

43 *****01 00043

44	EJEC			01	00044		
45 *				01	00045		
46 *				01	00046		
47 *	*****			01	00047		
48 *	*			01	00048		
49 *	* AREAS RESERVED BY EXECUTIVE *			01	00049		
50 *	*****			01	00050		
51 *				01	00051		
52 *				01	00052		
53 *	ORG	0		01	00053		
54 *	JMP	EXECUTIVE		01	00054		
55 *	ORG	040		01	00055		
56 *	JMPM	POWER DOWN ROUTINE		01	00056		
57 *	JMP	POWER UP ROUTINE		01	00057		
58 *	NOTE:	THE TEST EXECUTIVE ALSO RESERVES LOCATIONS 0400 TO 0477			01	00058	
59 *		FOR A POINTER TABLE TO STANDARD ROUTINES, AND AS AN AREA			01	00059	
60 *		FOR EXECUTIVE DATA. ALL TEST PROGRAMS WORKING WITH THE			01	00060	
61 *		EXECUTIVE MUST PRESERVE THIS BLOCK.			01	00061	
62 *		STANDARD ROUTINES WILL BE CALLED INDIRECTLY THRU			01	00062	
63 *		THIS TABLE			01	00063	
64 *				01	00064		
65 *				01	00065		
66 *				01	00066		
67 *				01	00067		
68 *				01	00068		
000400	69	ORG	0400	01	00069		
000400	70	OUTA	BSS	1	OUTPUT ONE CHAR ROUTINE	01	00070
000401	71	OUTB	BSS	1	OUTPUT TWO CHAR ROUTINE	01	00071
000402	72	OUTC	BSS	1	OUTPUT CR/LF ROUTINE	01	00072
000403	73	OUTD	BSS	1	OUTPUT MESSAGE ROUTINE	01	00073
000404	74	OUTE	BSS	1	OUTPUT OCTAL WORD ROUTINE	01	00074
000405	75	OUTF	BSS	1	OUTPUT OCTAL ADDR ROUTINE	01	00075
000406	76	OUTG	BSS	1	OUTPUT ERROR MSG ROUTINE	01	00076
000407	77	OUTH	BSS	1	OUTPUT CONTROL CHAR TO TTY ROUTINE	01	00077
000410	78	INPA	BSS	1	INPUT ONE CHAR ROUTINE	01	00078
000411	79	INPB	BSS	1	INPUT AND PRINT ONE CHAR ROUTINE	01	00079
000412	80	INPC	BSS	1	INPUT ONE CHAR EDITED ROUTINE	01	00080
000413	81	INPD	BSS	1	INPUT ONE ALPHA CHAR ROUTINE	01	00081
000414	82	INPE	BSS	1	INPUT TWO ALPHA CHAR ROUTINE	01	00082
000415	83	INPF	BSS	1	INPUT COMMA/PERIOD TERMINATION ROUTINE	01	00083
000416	84	INPG	BSS	1	INPUT OCTAL NUMBER ROUTINE	01	00084
000417	85	INPT	BSS	1	TIME-OUT ROUTINE	01	00085

000420	86	TDLV	BSS	1	TIME DELAY ROUTINE	01	00086
000421	87	SSKT	BSS	1	STANDARD SENSE SWITCH ROUTINE	01	00087
000422	88	\$LWE	BSS	1	LOWEST WORD USED BY EXEC	01	00088
000423	89	ESZC	BSS	1	MEMORY SIZE DETERMINATION ROUTINE	01	00089
000424	90	\$MSM	BSS	1	MEMORY SIZE MESSAGE	01	00090
	91	*				01	00091
	92	*				01	00092
000440	93		ORG	0440		01	00093
	94	*				01	00094
	95	*	EXECUTIVE DATA TABLE			01	00095
	96	*				01	00096
000440	97	\$FLG	BSS	1	LOOP ON ERROR FLAG, 0=DON'T LOOP 1=LOOP	01	00097
000441	98	\$MEM	BSS	1	MEMORY SIZE (HIGHEST AVAIL CORE)	01	00098
000442	99	\$CON	BSS	1	0=CONSOLE MODE 1=TTY MODE	01	00099
000443	100		BSS	22		01	00100
000471	101	\$DCT	BSS	1	DIGIT COUNTER FOR INPG	01	00101
	102	*				01	00102
000047 A	103	RTC	EQU	047		01	00103

			104		FJEC			01	00104
000500			105		ORG	0500		01	00105
000500	001000	A	106		JMP	**7		01	00106
000501	000507	A							
000502			107	PNTD	BSS	5	INDIRECT POINTERS	01	00107
000507	005101	A	108		INCR	1	BIT SIZE DETERMINER	01	00108
000510	004260	A	109		LRLA	16		01	00109
000511	006130	A	110		ERAI	1		01	00110
000512	000001	A							
000513	001010	A	111		JAZ	**7		01	00111
000514	000522	A							
000515	006010	A	112		LDAI	18		01	00112
000516	000022	A							
000517	051156	A	113		STA	18BIT	18 BITS	01	00113
000520	001000	A	114		JMP	**5		01	00114
000521	000525	A							
000522	006010	A	115		LDAT	16		01	00115
000523	000020	A							
000524	051156	A	116		STA	16BIT	16 BITS	01	00116
000525	002000	A	117		CALL	RCMG	SET AFFECTED INSTRUCTIONS IN ARITH. SUBS.	01	00117
000526	003321	A							

ADDRESS	OPERAND	INSTR	COMMENT	LOC	DESCRIPTION
000527	100447 A	EJEC		118	
000530	000020 A	EXC	0400+RTC	119	RTCT
000531	000002 A	LDBI	2	120	
000532	005021 A	TBA		121	
000533	006110 A	ORAI	0400	122	EXCEPT LOCATIONS 040 TO 043 (PF/R) INCLUSIVE-OR BIT 8 IN A REG.
000534	000400 A				
000535	056000 A	STA	0,2	123	
000536	005122 A	TBR		124	
000537	005021 A	TBA		125	
000540	006140 A	SUBI	040	126	CHECK IF LOC 040 (POWER FAILURE RESTART INTERRUPT ADDRESSES)
000541	000040 A				
000542	001010 A	JAZ	*+9	127	
000543	000553 A				
000544	005021 A	TBA		128	
000545	006140 A	SUBI	0377	129	CHECK IF ALL INTERRUPT LOCATIONS SETUP
000546	000377 A				
000547	001010 A	JAZ	RTCT	130	
000550	000557 A				
000551	001000 A	JMP	RTCT+3	131	
000552	000532 A				
000553	006020 A	LOBI	044	132	JUMP OVER PF/R INTERRUPT ADDRESSES.
000554	000044 A				
000555	001000 A	JMP	RTCT+3	133	
000556	000532 A				
000557	010442 A	LDA	SCON	134	RTC1 CHECK IF CONSOLE MODE
000560	001010 A	JAZ	RTCK	135	
000561	000570 A				
000562	002000 A	CALL*	OUTC	136	CR/LF
000563	100402 A				
000564	006030 A	LDXI	MS1	137	WRITE (REAL TIME CLOCK TEST)
000565	002767 A				
000566	002000 A	CALL*	OUTD	138	
000567	100403 A				
000570	010442 A	LDA	SCON	139	RTCK CHECK IF CONSOLE MODE
000571	001010 A	JAZ	RTCP	140	
000572	000636 A				
000573	006030 A	LDXI	MS15	141	WRITE (COMPUTER IS AN)
000574	003167 A				
000575	002000 A	CALL*	OUTD	142	
000576	100403 A				
000577	002000 A	CALL*	INPB	143	RTCM

000600	100411	A					
000601	001000	A	144	JMP	RTCM		01 00144
000602	000577	A					
000603	005012	A	145	TAR			01 00145
000604	002000	A	146	CALL*	OUTC	CR/LF	01 00146
000605	100402	A					
000606	002000	A	147	CALL*	OUTC	CR/LF	01 00147
000607	100402	A					
000610	005021	A	148	TBA			01 00148
000611	006140	A	149	SUBI	0261	AN 'F' OR V73?	01 00149
000612	000261	A					
000613	001010	A	150	JAZ	RTCM		01 00150
000614	000627	A					
000615	006120	A	151	ADDI	1		01 00151
000616	000001	A					
000617	001010	A	152	JAZ	RTCM		01 00152
000620	000633	A					
000621	006030	A	153	LDXI	MS16	WRITE (INVALID)	01 00153
000622	003314	A					
000623	002000	A	154	CALL*	OUTC		01 00154
000624	100403	A					
000625	001000	A	155	JMP	RTCM		01 00155
000626	000570	A					
			156 *				01 00156
000627	005111	A	157	JAR	RTCM		01 00157
000630	051157	A	158	STA	COMP	SET COMPUTER FLAG FOR 'F'	01 00158
000631	001000	A	159	JMP	RTCM		01 00159
000632	000640	A					
			160 *				01 00160
000633	051157	A	161	STA	COMP	SET COMPUTER FLAG FOR 'T'	01 00161
000634	001000	A	162	JMP	RTCM		01 00162
000635	000640	A					
			163 *				01 00163
000636	000000	A	164	HLT	RTCM	SET A=0 FOR T, OR A=1 FOR F	01 00164
000637	051157	A	165	STA	COMP	SET COMPUTER FLAG FROM REGISTER ENTRY	01 00165
000640	010442	A	166	LDA	SCON	CHECK IF CONSOLE MODE	01 00166
000641	001010	A	167	JAZ	RTCM		01 00167
000642	000647	A					
000643	006030	A	168	LDXI	MS2	WRITE (I/O INST. AND INT. TEST)	01 00168
000644	003003	A					
000645	002000	A	169	CALL*	OUTC		01 00169
000646	100403	A					

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VORTEX DASM

1945 HOURS

			170	EJEC			01 00170
			171 *	FOLLOWING THREE TESTS PERFORM THE I (VARIABLE) INTERVAL			01 00171
			172 *	INTERRUPT CHECK'			01 00172
			173 *				01 00173
000647	006010	A	174 RTC2	LDAI	1	SET ERROR COUNT TO ONE ** 1 **	01 00174
000650	000001	A					
000651	051160	A	175	STA	ERRC		01 00175
000652	006010	A	176	LDAI	02000	SET UP JUMP AND MARK IN INTERRUPT ADDRESSES	01 00176
000653	002000	A					
000654	050044	A	177	STA	044		01 00177
000655	050046	A	178	STA	046		01 00178
000656	006010	A	179	LDAI	ERRS	STORE LOC. OF ERROR SUBROUTINE AS JUMP ADDR	01 00179
000657	001165	A					
000660	050047	A	180	STA	047		01 00180
000661	006010	A	181	LDAI	RTC3	LOCATION TO RETURN UPON INTERRUPT	01 00181
000662	000677	A					
000663	050045	A	182	STA	045		01 00182
000664	006010	A	183	LDAI	*		01 00183
000665	000664	A					
000666	051155	A	184	STA	LOOP	SET LOOP ADDRESS	01 00184
000667	100447	A	185	EXC	0400+RTC	INITIALIZE RTC	01 00185
000670	100147	A	186	EXC	0100+RTC	ENABLE RTC	01 00186
000671	006030	A	187	LXI	16	4 SEC. WAIT	01 00187
000672	000020	A					
000673	002000	A	188	CALL	TDSC		01 00188
000674	002721	A					
000675	002000	A	189	CALL	ERRS	NO INTERRUPT ERROR	01 00189
000676	001165	A					

			190	EJEC			01	00190
			191 *		ENTRANCE FROM RECEIVING INTERRUPT		01	00191
			192 *				*01	00192
000677	000000	A	193	RTCA	ENTR		01	00193
000700	006010	A	194		LDAI *		01	00194
000701	000700	A						
000702	051155	A	195	STA	LOOP	SET LOOP ADDR	01	00195
000703	100747	A	196	EXC	0700+RTC	INHIBIT VII	01	00196
000704	006010	A	197	LDAI	2	SET ERROR COUNT	01	00197
000705	000002	A						
000706	051160	A	198	STA	ERRC		01	00198
000707	006010	A	199	LDAI	ERRS	IF INTERRUPT = GO TO EERC	01	00199
000710	001165	A						
000711	050045	A	200	STA	045		01	00200
000712	006030	A	201	LDXI	8	2 SEC. WAIT	01	00201
000713	000010	A						
000714	002000	A	202	CALL	TOSC		01	00202
000715	002721	A						
000716	041160	A	203	INP	ERRC	ERROR COUNT	** 3 **	01 00203
000717	006010	A	204	LDAI	RTCA	LOC. TO RETURN UPON INTERRUPT	01	00204
000720	000735	A						
000721	050045	A	205	STA	045		01	00205
000722	006010	A	206	LDAI	*		01	00206
000723	000722	A						
000724	051155	A	207	STA	LOOP	SET LOOP ADDR	01	00207
000725	100647	A	208	EXC	0600+RTC	INITIALIZE VARIABLE INTERVAL INTERRUPT	01	00208
000726	100347	A	209	EXC	0300+RTC	ENABLE VII AND INHIBIT MOI	01	00209
000727	006030	A	210	LDXI	16		01	00210
000730	000020	A						
000731	002000	A	211	CALL	TOSC		01	00211
000732	002721	A						
000733	002000	A	212	CALL	ERRS		01	00212
000734	001165	A						

			213	FJEC			01	00213
			214 *		ENTRANCE FROM RECEIVING INTERRUPT		01	00214
			215 *				01	00215
000735	000000	A	216	RTCA	ENTR		01	00216
000736	100447	A	217		EAC	0400+RTC	01	00217
000737	006010	A	218		LDAT	ERRS	01	00218
000740	001165	A						
000741	050045	A	219		STA	045	01	00219
000742	010442	A	220		LOA	SCON	01	00220
000743	001010	A	221		JAZ	++13	01	00221
000744	000760	A						
000745	011157	A	222		LOA	COMP	01	00222
000746	001010	A	223		JAZ	++6	01	00223
000747	000754	A						
000750	006030	A	224		LDXI	MES4	01	00224
000751	003035	A						
000752	002000	A	225		CALL*	OUT0	01	00225
000753	100403	A						
000754	006030	A	226		LDXI	MESA	01	00226
000755	003042	A						
000756	002000	A	227		CALL*	OUT0	01	00227
000757	100403	A						

			228	FJEC			01	00228
			229 *	FOLLOWING TEST PERFORM MEMORY OVERFLOW INTERRUPT CHECK			01	00229
			230 *				01	00230
			231 *	TEST FOR ERROR CODE 4			01	00231
000760	041160	A	232	INR	ERRC	INCR. ERROR COUNT	** 4 **	01 00232
000761	006010	A	233	LDAI	040045	INCR. AND REPLACE INSTR. STORE IN LOC. 044		01 00233
000762	040045	A						
000763	050044	A	234	STA	044			01 00234
000764	006010	A	235	LDAI	RTC5	LOC TO RETURN UPON INTERRUPT		01 00235
000765	001013	A						
000766	050047	A	236	STA	047			01 00236
000767	006010	A	237	LDAI	*			01 00237
000770	000767	A						
000771	051155	A	238	STA	LOOP	SET LOOP ADDR		01 00238
000772	006010	A	239	LDAI	4			01 00239
000773	000004	A						
000774	051160	A	240	STA	ERRC	SET ERROR COUNT		01 00240
000775	006010	A	241	LDAI	1	SET UP NO. OF TRIES FOR TEST 4		01 00241
000776	000001	A						
000777	051163	A	242	STA	CNTL			01 00242
001000	006010	A	243	RTT4 LDAI	037775	SET UP OVERFLOW COUNT		01 00243
001001	037775	A						
001002	050045	A	244	STA	045			01 00244
001003	100447	A	245	EXC	0400+RTC	INITIALIZE RTC		01 00245
001004	100147	A	246	EXC	0100+RTC	ENABLE RTC		01 00246
001005	006030	A	247	LOXI	16	4 SEC. WAIT		01 00247
001006	000020	A						
001007	002000	A	248	CALL	TDSC			01 00248
001010	002721	A						
001011	002000	A	249	CALL	ERRS	NO INTERRUPT - ERROR 4		01 00249
001012	001165	A						

			250	EJEC				01 00250
001013	000000	A	251	RTCS	ENTR			01 00251
001014	100147	A	252		FXC	0100+RTC	ENABLE RTC	*****
001015	100247	A	253		FXC	0200+RTC	INHIBIT MOT	01 00252
001016	041160	A	254		TNR	FRFC	ERROR COUNT	** 5 ** 01 00253
001017	010045	A	255		LDA	045		01 00254
001020	006140	A	256		SUBI	040001		01 00255
001021	040001	A						
001022	001010	A	257		JAZ	++S		01 00256
001023	001027	A						
001024	100447	A	258	RTCS	FXC	0400+RTC	ERROR INITIALIZE RTC	01 00257
001025	002000	A	259		CALL	FRFC		01 00258
001026	001155	A						
001027	011163	A	260		LDA	CNTL	CHECK IF TEST TRIED 50 TIMES	01 00259
001030	041163	A	261		INR	CNTL		01 00260
001031	006140	A	262		SUBI	50		01 00261
001032	000062	A						
001033	001002	A	263		JAP	RTTC		01 00262
001034	001042	A						
001035	006010	A	264		LDAI	04	RE-SETUP ERROR COUNT.	01 00263
001036	000004	A						
001037	051160	A	265		STA	FRFC		01 00264
001040	001000	A	266		JMP	RTTC		01 00265
001041	001000	A						

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VORTEX DASH

1945 HURS

			295	EJEC				01	00294
			296 *		CHECK FREE RUNNING			01	00295
			297 *		CHECK CLEAR OPTION OF FREE RUNNING COUNTER			01	00296
			298 *		CHECK IF FRC INCREMENTING			01	00297
001113	041160	A	299	INR	ERRC	ERROR COUNT = 11	** 11 **	01	00298
001114	006010	A	300	LDAI	*			01	00299
001115	001114	A							
001116	051155	A	301	STA	LOOP	SET LOOP ADDR		01	00300
001117	100047	A	302	EXC	RTC	CLEAR FREE RUNNING COUNTER		01	00301
001120	102547	A	303	CIA	RTC	INPUT FREE RUNNING COUNTER TO A		01	00302
001121	051161	A	304	STA	RTSA			01	00303
001122	006030	A	305	LOXI	2	DELAY 1/2 SEC.		01	00304
001123	006002	A							
001124	002000	A	306	CALL	TDSC			01	00305
001125	002721	A							
001126	102547	A	307	CIA	RTC	INPUT FRC TO A		01	00306
001127	141161	A	308	SUB	RTSA	IF COUNTER ZERO FRC NOT		01	00307
001130	002010	A	309	JAZM	ERRS	INCREMENTING CORRECTLY.		01	00308
001131	001165	A							
001132	041160	A	310	INR	ERRC	ERROR COUNT	** 12 **	01	00309
001133	006010	A	311	LDAI	*			01	00310
001134	001133	A							
001135	051155	A	312	STA	LOOP	SET LOOP ADDR		01	00311
001136	100047	A	313	EXC	RTC	CLEAR FRC		01	00312
001137	102547	A	314	CIA	RTC	INPUT FRC		01	00313
001140	001010	A	315	JAZ	*+4			01	00314
001141	001144	A							
001142	002000	A	316	CALL	ERRS			01	00315
001143	001165	A							
001144	010442	A	317	RTCA	LDA	SCON	TEST IF CONTINUE MODE.	01	00316
001145	001010	A	318	JAZ	RT10			01	00317
001146	001217	A							
001147	006030	A	319	LOXI	MESS	OUTPUT FRC (TEST COMPLETED)		01	00318
001150	003103	A							
001151	002000	A	320	CALL*	OUTD			01	00319
001152	100403	A							
001153	001000	A	321	JMP	RT10			01	00320
001154	001217	A							

			322	EJEC				01	00321
			323	*****				01	00322
			324	* FLAGS, POINTER AND MESSAGE BUFFERS				01	00323
			325	*****				01	00324
001155	000000	A	326	LOOP	DATA	0	ADDRESS FOR LOOPING ON ERRORS	01	00325
001156	000000	A	327	NBIT	DATA	0		01	00326
001157	000000	A	328	COMP	DATA	0		01	00327
001160	000000	A	329	ERRC	DATA	0		01	00328
001161	000000	A	330	RTSA	DATA	0		01	00329
001162	000000	A	331	TMSV	DATA	0	TEMP. STORAGE	01	00330
001163	000000	A	332	CHTL	DATA	0		01	00331
001164	000000	A	333	PINT	DATA	0		01	00332

			356	EJEC		01	00355
			357	*****		*01	00356
			358	*		*01	00357
			359	*	THE OPERATOR IS REQUESTED TO INPUT HARDWARE SETUP	*01	00358
			360	*		*01	00359
			361	*****		*01	00360
001217	005001	A	362	RT10 TZA	CLEAR PRINT FLAG	01	00361
001220	051164	A	363	STA PINT		01	00362
001221	010442	A	364	LDA \$CON	CHECK IF CONSOLE MODE.	01	00363
001222	001010	A	365	JAZ RT13		01	00364
001223	001265	A					
001224	002000	A	366	CALL* OUTC	CR/LF	01	00365
001225	100402	A					
001226	011157	A	367	LDA COMP		01	00366
001227	001010	A	368	JAZ **15		01	00367
001230	001246	A					
001231	006030	A	369	LOXI MES7	WRITE (INPUT FRC INCREMENTS PER SEC)	01	00368
001232	003122	A					
001233	002000	A	370	CALL* OUTD		01	00369
001234	100403	A					
001235	002000	A	371	CALL IPDC	INPUT DECIMAL NUMBER (DOUBLE PRECISION)	01	00370
001236	002337	A					
001237	052305	A	372	STA FROM		01	00371
001240	062307	A	373	STB FROM+1		01	00372
			374	*	COMPUTE INTERRUPTS PER MIN	01	00373
			375	*	THESE WILL BE USED LATER IN COMPUTING ELAPSED TIME	01	00374
001241	002000	A	376	CALL XDTH,060		01	00375
001242	003402	A					
001243	002334	A					
001244	052324	A	377	STA IFM		*01	00376
001245	052325	A	378	STB IFM+1		01	00377
001246	006030	A	379	LOXI MES8	WRITE (INPUT BASIC INTERRUPTS PER SEC)	01	00378
001247	003144	A					
001250	002000	A	380	CALL* OUTD		01	00379
001251	100403	A					
001252	002000	A	381	CALL IPDC		01	00380
001253	002337	A					
001254	052310	A	382	STA VIIF	INPUT DECIMAL NUMBER. (DOUBLE PRECISION)	01	00381
001255	052311	A	383	STB VIIF+1		01	00382
001256	002000	A	384	CALL XDTH,060		01	00383
001257	003402	A					
001260	002334	A					

001261	052326	A	385	STA	IVM		01	00384
001262	052327	A	386	STB	IVM+1		01	00385
001263	001000	A	387	JMP	ITT	BGN INTERRUPT TIMING TEST	01	00386
001264	001320	A						
001265	011157	A	388	LDA	COMP	CONSOLE MODE	01	00387
001266	001010	A	389	JAZ	*+13		01	00388
001267	001303	A						
001270	005001	A	390	TZA			01	00389
001271	005002	A	391	TZB			01	00390
001272	005004	A	392	TZX			01	00391
001273	000020	A	393	HLT	020		01	00392
001274	052306	A	394	STA	FRGM	INPUT IN A AND B REG. FRC INCR IN MICROSEC.	01	00393
001275	052307	A	395	STB	FRGM+1	(DOUBLE-PRECISION) (OCTAL)	01	00394
001276	002000	A	396	CALL	XDIM,060	COMPUTE INTERRUPTS PER MIN	01	00395
001277	003402	A						
001300	002334	A						
001301	052324	A	397	STA	IFM		01	00396
001302	052325	A	398	STB	IFM+1		01	00397
001303	005004	A	399	TZX			01	00398
001304	005001	A	400	TZA			01	00399
001305	005002	A	401	TZB			01	00400
001306	000021	A	402	HLT	021		01	00401
001307	052310	A	403	STA	VIIF	INPUT IN A AND B REG. VII SOURCE FREQ.	01	00402
001310	052311	A	404	STB	VIIF+1	IN HZ. IN DOUBLE PRECISION (OCTAL)	01	00403
001311	002000	A	405	CALL	XDIM,060	COMPUTE INTERRUPTS PER MIN	01	00404
001312	003402	A						
001313	002334	A						
001314	052326	A	406	STA	IVM		01	00405
001315	052327	A	407	STB	IVM+1		01	00406
001316	001000	A	408	JMP	ITT	BGN INTERRUPT TIMING TEST	01	00407
001317	001320	A						

			409	EJEC			01	00408
			410	*****			01	00409
			411	*			*01	00410
			412	* INTERRUPT TIMING TEST			01	00411
			413	*			*01	00412
			414	*****			01	00413
001320	010442	A	415	ITI LDA SCRN	CONSOLE MODE?		01	00414
001321	001010	A	416	JAZ I1	IF 30, BRANCH		01	00415
001322	001471	A						
001323	002000	A	417	CALL* OUTC	CR/LF		01	00416
001324	100402	A						
001325	006030	A	418	LDXI IM1			01	00417
001326	003175	A						
001327	002000	A	419	CALL* OUTD	IDENTIFY TEST		01	00418
001330	100403	A						
001331	011741	A	420	LDA I151	INIT TTY DEV ADDRESS		01	00419
001332	006150	A	421	ANAI 0177700			01	00420
001333	177700	A						
001334	117000	T	422	ORA* BTTY			01	00421
001335	051741	A	423	STA I151			01	00422
001336	006010	A	424	LDAI 1			01	00423
001337	000001	A						
001340	052323	A	425	STA INTT	INITIALIZE FOR IT INTRVL TIMER		01	00424
001341	011157	A	426	LDA COMP	SEE IF THERE IS A CHOICE		01	00425
001342	001010	A	427	JAZ I2	IF NOT, SKIP THE QUESTIONS		01	00426
001343	001402	A						
001344	006030	A	428	LDXI IM3			01	00427
001345	003212	A						
001346	002000	A	429	CALL* OUTD	FRC OR VII FOR INTERVAL TIMER		01	00428
001347	100403	A						
001350	002000	A	430	CALL IPDC			01	00429
001351	002337	A						
001352	052323	A	431	STB INTT			01	00430
001353	006030	A	432	ISCP LDXI IM4			01	00431
001354	003223	A						
001355	002000	A	433	CALL* OUTD	REQUEST VII SELECT COUNT		01	00432
001356	100403	A						
001357	002000	A	434	CALL IPDC			01	00433
001360	002337	A						
			435	IF ZERO, SET TO HARDWARE DEFAULT OF 10 AND SIGNAL THIS WAS			01	00434
			436	DONE BY SETTING HOFF TO ZERO			01	00435
001361	062335	A	437	STB HOFF	SET FLAG APPROPRIATELY		01	00436

001362	001020	A	438		JBZ	**4	DEFAULT		01	00437
001363	001366	A								
001364	001000	A	439		JMP	**4	NO DEFAULT		01	00438
001365	001370	A								
001366	006020	A	440		LDBI	10	SET DEFAULT		01	00439
001367	000012	A								
001370	062313	A	441		STB	SEL0+1			01	00440
001371	001010	A	442		JAZ	**4			01	00441
001372	001375	A								
001373	001000	A	443		JMP	ISCP	TOO LARGE		01	00442
001374	001452	A								
001375	005021	A	444		TBA				01	00443
001376	006140	A	445		SUBI	4096			01	00444
001377	010000	A								
001400	001002	A	446		JAP	ISCP	TOO LARGE		01	00445
001401	001452	A								
001402	006030	A	447	I2	LDXI	IM5	REQUEST INTERVAL LENGTH		01	00446
001403	003235	A								
001404	002000	A	448		CALL*	OUTD			01	00447
001405	100403	A								
001406	002000	A	449		CALL	IPDC			01	00448
001407	002337	A								
001410	005311	A	450		DAR				01	00449
001411	001002	A	451		JAP	I3	IF INTERVAL TOO LARGE, TRY AGAIN		01	00450
001412	001460	A								
001413	062321	A	452		STB	ILNG			01	00451
			453	*	FOLLOWING COMPUTES THE NUMBER OF INTERRUPTS PER INTERVAL				01	00452
001414	012323	A	454	I4	LDA	INTT	CJHOUSE CORRECT INTERRUPTS PER SEC VALUE		01	00453
001415	001010	A	455		JAZ	I5			01	00454
001416	001423	A								
001417	012310	A	456		LDA	VITF			01	00455
001420	022311	A	457		LDB	VITF+1			01	00456
001421	001000	A	458		JMP	I6			01	00457
001422	001425	A								
001423	012306	A	459	I5	LDA	FROM			01	00458
001424	022307	A	460		LDB	FROM+1			01	00459
001425	002000	A	461	I6	CALL	XDIM,ILNG	GET INTERRUPTS PER INTERVAL		01	00460
001426	003402	A								
001427	002321	A								
			462	*	CHECK TO SEE IF VII SELECT COUNT NEED BE CONSIDERED				01	00461
001430	031157	A	463		LDX	COMP	IS THERE A VII		01	00462
001431	001040	A	464		JXZ	I7	IF NOT, INTERRUPTS/INTERVAL VALUE IS OK		01	00463

001432	001512	A					
001433	032323	A	465	LDX	INTT		01 00464
001434	001040	A	466	JXZ	I7	IF FRC IS THE INTERVAL TIMER, NO MOD NEEDED	01 00465
001435	001512	A					
001436	005004	A	467	TZX		OTHERWISE, DIVIDE INTERRUPTS PER INTERVAL BY	01 00466
001437	002000	A	468	CALL	XDSU, SELC		01 00467
001440	003502	A					
001441	002312	A					
001442	001004	A	469	JAN	I71		01 00468
001443	001511	A					
001444	007400	A	470	ROF			01 00469
001445	005144	A	471	IXR			01 00470
001446	001001	A	472	JOF	I3	CUT OUT IF DIVISION COMPLETE	01 00471
001447	001460	A					
001450	001000	A	473	JMP	I8		01 00472
001451	001437	A					

			474	EJEC			01 00473
			475	* FOLLOWING HANDLES ILLEGAL INPUTS FOR INTERVAL SELECT COUNT			01 00474
001452	006030	A	476	ISCP	LDXI	IM6	01 00475
001453	003256	A					
001454	002000	A	477	CALL*	OUTD		01 00476
001455	100403	A					
001456	001000	A	478	JMP	ISCR		01 00477
001457	001353	A					
			479	* ROUTINE TO HANDLE INTERVALS WHICH ARE TO LARGE			01 00478
			480	* ROUTINE TO HANDLE INTERVALS WHICH ARE TO LARGE			01 00479
			481	* ROUTINE TO HANDLE INTERVALS WHICH ARE TO LARGE			01 00480
001460	010442	A	482	I3	LDA	%CON	01 00481
001461	001010	A	483		JAZ	I1	01 00482
001462	001471	A					
001463	006030	A	484		LDXI	IM6	01 00483
001464	003256	A					
001465	002000	A	485	CALL*	OUTD	GIVE ERROR MESSAGE	01 00484
001466	100403	A					
001467	001000	A	486	JMP	I2	GIVE ANOTHER CHANCE	01 00485
001470	001402	A					
			487	* FOLLOWING HANDLES INITIALIZATION WHEN IN CONSOLE MODE			01 00486
			488	* FOLLOWING HANDLES INITIALIZATION WHEN IN CONSOLE MODE			01 00487
			489	* FOLLOWING HANDLES INITIALIZATION WHEN IN CONSOLE MODE			01 00488
001471	005001	A	490	I1	TZA		01 00489
001472	005002	A	491		TZB		01 00490
001473	005004	A	492		TZX		01 00491
001474	000022	A	493		HLT	022	01 00492
001475	052323	A	494		STA	INTI	01 00493
001476	062336	A	495		STB	HDEF	01 00494
001477	001020	A	496		JBZ	**+4	01 00495
001500	001503	A					
001501	001000	A	497		JMP	**+4	01 00496
001502	001505	A					
001503	006020	A	498		LDBI	10	01 00497
001504	000012	A					
001505	062313	A	499		STB	SELC+1	01 00498
001506	072321	A	500		STX	ILNG	01 00499
001507	001000	A	501		JMP	I4	01 00500
001510	001414	A					

			502	EJEC			01	00501
			503	*			01	00502
001511	005042	A	504	I71	TXH		01	00503
001512	002322	A	505	I7	STR	IINT	01	00504
001513	005311	A	506		DAR		01	00505
001514	001002	A	507		JAP	I3	01	00506
001515	001460	A				TOO LARGE, IF HIGH HALF NOT ZERO OR NEG		
001516	005021	A	508		TBA		01	00507
001517	006140	A	509		SUBI	037774	01	00508
001520	037774	A						
001521	001002	A	510		JAP	I3	01	00509
001522	001460	A				IF TOO LARGE, REPORT IT		
001523	012322	A	511		LDA	IINT	01	00510
001524	001010	A	512		JAZ	I3	01	00511
001525	001460	A				IF TOO SMALL (IE ZERO), REPORT IT		
			513	*	SETUP NO1 INTERRUPT TO UPDATE	THE (V)IT ELAPSED TIME COUNTER	01	00512
001526	006010	A	514	I9	LOAI	040045	01	00513
001527	040045	A				STORE INR IN LOC 044		
001530	050044	A	515		STA	044	01	00514
001531	006010	A	516		LOAI	02000	01	00515
001532	002000	A				STORE JMPM IN 046		
001533	050046	A	517		STA	046	01	00516
001534	006010	A	518		LOAI	T10	01	00517
001535	001640	A				STORE INTERRUPT HANDLING SUBROUTINE IN / 047		
001536	050047	A	519		STA	047	01	00518
001537	010442	A	520		LDA	\$CON	01	00519
001540	001010	A	521		JAZ	T70	01	00520
001541	001546	A						
001542	006030	A	522		LUXI	IM7	01	00521
001543	003266	A				SIGNAL BEGINING OF TEST		
001544	002000	A	523		CALL*	OUT0	01	00522
001545	100403	A						
			524	*	INITIALIZE AND START CLOCKS		01	00523
001546	100447	A	525	I70	EXC	0400+RTC	01	00524
001547	005001	A	526		TZA	INIT RTC	01	00525
001550	050045	A	527		STA	045	01	00526
001551	052316	A	528		STA	UFRC	01	00527
001552	052314	A	529		STA	UVTI	01	00528
001553	052315	A	530		STA	LVII	01	00529
001554	052317	A	531		STA	LFRC	01	00530
001555	012322	A	532		LDA	TINT	01	00531
001556	052320	A	533		STA	TNYT	01	00532
						SET COUNT FOR END OF INTERVAL CHECK		

001557	011157	A	534	IX11	LDA	COMP		01	00533
001560	001010	A	535		JAZ	IX12		01	00534
001561	001571	A							
001562	012336	A	536		LDA	HDF	HARDWARE DEFAULT DESIRED	01	00535
001563	001010	A	537		JAZ	++A	YES, SO SKIP SETTING COUNT	01	00536
001564	001567	A							
001565	012313	A	538		LDA	SEIC+1		01	00537
001566	103147	A	539		DAR	RTC	SET INTERVAL SELECT COUNT	01	00538
001567	100647	A	540		EXC	0600+RTC	INIT VII COUNTER	01	00539
001570	100047	A	541		EXC	RTC	CLEAR FRC	01	00540
001571	100147	A	542	IX12	EXC	0100+RTC	ENABLE VII	01	00541

			543		FJEC			01	00542
			544	*	LOOP TILL ABORT BY SS3			01	00543
001572	001400	A	545	I11	JSS3 RTCT			01	00544
001573	000527	A							
001574	002000	A	546		JNPM IUPR	UPDATE FRC ELAPSED TIME COUNTER IF NECESSARY		01	00545
001575	001703	A							
			547	*	CHECK FOR END OF INTERVAL			01	00546
001576	022323	A	548		LDB IUTT			01	00547
001577	001020	A	549		JBZ I141			01	00548
001600	001604	A							
001601	010045	A	550		LDA 045	GET VII CNT		01	00549
001602	001000	A	551		JMP I14			01	00550
001603	001614	A							
001604	012317	A	552	I141	LDA LFPC			01	00551
001605	006150	A	553		ANAI 037777			01	00552
001606	037777	A							
001607	052330	A	554		STA EMFR	STORE IN TEMP LOC		01	00553
001610	102547	A	555		CIA RTC			01	00554
001611	122330	A	556		ADD EMFR	NO ADD, NO OVERFLOW POSSIBLE		01	00555
001612	006150	A	557		ANAI 037777			01	00556
001613	037777	A							
001614	142320	A	558	I14	SUB INYT	SUBTRACT TARGET NUMBER OF INTERRUPTS		01	00557
001615	001004	A	559		JAN I15	IF TOO LOW, INTERVAL NOT UP		01	00558
001616	001736	A							
001617	006140	A	560		SUBI 04	IF CLOSE ENOUGH TO TARGET, TIME UP		01	00559
001620	000004	A							
001621	001002	A	561		JAP I15			01	00560
001622	001736	A							
			562	*	SIGNAL INTERVAL UP			01	00561
			563	*	BLINK CONSOLE LIGHTS			01	00562
001623	102577	A	564	I162	CIA 077			01	00563
001624	005211	A	565		CPA			01	00564
001625	103177	A	566		DAR 077			01	00565
			567	*	BLINK THE OVERFLOW LIGHT			01	00566
001626	001001	A	568	I161	JUF I17			01	00567
001627	001631	A							
001630	007401	A	569		SOF			01	00568
			570	*	COMPUTE NEW TARGET COUNT			01	00569
001631	012320	A	571	I17	LDA INYT	GET OLD TARGET CNT		01	00570
001632	122322	A	572		ADD IINT	COMPUTE NEW ONE		01	00571
001633	006150	A	573		ANAI 037777	MOD COUNTER SIZE		01	00572
001634	037777	A							

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VORTEX DASHR

1945 HOURS

001635 052320 A 574
001636 001000 A 575
001637 001736 A

STA INVT
JMP I15

01 00573
01 00574

			576		EJEC			01	00575
			577	*	FOLLOWING IS EXECUTED ON MOI INTERRUPT			01	00576
			578	*	IT UPDATES THE DOUBLE PRECISION II COUNT			01	00577
001640	000000	A	579	I10	DATA	0		01	00578
001641	100247	A	580		EXC	0200+RTC	INHIBIT MOI	*****	
001642	051677	A	581		STA	I10T		01	00579
001643	061700	A	582		STR	I10T+1		01	00580
001644	071701	A	583		STX	I10T+2		01	00581
001645	005004	A	584		TZX			01	00582
001646	005544	A	585		AOPX		SAVE ORIGINAL OVERFLOW CONDITION	01	00583
001647	010045	A	586		LDA	045		01	00584
001650	006150	A	587		ANAI	037777		01	00585
001651	037777	A							
001652	050045	A	588		STA	045		01	00586
001653	012315	A	589		LDA	LVTI		01	00587
001654	007400	A	590		RDF			01	00588
001655	006120	A	591		ADDT	040000		01	00589
001656	040000	A							
001657	006150	A	592	XDAY	ANAI	077777		01	00590
001660	077777	A							
001661	052315	A	593		STA	LVTI		01	00591
001662	012314	A	594		LDA	HVTI		01	00592
001663	005511	A	595		AQFA			01	00593
001664	052314	A	596		STA	HVTI		01	00594
001665	007400	A	597		RDF			01	00595
001666	001040	A	598		JXZ	T101		01	00596
001667	001671	A							
001670	007401	A	599		SDF		RESTORE OVERFLOW, IF NEC.	01	00597
001671	011677	A	600	I101	LDA	T10T		01	00598
001672	021700	A	601		LDB	I10T+1		01	00599
001673	031701	A	602		LDX	T10T+2		01	00600
001674	100147	A	603		EXC	0100+RTC	ENABLE RTC	*****	
001675	001000	A	604		JMP*	I10		01	00601
001676	101640	A							
001677	000000	A	605	I10T	DATA	0,0,0,0		01	00602
001700	000000	A							
001701	000000	A							
001702	000000	A							

			606	EJEC			01	00603
			607	*	FOLLOWING IS MANUAL UPDATE OF FRC ELAPSED TIME COUNTER		01	00604
001703	000000	A	608	IUER	DATA	0	01	00605
001704	011157	A	609		LDA	COMP	01	00606
001705	001010	A	610		JAZ*	IUER	01	00607
						IF NO FRC, CUT OUT		
001706	101703	A						
001707	102547	A	611		CIA	RTC	01	00608
001710	006150	A	612		ANAI	040000	01	00609
001711	040000	A						
001712	001010	A	613		JAZ*	IUER	01	00610
						IF BIT 14 IS ON, TIME TO UPDATE LFRC		
001713	101703	A						
001714	005004	A	614		TZX		01	00611
001715	005544	A	615		AUFX	SAVE OVERFLOW	01	00612
			616	*	MOVE DYNAMIC COUNT INTO DBL PREC TOTAL		01	00613
001716	007400	A	617		RUF		01	00614
001717	102547	A	618		CIA	RTC	01	00615
001720	100047	A	619		EXC	RTC	01	00616
001721	122317	A	620		ADD	LFRC	01	00617
001722	006150	A	621		ANAI	077777	01	00618
001723	077777	A				CUT OFF THE SIGN BIT		
001724	052317	A	622		STA	LFRC	01	00619
001725	012316	A	623		LDA	UFRC	01	00620
001726	005511	A	624		AOFA	ADD IM ANY OVERFLOW	01	00621
001727	052316	A	625		STA	UFRC	01	00622
001730	007400	A	626		RUF		01	00623
001731	001040	A	627		JXZ*	IUER	01	00624
001732	101703	A						
001733	007401	A	628		SUF	RESTORE OVERFLOW	01	00625
001734	001000	A	629		JMP*	IUER	01	00626
001735	101703	A						

			630	EJEC			01 00627
			631	*	FOLLOWING CHECKS FOR ELAPSED TIME READOUT REQUESTS		01 00628
001736	010442	A	632	I15	LDA	SCON	01 00629
001737	001010	A	633		JAZ	I30	01 00630
001740	002150	A				IF NO TTY, MAKE SPEC CHECK	
001741	101201	A	634	I151	SEN	0201, **4	01 00631
001742	001745	A				SEE IF A CHARACTER AWAITS	
001743	001000	A	635		JMP	I11	01 00632
001744	001572	A				IF NOT, LOOP BACK TO REPEAT PREV CHECKS	
001745	002000	A	636		CALL*	INPR	01 00633
001746	100411	A				OTHERWISE, GET THE CHARACTER	
001747	001000	A	637		JMP	I11	01 00634
001750	001572	A				IF SS3 ON, RETURN TO BEGINNING OF TEST	
001751	005012	A	638		TBA		01 00635
001752	006140	A	639		SUBI	I11	01 00636
001753	000240	A					
001754	001010	A	640		JAZ	I50	01 00637
001755	001774	A				ELAPSED TIME WANTED	
001756	002000	A	641		CALL*	OUTC	01 00638
001757	100402	A				CR/LF	
001760	005021	A	642		TBA		01 00639
001761	006140	A	643		SUBI	I11	01 00640
001762	000322	A					
001763	001010	A	644		JAZ	I70	01 00641
001764	001546	A				RESET ELAPSED TIME COUNTERS	
001765	005021	A	645		TBA		01 00642
001766	006140	A	646		SUBI	I11	01 00643
001767	000313	A					
001770	001010	A	647		JAZ	I11	01 00644
001771	001320	A				RESTART	
001772	001000	A	648		JMP	I11	01 00645
001773	001572	A				IF NONE OF THESE, IGNORE IT	

			649	EJEC			01	00646
			650	*	FOLLOWING COMPUTES ELAPSED TIME AND OUTPUTS IT		01	00647
			651	*	DURING THIS TIME, FREQUENT CALLS ARE MADE TO ROUTINE IUFR.		01	00648
			652	*	THIS IS NECESSARY SINCE A DELAY OF MORE THAN 1-6 SECONDS		01	00649
			653	*	BETWEEN CALLS COULD RESULT IN BIT 15 OF THE FRC COUNT BECOMING		01	00650
			654	*	A ONE, SUCH A SITUATION WOULD CAUSE ERRORS IN FRC ELAPSED		01	00651
			655	*	TIME COUNT		01	00652
			656	*			01	00653
001774	002000	A	657	I50	JMPM ICOM	COMPUTE ELAPSED TIMES	01	00654
001775	002176	A						
001776	002000	A	658		CALL* OUTC	CR/LF	01	00655
001777	100402	A						
002000	011157	A	659		LDA COMP		01	00656
002001	001010	A	660		JAZ I51	IF NO FRC, SKIP NEXYT	01	00657
002002	002055	A						
002003	002000	A	661		JMPM IUFR	UPDATE FRC FLAP. TIME CNTR IF NEC.	01	00658
002004	001703	A						
002005	006030	A	662		LDXI IM9		01	00659
002006	003275	A						
002007	002000	A	663		CALL* OUTD	TYPE 'FRC: '	01	00660
002010	100403	A						
002011	002000	A	664		CALL IUFR	CHECK FRC COUNT	01	00661
002012	001703	A						
002013	005001	A	665		TZA		01	00662
002014	022330	A	666		LDB EMFR	GET ELAPSED MIN FOR FRC	01	00663
002015	006030	A	667		LDXI RUF0		01	00664
002016	002614	A						
002017	002000	A	668		CALL CONV		01	00665
002020	002433	A						
002021	006030	A	669		LDXI RUF0+3	LAST FOUR CHARACTERS	01	00666
002022	002617	A						
002023	002000	A	670		CALL* OUTD	OUT ELAPSED MIN	01	00667
002024	100403	A						
002025	002000	A	671		CALL IUFR	CHECK FRC COUNT	01	00668
002026	001703	A						
002027	006030	A	672		LDXI IM10		01	00669
002030	003301	A						
002031	002000	A	673		CALL* OUTD	OUT 'MIN '	01	00670
002032	100403	A						
002033	002000	A	674		CALL IUFR	CHECK FRC COUNT	01	00671
002034	001703	A						
002035	005001	A	675		TZA		01	00672

002036	022331	A	676	LDR	FSFR	GET ELAPSED SEC FOR FRC	01	00673
002037	006030	A	677	LDXI	BUFD		01	00674
002040	002614	A						
002041	002000	A	678	CALL	CONV		01	00675
002042	002433	A						
002043	006030	A	679	LDXI	BUFD+3	LAST FOUR CHARACTERS	01	00676
002044	002617	A						
002045	002000	A	680	CALL*	OUTD		01	00677
002046	100403	A						
002047	002000	A	681	CALL	IUFH	CHECK FRC COUNT	01	00678
002050	001703	A						
002051	006030	A	682	LDXI	IM11		01	00679
002052	003304	A						
002053	002000	A	683	CALL*	OUTD	OUT 'SEC' AND CR/LF	01	00680
002054	100403	A						
002055	002000	A	684 151	JMPM	IUFH		01	00681
002056	001703	A						
002057	006030	A	685	LDXI	IM12		01	00682
002060	003310	A						
002061	002000	A	686	CALL*	OUTD		01	00683
002062	100403	A						
002063	002000	A	687	CALL	IUFH	CHECK FRC COUNT	01	00684
002064	001703	A						
002065	005001	A	688	TZA			01	00685
002066	022332	A	689	LDR	EMVI	GET ELAPSED MIN FOR VII	01	00686
002067	006030	A	690	LDXI	BUFD		01	00687
002070	002614	A						
002071	002000	A	691	CALL	CONV		01	00688
002072	002433	A						
002073	006030	A	692	LDXI	BUFD+3	LAST FOUR CHARACTERS	01	00689
002074	002617	A						
002075	002000	A	693	CALL*	OUTD	OUTPUT ELAPSED MIN	01	00690
002076	100403	A						
002077	002000	A	694	CALL	IUFH	CHECK FRC COUNT	01	00691
002100	001703	A						
002101	006030	A	695	LDXI	IM10		01	00692
002102	003301	A						
002103	002000	A	696	CALL*	OUTD	OUTPUT 'MIN, I	01	00693
002104	100403	A						
002105	002000	A	697	CALL	IUFH	CHECK FRC COUNT	01	00694
002106	001703	A						
002107	005001	A	698	TZA			01	00695

002110	022333	A	699	LDB	ESVI	GET ELAPSED SEC	01	00696
002111	006030	A	700	LDXI	BUFO		01	00697
002112	002614	A						
002113	002000	A	701	CALL	CONV		01	00698
002114	002433	A						
002115	006030	A	702	LDXI	BUFO+3	LAST FOUR CHARACTERS	01	00699
002116	002617	A						
002117	002000	A	703	CALL*	OUTD	OUTPUT ELAPSED SEC	01	00700
002120	100403	A						
002121	002000	A	704	CALL	IUFR	CHECK FRC COUNT	01	00701
002122	001703	A						
002123	006030	A	705	LDXI	IM11		01	00702
002124	003304	A						
002125	002000	A	706	CALL*	OUTD	OUTPUT 1 SEC	01	00703
002126	100403	A						
002127	002000	A	707	CALL	IUFR	CHECK FRC COUNT	01	00704
002130	001703	A						
			708 *	REINIT THE	INTERVAL TIMER	TARGET CNT	01	00705
002131	102547	A	709	CIA	RTC	ASSUME FRC THE INT TMR	01	00706
002132	122317	A	710	ADD	LFRC		01	00707
002133	006150	A	711	ANAI	037777		01	00708
002134	037777	A						
002135	022323	A	712	LDR	INTT	IS THE FRC THE INTERVAL TIMER?	01	00709
002136	001020	A	713	JBZ	152	IF SO, ALL OK	01	00710
002137	002141	A						
002140	010045	A	714	LDA	045	ELSE, USE VIT	01	00711
002141	122322	A	715 I52	ADD	IINT	ADD IN INTERRUPTS PER INTERVAL	01	00712
002142	006150	A	716	ANAI	037777	MOD COUNTER SIZE	01	00713
002143	037777	A						
002144	052320	A	717	STA	INXT	USE AS NEW TARGET COUNT	01	00714
002145	007400	A	718	RDF		RESET OVERFLOW INDICATOR	01	00715
002146	001000	A	719	JMP	I11		01	00716
002147	001572	A						

			720	EJEC			01 00717
			721	★ FOLLOWING HANDLES ELAPSED TIME READOUTS IN CONSOLE MODE			01 00718
002150	001100	A	722	I30 JSS1	★+4	NEED ELAPSED TIME?	01 00719
002151	002154	A					
002152	001000	A	723	JMP	I11	IF NOT, LOOP BACK	01 00720
002153	001572	A					
002154	002000	A	724	JMPM	ICOM	OTHERWISE, GET ELAPSED TIME	01 00721
002155	002176	A					
002156	012332	A	725	LDA	EMVI	GET MIN/SEC CNT	01 00722
002157	004246	A	726	LRLA	F		01 00723
002160	112333	A	727	ORA	ESVI		01 00724
002161	005012	A	728	TAB			01 00725
002162	011157	A	729	LDA	EMPR	A FRC?	01 00726
002163	001010	A	730	JAZ	I301		01 00727
002164	002170	A					
002165	012330	A	731	LDA	EMPR	GET MIN/SEC COUNT	01 00728
002166	004246	A	732	LRLA	F		01 00729
002167	112331	A	733	ORA	ESFR		01 00730
002170	005004	A	734	I301	T2X		01 00731
002171	000023	A	735	HLT	023	RETURN ELAPSED TIMES	01 00732
002172	001004	A	736	JAN	ITT	REINIT?	01 00733
002173	001320	A					
002174	001000	A	737	JMP	I70		01 00734
002175	001546	A					

			738	EJEC				01	00735	
			739	* FOLLOWING COMPUTES ELAPSED TIMES IN MIN AND SEC					01	00736
002176	000000	A	740	ICOM	DATA	0		01	00737	
002177	005001	A	741		TZA			01	00738	
002200	102647	A	742	CIB	RTC		GET CURRENT FRC COUNT	01	00739	
002201	062331	A	743	STR	ESFR		SAVE IT TEMPORARILY IN ESFR	01	00740	
002202	020045	A	744	LDB	045			01	00741	
002203	002000	A	745	CALL	XDAD,UVII		GET CURRENT VIT DOBL PREC CNT	01	00742	
002204	003434	A								
002205	002314	A								
002206	031157	A	746	LUX	COMP			01	00743	
002207	001040	A	747	JXZ	IC1			01	00744	
002210	002215	A								
002211	002000	A	748	CALL	XDIM,SELC+1		IF VII, ADJUST FOR SELECT COUNT	01	00745	
002212	003402	A								
002213	002313	A								
002214	005004	A	749	TZX				01	00746	
002215	002000	A	750	IC1	CALL	XDSU,IVM	SUB INCR PER MIN	01	00747	
002216	003502	A								
002217	002326	A								
002220	001004	A	751	JAN	IC2			01	00748	
002221	002225	A								
002222	005144	A	752	IXR				01	00749	
002223	001000	A	753	JMP	IC1			01	00750	
002224	002215	A								
002225	002000	A	754	IC2	CALL	XDAD,IVM		01	00751	
002226	003434	A								
002227	002326	A								
002230	072332	A	755	STX	EMVI		SAVE ELAPSED MIN	01	00752	
002231	005004	A	756	TZX				01	00753	
002232	002000	A	757	IC3	CALL	XDSU,VIIF		01	00754	
002233	003502	A								
002234	002310	A								
002235	001004	A	758	JAN	IC4			01	00755	
002236	002242	A								
002237	005144	A	759	IXR				01	00756	
002240	001000	A	760	JMP	IC3			01	00757	
002241	002232	A								
002242	072333	A	761	IC4	STX	ESVI	STORE ELAPSED SEC	01	00758	
002243	011157	A	762	LDA	COMP		AN FRC?	01	00759	
002244	001010	A	763	JAZ*	ICOM		IF NOT, DONE	01	00760	
002245	102176	A								

002246	002000	A	764	CALL	IUFR	UPDATE FRC ELAP. TIME CNTR. IF NEC	01	00761
002247	001703	A						
002250	005001	A	765	TZA			01	00762
002251	022331	A	766	LDB	ESFR	GET CURRENT FRC COUNT FROM ITS TEMP STORAGE	01	00763
002252	002000	A	767	CALL	XDAD,UFRC	GET DBL PREC TOTAL	01	00764
002253	003434	A						
002254	002316	A						
002255	005004	A	768	TZX			01	00765
002256	002000	A	769	IC5	CALL	XDSU,IF4	01	00766
002257	003502	A						
002260	002324	A						
002261	001004	A	770	JAN	IC6		01	00767
002262	002266	A						
002263	005144	A	771	IXR			01	00768
002264	001000	A	772	JMP	IC5		01	00769
002265	002256	A						
002266	002000	A	773	IC6	CALL	XDAD,IF4	01	00770
002267	003434	A						
002270	002324	A						
002271	072330	A	774	STX	EMFR	STORE FLAP MIN	01	00771
002272	005004	A	775	TZX			01	00772
002273	002000	A	776	IC7	CALL	XDSU,FRCH	01	00773
002274	003502	A						
002275	002306	A						
002276	001004	A	777	JAN	IC8		01	00774
002277	002303	A						
002300	005144	A	778	IXR			01	00775
002301	001000	A	779	JMP	IC7		01	00776
002302	002273	A						
002303	072331	A	780	IC8	STX	ESFR	01	00777
002304	001000	A	781	JMP*	ICOM	SAVE ELAPSED SFC	01	00778
002305	102176	A						

002306	000000	A	782	EJEC				01 00779
			783	FRCM	DATA	0,0	FRC INCR, PER SEC (DOUBLE PREC.)	01 00780
002307	000000	A						
002310	000000	A	784	VIIF	DATA	0,0	VII INTERRUPTS PER SEC (DOUBLE PREC.)	01 00781
002311	000000	A						
002312	000000	A	785	SELC	DATA	0,0		01 00782
002313	000000	A						
002314	000000	A	786	UVIT	DATA	0	UPPER HALF, VII FLAP TIME CNTR	01 00783
002315	000000	A	787	LVIT	DATA	0	LOWER HALF	01 00784
002316	000000	A	788	UFRC	DATA	0	UPPER HALF, FRC FLAP TIME CNTR	01 00785
002317	000000	A	789	LFRC	DATA	0	LOWER HALF DBL PREC FRC ELAP TIME CNTR	01 00786
002320	000000	A	790	INXT	DATA	0	COUNT AT END OF NEXT INTERVAL	01 00787
002321	000000	A	791	ILNG	DATA	0	INTERVAL LENGTH	01 00788
002322	000000	A	792	IINT	DATA	0	NUMBER OF INTERRUPTS PER INTERVAL	01 00789
002323	000000	A	793	INTT	DATA	0	INTERVAL TIMER, 1=FRC, 1=VII	01 00790
002324	000000	A	794	IFM	DATA	0,0	DBL PREC INCR PER MIN FRC	01 00791
002325	000000	A						
002326	000000	A	795	IVM	DATA	0,0	DBL PREC VII INCR PER MIN	01 00792
002327	000000	A						
002330	000000	A	796	EMFR	DATA	0	TEMP LDC FOR ELAP TIME COMP	01 00793
002331	000000	A	797	ESFR	DATA	0		01 00794
002332	000000	A	798	EMVT	DATA	0		01 00795
002333	000000	A	799	ESVI	DATA	0		01 00796
002334	000074	A	800	D50	DATA	60		01 00797
002335	007370	A	801	STTY	DATA	07370	POINTER TO TTY DEV ADDRESS	01 00798
002336	000000	A	802	HDEF	DATA	0	FLAG: IF ZERO, HRDWR DFFAULT FOR SELC CNT	01 00799

			803	EJEC			01	00800
			804	*****			*01	00801
			805	*			*01	00802
			806	*	INPUT DECIMAL NUMBER SUBROUTINE (DOUBLE PRECISION)		*01	00803
			807	*	RETURN NUMBER IN A (HIGH ORDER) AND B (LOW ORDER)		*01	00804
			808	*			*01	00805
			809	*****			*01	00806
002337	000000	A	810	IPDC	ENTR	0	01	00807
002340	005001	A	811		TZA	ZERO OUT DOUBLE PRECISION SUM.	01	00808
002341	052426	A	812		STA	DPSM	01	00809
002342	052427	A	813		STA	DPSM+1	01	00810
002343	002000	A	814	IPD1	CALL*	TNPB	01	00811
002344	100411	A				GET 1 CHAR. IN A REG.		
002345	001000	A	815		JMP	PTCI	01	00812
002346	000527	A				TERMINATION EXIT IF SS3 SET		
002347	005012	A	816		TAB		01	00813
002350	006140	A	817		SUBI	0256	01	00814
002351	000256	A				CHECK IF PERIOD		
002352	001010	A	818		JAZ	IPD4	01	00815
002353	002413	A						
002354	005021	A	819		TBA		01	00816
002355	006140	A	820		SUBI	0254	01	00817
002356	000254	A				CHECK IF COMMA.		
002357	001010	A	821		JAZ	IPD5	01	00818
002360	002420	A						
002361	005021	A	822		TBA		01	00819
002362	006140	A	823		SUBI	0260	01	00820
002363	000260	A				CHECK IF LEGAL CHAR.		
002364	001004	A	824		JAN	IPD3	01	00821
002365	002407	A						
002366	052431	A	825		STA	VAL9	01	00822
002367	006140	A	826		SUBI	012	01	00823
002370	000012	A						
002371	001002	A	827		JAP	IPD3	01	00824
002372	002407	A						
002373	012426	A	828		LDA	DPSM	01	00825
002374	022427	A	829		LDR	DPSM+1	01	00826
002375	002000	A	830		CALL	XDIM,TEN	01	00827
002376	003402	A				MULTI DP SUM BY TEN		
002377	002432	A						
002400	002000	A	831		CALL	XDAD,VAL9-1	01	00828
002401	003434	A				ADD CHAR JUST READ		

002402	002430	A						
002403	052426	A	832	STA	DPSM			01 00829
002404	052427	A	833	STB	DPSM+1			01 00830
002405	001000	A	834	JMP	IPD1	GET NEXT CHAR.		01 00831
002406	002343	A						
002407	002000	A	835	IPD3	CALL*	OUTG	ILLEGAL CHAR. MESSAGE	01 00832
002410	100406	A						
002411	001000	A	836	JMP	IPDC+1			01 00833
002412	002340	A						
002413	002000	A	837	IPD4	CALL*	OUTC	OUTPUT CR/LF	01 00834
002414	100402	A						
002415	005004	A	838	TZX		PERIOD CHAR.		01 00835
002416	001000	A	839	JMP	*+4			01 00836
002417	002422	A						
002420	006030	A	840	IPD5	LDXI	1	COMMA CHAR.	01 00837
002421	000001	A						
002422	012426	A	841	LDA	DPSM			01 00838
002423	022427	A	842	LDB	DPSM+1			01 00839
002424	001000	A	843	JMP*	IPDC			01 00840
002425	102337	A						
002426	000000	A	844	DPSM	DATA	0,0,0		01 00841
002427	000000	A						
002430	000000	A						
002431	000000	A	845	VALU	DATA	0		01 00842
002432	000012	A	846	TEN	DATA	10		01 00843

			847	EJEC				01	00844
			848	*****				01	00845
			849	*	CONVERT DOUBLE PRECISION OCTAL NUMBER TO ASCII DECIMAL			01	00846
			850	*				01	00847
			851	*****				01	00848
002433	000000	A	852	CONV	FNTR			01	00849
002434	072720	A	853	STX	ADDR+1	ADDRESS OF BUFFER		01	00850
002435	052636	A	854	STA	SAVN	TEMP STORAGE		01	00851
002436	052637	A	855	STB	SAVN+1			01	00852
002437	006030	A	856	LDXI	BUFC	LOC OF 9 WORD TABLE		01	00853
002440	002624	A							
002441	072717	A	857	STX	ADDR			01	00854
002442	006030	A	858	LDXI	TRDC	LOC OF TABLE		01	00855
002443	002570	A							
002444	072452	A	859	STX	CON1+2			01	00856
002445	072460	A	860	STX	CON3+2			01	00857
002446	072467	A	861	STX	CON4+2			01	00858
002447	005004	A	862	TZX		INTEGER COUNTER		01	00859
002450	002000	A	863	CON1	CALL	XDSU,0	SUB. VALUE FROM TABLE	01	00860
002451	003502	A							
002452	000000	A							
002453	001004	A	864	JAN	CON5	CHECK IF VALUE LESS THAN TABLE	INTEGER	001	00861
002454	002472	A							
002455	005144	A	865	CON2	TXR	INCR. INTEGER COUNT		01	00862
002456	002000	A	866	CON3	CALL	XDSU,0	SUB. VALUE FROM TABLE	01	00863
002457	003502	A							
002460	000000	A							
002461	001004	A	867	JAN	***	CHECK IF VALUE NEG.		01	00864
002462	002465	A							
002463	001000	A	868	JMP	CON2	NO		01	00865
002464	002455	A							
002465	002000	A	869	CON4	CALL	XDAU,0	ADD TABLE VALUE BACK	01	00866
002466	003434	A							
002467	000000	A							
002470	052636	A	870	STA	SAVN	SAVE VALUE		01	00867
002471	062637	A	871	STB	SAVN+1			01	00868
002472	077000	T	872	CON5	STX*	ADDR	STORE INTEGER IN TABLE	01	00869
002473	042717	A	873	INR	ADDR			01	00870
002474	032452	A	874	LDX	CON1+2	UP-DATE BUFFER POINTER BY TWO.		01	00871
002475	005144	A	875	TXR				01	00872
002476	005144	A	876	TXR				01	00873
002477	072452	A	877	STX	CON1+2			01	00874

002500	072460	A	878		STX	CON3+2		01	00875
002501	072467	A	879		STX	CON4+2		01	00876
002502	035001	A	880		LDX	1,1	CHECK IF NEXT TABLE VALUE ZERO	01	00877
002503	001040	A	881		JXZ	CON9		01	00878
002504	002512	A							
002505	005004	A	882		TZX		ZERO INTEGER COUNTER	01	00879
002506	012636	A	883		LDA	SAVN	RETURN VALUE	01	00880
002507	022637	A	884		LDB	SAVN+1		01	00881
002510	001000	A	885		JMP	CON1		01	00882
002511	002450	A							
002512	006030	A	886	CON9	LDXI	(BUFC)	ADD ASCII NOTATION TO BINARY NUMBER	01	00883
002513	002624	A							
002514	005002	A	887		TZE		BLANK OUT HIGH ORDER DIGITS.	01	00884
002515	015000	A	888	CONL	LDA	0,1	GET BINARY NUMBER	01	00885
002516	001010	A	889		JAZ	CON7		01	00886
002517	002534	A							
002520	005322	A	890		OBR			01	00887
002521	006120	A	891	CON6	ADDI	0260	ADD ASCII CHARACTER ZERO.	01	00888
002522	000260	A							
002523	055000	A	892		STA	0,1		01	00889
002524	005144	A	893		IXR			01	00890
002525	005041	A	894		TXA			01	00891
002526	006140	A	895		SUBI	(BUFC+9)	CHECK IF 9 CHARACTERS CHECKED.	01	00892
002527	002635	A							
002530	001010	A	896		JAZ	CON8		01	00893
002531	002544	A							
002532	001000	A	897		JMP	CONL		01	00894
002533	002515	A							
002534	001020	A	898	CON7	JBZ	*+4		01	00895
002535	002540	A							
002536	001000	A	899		JMP	CON6		01	00896
002537	002521	A							
002540	006120	A	900		ADDI	0240	BLANK OUT HIGH ORDER CHARACTER	01	00897
002541	000240	A							
002542	001000	A	901		JMP	CON6+2		01	00898
002543	002523	A							
002544	006030	A	902	CON8	LDXI	(BUFC-1)	PACK ASCII CHARACTERS	01	00899
002545	002623	A							
002546	015000	A	903	CON11	LDA	0,1	GET HIGH ORDER CHAR	01	00900
002547	005144	A	904		IXR			01	00901
002550	004250	A	905		LRLA	8		01	00902
002551	125000	A	906		ADD	0,1	GET LOW ORDER CHAR.	01	00903

002552	005144	A	907	IXR			01 00904
002553	057000	T	908	STA*	ADDR+1	STORE CHAR. IN BUFFER	01 00905
002554	042720	A	909	INR	ADDR+1		01 00906
002555	005041	A	910	TXA			01 00907
002556	006140	A	911	SUBI	(BUFC+9)	CHECK IF BUFFER BACKED	01 00908
002557	002535	A					
002560	001010	A	912	JAZ	*+4		01 00909
002561	002564	A					
002562	001000	A	913	JMP	C011	GET NEXT CHARACTERS.	01 00910
002563	002546	A					
002564	002000	A	914	CALL	IUPR	UPDATE FRC ELAP. TIME CNTR. IF NEC	01 00911
002565	001703	A					
002566	001000	A	915	JMP*	CONV		01 00912
002567	102433	A					
002570	005753	A	916	TRDC	DATA	05753,050400 100000000	01 00913
002571	060400	A					
002572	000461	A	917	DATA	0461,013200 10000000		01 00914
002573	013200	A					
002574	000036	A	918	DATA	036,041100 1000000		01 00915
002575	041100	A					
002576	000003	A	919	DATA	03,03240 100000		01 00916
002577	003240	A					
002600	000000	A	920	DATA	0,023420 10000		01 00917
002601	023420	A					
002602	000000	A	921	DATA	0,01750 1000		01 00918
002603	001750	A					
002604	000000	A	922	DATA	0,0144 100		01 00919
002605	000144	A					
002606	000000	A	923	DATA	0,012 10		01 00920
002607	000012	A					
002610	000000	A	924	DATA	0,01 1		01 00921
002611	000001	A					
002612	000000	A	925	DATA	0,0 0		01 00922
002613	000000	A					
002614			926	BUFB	BSS	5	01 00923
002621	120240	A	927	DATA	1,0		01 00924
002622	000000	A					
002623	000240	A	928	DATA	0240		01 00925
002624			929	BUFC	BSS	9	01 00926
002635	000000	A	930	EGF	DATA	0	01 00927
002636	000000	A	931	AVR	DATA	0,0	01 00928
002637	000000	A					

002640	000000	A	932	TIME	DATA	0	TEMP. FR TIME	01	00929
002641	000000	A	933	CONT	DATA	0	TIME COUNTER	01	00930
002642			934	TABT	BSS	34	TIME BUFFER FOR 20 TIME PERIOD COUNTS	01	00931
002704	000000	A	935	SUMH	DATA	0,0	DOUBLE PRECISION ADD	01	00932
002705	000000	A							
002706	000000	A	936	TWNT	DATA	0,20		01	00933
002707	000024	A							
002710	000006	A	937	SIXM	DATA	6		01	00934
002711	000000	A	938	VAR	DATA	0,0		01	00935
002712	000000	A							
002713	000000	A	939	HVAL	DATA	0,0	TOLERANCE HIGH	01	00936
002714	000000	A							
002715	000000	A	940	LVAL	DATA	0,0	TOLERANCE LOW	01	00937
002716	000000	A							
002717			941	ADDR	BSS	2	STORAGE LOCATIONS	01	00938

			942	EJEC			01	00939	
			943	*****				01	00940
			944	*	TIME DELAY OF 1/4 SECOND		*01	00941	
			945	*	X = NO OF 1/4 SECONDS TO DELAY		*01	00942	
			946	*	CALLING SEQ.		*01	00943	
			947	*	LDXI NUMBER		*01	00944	
			948	*	CALL TOSC		*01	00945	
			949	*			*01	00946	
			950	*****				01	00947
002721	000000	A	951	TOSC	ENTR		01	00948	
002722	052742	A	952		STA TOSA	SAVE REGISTERS	01	00949	
002723	062743	A	953		STB TOSA+1		01	00950	
002724	072744	A	954		SIX TOSA+2		01	00951	
002725	002000	A	955	TDS1	CALL HLFS		01	00952	
002726	002745	A							
002727	032744	A	956		LDX TOSA+2		01	00953	
002730	005344	A	957		DXR	X = NO. OF 1/4 SEC. TIME OUTS.	01	00954	
002731	072744	A	958		SIX TOSA+2		01	00955	
002732	001040	A	959		JXZ TDS2		01	00956	
002733	002736	A							
002734	001000	A	960		JMP TDS1		01	00957	
002735	002725	A							
002736	012742	A	961	TDS2	LDA TOSA	RESTORE REGISTERS	01	00958	
002737	022743	A	962		LDR TOSA+1		01	00959	
002740	001000	A	963		JMP* TOSC		01	00960	
002741	102721	A							
002742	000000	A	964	TOSA	DATA 0,0,0		01	00961	
002743	000000	A							
002744	000000	A							
002745	000000	A	965	HLFS	ENTR		01	00962	
002746	011157	A	966		LDA COMP		01	00963	
002747	001010	A	967		JAZ **4		01	00964	
002750	002753	A							
002751	006010	A	968		LDAI 15632		01	00965	
002752	036420	A							
002753	006120	A	969		ADDI 10684		01	00966	
002754	024674	A							
002755	005014	A	970		TAX	1/4 SECOND TIME-OUT	01	00967	
002756	001040	A	971	HLFS	JXZ* HLFS		01	00968	
002757	102745	A							
002760	012762	A	972		LDA **2		01	00969	
002761	012763	A	973		LDA **2		01	00970	

002762 012764 A 974
002763 012765 A 975
002764 005344 A 976
002765 001000 A 977
002766 002756 A

LDA **2
LDA **2
DXR
JMP HLF1

01 00971
01 00972
01 00973
01 00974

Address	Content	Label	Value	Page
002767	151305 A	97H		
002770	140714 A	979 MES1		
002771	120324 A			
002772	144715 A			
002773	142640 A			
002774	141714 A			
002775	147703 A			
002776	145640 A			
002777	152305 A			
003000	151724 A			
003001	106612 A			
003002	000000 A			
003003	144657 A	980 MES2		
003004	147640 A			
003005	144716 A			
003006	151724 A			
003007	151325 A			
003010	141724 A			
003011	144717 A			
003012	147240 A			
003013	140716 A			
003014	142240 A			
003015	144716 A			
003016	152305 A			
003017	151322 A			
003020	152720 A			
003021	152240 A			
003022	152305 A			
003023	151724 A			
003024	106612 A			
003025	000000 A			
003026	142722 A	981 MES3		
003027	151317 A			
003030	151240 A			
003031	147317 A			
003032	127240 A			
003033	136640 A			
003034	000000 A			
003035	153301 A	982 MES4		
003036	151311 A			
003037	140702 A			

01 00975
01 00976

'REAL TIME CLOCK TEST',0106612,0

'I/O INSTRUCTION AND INTERRUPT TEST',0106612,0

01 00977

'ERROR NO. = 1,0

01 00978

'VARIABLE',0

01 00979

003040	146305	A				
003041	000000	A				
003042	120311	A	983 MESA	DATA	' INTERVAL INTERRUPT CHECK ',0106612,0	01 00980
003043	147324	A				
003044	142722	A				
003045	153301	A				
003046	146240	A				
003047	144716	A				
003050	152305	A				
003051	151322	A				
003052	152720	A				
003053	152240	A				
003054	141710	A				
003055	142703	A				
003056	145640	A				
003057	106612	A				
003060	000000	A				
003061	146705	A	984 MESA	DATA	' MEMORY OVERFLOW INTERRUPT CHECK ',0106612,0	01 00981
003062	146717	A				
003063	151331	A				
003064	120317	A				
003065	153305	A				
003066	151306	A				
003067	146317	A				
003070	153640	A				
003071	144716	A				
003072	152305	A				
003073	151322	A				
003074	152720	A				
003075	152240	A				
003076	141710	A				
003077	142703	A				
003100	145640	A				
003101	106612	A				
003102	000000	A				
003103	143322	A	985 MESA	DATA	' FREE RUNNING COUNTER CHECK ',0106612,0	01 00982
003104	142705	A				
003105	120322	A				
003106	152716	A				
003107	147311	A				
003110	147307	A				
003111	120303	A				

003112	147725	A					
003113	147324	A					
003114	142722	A					
003115	120303	A					
003116	144305	A					
003117	141713	A					
003120	106612	A					
003121	000000	A					
003122	144716	A	986	MES7	DATA	INPUT FRC INCREMENTS PER SECOND 1,0106612,0	01 00983
003123	150325	A					
003124	152240	A					
003125	143322	A					
003126	141640	A					
003127	144716	A					
003130	141722	A					
003131	142715	A					
003132	142716	A					
003133	152323	A					
003134	120320	A					
003135	142722	A					
003136	120323	A					
003137	142703	A					
003140	147716	A					
003141	142240	A					
003142	106612	A					
003143	000000	A					
003144	144716	A	987	MESR	DATA	INPUT BASIC INTERRUPTS PER SECOND 1,0106612,0	01 00984
003145	150325	A					
003146	152240	A					
003147	141301	A					
003150	151711	A					
003151	141640	A					
003152	144716	A					
003153	152305	A					
003154	151322	A					
003155	152720	A					
003156	152323	A					
003157	120320	A					
003160	142722	A					
003161	120323	A					
003162	142703	A					
003163	147716	A					

003164	142240	A					
003165	106612	A					
003166	000000	A					
003167	151324	A	988	MS15	DATA	IRTC TYPE = 1,0	01 00985
003170	141640	A					
003171	152331	A					
003172	150305	A					
003173	120275	A					
003174	000000	A					
003175	144716	A	989	IM1	DATA	INTERRUPT TIMING TEST 1,0106612,0	01 00986
003176	152305	A					
003177	151322	A					
003200	152720	A					
003201	152240	A					
003202	152311	A					
003203	146711	A					
003204	147307	A					
003205	120324	A					
003206	142723	A					
003207	152240	A					
003210	106612	A					
003211	000000	A					
003212	144716	A	990	IM3	DATA	INTERVAL TIMER = 1,0	01 00987
003213	152305	A					
003214	151326	A					
003215	140714	A					
003216	120324	A					
003217	144715	A					
003220	142722	A					
003221	136640	A					
003222	000000	A					
003223	153311	A	991	IM4	DATA	IVII SELECT COUNT = 1,0	01 00988
003224	144640	A					
003225	151705	A					
003226	146305	A					
003227	141724	A					
003230	120303	A					
003231	147725	A					
003232	147324	A					
003233	136640	A					
003234	000000	A					
003235	144716	A	992	IM5	DATA	INTERVAL DISPLAY PERIOD IN SEC. = 1,0	01 00989

003236	152305	A				
003237	151326	A				
003240	140714	A				
003241	120304	A				
003242	144723	A				
003243	150314	A				
003244	140731	A				
003245	120320	A				
003246	142722	A				
003247	144717	A				
003250	142240	A				
003251	144716	A				
003252	120323	A				
003253	142703	A				
003254	127275	A				
003255	000000	A				
003256	152716	A	993 IM6	DATA	'UNACCEPTABLE',0106612,0	01 00990
003257	140703	A				
003260	141705	A				
003261	150324	A				
003262	140702	A				
003263	146305	A				
003264	106612	A				
003265	000000	A				
003266	141305	A	994 IM7	DATA	'BEGIN TEST',0106612,0	01 00991
003267	143711	A				
003270	147240	A				
003271	152305	A				
003272	151724	A				
003273	106612	A				
003274	000000	A				
003275	143322	A	995 IM9	DATA	'FRC: ',0	01 00992
003276	141672	A				
003277	120240	A				
003300	000000	A				
003301	146711	A	996 IM10	DATA	'MIN, ',0	01 00993
003302	147254	A				
003303	000000	A				
003304	151705	A	997 IM11	DATA	'SEC ',0106612,0	01 00994
003305	141640	A				
003306	106612	A				
003307	000000	A				

003310 124326 A 998 IM12 DATA '(V)II:',0
003311 124711 A
003312 144672 A
003313 000000 A
003314 144716 A 999 MS15 DATA 'INVALID',0
003315 153301 A
003316 146311 A
003317 142240 A
003320 000000 A

01 00995

01 00996

			1000		FJEC				S01 00997
			1001	*					01 00998
003321	000000	A	1002	BONG	ENTR	0	ADJUST INSTRS. TO BIT SIZE		01 00999
003322	005002	A	1003		TZR				01 01000
003323	005101	A	1004		INCR	1			01 01001
003324	004541	A	1005		LLSR	1			01 01002
003325	063455	A	1006		STB	XDSB			01 01003
003326	063465	A	1007		STB	XDS4+1			01 01004
003327	005311	A	1008		DAR				01 01005
003330	004341	A	1009		LSRA	1			01 01006
003331	053422	A	1010		STA	XDA2+1	SET ANAI INST		01 01007
003332	053470	A	1011		STA	XDS2+1			01 01008
003333	051600	A	1012		STA	XDAX+1			01 01009
003334	011155	A	1013		LDA	NBIT			01 01010
003335	005311	A	1014		DAR				01 01011
003336	005311	A	1015		DAR				01 01012
003337	053454	A	1016		STA	XD1C	SET LOOP COUNT FOR DIVIDE		01 01013
003340	001000	A	1017		JMP*	BONG			01 01014
003341	103321	A							

Address	Op Code	Op	Target	Instruction	Comments	Source	Destination
1018				EJEC		S01	01015
1019	*					01	01015
1020	*					*01	01017
1021	*				DOUBLE PRECISION INTEGER MULTIPLY BY ADDITION	*01	01016
1022	*			CALL XDIM, MULT	WHERE MULTIPLIER MUST BE A SINGLE WORD +	*01	01019
003342	073411	A	1023	XDI1 STX	XDIS+4 SAVE VALUES	01	01020
003343	053405	A	1024	STA	XDIS	01	01021
003344	053407	A	1025	STA	XDIS+2	01	01022
003345	063406	A	1026	STB	XDIS+1	01	01023
003346	063410	A	1027	STB	XDIS+3	01	01024
003347	023402	A	1028	LDB	XDIM	01	01025
003350	036000	A	1029	LDX	0,2	01	01026
003351	035000	A	1030	LDX	0,1	01	01027
003352	043402	A	1031	INR	XDIM	01	01028
003353	001040	A	1032	JXZ	XDIS	01	01029
003354	003371	A			CHECK IF MULTIPLIER ZERO. ANS. ZERO		
003355	005344	A	1033	XDI2 DXR		01	01030
003356	001040	A	1034	JXZ	XDI4	01	01031
003357	003376	A					
003360	013405	A	1035	LDA	XDIS	01	01032
003361	023406	A	1036	LDB	XDIS+1	01	01033
003362	002000	A	1037	CALL	XDAD, XDIS+2	01	01034
003363	003434	A					
003364	003407	A					
003365	053405	A	1038	STA	XDIS	01	01035
003366	063406	A	1039	STB	XDIS+1	01	01036
003367	001000	A	1040	JMP	XDI2	01	01037
003370	003355	A					
003371	005001	A	1041	XDI3 TZA		01	01038
003372	005002	A	1042	TZB		01	01039
003373	033411	A	1043	LDX	XDIS+4	01	01040
003374	001000	A	1044	JMP*	XDIM	01	01041
003375	103402	A					
003376	013405	A	1045	XDI4 LDA	XDIS	01	01042
003377	023406	A	1046	LDB	XDIS+1	01	01043
003400	033411	A	1047	LDX	XDIS+4	01	01044
003401	001000	A	1048	JMP	0	01	01045
003402	000000	A					
003402			1049	XDIM BES	0	01	01046
003403	001000	A	1050	JMP	XDI1	01	01047
003404	003342	A					
003405	000000	A	1051	XDIS DATA	0,0,0,0,0	01	01048

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VORTEX DASHR

1945 HOURS

003406 000000 A
003407 000000 A
003410 000000 A
003411 000000 A

			1076	EJEC			S01	01073
			1077 *				01	01074
			1078 *				01	01075
			1079 *	XDCD		FIXED POINT DOUBLE PRECISION COMPLEMENT	01	01076
			1080 *				01	01077
003441	000000	A	1081	XDCD ENTR			01	01078
003442	005211	A	1082	CPA			01	01079
003443	001020	A	1083	JBZ	***		01	01080
003444	003453	A						
003445	005222	A	1084	CPH			01	01081
003446	005122	A	1085	THR			01	01082
003447	004041	A	1086	LRLB	1		01	01083
003450	004141	A	1087	LSRB	1		01	01084
003451	001000	A	1088	JMP*	XDCD		01	01085
003452	103441	A						
003453	005111	A	1089	TAR			01	01086
003454	000016	A	1090	XDLC DATA	16	DIVIDE LOOP COUNT (ALTERED)	01	01087
003455	100000	A	1091	XDSR DATA	0100000	SIGN (ALTERED)	01	01088
			1092 *				01	01089
			1093 *	XDSI		FIXED POINT DOUBLE PRECISION SUBTRACT	01	01090
			1094 *				01	01091
003456	073505	A	1095	STX	XDSU+3	SAVE XR	01	01092
003457	007400	A	1096	ROF		RESET OF	01	01093
003460	033502	A	1097	LIX	XDSU		01	01094
003461	035000	A	1098	LIX	0,1	XR-ADDR OF HI B	01	01095
003462	053506	A	1099	STA	XDSU+4	SAVE HI A	01	01096
003463	005021	A	1100	TBA			01	01097
003464	006110	A	1101	XDS4 ORAI	0100000	SET SIGN FOR CARRY	01	01098
003465	100000	A						
003466	145001	A	1102	SUB	1,1	SUB LO B	01	01099
003467	006150	A	1103	XDS2 ANA1	077777	MASK SIGN	01	01100
003470	077777	A						
003471	005012	A	1104	TAR		SAVE RESULT	01	01101
003472	005001	A	1105	TZA			01	01102
003473	005711	A	1106	SUFA		GET CARRY	01	01103
003474	007400	A	1107	ROF		RESET OF	01	01104
003475	123506	A	1108	ADD	XDSU+4	ADD HI A	01	01105
003476	145000	A	1109	SUB	0,1	SUB HI B	01	01106
003477	043502	A	1110	INR	XDSU	SET RETURN	01	01107
003500	033505	A	1111	LDX	XDSU+3	RESTORE XR	01	01108
003501	001000	A	1112	JMP	0	RETURN	01	01109
003502	000000	A						

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VORTEX DASM

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003502		1113	ORG	*=1		01 01110
003502	000000	A 1114	ENTR		ENTRY	01 01111
003503	001000	A 1115	JMP	*=21		01 01112
003504	003456	A				
003505	000000	A 1116	DATA	0,0	TEMP STORAGE	01 01113
003506	000000	A				

1117

EJEC

000500 A 1118

END 0500

ENTRY NAMES
EXTERNAL NAMES
SYMBOLS

000442	A	SCON	000471	A	SOCT	000440	A	SFLG	000422	A	SLWF
000441	A	SMEM	000424	A	SMSM	002335	A	STTY	002717	A	ADDR
003321	A	BCNG	002624	A	BRFC	002614	A	BUFO	001163	A	CNTL
002546	A	CO11	001157	A	COMP	002450	A	CON1	002455	A	CON2
002456	A	CON3	002465	A	CON4	002472	A	CON5	002521	A	CON6
002534	A	CON7	002544	A	CON8	002512	A	CON9	002515	A	CONL
002641	A	CONT	002433	A	CONV	002334	A	D60	002426	A	DPSM
002330	A	EMFR	002332	A	EMVI	001160	A	ERRC	001203	A	ERRP
001165	A	ERRS	002331	A	ESFR	002333	A	ESVT	000423	A	ESZC
002635	A	FLGC	002306	A	FRCM	002336	A	HDEF	002756	A	HLF1
002745	A	HLFS	002713	A	HVAL	001471	A	I1	001640	A	I10
001671	A	I101	001677	A	I10T	001572	A	I11	001614	A	I14
001604	A	I141	001736	A	I15	001741	A	I151	001626	A	I151
001623	A	I162	001631	A	I17	001402	A	I2	001450	A	I3
002150	A	I30	002170	A	I301	001414	A	I4	001423	A	I5
001774	A	I50	002055	A	I51	002141	A	I52	001425	A	I6
001512	A	I7	001546	A	I70	001511	A	I71	001437	A	I8
001526	A	I9	002215	A	IC1	002225	A	IC2	002232	A	IC3
002242	A	IC4	002256	A	IC5	002266	A	IC6	002273	A	IC7
002303	A	IC8	002176	A	ICOM	002324	A	IFM	002322	A	IINT
002321	A	ILNG	003175	A	IM1	003301	A	IM10	003304	A	IM11
003310	A	IM12	003212	A	IM3	003223	A	IM4	003235	A	IM5
003256	A	IM6	003266	A	IM7	003275	A	IM9	000410	A	INPA
000411	A	INPB	000412	A	INPC	000413	A	INPD	000414	A	INPE
000415	A	INPF	000416	A	INPG	002323	A	INTT	002320	A	INXT
002343	A	IPD1	002407	A	IPD3	002413	A	IPD4	002420	A	IPD5
002337	A	IPDC	001452	A	ISCP	001353	A	ISCR	001320	A	ITT
001703	A	IUFR	002326	A	IVM	001557	A	IX11	001571	A	IX12
002317	A	LFRC	001155	A	LDDP	002715	A	LVAL	002315	A	LVII
002767	A	MES1	003003	A	MES2	003026	A	MES3	003035	A	MES4
003061	A	MES5	003103	A	MES6	003122	A	MES7	003144	A	MES8
003042	A	MESA	003167	A	MS15	003314	A	MS16	001156	A	NRIT
000400	A	OUTA	000401	A	OUTH	000402	A	OUTC	000403	A	OUTD
000404	A	OUTE	000405	A	OUTF	000406	A	OUTG	000407	A	OUTH
001164	A	PINT	000502	A	PNTR	001217	A	RT10	001265	A	RT13
000047	A	RTC	000503	A	RTC1	000647	A	RTC2	000677	A	RTC3
00735	A	RTC4	000504	A	RTC5	001024	A	RTC6	001144	A	RTC9

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VORTEX DASHR

1945 HOURS

000570 A RTCK	000640 A RTCL	000577 A RTCM	000627 A RTCN
000633 A RTCN	000636 A RTCP	000527 A RTCT	001161 A RTSA
001000 A RTT4	001042 A RTTC	002636 A SAVN	002312 A SELC
002710 A SIXM	000421 A SSWT	002704 A SUMH	002642 A TABT
002570 A TBOC	000420 A TDLY	002725 A TDS1	002736 A TDS2
002742 A TDSA	002721 A TDSC	002432 A TEN	002640 A TIME
001162 A TMSV	000417 A TOUT	002706 A TWNT	002316 A UFRC
002314 A UVII	002431 A VALU	002711 A VAR	002310 A VIIF
003421 A XDA2	003434 A XDAD	001657 A XDAX	003441 A XDCC
003342 A XDI1	003355 A XDI2	003371 A XDI3	003376 A XDI4
003402 A XDIM	003405 A XDIS	003454 A XDLC	003467 A XDS2
003464 A XDS4	003455 A XDSB	003502 A XDSU	

0 ERRORS ASSEMBLY COMPLETE

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99	SCOM	134	139	166	220	289	317	364	415	482
		520	632							
101	SDCT	*								
97	SFLG	*								
88	SLWE	*								
98	S MEM	*								
90	SMSM	*								
801	STTY	422								
941	ADDR	853	857	872	873	908	909			
1002	BCNG	117	1017							
929	BUFC	856	888	895	902	911				
926	BUFB	667	669	677	678	690	692	700	702	
332	CNTL	242	261	261						
903	CO11	913								
328	COMP	158	161	165	222	243	367	388	426	453
		534	600	659	729	748	762	966		
863	CON1	859	874	872	885					
865	CON2	868								
866	CON3	860	878							
869	CON4	861	879							
872	CON5	864								
891	CON6	899	901							
898	CON7	889								
902	CON8	896								
886	CON9	881								
888	CONL	897								
933	CONT	*								
852	CONV	668	678	691	701	915				
800	D60	376	384	396	405					
844	DPSM	812	813	828	829	832	833	841	842	
796	EMFR	554	556	666	731	774				
798	EMVI	689	725	755						
329	ERRC	175	198	203	232	240	254	265	268	273
		277	299	310	345	352				
349	ERRP	347	355							
340	ERRS	179	189	199	212	218	249	259	269	283
		309	316	343						
797	ESFR	676	733	743	766	780				
799	ESVI	699	727	761						
89	ESZC	*								
930	FLGC	*								
783	FRGM	37	47	4	395	459	460	776		
802	HDEF	837	898	897						

E	2	04/22/74	VORTEX CONC				
971	HLF1	977					
965	HLFS	955	971				
939	HVAL	*					
490	I1	416	483				
579	I10	518	604				
600	I101	598					
605	I10T	581	582	583	600	601	602
545	I11	635	637	648	719	723	
558	I14	551					
552	I141	549					
632	I15	559	561	575			
634	I151	420	423				
568	I161	*					
564	I162	*					
571	I17	568					
447	I2	427	482				
482	I3	451	472	507	510	512	
722	I30	633					
734	I301	730					
454	I4	501					
459	I5	455					
657	I50	640					
684	I51	660					
715	I52	713					
461	I6	458					
505	I7	464	466				
525	I70	521	644	737			
504	I71	469					
468	I8	473					
514	I9	*					
750	IC1	747	753				
754	IC2	751					
757	IC3	760					
761	IC4	758					
769	IC5	772					
773	IC6	770					
776	IC7	779					
780	IC8	777					
740	ICOM	657	724	763	781		
794	IFM	377	378	397	398	769	773
792	IINT	505	511	532	572	715	
791	ILNG	452	461	500			
989	IM1	418					

996	IM10	672	695							
997	IM11	682	705							
998	IM12	685								
990	IM3	428								
991	IM4	432								
992	IM5	447								
993	IM6	476	484							
994	IM7	522								
995	IM9	662								
78	INPA	*								
79	INPR	143	634	814						
80	INPC	*								
81	INPD	*								
82	INPE	*								
83	INPF	*								
84	INPG	*								
793	INTT	425	431	454	465	494	548	712		
790	INXT	533	559	571	574	717				
814	IPD1	834								
835	IPD3	824	827							
837	IPD4	818								
840	IPD5	821								
810	IPDC	371	381	430	434	489	836	843		
476	ISCP	443	445							
432	ISCR	478								
415	ITI	387	408	647	736					
608	IIFR	546	619	613	627	629	661	664	671	674
		681	684	687	694	697	764	707	764	914
795	IVM	385	386	405	407	750	754			
534	IX11	*								
542	IX12	535								
789	LFRC	531	559	620	622	710				
326	LOOP	184	195	207	238	279	301	312	347	
940	LVAL	*								
787	LVII	530	580	593						
979	MES1	137								
980	MES2	168								
981	MES3	350								
982	MES4	224								
984	MES5	291								
985	MES6	31								
986	MES7	27								
987	MES8	11								

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VORTEX CONC

983	MESA	226								
988	MS15	141								
999	MS16	153								
327	NRIT	113	116	1013						
70	OUTA	*								
71	OUTB	*								
72	OUTC	136	146	147	354	366	417	641	658	837
73	OUTD	138	142	154	169	225	227	292	320	351
		370	380	419	429	433	448	477	485	523
		663	670	673	680	683	686	693	696	703
		706								
74	OUTE	353								
75	OUTF	*								
76	OUTG	835								
77	OUTH	*								
333	PINT	363								
107	PNTR	*								
362	RT10	294	318	321						
388	RT13	365								
103	RTC	119	185	186	196	208	209	217	245	246
		252	253	258	280	285	288	302	303	307
		313	314	341	525	539	540	541	542	555
		580	603	611	618	619	709	742		
134	RTC1	130								
174	RTC2	167								
193	RTC3	181								
216	RTC4	204								
251	RTC5	235								
258	RTC6	276								
317	RTC9	*								
139	RTCK	135	155							
166	RTCL	159	162	348						
143	RTCM	144								
157	RTCN	150								
161	RTCO	152								
164	RTCP	140								
119	RTCT	131	133	347	545	815				
330	RTSA	304	308							
243	RTT4	266								
268	RTTC	253								
931	SAVN	854	855	870	871	883	884			
785	SELC	441	468	499	538	748				
937	SIXM	*								

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87	SSWT	347									
935	SUMH	*									
934	TABT	*									
916	TRDC	858									
86	TOLY	*									
955	TDS1	960									
961	TDS2	959									
964	TDSA	952	953	954	956	958	961	962			
951	TRSC	188	202	211	248	272	287	306	963		
846	TEN	830									
932	TIME	*									
331	TNSV	*									
85	TOUT	*									
936	TRNT	*									
788	UFRC	528	623	625	767						
786	UMIT	529	594	596	741						
845	VALU	825	831								
938	VAR	*									
784	VIJF	382	383	403	404	456	457	757			
1063	XDA2	1010									
1073	XDA0	745	754	767	773	831	869	1037	1056	1058	
		1000	1068	1070	1071						
592	XDAX	1012									
1081	XDC0	1088									
1023	XD11	1050									
1033	XD12	1040									
1041	XD13	1032									
1045	XD14	1034									
1049	XD1M	376	384	396	405	461	748	830	1028	1031	
		1044									
1051	XD1S	1023	1024	1025	1026	1027	1035	1036	1037	1038	
		1039	1043	1045	1046	1047					
1090	XDLC	1016									
1103	XDS2	1011									
1101	XDS4	1007									
1091	XDS8	1006									
1114	XDSU	468	750	757	769	776	863	866	1095	1097	
		1099	1108	1110	1111						

/ASSIGN,BO,PT
 /ASSIGN,BI,GO
 /PROFILE,BI,GO
 /LOAD,MR2BA

MR TO BLD CONVERSION PRG

MU**
VIS,9200107-0350
MU**
PTR,142
MU**
TRAN

LITERALS

POINTERS
0142 8400
0143 85CF
0144 8500

TRAN COMPLETE

MU**
EXIT
/FINI