

00010

XLIST

01970

THE INDICATED PATCHES ARE THOSE PUT IN BY HASTINGS AND CLEMENTS  
AT BNL,

DAW 3-3-66

```

000000 260140 000000 00030
000001 551000 776000 00040
000002 413006 000002 00050
000003 201214 000000 00060
000004 260140 000007 00070
000005 254000 000000 00080
000006 260140 000000 00090
000007 621000 010000 00100
000010 660000 010000 00110
000011 260140 000064 00120
000012 242200 000010 00130
000013 405200 007400 00140
000014 306200 004000 00150
000015 254000 000437 00160
000016 302200 000400 00170
000017 254000 000022 00180
000020 722700 004000 00190
000021 254000 000521 00200
000022 201040 000001 00210
000023 542040 000045 00220
000024 542040 000212 00230
000025 135040 000000 00240
000026 137040 000540 00250
000027 135040 000541 00260
000030 431040 000005 00270
000031 137040 000542 00280
000032 201044 000000 00290
000033 722600 000000 00300
000034 660040 000200 00310
000035 722201 000000 00320
000036 402000 000535 00330
000037 542300 000534 00340
000040 506040 000534 00350
000041 603000 010000 00360
000042 700600 002100 00370
000043 201040 000226 00380
000044 542040 000223 00390
000045 722600 000005 00400
000046 263140 000000 00410
000047 621000 000020 00420
000050 260140 000057 00430
000051 460066 000007 00440
000052 541066 000007 00450
000053 270040 000543 00460
000054 201200 002400 00470
000055 200100 000544 00480
000056 254000 000133 00490

```

T=ITEM  
; MAG TAPE SERVICE SUBROUTINES

```

MTAPE1: PUSHJ PDP, WAIT1
        HRRZI IOS, 776000
        ANDCAB IOS, DEVIOS(DEV DAT)
        MOVEI T, (UUO)
        PUSHJ PDP, MTAPE+1
        JRST UXIT

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MTAPE:  PUSHJ PDP, WAIT1
        TLZ IOS, IODT
        TRO IOS, IOACT
        PUSHJ PDP, MTCHK2

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```

        LSH T, +08 ;MOVE TO FUNCTION
        ANDI T, 7400 ;MODE BITS
        CAIN T, 4000 ;LOGICAL EOT?
        JRST MLEOT
        CAIE T, 400 ;RWD?
        JRST .+3
        CONSZ 224, 4000 ;AT LOAD POINT?
        JRST MTDMP4

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MTGO1:  MOVEI TAC, TCF ;LOOK FOR TAPE CONTROL FREE 0

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        HRRM TAC, MTCONO
        HRRM TAC, MTCINT
MTGO1A: LDB TAC, PUNIT ;UNIT
        DPB TAC, [POINT 3, T, 31] ;UNIT
        LDB TAC, [POINT 3, IOS, 28] ;DENSITY PARITY
        XORI TAC, 5 ;ODD, 556
        DPB TAC, [POINT 3, T, 23]
        MOVEI TAC, MTCCHN(T) ;CHANNEL

```

```

MTGO:   CONO 224, 0 ;DISABLE ALL INTERRUPTS
        TRO TAC, 200 ;INHIBIT RETURN TO POOL
        CONO 220, (TAC) ;COMMAND
        SETZM MTEOFF# ;CLEAR EOF FLAG
        HRRM DEV DAT, MTDEV# ;COMMAND, DVDB

```

```

        HRLM TAC, MTDEV
        TLNE IOS, IODT
        CONO PI, 2000+DCB
        MOVEI TAC, MTPDUN
MTCONO: HRRM TAC, MTIDSP
        CONO 224, TCF+ERF ;ENABLE FLAGS
        POPJ PDP,

```

;READ

```

MTIN:   TLZ IOS, IO ;READING
        PUSHJ PDP, MTCHK ;IS SYSTEM AVAILABLE?

```

```

MTIN1: SETCM TAC, @DEVIAD(DEV DAT) ;-SIZE-1
        HRRI TAC, @DEVIAD(DEV DAT) ;BUFFER ADDRESS, PROG INCLUDE
        ADD TAC, [XWD 2, 1] ;-SIZE+1, BUFFER+1

```

```

MTIN2: MOVEI T, 2400 ;READ
        MOVE TAC1, [BLKI DC, 4000+DCN+MTDC*10]
        JRST MTINDC

```

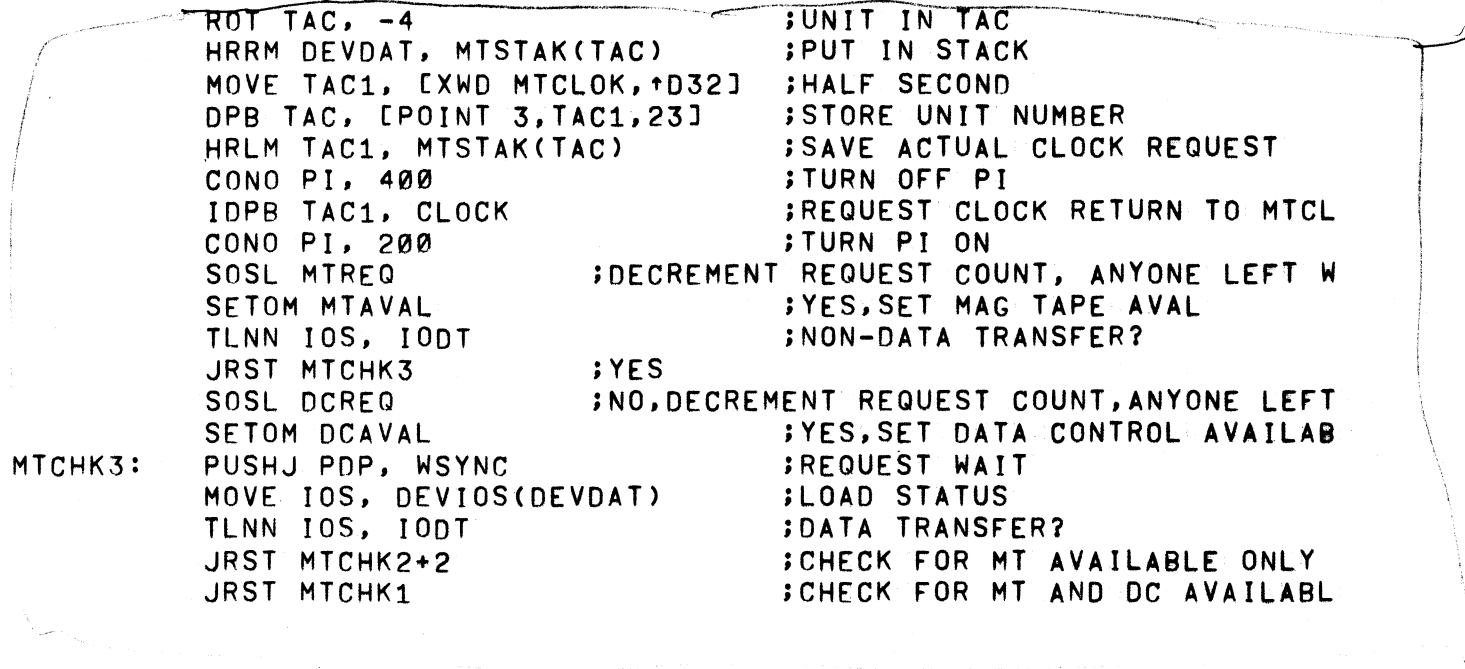
*MOVE TAC, DEV MOD (DEV DAT)  
TLZ IOS, DVMTA  
POPS PDP JRST UXIT*

*TRNN T, SETSLI  
JRST +4  
TLZ IOS, IOS LIL  
TRNE T, SLEVEL  
TRO IOS, IOS LIL*

*TWE IOS, PSLI1  
TRO T, 100000*

			00590		
			00600		
			00610	; IS SYSTEM AVAILABLE	
000057	660000	010000	00620	MTCHK: TRO IOS, IOACT	; SET ACTIVE
000060	661000	010000	00630	TLO IOS, IODT	; SET FOR DATA TRANSFER
000061	202006	000002	00640	MOVEM IOS, DEVIOS(DEV DAT)	
000062	352000	000000	00650	MTCHK1: AOSE DCREQ	
000063	260140	000000	00660	PUSHJ PDP, DCWAIT	
000064	621000	004002	00670	MTCHK2: TLZ IOS, IOSEOF <del>IOBEG</del>	; CLEAR SPACE TO EOF
000065	202006	000002	00680	MOVEM IOS, DEVIOS(DEV DAT)	; STORE BITS
000066	352000	000000	00690	AOSE MTREQ	
000067	260140	000000	00700	PUSHJ PDP, MTWAIT	
000070	256000	000025	00710	<del>XGT MTC01A</del> LDB TAC, PUNIT	; UNIT
000071	241040	000004	00720	ROT TAC, 4	; PUT IN UNIT POSITION
000072	722201	000200	00730	CONO 220, 200(TAC)	; HAS UNIT ONLY
000073	722600	000002	00740	CONO 224, SEL	; JAM UNIT INTO COMMAND BUFFER
000074	722700	000002	00750	<del>CONSZ 224, SEL</del>	; UNIT NOT READY?
000075	263140	000000	00760	POPJ PDP, 0	; EXIT
000076	241040	777774	00770	ROT TAC, -4	; UNIT IN TAC
000077	542301	000427	00780	HRRM DEV DAT, MTSTAK(TAC)	; PUT IN STACK
000100	200100	000545	00790	MOVE TAC1, [XWD MTCLOK, +D32]	; HALF SECOND
000101	137040	000546	00800	DPB TAC, [POINT 3, TAC1, 23]	; STORE UNIT NUMBER
000102	506101	000427	00810	HRLM TAC1, MTSTAK(TAC)	; SAVE ACTUAL CLOCK REQUEST
000103	700600	000400	00820	CONO PI, 400	; TURN OFF PI
000104	136100	000000	00830	IDPB TAC1, CLOCK	; REQUEST CLOCK RETURN TO MTCL
000105	700600	000200	00840	CONO PI, 200	; TURN PI ON
000106	371000	000066	00850	SOSL MTREQ	; DECREMENT REQUEST COUNT, ANYONE LEFT W
000107	476000	000000	00860	SETOM MTAVAL	; YES, SET MAG TAPE AVAL
000110	607000	010000	00870	TLNN IOS, IODT	; NON-DATA TRANSFER?
000111	254000	000114	00880	JRST MTCHK3	; YES
000112	371000	000062	00890	SOSL DCREQ	; NO, DECREMENT REQUEST COUNT, ANYONE LEFT
000113	476000	000000	00900	SETOM DCAVAL	; YES, SET DATA CONTROL AVAILAB
000114	260140	000000	00910	MTCHK3: PUSHJ PDP, WSYNC	; REQUEST WAIT
000115	200006	000002	00920	MOVE IOS, DEVIOS(DEV DAT)	; LOAD STATUS
000116	607000	010000	00930	TLNN IOS, IODT	; DATA TRANSFER?
000117	254000	000066	00940	JRST MTCHK2+2	; CHECK FOR MT AVAILABLE ONLY
000120	254000	000062	00950	JRST MTCHK1	; CHECK FOR MT AND DC AVAILABL

*TLZE IOS, IOBEG*  
*TLZ IOS, IOSL1*



			00960		
			00970		
			00980		
			00990		
000121	661000	000020	01000	MTOUT:	TLO IOS, IO ; WRITING
000122	260140	000057'	01010		PUSHJ PDP, MTCHEK
000123	722700	000200	01020		CONSZ 224, 200 ; IS FILE PROTECT RING IN?
000124	254000	000146'	01030		JRST MTOUTE ; NO, ERROR CANT WRITE. CROCK!!
000125	201066	000010	01040	MTOUT1:	MOVEI TAC, @DEVOAD(DEV DAT) ; BUFFER ADDRESS, PROG INCLUDE
000126	210101	000001	01050		MOVN TAC1, 1(TAC) ; -WD COUNT
000127	504040	000002	01060		HRL TAC, TAC1 ; -WD CMT, BUFFER
000130	347040	000275'	01070	MTOUT2:	AOJG TAC, MTNOTI ; BUFFER+1, TEST FOR ZERO WORD COUNT
000131	200100	000547'	01080		MOVE TAC1, [BLKO DC, 3400+DCN+MTDC*10]
000132	201200	001000	01090	MTINDC:	MOVEI T, 1000 ; WRITE
000133	202040	000533'	01100		MOVEM TAC, MTDCCN# ; BLKO POINTER
000134	202040	000530'	01110		MOVEM TAC, DCWRD#
000135	552100	000531'	01120		HRRZM TAC1, MDCSAV# ; SAVE DC COMMAND
000136	541100	000530'	01130		HRRI TAC1, DCWRD
000137	202100	000042	01140		MOVEM TAC1, 40+<2*DCN> ; BLK COMMAND
000140	200100	000550'	01150		MOVE TAC1, [JSR MTDCND]
000141	202100	000043	01160		MOVEM TAC1, 41+<2*DCN>
000142	700600	001100	01170		CONO PI, 1100
000143	720220	000531'	01180		CONO DC, @MDCSAV ; DATA CONTROL COMMAND
000144	201040	000004	01190		MOVEI TAC, ERF
000145	254000	000023'	01200		JRST MTG01
			01210	MTOUTE:	TRO IOS, IODERR ; WRITE LOCK, DEVICE ERROR
000146	660000	200000	01220		PUSHJ PDP, MTEND1
000147	260140	000250'	01230		JRST UXIT
000150	254000	000005'	01240		
			01250	MTCLS:	LDB TAC, PIOMOD ; MODE
000151	135040	000000	01260		CAIGE TAC, 16 ; DUMP MODE
000152	305040	000016	01270		JRST MTCLS1 ; CLOSE OUTPUT
000153	254000	000160'	01280		TLNE IOS, IO ; INPUT?
000154	603000	000020	01290		JRST MTCLS1+1 ; WRITE EOFS
000155	254000	000161'	01300		MOVEI T, 16 ; SPACE TO EOF
000156	201200	000016	01310		JRST MTAPE ; GOES BACK TO UO LEVEL
000157	254000	000006'	01320	MTCLS1:	PUSHJ PDP, OUT
000160	260140	000000	01330		MOVEI T, 3 ; WRITE IOF
000161	201200	000003	01340		PUSHJ PDP, MTAPE
000162	260140	000006'	01350		MOVEI T, 3 ; WRITE EOF
000163	201200	000003	01360		PUSHJ PDP, MTAPE
000164	260140	000006'	01370		MOVEI T, 7 ; BSP
000165	201200	000007	01380		JRST MTAPE
000166	254000	000006'	01390	MTDISP:	POPJ PDP, ; RELEASE
000167	263140	000000	01400		JRST MTCLS ; CLOSE
000170	254000	000151'	01410		JRST MTOUT ; WRITE
000171	254000	000121'	01420		JRST MTIN ; READ
000172	254000	000047'	01430		JRST CUXIT1 ; ENTER IN DIRECTORY
000173	254000	000000	01440		JRST CUXIT1 ; LOOKUP IN DIRECTORY
000174	254000	000173'	01450		JRST MTDMP0 ; DUMP OUT
000175	254000	000456'	01460		JRST MTDMPI ; DUMP IN
000176	254000	000506'	01470		JRST UXIT ; SETO
000177	254000	000150'	01480		JRST UXIT ; SETI
000200	254000	000177'	01490		JRST UXIT ; GETF
000201	254000	000200'	01500		
			01510	MTCINI:	MOVN TAC, MTREDO ; REPEAT COUNTER
000202	210040	000455'	01520		HRREM TAC, MTERCN ; RESET ERROR CNTR
000203	572040	000536'			

000204 722600 000000 01530  
000205 513000 000212' 01540  
000206 263140 000000 01550

CONO 224, 0  
HLLZS MTCINT  
POPJ PDP,

;CLEAR ENABLES  
;CLEAR CONSO

		01560		
		01570		
		01580		
		01590	;BLK COUNTED OUT	
		01600		
000207	000000 000000	01610	MTDCND: 0	
000210	700600 001100	01620	CONO PI,DCB+1000	;SHUT OF DC CHANNEL
000211	254520 000207	01630	JEN @MTDCND	

MT/WDN: *HRRZ TAC, DEVIAD (DEV DAT)*  
*ALRZ TACL, PROG*  
*CALL TAC, JOBPFI*  
*CAML TAC, TACL*  
*TRST MTERA*

```

01640
01650
01660
000212 722740 000005 01670
000213 254000 000213' 01680
000214 264000 000000 01690
000215 550300 000534' 01700
000216 135340 000000 01710
000217 550347 000000 01720
000220 200006 000002 01730
000221 722740 000001 01740
000222 254000 000325' 01750
000223 254000 000226' 01760
000224 254000 000357' 01770
000225 254000 000337' 01780
000226 607000 010000 01790
000227 254000 000314' 01800
000230 135040 000151' 01810
000231 301040 000016 01820
000232 254000 000250' 01830
000233 603000 000020 01840
000234 254000 000275' 01850
000235 332000 000535' 01860
000236 254000 000323' 01870
000237 201066 000007 01880
000240 210100 000533' 01890
000241 253100 000242' 01900
000242 513000 000002 01910
000243 270100 000530' 01920
000244 546101 000001 01930
000245 260140 000000 01940
000246 254000 000250' 01950
000247 254000 000277' 01960
000250 720200 000000 01970
000251 371000 000112' 01980
000252 476000 000113' 01990
000253 371000 000106' 02000
000254 476000 000107' 02010
000255 722700 010000 02020
000256 660000 002000 02030
000257 620000 004000 02040
000260 722700 004000 02050
000261 660000 004000 02060
000262 722700 020000 02070
000263 660000 004000 02080
000264 623000 000001 02090
000265 260140 000000 02100
000266 620000 010000 02110
000267 202006 000002 02120
000270 722600 000000 02130
000271 513000 000212' 02140
000272 210040 000455' 02150
000273 572040 000536' 02160
000274 263140 000000 02170
    
```

```

;FLAG FROM TAPE CONTROL. SET UP BY INSERT MACRO
MTCINT: CONSO 224,TCF+ERF
        JRST .
        JSR MTC SAV ;SAVE ACS
        HRRZ DEVDAT,MTDEV ;DVDB
        LDB PROG,PJOB#; JOB NUMBER
        MOVE HRRZ PROG,JB TADR(PROG)
        MOVE IOS,DEVIOS(DEVDAT)
        CONSO 224,TCF ;TAPE CONTROL FREE
        JRST MTEOR
MTIDSP: JRST MTPDUN ;POINTS TO MTERR FOR ERROR
        JRST MTBSP ;AFTER BACKSPACE
        JRST MTERR ;IF ERROR FOUND
MTPDUN: TLNN IOS,IODT
        JRST MTNIO2
        LDB TAC,PIOMOD
        CAIL TAC,16
        JRST MTEND1 ;DUMP
        TLNE IOS,IO
        JRST MTNOTI ;WRITING
        SKIPE MTEOFF ;NOT EOF?
        JRST MTEOF
MTIND1: MOVEI TAC,@DEVIAD(DEVDAT) ;BUFFER ADDRESS
        MOVN TAC1,MTDCCN ;WD CNT-1
        AOBJN TAC1, .+1 ;WD CNT
        HLLZS TAC1 ;CLR RT HALF
        ADD TAC1,DCWRD ;ADD CURRENT COUNT=NO. OF WDS
        HLRM TAC1,1(TAC) ;STORE AT WORD COUNT
        PUSHJ PDP,ADVBF
        JRST .+2 ;NEXT BUFFER FULL
        JRST MTC ON ;CONTINUE MODE
MTEND1: CONO DC, 0 ;TURN OFF DATA CONTROL
        SOSL DCREQ ;DECREMENT REQUEST COUNT, ANYONE LEFT?
        SETOM DCAVAL ;YES, SET FLAG FOR CLOCK
MTNIO: SOSL MTREQ
        SETOM MTAVAL ;YES, SET FLAG FOR CLOCK
        CONSZ 224,10000 ;END OF TAPE?
        TRO IOS,IOTEND ;SET END OF TAPE INDICATION
        TRZ IOS,IOBOT ;CLR LOAD POINT INDICATION
        CONSZ 224,4000 ;LOAD POINT?
        TRO IOS,IOBOT ;SET LOAD POINT INDICATION
        CONSZ 224,20000 ;TAPE REWINDING?
        TRO IOS,IOBOT ;SET LOAD POINT INDICATION
        TLZE IOS,IOW ;CLEAR WAIT
        PUSHJ PDP,SETIOD ;REQUEST WAIT SATISFIED
        TRZ IOS,IOACT ;CLEAR ACTIVE
        MOVEM IOS,DEVIOS(DEVDAT) ;RESTORE BITS
MTOFF: CONO 224,0 ;CLEAR MAG TAPE ENABLES
        HLLZS MTCINT ;CLEAR CONSO
        MOVN TAC,MTREDO ;REPEAT COUNTER
        HRREM TAC,MTERCN#
        POPJ PDP, ;DISMISS INTERRUPT OR RETURN TO CALLER
MTERA: PUSHJ PDP,MTEND1
        JRST ADR ERR
    
```

```

02180
02190
000275 260140 000000 02200
000276 254000 000250' 02210
000277 602000 000040 02220
000300 254000 000250' 02230
000301 722700 010000 02240
000302 254000 000250' 02250
000303 720200 000000 02260
000304 623000 000001 02270
000305 260140 000265' 02280
000306 202006 000002 02290
000307 210040 000455' 02300
000310 572040 000536' 02310
000311 607000 000020 02320
000312 254000 000052' 02330
000313 254000 000125' 02340
000314 554040 000534' 02350
000315 405040 007400 02360
000316 302040 003000 02370
000317 254000 000253' 02380
000320 722700 000400 02390
000321 661000 004000 02400
000322 254000 000253' 02410
000323 661000 000040 02420
000324 254000 000250' 02430
000325 722700 000030 02440
000326 370000 000223' 02450
02460
000327 722700 000400 02470
000330 476000 000535' 02480
000331 722600 000001 02490
02500
000332 202040 000207' 02510
000333 201040 000001 02520
000334 542040 000212' 02530
000335 200040 000207' 02540
000336 254000 000000 02550
    
```

```

MTNOTI:  PUSHJ PDP,ADVBF  ; WRITING
          JRST MTEND1
MTCON:   TRNE IOS,IOCON   ; CONTINUOUS?
          JRST MTEND1     ; STOP TAPE
          CONSZ 224,10000 ; END OF TAPE?
          JRST MTEND1     ; STOP TAPE
          CONO DC,0       ; CLEAR DATA CONTROL
          TLZE IOS,IOW
          PUSHJ PDP,SETIOD
          MOVEM IOS,DEVIOS(DEV DAT)
          MOVN TAC,MTREDO
          HRREM TAC,MTERCN
          TLNN IOS,IO     ; INPUT OR OUTPUT?
          JRST MTIN1      ; CALL INPUT SUBROUTINE
          JRST MTOUT1     ; CALL OUTPUT SUBROUTINE
MTNIO2:  HLRZ TAC,MTDEV   ; COMMAND
          ANDI TAC,7400
          CAIE TAC,3000   ; SPACING ONE RECORD
          JRST MTNIO      ; EXIT
          CONSZ 224,400   ; EOF?
          TLO IOS,IOSEOF ; SET EOF DETECTED
          JRST MTNIO      ; EXIT
MTEOF:   TLO IOS,IOEND
          JRST MTEND1
MTEOR:   CONSZ 224,LPE+CPE ; IF END OF RECORD CHECK PARIT
          SOS MTIDSP      ; IF ERROR CAUSE INTERRUPT TO
                          ; ERROR ROUTIE VIA TCF
          CONSZ 224,400   ; EOF?
          SETOM MTEOFF    ; SET EOF FLAG
MTIGN:   CONO 224,TCF    ; IF ERF, CAUSE INTERRUPT TO D
                          ; PATCH TABLE, DISABLE ERF FLA
          MOVEM TAC,MTDCND ; SAVE TAC
          MOVEI TAC,TCF    ; LOOK FOR TCF ONLY
          HRRM TAC,MTCINT  ; SET CONSO
          MOVE TAC,MTDCND  ; RESTORE TAC
          JRST MTCRET      ; DISMISS AND RETURN VIA TCF
    
```

{RAIN TAC,400  
 {JRST MTREW

MTREW: LDB TAC,PUNIT  
 PUSHJ PDP,MTOLKA  
 JRST MTOFF

```

02560
02570
000337 554040 000534' 02580
000340 405040 007400 02590
000341 306040 002400 02600
000342 254000 000345' 02610
000343 302040 001000 02620
000344 254000 000403' 02630
000345 606000 000100 02640
000346 351000 000536' 02650
000347 254000 000355' 02660
000350 554040 000534' 02670
000351 405040 770377 02680
000352 722201 003400 02690
000353 370000 000223' 02700
000354 254000 000331' 02710
02720
000355 660000 200000 02730
000356 254000 000226' 02740
02750
000357 200040 000533' 02760
000360 202040 000530' 02770
000361 720240 000001 02780
02790
000362 405040 000777 02800
000363 271040 003000 02810
000364 606040 000400 02820
000365 271040 001000 02830
000366 720201 000000 02840
000367 554040 000534' 02850
000370 722740 040000 02860
000371 254000 000370' 02870
000372 722201 000000 02880
000373 402000 000535' 02890
000374 700600 002100 02900
000375 201040 000226' 02910
000376 542040 000223' 02920
000377 201040 000004 02930
000400 542040 000212' 02940
000401 722600 000004 02950
000402 254000 000336' 02960
000403 350000 000223' 02970
000404 254000 000331' 02980
02990
03000
03010
  
```

```

MTERR:  HLRZ TAC,MTDEV          ;COMMAND
        ANDI TAC,7400
        CAIN TAC,2400          ;READ?
        JRST .+3
        CAIE TAC,1000         ;WRITE
        JRST MTIGN2           ;IGNORE IF NOT RD OR WRITE
        TRNN IOS, IONRCK      ;RE-DO?
        AOSL MTERCN           ;THIRD ERROR?
        JRST MTERR2          ;TRIPLE ERROR
        HLRZ TAC,MTDEV          ;COMMAND
        ANDI TAC,770377
        CONO 220,3400(TAC)    ;BSP
        SOS MTIDSP
        JRST MTIGN

MTERR2:  TRO IOS, IODERR       ;DEVICE ERROR
        JRST MTPDUN

MTBSP:   MOVE TAC,MTDCCN       ;POINTER
        MOVEM TAC,DCWRD       ;RESET POINTER WORD
        CONI DC,TAC           ;SAVE IN/OUT, PACK MD, DEV NU
        ;PRIORITY.

        ANDI TAC,777
        ADDI TAC,3000         ;MAKE WRITE
        TRNN TAC,400         ;WAS IT WRITING?
        ADDI TAC,1000         ;MAKE READ
        CONO DC,(TAC)        ;REISSUE CONO
        HLRZ TAC,MTDEV          ;COMMAND
        CONSO 224,XNC         ;WAIT FOR XNC
        JRST .-1 ;SHOULD ADD A COUNT(RUNAWAY TAPE TURNED
        CONO 220,(TAC)        ;REISSUE RD OR WRITE
        SETZM MTEOFF          ;CLR EOF FLAG
        CONO PI,2000+DCB      ;TURN ON CHANNEL
        MOVEI TAC,MTPDUN      ;RESET SWITCH

        HRRM TAC,MTIDSP
        MOVEI TAC,ERF
        HRRM TAC, MTCINT
        CONO 224,ERF
        JRST MTCRET          ;ENABLE PROPER FLAGS
        AOS MTIDSP           ;RESET DISPATCH SWITCH
        JRST MTIGN

        ;NEED TO TRY WRITING LONG RECORD GAP ON OUTPUT(ONLY) AND TRY
        ;ONCE MORE AT NEW SPOT ON TAPE IF TRIPLE ERROR
  
```

*EOSL11=220000  
SETSL1=100  
LEVEL=49  
XNC=40000*

```

03020
03030
03040
03050
03060
03070
03080
03090
03100
03110
03120
03130
03140
03150
03160
03170
03180
03190
03200
03210
03220
03230
03240
03250
03260
03270
03280
03290
03300
03310
03320
03330
03340
03350
03360
03370
03380
03390
03400
03410
03420
03430
03440

000405 550301 000427'
000406 241040 000004
000407 722201 000200
000410 722600 000002
000411 722700 000002
000412 254000 000422'
000413 241040 777774
000414 544101 000427'
000415 505100 000405'
000416 700600 000400
000417 136100 000104'
000420 700600 000200
000421 263140 000000
000422 200006 000002
000423 623000 000001
000424 260140 000305'
000425 202006 000002
000426 263140 000000
    
```

```

;TRANSFER NEW COMMAND
;MAG TAPE DATA CONTROL DEVICE NO.
;TAPE CONTROL FREE
;END OF RECORD FLAG
;LONG, PARITY ERROR
;CHAR. PARITY ERROR
;DATA CHANNEL NUMBER
;DATA CHANNEL NUMBER
;UNIT TO COMMAND BUFFER
;SPACING ONE RECORD FORWARD FOUND EOF
;EOT INDICATION
;DO NOT RE-TRY ON ERRORS
;TAPE AT LOAD POINT
;A 1 FOR A DATA TRANSFER TYPE COMMAND
EXTERNAL UXIT, ADVBFF, ADVBFE, DCREQ, DCWAIT, MTC SAV
EXTERNAL MTCRET, DCAVAL, MTAVAL, MTCCHN, MTCCHL, MTREQ
EXTERNAL MTSWAIT, OUT, SETIOD, CLOCK, CUXIT1
EXTERNAL WSYNC, USRREL, WAIT1, ADRERR, PUNIT, PIOMOD, PJOBN
EXTERNAL JBTADR
ENTRY MTDISP
INTERNAL MTCINT, MTAPE1, MTCINI
;CLOCK INTERRUPT, UNIT IN TAC
MTCLOCK: HRZE DEVDAT, MTSTAK(TAC) ;DVDB
MOVE ROT TAC, 4 ;PUT UNIT IN SEL BITS
CONO 220, 200(TAC) ;UNIT ONLY
CONO 224, SEL ;SET UNIT
CONSZ 224, SEL ;UNIT NOT READY?
JRST MTCLK2 MTN10 ;UNIT READY
ROT TAC, -4 ;FOR INDEXING PURPOSES
HLR TAC1, MTSTAK(TAC) ;CLOCK REQUEST
MRLI TAC1, MTCLOCK ;GET CLOCK REQUEST
CONO PI, 400 ;TURN OFF PI
IDPB TAC1, CLOCK ;STORE CLOCK REQUESTED
CONO PI, 200 ;TURN ON PI
POPJ PDP, 0 ;EXIT
MTCLK2: MOVE IOS, DEVIOS(DEVDAT)
TLZE IOS, IOW
PUSHJ PDP, SETIOD
MOVEM IOS, DEVIOS(DEVDAT)
POPJ PDP, 0
MTSTAK: BLOCK 108
    
```

*MOVE IOS, DEVIOS(DEVDAT)*

*MTCLK1: MOVEJ TAC1, 1000  
HRZE TAC1, MTCLOCK  
DPB TAC, [POINT3, TAC1, 73]*

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			03450		
			03460		
			03470		
			03480		
000437	722700	004000	03490		
000440	254000	000443'	03500		
000441	201200	003400	03510		
000442	260140	000022'	03520		
000443	201200	000016	03530		
000444	260140	000006'	03540		
000445	201200	000006	03550		
000446	260140	000006'	03560		
000447	260140	000006'	03570		
000450	200006	000002	03580		
000451	607000	004000	03590		
000452	254000	000443'	03600		
000453	201200	000007	03610		
000454	254000	000006'	03620		
000455	000000	000012			

```

;LOGICAL END OF TAPE LOOP
MTEOT:  CONSZ 224, 4000          ;TAPE NOT AT LOAD POINT?
        JRST MTEOT2            ;AVOID BACKSPACE IF AT LOAD P
        MOVEI T,3400          ;BACKSPACE
        PUSHJ PDP, MTG01-1
MTEOT2: MOVEI T,16             ;SPACE ONE FILE
        PUSHJ PDP, MTAPE
        MOVEI T,6 ;SPACE ONE RECORD
        PUSHJ PDP, MTAPE
        PUSHJ PDP, WAIT1      ;WAIT UNTIL SPACING IS COMPLE
        MOVE IOS, DEVIOS(DEVDAT)
        TLNN IOS, IOEOF       ;WAS EOF DETECTED?
        JRST MTEOT2          ;RESUME SPACING
        MOVEI T,7 ;BACKSPACE, LOGICAL EOT FOUND
        JRST MTAPE           ;RETURN BACK TO MAIN PROGRAM
MTREDO: 12 ;NUMBER OF TIMES TO RE-EXECUTE

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```

03630
03640 ;DEVICE DEPENDENT DUMP MODES. MODE 16.
03650 ;OUTPUT:
000456 661000 000020 03660 MTDMP0: TLO IOS, IO ;WRITING
000457 550200 000014 03670 HRRZ T,UUO
000460 260140 000057' 03680 PUSHJ PDP, MTCHEK ;IS SYSTEM AVAILABLE?
000461 200120 000131' 03690 MOVE TAC1, @MTOUT2 ;BLKO AND DATA CONTROL COMMAN
000462 200040 000004 03700 MOVE TAC,T ;COMMAND LIST POINTER
000463 201200 001000 03710 MOVEI T,1000 ;WRITING COMMAND
000464 505040 000007 03720 MTDMP1: HRLI TAC, PROG ;ACTUAL ADDRESS OF COMMAND LI
000465 202040 000532' 03730 MOVEM TAC, MTCMDP# ;COMMAND POINTER
000466 336060 000001 03740 SKIPN TAC,@TAC ;COMMAND WORD
000467 254000 000517' 03750 JRST MTDMP3 ;NOTHING TO DO
000470 325040 000464' 03760 JUMPGE TAC, MTDMP1 ;CHANGE COMMAND SEQUENCE
000471 576040 000537' 03770 HLREM TAC, SVCNTR# ;SAVE COUNTER
000472 553000 000001 03780 HRRZS TAC ;GET ADDRESS ALONE
000473 274040 000537' 03790 SUB TAC, SVCNTR ;GET LAST ADDRESS
000474 313040 000000 03800 CAMLE TAC, USRREL ;LESS THAN END?
000475 254000 000515' 03810 JRST MTDMP2 ;OUT OF BOUNDS
000476 200060 000532' 03820 MOVE TAC, @MTCMDP ;PICK UP POINTER AGAIN
000477 270040 000007 03830 ADD TAC, PROG ;GET ACTUAL ADDRESS
000500 260140 000133' 03840 PUSHJ PDP, MTINDC ;MOVE TAPE
000501 260140 000447' 03850 PUSHJ PDP, WAIT1
000502 350200 000532' 03860 AOS T, MTCMDP ;UPDATE COMMAND POINTER
000503 607000 000020 03870 TLNN IOS, IO ;WRITING?
000504 254000 000510' 03880 JRST MTDMP1+2 ;READING
000505 254000 000460' 03890 JRST MTDMP0+2 ;WRITING
03900 ;INPUT
000506 621000 000020 03910 MTDMPI: TLZ IOS, IO ;READING
000507 550200 000014 03920 HRRZ T,UUO
000510 260140 000057' 03930 PUSHJ PDP, MTCHEK ;IS SYSTEM AVAILABLE
000511 200120 000055' 03940 MOVE TAC1, @MTIN2 ;BLKI AND DATA CONTROL COMMAN
000512 200040 000004 03950 MOVE TAC,T ;COMMAND LIST POINTER
000513 201200 002400 03960 MOVEI T,2400 ;READ COMMAND
000514 254000 000464' 03970 JRST MTDMP1 ;DUMP
03980 ;ADDRESS ERROR
03990
04000 MTDMP2: PUSHJ PDP, MTDMP3
000515 260140 000517' 04010 JRST ADRERR
000516 254000 000000 04020 ;CLEAR ALL USE BITS. NOTHING IN COMMAND LIST
04030
04040 MTDMP3: SOSL DCREQ
000517 371000 000251' 04050 SETOM DCAVAL
000520 476000 000252' 04060 MTDMP4: SOSL MTREQ
000521 371000 000253' 04070 SETOM MTAVAL
000522 476000 000254' 04080 TRZ IOS, IOACT
000523 620000 010000 04090 TLZE IOS, IOW
000524 623000 000001 04100 PUSHJ PDP, SETIOD
000525 260140 000424' 04110 MOVEM IOS, DEVIOS(DEV DAT)
000526 202006 000002 04120 POPJ PDP,
000527 263140 000000 04130
04140 END,
000540 040300 000004 04140
000541 070300 000000
000542 140300 000004
000543 000002 000001
000544 720000 004021
000545 000405' 000040

```

000546 140300 000002  
000547 720100 003421  
000550 264000 000207'

THERE ARE NO ERRORS

PROGRAM BREAK IS 000551

MTPSER - MAGNETIC TAPE SERVICE ROUTINES - NO DIRECTORIES PAGE 13  
 SYMBOL TABLE

A	000000	INT
AC1	000015	INT
AC2	000016	INT
AC3	000017	INT
ADRERR	000516'	EXT
ADVBFE	000275'	EXT
ADVBFF	000245'	EXT
AL	000001	INT
ASSCON	400000	INT
ASSPRG	200000	INT
B	000014	INT
BUFPNT	000012	INT
BUFWRD	000013	INT
CLOCK	000417'	EXT
CLOS8	002000	INT
CLSIN	000002	INT
CLSOUT	000001	INT
CPE	000010	
CUXIT1	000174'	EXT
D	000017	INT
DAT	000005	INT
DCAVAL	000520'	EXT
DCR	000100	
DCL	000001	INT
DCN	000001	
DCREQ	000517'	EXT
DCW	020000	INT
DCWAIT	000063'	EXT
DCWRD	000530'	
DDI	000007	INT
DDO	000006	INT
DDTMEM	000037	INT
DDTSYM	000036	INT
DEN	000004	INT
DEVADR	000007	INT
DEVBUF	000006	INT
DEVCHR	000001	INT
DEVCTR	000011	INT
DEVDAT	000006	INT
DEVIAD	000007	INT
DEVIOS	000002	INT
DEVLOG	000005	INT
DEVMOD	000004	INT
DEVNAM	000000	INT
DEVOAD	000010	INT
DEVPTR	000010	INT
DEVSER	000003	INT
DGF	000012	INT
DIN	000003	INT
DLK	000005	INT
DOU	000002	INT
DR	000016	INT
DRL	000000	INT
DSI	000011	INT
DSO	000010	INT

MTPSER - MAGNETIC TAPE SERVICE ROUTINES - NO DIRECTORIES PAGE 14  
 SYMBOL TABLE

DTW	040000	INT
DVAVAL	000040	INT
DVCDR	100000	INT
DVDIR	000004	INT
DVDIRI	400000	INT
DVIN	000002	INT
DVLPT	040000	INT
DVMTA	000020	INT
DVOUT	000001	INT
DVTTY	000010	INT
ENTRB	020000	INT
FRF	000004	
I	000010	INT
IB	000013	INT
IBUFB	200000	INT
INITB	400000	INT
INPB	010000	INT
IO	000020	INT
IOACT	010000	INT
IOREG	000002	INT
IORKTL	040000	INT
IOROT	004000	
IOCON	000040	INT
IODEND	020000	INT
IODERR	200000	INT
IODISC	400000	INT
IODONE	400000	INT
IODT	010000	
IODTER	100000	INT
IOEND	000040	INT
IOFST	000004	INT
IOIMPM	400000	INT
IONRCK	000100	INT
IORDEL	000100	INT
IORET	000020	INT
IOS	000000	INT
IOSEOF	004000	
IOSTRT	000010	INT
IOTEND	002000	
IOUSE	400000	INT
IOW	000001	INT
IOWC	000020	INT
IOWS	400000	INT
ITEM	000004	INT
JBFAADR	000000	INT
JBFACTR	000002	INT
JBFPTR	000001	INT
JBTADR	000217	EXT
JBUF	000005	INT
JDAT	000011	INT
JERR	002000	INT
JIOW	100000	INT
JNA	004000	INT
LOOKB	040000	INT
LPE	000020	

MTPSER - MAGNETIC TAPE SERVICE ROUTINES - NO DIRECTORIES PAGE 15  
 SYMBOL TABLE

MDCSAV	000531'	
MTAPE	000006'	
MTAPE1	000000'	INT
MTAVAL	000522'	EXT
MTBSP	000357'	
MTCCHL	000000'	EXT
MTCCHN	000032'	EXT
MTCHEK	000057'	
MTCHK1	000062'	
MTCHK2	000064'	
MTCHK3	000114'	
MTCINI	000202'	INT
MTCINT	000212'	INT
MTCLK2	000422'	
MTCLOK	000405'	
MTCLS	000151'	
MTCLS1	000160'	
MTCMDP	000532'	
MTCON	000277'	
MTCONO	000045'	
MTCRET	000402'	EXT
MTCSAV	000214'	EXT
MTDC	000002'	
MTDCCN	000533'	
MTDCND	000207'	
MTDEV	000534'	
MTDISP	000167'	INT
MTDMP1	000464'	
MTDMP2	000515'	
MTDMP3	000517'	
MTDMP4	000521'	
MTDMPI	000506'	
MTDMPO	000456'	
MTEND1	000250'	
MTFOF	000323'	
MTFOFF	000535'	
MTFOR	000325'	
MTFOT2	000443'	
MTFRCN	000536'	
MTFRR	000337'	
MTFRR2	000355'	
MTGO	000033'	
MTG01	000023'	
MTG01A	000025'	
MTIDSP	000223'	
MTIGN	000331'	
MTIGN2	000403'	
MTIN	000047'	
MTIN1	000052'	
MTIN2	000055'	
MTINDC	000133'	
MTINDN	000237'	
MTLEOT	000437'	
MTNIO	000253'	
MTNIO2	000314'	

MTPSER - MAGNETIC TAPE SERVICE ROUTINES - NO DIRECTORIES PAGE 16  
SYMBOL TABLE

MTNOTI	000275'	
MTOUT	000121'	
MTOUT1	000125'	
MTOUT2	000131'	
MTOUTE	000146'	
MTPDUN	000226'	
MTREDO	000455'	
MTREQ	000521'	EXT
MTSTAK	000427'	
MTW	010000	INT
MTWAIT	000067'	EXT
OBUIR	100000	INT
OUT	000160'	EXT
OUTPR	004000	INT
PDP	000003	INT
PICRN	000100	INT
PIOMOD	000230'	EXT
PJOBK	000216'	EXT
PROG	000007	INT
PUNIT	000025'	EXT
RUN	200000	INT
RUNABL	204000	INT
SEL	000002	
SETIOD	000525'	EXT
SVCNTR	000537'	
T	000004	
TAC	000001	INT
TAC1	000002	INT
TCF	000001	
TEM	000010	INT
TTYATC	020000	INT
TTYUSE	010000	INT
USRMOD	010000	INT
USRREL	000474'	EXT
UO	000014	INT
UXIT	000201'	EXT
WAIT1	000501'	EXT
WSYK	000114'	EXT
XK	040000	

END OF ASSEMBLY