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                              ;THIS SUB-PROGRAM ASSEMBLED WITH SYSTEM PARAMETER FILE - S.MAC(V414)
                                      XLIST
                                      LIST
                              ;THIS SUB-PROGRAM ASSEMBLED WITH CONFIGURATION DEPENDENT FEATURE SWITCHES - FT50SB.MAC(
                              V003)
                                      XLIST
                                      LIST
                              TITLE   CLOCK1 - CLOCK, CONTEXT SWITCHING, AND JOB STARTUP AND STOP ROUTINES - V412
                              SUBTTL  APRINT TH/TH/CHW  TS  20 MAY 69
                              XP VCLOCK1,412↑
                                              ; PUT VERSION NUMBER IN GLOB LISTING AND LOADER STORAGE MAP

                                      ENTRY CLOCK1    ;ALWAYS LOAD CLOCK1 IF LIBRARY SEARCH
000000                        CLOCK1:

                              ;THIS SERVICE ROUTINE RUNS ON A HIGH PRIORITY CHANNEL
                              ;AND REQUESTS INTERRUPTS ON LOWER CLK CHANNEL
                              ;FOR SCHEDULING JOBS AND ERROR HANDLING THAT THE USER
                              ;IS NOT ENABLED TO HANDLE HIMSELF


                              EXTERNAL TIME,TIMEF,CLKFLG,REQCLK,APRCHL,APRPC,UPTIME
                              EXTERNAL JOBDAT,JOBTPC,JOBCNT,JOBAPR,APRERR,SCHEDF

                              EXTERNAL APRILM,COMMAN,CONMES,DEVCHK,DEVSRC,ERROR,INLMES
                              EXTERNAL RELEA9,CRSHWD,CRASHX

                              INTERNAL        FTTTYSER        ;THIS ROUTINE MAY BE ASSEMBLED TO WORK WITH  EITHER
                                                              ; THE OLD SCNSER OR THE NEW TTYSER.


                              INTERNAL FTCHECK,FTMONP

                              IFN FTCHECK+FTMONP,<
                              EXTERNAL DATA,APRCON,APRIN1,CLKS17,DAMESS,UUO0,CLOCK
                              INTERNAL UUO1
                              >
                              IFE FTCHECK+FTMONP,<
                                      INTERN CLOCK,DAMESS
                                      EXTERN CIPWTM
000000    000000    231000    APRCON: 231000          ;MONITOR ENABLED CPU FLAGS
000001    000000    000000    APRIN1: 0               ;USER ENABLED CPU FLAGS
000002    000000    000000    CLKS17: 0               ;PLACE TO SAVE AC17 ON CLOCK INTERRUPT
000003    266250    147132    DAMESS: ASCIZ /-JAN-/
000004    000000    000000
000005    004400    000000    CLOCK:  POINT 36,CIPWTM,35      ;BYTE POINTER TO CLOCK REQ QUEUE
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                                      INTERN APRINT

ØØØØØ6  254ØØØ  ØØØØ11' APRINT: JRST APRPAR             ;ALWAYS CHECK APR AND PI DEVICES
ØØØØØ7  254ØØØ  ØØØØØ7'          JRST .                 ;CHECK OTHER DEVICES

ØØØØ1Ø  7ØØ6ØØ  24ØØØØ  APRPCL: CONO PI,24ØØØØ          ;TURN OFF MEM PAR, ERR, AND
                                                        ; ENABLE FOR MEM PAR AND TRY AGAIN
                                                        ; (DO NOT TURN OFF POWR FAIL AS THAT PERMANENTLY
                                                        ; DISABLES POWR FAIL INTERRUPT)
ØØØØ11  7ØØ7ØØ  6ØØØØØ  APRPAR: CONSZ PI,6ØØØØØ         ;MEM PARITY ERROR OR POWER FAILURE?
ØØØØ12  2542ØØ  ØØØØ1Ø'          HALT APRPCL            ;YES, HALT MACHINE, CLEAR FLAGS AND TRY AGAIN
                                                        ; ON CONTINUE
ØØØØ13  7ØØ36Ø  ØØØØØØ'          CONSO APR,@APRCON      ;INTERRUPT FOR APR?
                                                        ; ALWAYS AT LEAST FOR CLOCK,ILM,NXM,PD OVF
                                                        ; RH MODIFIED EACH TIME USER RUNS IN CASE HE IS
                                                        ; ENABLED FOR PC CHANGE OR AR OVF
ØØØØ14  254ØØØ  ØØØØØ7'          JRST APRINT+1          ;NO,CHECK OTHER DEVICES ON THIS PI CHANNEL
ØØØØ15  332ØØØ  ØØØØØØ           SKIPE CRSHWD           ;IS LOC, 3Ø CLOBBERED?
ØØØØ16  254ØØØ  ØØØØØØ           JRST CRASHX            ;YES - GO SAVE AC'S & STATE OF ALL DEVS.
ØØØØ17  7ØØ34Ø  ØØ1ØØØ           CONSO APR,ØØ1ØØØ       ;YES, IS IT CLOCK?
ØØØØ2Ø  254ØØØ  ØØØØ37'          JRST APRER             ;NO, GO CHECK ERROR FLAGS
ØØØØ21  35ØØØØ  ØØØØØØ           AOS TIME               ;YES, INCREMENT TIME OF DAY
ØØØØ22  35ØØØØ  ØØØØØØ           AOS UPTIME             ;UPTIME IS LOADED AS ZERO,AND IS NEVER CLEARED
ØØØØ23  476ØØØ  ØØØØØØ           SETOM TIMEF            ;FLAG THAT APR CLOCK HAS TICKED
ØØØØ24  476ØØØ  ØØØØØØ           SETOM CLKFLG           ;SET FLAG FOR CLK FORCED INTERRUPT
ØØØØ25  7ØØ6ØØ  ØØØØØØ           CONO PI,REQCLK         ;REQUEST INTERRUPT ON CLK CHANNEL
ØØØØ26  7ØØ32Ø  ØØØØØ1'          CONSZ APR,@APRIN1      ;IS USER ENABLE FOR ANY FLAGS(INCLUDING CLOCK)
                                                        ; RH ALSO MODIFIED EACH TIME A USER RUNS
ØØØØ27  254ØØØ  ØØØØ32'          JRST APRER1            ;YES, GO PROCESS TRAP
ØØØØ3Ø  7ØØ2ØØ  ØØ1ØØØ           CONO APR,1ØØØ+APRCHN   ;NO, CLEAR ONLY THE CLOCK FLAG
ØØØØ31  25452Ø  ØØØØØØ           JEN @APRCHL            ;DISMISS INTERRUPT

                        ;HERE ON CLOCK FLAG AND IT OR SOME OTHER FLAG IS ON WHICH USERS WANTS

ØØØØ32  7ØØ2ØØ  ØØ1ØØØ  APRER1: ~~CONO APR,1ØØØ+APRCHN~~  ;NOW CLEAR CLOCK FLAG
ØØØØ33  25ØØ4Ø  ØØØØ31'          ~~FXCH TAC,APRCHL~~      ;SAVE TAC, GET PC
ØØØØ34  6Ø3Ø4Ø  Ø1ØØØØ           ~~TLNE TAC,USRMOD~~      ;IS PC FROM USER MODE?
ØØØØ35  254ØØØ  ØØØØ43'          ~~JRST APRER4~~          ;YES, GO TRAP TO HIM
ØØØØ36  254ØØØ  ØØØØ61'          ~~JRST APRER2~~          ;NO, GO CHECK IN CASE ALSO A SERIOUS ERROR
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                                ;OTHER APR INTERRUPTS BESIDES CLOCK

000037  250040  000033' APRER:  EXCH TAC,APRCHL         ;SAVE TAC, GET PC
000040  603040  010000          TLNE TAC,USRMOD         ;IS PC IN USER MODE?
000041  700360  000001'         CONSO APR,@APRIN1       ;YES, IS USER ENABLED FOR THIS ERROR
000042  254000  000061'         JRST APRER2             ;NO, PRINT ERROR MESSAGE AND STOP JOB
000043  250340  000000  APRER4: EXCH JDAT,JOBDAT        ;YES, SAVE JDAT, GET CURRENT JOB DATA AREA ADR,
000044  202047  000000          MOVEM TAC,JOBTPC(JDAT)  ;STORE PC IN JOB DATA AREA

000045  700247  000000          CONI APR,JOBCNI(JDAT)   ;STORE APR IN JOB DATA AREA
000046  513007  000000          HLLZS JOBENB(JDAT)      ;CLEAR SOFTWARE FLAGS SO THAT USER MUST DO
                                                        ; ANOTHER APRENB UUO IN ORDER TO ENABLE TRAPS
000047  402000  000001'         SETZM APRIN1            ;ALSO CLEAR USER APR CONSO FLAGS
000050  541040  231000          HRRI TAC,231000         ;AND SET MONITOR TO LOOK ONLY FOR
000051  542040  000000'         HRRM TAC,APRCON         ;PD OVF,ILM,NXM, AND CLOCK
000052  540047  000000          HRR TAC,JOBAPR(JDAT)  . ;GET USER LOC TO TRAP TO
000053  250340  000043'         EXCH JDAT,JOBDAT        ;RESTORE JDAT,JOBDAT
000054  700200  000440          CONO APR,440+APRCHN     ;DISABLE FOV, AROVF IN CASE ON
                                                        ;SO USER MUST REENABLE WITH SETAPR UUO

000055  621040  440000  APRER3: TLZ      TAC,440000     ;CLEAR FOV (PC CHANGE ON PDP-6) AND AR OVF FLAGS
                                                        ; SO INTERRUPT MAY BE DISMISSED
000056  250040  000037'         EXCH     TAC,APRCHL     ;RESTORE TAC & APRCHL
000057  700200  430110          CONO APR,430110+APRCHN  ;CLEAR ALL ERROR FLAGS WHICH CAN CAUSE INTERRUPTS
                                                  1000  ; EXCEPT CLOCK FLAG(ELSE LOSE TIME OF DAY)
000060  254520  000056'         JEN @APRCHL             ;DISMISS INTERRUPT
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ØØØØ61  7ØØ34Ø  23ØØØØ  APRER2: CONSO   APR,NXM!ILM!POV        ;DOES EXEC CARE?
ØØØØ62  254ØØØ  ØØØØ55'         JRST    APRER3                 ;NO. IGNORE EXEC OVERFLOW (MUST BE FOV OR AROVF b= clock)
ØØØØ63  2Ø2Ø4Ø  ØØØØØØ          MOVEM   TAC,APRPC              ;STORE ERROR PC FOR CLK CHANNEL
ØØØØ64  7ØØ24Ø  ØØØØØØ          CONI APR,APRERR                ;STORE ERROR FLAGS
                                                               ; (ALSO USED AS ERROR FLAG)
ØØØØ65  476ØØØ  ØØØØ24'         SETOM CLKFLG                   ;SET FLAG FOR CLK INTERRUPT
ØØØØ66  476ØØØ  ØØØØØØ          SETOM SCHEDF                   ;FLAG THAT RESCHEDULING IS NEEDED
                                                               ; (EVEN THOUGH PC MAY BE IN EXEC MODE)
ØØØØ67  7ØØ6ØØ  ØØØØ25'         CONO PI,REQCLK                 ;REQUEST INTERRUPT IN CLK CHANNEL
ØØØØ7Ø  7ØØ3ØØ  Ø2ØØØØ          CONSZ   APR,ILM                ;WAS ERROR ILLEGAL MEMORY(FROM USER)?
ØØØØ71  54ØØ4Ø  ØØØØØØ          HRRI    TAC,Ø                  ;YES,CLEAR RH OF PC,SO A SECOND ILM INTERRUPT
                                                               ; WILL NOT OCCUR IF THIS IS A WILD PC(AND A PDP-1Ø)
                        IFN FTHALT,<
                                CONSZ   PI,ØØ34ØØ              ;ARE ANY PI'S IN PROGRESS OF LOWER PRIORITY THAN APR?
                                                               ; (PDP-1Ø BITS ONLY)
                                HALT .+1                       ;YES, HALT SO CONTINUE WILL TRY TO RECOVER
                        >
ØØØØ72  254ØØØ  ØØØØ55'         JRST    APRER3                 ;NO,MUST BE UUO LEVEL(OR USER MODE AND
                                                               ; MEMORY DROPPED OUT)
                        SUBTTL  CLOCK - LOW PRIORITY CLOCK SERVICE(CLK)

                        ;THIS ROUTINE RUNS ON THE LOWEST PRIORITY PI CHANNEL AND AT UUO LEVEL
                        ;TO CAUSE AN INTERRUPT ON CLK CHANNEL:
                        ;       SETOM CLKFLG    ;FLAG THAT INTERRUPT HAS BEEN REQUESTED
                        ;       CONO PI,CLKREQ  ;REQUEST PI INTERUPT ON LOWEST PI CHANNEL
                        ;THE FOLLOWING OTHER FLAGS MUST ALSO BE SET
                        ;APRERR-APR DETECTED ERROR IN CURRENT JOB
                        ;SCHEDF-RESCHEDULING MUST TAKE PLACE(EVEN THOUGH PC IN EXEC MODE)
                        ;TIMEF-APR CLOCK HAS TICKED ON HIGH PRIORITY CHANNEL
                        ;SEE APRSER AND RUNCSS TO SEE HOW THIS ROUTINE IS CALLED

                        ;CLK SERVICE PERFORMS THE FOLLOWING ON A REGULAR BASIS:
                        ;PROCESSES CLOCK QUEUE REQUESTS
                        ;CALLS CONSOLE MONITOR COMMAND DECODER
                        ;CALLS CORE SHUFFLER
                        ;THEN CALLS SCHEDULER
                        ;IF THE CURRENT JOB IS IN EXEC MODE THE ABOVE 4 TASKS ARE
                        ;DELAYED UNTIL THE CURRENT JOB ENTERS A STOPPABLE STATE: I.E., UNTIL

                        ;       1, JOB STARTS TO WAIT FOR A BUSY SHARABLE DEVICE
                        ;       2, JOB STARTS TO WAIT FOR IO TO COMPLETE
                        ;       3, CONTROL ABOUT TO RETURN TO USER MODE
                        ;THEN CLK SERVICE IS ENTERED AT THE UUO LEVEL

                000005  STOR=DAT
                000001  T=TAC
                000002  T1=TAC1
                000007  JA=JDAT

                        ;THE CLOCK REQUEST QUEUE PROVIDES THE REST OF THE MONITOR
                        ;WITH THE ABILITY TO BE TRAPPED TO AFTER A NUMBER OF CLOCK TICKS
                        ;HAVE OCCURRED

                        ;TO MAKE A REQUEST:
                        ;       CONO PI,PIOFF
                        ;       IDPB AC,CLOCK   ;STORE CLOCK REQUEST IN QUEUE
                        ;       CONO PI,PION    ;TURN PI BACK ON
                        ;C(AC)=XWD ADDRESS,NO, OF CLOCK TICKS+DATA*10000
                        ;WHERE DATA IS 6 BITS OF INFO NEEDED WHEN TIME RUNS OUT
                        ;CLK SERVICE WILL PUSHJ PDP,ADR
                        ;WHEN TIME RUNS OUT WITH DATA RIGHT JUSTIFIED IN AC TAC
                        ;ALL ACS ARE FREE TO USE WHEN CALL IS MADE

                        INTERNAL CLKINI
                        EXTERNAL CIPWTM1,PION,PIOFF

000073  201040  000005' CLKINI: MOVEI TAC,CIPWTM1       ;SETUP CLOCK QUEUE BYTE POINTER
000074  542040  000005'         HRRM TAC,CLOCK          ;LH NEVER CHANGES(36 BIT BYTE)
000075  263140  000000          POPJ PDP,

                                ;HERE AT UUO LEVEL WHEN JOB GOES INTO IO WAIT OR SHARABLE DEVICE WAIT
                                ;CALL:  PUSHJ PDP,WSCHED
                                ;       RETURN HERE WHEN RUNABLE AGAIN

                                INTERNAL WSCHED
                                EXTERNAL JOBD14,JOBDAC,USRPC,JOBD16,NULPDL

ØØØØ76  26214Ø  ØØØØØØ  WSCHED: POP PDP,USRPC           ;SAVE PC IN PROTECTED PART OF SYSTEM DATA
ØØØØ77  2Ø1747  ØØØØØØ          MOVEI AC3,JOBDAC(JDAT)  ;SAVE ACS Ø-16 IN DUMP ACS
ØØØ1ØØ  251747  ØØØØØØ          BLT AC3,JOBD16(JDAT)    ;IN CURRENT JOB DATA AREA
ØØØ1Ø1  2Ø114Ø  ØØØØØØ          MOVEI PDP,NULPDL        ;NULL JOB PD LIST
ØØØ1Ø2  50514Ø  ØØØØØØ          HRLI PDP,MJOBP1         ;USED TO CALL SCHEDULER AND COMMAND DECODER
                                                        ; OTHERWISE GET PD OUF

ØØØ1Ø3  254ØØØ  ØØØ135'         JRST RSCHED             ;GO RESCHEDULE


                                ;HERE AT UUO LEVEL WHEN CURRENT JOB RETURNS TO USER MODE
                                ;FROM A UUO CALL AND EITHER:
                                ;       1. CURRENT JOB TYPED CONTROL C WHILE IN EXEC MODE
                                ;       2. CLOCK FLAG WENT OFF WHILE CURRENT JOB WAS
                                ;               IN EXEC MODE

                                ;CALL:  PUSHJ PDP,USCHED        ;FROM UUOCON(UUO HANDLER RETURN TO USER)
                                ;       RETURN HERE WHEN RUNABLE

                                INTERNAL USCHED
                                EXTERNAL JOBDPG,JOBDPD,USRPC

ØØØ1Ø4  26214Ø  ØØØØ76' USCHED: POP PDP,USRPC           ;SAVE PC IN PROTECTED PART OF SYSTEM DATA
ØØØ1Ø5  2Ø2347  ØØØØØØ          MOVEM PROG,JOBDPG(PROG) ;SAVE PROG IN DUMP AC AREA
ØØØ1Ø6  2Ø2147  ØØØØØØ          MOVEM PDP,JOBDPD(PROG)  ;SAVE PDP
ØØØ1Ø7  254ØØØ  ØØØ135'         JRST RSCHED             ;GO RESCHEDULE
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CLOCK - LOW PRIORITY CLOCK SERVICE(CLK)

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                                ;HERE AT CLK INTERRUPT LEVEL

                                INTERNAL CLKINT
                                INTERNAL FTTIME
                                EXTERNAL CLKFLG,JOBD17,CLKCHL,SCHEDF,JOBADR,JOBD16,JOBDAC
                                EXTERNAL JOBD15,JOBPD1,MJOBP1,APRERR,NULDAT,NULPDL

000110  336000  000065' CLKINT: SKIPN CLKFLG                ;CLK INTERRUPT REQUEST?
000111  254000  000110'         JRST CLKINT                         ;NO, CHECK OTHER DEVICES
000112  202740  000002'         MOVEM 17,CLKS17             ;SAVE AC 17
000113  200740  000000          MOVE 17,CLKCHL              ;IS CURRENT JOB IN USER MODE?
000114  607740  010000          TLNN 17,USRMOD
000115  332000  000066'         SKIPE SCHEDF                ;NO, IS THIS A FORSCED RESCHEDULING INTERRUPT?
000116  254000  000121'         JRST SAVPC                  ;YES, IT IS OK TO RESCHEDULE NOW
000117  200740  000002'         MOVE 17,CLKS17              ;NO, LEAVE TIMEF SET AND DISMISS INT.
000120  254520  000113'         JEN @CLKCHL

000121  202740  000104' SAVPC:  MOVEM 17,USRPC              ;SAVE PC IN PROTECTED PART OF SYSTEM DATA

                                                            ; STORAGE FOR CURRENT JOB
000122  336740  000053' CLKERR: SKIPN 17,JOBDAT             ;CURRENT JOB DATA AREA, IS THERE ONE?
000123  201740  000000          MOVEI 17,NULDAT             ;NO, MUST BE NULL JOB OR CORE 0
                                                            ; RUNS AT UUO LEVEL,REQUESTS CLK INT. TO STOP
000124  202717  000100'         MOVEM 16,JOBD16(17)         ;SAVE AC 16 IN DUMP AC PART OF JOB DATA AREA
000125  201717  000077'         MOVEI 16,JOBDAC(17)         ;SOURCE=0,DESTINATION=DUMP AC 0
000126  251717  000000          BLT 16,JOBD15(17)           ;SAVE ACS 0-15 JUST BELOW AC 16
000127  200040  000002'         MOVE TAC,CLKS17             ;NOW SAVE 17 IN JOB DATA AREA
000130  202057  000000          MOVEM TAC,JOBD17(17)        ;ALONG WITH OTHER ACS
000131  201140  007101'         MOVEI PDP,NULPDL            ;SET UP PUSH DOWN LIST IN NULL JOB DATA
                                                            ; AREA IN LOWER CORE
000132  505140  000172'         HRLI PDP,MJOBP1             ;-LENGTH+1(LEAVE ROOM FOR UUO PC)
000133  332040  000064'         SKIPE TAC,APRERR            ;IT THIS AN ERROR INTERRUPT?
000134  260140  000000          PUSHJ PDP,APRILM            ;YES, GO PROCESS ERROR,APRILM WILL CLEAR APRERR
                                                            ; FLAG IMMEDIATELY
```

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                          EXTERNAL COMCNT,NXTJOB,HNGTIM,POTLST,LSTWRD
                          EXTERNAL TIMEF,APRERR,CLKFLG,SCHEOF,JOB,PMONTB

ØØØ135  336Ø3Ø  ØØØØ23'   RSCHED: SKIPN TIMEF      ;HAS CLOCK GONE OFF SINCE LAST CALL?
ØØØ136  254ØØØ  ØØØ211'           JRST CIP6        ;NO, JUST RESCHEDULE

                          ;TIME ACCOUNTING

                          EXTERNAL TIME,MIDNIT,THSDAT,MONTAB

                          IFN FTTIME,<
                                  EXTERNAL RTIME,TTIME,JOB
ØØØ137  3362ØØ  ØØØØØØ            SKIPN   ITEM,JOB         ;WAS LAST JOB NULL JOB?
ØØØ14Ø  336ØØØ  ØØØØØØ            SKIPN   POTLST           ;YES-WAS IT A LOST TICK?
ØØØ141  254ØØØ  ØØØ144'           JRST    INCTIM           ;NO-PROCEED NORMALLY
ØØØ142  35ØØØØ  ØØØØØØ            AOS     LSTWRD           ;YES-INCREMENT LOST TIME COUNT
ØØØ143  4Ø2ØØØ  ØØØ14Ø'           SETZM   POTLST           ;AND CLEAR LOST TICK INDICATION
ØØØ144  35ØØØ4  ØØØØØØ    INCTIM: AOS RTIME(ITEM)          ;INCR, CURRENT JOB INCREMENTAL RUN TIME
ØØØ145  35ØØØ4  ØØØØØØ            AOS TTIME(ITEM)          ;INCR, CURRENT JOB TOTAL RUN TIME
                          >
                          IFN FTKCT,<
                                  EXTERN USRREL,JBTKCT
ØØØ146  135Ø4Ø  ØØØ565'           LDB TAC,[POINT 8,USRREL,25]      ;GET NO. OF 1K BLOCKS-1FOR CURRENT USER
ØØØ147  271Ø4Ø  ØØØØØ1            ADDI TAC,1                       ;MAKE IT NO. OF 1K BLOCKS
ØØØ15Ø  272Ø44  ØØØØØØ            ADDM TAC,JBTKCT(ITEM)            ;ADD IN ACCUMULATED CORE RUNNING TIME PRODUCT
                                                           ; (KILO-CORE TICKS)
                          IFN FT2REL,<
                                  EXTERN CHGHGH
ØØØ151  26Ø14Ø  ØØØØØØ            PUSHJ PDP,CHGHGH         ;CHARGE USER FOR HIGH SEGMENT IF HE HAS ONE
                          >
                          >
                          ;MIDNITE CHECK

ØØØ152  2ØØ1ØØ  ØØØØ21'           MOVE TAC1,TIME
ØØØ153  3151ØØ  ØØØØØØ            CAMGE TAC1,MIDNIT        ;GONE PAST MIDNITE?
ØØØ154  254ØØØ  ØØØ164'           JRST CIP2                ;NO
ØØØ155  4Ø3ØØØ  ØØØ152'   CIP3:   SETZB IOS,TIME           ;YES, RESET TIME OF DAY
ØØØ156  35ØØ4Ø  ØØØØØØ            AOS TAC,THSDAT           ;UPDATE DAY
ØØØ157  231Ø4Ø  ØØØØ37            IDIVI TAC,↑D31
ØØØ16Ø  235ØØØ  ØØØØ14            DIVI IOS,↑D12            ;NO,
ØØØ161  135Ø4Ø  ØØØØØØ            LDB TAC,PMONTB
ØØØ162  315Ø4Ø  ØØØØØ2            CAMGE TAC,TAC1           ;END OF MONTH?
ØØØ163  254ØØØ  ØØØ155'           JRST CIP3                ;YES.
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                                  ;PROCESS TIMING REQUESTS STORED IN QUEUE

  ØØØ164  55Ø24Ø  ØØØØØ5' CIP2:   HRRZ STOR,CLOCK          ;GET END OF LIST
  ØØØ165  3Ø624Ø  ØØØØ73' CIP4:   CAIN STOR,CIPWTM1        ;END YET?
  ØØØ166  254ØØØ  ØØØ2Ø5'         JRST CIP5                ;YES
  ØØØ167  37Ø1Ø5  ØØØØØØ          SOS TAC1, (STOR)         ;DECREMENT TIMING REQUEST
  ØØØ17Ø  6Ø21ØØ  ØØ7777          TRNE TAC1, 7777          ;TIME EXPIRED YET
  ØØØ171  36424Ø  ØØØ165'         SOJA STOR, CIP4          ;NO, CONTINUE SCAN
  ØØØ172  7ØØ6ØØ  ØØØØØØ          CONO PI, PIOFF           ;YES, MOVE LAST ITEM IN LIST TO THIS
  ØØØ173  2ØØØ6Ø  ØØØØØ5'         MOVE TAC, @CLOCK
  ØØØ174  37ØØØØ  ØØØØØ5'         SOS CLOCK
  ØØØ175  2Ø2Ø45  ØØØØØØ          MOVEM TAC, (STOR)
  ØØØ176  7ØØ6ØØ  ØØØØØØ          CONO PI,PION
  ØØØ177  135Ø4Ø  ØØØ566'         LDB TAC, [POINT 6, TAC1, 23]    ;GET 6 BIT DATA ITEM
  ØØØ2ØØ  2Ø7ØØØ  ØØØØØ2          MOVSS TAC1               ;SETUP DISPATCH ADDRESS
  ØØØ2Ø1  26114Ø  ØØØØØ5          PUSH PDP, STOR           ;SAVE ONLY VALUABLE AC
  ØØØ2Ø2  26Ø142  ØØØØØØ          PUSHJ PDP, (TAC1)        ;AND DISPATCH TO TIMING REQUEST ROUTINE
  ØØØ2Ø3  26214Ø  ØØØØØ5          POP PDP, STOR
  ØØØ2Ø4  36424Ø  ØØØ165'         SOJA STOR, CIP4          ;GO BACK FOR MORE REQUESTS


  ØØØ2Ø5  377ØØØ  ØØØØØØ  CIP5:   SOSG HNGTIM              ;DECREMENT HUNG IO DEVICE
  ØØØ2Ø6  26Ø14Ø  ØØØØØØ          PUSHJ PDP,DEVCHK         ;GO CHECK FOR HUNG IO DEVICES
  ØØØ2Ø7  332ØØØ  ØØØØØØ          SKIPE COMCNT             ;ANY COMMANDS TO PROCESS?
  ØØØ21Ø  26Ø14Ø  ØØØØØØ          PUSHJ PDP,COMMAND        ;YES, CALL COMMAND DECODER
  ØØØ211  26Ø14Ø  ØØØØØØ  CIP6:   PUSHJ PDP,NXTJOB         ;CALL SCHEDULER
  ØØØ212  4Ø2ØØØ  ØØØ11Ø'         SETZM CLKFLG             ;CLEAR CLK INTERRUPT FLAG
                                                           ; SET ON ALL FORCED CLK INTERRUPTS
  ØØØ213  4Ø2ØØØ  ØØØ135'         SETZM TIMEF              ;CLEAR TIMED (1 JIFFY) INTERRUPT FLAG,
  ØØØ214  4Ø2ØØØ  ØØØ115'         SETZM SCHEDF             ;CLEAR FORCED SCHEDULING FLAG
  ØØØ215  3162ØØ  ØØØ137'         CAMN ITEM,JOB            ;IS NEXT JOB SAME AS LAST ONE?
  ØØØ216  254ØØØ  ØØØ241'         JRST CIP8                ;YES, JUST RESTORE ACS AND DISMISS
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                                   ;DIFFERENT JOB, SAVE SOFTWARE STATE(HARDWARE ALREADY SAVED)

                                    EXTERNAL JOB,JOBDAT,JOBPRT,USRPRT,USRHCU,JOBJDA

ØØØ217  336340  ØØØ122'                 SKIPN JA,JOBDAT           ;NULL JOB OR CORE Ø ON OLD JOB?
ØØØ22Ø  254ØØØ  ØØØ23Ø'                 JRST CIP7                 ;YES, DO NO SAVE SOFTWARE STATE
ØØØ221  2Ø1Ø47  ØØØØØØ                  MOVEI T,JOBPRT(JA)        ;DEST,=FIRST LOC PROTECTED FROM USER
ØØØ222  5Ø5Ø4Ø  ØØØØØØ                  HRLI T,USRPRT             ;SOUR,=SYSTEM DATA STORAGE FOR CURRETN JOB
ØØØ223  3311ØØ  ØØØØØØ                  SKIPL T1,USRHCU           ;MOVE NO. OF OLD USER IO CHAN. IN USE
ØØØ224  3Ø31ØØ  ØØØØ17                  CAILE T1,17               ;MUST BE 17 OR LESS(IO MIGHT
                                                                  ; CLOBBER IF ADDRESS CHECKING MISSES)
ØØØ225  2Ø11ØØ  ØØØØØØ                  MOVEI T1,Ø                ;MOVE ONLY CHN Ø IF NEG, OR GR 17
                                                                  ; SAVGET SETS LH NEGATIVE DURING IO AS A FLAG
                                                                  ; SINCE IT DOES IO INTO AND OUT OF
                                                                  ; CHANNEL LOCATIONS (JOBJDA+1..,JOBJDA+17).
ØØØ226  27Ø34Ø  ØØØØØ2                  ADD JA,T1                 ;RFLOCATE TO USER AREA
ØØØ227  251Ø47  ØØØØØØ                  BLT T,JOBJDA(JA)          ;MOVE TO USER JOB DATA AREA
                                                                  ; STOP WITH USER CHANNEL Ø-1+C(USRHCU)
```

```
                                ;RESTORE SOFTWARE STATE OF NEW JOB,THEN HARDWARE STATE

                                INTERNAL NULJOB,NULADR
                                EXTERNAL JOB,JBTDAT,JOBDAT,USRPRT,JOBPRT
                                EXTERNAL JOBHCU,USRJDA,JOBENB,APRCHN,APRNUL,NULDAT,NULERR

000230                          NULJOB:                         ;TRANSFER HERE FROM SYSINI WITH ITEM=0
000230  202200  000215' CIP7:   MOVEM ITEM,JOB                  ;STORE NEW CURRENT JOB NUMBER
000231  260140  000256' NULADR: PUSHJ PDP,SETRL1                ;GO SETUP HARDWARE AND SOFTWARE RELOCATION
                                                                ; INFORMATION FOR NEW CURRENT USER
000232  322200  000252'         JUMPE ITEM,NULJB                ;IS NEW JOB THE NULL JOB?

                                IFN FTHALT,<
                                        SKIPN JA                ;DOES JOB HAVE CORE ASSIGNED?
                                        HALT .                  ;NO -ELSE CLOBBER MONITOR
                                >
000233  201040  000222'         MOVEI T,USRPRT                  ;NO, DEST,=PROTECTED AREA IN MONITOR
000234  505047  000221'         HRLI T,JOBPRT(JA)               ;SOURCE=FIRST PROTECTED LOC, IN JB  DATA AREA
000235  331107  000000          SKIPL T1,JOBHCU(JA)             ;MOVE NO. OF USER IO CHAN, IN USE

000236  303100  000017          CAILE T1,17                     ;MUST BE 17 OR LESS(IO MIGHT CLOBBER
                                                                ; IF ADRRESS CHECKING MISSES
000237  201100  000000          MOVEI T1,0                      ;MOVEJUST CHAN 0 IF NEG, OR GREATER THAN 17
                                                                ; SAVEGET SETS NEG,DURING IO
000240  251042  000000          BLT T,USRJDA(T1)                ;AND MOVE INTO MONITOR

                                ;RESTORE HARDWARE STATE OF CURRENT JOB

000241  336344  000000  CIP8:   SKIPN JA,JBTDAT(ITEM)           ;JOB DATA AREA(IS THERE ONE?)
000242  201340  000123'         MOVEI JA,NULDAT                 ;NO, MUST BE NULL JOB
000243  205747  000125'         MOVSI 17,JOBDAC(JA)             ;RESTORE DUMP ACS
000244  251740  000017          BLT 17,17
000245  332000  000133'         SKIPE APRERR                    ;DID AN ERROR OCCUR WHILE CLKPI IN PROGRESS
                                                                ; (ON CLK PI OR HIGHER)
000246  254000  000122'         JRST CLKERR                     ;YES, GO PROCESS ERROR
000247  336000  000230'         SKIPN JOB                       ;IS THIS JOB THE NULL JOB?
000250  336000  000000          SKIPN NULERR                    ;YES, HAS AN ERROR OCCURRED WHILE NULL JOB
                                                                ; WAS RUNNING? IF YES, RESTORE ACS
                                                                ; ILL UUO LOSED ACS
000251  254520  000121'         JEN @USRPC                      ;DISMISS CHANNEL(IF INTERRUPT IN PROGRESS)

                                ;THE NULL JOB
                                ;RUNS IN USER MODE WITH PC=1 AND COUNTS IN AC 0

                                EXTERNAL APRNUL,TIME,THSDAT,MIDNIT,NULERR

000252                          NULJB:
                                IFN FTCHECK,<EXTERNAL MONPTR,MONSUM,CHECK
                                        MOVE TAC,MONPTR
                                        PUSHJ PDP,CHECK
                                        CAME TAC1,MONSUM
                                        HALT .+1
                                >
000252  403000  000250'         SETZB 0,NULERR  ;CLEAR AC 0 USED FOR USUAL MONITORING
```

```
                                                        ; CLEAR FLAG SAYING ERROR IN NULL JOB
                                                        ; OF NULL TIME INTERVAL
                                                        ; LOC JOBDAT (LOCATION OF NULL JOB DATA AREA) TO Ø
                                                        ; AS A FLAG (ONLY DUMP ACS USED IN NULL JOB DATA AREA)

                                                        ; IF ANY ERRORS (APRERR NON-ZERO) OCCURRED
                                                        ; WHILE CLK IN PROGRESS
                                                        ; CATCH THEM NEXT CLK INTERRUPT
ØØØ253  2ØØØ4Ø  ØØØ567'         MOVE 1,[AOJA Ø,1]       ;INSTR, TO AC1
ØØØ254  25444Ø  ØØØØØ1          JRST 11,1               ;DISMISS IF INTERUPT IN PROGRESS
```

```
                              ;ROUTINE TO SET HARDWARE AND SOFTWARE RELOCATION INFORMATION FOR CURRENT USER
                              ;CALLED FROM:
                              ;       CLOCK ROUTINE WHEN NEW USER IS DIRRERENT FROM OLD USER
                              ;       CORE ROUTINE WHEN CORE REASSIGNED FOR CURRENT USER
                              ;       CORE UUO
                              ;       REMAP UUO
                              ;       CALL RESET UUO
                              ;       CALL SETUWP UUO

                              ;CALL:  STORE RELOCATION AND PROTECTION FOR LOW SEG IN JOBADR(JOB NUMBER)
                              ;       STORE LENGTH-1 AND ABS ORIGIN FOR HIGH SEG IN JBTADR(HIGH SEG NO)
                              ;       (MOVE ITEM,JOB NUMBER - IF CALLING SETRL1)
                              ;       PUSHJ PDP,SETREL OR SETRL1
                              ;       ALWAYS RETURN, C(ITEM)=JOB NUMBER, C(PROG)=XWD PROT,RELOC, FOR LOW SEG

                                      INTERN SETREL
                                      EXTERN JOB,JBTADR,JOBADR,USRREL,JBTDAT,JOBDAT,JOBREL,KT1ØA

ØØØ255  2ØØ2ØØ  ØØØ247' SETREL: MOVE ITEM,JOB               ;CURRENT JOB NUMBER

ØØØ256  2ØØ344  ØØØØØØ  SETRL1: MOVE PROG,JBTADR(ITEM)      ;XWD PROTECTION,RELOCATION FOR LOW SEG
ØØØ257  2Ø234Ø  ØØØØØØ          MOVEM PROG,JOBADR           ;SAVE TO MAKE UUO HANDLER FASTER
ØØØ26Ø  55634Ø  ØØØØØØ          HLRZM PROG,USRREL           ;SAVE PROTECTION FOR ADDRESS CHECKING
                                                            ; (HIGHEST LEGAL REL ADDRES FOR CURRENT USER IN LOW SEG
                        )
                        IFN JDAT-PROG,<
                                MOVE JA,JBTDAT(ITEM)        ;LOC OF JOB DATA AREA
                                MOVEM JA,JOBDAT             ;SAVE IT TOO FOR UUO HANDLER
                        >
ØØØ261  32234Ø  ØØØ265'         JUMPE PROG,SETHRD           ;IF Ø (NULL JOB OR JOB DOING CORE Ø OR KJOB)
                                                            ; DO NOT STORE IN JOB DATA AREA (SINCE IT WILL BE
                                                            ; IN EXEC LOWER CORE.  ALSO DO NOT STORE
                                                            ; IN LOC 33, SO CAN SEE LAST REAL USER TO RUN
ØØØ262  556347  ØØØØØØ          HLRZM PROG,JOBREL(JA)       ;SET PROTECTION IN USER JOB DATA AREA
                                                            ; FOR HIM TO LOOK AT
                        IFN FT2REL,<
                                EXTERN SETHGH
ØØØ263  26Ø14Ø  ØØØØØØ          PUSHJ PDP,SETHGH            ;SET UP FOR HIGH SEG, IF USER HAS ONE
                                                            ; PROG SETUP FOR DATAO
                        >
                        IFE FT2REL,<
                                TLZ PROG,1777               ;CLEAR OUT PROTECTION FOR HIGH SEG
                                                            ; JUST IN CASE THIS IS A 2 REG. MACHINE(FVEN THOGH
                                                            ; SOFTWARE CANNOT HANDLE 2 SEGS)
                        >
ØØØ264  2Ø234Ø  ØØØØØØ          MOVEM PROG,KT1ØA            ;STORE IN LOWER CORE SO IT CAN BE FOUND OUT
                                                            ; USING SWITCHES WHAT IS IN SECOND REGISTER
                                                            ; OPTION DOES NOT COME WITH PANEL LIGHTS
                                                            ; SO NOT STORE Ø FOR NULL JOB SO CAN SEE
                                                            ; LAST JOB TO RUN IN LOC 33
```

```
ØØØ265  7ØØ14Ø  ØØØØØ7  SETHRD: DATAO APR,PROG          ;SET APR HARDWARE FOR RELOCATION AND PROTECTION
                                                        ; FOR LOW(AND HIGH SEGS)
ØØØ266  33634Ø  ØØØ257'         SKIPN PROG,JOBADR       ;RESTORE PROG TO XWD PROT,RELOC FOR JUST LOW SEG
                                                        ; (IS THERE ONE)?
ØØØ267  63404Ø  ØØØØØ1          TDZA TAC,TAC            ;NO, MUST BE NULL JOB OR COREØ OR KJOB
                                                        ; SET FOR NO SPECIAL INTERRUPTS TO USER
ØØØ27Ø  2ØØØ47  ØØØØ46'         MOVE TAC,JOBENB(JA)     ;USER APR CONSO FLAGS (THE ONES HE WANTS TO HANDLE
                                                        ; FALL INTO SETAPR ROUTINE


                        ;ROUTINE TO ENABLE/DISABLE APR FOR TRAPPING TO USER AND EXEC
                        ;CALL:  MOVEI TAC, APR CONSO FLAGS FOR USER TRAPPING
                        ;       PUSHJ POP,SETAPR
                        ;       RETURN WITH APR RESET AND INTERRUPT LOCATION CONSO'S SET

                                INTERN SETAPR
                                EXTERN APRFOV

ØØØ271  4Ø5Ø4Ø  231Ø1Ø  SETAPR: ANDI TAC,231Ø1Ø+APRFOV          ;MASK OUT ALL BUT PD OVF, ILL MEM, NXM,
                                                        ; CLOCK, FOV(ONLY PDP-1Ø), AND AROVF CONSO FLAGS
                                                        ; FOV=PC CHANGE ON PDP-6 WHICH IS NEVER ALLOWED
                                                        ; UNDER TIME SHARING BECAUSE IT TRAPS MONITOR TOO
ØØØ272  5Ø7ØØØ  ØØØØØ1          HRLS TAC                ;PRESERVE USER BITS IN LH
ØØØ273  66Ø04Ø  231ØØØ          TRO TAC,231ØØØ          ;MAKE SURE MONITOR ALWAYS LOOKING FOR
                                                        ; PD OVF, ILM, NXM, CLOCK FLAGS
ØØØ274  2ØØ1ØØ  ØØØØØ1          MOVE TAC1,TAC           ;DUPLICATE BITS IN TAC1 FOR CONO TO APR,
ØØØ275  4311ØØ  ØØØ11Ø          XORI TAC1,11Ø           ;COMPLEMENT FOV(PDP-1Ø ONLY) AND AROV FLAGS
ØØØ276  2711ØØ  ØØØ33Ø          ADDI TAC1, 33Ø          ;SET DISABLE OR ENABLE FOR EACH
ØØØ277  4Ø51ØØ  ØØØ66Ø          ANDI TAC1,66Ø           ;MASK OUT ALL BUT DISABLE/ENABLE
                                                        ; BITS FOR FOV(PDP-1Ø ONLY) AND AROVF
ØØØ3ØØ  7ØØ6ØØ  ØØØ172'         CONO PI,PIOFF           ;DISABLE PI'S SO NO INTS. MAY OCCUR WHILE
                                                        ;CHANGING HARDWARE & SOFTWARE STATE FOR
                                                        ;APR TRAPPING
ØØØ3Ø1  54604Ø  ØØØØØ1'         HLRM TAC,APRIN1         ;STORE USER BITS
ØØØ3Ø2  54204Ø  ØØØØØØ'         HRRM TAC,APRCON         ;STORE EXEC BITS
ØØØ3Ø3  7ØØ2Ø2  ØØØØØØ          CONO APR,APRCHN(TAC1)   ;ENABLE OR DISABLE APR FOR
                                                        ; FOV(PDP-1Ø ONLY) AND AR OVF SEPARATELY
ØØØ3Ø4  7ØØ6ØØ  ØØØ176'         CONO PI,PION            ;ENABLE PI'S AGAIN
ØØØ3Ø5  26314Ø  ØØØØØØ          POPJ PDP,
                                SUBTTL  RUNCSS - RUN CONTROL(STARTING AND STOPPING OF JOBS)

                                ;RUN CONTROL IS A COLLECTION OF ROUTINES WHICH
                                ;SET AND CLEAR BITS IN THE JOB STATUS WORDS OF
                                ;ALL JOBS SO THAT THE SCHEDULER WILL START AND STOP
                                ;THEM ACCORDINGLY

                                ;COMMON ERROR STOPPING ROUTINES
                                ;CALLED AT ANY LEVEL(UUO,CLK, OR INTERRUPT)
                                ;CALL:  MOVE ITEM,JOB CAUSING ERROR OR BEING STOPPED
                                ;       MOVE DEVDAT,ADRRESS OF THAT JOB TTY DEVICE DATA BLOCK
                                ;       MOVE DAT,BYTE POINTER TO LAST CHAR. ALREADY MOVED
                                ;                       ;TO TTY OUTPUT BUFFER
                                ;       PUSHJ PDP,KSTOP,PHOLD,HOLD,OR ESTOP
                                ;       NEVER RETURN IF CALLED AT UUO LEVEL

                                ;ROUTINE TO STOP JOB AFTER KJOB COMMAND
                                ;CALLED AT UUO LEVEL IF JOB HAD CORE,CLK LEVEL IF NOT


                                INTERNAL KSTOP
                                EXTERNAL HIGHJB

000306  205040  140004  KSTOP:  MOVSI TAC,JNA+JLOG+JACCT         ;CLEAR JOB NUMBER ASSIGNED AND LOGGED IN BITS
000307  412044  000000          ANDCAM TAC,JBTSTS(ITEM)
                                IFN FTLOGIN,<
                                EXTERN PRJPRG

000310  402004  000000                  SETZM PRJPRG(ITEM)      ;CLEAR PROJECT-PROGRAMMER NUMBER WHEN JOB LOGS OUT
                                >
                                                        ; IF THIS IS THE LARGEST JOB IN USE,FIND NEXT
                                                        ; HIGHEST AND SET HIGHJB
000311  315200  000000                  CAMGE   ITEM,HIGHJB     ;IS THIS THE BIGGEST JOB NUMBER ASSIGNED?
000312  254000  000326'                 JRST    ESTOP           ;NO, LEAVE HOLE
000313  205100  040000                  MOVSI   TAC1,JNA        ;YES,JOB NUMBER ASSIGNED BIT
000314  550040  000004                  HRRZ    TAC,ITEM        ;SCAN DOWNWARD
000315  616101  000307'                 TDNN    TAC1,JBTSTS(TAC)        ;IS JNA BIT SET FOR THIS JOB?
000316  367040  000315'                 SOJG    TAC,.-1         ;NO,KEEP LOOKING.FINISHED(TRUE IF THIS THE ONLY JOB
000317  202040  000311'                 MOVEM   TAC,HIGHJB      ;YES,STORE NEW HIGHEST JOB NUMBER ASSIGNED
000320  254000  000326'                 JRST    ESTOP           ;GO SET ERROR BIT
```

```
                                ;ROUTINE TO STOP JOB, SET ERROR BIT AND PRINT MESSAGE
                                ;THEN ADD ↑C<CRLF><CRLF><PERIOD>
                                ;CALL:  MOVEI TAC,ADR, OF MESSAGE
                                ;       PUSHJ PDP,PHOLD

                                        INTERN PHOLD

000321  260140  000000  PHOLD:  PUSHJ PDP,CONMES        ;MOVE MESSAGE TO TTY OUTPUT BUFFER
                                                        ; FALL INTO HOLD
                                ;ROUTINE TO STOP JOB, SET ERROR BIT,
                                ;AND ADD "↑C<CRLF><CRLF><PERIOD>

                                INTERNAL HOLD,HOLD1
                                EXTERNAL TTYSTC

000322  260140  000000  HOLD:   PUSHJ PDP,INLMES
                                        ASCIZ /
000323  064253  641432  ↑C

000324  050321  227000  ./

000325  260140  000000  HOLD1:  PUSHJ PDP,TTYSTC        ;MAKE SURE TTY STAYS IN MONITOR MODE
                                                        ; AND START TTY TYPING OUT MESSAGE
                                                        ; FALL INTO ESTOP
```

```

                                   ;ROUTINE TO STOP USER AND FLAG AS ERROR STOP


                                   INTERNAL ESTOP,ESTOP1
                                   EXTERNAL JBTSTS,STUSER,STREQ,STAVAL
                                   EXTERNAL SCHEDF,JOB,CPOPJ

000326  322200  000000  ESTOP:   JUMPE ITEM,CPOPJ         ;IS THIS ERROR IN JOB 0?
000327  205040  100000           MOVSI TAC,JACCT          ;NO, CLEAR ACCOUNTING BIT(IN CASE LOGGING
000330  412044  000315'          ANDCAM TAC,JBTSTS(ITEM)  ;IN OR OUT) SO USER CAN USE CONTROL C
                                                          ; TO RECOVER
000331  205040  020000  ESTOP1:  MOVSI TAC,JERR           ;SET ERROR BIT IN JOB STATUS WORD
000332  436044  000330'          IORM TAC,JBTSTS(ITEM)    ;SO JOB CAN NOT CONTINUE(CONT COM.)
000333  312200  000000           CAME ITEM,STUSER         ;SYSTEM TAPE USER?
000334  254000  000341'          JRST STOP1               ;NO
000335  205040  637163           MOVSI TAC,637163         ;FIND SYS DDB
000336  260140  000000           PUSHJ PDP,DEVSRC         ;SYSTEM ERROR IF NOT FOUND
000337  265240  000000           JSP DAT,ERROR

000340  260140  000000           PUSHJ PDP,RELEA9         ;YES, RELEASE SYSTEM TAPE WITHOUT WAITING
```

```
                                 ;ROUTINE TO STOP ANY JOB FROM BEING SCHEDULED
                                 ;CALL:
                                 ;       MOVE ITEM, JOB NUMBER
                                 ;       PUSHJ PDP, STOP1
                                 ;       EXIT    ;RETURN HERE IMMEDIATELY, IF CALLED FROM HIGHER
                                 ;PRIORITY PI CHANNEL THAN CLK(LOWEST), OTHERWISE WHEN JOB IS RUNABLE
                                 ;CALLED FROM COMMAND DECODER WHEN <CONTROL>C TYPED IN BY USER
                                 ;OR ON ANY ERROR MESSAGE(SEE PREVIOUS PAGE)

                                 INTERNAL STOP1
                                 EXTERNAL JBTSTS,PJBSTS,REQTAB,JOB,STUSER,MAXQ,AVALTB

ØØØ341  2Ø5Ø4Ø  4ØØØØØ  STOP1:  MOVSI TAC, RUN
ØØØ342  7ØØ6ØØ  ØØØ3ØØ'         CONO PI, PIOFF          ;DONE AT INTERUPT LEVEL HIGHER THAN DT LEVEL
ØØØ343  3122ØØ  ØØØ333'         CAME ITEM,STUSER        ;IS THIS JOB CURRENTLY USING THE SYSTEM TAPE?
ØØØ344  616Ø44  ØØØ332'         TDNN TAC,JBTSTS(ITEM)   ;NO, IS RUN BIT OFF IN JOB STATUS WORD
ØØØ345  254ØØØ  ØØØ356'         JRST STOP1A             ;YES
ØØØ346  412Ø44  ØØØ344'         ANDCAM TAC,JBTSTS(ITEM) ;NO, SO CLEAR IT
ØØØ347  7ØØ6ØØ  ØØØ3Ø4'         CONO PI, PION
ØØØ35Ø  135Ø4Ø  ØØØØØØ          LDB TAC,PJBSTS          ;GET JOB WAIT QUEUE CODE(IF ANY)
ØØØ351  3Ø7Ø4Ø  ØØØØØØ          CAIG TAC,MAXQ           ;DOES STATE HAVE Q ?
ØØØ352  371ØØ1  ØØØØØØ          SOSL REQTAB(TAC)        ;YES. REDUCE IT.
ØØØ353  254ØØØ  ØØØ356'         JRST STOP1A             ;NO
ØØØ354  375ØØ1  ØØØØØØ          SOSGE AVALTB(TAC)       ;YES REDUCE  COUNT
ØØØ355  4Ø2ØØ1  ØØØ354'         SETZM AVALTB(TAC)       ;CLEAR AVAL FLAG IF NO ONE WAITING
ØØØ356  7ØØ6ØØ  ØØØ347' STOP1A: CONO PI, PION           ;MAKE SURE PI ON
ØØØ357  3122ØØ  ØØØ255'         CAME ITEM, JOB          ;NO, IS THIS JOB CURRENT USER

                        INTERNAL FTSWAP

                        IFE FTSWAP,<
                                POPJ PDP,               ;NO
                        >
                        IFN FTSWAP,<
ØØØ36Ø  254ØØØ  ØØØ442'         JRST REQUE              ;SET REQUE JOB FLAG
                        >

ØØØ361  331Ø44  ØØØ346'         SKIPL TAC,JBTSTS(ITEM)  ;RUN FLAG OFF?
ØØØ362  6Ø7Ø4Ø  Ø2ØØØØ          TLNN    TAC,JERR        ;YES, ERROR FLAG ON?
ØØØ363  254ØØØ  ØØØ533'         JRST    STOP2           ;NO
ØØØ364  476ØØØ  ØØØ214'         SETOM   SCHEDF          ;YES, FORCE RESCHEDULING EVEN IF JOB IN EXEC MODE
ØØØ365  254ØØØ  ØØØ533'         JRST STOP2              ;YES, MAKE CLK RESCHEDULE ANOTHER JOB
```

```
                            ;ROUTINE TO REQUE JOB WHICH HAS HAD A COMMAND TYPED
                            ;WHICH NEEDS CORE AND THE CORE IMAGE IS ON THE DISK,
                            ;OR IS IN CORE AND HAS ACTIVE DEVICES,
                            ;CALLED FROM COMMAND DECODER
                            ;CALL:   MOVE ITEM,JOB NO,
                            ;        PUSHJ PDP,DLYCOM

                            INTERNAL DLYCOM

000366  205040  200000      DLYCOM: MOVSI TAC,CMWB          ;SET COMMAND WAIT BIT
                            IFN FTSWAP,<
000367  250044  000361'             EXCH    TAC,JBTSTS(ITEM)
                            >
000370  436044  000367'             IORM TAC,JBTSTS(ITEM)   ;IN JOB STATUS WORD

                            INTERNAL FTSWAP
                            IFN FTSWAP,<
000371  607040  200000              TLNN    TAC,CMWB
000372  260140  000442'             PUSHJ   PDP,REQUE

                            >
000373  263140  000000                      POPJ PDP,

                            ;ROUTINE TO PUT JOB IN NO CORE QUEUE


                            INTERNAL FTSWAP
                            IFN FTSWAP,<INTERNAL NOCORQ
                                    EXTERNAL NULQ

000374  201040  000000      NOCORQ: MOVEI TAC,NULQ          ;NO JOB NO, OR NO CORE QUEUE
000375  137040  000350'             DPB TAC,PJBSTS
000376  254000  000442'             JRST REQUE
                            >
```

```
                                ;ROUTINE TO SETUP MONITOR JOB TO RUN LATER AT UUO LEVEL
                                ;CALLED BY COMMANDS WHICH MAY OR MAY NOT NEED TO
                                ;RUN MONITOR JOB DEPENDING ON WHETHER JOB HAS CORE(KJOB,IJOB)
                                ;TTY WILL REMAIN IN MONITOR MODE
                                ;JOB MUST HAVE CORE ASSIGNED
                                ;CALL:  MOVE ITEM, JOB NUMBER
                                ;       MOVEI TAC1,ADDR. OF MONITOR JOB TO BE RUN
                                ;       PUSHJ PDP,MONJOB
                                ;WHEN SCHEDULED TO RUN, MONITOR JOB MUST SET UP ITS OWN ACS

                                INTERNAL MONJOB

ØØØ377  26Ø14Ø  ØØØ423' MONJOB: PUSHJ PDP,MSTART          ;START WITH PC IN MONITOR
ØØØ4ØØ  254ØØØ  ØØØ427'         JRST SETRUN               ;SET TTY TO START JOB WHEN COMMAND RESPONSE
                                                          ; IS FINISHED AND KEEP TTY IN MONITOR MODE


                                ;ROUTINE TO SETUP ACS FOR MONITOR JOB STARTING AT UUO LEVEL
                                ;SETS UP ITEM, WITH JOB NO.; PROG WITH RELOCATION, AND PDP
                                ;WITH PUSH DOWN LIST ADR. IN JOB DATA AREA
                                ;USED BY KJOB,CORE Ø,SAVE,GET,RUN,R,REASSIGN AND FINISH COMMANDS
                                ;CALL:  MOVEI TAC1,MONITOR JOB STOP ADDRESS
                                ;       JSP TAC,MONSTR
                                ;       RETURN WITH ACS PDP,PROG,JDAT, AND ITEM SETUP

                                INTERNAL MONSTR
                                EXTERNAL JOB,JBTADR,MJOBPD,JOBPDL,TTYFNU,JBTDAT

ØØØ4Ø1  2ØØ2ØØ  ØØØ357' MONSTR: MOVE ITEM,JOB             ;CURRENT JOB NUMBER
ØØØ4Ø2  2ØØ344  ØØØ241'         MOVE JDAT,JBTDAT(ITEM)    ;ADR. OF JOB DATA AREA
                        IFN JDAT-PROG,<
                                MOVE PROG,JBTADR(ITEM)    ;JOB RELOCATION
                        >
ØØØ4Ø3  2Ø514Ø  ØØØØØØ          MOVSI PDP,MJOBPD          ;MINUS LENGTH OF SYSTEM PD LIST
ØØØ4Ø4  541147  ØØØØØØ          HRRI PDP,JOBPDL(JDAT)     ;FIRST LOC.-1 OF PD LIST
ØØØ4Ø5  26114Ø  ØØØØØ2          PUSH PDP,TAC1             ;SAVE STOP ADDRESS
ØØØ4Ø6  254ØØ1  ØØØØØØ          JRST (TAC)                ;RETURN AND DO MONITOR JOB
                                                          ; WITH TTY DDB,OUTPUT BYTE POINTER, AND JOB NO.
```

```
                             ;ROUTINE TO SET JOB STATE TO BE SCHEDULED TO RUN
                             ;WITH SPECIFIED STARTING ADDRESS INCLUDING PC FLAGS
                             ;CALLED ONLY WHEN JOB IN CORE AND AFTER JOB HAS BEEN
                             ;SAFELY STOPPED IN ONE OF 3 STATES:
                             ;1) PC IN USER MODE
                             ;2) JOB IN A WAIT FOR SHARABLE DEVICE, OR IO WAIT
                             ;3) JOB JUST ABOUT TO RETURN TO USER MODE FROM A UUO CALL
                             ;CALL:  MOVE TAC1,STARTING PC
                             ;       MOVE ITEM, JOB NUMBER
                             ;       MOVE JDAT,ADR, OF JOB DATA AREA WHICH MUST BE IN CORE
                             ;       PUSHJ PDP,USTART(PC TO USER MODE),MSTART(PC TO MONITOR MODE)
                             ;       RETURN HERE IMMEDIATELY

                             INTERNAL MSTART,USTART
                             EXTERNAL JOBPC,JOBDAC,JOBD17,TTYSET,JOBOPC,JOBPD1

000407  200047  000000   USTART: MOVE TAC,JOBPC(JDAT)     ;GET OLD PC
000410  603040  010000           TLNE TAC,USRMOD          ;IS IT IN USER MODE TOO?
000411  254000  000417'          JRST USTRT1              ;YES, DUMP ACS AND PC FLAGS ARE ALREADY HIS

000412  201047  000243'          MOVEI TAC,JOBDAC(JDAT)   ;NO, MOVE USERS(UUO) ACS TO DUMP ACS
000413  504040  000007           HRL TAC,JDAT             ;SOURCE=REL. 0,DEST.=JOBDAC IN JOB DATA AREA
000414  251047  000130'          BLT TAC,JOBD17(JDAT)     ;MOVE ALL ACS
000415  200047  000000           MOVE TAC,JOBPD1(JDAT)    ;UUO PC HAS LAST PC
000416  541041  777777           HRRI TAC,-1(TAC)         ;SUBTRACT 1 FROM RIGHT HALF AND
                                                          ; PRESERVE LH PC FLAGS.
                                                          ; (RH=0 ON HALT 0 OR FIRST START)
000417  202047  000000   USTRT1: MOVEM TAC,JOBOPC(JDAT)   ;STORE OLD PC FOR USER TO LOOK AT
000420  500100  000001           HLL TAC1,TAC             ;PRESERVE USER APR FLAGS
000421  661100  010000           TLO TAC1,USRMOD          ;MAKE SURE NEW PC IN USER MODE
000422  621100  000037           TLZ TAC1,37              ;MAKE SURE NO INDIRECT BITS OR INDEX FIELD

000423  202107  000407' MSTART: MOVEM TAC1,JOBPC(JDAT)    ;STORE NEW PC
000424  205040  020370           MOVSI TAC,JERR+WTMASK
000425  412044  000370'          ANDCAM TAC,JBTSTS(ITEM)  ;CLEAR ERROR AND WAIT STATUS BITS
000426  254000  000000           JRST TTYSET              ;SET TTY STATE TO INITIAL COND.
                                                          ; TTYUSR OR TTYURC SHOULD BE CALLED
                                                          ; TO INDICATE WHETHER TTY TO USER OR EXEC MODE
                                                          ; AND THAT JOB IS TO RUN(RUN BIT =1) WHEN
                                                          ; MONITOR COMMAND RESPONSE FINISHES.
                                                          ; SEE SETRUN BELOW
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                                ;ROUTINE TO SET JOB STATUS RUN BIT(RUN)
                                ;CALLED BY SCANNER SERVICE WHEN TTY MONITOR COMMAND
                                ;RESPONSE FINISHES.  THIS ACTION IS ENABLED BY CALLING
                                ;TTYUSR, OR TTYURC IN SCNSER
                                ;CALL:  MOVE ITEM,JOB NUMBER
                                ;       PUSHJ PDP,SETRUN

                                INTERNAL SETRUN
                                EXTERNAL JBTSTS,PJBSTS,REQTAB,AVALTB,RNQUNT
                                EXTERNAL MAXQ

000427  135040  000375' SETRUN: LDB TAC,PJBSTS          ;GET JOB STATUS WAIT QUEUE CODE
000430  303040  000351'         CAILE TAC,MAXQ          ;DOES JOB STATUS CODE HAVE A QUEUE?
000431  254000  000436'         JRST SETR1              ;NO
000432  353001  000352'         AOSLE REQTAB(TAC)       ;ADD TO REQUEST COUNT
000433  254000  000436'         JRST SETR1              ;OTHERS WAITING?
000434  357001  000355'         AOSG AVALTB(TAC)        ;MAKE AVAILABLE
000435  476001  000434'         SETOM AVALTB(TAC)       ;FLAG AS JUST AVAILABLE, BECAUSE
                                                        ; NO JOB WAS USING DEVICE, SCHEDULER
                                                        ; WILL SCAN THIS QUEUE
000436  205040  400000  SETR1:  MOVSI TAC,RUN           ;SET RUN BIT IN JOB STATUS WORD
000437  436044  000425'         IORM TAC,JBTSTS(ITEM)
000440  200040  000000  SETR2:  MOVE TAC,RNQUNT         ;SET QUANTUM TIME TO RUN QUEUE QUANTUM
000441  542044  000437'         HRRM TAC,JBTSTS(ITEM)   ;RUN QUEUE QUANTUM

                                INTERNAL FTSWAP
                                IFE FTSWAP,<
                                                JRST NULTST     ;GO SEE IF NULL JOB IS RUNNING
                                >
                                IFN FTSWAP,<
                                        INTERNAL REQUE
                                        EXTERNAL QJOB,JBTSTS

000442  205040  000002  REQUE:  MOVSI TAC,JRQ           ;MARK JOB TO BE REQUEUED WITH JRQ BIT
000443  616044  000441'         TDNN TAC,JBTSTS(ITEM)   ;INCREMENT COUNT ONLY ONCE FOR EACH JOB
                                AOS QJOB                ;INCREMENT COUNT OF NO. OF JOBS WAITING TO BE REQUEUED
000444  350000  000000
000445  436044  000443'         IORM TAC,JBTSTS(ITEM)   ;SET REQUE BIT FOR SCHEDULER
000446  263140  000000          POPJ PDP,

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                              ;ROUTINE TO PUT A JOB TO SLEEP AND WAKE UP AGAIN LATER
                              ;CALLED AFTER CLOCK QUEUE REQUEST PUT IN BY UUO ROUTINE

                              INTERNAL FTSLEEP

                              IFN FTSLEEP,<
                              INTERNAL SETSLP
                              EXTERNAL JBTSTS,SLPQ

ØØØ447  2Ø5Ø4Ø  ØØØ4ØØ        SETSLP: MOVSI TAC,CLKR          ;FLAG THAT A CLOCK REQUEST HAS BEEN PUT IN
ØØØ45Ø  436Ø44  ØØØ445'               IORM TAC,JBTSTS(ITEM)   ;SO ONLY ONE PER JOB
ØØØ451  2Ø164Ø  ØØØØØØ                MOVEI AC1,SLPQ          ;SLEEP STATE CODE
ØØØ452  254ØØØ  ØØØ511'               JRST SETSTT             ;SET STATUS AND RESCHEDULE

                              ;HERE AT CLOCK LEVEL WHEN CLOCK REQUEST TIMES OUT FOR SLEEP
                              ;JOB NO. IN AC TAC

                              INTERNAL WAKE

                              EXTERNAL PJBSTS,RNQ,SLPQ

ØØØ453  2Ø11ØØ  ØØØØØØ        WAKE:   MOVEI TAC1,RNQ          ;RUN QUEUE CODE
ØØØ454  2ØØ2ØØ  ØØØØØ1                MOVE ITEM,TAC           ;JOB NO.
ØØØ455  2Ø5Ø4Ø  ØØØ4ØØ                MOVSI TAC,CLKR          ;CLEAR CLOCK REQUEST BIT FOR THIS JOB
ØØØ456  412Ø44  ØØØ45Ø'               ANDCAM TAC,JBTSTS(ITEM) ;SO IT CAN PUT ANOTHER ONE IN
ØØØ457  135Ø4Ø  ØØØ427'               LDB TAC,PJBSTS          ;GET QUEUE CODE
ØØØ46Ø  3Ø2Ø4Ø  ØØØ451'               CAIE TAC,SLPQ           ;IS JOB STILL SLEEPING?
ØØØ461  26314Ø  ØØØØØØ                POPJ PDP,               ;NO, RETURN TO CLOCK ROUTINE
ØØØ462  1371ØØ  ØØØ457'               DPB TAC1,PJBSTS         ;YES, STORE RUN QUEUE CODE
                                                              ; (CONTROL C, START CAN GET JOB OUT OF SLEEP)
ØØØ463  254ØØØ  ØØØ44Ø'               JRST SETR2
                              >
```

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                                ;ROUTINE TO GET DATA CONTROL AND ANOTHER SHARABLE DEVICE
                                ;JOB NEVER GETS ONE DEVICE AND WAITS FOR SECOND, SINCE TYPING
                                ;CONTROL C WOULD NEVER FINISH WITH FIRST DEVICE
                                ;CALL   PUSHJ PDP,GETDCXX
                                ;       AOSE XXREQ      ;REQUEST COUNT FOR OTHER DEVICE
                                ;       RETURN WHEN BOTH AVAILABLE

                                INTERNAL GETDCDT,GETDCMT
                                EXTERNAL DCREQ,REQTAB,AVALTB,DCAVAL,CPOPJ1

000464                          GETDCDT:GETDCMT:
000464  256023  000000                  XCT @(PDP)              ;INCREASE SHARABLE DEVICE REQ. COUNT
000465  260140  000507' GETWT:          PUSHJ PDP,DVWAT1        ;NOT AVAIL., GO WAIT FOR IT
000466  356000  000000                  AOSN DCREQ              ;IS DATA CONTROL AVAILABLE?
000467  254000  000000                  JRST CPOPJ1             ;YES, RETURN BOTH AVAILABLE
000470  200663  000000                  MOVE AC1,@(PDP)         ;DATA CONTROL NOT AVAILABLE
000471  275640  000432'                 SUBI AC1,REQTAB
000472  371015  000471'                 SOSL REQTAB(AC1)        ;REDUCE REQ. COUNT FOR OTHER
                                                                ; SHARABLE DEVICE.
000473  476015  000435'                 SETOM AVALTB(AC1)       ;SET AVAILABLE IF OTHER JOBS WAITING
000474  255000  000466'                 JFCL DCREQ              ;ARGUMENT FOR DCWAIT
000475  260140  000504'                 PUSHJ PDP,DCWAIT        ;WAIT FOR DATA CONTROL FREE
000476  200663  000000                  MOVE AC1,@(PDP)         ;INCREMENT REQ. COUNT
000477  356020  000015                  AOSN @AC1               ;NOW IS SHARABLE DEVICE FREE?
000500  254000  000467'                 JRST CPOPJ1             ;YES
000501  371000  000474'                 SOSL DCREQ              ;NO, REDUCE DATA CONTROL REQUEST
000502  476000  000000                  SETOM DCAVAL            ;SET AVAIL., SOME OTHER JOB WAITING FOR IT
000503  254000  000465'                 JRST GETWT              ;TRY AGAIN
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                                ;ROUTINE TO WAIT FOR A SHARABLE DEVICE
                                ;CALLED AT UUO LEVEL ONLY BY DEVICE SERVICE ROUTINES
                                ;CALL:  AOSLE XXREQ              ;ADD 1 TO SHARABLE DEVICE REQUEST COUNT
                                ;                                ;IS DEVICE AVAILABLE?
                                ;       PUSHJ PDP,XXWAIT         ;NO, PUT JOB IN WAIT QUEUE
                                ;       RETURN WHEN DEVICE AVAILABLE

                                ;INITIALLY THE REQUEST COUNT IS -N, WHERE N IS THE
                                ;NUMBER OF JOBS WHICH CAN USE THE SHARABLE DEVICE AT THE SAME TIME
                                ;A REQUEST COUNT OF 0 MEANS THE MAXIMUM NO. OF JOBS ARE
                                ;USING THE DEVICE, A POSITIVE NUMBER IS THE
                                ;NUMBER OF JOBS WAITING IN THE SHARABLE DEVICE WAIT QUEUE

                                INTERNAL DVWAIT
                                INTERNAL MTWAIT,STWAIT,DTWAIT,DCWAIT,DAWAIT,MQWAIT,AUWAIT
                                EXTERNAL JOB,REQTAB

        000504                  MTWAIT:DTWAIT:DCWAIT:STWAIT:DAWAIT:MQWAIT:AUWAIT:

        000504  200643  000000  DVWAIT: MOVE AC1,(PDP)           ;GET ADR. OF CALLER
        000505  200655  777776          MOVE AC1,-2(AC1)         ;GET AOSLE XXREQ INSTRUCTION
        000506  254000  000510'         JRST .+2
        000507  200663  777777  DVWAT1: MOVE AC1,@-1(PDP)        ;GET ADR. OF CALLER OF THIS ROUTINE
        000510  275640  000472'         SUBI AC1,REQTAB          ;COMPUTE WAIT-STATE QUEUE CODE
        000511  200740  000401' SETSTT: MOVE AC3,JOB             ;CURRENT JOB NO.
        000512  137640  000514'         DPB AC1,PJBS1            ;STORE IN JOB STATUS WORD
        000513  254000  000076'         JRST WSCHED              ;GO SCHEDULE ANOTHER AND RETURN TO CALLER
                                                                 ; WHEN SHARABLE DEVICE BECOMES AVAILABLE
                                                                 ; SEE CLOCK AND CLKCSS

        000514  250517  000456' PJBS1:  POINT JWSIZ,JBTSTS(AC3),JWPOS   ;BYTE POINTER TO JOB STATUS
                                                                 ; WORD WAIT QUEUE CODE
                                ;ROUTINE TO SET JOB TO RUN AFTER IT HAS BEEN STOPPED
                                ;BECAUSE IT HAD TO WAIT FOR IO TO COMPLETE FOR SOME DEVICE
                                ;EACH SERVICE ROUTINE AT INTERRUPT LEVEL
                                ;CHECK EACH TIME IT FINISHED A TASK(BUFFERFUL)
                                ;TO SEE IF THE JOB USING THE DEVICE HAS
                                ;PREVIOUSLY CAUGHT UP WITH DEVICE AND HAS BEEN STOPPED
                                ;CALL:  MOVE DEVDAT,ADR. OF DEVICE DATA BLOCK
                                ;       MOVE IOS,DEVIOS(DEVDAT) ;GET DEVICE IO STATUS WORD FROM DDB
                                ;       TLZE IOS,IOW    ;IS JOB IN AN IO WAIT FOR THIS DEVICE?
                                ;       PUSHJ PDP,SETIOD        ;YES, GO FLAG JOB TO START UP AGAIN
                                ;       RETURN
                                ;SETS THE JOB QUEUE WAIT CODE TO WSQ IN JOB STATUS WORD,
                                ;THE SCHEDULER THEN SEES THAT THIS JOB HAS ITS
                                ;IO WAIT SATISFIED AND IS WAITING TO BE RUN AGAIN

                                INTERNAL SETIOD,STTIOD
                                EXTERNAL WSQ,WSAVAL,TSQ,TSAVAL,JOB,PJOBN

ØØØ515  25Ø5Ø1  ØØØ514' PJBS2:  POINT JWSIZ,JBTSTS(TAC),JWPOS   ;BYTE POINTER TO JOB STATUS
                                                        ; WORD QUEUE CODE

ØØØ516  2Ø11ØØ  ØØØØØØ  STTIOD: MOVEI TAC1,TSQ          ;SET TTY IO WAIT SATISFIED QUEUE CODE
ØØØ517  35ØØØØ  ØØØØØØ          AOS TSAVAL
ØØØ52Ø  254ØØØ  ØØØ523'         JRST SETID1
ØØØ521  2Ø11ØØ  ØØØØØØ  SETIOD: MOVEI TAC1,WSQ          ;REQUE TO WAIT SATISFIED Q
ØØØ522  35ØØØØ  ØØØØØØ          AOS WSAVAL              ;INCR. NO. OF JOBS WITH IO WAIT
                                                        ; SATISFIED, NON-ZERO WSAVAL WILL
                                                        ; CAUSE SCHED. TO SCAN FOR IO
                                                        ; SATISFIED JOB.
ØØØ523  135Ø4Ø  ØØØØØØ  SETID1: LDB TAC,PJOBN
ØØØ524  1371ØØ  ØØØ515'         DPB TAC1,PJBS2          ;IN JOB STATUS WORD

                                INTERNAL FTSWAP
                                IFN FTSWAP,<
                                        EXTERN QJOB,JBTSTS
ØØØ525  2Ø51ØØ  ØØØØØ2          MOVSI TAC1,JRQ          ;SET JOB TO BE REQUEUED AT NEXT CLOCK TICK
ØØØ526  6161Ø1  ØØØ515'         TDNN TAC1,JBTSTS(TAC)   ;IS REQUE BIT ALREADY ON?
ØØØ527  35ØØØØ  ØØØ444'         AOS QJOB                ;NO, INCREMENT COUNT ONCE FOR EACH JOB
ØØØ53Ø  4361Ø1  ØØØ526'         IORM TAC1,JBTSTS(TAC)   ;SET REQUEUEING BIT FOR SCHEDULER
                                >
ØØØ531  332ØØØ  ØØØ511' NULTST: SKIPE JOB               ;IS NULL JOB RUNNING?
ØØØ532  26314Ø  ØØØØØØ          POPJ PDP,               ;NO LET OTHER JOB RUN TILL SCHEDULER IS TRAPPPED TO
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                        ;ROUTINE TO CAUSE CLK ROUTINE TO RESCHEDULE
                        ;CALLED AT ANY LEVEL
                        ;CALL:  PUSHJ PDP,STOP2
                        ;       RETURN IMMEDIATELY EXCEPT IF AT UUO LEVEL
                        ;       IF AT UUO LEVEL, RETURN WHEN JOB IS RUNABLE AGAIN

                        INTERNAL STOP2
                        EXTERNAL PICLK,CLKFLG

000533  700600  000342' STOP2:  CONO PI,PIOFF   ;PREVENT CLOCK INTERRUPT DURING STOP2 CODE
000534  476000  000212'         SETOM CLKFLG    ;SET FLAG TO INDICATE CLK INTERRUPT
                                                ; EVEN THOUGH CLK INTERRUPT IS NOT A TIME INTERRUPT
000535  700600  000000          CONO PI,PICLK   ;TURN PI BACK ON AND REQUEST INTERRUPT TO
                                                ; CLK PI CHANNEL(LOWEST PRIORITY CHANNEL)
000536  263140  000000          POPJ PDP,       ;INTERRUPT IMMEDIATELY IF AT UUO LEVEL
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                             ;ROUTINE TO WAIT TILL DEVICE CATCHES UP WITH USER AND BECOMES INACTIVE
                             ,CALLING SEQUENCE
                             ,      PUSHJ PDP, WAIT1
                             ,      EXIT            ALWAYS RETURNS HERE

                             ,IF THE DEVICE IS INACTIVE (IOACT=Ø), RETURNS TO EXIT, OTHERWISE, SETS
                             ,IOW:=1 AND ENTERS WAIT UNLESS IOACT BECOMES ZERO BEFORE THE
                             ,JUMP IS MADE, IN WHICH CASE IT SETS IOW:=Ø AND RETURNS TO EXIT,
                             ,ON LEAVING THE WAIT STATE, RETURNS TO EXIT,
                             ,THIS ROUTINE PREVENTS THE STATE IOACT=Ø AND IOW=1 FROM OCCURING
                             ,CALLING SEQUENCE
                             ,      PUSHJ PDP, WSYNC
                             ,      EXIT                  ALWAYS RETURNS HERE
                             ,SETS IOW:=1 AND ENTERS WAIT ROUTINE. RETURNS TO EXIT WHEN IOACT=Ø,

                             INTERNAL WAIT1

ØØØ537  2ØØØØ6  ØØØØØ2  WAIT1:  MOVE IOS,DEVIOS(DEVDAT)
ØØØ54Ø  6Ø6ØØØ  Ø1ØØØØ          TRNN IOS, IOACT            ;IS DEVICE ACTIVE? (IOACT=1?)
ØØØ541  26314Ø  ØØØØØØ          POPJ PDP,                  ;RETURN
ØØØ542  26Ø14Ø  ØØØ544'         PUSHJ PDP,WSYNC            ;WAIT
ØØØ543  254ØØØ  ØØØ537'         JRST WAIT1
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                        ;WSYNC IS CALLED TO WAIT UNTIL SETIOD IS CALLED BY INTERRUPT SERVICE ROUTINE
                        ;IE  UNTIL CURRENT BUFFER ACTIVITY IS COMPLETED
                        ;CALLED ONLY FROM UUO LEVEL
                        ;CALL:  MOVE DEVDAT,ADR, OF DEVICE DATA BLOCK
                        ;       PUSHJ PDP,WSYNC
                        ;       RETURN IMMEDIATELY IF DEVICE IS INACTIVE
                        ;       RETURN WHEN DEVICE FINISHES NEXT BUFFER IF IT IS ACTIVE


                        INTERNAL WSYNC
                        EXTERNAL IOWQ,TIOWQ,PION,PIOFF

000544  205000  000001  WSYNC:  MOVSI IOS,IOW           ;SETUP DEVICE IO WAIT BIT
000545  201640  000000          MOVEI AC1,IOWQ          ;IO WAIT STATE CODE
000546  200746  000004          MOVE AC3,DEVMOD(DEVDAT) ;DEVICE CHARACTERISTICS
000547  603740  000010          TLNE AC3,DVTTY          ;IS THIS DEVICE A TTY?
000550  201640  000000          MOVEI AC1,TIOWQ         ;YES, SET TTY WAIT STATE CODE
000551  200740  000531'         MOVE AC3,JOB            ;CURRENT JOB NO.

000552  201700  010000          MOVEI AC2,IOACT         ;DEVICE ACTIVE BIT
000553  700600  000533'         CONO PI, PIOFF          ;TURN PI OFF
000554  616706  000002          TDNN AC2,DEVIOS(DEVDAT) ;IS THE DEVICE ACTIVE?
000555  254000  000562'         JRST WSYNC1             ;NO
000556  436006  000002          IORM IOS,DEVIOS(DEVDAT) ;YES, SET DEVICE IO-WAIT BIT
                                                        ; AND SETUP IOS FOR RETURN WHEN WAIT SATISFIED
000557  137640  000514'         DPB AC1,PJBS1           ;SET JOB WAIT STATE CODE
                                                        ; IN JOB STATUS WORD
000560  700600  000356'         CONO PI, PION           ;TURN PI ON
000561  260140  000076'         PUSHJ PDP,WSCHED        ;CALL SCHEDULER TO FIN ANOTHER JOB TO RUN
                                                        ; RETURN WHEN NEXT BUFFERFUL IS FINISHED
                                                        ; WITH ACS 0-14 OCTAL RESTORED
                                                        ; RETURN WHEN IO-WAIT FINISHED
000562  700600  000560' WSYNC1: CONO PI, PION
000563  413006  000002          ANDCAB IOS, DEVIOS(DEVDAT)       ;CLEAR DEVICE IO-WAIT BIT
000564  263140  000000          POPJ PDP,


000565                  CLKEND: END
000565  121000  000260'
000566  140600  000002
000567  344000  000001
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NO ERRORS DETECTED

PROGRAM BREAK IS 000570

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        SYMBOL TABLE

AC1               ØØØØ15  INT        AC2               ØØØØ16  INT        AC3               ØØØØ17  INT
APRCHL            ØØØØ6Ø' EXT        APRCHN            ØØØ3Ø3' EXT        APRCON            ØØØØØØ'
APRER             ØØØØ37'            APRER1            ØØØØ32'            APRER2            ØØØØ61'
APRER3            ØØØØ55'            APRER4            ØØØØ43'            APRERR            ØØØ245' EXT
APRFOV            ØØØØØØ  EXT        APRILM            ØØØ134' EXT        APRIN1            ØØØØØ1'
APRINT            ØØØØØ6' INT        APRNUL            ØØØØØØ  EXT        APRPAR            ØØØØ11'
APRPC             ØØØØ63' EXT        APRPCL            ØØØØ1Ø'            AUWAIT            ØØØ5Ø4' INT
AVALTB            ØØØ473' EXT        CHGHGH            ØØØ151' EXT        CIP2              ØØØ164'
CIP3              ØØØ155'            CIP4              ØØØ165'            CIP5              ØØØ2Ø5'
CIP6              ØØØ211'            CIP7              ØØØ23Ø'            CIP8              ØØØ241'
CIPWTM            ØØØ165' EXT        CLKCHL            ØØØ12Ø' EXT        CLKEND            ØØØ565'
CLKERR            ØØØ122'            CLKFLG            ØØØ534' EXT        CLKINI            ØØØØ73' INT
CLKINT            ØØØ11Ø' INT        CLKR              ØØØ4ØØ  INT        CLKS17            ØØØØØ2'
CLOCK             ØØØØØ5' INT        CLOCK1            ØØØØØØ' INT        CMWB              2ØØØØØ  INT
COMCNT            ØØØ2Ø7' EXT        COMMAN            ØØØ21Ø' EXT        CONMES            ØØØ321' EXT
CPOPJ             ØØØ326' EXT        CPOPJ1            ØØØ5ØØ' EXT        CRASHX            ØØØØ16' EXT
CRSHWD            ØØØØ15' EXT        DAMESS            ØØØØØ3' INT        DAT               ØØØØØ5  INT
DAWAIT            ØØØ5Ø4' INT        DCAVAL            ØØØ5Ø2' EXT        DCREQ             ØØØ5Ø1' EXT
DCWAIT            ØØØ5Ø4' INT        DEVCHK            ØØØ2Ø6' EXT        DEVDAT            ØØØØØ6  INT
DEVIOS            ØØØØØ2  INT        DEVMOD            ØØØØØ4  INT        DEVSRC            ØØØ336' EXT
DLYCOM            ØØØ366' INT        DTWAIT            ØØØ5Ø4' INT        DVTTY             ØØØØ1Ø  INT
DVWAIT            ØØØ5Ø4' INT        DVWAT1            ØØØ5Ø7'            ERROR             ØØØ337' EXT
ESTOP             ØØØ326' INT        ESTOP1            ØØØ331' INT        FT2REL    777777  777777
FTCCL     777777  777777             FTCHEC            ØØØØØØ  INT        FTDISK    777777  777777
FTHALT            ØØØØØØ             FTKCT     777777  777777             FTLOGI    777777  777777
FTMONP            ØØØØ7Ø  INT        FTRC1Ø    777777  777777             FTSLEE    777777  777777  INT
FTSWAP    777777  777777  INT        FTTIME    777777  777777  INT        FTTTYS    777777  777777  INT
GETDCD            ØØØ464' INT        GETDCM            ØØØ464' INT        GETWT             ØØØ465'
HIGHJB            ØØØ317' EXT        HNGTIM            ØØØ2Ø5' EXT        HOLD              ØØØ322' INT
HOLD1             ØØØ325' INT        ILM               Ø2ØØØØ             INCTIM            ØØØ144'
INLMES            ØØØ322' EXT        IOACT             Ø1ØØØØ  INT        IOS               ØØØØØØ  INT
IOW               ØØØØØ1  INT        IOWQ              ØØØ545' EXT        ITEM              ØØØØØ4  INT
JA                ØØØØ77             JACCT             1ØØØØØ  INT        JBTADR            ØØØ256' EXT
JBTDAT            ØØØ4Ø2' EXT        JBTKCT            ØØØ15Ø' EXT        JBTSTS            ØØØ532' EXT
JDAT              ØØØØ77  INT        JERR              Ø2ØØØØ  INT        JLOG              ØØØØØ4  INT
JNA               Ø4ØØØØ  INT        JOB               ØØØ551' EXT        JOBADR            ØØØ266' EXT
JOBAPR            ØØØØ52' EXT        JOBCNI            ØØØØ45' EXT        JOBD14            ØØØØ22  EXT
JOBD15            ØØØ126' EXT        JOBD16            ØØØ124' EXT        JOBD17            ØØØ414' EXT
JOBDAC            ØØØ412' EXT        JOBDAT            ØØØ217' EXT        JOBDPD            ØØØ136' EXT
JOBDPG            ØØØ125' EXT        JOBENB            ØØØ27Ø' EXT        JOBHCU            ØØØ235' EXT
JOBJDA            ØØØ227' EXT        JOBOPC            ØØØ417' EXT        JOBPC             ØØØ423' EXT
JOBPD1            ØØØ415' EXT        JOBPDL            ØØØ434' EXT        JOBPRT            ØØØ234' EXT
JOBREL            ØØØ262' EXT        JOBTPC            ØØØØ44' EXT        JRQ               ØØØØØ2  INT
JWPOS             ØØØØ16  INT        JWSIZ             ØØØØ35  INT        KSTOP             ØØØ376' INT
KT1ØA             ØØØ264' EXT        LSTWRD            ØØØ142' EXT        MAXQ              ØØØ43Ø' EXT
MIDNIT            ØØØ153' EXT        MJOBP1            ØØØ132' EXT        MJOBPD            ØØØ473' EXT
MONJOB            ØØØ377' INT        MONSTR            ØØØ4Ø1' INT        MONTAB            ØØØ2ØØ  EXT
MQWAIT            ØØØ5Ø4' INT        MSTART            ØØØ423' INT        MTWAIT            ØØØ5Ø4' INT
NOCORQ            ØØØ374' INT        NULADR            ØØØ231' INT        NULDAT            ØØØ242' EXT
NULERR            ØØØ252' EXT        NULJB             ØØØ252'            NULJOB            ØØØ232' INT
NULPDL            ØØØ131' EXT        NULC              ØØØ374' EXT        NULTST            ØØØ531'
NXM               Ø1ØØØØ             NXTJOB            ØØØ211' EXT        POP               ØØØ223  INT
PHOLD             ØØØ321' INT        PICLK             ØØØ535' EXT        PIOFF             ØØØ553' EXT
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PION            000562' EXT         PJBS1           000514'             PJBS2           000515'
PJBSTS          000462' EXT         PJOBN           000523' EXT         PMONTB          000161' EXT
POTLST          000143' EXT         POV             200000              PRJPRG          000310' EXT
PROG            000007  INT         QJOB            000527' EXT         RELEA9          000340' EXT
REQCLK          000067' EXT         REQTAB          000510' EXT         REQUE           000442' INT
RNQ             000453' EXT         RNQUNT          000440' EXT         RSCHED          000135'
RTIME           000144' EXT         RUN             400000  INT         SAVPC           000121'
SCHEDF          000364' EXT         SETAPR          000271' INT         SETHGH          000263' EXT
SETHRD          000265'             SETID1          000523'             SETIOD          000521' INT
SETR1           000436'             SETR2           000440'             SETREL          000255' INT
SETRL1          000256'             SETRUN          000427' INT         SETSLP          000447' INT
SETSTT          000511'             SLPQ            000460' EXT         STAVAL          000000  EXT
STOP1           000341' INT         STOP1A          000356'             STOP2           000533' INT
STOR            000005              STREQ           000000  EXT         STTIOD          000516' INT
STUSER          000343' EXT         STWAIT          000504' INT         T               000001
T1              000002              TAC             000001  INT         TAC1            000002  INT
THSDAT          000156' EXT         TIME            000155' EXT         TIMEF           000213' EXT
TIOWQ           000550' EXT         TSAVAL          000517' EXT         TSQ             000516' EXT
TTIME           000145' EXT         TTYFNU          000000  EXT         TTYSET          000426' EXT

TTYSTC          000325' EXT         UPTIME          000022' EXT         USCHED          000104' INT
USRHCU          000223' EXT         USRJDA          000240' EXT         USRMOD          010000  INT
USRPC           000251' EXT         USRPRT          000233' EXT         USRREL          000565' EXT
USTART          000407' INT         USTRT1          000417'             VCLOCK          000412  INT
WAIT1           000537' INT         WAKE            000453' INT         WSAVAL          000522' EXT
WSCHED          000076' INT         WSQ             000521' EXT         WSYNC           000544' INT
WSYNC1          000562'             WTMASK          000370  INT
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A           6#        6
AC1         6#        6       785       82Ø       821       822       824       827       828       852       853       855       856       858
          958       961       969
AC2         6#        6       963       965
AC3         6#      191       192       857       863       959       96Ø       962
AEFERR      6#        6
AL          6#        6
APR        62        69        76        79        84        93        98       1Ø6       111       114       117       123       455       49Ø
APRCHL     25        8Ø        85        91       11Ø       113
APRCHN     79        84       1Ø6       111       346       49Ø
APRCON     44#       62       1Ø3       489
APRER      7Ø        91#
APRER1     78        84#
APRER2     88        94       114#
APRER3    1Ø8#      115       131
APRER4     87        95#
APRERR     26       117       222       247       251       373
APRFOV    471       473
APRILM     28       248
APRIN1     45#       76        93       1Ø1       488
APRINT     5Ø        52#       66
APRNUL    346       385
APRPAR     52        59#
APRPC      25       116
APRPCL     55#       6Ø
ASSCON      6#        6
ASSPRG      6#        6
AUWAIT    848       851#
AVALTB    587       6ØØ       6Ø1       74Ø       748       749       813       824
B           6#        6
BUFPNT      6#        6
BUFWRD      6#        6
CHGHGH    277       278
CIP2      285       295#
CIP3      286#      292
CIP4      296#      3ØØ       311
CIP5      297       313#
CIP6      254       317#
CIP7      329       349#
CIP8      323       369#
CIPWTM     43        48       177       179       296
CLKCHL    221       227       232
CLKEND    981#
CLKERR    236#      375
CLKFLG     25        74       119       221       224       251       318       914       917
CLKINI    176       179#
CLKINT    219       224#      225
CLKR        6#        6       783       796
CLKS17     46#      226       231       242
CLOCK      42        48#      18Ø       295       3Ø2       3Ø3
CLOCK1     16        17#
CLSIN       6#        6
CLSOUT      6#        6
```

```
CMWB        6#      6      628     636
COMCNT    25Ø     315
COMMAN     28     316
CONMES     28     54Ø
CORCNT      6#      6
CPOPJ     563     565
CPOPJ1    813     819      829
CRASHX     29      68
CRSHWD     29      67
D           6#      6
DAMESS     42      47#
DAT         6#      6      157     575
DAWAIT    848     851#
DCAVAL    813     831
DCL         6#      6
DCLI        6#      6
DCLO        6#      6
DCLR        6#      6
DCREQ     813     818      825     83Ø
DCWAIT    826     848      851#
DDI         6#      6
DDO         6#      6

DEN         6#      6
DEVADR      6#      6
DEVBUF      6#      6
DEVCHK     28     314
DEVCHR      6#      6
DEVCTR      6#      6
DEVDAT      6#      6      939     959     965     967     977
DEVEXT      6#      6
DEVFIL      6#      6
DEVIAD      6#      6
DEVIOS      6#      6      939     965     967     977
DEVLOG      6#      6
DEVMOD      6#      6      959
DEVNAM      6#      6
DEVOAD      6#      6
DEVPPN      6#      6
DEVPTR      6#      6
DEVSER      6#      6
DEVSRC     28     574
DGF         6#      6
DHNG        6#      6
DIN         6#      6
DINI        6#      6
DLK         6#      6
DLYCOM    626     628#
DMT         6#      6
DNAERR      6#      6
DOU         6#      6
DR          6#      6
DRL         6#      6
DRN         6#      6
```

```
DSER          6#      6
DSI           6#      6
DSKRLB        6#      6
DS0           6#      6
DTWAIT      848     851#
DVAVAL        6#      6
DVCDR         6#      6
DVDIR         6#      6
DVDIRI        6#      6
DVDIS         6#      6
DVDSK         6#      6
DVDTA         6#      6
DVIN          6#      6
DVLNG         6#      6
DVLPT         6#      6
DVMTA         6#      6
DVOUT         6#      6
DVPTP         6#      6
DVPTR         6#      6
DVTTY         6#      6       960
DVWAIT      847     852#
DVWAT1      817     855#
ENTRP         6#      6
ERROR        28     575
ESTOP       526     532       561      565#
ESTOP1      561     569#
EBMERR        6#      6
ENFERR        6#      6
ERGSEG        6#      6
ET2REL        6#    276       442      445
ETATTA        6#
ETCCL        10#
ETCHEC        6#     35        37       41       388
ETDISK       10#
ETEXAM        6#
ETFINI        6#
ETGETT        6#
ETHALT        6#    126       354
ETKCT         6#    270
ETLOGI       10#    518
ETMONP        6#     35        37       41
ETPRV         6#
ETRA10        6#
ETRC10       10#
ETRCHK        6#
ETREAS        6#
ETSLEE        6#    777       779
ETSWAP       10#    605       607      610       629       634       635       644       645       757       758       761       897       898
ETTALK        6#
ETTIME        6#    220       260
ETTRAC        6#
ETTRPS        6#
ETTTYS        6#     31
```

```
GETDCD      812      815#
GETDCM      812      815#
GETWT       817#     832
HIGHJB      514      525      531
HNGTIM      25Ø      313
HOLD        545      548#
HOLD1       545      554#
HSAMSK        6#       6
HSAPOS        6#       6
HSASIZ        6#       6
HUNGCT        6#       6
HUNGST        6#       6
I             6#       6
IB            6#       6
IBUFR         6#       6
ICLOSB        6#       6
ILM           6#     114      123
ILUERR        6#       6
INBFR         6#       6
INCTIM      264      267#
INITB         6#       6
INLMES       28      548

INPB          6#       6
IO            6#       6
IOACT         6#       6      94Ø      963
IOBEG         6#       6
IOBKTL        6#       6
IOBOT         6#       6
IOCON         6#       6
IODEND        6#       6
IODERR        6#       6
IODTER        6#       6
IOEND         6#       6
IOFST         6#       6
IOIMPM        6#       6
IONRCK        6#       6
IOPAR         6#       6
IOS           6#       6      286      289      939      94Ø      957      967      977
IOTEND        6#       6
IOUSE         6#       6
IOW           6#       6      957
IOWC          6#       6
IOWQ        955      958
IPPERR        6#       6
ITEM          6#       6      262      267      268      274      322      349      352      369      423      424      517      521
            525      528      565      567      57Ø      571      591      592      594      6Ø3      614      632      632      652
            681      723      753      755      766      769      794      795      797
JA          16Ø#     328      33Ø      339      34Ø      359      36Ø      369      37Ø      371      438      461
JACCT         6#       6      516      566
JBFADR        6#       6
JBFCTR        6#       6
JBFPTR        6#       6
JBTADR      421      424      678
```

```
JBTDAT      345       369       421       676       681
JBTKCT      271       274
JBTSTS      517       529       542       567       572       587       592       594       614       63Ø       632       723       74Ø       753
            755       763       766       769       781       784       797       863       883       899       9Ø1       9Ø3
JBUF          6#        6
JDAT          6#        6        95        96        98        99       1Ø4       1Ø5       16Ø       191       192       429       681       682
            686       7Ø6       7Ø9       71Ø       711       712       716       721
JERR          6#        6       569       615       722
JLOG          6#        6       516
JNA           6#        6       516       527
JOB         251       261       262       322       326       345       349       376       421       423       563       587       6Ø3       678
            68Ø       849       857       881       9Ø5       962
JOBADR      221       421       425       457
JOBAPR       26       1Ø4
JOBCNI       26        98
JOBD14      188
JOBD15      222       241
JOBD16      188       192       221       239
JOBD17      221       243       7Ø4       711
JOBDAC      188       191       221       24Ø       371       7Ø4       7Ø9
JOBDAT       26        95       1Ø5       236       326       328       345       421
JOBDPD      21Ø       214
JOBDPG      21Ø       213
JOBENB       99       346       461
JOBHCU      346       36Ø
JOBJDA      326       34Ø
JOBOPC      7Ø4       716
JOBPC       7Ø4       7Ø6       721
JOBPD1      222       7Ø4       712
JOBPDL      678       686
JOBPRT      326       33Ø       345       359
JOBREL      421       438
JOBTPC       26        96
JRQ           6#        6       765       9ØØ
JWPOS         6#        6       863       883
JWSIZ         6#        6       863       883
JXPN          6#        6
KSTOP       513       516#
KT1ØA       421       45Ø
LISTSN        6
LOOKB         6#        6
LSTWRD      25Ø       265
MAXQ        587       597       741       744
MEDDLE        6#        6
MIDNIT      258       284       385
MJOBP1      194       222       246
MJOBPD      678       685
MONJOB      662       664#
MONSTR      677       68Ø#
MONTAB      258
MQWAIT      848       851#
MSTART      664       7Ø3       721#
MTWAIT      848       851#
```

```
NECERR      6#      6
NLFERR      6#      6
NOCORG    645       [illegible]
NSDERR      6#      6
NSFERR      6#      6
NSHF        6#      6
NSRBIT      6#      6
NSWP        6#      6
NULADR    344     350#
NULDAT    222     237     346     370
NULERR    346     377     385     394
NULJB     352     387#
NULJOB    344     348#
NULPDL    188     193     222     244
NULQ      646     648
NULTST    905#
NXM         6#    114
NXTJOB    250     317
OBUFB       6#      6
OCLOSB      6#      6
OUTBFB      6#      6
OUTPB       6#      6

PDP         6#      6     191     190     193     194     212     214     244     246     248     278     308     309
          310     314     316     317     350     442     493     540     548     554     574     576     637     639
          664     685     686     687     770     800     816     817     820     826     827     852     855     926
          921     941     942     972     978
PHOLD     538     540#
PI         55      59      75     122     301     305     485     492     590     595     602     916     919     964
          971     976
PICLK     914     919
PIOFF     177     301     485     590     916     955     964
PION      177     305     492     595     602     955     971     976
PJBS1     858     863#    969
PJBS2     883#    895
PJBSTS    587     596     649     740     743     792     798     801
PJOBN     881     894
PMONTB    251     290
POTLST    250     263     266
POV         6#    114
PRJPRG    519     521
PROG        6#      6     213     214     424     425     426     429     433     438     450     455     457     602
PRTERR      6#      6
PVSPYA      6#      6
PVSPYM      6#      6
PVTRPS      6#      6
QJOB      763     767     899     902
RELEA9     29     576
RENMB       6#      6
REOCLK     25      75     122
REQTAB    587     598     740     746     813     821     822     849     856
REQUE     611     637     650     762     765#
RNQ       792     794
RNQUNT    740     754
```

```
RSCHED      197     215     253#
RTIME       261     267
RUN           6#      6     589     752
RUNABL        6#      6
RUNMSK        6#      6
SAVPC       23Ø     234#
SCHEDF       26     12Ø     221     229     251     321     563     617
SD            6#      6
SETAPR      47Ø     473#
SETHGH      441     442
SETHRD      433     455#
SETIO1      888     894#
SETIOD      88Ø     889#
SETR1       745     747     752#
SETR2       754#    8Ø3
SETREL      42Ø     423#
SETRL1      35Ø     424#
SETRUN      665     739     743#
SETSLP      78Ø     783#
SETSTT      786     857#
SHF           6#      6
SHRSEG        6#      6
SLEVEL        6#      6
SLICE         6#      6
SLPQ        781     785     792     799
SNA           6#      6
SPYSEG        6#      6
STAVAL      562
STOP1       572     586     589#
STOP1A      593     599     6Ø2#
STOP2       616     618     913     916#
STOPIO        6#      6
STOR        157#    295     296     298     3ØØ     3Ø4     3Ø8     31Ø     311
STREQ       562
STTIOD      88Ø     886#
STTYB1        6#      6
STTYBF        6#      6
STUSER      562     571     587     591
STWAIT      848     851#
SWP           6#      6
SWPCLR        6#      6
SYSDEV        6#      6
T           158#    33Ø     331     34Ø     358     359     365
T1          159#    332     333     335     339     36Ø     361     363     365
TAC           6#      6      85      86      91      92      96     1Ø2     1Ø3     1Ø4     1Ø8     112     116     124
            158     179     18Ø     242     243     247     272     273     274     287     288     29Ø     291     3Ø2
            3Ø4     3Ø6     459     461     473     477     478     48Ø     488     489     516     517     528     529
            53Ø     531     566     567     569     57Ø     573     589     592     594     596     597     598     6Ø2
            6Ø1     614     615     628     63Ø     632     636     648     649     688     7Ø6     7Ø7     7Ø9     71Ø
            711     712     713     716     717     722     723     743     744     746     748     749     752     753
            754     755     765     766     769     783     784     795     796     797     798     799     883     894
            9Ø1     9Ø3
TAC1          6#      6     159     283     284     291     298     299     3Ø6     3Ø7     3Ø9     48Ø     481     482
```

```
             483      49Ø      527      529      687      717      718      719      721      794      821      856      859      875
             97Ø      971      973
TEM            6#       6
THSDAT       258      287      385
TIME          25       71      258      283      286      385
TIMEF         25       73      251      253      32Ø
TIOWQ        955      961
TRNERR         6#       6
TSAVAL       881      887
TSQ          881      886
TTIME        261      268
TTYATC         6#       6
TTYBIU         6#       6
TTYFNU       678
TTYSET       7Ø4      724
TTYSTC       546      554
TTYUSE         6#       6
UCHN           6#       6
UIOMOD         6#       6
UPTIME        25       72
USCHED       2Ø9      212#
USRHCU       326      332

USRJDA       346      365
USRMOD         6#       6       86       92      226      7Ø7      718
USRPC        188      19Ø      21Ø      212      234      38Ø
USRPRT       326      331      345      358
USRREL       271      272      421      426
USTART       7Ø3      7Ø6#
USTRT1       7Ø8      716#
UUO            6#       6
UWP            6#       6
UWPOFF         6#       6
VCLOCK        14#      14
WAIT1        937      939#     943
WAKE         791      794#
WSAVAL       881      89Ø
WSCHED       187      19Ø#     859      972
WSQ          881      889
WSYNC        942      954      957#
WSYNC1       966      976#
WTMASK         6#       6      722
```

```
CODES         6#
DISABL        6#
ENABLE        6#
NOSCHE        6#
NOSHUF        6#
QUEUES        6#
SCHEDU        6#
SHUFFL        6#
STARTD        6#
XP            6#      6       13
```