

00010

XLIST

01970

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00030 ;SCHEDULING ALGORITHM
00040 ;CALL:
00050 ; PUSHJ PDP, NXTJOB
00060 ; EXIT ;RETURN HIGHEST PRIORITY USER IN AC ITE
00070
00080 ;NXTJOB ASSUMES NO ACS SET EXCEPT PDP AND THAT IS MAY USE
00090 ;ANY OF THE OTHER ACS
00100 ;EXECUTION REQUIRES ROUGHLY 37 CYCLES FOR NORMAL CASE
00110
00120 INTERNAL NXTJOB, QUANTS
00130 EXTERNAL IOCOMP,JOBN,JBTSTS,JOB
00140 EXTERNAL MTAVAL,DCAVAL,DTAVAL,SCNOFF,SCNON
00150
00160
00170 T=TAC1 ;TEMPORARY AC
00180 C=DEV DAT
00190 P=DAT
00200
000000 200100 000000 00210 NXTJOB: MOVE T, IOCOMP ;NO. OF COMPLETED IO JOBS
000001 202100 000064' 00220 MOVEM T, IOAVAL ;MAKE SLOW IO LOOK LIKE FAST IO
00230
00240 ;KEEP IO DEVICES BUSY
000002 515240 777774 00250 HRLZI P, -NUM ;NO. OF IO DEVICE CATEGORIES TO CHECK
000003 336025 000060' 00260 NXT0: SKIPN @AVALTB(P) ;NON-ZERO IF IO JUST BECOME AVAILABLE
000004 253240 000003' 00270 NXT1: AOBJN P, NXT0
000005 327240 000026' 00280 JUMPG P, NXT4 ;FINISHED YET
000006 402025 000060' 00290 SETZM @AVALTB(P) ;IO DEVICE AVAIL. ACKNOWLEDGE FACT
000007 200105 000065' 00300 MOVE T, WAITB(P) ;GET APPROPRIATE JOB STATUS BIT
000010 200205 000071' 00310 MOVE ITEM, JOBP(P) ;SEARCH FOR WAITING JOB
000011 350000 000004 00320 AOS ITEM ;LOOK AT EVERYONE ELSE FIRST
000012 301200 000000 00330 NXT2: CAIL ITEM, JOBN ;MODULO JOBN
000013 201200 000001 00340 MOVEI ITEM, 1 ;SKIP NULL JOB
000014 617104 000000 00350 TSNN T, JBTSTS(ITEM) ;IS WAIT BIT SET FOR THIS JOB?
000015 254000 000023' 00360 JRST NXT3 ;NO, KEEP LOOKING
000016 700600 000000 00370 CONO PI, SCNOFF ;YES, TURN SCANNER CHAN. OFF(CONTROL C)
000017 554044 000014' 00380 HLRZ TAC, JBTSTS(ITEM) ;IS JOB RUNABLE?
000020 306042 204000 00390 CAIN TAC, RUNABLE(T)
000021 254000 000041' 00400 JRST NXT7 ;YES, CLEAR BIT, SET RUN TIME, RETURN
000022 700600 000000 00410 CONO PI, SCNON ;NO, TURN SCANNER CHAN. ON, KEEP LOOKIN
000023 312205 000071' 00420 NXT3: CAME ITEM, JOBP(P) ;HAVE ALL USERS BEEN LOOKED AT
000024 344200 000012' 00430 AOJA ITEM, NXT2 ;NO, KEEP LOOKING
000025 254000 000004' 00440 JRST NXT1 ;YES, SHOULD NOT HAPPEN

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00450
00460 ;NO JOBS WAITING TO USE IO DEVICES
00470 ;HAS CURRENT JOB USED ITS QUANTUM
00480
000026 201300 000012' 00490
000027 334200 000000 00500
00510
000030 350000 000004 00520
000031 301200 000026' 00530
000032 201200 000001 00540
00550
000033 554104 000017' 00560
000034 306100 204000 00570
000035 254000 000050' 00580
000036 367300 000030' 00590
000037 403200 000002 00600
000040 344100 000054' 00610
00620
000041 202205 000071' 00630
000042 620042 000000 00640
000043 506044 000033' 00650
000044 602100 400000 00660
000045 370000 000000' 00670
000046 700600 000022' 00680
000047 254000 000053' 00690
00700
000050 550104 000043' 00710
000051 602100 777777 00720
000052 263140 000000 00730
000053 200105 000075' 00740
000054 542104 000050' 00750
000055 316200 000027' 00760
000056 326200 000036' 00770
000057 263140 000000 00780

NXT4: MOVEI C,JOBN ;GET READY FOR POSSIBLE LOOP
      SKIPA ITEM, JOB ;CURRENTLY RUNNING JOB

NXT6: AOS ITEM ;LOOK AT NEXT JOB
      CAIL ITEM, JORN ;MODULO JOBN
      MOVEI ITEM, 1 ;SKIP NULL JOB

NXT5: HLRZ T, JBTSTS(ITEM) ;IS THIS JOB RUNABLE
      CAIN T, RUNABLE
      JRST NXT9 ;YES, RETURN WITH ITEM SET

NXT5A: SOJG C, NXT6 ;NO, LOOKED AT ALL JOBS YET?
       SETZB ITEM, T ;YES, INDICATE NULL JOB TO RUN
       AOJA T, NXT8 ;SET TO RUN FOR ONE CLOCK TICK

NXT7: MOVEM ITEM, JOBP(P) ;SAVE THIS JOB NO. FOR NEXT TIME
      TRZ TAC, (T) ;CLEAR WAIT BIT
      HRLM TAC, JBTSTS(ITEM) ;IN JOB STATUS WORD
      TRNE T, IOWS ;IS WAIT BIT IOWS?
      SOS IOCOMP ;YES, SUBTRACT REQUEST COUNT
      CONO PI, SCNON ;TURN SCANNER CHANNEL BACK ON
      JRST NXT10 ;AND GO SET RUNNING TIME

NXT9: HRRZ T, JBTSTS(ITEM) ;HAS TIME GONE TO ZERO FOR THIS JOB?
      TRNE T, -1
      POPJ PDP, ;NO

NXT10: MOVE T, QUANTS(P) ;SET QUANTUM RUNNING TIME FOR THIS QUEUE
NXT8: HRRM T, JBTSTS(ITEM)
      CAMN ITEM, JOR ;IS THIS SAME AS OLD JOB?
      JUMPN ITEM, NXT5A ;AND NOT NULL JOB
      POPJ PDP,

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00790
00800 ;FLAGS SET NON-ZERO WHEN IO DEVICES BECOME AVAILABLE
00810
000060 000000 000000 00820 AVALTB: EXP MTAVAL ;MAG TAPE
000061 000000 000000 00830 EXP DCAVAL ;DATA CONTROL
000062 000000 000000 00840 EXP DTAVAL ;DECTAPE
000063 000000 000064 00850 EXP IOAVAL ;ALL OTHER DEVICES
00860 NUM=.-AVALTB
00870
000064 000000 000000 00880 IOAVAL: 0 ;FLAG = NO. OF IO COMPLETED JOBS
00890
00900 ;BIT IN STATUS WORD MEANING JOB WAITING TO USE DEVICE
000065 000000 010000 00910 WAITB: EXP MTW
000066 000000 020000 00920 EXP DCW
000067 000000 040000 00930 EXP DTW
000070 000000 400000 00940 EXP IOWS
00950
00960 ;LAST JOB SCHEDULED FOR DEVICE
00970 JOBP: REPEAT NUM,
00980 < EXP 1
00990 >
000071 000000 000001 EXP 1
000072 000000 000001 EXP 1
000073 000000 000001 EXP 1
000074 000000 000001 EXP 1
01000
01010 ;QUANTUM TIMES FOR EACH QUEUE
01020
000075 000000 000004 01030 QUANTS: EXP 4 ;MAGTAPE QUEUE
000076 000000 000004 01040 EXP 4 ;DATA CONTROL QUEUE
000077 000000 000004 01050 EXP 4 ;DECTAPE QUEUE
000100 000000 000006 01060 EXP 6 ;IOWAIT SATISFIED QUEUE
000101 000000 000017 01070 EXP QUANT1 ;STRAIGHT COMPUTATION QUEUE
01080
01090 XP QUANT1, *D15; STRAIGHT COMPUTATION QUEUE
01100
01110 END,

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THERE ARE NO ERRORS

PROGRAM BREAK IS 000102

CLKCSS - SCHEDULING ALGORITHM
SYMBOL TABLE

A	000000	INT
AC1	000015	INT
AC2	000016	INT
AC3	000017	INT
AL	000001	INT
ASSCON	400000	INT
ASSPRG	200000	INT
AVALTB	000060	
R	000014	INT
BUFPNT	000012	INT
BUFWRD	000013	INT
C	000006	
CLOSE	002000	INT
CLSIN	000002	INT
CLSOUT	000001	INT
D	000017	INT
DAT	000005	INT
DCAVAL	000061	EXT
DCL	000001	INT
DCW	020000	INT
DDI	000007	INT
DDO	000006	INT
DDTMEM	000037	INT
DDTSYM	000036	INT
DEN	000004	INT
DEVADR	000007	INT
DEVBUF	000006	INT
DEVCHR	000001	INT
DEVCTR	000011	INT
DEVDAT	000006	INT
DEVIAD	000007	INT
DEVIOS	000002	INT
DEVLOG	000005	INT
DEVMOD	000004	INT
DEVNAM	000000	INT
DEVOAD	000010	INT
DEVPTR	000010	INT
DEVSER	000003	INT
DGF	000012	INT
DIN	000003	INT
DLK	000005	INT
DOU	000002	INT
DR	000016	INT
DRL	000000	INT
DSI	000011	INT
DSO	000010	INT
DTAVAL	000062	EXT
DTW	040000	INT
DVAVAL	000040	INT
DVCDR	100000	INT
DVDIR	000004	INT
DVDIRI	400000	INT
DVIN	000002	INT
DVLPT	040000	INT
DVMTA	000020	INT

DVOUT	000001	INT
DVTTY	000010	INT
ENTRB	020000	INT
I	000010	INT
IB	000013	INT
IBUFB	200000	INT
INITB	400000	INT
INPB	010000	INT
IO	000020	INT
IOACT	010000	INT
IOAVAL	000064'	
IOREG	000002	INT
IORKTL	040000	INT
IOCOMP	000045'	EXT
IOCON	000040	INT
IODEND	020000	INT
IODERR	200000	INT
IODISC	400000	INT
IODONE	400000	INT
IODTER	100000	INT
IOFND	000040	INT
IOFST	000004	INT
IOIMPM	400000	INT
IONRCK	000100	INT
IORDEL	000100	INT
IORET	000020	INT
IOS	000000	INT
IOSTRT	000010	INT
IOUSE	400000	INT
IOW	000001	INT
IOWC	000020	INT
IOWS	400000	INT
ITFM	000004	INT
JBFAADR	000000	INT
JBFCR	000002	INT
JBFPTR	000001	INT
JBTSTS	000054'	EXT
JBUF	000005	INT
JDAT	000011	INT
JERR	002000	INT
JIOW	100000	INT
JNA	004000	INT
JOR	000055'	EXT
JORN	000031'	EXT
JORP	000071'	
LOOKB	040000	INT
MTAVAL	000060'	EXT
MTW	010000	INT
NUM	000004	
NXT0	000003'	
NXT1	000004'	
NXT10	000053'	
NXT2	000012'	
NXT3	000023'	
NXT4	000026'	

NXT5	000033'	
NXT5A	000036'	
NXT6	000030'	
NXT7	000041'	
NXT8	000054'	
NXT9	000050'	
NXTJOB	000000'	INT
OBUFR	100000	INT
OUTPR	004000	INT
P	000005	
PDP	000003	INT
PICHN	000100	INT
PROG	000007	INT
QUANT1	000017	INT
QUANTS	000075'	INT
RUN	200000	INT
RUNABL	204000	INT
SCNOFF	000016'	EXT
SCNON	000046'	EXT
T	000002	
TAC	000001	INT
TAC1	000002	INT
TEM	000010	INT
TTYATC	020000	INT
TTYUSE	010000	INT
USRMOD	010000	INT
UUO	000014	INT
WAITB	000065'	

END OF ASSEMBLY