

```

0 *      73/620 REAL TIME CLOCK TEST                                THRU Z1
1 *
2 *
3 *
4 *
5 *          *****       *              *****   ***    *     *     *****
6 *          *      *        *      *           *      *      **   **   *
7 *          *      *        *      *           *      *      **   **   *
8 *          *****       *      *           *      *      **   **   *
9 *          *      *        *      *           *      *      **   **   *
10 *         *      *        *      *           *      *      **   **   *
11 *         *      *        *      *           *      *      **   **   *
12 *         *      *        *      *           *      *      **   **   *
13 *
14 *          ****  *            *****   ****  *             *****
15 *          *  *  *      *      *      *      *      *      *      *      *
16 *          *  *  *      *      *      *      *      *      *      *      *
17 *          *  *  *      *      *      *      *      *      *      *      *
18 *          *  *  *      *      *      *      *      *      *      *      *
19 *          *  *  *      *      *      *      *      *      *      *      *
20 *          ****  *****   ****  *      *      *****   ****  *
21 *
22 *
23 *          THIS TEST PROGRAM IS A PART OF THE MAINTAIN II
24 *                   TEST PROGRAM SYSTEM
25 *
26 *
27 *
28 *
29 *  THIS IS A COPYRIGHTED PROGRAM
30 *  COPYRIGHT 1973 BY VARIAN DATA MACHINES
31 *  V.D.M. PART NO 92L0107-035D                                     Release Date 4/4/75
32 *  *************************************************************************************
33 *
34 *          73/620 REAL TIME CLOCK TEST PROGRAM
35 *
36 *          73 AND 620/F: VARIABLE INTERVAL INTERRUPT; MEMORY OVERFLOW
37 *                        INTERRUPT; AND READABLE FREE RUNNING COUNTER
38 *                        ARE EXERCISED
39 *          620/I*L AND 622/I: INTERVAL INTERRUPT AND MEMORY OVERFLOW
40 *                        INTERRUPT ARE EXERCISED
41 *          NOTE: NO SOFTWARE TIMING CHECKS ARE MADE.
42 *  *************************************************************************************
43 *
44 *          EXEC
45 *
46 *
47 *          *****
48 *          *                      *
49 *          * AREAS RESERVED BY EXECUTIVE *
50 *          *****
51 *
52 *
53 *          ORG      0
54 *          JMP      EXECUTIVE
55 *          ORG      0400
56 *          JPM      POWER DOWN ROUTINE
57 *          JMP      POWER UP ROUTINE
58 *          NOTE:    THE TEST EXECUTIVE ALSO RESERVES LOCATIONS 0400 TO 0477
59 *                    FOR A POINTER TABLE TO STANDARD ROUTINES,AND AS AN AREA
60 *                    FOR EXECUTIVE DATA. ALL TEST PROGRAMS WORKING WITH THE
61 *                    EXECUTIVE MUST PRESERVE THIS BLOCK.
62 *                    STANDARD ROUTINES WILL BE CALLED INDIRECTLY THRU
63 *                    THIS TABLE
64 *
65 *
66 *
67 *
68 *
69 *          ORG      0400
70 *          BSS      1 OUTPUT ONE CHAR ROUTINE
71 *          BSS      1 OUTPUT TWO CHAR ROUTINE
72 *          BSS      1 OUTPUT CR/LF ROUTINE
73 *          BSS      1 OUTPUT MESSAGE ROUTINE
74 *          BSS      1 OUTPUT OCTAL WORD ROUTINE
75 *          BSS      1 OUTPUT OCTAL ADDR ROUTINE
76 *          BSS      1 OUTPUT ERROR MSG ROUTINE
77 *          BSS      1 OUTPUT CONTROL CHAR TO TTY ROUTINE
78 *          BSS      1 INPUT ONE CHAR ROUTINE
79 *          BSS      1 INPUT AND PRINT ONE CHAR ROUTINE
80 *          BSS      1 INPUT ONE CHAR EDITED ROUTINE
81 *          BSS      1 INPUT ONE ALPHA CHAR ROUTINE
82 *          BSS      1 INPUT TWO ALPHA CHAR ROUTINE
83 *          BSS      1 INPUT COMMA/PERIOD TERMINATION ROUTINE
84 *          BSS      1 INPUT OCTAL NUMBER ROUTINE
85 *          BSS      1 TIME-OUT ROUTINE
86 *          BSS      1 TIME DELAY ROUTINE
87 *          BSS      1 STANDARD SENSE SWITCH ROUTINE
88 *          BSS      1 LOWEST WORD USED BY EXEC
89 *          BSS      1 MEMORY SIZE DETERMINATION ROUTINE
90 *          BSS      1 MEMORY SIZE MESSAGE
91 *
92 *
93 *          ORG      0440
94 *
95 *          EXECUTIVE DATA TABLE

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PAGE	2	MAINTAIN III	RTCLCK	
000440		96 *		04 00096
000441		97 \$FLG BSS 1	LOOP ON ERROR FLAG, 0=DON'T LOOP 1=LOOP	04 00097
000442		98 \$MEM BSS 1	MEMORY SIZE (HIGHEST AVAIL CORE)	04 00098
000443		99 \$CDN BSS 1	0=CONSOLE MODE 1=TTY MODE	04 00099
000471		100 BSS 22		04 00100
		101 \$DCT BSS 1	DIGIT COUNTER FOR INPG	04 00101
		102 *		04 00102
000047	A	103 RTC EQU 047		04 00103
		104 EJEC		04 00104
000500		105 DRG 0500		04 00105
000500	001000	106 JMP *+7		04 00106
000501	000507			
000502		107 PNTR BSS 5	INDIRECT POINTERS	04 00107
000507	005101	108 INCR 1	BIT SIZE DETERMINER	04 00108
000510	004260	109 LRLA 16		04 00109
000511	006130	110 ERAI 1		04 00110
000512	000001			
000513	001010	111 JAZ *+7		04 00111
000514	000522			
000515	006010	112 LDAI 18		04 00112
000516	000022			
000517	051156	113 STA NBIT	18 BITS	04 00113
000520	001000	114 JMP *+5		04 00114
000521	000525			
000522	006010	115 LDAI 16		04 00115
000523	000020			
000524	051156	116 STA NBIT	16 BITS	04 00116
000525	002000	117 CALL BCNG	SET AFFECTED INSTRUCTIONS IN ARITH. SUBS.	04 00117
000526	003321			
000527	100447	118 EJEC		04 00118
000530	006020	119 RTCT EXC 0400+RTC		04 00119
000531	000002	120 LDBI 2		04 00120
000532	005021			
000533	006110	121 TEA	EXCEPT LOCATIONS 040 TO 043 (PF/R)	04 00121
000534	000400	122 DRAI 0400	INCLUSIVE-OR BIT 8 IN A REG.	04 00122
000535	056000			
000536	005122	123 STA 0,2		04 00123
000537	005021	124 IER		04 00124
000540	006140	125 TEA		04 00125
000541	000040	126 SUBI 040	CHECK IF LOC 040 (POWER FAILURE RESTART	04 00126
000542	001010			
000543	000553	127 JAZ *+9	INTERRUPT ADDRESSES)	04 00127
000544	005021			
000545	006140	128 TEA		04 00128
000546	000377	129 SUBI 0377	CHECK IF ALL INTERRUPT LOCATIONS SETUP	04 00129
000547	001010			
000550	000557	130 JAZ RTC1		04 00130
000551	001000	131 JMP RTCT+3		04 00131
000552	000532			
000553	006020	132 LDBI 044	JUMP OVER PF/R INTERRUPT ADDRESSES.	04 00132
000554	000044			
000555	001000	133 JMP RTCT+3		04 00133
000556	000532			
000557	010442	134 RTC1 LDA \$CDN	CHECK IF CONSOLE MODE	04 00134
000560	001010	135 JAZ RTCK		04 00135
000561	000570			
000562	002000	136 CALL* OUTC	CR/LF	04 00136
000563	100402			
000564	006030	137 LDXI MES1	WRITE (REAL TIME CLOCK TEST)	04 00137
000565	002767			
000566	002000	138 CALL* OUTD		04 00138
000567	100403			
000570	010442	139 RTCK LDA \$CDN	CHECK IF CONSOLE MODE	04 00139
000571	001010	140 JAZ RTCP		04 00140
000572	000636			
000573	006030	141 LDXI MS15	WRITE (COMPUTER IS AN)	04 00141
000574	003167			
000575	002000	142 CALL* OUTD		04 00142
000576	100403			
000577	002000	143 RTCM CALL* INPB		04 00143
000600	100411			
000601	001000	144 JMP RTCM		04 00144
000602	000577			
000603	005012	145 TAB		04 00145
000604	002000	146 CALL* OUTC	CR/LF	04 00146
000605	100402			
000606	002000	147 CALL* OUTC	CR/LF	04 00147
000607	100402			
000610	005021	148 TEA		04 00148
000611	006140	149 SUBI 0261	AN 'F' OR V73?	04 00149
000612	000261			
000613	001010	150 JAZ RTCN		04 00150
000614	000627			
000615	006120	151 ADDI 1		04 00151
000616	000001			
000617	001010	152 JAZ RTCD		04 00152
000620	000633			
000621	006030	153 LDXI MS16	WRITE (INVALID)	04 00153
000622	003314			
000623	002000	154 CALL* OUTD		04 00154
000624	100403			
000625	001000	155 JMP RTCK		04 00155
000626	000570			
		156 *		04 00156

		MAINTAIN III	RTCLCK		PAGE 3
000627	0051111	A	157	RTCN IAR	04 00157
000630	0511157	A	158	STA COMP	04 00158
000631	001000	A	159	JMP RTCL	04 00159
000632	000640	A			
			160	*	04 00160
000633	0511157	A	161	RTCD STA COMP	04 00161
000634	001000	A	162	JMP RTCL	04 00162
000635	000640	A			
			163	*	04 00163
000636	000000	A	164	RTCP HLT	04 00164
000637	0511157	A	165	STA COMP	04 00165
000640	010442	A	166	RTCL LDA \$CON	04 00166
000641	001010	A	167	JAZ RTCL	04 00167
000642	000647	A			
000643	006030	A	168	LDXI MES2	04 00168
000644	003003	A			
000645	002000	A	169	CALL* OUTD	04 00169
000646	100403	A			
			170	EJEC	04 00170
			171	* FOLLOWING THREE TESTS PERFORM THE (VARIABLE) INTERVAL	04 00171
			172	* INTERRUPT CHECK	04 00172
			173	*	04 00173
000647	006010	A	174	RTC2 LDAI 1	04 00174
000650	000001	A			
000651	0511160	A	175	STA ERRC	04 00175
000652	006010	A	176	LDAI 02000	04 00176
000653	002000	A			
000654	050044	A	177	STA 044	04 00177
000655	050046	A	178	STA 046	04 00178
000656	006010	A	179	LDAI ERRC	04 00179
000657	001165	A			
000660	050047	A	180	STA 047	04 00180
000661	006010	A	181	LDAI RTC3	04 00181
000662	000677	A			
000663	050045	A	182	STA 045	04 00182
000664	006010	A	183	LDAI *	04 00183
000665	000664	A			
000666	0511155	A	184	STA LOOP	04 00184
000667	100447	A	185	EXC 0400+RTC	04 00185
000670	100147	A	186	EXC 0100+RTC	04 00186
000671	006030	A	187	LDXI 16	04 00187
000672	000020	A			
000673	002000	A	188	CALL TDSC	04 00188
000674	002721	A			
000675	002000	A	189	CALL ERRC	04 00189
000676	001165	A			
			190	EJEC	04 00190
			191	* ENTRANCE FROM RECEIVING INTERRUPT	04 00191
			192	*	04 00192
000677	000000	A	193	RTC3 ENTR	04 00193
000700	006010	A	194	LDAI *	04 00194
000701	000700	A			
000702	0511155	A	195	STA LOOP	04 00195
000703	100747	A	196	EXC 0700+RTC	04 00196
000704	006010	A	197	LDAI 2	04 00197
000705	000002	A			
000706	0511160	A	198	STA ERRC	04 00198
000707	006010	A	199	LDAI ERRC	04 00199
000710	001165	A			
000711	050045	A	200	STA 045	04 00200
000712	006030	A	201	LDXI 8	04 00201
000713	000010	A			
000714	002000	A	202	CALL TDSC	04 00202
000715	002721	A			
000716	041160	A	203	INR ERRC	04 00203
000717	006010	A	204	LDAI RTC4	04 00204
000720	000735	A			
000721	050045	A	205	STA 045	04 00205
000722	006010	A	206	LDAI *	04 00206
000723	000722	A			
000724	0511155	A	207	STA LOOP	04 00207
000725	100647	A	208	EXC 0600+RTC	04 00208
000726	100347	A	209	EXC 0300+RTC	04 00209
000727	006030	A	210	LDXI 16	04 00210
000730	000020	A			
000731	002000	A	211	CALL TDSC	04 00211
000732	002721	A			
000733	002000	A	212	CALL ERRC	04 00212
000734	001165	A			
			213	EJEC	04 00213
			214	* ENTRANCE FROM RECEIVING INTERRUPT	04 00214
			215	*	04 00215
000735	000000	A	216	RTC4 ENTR	04 00216
000736	100447	A	217	EXC 0400+RTC	04 00217
000737	006010	A	218	LDAI ERRC	04 00218
000740	001165	A			
000741	050045	A	219	STA 045	04 00219
000742	010442	A	220	LDA \$CON	04 00220
000743	001010	A	221	JAZ *+13	04 00221
000744	000760	A			
000745	011157	A	222	LDA COMP	04 00222
000746	001010	A	223	JAZ *+6	04 00223
000747	000754	A			
000750	006030	A	224	LDXI MES4	04 00224
000751	003035	A			

PAGE	4	MAINTAIN III	RTCLCK	
000752	002000	A	225	CALL* OUTD 04 00225
000753	100403	A		
000754	006030	A	226	LDXI MESA TYPE (INTERVAL INTERRUPT) 04 00226
000755	003042	A		
000756	002000	A	227	CALL* OUTD 04 00227
000757	100403	A		
			228	EJEC 04 00228
			229 *	FOLLOWING TEST PERFORM 'MEMORY OVERFLOW INTERRUPT CHECK' 04 00229
			230 *	
			231 *	
000760	041160	A	232	INR ERRC TEST FOR ERROR CODE 4 04 00231
000761	006010	A	233	LDXI 040045 INCR. ERROR COUNT ** 4 ** 04 00232
000762	040045	A		
000763	050044	A	234	STA 044 INCR. AND REPLACE INSTR. STORE IN LOC. 044 04 00233
000764	006010	A	235	LDXI RTC5 LOC TO RETURN UPON INTERRUPT 04 00234
000765	001013	A		
000766	050047	A	236	STA 047 04 00236
000767	006010	A	237	LDXI * 04 00237
000770	000767	A		
000771	051155	A	238	STA LOOP SET LOOP ADDR 04 00238
000772	006010	A	239	LDXI 4 04 00239
000773	000004	A		
000774	051160	A	240	STA ERRC SET ERROR COUNT 04 00240
000775	006010	A	241	LDXI 1 SET UP NO. OF TRIES FOR TEST 4 04 00241
000776	000001	A		
000777	051163	A	242	STA CNTL 04 00242
001000	006010	A	243	LDXI 037775 SET UP OVERFLOW COUNT 04 00243
001001	037775	A		
001002	050045	A	244	STA 045 04 00244
001003	100447	A	245	EXC 0400+RTC INITIALIZE RTC 04 00245
001004	100147	A	246	EXC 0100+RTC ENABLE RTC 04 00246
001005	006030	A	247	LDXI 16 4 SEC. WAIT 04 00247
001006	000020	A		
001007	002000	A	248	CALL TDSC 04 00248
001010	002721	A		
001011	002000	A	249	CALL ERRS NO INTERRUPT - ERROR 4 04 00249
001012	001165	A		
001013	000000	A	250	EJEC 04 00250
001014	100147	A	251	ENTR RTC5 04 00251
001015	100247	A	252	EXC 0100+RTC ENABLE RTC 04 00252
001016	041160	A	253	EXC 0200+RTC INHIBIT MOI 04 00253
001017	010045	A	254	INR ERRC ERROR COUNT ** 5 ** 04 00254
001020	006140	A	255	LDA 045 04 00255
001021	040001	A	256	SUBI 040001 04 00256
001022	001010	A	257	JAZ *+5 04 00257
001023	001027	A		
001024	100447	A	258	EXC 0400+RTC ERROR INITIALIZE RTC 04 00258
001025	002000	A	259	CALL ERRS 04 00259
001026	001165	A		
001027	011163	A	260	LDA CNTL CHECK IF TEST TRIED 50 TIMES 04 00260
001030	041163	A	261	INR CNTL 04 00261
001031	006140	A	262	SUBI 50 04 00262
001032	000062	A		
001033	001002	A	263	JAP RTTC 04 00263
001034	001042	A		
001035	006010	A	264	LDXI 04 RE-SETUP ERROR COUNT. 04 00264
001036	000004	A		
001037	051160	A	265	STA ERRC 04 00265
001040	001000	A	266	JMP RTT4 04 00266
001041	001000	A		
001042	041160	A	267	EJEC 04 00267
001043	006010	A	268	INR ERRC ERROR COUNT ** 6 ** 04 00268
001044	001165	A	269	LDXI ERRS SET INTERRUPT ADDRESS TO ERROR SUBR. 04 00269
001045	050047	A	270	STA 047 04 00270
001046	006030	A	271	LDXI 2 1/2 SECOND DELAY 04 00271
001047	000002	A		
001050	002000	A	272	CALL TDSC 04 00272
001051	002721	A		
001052	041160	A	273	INR ERRC ERROR COUNT ** 7 ** 04 00273
001053	010045	A	274	LDA 045 LOCATION 45 MUST BE GREATER THAN 40001 04 00274
001054	006140	A	275	SUBI 040001 04 00275
001055	040001	A		
001056	001010	A	276	JAZ RTC6 04 00276
001057	001024	A		
001060	041160	A	277	INR ERRC ERROR 8 CHECK - INHIBIT MOI ** 10 ** 04 00277
001061	006010	A	278	LDXI * 04 00278
001062	001061	A		
001063	051155	A	279	STA LOOP SET LOOP ADDR 04 00279
001064	100447	A	280	EXC 0400+RTC INITIALIZE RTC 04 00280
001065	006010	A	281	LDXI 037775 04 00281
001066	037775	A		
001067	050045	A	282	STA 045 04 00282
001070	006010	A	283	LDXI ERRS IF INTERRUPT GO TO ERROR ROUTINE 04 00283
001071	001165	A		
001072	050047	A	284	STA 047 04 00284
001073	100347	A	285	EXC 0300+RTC 04 00285
001074	006030	A	286	LDXI 4 1 SECOND DELAY 04 00286
001075	000004	A		
001076	002000	A	287	CALL TDSC 04 00287
001077	002721	A		
001100	100447	A	288	EXC 0400+RTC INITIALIZE RTC 04 00288
001101	010442	A	289	LDA \$CON 04 00289
001102	001010	A	290	JAZ *+6 04 00290

001103	001110	A							
001104	006030	A	291	LDXI	MESS	WRITE MESSAGE MOI		04	00291
001105	003061	A							
001106	002000	A	292	CALL*	OUTD			04	00292
001107	100403	A							
001110	011157	A	293	LDA	COMP			04	00293
001111	001010	A	294	JAZ	RT10	SKIP FREE RUNNING COUNTER CHECK FOR I'S		04	00294
001112	001217	A							
			295	EJEC				04	00295
			296 *		CHECK FREE RUNNING			04	00296
			297 *		CHECK CLEAR OPTION OF FREE RUNNING COUNTER			04	00297
			298 *		CHECK IF FRC INCREMENTING			04	00298
001113	041160	A	299	INR	ERRC	ERROR COUNT = 11	** 11 **	04	00299
001114	006010	A	300	LDAI	*			04	00300
001115	001114	A							
001116	051155	A	301	STA	LOOP	SET LOOP ADDR		04	00301
001117	100047	A	302	EXC	RTC	CLEAR FREE RUNNING COUNTER		04	00302
001120	102547	A	303	CIA	RTC	INPUT FREE RUNNING COUNTER TO A		04	00303
001121	051161	A	304	STA	RTSA			04	00304
001122	006030	A	305	LDXI	2	DELAY 1/2 SEC.		04	00305
001123	000002	A							
001124	002000	A	306	CALL	TOSC			04	00306
001125	002721	A							
001126	102547	A	307	CIA	RTC	INPUT FRC TO A		04	00307
001127	141161	A	308	SUB	RTSA	IF COUNTER ZERO FRC NOT		04	00308
001130	002010	A	309	JAZM	ERRS	INCREMENTING CORRECTLY.		04	00309
001131	001165	A							
001132	041160	A	310	INR	ERRC	ERROR COUNT	** 12 **	04	00310
001133	006010	A	311	LDAI	*			04	00311
001134	001133	A							
001135	051155	A	312	STA	LOOP	SET LOOP ADDR		04	00312
001136	100047	A	313	EXC	RTC	CLEAR FRC		04	00313
001137	102547	A	314	CIA	RTC	INPUT FRC		04	00314
001140	001010	A	315	JAZ	*+4			04	00315
001141	001144	A							
001142	002000	A	316	CALL	ERRS			04	00316
001143	001165	A							
001144	010442	A	317	RTC9	LDA	\$CON	TEST IF CONTINUE MODE.	04	00317
001145	001010	A	318	JAZ	RT10			04	00318
001146	001217	A							
001147	006030	A	319	LDXI	MESS	OUTPUT FRC (TEST COMPLETE)		04	00319
001150	003103	A							
001151	002000	A	320	CALL*	OUTD			04	00320
001152	100403	A							
001153	001000	A	321	JMP	RT10			04	00321
001154	001217	A							
			322	EJEC				04	00322
			323	*****	*****	*****		04	00323
			324 *	*****	*****	*****		04	00324
			325	*****	*****	*****		04	00325
001155	000000	A	326	LOOP	DATA	0	ADDRESS FOR LOOPING ON ERRORS	04	00326
001156	000000	A	327	NEIT	DATA	0		04	00327
001157	000000	A	328	COMP	DATA	0		04	00328
001160	000000	A	329	ERRC	DATA	0		04	00329
001161	000000	A	330	RTSA	DATA	0		04	00330
001162	000000	A	331	TMSV	DATA	0	TEMP. STORAGE	04	00331
001163	000000	A	332	ENTL	DATA	0		04	00332
001164	000000	A	333	PINT	DATA	0		04	00333
			334	EJEC				04	00334
			335	*****	*****	*****		04	00335
			336 *	*****	*****	*****		04	00336
			337 *	*****	*****	*****		04	00337
			338 *	*****	*****	*****		04	00338
			339	*****	*****	*****		04	00339
001165	000000	A	340	ERRS	ENTR			04	00340
001166	100447	A	341	EXC	0400+RTC	INITIALIZE RTC		04	00341
			342 *			SET UP ERROR VOLATILE REGISTERS.		04	00342
001167	021165	A	343	LOB	ERRS	B = LOCATION INTERRUPTED FROM.		04	00343
001170	005004	A	344	TXZ				04	00344
001171	011160	A	345	LDA	ERRC	A = ERROR CODE NUMBER		04	00345
001172	051175	A	346	STA	*+C			04	00346
001173	002000	A	347	CALL*	DSRT,00,(ERRP)*,RTCT,(LOOP)*			04	00347
001174	100421	A							
001175	000000	A							
001176	101203	A							
001177	000527	A							
001200	101155	A							
001201	001000	A	348	JMP	RTCL			04	00348
001202	000640	A							
001203	000000	A	349	ERRP	ENTR			04	00349
001204	006030	A	350	LDXI	MESS	WRITE ERROR MESSAGE		04	00350
001205	003026	A							
001206	002000	A	351	CALL*	OUTD			04	00351
001207	100403	A							
001210	011160	A	352	LDA	ERRC			04	00352
001211	002000	A	353	CALL*	OUTE			04	00353
001212	100404	A							
001213	002000	A	354	CALL*	OUTC	CR/LF		04	00354
001214	100402	A							
001215	001000	A	355	JMP*	ERRP			04	00355
001216	101203	A							
			356	EJEC				04	00356
			357	*****	*****	*****		04	00357
			358 *	*****	*****	*****		04	00358
			359 *	*****	*****	*****		04	00359
					THE OPERATOR IS REQUESTED TO INPUT HARDWARE SETUP				


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360 *
361 *****
001217 005001 A 362 RT10 TZA CLEAR PRINT FLAG
001220 051164 A 363 STA PINT
001221 010442 A 364 LDA $CON CHECK IF CONSOLE MODE.
001222 001010 A 365 JAZ RT13
001223 001265 A
001224 002000 A 366 CALL* OUTC CR/LF
001225 100402 A
001226 011157 A 367 LDA COMP
001227 001010 A 368 JAZ *+15
001230 001246 A
001231 006030 A 369 LDXI MES7 WRITE (INPUT FRC INCREMENTS PER SEC)
001232 003122 A
001233 002000 A 370 CALL* OUTD
001234 100403 A
001235 002000 A 371 CALL IPDC INPUT DECIMAL NUMBER (DOUBLE PRECISION)
001236 002337 A
001237 052306 A 372 STA FROM
001240 062307 A 373 STB FROM+1
374 * COMPUTE INTERRUPTS PER MIN
375 * THESE WILL BE USED LATER IN COMPUTING ELAPSED TIME
376 CALL XDIM,D60
001241 002000 A
001242 003402 A
001243 002334 A
001244 052324 A 377 STA IFM
001245 062325 A 378 STB IFM+1
001246 006030 A 379 LDXI MES8 WRITE (INPUT BASIC INTERRUPTS PER SEC)
001247 003144 A
001250 002000 A 380 CALL* OUTD
001251 100403 A
001252 002000 A 381 CALL IPDC
001253 002337 A
001254 052310 A 382 STA VIIF INPUT DECIMAL NUMBER. (DOUBLE PRECISION)
001255 062311 A 383 STB VIIF+1
001256 002000 A 384 CALL XDIM,D60
001257 003402 A
001260 002334 A
001261 052326 A 385 STA IVM
001262 062327 A 386 STB IVM+1
001263 001000 A 387 JMP ITT BGN INTERRUPT TIMING TEST
001264 001320 A
001265 011157 A 388 RT13 LDA COMP
001266 001010 A 389 JAZ *+13 CONSOLE MODE
001267 001303 A
001270 005001 A 390 TZA
001271 005002 A 391 TZP
001272 005004 A 392 TZX
001273 000020 A 393 HLT 020
001274 052306 A 394 STA FROM INPUT IN A AND B REG. FRC INCR IN MICROSEC.
001275 062307 A 395 STB FROM+1 (DOUBLE-PRECISION) (OCTAL)
001276 002000 A 396 CALL XDIM,D60 COMPUTE INTERRUPTS PER MIN
001277 003402 A
001300 002334 A
001301 052324 A 397 STA IFM
001302 062325 A 398 STB IFM+1
001303 005004 A 399 TZX
001304 005001 A 400 TZA
001305 005002 A 401 TZP
001306 000021 A 402 HLT 021
001307 052310 A 403 STA VIIF INPUT IN A AND B REG. VII SOURCE FREQ.
001310 062311 A 404 STB VIIF+1 IN HZ. IN DOUBLE PRECISION (OCTAL)
001311 002000 A 405 CALL XDIM,D60 COMPUTE INTERRUPTS PER MIN
001312 003402 A
001313 002334 A
001314 052326 A 406 STA IVM
001315 062327 A 407 STB IVM+1
001316 001000 A 408 JMP ITT BGN INTERRUPT TIMING TEST
001317 001320 A
409 EJECT
410 *****
411 *
412 * INTERRUPT TIMING TEST
413 *
414 *****
001320 010442 A 415 ITT LDA $CON CONSOLE MODE?
001321 001010 A 416 JAZ I1 IF SD, BRANCH
001322 001471 A
001323 002000 A 417 CALL* OUTC CR/LF
001324 100402 A
001325 006030 A 418 LDXI IM1
001326 003175 A
001327 002000 A 419 CALL* OUTD IDENTIFY TEST
001330 100403 A
001331 011741 A 420 LDA I151 INIT TTY DEV ADDRESS
001332 006150 A 421 ANAI 0177700
001333 177700 A
001334 117000 I 422 DRA* $TTY
001335 051741 A 423 STA I151
001336 006010 A 424 LDAI 1
001337 000001 A
001340 052323 A 425 STA INTT INITIALIZE FOR II INTRVL TIMER
001341 011157 A 426 LDA COMP SEE IF THERE IS A CHOICE
001342 001010 A 427 JAZ I2 IF NOT, SKIP THE QUESTIONS
001343 001402 A

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001344	006030	A	428	LDXI IM3	04 00428
001345	003212	A			
001346	002000	A	429	CALL* OUTD FRC OR VII FOR INTERVAL TIMER	04 00429
001347	100403	A			
001350	002000	A	430	CALL IPDC	04 00430
001351	002337	A			
001352	062323	A	431	STB INTT	04 00431
001353	006030	A	432	ISCR LDXI IM4	04 00432
001354	003223	A			
001355	002000	A	433	CALL* OUTD REQUEST VII SELECT COUNT	04 00433
001356	100403	A			
001357	002000	A	434	CALL IPDC	04 00434
001360	002337	A			
			435 *	IF ZERO, SET TO HARDWARE DEFAULT OF 10 AND SIGNAL THIS WAS	04 00435
			436 *	DONE BY SETTING HDEF TO ZERO	04 00436
001361	062336	A	437	STB HDEF SET FLAG APPROPRIATELY	04 00437
001362	001020	A	438	JBZ *+4 DEFAULT	04 00438
001363	001366	A			
001364	001000	A	439	JMP *+4 NO DEFAULT	04 00439
001365	001370	A			
001366	006020	A	440	LDBI 10 SET DEFAULT	04 00440
001367	000012	A			
001370	062313	A	441	STB SELC+1	04 00441
001371	001010	A	442	JAZ *+4	04 00442
001372	001375	A			
001373	001000	A	443	JMP ISCP TOO LARGE	04 00443
001374	001452	A			
001375	005021	A	444	TEA	04 00444
001376	006140	A	445	SUBI 4096	04 00445
001377	010000	A			
001400	001002	A	446	JAP ISCP TOO LARGE	04 00446
001401	001452	A			
001402	006030	A	447	I2 LDXI IM5 REQUEST INTERVAL LENGTH	04 00447
001403	003235	A			
001404	002000	A	448	CALL* OUTD	04 00448
001405	100403	A			
001406	002000	A	449	CALL IPDC	04 00449
001407	002337	A			
001410	005311	A	450	DAR	04 00450
001411	001002	A	451	JAP I3 IF INTERVAL TOO LARGE, TRY AGAIN	04 00451
001412	001460	A			
001413	062321	A	452	STB ILNG	04 00452
			453 *	FOLLOWING COMPUTES THE NUMBER OF INTERRUPTS PER INTERVAL	04 00453
001414	012323	A	454	I4 LDA INIT CHOOSE CORRECT INTERRUPTS PER SEC VALUE	04 00454
001415	001010	A	455	JAZ I5	04 00455
001416	001423	A			
001417	012310	A	456	LDA VIIIF	04 00456
001420	022311	A	457	LDB VIIIF+1	04 00457
001421	001000	A	458	JMP I6	04 00458
001422	001425	A			
001423	012306	A	459	I5 LDA FROM	04 00459
001424	022307	A	460	LDB FROM+1	04 00460
001425	002000	A	461	I6 CALL MAIN,ILNG GET INTERRUPTS PER INTERVAL	04 00461
001426	003402	A			
001427	002321	A			
			462 *	CHECK TO SEE IF VII SELECT COUNT NEED BE CONSIDERED	04 00462
001430	031157	A	463	LDB COMP	04 00463
001431	001040	A	464	JAZ I7 IF NOT, INTERRUPTS/INTERVAL VALUE IS OK	04 00464
001432	001512	A			
001433	032323	A	465	LDB INTT	04 00465
001434	001040	A	466	JAZ I7 IF FRC IS THE INTERVAL TIMER, NO ADD NEEDED	04 00466
001435	001512	A			
001436	005004	A	467	I7 TXZ	04 00467
001437	002000	A	468	I8 CALL XDSU,SELC OTHERWISE, DIVIDE INTERRUPTS PER INTERVAL BY	04 00468
001440	003508	A			
001441	002312	A			
001442	001001	A	469	JBN I71	04 00469
001443	001511	A			
001444	007490	A	470	DEF	04 00470
001445	005144	A	471	I8	04 00471
001446	001001	A	472	I9	04 00472
001447	001460	A			
001450	001000	A	473	JMP I8 OUT OUT IF DIVISION COMPLETE	04 00473
001451	001437	A			
			474	EXCC	04 00474
			475 *	FOLLOWING HANDLES ILLEGAL INPUTS FOR INTERVAL SELECT COUNT	04 00475
001452	006030	A	476	ISCP LDXI IM6	04 00476
001453	003256	A			
001454	002000	A	477	CALL* OUTD	04 00477
001455	100403	A			
001456	001000	A	478	JMP ISCR	04 00478
001457	001353	A			
			479 *		04 00479
			480 *	ROUTINE TO HANDLE INTERVALS WHICH ARE TO LARGE	04 00480
			481 *		04 00481
001460	010442	A	482	I3 LDA %CON	04 00482
001461	001010	A	483	JAZ I1	04 00483
001462	001471	A			
001463	006030	A	484	LDXI IM6	04 00484
001464	003256	A			
001465	002000	A	485	CALL* OUTD GIVE ERROR MESSAGE	04 00485
001466	100403	A			
001467	001000	A	486	JMP I2 GIVE ANOTHER CHANCE	04 00486
001470	001402	A			
			487 *		04 00487

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		488 *	FOLLOWING HANDLES INITIALIZATION WHEN IN CONSOLE MODE		04 00488
		489 *			04 00489
001471	005001	A 490 I1	TZA		04 00490
001472	005002	A 491	TZB		04 00491
001473	005004	A 492	TZX		04 00492
001474	000022	A 493	HLT	022	04 00493
001475	052323	A 494	STA	INTT	04 00494
001476	062336	A 495	STB	HDEF	04 00495
001477	001020	A 496	JBZ	*+4	04 00496
001500	001503	A			
001501	001000	A 497	JMP	*+4	04 00497
001502	001505	A			
001503	006020	A 498	LDBI	10	04 00498
001504	000012	A			
001505	062313	A 499	STB	SELC+1	04 00499
001506	072321	A 500	STX	ILNG	04 00500
001507	001000	A 501	JMP	I4	04 00501
001510	001414	A			
		502	EJEC		04 00502
		503 *			04 00503
001511	005042	A 504 I71	TXB		04 00504
001512	062322	A 505 I7	STB	IINT	04 00505
001513	005311	A 506	DAR		04 00506
001514	001002	A 507	JAP	I3	04 00507
001515	001460	A			
001516	005021	A 508	TBA		04 00508
001517	006140	A 509	SUBI	037774	04 00509
001520	037774	A			
001521	001002	A 510	JAP	I3	04 00510
001522	001460	A			
001523	012322	A 511	LDA	IINT	04 00511
001524	001010	A 512	JAZ	I3	04 00512
001525	001460	A			
		513 *	SETUP MOI INTERUPT TO UPDATAE THE (V)II ELAPSED TIME COUNTER		04 00513
001526	006010	A 514 I9	LDAI	040045	04 00514
001527	040045	A			
001530	050044	A 515	STA	044	04 00515
001531	006010	A 516	LDAI	02000	04 00516
001532	002000	A			
001533	050046	A 517	STA	046	04 00517
001534	006010	A 518	LDAI	I10	04 00518
001535	001640	A			
001536	050047	A 519	STA	047	04 00519
001537	010442	A 520	LDA	SCON	04 00520
001540	001010	A 521	JAZ	I70	04 00521
001541	001546	A			
001542	006030	A 522	LDXI	IM7	04 00522
001543	003266	A			
001544	002000	A 523	CALL*	OUTD	04 00523
001545	100403	A			
		524 *	INITIALIZE AND START CLOCKS		04 00524
001546	100447	A 525 I70	EXC	0400+RTC	04 00525
001547	005001	A 526	TZA		04 00526
001550	050045	A 527	STA	045	04 00527
001551	052316	A 528	STA	UFRC	04 00528
001552	052314	A 529	STA	UVII	04 00529
001553	052315	A 530	STA	LVII	04 00530
001554	052317	A 531	STA	LFRC	04 00531
001555	012322	A 532	LDA	IINT	04 00532
001556	052320	A 533	STA	INXT	04 00533
001557	011157	A 534 IX11	LDA	CDMP	04 00534
001560	001010	A 535	JAZ	IX12	04 00535
001561	001571	A			
001562	012336	A 536	LDA	HDEF	04 00536
001563	001010	A 537	JAZ	*+4	04 00537
001564	001567	A			
001565	012313	A 538	LDA	SELC+1	04 00538
001566	103147	A 539	DAR	RTC	04 00539
001567	100647	A 540	EXC	0600+RTC	04 00540
001570	100047	A 541	EXC	RTC	04 00541
001571	100147	A 542 IX12	EXC	0100+RTC	04 00542
		543	EJEC		04 00543
		544 *	LOOP TILL ABOBT BY SS3		04 00544
001572	001400	A 545 I11	JSS3	RTCT	04 00545
001573	000527	A			
001574	002000	A 546	JMPM	IUFRC	04 00546
001575	001703	A			
		547 *	CHECK FOR END OF INTERVAL		04 00547
001576	022323	A 548	LDB	INTT	04 00548
001577	001020	A 549	JBZ	I141	04 00549
001600	001604	A			
001601	010045	A 550	LDA	045	04 00550
001602	001000	A 551	JMP	I14	04 00551
001603	001614	A			
001604	012317	A 552 I141	LDA	LFRC	04 00552
001605	006150	A 553	ANAI	037777	04 00553
001606	037777	A			
001607	052330	A 554	STA	EMFR	04 00554
001610	102547	A 555	CIA	RTC	04 00555
001611	122330	A 556	ADD	EMFR	04 00556
001612	006150	A 557	ANAI	037777	04 00557
001613	037777	A			
001614	142320	A 558 I14	SUB	INXT	04 00558
001615	001004	A 559	JAN	I15	04 00559
001616	001736	A			

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001617	006140	A	560	SUBI 04	IF CLOSE ENOUGH TO TARGET , TIME UP	04 00560
001620	000004	A				
001621	001002	A	561	JAP I15		04 00561
001622	001736	A				
			562	* SIGNAL INTERVAL UP		04 00562
			563	* BLINK CONSOLE LIGHTS		04 00563
001623	102577	A	564	I162 CIA 077		04 00564
001624	005211	A	565	CPA		04 00565
001625	103177	A	566	DAR 077		04 00566
			567	* BLINK THE OVERFLOW LIGHT		04 00567
001626	001001	A	568	I161 JDF I17		04 00568
001627	001631	A				
001630	007401	A	569	SDF		04 00569
			570	* COMPUTE NEW TARGET COUNT		04 00570
001631	012320	A	571	I17 LBA INXT	GET OLD TARGET CNT	04 00571
001632	122322	A	572	ADD IINT	COMPUTE NEW ONE	04 00572
001633	006150	A	573	ANAI 037777	MOD COUNTER SIZE	04 00573
001634	037777	A				
001635	052320	A	574	STA INXT		04 00574
001636	001000	A	575	JMP I15		04 00575
001637	001736	A				
			576	EJEC		04 00576
			577	* FOLLOWING IS EXECUTED ON MOI INTERRUPT		04 00577
			578	* IT UPDATES THE DOUBLE PRECISION II COUNT		04 00578
001640	000000	A	579	I10 DATA 0		04 00579
001641	100247	A	580	EXC 0200+RTC	INHIBIT MOI	04 00580
001642	051677	A	581	STA I10T		04 00581
001643	061700	A	582	STB I10T+1		04 00582
001644	071701	A	583	STX I10T+2		04 00583
001645	005004	A	584	TX		04 00584
001646	005544	A	585	ADFX	SAVE ORIGINAL OVERFLOW CONDITION	04 00585
001647	010045	A	586	LDA 045		04 00586
001650	006150	A	587	ANAI 037777		04 00587
001651	037777	A				
001652	050045	A	588	STA 045		04 00588
001653	012315	A	589	LDA LVII		04 00589
001654	007400	A	590	PDX		04 00590
001655	006120	A	591	ADDI 040000		04 00591
001656	040000	A				
001657	006150	A	592	XDAX ANAI 077777		04 00592
001660	077777	A				
001661	052315	A	593	STA LVII		04 00593
001662	012314	A	594	LDA UVII		04 00594
001663	005511	A	595	PDX		04 00595
001664	052314	A	596	STA UVII		04 00596
001665	007400	A	597	RDX		04 00597
001666	001040	A	598	JMP I101		04 00598
001667	001671	A				
001670	007401	A	599	SDF	RESTORE OVERFLOW, IF NEC.	04 00599
001671	011677	A	600	I101 LDA I10T		04 00600
001672	021700	A	601	LDS I10T+1		04 00601
001673	031701	A	602	LDS I10T+2		04 00602
001674	100147	A	603	EXC 0100+RTC	ENABLE RTC	04 00603
001675	001000	A	604	JMP* I10		04 00604
001676	101640	A				
001677	000000	A	605	I10T DATA 0.0.0.0		04 00605
001700	000000	A				
001701	000000	A				
001702	000000	A				
			606	EJEC		04 00606
			607	* FOLLOWING IS MANUAL UPDATE OF FRC ELAPSED TIME COUNTER		04 00607
001703	000000	A	608	IUFR DATA 0		04 00608
001704	011157	A	609	LDA COMP		04 00609
001705	001010	A	610	JAL* IUFR	IF NO FRC, CUT OUT	04 00610
001706	101703	A				
001707	102547	A	611	STA PTC		04 00611
001710	006150	A	612	ANAI 040000		04 00612
001711	040000	A				
001712	001010	A	613	JAL* IUFR	IF BIT 14 IS ON, TIME TO UPDATE LFRC	04 00613
001713	101703	A				
001714	005004	A	614	TX		04 00614
001715	005544	A	615	NOIX	SAVE OVERFLOW	04 00615
			616	* MOVE DYNAMIC COUNT INTO DRL PREC TOTAL		04 00616
001716	007400	A	617	PDX		04 00617
001717	102547	A	618	STA PTC	GET THE DYNAMIC COUNT	04 00618
001720	100047	A	619	EXC PTC	CLEAR THE FRC	04 00619
001721	122317	A	620	ADD LFRC		04 00620
001722	006150	A	621	ANAI 077777	CUT OFF THE SIGN BIT	04 00621
001723	077777	A				
001724	052317	A	622	STA LFRC		04 00622
001725	012316	A	623	LDA UFRC		04 00623
001726	005511	A	624	ADFA	ADD IN ANY OVERFLOW	04 00624
001727	052316	A	625	STA UFRC		04 00625
001730	007400	A	626	RDX		04 00626
001731	001040	A	627	JY2* IUFR		04 00627
001732	101703	A				
001733	007401	A	628	SDF	RESTORE OVERFLOW	04 00628
001734	001000	A	629	JMP* IUFR		04 00629
001735	101703	A				
			630	EJEC		04 00630
			631	* FOLLOWING CHECKS FOR ELAPSED TIME READOUT REQUESTS		04 00631
001736	010442	A	632	I15 LDA SCCH		04 00632
001737	001010	A	633	JAL I20	IF NO ITT, MAKE SPEC CHECK	04 00633
001740	002150	A				
001741	101201	A	634	I151 SEN 0201, *+4	SEE IF A CHARACTER AWAITS	04 00634

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001742 001745 A			
001743 001000 A	635	JMP I11	IF NOT, LOOP BACK TO REPEAT PREV CHECKS 04 00635
001744 001572 A			
001745 002000 A	636	CALL* INPB	OTHERWISE, GET THE CHARACTER 04 00636
001746 100411 A			
001747 001000 A	637	JMP I11	IF SS3 ON, RETURN TO BEGINING OF TEST 04 00637
001750 001572 A			
001751 005012 A	638	TAB	
001752 006140 A	639	SUBI *	04 00638
001753 000240 A			04 00639
001754 001010 A	640	JAZ I50	ELAPSED TIME WANTED 04 00640
001755 001774 A			
001756 002000 A	641	CALL* OUTC	CR/LF 04 00641
001757 100402 A			
001760 005021 A	642	TBA	
001761 006140 A	643	SUBI 'R'	04 00642
001762 000322 A			04 00643
001763 001010 A	644	JAZ I70	RESET ELAPSED TIME COUNTERS 04 00644
001764 001546 A			
001765 005021 A	645	TBA	
001766 006140 A	646	SUBI 'K'	04 00645
001767 000313 A			04 00646
001770 001010 A	647	JAZ ITT	RESTART 04 00647
001771 001320 A			
001772 001000 A	648	JMP I11	IF NONE OF THESE, IGNORE IT 04 00648
001773 001572 A			
	649	EJEC	04 00649
	650	* FOLLOWING COMPUTES ELAPSED TIME AND OUTPUTS IT	04 00650
	651	* DURING THIS TIME, FREQUENT CALLS ARE MADE TO ROUTINE IUFR.	04 00651
	652	* THIS IS NECESSARY SINCE A DELAY OF MORE THAN 1-6 SECONDS	04 00652
	653	* BETWEEN CALLS COULD RESULT IN BIT 15 OF THE FRC COUNT BECOMING	04 00653
	654	* A ONE. SUCH A SITUATION WOULD CAUSE ERRORS IN FRC ELAPSED	04 00654
	655	* TIME COUNT	04 00655
	656	*	04 00656
001774 002000 A	657 I50	JMPM ICOM	COMPUCE ELAPSED TIMES 04 00657
001775 002176 A			
001776 002000 A	658	CALL* OUTC	CR/LF 04 00658
001777 100402 A			
002000 011157 A	659	LDA COMP	
002001 001010 A	660	JAZ I51	IF NO FRC, SKIP NEXYT 04 00659
002002 002055 A			04 00660
002003 002000 A	661	JMPM IUFR	UPDATE FRC ELAP. TIME CNTR IF NEC. 04 00661
002004 001703 A			
002005 006030 A	662	LDXI IM9	04 00662
002006 003275 A			
002007 002000 A	663	CALL* OUTD	TYPE 'FRC: ' 04 00663
002010 100403 A			
002011 002000 A	664	CALL IUFR	CHECK FRC COUNT 04 00664
002012 001703 A			
002013 005001 A	665	TZA	
002014 022330 A	666	LDB EMFR	GET ELAPSED MIN FOR FRC 04 00665
002015 006030 A	667	LDXI BUFD	04 00666
002016 002614 A			04 00667
002017 002000 A	668	CALL CONN	04 00668
002020 002433 A			
002021 006030 A	669	LDXI BUFD+3	LAST FOUR CHARACTERS 04 00669
002022 002617 A			
002023 002000 A	670	CALL* OUTD	OUT ELAPSED MIN 04 00670
002024 100403 A			
002025 002000 A	671	CALL IUFR	CHECK FRC COUNT 04 00671
002026 001703 A			
002027 006030 A	672	LDXI IM10	04 00672
002030 003301 A			
002031 002000 A	673	CALL* OUTD	OUT 'MIN ' 04 00673
002032 100403 A			
002033 002000 A	674	CALL IUFR	CHECK FRC COUNT 04 00674
002034 001703 A			
002035 005001 A	675	TZA	
002036 022331 A	676	LDB ESFR	GET ELAPSED SEC FOR FRC 04 00675
002037 006030 A	677	LDXI BUFD	04 00676
002040 002614 A			04 00677
002041 002000 A	678	CALL CONN	04 00678
002042 002433 A			
002043 006030 A	679	LDXI BUFD+3	LAST FOUR CHARACTERS 04 00679
002044 002617 A			
002045 002000 A	680	CALL* OUTD	04 00680
002046 100403 A			
002047 002000 A	681	CALL IUFR	CHECK FRC COUNT 04 00681
002050 001703 A			
002051 006030 A	682	LDXI IM11	04 00682
002052 003304 A			
002053 002000 A	683	CALL* OUTD	OUT 'SEC' AND CR/LF 04 00683
002054 100403 A			
002055 002000 A	684 I51	JMPM IUFR	04 00684
002056 001703 A			
002057 006030 A	685	LDXI IM12	04 00685
002060 003310 A			
002061 002000 A	686	CALL* OUTD	04 00686
002062 100403 A			
002063 002000 A	687	CALL IUFR	CHECK FRC COUNT 04 00687
002064 001703 A			
002065 005001 A	688	TZA	
002066 022332 A	689	LDB EMVI	GET ELAPSED MIN FOR VII 04 00688
002067 006030 A	690	LDXI BUFD	04 00689
002070 002614 A			04 00690

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002071	002000	A	691	CALL	CONV	04 00691
002072	002433	A				
002073	006030	A	692	LDBI	BUFD+3	04 00692
002074	002617	A			LAST FOUR CHARACTERS	
002075	002000	A	693	CALL*	OUTD	04 00693
002076	100403	A			OUTPUT ELAPSED MIN	
002077	002000	A	694	CALL	IUFR	04 00694
002100	001703	A			CHECK FRC COUNT	
002101	006030	A	695	LDBI	IN10	04 00695
002102	003301	A				
002103	002000	A	696	CALL*	OUTD	04 00696
002104	100403	A			OUTPUT 'MIN.'	
002105	002000	A	697	CALL	IUFR	04 00697
002106	001703	A			CHECK FRC COUNT	
002107	005001	A	698	TZA		04 00698
002110	022333	A	699	LDB	ESVI	04 00699
002111	006030	A	700	LDBI	BUFD	04 00700
002112	002617	A				
002113	002000	A	701	CALL	CONV	04 00701
002114	002433	A				
002115	006030	A	702	LDBI	BUFD+3	04 00702
002116	002617	A			LAST FOUR CHARACTERS	
002117	002000	A	703	CALL*	OUTD	04 00703
002120	100403	A			OUTPUT ELAPSED SEC	
002121	002000	A	704	CALL	IUFR	04 00704
002122	001703	A			CHECK FRC COUNT	
002123	006030	A	705	LDBI	IN11	04 00705
002124	003301	A				
002125	002000	A	706	CALL*	OUTD	04 00706
002126	100403	A			OUTPUT 'SEC'	
002127	002000	A	707	CALL	IUFR	04 00707
002130	001703	A			CHECK FRC COUNT	
002131	102547	A	708 *	REINIT THE INTERVAL TIMER TARGET CNT		04 00708
002132	122317	A	709	RTD	RTD	04 00709
002133	006150	A	710	ADP	LRFC	04 00710
002134	007777	A	711	ADAI	007777	04 00711
002135	022333	A	712	LDB	INTT	04 00712
002136	001020	A	713	JR2	102	04 00713
002137	002141	A			IS THE FRC THE INTERVAL TIMER?	
002140	010045	A	714	LDB	045	04 00714
002141	122332	A	715	INT	INT	04 00715
002142	006150	A	716	ADAI	01/777	04 00716
002143	007777	A			ADD IN INTERVALS PER INTERVAL	
002144	052320	A	717	ADP	INTT	04 00717
002145	007400	A	718	ADP	007400	04 00718
002146	001000	A	719	ADP	111	04 00719
002147	001572	A			RESET OVERFLOW INDICATOR	
002150	001100	A	720	LJED		04 00720
002151	002154	A	721 *	FOLLOWING HANDLES ELAPSED TIME READOUTS IN CONSOLE MODE		04 00721
002152	001000	A	722	130	1011	04 00722
002153	001572	A			NEED ELAPSED TIME?	
002154	002000	A	723	JBR	111	04 00723
002155	002176	A			IF NOT, LOAD PACK	
002156	012332	A	724	JMPM	107M	04 00724
002157	004246	A			OTHERWISE, GET ELAPSED TIME	
002160	112333	A	725	LDB	EMVI	04 00725
002161	005012	A	726	LDBA	0	04 00726
002162	011157	A	727	URH	ESVI	04 00727
002163	001010	A	728	TAB		04 00728
002164	002170	A	729	LDB	COMP	04 00729
002165	012333	A	730	JAZ	1301	04 00730
002166	004246	A				
002167	112331	A	731	LDB	EMFR	04 00731
002170	002000	A	732	LDBA	0	04 00732
002171	000023	A	733	0	ESFR	04 00733
002172	001000	A	734	1301	101	04 00734
002173	001000	A	735	0	001	04 00735
002174	001000	A	736	0	001	04 00736
002175	001000	A	737	0	001	04 00737
002176	000000	A	738	0	001	04 00738
002177	005001	A	739 *	FOLLOWING COMPUTES ELAPSED TIMES IN MIN AND SEC		04 00739
002200	102647	A	740	100M	00 A	04 00740
002201	062331	A	741	0	0	04 00741
002202	020045	A	742	0	RTD	04 00742
002203	002000	A	743	0	ESFR	04 00743
002204	003434	A	744	0	001	04 00744
002205	002314	A	745	CALL	XPDP,UVII	04 00745
002206	031157	A			GET CURRENT FRC COUNT	
002207	001040	A	746	LDB	COMP	04 00746
002210	002215	A	747	JX2	101	04 00747
002211	002000	A	748	CALL	XPDP,SELC+1	04 00748
002212	003402	A			IF VII, ADJUST FOR SELECT COUNT	
002213	002313	A				
002214	005004	A	749	TDX		04 00749
002215	002000	A	750	CALL	XPDP,IVM	04 00750
002216	003502	A			SUB INCR PER MIN	
002217	002326	A				
002220	001004	A	751	JAM	102	04 00751
002221	002225	A				
002222	005144	A	752	IXB		04 00752

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002223	001000	A 753	JMP IC1 04 00753
002224	002215	A 754 IC2	CALL XAD,IVM 04 00754
002225	002000	A 755	STX EMVI SAVE ELAPSED MIN 04 00755
002226	003434	A 756	TZX 04 00756
002227	002326	A 757 IC3	CALL XDSU,VIIIF 04 00757
002230	072332	A 758	JAN IC4 04 00758
002231	005004	A 759	IXR 04 00759
002232	002000	A 760	JMP IC3 04 00760
002233	003502	A 761 IC4	STX ESVI STORE ELAPSED SEC 04 00761
002234	002310	A 762	LDA COMP AN FRC? 04 00762
002235	001004	A 763	JAZ* ICOM IF NOT, DONE 04 00763
002236	002242	A 764	CALL IUFR UPDATE FRC ELAP. TIME CNTR. IF NEC 04 00764
002237	005144	A 765	TZA 04 00765
002240	001000	A 766	LDB ESFR GET CURRENT FRC COUNT FROM ITS TEMP STORAGE 04 00766
002241	002232	A 767	CALL XAD,UFR GET DBL PREC TOTAL 04 00767
002242	072333	A 768	TZX 04 00768
002243	011157	A 769 IC5	CALL XDSU,IFM SUB INCR PER MIN 04 00769
002244	001010	A 770	JAN IC6 04 00770
002245	102176	A 771	IXR 04 00771
002246	002000	A 772	JMP IC5 04 00772
002247	001703	A 773 IC6	CALL XAD,IFM 04 00773
002250	005001	A 774	STX EMFR STORE ELAP MIN 04 00774
002251	022331	A 775	TZX 04 00775
002252	002000	A 776 IC7	CALL XDSU,FRM 04 00776
002253	003434	A 777	JAN IC8 04 00777
002254	002316	A 778	IXR 04 00778
002255	005004	A 779	JMP IC7 04 00779
002256	002000	A 780 IC8	STX ESFR SAVE ELAPSED SEC 04 00780
002257	003502	A 781	JMP* ICOM 04 00781
002260	002324	A 782	EJEC 04 00782
002261	001004	A 783 FRM	DATA 0,0 FRC INCR. PER SEC (DOUBLE PREC.) 04 00783
002262	002266	A 784 VIIIF	DATA 0,0 VII INTERRUPTS PER SEC (DOUBLE PREC.) 04 00784
002263	005144	A 785 SELC	DATA 0,0 04 00785
002264	001000	A 786 UVII	DATA 0 UPPER HALF, VII ELAP TIME CNTR 04 00786
002265	002256	A 787 LVII	DATA 0 LOWER HALF 04 00787
002266	002000	A 788 UFR	DATA 0 UPPER HALF, FRC ELAP TIME CNTR 04 00788
002267	003434	A 789 LFRC	DATA 0 LOWER HALF DBL PREC FRC ELAP TIME CNTR 04 00789
002270	002324	A 790 INXT	DATA 0 COUNT AT END OF NEXT INTERVAL 04 00790
002271	072330	A 791 ILNG	DATA 0 INTERVAL LENGTH 04 00791
002272	005004	A 792 IINT	DATA 0 NUMBER OF INTERRUPTS PER INTERVAL 04 00792
002273	002000	A 793 INTT	DATA 0 INTERVAL TIMER, 2=FRC, 1=VII 04 00793
002274	003502	A 794 IFM	DATA 0,0 DBL PREC INCR PER MIN FRC 04 00794
002275	002306	A 795 IVM	DATA 0,0 DBL PREC VII INCR PER MIN 04 00795
002276	001004	A 796 EMFR	DATA 0 TEMP LOC FOR ELAP TIME COMP 04 00796
002277	002303	A 797 ESFR	DATA 0 04 00797
002300	005144	A 798 EMVI	DATA 0 04 00798
002301	001000	A 799 ESVI	DATA 0 04 00799
002302	002273	A 800 D60	DATA 60 04 00800
002303	072331	A 801 STTY	DATA 07370 POINTER TO TTY DEV ADDRESS 04 00801
002304	001000	A 802 HDEF	DATA 0 FLAG: IF ZERO, HDEF DEFAULT FOR SELC CNT 04 00802
002305	102176	A 803	EJEC 04 00803
002306	000000	A 804	***** 04 00804
002307	000000	A 805	***** 04 00805
002310	000000	A 806	***** 04 00806
002311	000000	A 807	***** 04 00807
002312	000000	A 808	***** 04 00808
002313	000000	A 809	***** 04 00809
002314	000000	A 810	IPDC ENTR 0 04 00810
002315	000000	A 811	TZA ZERO OUT DOUBLE PRECISION SUM. 04 00811
002316	000000	A 812	STA DPCM 04 00812
002317	000000	A 813	STA DPCM+1 04 00813
002320	000000	A 814	IPD1 CALL* INPB GET 1 CHAR. IN A REG. 04 00814
002321	000000	A 815	JMP RTCT TERMINATION EXIT IF SS3 SET 04 00815
002322	000000	A 816	TAB 04 00816
002323	000000	A 817	SUBI 0256 CHECK IF PERIOD 04 00817
002324	000000	A	
002325	000000	A	
002326	000000	A	
002327	000000	A	
002330	000000	A	
002331	000000	A	
002332	000000	A	
002333	000000	A	
002334	000074	A	
002335	007370	A	
002336	000000	A	
002337	000000	A	
002340	005001	A	
002341	052426	A	
002342	052427	A	
002343	002000	A	
002344	100411	A	
002345	001000	A	
002346	000527	A	
002347	005012	A	
002350	006140	A	
002351	000256	A	

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002352	001010	A	818	JAZ	IPD4	04 00818
002353	002413	A				
002354	005021	A	819	TBA		04 00819
002355	006140	A	820	SUBI	0254	04 00820
002356	000254	A			CHECK IF COMMA.	
002357	001010	A	821	JAZ	IPD5	04 00821
002360	002420	A				
002361	005021	A	822	TBA		04 00822
002362	006140	A	823	SUBI	0260	04 00823
002363	000250	A			CHECK IF LEGAL CHAR.	
002364	001004	A	824	JAN	IPD3	04 00824
002365	002407	A				
002366	052431	A	825	STA	VALU	04 00825
002367	006140	A	826	SUBI	012	04 00826
002370	000012	A				
002371	001002	A	827	JAP	IPD3	04 00827
002372	002407	A				
002373	012426	A	828	LDA	DPSM	04 00828
002374	022427	A	829	LDB	DPSM+1	04 00829
002375	002000	A	830	CALL	XDIM,TEN	04 00830
002376	003402	A			MULTI DP SUM BY TEN	
002377	002432	A				
002400	002000	A	831	CALL	XDAD,VALU-1	04 00831
002401	003434	A			ADD CHAR JUST READ	
002402	002430	A				
002403	052426	A	832	STA	DPSM	04 00832
002404	062427	A	833	STB	DPSM+1	04 00833
002405	001000	A	834	JMP	IPD1	04 00834
002406	002343	A			GET NEXT CHAR.	
002407	002000	A	835	IPD3	CALL*	04 00835
002410	100406	A			ILLEGAL CHAR. MESSAGE	
002411	001000	A	836	JMP	IPD0+1	04 00836
002412	002340	A				
002413	002000	A	837	IPD4	CALL*	04 00837
002414	100402	A			OUTPUT CR/LF	
002415	005004	A	838	TZX		04 00838
002416	001000	A	839	JMP	*+4	04 00839
002417	002422	A				
002420	006030	A	840	IPD5	LDSI	04 00840
002421	000001	A			COMMA CHAR.	
002422	012426	A	841	LDA	DPSM	04 00841
002423	022427	A	842	LDB	DPSM+1	04 00842
002424	001000	A	843	JMP*	IPD0	04 00843
002425	102337	A				
002426	000000	A	844	DPSM	DATA	04 00844
002427	000000	A			0,0,0	
002430	000000	A				
002431	000000	A	845	VALU	DATA	04 00845
002432	000012	A	846	TEN	DATA	04 00846
			847	EJEC	10	04 00847
			848	*****		
			849	* CONVERT DOUBLE PRECISION OCTAL NUMBER TO ASCII DECIMAL		
			850	*****		
			851	*****		
002433	000000	A	852	CONV	ENTR	04 00852
002434	072720	A	853	STX	ADDR+1	04 00853
002435	052636	A	854	STA	SAVN	04 00854
002436	062637	A	855	STB	SAVN+1	04 00855
002437	006030	A	856	LDSI	BUFC	04 00856
002440	002624	A			LOC OF 9 WORD TABLE	
002441	072717	A	857	STX	ADDR	04 00857
002442	006030	A	858	LDSI	TADC	04 00858
002443	002570	A			LOC OF TABLE	
002444	072452	A	859	STX	CON1+2	04 00859
002445	072460	A	860	STX	CON3+2	04 00860
002446	072467	A	861	STX	CON4+2	04 00861
002447	005004	A	862	TZX		04 00862
002450	002000	A	863	CON1	CALL	04 00863
002451	003502	A			INTEGER COUNTER	
002452	000000	A			SUB. VALUE FROM TABLE	
002453	001004	A	864	JAN	CON5	04 00864
002454	002472	A			CHECK IF VALUE LESS THAN TABLE	
002455	005144	A	865	CON2	IXR	04 00865
002456	002000	A	866	CON3	CALL	04 00866
002457	003502	A			INCR. INTEGER COUNT	
002460	000000	A			SUB. VALUE FROM TABLE	
002461	001004	A	867	JAN	*+4	04 00867
002462	002465	A			CHECK IF VALUE NEG.	
002463	001000	A	868	JMP	CON2	04 00868
002464	002455	A			NO	
002465	002000	A	869	CON4	CALL	04 00869
002466	003434	A			ADD TABLE VALUE BACK	
002467	000000	A				
002470	052636	A	870	STA	SAVN	04 00870
002471	062637	A	871	STB	SAVN+1	04 00871
002472	077000	I	872	CON5	STX*	04 00872
002473	042717	A	873	INR	ADDR	04 00873
002474	032452	A	874	LDSI	CON1+2	04 00874
002475	005144	A	875	IXR		04 00875
002476	005144	A	876	IXR		04 00876
002477	072452	A	877	STX	CON1+2	04 00877
002500	072460	A	878	STX	CON3+2	04 00878
002501	072467	A	879	STX	CON4+2	04 00879
002502	035001	A	880	LDSI	1+1	04 00880
002503	001040	A	881	JXZ	CON9	04 00881
					CHECK IF NEXT TABLE VALUE ZERO	

002504	002512	A									
002505	005004	A	882	TZX		ZERO INTEGER COUNTER		04	00882		
002506	012636	A	883	LDA	SAVN	RETURN VALUE		04	00883		
002507	022637	A	884	LDB	SAVN+1			04	00884		
002510	001000	A	885	JMP	CON1			04	00885		
002511	002450	A									
002512	006030	A	886	CON9	LDXI	(BUFC)	ADD ASCII NOTATION TO BINARY NUMBER	04	00886		
002513	002624	A									
002514	005002	A	887	TZR		BLANK OUT HIGH ORDER DIGITS.		04	00887		
002515	015000	A	888	CONL	LDA	0:1	GET BINARY NUMBER	04	00888		
002516	001010	A	889	JAZ	CON7			04	00889		
002517	002534	A									
002520	005322	A	890	DBR				04	00890		
002521	006120	A	891	CON6	ADDI	0260	ADD ASCII CHARACTER ZERO.	04	00891		
002522	000260	A									
002523	055000	A	892	STA	0:1			04	00892		
002524	005144	A	893	IXR				04	00893		
002525	005041	A	894	TXA				04	00894		
002526	006140	A	895	SUBI	(BUFC+9)	CHECK IF 9 CHARACTERS CHECKED.		04	00895		
002527	002635	A									
002530	001010	A	896	JAZ	CON8			04	00896		
002531	002544	A									
002532	001000	A	897	JMP	CONL			04	00897		
002533	002515	A									
002534	001020	A	898	CON7	JBZ	*+4		04	00898		
002535	002540	A									
002536	001000	A	899	JMP	CON6			04	00899		
002537	002521	A									
002540	006120	A	900	ADDI	0240	BLANK OUT HIGH ORDER CHARACTER		04	00900		
002541	000240	A									
002542	001000	A	901	JMP	CON6+2			04	00901		
002543	002523	A									
002544	006030	A	902	CON8	LDXI	(BUFC-1)	PACK ASCII CHARACTERS	04	00902		
002545	002623	A									
002546	015000	A	903	CD11	LDA	0:1	GET HIGH ORDER CHAR	04	00903		
002547	005144	A	904	IXR				04	00904		
002550	004250	A	905	LRLA	8			04	00905		
002551	125000	A	906	ADD	0:1	GET LOW ORDER CHAR.		04	00906		
002552	005144	A	907	IXR				04	00907		
002553	057000	I	908	STA*	ADDR+1	STORE CHAR. IN BUFFER		04	00908		
002554	042720	A	909	INR	ADDR+1			04	00909		
002555	005041	A	910	TXA				04	00910		
002556	006140	A	911	SUBI	(BUFC+9)	CHECK IF BUFFER BACKED		04	00911		
002557	002635	A									
002560	001010	A	912	JAZ	*+4			04	00912		
002561	002564	A									
002562	001000	A	913	JMP	CD11	GET NEXT CHARACTERS.		04	00913		
002563	002546	A									
002564	002000	A	914	CALL	IUFR	UPDATE FRC ELAP. TIME CNTR. IF NEC		04	00914		
002565	001703	A									
002566	001000	A	915	JMP*	CONV			04	00915		
002567	102433	A									
002570	005753	A	916	TEDC	DATA	05753,060400	100000000	04	00916		
002571	060400	A									
002572	000461	A	917	DATA	0461,013200	100000000		04	00917		
002573	013200	A									
002574	000036	A	918	DATA	036,041100	10000000		04	00918		
002575	041100	A									
002576	000003	A	919	DATA	03,03240	100000		04	00919		
002577	003240	A									
002600	000000	A	920	DATA	0,023420	10000		04	00920		
002601	023420	A									
002602	000000	A	921	DATA	0,01750	1000		04	00921		
002603	001750	A									
002604	000000	A	922	DATA	0,0144	100		04	00922		
002605	000144	A									
002606	000000	A	923	DATA	0,012	10		04	00923		
002607	000012	A									
002610	000000	A	924	DATA	0,01	1		04	00924		
002611	000001	A									
002612	000000	A	925	DATA	0,0	0		04	00925		
002613	000000	A									
002614		A	926	BUFD	BSS	5		04	00926		
002621	120240	A	927	DATA	' , 0			04	00927		
002622	000000	A									
002623	000240	A	928	DATA	0240			04	00928		
002624		A	929	BUFC	BSS	9		04	00929		
002635	000000	A	930	FLGC	DATA	0		04	00930		
002636	000000	A	931	SAVN	DATA	0,0		04	00931		
002637	000000	A									
002640	000000	A	932	TIME	DATA	0	TEMP. FR TIME	04	00932		
002641	000000	A	933	CONT	DATA	0	TIME COUNTER	04	00933		
002642		A	934	TABT	BSS	34	TIME BUFFER FOR 20 TIME PERIOD COUNTS	04	00934		
002704	000000	A	935	SUMH	DATA	0,0	DOUBLE PRECISION ADD	04	00935		
002705	000000	A									
002706	000000	A	936	TWNT	DATA	0,20		04	00936		
002707	000024	A									
002710	000006	A	937	SIXM	DATA	6		04	00937		
002711	000000	A	938	VAR	DATA	0,0		04	00938		
002712	000000	A									
002713	000000	A	939	HVAL	DATA	0,0	TOLERANCE HIGH	04	00939		
002714	000000	A									
002715	000000	A	940	LVAL	DATA	0,0	TOLERANCE LOW	04	00940		
002716	000000	A									
002717		A	941	ADDR	BSS	2	STORAGE LOCATIONS	04	00941		

942	EJEC			04 00942
943	*****			04 00943
944	*	TIME DELAY OF 1/4 SECOND		04 00944
945	*	X = NO OF 1/4 SECONDS TO DELAY		04 00945
946	*	CALLING SEQ.		04 00946
947	*	LDXI NUMBER		04 00947
948	*	CALL TDSC		04 00948
949	*			04 00949
950	*****			04 00950
002721	000000	A		
002722	052742	A		
002723	062743	A		
002724	072744	A		
002725	002000	A		
002726	002745	A		
002727	032744	A		
002730	005344	A		
002731	072744	A		
002732	001040	A		
002733	002736	A		
002734	001000	A		
002735	002725	A		
002736	012742	A		
002737	022743	A		
002740	001000	A		
002741	102721	A		
002742	000000	A		
002743	000000	A		
002744	000000	A		
002745	000000	A		
002746	011157	A		
002747	001010	A		
002750	002753	A		
002751	006010	A		
002752	036420	A		
002753	006120	A		
002754	024674	A		
002755	005014	A		
002756	001040	A		
002757	102745	A		
002760	012762	A		
002761	012763	A		
002762	012764	A		
002763	012765	A		
002764	005344	A		
002765	001000	A		
002766	002756	A		
951	TDSC	ENTR		
952		STA	TDSC	SAVE REGISTERS
953		STB	TDSC+1	
954		STX	TDSC+2	
955	TDSC	CALL	HLFS	
956		LDX	TDSC+2	
957		DXR		X = NO. OF 1/4 SEC. TIME OUTS.
958		STX	TDSC+2	
959		JXZ	TDSC	
960		JMP	TDSC	
961	TDSC	LDA	TDSC	RESTORE REGISTERS
962		LDB	TDSC+1	
963		JMP*	TDSC	
964	TDSC	DATA	0,0,0	
965	HLFS	ENTR		
966		LDA	COMP	
967		JAZ	*+4	
968		LDRI	15632	
969		ADDI	10684	
970		TAX		1/4 SECOND TIME-OUT
971	HLF1	JXZ*	HLFS	
972		LDA	*+2	
973		LDA	*+2	
974		LDA	*+2	
975		LDA	*+2	
976		DXR		
977		JMP	HLF1	
978		EJEC		
979	MES1	DATA	'REAL TIME CLOCK TEST',0106612,0	
002767	151305	A		
002770	140714	A		
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		
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		
003027	151317	A		
003030	151240	A		
003031	147317	A		
003032	127240	A		
003033	136640	A		
003034	000000	A		
003035	153301	A		
003036	151311	A		
003037	140702	A		
003040	146305	A		
003041	000000	A		
003042	120311	A		
003043	147324	A		
003044	142722	A		
003045	153301	A		
980	MES2	DATA	'I/O INSTRUCTION AND INTERRUPT TEST',0106612,0	
981	MES3	DATA	'ERROR NO. = ',0	
982	MES4	DATA	'VARIABLE',0	
983	MES5	DATA	' INTERVAL INTERRUPT CHECK',0106612,0	

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 MES5	DATA	'MEMORY OVERFLOW INTERRUPT CHECK ',0106612,0
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 MES6	DATA	'FREE RUNNING COUNTER CHECK',0106612,0
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 ',0106612,0
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 MES8	DATA	'INPUT BASIC INTERRUPTS PER SECOND ',0106612,0
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	'RTC TYPE =',0
003170	141640	A			
003171	152331	A			
003172	150305	A			
003173	120275	A			
003174	000000	A			
003175	144716	A	989 IM1	DATA	'INTERRUPT TIMING TEST ',0106612,0
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= ',0		04 00990
003213	152205	A						
003214	151326	H						
003215	140714	A						
003216	120324	A						
003217	144715	A						
003220	142723	A						
003221	136640	A						
003222	000000	A						
003223	152211	A	991	IM4	DATA	'VII SELECT COUNT= ',0		04 00991
003224	144640	A						
003225	151724	A						
003226	146305	A						
003227	141724	A						
003230	120303	A						
003231	147723	A						
003232	147324	A						
003233	136640	A						
003234	000000	A						
003235	144716	A	992	IM5	DATA	'INTERVAL DISPLAY PERIOD IN SEC.= ',0		04 00992
003236	152205	A						
003237	151326	A						
003240	140714	A						
003241	120303	A						
003242	144723	A						
003243	150311	A						
003244	140723	A						
003245	120303	A						
003246	142723	A						
003247	144715	A						
003250	142241	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		04 00993
003257	140723	A						
003260	141723	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		04 00994
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		04 00995
003276	141672	A						
003277	120240	A						
003300	000000	A						
003301	146711	A	996	IM10	DATA	'MIN',0		04 00996
003302	147254	A						
003303	000000	A						
003304	151725	A	997	IM11	DATA	'SEC ',0106612,0		04 00997
003305	141640	A						
003306	116612	A						
003307	000000	A						
003310	124326	A	998	IM12	DATA	'(V)II:',0		04 00998
003311	124711	A						
003312	144672	A						
003313	000000	A						
003314	144716	A	999	MS16	DATA	'INVALID',0		04 00999
003315	153301	A						
003316	146311	A						
003317	142240	A						
003320	000000	A						
			1000	EJEC				S04 01000
			1001	*				04 01001
003321	000000	A	1002	BCNG	ENTR	0	ADJUST INSTRS. TO BIT SIZE	04 01002
003322	005002	A	1003		IZB			04 01003
003323	005101	A	1004		INCR	1		04 01004
003324	004541	A	1005		LLSR	1		04 01005
003325	063455	A	1006		STB	XDSB		04 01006
003326	063465	A	1007		STB	XDS4+1		04 01007
003327	005311	A	1008		DAR			04 01008
003330	004341	A	1009		LSRA	1		04 01009
003331	053422	A	1010		STA	XDA2+1	SET ANAI INST	04 01010
003332	053470	A	1011		STA	XDS2+1		04 01011
003333	051660	A	1012		STA	XDA3+1		04 01012
003334	011156	A	1013		LDA	NBIT		04 01013
003335	005311	A	1014		DAR			04 01014
003336	005311	A	1015		DAR			04 01015
003337	053454	A	1016		STA	XDLC	SET LOOP COUNT FOR DIVIDE	04 01016
003340	001000	A	1017		JMP*	BCNG		04 01017
003341	103321	A						

1018	EJEC				S04 01018
1019 *					04 01019
1020 *					*04 01020
1021 *					*04 01021
1022 *					*04 01022
003342 073411 A	1023 XDI1	STX	XDIS+4	DOUBLE PRECISION INTEGER MULTIPLY BY ADDITION CALL XDIM,MULT WHERE MULTIPLIER MUST BE A SINGLE WORD + SAVE VALUES	04 01023
003343 053405 A	1024	STA	XDIS		04 01024
003344 053407 A	1025	STA	XDIS+2		04 01025
003345 063406 A	1026	STB	XDIS+1		04 01026
003346 063410 A	1027	STB	XDIS+3		04 01027
003347 023402 A	1028	LDB	XDIM		04 01028
003350 036000 A	1029	LDB	0,2	SET NO. OF TIMES TO ADD.	04 01029
003351 035000 A	1030	LDB	0,1		04 01030
003352 043402 A	1031	INR	XDIM		04 01031
003353 001040 A	1032	JXZ	XDIS	CHECK IF MULTIPLIER ZERO. ANS. ZERO	04 01032
003354 003371 A					
003355 005344 A	1033 XDI2	DMR			04 01033
003356 001040 A	1034	JXZ	XDI4		04 01034
003357 003376 A					
003360 013405 A	1035	LDA	XDIS		04 01035
003361 023406 A	1036	LDB	XDIS+1		04 01036
003362 002000 A	1037	CALL	XDAD,XDIS+2		04 01037
003363 003434 A					
003364 003407 A					
003365 053405 A	1038	STA	XDIS		04 01038
003366 063406 A	1039	STB	XDIS+1		04 01039
003367 001000 A	1040	JMP	XDI2		04 01040
003370 003355 A					
003371 005001 A	1041 XDI3	TZA			04 01041
003372 005002 A	1042	TZB			04 01042
003373 033411 A	1043	LDB	XDIS+4		04 01043
003374 001000 A	1044	JMP*	XDIM		04 01044
003375 103402 A					
003376 013405 A	1045 XDI4	LDA	XDIS		04 01045
003377 023406 A	1046	LDB	XDIS+1		04 01046
003400 033411 A	1047	LDB	XDIS+4		04 01047
003401 001000 A	1048	JMP	0		04 01048
003402 000000 A					
003403 001000 A	1049 XDIM	BES	0		04 01049
003404 003342 A	1050	JMP	XDI1		04 01050
003405 000000 A	1051 XDIS	DATA	0,0,0,0,0		04 01051
003406 000000 A					
003407 000000 A					
003410 000000 A					
003411 000000 A					
1052	EJEC				S04 01052
1053 *					04 01053
1054 *	XDAD			FIXED POINT DOUBLE PRECISION ADD/SUBTRACT	04 01054
1055 *					04 01055
003412 073437 A	1056	STX	XDAD+3	SAVE XR	04 01056
003413 007400 A	1057	RDF		RESET OF	04 01057
003414 033434 A	1058	LDB	XDAD		04 01058
003415 035000 A	1059	LDB	0,1	XR>ADDR OF HI B	04 01059
003416 053440 A	1060	STA	XDAD+4	SAVE HI A	04 01060
003417 005021 A	1061	TBA		GET LO A	04 01061
003420 125001 A	1062	ADD	1,1	ADD LO B	04 01062
003421 006150 A	1063 XDA2	ANAI	077777	SIGN BIT	04 01063
003422 077777 A					
003423 005012 A	1064	TAB		SAVE RESULT	04 01064
003424 005001 A	1065	TZA			04 01065
003425 005511 A	1066	ADFA		GET CARRY	04 01066
003426 007400 A	1067	RDF		RESET OF	04 01067
003427 123440 A	1068	ADD	XDAD+4	ADD HI A	04 01068
003430 125000 A	1069	ADD	0,1	ADD HI B	04 01069
003431 043434 A	1070	INR	XDAD	SET RETURN	04 01070
003432 033437 A	1071	LDB	XDAD+3	RESTORE XR	04 01071
003433 001000 A	1072	JMP	0	RETURN	04 01072
003434 000000 A					
003435 001000 A	1073 XDAD	EDU	*-1	ENTRY	04 01073
003436 003412 A	1074	JMP	*-19		04 01074
003437 000000 A					
003440 000000 A	1075	DATA	0,0	TEMP STORAGE	04 01075
1076	EJEC				S04 01076
1077 *					04 01077
1078 *					04 01078
1079 *	XDCD			FIXED POINT DOUBLE PRECISION COMPLEMENT	04 01079
1080 *					04 01080
003441 000000 A	1081 XDCD	ENTR			04 01081
003442 005211 A	1082	CPA			04 01082
003443 001020 A	1083	JBZ	*+8		04 01083
003444 003453 A					
003445 005222 A	1084	CPB			04 01084
003446 005122 A	1085	IBR			04 01085
003447 004041 A	1086	LRLB	1		04 01086
003450 004141 A	1087	LSRB	1		04 01087
003451 001000 A	1088	JMP*	XDCD		04 01088
003452 103441 A					
003453 005111 A	1089	IAR			04 01089
003454 000016 A	1090 XDLC	DATA	14	DIVIDE LOOP COUNT (ALTERED)	04 01090
003455 100000 A	1091 XDSB	DATA	0100000	SIGN (ALTERED)	04 01091
1092 *					04 01092
1093 *	XDSU			FIXED POINT DOUBLE PRECISION SUBTRACT	04 01093
1094 *					04 01094

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003456	073505	A	1095	STX	XDSU+3	SAVE XR	04	01095
003457	007400	A	1096	RDF		RESET OF	04	01096
003460	033502	A	1097	LDX	XDSU		04	01097
003461	035500	A	1098	LDX	0,1	XR-ADDR OF HI B	04	01098
003462	053506	A	1099	STA	XDSU+4	SAVE HI A	04	01099
003463	005021	A	1100	TBA			04	01100
003464	006110	A	1101	XDS4	ORAI	0100000	04	01101
003465	100000	A				SET SIGN FOR CARRY		
003466	145001	A	1102	SUB	1,1	SUB LO B	04	01102
003467	006150	A	1103	XDS2	ANAI	077777	04	01103
003470	077777	A						
003471	005012	A	1104	TAB		SAVE RESULT	04	01104
003472	005001	A	1105	TZA			04	01105
003473	005711	A	1106	SOFA		GET CARRY	04	01106
003474	007400	A	1107	RDF		RESET OF	04	01107
003475	123506	A	1108	ADD	XDSU+4	ADD HI A	04	01108
003476	145000	A	1109	SUB	0,1	SUB HI B	04	01109
003477	040502	A	1110	IMR	XDSU	SET RETURN	04	01110
003500	033505	A	1111	LDX	XDSU+3	RESTORE XR	04	01111
003501	001000	A	1112	JMP	0	RETURN	04	01112
003502	000000	A						
003502			1113	ORG	*-1		04	01113
003502	000000	A	1114	XDSU	ENTR	ENTRY	04	01114
003503	001000	A	1115	JMP	*-21		04	01115
003504	003456	A						
003505	000000	A	1116	DATA	0,0	TEMP STORAGE	04	01116
003506	000000	A						
			1117	EJEC				
003507	010422	A	1118	M23	LDA	\$LWE	04	01117
003510	006150	A	1119		ANAI	010000	D	04 01118
003511	010000	A					D	04 01119
003512	031010	A	1120	JAZ	0500	FROM M2	D	04 01120
003513	000500	A						
003514	006010	A	1121	LDAI	0473		D	04 01121
003515	000073	A						
003516	052335	A	1122	STA	\$TTY		D	04 01122
003517	001000	A	1123	JMP	0500	FROM M3	D	04 01123
003520	000500	A						
003507	003507	A	1124	END	M23		D	04 01124

ENTRY NAMES

EXTERNAL NAMES

SYMBOLS

000442	A	\$CON	000471	A	\$DCT	000440	A	\$FLG	000422	A	\$LWE
000441	A	\$HCH	000424	A	\$MSM	002335	A	\$TTY	002717	A	ADDR
003321	A	\$CHG	002424	A	\$UFC	002614	A	\$UFD	001163	A	CNTL
002546	A	\$C11	001157	A	\$CMP	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	\$ERRC	002331	A	\$ESFR	002333	A	\$ESVI	000423	A	ESZC
002635	A	\$FLGC	002306	A	\$FROM	002336	A	\$HDEF	002756	A	HLF1
002745	A	\$HLFS	002713	A	\$HVAL	001471	A	\$I1	001640	A	I10
001671	A	\$I101	001627	A	\$I10Y	001572	A	\$I11	001614	A	I14
001604	A	\$I141	001736	A	\$I15	001741	A	\$I151	001826	A	I161
001623	A	\$I162	001631	A	\$I17	001402	A	\$I2	001460	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	\$I01	002225	A	\$I02	002232	A	I03
002242	A	\$I04	002256	A	\$I05	002266	A	\$I06	002273	A	I07
002303	A	\$I08	002176	A	\$I0CM	002324	A	\$I0FM	002322	A	I0INT
002321	A	\$I0NG	003175	A	\$I0M1	003301	A	\$I0M10	003304	A	I0M11
003310	A	\$I0M12	003212	A	\$I0M3	003223	A	\$I0M4	003235	A	I0M5
003256	A	\$I0M6	003203	A	\$I0M7	003275	A	\$I0M9	003410	A	I0MFA
000411	A	\$I0MPE	000412	A	\$I0MPC	000413	A	\$I0MPC	000414	A	I0MPE
000415	A	\$I0MPE	000416	A	\$I0MPC	002323	A	\$I0MPC	002320	A	I0MPC
002343	A	\$I0MPC	002407	A	\$I0MPC	002412	A	\$I0MPC	002420	A	I0MPC
002337	A	\$I0MPC	001652	A	\$I0MPC	001350	A	\$I0MPC	001320	A	I0MPC
001703	A	\$I0MPC	002326	A	\$I0MPC	001357	A	\$I0MPC	001371	A	I0MPC
002317	A	\$I0MPC	001155	A	\$I0MPC	002715	A	\$I0MPC	002315	A	I0MPC
003507	A	\$M23	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	\$MES9	003107	A	\$MS15	003314	A	MS16
001156	A	\$MS11	000400	A	\$DUTA	000401	A	\$DUTR	000402	A	DUTC
000403	A	\$DUTA	000404	A	\$DUTE	000405	A	\$DUTF	000406	A	DUTG
000407	A	\$DUTH	001164	A	\$PINT	000502	A	\$PNTR	001217	A	RT10
001265	A	\$RT13	000047	A	\$RTC	000557	A	\$RTC1	000647	A	RTC2
000677	A	\$RTC3	000735	A	\$RTC4	001013	A	\$RTC5	001024	A	RTC6
001144	A	\$RTC9	000570	A	\$RTCK	000640	A	\$RTCL	000577	A	RTCM
000627	A	\$RTCN	000633	A	\$RTCD	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	\$TBD	000420	A	\$TDLY	002725	A	TDS1
002736	A	\$TDS2	002742	A	\$TDSA	002721	A	\$TDS	002432	A	TEN
002640	A	\$TIME	001162	A	\$TMSV	000417	A	\$TOUT	002706	A	TWNT
002316	A	\$UFRC	002314	A	\$UVI1	002431	A	\$VALU	002711	A	VAR
002310	A	\$V1IF	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

LITERALS

POINTERS

000502 102335

000503 102717
000504 102720

		134	139	166	220	289	317	364	415	482
99	\$CON	520	632							
101	\$DCT	*								
97	\$FLG	*								
88	\$LWE	1118								
98	\$MEM	*								
90	\$MSM	*								
801	\$TTY	422	1122							
941	ADDR	853	857	872	873	908	909			
1002	BCNG	117	1017							
929	BUFC	856	886	895	902	911				
926	BUFD	667	669	677	679	690	692	700	702	
332	CNTL	242	260	261						
903	CD11	913								
328	COMP	158	161	165	222	293	367	388	426	463
		534	609	659	729	746	762	966		
863	CON1	859	874	877	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	FROM	372	373	394	395	459	460	776		
802	HDEF	437	495	536						
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	486							
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	ICDM	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							

MAINTAIN III

RTCLCK

PAGE 21

994	IM7	522									
995	IM9	662									
78	INPA	*									
79	INPB	143	636	814							
80	INPC	*									
81	INPD	*									
82	INPE	*									
83	INPF	*									
84	INPG	*									
793	INTT	425	431	454	465	494	548	712			
790	INXT	533	558	571	574	717					
814	IPD1	834									
835	IPD3	824	827								
837	IPD4	818									
840	IPD5	821									
810	IPDC	371	381	430	434	449	836	843			
476	ISCP	443	446								
432	ISCR	478									
415	ITT	387	408	647	736						
608	IUFR	546	610	613	627	629	661	664	671	674	
		681	684	687	694	697	704	707	764	914	
		385	386	406	407	750	754				
795	IVN	*									
534	IX11										
542	IX12	535									
789	LFRC	531	552	620	622	710					
326	LDDP	184	195	207	238	279	301	312	347		
940	LVAL	*									
787	LV11	530	589	593							
1118	M23	1124									
979	MES1	137									
980	MES2	168									
981	MES3	350									
982	MES4	224									
984	MES5	291									
985	MES6	319									
986	MES7	369									
987	MES8	379									
983	MESA	226									
988	MS15	141									
999	MS16	153									
327	NBIT	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	RTCD	152									
134	RTCP	140									
119	RTCT	131	133	347	545	815					
330	RTSA	304	308								
243	RTT4	266									
268	RTTC	263									
931	SAVN	854	855	870	871	883	884				
785	SELC	441	468	499	538	748					
937	SIXM	*									
87	SSNT	347									
935	SUMH	*									
934	TABT	*									
916	TEDC	858									
86	TDLY	*									
955	TDS1	960									
961	TDS2	959									
964	TDSA	952	953	954	956	958	961	962			
951	TDSO	188	202	211	249	272	287	306	963		
846	TEN	830									
932	TIME	*									
331	TMSV	*									
85	TOUT	*									
936	TWNT	*									
788	UFRC	528	623	625	767						

