

00010

XLIST

01970

		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	NXTJOB:	MOVE T, IOCOMP ;NO. OF COMPLETED IO JOBS
000001	202100	000064		MOVEM T, IOAVAL ;MAKE SLOW IO LOOK LIKE FAST IO
		00230		
		00240	;KEEP IO DEVICES BUSY	
000002	515240	777774		HRLZI P, -NUM ;NO. OF IO DEVICE CATEGORIES TO CHECK
000003	336025	000060	NXT0:	SKIPN @AVALTB(P) ;NON-ZERO IF IO JUST BECOME AVAILABLE
000004	253240	000003	NXT1:	AOBJN P, NXT0
000005	327240	000026		JUMPG P, NXT4 ;FINISHED YET
000006	402025	000060		SETZM @AVALTB(P) ;IO DEVICE AVAIL. ACKNOWLEDGE FACT
000007	200105	000065		MOVE T, WAITB(P) ;GET APPROPRIATE JOB STATUS BIT
000010	200205	000071		MOVE ITEM, JOBP(P) ;SEARCH FOR WAITING JOB
000011	350000	000004		AOS ITEM ;LOOK AT EVERYONE ELSE FIRST
000012	301200	000000	NXT2:	CAIL ITEM, JOBN ;MODULO JOBN
000013	201200	000001		MOVEI ITEM, 1 ;SKIP NULL JOB
000014	617104	000000		TSNN T, JBTSTS(ITEM) ;IS WAIT BIT SET FOR THIS JOB?
000015	254000	000023		JRST NXT3 ;NO, KEEP LOOKING
000016	700600	000000		CONO PI, SCNOFF ;YES, TURN SCANNER CHAN. OFF(CONTROL C)
000017	554044	000014		HLRZ TAC, JBTSTS(ITEM) ;IS JOB RUNABLE?
000020	306042	204000		CAIN TAC, RUNABLE(T)
000021	254000	000041		JRST NXT7 ;YES, CLEAR BIT, SET RUN TIME, RETURN
000022	700600	000000		CONO PI, SCNON ;NO, TURN SCANNER CHAN. ON, KEEP LOOKIN
000023	312205	000071	NXT3:	CAME ITEM, JOBP(P) ;HAVE ALL USERS BEEN LOOKED AT
000024	344200	000012		AOJA ITEM, NXT2 ;NO, KEEP LOOKING
000025	254000	000004		JRST NXT1 ;YES, SHOULD NOT HAPPEN

			00450		
			00460		;NO JOBS WAITING TO USE IO DEVICES
			00470		;HAS CURRENT JOB USED ITS QUANTUM
			00480		
000026	201300	000012'	00490	NXT4:	MOVEI C,JOBN ;GET READY FOR POSSIBLE LOOP
000027	334200	000000	00500		SKIPA ITEM, JOB ;CURRENTLY RUNNING JOB
			00510		
000030	350000	000004	00520	NXT6:	AOS ITEM ;LOOK AT NEXT JOB
000031	301200	000026'	00530		CAIL ITEM, JOBN ;MODULO JOBN
000032	201200	000001	00540		MOVEI ITEM, 1 ;SKIP NULL JOB
			00550		
000033	554104	000017'	00560	NXT5:	HLRZ T, JBTSTS(ITEM) ;IS THIS JOB RUNABLE
000034	306100	204000	00570		CAIN T, RUNABLE
000035	254000	000050'	00580		JRST NXT9 ;YES, RETURN WITH ITEM SET
000036	367300	000030'	00590	NXT5A:	SOJG C, NXT6 ;NO, LOOKED AT ALL JOBS YET?
000037	403200	000002	00600		SETZB ITEM, T ;YES, INDICATE NULL JOB TO RUN
000040	344100	000054'	00610		AOJA T, NXT8 ;SET TO RUN FOR ONE CLOCK TICK
			00620		
000041	202205	000071'	00630	NXT7:	MOVEM ITEM, JOBP(P) ;SAVE THIS JOB NO. FOR NEXT TIME
000042	620042	000000	00640		TRZ TAC, (T) ;CLEAR WAIT BIT
000043	506044	000033'	00650		HRLM TAC, JBTSTS(ITEM) ;IN JOB STATUS WORD
000044	602100	400000	00660		TRNE T, IOWS ;IS WAIT BIT IOWS?
000045	370000	000000'	00670		SOS IOCOMP ;YES, SUBTRACT REQUEST COUNT
000046	700600	000022'	00680		CONO PI, SCNON ;TURN SCANNER CHANNEL BACK ON
000047	254000	000053'	00690		JRST NXT10 ;AND GO SET RUNNING TIME
			00700		
000050	550104	000043'	00710	NXT9:	HRRZ T, JBTSTS(ITEM) ;HAS TIME GONE TO ZERO FOR THIS JOB?
000051	602100	777777	00720		TRNE T, -1
000052	263140	000000	00730		POPJ PDP, ;NO
000053	200105	000075'	00740	NXT10:	MOVE T, QUANTS(P) ;SET QUANTUM RUNNING TIME FOR THIS QUEUE
000054	542104	000050'	00750	NXT8:	HRRM T, JBTSTS(ITEM)
000055	316200	000027'	00760		CAMN ITEM, JOR ;IS THIS SAME AS OLD JOB?
000056	326200	000036'	00770		JUMPN ITEM, NXT5A ;AND NOT NULL JOB
000057	263140	000000	00780		POPJ PDP,

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;FLAGS SET NON-ZERO WHEN IO DEVICES BECOME AVAILABLE

AVALTB:    EXP MTAVAL                ;MAG TAPE
           EXP DCAVAL                ;DATA CONTROL
           EXP DTAVAL                ;DECTAPE
           EXP IOAVAL                ;ALL OTHER DEVICES
NUM=.-AVALTB

IOAVAL:    0                        ;FLAG = NO. OF IO COMPLETED JOBS

;BIT IN STATUS WORD MEANING JOB WAITING TO USE DEVICE
WAITB:    EXP MTW
           EXP DCW
           EXP DTW
           EXP IOWS

;LAST JOB SCHEDULED FOR DEVICE
JOBP:    REPEAT NUM,
<        EXP 1
>
EXP 1

EXP 1

EXP 1

EXP 1

;QUANTUM TIMES FOR EACH QUEUE

QUANTS:    EXP 4                    ;MAGTAPE QUEUE
           EXP 4                    ;DATA CONTROL QUEUE
           EXP 4                    ;DECTAPE QUEUE
           EXP 6                    ;IOWAIT SATISFIED QUEUE
           EXP QUANT1                ;STRAIGHT COMPUTATION QUEUE

XP QUANT1, +D15;    STRAIGHT COMPUTATION QUEUE

END,

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PROGRAM BREAK IS 000102

CLKCSS - SCHEDULING ALGORITHM
SYMBOL TABLE

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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
IOEND	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
ITEM	000004	INT
JBFAADR	000000	INT
JBFCCTR	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