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SWAPPER (SWAP,75) 10/2/73 JGC/BPC/JBL

/PRESWAPPER, HANDLES RUN TIME FOR RUNNING USER

SWAPT, 0 /TIME OF LAST DEBREAK (IN MS.)

SWAP, DSC 1700 /BREAK ON CHAN 17

SZS 10

JSP CEXECTT

EEM

RCK

LAI

SUB SWAPT

/CALCULATE ELAPSED TIME

SPA

ADD (60000.)

DAC SWAPT

/SAVE ELAPSED TIME

LIF"U"SCF"U"CLL

/PRESERVE LINK IN IO

TAD I (TOTRT+1)

DAC I (TOTRT+1)

SZL"U"LF I

IDX I (TOTRT)

LAC (700000)

AND I ERSTAT

SZA

SAD (400000)

JMP SWAPH

DAP I (PRIORITY)

JMP SWAPI

SWAPH,

LAW 777

/UPDATE UNCHARGED RUN TIME

AND I ERSTAT

DAC RUNTM

DAC SRUNTM

LAW 7777

AND I (PRIORITY)

LIA

ADD SWAPT

DAP I (PRIORITY)

SWP

XAI

RAR 6S

SMA

/USER USED ANOTHER 32 MS YET?

JMP SWAPI

/NO, SO DON'T CHARGE HIM ANYTHING

DZM SWCTR

LAC RUNTM

/CHECK IF USER'S QUEUE IS IN RANGE

LIA

SUB SWAPUL

/LOWEST QUEUE NOT MODIFIED (LUB)

SWP

SUB SWAPLL

/HIGHEST QUEUE NOT MODIFIED (GLB)

SPI"U"SZM I

JMP SWAPL

/NOT IN RANGE, CHARGE 1 TICK

LAC I (PRIORITY)

SAR 6S

SAR 6S

SPQ

SUB (1)

/FORM THE TWO'S COMPLEMENT FOR NEG. PRIORITY

DAC SWCTR

/AND SAVE IN PROPER ISP FORMAT

SPQ

JMP SWAPL

/ZERO OR NEG. PRIORITY, GO CHARGE RIGHT AWAY

	LAW 1740	/SEE IF IT'S TIME TO CHARGE HIM YET
	AND I (PRIORITY)	
	SAR 59	
	SAS SWCTR	
	JMP SWAPI	/NOT TIME TO CHARGE YET
SWAPL,	LAW 37	/TRUNCATE UNCHARGED RUN TIME
	AND I (PRIORITY)	
	DAP I (PRIORITY)	
SWAPM,	LAW I 1	/NOW LOOP CHARGING CLOCK TICKS
	ADD RUNTM	
	LIA	
	AND RUNTM	
	SWP	
	SNI I	
	JMP SWAPA	
	LAC RUNTM	/USER IS CHANGING QUEUE
	SAL 29	
	SUB (1)	
	AND (777)	
	DZM HOTFLG	/SIGNAL THE CHANGE
SWAPA,	DAP RUNTM	/UPDATED RUN TIME
	SAD (777)	/GUY PUT ON BOTTOM OF LOW QUEUE?
	JMP SWAPA1	/YES, LEAVE HIM THERE
	ISP SWCTR	/THROUGH PUNISHING THIS GUY?
	JMP SWAPM	/SOME PEOPLE NEVER LEARN
SWAPA1,	LAW 777	
	LSM	
	AND I ERSTAT	
	SAD SRUNTM	/SKIP IF QUEUE HAS BEEN CHANGED BY...
	LAC RUNTM	/...SOME OTHER SB CHANNEL
	DAP I ERSTAT	
	ESM	
	LAC I NETHND	
	SAS ERSTAT	/IS THIS GUY "NCP" ?
	JMP SWAPI	
	LAC (200000)	
	AND I ERSTAT	
	SZA	
	JMP SWAPI	
	LAW 7777	
	AND I ERSTAT	
	SUB (200)	
	SPA	
	JMP SWAPI	
	LAW 40	/GOOSE "NCP"
	DAP I ERSTAT	

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SWAPI, LIO HOTFLG  
SNI  
JMP SWAPB  
SWDBK, LAC RSTAT  
SAS BDSTAT  
SZS I 30  
JMP SWDBK1

SWAPB, LAC 74  
DAC I (AC) /SETUP P POINTERS FROM DEBREAK AREA  
LIO 75  
DIO I (PC)  
JSP C16TSV  
LIO 76  
DIO I (IO)  
LIF"U"SCF"U"CLL  
DIO I (FLAGS)  
LAW I 7777  
AND I ERSTAT  
SAD (CLKHNG)  
JMP SWORG  
CLI  
LAC I (BILLTT)  
RCR 9S  
RIL 9S  
DIO I (BILLTT)  
SZA  
DAP I ERSTAT

```

SWORG,   ESM
          LEM
          CLC"U"CLF 7
          DAC HOTFLG      /INIT, HOTFLG
          LAW I 7777      /SEE IF XDDT PERMANENTLY HUNG
          AND STAT 0
          DAP STAT+0      /XDDT ALWAYS QUEUE ZERO
          LIO BDSTAT
          SNI I
          DAP I BDSTAT    /FASTRAND SWAPPER ALWAYS AT QUEUE 0
          SAS (40000)
          JMP SWL0
          LAW I 2
          SAS I DCORE
          JMP SWL0
          LAW STAT 0
          DAC I DCORE
          DZM DDTGUY
SWL0,    CLA
          SAS LDSTAT
          STF 1
          SAS BDSTAT
          STF 2
SWL0A,   LAW STAT      /INIT TO FIND BEST GUY
          DAP SWV1
          LAW WHERE
          DAP SWV2
          LAC (I)
          DAC SWBQ
SWV1,    LIO .          /GET HIS QUEUE
          SPI          /HUNG?
          JMP SWL1      /YES, IGNORE
          LAW 740       /NO
SWV2,    AND .          /FIND OUT WHERE HE IS
          RAR 6S
          SAD (ADD)
          LAW 1
          ADD (SWSTB)   /LOOK UP IN SKIP TABLE
          DAP SWV3
SWV3,    XCT .          /SKIP IF ACCESSIBLE
          JMP SWL1      /INACCESSIBLE, IGNORE
          CLA          /FIGURE EFFECTIVE QUEUE
          RCL 6S
          SZA
          CLI
          RIR 6S
          LAI
          SUB SWBQ
          SMA
          JMP SWL1      /NOT AS GOOD AS BEST SO FAR
          DIO SWBQ      /BETTER, UPDATE BEST SO FAR
          LAC SWV2
          DAP SWV7
          SNI
          JMP SWL37     /FIND A GUY WITH QUEUE 0?
          IDX SWV1      /YES, SO WE CAN STOP LOOKING
          IDX SWV2      /LOOK AT NEXT GUY
          SUB (AND)
          SAS WTOP
          JMP SWV1

```

LAC SWBQ  
SAD (I)  
JMP SWBGC

/DID WE FIND ANYBODY?  
/NO, RUN BEST GUY IN CORE

SWL37,	CLC	
	DAC SWWQ	
	LAW CS1	
	DAP SWV4	
SWV4,	LAC .	/GET CORE STATUS
	SPA	
	JMP SWL2	/UNAVAILABLE, IGNORE
	SZA I	
	JMP SWL3	/FREE, STOP SEARCHING
	DAP SWV5	
SWV5,	LIO .	/LOOK AT STATUS OF PGM IN THAT CORE
	SPI	
	JMP SWL9	/HUNG, EFFECTIVE QUEUE IS (I)
	CLA	
	RCL 6S	
	SZA	
	CLI	
	RIR 6S	
SWL10,	LAI	/GET STATUS INTO AC TOO
	SUB SWWQ	
	SPA	
	JMP SWL2	/ALREADY HAVE A WORSE GUY
	DIO SWWQ	/REMEMBER NEW WORSE GUY
	LAC SWV4	
	DAP SWT2	
SWL2,	IDX SWV4	/LOOK AT NEXT CORE
	SAS (LAC CS3+1)	
	JMP SWV4	
	LAC SWWQ	
	SPA	
	JMP SWNN	/DIDN'T FIND ANY CORES AT ALL, WAIT
	SUB SWBQ	
	SPQ	/SWAPPABLE PAIR?
	JMP SWBGC	/NO, GO RUN BEST GUY IN CORE
SWL8,	LAW 740	/YES, WHERE IS NON-CORE GUY?
SWV7,	AND .	
	CLI	
	SZA I	
	JMP SWLD	/LITTLE DRUM
	SAS (40)	
	SAD (100)	
	STF 4	/FG 4 ON MEANS B.D., OFF MEANS LIMBO
SWL35,	SZF 3	/FG 3 INDICATES FREE CORE
	JMP SWFC	
	LAW WHAT	/INIT. TO SEARCH FOR FREE L.D. FIELD
	DAP SWV6	
SWL5,	LAW 777	
SWV6,	AND .	
	SAD (400)	
	JMP SWL4	/FOUND FREE L.D. FIELD
	IDX SWV6	
	SAS (AND WHAT+40)	
	JMP SWL5	
	SZF 4	
	JMP SWL11	/GUY IS ON BIG DRUM
	DAP SWV11	/GUY IS IN LIMBO, INIT. TO FIND B.D. FIELD

```
SWL12,    LAW 777
SWV11,    AND
          SAD (400)
          JMP SWL11A    /FOUND FREE B.D. FIELD
          IDX SWV11
          SAS (AND WHAT+140=16)
          JMP SWL12    /KEEP LOOKING
```

```
/SORRY, YOU LOSE.
SWL36,    LIO I SWV7
          LAW I WHERE-STAT
          ADD SWV7
          DAP SWV11A
          LAW 300
          LSM
          DAC I SWV7
          LAC (UNUSED)
SWV11A,   DIP
          LAW 200
          XAI"U"CLL"U"CML    /WE'LL NEED THE LINK LATER
          SAS (700)
          JMP SWV11C
          EEM
          LAC (DCH SWV11Z)
          JDA 14STXT
          JMP SWORG
```

```
SWV11C,   JDA TTNUM    /SET UP TT POINTERS
          DZM I TTPP    /FLUSH THE PROGRAM NUMBER
          LAW TTSTPT
          DAC SWV11W
SWV11D,   LCH I SWV11W
          SAD (SPO
          JMP SWORG
          JDA TTS    /GO TYPE OUT THE CHARACTER
          NOP
          JMP SWV11D
```

```
SWV11W,   0
```

```
SWV11Z,   472224    /PSU MISSED
          004471
          222265
          647756
```

## /MISCELLANEOUS BITS OF CODING

## /FOUND FREE CORE

```

SWL3,      STF 3           /FREE CORE INDICATOR
           LAC SWV4
           DAP SWT2        /REMEMBER WHICH CORE
           JMP SWL8

```

## /SKIP TABLE FOR FIGURING ACCESSIBILITY

```

SWSTB,     SZF 1           /ON L.D.
           SZF 2           /ON B.D.
           SZF 6           /IN LIMBO
           NOP             /HALTED PGMS ARE NEVER ACCESSIBLE
           NOP             /CORE IS NEVER ACCESSIBLE
           SZF 6           /STARTUP PROGRAM PRIME

```

## /PGM IN CORE IS HUNG

```

SWL9,      LIO (I)
           JMP SWL10
SWV20,     LIO WHAT        /VARIABLE FOR SWL11 LOOP

```

## /FIND GUY TO PUT ON B.D.

```

SWL11A,    SZF I 2
           JMP SWL11
           STF 6

```

```

           JMP SWL0A
SWL11,     LAC SWV20
           DAC SWV13
           CLC

```

```

           DAC SWWQ
SWV13,     LIO .           /SEARCH ONLY LD WE HAVE
           LAW 700
           NAI

```

```

           SZA
           JMP SWL14        /NOT A GUY THERE
           LAW STAT

```

```

           AAI
SWL13,     DAP SWV12
           SAD (STAT)
           JMP SWL14

```

```

SWV12,     LAC .           /DON'T SWAP XDDT ON FASTRAND
           LIA             /GET GUY'S STATUS
           /INTO IO

```

```

           AND (720000)
           SAS (400000)
           SAD (020000)
           JMP SWL14        /SKIP ANY FASTRAND GUYS
           LAW I 7777

```

```

           NAI
           SZA
           CLI
           SPA
           LIO (I)         /EXCEPT HUNG GUYS
           LAI             /EFFECTIVE Q IN AC,IO

```

```

           SUB SWWQ
           SPA
           JMP SWL14        /WORSER GUY ALREADY (SIC)
           DIO SWWQ        /REMEMBER THIS GUY

```



```

LAW WHERE=STAT
ADD SWV12
DAP SWV16
SWL14, SZF 6 /GET NEXT GUY, CORE OR LD?
JMP SWL15 /CORE, GO LOOK AT NEXT CORE
IDX SWV13 /LOOK AT NEXT LD FIELD
SAD (LIO WHAT+40)
LAC (LIO WHAT)
DAP SWV13
SAS SWV20
JMP SWV13
LAW WHAT
ADD I SWV16
LIO SWWQ
SPI I
DAP SWV20
STF 6 /NO LD FIELDS LEFT, LOOK AT CORES NOW
LAW CS1
DAP SWV15
SWV15, LAC . /CORE STATUS WORD
SZM /IS CORE OK?
JMP SWL13 /YES, COMPARE GUY WITH OTHERS
SWL15, IDX SWV15 /GET NEXT CORE
SAS (LAC CS3+1)
JMP SWV15
LAC SWWQ
SPA
JMP SWBGC /NO, WAIT
SUB SWBQ
SPQ /FASTRAND SWAPPABLE PAIR?
JMP SWBGC
LAW 400 /YES, WHERE IS HE?
SWV16, AND . /WHERE PTR TO GUY FOUND
SZA
JMP SWBD /CORE, GO SET UP BD WRITE
SAS LDSTAT /LD, SETUP LD READ UNLESS LD BUSY
JMP SWBGC /LD BUSY, WAIT
LAW WHAT
ADD I SWV16
DAP SWV13
SWL17, LAW I WHAT
ADD SWV13 /GET L.D. READ FIELD
DAP SWT3
RAR 6S /INTO HI ORDER AC
IOR (4000000) /SET READ BIT
DIP LDIA
LAW 777
AND I SWV13 /GET INCOMING PGM
ADD (STAT)
DAP LDT2 /SETUP FOR L.D. S.B. ROUTINE
ADD (WHERE=STAT)
DAP LDV1

```

```

LAW I CS1-1-400          /GET PHYSICAL CORE
ADD SWT2
DAC LDT1
RAR 4S
DIP LDCL
LAC SWT2
DAP LDV2
SZF 3
JMP SWL19                /READ ONLY, GO DO DIFFERENT THINGS
LAW 201                  /SAVE L.D. READ FIELD FOR NEXT SWAP
DAC I SWV13
LIO SWT3                 /GET READ FIELD
LAC SWFLDF               /RESET SAVED L.D. FIELD
DIO SWFLDF
SWL21, LIA                /GET WRITE FIELD IN AC AND IO
RAR 6S
IOR (400000)            /SET WRITE BIT, WRITE ONLY JOINS HERE
DIP LDWC
LAW WHERE=STAT
ADD I SWT2              /GET WHERE PTR. TO GUY BEING WRITTEN
DAP .+1
DIO .                   /SAY HE'S ON THE DRUM
LAW WHAT                /GET WHAT PTR. TO WRITE FIELD
AAI
DAP SWV17
LAW I STAT              /SAY DRUM FIELD HAS GUY
ADD I SWT2
SWV17, SWL23, DAC .
CLC                     /SET UP STATUS FOR SWAPPING
DAC LDSTAT
DAC I SWT2              /SAY CORE IS HELD
LAW I 2
DAC LDERC
LSM
DRA
LAW 48.
AAI
DAP LDIA
DAP LDCL
LIO LDIA
DIA
LIO LDWC
DWC
LIO LDCL
DCL
JMP SWORG

```

## /NORMAL ENTRY TO LITTLE DRUM CODING

```

SWLD,    LAW WHAT
          ADD I SWV7      /GET READ FIELD
          DAP SWV13
          JMP SWL17       /ENTER L.D. CODING

```

## /READ ONLY CODING

```

SWL19,    LAW 400
          DAC I SWV13     /MARK READ FIELD AS FREE
          CLA             /SETUP TO NOT WRITE
          DIP LDWC
          JMP SWL23       /GO DO DRUMSWAP

```

## /WRITE ONLY CODING

```

SWL18,    CLA             /ENTRY POINT, SETUP TO NOT READ
          DIP LDIA
          LAC SWT2        /GET CORE TO SET UP FOR S.B. ROUTINE
          DAP LDV2
          SUB (CS1-1)     /GET PHYSICAL CORE
          RAR 48
          DIP LDCL
          LAC SWV6
          SUB (AND WHAT)  /GET WRITE FIELD
          JMP SWL21       /ENTER MAINLINE SETUP CODING

```

## /LITTLE DRUM SEQUENCE BREAK ROUTINE

```

LD,        DRA            /GET DRA
          LAC .           /10 MICROSECS.
          SPI
          JMP LDERR       /ERROR ROUTINE
LDERI,     DZM LDSTAT     /RESTORE STATUS, UNAFFECTED BY EM
          DZM HOTFLG     /MARK ALARM
          ISB 1700       /ACTIVATE SWAPPER
          LAC LDIA
          SMA            /WRITE ONLY?
          JMP LDWO        /YES
          LIO LDT1       /PRE SET-UP CORE OF GUY WHO CAME IN
LDV1,      DIO .         /MARK GUY WHO CAME IN AS BEING IN CORE
LDT2,      LAW .         /STAT PTR. FOR GUY WHO CAME IN
LDV2,      DAC .         /RESTORE CORE STATUS
LDERGI,    LAC 24
          LIO 26
          JMP I 25       /DEBREAK

LDWO,      CLA           /SET CORE TO FREE
          JMP LDV2

LDT1,      0

```

```

LDERR,      IDX LDERRS      /COUNT AN ERROR
             LAC LDIA
             DIP LDERRS      /SAVE READ FIELD
             RIL 18
             SPI I
             XX              /TIMING ERRORS
             ISP LDERC
             JMP LDERG      /TRY AGAIN
             LAW I STAT
             ADD LDT2
             RCR 98
             LAW I 3
             EEM
             LSM
             JDA 14SOCT
             LAC (LDERT)
             JDA 14STXT
             LAC LDIA
             AND (-ADD)
             LIA
             LAW I 2
             JDA 14SOCT
             LAC (LDECRT)
             JDA 14STXT
             ESM
             JMP LDERI

```

```

LDECRT:      775600
LDERT:        436400
              476151
              005600

```

```

LDERC,        0
LDERRS,       0

```

```

LDERG,        CLA
              DIP LDWC
              LAC LDIA
              SMA
              JMP LDWO
              LIO LDIA
              DIA
              LIO LDWC
              DWC
              LIO LDCL
              DCL
              JMP LDERGI

```

/FOUND FREE L.D. FIELD

```

SWL4,      CLA      /IS L.D. BUSY?
           SAD LDSTAT
           JMP SWL18  /NO, DO DRUM WRITE TO GET FREE CORE

```

/THIS SECTION FINDS THE BEST GUY IN CORE TO RUN

```

SWBGC,     LAW CS1    /INITIALIZE
           DAP SWV8
           LAC (I)     /WORSE THAN WORST QUEUE
           DAC SWBQ
SWV8,      LAC .       /GET CORE STATUS
           SPQ
           JMP SWL6    /NOBODY THERE
           DAP SWV9
SWV9,      LIO .       /LOOK AT STATUS OF GUY THERE
           SPI        /HUNG?
           JMP SWL6    /YES, IGNORE
           CLA        /FIGURE EFFECTIVE QUEUE
           RCL 6S
           SZA
           CLI
           RIR 6S
           LAI
           SUB SWBQ    /COMPARE WITH BEST QUEUE SO FAR
           SMA
           JMP SWL6    /NOT AS GOOD
           DIO SWBQ    /BETTER, REMEMBER THIS GUY
           LAC SWV8    /REMEMBER CORE
           DAP RCORE
           LAC SWV9    /REMEMBER GUY
           DAP RSTAT
           DAP ERSTAT
SWL6,      IDX SWV8    /LOOK AT NEXT CORE
           SAS (LAC CS3+1)
           JMP SWV8
           LAC SWBQ    /NO MORE CORES, DID WE FIND ANYONE?
           SAD (I)
           JMP SWNN    /NO ONE WANTS TO RUN, WAIT
           SAD (777)
           JMP SWL26   /YES
SWL30,     LAW I CS1-1
           ADD RCORE   /SETUP TOP OF RCORE
           RAR 4S
           DIP RCORE
           SAR 2S      /SETUP TO RENAME
           DCH (ADD SWV10)
SWV10,     RNM
           LAC RSTAT
           SAD BDSTAT  /RUNNING THE FASTRAND SWAPPER?
           JMP SWV10B  /YES, SO DON'T CHECK SPP STUFF
           LIO SPOWN
           SAD SPUSER
           SNI
           JMP SWV10B  /THIS USER NOT WANTED BY SPP LOGIC

```

```

EEM                                     /SUPER=P-POINTER STUFF
LAC SPCNT
DAC T3
LAC SPCAD
DAC T1
LAC (DCH SPWORD)
DAC T2
LIO SPFLAG
SNI                                     /SPP READ OR WRITE ?
JMP ,+4                               /READ, SO COPY FROM USER TO EXEC CORE
LIO T1                               /WRITE, SO CLOBBER USER'S CORE
DAC T1
DIO T2
LAC I T1
DAC I T2
IDX T1
IDX T2
ISP T3
JMP ,=-5
LEM
LAC SPOWN                             /UNHANG SPP OWNER
SAD BDSTAT
LAW FSTAT
DAP SWV10A
LAC (300000
LSM
SWV10A, AND ,
CLI "U"SWP
SNI I
DIP I SWV10A
ESM
LAW SPDONE
DAP SPX                               /SET SWITCH TO GIVE OWNER R2
DZM SPUSER                           /SO USER WON'T BE FOUND AGAIN
SWV10B, LAW STAT
SAD RSTAT
JMP RUNDOT
EEM
SWV19, JMP SWL32                     /SWITCH
SWL31, LAW SWL32
DAP SWV19                             /RESTORE SWITCH
LAW 200
XOR SWSUTT
LIO C16SU
SAD (700)
LIO C16PSU
DIO I (PC)
DAC I (BILLTT)
DZM I (TOTRT)
DZM I (TOTRT+1)
DZM I (IOPRT)
DZM I (IOPRT+1)
DZM I (BITS)
DZM I (PRIORITY)
LSM
LAC I DAT
LIO I TME
ESM
DAC I (SUPTD)
DIO I (SUPTD+1)

```

SWL32,	LEM	
	LAC I RSTAT	/GET GUY'S STATUS
	RAL 4S	
	SPA	
	JMP IOPWS1	/THE IOP WANTS HIM
	RAL 1S	
	SPA	
	JMP DDTWS	/XDDT WANTS HIM
	RAR 2S	
	SPA	
	JMP BRKS	/HE HIT THE BREAK KEY
SWL33,	EEM	/HE REALLY WANTS TO RUN
	LIO I (PC)	
	LAC (170000)	
	NAI	
	SZA	
	SAD (160000)	
	JMP SWL33A	
	HLT	/OPERATOR PUSHES CONTINUE. BUG IS IN EXEC,
	CLI	/USER IS LOSER - CRASH HIM
SWL33A,	DIO 7S	/SETUP PC IN DEBREAK AREA
SWL34,	JSP C16TUS	/UNSAVE CORE 16 IF NECESSARY
	LIO I (FLAGS)	
	LFI	
	LAC I (AC)	
	DAC 74	
	LIO I (IO)	
	DIO 76	
	JMP SWDBK	/DEBREAK
SWL26,	LAW STAT	/INIT TO CHANGE ALL 777'S TO 776'S
	DAP SWV18	
SWL28,	LAW 777	
SWV18,	SAS .	
	JMP SWL29	/NOT 777; IGNORE.
	LAW 776	
	DAP I SWV18	/STORE 776
SWL29,	IDX SWV18	
	SUB (SAS STAT-WHERE)	
	SAS WTOP	
	JMP SWL28	
	JMP SWL30	

```

SWFC,      SZF 4           /WHERE IS BEST GUY?
           JMP SWBDR       /READ FROM FASTRAND
           LAW I WHERE-STAT /STARTUP STUFF
           ADD SWV7        /GET STAT PTR.
           DAP I SWT2      /SAY HE'S IN CORE
           DAP RSTAT       /SAY HE'S RUNNING
           DAP ERSTAT
           LAC SWT2
           DAC RCORE       /SAY THIS CORE IS RUNNING
           LIO I SWV7      /GET TT #
           DIO SWSUTT
           SUB (CS1-1-400) /GET 400 CORE PTR
           DAC I SWV7      /REPLACE IN WHERE TABLE
           LAW SWL31       /SETUP SWITCH
           DAP SWV19
           JMP SWL30       /GO RUN GUY

SWSUTT,    0

SWNN,      SZS 10
           JSP CEXECTT
           LAW 374
           AND TTF
           RAR 28
           LIA
           LAC I TTF
           RAR 18
           SPA
           LFI
           CLA
           SAS HOTFLG
           JMP SWNN        /WAIT FOR SOMETHING TO HAPPEN
           JMP SWORG       /SOMETHING HAPPENED, GO HANDLE IT

SWDBK1,    DAC SWLGR       /SAVE UP LAST GUY RUN
           RCK
           DIO SWAPT
           LAC 74
           LIO 76
           ASC 1700
           JMP I 75        /DEBREAK

```



/BREAK KEY HAS BEEN HIT

```

BRKS,      LAC RSTAT      /GUY BEING FASTRAND SWAPPED?
           SAD BDSTAT
           JMP SWL33       /YES, IGNORE BREAK KEY
           LAC (-40000)    /REMOVE BREAK KEY BIT
           LSM
           AND I RSTAT
           DAC I RSTAT
           ESM
           EEM
           LAC I (BITS)    /IS HE RUNNING UNDER IDDT
           SMA
           JMP BRK1+1      /NO : GO CHECK RESTART MODE
           LAW 77          /WAS THE TT THE BILLTT
           AND I (BILLTT)
           JDA TTNUM       /SET UP POINTERS
           LAW ,+3         /USE TT ROUTINES TO CHECK
           DAP TTCKSX
           JMP TTCKS1+2
           SAS (2)         /,+3 : IS IT A BREAK
           JMP BRK1        /NOT BILLTT : IS USER IN RESTART MODE
           LAC I (AC)      /COPY AC,PC,IO,FLAGS
           DAC I (HH16AC)
           LIO I (IO)
           DIO I (HH16IO)
           LIO I (FLAGS)
           DIO I (HH16FG)
           DZM I (FLAGS)   /CLEAR LINK FOR C16 "GETDDT" LOGIC
           LAC (-500000)   /REMOVE IDDT AND RESTART BITS
           AND I (BITS)
           DAC I (BITS)
           LAC C16BKK
           LIO I (PC)
           DIO I (HH16PC)
           JMP BRK3

BRK1,      LAC I (BITS)    /IS USER IN RESTART MODE
BRK1+1,    AND (-100000)
           SAD I (BITS)
           JMP SWORG       /USER NOT IN RESTART MODE
           IOR (40000)     /SET DEBREAK LEGAL BIT
           DAC I (BITS)
           LIO I (PC)
           DIO I (RESTPC)
           LAW RESTSU
BRK3,      DAC 75          /RESET PC TO APPROPRIATE POSITION
           LAC RSTAT
           SAD SPOWN
           DZM SPOWN       /HE'S NOT DOING A SUPER-PEEK ANY MORE
           LAW 1           /SET TO HIGH QUE
           DAP I ERSTAT
           JMP SWL34

```

```

/FASTRAND SWAPPER
SWBD,    SZF I 4          /SWAP OR WRITE ONLY
        JMP SWBDW        /WRITE ONLY
        LAW WHAT
        LIO SWFBDF       /GET SLOT TO WRITE ON (WS)
        AAI
        DAP SWBDV1
        LAC I SWV7       /GET SLOT TO READ FROM (RS)
        DAC SWFBDF       /NEW SWAPPING SLOT
        ADD (WHAT)
        DAP SWBDV2
        LAC I SWV16      /GET 40C WHERE C IS CORE INVOLVED
        DAC I SWV7       /SAY GUY ON RS IS NOW IN CORE
        ADD (CS1-1-400)
        DAP SWV4         /CS PTR TO CORE
        DIO I SWV16      /SAY GUY WHO'S IN CORE IS NOW ON WS
        LAW I STAT
        ADD I SWV4
SWBDV1,  DAC .          /WHAT PTR TO WS
SWBDL1,  LAW STAT       /READ ONLY COMES IN HERE
SWBDV2,  ADD .          /WHAT PTR TO RS
        DAC I SWV4       /SAY CORE HAS GUY WHO USED TO BE ON RS
        LAW 201         /CODE: SAVED FOR SWAPPING
        SZF 3
        LAW 400         /READ ONLY, CODE: FREE
SWBDL2,  DAC I SWBDV2    /SETUP NEW STATUS OF RS
        LAW I WHAT 40    /WRITE ONLY COMES IN HERE
        ADD SWBDV1       /CALCULATE WRITE SLOT
        RCR 9S
        LAW I WHAT 40
        ADD SWBDV2       /CALCULATE READ SLOT
        RCR 9S
        LAW I CS1-1
        ADD SWV4         /GET CORE
        RAR 6S          /POSITION
        DCH (ADD ,+1)    /SETUP TO RENAME THAT CORE TO 0
        RNM
        EEM
        LAC I (AC)
        DAC I (FASTAC)
        LAC I (PC)
        DAC I (FASTPC)
        DIO I (AC)
        LAC C16FSW       /STARTING ADDRESS FOR SWAP
        SZF 3
        LAC C16FIN       /SA FOR READ ONLY
        SZF I 4
        LAC C16FOU       /SA FOR WRITE ONLY
        DAC I (PC)
        LEM
        LAW SWBDL5
        SZF I 4
        LAW SWBDL4       /SPECIAL CODING ON RETURN FROM WRITE ONLY
        DAP SWBDV4

```

```

LAC I SWV4
LSM
DAC BDSTAT
LAC I BDSTAT
DAC FSTAT
ESM
LAW 1
DAC I BDSTAT
JMP SWORG

```

## /WRITE ONLY ENTRY

```

SWBDW,   LAW CS1-1-400
        ADD I SWV16
        DAP SWV4           /SETUP CS PTR TO CORE
        LAC SWV11         /GET FREE BD FIELD FOUND
        DAP SWBDV1        /SETUP PTR
        JMP SWBDL2

```

## /READ ONLY ENTRY

```

SWBDR,   LAW WHAT
        ADD I SWV7         /GET RS PTR
        DAP SWBDV2
        LAW I CS1-1-400
        ADD SWV4           /GET CORE PTR
        DAP I SWV7
        JMP SWBDL1

```

## /ERROR RETURN FROM FASTRAND SWAP

```

SWFERR,  LAW I STAT
        ADD RSTAT
        RCR 9S
        LAW I 3
        LSM
        JDA 14SOCT
        LAC (SWFERT)
        JDA 14STXT
        ESM

```

## /RETURN FROM FASTRAND SWAPPING (CHANNEL 16)

```

SWFAST,  LAC I (FASTAC)
        DAC 70
        LAC I (FASTPC)
        DAC 71
        LEM
        LSM
        LAC FSTAT
        DAC I RSTAT
        DZM BDSTAT
        ESM

```

```

SWBDV4,  JMP .           /SWITCH

```

```

SWBDL4,  DZM I RCORE      /WRITE ONLY, MARK CORE AS FREE
        LAW I STAT
        ADD RSTAT
        DAC I SWBDV1      /MARK WS AS CONTAINING GUY
        ADD (WHERE)
        DAP SWBDV5
        LAW I WHAT
        ADD SWBDV1
SWBDV5,  DAP .            /MARK GUY AS BEING ON FASTRAND
SWBDL5,  JMP HANG1        /TELL SWAPPER IN ALL 3 CASES

SWFERT:  662226
        006451
        517756

```

/SUBROUTINES TO SAVE AND UNSAVE CORE 16 VARIABLES IF NECESSARY  
/PC IN IO

```

C16TUS,  DAP C16TSX
        LAW SWP"A"7777
        JMP C16TS1

C16TSV,  DAP C16TSX
        CLA
C16TS1,  DAP C16TS2
        RIL 2S
        SPI I
C16TSX,  JMP .
        LAW C16TEM
        LIO (160000
C16TS2,  OPR .            /SWP OR NOP
        DAC C16TSS
        DIO C16TSF
        LAW I 10
        DAC C16TSC
C16TSL,  LAC I C16TSF
        DAC I C16TSS
        IDX C16TSF
        IDX C16TSS
        ISP C16TSC
        JMP C16TSL
        JMP C16TSX

C16TSF,  0                /FETCHING PTR
C16TSS,  0                /STORING PTR
C16TSC,  0                /COUNTER

```

```

IOPWS1,  LAC (-20000)  /CLEAR "IOP WANTS" BIT
          LSM
          AND I RSTAT
          DAC I RSTAT
          ESM
          LAC RSTAT
          DAC ISTAT
          LAW I 1
          DAC I RCORE
          LAC RCORE
          DAC ICORE
          SAR 28
          IOR (100000)  /RENAME CORE TO 4
          DCH (ADD ,+1)
          RNM
          LAW I 7777
          AND ICORE      /RETURN TO IOP WITH REALCORE IN AC
          EEM
          JMP I IOPWGO    /GO TO CORE 17

CEXECTT,  DAP CEXECX
          LAW TTP"TLAC
          IOR EXECTT
          SAL 28
          DAP CEXEC1
          ADD (3)
          DAP CEXEC2
          LAW 101
CEXEC1,   DAC .
CEXEC2,   DZM .
          LAT
          AND (77)
          DAC EXECTT
          SAL 28
          ADD (TTP)
          DAP CEXEC3
          ADD (3)
          DAP CEXEC4
          LAW 105
CEXEC3,   DAC .
          LAW STAT 0
CEXEC4,   DAC .
CEXECX,   JMP .

```

LDIA,	0	
LDWC,	0	
LDCL,	0	
LDSTAT,	0	
BDSTAT,	0	
FSTAT,	0	
SWWQ,	0	
SWBQ,	0	
SWT1,	0	
SWT2,	0	
SWT3,	0	
RUNTM,	0	
SRUNTM,	0	
HOTFLG,	0	
SWCTR,	0	/PRESWAPPER COUNTS CLOCK TICKS HERE
SWAPUL,	1000	/LOWEST QUEUE PRIORITY SCHEME HAS EFFECT
SWAPLL,	20	/HIGHEST QUEUE PRIORITY SCHEME HAS EFFECT

## VARIABLES

## CON,CONSTANTS

FOO,	FLEXO FOO	PRINT /FOO/
------	-----------	-------------

7500/

DSPTB,

140000	ELGIOT
140000	DHANG
140000	TYI
140000	TYO
140000	TIS
140000	TOS
140000	GTY
140000	RTY

140000	TTCKS
140000	TTMODE
140000	RSMC
REPEAT 2,	140000 ELGIOT
140000	PSU
140000	DELAY
140000	SPP

REPEAT 10, 140000 ELGIOT

REPEAT 2,	140000 ELGIOT
140000	DWPP
140000	FFB
REPEAT 3,	140000 ELGIOT
140000	DPEEK

140000	ELGIOT	
140000	DCLR	/GRDR GET THE READER
140000	DRPA	/RPA READ PUNCHED TAPE ALPHABETIC
140000	DRLSRD	/RRDR RELEASE THE READER
140000	DGETPU	/GPUN GET PUNCH
140000	DPPA	/PPA PUNCH PUNCHED TAPE ALPHABETIC
140000	DRLSPU	/RPUN RELEASE PUNCH
140000	.RCK	

REPEAT 30, 140000 ELGIOT

DSPTB+100,

C16TB, REPEAT 100, 360000 10  
C16TB+100,

C16BKP, 360000 10  
C16BKK, 360000 10  
C16HH, 360000 10  
C16HLT, 360000 10  
C16SU, 360000 10  
C16PSU, 360000 10  
C16FIN, 360000 10  
C16FOU, 360000 10  
C16FSW, 360000 10

7714/ /CORE 15 ENTRIES

1SECJA, DCH 1SECA  
1SECJB, DCH 1SECB  
SORADR, DCH SORX  
1MIADR, DCH 1MIX  
1SSOCT, 0  
1SSOC1, 0  
1SSTXT, 0  
1SSTX1, 0  
DAT, 0  
TME, 0  
NTINT, 0  
PTRBRK, DCH PTRRTN  
TELINT, DCH PDP7X  
NETHND, 0

/ENTRY TO NET INTERRUPT HANDLER

7740/ /CORE 17 ROUTINES

DATADR, DCH DATX  
CONADR, DCH CONX  
IOPADR, DCH IOPX  
IOPWGO, JDA .  
XNUMRRO, JDA .

EXPUNGE TYIHNG, TYOHNG, GTYHNG, EOTHNG, RPAHNG, UNUSED, CORHNG, CLKHNG  
EXPUNGE SPPHNG, BITS

START HLT=JMP