ASCIZ /*N*AA Special was reported when running local program don't know how to handle it/
1453 012065 SFO: .ASCIZ /DUP protocol Error, unexpected message/
1454 012134 SF1: .ASCIZ /*N*ASYSTEM is NOT in manual mode/
1455 012175 SF100: .ASCIZ /Unexpected or delayed Controller Interrupt/
1456 012250 HRD0: .ASCIZ /Fatal Format error/
1457 012273 SFT0: .ASCIZ /Controller in an unexpected ACTIVE state/
1458 012344 SFT1: .ASCIZ /Wrong Model Number on controller/
1459 012405 PBO: .ASCIZ /*N*AModel # listed %06/
1460 012434 PB1: .ASCIZ /*N*AEExpected SA step bit %06%A,Received in SA %06/
1461 012516 PB3: .ASCIZ /*N*AAasking for Format Parameter table/

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DISK PARAMETER QUESTIONS

```

1462 012564 PB4: .ASCIZ /*N%AReceived valid Format Parameter table/
1463 012636 PB5: .ASCIZ /*N%AO n UNIT %06%A, %06 Bad Blks were found during Format/
1464 012727 PB6: .ASCIZ /*N%AO n UNIT %06%A, %06 Bad Blks were found during Verify pass %06/
1465 013031 PB7: .ASCIZ /*N%ADUP Message Type: %06/
1466 013063 PB8: .ASCIZ /*N%ADUP message number: %06/
1467 013117 PB9: .ASCIZ /*N%AMSCP Controller model #: %D3/
1468 013161 PB10: .ASCIZ /*N%A Microcode version #: %D3/
1469 013223 PB11: .ASCIZ /*N%AController is IDLE when it should be ACTIVE running format program/
1470 013332 PB13: .ASCIZ /*N/
1471 013335 PF2: .ASCIZ /*N%N%AFinished local program without procedure error/
1472 013422 PBF0: .ASCIZ /*N%AFormat Parameter table entry at byte %06%N%A is out of range/
1473 013522 PBF1: .ASCIZ /*N%AFormat Parameter table entry at byte %06%N%A is incompatible with entry at byte %06/
1474 013651 PBF2: .ASCIZ /*N%AUNIT %06%A does not exist on controller/
1475 013725 PBF3: .ASCIZ /*N%AUNIT %06%A does exist but doesn't respond on controller/
1476 014021 PBF4: .ASCIZ /*N%AUNIT %06%A is write protected /
1477 014064 PBF5: .ASCIZ /*N%AWrite Fault detected on UNIT %06/
1478 014131 PBF6: .ASCIZ /*N%AAtempt to step hd %03%A at cyl %03%A failed on UNIT %06/
1479 014226 PBF7: .ASCIZ /*N%AAtempt to format hd %03%A at cyl %03%A failed on UNIT %06/
1480 014325 PBF8: .ASCIZ /*N%ATo many Bad Blocks total Bad Blocks %06/
1481 014415 PBF9: .ASCIZ /*N%ADisk Controller model : %D3/
1482 014455 PBF10: .ASCIZ /*N%A Microcode version : %D3/
1483 014515 PB11crn: .ASCIZ /*N%AEExpected CRN %06%A,Received CRN %06/
1484 014565 PB11op: .ASCIZ /*N%ACMDpkt Opcode %06%A,RSPpkt Opcode %06/
1485 014637 PB11sts: .ASCIZ /*N%AResponse pkt status %06/
1486 014673 PB11end: .ASCIZ /*N%ANo end bit(200) in response packet endcode/
1487 014752 PB11GDS: .ASCIZ /*N%AGet Dust Status cmd/
1488 015002 PB11ESP: .ASCIZ /*N%AEExecute Supplied Prg cmd/
1489 015037 PB11ELP: .ASCIZ /*N%AEExecute Local Prg cmd/
1490 015071 PB11SD: .ASCIZ /*N%ASend Data cmd/
1491 015113 PB11RD: .ASCIZ /*N%AReceive Data cmd/
1492 015140 PB11AP: .ASCIZ /*N%AAbort Prg cmd/
1493 015162 pb11s0: .ASCIZ /*N%AsTs: successful/
1494 015207 pb11s1: .ASCIZ /*N%AsTs: Invalid Command/
1495 015241 pb11s2: .ASCIZ /*N%AsTs: No Region Available/
1496 015277 pb11s3: .ASCIZ /*N%AsTs: No Region Suitable/
1497 015334 pb11s4: .ASCIZ /*N%AsTs: Program Not Known/
1498 015370 pb11s5: .ASCIZ /*N%AsTs: Load Failure/
1499 015417 pb11s6: .ASCIZ /*N%AsTs: Standalone/
1500 015444 pb11s9: .ASCIZ /*N%AsTs: Host Buffer Access error/
1501 015507 pb11w0: .ASCIZ /*N%AUknown command OPCODE received in timeout loop/
1502 015573 pb11w1: .ASCIZ /*N%AUknown command CRN received in command timeout loop/
1503 015664 pb1201: .ASCIZ /*N%ASA er: Envelope\packet Read (parity or timeout)/
1504 015750 pb1202: .ASCIZ /*N%ASA er: Envelope\packet Write (parity or timeout)/
1505 016035 pb1203: .ASCIZ /*N%ASA er: Controller ROM and RAM parity/
1506 016106 pb1204: .ASCIZ /*N%ASA er: Controller RAM parity/
1507 016147 pb1205: .ASCIZ /*N%ASA er: Controller ROM parity/
1508 016210 pb1206: .ASCIZ /*N%ASA er: Queue Read (parity or timeout)/
1509 016262 pb1207: .ASCIZ /*N%ASA er: Queue Write (parity or timeout)/
1510 016335 pb1208: .ASCIZ /*N%ASA er: Interrupt Master/
1511 016371 pb1209: .ASCIZ /*N%ASA er: Host Access Timeout (higher level protocol dependent)/
1512 016472 pb1210: .ASCIZ /*N%ASA er: Credit Limit Exceeded /
1513 016534 pb1211: .ASCIZ /*N%ASA er: Bus Master Error/
1514 016570 pb1212: .ASCIZ /*N%ASA er: Diagnostic Controller Fatal error/
1515 016645 pb1213: .ASCIZ /*N%ASA er: Instruction Loop Timeout/
1516 016711 pb1214: .ASCIZ /*N%ASA er: Invalid Connection Identifier/
1517 016762 pb1215: .ASCIZ /*N%ASA er: Interrupt Write Error/
1518 017023 pb1216: .ASCIZ /*N%ASA er: MAINTENANCE READ\WRITE Invalid Region Identifier/

```

DISK PARAMETER QUESTIONS

```
1519 017117 pb1217: .ASCIZ /%N%ASA er: MAINTENANCE WRITE Load to non-loadable controller/
1520 017214 pb1218: .ASCIZ /%N%ASA er: Controller RAM error (non-parity)/
1521 017271 pb1219: .ASCIZ /%N%ASA er: INIT sequence error/
1522 017330 pb1220: .ASCIZ /%N%ASA er: High level protocol incompatibility error/
1523 017415 pb1221: .ASCIZ /%N%ASA er: Purge\poll hardware failure/
1524 017464 pb1222: .ASCIZ /%N%ASA er: Mapping Register read error (parity or timeout)/
1525 017557 pb1223: .ASCIZ /%N%ASA er: Attempt to set port data transfer mapping when option not present/
1526 017674 PB12: .ASCIZ /%N%ASA Value (oct) %06/
1527
1528 017723 PBsf0: .ASCIZ /%N%ADUP type %06%A message number %06/
1529 017771 DRPunt: .ASCIZ /%N%N%ARQDX DRIVE %06%A finished./
1530 020032 TYPASC: .ASCIZ /%N%APLEASE TYPE ANSWER to controller question or just <return>/
1531
1532 ;mmm
1533 ;
```

FORMAT Messages

```

1535          .sbttl  FORMAT Messages
1536
1537          ; queries
1538
1539 020131  qfuit:  ;.byte  2...b.spl          ; Unit Info Table? (spl #2)
1540 020131          .asciz  '%N%AEntering UIT%02%A: on drive number %D3%N'
1541 020206  qfdat:  ;.byte  0...a.que          ; Date? (que #0)
1542 020206          .asciz  'Enter date <MM-DD-YYYY>:'
1543 020237  dfunt:  ;.byte  1...a.def          ; Unit? (def #1)
1544 020237          .asciz  'Enter unit number to format <0>:'
1545 020300  dfbad:  ;.byte  4...a.def          ; Use Bad? (def #4)
1546 020300          .asciz  'Use existing bad block information <N>:'
1547 020350  dfdwn:  ;.byte  5...a.def          ; Downline? (def #5)
1548 020350          .asciz  'Use down-line load <Y>:'
1549 020400  dfcon:  ;.byte  6...a.def          ; Continue? (def #6)
1550 020400          .asciz  'Continue if bad block information is inaccessible <N>:'
1551 020467  qfser:  ;.byte  7...a.que          ; Serial #? (que #7)
1552 020467          .asciz  'Enter non-zero serial number <8-10 digits>:'
1553 020543  ASK.ANSWER:
1554 020543          .asciz  'ans>'
1555
1556          ; Informational Messages
1557
1558 020550  sfbegt:  ;.byte  0...a.inf          ; Begin (inf #0)
1559 020550          .asciz  '%N%AFFormat Begun'
1560 020571  sfdont:  ;.byte  1...a.inf          ; Complete (inf #1)
1561 020571          .asciz  '%N%AFFormat complete'
1562 020615  sfrevt:  ;.byte  2...a.inf          ; # of Revectorred LBNS (inf #2)
1563 020615          .asciz  '% Revectorred LBNS'
1564 020637  sfr1t:  ;.byte  3...a.inf          ; # of primary ... (inf #3)
1565 020637          .asciz  '% Primary revectorred LBNS'
1566 020671  sfr2t:  ;.byte  4...a.inf          ; # of secondary ... (inf #4)
1567 020671          .asciz  '% Secondary/tertiary revectorred LBNS'
1568 020736  sfrcbt:  ;.byte  5...a.inf          ; # of Bad RCT blocks ... (inf #5)
1569 020736          .asciz  '% Bad blocks in the RCT area due to data errors'
1570 021016  sfdbbt:  ;.byte  7...a.inf          ; # of Bad DBNs ... (inf #7)
1571 021016          .asciz  '% Bad blocks in the DBN area due to data errors'
1572 021076  sfxbbt:  ;.byte  9...a.inf          ; # of Bad XBNs ... (inf #9)
1573 021076          .asciz  '% Bad blocks in the XBN area due to data errors'
1574 021156  sftryt:  ;.byte  11...a.inf         ; # of Retries (inf #11)
1575 021156          .asciz  '% Blocks retried on the check pass'
1576 021221  sfrbbt:  ;.byte  14...a.inf         ; # of Bad RBNS ... (inf #14)
1577 021221          .asciz  '% Bad RBNS'
1578 021234  sfcylt:  ;.byte  15...a.inf         ; Formatting Cyl (inf #15)
1579 021234          .asciz  'Formatting Cyl %'

```

FORMAT Messages

```

1581
1582      ; Successful Termination Messages
1583
1584      ;.byte      12...a.ter      ; Reformat Worked (ter #12)
1585 021255 sffcct: .asciz  '%N%AFCT used successfully'
1586      ;.byte      13...a.ter      ; Reconstruct Worked (ter #13)
1587 021307 sffcct: .ascii  '%N%AFCT was not used'
1588 021333 sffcct: .asciz  '%N%AFformat completed'
1589      ; Error messages
1590
1591 021360 efstat: ;.byte  1...a.fat      ; Status Error (fat #1)
1592 021360 efstat: .asciz  '%N%AGET STATUS failure'
1593
1594 021407 efsndt: ;.byte  2...a.fat      ; Send Error (fat #2)
1595 021407 efsndt: .asciz  '%N%AQ-PORT send error'
1596
1597 021435 efcmdt: ;.byte  3...a.fat      ; Command Error (fat #3)
1598 021435 efcmdt: .asciz  '%N%AUnsuccessful command'
1599
1600 021466 efrcvr: ;.byte  4...a.fat      ; Receive Error (fat #4)
1601 021466 efrcvr: .asciz  '%N%AQ-PORT receive error'
1602
1603 021517 efbust: ;.byte  5...a.fat      ; Bus Error (fat #5)
1604 021517 efbust: .asciz  '%N%AQ-Bus I/O error'
1605
1606 021543 efinit: ;.byte  6...a.fat      ; Format Init Error (fat #6)
1607 021543 efinit: .asciz  '%N%AFormatter initialization error'
1608
1609 021606 efnut:  ;.byte  7...a.fat      ; Unit nonexistent error (fat #7)
1610 021606 efnut:  .asciz  '%N%ANonexistent unit number'
1611
1612 021642 efdxft: ;.byte  8...a.fat      ; DBN/XBN Format error (fat #8)
1613 021642 efdxft: .asciz  '%N%ADBn/XBN format error (drive FORMAT command failed)'
1614
1615 021731 effcct: ;.byte  9...a.fat      ; FCT copies error (fat #9)
1616 021731 effcct: .asciz  '%N%AFCT does not have enough good copies of each block'
1617
1618 022020 efsekt: ;.byte 10...a.fat      ; Seek error (fat #10)
1619 022020 efsekt: .asciz  '%N%ASEEK error'
1620
1621 022037 efrctt: ;.byte 11...a.fat      ; RCT copies error (fat #11)
1622 022037 efrctt: .asciz  '%N%ARCT does not have enough good copies of each block'
1623
1624 022126 eflbft: ;.byte 12...a.fat      ; LBN format error (fat #12)
1625 022126 eflbft: .asciz  '%N%ALBN format error (drive FORMAT command failed)'
1626
1627 022211 effcwt: ;.byte 13...a.fat      ; FCT write error (fat #13)
1628 022211 effcwt: .asciz  '%N%AFCT write error (check write protect switch)'
1629
1630 022272 efrctr: ;.byte 14...a.fat      ; RCT read error (fat #14)
1631 022272 efrctr: .asciz  '%N%ARCT read error'
1632
1633 022315 efrctw: ;.byte 15...a.fat      ; RCT write error (fat #15)
1634 022315 efrctw: .asciz  '%N%ARCT write error'
1635
1636 022341 efrctf: ;.byte 16...a.fat      ; RCT full error (fat #16)
1637 022341 efrctf: .asciz  '%N%ARCT full'

```

FORMAT Messages

```
1638
1639 022356 effcrt: ;.byte 17...a.fat ; FCT read error (fat #17)
1640 022356 .asciz '%N%AFCT read error'
1641
1642 022401 effcnt: ;.byte 18...a.fat ; FCT nonexistent error (fat #18)
1643 022401 .asciz '%N%AFCT nonexistent'
1644
1645 022425 effcdt: ;.byte 19...a.fat ; FCT downline load error (fat #19)
1646 022425 .asciz '%N%AFCT Down-line load error'
1647
1648 022462 eftmot: ;.byte 20...a.fat ; Drive timeout error (fat #20)
1649 022462 .asciz '%N%ADrive init timeout'
1650
1651 022511 efillt: ;.byte 21...a.fat ; Illegal response error (fat #21)
1652 022511 .asciz '%N%AIllegal response to start-up question'
1653
1654 022563 efwart: ;.byte 22...a.fat ; Head error (fat #22)
1655 022563 .asciz '%N%AWARNING - possible head addressing problem - run diagnostics'
1656
1657 022664 efinpt: ;.byte 23...a.fat ; Input error (fat #23)
1658 022664 .asciz '%N%AINPUT Error '
1659
1660 022705 efmedt: ;.byte 24...a.fat ; Media error (fat #24)
1661 022705 .asciz '%N%AMedia degraded'
1662
1663 022730 efunrg: ;.byte 1...a.fat ; Status Error (fat #1)
1664 022730 .asciz '%N%AUncognized drive'
1665
1666 .list bin
1667 .even
```


Global subroutines

```

1726 023022 106427 000340      mtps   #340      ;don't want interrupts while setting up for cmd
1727 023026 004737 031606      jsr    pc,BIT15T ;test SA make sure not a fatal error
1728 023032 013700 002462      mov    cmdpak+10,r0 ;get opcode
1729 023036 022700 000001      cmp    #op.gds,r0 ;if the command issued was a GETDUST STATUS and time
out big trouble
1730 023042 001006      bne    GDS0      ;if not go do a GET DUST to find out what the situat
ion is
1731 023044      ERRDF  12,df14   ;type no iterrupt after get dust status command cont
roller dead
1732 023054 000137 037420      jmp    dropunt   ;drop unit and go on
1733      ;GETDUST      ;save timed out command information
1734
1735      GDS0:      ;store the vector address of timeout command
1736 023060 017737 157242 002544      mov    @vector,LSTVCT
1737 023066 013737 002452 002540      mov    cmdpak,LSTCRN ;store the CRN of the timed out command
1738 023074 013737 002462 002542      mov    cmdpak+10,LSTCMD ;store the opcode of timed out command
1739
1740 023102 032737 100000 002534      bit    #bit15,cmdrng+2 ;test ownership of ring make sure we own it
1741 023110 001363      bne    GDS0      ;if we don't own it wait until we do
1742 023112 012737 000016 002446      mov    #14.,cmdlen ;load lenght of packet to be send
1743 023120 112737 000000 002450      movb   #0,cmdlen+2 ;load msg type and credit
1744 023126 112737 000002 002451      movb   #dup.id,cmdlen+3 ;load DUP connection ID
1745 023134 005237 002452      inc    cmdpak    ;load new CRN
1746 023140 005037 002454      clr    cmdpak+2
1747 023144 005037 002456      clr    cmdpak+4
1748 023150 005037 002460      clr    cmdpak+6
1749 023154 012737 000001 002462      mov    #op.gds,cmdpak+10 ;load up opcode
1750 023162 005037 002464      clr    cmdpak+12 ;no modifiers
1751
1752 023166 012777 023226 157132      mov    #RFDO,@vector ;NEW VECTOR PLACE
1753 023174 012737 002352 002526      mov    #rsppak,rsprng ;load response packet area into ring
1754 023202 012737 002452 002532      mov    #cmdpak,cmdrng ;load command packet area into ring
1755 023210 012737 140000 002530      mov    #140000,RSPRNG+2 ;PORT OWNERSHIP BIT.
1756 023216 012737 100000 002534      mov    #bit15,CMDRNG+2
1757 023224 000655      br     POLLWT    ;GO and wait for interrupt
1758
1759
1760      ;+
1761      ; There is only 3 ways out code.
1762      ; If GETDUST resposne and TIMED_OUT cmd response was handled
1763      ; if LSTCRN = 0 and RSPPAK+10 = OP.GDS+OP.END then
1764      ; back to DUP dialog mode.
1765      ; or
1766      ; (TIMED_OUT cmd still hasn't returned but GETDUST has returned)
1767      ; if LSTCRN = # and RSPPAK+10 = OP.GDS+OP.END then
1768      ; check if idle or active. if idle then error
1769      ; check for progress in progress indicator if no progress then error
1770      ; load LSTVCT into @vector,LSTCRN into cmdpak, LSTCMD into cmdpak+10
1771      ; set response ring ownership to Port Owned
1772      ; jmp to pollwt.
1773      ; or
1774      ; (TIMED_OUT cmd response recieved before GETDUST response returned)
1775      ; if LSTCRN = # and RSPPAK+10 not= OP.GDS+OP.END then
1776      ; clear LSTCRN and
1777      ; jmp to pollwt.
1778      ;+
1779
1780 023226      RFDO:      ;INTR TO HERE if GETDUST or TIMED_OUT cmd
1781 023226 106427 000340      mtps   #340      ;No interrupts please
1782 023232 062706 000004      add    #4,sp    ;fix stack 4 for intrpt

```

Global subroutines

```

1783 023236 013701 002452      mov      cmdpak,r1      ;check command packet CRN
1784 023242 013700 002352      mov      rsppak,r0     ;check response packet CRN
1785 023246 020001              cmp      r0,r1         ;Are they the SAME must be GETDUST cmd
1786 023250 001103              bne     3$             ;if not it must be the TIMED_OUT cmd
1787
1788 023252 023727 002362 000201  cmp      rsppak+10,#op.gds+op.end ;it should be a GETDUST lets make sure
1789 023260 001412              beq     1$             ;
1790 023262              printf  #pb11w0         ;unexpected cmd response in time out loop
1791 023302 000137 037404          jmp     unkwn          ;error handler
1792
1793 023306 004737 030654          1$:      jsr     pc,RSPCHK     ;check the response
1794 023312 005737 002540          tst     LSTCRN        ;see if timed out command was already recieved (lstc
rn = 0)
1795 023316 001004              bne     2$             ;
1796 023320 062706 000002          add     #2,sp         ;adjust stack for Timed Out cmd's initial call to P0
LLWT
1797 023324 000137 034100          jmp     DUPDLG        ;if Timed out cmd was already received then goto DUP
dialog mode
1798
1799 023330          2$:      ;if Timed out command was not received already (LSTC
RN not= 0)
1800 023330 132737 000010 002371      bitb   #bit3,rsppak+17 ;if server idle then error
1801 023336 001010              bne     1002$         ;if not check for progress
1802 023340              printf  #pb11         ;controller idle when it should be active
1803
1804 023360 013700 002372          1002$:  mov     rsppak+20,r0   ;check for progress in progress indicator
1805 023364 013701 002374          mov     rsppak+22,r1   ;
1806 023370 020037 002546          cmp     r0,loprgi     ;see if low word of progress indicator is the same a
s older value
1807 023374 001007              bne     1001$         ;if it is then continue
1808 023376 020137 002550          cmp     r1,hiprgi     ;see if high vaule is the same
1809 023402 001004              bne     1001$         ;
1810 023404              ERRDF  11,DF13      ;no progress shown after cmd timeout
1811
1812 023414 010037 002546          1001$:  mov     r0,loprgi     ;update progress indicator
1813 023420 010137 002550          mov     r1,hiprgi     ;
1814 023424 013737 002540 002452      mov     LSTCRN,cmdpak ;move TIMED_OUT cmd CRN into cmd
1815 023432 013737 002542 002462      mov     LSTCMD,cmdpak+10 ;move TIMED_OUT cmd Opcode into cmd
1816 023440 013777 002544 156660      mov     LSTVCT,@vector ;load TIMED_OUT cmd interrupt handler address into v
ector
1817 023446 012737 140000 002530      mov     #140000,RSPRNG+2 ;Port owned
1818 023454 000137 022760          jmp     pollw         ;wait for TIMED_OUT cmd response
1819
1820
1821
1822 023460 020037 002540          3$:      cmp     r0,LSTCRN     ;check the crn with the last CRN from the timeout co
mmand
1823 023464 001412              beq     4$             ;
1824 023466              printf  #pb11w1         ;Unexpected cmd response in time out loop
1825 023506 000137 037404          jmp     unkwn          ;error handler
1826
1827              ;Timed out command recieved but Get Dust Status is s
till in Queue
1828 023512 013737 002540 002452 4$:      mov     LSTCRN,cmdpak ;load timed out command values for RSPCHK routine
1829 023520 013737 002542 002462      mov     LSTCMD,cmdpak+10 ;load timed out command values for RSPCHK routine
1830 023526 005037 002540          clr     LSTCRN        ;if it is the timeout command clear LAST CRN registe
r
1831 023532 004737 030654          jsr     pc,RSPCHK     ;go check the command
1832 023536 012737 140000 002530      mov     #140000,RSPRNG+2 ;PORT OWNERSHIP BIT.
1833 023544 000137 022760          jmp     POLLW         ;go wait for GETDUST interupt

```


Global subroutines

```

1949 024210          ERRDF  4,DF2          ; DEVICE FATAL wrong step bit set after interrupt
1350 024220          Printf #pb1,r3,(r4) ; Expected SA step bit xxxxx, received in SA yyyyyy
1951 024244 000137 037420 jmp      dropunt ;drop unit and go on
1952
1953 024250          GOBIT:
1954 024250 012714 000001      mov      #1,(r4)          ;Controller is NOW INITIALIZED
1955 024254 012700 177777      mov      #-1,r0
1956 024260 000240          1$:      nop
1957 024262 077002          sob      r0,1$          ;waste just a little time so program can terminate
1958 024264          GDScmd:
1959 024264          GETDUST
024264 032737 100000 002534 GDS2:  bit      #bit15,cmdrng+2 ;Do a Get Dust Status command start things off
024272 001374          bne      GDS2          ;test ownership of ring make sure we own it
024274 012737 000016 002446      mov      #14.,cmdlen ;if we don't own it wait until we do
024302 112737 000000 002450      movb    #0,cmdlen+2 ;load lenght of packet to be send
024310 112737 000002 002451      movb    #dup.id,cmdlen+3 ;load msg type and credit
024316 005237 002452          inc      cmdpak        ;load DUP connection ID
024322 005037 002454          clr      cmdpak+2      ;load new CRN
024326 005037 002456          clr      cmdpak+4
024332 005037 002460          clr      cmdpak+6
024336 012737 000001 002462      mov      #op.gds,cmdpak+10 ;load up opcode
024344 005037 002464          clr      cmdpak+12    ;no modifiers

024350 012777 024412 155750      mov      #RFD2,@vector ;New vector place
024356 012737 002352 002526      mov      #rsppak,rsprng ;load response packet area into ring
024364 012737 002452 002532      mov      #cmdpak,cmdrng ;load command packet area into ring
024372 012737 140000 002530      mov      #140000,RSPRNG+2 ;Port ownership bit.
024400 012737 100000 002534      mov      #bit15,CMDRNG+2
024406 004737 022760          jsr      pc,POLLWT    ;Go to poll and wait routine.

;*****

024412          RFD2:
024412 062706 000006          add      #6,sp          ;Intr to here.
024416 012777 032650 155702      mov      #intsrv,@vector ;fix stack for interrupt (4), pollwt subrtn (2)
024424 004737 030654          jsr      pc,RSPCHK    ;Change vector
                                ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.
024430 132737 000010 002371      bitb    #bit3,rsppak+17 ;is this server active already
1961 024436 001467          beq     dnint          ;branch to Execute Local Program
1962 024440          ERRSOFT 3,SFT0      ;Soft Error "already active will do an ABORT cmd"
1963 024450          ABRT
024450 032737 100000 002534 ABRT3: bit      #bit15,cmdrng+2 ;Doing an ABRT do get into idle state
024456 001374          bne      ABRT3        ;test ownership of ring make sure we own it
024460 012737 000016 002446      mov      #14.,cmdlen ;if we don't own it wait until we do
024466 112737 000000 002450      movb    #0,cmdlen+2 ;load lenght of packet to be send
024474 112737 000002 002451      movb    #dup.id,cmdlen+3 ;load msg type and credit
024502 005237 002452          inc      cmdpak        ;load DUP connection ID
024506 005037 002454          clr      cmdpak+2      ;load new CRN
024512 005037 002456          clr      cmdpak+4
024516 005037 002460          clr      cmdpak+6
024522 012737 000006 002462      mov      #op.abrt,cmdpak+10 ;load up opcode
024530 005037 002464          clr      cmdpak+12    ;no modifiers

024534 012777 024576 155564      mov      #RFD3,@vector ;New vector place
024542 012737 002352 002526      mov      #rsppak,rsprng ;load response packet area into ring

```

E4

Global subroutines

```

024550 012737 002452 002532      mov    #cmdpak,cmdrng      ;load command packet area into ring
024556 012737 140000 002530      mov    #140000,RSPRNG+2   ;Port ownership bit.
024564 012737 100000 002534      mov    #bit15,CMDRNG+2
024572 004737 022760              jsr    pc,POLLWT          ;Go to poll and wait routine.

```

```

024576                                RFD3:
024576 062706 000006              add    #6,sp              ;Intr to here.
024602 012777 032650 155516      mov    #intsrv,@vector   ;fix stack for interrupt (4), pollwt subrtn (2)
024610 004737 030654              jsr    pc,RSPCHK         ;Change vector
                                ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.
                                ;branch back to make sure not busy

```

```

1964 024614 000623              br     GDScmd
1965 024616
1966 024616 000207              DNINT: rts    pc
1967

```

Global subroutines

1969
1970
1971
1972
1973
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1975
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1978
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1980
1981
1982

024620
024620 032737 100000 002534
024626 001374
024630 012737 000050 002446
024636 112737 000000 002450
024644 112737 000002 002451
024652 005037 002454
024656 005037 002456
024662 005037 002460
024666 012737 000002 002462
024674 012737 000000 002464
024702 012737 001204 002466
024710 005037 002470
024714 012737 025270 002472
024722 005037 002474
024726 005037 002476
024732 005037 002500
024736 005037 002502
024742 005037 002504
024746 005037 002506
024752 005037 002510
024756 005037 002512
024762 005037 002514
024766 005037 002516
024772 005037 002520
024776 012777 025040 155322
025004 012737 002352 002526
025012 012737 002452 002532
025020 012737 140000 002530
025026 012737 100000 002534
025034 004737 022760

```
*****
;
;           AUTOSizer
;   This routine runs the Execute Supplied program called AUTOSZ
;   This program is downline loaded into the controller to determine
;   which drive is out in the controller. First you must tell which drive
;   you want to format. After listing the drive number the program will load
;   the program and figure which DEC drive it is and which UIT to load into
;   the disk controller fo rthe format program.
;
;*****
```

```
AUTOSizer:
  excSUPprg      ;downline load the program autosz
ESP4:  bit        #bit15,cmdrng+2    ;test ownership of ring make sure we own it
       bne        ESP4              ;if we don't own it wait until we do
       mov        #50,cmdlen         ;load lenght of packet to be send
       movb       #0,cmdlen+2       ;load msg type and credit value
       movb       #dup.id,cmdlen+3  ;load DUP connection ID
       clr        CMDpak+2
       clr        CMDpak+4
       clr        CMDpak+6
       mov        #op.esp,CMDpak+10 ;load up opcode
       mov        #0,CMDpak+12      ;no stand alone modifier
       mov        #<autoend-autosz>,cmdpak+14 ;load length of prg into buffer
       clr        cmdpak+16
       mov        #autosz,cmdpak+20 ;starting address of downline load prg
       clr        CMDpak+22
       clr        CMDpak+24
       clr        CMDpak+26
       clr        CMDpak+30
       clr        CMDpak+32
       clr        CMDpak+34        ;overlay buffer descriptor
       clr        CMDpak+36
       clr        CMDpak+40
       clr        CMDpak+42
       clr        CMDpak+44
       clr        CMDpak+46
       mov        #RFD4,@vector     ;New vector place
       mov        #rsppak,rsprng    ;load response packet area into ring
       mov        #cmdpak,cmdrng    ;load command packet area into ring
       mov        #140000,RSPRNG+2 ;Port ownership bit.
       mov        #bit15,CMDRNG+2
       jsr        pc,POLLWT         ;Go to poll and wait routine.
*****
```

025040
025040 062706 000006
025044 012777 032650 155254
025052 004737 030654

```
RFD4:
  add        #6,sp
  mov        #intsrv,@vector
  jsr        pc,RSPCHK
;Intr to here.
;fix stack for interrupt (4), pollwt subrtn (2)
;Change vector
;Go to routine that will check on
;the response recvd from the mut.
;get results of auto size
```

1983

025056
025056 032737 100000 002534
025064 001374
025066 012737 000034 002446
025074 112737 000000 002450
025102 112737 000002 002451
025110 005237 002452

```
Recvdata      #msg,#msglen
RCD5:  bit        #bit15,cmdrng+2    ;test ownership of ring make sure we own it
       bne        RCD5              ;if we don't own it wait until we do
       mov        #34,cmdlen         ;load lenght of packet to be send
       movb       #0,cmdlen+2       ;load msg type and credit
       movb       #dup.id,cmdlen+3  ;load DUP connection ID
       inc        cmdpak            ;load new CRN
```

Global subroutines

```

025114 005037 002454      clr      cmdpak+2
025120 005037 002456      clr      cmdpak+4
025124 005037 002460      clr      cmdpak+6
025130 012737 000005 002462      mov      #op.rec,cmdpak+10      ;load up opcode
025136 005037 002464      clr      cmdpak+12      ;no modifiers
025142 012737 000014 002466      mov      #msglen,cmdpak+14
025150 005037 002470      clr      cmdpak+16
025154 012737 026460 002472      mov      #msg,cmdpak+20      ;load address of buffer descriptor
025162 005037 002474      clr      cmdpak+22
025166 005037 002476      clr      cmdpak+24
025172 005037 002500      clr      cmdpak+26
025176 005037 002502      clr      cmdpak+30
025202 005037 002504      clr      cmdpak+32

025206 012777 025250 155112      mov      #RFD5,@vector      ;New vector place
025214 012737 002352 002526      mov      #rspak,rspng      ;load response packet area into ring
025222 012737 002452 002532      mov      #cmdpak,cmdrng      ;load command packet area into ring
025230 012737 140000 002530      mov      #140000,RSPRNG+2      ;Port ownership bit.
025236 012737 100000 002534      mov      #bit15,CMDRNG+2
025244 004737 022760      jsr      pc,PULLWT      ;Go to poll and wait routine.

;*****

025250      RFD5:      ;Intr to here.
025250 062706 000006      add      #6,sp      ;fix stack for interrupt (4), pollwt subrtn (2)
025254 012777 032650 155044      mov      #intsrv,@vector      ;Change vector
025262 004737 030654      jsr      pc,RSPCHK      ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.
                                ;return

1984 025266 000207      rts      pc

```

Global subroutines

1986
1987
1988
1989
1990
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1992
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1997
1998
1999
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2033
2034
2035
2036
2037
2038
2039
2040
2041
2042

025270
001204
000000
000000
000000
101 125 124

```

.sbttl AUTOSZ
;*****
;          AUTOsz
;          This is the actual down line loaded code which is placed in
; the RAM inside the RQDX3 controller. This code figures out the
; cylinder size of the drive. From the cylinder size we can determine
; which drive it is. If the drive is a winchester we will step the drive
; into the inner most cylinder. The inner most cylinder for most drives
; is the parking cylinder.
;
;+
; AUTOsz - Determine Drive Type and Size
; Input:      None.
; Output:     A Special Type Message:
;
;-----+-----+
; } Special Msg #10 (decimal) } +00
;-----+-----+
; }          Status          } +02
;-----+-----+
; } Innermost Cylinder for Unit 0 } +04
;-----+-----+
; } Innermost Cylinder for Unit 1 } +06
;-----+-----+
; } Innermost Cylinder for Unit 2 } +10
;-----+-----+
; } Innermost Cylinder for Unit 3 } +12
;-----+-----+
;
; where, status      = 0 for success,
;                   1 for UDC never went done,
;                   2 for UDC never interrupted,
;                   3 for Seek Failed
;
; cylinder          = 3 for RX33 Floppy
;                   2 for RX50 Floppy
;                   0 to 2048 for Winnie,
;                   -1 for Non-existent unit
;
; Note: The Unit Numbers will correspond to the numbers that the Host
; would use (i.e., not necessarily the DRVSEL numbers). Thus,
; Winnies will always precede Floppies and "null devices".
;
;*****
AUTOsz:
.dsable AMA
.word <AUTOend-AUTOsz> ;Byte count low      TEST HEADER
.word 0                 ;byte count high
.word 0                 ;overlay low
.word 0                 ;overlay high
.ascii /AUTOSZ/        ;6 character asciz name

```

AUTOSZ

```

025303      117      123      132
2043
2044 025306 000001      .even
2045 025310      000      .word      1      ;version number
2046 025311      177      .byte      0      ;flags
2047 025312 000240      .byte      177     ;timeout
2048
2049 025314      000240      nop      ;start down line loaded test
2050 025314 000240      AUTO::
2051
2052      ; Executable Code Starts Here
2053
2054 025316 106427 000340      mtps      #ps7      ; Set up our own interrupts handlers
2055 025322 005037 140004      clr      @#w$fp1      ; clear the leds
2056 025326 013746 100002      mov      @#i$udc,-(sp) ; Save the MSCP handlers - UDC
2057 025332 013746 100006      mov      @#i$clk,-(sp) ; ... Clock
2058 025336 013746 100016      mov      @#i$sec,-(sp) ; ... Sector
2059
2060      ; Taken from RQDX3.MAC m$init code:
2061
2062 025342 112737 000000 140022      movb     #op.res,@#w$cmd ; reset the smc9224 chip
2063 025350 112737 000111 140022      movb     #op.srp+11,@#w$cmd ; enable interrupts
2064 025356 112737 000040 140020      movb     #40,@#w$dat      ;
2065 025364 005067 001064      clr      s$$bug          ; assume the bug is not present
2066 025370 032737 020000 140006      bit      #20000,@#r$fps   ; is the ECO wire there?
2067 025376 001415      beq      sizset          ; definitely not
2068 025400 112737 000001 140022      movb     #op.dd,@#w$cmd   ; deselect all drives
2069 025406 012700 001000      mov      #1000,r0        ; wait for a bit
2070 025412      sizwt:
2071 025412 005300      dec      r0              ; ...
2072 025414 001376      bne      sizwt           ; ...
2073
2074 025416 032737 020000 140006      bit      #20000,@#r$fps   ; is the ECO wire there?
2075 025424 001002      bne      sizset          ; nope
2076 025426 005267 001022      inc      s$$bug          ; say it is
2077
2078      sizset:
2079 025432 010700      mov      pc,r0           ; Set up handlers
2080 025434 062700 000670      add      #<s$$udc-.>,r0   ; ...
2081 025440 010037 100002      mov      r0,@#i$udc      ; Use our own udc handler
2082 025444 010700      mov      pc,r0           ; ...
2083 025446 062700 000716      add      #<s$$rti-.>,r0   ;
2084 025452 010037 100006      mov      r0,@#i$clk      ; Make clock interrupt rti
2085 025456 010037 100016      mov      r0,@#i$sec      ; Make sector interrupt rti
2086 025462 106427 000000      mtps     #ps0            ; Make it good
2087
2088      ; Go Size the Drives
2089
2090 025466 010146      mov      r1,-(sp)        ; Save Registers
2091 025470 010246      mov      r2,-(sp)        ; Save Registers
2092 025472 010346      mov      r3,-(sp)        ;
2093 025474 010702      mov      pc,r2           ; Point to Unit Descriptor Table
2094 025476 062702 000766      add      #<msgdat+2>-.,r2 ; ...
2095 025502 010200      mov      r2,r0           ;
2096 025504 012703 000004      mov      #4.,r3          ; Initialize all Unit Descriptors
2097 025510      siznon:
2098 025510 012720 177777      mov      #-1.,(r0)+      ; ... to "Non-Existant Unit"

```


AUTOSZ

```

2156 025754          sizrx:          ; ** Check Floppy type RX50/RX33 **
2157 025754 112737 000111 140022      movb   #op.srp+9.,@#w$cmd      ; Set up UDC registers
2158 025762 132737 000020 140010      bitb   #bit4,@#r$dat          ; At track 0?
2159 025770 001506          beq     sizdrv                ;
2160 025772 112737 000104 140022      movb   #op.srp+4,@#w$cmd      ; Set up UDC registers
2161 026000 112737 000001 140020      movb   #1,@#w$dat            ; .. Head =1
2162 026006 010300          mov     r3,r0                 ; Select the Drive
2163 026010 062700 000054          add    #op.srx,r0             ; ... op.sd.rx=54
2164 026014 004767 000346          jsr    pc,doudc               ; Do UDC command
2165 026020 005700          tst    r0                     ; Okay?
2166 026022 001077          bne    sizend                 ; Nope, something is screwed up
2167 026024 112737 000111 140022      movb   #op.srp+9.,@#w$cmd      ; Set up UDC registers
2168 026032 132737 000020 140010      bitb   #bit4,@#r$dat          ; At track 0?
2169 026040 001003          bne    sizrx3                 ; No, it's an RX50
2170 026042 012712 000002          mov    #2,(r2)                ; Mark it as an RX50
2171 026046 000455          br     sizrd                   ;
2172 026050          sizrx3:
2173 026050 012712 000003          mov    #3,(r2)                ; Yes, mark it as an RX33
2174 026054 000452          br     sizrd                   ; Go do next drive
2175 026056          sizwin:
2176 026056 005012          clr    (r2)                   ; It's a Winnie - Set Count to 0
2177
2178 026060 012700 000007          mov    #op.sol,r0             ; Step out one track
2179 026064 004767 000276          jsr    pc,doudc               ; Do UDC command
2180 026070 005700          tst    r0                     ; Okay?
2181 026072 001053          bne    sizend                 ; Nope, something is screwed up
2182
2183 026074 012700 000003          mov    #ersek0,r0             ; Assume that seek to 0 failed
2184 026100 112737 000111 140022      movb   #op.srp+9.,@#w$cmd      ; At Cylinder 0?
2185 026106 132737 000020 140010      bitb   #bit4,@#r$dat          ; ...
2186 026114 001442          beq    sizend                 ; Nope, something's wrong
2187
2188 026116          sizin:
2189 026116 005212          inc    (r2)                   ; ** Step In Until Track 0 Found **
2190 026120 012700 000005          mov    #op.sil,r0             ; Up Cylinder Count
2191 026124 004767 000236          jsr    pc,doudc               ; Step In One Cylinder
2192 026130 005700          tst    r0                     ; Do UDC Command
2193 026132 001033          bne    sizend                 ; Okay?
2194
2195 026134 112737 000111 140022      movb   #op.srp+9.,@#w$cmd      ; At Cylinder 0?
2196 026142 132737 000020 140010      bitb   #bit4,@#r$dat          ; If so, skip to bump up
2197 026150 001003          bne    parkit                 ; ... descriptors
2198
2199 026152 021227 004000          cmp    (r2),#2048.            ; SMC Cylinder Limit Reached?
2200 026156 002757          blt    sizin                  ; ** Bottom of Step In Loop **
2201
2202 026160          parkit:
2203 026160 011201          mov    (r2),r1                ; step in, to inner most cylinder
2204 026162 005301          dec    r1                     ; get total number of cylinders
2205 026164 012700 000005          mov    #op.sil,r0             ; we want one less then recalibrate cylinder
2206 026170 004767 000172          jsr    pc,doudc               ; Step In One Cylinder
2207 026174 005700          tst    r0                     ; Do UDC Command
2208 026176 001011          bne    sizend                 ; Okay?
2209 026200 077107          sob    r1,1$                  ; Nope, something is screwed up
2210          sizrd:
2211
2212 026202 062702 000002          add    #untdsz,r2             ; ** This was a Winnie **
                                         ; Bump Pointer to Next Unit Descriptor

```

AUTOSZ

```

2213
2214 026206          sizdrv:          ; ** Check Next Drive **
2215 026206 005203   inc      r3          ; Up Drive Count
2216 026210 020327 000005   cmp      r3,#5.       ; All 4 Drives Checked?
2217 026214 003002           bgt      sizend       ; ...
2218 026216 000167 177300   jmp      sizlop       ; ** Bottom of Loop **
2219
2220 026222          sizend:          ; ** Send Status and Table **
2221 026222 010067 000234   mov      r0,msgdat    ; Save status
2222 026226 012700 000001   mov      #op.dd,r0    ; Deselect Drive
2223 026232 004767 000130   jsr      pc,doudc     ; ...
2224 026236 012603           mov      (sp)+,r3     ; Pop
2225 026240 012602           mov      (sp)+,r2     ; ...
2226 026242 012601           mov      (sp)+,r1     ; ...
2227 026244 106427 000340   mtps    #ps7         ; Put the MSCP Handlers Back
2228 026250 012637 100016   mov      (sp)+,@#i$sec ; ...
2229 026254 012637 100006   mov      (sp)+,@#i$clk ; ...
2230 026260 012637 100002   mov      (sp)+,@#i$udc ; ...
2231 026264 106427 000000   mtps    #ps0         ; ...
2232
2233 026270          sizexi::          ; ** Okay, talk to the Host **
2234
2235          ;PutData,msg,msglen - Send Response to Host
2236
2237 026270 010700           mov      pc,r0        ;figure the relative address
2238 026272 062700 000166   add      #msg-.,r0    ;... of the buffer
2239 026276 012746 000014   mov      #msglen,-(sp) ;load lenght in bytes of the buffer
2240 026302 010046           mov      r0,-(sp)     ;load relative address of the buffer
2241 026304 013746 000146   mov      @#146,-(sp)  ;load location of routine in microcode
2242 026310 004736           jsr      pc,@(sp)+    ;call Put Data routine in Ucode
2243 026312 022626           cmp      (sp)+,(sp)+ ;fix stack
2244
2245          ; Terminate Supplied Program
2246
2247 026314 013700 000142   mov      @#142,r0     ;load location of routine in microcode
2248 026320 004710           jsr      pc,(r0)     ;call Terminate routine in Ucode
2249 026322 000207           rts                ; ...

```

AUTOSZ

```

2251 ;+
2252 ; UDC Interrupt Handler
2253 ;
2254 ; Taken from RQDX3.MAC m$udc code:
2255 ;-
2256
2257 026324 s$$udc:: ; UDC Handler
2258 026324 005767 000124          tst    s$$bug ; is the ECO wire there?
2259 026330 001404                beq    s$$udi ; nope
2260 026332 032737 020000 140006 bit    #20000,@#r$fps ; is the 9224 interrupt line set?
2261 026340 001011                bne    s$$rti ; if not, must be a bogus interrupt
2262
2263 026342 s$$udi: ; ...
2264 026342 113746 140012          movb   @#r$cmd,-(sp) ; get interrupt status
2265 026346 142716 000035          bicb   #35,(sp) ; clear bits of no interest
2266 026352 122726 000240          cmpb   #240,(sp)+ ; valid status?
2267 026356 001002                bne    s$$rti ; no, it's a bogus interrupt
2268 026360 005267 000072          inc    s$$flag ; set the flag
2269
2270 ;+
2271 ; Return from Interrupt
2272 ;-
2273
2274 026364 s$$rti:: ;;; ...
2275 026364 000002          rti ;;; just quit
2276
2277 ;+
2278 ; DOUDC - Do a UDC Command
2279 ;
2280 ; This routine sends a commands and waits an interrupt or
2281 ; until timer expires.
2282 ;
2283 ; Input:      r0      = command
2284 ; Output:     r0      = 0 for success, non-zero for failure
2285 ;-
2286
2287          msec = 30.*132. ; Max Step Rate + some *
2288 ; loop for 7.5 MHz T11 clock
2289
2290 026366 doudc:: ; ** Do a UDC command **
2291 026366 010146          mov    r1,-(sp) ; save r1
2292 026370 005067 000062          clr    s$$flag ; Clear udc flag (interrupt pending)
2293 026374 010037 140022          mov    r0,@#w$cmd ; Send the command
2294 026400 012700 004000          mov    #2048.,r0 ; Set the rom timer (max cylinders)
2295
2296 026404 mswait: ; ** Wait **
2297 026404 012701 007570          mov    #msec,r1 ; set one millisecond counter
2298 026410 msin: ; ** Top of Inner Loop **
2299 026410 005767 000042          tst    s$$flag ; 3.60 udc interrupted
2300 026414 001005                bne    msend ; 1.60 out if udc interrupted
2301 026416 077104                sob    r1,msin ; 2.40 Total: 7.60 @7.5MHz=>
2302 ; ; 8.5457 @6.67MHz
2303 026420 077007                sob    r0,mswait ; ** Bottom of Outer Loop **
2304 026422 012700 000002          mov    #eruint,r0 ; Never Interrupted
2305 026426 000410                br     douret ; ...
2306
2307 026430 msend: ; ** Interrupt Happened **

```

N4

AUTOSZ

```
2308 026430 012700 000001      mov    #erudon,r0      ; Assume Never Done
2309 026434 013701 140012      mov    @#r$cmd,r1     ; Get the return status
2310 026440 032701 000040      bit    #bit5,r1       ; All done yet?
2311 026444 001401              beq    douret          ; If so, pop out of this
2312                               ;
2313 026446 005000              clr    r0              ; Assume everything's ok
2314                               ;
2315                               douret: ; ** Return **
2316 026450 012601      mov    (sp)+,r1
2317 026452 000207      rts    pc              ; Back to caller
```

SIZER Supplied Program Data

```

2319      .sbttl  SIZER Supplied Program Data
2320
2321      ;      .psect  c$data
2322
2323      ; Special Stuff
2324
2325 026454  s$$bug: .blkw  1      ; ECO Wire
2326 026456  s$$flag: .blkw  1      ; UDC flag
2327
2328      ; Packet Area
2329
2330 026460      012      140      msg::  .byte  10...b.spl      ; Final Message
2331 026462      msgdat: .blkw  5.      ; Status and Unit Descriptor Table
2332      000014      msglen =  .-msg      ; Message Length (Byte Count)
2333      000002      untdsz =  2.      ; Unit Descriptor Length
2334
2335      .enable AMA
2336 026474  AUTOend:

```

SIZER Supplied Program Data

```

2338
2339 ;*****
2340 ;           AUTOdisplay
2341 ;           This routine will display the results of the autosizers
2342 ;           findings. It will say weather the autosizer errored or not and
2343 ;           what drives it found.
2344 ;
2345 ;*****
2346
2347 026474          AUTOdis:
2348 026474 123727 026461 000140      cmpb    msg+1,#.b.spl      ;check if Special Message
2349 026502 001401          beq      1$          ;if not then no info to print
2350 026504 000207          rts      pc          ;so just return
2351
2352 026506 123727 026460 000012 1$:  cmpb    msg,#10.        ;
2353 026514 001401          beq      2$          ;check message number
2354 026516 000207          rts      pc          ;return if msg number doesn't match
2355 026520          2$:
2356 026520 005737 026462          tst     msg+2            ;test completion status of Autosizer
2357 026524 001457          beq      24$         ;if zero no error report the findings
2358
2359
2360 ; Autosizer Failure Code
2361 026526          printb  #ASMSG3,msg+2      ; Print Autosizer Failure Code
2362 026552 023727 026462 000001      cmp     msg+2,#1        ; Is it a UDC never done error ?
2363 026560 001010          bne     11$         ; No, check for next code
2364 026562          printb  #ASMSG4            ; Yes, Tell error type
2365 026602 023727 026462 000002 11$:  cmp     msg+2,#2        ; Is it a UDC never interrupted error ?
2366 026610 001010          bne     12$         ; No, check for next code
2367 026612          printb  #ASMSG5            ; Yes, Tell error type
2368 026632 023727 026462 000003 12$:  cmp     msg+2,#3        ; Is it a seek error ?
2369 026640 001010          bne     13$         ; No, go reinitialize ctrl
2370 026642          printb  #ASMSG6            ; Yes, Tell error type
2371 026662          13$:
2372 026662 000207          rts      pc          ;return
2373
2374 ; Autosizer Findings
2375 026664          24$:
2376 026664          printb  #ASMSG1            ; print Autosizer findings
2377 026704 012701 026464          mov     #msg+4,r1      ; first cylinder entry
2378 026710 005002          clr     r2            ; Start with unit number zero
2379 026712 022711 177777 26$:  cmp     #-1.,(r1)      ; Is unit Non-existent ?
2380 026716 001013          bne     61$         ; No, check for RX50
2381 026720          printb  #ASMSG7,R2          ; Yes, tell it is non-existent
2382 026742 000137 027522          jmp     20$         ;
2383 026746 022711 000002 61$:  cmp     #2.,(r1)      ; Is unit an RX50 ?
2384 026752 001013          bne     62$         ; No, check for RX33
2385 026754          printb  #ASMSG8,R2          ; Yes, tell it is an RX50
2386 026776 000137 027522          jmp     20$         ;
2387 027002 022711 000003 62$:  cmp     #3.,(r1)      ; Is unit an RX33 ?
2388 027006 001013          bne     63$         ; No, then it is a Winchester
2389 027010          printb  #ASMSG9,R2          ; Yes, tell it is RX33
2390 027032 000137 027522          jmp     20$         ;
2391 027036          63$:
2392 027036          printb  #ASMSG2,r2,(r1)      ; It is a WINCHESTER
2393
2394 027062          71$:

```

SIZER Supplied Program Data

```

2395 027062 023711 003102      cmp      UIT0+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2396 027066 001403      beq      710$
2397 027070 023711 003100      cmp      UIT0+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2398 027074 001012      bne      72$
2399 027076      710$:      printb  #DrvTx0
2400 027116 000137 027522      jmp      20$
2401
2402 027122 023711 003206      72$:      cmp      UIT1+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2403 027126 001403      beq      720$
2404 027130 023711 003204      cmp      UIT1+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2405 027134 001011      bne      73$
2406 027136      720$:      printb  #DrvTx1
2407 027156 000561      br       20$
2408
2409 027160 023711 003312      73$:      cmp      UIT2+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2410 027164 001403      beq      730$
2411 027166 023711 003310      cmp      UIT2+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2412 027172 001011      bne      74$
2413 027174      730$:      printb  #DrvTx2
2414 027214 000542      br       20$
2415
2416 027216 023711 003416      74$:      cmp      UIT3+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2417 027222 001403      beq      740$
2418 027224 023711 003414      cmp      UIT3+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2419 027230 001011      bne      75$
2420 027232      740$:      printb  #DrvTx3
2421 027252 000523      br       20$
2422
2423 027254 023711 003522      75$:      cmp      UIT4+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2424 027260 001403      beq      750$
2425 027262 023711 003520      cmp      UIT4+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2426 027266 001011      bne      76$
2427 027270      750$:      printb  #DrvTx4
2428 027310 000504      br       20$
2429
2430 027312 023711 003626      76$:      cmp      UIT5+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2431 027316 001403      beq      760$
2432 027320 023711 003624      cmp      UIT5+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2433 027324 001011      bne      77$
2434 027326      760$:      printb  #DrvTx5
2435 027346 000465      br       20$
2436
2437 027350 023711 003732      77$:      cmp      UIT6+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2438 027354 001403      beq      770$
2439 027356 023711 003730      cmp      UIT6+UITsiz-4,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2440 027362 001011      bne      78$
2441 027364      770$:      printb  #DrvTx6
2442 027404 000446      br       20$
2443
2444 027406 023711 004036      78$:      cmp      UIT7+UITsiz-2,(r1)      ;if cylinder # equals UIT table # this is the correc
t  UIT table
2445 027412 001403      beq      780$

```



```

2447 027420 001011
2448 027422
2449 027442 000427
2450
2451 027444 023711 004142 79$: cmp UITdf+UITsiz-2,(r1) ;if cylinder # equals UIT table # this is the correc
t UIT table
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SEQ 0056

SIZER Supplied Program Data

2452 027450 001403 beq 790$
2453 027452 023711 004140 cmp UITdf+UITsiz-4,(r1) ;if cylinder # equals UIT table # this is the correc
t UIT table
2454 027456 001011
2455 027460 790$: printb #DrvTxc ;1 custom rd
2456 027500 000410 br 20$
2457
2458 027502 80$: printb #ASMSGr ;"Unrecognized Drive"
2459
2460 027522 005721 20$: tst (r1)+ ; Point to next unit descriptor
2461 027524 005202 inc r2 ; Set for next unit
2462 027526 020227 000004 cmp r2,#MaxDrv ; Last unit?
2463 027532 001402 beq 27$ ; Yes, exit routine
2464 027534 000137 026712 jmp 26$ ; No, do next unit
2465 027540 000207 27$: rts pc ;
2466
2467 ;*****
2468 ;
2469 ; This routine builds the UIT table or get the UIT table
2470 ; depending who the questions are answered to the manual questions.
2471 ; If the unit is a listed or regconizable drive we will use a prebuilt
2472 ; UIT table. If not we will have to ask all the questions to build
2473 ; a table.
2474 ;
2475 ;*****
2476 027542 BLDUIT:
2477 027542 032737 100000 002336 bit #bit15,untflgs
2478 027550 001402 beq manbld
2479 027552 000137 030060 jmp autobld
2480
2481 027556 manbld: printf #DrvTxa ;print out UIT tables and their related drives
2482 027576 printf #DrvTxb ;UIN Drive
2483 027616 printf #DrvTx0 ;0 rd51
2484 027636 printf #DrvTx1 ;1 rd52
2485 027656 printf #DrvTx2 ;2 etc
2486 027676 printf #DrvTx3 ;3 etc
2487 027716 printf #DrvTx4 ;4
2488 027736 printf #DrvTx5
2489 027756 printf #DrvTx6
2490 027776 printf #DrvTx7
2491 030016 printf #DrvTxc
2492
2493 030036 GMANID unt.nbr,UIN,0,17,0,10,no ;GET Unit identifier number (0-7)
2494 ;PLACE IN bits 0-3.
2495 ;no defaults person must know what Unit Identificati
on number.
2496 030056 000515 br uitloc ;get correct table address into UITadrs
2497
2498 030060 autobld:
2499 030060 013700 002330 mov unit,r0 ;get unit number
2500 030064 006300 asl r0 ;get the byte offset of tbl
2501 030066 012737 000000 002344 1$: mov #0,uin ;pick UIT number 0
2502 030074 023760 003102 026464 cmp UIT0+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2503 030102 001503 beq 2$
2504 030104 012737 000001 002344 mov #1,uin ;pick UIT number 1
2505 030112 023760 003206 026464 cmp UIT1+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2506 030120 001474 beq 2$
2507 030122 012737 000002 002344 mov #2,uin ;pick UIT number 2
2508 030130 023760 003312 026464 cmp UIT2+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table

```

SIZER Supplied Program Data

```

2509 030136 001465          beq      2$
2510 030140 012737 000003 002344  mov      #3,uin          ;pick UIT number 3
2511 030146 023760 003416 026464  cmp      UIT3+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2512 030154 001456          beq      2$
2513 030156 012737 000004 002344  mov      #4,uin          ;pick UIT number 4
2514 030164 023760 003522 026464  cmp      UIT4+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2515 030172 001447          beq      2$
2516 030174 023760 003520 026464  cmp      UIT4+UITsiz-4,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2517 030202 001443          beq      2$          ;automatic recal feature of this drive
2518 030204 012737 000005 002344  mov      #5,uin          ;pick UIT number 5
2519 030212 023760 003626 026464  cmp      UIT5+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2520 030220 001434          beq      2$
2521 030222 023760 003624 026464  cmp      UIT5+UITsiz-4,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2522 030230 001430          beq      2$          ;automatic recal feature of this drive
2523 030232 012737 000006 002344  mov      #6,uin          ;pick UIT number 6
2524 030240 023760 003732 026464  cmp      UIT6+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2525 030246 001421          beq      2$
2526 030250 012737 000007 002344  mov      #7,uin          ;pick UIT number 7
2527 030256 023760 004036 026464  cmp      UIT7+UITsiz-2,msg+4(r0) ;if cylinder # equals UIT table # this is the correc
t UIT table
2528 030264 001412          beq      2$
2529 030266          printb  #efunrg          ;"No UIT table suitable for this drive"
2530 030306 000137 037420          jmp      dropunt        ;drop unit and end pass
2531 030312          2$:
2532 030312          uitloc:
2533 030312 012703 003000          mov      #UIT0,r3          ;r3 contains base address of UIT tables
2534 030316 013702 002344          mov      UIN,r2          ;get the correct UIT table address into UITadr regis
ter
2535 030322 001403          beq      11$          ;if UIN=0 then set table to UIT0
2536 030324 062703 000104          10$: add      #UITsiz,r3          ;else multiply UIT size by the UIN number and add to
base address
2537 030330 077203          sob      r2,10$
2538 030332 010337 002320          11$: mov      r3,UITadr        ;store the proper address of the UIT table
2539 030336 000137 030344          jmp      cont          ;all done
2540
2541 030342          tblbld:
2542 030342 000240          nop          ;We must build a UNIT INFORMATION TABLE
;try IRQCBI for custom built tables available thru S
DC.
2543 030344 000207          cont: rts      pc          ;go back
2544          ;*****
2545          ;
2546          ; Octal number to ASCII Decimal number
2547          ; r1 = address of ascii decimal data
2548          ; r0 = octal data word
2549          ;*****
2550 030346          OCTASC:
2551 030346 010246          mov      r2,-(sp)
2552 030350 010346          mov      r3,-(sp)
2553 030352 005002          clr      r2          ;clear the decimal table pointer
2554 030354 005003          1$: clr      r3          ;clear decimal digit
2555 030356 005203          2$: inc      r3          ;increment decimal digit
2556 030360 166200 030420          sub      dectbl(r2),r0        ;subtract a power of ten from accumulator
2557 030364 002374          bge      2$          ;if not negative subtract another
2558 030366 066200 030420          add      dectbl(r2),r0        ;adjust accumulator so positive
2559 030372 005303          dec      r3          ;adjust decimal digit
2560 030374 062703 000060          add      #60,r3          ;convert decimal to ascii
2561 030400 110321          movb     r3,(r1)+          ;mov ascii digit text into buffer
2562 030402 005722          tst      (r2)+          ;increment table pointer
2563 030404 005762 030420          tst      dectbl(r2)        ;check if thats all
2564 030410 001361          bne      1$

```

SIZER Supplied Program Data

```

2566 030414 012602
2567 030416 000207
2568 030420
2569 030420 023420
2570 030422 001750
2571 030424 000144
2572 030426 000012
2573 030430 000001
2574 030432 000000
2575
2576
2577
2578
2579
2580
2581 030434
2582 030434 010546
2583 030436 010446
2584 030440 010346
2585 030442 010246
2586 030444 005004
2587 030446 005003
2588 030450 005002
2589 030452 112104
2590 030454 001423
2591
2592
2593
2594
2595
2596 030456 162704 000060
2597 030462 010346
2598 030464 010246
2599
2600 030466 012705 000003
2601 030472 006302
2602 030474 006103
2603 030476 077503
2604
2605 030500 006316
2606 030502 006166 000002
2607
2608 030506 000241
2609 030510 062602
2610 030512 005503
2611 030514 062603
2612
2613 030516 060402
2614 030520 005503
2615 030522 000753
2616
2617 030524 010220
2618 030526 010310
2619
2620 030530 012602
2621 030532 012603
2622 030534 012604

```

```

mov      (sp)+,r2
rts      pc
dectbl:
.word    10000.
.word    1000.
.word    100.
.word    10.
.word    1.
.word    0
;*****
;
;   ASCII DECIMAL numbers to Octal numbers
;   r1 = address of ascii decimal data
;   r0 = address to store octal data low word, high word
;*****
ASCDEC:
mov      r5,-(sp)
mov      r4,-(sp)
mov      r3,-(sp)
mov      r2,-(sp)
clr      r4
clr      r3
clr      r2
3$:      movb   (r1)+,r4
         beq    1$
         cmp    r4,#60
         blt    asklbn
         cmp    r4,#71
         bgt    asklbn
         ;if digit equals null than all done
         ;check for a real number value
         ;wasn't a real number
         ;wasn't a real number
sub      #60,r4
mov      r3,-(sp)
mov      r2,-(sp)
         ;save accum
         ;accum * 8
4$:      mov    #3,r5
         asl   r2
         rol   r3
         sob   r5,4$
         ;accum*2
         asl   (sp)
         rol   2(sp)
         ; accum*8 + accum*2
         clc
         add   (sp)+,r2
         adc   r3
         add   (sp)+,r3
         ;add present digit to accum*10
         add   r4,r2
         adc   r3
         br    3$
1$:      mov    r2,(r0)+
         mov    r3,(r0)
         ;load lo number
         ;load hi number
         mov    (sp)+,r2
         mov    (sp)+,r3
         mov    (sp)+,r4
         ;restore stack to its orginal

```


SIZER Supplied Program Data

```

2680 030764 032701 000200      bit      #200,r1      ;see if a end command response was send
2681 030770 001010      bne      2$          ;No end bit in response packet encode
2682 030772      printx  #PB1lend    ;check if Get Dust Status command
2683 031012 022701 000201      2$:      cmp      #201,r1
2684 031016 001010      bne      3$          ;check if Execute Supplied Program
2685 031020      printx  #PB11GDS
2686 031040 022701 000202      3$:      cmp      #202,r1
2687 031044 001010      bne      4$          ;check if Execute Local Program
2688 031046      printx  #PB11ESP
2689 031066 022701 000203      4$:      cmp      #203,r1
2690 031072 001010      bne      5$          ;check if Send Data
2691 031074      printx  #PB11ELP
2692 031114 022701 000204      5$:      cmp      #204,r1
2693 031120 001010      bne      6$          ;check if Receive Data
2694 031122      printx  #PB11SD
2695 031142 022701 000205      6$:      cmp      #205,r1
2696 031146 001022      bne      7$          ;check if Receive Data
2697 031150      printx  #PB11RD
2698 031170      Printb  #PBSF0,r3,r5 ;"type xxx, message number xxxxx is unknow to this program"
2699 031214 022701 000206      7$:      cmp      #206,r1
2700 031220 001010      bne      8$          ;check if Abort Program
2701 031222      printx  #PB11AP
2702 031242      8$:      Printb  #PB11op,cmdpak+10,rsppak+10
2703      ;CMDpkt opcode XXXX,RSPpkt opcode YYYYY
2704      ;find out what kind of status we have
2705 031272 013701 002364      mov      rsppak+12,r1
2706 031276 022701 000000      cmp      #0.,r1
2707 031302 001010      bne      10$
2708 031304      printx  #pb11s0      ;status:  successful
2709 031324 022701 000001      10$:     cmp      #1.,r1
2710 031330 001010      bne      11$
2711 031332      printx  #pb11s1      ;status:  Invalid Command
2712 031352 022701 000002      11$:     cmp      #2.,r1
2713 031356 001010      bne      12$
2714 031360      printx  #pb11s2      ;status:  No Region Available
2715 031400 022701 000003      12$:     cmp      #3.,r1
2716 031404 001010      bne      13$
2717 031406      printx  #pb11s3      ;status:  No Region Suitable
2718 031426 022701 000004      13$:     cmp      #4.,r1
2719 031432 001010      bne      14$
2720 031434      printx  #pb11s4      ;status:  Program Not Known
2721 031454 022701 000005      14$:     cmp      #5.,r1
2722 031460 001010      bne      15$
2723 031462      printx  #pb11s5      ;status:  Load Failure
2724 031502 022701 000006      15$:     cmp      #6.,r1
2725 031506 001010      bne      16$
2726 031510      printx  #pb11s6      ;status:  Standalone
2727 031530 022701 000011      16$:     cmp      #9.,r1
2728 031534 001010      bne      19$
2729 031536      printx  #pb11s9      ;status:  Host Buffer Access error
2730 031556      19$:     Printb  #PB11sts,rsppak+12 ;Response packet status XXXX
2731 031556      jmp     dropunt      ;drop unit and go on
2732 031602 000137 037420
2733
2734
2735      ;*****
2736      ;

```

SIZER Supplied Program Data

```

2737
2738
2739 031606
2740 031606 032714 100000
2741 031612 001001
2742 031614 000207
2743 031616
2744 031626 011401
2745 031630 022701 001000
2746 031634 001010
2747 031636
2748 031656 022701 100001
2749 031662 001010
2750 031664
2751 031704 022701 100002
2752 031710 001010
2753 031712
2754 031732 022701 100003
2755 031736 001010
2756 031740
2757 031760 022701 100004
2758 031764 001010
2759 031766
2760 032006 022701 100005
2761 032012 001010
2762 032014
2763 032034 022701 100006
2764 032040 001010
2765 032042
2766 032062 022701 100007
2767 032066 001010
2768 032070
2769 032110 022701 100010
2770 032114 001010
2771 032116
2772 032136 022701 100011
2773 032142 001010
2774 032144
2775 032164 022701 100012
2776 032170 001010
2777 032172
2778 032212 022701 100013
2779 032216 001010
2780 032220
2781 032240 022701 100014
2782 032244 001010
2783 032246
2784 032266 022701 100015
2785 032272 001010
2786 032274
2787 032314 022701 100016
2788 032320 001010
2789 032322
2790 032342 022701 100017
2791 032346 001010
2792 032350
2793 032370 022701 100020

```

```

;
;*****
; BIT FIFTEEN TEST
;*****
BIT15T:
    bit    #bit15,(r4)
    bne    100$
    rts    pc
100$:   ERRDF 9,df12          ;Fatal SA error
    mov    (r4),r1
    cmp    #1000,r1
    bne    1$
    printx #pb1201          ;
    cmp    #100001,r1
    bne    2$
    printx #pb1202          ;
    cmp    #100002,r1
    bne    3$
    printx #pb1203          ;
    cmp    #100003,r1
    bne    4$
    printx #pb1204          ;
    cmp    #100004,r1
    bne    5$
    printx #pb1205          ;
    cmp    #100005,r1
    bne    6$
    printx #pb1206          ;
    cmp    #100006,r1
    bne    7$
    printx #pb1207          ;
    cmp    #100007,r1
    bne    8$
    printx #pb1208          ;
    cmp    #100010,r1
    bne    9$
    printx #pb1209          ;
    cmp    #100011,r1
    bne    10$
    printx #pb1210          ;
    cmp    #100012,r1
    bne    11$
    printx #pb1211          ;
    cmp    #100013,r1
    bne    12$
    printx #pb1212          ;
    cmp    #100014,r1
    bne    13$
    printx #pb1213          ;
    cmp    #100015,r1
    bne    14$
    printx #pb1214          ;
    cmp    #100016,r1
    bne    15$
    printx #pb1215          ;
    cmp    #100017,r1
    bne    16$
    printx #pb1216          ;
    cmp    #100020,r1

```

SIZER Supplied Program Data

```

2794 032374 001010          bne      17$
2795 032376                printx  #pb1217          ;
2796 032416 022701 100021 17$:  cmp      #100021,r1
2797 032422 001010          bne      18$
2798 032424                printx  #pb1218          ;
2799 032444 022701 100022 18$:  cmp      #100022,r1
2800 032450 001010          bne      19$
2801 032452                printx  #pb1219          ;
2802 032472 022701 100023 19$:  cmp      #100023,r1
2803 032476 001010          bne      20$
2804 032500                printx  #pb1220          ;
2805 032520 022701 100024 20$:  cmp      #100024,r1
2806 032524 001010          bne      21$
2807 032526                printx  #pb1221          ;
2808 032546 022701 100025 21$:  cmp      #100025,r1
2809 032552 001010          bne      22$
2810 032554                printx  #pb1222          ;
2811 032574 022701 100026 22$:  cmp      #100026,r1
2812 032600 001010          bne      23$
2813 032602                printx  #pb1223          ;
2814 032622                printb  #pb12,r1          ;SA value: xxxxx
2815 032622                jmp      dropunt        ;drop unit and go on
2816 032644 000137 037420
2817
2818 ;*****
2819 ; Unexpected Interrupt Server
2820 ;
2821 ;*****
2822 032650 intsrv:
2823
2824 032650 ERRSF 8,sf100 ;Fatal SA error
2825 032660 docln          ;do clean up and quit
2826 032662 000137 037420 jmp      dropunt        ;drop test unit and end pass
2827
2828

```

SIZER Supplied Program Data

```

2830 032666          BGNPROT
2831 032666 177777  .WORD -1
2832 032670 177777  .WORD -1
2833 032672 177777  .WORD -1
2834 032674          ENDPROT
2835
2836 032674          BGNINIT
2837 032674          READEF      #EF.CONTINUE
2838 032702          BCOMPLETE  conton
2839 032704          READEF      #EF.NEW
2840 032712          BNCOMPLETE  next
2841 032714          SETUP:
2842 032714 012737 177777 002310  mov      #-1,LOGUNIT
2843 032722          NEXT:
2844 032722 005237 002310      inc      LOGUNIT
2845 032726 023737 002310 002012  cmp      LOGUNIT,L$UNIT
2846 032734 001002          bne     1$
2847 032736 000137 033114      jmp     ABORT
2848 032742          1$:
2849 032742          GPHARD LOGUNIT,PLOC
2850 032754          BNCOMPLETE NEXT
2851
2852 032756 013700 002314      mov     ploc,r0
2853 032762 010037 002316      mov     r0,ptbl
2854 032766 012037 002324      mov     (r0)+,ipreg
2855 032772 012037 002326      mov     (r0)+,vector
2856 032776 012037 002330      mov     (r0)+,unit
2857 033002 012037 002334      mov     (r0)+,sernbr
2858 033006 012037 002336      mov     (r0)+,untflgs
2859
2860 033012 005037 002540      conton: clr   LSTCRN
2861 033016 005037 002544      clr   LSTVCT
2862 033022 005037 002546      clr   LOPRGI
2863 033026 005037 002550      clr   HIPRGI
2864
2865 033032 013746 000004      1$:   mov     @#4,-(sp)
2866 033036 012737 033052 000004  mov     #12,@#4
2867 033044 005077 147254      clr   @IPreg
2868 033050 000410          br     $3
2869
2870 033052          $2:   ERRDF  7,DF4
2871 033062          dodu  LOGUNIT
2872 033070 000714          br     next
2873
2874 033072 012637 000004      $3:   mov     (sp)+,@#4
2875
2876 033076 012700 000076      mov     #76,r0
2877 033102 012701 002346      mov     #rsp1,r1
2878 033106 005021          $4:   clr   (r1)+
2879 033110 077002          sob   r0,$4
2880
2881 033112 000401          br     end
2882
2883 033114          ABORT:
2884 033114          DOCLN
2885 033116          END:
2886 033116          ENDINIT

```

```

;Sequential example
;Continue command?
;Yes, get no P-table but still initialize
;New pass
;if not new then go to next unit number

;Initialize logical unit nbr

;Point to next logical unit
;Have we passed maximum?
;No
;Yes, abort the pass

;Get the P-table
;if not available get next unit

;store the Ptable address for unit
;store IPreg address into register
;store vector
;store logical drive number
;store the serial number

;basic initialization stuff

;test to see if controller is there
;get controller into know state

;NXM trap at controller IP address
;drop unit
;get new unit

;move value back into location 4

;clean out all packets and interrupt flags
;and the command area

;Do clean-up and abort the pass

;Finished

```


M5

SIZER Supplied Program Data

```
2887
2888
2889 033120      BGNAUTO
2890 033120      DODU LOGUNIT
2891 033126      ENDAUTO
2892
2893 033130      BGNCLN
2894 033130      005077 147170      clr      @IPreg      ;get controller into know state
2895 033134      Break
2896 033136      ENDCLN      ;waste some time
2897
2898 033140      BGN DU
2899 033140      printf #DRPunt,unit
2900 033164      ENDDU
2901
```

SIZER Supplied Program Data

```

2903 033166          BGNTST 1
2904 033166 004737 023550          jsr    pc,hrdint          ;init the controller
2905 033172 032737 010000 002336  bit    #bit12,untflgs    ;check if just want to park the heads
2906 033200 001402          beq    3$
2907 033202 000137 037420          jmp    dropunt           ;jump to end of test where heads are automatically p
arked
2908 033206 122737 000023 002340 3$:  cmpb  #Mrqdx3,mdlnbr    ;check if RQDX3 controller
2909 033214 001403          beq    2$
2910 033216 042737 100000 002336  bic    #bit15,untflgs    ;if other than RQDX3 than impossible to run auto siz
er or in auto mo
2911 033224 032737 100000 002336 2$:  bit    #bit15,untflgs    ;test if auto mode is enabled
2912 033232 001404          beq    1$                ;if not skip the auto sizer routine
2913 033234 004737 024620          jsr    pc,AUTOsizer      ;if it is then run AUTO SIZER on the controller
2914 033240 004737 026474          jsr    pc,AUTOdis       ;display information from autosizer routine
2915
2916 033244          1$:
2917 033244 005077 147054          clr    @IPreg           ;...
2918 033250          printb #ASMSGT        ;can any spurious interrupts
2919 033270          ELPcmd:
2920 033270 000401          br    4$                ; set this to a NOP for APT compatability
2921 033272 000415          br    3$                ; skip manual question
2922 033274 005037 002322          4$:  clr    boot            ; WARNING - remove boot diskette first
2923 033300          GMANIL bot.dev,BOOT,-1,YES ; Insert new diskette
2924
2925 033314 005737 002322          tst    BOOT            ; DO you want to continue
2926 033320 001002          bne   3$                ;
2927 033322 000137 037420          jmp    dropunt         ; Yes, run format
2928 033326          3$:
2929
2930 033326 004737 023550          jsr    pc,hrdint       ; Reinit ctrl in case of unknown state
2931 033332          printb #pb9,mdlnbr   ; Print the disk controller model number
2932 033356          printb #pb10,mcnbr   ; Print microcode version number in dec.
2933
2934 033402 032737 100000 002336  bit    #bit15,untflgs    ;test if auto mode is enabled
2935 033410 001011          bne   1$                ;branch if in auto mode else
2936 033412          GMANID ASK.prg,PRGnam,A,-1,6.,6.,yes ;ask for the User what local program he wants to run
2937 033432 000411          br    2$
2938 033434          1$:
2939 033434 012737 047506 002676          mov    #"FO,PRGnam      ;place "FORMAT" into ascii buffer if in auto mode
2940 033442 012737 046522 002700          mov    #"RM,PRGnam+2
2941 033450 012737 052101 002702          mov    #"AT,PRGnam+4
2942 033456          2$:
2943 033456          EXLCPRG PRGnam      ;Execute Local program "FORMAT" or what ever they wr
ote
033456 032737 100000 002534  ELP6:  bit    #bit15,cmdrng+2    ;test ownership of ring make sure we own it
033464 001374          bne   ELP6             ;if we don't own it wait until we do
033466 012737 000022 002446          mov    #22,cmdlen     ;load lenght of packet to be send
033474 112737 000000 002450          movb  #0,cmdlen+2     ;load msg type and credit
033502 112737 000002 002451          movb  #dup.id,cmdlen+3 ;load DUP connection ID
033510 005237 002452          inc   cmdpak          ;load new CRN
033514 005037 002454          clr  cmdpak+2
033520 005037 002456          clr  cmdpak+4
033524 005037 002460          clr  cmdpak+6
033530 012737 000003 002462          mov  #op.elp,cmdpak+10 ;load up opcode
033536 012737 000001 002464          mov  #stdaln,cmdpak+12 ;stand alone modifier
033544 012700 000006          mov  #6,r0            ;6 letters transfer
033550 012701 002466          mov  #cmdpak+14,r1   ;starting address to place program name
033554 012702 002676          mov  #PRGnam,r2      ;start of Program Name
033560 112221          rfdj6: movb  (r2)+,(r1)+    ;add 2 to bycnt then store
033562 077002          sob  r0,rfdj6

```

SIZER Supplied Program Data

```

033564 012777 033626 146534      mov      #RFD6,@vector      ;New vector place
033572 012737 002352 002526      mov      #rsppak,rsprng    ;load response packet area into ring
033600 012737 002452 002532      mov      #cmdpak,cmdrng    ;load command packet area into ring
033606 012737 140000 002530      mov      #140000,RSPRNG+2  ;Port ownership bit.
033614 012737 100000 002534      mov      #bit15,CMDRNG+2
033622 004737 022760                jsr      pc,POLLWT         ;Go to poll and wait routine.

;*****

033626 062706 000006                RFD6:                      ;Intr to here.
033626 062706 000006                add      #6,sp              ;fix stack for interrupt (4), pollwt subrtn (2)
033632 012777 032650 146466      mov      #intsrv,@vector   ;Change vector
033640 004737 030654                jsr      pc,RSPCHK         ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.

2944
2945 033644 122737 000011 002371      cmpb    #bit3+bit0,rsppak+17 ;is this program a standalone,DUP dialog type
2946 033652 001406                beq      1$                 ;
2947 033654                ERRDF   2,DF3              ;"Device Fatal can't do remote programs"
2948 033664 000137 037420                jmp      dropunt           ;drop unit and go on
2949 033670
2950 033670
2951 033670                1$:
RCDcmd:
RECVDAT #datare,#80.
RCD7:   bit      #bit15,cmdrng+2 ;test ownership of ring make sure we own it
        bne      RCD7         ;if we don't own it wait until we do
        mov      #34,cmdlen    ;load lenght of packet to be send
        movb    #0,cmdlen+2    ;load msg type and credit
        movb    #dup.id,cmdlen+3 ;load DUP connection ID
        inc     cmdpak         ;load new CRN
        clr     cmdpak+2
        clr     cmdpak+4
        clr     cmdpak+6
        mov     #op.rec,cmdpak+10 ;load up opcode
        clr     cmdpak+12      ;no modifiers
        mov     #80.,cmdpak+14
        clr     cmdpak+16
        mov     #datare,cmdpak+20 ;load address of buffer descriptor
        clr     cmdpak+22
        clr     cmdpak+24
        clr     cmdpak+26
        clr     cmdpak+30
        clr     cmdpak+32

034020 012777 034062 146300      mov      #RFD7,@vector     ;New vector place
034026 012737 002352 002526      mov      #rsppak,rsprng    ;load response packet area into ring
034034 012737 002452 002532      mov      #cmdpak,cmdrng    ;load command packet area into ring
034042 012737 140000 002530      mov      #140000,RSPRNG+2  ;Port ownership bit.
034050 012737 100000 002534      mov      #bit15,CMDRNG+2
034056 004737 022760                jsr      pc,POLLWT         ;Go to poll and wait routine.

;*****

034062 062706 000006                RFD7:                      ;Intr to here.
034062 062706 000006                add      #6,sp              ;fix stack for interrupt (4), pollwt subrtn (2)
034066 012777 032650 146232      mov      #intsrv,@vector   ;Change vector

```

SIZER Supplied Program Data

```

034074 004737 030654          jsr      pc.RSPCHK          ;Go to routine that will check on
                                          ;the response recvd from the mut.
                                          ;it will check the cmd ref
                                          ;num, the endcode and status.

2952          ;+
2953          ;
2954          ;   get
2955          ;   r3 = type
2956          ;   r4 = SA adrs
2957          ;   r5 = sub number
2958 034100 113703 002553  DUPDLG: movb   datare+1,r3          ;get dup type info
2959 034104 006203          asr      r3
2960 034106 006203          asr      r3
2961 034110 006203          asr      r3
2962 034112 006203          asr      r3
2963 034114 042703 177760  bic      #type,r3          ;mask off all but DUP type
2964 034120 013705 002552  mov      datare,r5          ;get dup message number info
2965 034124 042705 170000  bic      #msgnbr,r5        ;clear out top 4 bits
2966
2967
2968          ;+
2969          ; Check for the type.
2970          ; if QUESTION type, it will be answered by sending
2971          ; an answer through a Send command which will be followed
2972          ; by a Receive command to await further instructions.
2973          ;
2974          ; If a DEFAULT QUESTION type is given an answer will
2975          ; either be given or a blank send command returned.
2976          ; Either way we will do a Send command followed by a
2977          ; Receive command.
2978          ;
2979          ; if INFORMATIONAL type, check message number and type
2980          ; information according to message number given.
2981          ;
2982          ; if FATAL ERROR type, check message number and print
2983          ; error message accordingly. No other commands will
2984          ; be given following this type of command.
2985          ;
2986          ; If TERMINATION type check the message number and print the
2987          ; correct message. Usually this implies a succesful
2988          ; end to the formatter. After this command we exit the program
2989          ;
2990          ; If SPECIAL type we are asking for the FCT table to be passed
2991          ; to the RQDX3 controller. We will send the table with a Send
2992          ; command and then to a Receive command to proceed.
2993          ;
2994 034130 022703 000001  qstn:  cmp     #Question,r3          ;test for "question" subtype
2995 034134 001117          bne     dfqstn          ;if not branch
2996 034136 032737 020000 002336  bit     #bit13,untflgs          ;see if we are working on a known controller
2997 034144 001077          bne     qnbra          ;if not type out ascii
2998 034146 122737 000106 002676  cmpb   #'F,prgram          ;if running the format program then print info
2999 034154 001073          bne     qnbra          ;else just go for an answer
3000
3001 034156 004737 030636  qnbr0: jsr     pc.clrDUPbuf          ;clear out data buffer so DRS macros don't show defa
ult
3002 034162 022705 000000          cmp     #0,r5          ;check for message number
3003 034166 001036          bne     qnbr7          ;check for next message number
3004 034170 032737 100000 002336  bit     #bit15,untflgs

```

SIZER Supplied Program Data

```

3005 034176 001011          bne      1$
3006 034200          GMANID  qfdat,DATARE,A,177777,10.,10.,no      ;DATE MM-DD-YYYY ?
3007 034220 000417          br      2$
3008 034222 012737 033060 002552 1$:      mov      #"06,datare      ;The date is not used anyway so any date will do
3009 034230 012737 030455 002554      mov      #"1,datare+2      ;I'll be celebrating this day
3010 034236 012737 026467 002556      mov      #"7-,datare+4
3011 034244 012737 034461 002560      mov      #"19,datare+6
3012 034252 012737 033070 002562      mov      #"86,datare+10
3013 034260 000137 035016      2$:      jmp      SDTcmd      ;branch to Send Data command
3014
3015 034264 022705 000007      qnbr7:   cmp      #7,r5      ;check for message number
3016 034270 001025          bne      qnbr8      ;check for next message number
3017 034272 032737 100000 002336      bit      #bit15,untflgs
3018 034300 001011          bne      1$
3019 034302          GMANID  qfser,DATARE,A,177777,8.,10.,NO      ;SERIAL NUMBER 9 digits ?
3020 034322 000406          br      2$
3021 034324 013700 002334      1$:      mov      sernbr,r0
3022 034330 012701 002552      mov      #datare,r1      ;place to stick ascii
3023 034334 004737 030346      jsr      pc,OCTASC      ;convert octal to decimal ascii
3024 034340 000137 035016      2$:      jmp      SDTcmd
3025
3026 034344 004737 030542      qnbr8:   jsr      pc,typDUPbuf      ;type out ASCII sent by disk controller
3027 034350          GMANID  ASK.ANSWER,DATARE,A,177777,0.,10.,YES      ;give it an answer
3028 034370 000137 035016      jmp      SDTcmd      ;branch to Send Data command
3029
3030
3031 034374 022703 000002      dfqstn: cmp      #DefQuest,r3      ;test for "Default Question" subtype
3032 034400 001402          beq      1$
3033 034402 000137 035232          jmp      infrm      ;if not branch
3034 034406 032737 020000 002336 1$:      bic      #bit13,untflgs      ;see if we are working on a known controller
3035 034414 001402          beq      2$
3036 034416 000137 034772          jmp      dqnbr8      ;if not type out ascii
3037 034422 122737 000106 002676 2$:      cmpb    #'F,prgnam      ;if running the format program then print info
3038 034430 001160          bne      dqnbr8      ;else just go for an answer
3039
3040 034432 004737 030636      dqnbr1: jsr      pc,clrDUPbuf      ;clear out data buffer so DRS macros don't show defa
ult
3041 034436 022705 000001          cmp      #1,r5      ;check for message number
3042 034442 001043          bne      dqnbr4      ;check for next message number
3043
3044 034444 032737 100000 002336      bit      #bit15,untflgs      ;put in message number
3045 034452 001011          bne      3$
3046 034454          GMANID  dfunt,DATARE,A,177777,0,3,YES      ;Ask for UNIT NUMBER 0-255 ?
3047 034474 000406          br      4$
3048 034476 013700 002330      3$:      mov      unit,r0      ;get unit number if in auto mode from Hardware P tab
le
3049 034502 012701 002552          mov      #datare,r1      ;store decimal ascii conversion in data area
3050 034506 004737 030346      jsr      pc,OCTASC      ;convert octal to ascii decimal in data area
3051
3052 034512 012701 002552      4$:      mov      #datare,r1      ;address of ascii decimal data
3053 034516 012700 002330          mov      #unit,r0      ;address to store octal conversion
3054 034522 004737 030434          jsr      pc,ASCDEC      ;convert ascii decimal to octal
3055 034526 022737 000003 002330 2$:      cmp      #3,unit      ;make sure unit number is less than 4 or between 0-3
3056 034534 002004          bge      1$
3057 034536 162737 000004 002330      sub      #4,unit      ;subtract 4 until unit is less than four
3058 034544 000770          br      2$
3059 034546          1$:
3060
3061 034546 000137 035016          jmp      SDTcmd      ;branch to Send Data command

```

SIZER Supplied Program Data

```

3062
3063 034552 022705 000004      dqnbr4: cmp      #4,r5          ;check for message number
3064 034556 001021              bne      dqnbr5          ;check for next message number
3065 034560 012737 000116 002552  mov      #'N,datare      ;set the default for NO
3066 034566 032737 100000 002336  bit      #bit15,untflgs
3067 034574 001010              bne      1$
3068 034576              GMANID  dfbad,DATAARE,A,177777,0,1,YES ;Use existing bad block information (Y or N)?
3069 034616 000137 035016      1$:      jmp      SDTcmd          ;branch to Send Data command
3070
3071 034622 022705 000005      dqnbr5: cmp      #5,r5          ;check for message number
3072 034626 001021              bne      dqnbr6          ;check for next message number
3073 034630 012737 000131 002552  mov      #'Y,datare      ;Set the default for YES
3074 034636 032737 100000 002336  bit      #bit15,untflgs
3075 034644 001010              bne      1$
3076 034646              GMANID  dfdwn,DATAARE,A,177777,0,1,YES ;Use Down Line Load (Y or N)?
3077 034666 000137 035016      1$:      jmp      SDTcmd          ;branch to Send Data command
3078
3079 034672 022705 000006      dqnbr6: cmp      #6,r5          ;check for message number
3080 034676 001035              bne      dqnbr6          ;check for next message number
3081 034700 012737 000116 002552  mov      #'N,datare      ;set the default for NO
3082 034706 032737 100000 002336  bit      #bit15,untflgs ;is this auto mode
3083 034714 001414              beq      1$              ;NO, ask question
3084                                ;Yes see if RD51
3085 034716 013701 002330              mov      unit,r1         ; first cylinder entry
3086 034722 006301              asl      r1              ;
3087 034724 062701 026464              add      #msg+4,r1       ; point to current unit entry
3088 034730 023711 003102              cmp      UIT0+UITsiz-2,(r1) ; Is it an RD51?
3089 034734 001014              bne      2$              ; NO, all done
3090                                ; YES, make question answer yes because
3091                                ; NO FCT tables on RD51
3092 034736 012737 000131 002552  mov      #'Y,datare      ; set the default for NO
3093 034744 000410              br       2$              ; and skip question
3094 034746
3095 034746              1$:      GMANID  dfcon,DATAARE,A,177777,0,1,YES ;Continue if bad block information is inaccessible (
Y or N)?
3096 034766 000137 035016      2$:      jmp      SDTcmd
3097
3098                                ;if unknown use default and continue
3099                                ;who knows maybe it will be useful some day
3100 034772
3101 034772 004737 030542      dqnbr6: jsr      pc,typDUPbuf ;type out ASCII sent by disk controller
3102
3103 034776              GMANID  ASK.ANSWER,DATAARE,A,177777,0.,10.,YES ;give it an answer
3104
3105 035016              SDTcmd:
3106 035016              SENDDAT #datare,#10.      ;sent the answer
035016 032737 100000 002534  SDT10: bit      #bit15,cmdrng+2 ;test ownership of ring make sure we own it
035024 001374              bne      SDT10          ;if we don't own it wait until we do
035026 012737 000034 002446  mov      #34,cmdlen      ;load length of packet to be send
035034 112737 000000 002450  movb     #0,cmdlen+2      ;load msg type and credit
035042 112737 000002 002451  movb     #dup.id,cmdlen+3 ;load DUP connection ID
035050 005237 002452              inc      cmdpak         ;load new CRN
035054 005037 002454              clr     cmdpak+2
035060 005037 002456              clr     cmdpak+4
035064 005037 002460              clr     cmdpak+6
035070 012737 000004 002462  mov      #op.sen,cmdpak+10 ;load up opcode
035076 005037 002464              clr     cmdpak+12      ;no modifiers
035102 012737 000012 002466  mov      #10.,cmdpak+14

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SIZER Supplied Program Data

```

035110 005037 002470          clr      cmdpak+16
035114 012737 002552 002472  mov      #datare,cmdpak+20      ;load address of buffer descriptor
035122 005037 002474          clr      cmdpak+22
035126 005037 002476          clr      cmdpak+24
035132 005037 002500          clr      cmdpak+26
035136 005037 002502          clr      cmdpak+30
035142 005037 002504          clr      cmdpak+32

035146 012777 035210 145152  mov      #RFD10,@vector      ;New vector place
035154 012737 002352 002526  mov      #rsppak,rsprng      ;load response packet area into ring
035162 012737 002452 002532  mov      #cmdpak,cmdrng      ;load command packet area into ring
035170 012737 140000 002530  mov      #140000,RSPRNG+2    ;Port ownership bit.
035176 012737 100000 002534  mov      #bit15,CMDRNG+2
035204 004737 022760          jsr      pc,POLLWT          ;Go to poll and wait routine.

;*****

035210          RFD10:
035210 062706 000006          add      #6,sp              ;Intr to here.
035214 012777 032650 145104  mov      #intsrv,@vector    ;fix stack for interrupt (4), pollwt subrtn (2)
035222 004737 030654          jsr      pc,RSPCHK         ;Change vector
                                ;Go to routine that will check on
                                ;the response recvd from the mut.
                                ;it will check the cmd ref
                                ;num, the endcode and status.
                                ;do another receive cmd

3107 035226 000137 033670          jmp      RCDcmd

3108
3109
3110
3111 035232 022703 000003  infrm:  cmp      #Inform,r3      ;test for "Informational" subtype
3112 035236 001046          bne      term              ;if not branch
3113 035240 032737 020000 002336  bit      #bit13,untflgs     ;see if we are working on a known controller
3114 035246 001036          bne      inbra             ;if not type out ascii
3115 035250 122737 000106 002676  cmpb     #'F,prngam        ;if running the format program then print info
3116 035256 001032          bne      inbra
3117
3118 035260 022705 000000  inbr0:  cmp      #0,r5          ;check for message number
3119 035264 001012          bne      inbr1            ;check for next message number
3120 035266 004737 030636          jsr      pc,clrDUPbuf      ;clear out DUP buffer so there is no echo on last AS

CII
3121 035272          printf  #sfbegt           ;format begun
3122 035312 022705 000001  inbr1:  cmp      #1,r5          ;check for message number
3123 035316 001012          bne      inbra             ;check for next message number
3124 035320 004737 030636          jsr      pc,clrDUPbuf      ;clear out DUP buffer so there is no echo on last AS

CII
3125 035324          printf  #sfdont           ;format complete
3126
3127 035344 004737 030542  inbra:  jsr      pc,typDUPbuf ;type out ASCII sent by disk controller
3128 035350 000137 033670          jmp      RCDcmd           ;do another receive command
3129
3130
3131
3132 035354 022703 000004  term:   cmp      #terminat,r3   ;test for termination type
3133 035360 001116          bne      ftler            ;if not branch
3134 035362 032737 020000 002336  bit      #bit13,untflgs     ;see if we are working on a known controller
3135 035370 001076          bne      tnbra            ;if not type out ascii
3136 035372 122737 000106 002676  cmpb     #'F,prngam        ;if running the format program then branch to error

routine
3137 035400 001072          bne      tnbra
3138
3139 035402 022705 000014  tnbr12: cmp      #12.,r5     ;test for sub number #1

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SIZER Supplied Program Data

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3140 035406 001012          bne      tnbr13          ;branch if not sub number #1
3141 035410          printf   #sffcut
3142 035430 000137 037420    jmp      dropunt        ;drop test unit and end pass
3143
3144 035434 022705 000015    tnbr13: cmp      #13.,r5    ;test for msg number
3145 035440 001052          bne      tnbra          ;branch if not right number
3146 035442          printf   #sffcnt
3147 035462 032737 100000 002336 bit      #bit15,untflgs ;
3148 035470 001434          beq      2$            ;are we in auto mode
3149                                     ; NO , then we are all done
3150 035472 013701 002330    mov      unit,r1        ; YES, is this an RX33
3151 035476 006301          asl      r1             ; first cylinder entry
3152 035500 062701 026464    add      #msg+4,r1      ;
3153 035504 022711 000003    cmp      #3,(r1)        ; point to current unit entry
3154 035510 001024          bne      2$            ; Is it an RX33?
3155                                     ; NO, all done
3156                                     ; YES, ask if it wants to continue or not
3157 035512 005077 144606    GMANIL  clr      @IPreg   ; reinit the controller stop spurious interrupts
3158 035516          bot.con,BOOT,-1,YES ; Do you want to format another?
3159
3160 035532 005737 002322    tst      BOOT           ; Yes, execute local program
3161 035536 001007          bne      1$            ; No, tell him to insert bootable media
3162
3163 035540          GMANIL  bot.rep,BOOT,-1,YES ; Please insert boot media and hit return
3164 035554 000402          br       2$            ;
3165 035556 000137 033270    1$:     jmp      ELPcmd    ;
3166 035562 000137 037420    2$:     jmp      dropunt ;
3167
3168 035566 004737 030542    tnbra:  jsr      pc,typDUPbuf ;type out ASCII sent by disk controller
3169 035572          printf   #PF2        ;print finished local program without procedure erro
r
3170 035612 000137 037426    jmp      etst          ;end DUP diaglog but stay in test loop
3171
3172
3173 035616 022703 000005    ftler:  cmp      #Ftlerr,r3 ;test for "Fatal Error" subtype
3174 035622 001402          beq      1$            ;
3175 035624 000137 037100    jmp      spcl          ;if not branch
3176 035630 032737 020000 002336 1$:     bit      #bit13,untflgs ;see if we are working on a known controller
3177 035636 001004          bne      3$            ;if not type out ascii
3178 035640 122737 000106 002676    cmpb    #'F,prgram     ;if running the format program then branch to error
routine
3179 035646 001414          beq      2$            ;
3180 035650 004737 030542    3$:     jsr      pc,typDUPbuf ;type out ASCII sent by disk controller
3181 035654          printf   #DF15        ;Fatal error reported when running local program
3182 035674 000137 037420    jmp      dropunt        ;drop unit and end pass
3183
3184 035700          2$:     ERRHRD  1,HRDO    ;Hard device error
3185
3186 035710 022705 000001    fnbr1:  cmp      #1,r5    ;test for sub number #1
3187 035714 001012          bne      fnbr2         ;branch if not sub number #1
3188 035716          gstsfc:
3189 035716          printb  #efstat       ;"GET STATUS failure"
3190 035736 000137 037420    jmp      dropunt        ;drop unit and end pass
3191
3192 035742 022705 000002    fnbr2:  cmp      #2.,r5    ;test for msg number
3193 035746 001012          bne      fnbr3         ;branch if not right number
3194 035750          printf   #efsndt     ;
3195 035770 000137 037420    jmp      dropunt        ;drop unit and end pass
3196

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SIZER Supplied Program Data

3197	035774	022705	000003	fnbr3:	cmp	#3.,r5	;test for msg number
3198	036000	001012			bne	fnbr4	;branch if not right number
3199	036002				printf	#efcmdt	;
3200	036022	000137	037420		jmp	dropunt	;drop unit and end pass
3201				fnbr4:	cmp	#4.,r5	;test for msg number
3202	036026	022705	000004		bne	fnbr5	;branch if not right number
3203	036032	001012			printf	#efrcvt	;
3204	036034				jmp	dropunt	;drop unit and end pass
3205	036054	000137	037420				
3206				fnbr5:	cmp	#5.,r5	;test for msg number
3207	036060	022705	000005		bne	fnbr6	;branch if not right number
3208	036064	001012			printf	#efbust	;
3209	036066				jmp	dropunt	;drop unit and end pass
3210	036106	000137	037420				
3211				fnbr6:	cmp	#6.,r5	;test for msg number
3212	036112	022705	000006		bne	fnbr7	;branch if not right number
3213	036116	001012			printf	#efinit	;
3214	036120				jmp	dropunt	;drop unit and end pass
3215	036140	000137	037420				
3216				fnbr7:	cmp	#7.,r5	;test for msg number
3217	036144	022705	000007		bne	fnbr8	;branch if not right number
3218	036150	001012			printf	#efnut	;
3219	036152				jmp	dropunt	;drop unit and end pass
3220	036172	000137	037420				
3221				fnbr8:	cmp	#8.,r5	;test for msg number
3222	036176	022705	000010		bne	fnbr9	;branch if not right number
3223	036202	001012			printf	#efdxft	;
3224	036204				jmp	dropunt	;drop unit and end pass
3225	036224	000137	037420				
3226				fnbr9:	cmp	#9.,r5	;test for msg number
3227	036230	022705	000011		bne	fnbr10	;branch if not right number
3228	036234	001012			printf	#effcct	;
3229	036236				jmp	dropunt	;drop unit and end pass
3230	036256	000137	037420				
3231				fnbr10:	cmp	#10.,r5	;test for msg number
3232	036262	022705	000012		bne	fnbr11	;branch if not right number
3233	036266	001012			printf	#efsekt	;
3234	036270				jmp	dropunt	;drop unit and end pass
3235	036310	000137	037420				
3236				fnbr11:	cmp	#11.,r5	;test for msg number
3237	036314	022705	000013		bne	fnbr12	;branch if not right number
3238	036320	001012			printf	#efrcct	;
3239	036322				jmp	dropunt	;drop unit and end pass
3240	036342	000137	037420				
3241				fnbr12:	cmp	#12.,r5	;test for msg number
3242	036346	022705	000014		bne	fnbr13	;branch if not right number
3243	036352	001012			printf	#eflbft	;
3244	036354				jmp	dropunt	;drop unit and end pass
3245	036374	000137	037420				
3246				fnbr13:	cmp	#13.,r5	;test for msg number
3247	036400	022705	000015		bne	fnbr14	;branch if not right number
3248	036404	001012			printf	#effcwt	;
3249	036406				jmp	dropunt	;drop unit and end pass
3250	036426	000137	037420				
3251				fnbr14:	cmp	#14.,r5	;test for msg number
3252	036432	022705	000016		bne	fnbr15	;branch if not right number
3253	036436	001012					

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3254 036440          printf #efrcrt          ;
3255 036460 000137 037420      jmp      dropunt          ;drop unit and end pass
3256
3257 036464 022705 000017      fnbr15: cmp      #15.,r5          ;test for msg number
3258 036470 001012          bne      fnbr16          ;branch if not right number
3259 036472          printf #efrcwt          ;
3260 036512 000137 037420      jmp      dropunt          ;drop unit and end pass
3261
3262 036516 022705 000020      fnbr16: cmp      #16.,r5          ;test for msg number
3263 036522 001012          bne      fnbr17          ;branch if not right number
3264 036524          printf #efrcft          ;
3265 036544 000137 037420      jmp      dropunt          ;drop unit and end pass
3266
3267 036550 022705 000021      fnbr17: cmp      #17.,r5          ;test for msg number
3268 036554 001012          bne      fnbr18          ;branch if not right number
3269 036556          printf #effcrt          ;
3270 036576 000137 037420      jmp      dropunt          ;drop unit and end pass
3271
3272 036602 022705 000022      fnbr18: cmp      #18.,r5          ;test for msg number
3273 036606 001012          bne      fnbr19          ;branch if not right number
3274 036610          printf #effcnt          ;
3275 036630 000137 037420      jmp      dropunt          ;drop unit and end pass
3276
3277 036634 022705 000023      fnbr19: cmp      #19.,r5          ;test for msg number
3278 036640 001012          bne      fnbr20          ;branch if not right number
3279 036642          printf #effcdt          ;
3280 036662 000137 037420      jmp      dropunt          ;drop unit and end pass
3281
3282 036666 022705 000024      fnbr20: cmp      #20.,r5         ;test for msg number
3283 036672 001012          bne      fnbr21          ;branch if not right number
3284 036674          printf #eftmot          ;
3285 036714 000137 037420      jmp      dropunt          ;drop unit and end pass
3286
3287 036720 022705 000025      fnbr21: cmp      #21.,r5         ;test for msg number
3288 036724 001012          bne      fnbr22          ;branch if not right number
3289 036726          printf #efillt          ;
3290 036746 000137 037420      jmp      dropunt          ;drop unit and end pass
3291
3292 036752 022705 000026      fnbr22: cmp      #22.,r5         ;test for msg number
3293 036756 001012          bne      fnbr23          ;branch if not right number
3294 036760          printf #efwart          ;
3295 037000 000137 037420      jmp      dropunt          ;drop unit and end pass
3296
3297 037004 022705 000027      fnbr23: cmp      #23.,r5         ;test for msg number
3298 037010 000412          br       fnbr24          ;branch if not right number
3299 037012          printf #efinpt          ;
3300 037032 000137 037420      jmp      dropunt          ;drop unit and end pass
3301
3302
3303 037036 022705 000030      fnbr24: cmp      #24.,r5         ;test for msg number
3304 037042 001012          bne      1$              ;
3305 037044          printf #efmedt          ;
3306 037064 000137 037420      jmp      dropunt          ;drop unit and end pass
3307
3308 037070 004737 030542      1$:      jsr     pc,typDUPbuf      ;type out ASCII sent by disk controller
3309 037074 000137 037420      jmp      dropunt          ;drop unit and end pass
3310

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SIZER Supplied Program Data

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3311
3312
3313
3314 037100 022703 000006      spcl:  cmp    #specl,r3      ;test for special type
3315 037104 001137              bne    unkwn          ;branch if not known
3316 037106 032737 020000 002336 bit    #bit13,untflgs ;see if we are working on a known controller
3317 037114 001004              bne    2$            ;if not type out ascii
3318 037116 122737 000106 002676 cmpb   #'F,prgnam     ;if running the format program then print info
3319 037124 001414              beq    1$            ;type out ASCII sent by disk controller
3320 037126 004737 030542      2$:   jsr    pc,typDUPbuf ;special command issued by local program did not kno
3321 037132                    printf  #DF16
w how to handle
3322 037152 000137 037404              jmp    unkwn          ;report error
3323
3324 037156 022705 000002      1$:   cmp    #2,r5          ;test for message number 1
3325 037162 001110              bne    unkwn          ;branch if not known
3326 037164 004737 027542              jsr    pc,blduit     ;go get or build UIT table
3327 037170                    SENDDAT UITadr,#UITsiz ;sent Unit Information table
037170 032737 100000 002534 SDT11: bit    #bit15,cmdrng+2 ;test ownership of ring make sure we own it
037176 001374                    bne    SDT11         ;if we don't own it wait until we do
037200 012737 000034 002446      mov    #34,cmdlen    ;load length of packet to be send
037206 112737 000000 002450      movb   #0,cmdlen+2   ;load msg type and credit
037214 112737 000002 002451      movb   #dup.id,cmdlen+3 ;load DUP connection ID
037222 005237 002452                    inc    cmdpak        ;load new CRN
037226 005037 002454                    clr   cmdpak+2
037232 005037 002456                    clr   cmdpak+4
037236 005037 002460                    clr   cmdpak+6
037242 012737 000004 002462      mov    #op.sen,cmdpak+10 ;load up opcode
037250 005037 002464                    clr   cmdpak+12     ;no modifiers
037254 012737 000104 002466      mov    #UITsiz,cmdpak+14
037262 005037 002470                    clr   cmdpak+16
037266 013737 002320 002472      mov    UITadr,cmdpak+20 ;load address of buffer descriptor
037274 005037 002474                    clr   cmdpak+22
037300 005037 002476                    clr   cmdpak+24
037304 005037 002500                    clr   cmdpak+26
037310 005037 002502                    clr   cmdpak+30
037314 005037 002504                    clr   cmdpak+32
037320 012777 037362 143000      mov    #RFD11,@vector ;New vector place
037326 012737 002352 002526      mov    #rsppak,rsprng ;load response packet area into ring
037334 012737 002452 002532      mov    #cmdpak,cmdrng ;load command packet area into ring
037342 012737 140000 002530      mov    #140000,RSPRNG+2 ;Port ownership bit.
037350 012737 100000 002534      mov    #bit15,CMDRNG+2
037356 004737 022760      jsr    pc,POLLWT     ;Go to poll and wait routine.

;*****
037362                    RFD11: ;Intr to here.
037362 062706 000006              add    #6,sp          ;fix stack for interrupt (4), pollwt subrtn (2)
037366 012777 032650 142732      mov    #intsrv,@vector ;Change vector
037374 004737 030654              jsr    pc,RSPCHK     ;Go to routine that will check on
;the response recvd from the mut.
;it will check the cmd ref
;num, the endcode and status.
;do another receive cmd
3328 037400 000137 033670              jmp    RCDcmd
3329
3330
3331 037404                    unkwn: ERRSF 0,SFO    ; system error unkown response

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K6

SIZER Supplied Program Data

```

3332 037414 004737 030730          jsr    pc,PRNTpkt          ;type out packet information
3333
3334 037420          dropunt: DODU LOGUNIT      ;drop the unit
3335 037420
3336
3337 037426          etst:      cmp    mdlnbr,#mrqdx3
3338 037426 023727 002340 000023      bne    1$
3339 037434 001014          jsr    pc,hrdint          ;if rqdx3 do park else don't
3340 037436 004737 023550          printb #Parkdrv          ;reboot system controller
3341 037442          jsr    pc,autosizer      ;tell user to wait while parking heads
3342 037462 004737 024620          1$:      docln           ;go park heads
3343 037466
3344 037466
3345 037470          ENDTST           ;take controller offline

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SIZER Supplied Program Data

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3347 037472          BGNHRD
3348
3349 037474          GPRMA ip.adr,0,0,160000,177776,YES ;Get IP reg addr (170000-177776)
3350                                     ;place in word 2 of the table
3351                                     ;default value is from default
3352                                     ;table.
3353
3354 037504          GPRMA vec.adr,2,0,0,776,YES ;Get the vector addr (octal 0-776)
3355                                     ;place in word
3356                                     ;default value is from default
3357                                     ;table.
3358
3359 037514          GPRML prk.hds,10,bit12,YES ;ask if they want to just park the heads
3360
3361 037522          XFERT label0 ;If last gprml input is true (y) transfer
3362
3363 037524          GPRML auto.md,10,bit15,YES ;ask if they want to go in to auto mode
3364                                     ;This will format the drive using the autosizer
3365
3366 037532          XFERF label0 ;If last gprml input is false (n) transfer
3367                                     ;control to label.
3368
3369 037534          GPRMD drv.nbr,4,D,-1,0,255.,YES ;Get the logical drive (dECIMAL 0-255)
3370                                     ;place in word
3371                                     ;default value is from default
3372                                     ;table.
3373
3374
3375 037546          GPRMD ser.nbr,6,D,-1,1,012345.,YES ;Get the drive serial number
3376                                     ;place in word
3377                                     ;default value is from default
3378                                     ;table.
3379
3380
3381 037560          label0:
3382
3383 037560          exit hrd
3384 037562          ENDHRD
3385
3386
3387 037562          LASTAD
3388 037566          L$LAST::
3389 037566          ENDMOD
000001          .END

```

Symbol table

A	=	000000	BIT9	=	001000	G	C\$PNTB=	000014	DRVTX4	005165	FNBR18	036602
ABORT		033114	BLDUIT		027542		C\$PNTF=	000017	DRVTX5	005261	FNBR19	036634
ABRT3		024450	BOE	=	000400	G	C\$PNTS=	000016	DRVTX6	005355	FNBR2	035742
ADR	=	000020	BOOT		002322		C\$PNTX=	000015	DRVTX7	005450	FNBR20	036666
ASCDEC		030434	BOT.CO		007673		C\$PUTB=	000072	DRV.NB	004222	FNBR21	036720
ASK.AN		020543	BOT.DE		007147		C\$PUTW=	000073	DUPDLG	034100	FNBR22	036752
ASK.DB		006746	BOT.RE		007603		C\$QIO =	000377	DUP.ID=	000002	FNBR23	037004
ASK.LB		007021	CINTR		002522		C\$RDBU=	000007	EFBUST	021517	FNBR24	037036
ASK.PR		006625	CLRDUP		030636		C\$REFG=	000047	EFCMDT	021435	FNBR3	035774
ASK.RB		007074	CMDLEN		002446		C\$REL =	000077	EFDXFT	021642	FNBR4	036026
ASK.XB		006673	CMDPAK		002452		C\$RESE=	000033	EFFCCT	021731	FNBR5	036060
ASMSGR		005637	CMDRNG		002532		C\$REVI=	000003	EFFCDT	022425	FNBR6	036112
ASMSGT		006507	CONT		030344		C\$RFLA=	000021	EFFCNT	022401	FNBR7	036144
ASMSG1		005733	CONTON		033012		C\$RPT =	000025	EFFCRT	022356	FNBR8	036176
ASMSG2		006234	C\$AU =		000052		C\$SEFG=	000046	EFFCWT	022211	FNBR9	036230
ASMSG3		006257	C\$AUTO=		000061		C\$SPRI=	000041	EFILLT	022511	FTLER	035616
ASMSG4		006341	C\$BRK =		000022		C\$SVEC=	000037	EFINIT	021543	FTLERR=	000005
ASMSG5		006411	C\$BSEG=		000004		C\$TOME=	000076	EFINPT	022664	F\$AU =	000015
ASMSG6		006463	C\$BSUB=		000002		DATARE	002552	EFLBFT	022126	F\$AUTO=	000020
ASMSG7		006021	C\$CLCK=		000062		DBN	002720	EFMEDT	022705	F\$BGN =	000040
ASMSG8		006066	C\$CLEA=		000012		DECTBL	030420	EFNUT	021606	F\$CLEA=	000007
ASMSG9		006152	C\$CLOS=		000035		DEFQUE=	000002	EFRCCCT	022037	F\$DU =	000016
ASSEMB=		000010	C\$CLP1=		000006		DFBAD	020300	EFRCCFT	022341	F\$END =	000041
AUTO		025314	C\$CPBF=		000074		DFCON	020400	EFRCRT	022272	F\$HARD=	000004
AUTOBL		030060	C\$CPME=		000075		DFDWN	020350	EFRCVT	021466	F\$HW =	000013
AUTODI		026474	C\$CVEC=		000036		DFPTBL	002276	EFRDWT	022315	F\$INIT=	000006
AUTOEN		026474	C\$DCLN=		000044		DFQSTN	034374	EFSEKT	022020	F\$JMP =	000050
AUTOSI		024620	C\$DODU=		000051		DFUNT	020237	EFSNDT	021407	F\$MOD =	000000
AUTOSZ		025270	C\$DRPT=		000024		DF1	011141	EFSTAT	021360	F\$MSG =	000011
AUTO.M		004305	C\$DU =		000053		DF11	011425	EFTMOT	022462	F\$PROT=	000021
B	=	000011	C\$EDIT=		000003		DF12	011462	EFUNRG	022730	F\$PWR =	000017
BIT0	=	000001	C\$ERDF=		000055		DF13	011516	EFWART	022563	F\$RPT =	000012
BIT00	=	000001	C\$ERHR=		000056		DF14	011572	EF.CON=	000036	F\$SEG =	000003
BIT01	=	000002	C\$ERRO=		000060		DF15	011653	EF.NEW=	000035	F\$SOFT=	000005
BIT02	=	000004	C\$ERSF=		000054		DF16	011743	EF.PWR=	000034	F\$SRV =	000010
BIT03	=	000010	C\$ERSO=		000057		DF2	011203	EF.RES=	000037	F\$SUB =	000002
BIT04	=	000020	C\$ESCA=		000010		DF3	011252	EF.STA=	000040	F\$SW =	000014
BIT05	=	000040	C\$ESEG=		000005		DF4	011362	ELPCMD	033270	F\$TEST=	000001
BIT06	=	000100	C\$ESUB=		000003		DIAGMC=	000000	ELP6	033456	GDSCMD	024264
BIT07	=	000200	C\$ETST=		000001		DNINT	024616	END	033116	GDS0	023060
BIT08	=	000400	C\$EXIT=		000032		DOUDC	026366	ERSEK0=	000003	GDS2	024264
BIT09	=	001000	C\$FREQ=		000101		DOURET	026450	ERUDON=	000001	GOBIT	024250
BIT1	=	000002	C\$FRME=		000100		DO.CON	004426	ERUINT=	000002	GSTS F	035716
BIT10	=	002000	C\$GETB=		000026		DQNBR	034772	ESP4	024620	G\$CNT0=	000200
BIT11	=	004000	C\$GETW=		000027		DQNBR1	034432	ETST	037426	G\$DELM=	000372
BIT12	=	010000	C\$GMAN=		000043		DQNCR4	034552	EVL =	000004	G\$DISP=	000003
BIT13	=	020000	C\$GPHR=		000042		DQNBR5	034622	E\$END =	002100	G\$EXCP=	000400
BIT14	=	040000	C\$GPRI=		000040		DQNBR6	034672	E\$LOAD=	000035	G\$HILI=	000002
BIT15	=	100000	C\$INIT=		000011		DROPUN	037420	FNBR1	035710	G\$LOLI=	000001
BIT15T		031606	C\$INLP=		000020		DRPUNT	017771	FNBR10	036262	G\$NO =	000000
BIT2	=	000004	C\$MANI=		000050		DRVTXA	004462	FNBR11	036314	G\$OFFS=	000400
BIT3	=	000010	C\$MAP =		000102		DRVTXB	004511	FNBR12	036346	G\$OF SI=	000376
BIT4	=	000020	C\$MEM =		000031		DRVTXC	005543	FNBR13	036400	G\$PRMA=	000001
BIT5	=	000040	C\$MMU =		000103		DRVTX0	004605	FNBR14	036432	G\$PRMD=	000002
BIT6	=	000100	C\$MSG =		000023		DRVTX1	004701	FNBR15	036464	G\$PRML=	000000
BIT7	=	000200	C\$OPNR=		000034		DRVTX2	004775	FNBR16	036516	G\$RADA=	000140
BIT8	=	000400	C\$OPNW=		000104		DRVTX3	005071	FNBR17	036550	G\$RADB=	000000

Symbol table

G\$RADD=	000040	L\$CCP	002106	G	MRQDX1=	000007	PB11EN	014673	PRI01 =	000040	G
G\$RADL=	000120	L\$CLEA	033130	G	MRQDX3=	000023	PB11ES	015002	PRI02 =	000100	G
G\$RADO=	000020	L\$CO	002032	G	MSECA =	007570	PB11GD	014752	PRI03 =	000140	G
G\$XFER=	000004	L\$DEPO	002011	G	MSEND	026430	PB11OP	014565	PRI04 =	000200	G
G\$YES =	000010	L\$DESC	002126	G	MSG	026460	PB11RD	015113	PRI05 =	000240	G
HIPRGI	002550	L\$DESP	002076	G	MSGDAT	026462	PB11SD	015071	PRI06 =	000300	G
HOE =	100000	L\$DEVP	002060	G	MSGLEN=	000014	PB11ST	014637	PRI07 =	000340	G
HRDINT	023550	L\$DISP	002124	G	MSGNBR=	170000	PB11SO	015162	PRK.HD	004176	
HRDO	012250	L\$DLY	002116	G	MSIN	026410	PB11S1	015207	FRNTPK	030730	
IBE =	010000	L\$DTP	002040	G	MSWAIT	026404	PB11S2	015241	PS0 =	000000	
IDU =	000040	L\$DTYP	002034	G	NEXT	032722	PB11S3	015277	PS7 =	000340	
IER =	020000	L\$DU	033140	G	OCTASC	030346	PB11S4	015334	PTBL	002316	
INBRA	035344	L\$DUT	002072	G	OP.ABR=	000006	PB11S5	015370	QFDAT	020206	
INBRO	035260	L\$DVTY	002166	G	OP.DD =	000001	PB11S6	015417	QFSER	020467	
INBR1	035312	L\$EF	002052	G	OP.ELP=	000003	PB11S9	015444	QFUIT	020131	
INFORM=	000003	L\$ENVI	002044	G	OP.END=	000200	PB11W0	015507	QNBRA	034344	
INFRM	035232	L\$ETP	002102	G	OP.ESP=	000002	PB11W1	015573	QNBRO	034156	
INTSRV	032650	L\$EXP1	002046	G	OP.GDS=	000001	PB12	017674	QNBR7	034264	
IPREG	002324	L\$EXP4	002064	G	OP.RD =	000003	PB1201	015664	QSTN	034130	
IP.ADR	004144	L\$EXP5	002066	G	OP.REC=	000005	PB1202	015750	QUESTI=	000001	
ISR =	000100	L\$HARD	037474	G	OP.RES=	000000	PB1203	016035	RBN	002746	
IXE =	004000	L\$HIME	002120	G	OP.SEN=	000004	PB1204	016106	RCDCMD	033670	
I\$AU =	000041	L\$HPCP	002016	G	OP.SI1=	000005	PB1205	016147	RCD5	025056	
I\$AUTO=	000041	L\$HPTP	002022	G	OP.S01=	000007	PB1206	016210	RCD7	033670	
I\$CLK =	100006	L\$HW	002276	G	OP.SRD=	000044	PB1207	016262	RD.MOD=	000300	
I\$CLN =	000041	L\$ICP	002104	G	OP.SRP=	000100	PB1208	016335	RETRY =	000367	
I\$DU =	000041	L\$INIT	032674	G	OP.SRX=	000054	PB1209	016371	RFDJ6	033560	
I\$HRD =	000041	L\$LADP	002026	G	O\$APTS=	000000	PB1210	016472	RFD0	023226	
I\$INIT=	000041	L\$LAST	037566	G	O\$AU =	000000	PB1211	016534	RFD10	035210	
I\$MOD =	000041	L\$LOAD	002100	G	O\$BGNR=	000000	PB1212	016570	RFD11	037362	
I\$MSG =	000041	L\$LUN	002074	G	O\$BGNS=	000000	PB1213	016645	RFD2	024412	
I\$PROT=	000040	L\$MREV	002050	G	O\$DU =	000001	PB1214	016711	RFD3	024576	
I\$PTAB=	000041	L\$NAME	002000	G	O\$ERRT=	000000	PB1215	016762	RFD4	025040	
I\$PWR =	000041	L\$PRIO	002042	G	O\$GNSW=	000000	PB1216	017023	RFD5	025250	
I\$RPT =	000041	L\$PROT	032666	G	O\$POIN=	000001	PB1217	017117	RFD6	033626	
I\$SEC =	100016	L\$PRT	002112	G	O\$SETU=	000001	PB1218	017214	RFD7	034062	
I\$SEG =	000041	L\$REPP	002062	G	PARKDR	006512	PB1219	017271	RINTR	002524	
I\$SETU=	000041	L\$REV	002010	G	PARKIT	026160	PB1220	017330	RSPCHK	030654	
I\$SRV =	000041	L\$SPC	002056	G	PBF0	013422	PB1221	017415	RSPPAK	002352	
I\$SUB =	000041	L\$SPCP	002020	G	PBF1	013522	PB1222	017464	RSPRNG	002526	
I\$TST =	000041	L\$SPTP	002024	G	PBF10	014455	PB1223	017557	RSP1	002346	
I\$UDC =	100002	L\$STA	002030	G	PBF2	013651	PB13	013332	RW\$PLL=	140002	
J\$JMP =	000167	L\$TEST	002114	G	PBF3	013725	PB3	012516	R\$CMD =	140012	
LABEL0	037560	L\$TIML	002014	G	PBF4	014021	PB4	012564	R\$DAT =	140010	
LBN	002733	L\$UNIT	002012	G	PBF5	014064	PB5	012636	R\$FPS =	140006	
LOCAL	002312	L10000	002310		PBF6	014131	PB6	012727	SDTCMD	035016	
LOE =	040000	L10002	033116		PBF7	014226	PB7	013031	SDT10	035016	
LOGUNI	002310	L10003	033126		PBF8	014325	PB8	013063	SDT11	037170	
LOPRGI	002546	L10004	033136		PBF9	014415	PB9	013117	SERNBR	002334	
LOT =	000010	L10005	033164		PBSF0	017723	PF2	013335	SER.NB	004250	
LSTCMD	002542	L10006	037470		PB0	012405	PLQC	002314	SETUP	032714	
LSTCRN	002540	L10007	037562		PB1	012434	PNT =	001000	SFBEGT	020550	G
LSTVCT	002544	MANBLD	027556		PB10	013161	POLLW	022760	SFCYLT	021234	
L\$ACP	002110	MAXDRV=	000004		PB11	013223	POLLWT	022760	SFDBBT	021016	
L\$APT	002036	MCDNBR	002342		PB11AP	015140	PRGNAM	002676	SFDONT	020571	
L\$AUT	002070	MDLNBR	002340		PB11CR	014515	PRI =	002000	SFFCNT	021307	G
L\$AUTO	033120	MOD1	002000	G	PB11EL	015037	PRI00 =	000000	SFFCUT	021255	G

Symbol table

SFRBBT	021221	STPRX	025656	TBQ28	010735	T\$NEST=	177777	UIT2	003210
SFRCBT	020736	SVCGBL=	000000	TBQ29	010765	T\$NSO =	000000	UIT3	003314
SFREVT	020615	SVCINS=	177777	TBQ3	010076	T\$NS1 =	000004	UIT4	003420
SFR1T	020637	SVCSUB=	177777	TBQ30	011016	T\$PTHV=	***** GX	UIT5	003524
SFR2T	020671	SVCTAG=	177777	TBQ31	011044	T\$PTNU=	000000	UIT6	003630
SFTRYT	021156	SVCTST=	177777	TBQ32	011106	T\$SAVL=	177777	UIT7	003734
SF10	012273	S\$LSYM=	010000	TBQ4	010120	T\$SEGL=	177777	UNIT	002330
SFT1	012344	S\$#BUG	026454	TBQ5	010142	T\$SIZE=	***** GX	UNKWN	037404
SFXBBT	021076	S\$#FLA	026456	TBQ6	010164	T\$SUBN=	000000	UNTD SZ=	000002
SFO	012065	S\$#RTI	026364 G	TBQ7	010206	T\$TAGL=	177777	UNTFLG	002336
SF1	012134	S\$#UDC	026324 G	TBQ8	010230	T\$TAGN=	010010	UNT.NB	006563
SF100	012175	S\$#UDI	026342	TBQ9	010252	T\$TEMP=	000000	VECTOR	002326
SIZDRV	026206	TBLBLD	030342	TERM	035354	T\$TEST=	000001	VEC.AD	004157
SIZEND	026222	TBQ0	007745	TERMIN=	000004	T\$TSTM=	177777	WARNIN	004326
SIZEXI	026270 G	TBQ1	010032	TIMOUT	024150	T\$TSTS=	000001	WRNGST	024210
SIZFLP	025614	TBQ10	010274	TNBRA	035566	T\$#AUT=	010003	W\$CMD =	140022
SIZFPS	025604	TBQ11	010317	TNBR12	035402	T\$#CLE=	010004	W\$DAT =	140020
SIZIN	026116	TBQ12	010346	TNBR13	035434	T\$#DU =	010005	W\$FPL =	140004
SIZLOP	025522 G	TBQ13	010405	TYPASC	020032	T\$#HAR=	010007	XBN	002705
SIZNON	025510	TBQ14	010417	TYPDUP	030542	T\$#INI=	010002	X\$ALWA=	000000
SIZRD	026202	TBQ15	010436	TYPE =	177760	T\$#PRO=	010001	X\$FALS=	000040
SIZRX	025754	TBQ16	010447	T\$ARGC=	000001	T\$#TES=	010006	X\$OFFS=	000400
SIZRX3	026050	TBQ17	010474	T\$CODE=	001004	T1	033166 G	X\$TRUE=	000020
SIZSET	025432	TBQ18	010513	T\$ERRN=	000000	UAM =	000200 G	\$2	033052
SIZWIN	026056	TBQ19	010532	T\$EXCP=	000000	UIN	002344	\$3	033072
SIZWT	025412	TBQ2	010054	T\$FLAG=	000041	UITADR	002320	\$4	033106
SPCL	037100	TBQ20	010565	T\$FREE=	***** GX	UITDF	004040	.A.DEF=	000040
SPECL =	000006	TBQ21	010615	T\$GMAN=	000000	UITLOC	030312	.A.FAT=	000120
SP2INT	023672	TBQ22	010647	T\$HILI=	030071	UITOTH=	000010	.A.INF=	000060
SP3INT	023762	TBQ23	010662	T\$LAST=	000001	UITSIZ=	000104	.A.QUE=	000020
SP4INT	024042	TBQ24	010675	T\$LOLI=	000001	UITO	003000	.A.TER=	000100
STDALN=	000001	TBQ25	010710	T\$LSYM=	010000	UIT1	003104	.A.TYP=	000020
STEPMO	025750	TBQ26	010723	T\$LTNO=	000001			.B.SPL=	000140
STEPOU	025734								

. ABS. 037566 000 (RW,I,GBL,ABS,OVR)
 000000 001 (RW,I,LCL,REL,CON)
 Errors detected: 0

*** Assembler statistics

Work file reads: 332
 Work file writes: 338
 Size of work file: 39752 Words (156 Pages)
 Size of core pool: 19684 Words (75 Pages)
 Operating system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:04:22.27
 ZRQCCO.ZRQCCO.LST/-SP=SVC35R/ML,ZRQCCO.MAC