

DISK DRIVER PDU
STORAGE ALLOCATION.

COMPASS - VER 2.

11/12/81 20.09.09.

PAGE 1

ADDRESS	LENGTH
0	6426
6426	(1237)

BINARY CONTROL CARDS.
IDENT DSK
END

IDENT DSK
PERIPH

*
*
*

TRACE MACRO
 DATA 25008
 ENRM

*

KILLT MACRO
 DATA 25008
 ENRM

```

*
*
*      COMMAND BITS FROM PPU TO CENTRAL
*
1      ECTOCM   EQU   1B      COPY ECS BUFFER TO CM BUFFER
2      CMTOEC   EQU   2B      COPY CM BUFFER TO ECS BUFFER
4      USRRDRSP EQU   4B      SEND READ RESPONSE TO USER
10     USRWRRSP EQU   10B     SEND WRITE RESPONSE TO USER
20     NEWARMP5 EQU   20B     GET NEW ARM POSITION AND STACK
40     SETUPCM  EQU   40B     INITIALIZE
*
*      DEFINE DISK
*
0      DISK     EQU   0       DISK CHANNEL
*
1700   DSKSTAT1 EQU   1700B   GET 1ST STATUS WORD
1400   SEEKFCM  EQU   1400B   SEEK ( ADD ARM POSITION )
1600   HDSELECT EQU   1600B   SELECT HEAD GROUP ( ADD HD GR AND STR )
1000   RDDISK   EQU   1000B   READ DISK ( ADD SECTOR )
1200   WRDYSK   EQU   1200B   WRITE DISK ( ADD SECTOR )
*
177    SECTFLD  EQU   0177B   DEFINE SECTOR FIELD IN 1ST STATUS WORD
1000   NOTREADY EQU   1000B   DEFINE NOT READY BIT IN 1ST STATUS WORD
7400   RWERR05  EQU   7400B   DEFINE ERROR BITS IN 1ST STATUS WORD
*
133320 DISKROT  EQU   52000*9/10  SPEED UP BY 10 PERCENT
32     ZEROSZX  EQU   DISKROT*24/43024
133266 SECTMX    EQU   DISKROT-ZEROSZX
*
1      SYNCTIME EQU   20/208
*
*      DEFINE CLOCK
*
14     CLOCKCHN EQU   14B
*
*      DEFINE SYSTEM INTERFACE
*
3      DISKINTN EQU   3
4      DSKPNYS  EQU   4
11     INTCHAN  EQU   9
22     I.POINTS EQU   22B
*
*
*      INDEXES OF COUNT CELLS IN CM
*
0      REPOSITX EQU   0       INDEX OF REPOSITION COUNT
1      FAILX    EQU   1       INDEX OF FINAL FAILURE COUNT
2      RETRYORX EQU   2       INDEX OF RETRYS THAT WORKED

```

*
*
*

MISCELLANEOUS CONSTANTS

1	ALPHA	EQU	1
0	TOBESY	EQU	0

```
LOC      MACRO      ADCX•LOC
          ADC        TOBESET
          RMT
          ORG        ALPHA
          VFD        12/.•LOC
          RMT
          ENDM

*
LOC      MACRO      LDCX•LOC
          LDC        TOBESET
          RMT
          ORG        ALPHA
          VFD        12/.•LOC
          RMT
          ENDM

*
VFD24XA MACRO      ARG1,ARG2
          IFC        NE,***ARG1,**
          EQU        *
          VFD        12/ARG1,12/ARG2
          ENDM

*
VFD24X  MACRO      A1, L1, A2, L2, A3, L3, A4, L4, A5, L5, A6, L6, A7, L7, A8, L8
          VFD24XA   A1, L1
          VFD24XA   A2, L2
          VFD24XA   A3, L3
          VFD24XA   A4, L4
          VFD24XA   A5, L5
          VFD24XA   A6, L6
          VFD24XA   A7, L7
          VFD24XA   A8, L8
          ENDF
          ENDM
```

```

*
*
*
0      0      1415      *      ORG      0
0      *      *      *      VFD      12/START1-1
*
*
20      *      *      *      ORG      208
*      *      *      *      SECTOR REQUEST WORD
*      *      *      *      OR TAKEN BY SCAN FOR SEKS AND SKIPS
*
20      *      *      *      REQWD      EQU      *
*
20      *      *      *      HEADGRP      BSSZ      1      HEADGROUP ( WITH STACK BIT )
21      *      *      *      PDWRBIT      BSSZ      1      0 READ 1 WRITE
*      *      *      *      *      *      *      *      ( 2 SEEK, 3 SKIP PARED )
*
22      *      *      *      REQSIZE      BSSZ      1      0 NO REQUEST OR BUSY
*      *      *      *      *      *      *      *      1 - 64, 2 - 129, 3 - 257, 4 - 512
23      *      *      *      RETRY      BSSZ      1      NUMBER TRYS PERMITTED
24      *      *      *      REQINDEX      BSSZ      1      INDEX OF SLOT IN ECS TABLE FOR THIS
*      *      *      *      *      *      *      *      REQUEST
*
*
25      *      *      *      XSIZE      BSSZ      1      REQUEST SIZE HELD DURING A REQUEST
*
*
*      *      *      *      *      *      *      *      SCAN TABLE STATE WORD
*
26      *      *      *      SCANSTWD      EQU      *
*
26      *      *      *      STACK      BSSZ      1      STACK BIT FOR HEAD GROUP SELECTS
27      *      *      *      ARMPOS      BSSZ      1      ARM POSITION FOR SEKS
30      *      *      *      NUMBREQS      BSSZ      1      NUMBER REQS LEFT THIS ARM POS + STR
31      *      *      *      NEXTSECT      BSSZ      1      NEXT PLAUSABLE SECTOR FOR A READ
*      *      *      *      *      *      *      *      ( = 777B IF PPU SHOULD SKIP )
32      *      *      *      NEXTPHS      BSSZ      1      EXPECTED PHASE OF DISK AT TIME OF
*      *      *      *      *      *      *      *      GETTING DISK
*
*
*      *      *      *      *      *      *      *      CM REQUEST WORD
*
33      *      *      *      CMREQWD      EQU      *
*
33      *      *      *      STATUS1      BSSZ      1      STATUS WORD 1 FROM DISK
34      *      *      *      CMMOVEA2      BSSZ      1
35      *      *      *      STATUS3      BSSZ      1      TERMINATION INDICATION OF DISK OP
*      *      *      *      *      *      *      *      0 OK
*      *      *      *      *      *      *      *      1 I O FAILED
*      *      *      *      *      *      *      *      2 TIMING FAILED
*      *      *      *      *      *      *      *      3 WRONG RECORD

```

DISK DRIVER PPU5
DIRECT CELLS

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*
THISSECT BSSZ 1
CMRQBITS BSSZ 1

FIRST SECTOR OF CURRENT REQUEST
CM ACTION REQUEST

Cell No.	Address	Content	Size	Description
* * * MISCELLANEOUS CELLS				
40		X0 BSSZ	1	
41		X1 BSSZ	1	
42		X2 BSSZ	1	
43		X3 BSSZ	1	
* * *				
44		OLDCLK BSSZ	1	TIME OF LAST UPDATE/200 MICRO SEC/200 SINCE START OF 0 SECTOR
45		PHSCLK BSSZ	1	
46		BSSZ	1	
* * *				
51	0001	N1 DATA	1	
52	0002	N2 DATA	2	
53	0200	N120 DATA	120	
* * *				
54		CM EQU	*	
* * *				
54		CM0 BSSZ	1	
55		CM1 BSSZ	1	
56		CM2 BSSZ	1	
57		CM3 BSSZ	1	
60		CM4 BSSZ	1	
* * *				
61		PHASE1 BSSZ	1	DATA FOR PHASE TEST
62		PHASE2 BSSZ	1	
* * *				
63		WSECTDR BSSZ	1	USED BY SCAN TO CHECK WRITE (12/25/70)
64		CNTSECT BSSZ	1	CURRENT NEXT SECTOR (DISK STATUS) (12/25)
65		LASTSECT BSSZ	1	DISK WAS KNOWN TO BE HERE AT ONE TIME
* * *				
66		SKIPFLAG BSSZ	1	INTERNAL SIGNAL TO SKIP, ALLOW OTHER PPU TO RESYNC
* * *				

```

*
*
*
100          ORG          1008
*
*          MASTER DRIVING LOOP
*
100          1401          MLOOP          LDN          1
101          0200 1254          RJM          ENTER
103          0200 0201          RJM          POST
105          0200 022E          MLOOP1        RJM          SCAN
*
107          1402          LDN          2
110          0200 1254          RJM          ENTER
112          1021          LDD          RDWRBIT
113          0407          ZJN          MLOOPR
114          1701          SBN          1
115          0421          ZJN          MLOOPW
116          1701          SBN          1
117          0435          ZJN          MLOOPSK
120          0100 010A          LJM          MLOOPSKP
*
*
122          1403          MLOOPR        LDN          3
123          0200 1254          RJM          ENTER
125          0200 0404          RJM          READ
*
127          1404          LDN          4
130          0200 1254          RJM          ENTER
132          0200 1021          RJM          RDRSP
134          0100 0100          LJM          MLOOP
*
*
136          0205 0167          MLOOPW        RJM          MVTOPP
*
140          1403          LDN          3
141          0200 1254          RJM          ENTER
143          0200 0517          RJM          WRITE
*
145          1404          LDN          4
146          0200 1254          RJM          ENTER
150          0200 1101          RJM          WSP
152          0100 0100          LJM          MLOOP
*
*
154          1403          MLOOPSK       LDN          3
155          0200 1254          RJM          ENTER
157          0200 0544          RJM          SEEK
*
161          1404          LDN          4

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DISK DRIVER PDUS
MAIN DRIVING LOOP

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162	0200	1254	RJM	ENTER
164	0100	0100	LJM	MLOOP
			*	
			*	
			*	
166	1403		MLOOPSKP	LDN
167	0200	1254	RJM	3
171	0200	0572	RJM	ENTER
			*	SKIP
173	1404		LDN	4
174	0200	1254	RJM	ENTER
176	0100	0100	LJM	MLOOP

```

*
*
* THIS ROUTINE READS IN SCAN CONTROL WORD ( UNLESS
* LAST OP WAS A SEEK ) AND POSTS COMPLETION OF
* LAST OPERATION IN SCAN TABLE.
*
* IF LAST OPERATION WAS UNSUCCESSFUL AND IS TO BE
* RETRIED IT WILL FIND REQSIZ NON ZERO.
*
200 0100 0000 201 POST LJM 0
202 3021 EQU *-1
203 1102 LDD RDRRBIT
204 0473 LMN 3
ZUN POST-1 LAST OP WAS A SEEK, SO ALL DONE
*
205 2000 0000 SCNTBCI LDCX FILLEDIN
207 6026 CRD SCANSTW GET SCAN STATE WORD
210 3021 LDD RDRRBIT
211 1103 LMN 3
212 0465 ZUN POST-1 LAST OP A SKIP, SO NO NEED TO POST
*
213 3022 LDD REQSIZ
214 0406 ZUN POST1 LAST OP SUCCESSFUL
*
215 3036 LDD TWISSST LAST OP UNSUCCESSFUL
216 2100 0000 SCNTBI ADCK FILLEDIN
220 6220 CWD REQW SET REQUEST NON BUSY IN SCAN TABLE
221 0256 UJN POST-1
*
222 3730 POST1 SOD NUMBREQS LAST OP SUCCESSFUL, DECREMENT
223 0256 UJN POST-1 REQUEST COUNT

```



```

262      0100 0271      LJM      SCAN2
*
*
*      OTHER PPW IN STATE 4. OR SKIPPING
264      0200 1200      SCAN1      RJM      GETDISK!
266      2200 0177      LPC      SECTFLD
270      3465      STD      LASTSECT
*
*
*      NOW FINNISH SET UP FOR SCAN
271      3065      SCAN2      LDD      LASTSECT
272      1601      ADN      I
273      3436      STD      THISSECT      THISSECT MUST BE AT LEAST 1 AHEAD OF
274      2177 7433      ADC      +100      LASTSECT FOR PHASE CHECK SECURITY
276      0703      MJN      *+3
277      1400      LDN      0
300      3436      STD      THISSECT
*
*
*      PHASE CHECK SECURITY FOR WRITE INCLUDED
301      1400      LDN      0
302      3463      STD      WSECTDF      HERE DUE TO THISSECT = LASTSECT+1
*
*
*
*
*      MAIN SCANNING LOOP ITSELF
303      3036      SCANLP      LDD      THISSECT
304      2100 0000      SCNTB2      ADCX     FILLEDIN
306      6020      CRD      REGRD
307      3022      LDD      REOSIZE
310      0407      ZJN      SCANLPX      NO REQUEST, OR BUSY
311      3021      LDR      RDWRBIT
312      0403      ZJN      *+3
313      0100 0271      LJM      SCANW      CHECK A WRITE REQUEST
315      0100 0271      LJM      SCANR      CHECK A READ REQUEST
*
*
*      SCANLPX      AOD      WSECTDF      INCREMENT WRITE PREPARE TIME COUNTER
317      3663      AOD      THISSECT      TRY ANOTHER SECTOR
320      3636      AOD      THISSECT
321      2177 7433      ADC      +100
323      0703      MJN      *+3
324      1400      LDN      0
325      3436      STD      THISSECT
326      3036      LDD      THISSECT
327      3265      SBD      LASTSECT      SEE IF MOST TRIED
330      0552      NJN      SCANLP      NO
331      0100 0333      LJM      SCANSKP      HAVE TRIED MOST SECTORS, SO SKIP
*
*
*
*
*      DO A SKIP
333      1403      SCANSKP      LDN      3
334      3421      STD      RDWRBIT      SIGNAL A SKIP
335      1400      LDN      0

```

DISK DRIVER PPU8
POST AND SCAN TIME ROUTINES

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336          3466          STD      SKIPFLAG  TURN OFF SKIP FLAG
337          2000  7774          LDC      7776B
341          3431          STD      NEXTSECT  SIGNAL TO OTHER PPU THAT WE ARE SKIPPING
342          0100  0454          LJM      SCANFIN2

*
*
*
*
344          2000  0000          SCANSK  LOCKX    FILLEDIN
345          6226          CWD      SCANSTW  WRITE 0 COUNT TO CM
347          2000  0020          LDC      NEWARMP  REQUEST A NEW ARM POS
351          0200  1370          NJM      CMROST   AND STACK FROM CENTRAL
353          0200  1400          NJM      CMROSTWT
355          2000  0000          SCNTBCX LOCKX    FILLEDIN
357          6026          CRD      SCANSTW  GET THE HOPEFULLY NEW STATE WORK
360          3030          LDC      NUMREQS
361          0473          NJN      SCNTBCX  WAIT FOR NEW ARM POSITION
362          2000  7777          LDC      7777B
364          3431          STD      NEXTSECT  FORCE OTHER PPU TO SKIP
365          1402          LJM      ?
366          3421          STD      RDWRBIT   SIGNAL A SPEK
367          0100  0454          LJM      SCANFIN2

*
*
*
*
371          0200  1400          SCANR   NJM      CMROSTWT
373          2000  0000          SCANRA  LOCKX    FILLEDIN
375          6054          CRD      CM
376          3022          LDC      RESSIZE
377          1701          SBN      ?
400          3441          STD      XI
401          5041  0454          SCANRI  LDM      CM,XI   SEE IF A LARGE ENOUGH BUFFER AVAILABLE
403          0506          NJN      SCANR2   YES
404          3641          ADD      XI
405          1704          SBN      ?
406          0772          MJN      SCANRI
407          0100  0417          LJM      SCANLFX  NO, REJECT REQUEST

*
*
*
*
411          3466          SCANR2  STD      CM,
412          2000  0000          SCANR3  LOCKX    FILLEDIN
414          6254          CWD      CM      WRITE CHOICE OF BUFFER BACK TO CM
415          0100  0434          LJM      SCANFIN1 ACCEPT REQUEST

*
*
*
*
417          3063          SCANW   LDD      WSECTDE  SECTORS AVAILABLE TO PREPARE
420          5222  0427          SBN      $NEEDW1,RESSIZE  SECTORS NEEDED
422          0703          MJN      **3
423          0100  0434          LJM      SCANFIN1 ENOUGH AVAILABLE
425          0100  0417          LJM      SCANLFX  NOT ENOUGH AVAILABLE

```

```

*
*
*
427      7777      SNEEDHT  DATA  77778      ( NO REQUEST )
430      0002      DATA      2          ( 64 WDS )
431      0004      DATA      4          ( 128 WDS )
432      0010      DATA      8          ( 257 WDS )
433      0016      DATA     14          ( 512 WDS )
*
*
*
ACCEPT A REQUEST
*
434      3022      SCANFIN1 LDD  REQUEST  SAVE REQUEST SIZE AND MARK BUSY
435      3425      STD      XSIZE
436      1400      LDN      0
437      3429      STD      REQUEST
440      2000 0000  SCNTYBS  LDCH  FILLEDIN
442      3136      ADD      THISSECT
443      6220      CWD      REGRD
*
*
*
NOW COMPUTE WHAT DISK WILL READ AT END OF
TO ACTION, PLACE IN NEXTSECT
*
*
444      3036      LDD      THISSECT
445      5125 0467  ADK      SECTCNT*XSIZE
447      3431      STD      NEXTSECT
450      2177 7434  ADC      =100
452      0702      MUM      *+2
453      3431      STD      NEXTSECT
*
*
*
NOW WRITE BACK SCAN TABLE CONTROL WORDS
*
*
454      2000 0000 454  SCANFIN2 EQU 0
455      6220      LOCK    FILLEDIN
457      0100 0224  CWD    SCANSTWD
LJM    SCAN-I
*
*
*
SECTORS REQUIRED FOR RECORD
*
461      7777      SECTCNT  DATA  77778      ( NO REQUEST )
462      0001      DATA      1          ( 64 WDS )
463      0002      DATA      2          ( 128 WDS )
464      0004      DATA      4          ( 257 WDS )
465      0007      DATA      7          ( 512 WDS )

```



```

*
*
*
466      0100 0000      467      MVTOPP      LJM      0
470      3025      EQU      *-1
471      1701      LDD      XSIZE
472      3434      STB      I
473      2000 0001      LDR      ECTOCH
475      0200 1575      RJM      CMROST
477      1401      LON      I
500      0200 1145      RJM      TOFRMCM
502      0363      UJN      MVTOPP-I

```

```
*
*
*
503      0100 0000      *
          0200 007E      *
505      0473          *
507      7100 1416      *
510      0200 0A4E      *
512      0573          *
514      0365          *
515

          504  READ    LJM
                    EQU
                    RJM
                    ZJN
                    IAM
                    RJM
                    NJN
                    UJN
                    0
                    *-1
                    SETUPDSK
                    READ-1      NO TIME, DO NOT DO READ
                    BUFCHK1,DISK
                    ENDOSK
                    READ1      RETRY
                    READ-1
```

```

*
*
*
516          0100 0000          517  WRITE  LJM          0
                                           EQU          *-1
520          0200 0578          RJM          SETUPDSK
522          0473                ZJN          WRITE-1
523          3441                STD          XI
524          3027                LOD          ARMPOS
525          1005                SHN          S
526          3120                ADD          HEADBP
527          5400 1414          STM          BUFCHK1
531          3036                LDD          THISSECT
532          5400 1414          STM          BUFCHK2
534          3041                LOD          XI
535          7300 1414          WRITE1  OAM          BUFCHK1,DISK
537          0200 0A48          RJM          ENDDSK
541          0573                NJN          WRITE1
542          0353                UJN          WRITE-1
                                           NO TIME, DO NOT DO WRITE
                                           SAVE COUNT
                                           PREPARE IO FOR
                                           THIS RECORD
                                           PICK UP COUNT
                                           RETRY

```

```

*
*
*
543      0100 0000      544      SEEK      LJM      0
*
545      2000 1400      EQU      *L1
547      3127          LDC      SEEKFCN      SEEK FUNCTION
550      7000          ADD      ARMPOS
551      2000 1400      FAN      DISK      SEND SEEK REQUEST TO DISK
553      3126          LDC      HDSELECT      HEAD SELECT FUNCTION
554      7000          ADD      STACK
*
555      0200 1360      FAN      DISK      SELECT A HEAD GROUP ON NEW STACK
557      2200 1000      *
561      0573          SEEK1     RJM      GETDISK1
*
562      0200 1360      LPC      NOTREADY1  WAIT FOR SEEK TO COMPLETE
564      2200 0177      NJN      SEEK1
566      3431          RJM      GETDISK1
567      0100 0543      LPC      SECTFLD
*
                    STD      NEXTSECT1  WILL LOOK AS IF CAME FROM OTHER PPU
                    LJM      SEEK-1

```



```

*
*
*   PREPARE FOR A DISK READ OR WRITE
*   RETURNS WITH A = 0 IF NO TIME
*   ELSE A HAS COUNT
*
574      0100 0000      575  SETUPD&K  LJM      0
576      1400          EQU      0
577      3435          LDM      0
600      2000 1400     STR      STATUS3  PRE SET STATUS 3
602      3120          LDC      HDSELECT
603      7600          ADD      HEADGRP
*                               DISK      DO HEAD GROUP SELECT
*
604      3065          LDD      LASTSECT  PREPARE
605      3461          STD      PHASE1    FOR
606      3035          LDD      THISSECT  PHASE
607      3462          STD      PHASE1    TEST
*
610      6400 0410     STUPO&KA AJM      STUPO&KA DISK      WAIT FOR HEAD SELECT TO COMPLETE
612      0200 1324     RJM      PHASE1    NOW NO PHASE TEST
614      0412          ZJM      STUPO&KE  FAILED
*
615      5021 0420     LDM      RWSELECT  RWWRITE
617      3136          ADD      THISSECT
620      7600          FAN      DISK      DO READ OR WRITE SELECT
*
*
*
621      5025 0424     LDM      RWCOUNT, NSIZE
623      7400          ACN      DISK
624      0100 0474     LJM      SETUPD&K*1
*
*
*   PHASE FAILED
*
626      1402          STUPO&KF LDM      2
627      3435          STD      SSTATUS
630      0200 0730     RJM      DISKWAIT
632      1400          LDM      0
633      0100 0574     LJM      SETUPD&K*1
*
*
*
635      1000          RWSELECT  VFD      12/ADDISK
636      1200          VFD      12/WRDISK
*
637      0000          RWCOUNT  DATA   0      NO REQUEST
640      0802          VFD      12/6445+2  64 WDS
641      1207          VFD      12/12895+2 128 WDS
642      2407          VFD      12/25745+2 257 WDS
643      5007          VFD      12/51345+2 513 WDS

```

```

*
*
*
644      0100 0000      645  ENDDSK  LJM      0
646      6500 0712      EQU      *-1
680      7500          IJM      ENDDSKF.DISK
691      2000 0001      DCN      DISK
693      2000 0001      LDC      1          DELAY FOR SIMULATED DISK
695      2000 0001      LDC      1          DELAY FOR SIMULATED DISK
697      2000 0001      LDC      1          DELAY FOR SIMULATED DISK
699      0200 1360      RJM      GETDISK1
701      3433          STD      STATUS1
703      2200 7400      LPC      RWERROR
705      0512          NJN      ENDDSK1
707      3035          LDR      STATUS3
709      1701          SBN      1
711      0504          NJN      ENDDSK2
*
670      1402          LON      RETRYOKX
671      0200 1130      RJM      BUMPCK          INDICATE A RETRY SUCCEEDED
*
673      1400          ENDDSK2  LON      0
674      3435          STD      STATUS3
675      0346          UJN      ENDDSK1          ( 0 SIGNAL & NO RETRY )
*
678      1401          ENDDSK1  LON      1          SIGNAL IO ERROR
679      3435          STD      STATUS3
700      3723          SOD      RETRY          DECREMENT RETRY COUNT
701      0617          PJN      ENDSK3
702      1400          LON      0
703      3423          STD      RETRY
704      1401          LON      FAILX
705      0200 1130      RJM      BUMPCK          BUMP FAILURE COUNT
707      1400          LON      0          SIGNAL NO RETRY
710      0100 0444      LJM      ENDDSK-I
*
712      0200 1440      ENDDSKF  RJM      GETDISK1
714      3433          STD      STATUS1
715      0200 0730      RJM      DISKWAIT
717      0356          UJN      ENDDSK1
*
720      1400          ENDDSK3  LON      REPOSITX
721      0200 1130      RJM      BUMPCK          BUMP REPOSITION COUNT
723      0200 0762      RJM      REPOSIT          REPOSITION AND PREPARE TO RETRY
725      0100 0644      LJM      ENDDSK-1          ( A NE 0 INDICATES A RETRY )
*
*
*
*
*
NEW 2 PPU VERSION ( 12/27/70 )
*
727      0100 0000      730  DISKWAIT LJM      0
EQU      *-1

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DISK DRIVER PPU8
DISK TIME SUBROUTINES

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731	3036	LDD	THISSECT	
732	3461	STD	PHASE1	
733	3031	LDD	NEXTSECT	
734	3462	STD	PHASE2	
735	0200 1324	RJM	PHASE1ST	SEE IF IN IO REGION
737	0410	ZJN	DSKWAIT2	NO
*				
740	0200 1360	DSKWAIT1	RJM	GETDISK1 NOW WAIT FOR DISK TO ROTATE TO END OF IO
742	2200 0177	LPC	SECTFLD	REGION
744	3231	SBD	NEXTSECT	
745	0572	NJN	DSKWAIT1	
746	0360	UJN	DISKWAIT1	
*				
747	3064	DSKWAIT2	LDD	CNTSECT
750	3231	SBD	NEXTSECT	
751	0503	NJN	++3	
752	0100 0727	LJM	DISKWAIT1	AT END OF IO REGION, ALL DONE
*				
754	1401	LON	I	WENT PASTER IO REGION, SO FORCE A SKIP SO
755	3466	STO	SKIPPFLAG	THAT OTHER PPU CAN RESYNC
756	0100 0727	LJM	DISKWAIT1	
760	0246	UJN	DISKWAIT1	
* * * * * * *				
REPOSITION ARM IN AN ATTEMPT TO RECOVER FROM ERRORS NOV 12 71				
761	0100 0000	LJM	I	
763	3027	EQU	*-1	
764	1161	LDD	ARMPOS	
* *				
765	2100 1400	REPOSIT1	ADC	SEEKFN REPOSITION
767	7600	FAN	DISK	
770	2000 1400	LDC	SEEKFN	
772	3127	ADD	ARMPOS	
773	7600	FAN	DISK	
* *				
774	2000 1400	LDC	HOSELECT	
776	3126	ADD	STACK	
777	7600	FAN	DISK	
* *				
1000	0400 1360	REPOSIT2	RJM	GETDISK1 NOW WAIT FOR READY
1002	2200 1000	LPC	NOTREADY	
1004	0573	NJN	REPOSIT2	
* *				
1005	6400 1000	REPOSIT3	AJM	REPOSIT3:DISK WAIT FOR HEAD SELECT TO COMPLETE
1007	5021 0638	LDM	BWSELECT:RDRB1T	
1011	3136	ADD	THISSECT	
1012	7600	FAN	DISK	
1013	5025 0437	LDM	R#COUNT*XSIZE	
1015	7400	ACN	DISK	

DISK DRIVER PPU5
DISK TIME SUBROUTINES

1016 0100 0767

LJM REPOSIT-1

DISK DRIVER PBUS
RESPONSE TIME ROUTINES

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```

*
*
*
1020      0100 0000      *
1022      3035      1021  RDRSP  EQU      0
1023      0526      *      LDD      *%L
*      *      *      STATUS
*      *      *      RDRSPF      IO OR TIMING FAILURE
*
1024      3027      *      LDD      ARMPOS
1025      1005      *      SHN      5
1026      3120      *      ADD      HEADGP
1027      5360 1474      *      LMM      BUFCHK1
1031      0525      *      NJN      RDRSPW      READ WRONG RECORD
1032      3036      *      LDD      TRISSECT
1033      5360 1474      *      LMM      BUFCHK2
1035      0521      *      NJN      RDRSPW      READ WRONG RECORD
*
1036      1400      *      LDN      0
1037      0200 1467      *      RJM      TOPAMCN
1041      3025      *      LDD      XSIZE
1042      1701      *      SBN      1
1043      3434      *      STD      CMWMOVESZ
1044      2000 000A      *      LDC      CMTOEC+USRDRDRSP
1046      0200 1475      *      RJM      CMRQST
1050      0367      *      UJN      RDRSP-I
*
*
*
1051      3023      *      RDRSPF  LDD      RETRY
1052      0420      *      ZJN      RDRSPX      NO MORE RETRYS
1053      3025      *      LDD      XSIZE
1054      3422      *      STD      REQSIZR      SIGNAL A RETRY
1055      0342      *      UJN      RDRSP-I
*
*
*
1056      2000 0000      1056  RDRSPW  EQU      *
1060      6352 1475      *      CMBSUP3  LDCX     FILLEDIN
1062      1403      *      CWM      BUFCHK1-0+02  WRITE CHECK BYTES AND 1ST WORD
1063      3435      *      LDN      3
1064      2000 000A      *      STD      STATUS
1066      0200 1475      *      LDC      CMTOEC+USRDRDRSP
1070      0100 1020      *      RJM      CMRQST
*      *      *      LJM      RDRSP-I
*
*
*
1072      2000 0000      *      RDRSPX  LDC      USRDRDRSP
1074      0200 1475      *      RJM      CMRQST
1076      0100 1020      *      LJM      RDRSP-I

```

DISK DRIVER PPU5
 RESPONSE TIME ROUTINES

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```

*
*
*
1100      0100 0000      1101  WRSP  LJM  0
1102      3035      EQU  *1
1103      0506      LDD  STATUS3
*          NJN  WRSPF      IO OR TIMING FAILURE
*
1104      2000 0010      LDC  USRWRRSP
1106      0200 1370      RJM  CMRGST
1110      0367      UJN  WRSP-1
*
*
*          IO OR TIMING FAILURE
*
1111      3023      WRSPF  LDD  RETRY
1112      0404      ZJN  WRSPX      NO MORE RETRYS
1113      3025      LDD  XSIZE
1114      3422      STD  REQSIZR      SIGNAL A RETRY
1115      0362      UJN  WRSP-1
*
*
*          NO MORE RETRYS
*
1116      2000 0010      WRSPX  LDC  USRWRRSP
1120      0200 1370      RJM  CMRGST
1122      0100 1100      LJM  WRSP-1
  
```

*
*
*
*
*
*

UPDATE CLOCK INFO FROM CHANNEL CLOCK, ALSO UPDATES
THIS PPU CLOCK DATA IN CM

DUMMY, NOT USED IN THIS VERSION

1124	0100 0000	1125	UPDTCLK	LJM EQU UJN	0 *-1 UPDTCLK-1
1126	0375				

```

*
*
*
*
*
1127      0100 0000      1130  BUMPCM  LJM      0
1131      3440      EQU      *-1
1132      2100 0000      BUMPCM1 STD      X0
1134      6054      ADCX    FILLERIN
1135      3660      CRD     CM
1136      1063      AOD     CM4
1137      0413      SHN     -12
1140      3557      ZJN     BUMPCM2
1141      1063      RAS     CM3
1142      0410      SHN     -12
1143      3556      ZJN     BUMPCM2
1144      1063      RAD     CM2
1145      0405      SHN     -12
1146      3555      ZJN     BUMPCM2
1147      1063      RAD     CM1
1150      0402      SHN     -12
1151      3556      ZJN     BUMPCM2
1152      3040      RAD     CM0
1153      2100 0000      *BUMPCM2 LDD      X0
1155      6254      BUMPCM3 ADCX    FILLERIN
1156      0100 1127      CWD     CM
          LJM     BUMPCM-1

```

*
*
*
*
*
*
*
*

THIS CODE MOVES A BUFFER LOAD TO OR FROM CM
IT MOVES IN 128 WORD CHUNKS PLUS 1 EXTRA WORD
NOTE THAT IT IS INEFFICIENT FOR A 64 WORD AMOUNT
ENTER WITH A .EQ. 0 FOR PPU TO CM
.NE. 0 FOR CM TO PPU

1160	0100 0000		LJM	0	
		1161	TOFRMCM	*-1	
1162	0402		EQU	*+2	WRITE TO CM
1163	1401		ZJN	1	READ FROM CM
1164	3440		LDM	X0	
1165	5040 1247		STD	CXMN1,X0	SET
1167	5400 1214		LDM	TOFRMCM	UP
1171	5040 1251		STM	CXMN128,X0	CRM
1173	5400 1223		LDM	TOFRMCM	OR CWM S
1175	2000 0000		STM	FILLEDIN	
		CMBUF1	LDCX	1	
1177	1601		ADN	X0	
1200	3440		STD	-12	
1201	1063		SHN	X3	SET UP CM BUFFER ADDRESSES
1202	3443		STD	PPUBUF,S	
1203	2000 1425		LDC	TOFRMCM*1	SET UP PPU BUFFER ADDRESS
1205	5400 1228		STM	BUFBLOCK,XSIZE	
1207	5025 1242		LDM	X2	SET UP BLOCK COUNT
1211	3442		STD	CMRSTWT	WAIT FOR CM BUFFER ACTION TO FINNISH
1212	0200 1400		RJM		
		*			
1214	2000 0000		CMBUF2	LDCX	FILLEDIN
1215	0000		TOFRMCM	VFD	12/0,12/PPUBUF CWM PPUBUF,N1
1217	1420				
		*			
1220	3043		TOFRMCM	LDD	X3
1221	1014		SHN	12	PICK UP CM BUFFER ADDRESS
1222	3140		ADD	X0	
1223			TOFRMCM	BSSZ	2
1225	3440		STD	X0	CWM TOBESSET*N128
1226	1063		SHN	-12	
1227	3443		STD	X3	SAVE CM BUFFER ADDRESS
1230	2000 1200		LDC	128+S	
1232	5500 1224		RAM	TOFRMCM*1	STEP PPU ADDRESS
1234	0200 1120		RJM	UPDTCLK	
1236	3742		SOD	X2	
1237	0560		NJN	TOFRMCM	
1240	0100 1160		LJM	TOFRMCM-1	
		*			
		*			
		*			
1242	0000		BUFBLOCK	DATA	0 (NO ACTION)
1243	0001		DATA	1	64 WDS
1244	0001		DATA	1	129 WDS
1245	0002		DATA	2	257 WDS

DISK DRIVER PPU6
GENERAL SUBROUTINES

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1246	0004		DATA	4		513 WDS
		*				
		*				
		*				
1247	6351	CXMN1	VFD	6/63B.6/N1	CWM	TOBESET.N1
1250	6151		VFD	6/61B.6/N1	CRM	TOBESET.N1
		*				
1251	6353	CXMN12A	VFD	6/63B.6/N128	CWM	TOBESET.N128
1252	6153		VFD	6/61B.6/N128	CRM	TOBESET.N128

```

*
*
*
1253      0100 0000      1254  ENTER      LJM      0
1255      2500      EQU      *-1
1256      3443      KILLT
          3443      STD      X3
*
1257      2000 0144      ENTER1     LDC      100
1261      3442      STD      X2
1262      0200 1125      RJM      UPDTCLK
*
1264      3043      ENTER2     LDD      X3
1265      2100 0000      STATES1   ADCX    FILLEDIN
1267      6054      CRD      CM
1270      3060      LDD      CM4
1271      0404      ZJN      ENTER3
1272      3742      SOD      X2
1273      0570      NJN      ENTER2
1274      0362      UJN      ENTER1
*
1275      5000 1125      ENTER3     LDN      PPNUM
1277      3460      STD      CM4
1300      2000 0000      STATES2   LDCX    FILLEDIN
1302      3143      ADD      X3
1303      6254      CWD      CM
1304      1400      LDN      0
1305      3460      STD      CM4
1306      2000 0000      STATES3   LDCX    FILLEDIN
1310      5100 1321      ADM      STATE
1312      6254      CWR      CM
1313      3043      LDD      X3
1314      5400 1321      STM      STATE
1316      2500      TRACE
1317      0100 1254      LJM      ENTER-1
*
*
1321      STATE      BSSZ      1
1322      PPNUM     BSSZ      1

```



```

*
*
* THIS IS THE NEW TWO PPU VERSION ( 12/27/70 )
*
* THIS ROUTINE CHECKS TO SEE IF SECTOR READ FROM
* DISK STATUS WDI SATISFIES
* PHASE1 .LE. SECTOR .LT. PHASE2
*
* RETURNS 1 IF YES, 0 IF NO
*
* SAVES SECTOR NUMBER IN CNTSECT
*
1323      0100 0005      1324      PHASETST EQU 0
1325      0200 1365      PHASETST EQU GETDISK1
1327      2200 0177      PHASETST EQU SECTFLO
1331      3464          PHASETST EQU CNTSECT
1332      3062          PHASETST EQU PHASE1
1333      3261          PHASETST EQU PHASE2
1334      0712          PHASETST EQU PHSTSTA

*
* INDEX MARK NOT BETWEEN PHASE1 AND PHASE2
*
1335      3064          PHSTSTA LDD CNTSECT
1336      3261          PHSTSTA SBD PHASE1
1337      0716          PHSTSTA MJN PHSTSTA
1340      3062          PHSTSTA LDD PHASE1
1341      3264          PHSTSTA SBD CNTSECT
1342      0413          PHSTSTA ZJN PHSTSTA
1343      0712          PHSTSTA MJN PHSTSTA

*
* PHSTSTA LDD 1
1344      1401          PHSTSTA LON PHASETST-1
1345      0355          PHSTSTA UJN PHASETST-1

*
* INDEX MARK BETWEEN PHASE1 AND PHASE2
*
1346      3064          PHSTSTA LDD CNTSECT
1347      3261          PHSTSTA SBD PHASE1
1350      0573          PHSTSTA PUN PHSTSTA
1351      3062          PHSTSTA LDD PHASE1
1352      3264          PHSTSTA SBD CNTSECT
1353      0402          PHSTSTA ZJN PHSTSTA
1354      0667          PHSTSTA PUN PHSTSTA

*
* PHSTSTA LDD 0
1355      1400          PHSTSTA LON PHASETST-1
1356      0344          PHSTSTA UJN PHASETST-1
*
*

```

```
*  
*  
*  
*  
1357      0100 0000      1360  GETDISK1  LJM      0  
1361      7700 1700      FNC      *-I  
1363      7400      ACN      DISKSTATI-DISK  
1364      7000      IAN      DISK  
1365      7500      DCN      DISK  
1366      0370      UJN      GETDISK1-I
```

```

*
*
* THIS CODE SENDS A REQUEST TO CM
1367      0100 0000      1370  CMRGST  LJM      0
          3437          EQU      *-1
1371      0200 1400          STD      CMRQBITS
1372      2000 0000          RJM      CMRGSTWT
1374      6233          CMRQ1  LDCK   FILLEDIN
1376      1403          CWD      CMREQWD
1377      7211          LDN      DISKINTN
1400      0365          OAN      INTCHAN
1401          UJN      CMRGST-1
*
*
* THIS CODE WAITS FOR A CM REQUEST TO COMPLETE
1402      0100 0000      1403  CMRGSTWT LJM      0
          0200 1725          EQU      *-1
1404      2500          RJM      UPDTCLR
1406      2000 0000          KILLT
1407      6054          CMRQ2  LDCK   FILLEDIN
1411      3060          CRD      CM
1412      0570          LDD      CM4
1413      2500          NJN      CMRGSTWT*1
1414      0364          TRICE
1415          UJN      CMRGSTWT-1

```

DISK DRIVER PPU5
FINAL PART OF DECK

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	*				
	*				
	*				PPU5 BUFFER
1416	BUFCHK1	BSSZ	1		ID WORDS
1417	BUFCHK2	BSSZ	1		
	*				
1420	PPUBUF	BSSZ	5451225		
	*				
6425		BSSZ	1		

```

*
*
*      INITIALIZING   LOOPS
*
1416          ORG      BUFCHKI
*
*      FIRST DISK PPU
*
1416          1417    STARTI   LDN      16
1417          1701    SBN      1
1420          0576    NJN      *1      WAIT FOR ALL PPUS TO GET STARTED
*
*
1421          1400    LDN      2
1422          5600    STM      PENVM
1423          0200    RJM      FILLIN   SET UP CONSTANTS FOR 2ND DISK PPU
1424          1404    LDN      4
1425          5400    STM      STATE
1426          1401    LDN      1
1427          0200    RJM      ENTER    PLACE 2ND DISK PPU IN STATE 1
1428          0200    KILLT
1429          7400    ACN      DISK
1430          2000    LDC      STARTI-1
1431          7200    CAN      DISK     SET UP START FOR 2ND PPU
1432          2000    LDC      LIMITI
1433          7300    CAN      1+DISK   WRITE CODE TO 2ND DISK PPU
1434          1401    LDN      1        SWITCH DATA FOR THIS PPU
1435          5600    STM      PENVM
1436          0200    RJM      FILLIN   SET UP CONSTANTS FOR THIS PPU
1437          1440    LDN      SETUPCM
1438          0200    RJM      ORGST    SET UP OK
1439          0200    RJM      ORGSTW
1440          1403    LDN      3
1441          5400    STM      STATE
1442          1404    LDN      4
1443          0200    RJM      ENTER    PLACE THIS PPU IN STATE 4
1444          7500    DCN      DISK     START UP OTHER PPU
1445          1401    LDN      1
1446          0200    RJM      ENTER    NOW WAIT FOR STATE 1 TO CLEAR
1447          2000    SCNTBC4  LOCK     FILLEDIN
1448          6026    CRD      SCANSTD
1449          0100    LJM      MLOOP1
*
*
*      2ND DISK PPU
*
1476          1476    START2   EGU      6
1477          7700    PNC      DISKSTAT+DISK   CONNECT TO DISK
1478          7400    ACN      DISK
1479          7000    IAN      DISK     ( FOR SIMULATOR )
1480          7500    DCN      DISK
1481          2000    SCNTBC5  LDCX    FILLEDIN
1482          6026    CRD      SCANSTD
1483          0100    LJM      MLOOP1
*

```

```

*
*
*
1510      0100 0000      *
1511      2000 0000      *
1512      2100 0000      *
1513      1701 1300      *
1514      0054          *
1515      3057          *
1516      1277          *
1517      3457          *
1518      0000          *
1519      0000          *
1520      2200 7700      *
1521      1157          *
1522      0000 1500      *
1523      2000 7777      *
1524      3441          *
1525      2000 0000      *
1526      3442          *
1527      0042 1400      *
1528      0241          *
1529      0012          *
1530      0042 1400      *
1531      0441          *
1532      0100 0000      *
1533      0054          *
1534      0057          *
1535      1277          *
1536      3457          *
1537      0042 1400      *
1538      0444          *
1539      4044          *
1540      2200 7700      *
1541      3157          *
1542      4444          *
1543      2060          *
1544      5444 0000      *
1545      1502          *
1546      0542          *
1547      0044          *
1548      0100 1410      *

```

FILL IN CONSTANTS

```

LJK      0
EQU      *-1
LDC      1. POINTS*DSKPNTS
ADM      PENUM
SBN      1
CRD      CM
LDD      CM3
LPN      77B
STD      CM3
LDD      CM3
STM      FILLIN+1
LDM      FILLIN+1
LPC      7700B
ADD      CM3
STM      FILLIN
LDR      7777B
STD      X1
LDC      NPPTS
STD      X2
*
LDM      FAIRLIST*X2
SBD      X1
ZUN      FILLIN2      ALREADY HAVE THIS ADDRESS.
*
LDM      FAIRLIST*X2
STD      X1
ADC      TDBSET
CRD      CM3
LDD      CM3
LPN      77B
STD      CM3
*
LDM      FAIRLIST*1.X2
STD      X2
LDI      X2
LPC      7700B
ADD      CM3
STI      X2
LDD      CM4
STM      1.X2
LON      B
RAD      X2
ZUN      FILLIN1
LJK      FILLIN-1

```

```
*
*
*
1600      0000      PAIRLIST VFD24X 0,SCNTBC1,0,SCNTBC2,0,SCNTBC3
1606      0000      VFD24X 0,SCNTBC4,0,SCNTBC5
1612      0000      VFD24X 0,SCANR
1614      0001      VFD24X 1,SCNTB1,1,SCNTB2,1,SCNTB3
1622      0002      VFD24X 2,STATES1,2,STATES2,2,STATES3
1630      0002      VFD24X 2,STATES4
1632      0003      VFD24X 3,SCANR4,3,SCANR3
1636      0005      VFD24X 5,CMRQ1,5,CMRQ2
1642      0006      VFD24X 6,CMBUF1,6,CMBUF2
1646      0006      VFD24X 6,CMBUF3
1650      0010      VFD24X 8,BUMPC1,8,BUMPC3

*
52      NPAIRS EQU *-PAIRLIST-2
*
*
1654      LIMIT EQU *
```

DISK DRIVER PPLUS
FINAL PART OF DECK

COMPASS - VER 2.

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*
*
*

6426

HERE
END

35366

STORAGE USED
8600 ASSEMBLY

1409 STATEMENTS
6.299 SECONDS

203 SYMBOLS
759 REFERENCES

DISK DRIVER PLUS
SYMBOLIC REFERENCE TABLE.

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PAGE 41

ALPHA	1	5/14 D	40/05	40/05						
ARMPOS	27	7/16 L	19/09	20/07	24/31	24/37	26/09			
BUPBLKCN	1242	30/26	30/50 L							
BUPCHK1	1416	18/18	19/12	19/16	26/12	26/39	36/04 L	37/04		
BUPCHK2	1417	19/14	26/15	36/05 L						
BUMPCM	1130	23/20	23/33	23/43	26/07 D	29/28				
BUMPCM1	1132	29/19 L	39/15							
BUMPCM2	1152	29/13	29/16	29/19	29/22	29/25 L				
BUMPCM3	1153	29/26 L	39/15							
CLOCKCHN	14	4/13 D								
CM	54	9/21 D	15/20	15/42	29/27	32/26	35/21			
		13/45	15/33	29/10	32/15	32/31	38/06			
CMBUF1	1175	30/19 L	39/13							
CMBUF2	1214	30/30 L	39/13							
CMBUF3	1056	28/18 L	39/14							
CMMOVESZ	34	7/18 L	17/08	26/22						
CMREQWD	33	7/45 D	35/08							
CMRBBITS	37	18/10 L	35/06							
CMRST	1370	15/12	26/24	26/49	27/28	35/12				
		17/10	26/43	27/10	35/05 D	37/29				
CMRGSTWT	1403	19/13	15/27	30/28	35/07	35/17 D	35/23	35/25	37/38	
CMR21	1374	35/10 L	39/12							
CMR22	1407	35/20 L	39/12							
CMTOEC	2	4/20 D	24/23	26/42						
CM0	54	9/23 L	29/23	36/31						
CM1	55	9/24 L	29/20							
CM2	56	9/25 L	29/17							
CM3	57	9/26 L	29/14	36/10	36/15	36/17	36/32	36/34	36/40	
CM4	60	9/27 L	15/40	32/18	36/20	36/15				
		15/40	29/11	32/25	36/20	36/42				
CM5	64	9/28 L	24/14	33/17	36/22	36/28	33/38	33/42		
CNTSECT	64	30/15 L	31/05 L							
CXMN1	1247	4/12 D	20/11	22/30	24/32	24/53	34/18	37/35	37/40	
CXMN128	1251	18/18	22/12	23/06	24/42	34/07	37/20	37/46		
DISK	0	19/16	22/19	23/07	24/42	34/08	37/22	37/47		
		20/08	22/25	24/35	24/51	34/09	37/24	37/48		
DISKINTN	3	4/37 D	35/10							
DISKR0T	133320	4/28 D	4/28	4/27						
DISKWAIT	750	22/37	23/39	23/53 D	24/12	24/17	24/21	24/22		
DSKPNFS	4	4/18 D	34/06							
DSKSTAT1	1700	4/15 D	34/07	37/46						
DSKWAIT1	740	24/18 L	24/11							
DSKWAIT2	747	24/16 L	24/14 L							
ECTOCM	1	4/04 D	17/09							
ENDDSK	645	18/09	19/17	23/05 D	23/24	23/35	23/45			
ENDDSKF	712	23/06	23/37 L							
ENDDSKG	720	23/29	23/42 L							
ENDDSK1	676	23/14	23/26 L	23/40						
ENDDSK2	673	23/17	23/22 L							
ENTER	1254	10/09	10/26	10/39	10/50	11/07	32/05 D	37/18	37/37	
		10/14	10/30	10/43	11/01	11/11	32/35	37/34		
ENTER1	1257	32/09 L	32/20							

DISK DRIVER PDS
SYMBOLIC REFERENCE TABLE.

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PAGE 42

ENTER2	1264	32/13	L	32/19					
ENTER3	1275	32/17		32/22	L				
FAILX	1	4/46	D	23/32					
FILLIN	1511	37/14		37/27		38/05	n	38/47	
FILLINL	1543	38/24	L	38/46					
FILLINI	1552	38/14		38/15		38/18		38/30	L
FILLIN2	1560	38/26		38/36	L				
GETDISK1	1360	14/05		20/17		23/37		24/47	34/06
		20/13		23/11		24/08		33/15	34/11
		4/17	D	20/09		22/10		24/40	
		7/18	L	19/11		22/11		28/11	
		4/30	D	35/11					
		4/40	D	38/06					
		9/38	L	13/53		14/07		14/11	14/44
		37/23		39/20	D				22/14
		10/28	L	10/32		10/45		11/02	11/12
		10/16		10/25	L				
		10/20		10/49	L				
		10/21		11/06	L				
		10/18		10/36	L				
		10/11	L	37/40		37/52			
		10/36		17/05	D	17/13			
		4/06	D	15/11					
		7/10	L						
		7/38	L	13/40		15/03		16/28	20/19
		13/24		13/52		15/14		16/29	24/03
		4/22	D	20/14		24/45			24/16
		38/21		39/16	D				24/18
		7/37	L	12/29		13/29		15/16	
		9/18	L	31/08		31/06			
		9/18	L	31/08		31/09			
		9/17	L	26/39					
		9/11	L						
		38/24		35/28		38/26		39/02	39/16
		22/30		24/05		33/14	D	33/24	33/48
		9/30	L	22/15		24/02		33/10	33/25
		9/31	L	22/17		24/04		33/18	33/27
		9/12	L						33/41
		33/54	L						
		33/20		33/38	L				
		33/26		33/29		33/30		33/43	33/47
		33/33	L	33/40		33/44			
		10/10		12/10	D	12/13		12/16	12/27
		12/22		12/29	L				12/30
		32/22		32/39	L	37/13		37/26	38/07
		30/24		30/32		35/07	L		
		4/18	D	22/43					
		10/31		26/05	D	26/25		26/33	26/44
		26/07		26/29	L				26/50
		26/13		26/16		26/37	n		
		26/30		26/48	L				
		7/19	L	12/11		14/32		15/21	24/49
		10/15		12/17		14/52		22/23	

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READ	504	10/27	18/05 D	18/07	18/11				
READ1	510	18/08 L	18/10						
REPOSIT	762	23/44	24/30 D	25/01					
REPOSITX	0	4/45 D	23/42						
REPOSIT1	765	24/34 L							
REPOSIT2	1000	24/44 L	24/46						
REPOSIT3	1005	24/48 L	24/48						
REQINDEX	24	7/25 L							
REQSIZE	22	7/22 L	14/30	15/49	16/16	27/16			
		12/21	15/30	15/13	26/32				
REQWD	20	7/16 D	12/26	14/29	16/13				
RETRY	23	7/24 L	23/28	23/31	26/28	27/15			
RETRYOKX	2	4/47 D	23/19						
RWCOUNT	637	22/29	22/46 L	24/52					
RWERROR	7400	4/23 D	23/13						
RWSELECT	635	22/23	22/43 L	24/49					
SCAN	225	10/11	13/23 D	15/36					
SCANFIN1	434	15/43	15/51	16/13 L					
SCANFIN2	454	15/54	15/22	16/33 D					
SCANLP	303	14/27 L	14/45						
SCANLX	317	14/31	14/37 L	15/38	15/55				
SCANR	371	14/35	15/27 L						
SCANR1	401	15/33 L	15/37						
SCANR2	411	15/34	15/40 L						
SCANR3	412	15/41 L	39/11						
SCANR4	373	15/28 L	39/11						
SCANSK	344	13/31	15/09 L	39/07					
SCANSKP	353	13/27	13/35	14/46	14/51 L				
SCANSTWD	26	7/23 D	12/16	15/10	15/15	16/35	37/39	37/51	
SCANW	417	14/34	15/48 L						
SCAN1	264	13/42	13/49	14/05 L					
SCAN2	271	14/51	14/11 L						
SCNTBC1	205	12/15 L	39/05						
SCNTBC2	355	15/14 L	15/17	39/05					
SCNTBC3	454	16/24 L	39/05						
SCNTBC4	1471	37/38 L	39/06						
SCNTBC5	1503	37/50 L	39/06						
SCNTB1	216	12/25 L	39/08						
SCNTB2	304	14/28 L	39/08						
SCNTB3	440	16/17 L	39/08						
SECTCNT	461	16/25	16/41 L						
SECTFLD	177	4/21 D	14/06	20/18	24/09	33/16			
SECTMX	133266	4/27 D							
SEEK	544	10/21	20/05 D	20/20					
SEEKFCN	1400	4/16 D	20/06	24/34	24/36				
SEEK1	555	20/13 L	20/15						
SETUPCM	40	4/09 D	37/28						
SETUPDSK	575	18/26	19/06	22/07 D	22/31	22/39			
SKIP	572	11/08	21/05 D	21/06					
SKIPFLAG	66	9/20 L	13/33	15/01	24/20				
SNEEDW1	427	15/49	16/04 L						
STACK	26	7/25 L	20/10	24/41					
START1	1416	7/05	37/08 L						

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START2	1476	37/31	37/45 D						
STATE	1321	32/30	32/33	32/38 L	37/16	37/32			
STATES1	1265	32/14 L	39/09						
STATES2	1300	32/24 L	39/09						
STATES3	1306	32/09 L	39/09						
STATES4	250	13/43 L	39/10						
STATUS1	33	7/47 L	23/12	23/38					
STATUS3	35	7/49 L	22/36	23/23	26/06	27/06			
		22/09	23/15	23/27	26/41				
STUPDSKA	610	22/79 L	22/19						
STUPDSKF	626	22/31	22/35 L						
SYNCTIME	1								
THISSECT	36	4/29 D							
		8/02 L	14/15	14/27	14/42	16/18	19/13	22/24	24/50
		12/24	14/17	14/38	14/43	16/24	22/16	24/01	26/14
TORSET	0	5/05 D	13/43	15/14	16/17	29/09	30/30	32/29	37/38
		12/19	14/28	15/28	16/34	29/26	32/14	35/08	37/50
		12/25	15/09	15/41	26/38	30/19	32/24	35/20	38/30
TOFRMCM	1161	17/12	26/19	30/11 D	30/46				
TOFRMCA	1216	30/16	30/31 L						
TOFRMCMB	1223	30/18	30/25	30/37 L	30/45				
TOFRMCL	1220	30/24 L	30/45						
UPDTCLM	1185	28/09 D	26/10	30/43	32/17	35/16			
USRRDRSP	4	4/16 D	26/23	26/48	26/48				
USRWRDRSP	10	4/07 D	27/09	27/23					
WRDISK	1200	4/19 D	22/44						
WRITE	517	10/60	19/05 D	19/07	19/16				
WRITE1	555	19/16 L	19/18						
WRSP	1101	10/04	27/05 D	27/11	27/16	27/25			
WRSPF	1111	27/07	27/15 L						
WRSPX	1116	27/16	27/23 L						
WSECTOF	63	9/38 L	14/20	14/27	15/40				
XSIZE	25	7/22 L	16/25	22/04	26/20	27/17			
		16/14	17/06	24/22	26/31	30/26			
X0	40	9/04 L	29/25	30/15	30/21	30/36			
		29/08	30/14	30/17	30/36				
X1	41	9/05 L	15/33	19/00	30/20	38/29			
		18/32	15/35	19/15	30/25				
X2	42	9/06 L	30/44	32/12	30/24	38/36			
		30/27	32/16	30/22	30/28	38/45			
X3	43	9/07 L	30/34	32/07	32/25	36/37	38/47		
		30/33	30/40	32/13	32/32	38/38	38/43		
ZEROSZX	32	4/26 D	4/27						
.BUMPCM1	1650	39/14 D	40/05						
.BUMPCM3	1652	39/15 D	40/05						
.CMBUF1	1642	39/12 D	40/05						
.CMBUF2	1644	39/13 D	40/05						
.CMBUF3	1646	39/13 D	40/05						
.CMRQ1	1636	39/11 D	40/05						
.CMRQ2	1640	39/12 D	40/05						
.SCANR3	1634	39/11 D	40/05						
.SCANR4	1632	39/10 D	40/05						
.SCANSK	1612	39/06 D	40/05						
.SCNTRC1	1600	39/04 D	40/05						

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.SCNTBC2	1602	39/05 D	40/05
.SCNTBC3	1604	39/05 D	40/05
.SCNTBC4	1606	39/05 D	40/05
.SCNTBC5	1610	39/06 D	40/05
.SCNTR1	1614	39/07 D	40/05
.SCNTB2	1616	39/08 D	40/05
.SCNTB3	1620	39/08 D	40/05
.STATES1	1622	39/08 D	40/05
.STATES2	1624	39/09 D	40/05
.STATES3	1626	39/09 D	40/05
.STATES4	1630	39/09 D	40/05

