

DDP-416  
VERIFICATION AND TEST PROGRAMS

August 1967

**Honeywell**

 **COMPUTER CONTROL**  
DIVISION

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# DDP-416 Verification and Test Programs

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516-11T1

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✓ REC'D IN ORIGINAL SOFTWARE PACKAGE JAN 1968

\* PRT'D FOR 104

ALL INFORMATION CONTAINED





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COMPUTER CONTROL DIVISION

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0030	*			00T10030
0031	*			00T10031
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0033	*	D/M <i>RB</i> , <i>C.J. McJannet</i>	<i>5-11-67</i>	00T10033
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9038	*		00T10038
0039	*	REVISIONS	00T10039
0040	*		00T10040
0041	*	REV. B      ECO 4582	00T10041
0042	*	REV. A      08-23-66	00T10042
0043	*		00T10043
0044	*		00T10044
0045	*	AUTHOR	00T10045
0046	*		00T10046
0047	*	HONEYWELL, INC. - COMPUTER CONTROL DIVISION	00T10047
0048	*		00T10048
0049	*		00T10049
0050	*	PURPOSE	00T10050
0051	*		00T10051
0052	*	TO TEST THE CENTRAL PROCESSOR OF THE DDP-416	00T10052
0053	*		00T10053
0054	*		00T10054
0055	*	RESTRICTIONS	00T10055
0056	*		00T10056
0057	*	THIS PROGRAM WILL OPERATE ON ANY DDP-416.	00T10057
0058	*		00T10058
0059	*		00T10059
0060	*	TIMING	00T10060
0061	*		00T10061
0062	*	THIS PROGRAM TAKES ABOUT 2.6 MILLISEC. PER PASS OR 22,786 PASSES	00T10062
0063	*	PER MINUTE OR 1,367,000 PASSES PER HOUR.	00T10063
0064	*		00T10064
0065	*		00T10065
0066	*	STORAGE	00T10066
0067	*		00T10067
0068	*	THIS PROGRAM WILL NOT EXCEED 4K.	00T10068
0069	*		00T10069
0070	*		00T10070
0071	*	USE	00T10071
0072	*		00T10072
0073	*	START PROGRAM AT LOCATION 'STRT'.	00T10073
0074	*	THE PROGRAM SHOULD STOP IN 'HLT1'.      PUSH THE START BUTTON	00T10074

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0075	*	AGAIN.	00T10075
0076	*	THE PROGRAM SHOULD STOP IN "HLT2". PUSH THE START BUTTON	00T10076
0077	*	A THIRD TIME.	00T10077
0078	*	THE PROGRAM SHOULD STOP AT "EOPH", THE END-OF-PASS HALT.	00T10078
0079	*	EACH PUSH OF THE START BUTTON SHOULD CAUSE THE PROGRAM TO LOOP	00T10079
0080	*	THROUGH ALL THE TESTS AND STOP AT "EOPH". IF IT DOES, TYPE IN THE	00T10080
0081	*	CHARACTER "G" AND THEN PRESS START TO CAUSE THE PROGRAM TO CYCLE	00T10081
0082	*	WITHOUT STOPPING UNLESS IT DETECTS AN ERROR.	00T10082
0083	*	IF THE CHARACTER "S" IS TYPED IN, THE PROGRAM WILL AGAIN	00T10083
0084	*	STOP AFTER EACH PASS.	00T10084
0085	*		00T10085
0086	*	IF THE CHARACTER "T" IS TYPED IN, THE NUMBER OF PASSES	00T10086
0087	*	COMPLETED WILL BE TYPED OUT.	00T10087
0088	*		00T10088
0089	*	AFTER THE PROGRAM HAS BEEN TRIED AT LEAST ONCE, IT MAY BE	00T10089
0090	*	RESTARTED, AFTER MASTER CLEARING, FROM ANY POINT BEFORE ITS FIRST	00T10090
0091	*	ERROR HALT (IF ANY) WHICH IS MARKED WITH AN ASTERISK IN THE 1ST	00T10091
0092	*	SPACE OF THE COMMENTS FIELD (CARD COLUMN 30).	00T10092
0093	*		00T10093
0094	*		00T10094
0095	*	ERRORS	00T10095
0096	*		00T10096
0097	*	THIS PROGRAM CONTAINS A FEATURE WHICH TRACES THE PATH OF THE	00T10097
0098	*	PROGRAM USING JST INSTRUCTIONS. AFTER THE FIRST FEW TESTS HAVE	00T10098
0099	*	BEEN EXECUTED, EACH TEST STARTS WITH A JST TO "JSTL" (THE JST-	00T10099
0100	*	REPORTING LOCATION) FOLLOWED BY A JST TO **1 WHICH IN TURN IS	00T10100
0101	*	FOLLOWED BY A PZE 2. LOCATION "JSTL" IS MODIFIED AT THE BEGINNING	00T10101
0102	*	OF EACH TEST AND EACH PZE 2 IS MODIFIED TO CONTAIN ITS OWN ADDRESS.	00T10102
0103	*	THE "PZE 2" LOCATIONS ARE CHECKED FOR THEIR OWN ADDRESSES AT THE	00T10103
0104	*	END OF EACH PASS.	00T10104
0105	*		00T10105
0106	*	THE PROGRAM WILL HALT IF IT DETECTS AN ERROR. THE FOLLOWING	00T10106
0107	*	PROCEDURE SHOULD BE FOLLOWED WHEN AN ERROR HALT IS ENCOUNTERED -	00T10107
0108	*		00T10108
0109	*	WRITE DOWN THE CONTENTS OF ALL REGISTERS SO THAT THE	00T10109
0110	*	INFORMATION IN THEM WILL NOT BE LOST.	00T10110
0111	*	THE LOCATION OF THE ERROR HALT WILL BE DISPLAYED IN REG. Y.	00T10111

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0112 * LOOK UP THIS LOCATION IN THE LISTING. 00T10112
0113 * THE BEGINNING OF THE TEST WHICH RESULTED IN THE ERROR HALT 00T10113
0114 * WILL BE IDENTIFIED BY AN ENTRY IN THE LOCATION FIELD USUALLY 00T10114
0115 * CONSISTING OF 3 LETTERS AND 1 NUMBER. THE THREE LETTERS ARE THE 00T10115
0116 * MNEMONIC CODE OF THE INSTRUCTION BEING TESTED AND THE NUMBER 00T10116
0117 * DENOTES THE NUMBER OF TIMES THIS INSTRUCTION HAS BEEN TESTED. THE 00T10117
0118 * INSTRUCTION IN THIS LOCATION, EXCEPT FOR THE BEGINNING OF THE 00T10118
0119 * PROGRAM, WILL BE 'JST JSTL' FOLLOWED BY 'JST **1' AND 'JXXX PZE 2'. 00T10119
0120 * FIRST, CHECK TO SEE THAT LOCATION 'JSTL' CONTAINS THE 00T10120
0121 * ADDRESS OF THE LOCATION CONTAINING THE 'JST **1' (CAUSED BY 'JST 00T10121
0122 * JSTL'). THEN CHECK THE 'JXXX PZE 2' TO SEE THAT IT CONTAINS ITS 00T10122
0123 * OWN ADDRESS (CAUSED BY 'JST **1'). IF NOT, THE TEST WAS NOT 00T10123
0124 * ENTERED PROPERLY AND ONE OF THE JUMP INSTRUCTIONS MAY BE FAILING. 00T10124
0125 * IF LOCATION 'JSTL' AND THE 'JXXX PZE 2' CONTAIN THE PROPER 00T10125
0126 * ADDRESSES, EXECUTE THE TEST IN THE SINGLE INSTRUCTION MODE. IF 00T10126
0127 * THERE IS A * IN THE FIRST SPACE OF THE COMMENTS FIELD ON THE 'JST 00T10127
0128 * JSTL' LINE, THE TEST DOES NOT DEPEND ON THE RESULTS OF THE 00T10128
0129 * PREVIOUS TEST AND CAN BE PROPERLY EXECUTED BY STARTING EITHER WITH 00T10129
0130 * THE 'JST JSTL' OR AT THE LOCATION FOLLOWING THE 'JXXX PZE 2'. IF 00T10130
0131 * THE ERROR HALT IS ENCOUNTERED AGAIN, THE FAILURE IS PROBABLY SOLID. 00T10131
0132 * WHETHER THE FAILURE IS SOLID OR NOT, IT IS POSSIBLE TO LOOP 00T10132
0133 * ON MOST OF THE TESTS BY REPLACING THE ERROR HALT, AND THE 'SZE' 00T10133
0134 * JUST BEFORE IT, WITH JUMPS BACK TO THE BEGINNING OF THE TEST. IN 00T10134
0135 * A FEW CASES IT MAY ALSO BE NECESSARY TO CLEAR A REGISTER BEFORE 00T10135
0136 * RESTARTING THE TEST. 00T10136
0137 * 00T10137
0138 * 00T10138
0139 * METHOD 00T10139
0140 * 00T10140
0141 * THIS PROGRAM TESTS THE DDP-416 INSTRUCTIONS IN THE FOLLOWING 00T10141
0142 * ORDER (READ VERTICALLY) - 00T10142
0143 * HLT SPL LGR SUB 00T10143
0144 * NOP SMI ALR STA 00T10144
0145 * JMP LDA ARR JST 00T10145
0146 * SZE ERA ALS IRS 00T10146
0147 * SNZ ANA ARS 00T10147
0148 * CRA LGL ADD 00T10148
    
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0149 * IT DOES NOT SPECIFICALLY TEST THE OCP, SKS, OTA, INA, OR SMK OOT10149
0150 * INSTRUCTIONS, BUT DOES USE THE FIRST FOUR IN THE TYPING ROUTINE. OOT10150
0151 * OOT10151
0152 * A NUMBER OF OTHER TESTS ARE PERFORMED - OOT10152
0153 * NJP -INSTRUCTIONS WHOSE OP-CODES WOULD BECOME JMP OR JST IF ONE OF OOT10153
0154 * THE OP-CODE BITS WERE DROPPED ARE CHECKED TO SEE THAT THEY DO OOT10154
0155 * NOT CAUSE A JUMP. OOT10155
0156 * BT -THE SNZ INSTRUCTION IS CHECKED WITH EACH BIT INDIVIDUALLY. OOT10156
0157 * IND -INDIRECT ADDRESSING IS CHECKED. OOT10157
0158 * NHLT-A "HLT" INSTRUCTION WITH BIT 16 SET IS CHECKED TO SEE THAT IT OOT10158
0159 * DOES NOT HALT. OOT10159
0160 * SB -THE STA INSTRUCTION IS CHECKED WITH EACH BIT INDIVIDUALLY. OOT10160
0161 * SCT -ADDRESSING IS CHECKED FROM SECTOR 1 TO SECTOR 2 AND SECTOR 0. OOT10161
0162 * OOT10162
0163 * OOT10163
0164 * ABBREVIATIONS OOT10164
0165 * OOT10165
0166 * A - REGISTER A OOT10166
0167 * M - MEMORY REGISTER OOT10167
0168 * ASR - TELETYPEWRITER (AUTOMATIC SEND-RECEIVE SET) OOT10168
0169 * ASCII-AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE OOT10169
0170 * OOT10170
0171 * OOT10171
0172 * ***** OOT10172
0173 * OOT10173
0174 * CF4 416 PROGRAM OOT10174
0175 * OOT10175
0176 * ORG *200 09-26-66 OOT10176
0177 * OOT10177
0178 00200 101000 STRT NOP * START PROGRAM FROM THIS LOCATION OOT10178
0179 00201 000000 HLT1 HLT * TESTING HLT OOT10179
0180 00202 101000 NOP1 NOP * TESTING NOP OOT10180
0181 00203 000000 HLT2 HLT * TESTING HLT OOT10181
0182 00204 101000 NOP2 NOP * TESTING NOP OOT10182
0183 00205 101000 NOP3 NOP TESTING NOP OOT10183
0184 00206 101000 NOP4 NOP * TESTING NOP TO SEE THAT IT DOESN'T SKIP OOT10184
0185 00207 0 01 00211 JMP1 JMP **2 * TESTING JMP OOT10185
    
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0186	00210	000000		HLT			00T10186
0187	00211	0 01 00214	JMP2	JMP	**3	* TESTING JMP	00T10187
0188	00212	000000		HLT			00T10188
0189	00213	000000		HLT			00T10189
0190	00214	100040	SZE1	SZE		* TESTING SZE (A=0)	00T10190
0191	00215	000000		HLT			00T10191
0192	00216	101040	SNZ1	SNZ		* TESTING SNZ (A=0)	00T10192
0193	00217	0 01 00221		JMP	**2		00T10193
0194	00220	000000		HLT			00T10194
0195	00221	140040	CRA1	CRA		* TESTING CRA (A WAS 0)	00T10195
0196	00222	100040		SZE			00T10196
0197	00223	000000		HLT			00T10197
0198	00224	101040		SNZ			00T10198
0199	00225	0 01 00227		JMP	**2		00T10199
0200	00226	000000		HLT			00T10200
0201	00227	100400	SPL1	SPL		* TESTING SPL (A=0)	00T10201
0202	00230	000000		HLT			00T10202
0203	00231	101400	SMI1	SMI		* TESTING SMI (A=0)	00T10203
0204	00232	0 01 00234		JMP	**2		00T10204
0205	00233	000000		HLT			00T10205
0206	00234	0 01 00236	NJP1	JMP	**2	* TESTING ANA TO SEE THAT IT DOES NOT BECOME A JMP OR JST	00T10206
0207	00235	000000		HLT			00T10207
0208	00236	0 03 00235		ANA	*-1		00T10208
0209	00237	0 01 00241	NJP2	JMP	**2	* TESTING ERA TO SEE THAT IT DOES NOT BECOME A JMP OR JST	00T10209
0210	00240	000000		HLT			00T10210
0211	00241	0 05 00240		ERA	*-1		00T10211
0212	00242	0 01 00245	NJP3	JMP	**3	* TESTING CAS (NOT A DDP-416 INSTRUCTION) TO SEE THAT IT DOES NOT BECOME A JMP OR JST	00T10212
0213	00243	000000		HLT			00T10213
0214	00244	000000		HLT			00T10214
0215				CF5			00T10215
0216	00245	0 11 00243		CAS	*-2		00T10216
0217				CF4			00T10217
0218	00246	0 01 00251		JMP	**3		00T10218
0219	00247	0 01 00251		JMP	**2		00T10219
0220	00250	000000		HLT			00T10220
0221	00251	140040		CRA			00T10221
0222	00252	0 04 00243		STA	NJP3+1		00T10222

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0223	00253	0 01 00256	NJP4	JMP	**+3	* TESTING IRS TO SEE THAT IT DOES NOT	00T10223
0224	00254	000000		HLT		BECOME A JMP OR JST	00T10224
0225	00255	000000		HLT			00T10225
0226	00256	0 12 00254		IRS	*-2		00T10226
0227	00257	0 01 00262		JMP	**+3		00T10227
0228	00260	000000		HLT			00T10228
0229	00261	000000		HLT			00T10229
0230	00262	140040		CRA			00T10230
0231	00263	0 04 00254		STA	NJP4+1		00T10231
0232	00264	0 01 00267	NJP5	JMP	**+3	* TESTING OCP TO SEE THAT IT DOES NOT	00T10232
0233	00265	000000		HLT		BECOME A JMP OR JST	00T10233
0234	00266	000000		HLT			00T10234
0235	00267	14 0265		OCP	*-2		00T10235
0236	00270	140040		CRA			00T10236
0237	00271	0 04 00265		STA	NJP5+1		00T10237
0238	00272	0 04 00776		STA	JSTL		00T10238
0239	00273	0 02 00770	LDA1	LDA	=0	* TESTING LDA WITH 0 (A WAS 0)	00T10239
0240	00274	100040		SZE			00T10240
0241	00275	000000		HLT			00T10241
0242	00276	0 02 00746	LDA2	LDA	=*177777	* TESTING LDA WITH ALL ONES (A WAS 0)	00T10242
0243	00277	100040	SZE2	SZE		TESTING SZE (A=*177777)	00T10243
0244	00300	0 01 00302		JMP	**+2		00T10244
0245	00301	000000		HLT			00T10245
0246	00302	101040	SNZ2	SNZ		TESTING SNZ (A=*177777)	00T10246
0247	00303	000000		HLT			00T10247
0248	00304	100400	SPL2	SPL		TESTING SPL (A=*177777)	00T10248
0249	00305	0 01 00307		JMP	**+2		00T10249
0250	00306	000000		HLT			00T10250
0251	00307	101400	SMI2	SMI		TESTING SMI (A=*177777)	00T10251
0252	00310	000000		HLT			00T10252
0253	00311	140040	CRA2	CRA		TESTING CRA (A WAS ALL ONES)	00T10253
0254	00312	100040		SZE			00T10254
0255	00313	000000		HLT			00T10255
0256	00314	0 02 00766	BT01	LDA	=*100000	* TESTING, WITH BIT 1 SET:	00T10256
0257	00315	100400		SPL		SPL	00T10257
0258	00316	0 01 00320		JMP	**+2		00T10258
0259	00317	000000		HLT			00T10259

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0260	00320	101400		SMI			SMI	00T10260
0261	00321	000000		HLT				00T10261
0262	00322	100040		SZE			SZE	00T10262
0263	00323	0 01 00325		JMP	**2			00T10263
0264	00324	000000		HLT				00T10264
0265	00325	101040		SNZ			SNZ	00T10265
0266	00326	000000		HLT				00T10266
0267	00327	0 02 00765	BT02	LDA	=*40000	*	TESTING SNZ WITH BIT 2	00T10267
0268	00330	101040		SNZ				00T10268
0269	00331	000000		HLT				00T10269
0270	00332	0 02 00764	BT03	LDA	=*20000	*	TESTING SNZ WITH BIT 3	00T10270
0271	00333	101040		SNZ				00T10271
0272	00334	000000		HLT				00T10272
0273	00335	0 02 00763	BT04	LDA	=*10000	*	TESTING SNZ WITH BIT 4	00T10273
0274	00336	101040		SNZ				00T10274
0275	00337	000000		HLT				00T10275
0276	00340	0 02 00762	BT05	LDA	=*4000	*	TESTING SNZ WITH BIT 5	00T10276
0277	00341	101040		SNZ				00T10277
0278	00342	000000		HLT				00T10278
0279	00343	0 02 00761	BT06	LDA	=*2000	*	TESTING SNZ WITH BIT 6	00T10279
0280	00344	101040		SNZ				00T10280
0281	00345	000000		HLT				00T10281
0282	00346	0 02 00760	BT07	LDA	=*1000	*	TESTING SNZ WITH BIT 7	00T10282
0283	00347	101040		SNZ				00T10283
0284	00350	000000		HLT				00T10284
0285	00351	0 02 00757	BT08	LDA	=*400	*	TESTING SNZ WITH BIT 8	00T10285
0286	00352	101040		SNZ				00T10286
0287	00353	000000		HLT				00T10287
0288	00354	0 02 00756	BT09	LDA	=*200	*	TESTING SNZ WITH BIT 9	00T10288
0289	00355	101040		SNZ				00T10289
0290	00356	000000		HLT				00T10290
0291	00357	0 02 00755	BT10	LDA	=*100	*	TESTING SNZ WITH BIT 10	00T10291
0292	00360	101040		SNZ				00T10292
0293	00361	000000		HLT				00T10293
0294	00362	0 02 00754	BT11	LDA	=*40	*	TESTING SNZ WITH BIT 11	00T10294
0295	00363	101040		SNZ				00T10295
0296	00364	000000		HLT				00T10296



0297	00365	0 02 00753	BT12	LDA	=*20	* TESTING SNZ WITH BIT 12	00T10297
0298	00366	101040		SNZ			00T10298
0299	00367	000000		HLT			00T10299
0300	00370	0 J2 00752	BT13	LDA	=*10	* TESTING SNZ WITH BIT 13	00T10300
0301	00371	101040		SNZ			00T10301
0302	00372	000000		HLT			00T10302
0303	00373	0 02 00751	BT14	LDA	=4	* TESTING SNZ WITH BIT 14	00T10303
0304	00374	101040		SNZ			00T10304
0305	00375	000000		HLT			00T10305
0306	00376	0 02 00750	BT15	LDA	=2	* TESTING SNZ WITH BIT 15	00T10306
0307	00377	101040		SNZ			00T10307
0308	00400	000000		HLT			00T10308
0309	00401	0 02 00747	BT16	LDA	=1	* TESTING SNZ WITH BIT 16	00T10309
0310	00402	101040		SNZ			00T10310
0311	00403	000000		HLT			00T10311
0312	00404	0 10 00770	ERA1	JST	JSTL	* TESTING ERA - ZEROS ERA'D WITH ZEROS	00T10312
0313	00405	0 10 00400		JST	**1	EQUAL ZEROS	00T10313
0314	00406	0 00 00002	J001	PZE	2		00T10314
0315	00407	140040		CRA		A=0	00T10315
0316	00410	0 05 00770		ERA	=0	M=0	00T10316
0317	00411	100040		SZE		A=0	00T10317
0318	00412	000000		HLT			00T10318
0319	00413	0 10 00770	ERA2	JST	JSTL	* TESTING ERA - ZEROS ERA'D WITH ONES	00T10319
0320	00414	0 10 00410		JST	**1	EQUAL ONES	00T10320
0321	00415	0 00 00002	J002	PZE	2		00T10321
0322	00416	140040		CRA		A=0	00T10322
0323	00417	0 05 00740		ERA	=*177777	M=*177777	00T10323
0324	00420	101040		SNZ		A=*177777	00T10324
0325	00421	000000		HLT			00T10325
0326	00422	0 10 00770	ERA3	JST	JSTL	TESTING ERA - ONES ERA'D WITH ZEROS EQUAL	00T10326
0327	00423	0 10 00424		JST	**1	ONES	00T10327
0328	00424	0 00 00002	J003	PZE	2		00T10328
0329	00425	0 05 00770		ERA	=0	A=*177777, M=0	00T10329
0330	00426	101040		SNZ		A=*177777	00T10330
0331	00427	000000		HLT			00T10331
0332	00430	0 10 00770	ERA4	JST	JSTL	TESTING ERA - ONES ERA'D WITH ONES EQUAL	00T10332
0333	00431	0 10 00432		JST	**1	ZEROS	00T10333

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0334	00432	0 00 00002	J004	PZE	2			00T10334
0335	00433	0 05 00746		ERA	=*177777	A=*177777, M=*177777		00T10335
0336	00434	100040		SZE		A=0		00T10336
0337	00435	000000		HLT				00T10337
0338	00436	0 10 00776	ANA1	JST	JSTL	* TESTING ANA - ZEROS AND ZEROS EQUAL		00T10338
0339	00437	0 10 00440		JST	**1	ZEROS		00T10339
0340	00440	0 00 00002	J005	PZE	2			00T10340
0341	00441	140040		CRA		A=0		00T10341
0342	00442	0 03 00770		ANA	=0	M=0		00T10342
0343	00443	100040		SZE		A=0		00T10343
0344	00444	000000		HLT				00T10344
0345	00445	0 10 00776	ANA2	JST	JSTL	* TESTING ANA - ZEROS AND ONES EQUAL		00T10345
0346	00446	0 10 00447		JST	**1	ZEROS		00T10346
0347	00447	0 00 00002	J006	PZE	2			00T10347
0348	00450	140040		CRA		A=0		00T10348
0349	00451	0 03 00746		ANA	=*177777	M=*177777		00T10349
0350	00452	100040		SZE		A=0		00T10350
0351	00453	000000		HLT				00T10351
0352	00454	0 10 00776	ANA3	JST	JSTL	* TESTING ANA - ONES AND ONES EQUAL ONES		00T10352
0353	00455	0 10 00456		JST	**1			00T10353
0354	00456	0 00 00002	J007	PZE	2			00T10354
0355	00457	0 02 00746		LDA	=*177777	A=*177777		00T10355
0356	00460	0 03 00746		ANA	=*177777	M=*177777		00T10356
0357	00461	0 05 00746		ERA	=*177777	A=*177777		00T10357
0358	00462	100040		SZE				00T10358
0359	00463	000000		HLT				00T10359
0360	00464	0 10 00776	ANA4	JST	JSTL	* TESTING ANA - ONES AND ZEROS EQUAL		00T10360
0361	00465	0 10 00466		JST	**1	ZEROS		00T10361
0362	00466	0 00 00002	J008	PZE	2			00T10362
0363	00467	0 02 00746		LDA	=*177777	A=*177777		00T10363
0364	00470	0 03 00770		ANA	=0			00T10364
0365	00471	100040		SZE				00T10365
0366	00472	000000		HLT				00T10366
0367	00473	0 10 00776	INDI	JST	JSTL	* TESTING INDIRECT ADDRESSING		00T10367
0368	00474	0 10 00475		JST	**1			00T10368
0369	00475	0 00 00002	J009	PZE	2			00T10369
0370	00476	-0 02 00500		LDA*	**2			00T10370

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0371	00477	0 01 00501	JMP	++2		00T10371
0372	00500	0 000746	BAC	=*177777		00T10372
0373	00501	0 05 00746	ERA	=*177777		00T10373
0374	00502	100046	SZE			00T10374
0375	00503	000000	HLT			00T10375
0376	00504	0 10 00776	LGL1 JST	JSTL	* TESTING LGL 1	00T10376
0377	00505	0 10 00506	JST	++1		00T10377
0378	00506	0 00 00002	JU10 PZE	2		00T10378
0379	00507	0 02 00747	LDA	=1		00T10379
0380	00510	0414 77	LGL	1		00T10380
0381	00511	0 05 00750	ERA	=2		00T10381
0382	00512	100046	SZE			00T10382
0383	00513	000000	HLT			00T10383
0384	00514	0 10 00776	LGL2 JST	JSTL	* TESTING LGL 8	00T10384
0385	00515	0 10 00516	JST	++1		00T10385
0386	00516	0 00 00002	JU11 PZE	2		00T10386
0387	00517	0 02 00750	LDA	=2		00T10387
0388	00520	0414 70	LGL	8		00T10388
0389	00521	0 05 00760	ERA	=*1000		00T10389
0390	00522	100046	SZE			00T10390
0391	00523	000000	HLT			00T10391
0392	00524	0 10 00776	LGL3 JST	JSTL	* TESTING LGL 15	00T10392
0393	00525	0 10 00526	JST	++1		00T10393
0394	00526	0 00 00002	JU12 PZE	2		00T10394
0395	00527	0 02 00747	LDA	=1		00T10395
0396	00530	0414 61	LGL	15		00T10396
0397	00531	0 05 00766	ERA	=*100000		00T10397
0398	00532	100046	SZE			00T10398
0399	00533	000000	HLT			00T10399
0400	00534	0 10 00776	LGL4 JST	JSTL	* TESTING LGL 4	00T10400
0401	00535	0 10 00536	JST	++1		00T10401
0402	00536	0 00 00002	JU13 PZE	2		00T10402
0403	00537	0 02 00763	LDA	=*10000		00T10403
0404	00540	0414 74	LGL	4		00T10404
0405	00541	100046	SZE			00T10405
0406	00542	000000	HLT			00T10406
0407	00543	0 10 00776	LGR1 JST	JSTL	* TESTING LGR 2	00T10407

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0408	00544	0 10 00545	JST	++1			00T10408
0409	00545	0 00 00002	J014	PZE	2		00T10409
0410	00546	0 02 00761	LDA	=#2000			00T10410
0411	00547	0404 76	LGR	2			00T10411
0412	00550	0 05 00757	ERA	=#400			00T10412
0413	00551	100040	SZE				00T10413
0414	00552	000000	HLT				00T10414
0415	00553	0 10 00776	LGR2	JST	JSTL	* TESTING LGR 14	00T10415
0416	00554	0 10 00555	JST	++1			00T10416
0417	00555	0 00 00002	J015	PZE	2		00T10417
0418	00556	0 02 00745	LDA	=#140000			00T10418
0419	00557	0404 62	LGR	14			00T10419
0420	00560	0 05 00744	ERA	=3			00T10420
0421	00561	100040	SZE				00T10421
0422	00562	000000	HLT				00T10422
0423	00563	0 10 00776	LGR3	JST	JSTL	* TESTING LGR 17	00T10423
0424	00564	0 10 00565	JST	++1			00T10424
0425	00565	0 00 00002	J016	PZE	2		00T10425
0426	00566	0 02 00766	LDA	=#100000			00T10426
0427	00567	0404 57	LGR	17			00T10427
0428	00570	100040	SZE				00T10428
0429	00571	000000	HLT				00T10429
0430	00572	0 10 00776	ALR1	JST	JSTL	* TESTING ALR 1	00T10430
0431	00573	0 10 00574	JST	++1			00T10431
0432	00574	0 00 00002	J017	PZE	2		00T10432
0433	00575	0 02 00751	LDA	=4			00T10433
0434	00576	0416 77	ALR	1			00T10434
0435	00577	0 05 00752	ERA	=#10			00T10435
0436	00600	100040	SZE				00T10436
0437	00601	000000	HLT				00T10437
0438	00602	0 10 00776	ALR2	JST	JSTL	* TESTING ALR 2	00T10438
0439	00603	0 10 00604	JST	++1			00T10439
0440	00604	0 00 00002	J018	PZE	2		00T10440
0441	00605	0 02 00765	LDA	=#40000			00T10441
0442	00606	0416 76	ALR	2			00T10442
0443	00607	0 05 00747	ERA	=1			00T10443
0444	00610	100040	SZE				00T10444

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0445	00611	000000		HLT				00T10445
0446	00612	0 10 00776	ARR1	JST	JSTL	*	TESTING ARR 1	00T10446
0447	00613	0 10 00614		JST	**1			00T10447
0448	00614	0 00 00002	J019	PZE	2			00T10448
0449	00615	0 02 00754		LDA	=*40			00T10449
0450	00616	0406 77		ARR	1			00T10450
0451	00617	0 05 00753		ERA	=*20			00T10451
0452	00620	100040		SZE				00T10452
0453	00621	000000		HLT				00T10453
0454	00622	0 10 00776	ARR2	JST	JSTL	*	TESTING ARR 15	00T10454
0455	00623	0 10 00624		JST	**1			00T10455
0456	00624	0 00 00002	J020	PZE	2			00T10456
0457	00625	0 02 00766		LDA	=*100000			00T10457
0458	00626	0406 61		ARR	15			00T10458
0459	00627	0 05 00747		ERA	=1			00T10459
0460	00630	100040		SZE				00T10460
0461	00631	000000		HLT				00T10461
0462	00632	0 10 00776	ARR3	JST	JSTL	*	TESTING ARR 3	00T10462
0463	00633	0 10 00634		JST	**1			00T10463
0464	00634	0 00 00002	J021	PZE	2			00T10464
0465	00635	0 02 00750		LDA	=2			00T10465
0466	00636	0406 75		ARR	3			00T10466
0467	00637	0 05 00765		ERA	=*40000			00T10467
0468	00640	100040		SZE				00T10468
0469	00641	000000		HLT				00T10469
0470	00642	0 10 00776	ALS1	JST	JSTL	*	TESTING ALS 7	00T10470
0471	00643	0 10 00644		JST	**1			00T10471
0472	00644	0 00 00002	J022	PZE	2			00T10472
0473	00645	0 02 00755		LDA	=*100			00T10473
0474	00646	0415 71		ALS	7			00T10474
0475	00647	0 05 00764		ERA	=*20000			00T10475
0476	00650	100040		SZE				00T10476
0477	00651	000000		HLT				00T10477
0478	00652	0 10 00776	ALS2	JST	JSTL	*	TESTING ALS 8	00T10478
0479	00653	0 10 00654		JST	**1			00T10479
0480	00654	0 00 00002	J023	PZE	2			00T10480
0481	00655	0 02 00743		LDA	=*100001			00T10481

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0482	00656	0415 70	ALS	8			00T10482
0483	00657	0 05 00757	ERA	=°400			00T10483
0484	00660	100040	SZE				00T10484
0485	00661	000000	HLT				00T10485
0486	00662	0 10 00776	ARS1 JST	JSTL	* TESTING ARS 1		00T10486
0487	00663	0 10 00664	JST	**+1			00T10487
0488	00664	0 00 00002	J024 PZE	2			00T10488
0489	00665	0 02 00756	LDA	=°200			00T10489
0490	00666	0405 77	ARS	1			00T10490
0491	00667	0 05 00755	ERA	=°100			00T10491
0492	00670	100040	SZE				00T10492
0493	00671	000000	HLT				00T10493
0494	00672	0 10 00776	ARS2 JST	JSTL	* TESTING ARS 15		00T10494
0495	00673	0 10 00674	JST	**+1			00T10495
0496	00674	0 00 00002	J025 PZE	2			00T10496
0497	00675	0 02 00766	LDA	=°100000			00T10497
0498	00676	0405 61	ARS	15			00T10498
0499	00677	0 05 00746	ERA	=°177777			00T10499
0500	00700	100040	SZE				00T10500
0501	00701	000000	HLT				00T10501
0502	00702	0 10 00776	ARS3 JST	JSTL	* TESTING ARS 16		00T10502
0503	00703	0 10 00704	JST	**+1			00T10503
0504	00704	0 00 00002	J026 PZE	2			00T10504
0505	00705	0 02 00765	LDA	=°40000			00T10505
0506	00706	0405 60	ARS	16			00T10506
0507	00707	100040	SZE				00T10507
0508	00710	000000	HLT				00T10508
0509	00711	0 10 00776	ARS4 JST	JSTL	* TESTING ARS 32		00T10509
0510	00712	0 10 00713	JST	**+1			00T10510
0511	00713	0 00 00002	J027 PZE	2			00T10511
0512	00714	0 02 00763	LDA	=°10000			00T10512
0513	00715	0405 40	ARS	32			00T10513
0514	00716	100040	SZE				00T10514
0515	00717	000000	HLT				00T10515
0516	00720	0 10 00776	ADD1 JST	JSTL	* TESTING ADD (+) + (+) = (+)		00T10516
0517	00721	0 10 00722	JST	**+1			00T10517
0518	00722	0 00 00002	J028 PZE	2			00T10518

0519	00723	0 02 00747	LDA	=1		00T10519
0520	00724	0 06 00747	ADD	=1		00T10520
0521	00725	0 05 00750	ERA	=2		00T10521
0522	00726	100040	SZE			00T10522
0523	00727	000000	HLT			00T10523
0524	00730	0 10 00770	ADD2	JSTL	* TESTING ADD (+) + (+) = (+)	00T10524
0525	00731	0 10 00732	JST	**1		00T10525
0526	00732	0 00 00002	J029	PZE	2	00T10526
0527	00733	0 02 00742	LDA	=5		00T10527
0528	00734	0 06 00744	ADD	=3		00T10528
0529	00735	0 05 00752	ERA	=*10		00T10529
0530	00736	100040	SZE			00T10530
0531	00737	000000	HLT			00T10531
0532						00T10532
0533	00740	-0 01 00741	JMP*	**1	GO TO	00T10533
0534	00741	0 001007	BAC	NHLT	NEXT SECTOR	00T10534
0535						00T10535
0536	00742	000005	FIN		DUMP LITERALS FOR THIS SECTOR	00T10536
	00743	100001				
	00744	000003				
	00745	140000				
	00746	177777				
	00747	000001				
	00750	000002				
	00751	000004				
	00752	000010				
	00753	000020				
	00754	000040				
	00755	000100				
	00756	000200				
	00757	000400				
	00760	001000				
	00761	002000				
	00762	004000				
	00763	010000				
	00764	020000				
	00765	040000				

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00766	100000						
00767	177777						
00770	000000						
0537	00771	000000	BSZ	*776-*			00T10537
	00772	000000					
	00773	000000					
	00774	000000					
	00775	000000					
0538			*				00T10538
0539	00776	0 000000	JSTL DAC	**	JST-REPORTING LOCATION (ENTRY)		00T10539
0540	00777	-0 01 00776	JMP*	JSTL	EXIT		00T10540
0541			*				00T10541
0542			*	START OF SECTOR 1.	NEXT ADDRESS SHOULD BE *1000.		00T10542
0543			*				00T10543
0544	01000	0 002001	T12 DAC	**	*1001		00T10544
0545	01001	0 00 00000	T11 PZE			SAVE THIS LOC. IN NEXT SECTOR	00T10545
0546	01002	0 00 00000	T1 PZE				00T10546
0547	01003	0 00 00000	TK0 PZE				00T10547
0548	01004	0 001532	TK1 DAC	TABL		ADDRESS OF JST-CHECK TABLE	00T10548
0549	01005	0 00 00000	TK2 PZE				00T10549
0550	01006	0 00 00000	CNTR PZE			COUNTER	00T10550
0551			*				00T10551
0552	01007	000001	NHLT OCT	1		* COMPUTER SHOULD NOT HALT WITH BIT 1 SET	00T10552
0553	01010	0 10 00776	ADD3 JST	JSTL		* TESTING ADD (-) + (-) = (-)	00T10553
0554	01011	0 10 01012	JST	**1			00T10554
0555	01012	0 00 00002	J030 PZE	2			00T10555
0556	01013	0 02 01665	LDA	=*177757			00T10556
0557	01014	0 06 01664	ADD	=*177717			00T10557
0558	01015	0 05 01663	ERA	=*177676			00T10558
0559	01016	100040	SZE				00T10559
0560	01017	000000	HLT				00T10560
0561	01020	0 10 00776	ADD4 JST	JSTL		* TESTING ADD (+) + (-) = (0)	00T10561
0562	01021	0 10 01022	JST	**1			00T10562
0563	01022	0 00 00002	J031 PZE	2			00T10563
0564	01023	0 02 01662	LDA	=1			00T10564
0565	01024	0 06 01661	ADD	=*177777			00T10565



0566	01025	100040		SZE					00T10566
0567	01026	000000		HLT					00T10567
0568	01027	0 10 00776	ADD5	JST	JSTL	*	TESTING ADD (-) + (+) = (0)		00T10568
0569	01030	0 10 01031		JST	++1				00T10569
0570	01031	0 00 00002	J032	PZE	2				00T10570
0571	01032	0 02 01660		LDA	=#125252				00T10571
0572	01033	0 06 01657		ADD	=#52526				00T10572
0573	01034	100040		SZE					00T10573
0574	01035	000000		HLT					00T10574
0575	01036	0 10 00776	SUB1	JST	JSTL	*	TESTING SUB (+) - (+) = (0)		00T10575
0576	01037	0 10 01040		JST	++1				00T10576
0577	01040	0 00 00002	J033	PZE	2				00T10577
0578	01041	0 02 01656		LDA	=2				00T10578
0579	01042	0 07 01656		SUB	=2				00T10579
0580	01043	100040		SZE					00T10580
0581	01044	000000		HLT					00T10581
0582	01045	0 10 00776	SUB2	JST	JSTL	*	TESTING SUB (-) - (-) = (+)		00T10582
0583	01046	0 10 01047		JST	++1				00T10583
0584	01047	0 00 00002	J034	PZE	2				00T10584
0585	01050	0 02 01655		LDA	=#146000				00T10585
0586	01051	0 07 01654		SUB	=#103000				00T10586
0587	01052	0 05 01653		ERA	=#43000				00T10587
0588	01053	100040		SZE					00T10588
0589	01054	000000		HLT					00T10589
0590	01055	0 10 00776	SUB3	JST	JSTL	*	TESTING SUB (-) - (+) = (-)		00T10590
0591	01056	0 10 01057		JST	++1				00T10591
0592	01057	0 00 00002	J035	PZE	2				00T10592
0593	01060	0 02 01652		LDA	=#101000				00T10593
0594	01061	0 07 01651		SUB	=#1000				00T10594
0595	01062	0 05 01650		ERA	=#100000				00T10595
0596	01063	100040		SZE					00T10596
0597	01064	000000		HLT					00T10597
0598	01065	0 10 00776	SUB4	JST	JSTL	*	TESTING SUB (+) - (-) = (+)		00T10598
0599	01066	0 10 01067		JST	++1				00T10599
0600	01067	0 00 00002	J036	PZE	2				00T10600
0601	01070	0 02 01647		LDA	=#400				00T10601
0602	01071	0 07 01646		SUB	=#101400				00T10602

5 8 6 4 2 1



0640	01137	0 00 00002	J040	PZE	2		00T10640
0641	01140	140040		CRA			00T10641
0642	01141	0 04 01002		STA	T1		00T10642
0643	01142	0 12 01002		IRS	T1		00T10643
0644	01143	0 01 01146		JMP	**3		00T10644
0645	01144	000000		HLT			00T10645
0646	01145	000000		HLT			00T10646
0647	01146	0 02 01002		LDA	T1		00T10647
0648	01147	0 05 01662		ERA	=1		00T10648
0649	01150	100040		SZE			00T10649
0650	01151	000000		HLT			00T10650
0651	01152	0 10 00776	IRS2	JST	JSTL	* TESTING IRS (#077777 TO #100000)	00T10651
0652	01153	0 10 01154		JST	**1		00T10652
0653	01154	0 00 00002	J041	PZE	2		00T10653
0654	01155	0 02 01644		LDA	=#77777		00T10654
0655	01156	0 04 01002		STA	T1		00T10655
0656	01157	0 12 01002		IRS	T1		00T10656
0657	01160	0 01 01162		JMP	**2		00T10657
0658	01161	000000		HLT			00T10658
0659	01162	0 02 01002		LDA	T1		00T10659
0660	01163	0 05 01650		ERA	=#100000		00T10660
0661	01164	100040		SZE			00T10661
0662	01165	000000		HLT			00T10662
0663	01166	0 10 00776	IRS3	JST	JSTL	* TESTING IRS (-1 TO 0)	00T10663
0664	01167	0 10 01170		JST	**1		00T10664
0665	01170	0 00 00002	J042	PZE	2		00T10665
0666	01171	0 02 01661		LDA	=#177777		00T10666
0667	01172	0 04 01002		STA	T1		00T10667
0668	01173	0 12 01002		IRS	T1		00T10668
0669	01174	000000		HLT			00T10669
0670	01175	0 01 01177		JMP	**2		00T10670
0671	01176	000000		HLT			00T10671
0672	01177	0 02 01002		LDA	T1		00T10672
0673	01200	100040		SZE			00T10673
0674	01201	000000		HLT			00T10674
0675	01202	0 10 00776	SB01	JST	JSTL	* TESTING STA WITH BIT 1	00T10675
0676	01203	0 10 01204		JST	**1		00T10676

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0677	01204	0 00 00002	J043	PZE	2		00T10677
0678	01205	0 02 01650		LDA	=#100000		00T10678
0679	01206	0 04 01002		STA	T1		00T10679
0680	01207	0 02 01002		LDA	T1		00T10680
0681	01210	0 05 01650		ERA	=#100000		00T10681
0682	01211	100040		SZE			00T10682
0683	01212	000000		HLT			00T10683
0684	01213	0 10 00776	SB02	JST	JSTL	* TESTING STA WITH BIT 2	00T10684
0685	01214	0 10 01215		JST	**+1		00T10685
0686	01215	0 00 00002	J044	PZE	2		00T10686
0687	01216	0 02 01643		LDA	=#40000		00T10687
0688	01217	0 04 01002		STA	T1		00T10688
0689	01220	0 02 01002		LDA	T1		00T10689
0690	01221	0 05 01643		ERA	=#40000		00T10690
0691	01222	100040		SZE			00T10691
0692	01223	000000		HLT			00T10692
0693	01224	0 10 00776	SB03	JST	JSTL	* TESTING STA WITH BIT 3	00T10693
0694	01225	0 10 01226		JST	**+1		00T10694
0695	01226	0 00 00002	J045	PZE	2		00T10695
0696	01227	0 02 01642		LDA	=#20000		00T10696
0697	01230	0 04 01002		STA	T1		00T10697
0698	01231	0 02 01002		LDA	T1		00T10698
0699	01232	0 05 01642		ERA	=#20000		00T10699
0700	01233	100040		SZE			00T10700
0701	01234	000000		HLT			00T10701
0702	01235	0 10 00776	SB04	JST	JSTL	* TESTING STA WITH BIT 4	00T10702
0703	01236	0 10 01237		JST	**+1		00T10703
0704	01237	0 00 00002	J046	PZE	2		00T10704
0705	01240	0 02 01641		LDA	=#10000		00T10705
0706	01241	0 04 01002		STA	T1		00T10706
0707	01242	0 02 01002		LDA	T1		00T10707
0708	01243	0 05 01641		ERA	=#10000		00T10708
0709	01244	100040		SZE			00T10709
0710	01245	000000		HLT			00T10710
0711	01246	0 10 00776	SB05	JST	JSTL	* TESTING STA WITH BIT 5	00T10711
0712	01247	0 10 01250		JST	**+1		00T10712
0713	01250	0 00 00002	J047	PZE	2		00T10713

0714	01251	0 02 01640	LDA	=*4000			00T10714
0715	01252	0 04 01002	STA	T1			00T10715
0716	01253	0 02 01002	LDA	T1			00T10716
0717	01254	0 05 01640	ERA	=*4000			00T10717
0718	01255	100040	SZE				00T10718
0719	01256	000000	HLT				00T10719
0720	01257	0 10 00776	SB06 JST	JSTL	* TESTING STA WITH BIT 6		00T10720
0721	01260	0 10 01261	JST	**+1			00T10721
0722	01261	0 00 00002	J048 PZE	2			00T10722
0723	01262	0 02 01637	LDA	=*2000			00T10723
0724	01263	0 04 01002	STA	T1			00T10724
0725	01264	0 02 01002	LDA	T1			00T10725
0726	01265	0 05 01637	ERA	=*2000			00T10726
0727	01266	100040	SZE				00T10727
0728	01267	000000	HLT				00T10728
0729	01270	0 10 00776	SB07 JST	JSTL	* TESTING STA WITH BIT 7		00T10729
0730	01271	0 10 01272	JST	**+1			00T10730
0731	01272	0 00 00002	J049 PZE	2			00T10731
0732	01273	0 02 01651	LDA	=*1000			00T10732
0733	01274	0 04 01002	STA	T1			00T10733
0734	01275	0 02 01002	LDA	T1			00T10734
0735	01276	0 05 01651	ERA	=*1000			00T10735
0736	01277	100040	SZE				00T10736
0737	01300	000000	HLT				00T10737
0738	01301	0 10 00776	SB08 JST	JSTL	* TESTING STA WITH BIT 8		00T10738
0739	01302	0 10 01303	JST	**+1			00T10739
0740	01303	0 00 00002	J050 PZE	2			00T10740
0741	01304	0 02 01647	LDA	=*400			00T10741
0742	01305	0 04 01002	STA	T1			00T10742
0743	01306	0 02 01002	LDA	T1			00T10743
0744	01307	0 05 01647	ERA	=*400			00T10744
0745	01310	100040	SZE				00T10745
0746	01311	000000	HLT				00T10746
0747	01312	0 10 00776	SB09 JST	JSTL	* TESTING STA WITH BIT 9		00T10747
0748	01313	0 10 01314	JST	**+1			00T10748
0749	01314	0 00 00002	J051 PZE	2			00T10749
0750	01315	0 02 01636	LDA	=*200			00T10750

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0751	01316	0 04 01002	SIA	T1		00T10751	
0752	01317	0 02 01002	LDA	T1		00T10752	
0753	01320	0 05 01636	ERA	=*200		00T10753	
0754	01321	100040	SZE			00T10754	
0755	01322	000000	HLT			00T10755	
0756	01323	0 10 00776	SB10	JST	JSTL	* TESTING STA WITH BIT 10	00T10756
0757	01324	0 10 01325		JST	++1		00T10757
0758	01325	0 00 00002	J052	PZE	2		00T10758
0759	01326	0 02 01635		LDA	=*100		00T10759
0760	01327	0 04 01002		STA	T1		00T10760
0761	01330	0 02 01002		LDA	T1		00T10761
0762	01331	0 05 01635		ERA	=*100		00T10762
0763	01332	100040		SZE			00T10763
0764	01333	000000		HLT			00T10764
0765	01334	0 10 00776	SB11	JST	JSTL	* TESTING STA WITH BIT 11	00T10765
0766	01335	0 10 01336		JST	++1		00T10766
0767	01336	0 00 00002	J053	PZE	2		00T10767
0768	01337	0 02 01634		LDA	=*40		00T10768
0769	01340	0 04 01002		STA	T1		00T10769
0770	01341	0 02 01002		LDA	T1		00T10770
0771	01342	0 05 01634		ERA	=*40		00T10771
0772	01343	100040		SZE			00T10772
0773	01344	000000		HLT			00T10773
0774	01345	0 10 00776	SB12	JST	JSTL	* TESTING STA WITH BIT 12	00T10774
0775	01346	0 10 01347		JST	++1		00T10775
0776	01347	0 00 00002	J054	PZE	2		00T10776
0777	01350	0 02 01633		LDA	=*20		00T10777
0778	01351	0 04 01002		STA	T1		00T10778
0779	01352	0 02 01002		LDA	T1		00T10779
0780	01353	0 05 01633		ERA	=*20		00T10780
0781	01354	100040		SZE			00T10781
0782	01355	000000		HLT			00T10782
0783	01356	0 10 00776	SB13	JST	JSTL	* TESTING STA WITH BIT 13	00T10783
0784	01357	0 10 01360		JST	++1		00T10784
0785	01360	0 00 00002	J055	PZE	2		00T10785
0786	01361	0 02 01632		LDA	=*10		00T10786
0787	01362	0 04 01002		STA	T1		00T10787



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0825	01430	0 04 01006		STA	CNTR		00T10825
0826	01431	0 02 01661	2AN5	LDA	=*177777		00T10826
0827	01432	0 03 01002		ANA	T1		00T10827
0828	01433	0 05 01002		ERA	T1		00T10828
0829	01434	10004C		SZE			00T10829
0830	01435	000000		HLT			00T10830
0831	01436	0 02 01002		LDA	T1		00T10831
0832	01437	0404 77		LGR	1		00T10832
0833	01440	0 04 01002		STA	T1		00T10833
0834	01441	0 12 01006		IRS	CNTR		00T10834
0835	01442	0 01 01431		JMP	2AN5		00T10835
0836	01443	0 10 00776	ANA6	JST	JSTL	* TESTING ANA WITH A FLOATING ZERO	00T10836
0837	01444	0 10 01445		JST	**+1		00T10837
0838	01445	0 00 00002	J060	PZE	2		00T10838
0839	01446	0 02 01644		LDA	=*77777		00T10839
0840	01447	0 04 01002		STA	T1		00T10840
0841	01450	0 02 01630		LDA	=-16		00T10841
0842	01451	0 04 01006		STA	CNTR		00T10842
0843	01452	0 02 01661	2AN6	LDA	=*177777		00T10843
0844	01453	0 03 01002		ANA	T1		00T10844
0845	01454	0 05 01002		ERA	T1		00T10845
0846	01455	10004C		SZE			00T10846
0847	01456	000000		HLT			00T10847
0848	01457	0 02 01002		LDA	T1		00T10848
0849	01460	0406 77		ARR	1		00T10849
0850	01461	0 04 01002		STA	T1		00T10850
0851	01462	0 12 01006		IRS	CNTR		00T10851
0852	01463	0 01 01452		JMP	2AN6		00T10852
0853	01464	0 10 00776	SCT1	JST	JSTL	* TESTING SECTOR ADDRESSING	00T10853
0854	01465	0 10 01466		JST	**+1		00T10854
0855	01466	0 00 00002	J061	PZE	2		00T10855
0856	01467	0 02 01660		LDA	=*125252		00T10856
0857	01470	-0 04 01000		STA*	T12		00T10857
0858	01471	14004C		CRA			00T10858
0859	01472	-0 02 01000		LDA*	T12		00T10859
0860	01473	0 05 01660		ERA	=*125252		00T10860
0861	01474	10004C		SZE			00T10861



0862	01475	000000		HLT			00T10862
0863	01476	0 02 01001		LDA	T11		00T10863
0864	01477	100040		SZE			00T10864
0865	01500	000000		HLT			00T10865
0866	01501	0 02 01000		LDA	T12		00T10866
0867	01502	0 07 01637		SUB	=*2000		00T10867
0868	01503	0 04 01002		STA	T1		00T10868
0869	01504	-0 02 01002		LDA*	T1		00T10869
0870	01505	0 05 01660		ERA	=*125252		00T10870
0871	01506	101040		SNZ			00T10871
0872	01507	000000		HLT			00T10872
0873	01510	140040		CKA			00T10873
0874	01511	0 04 01001		STA	T11		00T10874
0875			*				00T10875
0876			*	ROUTINE WHICH CHECKS ADDRESSES IN "JXXX" LOCATIONS DUE TO "JST **1"			00T10876
0877			*	INSTRUCTIONS.			00T10877
0878			*				00T10878
0879	01512	0 02 01627	CKJS	LDA	=-61	SET UP FOR 61	00T10879
0880	01513	0 04 00000		STA	0	PASSES THROUGH THIS ROUTINE	00T10880
0881	01514	0 02 01004		LDA	TK1	GET ADDRESS OF "TABL"	00T10881
0882	01515	0 04 01005		STA	TK2	AND SAVE IT FOR ONE-LEVEL IND. ADDRESSING	00T10882
0883	01516	0 05 01650		ERA	=*100000	ADD INDIRECT BIT	00T10883
0884	01517	0 04 01003		STA	TK0	AND SAVE IT FOR TWO-LEVEL IND. ADDRESSING	00T10884
0885	01520	-0 02 01003	CK2	LDA*	TK0	GET CONTENTS OF ONE OF THE "JXXX" LOCS.	00T10885
0886	01521	-0 05 01005		ERA*	TK2	AND CHECK IT AGAINST THE "TABL" ENTRY	00T10886
0887	01522	100040		SZE		GO ON IF OK	00T10887
0888	01523	000000		HLT		STOP, IF NOT. - ERROR HALT.	00T10888
0889	01524	0 12 01005		IRS	TK2		00T10889
0890	01525	0 12 01003		IRS	TK0		00T10890
0891	01526	0 12 00000		IRS	0		00T10891
0892	01527	0 01 01520		JMP	CK2	GO BACK UNTIL FINISHED	00T10892
0893			*				00T10893
0894	01530	-0 01 01531		JMP*	**1	GO TO	00T10894
0895	01531	0 002027		DAC	CM	NEXT SECTOR	00T10895
0896			*				00T10896
0897	01532	0 000406	TABL	DAC	J001	JST-ADDRESS-CHECK TABLE	00T10897
0898	01533	0 000415		DAC	J002		00T10898

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0899	01534	0	000424	DAC	J003	00T10899
0900	01535	0	000432	DAC	J004	00T10900
0901	01536	0	000440	DAC	J005	00T10901
0902	01537	0	000447	DAC	J006	00T10902
0903	01540	0	000456	DAC	J007	00T10903
0904	01541	0	000466	DAC	J008	00T10904
0905	01542	0	000475	DAC	J009	00T10905
0906	01543	0	000506	DAC	J010	00T10906
0907	01544	0	000516	DAC	J011	00T10907
0908	01545	0	000526	DAC	J012	00T10908
0909	01546	0	000536	DAC	J013	00T10909
0910	01547	0	000545	DAC	J014	00T10910
0911	01550	0	000555	DAC	J015	00T10911
0912	01551	0	000565	DAC	J016	00T10912
0913	01552	0	000574	DAC	J017	00T10913
0914	01553	0	000604	DAC	J018	00T10914
0915	01554	0	000614	DAC	J019	00T10915
0916	01555	0	000624	DAC	J020	00T10916
0917	01556	0	000634	DAC	J021	00T10917
0918	01557	0	000644	DAC	J022	00T10918
0919	01560	0	000654	DAC	J023	00T10919
0920	01561	0	000664	DAC	J024	00T10920
0921	01562	0	000674	DAC	J025	00T10921
0922	01563	0	000704	DAC	J026	00T10922
0923	01564	0	000713	DAC	J027	00T10923
0924	01565	0	000722	DAC	J028	00T10924
0925	01566	0	000732	DAC	J029	00T10925
0926	01567	0	001012	DAC	J030	00T10926
0927	01570	0	001022	DAC	J031	00T10927
0928	01571	0	001031	DAC	J032	00T10928
0929	01572	0	001040	DAC	J033	00T10929
0930	01573	0	001047	DAC	J034	00T10930
0931	01574	0	001057	DAC	J035	00T10931
0932	01575	0	001067	DAC	J036	00T10932
0933	01576	0	001077	DAC	J037	00T10933
0934	01577	0	001111	DAC	J038	00T10934
0935	01600	0	001122	DAC	J039	00T10935

0936	01601	0	001137	DAC	J040		00T10936
0937	01602	0	001154	DAC	J041		00T10937
0938	01603	0	001170	DAC	J042		00T10938
0939	01604	0	001204	DAC	J043		00T10939
0940	01605	0	001215	DAC	J044		00T10940
0941	01606	0	001226	DAC	J045		00T10941
0942	01607	0	001237	DAC	J046		00T10942
0943	01610	0	001250	DAC	J047		00T10943
0944	01611	0	001261	DAC	J048		00T10944
0945	01612	0	001272	DAC	J049		00T10945
0946	01613	0	001303	DAC	J050		00T10946
0947	01614	0	001314	DAC	J051		00T10947
0948	01615	0	001325	DAC	J052		00T10948
0949	01616	0	001336	DAC	J053		00T10949
0950	01617	0	001347	DAC	J054		00T10950
0951	01620	0	001360	DAC	J055		00T10951
0952	01621	0	001371	DAC	J056		00T10952
0953	01622	0	001402	DAC	J057		00T10953
0954	01623	0	001413	DAC	J058		00T10954
0955	01624	0	001424	DAC	J059		00T10955
0956	01625	0	001445	DAC	J060		00T10956
0957	01626	0	001466	DAC	J061		00T10957
0958							00T10958
0959	01627	1	77703	FIN			00T10959
	01630	1	77760				
	01631	0	000004				
	01632	0	000010				
	01633	0	000020				
	01634	0	000040				
	01635	0	000100				
	01636	0	000200				
	01637	0	002000				
	01640	0	004000				
	01641	0	010000				
	01642	0	020000				
	01643	0	040000				
	01644	0	077777				

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01645 077000  
01646 101400  
01647 000400  
01650 100000  
01651 001000  
01652 101000  
01653 043000  
01654 103000  
01655 146000  
01656 000002  
01657 052526  
01660 125252  
01661 177777  
01662 000001  
01663 177676  
01664 177717  
01665 177757

0960 01666 000000  
01667 000000  
01670 000000  
01671 000000  
01672 000000  
01673 000000  
01674 000000  
01675 000000  
01676 000000  
01677 000000  
01700 000000  
01701 000000  
01702 000000  
01703 000000  
01704 000000  
01705 000000  
01706 000000  
01707 000000  
01710 000000

BSZ \*2000-\*

00T10960

01711	000000
01712	000000
01713	000000
01714	000000
01715	000000
01716	000000
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01747	000000
01750	000000
01751	000000
01752	000000
01753	000000
01754	000000
01755	000000

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01756 000000  
 01757 000000  
 01760 000000  
 01761 000000  
 01762 000000  
 01763 000000  
 01764 000000  
 01765 000000  
 01766 000000  
 01767 000000  
 01770 000000  
 01771 000000  
 01772 000000  
 01773 000000  
 01774 000000  
 01775 000000  
 01776 000000  
 01777 000000

0961			*			00T10961
0962			* START OF SECTOR 2. NEXT ADDRESS SHOULD BE #2000.			00T10962
0963			*			00T10963
0964	02000	0 00 00000	T2	PZE		00T10964
0965	02001	0 00 00000		PZE	(FOR T11-1)	00T10965
0966			*			00T10966
0967	02002	0 00 00000	LINK	PZE		00T10967
0968	02003	0 00 00000	WDCT	PZE	WORD COUNTER	00T10968
0969	02004	0 00 00000	CHCT	PZE	CHARACTER COUNTER	00T10969
0970			*			00T10970
0971	02005	177766	HNML	DEC	-10 HUNDRED MILLIONS	00T10971
0972	02006	177766	TNML	DEC	-10 TEN MILLIONS	00T10972
0973	02007	177766	MILN	DEC	-10 MILLIONS	00T10973
0974	02010	177766	HNTH	DEC	-10 HUNDRED THOUSANDS	00T10974
0975	02011	177766	TNTH	DEC	-10 TEN THOUSANDS	00T10975
0976	02012	177766	THOU	DEC	-10 THOUSANDS	00T10976
0977	02013	177766	HUND	DEC	-10 HUNDREDS	00T10977
0978	02014	177766	TENS	DEC	-10 TENS	00T10978
0979	02015	177766	ONES	DEC	-10 ONES	00T10979

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0980			*				00T10980
0981	02016	0 002020		DAC	++2	STARTING ADDRESS OF TYPEOUT AREA	00T10981
0982	02017	0 002020	TYBA	DAC	++1	*	00T10982
0983	02020	106612		OCT	106612	CARRIAGE RETURN + LINE FEED	00T10983
0984	02021	142716		BCI	6	END OF PASS	00T10984
	02022	142240					
	02023	147706					
	02024	120326					
	02025	140723					
	02026	151640					
0985			*				00T10985
0986			*	CLEAR-UPPER-MEMORY ROUTINE			00T10986
0987			*				00T10987
0988	02027	101000	CM	NOP		THIS NOP IS REPLACED BY JMP AFETR 1ST TIME	00T10988
0989	02030	000013		OCT	13	ENABLE EXTENDED ADDRESSING	00T10989
0990	02031	140040		CRA			00T10990
0991	02032	0 06 02250	COR1	ADD	=*10000		00T10991
0992	02033	0 04 02002		SIA	LINK	STORE OWN ADDRESS	00T10992
0993	02034	-0 04 02002		STA*	LINK	AT EACH CHECKPOINT	00T10993
0994	02035	140040		CRA			00T10994
0995	02036	0 04 00000		SIA	0	CLEAR LOCATION 00000	00T10995
0996	02037	-0 02 02002		LDA*	LINK		00T10996
0997	02040	100040		SZE		IS CHECKPOINT CLEARED...	00T10997
0998	02041	0 01 02032		JMP	COR1		00T10998
0999	02042	0 07 02002		SUB	LINK		00T10999
1000	02043	0 06 02251		ADD	LAP0		00T11000
1001	02044	0 04 02002		STA	LINK		00T11001
1002	02045	140040		CRA			00T11002
1003	02046	-0 04 02251	COR2	STA*	LAP0		00T11003
1004	02047	0 12 02251		IRS	LAP0		00T11004
1005	02050	0 12 02002		IRS	LINK		00T11005
1006	02051	0 01 02046		JMP	COR2		00T11006
1007	02052	0 02 02054		LDA	CMJP		00T11007
1008	02053	0 04 02027		STA	CM		00T11008
1009	02054	0 01 02055	CMJP	JMP	++1		00T11009
1010			*				00T11010
1011			*	PASS-COUNTING ROUTINE			00T11011

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1012			*					00T11012
1013	02055	0 12 02015		IRS	ONES	INCREMENT ONES COUNTER		00T11013
1014	02056	0 01 02112		JMP	END	IF NOT =0, EXIT		00T11014
1015	02057	0 02 02247		LDA	=-10	IF =0,		00T11015
1016	02060	0 04 02015		STA	ONES	RESTORE TO -10,		00T11016
1017	02061	0 12 02014		IRS	TENS	INCREMENT TENS COUNTER, ETC.		00T11017
1018	02062	0 01 02112		JMP	END			00T11018
1019	02063	0 04 02014		STA	TENS			00T11019
1020	02064	0 12 02013		IRS	HUND			00T11020
1021	02065	0 01 02112		JMP	END			00T11021
1022	02066	0 04 02013		STA	HUND			00T11022
1023	02067	0 12 02012		IRS	THOU			00T11023
1024	02070	0 01 02112		JMP	END			00T11024
1025	02071	0 04 02012		STA	THOU			00T11025
1026	02072	0 12 02011		IRS	TNTH			00T11026
1027	02073	0 01 02112		JMP	END			00T11027
1028	02074	0 04 02011		STA	TNTH			00T11028
1029	02075	0 12 02010		IRS	HNTH			00T11029
1030	02076	0 01 02112		JMP	END			00T11030
1031	02077	0 04 02010		STA	HNTH			00T11031
1032	02100	0 12 02007		IRS	MILN			00T11032
1033	02101	0 01 02112		JMP	END			00T11033
1034	02102	0 04 02007		STA	MILN			00T11034
1035	02103	0 12 02006		IRS	TNML			00T11035
1036	02104	0 01 02112		JMP	END			00T11036
1037	02105	0 04 02006		STA	TNML			00T11037
1038	02106	0 12 02005		IRS	HNML			00T11038
1039	02107	0 01 02112		JMP	END			00T11039
1040	02110	0 04 02005		STA	HNML			00T11040
1041	02111	000000		HLT		PROGRAM HAS BEEN RUNNING OVER A WEEK		00T11041
1042			*					00T11042
1043	02112	101000		END	NOP			00T11043
1044			*					00T11044
1045			*		TYPE-IN ROUTINE			00T11045
1046			*					00T11046
1047	02113	34 0104		SKS	*104	IS ASR-33 BUSY -		00T11047
1048	02114	0 01 02131		JMP	EOPH	YES		00T11048



1049	02115	54 1004	INA	*1004	NO	00T11049
1050	02116	0 01 02130	JMP	EOPH-1	NOT READY	00T11050
1051	02117	0 05 02245	ERA	=*307		00T11051
1052	02120	101040	SNZ		IS INPUT CHAR. A "G" -	00T11052
1053	02121	0 01 02134	JMP	STG	YES	00T11053
1054	02122	J 05 02244	ERA	=*24	NO	00T11054
1055	02123	101040	SNZ		IS INPUT CHAR. AN "S" -	00T11055
1056	02124	0 04 02131	STA	EOPH	YES, STORE HALT IN *EOPH*	00T11056
1057	02125	0 05 02245	ERA	=7		00T11057
1058	02126	101040	SNZ		IS INPUT CHAR. A "T" -	00T11058
1059	02127	0 01 02137	JMP	TYPO	YES, GO TO TYPEOUT ROUTINE	00T11059
1060	02130	14 0004	UCP	4	ENABLE ASR IN INPUT MODE	00T11060
1061	02131	000000	EOPH HLT		END-OF-PASS HALT (CRA IN NON-STOP MODE)	00T11061
1062	02132	140040	CRA			00T11062
1063	02133	0 01 0204	JMP	NOP2	GO TO BEGINNING OF PROGRAM	00T11063
1064	02134	0 02 02132	STG LDA	EOPH+1	GET CRA INSTRUCTION	00T11064
1065	02135	0 04 02131	STA	EOPH	AND REPLACE HLT WITH IT	00T11065
1066	02136	0 01 02131	JMP	EOPH	RETURN	00T11066
1067			*			00T11067
1068			* TYPE-OUT ROUTINE			00T11068
1069			*			00T11069
1070	02137	34 0104	TYPO SKS	*104	ASR BUSY	00T11070
1071	02140	0 01 02137	JMP	*-1	LOOP	00T11071
1072	02141	14 0104	UCP	*104	IF NOT BUSY, ENABLE ASR IN OUTPUT MODE	00T11072
1073	02142	0 02 02245	LDA	=-7	SET	00T11073
1074	02143	0 04 02003	STA	WDCT	WORD COUNTER FOR 7 COMPUTER WORDS	00T11074
1075	02144	-0 02 02017	TYO2 LDA*	TYBA	GET NEXT WORD	00T11075
1076	02145	0406 70	ARR	8		00T11076
1077	02146	74 0004	OIA	4	OUTPUT LEFT HALF OF WORD	00T11077
1078	02147	0 01 02146	JMP	*-1		00T11078
1079	02150	0416 70	ALR	8		00T11079
1080	02151	74 0004	OIA	4	OUTPUT RIGHT HALF OF WORD	00T11080
1081	02152	J 01 02151	JMP	*-1		00T11081
1082	02153	0 12 02017	IRS	TYBA	INCREMENT TYPEOUT ADDRESS	00T11082
1083	02154	0 01 02156	JMP	**2		00T11083
1084	02155	000000	HLT		ERROR	00T11084
1085	02156	0 12 02003	IRS	WDCT	INCREMENT WORD COUNTER	00T11085

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1086	02157	0 01 02144	JMP	TY02	GO BACK FOR NEXT WORD	00T11086
1087	02160	0 02 02242	TYPN LDA	=-9	SET	00T11087
1088	02161	0 04 02004	STA	CHCT	CHARACTER COUNTER FOR 9 CHARACTERS	00T11088
1089	02162	0 02 02005	LDA	HNML	GET HUNDRED MILLIONS	00T11089
1090	02163	0 06 02241	ADD	=*272	CONVERT TO ASCII	00T11090
1091	02164	74 0004	OTA	4	OUTPUT THE	00T11091
1092	02165	0 01 02164	JMP	*-1	CHARACTER	00T11092
1093	02166	0 02 02006	LDA	TNML	GET TEN MILLIONS	00T11093
1094	02167	0 06 02241	ADD	=*272	CONVERT TO ASCII	00T11094
1095	02170	74 0004	OTA	4	OUTPUT THE	00T11095
1096	02171	0 01 02170	JMP	*-1	CHARACTER	00T11096
1097	02172	0 02 02007	LDA	MILN	DO LIKEWISE WITH - MILLIONS	00T11097
1098	02173	0 06 02241	ADD	=*272		00T11098
1099	02174	74 0004	OTA	4		00T11099
1100	02175	0 01 02174	JMP	*-1		00T11100
1101	02176	0 02 02010	LDA	HNTH	HUNDRED THOUSANDS	00T11101
1102	02177	0 06 02241	ADD	=*272		00T11102
1103	02200	74 0004	OTA	4		00T11103
1104	02201	0 01 02200	JMP	*-1		00T11104
1105	02202	0 02 02011	LDA	TNTH	TEN THOUSANDS	00T11105
1106	02203	0 06 02241	ADD	=*272		00T11106
1107	02204	74 0004	OTA	4		00T11107
1108	02205	0 01 02204	JMP	*-1		00T11108
1109	02206	0 02 02012	LDA	THOU	THOUSANDS	00T11109
1110	02207	0 06 02241	ADD	=*272		00T11110
1111	02210	74 0004	OTA	4		00T11111
1112	02211	0 01 02210	JMP	*-1		00T11112
1113	02212	0 02 02013	LDA	HUND	HUNDREDS	00T11113
1114	02213	0 06 02241	ADD	=*272		00T11114
1115	02214	74 0004	OTA	4		00T11115
1116	02215	0 01 02214	JMP	*-1		00T11116
1117	02216	0 02 02014	LDA	TENS	TENS	00T11117
1118	02217	0 06 02241	ADD	=*272		00T11118
1119	02220	74 0004	OTA	4		00T11119
1120	02221	0 01 02220	JMP	*-1		00T11120
1121	02222	0 02 02015	LDA	ONES	AND ONES	00T11121
1122	02223	0 06 02241	ADD	=*272		00T11122

1123	02224	74 0004	OTA	4			00T11123
1124	02225	0 01 02224	JMP	*-1			00T11124
1125	02226	0 02 02240	TY08 LDA	=P240	GET "SPACE" CHARACTER		00T11125
1126	02227	74 0004	OTA	4	OUTPUT		00T11126
1127	02230	0 01 02227	JMP	*-1	II		00T11127
1128	02231	0 12 02004	IRS	CHCT	NINE		00T11128
1129	02232	0 01 02226	JMP	TY08	TIMES		00T11129
1130	02233	0 02 02016	LDA	TYBA-1	RESET		00T11130
1131	02234	0 04 02017	STA	TYBA	TYPEOUT AREA ADDRESS		00T11131
x1132	02235	34 0104	SKS	*104	WAIT		00T11132
x1133	02236	0 01 02235	JMP	*-1	WHILE ASR IS BUSY		00T11133
x1134	02237	0 01 02130	JMP	EOPH-1	RETURN		00T11134
1135							00T11135
1136	02240	000240	FIN		DUMP LITERALS FOR THIS SECTOR		00T11136
	02241	000272					
	02242	177767					
	02243	000007					
	02244	000024					
	02245	000307					
	02246	177771					
	02247	177766					
	02250	010000					
1137							00T11137
1138	02251	0 002252	LAPD	DAC	*+1	LAST ADDRESS PLUS ONE	00T11138
1139			END	STRT			00T11139

NO ERRORS IN ABOVE ASSEMBLY.  
DAP-16 REV. BX 1-30-67 OPR



DDP-416

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**Honeywell**

 **COMPUTER CONTROL**  
DIVISION

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0001	* E500-001-6802 (416-CCT2)	3C NO. 180615000	REV. A	CCT20010
0002	*			CCT20020
0003	*			CCT20030
0004	*			CCT20040
0005	* COMPUTER: DDP-416			CCT20050
0006	*			CCT20060
0007	*			CCT20070
0008	* PROGRAM CATEGORY: TEST AND MAINTENANCE			CCT20080
0009	*			CCT20090
0010	*			CCT20100
0011	* PROGRAM TITLE: 416-CCT2			CCT20110
0012	*	DDP-416 CENTRAL PROCESSOR TEST NO.2		CCT20120
0013	*			CCT20130
0014	*			CCT20140
0015	*			CCT20150
0016	*			CCT20160
0017	*			CCT20170
0018	*			CCT20180
0019	*			CCT20190
0020	*			CCT20200
0021	*			CCT20210
0022	*			CCT20220
0023	*			CCT20230
0024	*			CCT20240
0025	*	APPROVAL	DATE	CCT20250
0026	*			CCT20260
0027	*	PROG, <i>D. E. Newman</i>	<i>8-20-68</i>	CCT20270
0028	*	-----	-----	CCT20280
0029	*			CCT20290
0030	*	SUPR, <i>A. J. Bull</i>	<i>8-21-68</i>	CCT20300
0031	*	-----	-----	CCT20310
0032	*			CCT20320
0033	*	QUAL, <i>V. A. Doster</i>	<i>10-1-68</i>	CCT20330
0034	*	-----	-----	CCT20340
0035	*			CCT20350
0036	*			CCT20360
0037	*	NO. OF PAGES	<i>47</i>	CCT20370





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0038	*		CCT20380
0039	*		CCT20390
0040	*		CCT20400
0041	*	AUTHOR	CCT20410
0042	*		CCT20420
0043	*	HONEYWELL, INC. - COMPUTER CONTROL DIVISION	CCT20430
0044	*		CCT20440
0045	*		CCT20450
0046	*	PURPOSE	CCT20460
0047	*		CCT20470
0048	*	TO DIAGNOSE MARGINAL PAGES AND NOISE INTERFERENCE IN THE	CCT20480
0049	*	CENTRAL PROCESSOR OF THE DDP-416,	CCT20490
0050	*		CCT20500
0051	*		CCT20510
0052	*	RESTRICTIONS	CCT20520
0053	*		CCT20530
0054	*	THIS PROGRAM WILL RUN ON A STANDARD DDP-416,	CCT20540
0055	*		CCT20550
0056	*		CCT20560
0057	*	TIMING	CCT20570
0058	*		CCT20580
0059	*	THIS PROGRAM TAKES ABOUT 23 SECONDS PER PASS,	CCT20590
0060	*		CCT20600
0061	*		CCT20610
0062	*	STORAGE	CCT20620
0063	*		CCT20630
0064	*	THIS PROGRAM WILL NOT EXCEED 4K,	CCT20640
0065	*		CCT20650
0066	*		CCT20660
0067	*	USE	CCT20670
0068	*		CCT20680
0069	*	START THE PROGRAM IN LOCATION '1000	CCT20690
0070	*		CCT20700
0071	*	ERRORS WILL CAUSE THE PROGRAM TO HALT IN LOCATION '1775	CCT20710
0072	*		CCT20720
0073	*	LOCKON OPTION	CCT20730
0074	*	THIS OPTION IS ENABLED, AFTER AN ERROR HALT, BY	CCT20740



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0075	*	CLEARING A REGISTER, THIS WILL CAUSE THE PROGRAM TO	CCT20750
0076	*	RETURN TO THE ROUTINE WHICH FAILED AND ENTER A ERROR	CCT20760
0077	*	LOOP, THIS ERROR LOOP WILL CYCLE THE INSTRUCTION WHICH	CCT20770
0078	*	IS FAILING PLUS EXECUTE AN OCP'1777 FOR SCOPE SYNC,	CCT20780
0079	*	TO REMOVE THIS OPTION, RESTART PROGRAM AT LOCATION '620	CCT20790
0080	*		CCT20800
0081	*	ERROR INDICATIONS	CCT20810
0082	*		CCT20820
0083	*	UPON FINDING ANY ERRORS THE SUBROUTINES COLLECT THE	CCT20830
0084	*	CONDITIONS AND RETURN TO THE EXECUTIVE ROUTINE WITH THE	CCT20840
0085	*	AMASSED DATA, THE DATA IN THE 'A' REGISTER IS DEFINED AS	CCT20850
0086	*	FOLLOWS	CCT20860
0087	*		CCT20870
0088	*	BIT 1 SET-ADDITIONAL REGISTER OF ERROR	CCT20880
0089	*	INFORMATION	CCT20890
0090	*		CCT20900
0091	*	ZERO-NO ADDITIONAL INFORMATION	CCT20910
0092	*		CCT20920
0093	*	BIT 2-7 AUXILIARY INFORMATION	CCT20930
0094	*		CCT20940
0095	*	BIT 8-16 THE OCTAL NUMBER OF THE ROUTINE IN	CCT20950
0096	*	WHICH THE FAILURE OCCURRED	CCT20960
0097	*		CCT20970
0098	*	THE CONTENTS OF THE 'B' REGISTER IS EITHER FAILING BIT	CCT20980
0099	*	INFORMATION, OR ADDITIONAL INFORMATION, REFER TO EACH	CCT20990
0100	*	ROUTINE FOR THE MEANING OF THE B REGISTER CONTENTS AS WELL	CCT21000
0101	*	AS THE DEFINITION OF THE AUXILIARY BITS, THE "B REGISTER"	CCT21010
0102	*	IN THIS PROGRAM IS LOCATION '777	CCT21020
0103	*		CCT21030
0104	*		CCT21040
0105	*	T002 ERA TEST	CCT21050
0106	*		CCT21060
0107	*	AUX BITS B REGISTER	CCT21070
0108	*		CCT21080
0109	*	NOT USED FAILING BITS	CCT21090
0110	*		CCT21100
0111	*		CCT21110



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0112	*	T003		ADD AND SUB TEST	CCT21120
0113	*				CCT21130
0114	*	AUX BITS		B, REGISTER	CCT21140
0115	*				CCT21150
0116	*	000001	ADD ERROR	FAILING BITS	CCT21160
0117	*	000010	SUB ERROR		CCT21170
0118	*				CCT21180
0119	*				CCT21190
0120	*	T004		ANA TEST	CCT21200
0121	*				CCT21210
0122	*	AUX BITS		B REGISTER	CCT21220
0123	*				CCT21230
0124	*	NOT USED		FAILING BITS	CCT21240
0125	*				CCT21250
0126	*				CCT21260
0127	*	T005		IRS TEST	CCT21270
0128	*				CCT21280
0129	*	AUX BITS		B REGISTER	CCT21290
0130	*				CCT21300
0131	*	000001	A REG ALTERED BY IRS	MEMORY VALUE	CCT21310
0132	*	000010	IMPROPER STEPPING OF MEMORY	WHEN FIRST	CCT21320
0133	*	000100	NO SKIP INCREMENTING TO ZERO	ERROR ENCOUNTERED	CCT21330
0134	*	001000	PREMATURE SKIP		CCT21340
0135	*				CCT21350
0136	*				CCT21360
0137	*	T041		ADDER SKIP CARRY	CCT21370
0138	*				CCT21380
0139	*	AUX BITS		B REGISTER	CCT21390
0140	*				CCT21400
0141	*	NOT USED		FAILING BITS	CCT21410
0142	*				CCT21420
0143	*				CCT21430
0144	*	T100		INDIRECT ADDRESSING CHECK	CCT21440
0145	*				CCT21450
0146	*	AUX BITS		B REGISTER	CCT21460
0147	*				CCT21470
0148	*	000001	LDA FAILURE BIT 10	1 LEVEL INDIRECT ADR. FAILURE	CCT21480



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0149	*	000010	ERA FAILURE BIT 11 2 LEVEL INDIRECT ADR. FAILURE	CCT21490
0150	*	000100	ANA FAILURE BIT 12 3 LEVEL INDIRECT ADR. FAILURE	CCT21500
0151	*	001000	ADD FAILURE BIT 13 4 LEVEL INDIRECT ADR. FAILURE	CCT21510
0152	*		BIT 14 5 LEVEL INDIRECT ADR. FAILURE	CCT21520
0153	*		BIT 15 6 LEVEL INDIRECT ADR. FAILURE	CCT21530
0154	*			CCT21540
0155	*			CCT21550
0156	*	T060	ARS	CCT21560
0157	*			CCT21570
0158	*	AUX BITS	B REGISTER	CCT21580
0159	*			CCT21590
0160	*	010000	FLOATING ZERO PATTERN BITS SET IN THE	CCT21600
0161	*	001000	ALL ONE PATTERN B REG INDICATE THE	CCT21610
0162	*	000100	125252 PATTERN AMOUNT OF SHIFT WHICH	CCT21620
0163	*	000010	052525 PATTERN FAILED BIT 1 = 1,	CCT21630
0164	*		BIT 2 = 2, BIT 3 = 3, ETC	CCT21640
0165	*			CCT21650
0166	*			CCT21660
0167	*			CCT21670
0168	*	T061	ALS	CCT21680
0169	*			CCT21690
0170	*	AUX BITS		CCT21700
0171	*			CCT21710
0172	*	010000	ALL ONES PATTERN	CCT21720
0173	*	001000	FLOATING ONE BIT	CCT21730
0174	*	000100	ALTERNATING BIT PATTERN	CCT21740
0175	*			CCT21750
0176	*			CCT21760
0177	*	T062	LGL	CCT21770
0178	*			CCT21780
0179	*	AUX BITS		CCT21790
0180	*			CCT21800
0181	*	010000	ALTERNATING BIT PATTERN	CCT21810
0182	*	001000	ALL ONE PATTERN	CCT21820
0183	*	000100	FLOATING ONE BIT	CCT21830
0184	*			CCT21840
0185	*			CCT21850





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0186	*	T063		LGR	CCT21860
0187	*				CCT21870
0188	*	AUX BITS			CCT21880
0189	*				CCT21890
0190	*	010000	FLOATING ONE BIT		CCT21900
0191	*	001000	ALL ONES PATTERN		CCT21910
0192	*	000100	ALTERNATING BITS		CCT21920
0193	*				CCT21930
0194	*				CCT21940
0195	*	T064		ALR	CCT21950
0196	*				CCT21960
0197	*	AUX BITS			CCT21970
0198	*				CCT21980
0199	*	010000	FLOATING ZERO BIT		CCT21990
0200	*	001000	FLOATING ONE BIT		CCT22000
0201	*	000100	ALTERNATING BIT PATTERN		CCT22010
0202	*				CCT22020
0203	*				CCT22030
0204	*	T065		ARR	CCT22040
0205	*				CCT22050
0206	*				CCT22060
0207	*	AUX BITS			CCT22070
0208	*				CCT22080
0209	*	010000	FLOATING ZERO BIT		CCT22090
0210	*	001000	FLOATING ONE BIT		CCT22100
0211	*	000100	ALTERNATING BIT PATTERN		CCT22110
0212	*				CCT22120
0213	*				CCT22130
0214	*	T074		GENERAL SHIFT	CCT22140
0215	*				CCT22150
0216	*	AUX BITS		B REG	CCT22160
0217	*				CCT22170
0218	*	NOT USED		B 6 = ALR 16	CCT22180
0219	*			B 7 = ARR 16	CCT22190
0220	*				CCT22200
0221	*				CCT22210
0222	*		THE PATTERNS USED IN THE GENERAL SHIFT		CCT22220



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0223 * ROUTINE ARE RANDOM DATA. CCT22230
0224 * CCT22240
0225 ***** CCT22250
0226 * CCT22260
0227 * CCT22270
0228 CF4 * CCT22280
0229 ORG '600 * CCT22290
0230 LOAD * CCT22300
0231 * CCT22310
0232 00600 -0 10 00766 STR1 JST* TYPO CCT22320
0233 00601 0 02 00773 STR2 LDA =-13 CCT22330
0234 00602 0 04 00637 STA TCTR * CCT22340
0235 00603 140040 CRA CCT22350
0236 00604 0 04 00632 STA LOCK CCT22360
0237 00605 0 02 00641 LDA ATST * CCT22370
0238 00606 0 04 00640 STA ADDR * CCT22380
0239 00607 140040 B CRA * CCT22390
0240 00610 0 04 00000 STA 0 * CCT22400
0241 00611 -0 10 00640 JST* ADDR * CCT22410
0242 00612 0 04 00662 STA DGTS * CCT22420
0243 00613 101040 SNZ CCT22430
0244 00614 0 01 00622 JMP NORM CCT22440
0245 00615 -0 10 00770 JST* ERHL CCT22450
0246 00616 101040 SNZ CCT22460
0247 00617 0 01 00627 JMP LSET CCT22470
0248 00620 140040 CRA REMOVE LOCK ON (RESTART) CCT22480
0249 00621 0 04 00632 STA LOCK CCT22490
0250 00622 0 12 00640 NORM IRS ADDR CCT22500
0251 00623 0 12 00637 IRS TCTR CCT22510
0252 00624 0 01 00607 JMP B CCT22520
0253 00625 -0 10 00767 JST* EOPH CCT22530
0254 00626 0 01 00601 JMP STR2 CCT22540
0255 00627 0 02 00772 LSET LDA =1 CCT22550
0256 00630 0 04 00632 STA LOCK SET OPTION CCT22560
0257 00631 0 01 00607 JMP B CCT22570
0258 * CCT22580
0259 00632 000000 LOCK BSZ 1 * CCT22590
    
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0260	00633	000000	SAVA	BSZ	1	*	CCT22600
0261	00634	000000	T	BSZ	1	*	CCT22610
0262	00635	000000	BREG	BSZ	1	*	CCT22620
0263	00636	000000	CNTR	BSZ	1	*	CCT22630
0264	00637	000000	TCTR	BSZ	1	*	CCT22640
0265	00640	000000	ADDR	BSZ	1	*	CCT22650
0266			*				CCT22660
0267	00641	-0 000642	ATST	DAC*	**+1	*	CCT22670
0268	00642	0 002002		DAC	T2AA	*T002	CCT22680
0269	00643	0 002067		DAC	TBAA	*T003	CCT22690
0270	00644	0 002222		DAC	TBBA	*T004	CCT22700
0271	00645	0 002316		DAC	TABA	*T041	CCT22710
0272	00646	0 002441		DAC	THAA	*T100	CCT22720
0273	00647	0 002607		DAC	IRSX	*T005	CCT22730
0274	00650	0 003002		DAC	ARSA	*T060	CCT22740
0275	00651	0 003064		DAC	ALSA	*T061	CCT22750
0276	00652	0 003137		DAC	LGLA	*T062	CCT22760
0277	00653	0 003212		DAC	LGRA	*T063	CCT22770
0278	00654	0 003273		DAC	ALRA	*T064	CCT22780
0279	00655	0 003346		DAC	ARRA	*T065	CCT22790
0280	00656	0 004122		DAC	SFTA	*T074	CCT22800
0281			*			*	CCT22810
0282	00657	0 004041	N3KW	DAC	SKNH+2	*	CCT22820
0283			*			*	CCT22830
0284	00660	0 00 00000	SFXV	PZE		*	CCT22840
0285	00661	0 00 00000	SFXZ	PZE		*	CCT22850
0286	00662	000000	DGTS	BSZ	1		CCT22860
0287	00663	000000	PAT	BSZ	1		CCT22870
0288	00664	000000	PATT	BSZ	1		CCT22880
0289			*				CCT22890
0290		000000	S	EQU	0		CCT22900
0291			*				CCT22910
0292	00665	0 003436	SFTT	DAC	SFT		CCT22920
0293	00666	0 003503	SFZZ	DAC	SFTZ		CCT22930
0294	00667	0 003506	SFYY	DAC	SFTY		CCT22940
0295	00670	0 003420	SHXT	DAC	SHFT		CCT22950
0296	00671	0 003507	SFXU	DAC	SFTU		CCT22960



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0297	00672	0	003510	SFXV	DAC	SFTV		CCT22970
0298	00673	0	003534	SXTR	DAC	SFTR		CCT22980
0299				*				CCT22990
0300	00674	0	000000	IILP	DAC	**	*	CCT23000
0301	00675	-0	04 00731	STA*		ASFT		CCT23010
0302	00676	0	02 00752	LDA		ASA	*	CCT23020
0303	00677	0	04 00736	STA		SAA	*	CCT23030
0304	00700	0	02 00753	LDA		ASH	*	CCT23040
0305	00701	0	04 00737	STA		SBA	*	CCT23050
0306	00702	0	02 00754	LDA		ASC	*	CCT23060
0307	00703	0	04 00740	STA		SCA	*	CCT23070
0308	00704	0	02 00755	LDA		ASD	*	CCT23080
0309	00705	0	04 00741	STA		SDA	*	CCT23090
0310	00706	0	02 00756	LDA		ASE	*	CCT23100
0311	00707	0	04 00742	STA		SEA	*	CCT23110
0312	00710	0	02 00757	LDA		ATB	*	CCT23120
0313	00711	0	04 00743	STA		TBA	*	CCT23130
0314	00712	0	02 00760	LDA		ATV	*	CCT23140
0315	00713	0	04 00744	STA		TVA	*	CCT23150
0316	00714	0	02 00761	LDA		ATC	*	CCT23160
0317	00715	0	04 00745	STA		TCA	*	CCT23170
0318	00716	0	02 00762	LDA		ATU	*	CCT23180
0319	00717	0	04 00746	STA		TUA	*	CCT23190
0320	00720	0	02 00763	LDA		ATD	*	CCT23200
0321	00721	0	04 00747	STA		TDA	*	CCT23210
0322	00722	0	02 00764	LDA		ATE	*	CCT23220
0323	00723	0	04 00750	STA		TEA	*	CCT23230
0324	00724	0	02 00765	LDA		ATE2	*	CCT23240
0325	00725	0	04 00751	STA		TE2A	*	CCT23250
0326	00726	0	02 00771	LDA		=-15	*	CCT23260
0327	00727	0	04 00000	STA		0	*	CCT23270
0328	00730	-0	01 00674	JMP*		IILP	*	CCT23280
0329				*			*	CCT23290
0330	00731	0	003436	ASFT	DAC	SFT	*	CCT23300
0331				*			*	CCT23310
0332	00732	0	000000	RPAT	DAC	**		CCT23320
0333	00733	140040			CRA			CCT23330





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0334	00734	0 04 00664	STA	PATT					
0335	00735	-0 01 00732	JMP*	RPAT					CCT23340
0336			*						CCT23350
0337	00736	000000	SAA	BSZ	1	*			CCT23360
0338	00737	000000	SBA	BSZ	1	*			CCT23370
0339	00740	000000	SCA	BSZ	1	*			CCT23380
0340	00741	000000	SDA	BSZ	1	*			CCT23390
0341	00742	000000	SEA	BSZ	1	*			CCT23400
0342	00743	000000	TBA	BSZ	1	*			CCT23410
0343	00744	000000	TVA	BSZ	1	*			CCT23420
0344	00745	000000	TCA	BSZ	1	*			CCT23430
0345	00746	000000	TUA	BSZ	1	*			CCT23440
0346	00747	000000	TDA	BSZ	1	*			CCT23450
0347	00750	000000	TEA	BSZ	1	*			CCT23460
0348	00751	000000	TE2A	BSZ	1	*			CCT23470
0349	00752	0 003547	ASA	DAC	SA	*			CCT23480
0350	00753	0 003567	ASB	DAC	SB	*			CCT23490
0351	00754	0 003607	ASC	DAC	SC	*			CCT23500
0352	00755	0 003627	ASD	DAC	SD	*			CCT23510
0353	00756	0 003647	ASE	DAC	SE	*			CCT23520
0354	00757	0 003670	ATB	DAC	TB	*			CCT23530
0355	00760	0 003671	ATV	DAC	TV	*			CCT23540
0356	00761	0 003711	ATC	DAC	TC	*			CCT23550
0357	00762	0 003712	ATU	DAC	TU	*			CCT23560
0358	00763	0 003732	ATD	DAC	TD	*			CCT23570
0359	00764	0 003753	ATE	DAC	TE	*			CCT23580
0360	00765	0 003754	ATE2	DAC	TE2	*			CCT23590
0361	00766	0 004267	TYPD	DAC	TYPD	*			CCT23600
0362			*			*			CCT23610
0363	00767	0 001004	EOPH	DAC	EOPH	*			CCT23620
0364	00770	0 001774	ERHL	DAC	ERST	*			CCT23630
0365	00771	177761	FIN			*			CCT23640
	00772	000001							CCT23650
	00773	177763							
0366			ORG	'1000					CCT23660
0367	01000	0 02 01073	STRT	LDA	=-50				CCT23670



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0368	01001	0 04 01063	STA	CNT1		CCT23680
0369	01002	-0 02 01060	LDA*	MSG1		CCT23690
0370	01003	0 01 00600	JMP	STR1		CCT23700
0371	01004	0 000000	EOP1	DAC	**	CCT23710
0372	01005	0 12 01063	IRS	CNT1		CCT23720
0373	01006	-0 01 01004	JMP*	EOP1		CCT23730
0374	01007	0 02 01073	LDA	=-50		CCT23740
0375	01010	0 04 01063	STA	CNT1	RESTORE PASS COUNT	CCT23750
0376	01011	-0 02 01055	LDA*	PCRT		CCT23760
0377	01012	0 04 01062	STA	CNTX		CCT23770
0378	01013	0 10 01022	JST	ST5		CCT23780
0379	01014	0 01 01017	JMP	TYPM		CCT23790
0380	01015	0 10 01022	JST	ST5		CCT23800
0381	01016	0 01 01017	JMP	**+1		CCT23810
0382	01017	-0 02 01061	TYPM	LDA*	MSG2	CCT23820
0383	01020	-0 10 01057	JST*	TYPP		CCT23830
0384	01021	-0 01 01004	JMP*	EOP1		CCT23840
0385		*			PASS COUNT CHECK ROUTINE	CCT23850
0386	01022	0 000000	ST5	DAC	**	CCT23860
0387	01023	-0 02 01062	LDA*	CNTX	LOAD UNITS + TENS	CCT23870
0388	01024	0 03 01072	ANA	= '377	AND CHECK FOR 09	CCT23880
0389	01025	0 05 01071	ERA	= '271	AND 99 COUNTS DEC	CCT23890
0390	01026	100040	SZE			CCT23900
0391	01027	0 01 01045	JMP	INC1	COUNT LESS THAN 09	CCT23910
0392	01030	-0 02 01062	LDA*	CNTX		CCT23920
0393	01031	0 03 01070	ANA	= '177400		CCT23930
0394	01032	0 05 01067	ERA	= '134400		CCT23940
0395	01033	100040	SZE			CCT23950
0396	01034	0 01 01050	JMP	INC2	COUNT LESS THAN 99	CCT23960
0397	01035	0 02 01066	LDA	= '130260		CCT23970
0398	01036	-0 04 01062	STA*	CNTX		CCT23980
0399	01037	0 02 01062	LDA	CNTX	SET UP FOR SECOND	CCT23990
0400	01040	0 07 01065	SUB	=1	PASS THRU IF COUNT	CCT24000
0401	01041	0 04 01062	STA	CNTX	EQUAL TO DEC 99	CCT24010
0402	01042	0 12 01022	IRS	ST5		CCT24020
0403	01043	-0 01 01022	JMP*	ST5		CCT24030
0404	01044	000000	HLT			CCT24040



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0405	01045	-0 12 01062	INC1	IRS*	CNTX	INC UNITS OR HUNDREDS	CCT24050
0406	01046	-0 01 01022		JMP*	ST5		CCT24060
0407	01047	000000		HLT			CCT24070
0408	01050	-0 02 01062	INC2	LDA*	CNTX	INC TENS OR THOUSANDS	CCT24080
0409	01051	0 03 01070		ANA	'177400		CCT24090
0410	01052	0 06 01064		ADD	'660		CCT24100
0411	01053	-0 04 01062		STA*	CNTX		CCT24110
0412	01054	-0 01 01022		JMP*	ST5		CCT24120
0413	01055	0 001056	PCRT	DAC	PCR1		CCT24130
0414	01056	0 004347	PCR1	DAC	CNT5+1		CCT24140
0415	01057	0 004267	TYPF	DAC	TYPD		CCT24150
0416	01060	0 004314	MSG1	DAC	MESS		CCT24160
0417	01061	0 004335	MSG2	DAC	MES2		CCT24170
0418	01062	0 000000	CNTX	DAC	**		CCT24180
0419	01063	0 000000	CNT1	DAC	**		CCT24190
0420	01064	000660		FIN			CCT24200
	01065	000001					
	01066	130260					
	01067	134400					
	01070	177400					
	01071	000271					
	01072	000377					
	01073	177716					
0421			ORG		'1774		CCT24210
0422	01774	0 000000	ERST	DAC	**		CCT24220
0423	01775	000000		HLT		ERROR HLT	CCT24230
0424	01776	-0 01 01774		JMP*	ERST		CCT24240
0425				FIN			CCT24250
0426			*		SUBROUTINE T002	ERA	CCT24260
0427			*		THIS SUBROUTINE CHECKS FOR THE PROPER		CCT24270
0428			*		OPERATION AT THE ERA INSTRUCTION, RANDOM DATA		CCT24280
0429			*		WORDS ARE SELECTED AND AN EXCLUSIVE OR WITH		CCT24290
0430			*		ITSELF IS PERFORMED WHICH SHOULD RESULT IN ZERO		CCT24300
0431			*		AN EXCLUSIVE OR IS THE MADE WITH ITS ONE'S		CCT24310
0432			*		COMPLEMENT RESULTING IN ALL ONE'S		CCT24320
0433			*		12/22/64		CCT24330



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0434			ORG	'2000	*	CCT24340
0435	02000	000000	BSZ	1	*	CCT24350
0436	02001	000002	T2AV	OCT 2		CCT24360
0437	02002	0 00 00000	T2AA	PZE	ENTRY POINT	CCT24370
0438	02003	0 02 02730	LDA	='2000	*INITIALIZE	CCT24380
0439	02004	0 04 00000	STA	0	**	CCT24390
0440	02005	140040	CRA		*	CCT24400
0441	02006	0 04 02064	STA	T2AZ	**	CCT24410
0442	02007	0 02 02727	LDA	=-1000	**	CCT24420
0443	02010	0 04 02063	STA	T2AY	**	CCT24430
0444	02011	0 12 00000	T2AB	IRS 0		CCT24440
0445	02012	-0 02 00000	LDA*	0	*PICK UP DATA	CCT24450
0446	02013	0 04 02065	STA	T2XZ	AND STORE FOR TEST	CCT24460
0447	02014	0 05 02726	ERA	=-1	*COMPLEMENT AND	CCT24470
0448	02015	0 04 02062	STA	T2AX	STORE FOR CHECK	CCT24480
0449	02016	0 05 02065	ERA	T2XZ	EXCLUSIVE OR DATA AND COMPLEMENT	CCT24490
0450	02017	0 04 02061	STA	T2AW	RESULTS SHOULD BE ALL ONES	CCT24500
0451	02020	0 12 02061	IRS	T2AW	CHECK BY INCREMENTING TO ZERO	CCT24510
0452	02021	0 01 02036	JMP	T2AC	ERROR	CCT24520
0453	02022	0 02 02065	LDA	T2XZ	EXCLUSIVE OR DATA WITH ITSELF	CCT24530
0454	02023	0 05 02065	ERA	T2XZ	RESULTS SHOULD BE ZERO	CCT24540
0455	02024	100040	SZE			CCT24550
0456	02025	0 01 02044	JMP	T2AD	ERROR	CCT24560
0457	02026	0 12 02063	T2AE	IRS T2AY	INCREMENT COUNTER	CCT24570
0458	02027	0 01 02011	JMP	T2AB	RETURN FOR NEXT PASS	CCT24580
0459	02030	0 02 02064	LDA	T2AZ	FINISHED - CHECK FOR ERRORS	CCT24590
0460	02031	101040	SNZ		**	CCT24600
0461	02032	-0 01 02002	JMP*	T2AA	NONE - EXIT	CCT24610
0462	02033	0 04 00635	STA	BREG	*SAVE ERROR BITS	CCT24620
0463	02034	0 02 02001	LDA	T2AV	IDENTITY TO A REG	CCT24630
0464	02035	-0 01 02002	JMP*	T2AA	AND EXIT	CCT24640
0465	02036	0 04 00633	T2AC	STA SAVA	*	CCT24650
0466	02037	0 02 00632	LDA	LOCK	*CHECK FOR LOCK-ON	CCT24660
0467	02040	100040	SZE		*	CCT24670
0468	02041	0 01 02052	JMP	T2AK	YES-TO LOCKON ROUTINE	CCT24680
0469	02042	0 02 00633	LDA	SAVA	*	CCT24690
0470	02043	0 05 02726	ERA	=-1	*COMPLEMENT AND	CCT24700





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0471	02044	0 04 02062	T2AD	STA	T2AX	ISOLATE THE FAILING	CCT24710
0472	02045	0 03 02064		ANA	T2AZ	BIT	CCT24720
0473	02046	0 05 02062		ERA	T2AX	ACCUMULATE FAILING BITS	CCT24730
0474	02047	0 05 02064		ERA	T2AZ	FOR EXIT	CCT24740
0475	02050	0 04 02064		STA	T2AZ	**	CCT24750
0476	02051	0 01 02026		JMP	T2AE	RETURN	CCT24760
0477	02052	14 1777	T2AK	OCF	'1777	LOCKON ROUTINE ** SYNC POINT	CCT24770
0478	02053	0 02 02062		LDA	T2AX	RE EXECUTE FAILING	CCT24780
0479	02054	-0 05 00000		ERA*	0	*SEQUENCE	CCT24790
0480	02055	0 02 00632		LDA	LOCK	*CHECK IF STILL IN LOCK-ON	CCT24800
0481	02056	100040		SZE		*	CCT24810
0482	02057	0 01 02052		JMP	T2AK	YES-REPEAT	CCT24820
0483	02060	0 01 02026		JMP	T2AE	NO-RETURN TO MAIN LOOP	CCT24830
0484	02061	0 00 00000	T2AW	PZE			CCT24840
0485	02062	0 00 00000	T2AX	PZE			CCT24850
0486	02063	0 00 00000	T2AY	PZE			CCT24860
0487	02064	0 00 00000	T2AZ	PZE			CCT24870
0488	02065	0 00 00000	T2XZ	PZE			CCT24880
0489			*			SUBROUTINE T003 ADD AND SUB	CCT24890
0490			*			THIS SUBROUTINE CHECKS FOR PROPER OPERATION OF	CCT24900
0491			*			THE ADD AND SUBTRACT INSTRUCTION	CCT24910
0492			*			12/28/64	CCT24920
0493	02066	000003	TBAQ	OCT		3	CCT24930
0494	02067	0 00 00000	TBAA	PZE			CCT24940
0495	02070	140040		CRA		INITIALIZE	CCT24950
0496	02071	0 04 02130		STA	TBAZ	**	CCT24960
0497	02072	0 04 02131		STA	TBAW	**	CCT24970
0498	02073	0 02 02727		LDA	=-1000	**	CCT24980
0499	02074	0 04 00636		STA	CNTR	*	CCT24990
0500	02075	0 02 02274		LDA	ATBA	*	CCT25000
0501	02076	0 04 00000		STA	0	**	CCT25010
0502	02077	-0 02 00000	TBAB	LDA*	0	*PICK UP DATA WORD,	CCT25020
0503	02100	0 04 02132		STA	TBAX	SAVE FOR LATER USE	CCT25030
0504	02101	0415 77		ALS	1	MULTIPLY BY TWO	CCT25040
0505	02102	0 04 02133		STA	TBAY	USING SHIFT	CCT25050
0506	02103	0 02 02132		LDA	TBAX	ADD DATA WORD TO	CCT25060
0507	02104	0 06 02132		ADD	TBAX	ITSELF AND CHECK RESULTS	CCT25070



0508	02105	0 04 00633	STA	SAVA	*AGAINST DATA TIMES 2	CCT25080
0509	02106	0 05 02133	ERA	TBAY	*	CCT25090
0510	02107	100040	SZE		*	CCT25100
0511	02110	0 01 02134	JMP	TBAE	ERROR	CCT25110
0512	02111	0 02 00633	LDA	SAVA	*	CCT25120
0513	02112	0 07 02132	TBAD SUB	TBAX	SUBTRACT DATA FROM SUM	CCT25130
0514	02113	0 04 00633	STA	SAVA	*AND CHECK AGAINST ORIGINAL	CCT25140
0515	02114	0 05 02132	ERA	TBAX	*	CCT25150
0516	02115	100040	SZE		*	CCT25160
0517	02116	0 01 02167	JMP	TBAF	ERROR	CCT25170
0518	02117	0 12 00636	TBAC IRS	CNTR	*INCREMENT INDEX AND	CCT25180
0519	02120	0 01 02077	JMP	TBAB	RETURN FOR NEXT PASS	CCT25190
0520	02121	0 02 02131	LDA	TBAW	FINISHED-CHECK FOR	CCT25200
0521	02122	101040	SNZ		ANY ERRORS	CCT25210
0522	02123	-0 01 02067	JMP*	TBAA	NONE RETURN	CCT25220
0523	02124	0 04 00635	STA	BREG	*SAVE ACCUMULATED ERRORS	CCT25230
0524	02125	0 02 02130	LDA	TBAZ	LOAD A REG WITH IDENTITY AND	CCT25240
0525	02126	0 05 02066	ERA	TBAQ	AUX INFORMATION AND	CCT25250
0526	02127	-0 01 02067	JMP*	TBAA	EXIT	CCT25260
0527	02130	0 00 00000	TBAZ PZE			CCT25270
0528	02131	0 00 00000	TBAW PZE			CCT25280
0529	02132	0 00 00000	TBAX PZE			CCT25290
0530	02133	0 00 00000	TBAY PZE			CCT25300
0531	02134	0 02 00632	TBAE LDA	LOCK	*ERROR ROUTINE, CHECK FOR LOCK-ON,	CCT25310
0532	02135	101040	SNZ		*	CCT25320
0533	02136	0 01 02152	JMP	TBBB	*NO, ACCUMULATE ERROR BITS,	CCT25330
0534	02137	14 1777	ADSA OCP	!1777	SYNC POINT	CCT25340
0535	02140	0 02 02132	LDA	TBAX	REPRODUCE ERROR	CCT25350
0536	02141	0 06 02132	ADD	TBAX	SEQUENCE AND CHECK	CCT25360
0537	02142	0 05 02133	ERA	TBAY	FOR PROPER ANSWER	CCT25370
0538	02143	101040	SNZ		**	CCT25380
0539	02144	0 01 02150	JMP	TBGZ	*ANSWER OK, RETURN TO MAIN LOOP,	CCT25390
0540	02145	0 02 00632	LDA	LOCK	*CHECK IF STILL IN LOCK-ON,	CCT25400
0541	02146	100040	SZE		*	CCT25410
0542	02147	0 01 02137	JMP	ADSA	YES-REPEAT	CCT25420
0543	02150	0 02 02133	TBGZ LDA	TBAY	*NO, RELOAD A-REG AND	CCT25430
0544	02151	0 01 02112	JMP	TBAD	RETURN TO MAIN LOOP	CCT25440



0545	02152	0 02 00633	TBBB	LDA	SAVA	*	CCT25450
0546	02153	0 05 02133		ERA	TBAY	*ISOLATE FAILING BIT	CCT25460
0547	02154	0 04 02220		STA	TBAV	AND ACCUMULATE FAILING	CCT25470
0548	02155	0 03 02131		ANA	TBAW	BIT INFORMATION	CCT25480
0549	02156	0 05 02220		ERA	TBAV	**	CCT25490
0550	02157	0 05 02131		ERA	TBAW	**	CCT25500
0551	02160	0 04 02131		STA	TBAW	**	CCT25510
0552	02161	0 02 02130		LDA	TBAZ	SET AUX BIT INFO	CCT25520
0553	02162	0 03 02725		ANA	= '76777	TO SHOW ERROR WAS	CCT25530
0554	02163	0 05 02724		ERA	= '1000	WITH ADD	CCT25540
0555	02164	0 04 02130		STA	TBAZ	**	CCT25550
0556	02165	0 02 02133		LDA	TBAY	**	CCT25560
0557	02166	0 01 02112		JMP	TBAD	RETURN	CCT25570
0558	02167	0 02 00632	TBAF	LDA	LOCK	*ERROR ROUTINE, CHECK FOR LOCK-ON,	CCT25580
0559	02170	101040		SNZ		*	CCT25590
0560	02171	0 01 02205		JMP	TBBC	NO-GO TO ERROR ACCUMULATION ROUTINE	CCT25600
0561	02172	14 1777	ADSB	OCF	'1777	SYNC POINT	CCT25610
0562	02173	0 02 02133		LDA	TBAY	REPRODUCE ERROR SEQUENCE	CCT25620
0563	02174	0 07 02132		SUB	TBAX	AND CHECK FOR CORRECT	CCT25630
0564	02175	0 05 02132		ERA	TBAX	OPERATION	CCT25640
0565	02176	101040		SNZ		**	CCT25650
0566	02177	0 01 02117		JMP	TBAC	*CORRECT RESULTS, RETURN.	CCT25660
0567	02200	0 02 00632		LDA	LOCK	*CHECK IF STILL IN LOCK-ON,	CCT25670
0568	02201	100040		SZE		*	CCT25680
0569	02202	0 01 02172		JMP	ADSB	YES-REPEAT SEQUENCE	CCT25690
0570	02203	0 01 02117		JMP	TBAC	NO RETURN TO MAIN LOOP	CCT25700
0571	02204	0 02 00633		LDA	SAVA	*	CCT25710
0572	02205	0 05 02132	TBBC	ERA	TBAX	ACCUMULATE ERROR BITS WITH	CCT25720
0573	02206	0 04 02220		STA	TBAV	PREVIOUS FAILING BITS	CCT25730
0574	02207	0 03 02131		ANA	TBAW	**	CCT25740
0575	02210	0 05 02220		ERA	TBAV	**	CCT25750
0576	02211	0 05 02131		ERA	TBAW	**	CCT25760
0577	02212	0 02 02130		LDA	TBAZ	**	CCT25770
0578	02213	0 04 02131		STA	TBAW	SET AUX BIT INFORMATION TO	CCT25780
0579	02214	0 03 02723		ANA	= '75777	INDICATE A SUB FAILURE	CCT25790
0580	02215	0 05 02730		ERA	= '2000	**	CCT25800
0581	02216	0 04 02130		STA	TBAZ	**	CCT25810



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0582	02217	0 01 02117	JMP	TBAC	RETURN TO MAIN LOOP	CCT25820
0583	02220	0 00 00000	TBAV	PZE		CCT25830
0584			*	SUBROUTINE T004	ANA	CCT25840
0585	02221	000004	TBBQ	OCT	4	CCT25850
0586	02222	0 00 00000	TBBA	PZE	IDENTIFICATION	CCT25860
0587	02223	140040		CRA	ENTRY POINT	CCT25870
0588	02224	0 04 02277	STA	TBBZ	INITIALIZE	CCT25880
0589	02225	0 04 02275	STA	TBBX	**	CCT25890
0590	02226	0 02 02727	LDA	==1000	**	CCT25900
0591	02227	0 04 00636	STA	CNTR	*	CCT25910
0592	02230	0 02 02273	LDA	AANA	*	CCT25920
0593	02231	0 04 00000	STA	0	**	CCT25930
0594	02232	-0 02 00000	ANAB	LDA*	0	CCT25940
0595	02233	0 04 02276	STA	TBBY	*	CCT25950
0596	02234	0 02 02312	LDA	TBBS	AN ODD ALTERNATING PATTERN	CCT25960
0597	02235	0 03 02313	ANA	TBBT	IS ADDED WITH EVEN ALTERNATING	CCT25970
0598	02236	100040	SZE		PATTERN, RESULTS SHOULD BE ZERO	CCT25980
0599	02237	0 01 02303	JMP	TBBF	OTHERWISE ERROR	CCT25990
0600	02240	0 02 02276	LDA	TBBY	RANDOM DATA IS ADDED WITH	CCT26000
0601	02241	0 03 02726	ANA	== '1	ALL ONES AND THE RESULT	CCT26010
0602	02242	0 04 00633	STA	SAVA	*	CCT26020
0603	02243	0 05 02276	ERA	TBBY	*SHOULD BE ORIGINAL DATA,	CCT26030
0604	02244	100040	SZE		*	CCT26040
0605	02245	0 01 02303	JMP	TBBF	ERROR	CCT26050
0606	02246	0 02 02726	LDA	== '1	ALL ONES IS THEN ADDED WITH	CCT26060
0607	02247	0 03 02276	ANA	TBBY	RANDOM DATA AND RESULTS	CCT26070
0608	02250	0 05 02276	ERA	TBBY	SHOULD BE ORIGINAL DATA	CCT26080
0609	02251	100040	SZE		IF NOT	CCT26090
0610	02252	0 01 02303	JMP	TBBF	ERROR	CCT26100
0611	02253	0 02 02312	TBBD	LDA	TBBS	INITIALIZE FOR NEXT PASS
0612	02254	0 04 00634	STA	T	*	CCT26120
0613	02255	0 02 02313	LDA	TBBT	*	CCT26130
0614	02256	0 04 02312	STA	TBBS	*	CCT26140
0615	02257	0 02 00634	LDA	T	*	CCT26150
0616	02260	0 04 02313	STA	TBBT	*	CCT26160
0617	02261	0 12 00000	IRS	0	INCREMENT INDEX	CCT26170
0618	02262	0 12 00636	IRS	CNTR	*	CCT26190





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0619	02263	0 01 02232	JMP	ANAB	AND RETURN	CCT26190
0620	02264	0 02 02277	LDA	TBBZ	CHECK FOR ERRORS	CCT26200
0621	02265	101040	SNZ		**	CCT26210
0622	02266	-0 01 02222	JMP*	TBBA	NONE-EXIT	CCT26220
0623	02267	0 04 00635	STA	BREG	*SAVE ERROR BITS,	CCT26230
0624	02270	0 02 02221	LDA	TBBQ	AUX INFO IN A REG	CCT26240
0625	02271	0 05 02275	ERA	TBBX	ADD IN IDENTITY	CCT26250
0626	02272	-0 01 02222	JMP*	TBBA	AND RETURN	CCT26260
0627	02273	0 000262	AANA DAC	ANAB-1000	*	CCT26270
0628	02274	0 000127	ATBA DAC	TBAB-1000	*	CCT26290
0629	02275	0 00 00000	TBBX PZE			CCT26290
0630	02276	0 00 00000	TBBY PZE			CCT26300
0631	02277	0 00 00000	TBBZ PZE			CCT26310
0632	02300	0 05 02276	TBBE ERA	TBBY		CCT26320
0633	02301	101040	SNZ			CCT26330
0634	02302	0 01 02253	JMP	TBBD		CCT26340
0635	02303	0 02 00633	TBBF LDA	SAVA	*	CCT26350
0636	02304	0 04 02314	STA	TBBW	*ACCUMULATE ERROR	CCT26360
0637	02305	0 03 02277	ANA	TBBZ	INFORMATION AND STORE	CCT26370
0638	02306	0 05 02314	ERA	TBBW	UNTIL LOOP COMPLETE	CCT26380
0639	02307	0 05 02277	ERA	TBBZ	**	CCT26390
0640	02310	0 04 02277	STA	TBBZ	**	CCT26400
0641	02311	0 01 02253	JMP	TBBD	RETURN TO MAIN LOOP	CCT26410
0642	02312	125252	TBBS OCT	125252		CCT26420
0643	02313	052525	TBRT OCT	52525		CCT26430
0644	02314	0 00 00000	TBBW PZE			CCT26440
0645			*	SUBROUTINE T041	ADDER SKIP CARRY	CCT26450
0646			*	THIS ROUTINE CHECK FOR THE GENERATION OF SKIP		CCT26460
0647			*	CARRY'S IN ALL POSITIONS		CCT26470
0648			*	12/28/64		CCT26480
0649	02315	000041	TABQ OCT	41	SUBROUTINE IDENTITY	CCT26490
0650	02316	0 00 00000	TABA PZE		ENTRY POINT	CCT26500
0651	02317	0 02 02727	LDA	=-1000	INITIALIZE	CCT26510
0652	02320	0 04 02365	STA	TABZ	**	CCT26520
0653	02321	140040	CRA		**	CCT26530
0654	02322	0 04 02364	STA	TABY	**	CCT26540
0655	02323	101000	NOP		***	CCT26550



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0656	02324	0 02 02367	TABB LDA	TXBA	ADD FIRST PARAMETER TO	CCT26560
0657	02325	0 06 02370	ADD	TXBB	SECOND PARAMETER AND COMPARE	CCT26570
0658	02326	0 04 00633	STA	SAVA	*	CCT26580
0659	02327	0 05 02371	ERA	TXBC	*RESULTS WITH PRE-CALCULATED VALUE,	CCT26590
0660	02330	100040	SZE		*	CCT26600
0661	02331	0 01 02350	JMP	TABE	ERROR	CCT26610
0662	02332	0 02 02372	LDA	TXBE	USE SECOND SET	CCT26620
0663	02333	0 06 02373	ADD	TXBF	OF PARAMETERS AND	CCT26630
0664	02334	0 04 00633	STA	SAVA	*	CCT26640
0665	02335	0 05 02374	ERA	TXBG	*CHECK RESULTS,	CCT26650
0666	02336	100040	SZE		*	CCT26660
0667	02337	0 01 02353	JMP	TABF	ERROR	CCT26670
0668	02340	0 12 02365	TABD IRS	TABZ	INCREMENT LOOP COUNTER	CCT26680
0669	02341	0 01 02404	JMP	TXBJ	NOT FINISHED GO ADJUST PARAMETERS	CCT26690
0670	02342	0 02 02364	LDA	TABY	FINISHED CHECK FOR ERRORS	CCT26700
0671	02343	101040	SNZ		**	CCT26710
0672	02344	-0 01 02316	JMP*	TABA	NO ERRORS - EXIT	CCT26720
0673	02345	0 04 00635	STA	BREG	*SAVE ERROR INFO,	CCT26730
0674	02346	0 02 02315	LDA	TABQ	IDENTITY IN A REG AND	CCT26740
0675	02347	-0 01 02316	JMP*	TABA	EXIT	CCT26750
0676	02350	0 02 00633	TABE LDA	SAVA	*	CCT26760
0677	02351	0 05 02371	ERA	TXBC	*ISOLATE FAILING BITS,	CCT26770
0678	02352	0 01 02355	JMP	TAGZ	*	CCT26780
0679	02353	0 02 00633	TABF LDA	SAVA	*	CCT26790
0680	02354	0 05 02374	ERA	TXBG	*ISOLATE FAILING BITS	CCT26800
0681	02355	0 04 02363	TAGZ STA	TABX	*AND "OR" WITH PREVIOUSLY	CCT26810
0682	02356	0 03 02364	ANA	TABY	FOUND FAILING BIT	CCT26820
0683	02357	0 05 02363	ERA	TABX	**	CCT26830
0684	02360	0 05 02364	ERA	TABY	**	CCT26840
0685	02361	0 04 02364	STA	TABY	**	CCT26850
0686	02362	0 01 02340	JMP	TABD	RETURN TO MAIN LOOP	CCT26860
0687	02363	0 00 00000	TABX PZE			CCT26870
0688	02364	0 00 00000	TABY PZE			CCT26880
0689	02365	0 00 00000	TABZ PZE			CCT26890
0690	02366	0 002367	TXBP DAC	**+1	*	CCT26900
0691	02367	057353	TXBA OCT	57353		CCT26910
0692	02370	041051	TXBB OCT	41051		CCT26920



0693	02371	120424	TXBC	OCT	120424		CCT26930
0694	02372	077373	TXBE	OCT	77373		CCT26940
0695	02373	001011	TXBF	OCT	1011		CCT26950
0696	02374	100404	TXBG	OCT	100404		CCT26960
0697	02375	0 002376	TXBD	DAC	**+1	*	CCT26970
0698	02376	057353		OCT	57353	TEST DATA	CCT26980
0699	02377	041051		OCT	41051	****	CCT26990
0700	02400	120424		OCT	120424	****	CCT27000
0701	02401	077373		OCT	77373	****	CCT27010
0702	02402	001011		OCT	1011	****	CCT27020
0703	02403	100404		OCT	100404	****	CCT27030
0704	02404	101000	TXBJ	NOP		***	CCT27040
0705	02405	0 02 02722		LDA	=-6	THIS ROUTINE CYCLES THE TEST	CCT27050
0706	02406	0 04 00636		STA	CNTR	*	CCT27060
0707	02407	0 02 02366		LDA	TXBP	*	CCT27070
0708	02410	0 04 00634		STA	T	*	CCT27080
0709	02411	0 02 02375		LDA	TXBD	*	CCT27090
0710	02412	0 04 00000		STA	0	DATA (SIX VALUES) ONE PLACE	CCT27100
0711	02413	-0 02 00000	TXBK	LDA*	0	*TO THE RIGHT TO GENERATE	CCT27110
0712	02414	0406 77		ARR	1	*TWO SETS OF 16 DIFFERENT	CCT27120
0713	02415	-0 04 00000		STA*	0	*VALUES TO CHECK CARRY	CCT27130
0714	02416	-0 04 00634		STA*	T	*	CCT27140
0715	02417	0 12 00634		IRS	T	*	CCT27150
0716	02420	0 12 00000		IRS	0	*PROPAGATION,	CCT27160
0717	02421	0 12 00636		IRS	CNTR	*	CCT27170
0718	02422	0 01 02413		JMP	TXBK	**	CCT27180
0719	02423	0 02 02370		LDA	TXBB	**	CCT27190
0720	02424	0 05 02721		ERA	=1	*	CCT27200
0721	02425	0 03 02370		ANA	TXBB	*	CCT27210
0722	02426	0 05 02721		ERA	=1	*	CCT27220
0723	02427	0 04 02370		STA	TXBB	**	CCT27230
0724	02430	0 02 02373		LDA	TXBF	**	CCT27240
0725	02431	0 05 02721		ERA	=1	*	CCT27250
0726	02432	0 03 02373		ANA	TXBF	*	CCT27260
0727	02433	0 05 02721		ERA	=1	*	CCT27270
0728	02434	0 04 02373		STA	TXBF	**	CCT27280
0729	02435	0 01 02324		JMP	TABB	RETURN TO LOOP	CCT27290









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0767	02475	-0 06 02500	ADD*	THAW	ABILITY TO INDIRECT ADDRESS	CCT27670
0768	02476	-0 05 00000	ERA*	0	*	CCT27680
0769	02477	100040	SZE			CCT27690
0770	02500	0 01 02537	JMP	THED	ERROR	CCT27700
0771	02501	0 12 00000	THAH IRS	0	INCREMENT INDEX	CCT27710
0772	02502	0 12 02605	IRS	THAZ	INCREMENT LOOP COUNTER	CCT27720
0773	02503	0 01 02457	JMP	THAB	RETURN FOR NEXT ITERATION	CCT27730
0774	02504	0 02 02716	LDA	=-500	RESET LOOP COUNTER	CCT27740
0775	02505	0 04 02605	STA	THAZ	**	CCT27750
0776	02506	140040	CRA		RESET INDEX REGISTER	CCT27760
0777	02507	0 04 00000	STA	0	**	CCT27770
0778	02510	0 02 02573	THAC LDA	THAV+1	STEP INDIRECT CHAIN TO	CCT27780
0779	02511	0 04 02600	STA	THAW	ADD ONE MORE LINK	CCT27790
0780	02512	0 12 02510	IRS	THAC	INCREMENT FOR NEXT PASS	CCT27800
0781	02513	0 12 02602	IRS	THAT	INCREMENT LINK COUNTER	CCT27810
0782	02514	0 01 02457	JMP	THAB	RETURN	CCT27820
0783	02515	0 02 02603	LDA	THAX	FINISHED CHECK	CCT27830
0784	02516	101040	SNZ		FOR ERRORS	CCT27840
0785	02517	-0 01 02441	JMP*	THAA	NONE EXIT	CCT27850
0786	02520	0 05 02440	ERA	THAQ	SET UP A AND B REGISTERS	CCT27860
0787	02521	0 04 00633	STA	SAVA	*WITH ERROR INFORMATION	CCT27870
0788	02522	0 02 02604	LDA	THAY	AND RETURN TO	CCT27880
0789	02523	0 04 00635	STA	BREG	*THE MONITOR,	CCT27890
0790	02524	0 02 00633	LDA	SAVA	*	CCT27900
0791	02525	-0 01 02441	JMP*	THAA	**	CCT27910
0792	02526	0 02 02724	THEA LDA	= '1000	SET (LDA) AUX BIT	CCT27920
0793	02527	0 10 02542	JST	THEX	SET FAILING BITS INDIRECT LEVEL	CCT27930
0794	02530	0 01 02463	JMP	THAD	RETURN	CCT27940
0795	02531	0 02 02730	THEB LDA	= '2000	SET (ERA) AUX BIT	CCT27950
0796	02532	0 10 02542	JST	THEX	**	CCT27960
0797	02533	0 01 02467	JMP	THAE	**	CCT27970
0798	02534	0 02 02715	THEC LDA	= '4000	SET (ANA) AUX BIT	CCT27980
0799	02535	0 10 02542	JST	THEX	**	CCT27990
0800	02536	0 01 02474	JMP	THAF	**	CCT28000
0801	02537	0 02 02714	THED LDA	= '10000	SET (ADD) AUX BIT	CCT28010
0802	02540	0 10 02542	JST	THEX	**	CCT28020
0803	02541	0 01 02501	JMP	THAH	*	CCT28030



0804	02542	0 00 00000	THEX	PZE		SET PROPER BIT REG	CCT28040
0805	02543	0 04 02571		STA	THEZ	TO INDICATE THE LEVEL	CCT28050
0806	02544	0 03 02603		ANA	THAX	OF INDIRECT ADDRESSING	CCT28060
0807	02545	100040		SZE		WHICH CAUSED THE	CCT28070
0808	02546	0 01 02552		JMP	THEY	ERROR	CCT28080
0809	02547	0 02 02603		LDA	THAX	**	CCT28090
0810	02550	0 05 02571		ERA	THEZ	**	CCT28100
0811	02551	0 04 02603		STA	THAX	**	CCT28110
0812	02552	0 02 02602	THEY	LDA	THAT	**	CCT28120
0813	02553	0 03 02713		ANA	= '77	**	CCT28130
0814	02554	0 05 02570		ERA	THEQ	**	CCT28140
0815	02555	0 04 02557		STA	THEM	**	CCT28150
0816	02556	0 02 02721		LDA	=1	**	CCT28160
0817	02557	0415 00	THEM	ALS	**	**	CCT28170
0818	02560	0 04 02571		STA	THEZ	**	CCT28180
0819	02561	0 03 02604		ANA	THAY	**	CCT28190
0820	02562	100040		SZE		**	CCT28200
0821	02563	-0 01 02542		JMP*	THEX	**	CCT28210
0822	02564	0 02 02604		LDA	THAY	**	CCT28220
0823	02565	0 05 02571		ERA	THEZ	**	CCT28230
0824	02566	0 04 02604		STA	THAY	**	CCT28240
0825	02567	-0 01 02542		JMP*	THEX	**	CCT28250
0826	02570	0415 00	THEQ	ALS	**	*	CCT28260
0827	02571	0 00 00000	THEZ	PZE			CCT28270
0828	02572	-0 000000	THAV	DAC*	0	*INDIRECT ADDRESSING CHAIN.	CCT28280
0829	02573	-0 002572		DAC*	THAV	**	CCT28290
0830	02574	-0 002573		DAC*	** -1	**	CCT28300
0831	02575	-0 002574		DAC*	** -1	**	CCT28310
0832	02576	-0 002575		DAC*	** -1	**	CCT28320
0833	02577	-0 002576		DAC*	** -1	**	CCT28330
0834	02600	0 00 00000	THAV	PZE			CCT28340
0835	02601	0 02 02573	THAV	LDA	THAV+1		CCT28350
0836	02602	0 00 00000	THAT	PZE			CCT28360
0837	02603	0 00 00000	THAX	PZE			CCT28370
0838	02604	0 00 00000	THAY	PZE			CCT28380
0839	02605	0 00 00000	THAZ	PZE			CCT28390
0840			*		SUBROUTINE T005	IRS	CCT28400



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0841			*		THIS ROUTINE CHECKS THE ABILITY TO		CCT28410	
0842			*		STEP FROM ZERO, PREMATURE SKIPS ARE CHECKED		CCT28420	
0843			*		FOR AS WELL AS THE SKIPPING WHEN INCREMENTING		CCT28430	
0844			*		TO ZERO		CCT28440	
0845			*		1/30/65		CCT28450	
0846	02606	000005		TPYD	OCT	5	CCT28460	
0847	02607	0 00 00000		IRSX	PZE		CCT28470	
0848	02610	140040			CRA		CCT28480	
0849	02611	0 04 02706		STA	TPYA		CCT28490	
0850	02612	0 04 02707		STA	TPYB		CCT28500	
0851	02613	0 04 02710		STA	TPYC		CCT28510	
0852	02614	0 02 02712		LDA	PTRN		CCT28520	
0853	02615	0 04 00635		STA	BREG	*	CCT28530	
0854	02616	140040			CRA		CCT28540	
0855	02617	0 06 02721		IRSD	ADD	=1	CCT28550	
0856	02620	0 04 00633		STA	SAVA	*	CCT28560	
0857	02621	0 02 00635		LDA	BREG	*	CCT28570	
0858	02622	0 12 02706		IRS	TPYA		CCT28580	
0859	02623	0 01 02640		JMP	IRSA		CCT28590	
0860	02624	0 02 00633		LDA	SAVA	*	CCT28600	
0861	02625	100040			SZE		CCT28610	
0862	02626	0 01 02703		JMP	IRSB		CCT28620	
0863	02627	0 02 02707		LDA	TPYB		CCT28630	
0864	02630	101040			SNZ		CCT28640	
0865	02631	-0 01 02607		JMP*	IRSX		CCT28650	
0866	02632	0 04 00635		IRSF	STA	BREG	*	CCT28660
0867	02633	0 02 02710			LDA	TPYC		CCT28670
0868	02634	0 04 00633			STA	SAVA	*	CCT28680
0869	02635	0 02 00635			LDA	BREG	*	CCT28690
0870	02636	0 05 02606			ERA	TPYD		CCT28700
0871	02637	-0 01 02607			JMP*	IRSX		CCT28710
0872	02640	0 05 02712		IRSA	ERA	PTRN	*	CCT28720
0873	02641	101040			SNZ		*	CCT28730
0874	02642	0 01 02647			JMP	IRSB		CCT28740
0875	02643	0 02 02707			LDA	TPYB		CCT28750
0876	02644	0 03 02725			ANA	= '76777		CCT28760
0877	02645	0 05 02724			ERA	= '1000		CCT28770



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0878	02646	0 04 02707	STA	TPYB		CCT28780
0879	02647	0 02 00633	IRSB	LDA	SAVA	CCT28790
0880	02650	101040	SNZ			CCT28800
0881	02651	0 01 02700	JMP	IRSE		CCT28810
0882	02652	0 05 02706	ERA	TPYA	*	CCT28820
0883	02653	101040	SNZ		*	CCT28830
0884	02654	0 01 02673	JMP	IRSG		CCT28840
0885	02655	0 02 00633	LDA	SAVA	*	CCT28850
0886	02656	0 04 02711	STA	TPYE		CCT28860
0887	02657	0 02 02707	LDA	TPYB		CCT28870
0888	02660	0 03 02723	ANA	= '75777		CCT28880
0889	02661	0 05 02730	ERA	= '2000		CCT28890
0890	02662	0 04 02707	STA	TPYB		CCT28900
0891	02663	0 02 02710	LDA	TPYC		CCT28910
0892	02664	100040	SZE			CCT28920
0893	02665	0 01 02671	JMP	IRSC		CCT28930
0894	02666	0 02 02711	LDA	TPYE		CCT28940
0895	02667	0 05 02706	ERA	TPYA		CCT28950
0896	02670	0 04 02710	STA	TPYC		CCT28960
0897	02671	0 02 02711	IRSC	LDA	TPYE	CCT28970
0898	02672	0 04 02706	STA	TPYA		CCT28980
0899	02673	101000	IRSG	NOP	***	CCT28990
0900	02674	0 02 02712	LDA	PTRN		CCT29000
0901	02675	0 04 00635	STA	BREG	*	CCT29010
0902	02676	0 02 00633	LDA	SAVA	*	CCT29020
0903	02677	0 01 02617	JMP	IRSD		CCT29030
0904	02700	0 02 02707	IRSE	LDA	TPYB	CCT29040
0905	02701	0 05 02715	ERA	= '4000		CCT29050
0906	02702	0 01 02632	JMP	IRSF		CCT29060
0907	02703	0 02 02707	IRSH	LDA	TPYB	CCT29070
0908	02704	0 05 02714	ERA	= '10000		CCT29080
0909	02705	0 01 02632	JMP	IRSF		CCT29090
0910	02706	0 00 00000	TPYA	PZE		CCT29100
0911	02707	0 00 00000	TPYB	PZE		CCT29110
0912	02710	0 00 00000	TPYC	PZE		CCT29120
0913	02711	0 00 00000	TPYE	PZE		CCT29130
0914	02712	052525	PTRN	OCT	52525	CCT29140





0915	02713	000077		FIN					
	02714	010000							
	02715	004000							
	02716	177014							
	02717	176031							
	02720	000012							
	02721	000001							
	02722	177772							
	02723	075777							
	02724	001000							
	02725	076777							
	02726	177777							
	02727	176030							
	02730	002000							
0916			ORG	'3000	*				CCT29160
0917			*	SUBROUTINE T060	ARS				CCT29170
0918	03000	0 003504	DAC	SHHH					CCT29180
0919	03001	000060	ARSW OCT	60					CCT29190
0920	03002	0 00 00000	ARSA PZE			SUBROUTINE IDENTITY			CCT29200
0921	03003	0 10 03534	JST	SFTR		ENTRY POINT			CCT29210
0922	03004	0 02 03061	ARSB LDA	ARSS		TO INITIALIZING ROUTINE			CCT29220
0923	03005	0 10 00674	JST	IILP					CCT29230
0924	03006	140040	ARSD CRA			INITIALIZE CHECK REGISTERS			CCT29240
0925	03007	0 04 03506	STA	SFTY		**			CCT29250
0926	03010	0 04 00635	STA	BREG		*			CCT29260
0927	03011	-0 02 00743	LDA*	TBA		*			CCT29270
0928	03012	0 04 03503	STA	SFTZ		**			CCT29280
0929	03013	0 02 03667	LDA	TSIX			CHECK ARS USING		CCT29290
0930	03014	0 10 03420	JST	SHFT			FLOATING ZERO		CCT29300
0931	03015	0 12 00743	IRS	TBA		*			CCT29310
0932	03016	140040	CRA			**			CCT29320
0933	03017	0 04 00635	STA	BREG		*			CCT29330
0934	03020	-0 02 00743	LDA*	TCA			*CHECK ARS USING		CCT29340
0935	03021	0 04 03503	STA	SFTZ			ALL ONES POSITIVE		CCT29350
0936	03022	0 02 03710	LDA	TSTV		**			CCT29360
0937	03023	0 10 03420	JST	SHFT		**			CCT29370



0938	03024	0 12 00745	IRS	TCA	*	CCT29380
0939	03025	140040	CRA		**	CCT29390
0940	03026	0 04 00635	STA	BREG	*CHECK ARS USING	CCT29400
0941	03027	-0 02 00747	LDA*	TDA	*NEGATIVE ALTERNATING PATTERN.	CCT29410
0942	03030	0 04 03503	STA	SFTZ	**	CCT29420
0943	03031	0 02 03731	LDA	TSTU	**	CCT29430
0944	03032	0 10 03420	JST	SHFT	**	CCT29440
0945	03033	0 12 00747	IRS	TDA	*	CCT29450
0946	03034	140040	CRA		CHECK ARS USING	CCT29460
0947	03035	0 04 00635	STA	BREG	*POSITIVE ALTERNATING PATTERN.	CCT29470
0948	03036	-0 02 00750	LDA*	TEA	*	CCT29480
0949	03037	0 04 03503	STA	SFTZ	**	CCT29490
0950	03040	0 02 03752	LDA	TSTR	**	CCT29500
0951	03041	0 10 03420	JST	SHFT	**	CCT29510
0952	03042	0 12 00750	IRS	TEA	*	CCT29520
0953	03043	0 10 00732	JST	RPAT		CCT29530
0954	03044	0 12 00000	IRS	0	INCREMENT INNER LOOP COUNTER	CCT29540
0955	03045	0 01 03057	JMP	ARSG	OFF FOR NEXT SHIFT	CCT29550
0956	03046	0 12 03546	IRS	SFTX		CCT29560
0957	03047	0 01 03004	JMP	ARSB	RETURN FOR NEXT PASS	CCT29570
0958	03050	0 02 03507	LDA	SFTU	FINISHED, CHECK FOR	CCT29580
0959	03051	101040	SNZ		ERRORS	CCT29590
0960	03052	-0 01 03002	JMP*	ARSA	NO ERRORS, EXIT	CCT29600
0961	03053	0 04 00635	STA	BREG	*ERROR REGISTER IN A-REG.	CCT29610
0962	03054	0 02 03510	LDA	SFTV	AUX IN, GO IN AREG	CCT29620
0963	03055	0 05 03001	ERA	ARSW	ADD IN IDENTITY	CCT29630
0964	03056	-0 01 03002	JMP*	ARSA	AND EXIT	CCT29640
0965	03057	0 12 03436	ARSG IRS	SFT	STEP SHIFT AMOUNT AND	CCT29650
0966	03060	0 01 03006	JMP	ARSD	RETURN FOR NEXT PASS	CCT29660
0967	03061	0405 61	ARSS	ARS	15	CCT29670
0968			*		SUBROUTINE T061	CCT29680
0969	03062	0 003504	DAC	SHHH	ALS	CCT29690
0970	03063	000061	ALSW	OCT	61	CCT29700
0971	03064	0 00 00000	ALSA	PZE		CCT29710
0972	03065	0 10 03534	JST	SFTR	TO INITIALIZING ROUTINE	CCT29720
0973	03066	0 02 03134	ALSB	LDA	ALSS	CCT29730
0974	03067	0 10 00674	JST	IILP		CCT29740



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0975	03070	0 02 03774	ALSD LDA	= '52525	CHECK OF ALS USING	CCT29750
0976	03071	0 04 03506	STA	SFTY	ALL ONE PATTERN	CCT29760
0977	03072	0 04 00635	STA	BREG	*	CCT29770
0978	03073	-0 02 00737	LDA*	SBA	*	CCT29780
0979	03074	0 04 03503	STA	SFTZ	**	CCT29790
0980	03075	0 02 03606	LDA	SKNB	**	CCT29800
0981	03076	0 10 03420	JST	SHFT	**	CCT29810
0982	03077	0 12 00737	IRS	SBA	*	CCT29820
0983	03100	0 02 03774	LDA	= '52525	CHECK OF ALS USING	CCT29830
0984	03101	0 04 00635	STA	BREG	*FLOATING ONE BIT,	CCT29840
0985	03102	-0 02 00740	LDA*	SCA	*	CCT29850
0986	03103	0 04 03503	STA	SFTZ	**	CCT29860
0987	03104	0 02 03626	LDA	SKNC	**	CCT29870
0988	03105	0 10 03420	JST	SHFT	**	CCT29880
0989	03106	0 12 00740	IRS	SCA	*	CCT29890
0990	03107	0 02 03774	LDA	= '52525	CHECK OF ALS USING	CCT29900
0991	03110	0 04 00635	STA	BREG	*ALTERNATING BIT PATTERN,	CCT29910
0992	03111	-0 02 00736	LDA*	SAA	*	CCT29920
0993	03112	0 04 03503	STA	SFTZ	**	CCT29930
0994	03113	0 02 03566	LDA	SKNA	**	CCT29940
0995	03114	0 10 03420	JST	SHFT	**	CCT29950
0996	03115	0 12 00736	IRS	SAA	*	CCT29960
0997	03116	0 10 00732	JST	RPAT		CCT29970
0998	03117	0 12 00000	IRS	0	INCREMENT	CCT29980
0999	03120	0 01 03132	JMP	ALSG	GO SET FOR NEXT ITERATION	CCT29990
1000	03121	0 12 03546	IRS	SFTX	INCREMENT MAIN COUNTER	CCT10000
1001	03122	0 01 03066	JMP	ALSB	RETURN FOR NEXT PASS	CCT10010
1002	03123	0 02 03507	LDA	SFTU	CHECK FOR ERRORS	CCT10020
1003	03124	101040	SNZ		**	CCT10030
1004	03125	-0 01 03064	JMP*	ALSA	NO, EXIT	CCT10040
1005	03126	0 04 00635	STA	BREG	*ERROR REG. TO B-REG,	CCT10050
1006	03127	0 02 03510	LDA	SFTV	AUX INFO IN A REG	CCT10060
1007	03130	0 05 03063	ERA	ALSW	ADD IN IDENTITY	CCT10070
1008	03131	-0 01 03064	JMP*	ALSA	EXIT	CCT10080
1009	03132	0 12 03436	ALSG IRS	SFT	INCREMENT SHIFT AMOUNT	CCT10090
1010	03133	0 01 03070	JMP	ALSD	AND RETURN FOR NEXT PASS	CCT10100
1011	03134	0415 61	ALSS ALS	15		CCT10110



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1012			*	SUBROUTINE T062	LGL		CCT10120
1013	03135	0 003504		DAC SHHH			CCT10130
1014	03136	000062	LGLw	OCT 62			CCT10140
1015	03137	0 00 00000	LGLA	PZE	ENTRY POINT		CCT10150
1016	03140	0 10 03534		JST SFTR	TO INITIALIZING ROUTINE		CCT10160
1017	03141	0 02 03207	LGLB	LDA LGLS			CCT10170
1018	03142	0 10 00674		JST IILP			CCT10180
1019	03143	0 02 03774	LGLD	LDA ='52525	INITIALIZE B REG AND		CCT10190
1020	03144	0 04 03506		STA SFTY	STORE VALUE FOR LATER		CCT10200
1021	03145	0 04 00635		STA BREG	*CHECK,		CCT10210
1022	03146	-0 02 00736		LDA* SAA	*STORE FINAL A-REG,		CCT10220
1023	03147	0 04 03503		STA SFTZ	VALUE FOR CHECK		CCT10230
1024	03150	0 02 03566		LDA SKNA	INITIALIZE A REG		CCT10240
1025	03151	0 10 03420		JST SHFT	GO TO SHIFT AND CHECK ROUTINE		CCT10250
1026	03152	0 12 00736		IRS SAA	*		CCT10260
1027	03153	0 02 03774		LDA ='52525	INITIALIZE		CCT10270
1028	03154	0 04 00635		STA BREG	*B-REG,,		CCT10280
1029	03155	-0 02 00737		LDA* SBA	*A-REG, VALUE FOR		CCT10290
1030	03156	0 04 03503		STA SFTZ	CHECK		CCT10300
1031	03157	0 02 03606		LDA SKNB	LOAD DATA		CCT10310
1032	03160	0 10 03420		JST SHFT	TO SHIFT AND CHECK		CCT10320
1033	03161	0 12 00737		IRS SBA	*		CCT10330
1034	03162	0 02 03774		LDA ='52525	INITIALIZE		CCT10340
1035	03163	0 04 00635		STA BREG	*B-REG,		CCT10350
1036	03164	-0 02 00740		LDA* SCA	*FINAL A-REG, VALUE		CCT10360
1037	03165	0 04 03503		STA SFTZ	TO STORAGE FOR CHECK		CCT10370
1038	03166	0 02 03626		LDA SKNC	INITIALIZE A REG		CCT10380
1039	03167	0 10 03420		JST SHFT	TO SHIFT AND CHECK		CCT10390
1040	03170	0 12 00740		IRS SCA	*		CCT10400
1041	03171	0 10 00732		JST RPAT			CCT10410
1042	03172	0 12 00000		IRS 0	STEP INNER LOOP COUNTER		CCT10420
1043	03173	0 01 03205		JMP LGLG	MOVE GO SET UP		CCT10430
1044	03174	0 12 03546		IRS SFTX			CCT10440
1045	03175	0 01 03141		JMP LGLB	RETURN FOR NEXT PASS		CCT10450
1046	03176	0 02 03507		LDA SFTU	FINISHED CHECK FOR		CCT10460
1047	03177	101040		SNZ	ANY ERRORS		CCT10470
1048	03200	-0 01 03137		JMP* LGLA	NO EXIT		CCT10480





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1049	03201	0 04	00635	STA	BREG	*ERROR INFO, I. B-REG,	CCT10490
1050	03202	0 02	03510	LDA	SFTV	AUX INTO IN A REG	CCT10500
1051	03203	0 05	03136	ERA	LGLW	ADD ROUTINE IDENTITY	CCT10510
1052	03204	-0 01	03137	JMP*	LGLA	AND EXIT	CCT10520
1053	03205	0 12	03436	LGLG IRS	SFT	INCREMENT SHIFT AMOUNT	CCT10530
1054	03206	0 01	03143	JMP	LGLD	AND RETURN TO INNER LOOP	CCT10540
1055	03207	0414	61	LGLS LGL	15		CCT10550
1056				*	SUBROUTINE T063	LGR	CCT10560
1057	03210	0 00	03504	DAC	SHHH		CCT10570
1058	03211	0000	63	LGRW OCT	63	IDENTITY	CCT10580
1059	03212	0 00	00000	LGRA PZE		ENTRY POINT	CCT10590
1060	03213	0 10	03534	JST	SFTR	TO INITIALIZING ROUTINE	CCT10600
1061	03214	0 02	03270	LGRB LDA	LGRS		CCT10610
1062	03215	0 10	00674	JST	IILP		CCT10620
1063	03216	0 02	03774	LGRD LDA	= '52525	INITIALIZE B REG AND B REG	CCT10630
1064	03217	0 04	03506	STA	SFTY	CHECK CELL	CCT10640
1065	03220	0 04	00635	STA	BREG	*	CCT10650
1066	03221	0 02	03626	LDA	SKNC	SET A REG CHECK CELL	CCT10660
1067	03222	0 04	03503	STA	SFTZ	TO PROPER VALUE	CCT10670
1068	03223	-0 02	00740	LDA*	SCA	*INITIALIZE A-REG,	CCT10680
1069	03224	0 10	03420	JST	SHFT	TO SHIFT AND CHECK ROUTINE	CCT10690
1070	03225	0 02	03774	LDA	= '52525	CHECK OF LGR	CCT10700
1071	03226	0 04	00635	STA	BREG	*WITH ALL ONE PATTERN,	CCT10710
1072	03227	-0 02	00746	LDA*	TUA	*	CCT10720
1073	03230	0 04	03503	STA	SFTZ	**	CCT10730
1074	03231	0 02	03773	LDA	= - '1	**	CCT10740
1075	03232	0 10	03420	JST	SHFT	**	CCT10750
1076	03233	0 12	00746	IRS	TUA	*	CCT10760
1077	03234	0 02	03774	LDA	= '52525	CHECK OF LGR	CCT10770
1078	03235	0 04	00635	STA	BREG	*WITH ALTERNATING BITS,	CCT10780
1079	03236	-0 02	00751	LDA*	TE2A	*	CCT10790
1080	03237	0 04	03503	STA	SFTZ	**	CCT10800
1081	03240	0 02	03751	LDA	TSTD	**	CCT10810
1082	03241	0 10	03420	JST	SHFT	**	CCT10820
1083	03242	0 12	00751	IRS	TE2A	*	CCT10830
1084	03243	0 02	03774	LDA	= '52525	CHECK OF LGR	CCT10840
1085	03244	0 04	00635	STA	BREG	*WITH FLOATING ONE,	CCT10850



1086	03245	0 02	03626	LDA	SKNC	**		CCT10860
1087	03246	0 04	03503	STA	SFTZ	**		CCT10870
1088	03247	-0 02	00740	LDA*	SCA	*		CCT10880
1089	03250	0 10	03420	JST	SHFT	**		CCT10890
1090	03251	0 12	00740	IRS	SCA	*		CCT10900
1091	03252	0 10	00732	JST	RPAT			CCT10910
1092	03253	0 12	00000	IRS	0			CCT10920
1093	03254	0 01	03266	JMP	LGRG			CCT10930
1094	03255	0 12	03546	IRS	SFTX			CCT10940
1095	03256	0 01	03214	JMP	LGRB			CCT10950
1096	03257	0 02	03507	LDA	SFTU			CCT10960
1097	03260	101040		SNZ				CCT10970
1098	03261	-0 01	03212	JMP*	LGRA			CCT10980
1099	03262	0 04	00635	STA	BREG	*		CCT10990
1100	03263	0 02	03510	LDA	SFTV			CCT11000
1101	03264	0 05	03211	ERA	LGRW			CCT11010
1102	03265	-0 01	03212	JMP*	LGRA			CCT11020
1103	03266	0 12	03436	LGRG IRS	SFT			CCT11030
1104	03267	0 01	03216	JMP	LGRD			CCT11040
1105	03270	0404 61		LGRS LGR	15			CCT11050
1106				*	SUBROUTINE T064	ALR		CCT11060
1107	03271	0 003504		DAC	SHHH			CCT11070
1108	03272	000064		ALRW OCT	64	IDENTITY		CCT11080
1109	03273	0 00 00000		ALRA PZE		ENTRY POINT		CCT11090
1110	03274	0 10 03534		JST	SFTR	TO INITIALIZING ROUTINE		CCT11100
1111	03275	0 02 03343		ALRB LDA	ALRS			CCT11110
1112	03276	0 10 00674		JST	IILP			CCT11120
1113	03277	0 02 03774		ALRD LDA	=152525	CHECK ALR USING		CCT11130
1114	03300	0 04 03506		STA	SFTY	FLOATING ZERO BIT		CCT11140
1115	03301	0 04 00635		STA	BREG	*		CCT11150
1116	03302	0 02 03710		LDA	TSTV	**		CCT11160
1117	03303	0 04 03503		STA	SFTZ	**		CCT11170
1118	03304	-0 02 00744		LDA*	TVA	*		CCT11180
1119	03305	0 10 03420		JST	SHFT	**		CCT11190
1120	03306	0 12 00744		IRS	TVA	*		CCT11200
1121	03307	0 02 03774		LDA	=152525	CHECK ALR USING		CCT11210
1122	03310	0 04 00635		STA	BREG	*FLOATING ONE BIT,		CCT11220



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1123	03311	0 02 03646	LDA	SKND	**	CCT11230
1124	03312	0 04 03503	STA	SFTZ	**	CCT11240
1125	03313	-0 02 00741	LDA*	SDA	*	CCT11250
1126	03314	0 10 03420	JST	SHFT	**	CCT11260
1127	03315	0 12 00741	IRS	SDA	*	CCT11270
1128	03316	0 02 03774	LDA	=152525	CHECK OF ALR USING	CCT11280
1129	03317	0 04 00635	STA	BREG	*	CCT11290
1130	03320	0 02 03666	LDA	SKNE	A ONE BIT MARKER	CCT11300
1131	03321	0 04 03503	STA	SFTZ	**	CCT11310
1132	03322	-0 02 00742	LDA*	SEA	*	CCT11320
1133	03323	0 10 03420	JST	SHFT	**	CCT11330
1134	03324	0 12 00742	IRS	SEA	*	CCT11340
1135	03325	0 10 00732	JST	RPAT		CCT11350
1136	03326	0 12 00000	IRS	0		CCT11360
1137	03327	0 01 03341	JMP	ALRG		CCT11370
1138	03330	0 12 03546	IRS	SFTX		CCT11380
1139	03331	0 01 03275	JMP	ALRB		CCT11390
1140	03332	0 02 03507	LDA	SFTU		CCT11400
1141	03333	101040	SNZ			CCT11410
1142	03334	-0 01 03273	JMP*	ALRA		CCT11420
1143	03335	0 04 00635	STA	BREG	*	CCT11430
1144	03336	0 02 03510	LDA	SFTV		CCT11440
1145	03337	0 05 03272	ERA	ALRW		CCT11450
1146	03340	-0 01 03273	JMP*	ALRA		CCT11460
1147	03341	0 12 03436	ALRG IRS	SFT		CCT11470
1148	03342	0 01 03277	JMP	ALRD		CCT11480
1149	03343	0416 61	ALRS ALR	15		CCT11490
1150			*	SUBROUTINE T065	ARR	CCT11500
1151	03344	0 003504	DAC	SHHH		CCT11510
1152	03345	000065	ARRW OCT	65	IDENTITY	CCT11520
1153	03346	0 00 00000	ARRA PZE		ENTRY POINT	CCT11530
1154	03347	0 10 03534	JST	SFTR	TO INITIALIZING ROUTINE	CCT11540
1155	03350	0 02 03416	ARRB LDA	ARRS		CCT11550
1156	03351	0 10 00674	JST	IILP		CCT11560
1157	03352	0 02 03774	ARRD LDA	=152525	CHECK OF ARR USING	CCT11570
1158	03353	0 04 03506	STA	SFTY	FLOATING ZERO BIT	CCT11580
1159	03354	0 04 00635	STA	BREG	*	CCT11590



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1160	03355	-0 02 00744	LDA*	TVA	*	CCT11600
1161	03356	0 04 03503	STA	SFTZ	**	CCT11610
1162	03357	0 02 03710	LDA	TSTV	**	CCT11620
1163	03360	0 10 03420	JST	SHFT	**	CCT11630
1164	03361	0 12 00744	IRS	TVA	*	CCT11640
1165	03362	0 02 03774	LDA	= '52525	CHECK OF ARR USING	CCT11650
1166	03363	0 04 00635	STA	BREG	*FLOATING ONE BIT	CCT11660
1167	03364	-0 02 00741	LDA*	SDA	*	CCT11670
1168	03365	0 04 03503	STA	SFTZ	**	CCT11680
1169	03366	0 02 03646	LDA	SKND	**	CCT11690
1170	03367	0 10 03420	JST	SHFT	**	CCT11700
1171	03370	0 12 00741	IRS	SDA	*	CCT11710
1172	03371	0 02 03774	LDA	= '52525	CHECK AT ARR USING	CCT11720
1173	03372	0 04 00635	STA	BREG	*ALTERNATING PATTERN WITH	CCT11730
1174	03373	-0 02 00742	LDA*	SEA	*A ONE MARKER BIT,	CCT11740
1175	03374	0 04 03503	STA	SFTZ	**	CCT11750
1176	03375	0 02 03666	LDA	SKNE	**	CCT11760
1177	03376	0 10 03420	JST	SHFT	**	CCT11770
1178	03377	0 12 00742	IRS	SEA	*	CCT11780
1179	03400	0 10 00732	JST	RPAT		CCT11790
1180	03401	0 12 00000	IRS	0	INCREMENT INNER LOOP COUNTER	CCT11800
1181	03402	0 01 03414	JMP	ARRG	AND GO SET NEXT TRY	CCT11810
1182	03403	0 12 03546	IRS	SFTX		CCT11820
1183	03404	0 01 03350	JMP	ARRB	RETURN FOR NEXT PASS	CCT11830
1184	03405	0 02 03507	LDA	SFTU	FINISHED CHECK FOR	CCT11840
1185	03406	101040	SNZ		ERRORS	CCT11850
1186	03407	-0 01 03346	JMP*	ARRA	NO ERRORS EXIT	CCT11860
1187	03410	0 04 00635	STA	BREG	*	CCT11870
1188	03411	0 02 03510	LDA	SFTV	AND AUX REGISTER IN A REG	CCT11880
1189	03412	0 05 03345	ERA	ARRW	ADD ROUTINE IDENTITY	CCT11890
1190	03413	-0 01 03346	JMP*	ARRA	AND EXIT	CCT11900
1191	03414	0 12 03436	ARRG IRS	SFT	INCREMENT SHIFT INSTRUCTION	CCT11910
1192	03415	0 01 03352	JMP	ARRD	AND RETURN FOR NEXT PASS	CCT11920
1193	03416	0406 61	ARRS ARR	15		CCT11930
1194	03417	0 00 00000	ARRZ PZE			CCT11940
1195			*			CCT11950
1196	03420	0 000000	SHFT DAC	**	*	CCT11960





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1197	03421	0 04 00660	STA	SFX Y		CCT11970
1198	03422	0 02 00635	LDA	BREG	*	CCT11980
1199	03423	0 04 00661	STA	SFX Z		CCT11990
1200	03424	0 12 00664	IRS	PATT		CCT12000
1201	03425	0 02 00664	LDA	PATT		CCT12010
1202	03426	0 03 03776	ANA	= '37777	*	CCT12020
1203	03427	0 06 00657	ADD	N3KW	*	CCT12030
1204	03430	0 04 00634	STA	T	*	CCT12040
1205	03431	-0 02 00634	LDA*	T	*	CCT12050
1206	03432	0 04 00663	STA	PAT		CCT12060
1207	03433	0 02 00661	LDA	SFX Z		CCT12070
1208	03434	0 04 00635	STA	BREG	*	CCT12080
1209	03435	0 02 00660	LDA	SFX Y	*	CCT12090
1210	03436	101000	SFT	NOP	PROPER SHIFT INSERTED	CCT12100
1211	03437	0 04 03511	STA	SHFQ		CCT12110
1212	03440	0 05 03503	ERA	SFTZ		CCT12120
1213	03441	100040	SZE			CCT12130
1214	03442	0 01 03514	JMP	SHTD		CCT12140
1215	03443	0 02 00635	LDA	BREG	*	CCT12150
1216	03444	0 04 03512	STA	SHFR		CCT12160
1217	03445	0 05 03506	ERA	SFTY		CCT12170
1218	03446	101040	SNZ			CCT12180
1219	03447	-0 01 03420	JMP*	SHFT		CCT12190
1220	03450	0 04 03512	SFTG	STA	SHFR	CCT12200
1221	03451	0 03 03505	ANA	SHHJ		CCT12210
1222	03452	0 05 03512	ERA	SHFR		CCT12220
1223	03453	0 05 03505	ERA	SHHJ		CCT12230
1224	03454	0 04 03505	STA	SHHJ		CCT12240
1225	03455	0 02 03510	LDA	SFTV		CCT12250
1226	03456	0 03 00663	ANA	PAT		CCT12260
1227	03457	0 05 03510	ERA	SFTV		CCT12270
1228	03460	0 05 00663	ERA	PAT		CCT12280
1229	03461	0 04 03510	STA	SFTV		CCT12290
1230	03462	-0 02 00741	SFTE	LDA*	SDA	CCT12300
1231	03463	0 03 03507	ANA	SFTU		CCT12310
1232	03464	-0 05 00741	ERA*	SDA	*	CCT12320
1233	03465	0 05 03507	ERA	SFTU		CCT12330



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1234	03466	0 04	03507	STA	SFTU				CCT12340
1235	03467	0 02	00632	SFZX LDA	LOCK	*			CCT12350
1236	03470	101040		SNZ		*			CCT12360
1237	03471	-0 01	03420	JMP*	SHFT				CCT12370
1238	03472	0 02	03436	LDA	SFT				CCT12380
1239	03473	0 04	03500	STA	SFGZ	*			CCT12390
1240	03474	0 02	00661	LDA	SFXZ				CCT12400
1241	03475	0 04	00635	STA	BREG	*			CCT12410
1242	03476	0 02	00660	LDA	SFXZ				CCT12420
1243	03477	14	1777	OCP	'1777				CCT12430
1244	03500	0415	00	SFGZ ALS	**	*			CCT12440
1245	03501	0 01	03467	JMP	SFZX				CCT12450
1246	03502	-0 01	03420	JMP*	SHFT				CCT12460
1247				*		*			CCT12470
1248	03503	0 00	00000	SFTZ PZE					CCT12480
1249	03504	0 00	00000	SHHH PZE					CCT12490
1250	03505	0 00	00000	SHHJ PZE					CCT12500
1251	03506	0 00	00000	SFTY PZE					CCT12510
1252	03507	0 00	00000	SFTU PZE					CCT12520
1253	03510	0 00	00000	SFTV PZE					CCT12530
1254	03511	0 00	00000	SHFQ PZE					CCT12540
1255	03512	0 00	00000	SHFR PZE					CCT12550
1256	03513	0 00	00000	SHFS PZE					CCT12560
1257				*		*			CCT12570
1258	03514	0 04	03512	SHTD STA	SHFR				CCT12580
1259	03515	0 03	03504	ANA	SHHH				CCT12590
1260	03516	0 05	03512	ERA	SHFR				CCT12600
1261	03517	0 05	03504	ERA	SHHH				CCT12610
1262	03520	0 04	03504	STA	SHHH				CCT12620
1263	03521	0 02	03510	LDA	SFTV				CCT12630
1264	03522	0 03	00663	ANA	PAT				CCT12640
1265	03523	0 05	03510	ERA	SFTV				CCT12650
1266	03524	0 05	00663	ERA	PAT				CCT12660
1267	03525	0 04	03510	STA	SFTV				CCT12670
1268	03526	0 02	00635	LDA	BREG	*			CCT12680
1269	03527	0 04	03512	STA	SHFR				CCT12690
1270	03530	0 05	03506	ERA	SFTY				CCT12700







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1308	03574	176000		OCT	176000		CCT13080
1309	03575	177000		OCT	177000		CCT13090
1310	03576	177400		OCT	177400		CCT13100
1311	03577	177600		OCT	177600		CCT13110
1312	03600	177700		OCT	177700		CCT13120
1313	03601	177740		OCT	177740		CCT13130
1314	03602	177760		OCT	177760		CCT13140
1315	03603	177770		OCT	177770		CCT13150
1316	03604	177774		OCT	177774		CCT13160
1317	03605	177776		OCT	177776		CCT13170
1318	03606	177777	SKNB	OCT	177777		CCT13180
1319	03607	100000	SC	OCT	100000	*	CCT13190
1320	03610	040000		OCT	40000		CCT13200
1321	03611	020000		OCT	20000		CCT13210
1322	03612	010000		OCT	10000		CCT13220
1323	03613	004000		OCT	4000		CCT13230
1324	03614	002000		OCT	2000		CCT13240
1325	03615	001000		OCT	1000		CCT13250
1326	03616	000400		OCT	400		CCT13260
1327	03617	000200		OCT	200		CCT13270
1328	03620	000100		OCT	100		CCT13280
1329	03621	000040		OCT	40		CCT13290
1330	03622	000020		OCT	20		CCT13300
1331	03623	000010		OCT	10		CCT13310
1332	03624	000004		OCT	4		CCT13320
1333	03625	000002		OCT	2		CCT13330
1334	03626	000001	SKNC	OCT	1		CCT13340
1335	03627	000001	SD	OCT	1	*	CCT13350
1336	03630	000002		OCT	2		CCT13360
1337	03631	000004		OCT	4		CCT13370
1338	03632	000010		OCT	10		CCT13380
1339	03633	000020		OCT	20		CCT13390
1340	03634	000040		OCT	40		CCT13400
1341	03635	000100		OCT	100		CCT13410
1342	03636	000200		OCT	200		CCT13420
1343	03637	000400		OCT	400		CCT13430
1344	03640	001000		OCT	1000		CCT13440





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1345	03641	002000		OCT	2000		CCT13450
1346	03642	004000		OCT	4000		CCT13460
1347	03643	010000		OCT	10000		CCT13470
1348	03644	020000		OCT	20000		CCT13480
1349	03645	040000		OCT	40000		CCT13490
1350	03646	100000	SKND	OCT	100000		CCT13500
1351	03647	125253	SE	OCT	125253	*	CCT13510
1352	03650	052527		OCT	052527		CCT13520
1353	03651	125256		OCT	125256		CCT13530
1354	03652	052535		OCT	052535		CCT13540
1355	03653	125272		OCT	125272		CCT13550
1356	03654	052565		OCT	052565		CCT13560
1357	03655	125352		OCT	125352		CCT13570
1358	03656	052725		OCT	052725		CCT13580
1359	03657	125652		OCT	125652		CCT13590
1360	03660	053525		OCT	053525		CCT13600
1361	03661	127252		OCT	127252		CCT13610
1362	03662	056525		OCT	056525		CCT13620
1363	03663	135252		OCT	135252		CCT13630
1364	03664	072525		OCT	072525		CCT13640
1365	03665	165252		OCT	165252		CCT13650
1366	03666	152525	SKNE	OCT	152525		CCT13660
1367	03667	137777	TSTX	OCT	137777		CCT13670
1368	03670	177777	TB	OCT	177777	*	CCT13680
1369	03671	177776	TV	OCT	177776	*	CCT13690
1370	03672	177775		OCT	177775		CCT13700
1371	03673	177773		OCT	177773		CCT13710
1372	03674	177767		OCT	177767		CCT13720
1373	03675	177757		OCT	177757		CCT13730
1374	03676	177737		OCT	177737		CCT13740
1375	03677	177677		OCT	177677		CCT13750
1376	03700	177577		OCT	177577		CCT13760
1377	03701	177377		OCT	177377		CCT13770
1378	03702	176777		OCT	176777		CCT13780
1379	03703	175777		OCT	175777		CCT13790
1380	03704	173777		OCT	173777		CCT13800
1381	03705	167777		OCT	167777		CCT13810



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1382	03706	157777		OCT	157777		CCT13820
1383	03707	137777	TSTB	OCT	137777		CCT13830
1384	03710	077777	TSTV	OCT	77777		CCT13840
1385	03711	0 00 00000	TC	PZE		*	CCT13850
1386	03712	000001	TU	OCT	1	*	CCT13860
1387	03713	000003		OCT	3		CCT13870
1388	03714	000007		OCT	7		CCT13880
1389	03715	000017		OCT	17		CCT13890
1390	03716	000037		OCT	37		CCT13900
1391	03717	000077		OCT	77		CCT13910
1392	03720	000177		OCT	177		CCT13920
1393	03721	000377		OCT	377		CCT13930
1394	03722	000777		OCT	777		CCT13940
1395	03723	001777		OCT	1777		CCT13950
1396	03724	003777		OCT	3777		CCT13960
1397	03725	007777		OCT	7777		CCT13970
1398	03726	017777		OCT	17777		CCT13980
1399	03727	037777		OCT	37777		CCT13990
1400	03730	077777	TSTC	OCT	77777		CCT14000
1401	03731	125252	TSTU	OCT	125252		CCT14010
1402	03732	177777	TD	OCT	177777	*	CCT14020
1403	03733	177776		OCT	177776		CCT14030
1404	03734	177775		OCT	177775		CCT14040
1405	03735	177772		OCT	177772		CCT14050
1406	03736	177765		OCT	177765		CCT14060
1407	03737	177752		OCT	177752		CCT14070
1408	03740	177725		OCT	177725		CCT14080
1409	03741	177652		OCT	177652		CCT14090
1410	03742	177525		OCT	177525		CCT14100
1411	03743	177252		OCT	177252		CCT14110
1412	03744	176525		OCT	176525		CCT14120
1413	03745	175252		OCT	175252		CCT14130
1414	03746	172525		OCT	172525		CCT14140
1415	03747	165252		OCT	165252		CCT14150
1416	03750	152525		OCT	152525		CCT14160
1417	03751	125252	TSTD	OCT	125252		CCT14170
1418	03752	052525	TSTR	OCT	52525		CCT14180



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1419	03753	0 00 00000	TE	PZE		*	CCT14190
1420	03754	000001	TE2	OCT	1	*	CCT14200
1421	03755	000002		OCT	2		CCT14210
1422	03756	000005		OCT	5		CCT14220
1423	03757	000012		OCT	12		CCT14230
1424	03760	000025		OCT	25		CCT14240
1425	03761	000052		OCT	52		CCT14250
1426	03762	000125		OCT	125		CCT14260
1427	03763	000252		OCT	252		CCT14270
1428	03764	000525		OCT	525		CCT14280
1429	03765	001252		OCT	1252		CCT14290
1430	03766	002525		OCT	2525		CCT14300
1431	03767	005252		OCT	5252		CCT14310
1432	03770	012525		OCT	12525		CCT14320
1433	03771	025252		OCT	25252		CCT14330
1434	03772	052525	TSTE	OCT	52525		CCT14340
1435	03773	177777		FIN			CCT14350
	03774	052525					
	03775	176030					
	03776	037777					
1436				ORG	14000	*	CCT14360
1437			*				CCT14370
1438	04000	000000		OCT	0		CCT14380
1439	04001	040000		OCT	40000		CCT14390
1440	04002	060000		OCT	60000		CCT14400
1441	04003	070000		OCT	70000		CCT14410
1442	04004	074000		OCT	74000		CCT14420
1443	04005	076000		OCT	76000		CCT14430
1444	04006	077000		OCT	77000		CCT14440
1445	04007	077400		OCT	77400		CCT14450
1446	04010	077600		OCT	77600		CCT14460
1447	04011	077700		OCT	77700		CCT14470
1448	04012	077740		OCT	77740		CCT14480
1449	04013	077760		OCT	77760		CCT14490
1450	04014	077770		OCT	77770		CCT14500
1451	04015	077774		OCT	77774		CCT14510









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1489	04063	005252		OCT	5252		CCT14890
1490	04064	002525		OCT	2525		CCT14900
1491	04065	001252		OCT	1252		CCT14910
1492	04066	000525		OCT	525		CCT14920
1493	04067	000252		OCT	252		CCT14930
1494	04070	000125		OCT	125		CCT14940
1495	04071	000052		OCT	52		CCT14950
1496	04072	000025		OCT	25		CCT14960
1497	04073	000012		OCT	12		CCT14970
1498	04074	000005		OCT	5		CCT14980
1499	04075	000002		OCT	2		CCT14990
1500	04076	000001		OCT	1		CCT15000
1501	04077	000000	SKNK	OCT	0		CCT15010
1502	04100	125252		OCT	125252		CCT15020
1503	04101	052524		OCT	52524		CCT15030
1504	04102	125250		OCT	125250		CCT15040
1505	04103	052520		OCT	52520		CCT15050
1506	04104	125240		OCT	125240		CCT15060
1507	04105	052500		OCT	52500		CCT15070
1508	04106	125200		OCT	125200		CCT15080
1509	04107	052400		OCT	52400		CCT15090
1510	04110	125000		OCT	125000		CCT15100
1511	04111	052000		OCT	52000		CCT15110
1512	04112	124000		OCT	124000		CCT15120
1513	04113	050000		OCT	50000		CCT15130
1514	04114	120000		OCT	120000		CCT15140
1515	04115	040000		OCT	40000		CCT15150
1516	04116	100000		OCT	100000		CCT15160
1517	04117	000000	SKNL	OCT	0		CCT15170
1518			*				CCT15180
1519			*				CCT15190
1520	04120	0 003504		DAC	SHHH+S	SUBROUTINE T074	CCT15200
1521	04121	000074	SFTW	OCT	74	SHIFT	CCT15210
1522	04122	0 00 00000	SFTA	PZE		SUBROUTINE IDENTIFICATION	CCT15220
1523	04123	-0 10 00673		JST*	SXTR	ENTRY POINT	CCT15230
1524	04124	140040		CRA			CCT15240
1525	04125	0 04 00000		STA	0		CCT15250







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1563	04173	-0 04 00667	STA*	SFYY		CCT15630
1564	04174	0 02 04265	LDA	SFFX		CCT15640
1565	04175	0 03 04354	ANA	= '77777		CCT15650
1566	04176	-0 04 00666	STA*	SFZZ		CCT15660
1567	04177	0 02 04264	LDA	SFFY		CCT15670
1568	04200	0 03 04353	ANA	=1	*	CCT15680
1569	04201	101040	SNZ		*	CCT15690
1570	04202	0 01 04227	JMP	STTH		CCT15700
1571	04203	-0 02 00666	LDA*	SFZZ		CCT15710
1572	04204	101400	SMI		*	CCT15720
1573	04205	0 05 04355	ERA	= '100000	*	CCT15730
1574	04206	-0 04 00666	STA*	SFZZ		CCT15740
1575	04207	0 01 04227	JMP	STTH		CCT15750
1576	04210	0 02 04264	STTF LDA	SFFY		CCT15760
1577	04211	0 03 04354	ANA	= '77777		CCT15770
1578	04212	-0 04 00667	STA*	SFYY		CCT15780
1579	04213	0 02 04265	LDA	SFFX		CCT15790
1580	04214	0 03 04355	ANA	= '100000		CCT15800
1581	04215	-0 05 00667	ERA*	SFYY		CCT15810
1582	04216	-0 04 00667	STA*	SFYY		CCT15820
1583	04217	0 02 04264	LDA	SFFY		CCT15830
1584	04220	100400	SPL			CCT15840
1585	04221	0 01 04225	JMP	STTG		CCT15850
1586	04222	140040	CRA			CCT15860
1587	04223	-0 04 00666	STA*	SFZZ		CCT15870
1588	04224	0 01 04227	JMP	STTH		CCT15880
1589	04225	0 02 04352	STTG LDA	= - '1		CCT15890
1590	04226	-0 04 00666	STA*	SFZZ		CCT15900
1591	04227	0 02 04265	STTH LDA	SFFX		CCT15910
1592	04230	0 04 00635	STA	BREG	*	CCT15920
1593	04231	-0 02 00634	LDA*	T	*	CCT15930
1594	04232	-0 04 00665	STA*	SFTT		CCT15940
1595	04233	0 02 04264	LDA	SFFY		CCT15950
1596	04234	-0 10 00670	JST*	SHXT		CCT15960
1597	04235	0 10 00732	JST	RPAT		CCT15970
1598	04236	0 01 04141	JMP	STTJ		CCT15980
1599	04237	0 02 04262	STTK LDA	INDR		CCT15990



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1600	04240	0 05 04266	ERA	NDTS		CCT16000
1601	04241	101040	SNZ			CCT16010
1602	04242	0 01 04246	JMP	STTM		CCT16020
1603	04243	0 02 04264	LDA	SFFY		CCT16030
1604	04244	0 04 04265	STA	SFFX		CCT16040
1605	04245	0 01 04132	JMP	STTL		CCT16050
1606	04246	-0 02 00671	STTM LDA*	SFXU		CCT16060
1607	04247	101040	SNZ			CCT16070
1608	04250	-0 01 04122	JMP*	SFTA		CCT16080
1609	04251	0 04 00635	STA	BREG	*	CCT16090
1610	04252	-0 02 00672	LDA*	SFXV		CCT16100
1611	04253	0 05 04121	ERA	SFTW		CCT16110
1612	04254	-0 01 04122	JMP*	SFTA		CCT16120
1613	04255	0 004255	ASFB DAC	*	*	CCT16130
1614	04256	0416 60	ALR	16		CCT16140
1615	04257	0406 60	ARR	16		CCT16150
1616	04260	0 00 00000	SFTB PZE			CCT16160
1617	04261	001000	RRST OCT	1000		CCT16170
1618	04262	0 00 00000	INDR PZE			CCT16180
1619	04263	0 00 00000	SFFZ PZE			CCT16190
1620	04264	0 00 00000	SFFY PZE			CCT16200
1621	04265	0 00 00000	SFFX PZE			CCT16210
1622	04266	002000	NDTS OCT	2000		CCT16220
1623	04267	0 000000	TYPD DAC	**		CCT16230
1624	04270	101000	NOP		NO OP	CCT16240
1625	04271	0 04 04312	STA	TS2	SAVE MSG ADRS	CCT16250
1626	04272	-0 02 04312	LDA*	TS2	GET WORD COUNT	CCT16260
1627	04273	0 04 04313	STA	TS3		CCT16270
1628	04274	34 0104	SKS	'104	TEST FOR ASR BUSY	CCT16280
1629	04275	0 01 04274	JMP	*-1		CCT16290
1630	04276	14 0104	OCP	'104	ENABLE OUTPUT MODE	CCT16300
1631	04277	0 12 04312	PRCH IRS	TS2	BUMP ADRS	CCT16310
1632	04300	-0 02 04312	LDA*	TS2		CCT16320
1633	04301	0416 70	ALR	8		CCT16330
1634	04302	74 0004	OTA	'4	OUTPUT 1-8 IN ASCII	CCT16340
1635	04303	0 01 04302	JMP	*-1		CCT16350
1636	04304	-0 02 04312	LDA*	TS2		CCT16360





\* E500-001-6802 (416-CCT2)

3C NO. 180615000

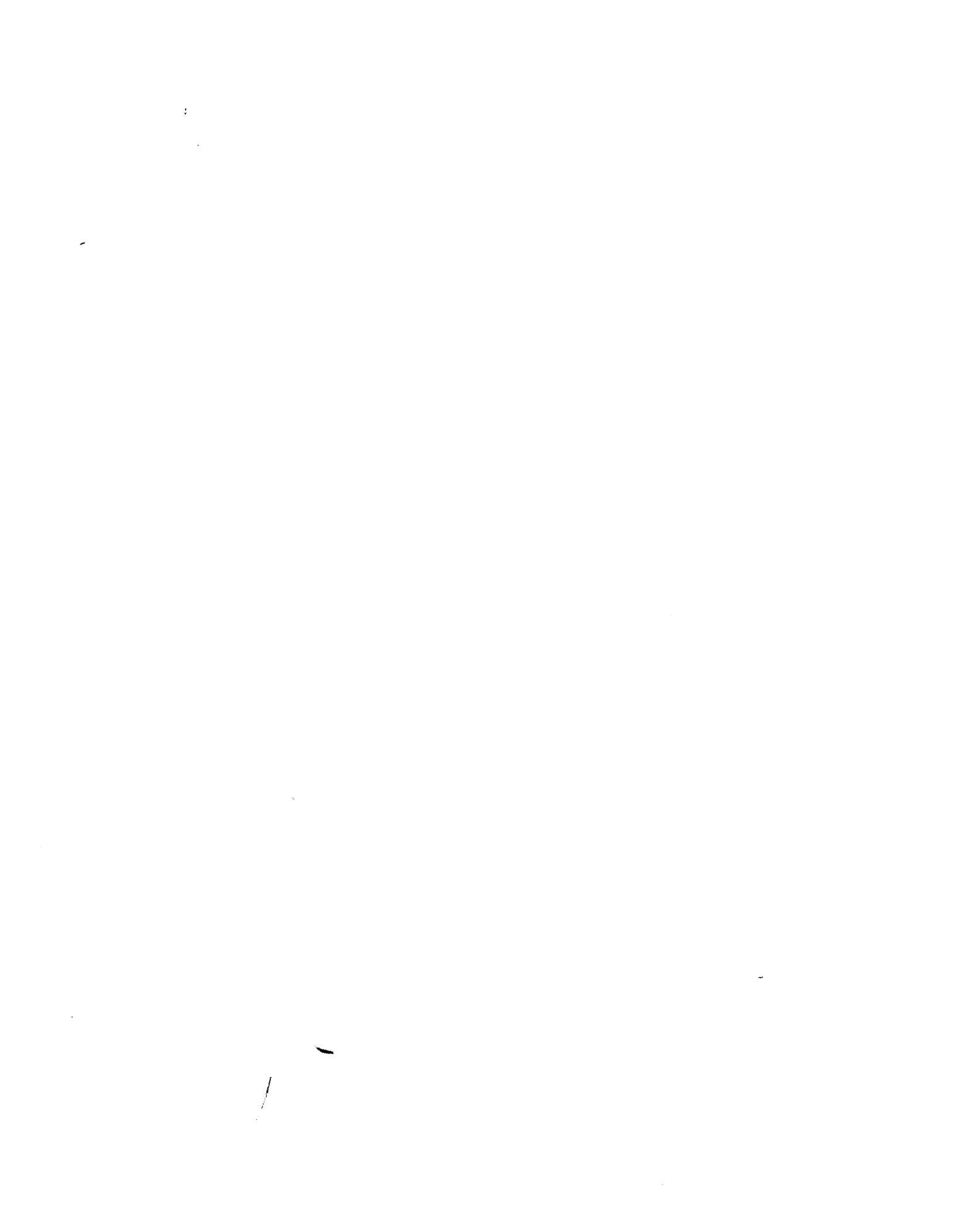
REV. A

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1637	04305	74 0004	OTA	'4	OUTPUT 9-16	CCT16370
1638	04306	0 01 04305	JMP	*-1		CCT16380
1639	04307	0 12 04313	IRS	TS3	SKIP AFTER LAST WORD	CCT16390
1640	04310	0 01 04277	JMP	PRCH	PRINT NEXT WORD	CCT16400
1641	04311	-0 01 04267	JMP*	TYPD		CCT16410
1642	04312	000000	TS2	BSZ	1	TEMP STORE
1643	04313	000000	TS3	BSZ	1	CCT16420
1644	04314	0 004315	MESS	DAC	*+1	CCT16430
1645	04315	177761	VALU	DEC	-15	CCT16440
1646	04316	106612	OCT		106612,105212	CCT16450
	04317	105212				CCT16460
1647	04320	132261	BCI		8,416-CCT2 REV. A	CCT16470
	04321	133255				
	04322	141703				
	04323	152262				
	04324	120322				
	04325	142726				
	04326	127240				
	04327	140640				
1648	04330	120262	BCI		5, 2 MAY 68	CCT16480
	04331	120315				
	04332	140731				
	04333	120266				
	04334	134240				
1649	04335	0 004336	MES2	DAC	*+1	CCT16490
1650	04336	177765		DEC	-11	CCT16500
1651	04337	106612		OCT	106612	CCT16510
1652	04340	150301	BCI		6,PASS COUNT	CCT16520
	04341	151725				
	04342	120303				
	04343	147725				
	04344	147324				
	04345	120240				
1653	04346	130260	CNT5	BCI	2,0000	CCT16530
	04347	130260				
1654	04350	154265	BCI		2,X50	CCT16540
	04351	130240				







H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

\* E510-001-6603 (X16-CMT1)    3C NO. 180265000      REV. C      PAGE    1

0001	*	E510-001-6603 (X16-CMT1)	3C NO. 180265000	REV. C	CMT10001
0002	*				CMT10002
0003	*				CMT10003
0004	*				CMT10004
0005	*	COMPUTERS: DDP-416, DDP-516			CMT10005
0006	*				CMT10006
0007	*				CMT10007
0008	*				CMT10008
0009	*				CMT10009
0010	*	PROGRAM CATEGORY: TEST AND MAINTENANCE			CMT10010
0011	*				CMT10011
0012	*				CMT10012
0013	*				CMT10013
0014	*				CMT10014
0015	*	PROGRAM TITLE: X16-CMT1			CMT10015
0016	*	CORE MEMORY TEST NO.1 FOR THE DDP-416 AND DDP-516			CMT10016
0017	*				CMT10017
0018	*				CMT10018
0019	*				CMT10019
0020	*				CMT10020
0021	*				CMT10021
0022	*				CMT10022
0023	*				CMT10023
0024	*		APPROVAL	DATE	CMT10024
0025	*				CMT10025
0026	*				CMT10026
0027	*				CMT10027
0028	*		P/S <i>REP</i> , <i>J. Butler</i> QA, 5-10-67		CMT10028
0029	*				CMT10029
0030	*				CMT10030
0031	*		D/M <i>REP</i> , <i>A. McLaney</i> 5-11-67		CMT10031
0032	*				CMT10032
0033	*				CMT10033
0034	*				CMT10034
0035	*				CMT10035
0036	*		NO. OF PAGES	<u>33</u>	CMT10036
0037	*				CMT10037

0038	*	REVISIONS	CMT10038
0039	*		CMT10039
0040	*	REV. C      ECO 4581	CMT10040
0041	*	REV. B      ECO 4113      01-23-67	CMT10041
0042	*	REV. A      10-19-66	CMT10042
0043	*		CMT10043
0044	*		CMT10044
0045	*	AUTHOR	CMT10045
0046	*		CMT10046
0047	*	HONEYWELL, INC. - COMPUTER CONTROL DIVISION	CMT10047
0048	*		CMT10048
0049	*		CMT10049
0050	*	PURPOSE	CMT10050
0051	*		CMT10051
0052	*	TO TEST THE CORE MEMORY OF A DDP-416 OR DDP-516.	CMT10052
0053	*		CMT10053
0054	*		CMT10054
0055	*	RESTRICTIONS	CMT10055
0056	*		CMT10056
0057	*	THIS PROGRAM WILL OPERATE ON DDP-416'S AND DDP-516'S WITH	CMT10057
0058	*	MEMORY UP TO 32K. IT HAS BEEN TESTED ON THE 4K DDP-416 AND THE	CMT10058
0059	*	16K DDP-516.	CMT10059
0060	*		CMT10060
0061	*		CMT10061
0062	*	STORAGE	CMT10062
0063	*		CMT10063
0064	*	THIS PROGRAM UTILIZES THE ENTIRE CORE MEMORY.	CMT10064
0065	*		CMT10065
0066	*		CMT10066
0067	*	USE	CMT10067
0068	*		CMT10068
0069	*	THIS PROGRAM WILL TEST ANY CONTIGUOUS SET OF MEMORY LOCA-	CMT10069
0070	*	TIONS BETWEEN THE INCLUSIVE LIMITS "FA (FIRST ADDRESS)" AND "LA	CMT10070
0071	*	(LAST ADDRESS)". WHEN THE PROGRAM IS LOADED, "FA" CONTAINS AN	CMT10071
0072	*	ADDRESS (2530) ABOVE THE PROGRAM AND "LA" CONTAINS AN ADDRESS	CMT10072
0073	*	(6777) WHICH IS BELOW THE LOCATIONS OCCUPIED BY MOST OF THE LOAD-	CMT10073
0074	*	ERS USED ON A 4K SYSTEM. THESE LIMITS MAY BE MANUALLY CHANGED AT	CMT10074

0075	*	ANY TIME BUT THE USUAL METHOD OF COMMUNICATION BETWEEN THE OPERA-	CMT10075
0076	*	TOR AND THE PROGRAM IS BY USING THE TELETYPEWRITER (ASR). THE	CMT10076
0077	*	LETTER "I" MAY BE TYPED IN AT ANY TIME THAT THE PROGRAM IS RUNNING	CMT10077
0078	*	BUT NOT TYPING OUT OR WHEN IT HAS STOPPED EITHER AFTER AN ERROR	CMT10078
0079	*	TYPEOUT OR AT THE END-OF-PASS HALT. THE PROGRAM WILL ANSWER BY	CMT10079
0080	*	ASKING FOR A TYPE-IN OF ONE OR MORE OF THE FOLLOWING LETTERS	CMT10080
0081	*	(WHICH ARE FOLLOWED HERE BY THEIR EFFECTS):	CMT10081
0082	*		CMT10082
0083	*	C - CLEAR TESTED LOCATIONS (DO NOT LEAVE COMPLEMENT OF WORST-	CMT10083
0084	*	CASE PATTERN IN MEMORY)	CMT10084
0085	*	E - STOP AFTER EACH ERROR TYPEOUT	CMT10085
0086	*	G - GO, DO NOT STOP, AT END OF EACH PASS	CMT10086
0087	*	M - MOVE PROGRAM TO SECTORS TO BE LATER SPECIFIED	CMT10087
0088	*	P - PARAMETERS (LIMITS) ARE TO BE CHANGED	CMT10088
0089	*	S - STOP AT END OF EACH PASS	CMT10089
0090	*	T - TYPE OUT HOW MANY PASSES HAVE BEEN COMPLETED AND WHAT LIMITS	CMT10090
0091	*	WERE USED	CMT10091
0092	*		CMT10092
0093	*	AFTER THE DESIRED LETTERS HAVE BEEN TYPED IN, THE "RETURN"	CMT10093
0094	*	KEY SHOULD BE DEPRESSED. WHENEVER A TYPE-IN REQUEST IS ANSWERED,	CMT10094
0095	*	THE PREVIOUS COMMANDS ARE NULLIFIED EXCEPT THAT THE "G" AND "S"	CMT10095
0096	*	FUNCTIONS, WHICH ACT LIKE THE SET AND RESET SIDES OF A FLIP-FLOP,	CMT10096
0097	*	STAY WHERE PREVIOUSLY SET.	CMT10097
0098	*		CMT10098
0099	*	WHEN THE PROGRAM IS LOADED, FUNCTIONS "T" AND "S" ARE SET:	CMT10099
0100	*	THE PROGRAM WILL TYPE OUT AND STOP AT THE END OF THE FIRST PASS.	CMT10100
0101	*	THE LETTER "I" MAY NOW BE TYPED IN AND THE PROGRAM RE-STARTED BY	CMT10101
0102	*	PUSHING THE "START" BUTTON. WHEN THE INPUT REQUEST IS ACKNOWL-	CMT10102
0103	*	EDGED, TYPING IN "G" WILL CAUSE THE PROGRAM TO CYCLE WITHOUT	CMT10103
0104	*	STOPPING. IF THE LIMITS ARE TO BE CHANGED AND IF END-OF-PASS-	CMT10104
0105	*	TYPEOUTS ARE DESIRED, "P" AND "T" SHOULD ALSO BE TYPED IN BEFORE	CMT10105
0106	*	PRESSING THE "RETURN" KEY.	CMT10106
0107	*		CMT10107
0108	*	A "P" INPUT WILL TYPE OUT THE FIRST AND LAST LOCATIONS	CMT10108
0109	*	BEING TESTED. EACH IS LOOKING FOR ONE OF 3 INPUTS:	CMT10109
0110	*		CMT10110
0111	*	1) "RETURN" MEANING NO CHANGE.	CMT10111

0112	*	2) 5 OCTAL DIGITS DESIGNATING NEW LIMIT, OR	CMT10112
0113	*	3) 1 TO 4 OCTAL DIGITS FOLLOWED BY "RETURN".	CMT10113
0114	*		CMT10114
0115	*	AN "M" INPUT WILL TYPE OUT THE SECTOR IN WHICH THE PROGRAM	CMT10115
0116	*	CURRENTLY STARTS. IT IS LOOKING FOR AN INPUT OF 2 OCTAL DIGITS	CMT10116
0117	*	OR 1 OCTAL DIGIT AND A "RETURN" TO DESIGNATE THE NEW SECTOR WHERE	CMT10117
0118	*	THE PROGRAM SHOULD START AFTER IT IS MOVED. SINCE THE ROUTINE	CMT10118
0119	*	WHICH MOVES THE PROGRAM IS IN THE SECOND SECTOR, THE PROGRAM MAY	CMT10119
0120	*	BE MOVED DOWN BY 1 SECTOR BUT MUST BE MOVED UP BY AT LEAST 2	CMT10120
0121	*	SECTORS. ALSO, THE START OF THE PROGRAM SHOULD NOT BE MOVED TO	CMT10121
0122	*	THE LAST IMPLEMENTED SECTOR, SINCE THE INFORMATION WHICH SHOULD GO	CMT10122
0123	*	IN THE FOLLOWING SECTOR WILL BE LOST.	CMT10123
0124	*		CMT10124
0125	*		CMT10125
0126	*	METHOD	CMT10126
0127	*		CMT10127
0128	*	AFTER CHECKING TO SEE THAT THE LIMITS BEING USED WILL NOT	CMT10128
0129	*	DESTROY THE PROGRAM, LOCATION 00000 (ALSO INDEX REGISTER ON	CMT10129
0130	*	DDP-516) IS CHECKED SINCE IT WILL CONTAIN THE ADDRESS OF EACH	CMT10130
0131	*	LOCATION BEING TESTED. THESE TESTS KEEP REPEATING UNTIL THEY BOTH	CMT10131
0132	*	WORK PROPERLY.	CMT10132
0133	*		CMT10133
0134	*	THE MAIN BODY OF THE PROGRAM IS DIVIDED INTO 5 SECTIONS:	CMT10134
0135	*	1) BASIC TESTS	CMT10135
0136	*	2) PATTERN TESTS	CMT10136
0137	*	3) ADDRESSING TESTS	CMT10137
0138	*	4) COMPLEMENT TESTS	CMT10138
0139	*	5) WORST-CASE NOISE TESTS	CMT10139
0140	*		CMT10140
0141	*	1) BASIC TESTS.	CMT10141
0142	*		CMT10142
0143	*	ALL ONES ARE STORED INTO EACH OF THE TESTED LOCATIONS,	CMT10143
0144	*	READ OUT, AND CHECKED. THE SAME IS DONE WITH ALL ZEROS.	CMT10144
0145	*	THE PURPOSE OF THIS SECTION IS TO DETECT CATASTROPHIC ERRORS	CMT10145
0146	*	BEFORE ATTEMPTING MORE DIFFICULT TESTS.	CMT10146
0147	*		CMT10147
0148	*	2) PATTERN TESTS.	CMT10148



0149	*		CMT10149
0150	*		CMT10150
0151	*	34 PATTERNS AND THE ADDRESS OF THE LOCATION ARE STORED	CMT10151
0152	*	INTO EACH LOCATION BEING TESTED BEFORE GOING ON TO THE NEXT	CMT10152
0153	*	LOCATION. EACH PATTERN IS READ OUT AND CHECKED IMMEDIATELY	CMT10153
0154	*	AFTER IT WAS STORED.	CMT10154
0155	*	3) ADDRESSING TESTS.	CMT10155
0156	*		CMT10156
0157	*	THESE TESTS OVERLAP THE PATTERN TESTS IN THAT THE	CMT10157
0158	*	ADDRESS OF EACH LOCATION IS WRITTEN INTO THAT LOCATION AND	CMT10158
0159	*	CHECKED BEFORE THE 34 PATTERNS ARE USED IN THE NEXT HIGHER	CMT10159
0160	*	LOCATION. AFTER ALL THE LOCATIONS BEING TESTED HAVE BEEN	CMT10160
0161	*	FILLED WITH THEIR ADDRESSES IN ASCENDING ORDER, THE	CMT10161
0162	*	ADDRESSES ARE READ OUT AND CHECKED IN DESCENDING ORDER.	CMT10162
0163	*	AFTER ALL HAVE BEEN CHECKED IN THIS MANNER, THE SAME	CMT10163
0164	*	ADDRESSES ARE STORED AND CHECKED IN DESCENDING ORDER AND	CMT10164
0165	*	FINALLY READ OUT AND CHECKED IN ASCENDING ORDER.	CMT10165
0166	*		CMT10166
0167	*	THE ADDRESSING TESTS CAN BE SUMMARIZED AS FOLLOWS:	CMT10167
0168	*		CMT10168
0169	*	A) WRITE AND READ ASCENDING ADDRESSES	CMT10169
0170	*	B) READ DESCENDING ADDRESSES	CMT10170
0171	*	C) WRITE AND READ DESCENDING ADDRESSES	CMT10171
0172	*	D) READ ASCENDING ADDRESSES	CMT10172
0173	*		CMT10173
0174	*	4) COMPLEMENT TESTS.	CMT10174
0175	*		CMT10175
0176	*	ALL ONES ARE STORED INTO ONE LOCATION 65,535 TIMES AS	CMT10176
0177	*	RAPIDLY AS POSSIBLE. THEN ALL ZEROS ARE STORED ONCE INTO	CMT10177
0178	*	THAT SAME LOCATION AND READ OUT AND CHECKED TO VERIFY THAT	CMT10178
0179	*	NONE OF THE BITS HAS REMAINED IN THE "ONE" STATE DUE TO CORE	CMT10179
0180	*	HEATING. THEN ALL ZEROS ARE STORED 65,535 TIMES FOLLOWED BY	CMT10180
0181	*	STORING ALL ONES ONCE AND READING AND CHECKING TO SEE THAT	CMT10181
0182	*	NONE OF THE BITS HAS REMAINED IN THE "ZERO" STATE.	CMT10182
0183	*		CMT10183
0184	*	5) WORST-CASE NOISE TESTS.	CMT10184
0185	*		CMT10185

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0186 * THE WORST-CASE NOISE PATTERN GENERATES THE MAXIMUM CMT10186
0187 * DELTA NOISE IN THE CORE STACK AND TESTS THE SENSE AMPLIFIER CMT10187
0188 * CIRCUITS' RECOVERY AND DISCRIMINATION CHARACTERISTICS. THIS CMT10188
0189 * PATTERN IS FIRST STORED INTO ALL THE TESTED LOCATIONS AND CMT10189
0190 * THEN READ OUT FROM EACH OF THE TESTED LOCATIONS AND CHECKED. CMT10190
0191 * THEN THE COMPLEMENT OF THE WORST-CASE PATTERN IS WRITTEN CMT10191
0192 * INTO EACH TESTED LOCATION, READ OUT, AND CHECKED FOLLOWED CMT10192
0193 * BY RE-WRITING THE WORST-CASE PATTERN, READING IT OUT, AND CMT10193
0194 * CHECKING IT. THE WHOLE PROCEDURE IS THEN REPEATED USING THE CMT10194
0195 * COMPLEMENTS OF ALL PATTERNS MENTIONED ABOVE. CMT10195
0196 * CMT10196
0197 * CMT10197
0198 * ERRORS CMT10198
0199 * CMT10199
0200 * EACH MEMORY FAILURE WILL RESULT IN A TYPEOUT OF ONE LINE CMT10200
0201 * DIVIDED INTO FIVE PARTS. EACH PART IS IDENTIFIED BY ONE OR TWO CMT10201
0202 * LETTERS AND IS FOLLOWED BY AN OCTAL NUMBER. THE FIVE PARTS ARE: CMT10202
0203 * CMT10203
0204 * D. -DROPPED: ANY BITS DROPPED IN THE FAILING LOCATION. CMT10204
0205 * P. -PICKED UP: ANY BITS PICKED UP IN THE FAILING LOCATION. CMT10205
0206 * L. -LOCATION: THE ADDRESS OF THE FAILING LOCATION. CMT10206
0207 * IS -IS: THE CONTENTS OF THE FAILING LOCATION. CMT10207
0208 * S.B.-SHOULD BE: THE TEST PATTERN BEING USED. CMT10208
0209 * CMT10209
0210 * CMT10210
0211 * ABBREVIATIONS USED CMT10211
0212 * CMT10212
0213 * ASCII - AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE CMT10213
0214 * ASR - AUTOMATIC SEND-RECEIVE SET (TELETYPEWRITER) CMT10214
0215 * RA - REGISTER A CMT10215
0216 * XR - MEMORY LOCATION 0000 (ALSO INDEX REGISTER ON DDP-516) CMT10216
0217 * CMT10217
0218 * CMT10218
0219 * ***** CMT10219
0220 * CMT10220
0221 * CF4 CMT10221
0222 * LOAD CMT10222

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0223			ORG	*1020		CMT10223
0224			*			CMT10224
0225	01020	0 10 01021	STRT	JST	PCHK	CMT10225
0226	01021	0 000000	PCHK	DAC	**	CMT10226
0227	01022	-0 01 01710	JMP*	APC2		CMT10227
0228	01023	0 000000	PC3	DAC	**	CMT10228
0229	01024	0 02 01720	LDA	LA		CMT10229
0230	01025	0 07 01717	SUB	FA		CMT10230
0231	01026	100400	SPL			CMT10231
0232	01027	0 01 01041	JMP	NG		CMT10232
0233	01030	0 02 01021	LDA	PCHK		CMT10233
0234	01031	0 07 01750	SUB	=2	*	CMT10234
0235	01032	0 07 01720	SUB	LA	*	CMT10235
0236	01033	101400	SMI		*	CMT10236
0237	01034	0 01 01115	JMP	PCE	*	CMT10237
0238	01035	0 02 01717	LDA	FA	*	CMT10238
0239	01036	0 07 01023	SUB	PC3	*	CMT10239
0240	01037	101400	SMI		*	CMT10240
0241	01040	0 01 01115	JMP	PCE	*	CMT10241
0242	01041	0 02 01747	NG	LDA	=-40	CMT10242
0243	01042	0 10 01613	JST	TYOB		CMT10243
0244	01043	106612	OCT	106612		CMT10244
0245	01044	150322	BCI	25,PROGRAM MAY BE DESTROYED IF THESE LIMITS ARE USED.		CMT10245
	01045	147707				
	01046	151301				
	01047	146640				
	01050	146701				
	01051	154640				
	01052	141305				
	01053	120304				
	01054	142723				
	01055	152322				
	01056	147731				
	01057	142704				
	01060	120311				
	01061	143240				
	01062	152310				

ESTABLISH ADDRESS OF BEGINNING OF PROGRAM AND END OF PROGRAM.

RETURN TO HERE. CHECK TO SEE THAT LIMITS BEING USED WILL NOT OVERWRITE PROGRAM ITSELF. KEEP REPEATING TYPEOUT UNTIL PROPER LIMITS ARE ENTERED.

TYPE OUT NEXT 40 WORDS.

CARRIAGE RETURN + LINE FEED.

01063	142723						
01064	142640						
01065	146311						
01066	146711						
01067	152323						
01070	120301						
01071	151305						
01072	120325						
01073	151705						
01074	142256						
0246	01075	106612	OCT	106612	CARRIAGE RETURN + LINE FEED.		CMT10246
0247	01076	150314	BCI	13,PLEASE CHANGE ONE OR BOTH.			CMT10247
	01077	142701					
	01100	151705					
	01101	120303					
	01102	144301					
	01103	147307					
	01104	142640					
	01105	147716					
	01106	142640					
	01107	147722					
	01110	120302					
	01111	147724					
	01112	144256					
0248	01113	0 10 01776	JST	TYAN	TYPE OUT OLD LIMITS, GET NEW LIMITS.		CMT10248
0249	01114	0 01 01020	JMP	STRT	RESTART.		CMT10249
0250	01115	000013	PCE	OCT 13	* EXA (ENABLE EXTENDED ADDRESSING)	*****	CMT10250
0251			*				CMT10251
0252			***	LOCATION 00000 (ALSO INDEX REGISTER ON DDP-516) TEST***			CMT10252
0253			*				CMT10253
0254	01116	140040	A	CRA	START WITH ZERO		CMT10254
0255	01117	0 04 00000	STA	0	IN XR		CMT10255
0256	01120	0 04 01700	STA	V1	AND V1.		CMT10256
0257	01121	0 02 01700	A2	LDA	V1	INCREMENT	CMT10257
0258	01122	0 06 01746	ADD	=1	V1		CMT10258
0259	01123	0 04 01700	STA	V1	UNTIL		CMT10259
0260	01124	101040	SNZ		IT		CMT10260

0261	01125	0 01 01141	JMP	A3	BECOMES ZERO AGAIN.	CMT10261
0262	01126	0 12 00000	IRS	0	IF NOT ZERO, ALSO INCREMENT XR.	CMT10262
0263	01127	0 01 01121	JMP	A2	KEEP REPEATING.	CMT10263
0264	01130	0 02 00000	ZERR LDA	0	IRS SHOULD NEVER GET A CHANCE TO SKIP HERE.	CMT10264
0265	01131	0 04 01704	STA	IS	*	CMT10265
0266	01132	0 02 01700	LDA	V1	*	CMT10266
0267	01133	0 04 01703	STA	CHCK	*	CMT10267
0268	01134	140040	CRA		*	CMT10268
0269	01135	0 04 00000	STA	0	*	CMT10269
0270	01136	0 10 01522	JST	TYPF	TYPE OUT FAILURE.	CMT10270
0271	01137	000000	IEH HLT		STOP HERE. INDEX ERROR HALT.	CMT10271
0272	01140	0 01 01116	JMP	A	TRY AGAIN.	CMT10272
0273	01141	0 12 00000	A3 IRS	0	INCREMENT XR WHEN V1=0. XR SHOULD ALSO	CMT10273
0274	01142	C 01 01130	JMP	ZERR	BECOME EQUAL TO 0 AND SKIP THIS INST.	CMT10274
0275			*			CMT10275
0276			***BASIC TESTS***			CMT10276
0277			*			CMT10277
0278	01143	0 02 01717	LDA	FA	GET FIRST ADDRESS	CMT10278
0279	01144	0 04 00000	STA	0	FOR THE ADDRESS COUNTER.	CMT10279
0280	01145	0 02 01711	B LDA	ALLB	USE ALL ONES.	CMT10280
0281	01146	0 10 01464	JST	TEST	TEST 1 LOCATION.	CMT10281
0282	01147	140040	CRA		USE ALL ZEROS.	CMT10282
0283	01150	0 10 01464	JST	TEST	TEST 1 LOCATION.	CMT10283
0284	01151	0 10 01442	JST	IDXS	INCREMENT ADDRESS (SKIP IF OVER LAST ADDR.)	CMT10284
0285	01152	0 01 01145	JMP	B	GO BACK TO TEST NEXT LOCATION.	CMT10285
0286			*			CMT10286
0287			***PATTERN TESTS***			CMT10287
0288			*			CMT10288
0289	01153	0 02 01717	LDA	FA	RESTORE FIRST ADDRESS	CMT10289
0290	01154	0 04 00000	STA	0	INTO XR.	CMT10290
0291			* TEST PATTERN IS EVEN ONES			CMT10291
0292	01155	0 02 01745	C LDA	#52525		CMT10292
0293	01156	0 10 01464	JST	TEST	TEST 1 LOCATION WHOSE ADDRESS IS IN THE XR.	CMT10293
0294			* TEST PATTERN IS ODD ONES			CMT10294
0295	01157	0 02 01744	LDA	#125252		CMT10295
0296	01160	0 10 01464	JST	TEST	TEST 1 LOCATION.	CMT10296
0297			* TEST PATTERN IS ONE BIT, REST ZEROS			CMT10297

0298	01161	0 02 01743	LDA	=*100000		CMT10298
0299	01162	0 10 01451	JST	SHFT	TEST 1 LOCATION WITH 16 PATTERNS.	CMT10299
0300			*		TEST PATTERN IS ONE ZERO. REST BITS	CMT10300
0301	01163	0 02 01742	LDA	=*77777		CMT10301
0302	01164	0 10 01451	JST	SHFT	TEST 1 LOCATION WITH 16 PATTERNS.	CMT10302
0303			*			CMT10303
0304			*		***ADDRESSING TESTS***	CMT10304
0305			*			CMT10305
0306			*		WRITE AND READ INCREASING ADDRESSES	CMT10306
0307	01165	0 02 00000	LDA	0	GET ADDRESS FROM XR.	CMT10307
0308	01166	0 10 01464	JST	TEST	TEST 1 LOCATION.	CMT10308
0309	01167	0 10 01442	JST	IDXS	INCREMENT ADDRESS (SKIP IF OVER LAST ADDR.)	CMT10309
0310	01170	0 01 01155	JMP	C	GO BACK TO TEST NEXT LOCATION.	CMT10310
0311			*		READ DECREASING ADDRESSES	CMT10311
0312	01171	0 02 01720	LDA	LA	GET LAST ADDRESS	CMT10312
0313	01172	0 04 00000	STA	0	FOR THE XR.	CMT10313
0314	01173	0 10 01471	JST	ATST	CHECK 1 LOCATION (READ ONLY).	CMT10314
0315	01174	0 02 00000	LDA	0	COMPARE CURRENT ADDRESS	CMT10315
0316	01175	0 05 01717	ERA	FA	AGAINST FIRST ADDRESS.	CMT10316
0317	01176	101040	SNZ		SKIP IF UNEQUAL.	CMT10317
0318	01177	0 01 01204	JMP	DD	IF EQUAL, GO TO NEXT TEST.	CMT10318
0319	01200	0 02 00000	LDA	0	DECREMENT ADDRESS OF LOCATION TO BE TESTED.	CMT10319
0320	01201	0 07 01746	SUB	=1	*	CMT10320
0321	01202	0 04 00000	STA	0	*	CMT10321
0322	01203	0 01 01173	JMP	D	RETURN TO CHECK NEXT LOWER LOCATION.	CMT10322
0323			*		WRITE AND READ DECREASING ADDRESSES	CMT10323
0324	01204	0 02 01720	LDA	LA	GET LAST ADDRESS	CMT10324
0325	01205	0 04 00000	STA	0	FOR THE XR.	CMT10325
0326	01206	0 10 01464	JST	TEST	TEST 1 LOCATION.	CMT10326
0327	01207	0 02 00000	LDA	0	COMPARE CURRENT ADDRESS	CMT10327
0328	01210	0 05 01717	ERA	FA	AGAINST FIRST ADDRESS.	CMT10328
0329	01211	101040	SNZ		SKIP IF UNEQUAL.	CMT10329
0330	01212	0 01 01217	JMP	EE	IF EQUAL, GO TO NEXT TEST.	CMT10330
0331	01213	0 02 00000	LDA	0	DECREMENT ADDRESS IN XR.	CMT10331
0332	01214	0 07 01746	SUB	=1	*	CMT10332
0333	01215	0 04 00000	STA	0	*	CMT10333
0334	01216	0 01 01206	JMP	E	RETURN TO TEST NEXT LOWER LOCATION.	CMT10334

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0335				* READ INCREASING ADDRESSES		CMT10335
0336	01217	J 02 01717	EE LDA FA	GET FIRST ADDRESS		CMT10336
0337	01220	0 04 00000	STA 0	FOR THE XR.		CMT10337
0338	01221	0 10 01471	F JST ATST	CHECK 1 LOCATION.		CMT10338
0339	01222	0 10 01442	JST IDXS	INCREMENT ADDRESS (SKIP IF GREATER THAN LA)		CMT10339
0340	01223	0 01 01221	JMP F	GO BACK TO CHECK NEXT LOCATION.		CMT10340
0341				*		CMT10341
0342				***COMPLEMENT TESTS***		CMT10342
0343				*		CMT10343
0344				* STORE ONES 65K TIMES, ZEROS ONCE INTO ONE LOCATION		CMT10344
0345	01224	140040	CRA	SET TO ZERO		CMT10345
0346	01225	0 04 01677	STA CTR1	COUNTER 1		CMT10346
0347	01226	0 04 01230	STA XH	AND XH (ONLY BIT 1 IS IMPORTANT BECAUSE		CMT10347
0348	01227	0 10 01230	JST **1	JST WILL CHANGE BITS 2-16).		CMT10348
0349	01230	0 00 00000	XH PZE	CORE HEATING TEST LOCATION.		CMT10349
0350	01231	0 02 01230	LDA XH	GET ADDRESS OF TESTED		CMT10350
0351	01232	0 04 00000	STA 0	LOCATION FOR THE XR.		CMT10351
0352	01233	0 02 01711	LDA ALLB	USE ALL ONES.		CMT10352
0353	01234	0 04 01230	STA XH	STORE IN TEST LOCATION.		CMT10353
0354	01235	0 12 01677	IRS CTR1	INCREMENT COUNTER.		CMT10354
0355	01236	0 01 01234	JMP *-2	RETURN UNTIL COUNTER GOES TO ZERO.		CMT10355
0356	01237	140040	CRA	NOW TEST		CMT10356
0357	01240	0 10 01464	JST TEST	WITH ZEROS.		CMT10357
0358				* STORE ZEROS 65K TIMES, ONES ONCE INTO ONE LOCATION		CMT10358
0359	01241	140040	CRA	USE ZEROS.		CMT10359
0360	01242	0 04 01230	STA XH	STORE IN TEST LOCATION		CMT10360
0361	01243	0 12 01677	IRS CTR1	INCREMENT COUNTER.		CMT10361
0362	01244	0 01 01242	JMP *-2	RETURN UNTIL COUNTER GOES TO ZERO.		CMT10362
0363	01245	0 02 01711	LDA ALLB	NOW TEST		CMT10363
0364	01246	0 10 01464	JST TEST	WITH ONES.		CMT10364
0365				*		CMT10365
0366				***NOISE TESTS***		CMT10366
0367				*		CMT10367
0368				* THIS SECTION OF THE TEST STORES THE WORST-CASE NOISE PATTERN		CMT10368
0369				* AND ITS COMPLEMENT INTO ALL THE TESTED MEMORY LOCATIONS. AFTER		CMT10369
0370				* EACH PATTERN HAS BEEN STORED INTO ALL THE TEST LOCATIONS, IT IS		CMT10370
0371				* READ OUT AND CHECKED.		CMT10371

0372			*						CMT10372
0373	01247	0 02	01741	LDA	=-2	SET COUNTER FOR 2 PASSES THRU THIS SECTION.			CMT10373
0374	01250	0 04	01677	STA	CTR1	*			CMT10374
0375	01251	0 02	01707	LDA	NOP	PUT A NOP			CMT10375
0376	01252	0 04	01517	STA	CON	IN COMPLEMENT-OR-NOT.			CMT10376
0377			*						CMT10377
0378	01253	0 02	01717	I LDA	FA	SET UP TO WRITE.			CMT10378
0379	01254	0 04	00000	STA	0	---			CMT10379
0380	01255	0 10	01500	J1 JST	GETP	GET PATTERN.			CMT10380
0381	01256	-0 04	00000	STA*	0	STORE PATTERN IN LOCATION WHOSE ADDRESS IS			CMT10381
0382	01257	0 10	01442	JST	IDXS	IN ADDRESS COUNTER.			CMT10382
0383	01260	0 01	01255	JMP	J1	LOOP BACK UNTIL IDXS CAUSES SKIP.			CMT10383
0384			*						CMT10384
0385	01261	0 02	01717	LDA	FA	SET UP TO READ.			CMT10385
0386	01262	0 04	00000	STA	0	---			CMT10386
0387	01263	0 10	01500	L JST	GETP	GET PATTERN.			CMT10387
0388	01264	-0 05	00000	ERA*	0	DOES IT EQUAL CONTENTS OF TESTED MEMORY			CMT10388
0389	01265	10104		SNZ		LOCATION -			CMT10389
0390	01266	0 01	01272	JMP	NR	YES, GO BACK TO CHECK THE NEXT LOCATION.			CMT10390
0391	01267	-0 02	00000	LDA*	0	NO, GET CONTENTS OF THE TESTED MEM. LOC.,			CMT10391
0392	01270	0 04	01704	STA	IS	SAVE THEM IN IS,			CMT10392
0393	01271	0 10	01522	JST	TYPE	AND TYPE OUT FAILURE.			CMT10393
0394	01272	0 10	01442	NN JST	IDXS	INCREMENT ADDRESS (SKIP IF GREATER THAN LA)			CMT10394
0395	01273	0 01	01265	JMP	L	GO BACK TO CHECK THE NEXT LOCATION.			CMT10395
0396			*						CMT10396
0397	01274	0 02	01717	LDA	FA	SET UP TO DISTURB, THEN RESTORE.			CMT10397
0398	01275	0 04	00000	STA	0	*			CMT10398
0399	01276	0 10	01500	00 JST	GETP	GET PATTERN.			CMT10399
0400	01277	0 05	01711	ERA	ALLB	COMPLEMENT IT.			CMT10400
0401	01300	0 10	01464	JST	TEST	WRITE COMPLEMENTS, READ, AND CHECK.			CMT10401
0402	01301	0 02	01703	LDA	CHCK	GET COMPLEMENTED PATTERN.			CMT10402
0403	01302	0 05	01711	ERA	ALLB	COMPLEMENT AGAIN BACK TO ORIGINAL PATTERN.			CMT10403
0404	01303	0 10	01464	JST	TEST	RESTORE ORIGINAL PATTERN, READ, AND CHECK.			CMT10404
0405	01304	0 10	01442	JST	IDXS	INCREMENT ADDRESS. IF GREATER THAN LAST			CMT10405
0406	01305	0 01	01270	JMP	00	ADDRESS, SKIP THIS INSTRUCTION.			CMT10406
0407			*						CMT10407
0408	01306	0 02	01712	LDA	CHC	WAS CHARACTER 'C' INPUT -			CMT10408



0409	01307	101040		SNZ				CMT10409
0410	01310	0 01 01317		JMP	0		NO, GO ON.	CMT10410
0411	01311	0 02 01717		LDA	FA		YES, CLEAR OUT TESTED LOCATIONS.	CMT10411
0412	01312	0 04 00000		STA	U		*	CMT10412
0413	01313	140040		DRA			*	CMT10413
0414	01314	-0 04 00000	P	STA*	U		*	CMT10414
0415	01315	0 10 01442		JST	IXS		*	CMT10415
0416	01316	0 01 01314		JMP	P		*	CMT10416
0417				*				CMT10417
0418	01317	0 02 01710	0	LDA	ERAB		PUT "ERA WITH ALL ONES"	CMT10418
0419	01320	0 04 01517		STA	CON		IN COMPLEMENT-OR-NOT.	CMT10419
0420	01321	0 12 01677		IRS	CTR1		INCREMENT COUNTER	CMT10420
0421	01322	0 01 01253		JMP	I		AND TEST USING COMPLEMENTED PATTERNS.	CMT10421
0422				*				CMT10422
0423				*				CMT10423
0424				*				CMT10424
0425	01323	0 01 01370		JMP	NA2			CMT10425
0426	01324	0 04 01700	INC2	STA	V1		PROGRAM RETURNS HERE WITH ADDRESS OF "ONES"	CMT10426
0427	01325	-0 12 01700		IRS*	V1		DIGIT.	CMT10427
0428	01326	0 01 01334		JMP	SEND		EXIT IF IRS DOES NOT SKIP.	CMT10428
0429	01327	0 02 01740		LDA	=-10		IF IRS SKIPS, RESTORE -10	CMT10429
0430	01330	-0 04 01700		STA*	V1		TO APPROPRIATE PASS COUNTER.	CMT10430
0431	01331	0 02 01700		LDA	V1		GET NEXT LOWER	CMT10431
0432	01332	0 07 01746		SUB	=1		ADDRESS.	CMT10432
0433	01333	0 01 01324		JMP	INC2		RETURN.	CMT10433
0434				*				CMT10434
0435	01334	54 1004	SEND	INA	*1004		LOOK FOR INPUT -	CMT10435
0436	01335	0 01 01337		JMP	SEN2		NO, GO ON.	CMT10436
0437	01336	0 04 01714		STA	C I		YES, SAVE INPUT.	CMT10437
0438	01337	0 02 01715	SEN2	LDA	CHT		WAS "I" PREVIOUSLY INPUT -	CMT10438
0439	01340	101040		SNZ				CMT10439
0440	01341	0 01 01421		JMP	FLG		NO, GO ON.	CMT10440
0441	01342	0 02 01737		LDA	=-8		YES,	CMT10441
0442	01343	0 10 01613		JST	TYOB		TYPE OUT.	CMT10442
0443	01344	106612		OGT	106612		CARRIAGE RETURN + LINE FEED.	CMT10443
0444	01345	154261		BGI	7,X16-CMT1 PASS			CMT10444
	01346	133255						

01347	141715					
01350	152261					
01351	120320					
01352	140723					
01353	151640					
0445	01354	0 02 01736	LDA	=-9	TYPE OUT 9	CMT10445
0446	01355	0 10 01633	JST	OUTN	DECIMAL DIGITS.	CMT10446
0447						CMT10447
0448						CMT10448
0449						CMT10449
0450	01356	177766	DEC	-10,-10,-10,-10,-10,-10,-10,-10		CMT10450
	01357	177766				
	01360	177766				
	01361	177766				
	01362	177766				
	01363	177766				
	01364	177766				
	01365	177766				
	01366	177766				
0451	01367	0 01 01375	JMP	N3		CMT10451
0452						CMT10452
0453	01370	0 10 01371	NA2 JST	**+1	FORM	CMT10453
0454	01371	0 000000	DAC	**	ADDRESS	CMT10454
0455	01372	0 02 01371	LDA	*-1	OF "ONES"	CMT10455
0456	01373	0 07 01735	SUB	=3	DIGIT.	CMT10456
0457	01374	0 01 01324	JMP	INC2	RETURN.	CMT10457
0458						CMT10458
0459	01375	0 02 01734	N3 LDA	=-1	TYPE	CMT10459
0460	01376	0 10 01613	JST	TY08	OUT	CMT10460
0461	01377	120240	BCI	1,	2 SPACES.	CMT10461
0462	01400	0 02 01733	LDA	=-3		CMT10462
0463	01401	0 10 01613	JST	TY08	TYPE.	CMT10463
0464	01402	124314	BCI	3,(LOC.		CMT10464
	01403	147703				
	01404	127240				
0465	01405	0 02 01717	LDA	FA	FIRST ADDRESS.	CMT10465
0466	01406	0 10 01660	JST	TYP5	5 OCTAL DIGITS.	CMT10466

0467	01407	0 02 01732	LDA	=*255	ONE DASH.	CMT10467
0468	01410	74 0004	OTA	4		CMT10468
0469	01411	0 01 01410	JMP	*-1		CMT10469
0470	01412	0 02 01720	LDA	LA	LAST ADDRESS.	CMT10470
0471	01413	0 10 01660	JST	TYP5	5 OCTAL DIGITS.	CMT10471
0472	01414	0 02 01735	LDA	=-3		CMT10472
0473	01415	0 10 01615	JST	TYOB		CMT10473
0474	01416	124640	BCI	3.)		CMT10474
	01417	120240				
	01420	120240				
0475	01421	34 0104	FLG SKS	*104	WAIT	CMT10475
0476	01422	0 01 01421	JMP	*-1	WHILE ASR IS BUSY.	CMT10476
0477	01423	14 0004	UCP	4	SET ASR TO INPUT MODE.	CMT10477
0478	01424	000000	EOPH HLT		END-OF-PASS HALT. NOP IF "G" WAS INPUT.	CMT10478
0479	01425	0 02 01714	LDA	CHI	WAS	CMT10479
0480	01426	0 05 01731	ERA	=*311	I(311) PREVIOUSLY INPUT -	CMT10480
0481	01427	101040	SNZ			CMT10481
0482	01430	0 01 01440	JMP	C3	YES.	CMT10482
0483	01431	54 1004	INA	*1004	NO, TRY AGAIN.	CMT10483
0484	01432	0 01 01110	JMP	A	NO INPUT, GO BACK TO DO NEXT PASS.	CMT10484
0485	01433	0 05 01731	ERA	=*311	YES, CHARACTER WAS INPUT. IS IT "I" -	CMT10485
0486	01434	100040	SZE			CMT10486
0487	01435	0 01 01110	JMP	A	NO, GO BACK FOR NEXT PASS.	CMT10487
0488	01436	0 02 01731	LDA	=*311	YES, IT IS "I"	CMT10488
0489	01437	0 04 01714	STA	CHI	SO SAVE IT.	CMT10489
0490	01440	0 10 01770	C3 JST	TYAN	GO TO TYPE-ANSWER SUBROUTINE.	CMT10490
0491	01441	0 01 01020	JMP	STRT	RETURN TO START NEXT PASS.	CMT10491
0492			*			CMT10492
0493			-----			CMT10493
0494			***SUBROUTINES***			CMT10494
0495			-----			CMT10495
0496			*			CMT10496
0497			*	THIS SUBROUTINE INCREMENTS XR (THE ADDRESS COUNTER) AND		CMT10497
0498			*	SKIPS THE INSTRUCTION AFTER "JST IDXS" WHEN THE CURRENT ADDRESS		CMT10498
0499			*	EXCEEDS LA (THE LAST ADDRESS TO BE TESTED).		CMT10499
0500			*			CMT10500
0501	01442	0 000000	IDXS DAC	**		CMT10501

0502	01443	0 12 00000	IRS	0	INCREMENT XR.	CMT10502
0503	01444	0 02 00000	LDA	0	GET INCREMENTED ADDRESS.	CMT10503
0504	01445	0 05 01721	ERA	LAP0	CHECK AGAINST LAST-ADDRESS-PLUS-ONE.	CMT10504
0505	01446	101040	SNZ		*	CMT10505
0506	01447	0 12 01442	IRS	IDXS	IF EQUAL, INCREMENT EXIT ADDRESS.	CMT10506
0507	01450	-0 01 01442	JMP*	IDXS	EXIT.	CMT10507
0508						CMT10508
0509						CMT10509
0510					THIS SUBROUTINE TAKES THE NUMBER IN RA AND SHIFTS IT THROUGH	CMT10510
0511					ALL 16 BIT POSITIONS, ONE AT A TIME. EACH OF THE RESULTING 16	CMT10511
0512					NUMBERS IS STORED INTO THE LOCATION WHOSE ADDRESS IS IN THE XR AND	CMT10512
0513					IS THEN READ OUT AND CHECKED.	CMT10513
0514	01451	0 000000	SHFT	DAC **		CMT10514
0515	01452	0 04 01701	STA	SN	SAVE NUMBER TO BE SHIFTED.	CMT10515
0516	01453	0 02 01730	LJA	=-16	PREPARE TO SHIFT	CMT10516
0517	01454	0 04 01677	STA	CTR1	16 TIMES.	CMT10517
0518	01455	0 02 01701	S1	LJA SN	GET NUMBER.	CMT10518
0519	01456	0416 77	ALR	1	ROTATE IT LEFT ONE BIT POSITION.	CMT10519
0520	01457	0 04 01701	STA	SN	SAVE NUMBER.	CMT10520
0521	01460	0 10 01464	JST	TEST	TEST MEMORY LOCATION USING ROTATED NUMBER.	CMT10521
0522	01461	0 12 01677	IRS	CTR1	INCREMENT SHIFT COUNTER.	CMT10522
0523	01462	0 01 01455	JMP	S1	LOOP BACK 15 TIMES.	CMT10523
0524	01463	-0 01 01451	JMP*	SHFT	EXIT 16TH TIME.	CMT10524
0525						CMT10525
0526					THIS SUBROUTINE STORES THE NUMBER WHICH IS IN RA INTO THE	CMT10526
0527					LOCATION BEING TESTED (WHOSE ADDRESS IS IN THE XR) AND THEN READS	CMT10527
0528					IT OUT AND CHECKS IT TO VERIFY THAT IT WAS STORED CORRECTLY.	CMT10528
0529						CMT10529
0530	01464	0 000000	TEST	DAC **		CMT10530
0531	01465	0 04 01703	SIA	CHCK	SAVE TEST PATTERN FOR CHECKING.	CMT10531
0532	01466	-0 04 00000	STA*	0	STORE TEST PATTERN INTO TESTED LOCATION.	CMT10532
0533	01467	0 10 01476	JST	SUBT	GO TO READ PATTERN AND CHECK IT.	CMT10533
0534	01470	-0 01 01464	JMP*	TEST	EXIT.	CMT10534
0535						CMT10535
0536					THIS SUBROUTINE CHECKS THE MEMORY LOCATION WHOSE ADDRESS IS	CMT10536
0537					IN THE XR TO VERIFY THAT THE MEMORY LOCATION ALSO CONTAINS ITS OWN	CMT10537
0538					ADDRESS.	CMT10538

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0539
0540 01471  0 00000  ATST DAC  **          ADDRESS TEST.
0541 01472  0 02 0000  LLA  0          GET ADDRESS OF LOCATION TO BE CHECKED
0542 01473  0 04 01703 STA  CHCK      AND SAVE IT AS TEST PATTERN.
0543 01474  0 10 01476 JST  SUBT      GO TO READ AND CHECK TESTED LOCATION.
0544 01475 -0 01 01471  JMP* ATST      EXIT.
0545
0546
0547
0548
0549 01476  0 00000  SUBT DAC  **          SUB-TEST.
0550 01477 -0 02 0000  LDA* 0          READ OUT CONTENTS OF TESTED LOCATION.
0551 01500  0 04 01704 STA  IS          SAVE THEM.
0552 01501  0 05 01703 ERA  CHCK      ARE THEY EQUAL TO TEST PATTERN -
0553 01502  101040  SNZ
0554 01503 -0 01 01476  JMP* SUBT      YES, EXIT.
0555 01504  0 10 01522 JST  TYPF      NO, TYPE OUT FAILURE
0556 01505 -0 01 01476  JMP* SUBT      AND EXIT.
0557
0558
0559
0560
0561 01506  0 00000  GETP DAC  **          GET PATTERN OF
0562 01507  0 02 0000  LDA  0          ALL ONES OR
0563 01510  0 03 01727 ANA  =*4020     ALL ZEROS
0564 01511  0 04 01703 STA  CHCK      DEPENDING ON
0565 01512  0404 71  LGR  7          RESULT OF
0566 01513  0 05 01703 ERA  CHCK      ADDRESS BIT 5
0567 01514  0 03 01726 ANA  =*20     ERA'D WITH
0568 01515  100040  SZE          ADDRESS BIT 12.
0569 01516  0 02 01711 LDA  ALLB     COMPLEMENT OR NOT.
0570 01517  0 00 00000 CON  ***          SAVE PATTERN FOR POSSIBLE FAILURE TYPEOUT.
0571 01520  0 04 01703 STA  CHCK
0572 01521 -0 01 01506  JMP* GETP     EXIT.
0573
0574
0575

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CMT10539  
CMT10540  
CMT10541  
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CMT10568  
CMT10569  
CMT10570  
CMT10571  
CMT10572  
CMT10573  
CMT10574  
CMT10575

0576	*	OUT ON ONE LINE IN THE FOLLOWING ORDER:	CMT10576
0577	*		CMT10577
0578	*	D. MEANING "DROPPED"	CMT10578
0579	*	6 OCTAL DIGITS REPRESENTING ANY BITS WHICH MAY HAVE BEEN DROPPED	CMT10579
0580	*	IN THE MEMORY LOCATION BEING TESTED.	CMT10580
0581	*		CMT10581
0582	*	P. MEANING "PICKED UP"	CMT10582
0583	*	5 OCTAL DIGITS REPRESENTING ANY EXCESS BITS WHICH MAY HAVE BEEN	CMT10583
0584	*	PICKED UP IN THE MEMORY LOCATION BEING TESTED.	CMT10584
0585	*		CMT10585
0586	*	L. MEANING "LOCATION"	CMT10586
0587	*	5 OCTAL DIGITS REPRESENTING THE ADDRESS OF THE TESTED LOCATION.	CMT10587
0588	*		CMT10588
0589	*	IS MEANING "IS"	CMT10589
0590	*	6 OCTAL DIGITS REPRESENTING THE ACTUAL CONTENTS OF THE MEMORY	CMT10590
0591	*	LOCATION BEING TESTED.	CMT10591
0592	*		CMT10592
0593	*	S.B. MEANING "SHOULD BE"	CMT10593
0594	*	6 OCTAL DIGITS REPRESENTING THE TEST PATTERN WHICH WAS STORED IN	CMT10594
0595	*	THE MEMORY LOCATION BEING TESTED.	CMT10595
0596	*		CMT10596
0597	01522	0 00000 TYPE DAC ** TYPE-FAILURE SUBROUTINE	CMT10597
0598	01523	54 1004 INA *1004 LOOK FOR INPUT -	CMT10598
0599	01524	0 01 01526 JMP **2 NO, GO ON.	CMT10599
0600	01525	0 04 01714 STA CHI YES, SAVE IT.	CMT10600
0601	01526	0 02 01703 LDA CHCK FORM	CMT10601
0602	01527	0 03 01704 ANA IS *	CMT10602
0603	01530	0 05 01703 ERA CHCK *	CMT10603
0604	01531	0 04 01705 STA DR DROPPED BITS.	CMT10604
0605	01532	0 02 01703 LDA CHCK FORM	CMT10605
0606	01533	0 03 01704 ANA IS *	CMT10606
0607	01534	0 05 01704 ERA IS *	CMT10607
0608	01535	0 04 01706 STA PU PICKED-UP BITS.	CMT10608
0609	01536	0 02 01741 LDA ==2 TYPE:	CMT10609
0610	01537	0 10 01613 JST TYOB	CMT10610
0611	01540	106612 OCT 106612 CARRIAGE RETURN + LINE FEED.	CMT10611
0612	01541	142256 BCI 1,D.	CMT10612

0613	01542	0 02 01705	LDA	DR	DR = DROPPED BITS.	CMT10613
0614	01543	0 10 01645	JST	TYP6	6 OCTAL DIGITS.	CMT10614
0615	01544	0 02 01741	LDA	=-2		CMT10615
0616	01545	0 10 01613	JST	TYOB		CMT10616
0617	01546	120240	BCI	2, P.		CMT10617
	01547	150256				
0618	01550	0 02 01705	LDA	PU	PU = PICKED-UP BITS.	CMT10618
0619	01551	0 10 01645	JST	TYP6	6 OCTAL DIGITS.	CMT10619
0620	01552	0 02 01741	LDA	=-2		CMT10620
0621	01553	0 10 01613	JST	TYOB		CMT10621
0622	01554	120240	BCI	2, L.		CMT10622
	01555	146256				
0623	01556	0 02 00000	LDA	0	XR = ADDRESS COUNTER.	CMT10623
0624	01557	0 10 01660	JST	TYP5	5 OCTAL DIGITS.	CMT10624
0625	01560	0 02 01733	LDA	=-3		CMT10625
0626	01561	0 10 01613	JST	TYOB		CMT10626
0627	01562	120240	BCI	3, IS		CMT10627
	01563	120311				
	01564	151640				
0628	01565	0 02 01704	LDA	IS	IS = CONTENTS OF TESTED LOCATION.	CMT10628
0629	01566	0 10 01645	JST	TYP6	6 OCTAL DIGITS.	CMT10629
0630	01567	0 02 01733	LDA	=-3		CMT10630
0631	01570	0 10 01613	JST	TYOB		CMT10631
0632	01571	120240	BCI	3, S.B.		CMT10632
	01572	151656				
	01573	141256				
0633	01574	0 02 01703	LDA	CHCK	CHCK = TEST PATTERN ("SHOULD BE").	CMT10633
0634	01575	0 10 01645	JST	TYP6	6 OCTAL DIGITS.	CMT10634
0635	01576	34 0104	SKS	*104	WAIT	CMT10635
0636	01577	0 01 01570	JMP	**1	WHILE BUSY	CMT10636
0637	01600	14 0004	OCP	4	THEN SET ASK TO INPUT MODE.	CMT10637
0638	01601	0 02 01713	LDA	CHE		CMT10638
0639	01602	100040	SZE			CMT10639
0640	01603	000000	EHLT	HLT	ERROR HALT. - STOP HERE IF "E" WAS INPUT.	CMT10640
0641	01604	54 1004	INA	*1004	LOOK FOR INPUT -	CMT10641
0642	01605	0 01 01607	JMP	**2	NO, GO ON.	CMT10642
0643	01606	0 04 01714	STA	CHI	YES, SAVE INPUT.	CMT10643

0644	01607	0 02 01714	LJA	CHI	IS IT "I" -	CMT10644
0645	01610	100040	SZE		*	CMT10645
0646	01611	3 10 01776	JST	TYAN	YES, TYPE ANSWER.	CMT10646
0647	01612	-0 01 01522	JMP*	TYFF	NO, EXIT.	CMT10647
0648			*			CMT10648
0649			*	TYPE-OUT	SUBROUTINE	CMT10649
0650			*			CMT10650
0651	01613	0 000100	TYOB	DAC	**	CMT10651
0652	01614	0 04 01702	STA	TYCT	SAVE -NO. OF WORDS TO BE TYPED OUT.	CMT10652
0653	01615	34 0104	SKS	*104	BUSY	CMT10653
0654	01616	0 01 01615	JMP	*-1	LOOP.	CMT10654
0655	01617	14 0104	UCP	*104	SET OUTPUT MODE ON ASR.	CMT10655
0656	01620	-0 02 01613	TY2	LDA*	TYOB	GET WORD TO BE TYPED OUT.
0657	01621	0416 70	ALR	8		CMT10657
0658	01622	74 0004	UTA	4	TYPE OUT MOST SIGNIFICANT HALF OF RA.	CMT10658
0659	01623	0 01 01622	JMP	*-1		CMT10659
0660	01624	0406 70	ARR	8		CMT10660
0661	01625	74 0004	UTA	4	TYPE OUT LEAST SIGNIFICANT HALF OF RA.	CMT10661
0662	01626	0 01 01625	JMP	*-1		CMT10662
0663	01627	0 12 01613	IRS	TYOB	INCREMENT MESSAGE ADDRESS	CMT10663
0664	01630	0 12 01702	IRS	TYCT	AND TYPEOUT COUNTER.	CMT10664
0665	01631	0 01 01620	JMP	TY2	RETURN UNTIL ALL WORDS ARE TYPED OUT.	CMT10665
0666	01632	-0 01 01613	JMP*	TYOB	EXIT.	CMT10666
0667			*			CMT10667
0668			*	NUMBER OUTPUT	SUBROUTINE (1 DECIMAL DIGIT PER COMPUTER WORD)	CMT10668
0669			*			CMT10669
0670	01633	0 000000	OUTN	DAC	**	CMT10670
0671	01634	0 04 01677	STA	CTR1	SAVE -NO. OF DIGITS TO BE TYPED OUT.	CMT10671
0672	01635	-0 02 01633	TYN2	LDA*	OUTN	GET WORD CONTAINING 1 DIGIT.
0673	01636	0 06 01725	ADD	*272	CONVERT TO ASCII.	CMT10673
0674	01637	74 0004	UTA	4	TYPE	CMT10674
0675	01640	0 01 01637	JMP	*-1	IT.	CMT10675
0676	01641	0 12 01633	IRS	OUTN	INCREMENT ADDRESS.	CMT10676
0677	01642	0 12 01677	IRS	CTR1	INCREMENT COUNTER.	CMT10677
0678	01643	0 01 01635	JMP	TYN2	RETURN UNTIL ALL DIGITS ARE TYPED OUT.	CMT10678
0679	01644	-0 01 01633	JMP*	OUTN	EXIT.	CMT10679
0680			*			CMT10680



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0681          *          THIS SUBROUTINE TYPES OUT THE CONTENTS OF RA IN THE FORM OF CMT10681
0682          *          6 OCTAL DIGITS. CMT10682
0683          * CMT10683
0684 01645    0 000000 TYP6 DAC ** CMT10684
0685 01646    0 04 01700 STA V1 SAVE NUMBER. CMT10685
0686 01647    0 03 01743 ANA =*100000 TYPE CMT10686
0687 01650    100400 SPL OUT CMT10687
0688 01651    0416 77 ALR 1 CONTENTS CMT10688
0689 01652    0 06 01724 ADD =*260 OF CMT10689
0690 01653    74 0004 OTA 4 BIT 1. CMT10690
0691 01654    0 01 01653 JMP *-1 * CMT10691
0692 01655    0 02 01700 LDA V1 RESTORE NUMBER. CMT10692
0693 01656    0 10 01660 JST TYP5 GO TO TYPE OUT BITS 2-16. CMT10693
0694 01657   -0 01 01645 JMP* TYP6 EXIT. CMT10694
0695          * CMT10695
0696          * 5-OCTAL-DIGIT-TYPEOUT SUBROUTINE CMT10696
0697          * CMT10697
0698 01660    0 000000 TYP5 DAC ** CMT10698
0699 01661    0416 77 ALR 1 IGNORE SIGN BIT CMT10699
0700 01662    0 04 01700 STA V1 (BIT 1). CMT10700
0701 01663    0 02 01723 LDA =-5 PREPARE TO TYPE OUT CMT10701
0702 01664    0 04 01702 STA TYCT 5 OCTAL DIGITS. CMT10702
0703 01665    0 02 01700 T2 LDA V1 POSITION CMT10703
0704 01666    0416 75 ALR 3 NEXT CMT10704
0705 01667    0 04 01700 STA V1 DIGIT. CMT10705
0706 01670    0 03 01722 ANA =7 PULL OUT 1 OCTAL DIGIT. CMT10706
0707 01671    0 06 01724 ADD =*260 CONVERT OCTAL TO ASCII. CMT10707
0708 01672    74 0004 OTA 4 TYPE CMT10708
0709 01673    0 01 01672 JMP *-1 OUT. CMT10709
0710 01674    0 12 01702 IRS TYCT INCREMENT TYPEOUT COUNTER. CMT10710
0711 01675    0 01 01665 JMP T2 GO BACK 4 TIMES. CMT10711
0712 01676   -0 01 01660 JMP* TYP5 EXIT. CMT10712
0713          * CMT10713
0714 01677    0 00 00000 CTR1 PZE COUNTER 1. CMT10714
0715 01700    0 00 00000 V1 PZE VARIABLE 1. CMT10715
0716 01701    0 00 00000 SN PZE SHIFTED NUMBER. CMT10716
0717 01702    0 00 00000 TYCT PZE TYPEOUT COUNTER. CMT10717
    
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0718	01703	0 00 00000	CHCK	PZE		CHECK NUMBER ("SHOULD BE").	CMT10718
0719	01704	0 00 00000	IS	PZE		IS.	CMT10719
0720	01705	0 00 00000	DR	PZE		DROPPED BITS.	CMT10720
0721	01706	0 00 00000	PU	PZE		PICKED-UP BITS.	CMT10721
0722	01707	101000	NOP	NOP		NOP.	CMT10722
0723	01710	0 05 01711	ERAB	ERA	ALLB	COMPLEMENT INSTRUCTION.	CMT10723
0724	01711	177777	ALLB	OCT	177777	ALL BITS.	CMT10724
0725	01712	0 00 00000	CHC	PZE		CHARACTER C.	CMT10725
0726	01713	0 00 00000	CHE	PZE		CHARACTER E.	CMT10726
0727	01714	0 00 00000	CHI	PZE		CHARACTER I.	CMT10727
0728	01715	000001	CHT	OCT	1	PRESET TO ONE - MAY CHANGE TO ZERO.	CMT10728
0729			*				CMT10729
0730	01716	0 002527	APC2	DAC	PC2	THIS WILL CHANGE IF PROGRAM IS MOVED.	CMT10730
0731			*				CMT10731
0732	01717	0 002530	FA	DAC	*2530	FIRST ADDRESS.	CMT10732
0733	01720	0 006777	LA	DAC	*6777	LAST ADDRESS.	CMT10733
0734	01721	0 007000	LAPC	DAC	*7000	LAST ADDRESS PLUS ONE.	CMT10734
0735			*				CMT10735
0736	01722	000007		FIN		DUMP LITERALS FOR THIS SECTOR.	CMT10736
	01723	177773					
	01724	000260					
	01725	000272					
	01726	000020					
	01727	004020					
	01730	177760					
	01731	000311					
	01732	000255					
	01733	177775					
	01734	177777					
	01735	000003					
	01736	177767					
	01737	177770					
	01740	177766					
	01741	177776					
	01742	077777					
	01743	100000					
	01744	125252					

01745 052525  
 01746 000001  
 01747 177736  
 01750 000002

0737			*						CMT10737
0738				ORG	*1776				CMT10738
0739			*						CMT10739
0740	01776	0 000000	TYAN	DAC	**		TYPE-ANSWER SUBROUTINE.		CMT10740
0741	01777	0 02 01776		LDA	**1		SET		CMT10741
0742	02000	0 04 02353		STA	TANE		TYPE-ANSWER-SUBROUTINE EXIT.		CMT10742
0743	02001	0 03 02526		ANA	=*77000				CMT10743
0744	02002	0 04 02460		STA	SECT		PRESENT STARTING SECTOR OF PROGRAM.		CMT10744
0745	02003	-0 02 02465		LDA*	ACHI		GET CHARACTER 'I'.		CMT10745
0746	02004	101040		SNZ					CMT10746
0747	02005	0 01 02257		JMP	TYA5		NO INPUT REQUESTED (BUT LIMITS NO GOOD).		CMT10747
0748	02006	0 02 02525		LLA	--25		INPUT REQUESTED.		CMT10748
0749	02007	0 10 02425		JST	T8		TYPE OUT FOLLOWING.		CMT10749
0750	02010	106612		OCT	106612		CARRIAGE RETURN + LINE FEED.		CMT10750
0751	02011	152331		BCI	24,TYPE IN LETTERS C, E, G, M, P, S, AND/OR T.				CMT10751
	02012	150305							
	02013	120311							
	02014	147240							
	02015	146305							
	02016	152324							
	02017	142722							
	02020	151640							
	02021	141654							
	02022	120305							
	02023	126240							
	02024	143654							
	02025	120315							
	02026	126240							
	02027	150254							
	02030	120323							
	02031	126240							
	02032	140716							

H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

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02033	142257				
02034	147722				
02035	120324				
02036	127240				
02037	120240				
02040	120240				
0752 02041	140040				
0753 02042	-0 04 02463	CRA		RESET CHARACTERS	CMT10752
0754 02043	-0 04 02464	STA* ACHC		C.	CMT10753
0755 02044	0 04 02452	STA* ACHE		E.	CMT10754
0756 02045	-0 04 02465	STA CHG		G.	CMT10755
0757 02046	0 04 02453	STA* ACHI		I.	CMT10756
0758 02047	0 04 02454	STA CHM		M.	CMT10757
0759 02050	0 04 02455	STA CHP		P.	CMT10758
0760 02051	-0 04 02466	STA CHS		S.	CMT10759
0761 02052	34 0104	STA* ACHT		T.	CMT10760
0762 02053	0 01 02052	SKS *104		BUSY	CMT10761
0763 02054	14 0004	JMP *-1		LOOP.	CMT10762
0764 02055	54 1004	OCP 4		SET INPUT MODE ON ASR.	CMT10763
0765 02056	0 01 02055	TYA2 INA *1004		INPUT ONE	CMT10764
0766 02057	0 05 02524	JMP *-1		CHARACTER.	CMT10765
0767 02060	101040	ERA =*303		IS IT C(303).	CMT10766
0768 02061	-0 12 02463	SNZ			CMT10767
0769 02062	0 05 02523	IRS* ACHC			CMT10768
0770 02063	101040	ERA =0		E(305).	CMT10769
0771 02064	-0 12 02464	SNZ			CMT10770
0772 02065	0 05 02522	IRS* ACHE			CMT10771
0773 02066	101040	ERA =2		G(307).	CMT10772
0774 02067	0 12 02452	SNZ			CMT10773
0775 02070	0 05 02521	IRS CHG			CMT10774
0776 02071	101040	ERA =*12		M(315).	CMT10775
0777 02072	0 12 02453	SNZ			CMT10776
0778 02073	0 05 02520	IRS CHM			CMT10777
0779 02074	101040	ERA =*35		P(320).	CMT10778
0780 02075	0 12 02454	SNZ			CMT10779
0781 02076	0 05 02517	IRS CHP			CMT10780
0782 02077	101040	ERA =3		S(323).	CMT10781
		SNZ			CMT10782

0783	02100	0 12 02455	IRS	CHS			CMT10783
0784	02101	0 05 02516	ERA	=7	T(324),		CMT10784
0785	02102	101040	SNZ				CMT10785
0786	02103	-0 12 02466	IRS*	ACHT			CMT10786
0787	02104	0 05 02515	ERA	=*131	OR CARRIAGE RETURN (215) -		CMT10787
0788	02105	100040	SZE				CMT10788
0789	02106	0 01 02055	JMP	TYA2	IF NONE OF ABOVE, TRY AGAIN.		CMT10789
0790	02107	0 02 02453	LDA	CHM	WAS "M"		CMT10790
0791	02110	101040	SNZ		INPUT -		CMT10791
0792	02111	0 01 02254	JMP	TYA4	NO, GO ON.		CMT10792
0793	02112	0 02 02514	LDA	=-14	YES,		CMT10793
0794	02113	0 10 02425	JST	TH	TYPE OUT.		CMT10794
0795	02114	106612	OCT	106612	CARRIAGE RETURN + LINE FEED.		CMT10795
0796	02115	150322	BCI	13,PROGRAM STARTS	IN SECTOR:		CMT10796
	02116	147707					
	02117	151301					
	02120	146640					
	02121	151724					
	02122	140722					
	02123	152323					
	02124	120311					
	02125	147240					
	02126	151705					
	02127	141724					
	02130	147722					
	02131	135240					
0797	02132	0 02 02460	LDA	SECT	GET CURRENT STARTING SECTOR IN BITS 2-7.		CMT10797
0798	02133	0406 64	ARR	12	MOVE MOST-SIGNIFICANT-DIGIT TO BITS 14-16.		CMT10798
0799	02134	0 03 02516	ANA	=7	MASK OUT REST.		CMT10799
0800	02135	0 06 02513	ADD	=*260	CONVERT TO ASCII.		CMT10800
0801	02136	74 0004	OTA	4	TYPE		CMT10801
0802	02137	0 01 02136	JMP	*-1	IT.		CMT10802
0803	02140	0 02 02460	LDA	SECT	GET SECTOR, AGAIN.		CMT10803
0804	02141	0406 67	ARR	9	MOVE LEAST-SINIFICANT-DIGIT TO BITS 14-16.		CMT10804
0805	02142	0 03 02516	ANA	=7	MASK OUT REST.		CMT10805
0806	02143	0 06 02513	ADD	=*260	CONVERT TO ASCII.		CMT10806
0807	02144	74 0004	OTA	4	TYPE		CMT10807

0808	02145	0 01 02144	JMP	*-1	IT.	CMT10808
0809	02146	0 02 02512	LDA	=-1	TYPE	CMT10809
0810	02147	0 10 02425	JST	T8	TWO	CMT10810
0811	02150	120240	BCI	1,	SPACES.	CMT10811
0812	02151	140040	CRA		INITIALIZE	CMT10812
0813	02152	0 04 02447	STA	V2	FOR	CMT10813
0814	02153	0 02 02511	LDA	=-2	INPUT.	CMT10814
0815	02154	0 04 02445	STA	CTR2	*	CMT10815
0816	02155	34 0104	SKS	*104	BUSY	CMT10816
0817	02156	0 01 02155	JMP	*-1	LOOP.	CMT10817
0818	02157	14 0004	DCP	4	SET INPUT MODE ON ASR.	CMT10818
0819	02160	54 1004	TYA3 INA	*1004	INPUT ONE	CMT10819
0820	02161	0 01 02160	JMP	*-1	CHARACTER.	CMT10820
0821	02162	0 04 02450	STA	V3	SAVE IT.	CMT10821
0822	02163	0 05 02510	ERA	=*215	IS IT CARRIAGE RETURN -	CMT10822
0823	02164	101040	SNZ			CMT10823
0824	02165	0 01 02205	JMP	TY32	YES, GO ON.	CMT10824
0825	02166	0 02 02450	LDA	V3	NO.	CMT10825
0826	02167	0 03 02507	ANA	=*267	IS IT OTHER THAN OCTAL DIGIT -	CMT10826
0827	02170	101040	SNZ			CMT10827
0828	02171	0 01 02160	JMP	TYA3	YES, TRY AGAIN.	CMT10828
0829	02172	0 02 02450	LDA	V3		CMT10829
0830	02173	0 07 02513	SUB	=*260		CMT10830
0831	02174	0 04 02450	STA	V3		CMT10831
0832	02175	100400	SPL			CMT10832
0833	02176	0 01 02160	JMP	TYA3	YES, TRY AGAIN.	CMT10833
0834	02177	0 02 02447	LDA	V2	NO. IT IS AN OCTAL DIGIT.	CMT10834
0835	02200	0 06 02450	ADD	V3	PACK 1 OR 2 DIGITS IN V2.	CMT10835
0836	02201	0416 75	ALR	3	*	CMT10836
0837	02202	0 04 02447	STA	V2	*	CMT10837
0838	02203	0 12 02445	IRS	CTR2		CMT10838
0839	02204	0 01 02160	JMP	TYA3		CMT10839
0840	02205	0 02 02447	TY32 LDA	V2	WHEN 2 OCTAL DIGITS	CMT10840
0841	02206	0415 72	ALS	6	OR 1 OCTAL DIGIT AND A CARRIAGE RETURN	CMT10841
0842	02207	0 04 02460	STA	SECT	HAVE BEEN INPUT,	CMT10842
0843	02210	0 06 02506	ADD	=*20	FORM NEW STARTING SECTOR	CMT10843
0844	02211	0 04 02447	STA	V2	AND STARTING LOCATION.	CMT10844

0845	02212	0 04	02451	STA	V4		*	CMT10845
0846	02213	-0 02	02474	LDA*	APCH		GET	CMT10846
0847	02214	0 07	02505	SUB	=1		CURRENT	CMT10847
0848	02215	0 04	02450	STA	V3		STARTING LOCATION	CMT10848
0849	02216	-0 02	02472	LDA*	APC3		AND FINAL LOCATION.	CMT10849
0850	02217	0 07	02450	SUB	V3		FORM DIFFERENCE (LENGTH OF PROGRAM).	CMT10850
0851	02220	0 05	02512	ERA	=-1		CONVERT TO	CMT10851
0852	02221	0 06	02505	ADD	=1		TWO'S	CMT10852
0853	02222	0 04	02445	STA	CTR2		COMPLEMENT.	CMT10853
0854	02223	-0 02	02473	LDA*	AAPC		CHANGE ADDRESS	CMT10854
0855	02224	0 03	02504	ANA	=*777		OF PC2 IN FIRST	CMT10855
0856	02225	0 06	02460	ADD	SECT		SECTOR SO THAT IT	CMT10856
0857	02226	0 06	02503	ADD	=*1000		WILL BE CORRECT AFTER	CMT10857
0858	02227	-0 04	02473	STA*	AAPC		PROGRAM IS MOVED.	CMT10858
0859	02230	0 02	02502	LDA	=-13		CHANGE 13	CMT10859
0860	02231	0 04	02445	STA	CTR3		ADDRESSES IN	CMT10860
0861	02232	0 02	02461	LDA	LDA1		THIS SECTOR	CMT10861
0862	02233	0 04	02235	STA	R1		SO THAT THEY	CMT10862
0863	02234	0 02	02462	LDA	STA1		WILL BE CORRECT	CMT10863
0864	02235	0 04	02241	STA	R2		AFTER PROGRAM	CMT10864
0865	02236	0 02	02463	R1 LDA	ACHC		IS MOVED.	CMT10865
0866	02237	0 03	02504	ANA	=*777		*	CMT10866
0867	02240	0 06	02460	ADD	SECT		*	CMT10867
0868	02241	0 04	02463	R2 STA	ACHC		*	CMT10868
0869	02242	0 12	02236	IRS	R1		*	CMT10869
0870	02243	0 12	02241	IRS	R2		*	CMT10870
0871	02244	0 12	02445	IRS	CTR3		*	CMT10871
0872	02245	0 01	02236	JMP	R1		*	CMT10872
0873	02246	-0 02	02450	TY34 LDA*	V3		MOVE PROGRAM.	CMT10873
0874	02247	-0 04	02447	STA*	V2		*	CMT10874
0875	02250	0 12	02450	IRS	V3		*	CMT10875
0876	02251	0 12	02447	IRS	V2		*	CMT10876
0877	02252	0 12	02445	IRS	CTR2		*	CMT10877
0878	02253	0 01	02246	JMP	TY34		*	CMT10878
0879	02254	0 02	02454	TYA4 LDA	CHP		WAS "P" INPUT -	CMT10879
0880	02255	101040		SNZ				CMT10880
0881	02256	0 01	02334	JMP	TYA8		NO, GO ON.	CMT10881

0882	02257	0 02 02501	TYA5	LDA	=-16	YES.	CMT10882
0883	02260	0 10 02425		JST	TR	TYPE OUT.	CMT10883
0884	02261	106612		OCT	106612	CARRIAGE RETURN + LINE FEED.	CMT10884
0885	02262	143311		BCI	3, FIRST		CMT10885
	02263	151323					
	02264	152240					
0886	02265	146317		BCI	12, LOCATION BEING TESTED:		CMT10886
	02266	141701					
	02267	152311					
	02270	147716					
	02271	120302					
	02272	142711					
	02273	147307					
	02274	120324					
	02275	142723					
	02276	152305					
	02277	142272					
	02300	120240					
0887	02301	-0 02 02475		LDA*	AFA	ADDRESS OF FIRST LOCATION BEING TESTED.	CMT10887
0888	02302	0 10 02354		JST	TY99	GET NEW FIRST ADDRESS	CMT10888
0889	02303	-0 04 02475		STA*	AFA	AND SAVE IT.	CMT10889
0890	02304	0 02 02501	TYA6	LDA	=-16	TYPE	CMT10890
0891	02305	0 10 02425		JST	TR	OUT.	CMT10891
0892	02306	106612		OCT	106612	CARRIAGE RETURN + LINE FEED.	CMT10892
0893	02307	120314		BCI	3, LAST		CMT10893
	02310	140723					
	02311	152240					
0894	02312	146317		BCI	12, LOCATION BEING TESTED:		CMT10894
	02313	141701					
	02314	152311					
	02315	147716					
	02316	120302					
	02317	142711					
	02320	147307					
	02321	120324					
	02322	142723					
	02323	152305					



02324	142272					
02325	120240					
0895 02326	-0 02 02476	LDA*	ALA	ADDRESS OF LAST LOCATION BEING TESTED.		CMT10895
0896 02327	0 10 02354	JST	TY99	GET NEW LAST ADDRESS		CMT10896
0897 02330	-0 04 02476	STA*	ALA	AND SAVE IT.		CMT10897
0898 02331	-0 02 02476	LDA*	ALA	THIS INST. NEC. BECAUSE TY99 MAY SKIP.		CMT10898
0899 02332	0 06 02505	ADD	=1	FORM		CMT10899
0900 02333	-0 04 02477	STA*	ALAP	LAST-ADDRESS-PLUS-ONE AND SAVE IT.		CMT10900
0901 02334	0 02 02452 TYA8	LDA	CHG	WAS "G" INPUT -		CMT10901
0902 02335	101040	SNZ				CMT10902
0903 02336	0 01 02341	JMP	TY86	NO, GO ON.		CMT10903
0904 02337	0 02 02457	LDA	NOPI	YES, PUT NOP INSTRUCTION		CMT10904
0905 02340	-0 04 02467	STA*	AEOP	IN END-OF-PASS-HALT LOCATION.		CMT10905
0906 02341	0 02 02455 TY86	LDA	CHS	WAS "S" INPUT -		CMT10906
0907 02342	101040	SNZ				CMT10907
0908 02343	0 01 02346	JMP	TY88	NO.		CMT10908
0909 02344	140040	CRA		YES. PUT HLT		CMT10909
0910 02345	-0 04 02467	STA*	AEOP	IN END-OF-PASS-HALT LOCATION.		CMT10910
0911 02346	0 02 02453 TY88	LDA	CHM	WAS "M" INPUT -		CMT10911
0912 02347	101040	SNZ				CMT10912
0913 02350	0 01 02352	JMP	TYA9	NO, GO TO EXIT.		CMT10913
0914 02351	-0 01 02451	JMP*	V4	YES, GO TO NEW STARTING LOCATION.		CMT10914
0915 02352	-0 01 02353 TYA9	JMP*	TANE			CMT10915
0916 02353	0 000000	TANE	DAC **	TYPE-ANSWER-SUBROUTINE EXIT.		CMT10916
0917		*				CMT10917
0918		*		THIS SUBROUTINE TYPES OUT THE PRESENT LIMIT (FIRST OR LAST		CMT10918
0919		*		ADDRESS) AND INPUTS 5 OCTAL DIGITS OR 0-4 OCTAL DIGITS FOLLOWED BY		CMT10919
0920		*		A CARRIAGE RETURN.		CMT10920
0921		*				CMT10921
0922 02354	0 000000	TY99	DAC **			CMT10922
0923 02355	-0 10 02470	JST*	ATY5	TYPE OUT PRESENT LIMIT.		CMT10923
0924 02356	0 02 02354	LDA	TY99	SET		CMT10924
0925 02357	0 06 02505	ADD	=1	SKIP		CMT10925
0926 02360	0 04 02456	STA	TY97	EXIT.		CMT10926
0927 02361	0 02 02512	LDA	=-1	TYPE		CMT10927
0928 02362	0 10 02425	JST	T8	TWO		CMT10928
0929 02363	120240	BCI	1,	SPACES.		CMT10929

0930	02364	140040		CRA		INITIALIZE	CMT10930
0931	02365	0 04 02447		STA	V2	FOR	CMT10931
0932	02366	0 02 02500		LDA	=-5	INPUT.	CMT10932
0933	02367	-0 04 02471		STA*	ACT1	*	CMT10933
0934	02370	34 0104		SKS	*104	BUSY	CMT10934
0935	02371	0 01 02370		JMP	*-1	LOOP.	CMT10935
0936	02372	14 0004		DCP	4	SET INPUT MODE ON ASR.	CMT10936
0937	02373	54 1004	TY98	INA	*1004	INPUT ONE	CMT10937
0938	02374	0 01 02373		JMP	*-1	CHARACTER.	CMT10938
0939	02375	0 04 02450		STA	V3	SAVE IT.	CMT10939
0940	02376	0 05 02510		ERA	=*215	IS IT CARRIAGE RETURN -	CMT10940
0941	02377	101040		SNZ			CMT10941
0942	02400	0 01 02420		JMP	TY96	YES, GO ON.	CMT10942
0943	02401	0 02 02450		LDA	V3	NO.	CMT10943
0944	02402	0 03 02507		ANA	=*267	IS IT ASCII OCTAL DIGIT -	CMT10944
0945	02403	101040		SNZ			CMT10945
0946	02404	0 01 02373		JMP	TY98	NO, TRY AGAIN.	CMT10946
0947	02405	0 02 02450		LDA	V3		CMT10947
0948	02406	0 07 02513		SUB	=*260		CMT10948
0949	02407	0 04 02450		STA	V3		CMT10949
0950	02410	100400		SPL			CMT10950
0951	02411	0 01 02373		JMP	TY98	NO, TRY AGAIN.	CMT10951
0952	02412	0 02 02447		LDA	V2	YES. PACK UP TO 5 OCTAL DIGITS IN V2.	CMT10952
0953	02413	0 06 02450		ADD	V3	*	CMT10953
0954	02414	0416 75		ALR	3	*	CMT10954
0955	02415	0 04 02447		STA	V2	*	CMT10955
0956	02416	-0 12 02471		IRS*	ACT1	*	CMT10956
0957	02417	0 01 02373		JMP	TY98	*	CMT10957
0958	02420	0 02 02447	TY96	LDA	V2	WAS ANY NUMBER (OTHER THAN 0) INPUT -	CMT10958
0959	02421	101040		SNZ			CMT10959
0960	02422	-0 01 02456		JMP*	TY97	NO, SKIP INSTRUCTION AFTER *JST TY99*.	CMT10960
0961	02423	3406 75		ARR	3	YES, REPOSITION NUMBER.	CMT10961
0962	02424	-0 01 02354		JMP*	TY99	EXIT.	CMT10962
0963				*			CMT10963
0964				* TYPE-OUT	SUBROUTINE		CMT10964
0965				*			CMT10965
0966	02425	0 000000	T8	DAC	**		CMT10966

0967	02426	0 04 02445	STA	CTR2	SAVE -NO. OF WORDS TO BE TYPED OUT.	CMT10967
0968	02427	34 0104	SKS	*104	BUSY	CMT10968
0969	02430	0 01 02427	JMP	*-1	LOOP.	CMT10969
0970	02431	14 0104	OCP	*104	SET OUTPUT MODE ON ASR.	CMT10970
0971	02432	-0 02 02425	TB2 LDA*	TB	GET WORD TO BE TYPED OUT.	CMT10971
0972	02433	0416 70	ALR	8		CMT10972
0973	02434	74 0004	OTA	4	TYPE OUT MOST SIGNIFICANT HALF OF RA.	CMT10973
0974	02435	0 01 02434	JMP	*-1		CMT10974
0975	02436	0406 70	ARR	8		CMT10975
0976	02437	74 0004	OTA	4	TYPE OUT LEAST SIGNIFICANT HALF OF RA.	CMT10976
0977	02440	0 01 02437	JMP	*-1		CMT10977
0978	02441	0 12 02425	IRS	TB	INCREMENT MESSAGE ADDRESS	CMT10978
0979	02442	0 12 02445	IRS	CTR2	AND COUNTER.	CMT10979
0980	02443	0 01 02432	JMP	TB2	RETURN UNTIL ALL WORDS ARE TYPED OUT.	CMT10980
0981	02444	-0 01 02425	JMP*	TB	EXIT.	CMT10981
0982			*			CMT10982
0983	02445	0 00 00000	CTR2	PZE	COUNTER 2.	CMT10983
0984	02446	0 00 00000	CTR3	PZE	COUNTER 3.	CMT10984
0985	02447	0 00 00000	V2	PZE	VARIABLE 2.	CMT10985
0986	02450	0 00 00000	V3	PZE	VARIABLE 3.	CMT10986
0987	02451	0 00 00000	V4	PZE	VARIABLE 4.	CMT10987
0988	02452	0 00 00000	CHG	PZE	CHARACTER G.	CMT10988
0989	02453	0 00 00000	CHM	PZE	CHARACTER M.	CMT10989
0990	02454	0 00 00000	CHP	PZE	CHARACTER P.	CMT10990
0991	02455	0 00 00000	CHS	PZE	CHARACTER S.	CMT10991
0992	02456	0 000000	TY97	DAC	**	CMT10992
0993	02457	101000	NOPI	NOP	NOP INSTRUCTION.	CMT10993
0994	02460	0 00 00000	SECT	PZE		CMT10994
0995	02461	0 02 02463	LDA1	LDA	ACHC	CMT10995
0996	02462	0 04 02463	STA1	STA	ACHC	CMT10996
0997			*			CMT10997
0998	02463	0 001712	ACHC	DAC	CHC	CMT10998
0999	02464	0 001713	ACHE	DAC	CHE	CMT10999
1000	02465	0 001714	ACHI	DAC	CHI	CMT11000
1001	02466	0 001715	ACHT	DAC	CHT	CMT11001
1002	02467	0 001424	AEOP	DAC	EOPH	CMT11002
1003	02470	0 001660	ATY5	DAC	TYP5	CMT11003

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1004 02471 0 001677 ACT1 DAC CTR1
1005 02472 0 001023 APC3 DAC PC3
1006 02473 0 001716 AAPC DAC APC2
1007 02474 0 001021 APCH DAC PCHK
1008
1009 02475 0 001717 AFA DAC FA
1010 02476 0 001720 ALA DAC LA
1011 02477 0 001721 ALAP DAC LAPO
1012
1013 02500 177773
      02501 177760
      02502 177763
      02503 001000
      02504 000777
      02505 000001
      02506 000020
      02507 000267
      02510 000215
      02511 177776
      02512 177777
      02513 000260
      02514 177762
      02515 000131
      02516 000007
      02517 000003
      02520 000035
      02521 000012
      02522 000002
      02523 000006
      02524 000303
      02525 177747
      02526 077000
    
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DUMP LITERALS FOR THIS SECTOR.

CMT11004  
CMT11005  
CMT11006  
CMT11007  
CMT11008  
CMT11009  
CMT11010  
CMT11011  
CMT11012  
CMT11013

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1014
1015 02527 -0 10 02472 PC2 JST* APC3
1016 END STRT
NO ERRORS IN ABOVE ASSEMBLY.
    
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THIS INST. ESTABLISHES WHERE PROGRAM  
CURRENTLY ENDS.

CMT11014  
CMT11015  
CMT11016

H O N E Y W E L L    C O M P U T E R   C O N T R O L   D I V I S I O N

P R O G R A M   D O C U M E N T A T I O N

\* E510-001-6603 (X16-CMT1)    3C NO. 180265000

REV. C

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DAP-16 REV. BX 1-30-67 OPR



H O N E Y W E L L

COMPUTER CONTROL DIVISION

PROGRAM DOCUMENTATION

\* E510-001-6608 (X16-08T1) 3C NO. 180318000 REV. A PAGE 1

0001	*	E510-001-6608 (X16-08T1)	3C NO. 180318000	REV. A	08T10001
0002	*				08T10002
0003	*				08T10003
0004	*				08T10004
0005	*	COMPUTERS: DDP-416, DDP-516			08T10005
0006	*				08T10006
0007	*				08T10007
0008	*				08T10008
0009	*				08T10009
0010	*	PROGRAM CATEGORY: TEST AND MAINTENANCE			08T10010
0011	*				08T10011
0012	*				08T10012
0013	*				08T10013
0014	*				08T10014
0015	*	PROGRAM TITLE: X16-08T1			08T10015
0016	*	MEMORY LOCKOUT TEST NO.1 FOR THE DDP-416 AND DDP-516			08T10016
0017	*				08T10017
0018	*				08T10018
0019	*				08T10019
0020	*				08T10020
0021	*				08T10021
0022	*				08T10022
0023	*				08T10023
0024	*		APPROVAL	DATE	08T10024
0025	*				08T10025
0026	*				08T10026
0027	*				08T10027
0028	*		P/S <i>RP</i> , <i>JR Butler D.A.</i>	<i>5-10-67</i>	08T10028
0029	*				08T10029
0030	*				08T10030
0031	*				08T10031
0032	*		D/M <i>Bill</i> , <i>C.F. McLanney</i>	<i>5-11-67</i>	08T10032
0033	*				08T10033
0034	*				08T10034
0035	*				08T10035
0036	*		NO. OF PAGES	<i>26</i>	08T10036
0037	*				08T10037

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REV. A

PAGE 2

0038	*		08T10038
0039	*	REVISIONS	08T10039
0040	*		08T10040
0041	*	REV. A	08T10041
0042	*		08T10042
0043	*		08T10043
0044	*	AUTHOR	08T10044
0045	*		08T10045
0046	*	HONEYWELL, INC. - COMPUTER CONTROL DIVISION	08T10046
0047	*		08T10047
0048	*		08T10048
0049	*	PURPOSE	08T10049
0050	*		08T10050
0051	*	TO TEST THE MEMORY LOCKOUT OPTION (516-08)	08T10051
0052	*		08T10052
0053	*		08T10053
0054	*	RESTRICTIONS	08T10054
0055	*		08T10055
0056	*	THIS PROGRAM WILL OPERATE ON ANY DDP-416 OR DDP-516 WHICH HAS	08T10056
0057	*	OPTION 516-08.	08T10057
0058	*		08T10058
0059	*		08T10059
0060	*	TIMING	08T10060
0061	*		08T10061
0062	*	THIS PROGRAM TAKES ABOUT 2.3 MILLISEC. PER PASS OR 25,500 PASSES	08T10062
0063	*	PER MINUTE OR 1,530,000 PASSES PER HOUR.	08T10063
0064	*		08T10064
0065	*		08T10065
0066	*	STORAGE	08T10066
0067	*		08T10067
0068	*	THIS PROGRAM USES LOCATIONS IN EVERY IMPLEMENTED SECTOR OF MEMORY.	08T10068
0069	*		08T10069
0070	*		08T10070
0071	*	EJCT	08T10071



0072	* USE	08T10072
0073	*	08T10073
0074	* START PROGRAM AT LOCATION "STRT".	08T10074
0075	*	08T10075
0076	* THE PROGRAM SHOULD STOP AT "EOPH", THE END-OF-PASS HALT.	08T10076
0077	* EACH PUSH OF THE START BUTTON SHOULD CAUSE THE PROGRAM TO LOOP	08T10077
0078	* THROUGH ALL THE TESTS AND STOP AT "EOPH". IF IT DOES, TYPE IN THE	08T10078
0079	* CHARACTER "G" AND THEN PRESS START TO CAUSE THE PROGRAM TO CYCLE	08T10079
0080	* WITHOUT STOPPING UNLESS IT DETECTS AN ERROR.	08T10080
0081	*	08T10081
0082	* IF THE CHARACTER "S" IS TYPED IN, THE PROGRAM WILL AGAIN	08T10082
0083	* STOP AFTER EACH PASS.	08T10083
0084	*	08T10084
0085	* IF THE CHARACTER "T" IS TYPED IN, THE NUMBER OF PASSES	08T10085
0086	* COMPLETED WILL BE TYPED OUT.	08T10086
0087	*	08T10087
0088	*	08T10088
0089	* ERRORS	08T10089
0090	*	08T10090
0091	* WHENEVER A PLANNED INTERRUPT DOES NOT OCCUR, A "JST EROR" IS	08T10091
0092	* EXECUTED. SINCE THE "HLT" IN THE ERROR ROUTINE MAY NOW CAUSE AN	08T10092
0093	* INTERRUPT, ANOTHER LINK ADDRESS IS STORED IN LOC. '62 AND A SECOND	08T10093
0094	* "HLT" IS USED. WHEN EITHER OF THESE TWO ERROR HALTS IS ENCOUN-	08T10094
0095	* TERED, THE CONTENTS OF REGISTER "A" WILL BE THE SAME AS THEY WERE	08T10095
0096	* WHEN THE PLANNED INTERRUPT SHOULD HAVE OCCURRED.	08T10096
0097	*	08T10097
0098	* IN ORDER TO DISPLAY MORE INFORMATION IN REG. A, NAMELY THE	08T10098
0099	* CONTENTS OF "EROR", THE ORIGINAL CONTENTS OF LOC. '62, AND THE	08T10099
0100	* PRESENT CONTENTS OF LOC. '62, THE "START" BUTTON WILL HAVE TO BE	08T10100
0101	* PUSHED 1, 2, OR 3 TIMES, RESPECTIVELY. A FOURTH PUSH WILL RETURN	08T10101
0102	* CONTROL TO THE MAIN PROGRAM WHICH WILL RE-TRY THE FAILING TEST.	08T10102
0103	*	08T10103
0104	*	08T10104
0105	EJCT	08T10105

0106	* METHOD	08T10106
0107	*	08T10107
0108	*	08T10108
0109	* THIS PROGRAM CONTAINS A FEATURE WHICH TRACES THE PATH OF THE	08T10109
0110	* PROGRAM USING JST INSTRUCTIONS. EACH TEST STARTS WITH A "JST	08T10110
0111	* JSTL" (THE JST-REPORTING LOCATION) FOLLOWED BY A "JST ++1" WHICH	08T10111
0112	* IN TURN IS FOLLOWED BY A "PZE 2". LOCATION "JSTL" IS MODIFIED AT	08T10112
0113	* THE BEGINNING OF EACH TEST AND EACH "PZE 2" IS MODIFIED TO CONTAIN	08T10113
0114	* ITS OWN ADDRESS. THE "PZE 2" LOCATIONS ARE CHECKED FOR THEIR OWN	08T10114
0115	* ADDRESSES AND RESTORED TO "PZE 2" AT THE END OF EACH PASS.	08T10115
0116	*	08T10116
0117	* THIS PROGRAM TESTS TO SEE THAT THE FOLLOWING INSTRUCTIONS	08T10117
0118	* CAUSE RESTRICTED MODE VIOLATION INTERRUPTS:	08T10118
0119	*	08T10119
0120	* 1. INDIRECT ADDRESSING (MORE THAN 8 LEVELS)	08T10120
0121	* 2. INH	08T10121
0122	* 3. OCP	08T10122
0123	* 4. SKS	08T10123
0124	* 5. OTA	08T10124
0125	* 6. INA	08T10125
0126	* 7. HLT	08T10126
0127	* 8. SMK	08T10127
0128	* 9. STX	08T10128
0129	* 10. IMA	08T10129
0130	* 11. IRS	08T10130
0131	* 12. JST	08T10131
0132	* 13. INDIRECT STA	08T10132
0133	* 14. INDEXED STA	08T10133
0134	* 15. LDX	08T10134
0135	*	08T10135
0136	* SECTOR 0 RELOCATION IS ALSO TESTED.	08T10136
0137	*	08T10137
0138	* EJCT	08T10138

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0158 00774 000000  
0159 00775 000000  
0160 00776 100000  
0161 00777 000000  
0162

\* ABBREVIATIONS

- \* ASCII-AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE
- \* ASR - TELETYPEWRITER (AUTOMATIC SEND-RECEIVE SET)
- \* INST- (COMPUTER) INSTRUCTION
- \* INT - INTERRUPT
- \* LOC - LOCATION (IN CORE MEMORY)
- \* RA - REGISTER A
- \* REG - (HARDWARE) REGISTER
- \* RM - RESTRICTED MODE
- \* RMVI- RESTRICTED MODE VIOLATION INTERRUPT

08T10139  
08T10140  
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08T10160  
08T10161  
08T10162

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F5  
ORG \*774  
LOAD

THIS PROGRAM IS NOT RELOCATABLE (08-29-66).

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T0 BSZ 1  
T2 BSZ 1  
TL0 OCT 100000  
TL1 BSZ 1  
EJCT

0163			*				08T10163
0164			* INITIALIZE				08T10164
0165			*				08T10165
0166	01000	0 10 01711	STRT JST	JSTL	REPORT IN TO "JSTL"		08T10166
0167	01001	0 10 01002		JST **+1	AND		08T10167
0168	01002	0 00 00002	J01 PZE	2	TO THIS LOCATION.		08T10168
0169	01003	0 02 01613		LDA ERAD	PUT "ERROR ADDRESS" IN		08T10169
0170	01004	0 04 00062		STA *62	LOCKOUT VIOLATION INTERRUPT LINK LOCATION.		08T10170
0171	01005	0 02 01657		LDA ONES	SET ALL SECTORS TO UN-PROTECTED MODE.		08T10171
0172	01006	74 1420		SMK *1420	*		08T10172
0173	01007	74 1520		SMK *1520	*		08T10173
0174	01010	74 1620		SMK *1620	*		08T10174
0175	01011	74 1720		SMK *1720	*		08T10175
0176	01012	0 02 01736		LDA =*100000	RESET		08T10176
0177	01013	0 04 00776		STA TLO	LOC. *776.		08T10177
0178	01014	0 02 01735		LDA =*140000	SET SECTORS 0 AND 1		08T10178
0179	01015	74 1420		SMK *1420	TO UN-PROTECTED MODE AND		08T10179
0180	01016	140040		CRA	ALL OTHERS		08T10180
0181	01017	74 1520		SMK *1520	TO		08T10181
0182	01020	74 1620		SMK *1620	PROTECTED		08T10182
0183	01021	74 1720		SMK *1720	MODE.		08T10183
0184			*				08T10184
0185			* TEST INDIRECT ADDRESSING INTERRUPT				08T10185
0186			*				08T10186
0187	01022	0 10 01711	S01 JST	JSTL	REPORT.		08T10187
0188	01023	0 10 01024		JST **+1	REPORT.		08T10188
0189	01024	0 00 00002	J02 PZE	2			08T10189
0190	01025	001401		ERM	ENTER RESTRICTED MODE.		08T10190
0191	01026	0 02 01033		LDA L1	RE-SET		08T10191
0192	01027	0 04 00062		STA *62	LINK.		08T10192
0193	01030	-0 04 01662		STA* IAT	ATTEMPT 8-LEVEL INDIRECT ADDRESSING.		08T10193
0194	01031	0 10 01614		JST EROR	GO TO ERROR IF NO INTERRUPT.		08T10194
0195	01032	0 01 01022		JMP S01	TRY AGAIN IF ERROR OCCURRED.		08T10195
0196	01033	0 001034	L1 DAC	**+1	LINK ADDRESS.		08T10196
0197	01034	0 000000		DAC **	LOCKOUT VIOLATION INTERRUPT ENTRY.		08T10197
0198			*				08T10198

0199			* TEST INH INTERRUPT					08T10199
0200			*					08T10200
0201	01035	0 10 01711	S02	JST	JSTL		REPORT.	08T10201
0202	01036	0 10 01037		JST	**+1		REPORT.	08T10202
0203	01037	0 00 00002	J03	PZE	2			08T10203
0204	01040	0 02 01047		LDA	L2		SET	08T10204
0205	01041	0 04 00062		STA	'62		LINK.	08T10205
0206	01042	001401		ERM			RE-ENTER RESTR. MODE.	08T10206
0207	01043	001001		INH			INHIBIT INTERRUPTS, CAUSE RMVI.	08T10207
0208	01044	0 02 01734		LDA	=#11		THIS INST. SHOULD BE EXECUTED.	08T10208
0209	01045	0 10 01014		JST	EROR		THIS ONE SHOULD NOT.	08T10209
0210	01046	0 01 01035		JMP	S02		TRY AGAIN IF ERROR OCCURRED.	08T10210
0211	01047	0 001050	L2	DAC	**+1		LINK ADDRESS.	08T10211
0212	01050	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10212
0213	01051	0 05 01734		ERA	=#11		WAS LDA	08T10213
0214	01052	100040		SZE			EXECUTED -	08T10214
0215	01053	0 10 01014		JST	EROR		NO.	08T10215
0216			*					08T10216
0217			* TEST OCP INTERRUPT					08T10217
0218			*					08T10218
0219	01054	0 10 01711	S03	JST	JSTL		YES.	08T10219
0220	01055	0 10 01056		JST	**+1			08T10220
0221	01056	0 00 00002	J04	PZE	2			08T10221
0222	01057	001401		ERM			RE-ENTER R.M.	08T10222
0223	01060	0 02 01066		LDA	L3		SET	08T10223
0224	01061	0 04 00062		STA	'62		LINK.	08T10224
0225	01062	14 0037		OCP	'37		UNASSIGNED OCP.	08T10225
0226	01063	0 10 01014		JST	EROR		GO TO ERROR IF NO INTERRUPT.	08T10226
0227	01064	0 10 01014		JST	EROR		ALSO, JST IN CASE INSTRUCTION SKIPS.	08T10227
0228	01065	0 01 01054		JMP	S03		TRY AGAIN IF ERROR OCCURRED.	08T10228
0229	01066	0 001067	L3	DAC	**+1		LINK ADDRESS.	08T10229
0230	01067	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10230
0231			*					08T10231
0232			* TEST SKS INTERRUPT					08T10232
0233			*					08T10233
0234	01070	0 10 01711	S04	JST	JSTL			08T10234
0235	01071	0 10 01072		JST	**+1			08T10235

0236	01072	0 00 00002	J05	PZE	2			08T10236
0237	01073	001401		ERM			SET R.M.	08T10237
0238	01074	0 02 01102		LDA	L4		SET	08T10238
0239	01075	0 04 00062		STA	*62		LINK.	08T10239
0240	01076	34 0037		SKS	*37		USE UNASSIGNED SKS TO CAUSE RMVI.	08T10240
0241	01077	0 10 01614		JST	EROR		IF NOT, GO TO ERROR	08T10241
0242	01100	0 10 01614		JST	EROR		WHETHER SKS SKIPS OR DOESN'T.	08T10242
0243	01101	0 01 01070		JMP	S04		TRY AGAIN.	08T10243
0244	01102	0 001103	L4	DAC	**1		LINK ADDRESS.	08T10244
0245	01103	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10245
0246			*					08T10246
0247			* TEST OTA INTERRUPT					08T10247
0248			*					08T10248
0249	01104	0 10 01711	S05	JST	JSTL			08T10249
0250	01105	0 10 01106		JST	**1			08T10250
0251	01106	0 00 00002	J06	PZE	2			08T10251
0252	01107	0 02 01116		LDA	L5		SET	08T10252
0253	01110	0 04 00062		STA	*62		LINK.	08T10253
0254	01111	001401		ERM			SET R.M.	08T10254
0255	01112	74 0037		OTA	*37		UNASSIGNED OTA.	08T10255
0256	01113	0 10 01614		JST	EROR		IF NO INTERRUPT, GO TO ERROR	08T10256
0257	01114	0 10 01614		JST	EROR		WHETHER OTA SKIPS DOESN'T.	08T10257
0258	01115	0 01 01104		JMP	S05		TRY AGAIN IF ERROR OCCURRED.	08T10258
0259	01116	0 001117	L5	DAC	**1		LINK ADDRESS.	08T10259
0260	01117	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10260
0261			*					08T10261
0262			* TEST INA INTERRUPT					08T10262
0263			*					08T10263
0264	01120	0 10 01711	S06	JST	JSTL			08T10264
0265	01121	0 10 01122		JST	**1			08T10265
0266	01122	0 00 00002	J07	PZE	2			08T10266
0267	01123	0 02 01133		LDA	L6		SET	08T10267
0268	01124	0 04 00062		STA	*62		LINK.	08T10268
0269	01125	001401		ERM			SET R.M.	08T10269
0270	01126	0 02 01733		LDA	=*125252		PATTERN IN RA SHOULD NOT BE CHANGED	08T10270
0271	01127	54 1037		INA	*1037		BY INA.	08T10271
0272	01130	0 10 01614		JST	EROR		GO TO ERROR IF NO INTERRUPT.	08T10272

0273	01131	0 10 01614		JST	EROR				08T10273
0274	01132	0 01 01120		JMP	S06		TRY AGAIN.		08T10274
0275	01133	0 001134	L6	DAC	**+1		LINK ADDRESS.		08T10275
0276	01134	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.		08T10276
0277	01135	101040		SNZ			RA SHOULD NOT HAVE BEEN CLEARED.		08T10277
0278	01136	0 10 01614		JST	EROR		GO TO ERROR IF IT WAS CLEARED.		08T10278
0279	01137	0 05 01733		ERA	=#125252		RA SHOULD NOT HAVE		08T10279
0280	01140	100040		SZE			BEEN CHANGED.		08T10280
0281	01141	0 10 01614		JST	EROR		GO TO ERROR IF IT WAS CHANGED.		08T10281
0282				*					08T10282
0283				* TEST HLT INTERRUPT					08T10283
0284				*					08T10284
0285	01142	0 10 01711	S07	JST	JSTL				08T10285
0286	01143	0 10 01144		JST	**+1				08T10286
0287	01144	0 00 00002	J08	PZE	2				08T10287
0288	01145	001401		ERM			SET R.M.		08T10288
0289	01146	0 02 01153		LDA	L7		SET		08T10289
0290	01147	0 04 00062		STA	#62		LINK.		08T10290
0291	01150	000000		HLT			USE HLT.		08T10291
0292	01151	0 10 01614		JST	EROR		GO TO ERROR IF NO INTERRUPT.		08T10292
0293	01152	0 01 01142		JMP	S07		TRY AGAIN.		08T10293
0294	01153	0 001154	L7	DAC	**+1		LINK ADDRESS.		08T10294
0295	01154	0 000000		DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.		08T10295
0296				*					08T10296
0297				* TEST SMK INTERRUPT					08T10297
0298				*					08T10298
0299	01155	0 10 01711	S08	JST	JSTL				08T10299
0300	01156	0 10 01157		JST	**+1				08T10300
0301	01157	0 00 00002	J09	PZE	2				08T10301
0302	01160	001401		ERM			SET R.M.		08T10302
0303	01161	0 02 01170		LDA	L8		SET		08T10303
0304	01162	0 04 00062		STA	#62		LINK.		08T10304
0305	01163	140040		CRA			CLEAR RA JUST IN CASE		08T10305
0306	01164	74 1720		SMK	#1720		SMK IS EXECUTED.		08T10306
0307	01165	0 10 01614		JST	EROR		GO TO ERROR IF NO INTERRUPT.		08T10307
0308	01166	0 10 01614		JST	EROR		ALSO, JUST IN CASE INSTRUCTION SKIPS.		08T10308
0309	01167	0 01 01155		JMP	S08		TRY AGAIN IF ERROR OCCURRED.		08T10309

0310	01170	0 001171	L8	DAC	**1	LINK ADDRESS.	08T10310
0311	01171	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10311
0312			*				08T10312
0313			*	* TEST STX INTERRUPT (NOT ON DDP-416)			08T10313
0314			*				08T10314
0315	01172	0 10 01711	S09	JST	JSTL		08T10315
0316	01173	0 10 01174		JST	**1		08T10316
0317	01174	0 00 00002	J10	PZE	2		08T10317
0318	01175	140040		CRA		CLEAR	08T10318
0319	01176	-0 04 01702		STA*	TS2	LOCATION *2002.	08T10319
0320	01177	0 11 01732		CAS	=0	COMPUTER IS A	08T10320
0321	01200	0 01 01637		JMP	P416	DDP-416, MODIFY CERTAIN TESTS.	08T10321
0322	01201	001401	P085	ERM		DDP-516, GO ON.	08T10322
0323	01202	0 02 01211		LDA	L9	SET	08T10323
0324	01203	0 04 00062		STA	*62	LINK.	08T10324
0325	01204	0 35 01731		LUX	=*12345		08T10325
0326	01205	-0 15 01702		STX*	TS2	STX SHOULD CAUSE INTERRUPT ON DDP-516.	08T10326
0327	01206	101000	40R5	NOP		(JMP P091 IF DDP-416)	08T10327
0328	01207	0 10 01614		JST	EROR	GO TO ERROR IF NO INTERRUPT ON DDP-516.	08T10328
0329	01210	0 01 01172		JMP	S09	TRY AGAIN IF ERROR OCCURRED	08T10329
0330	01211	0 001212	L9	DAC	**1	LINK ADDRESS.	08T10330
0331	01212	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10331
0332	01213	-0 02 01702	P091	LDA*	TS2	*2002 SHOULD NOT HAVE BEEN CHANGED	08T10332
0333	01214	100040		SZE		ON EITHER -416 OR -516.	08T10333
0334	01215	0 10 01614		JST	EROR	GO TO ERROR IF IT WAS CHANGED.	08T10334
0335			*				08T10335
0336			*	* TEST IMA INTERRUPT (NOT ON DDP-416)			08T10336
0337			*				08T10337
0338	01216	0 10 01711	S10	JST	JSTL		08T10338
0339	01217	0 10 01220		JST	**1		08T10339
0340	01220	0 00 00002	J11	PZE	2		08T10340
0341	01221	0 02 01730		LDA	=-1	PUT ALL ONES	08T10341
0342	01222	-0 04 01703		STA*	TS3	IN *3003.	08T10342
0343	01223	001401		ERM		SET RESTRICTED MODE.	08T10343
0344	01224	0 02 01233		LDA	L10	SET	08T10344
0345	01225	0 04 00062		STA	*62	LINK.	08T10345
0346	01226	0 02 01727		LDA	=*54321	GET A PATTERN.	08T10346



0347	01227	-0 13 01703		IMA*	TS3	CAUSE INTERRUPT ON -516.	08T10347
0348	01230	101000	405	NOP		(JMP P100 IF DDP-416)	08T10348
0349	01231	0 10 01614		JST	EROR	GO TO ERROR IF NO INTERRUPT ON -516.	08T10349
0350	01232	0 01 01216		JMP	S10	TRY AGAIN IF ERROR OCCURRED.	08T10350
0351	01233	0 001234	L10	DAC	**+1	LINK ADDRESS.	08T10351
0352	01234	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10352
0353	01235	0 01 01242		JMP	P101	ON DDP-516, SKIP OVER -416 PART.	08T10353
0354	01236	0 05 01727	P100	ERA	=*54321	RA SHOULD NOT HAVE	08T10354
0355	01237	100040		SZE		CHANGED ON -416.	08T10355
0356	01240	0 10 01614		JST	EROR	GO TO ERROR IF IT WAS CHANGED.	08T10356
0357	01241	-0 02 01703		LDA*	TS3	CHECK CONTENTS OF *3003 ON -416	08T10357
0358	01242	0 05 01730	P101	ERA	=-1	OR RA ON -516.	08T10358
0359	01243	100040		SZE		ALL ONES -	08T10359
0360	01244	0 10 01614		JST	EROR	NO, GO TO ERROR.	08T10360
0361				*			08T10361
0362				* TEST IRS INTERRUPT			08T10362
0363				*			08T10363
0364	01245	0 10 01711	S11	JST	JSTL		08T10364
0365	01246	0 10 01247		JST	**+1		08T10365
0366	01247	0 00 00002	J12	PZE	2		08T10366
0367	01250	0 02 01730		LDA	=-1	PUT ALL ONES	08T10367
0368	01251	-0 04 01704		STA*	TS4	IN *4004.	08T10368
0369	01252	001401		ERM		ENTER RESTRICTED MODE.	08T10369
0370	01253	0 02 01262		LDA	L11	SET	08T10370
0371	01254	0 04 00062		STA	*62	LINK.	08T10371
0372	01255	-0 12 01704		IRS*	TS4	TRY TO INCREMENT *4004.	08T10372
0373	01256	0 10 01614		JST	EROR	GO TO ERROR IF NO INTERRUPT.	08T10373
0374	01257	0 10 01614		JST	EROR	*	08T10374
0375	01260	0 01 01245		JMP	S11	TRY AGAIN IF ERROR OCCURRED.	08T10375
0376	01261	0 001257	P109	DAC	**+2	COMPARE ADDRESS.	08T10376
0377	01262	0 001263	L11	DAC	**+1	LINK ADDRESS.	08T10377
0378	01263	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10378
0379	01264	0 02 01263		LDA	**+1	MAKE SURE IRS	08T10379
0380	01265	0 05 01261		ERA	P109	CAUSED SKIP EVEN THOUGH	08T10380
0381	01266	100040		SZE		INTERRUPT OCCURRED.	08T10381
0382	01267	0 10 01614		JST	EROR		08T10382
0383	01270	-0 02 01704		LDA*	TS4	ALSO CHECK *4004	08T10383

0384	01271	0 05 01730	ERA	--1	TO SEE THAT	08T10384
0385	01272	10004C	SZE		IT WAS NOT CHANGED.	08T10385
0386	01273	0 10 01614	JST	EROR		08T10386
0387			*			08T10387
0388			* TEST JST INTERRUPT			08T10388
0389			*			08T10389
0390	01274	0 10 01711	S12	JST	JSTL	08T10390
0391	01275	0 10 01276	JST	**+1		08T10391
0392	01276	0 00 00002	J13	PZE	2	08T10392
0393	01277	0 02 01726	LDA	=*1234	GET A PATTERN	08T10393
0394	01300	-0 04 01705	STA*	TS5	FOR LOCATION *5005.	08T10394
0395	01301	0 02 01314	LDA	ERRJ+1	PUT ADDRESS OF LOC. CONTAINING "JST EROR"	08T10395
0396	01302	0 04 00777	STA	*777	IN *777 IN CASE "JST* TS5" TRANSFERS CON-	08T10396
0397	01303	0 02 01313	LDA	ERRJ	PUT A JUMP THROUGH *777 / TROL TO *5006.	08T10397
0398	01304	-0 04 01706	STA*	TS51	IN *5006.	08T10398
0399	01305	001401	ERM		ENTER RESTRICTED MODE.	08T10399
0400	01306	0 02 01317	LDA	L12	SET	08T10400
0401	01307	0 04 00062	STA	*62	LINK.	08T10401
0402	01310	-0 10 01705	JST*	TS5	TRY TO JST TO *5005.	08T10402
0403	01311	0 10 01614	JST	EROR	GO TO ERROR IF NO INTERRUPT.	08T10403
0404	01312	0 01 01274	JMP	S12	TRY AGAIN IF ERROR OCCURRED.	08T10404
0405	01313	-0 01 00777	ERRJ JMP*	TL1	THIS INST. GOES IN LOC. *5006.	08T10405
0406	01314	0 001315	DAC	**+1	THIS ADDRESS GOES IN LOC. *777.	08T10406
0407	01315	0 10 01614	JST	EROR	THIS INST. MAY BE EXECUTED IF NO INTERRUPT.	08T10407
0408	01316	0 01 01274	JMP	S12	TRY AGAIN IF NO INTERRUPT.	08T10408
0409	01317	0 001320	L12 DAC	**+1	LINK ADDRESS.	08T10409
0410	01320	0 000000	DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10410
0411	01321	-0 02 01705	LDA*	TS5	ARE CONTENTS OF *5005	08T10411
0412	01322	0 05 01726	ERA	=*1234	STILL EQUAL TO PATTERN -	08T10412
0413	01323	100040	SZE			08T10413
0414	01324	0 10 01614	JST	EROR	GO TO ERROR IF NOT EQUAL.	08T10414
0415	01325	0 02 01320	LDA	L12+1	WAS REG. P CORRECT	08T10415
0416	01326	0 05 01706	ERA	TS51	WHEN INTERRUPT OCCURRED -	08T10416
0417	01327	100040	SZE			08T10417
0418	01330	0 10 01614	JST	EROR	GO TO ERROR IF NOT CORRECT.	08T10418
0419			*			08T10419
0420			* TEST STA INTERRUPT (USING INDIRECT STA)			08T10420

0421			*							08T10421
0422	01331	0 10	01711	S13	JST	JSTL				08T10422
0423	01332	0 10	01333		JST	**1				08T10423
0424	01333	0 00	00002	J14	PZE	2				08T10424
0425	01334	0 02	01730		LDA	=-1		PUT ALL ONES		08T10425
0426	01335	-0 04	01707		STA*	TS6		IN *6006.		08T10426
0427	01336	001401			ERM			ENTER RESTRICTED MODE.		08T10427
0428	01337	0 02	01345		LDA	L13		SET		08T10428
0429	01340	0 04	00062		STA	*62		LINK.		08T10429
0430	01341	0 02	01707		LDA	TS6		TRY TO PUT *6006		08T10430
0431	01342	-0 04	01707		STA*	TS6		IN LOC. *6006.		08T10431
0432	01343	0 10	01614		JST	EROR		GO TO ERROR IF NO INTERRUPT.		08T10432
0433	01344	0 01	01331		JMP	S13		TRY AGAIN IF NO INTERRUPT.		08T10433
0434	01345	0 001340		L13	DAC	**1		LINK ADDRESS.		08T10434
0435	01346	0 000000			DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.		08T10435
0436	01347	-0 02	01707		LDA*	TS6		CHECK *6006.		08T10436
0437	01350	0 05	01730		ERA	--1		DOES IT STILL CONTAIN		08T10437
0438	01351	100040			SZE			ALL ONES -		08T10438
0439	01352	0 10	01614		JST	EROR		GO TO ERROR IF IT DOESN'T.		08T10439
0440			*							08T10440
0441			* TEST INDEXED STA INTERRUPT (INDIRECT STA ON DDP-416)							08T10441
0442			*							08T10442
0443	01353	0 10	01711	S14	JST	JSTL				08T10443
0444	01354	0 10	01355		JST	**1				08T10444
0445	01355	0 00	00002	J15	PZE	2				08T10445
0446	01356	0 02	01727		LDA	=*54321		PUT A PATTERN		08T10446
0447	01357	-0 04	01710		STA*	TS7		IN *7007.		08T10447
0448	01360	001401			ERM			ENTER RESTRICTED MODE.		08T10448
0449	01361	0 02	01370		LDA	L14		SET		08T10449
0450	01362	0 04	00062		STA	*62		LINK.		08T10450
0451	01363	0 35	01710		LDX	TS7		(EXECUTED ON -516 ONLY.)		08T10451
0452	01364	0 02	01710		LDA	TS7		GET CONSTANT *7007.		08T10452
0453	01365	1 04	00000	4R5	STA	0,1		(STA* TS7 IF DDP-416)		08T10453
0454	01366	0 10	01614		JST	EROR		GO TO ERROR IF NO INTERRUPT.		08T10454
0455	01367	0 01	01353		JMP	S14		TRY AGAIN IF NO INTERRUPT.		08T10455
0456	01370	0 001371		L14	DAC	**1		LINK ADDRESS.		08T10456
0457	01371	0 000000			DAC	**		LOCKOUT VIOLATION INTERRUPT ENTRY.		08T10457

0458	01372	-0 02 01710	LDA*	TS7	CHECK LOC. #7007.	08T10458
0459	01373	0 05 01727	ERA	=*54321	DOES IT STILL	08T10459
0460	01374	100040	SZE		CONTAIN PATTERN -	08T10460
0461	01375	0 10 01614	JST	EROR	GO TO ERROR IF NOT.	08T10461
0462			*			08T10462
0463			*		TEST STA INTERRUPT IN 346TH (OCTAL) LOCATION OF EACH SECTOR	08T10463
0464			*		FROM SECTOR 2 TO TOP OF CORE.	08T10464
0465			*			08T10465
0466	01376	0 10 01711	S15	JST	JSTL	08T10466
0467	01377	0 10 01400		JST	**+1	08T10467
0468	01400	0 00 00002	J16	PZE	2	08T10468
0469	01401	140040		CRA		08T10469
0470	01402	0 06 01725	A	ADD	=*10000	08T10470
0471	01403	0 04 01674		STA	C1	08T10471
0472	01404	-0 04 01674		STA*	C1	08T10472
0473	01405	140040		CRA		08T10473
0474	01406	0 04 00000		STA	0	08T10474
0475	01407	-0 02 01674		LDA*	C1	08T10475
0476	01410	100040		SZE		08T10476
0477	01411	0 01 01402		JMP	A	08T10477
0478	01412	0 02 01674		LDA	C1	08T10478
0479	01413	0405 67		ARS	9	08T10479
0480	01414	0 05 01730		ERA	=-1	08T10480
0481	01415	0 06 01724		ADD	=3	08T10481
0482	01416	0 04 00774		STA	T0	08T10482
0483	01417	0 04 01674		STA	C1	08T10483
0484	01420	0 02 01434		LDA	L15	08T10484
0485	01421	0 04 00062		STA	*62	08T10485
0486	01422	0 02 01723		LDA	=*2345	08T10486
0487	01423	0 04 00775	P149	STA	T2	08T10487
0488	01424	140040		CRA		08T10488
0489	01425	-0 04 00775		STA*	T2	08T10489
0490	01426	001401		ERM		08T10490
0491	01427	0 02 01722		LDA	=*123456	08T10491
0492	01430	-0 04 00775		STA*	T2	08T10492
0493	01431	101000		NOP		08T10493
0494	01432	0 10 01614		JST	EROR	08T10494

0495	01433	0 01 01376		JMP	S15	TRY AGAIN IF NO INTERRUPT.	08T10495
0496	01434	0 001435	L15	DAC	**1	LINK ADDRESS.	08T10496
0497	01435	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10497
0498	01436	-0 02 00775		LDA*	T2	CHECK CONTENTS OF TEST LOCATION.	08T10498
0499	01437	100040		SZE		ARE THEY STILL ZERO -	08T10499
0500	01440	0 10 01614		JST	EROR	NO, GO TO ERROR.	08T10500
0501	01441	0 02 00775		LDA	T2	YES,	08T10501
0502	01442	0 06 01721		ADD	=*1000	TRY NEXT SECTOR.	08T10502
0503	01443	0 12 00774		IRS	T0	INCREMENT SECTOR COUNTER.	08T10503
0504	01444	0 01 01423		JMP	P149	GO BACK UNTIL ALL SECTORS ARE TESTED.	08T10504
0505							08T10505
0506				*			08T10506
0507				* TEST STA-TO-SECTOR-1 INTERRUPT			08T10507
0508	01445	0 10 01711	S16	JST	JSTL		08T10508
0509	01446	0 10 01447		JST	**1		08T10509
0510	01447	0 00 00002	J17	PZE	2		08T10510
0511	01450	0 02 01613		LDA	ERAD	TEMPORARILY, PUT ERROR ADDRESS	08T10511
0512	01451	0 04 00062		STA	*62	IN LINK LOCATION.	08T10512
0513	01452	0 02 01736		LDA	=*100000	LEAVE ONLY SECTOR 0	08T10513
0514	01453	74 1420		SMK	*1420	IN UN-PROTECTED MODE.	08T10514
0515	01454	001401		ERM		ENTER RESTRICTED MODE.	08T10515
0516	01455	0 02 01465		LDA	L16	SET	08T10516
0517	01456	0 04 00062		STA	*62	LINK.	08T10517
0518	01457	0 04 01464		STA	P159	TRY TO STORE.	08T10518
0519	01460	101000		NOP		INTERRUPT SHOULD OCCUR AFTER THIS INST.	08T10519
0520	01461	0 10 01614		JST	EROR	GO TO ERROR IF NO INTERRUPT.	08T10520
0521	01462	0 01 01445		JMP	S16	TRY AGAIN IF NO INTERRUPT.	08T10521
0522	01463	0 001461	P158	DAC	**2	ADDRESS WHICH SHOULD BE STORED BY INT. JST.	08T10522
0523	01464	000000	P159	BSZ	1	TEST LOCATION.	08T10523
0524	01465	0 001466	L16	DAC	**1	LINK ADDRESS.	08T10524
0525	01466	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10525
0526	01467	0 02 01464		LDA	P159	MAKE SURE THAT TEST LOCATION	08T10526
0527	01470	100040		SZE		WAS NOT DISTURBED.	08T10527
0528	01471	0 10 01614		JST	EROR	GO TO ERROR IF IT WAS.	08T10528
0529	01472	0 02 01466		LDA	L16+1	CHECK THE ADDRESS	08T10529
0530	01473	0 05 01463		ERA	P158	STORED BY	08T10530
0531	01474	100040		SZE		THE FORCED JST.	08T10531

H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

\* E510-001-6608 (X16-08T1)      J C N O . 1 8 0 3 1 8 0 0 0      R E V . A      P A G E      1 6

0532	01475	0 10 01614	JST	EROR		08T10532
0533			*			08T10533
0534			*	TEST STA-TO-SECTOR-0 INTERRUPT		08T10534
0535			*			08T10535
0536	01476	0 10 01711	S17	JST	JSTL	08T10536
0537	01477	0 10 01500		JST	**1	08T10537
0538	01500	0 00 00002	J18	PZE	2	08T10538
0539	01501	0 02 01513		LDA	L17	08T10539
0540	01502	0 04 00062		STA	*62	08T10540
0541	01503	0 02 01720		LDA	*40000	08T10541
0542	01504	74 1420		SMK	*1420	08T10542
0543	01505	001401		ERM		08T10543
0544	01506	0 04 00776		STA	TLO	08T10544
0545	01507	101000		NOP		08T10545
0546	01510	0 10 01614		JST	EROR	08T10546
0547	01511	0 01 01476		JMP	S17	08T10547
0548	01512	0 001510	P169	DAC	*-2	08T10548
0549	01513	0 001514	L17	DAC	**1	08T10549
0550	01514	0 000000		DAC	**	08T10550
0551	01515	0 02 00776		LDA	TLO	08T10551
0552	01516	0 05 01736		ERA	*100000	08T10552
0553	01517	100040		SZE		08T10553
0554	01520	0 10 01614		JST	EROR	08T10554
0555	01521	0 02 01514		LDA	L17+1	08T10555
0556	01522	0 05 01512		ERA	P169	08T10556
0557	01523	100040		SZE		08T10557
0558	01524	0 10 01614		JST	EROR	08T10558
0559			*			08T10559
0560			*	TEST LDX INTERRUPT (NOT ON DDP-416)		08T10560
0561			*			08T10561
0562	01525	0 10 01711	S18	JST	JSTL	08T10562
0563	01526	0 10 01527		JST	**1	08T10563
0564	01527	0 00 00002	J19	PZE	2	08T10564
0565	01530	101000	4RR5	NOP		08T10565
0566	01531	0 02 01540		LDA	L18	08T10566
0567	01532	0 04 00062		STA	*62	08T10567
0568	01533	0 35 01717		LDX	*2	08T10568

SET  
LINK.  
RE-SET SECTOR 1 TO UN-PROTECTED MODE  
(SECTOR 0 IS NOW PROTECTED).  
ENTER RESTRICTED MODE.  
CAUSE INTERRUPT (TRY TO STORE IN SECTOR 0).  
INTERRUPT SHOULD OCCUR AFTER THIS INST.  
GO TO ERROR IF NO INTERRUPT.  
TRY AGAIN IF NO INTERRUPT.  
ADDRESS WHICH SHOULD BE STORED BY INT. JST.  
LINK ADDRESS.  
LOCKOUT VIOLATION INTERRUPT ENTRY.  
CHECK TEST LOCATION  
TO MAKE SURE THAT  
IT WAS NOT DISTURBED.  
GO TO ERROR IF IT WAS.  
CHECK THE ADDRESS  
WHICH SHOULD HAVE BEEN  
STORED BY THE FORCED JST.  
GO TO ERROR IF WRONG.  
(JMP S19 IF DDP-416)

H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

\* E510-001-6608 (X16-08T1)      J C N O . 1 8 0 3 1 8 0 0 0      R E V . A      P A G E    1 7

0569	01534	001401		ERM		ENTER RESTRICTED MODE.	08T10569
0570	01535	0 35 01716		LDX	=1	CAUSE INTERRUPT (SECTOR 0 IS PROTECTED).	08T10570
0571	01536	0 10 01614		JST	EROR	GO TO ERROR IF NO INTERRUPT.	08T10571
0572	01537	0 01 01525		JMP	S18	TRY AGAIN IF NO INTERRUPT.	08T10572
0573	01540	0 001541	L18	DAC	**+1	LINK ADDRESS.	08T10573
0574	01541	0 000000		DAC	**	LOCKOUT VIOLATION INTERRUPT ENTRY.	08T10574
0575	01542	0 02 00000		LDA	0	CHECK CONTENTS OF INDEX REGISTER	08T10575
0576	01543	0 05 01717		ERA	=2	TO MAKE SURE THAT PATTERN IS STILL THERE.	08T10576
0577	01544	100040		SZE		*	08T10577
0578	01545	0 10 01614		JST	EROR	GO TO ERROR IF IT IS NOT.	08T10578
0579							08T10579
0580						* TEST SECTOR 0 RELOCATION	08T10580
0581						*	08T10581
0582	01546	0 10 01711	S19	JST	JSTL		08T10582
0583	01547	0 10 01550		JST	**+1		08T10583
0584	01550	0 00 00002	J20	PZE	2		08T10584
0585	01551	0 02 01674		LDA	C1	START	08T10585
0586	01552	0 07 01716		SUB	=1	WITH	08T10586
0587	01553	0 04 00774		STA	T0	SECTOR 1 THIS TIME.	08T10587
0588	01554	0 02 01715		LDA	=*767	SET 3RD TEST ADDRESS IN LOCATION 0.	08T10588
0589	01555	0 04 00000		STA	0	AND ALSO INDEX REGISTER ON DDP-516.	08T10589
0590	01556	0 02 01714		LDA	=*1765	GET ADDRESS OF 1ST TEST LOCATION.	08T10590
0591	01557	0 04 00775		STA	T2		08T10591
0592	01560	0 02 01721		LDA	=*1000	GET CONSTANT	08T10592
0593	01561	0 04 01675	P29	STA	T3	WHICH IS ALSO USED AS MASK.	08T10593
0594	01562	74 1320		SMK	*1320	SET RELOCATION REGISTER.	08T10594
0595	01563	0 04 00765		STA	*765	TEST USING STANDARD STA.	08T10595
0596	01564	-0 04 01661		STA*	SZRA	TEST USING INDIRECT STA.	08T10596
0597	01565	1 04 00000	4N5	STA	0.1	(STA* 0 IF DDP-416) TEST USING INDEXED STA.	08T10597
0598	01566	140040		CRA			08T10598
0599	01567	74 1320		SMK	*1320	RE-SET RELOCATION REGISTER.	08T10599
0600	01570	0 02 01713		LDA	=-2	CHECK	08T10600
0601	01571	0 04 01701		STA	T7	ALL	08T10601
0602	01572	-0 02 00775	P30	LDA*	T2	THREE	08T10602
0603	01573	0 05 01675		ERA	T3	LOCATIONS.	08T10603
0604	01574	100040		SZE		*	08T10604
0605	01575	0 10 01614		JST	EROR	GO TO ERROR IF ANY INCORRECT.	08T10605

0606	01576	-0 04 00775	STA*	T2	CLEAR OUT TEST LOCATION.	08T10606
0607	01577	0 12 00775	IRS	T2	INCREMENT ADDRESS.	08T10607
0608	01600	0 12 01701	IRS	T7	INCREMENT COUNTER.	08T10608
0609	01601	0 01 01572	JMP	P30	GO BACK TWICE.	08T10609
0610	01602	0 02 00775	LDA	T2	SET UP FOR	08T10610
0611	01603	0 06 01721	ADD	=*1000	LOCATION	08T10611
0612	01604	0 07 01717	SUB	=2	XX765	08T10612
0613	01605	0 04 00775	STA	T2	IN NEXT SECTOR.	08T10613
0614	01606	0 02 01675	LDA	T3	GET NEW CONSTANT	08T10614
0615	01607	0 06 01721	ADD	=*1000	AND MASK.	08T10615
0616	01610	0 12 00774	IRS	T0	INCREMENT COUNTER.	08T10616
0617	01611	0 01 01561	JMP	P29	GO BACK UNTIL DONE.	08T10617
0618			*			08T10618
0619			*	END OF INTERRUPT TESTS		08T10619
0620			*			08T10620
0621	01612	-0 01 01660	JMP*	CJRA	GO TO CHECK PROGRAM.	08T10621
0622			*			08T10622
0623			*	ERROR HALT ROUTINE		08T10623
0624			*			08T10624
0625	01613	0 001614	ERAD	DAC	**+1	08T10625
0626	01614	0 000000	EROR	DAC	**	08T10626
0627	01615	0 04 01677	STA	T5	SAVE CONTENTS OF RA	08T10627
0628	01616	0 02 00062	LDA	*62	AND CONTENTS	08T10628
0629	01617	0 04 01700	STA	T6	OF LOC. *62.	08T10629
0630	01620	0 02 01625	LDA	L99	SET NEW LINK IN CASE ERROR	08T10630
0631	01621	0 04 00062	STA	*62	HALT CAUSES INTERRUPT.	08T10631
0632	01622	0 02 01677	LDA	T5	DISPLAY CONTENTS OF RA WHEN ERROR OCCURRED.	08T10632
0633	01623	000000	HLT		1ST ERROR HLT. IF IT CAUSES RMVI, GO TO 2ND.	08T10633
0634	01624	0 01 01630	JMP	ER8		08T10634
0635	01625	0 001626	L99	DAC	**+1	08T10635
0636	01626	0 000000	DAC	**	LINK ADDRESS.	08T10636
0637	01627	000000	HLT		2ND ERROR HALT.	08T10637
0638	01630	0 02 01614	ER8	LDA	EROR	08T10638
0639	01631	000000	HLT		DISPLAY CONTENTS OF EROR.	08T10639
0640	01632	0 02 01700	LDA	T6	DISPLAY ORIGINAL CONTENTS OF LOC. *62.	08T10640
0641	01633	000000	HLT			08T10641
0642	01634	0 02 00062	LDA	*62	DISPLAY PRESENT CONTENTS OF LOC. *62.	08T10642



0643	01635	000000		HLT				08T10643
0644	01636	-0 01 01614		JMP*	ERRR		EXIT.	08T10644
0645				*				08T10645
0646				*	ROUTINE WHICH CHANGES PROGRAM IF COMPUTER IS DDP-416, INSTEAD OF -516			08T10646
0647				*				08T10647
0648	01637	0 02 01652	P416	LDA	J1			08T10648
0649	01640	0 04 01200		STA	40R5			08T10649
0650	01641	0 02 01653		LDA	J2			08T10650
0651	01642	0 04 01230		STA	40S			08T10651
0652	01643	0 02 01654		LDA	S1			08T10652
0653	01644	0 04 01365		STA	4R5			08T10653
0654	01645	0 02 01655		LDA	J3			08T10654
0655	01646	0 04 01530		STA	4RR5			08T10655
0656	01647	0 02 01656		LDA	S2			08T10656
0657	01650	0 04 01565		STA	4N5			08T10657
0658	01651	0 01 01201		JMP	P085			08T10658
0659				*				08T10659
0660				*	CONSTANTS			08T10660
0661				*				08T10661
0662	01652	0 01 01213	J1	JMP	P091			08T10662
0663	01653	0 01 01236	J2	JMP	P100			08T10663
0664	01654	-0 04 01710	S1	STA*	TS7			08T10664
0665	01655	0 01 01546	J3	JMP	S19			08T10665
0666	01656	-0 04 00000	S2	STA*	0			08T10666
0667	01657	177777	ONES	OCT	177777			08T10667
0668	01660	0 002003	CJRA	DAC	CKJS			08T10668
0669	01661	0 000766	SZRA	DAC	*766			08T10669
0670				*				08T10670
0671				*	INDIRECT ADDRESS TABLE			08T10671
0672				*				08T10672
0673	01662	-0 001663	IAT	DAC*	**1		INDIRECT ADDRESS TABLE, STEP 1.	08T10673
0674	01663	-0 001664		DAC*	**1		STEP 2	08T10674
0675	01664	-0 001665		DAC*	**1		STEP 3	08T10675
0676	01665	-0 001666		DAC*	**1		STEP 4	08T10676
0677	01666	-0 001667		DAC*	**1		STEP 5	08T10677
0678	01667	-0 001670		DAC*	**1		STEP 6	08T10678
0679	01670	-0 001671		DAC*	**1		STEP 7	08T10679

0680	01671	-0 001672	DAC*	**1	STEP 8	08T10680
0681	01672	0 001673	DAC	**1	STEP 9	08T10681
0682	01673	000000	BSZ	1	FINAL LOCATION OF INDIRECT ADDRESS TABLE.	08T10682
0683			*			08T10683
0684			* CONSTANT AND TEMPORARY STORAGE			08T10684
0685			*			08T10685
0686	01674	000000	C1	BSZ 1		08T10686
0687	01675	000000	T3	BSZ 1		08T10687
0688	01676	000000	T4	BSZ 1		08T10688
0689	01677	000000	T5	BSZ 1		08T10689
0690	01700	000000	T6	BSZ 1		08T10690
0691	01701	000000	T7	BSZ 1		08T10691
0692			*			08T10692
0693			* SECTOR TEST LOCATIONS			08T10693
0694			*			08T10694
0695	01702	0 002002	TS2	DAC TL4		08T10695
0696	01703	0 003003	TS3	DAC *3003		08T10696
0697	01704	0 004004	TS4	DAC *4004		08T10697
0698	01705	0 005005	TS5	DAC *5005		08T10698
0699	01706	0 005006	TS51	DAC *5006		08T10699
0700	01707	0 006006	TS6	DAC *6006		08T10700
0701	01710	0 007007	TS7	DAC *7007		08T10701
0702			*			08T10702
0703	01711	0 000000	JSTL	DAC **		08T10703
0704	01712	-0 01 01711	JMP*	JSTL		08T10704
0705			*			08T10705
0706	01713	177776	FIN		DUMP LITERALS FOR THIS SECTOR.	08T10706
	01714	001765				
	01715	000767				
	01716	000001				
	01717	000002				
	01720	040000				
	01721	001000				
	01722	123456				
	01723	002345				
	01724	000003				
	01725	010000				

01726 001234  
 01727 054321  
 01730 177777  
 01731 012345  
 01732 000000  
 01733 125252  
 01734 000011  
 01735 140000  
 01736 100000

0707			*						08T10707
0708				ORG	*1765				08T10708
0709	01765	000000	TL3	BSZ	3				08T10709
	01766	000000							
	01767	000000							
0710				ORG	*2002				08T10710
0711	02002	000000	TL4	BSZ	1				08T10711
0712			*						08T10712
0713			*						08T10713
0714			*						08T10714
0715			*						08T10715
0716			*						08T10716
0717	02003	0 02 02230	CKJS	LDA	=-20		SET UP FOR 20		08T10717
0718	02004	0 04 00000		STA	0		PASSES THROUGH THIS ROUTINE.		08T10718
0719	02005	0 02 02211		LDA	TK1		GET ADDRESS OF "TABL"		08T10719
0720	02006	0 04 02212		STA	TK2		AND SAVE IT FOR ONE-LEVEL IND. ADDRESSING.		08T10720
0721	02007	0 05 02227		ERA	=*100000		ADD INDIRECT BIT		08T10721
0722	02010	0 04 02210		STA	TK0		AND SAVE IT FOR TWO-LEVEL IND. ADDRESSING.		08T10722
0723	02011	-0 02 02210	CK2	LDA*	TK0		GET CONTENTS OF ONE OF THE "JXX" LOCATIONS		08T10723
0724	02012	-0 05 02212		ERA*	TK2		AND CHECK IT AGAINST THE "TABL" ENTRY.		08T10724
0725	02013	100040		SZE			GO ON IF OK.		08T10725
0726	02014	000000		HLT			STOP, IF NOT. - ERROR HALT.		08T10726
0727	02015	0 02 02226		LDA	=2		RESTORE "PZE 2"		08T10727
0728	02016	-0 04 02210		STA*	TK0		TO "JXX" LOCATIONS.		08T10728
0729	02017	0 12 02212		IRS	TK2		INCREMENT		08T10729
0730	02020	0 12 02210		IRS	TK0		ADDRESSES		08T10730
0731	02021	0 12 00000		IRS	0		AND COUNTER.		08T10731

0732	02022	0 01 02011	JMP	CK2	GO BACK UNTIL FINISHED.	08T10732
0733			*			08T10733
0734			*	INCREMENT-PASS-COUNTER ROUTINE		08T10734
0735			*			08T10735
0736	02023	0 02 02225	LDA	=-9	SET UP FOR 9	08T10736
0737	02024	0 04 00774	STA	T0	DIGITS.	08T10737
0738	02025	0 02 02163	LDA	NA2	GET ADDRESS OF WORD REPRESENTING "ONES"	08T10738
0739	02026	0 04 00775	INC2 STA	T2	DIGIT.	08T10739
0740	02027	-0 12 00775	IRS*	T2	INCREMENT NUMBER.	08T10740
0741	02030	0 01 02040	JMP	TYIN	EXIT WHEN NO SKIP.	08T10741
0742	02031	0 02 02224	LDA	=-10	IF SKIP,	08T10742
0743	02032	-0 04 00775	STA*	T2	RESTORE TO -10.	08T10743
0744	02033	0 02 00775	LDA	T2	GET	08T10744
0745	02034	0 07 02223	SUB	=1	NEXT ADDRESS.	08T10745
0746	02035	0 12 00774	IRS	T0	INCREMENT COUNTER.	08T10746
0747	02036	0 01 02026	JMP	INC2	REPEAT.	08T10747
0748	02037	000000	HLT		ERROR HALT.	08T10748
0749			*			08T10749
0750			*	TYPE-IN ROUTINE		08T10750
0751			*			08T10751
0752	02040	34 0104	TYIN SKS	*104	IS ASR-33 BUSY -	08T10752
0753	02041	0 01 02056	JMP	EOPH	YES.	08T10753
0754	02042	54 1004	INA	*1004	NO.	08T10754
0755	02043	0 01 02055	JMP	EOPH-1	NOT READY.	08T10755
0756	02044	0 05 02222	ERA	=*307		08T10756
0757	02045	101040	SNZ		IS INPUT CHARACTER A "G" -	08T10757
0758	02046	0 01 02061	JMP	STG	YES.	08T10758
0759	02047	0 05 02221	ERA	=*24	NO.	08T10759
0760	02050	101040	SNZ		IS INPUT CHARACTER AN "S" -	08T10760
0761	02051	0 04 02056	STA	EOPH	YES, STORE HALT IN "EOPH".	08T10761
0762	02052	0 05 02220	ERA	=7		08T10762
0763	02053	101040	SNZ		IS INPUT CHARACTER A "T" -	08T10763
0764	02054	0 01 02064	JMP	TYPO	YES, GO TO TYPEOUT ROUTINE.	08T10764
0765	02055	14 0004	OCF	4	ENABLE ASR-33 IN INPUT MODE.	08T10765
0766	02056	000000	EOPH HLT		END-OF-PASS HALT (CRA IN NON-STOP MODE).	08T10766
0767	02057	140040	CRA			08T10767
0768	02060	-0 01 02213	JMP*	ASTR	GO TO BEGINNING OF PROGRAM.	08T10768

0769	02061	0 02 02057	STG LDA	EOPH+1	GET CRA INSTRUCTION	08T10769
0770	02062	0 04 02056	STA	EOPH	AND REPLACE HLT WITH IT.	08T10770
0771	02063	0 01 02056	JMP	EOPH	RETURN.	08T10771
0772			*			08T10772
0773			* TYPE-OUT	ROUTINE		08T10773
0774			*			08T10774
0775	02064	34 0104	TYPO SKS	*104	BUSY	08T10775
0776	02065	0 01 02064	JMP	*-1	LOOP.	08T10776
0777	02066	14 0104	OCP	*104	ENABLE ASR IN OUTPUT MODE.	08T10777
0778	02067	0 02 02217	LDA	==8	SET COUNTER FOR 8 WORDS.	08T10778
0779	02070	0 04 00774	STA	T0	*	08T10779
0780	02071	0 02 02140	LDA	MA1	GET MESSAGE ADDRESS.	08T10780
0781	02072	0 04 00775	STA	T2		08T10781
0782	02073	0 10 02113	JST	OUTL	OUTPUT MESSAGE (2 CHARACTERS/WORD).	08T10782
0783	02074	0 02 02225	LDA	==9	SET COUNTER FOR 9 DIGITS.	08T10783
0784	02075	0 04 00774	STA	T0	*	08T10784
0785	02076	0 02 02151	LDA	NA1	GET MESSAGE ADDRESS.	08T10785
0786	02077	0 04 00775	STA	T2		08T10786
0787	02100	0 10 02127	JST	OUTN	OUTPUT DECIMAL DIGITS	08T10787
0788	02101	0 02 02216	LDA	==6	FOLLOWED	08T10788
0789	02102	0 04 00774	STA	T0	BY	08T10789
0790	02103	0 02 02215	LDA	==240	6	08T10790
0791	02104	74 0064	CHTO OTA	4	SPACES.	08T10791
0792	02105	0 01 02104	JMP	*-1	*	08T10792
0793	02106	0 12 00774	IRS	T0	*	08T10793
0794	02107	0 01 02104	JMP	CHTO	*	08T10794
0795	02110	34 0104	SKS	*104	WAIT	08T10795
0796	02111	0 01 02110	JMP	*-1	WHILE ASR IS BUSY.	08T10796
0797	02112	0 01 02055	JMP	EOPH-1	RETURN.	08T10797
0798			*			08T10798
0799			* BCI OUTPUT	SUBROUTINE		08T10799
0800			*			08T10800
0801	02113	0 00000	OUTL DAC	**	ENTRY.	08T10801
0802	02114	-0 02 00775	LDA*	T2	GET 2 CHARACTERS.	08T10802
0803	02115	0406 70	ARR	8	TYPE	08T10803
0804	02116	74 0064	OTA	4	OUT	08T10804
0805	02117	0 01 02116	JMP	*-1	1ST CHARACTER (BITS 1-8).	08T10805

0806	02120	0416 70	ALR	8	TYPE	08T10806
0807	02121	74 0004	OTA	4	OUT	08T10807
0808	02122	0 01 02121	JMP	*-1	2ND CHARACTER (BITS 9-16).	08T10808
0809	02123	0 12 00775	IRS	T2	INCREMENT ADDRESS.	08T10809
0810	02124	0 12 00774	IRS	T0	INCREMENT COUNTER.	08T10810
0811	02125	0 01 02114	JMP	OUTL+1	GO BACK UNTIL ALL OUT.	08T10811
0812	02126	-0 01 02113	JMP*	OUTL	EXIT.	08T10812
0813			*			08T10813
0814			*	NUMBER OUTPUT SUBROUTINE		08T10814
0815			*			08T10815
0816	02127	0 000000	OUTN DAC	**	ENTRY.	08T10816
0817	02130	-0 02 00775	LDA*	T2	GET NUMBER.	08T10817
0818	02131	0 06 02214	ADD	*272	CONVERT TO ASCII DECIMAL DIGIT.	08T10818
0819	02132	74 0004	OTA	4	TYPE	08T10819
0820	02133	0 01 02132	JMP	*-1	IT.	08T10820
0821	02134	0 12 00775	IRS	T2	INCREMENT ADDRESS.	08T10821
0822	02135	0 12 00774	IRS	T0	INCREMENT COUNTER.	08T10822
0823	02136	0 01 02130	JMP	OUTN+1	GO BACK UNTIL ALL TYPED.	08T10823
0824	02137	-0 01 02127	JMP*	OUTN	EXIT.	08T10824
0825			*			08T10825
0826			*	END-OF-PASS MESSAGE		08T10826
0827			*			08T10827
0828	02140	0 002141	MA1 DAC	**+1		08T10828
0829	02141	106612	OCT	106612		08T10829
0830	02142	154261	BCI	7,X16-08T1 PASS 5		08T10830
	02143	133255				
	02144	130270				
	02145	152261				
	02146	120320				
	02147	140723				
	02150	151640				
0831			*			08T10831
0832			*	PASS COUNTERS		08T10832
0833			*			08T10833
0834	02151	0 002152	NA1 DAC	**+1		08T10834
0835	02152	177766	DEC	-10,-10,-10,-10,-10,-10,-10,-10		08T10835
	02153	177766				

02154	177766					
02155	177766					
02156	177766					
02157	177766					
02160	177766					
02161	177766					
02162	177766					
0836	02163	0 002162	NA2	DAC	*-1	08T10836
0837			*			08T10837
0838			*	JST-ADDRESS-CHECK	TABLE	08T10838
0839			*			08T10839
0840	02164	0 001002	TABL	DAC	J01	08T10840
0841	02165	0 001024		DAC	J02	08T10841
0842	02166	0 001037		DAC	J03	08T10842
0843	02167	0 001056		DAC	J04	08T10843
0844	02170	0 001072		DAC	J05	08T10844
0845	02171	0 001106		DAC	J06	08T10845
0846	02172	0 001122		DAC	J07	08T10846
0847	02173	0 001144		DAC	J08	08T10847
0848	02174	0 001157		DAC	J09	08T10848
0849	02175	0 001174		DAC	J10	08T10849
0850	02176	0 001220		DAC	J11	08T10850
0851	02177	0 001247		DAC	J12	08T10851
0852	02200	0 001276		DAC	J13	08T10852
0853	02201	0 001333		DAC	J14	08T10853
0854	02202	0 001355		DAC	J15	08T10854
0855	02203	0 001400		DAC	J16	08T10855
0856	02204	0 001447		DAC	J17	08T10856
0857	02205	0 001500		DAC	J18	08T10857
0858	02206	0 001527		DAC	J19	08T10858
0859	02207	0 001550		DAC	J20	08T10859
0860			*			08T10860
0861	02210	0 000000	TK0	DAC	**	08T10861
0862	02211	0 002164	TK1	DAC	TABL	08T10862
0863	02212	0 000000	TK2	DAC	**	08T10863
0864	02213	0 001000	ASTR	DAC	STRT	08T10864
0865			*			08T10865

			END	STRT
0466	02214	000272		
	02215	000240		
	02216	177772		
	02217	177770		
	02220	000007		
	02221	000024		
	02222	000307		
	02223	000001		
	02224	177766		
	02225	177767		
	02226	000002		
	02227	100000		
	02230	177754		

08T10866

NO ERRORS IN ABOVE ASSEMBLY.  
DAP-16 REV. BX 1-30-67 OPR



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0001	* E510-001-6604 (X16-CMT2)	JC NO. 180266000	REV. B	CMT20001
0002	*			CMT20002
0003	*			CMT20003
0004	*			CMT20004
0005	* COMPUTER: DDP-116, 416, 516			CMT20005
0006	*			CMT20006
0007	*			CMT20007
0008	*			CMT20008
0009	*			CMT20009
0010	* PROGRAM CAGEGORY: TEST AND MAINTENANCE			CMT20010
0011	*			CMT20011
0012	*			CMT20012
0013	*			CMT20013
0014	*			CMT20014
0015	* PROGRAM TITLE: X16-CMT2			CMT20015
0016	* CORE MEMORY TEST NO. 2			CMT20016
0017	*			CMT20017
0018	*			CMT20018
0019	*			CMT20019
0020	*			CMT20020
0021	*			CMT20021
0022	*			CMT20022
0023	*			CMT20023
0024	*			CMT20024
0025		APPROVAL	DATE	CMT20025
0026	*			CMT20026
0027	*			CMT20027
0028	*			CMT20028
0029	*	P/S <i>RL</i> <i>JM Butler</i>	<i>5-10-67</i>	CMT20029
0030	*			CMT20030
0031	*			CMT20031
0032	*			CMT20032
0033	*	D/M <i>CJ McLeary</i>	<i>5-11-67</i>	CMT20033
0034	*			CMT20034
0035	*			CMT20035
0036	*			CMT20036
0037	*			CMT20037

H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

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0038	*			CMT20038
0039	*	REVISIONS		CMT20039
0040	*			CMT20040
0041	*	REV. B	ECO 4578	CMT20041
0042	*	REV. A	02-03-67	CMT20042
0043	*			CMT20043
0044	*			CMT20044
0045	*			CMT20045
0046	*	AUTHOR		CMT20046
0047	*			CMT20047
0048	*	HONEYWELL INC.,	COMPUTER CONTROL DIVISION	CMT20048
0049	*			CMT20049
0050	*			CMT20050
0051	*	PURPOSE		CMT20051
0052	*			CMT20052
0053	*	TO INSURE THAT THE CONTENTS OF THE CORE MEMORY ARE NOT DIS-		CMT20053
0054	*	TURBED WHEN AC POWER IS DISCONNECTED.		CMT20054
0055	*			CMT20055
0056	*			CMT20056
0057	*	RESTRICTIONS		CMT20057
0058	*			CMT20058
0059	*	THIS PROGRAM WILL OPERATE ON ANY DDP-X16. LOCATION LA (LAST		CMT20059
0060	*	ADDRESS) SHOULD BE CHANGED IF THE MEMORY IS OF ANY SIZE OTHER		CMT20060
0061	*	THAN 4K.		CMT20061
0062	*			CMT20062
0063	*			CMT20063
0064	*	STORAGE		CMT20064
0065	*			CMT20065
0066	*	THIS PROGRAM UTILIZES THE ENTIRE CORE MEMORY		CMT20066
0067	*			CMT20067
0068	*			CMT20068
0069	*	USE		CMT20069
0070	*			CMT20070
0071	*	AFTER THE PROGRAM IS LOADED, CHANGE LOCATION LA IF IT IS DE-		CMT20071
0072	*	SIRED TO TEST A MEMORY WHICH IS NOT 4K. THEN START AT LOCATION		CMT20072
0073	*	WRIT (100). WHEN THE PROGRAM STOPS IN LOCATION C (113), EACH OF		CMT20073
0074	*	THE TESTED LOCATIONS WILL CONTAIN ITS OWN ADDRESS. PUSHING START		CMT20074

0075	*	WILL NOW CAUSE THE PROGRAM TO READ AND CHECK THESE ADDRESSES.	CMT20075
0076	*	AC POWER CAN NOW BE DISCONNECTED. AFTER IT IS REAPPLIED, MASTER	CMT20076
0077	*	CLEAR, SET THE P-REGISTER TO READ (114), AND PUSH START. THE	CMT20077
0078	*	PROGRAM WILL KEEP CYCLING UNLESS IT DETECTS AN ERROR. THE ERROR	CMT20078
0079	*	HALT IS IN LOCATION 132. IF THE PROGRAM STOPS HERE, REGISTER A	CMT20079
0080	*	WILL CONTAIN WHAT WAS READ OUT OF THE LOCATION BEING CHECKED.	CMT20080
0081	*	PUSHING START WILL CAUSE THE PROGRAM TO HALT AT LOCATION (134).	CMT20081
0082	*	HERE A WILL CONTAIN WHAT THE VALUE SHOULD HAVE BEEN. TO	CMT20082
0083	*	CONTINUE, PRESS START AGAIN.	CMT20083
0084	*		CMT20084
0085	*		CMT20085
0086	*	METHOD	CMT20086
0087	*		CMT20087
0088	*	EACH CORE LOCATION IS LOADED WITH ITS ADDRESS, AFTER WHICH	CMT20088
0089	*	THE PROGRAM CONTINUOUSLY READS LOCATIONS SEQUENTIALLY. AFTER	CMT20089
0090	*	A SIMILATED POWER FAILURE. THE CHECK IS RESUMED. IF THE	CMT20090
0091	*	MEMORY HAS BEEN DISTURBED, AN ERROR HALT OCCURS.	CMT20091
0092	*		CMT20092
0093	*		CMT20093
0094	*	*****	CMT20094
0095	*		CMT20095
0096	*		CMT20096
0097		CF4	CMT20097
0098		ORG *100	CMT20098
0099	00100	0 02 00140 WRIT LDA FA	CMT20099
0100	00101	0 07 00136 SUB ONE	CMT20100
0101	00102	0 04 00000 STA 0	CMT20101
0102	00103	0 12 00000 B IRS 0	CMT20102
0103	00104	0 02 00000 LDA 0	CMT20103
0104	00105	0 10 00141 JST CAS	CMT20104
0105	00106	0 000137 DAC LA	CMT20105
0106	00107	0 01 00113 JMP C	CMT20106
0107	00110	101000 NOP	CMT20107
0108	00111	-0 04 00000 STA* 0	CMT20108
0109	00112	0 01 00103 JMP B	CMT20109
0110	00113	000000 C HLT	CMT20110
0111	00114	0 02 00140 READ LDA FA	CMT20111

DECREMENT FIRST ADDRESS BY 1 BECAUSE IT  
 WILL BE INCREMENTED BEFORE BEING USED  
 \*  
 INCREMENT INDEX REGISTER  
 GET CONTENTS OF INDEX REGISTER  
 IS IT GREATER THAN  
 LA. (CAS LA).  
 YES, GO TO C  
 NO  
 GO BACK FOR NEXT LOCATION  
 STOP BEFORE READING  
 DECREMENT FIRST ADDRESS BY 1 BECAUSE IT

0112	00115	0 07 00136		SUB	ONE	WILL BE INCREMENTED BEFORE BEING USED	CMT20112
0113	00116	0 04 00000		STA	0	*	CMT20113
0114	00117	0 12 00000	D	IRS	0	INCREMENT INDEX REGISTER	CMT20114
0115	00120	0 02 00000		LDA	0	GET CONTENTS OF INDEX REGISTER	CMT20115
0116	00121	0 10 00141		JST	CAS	IS IT GREATER THAN	CMT20116
0117	00122	0 000137		DAC	LA	LAST ADDRESS (CAS LA)	CMT20117
0118	00123	0 01 00114		JMP	READ	YES, GO BACK TO START OF READ SECTION	CMT20118
0119	00124	101000		NOP		NO	CMT20119
0120	00125	-0 02 00000		LDA*	0		CMT20120
0121	00126	0 10 00141		JST	CAS	DO THEY EQUAL	CMT20121
0122	00127	0 000000		DAC	0	CONTENTS OF XR (CAS 0).	CMT20122
0123	00130	0 01 00132		JMP	**2	NO	CMT20123
0124	00131	0 01 00117		JMP	D	YES, GO BACK TO CHECK NEXT LOCATION	CMT20124
0125	00132	000000		HLT			CMT20125
0126	00133	0 02 00000		LDA	0	GET CONTENTS OF INDEX REGISTER IN REG. A	CMT20126
0127	00134	000000		HLT		STOP	CMT20127
0128	00135	0 01 00117		JMP	D	GO BACK TO CHECK NEXT LOCATION	CMT20128
0129	00136	000001	ONE	OCT	1	CONSTANT	CMT20129
0130	00137	007777	LA	OCT	7777	LAST ADDRESS (OF 4K CORE) - CHANGE IF NEEDED	CMT20130
0131	00140	000173	FA	OCT	173	FIRST ADDRESS	CMT20131
0132	00141	-0 000000	CAS	DAC*	**	CAS ROUTINE	CMT20132
0133	00142	0 04 00170		STA	SAVE		CMT20133
0134	00143	0 02 00141		LDA	CAS	SET	CMT20134
0135	00144	0 06 00172		ADD	=*100001	UP	CMT20135
0136	00145	0 04 00171		STA	EXIT	RETURN	CMT20136
0137	00146	0 02 00170		LDA	SAVE		CMT20137
0138	00147	-0 05 00141		ERA*	CAS	ARE THE TWO QUANTITIES EQUAL	CMT20138
0139	00150	100040		SIZE			CMT20139
0140	00151	0 01 00153		JMP	**2		CMT20140
0141	00152	0 01 00165		JMP	EXIE	YES	CMT20141
0142	00153	101400		SMI		NO, ARE SIGNS THE SAME	CMT20142
0143	00154	0 01 00157		JMP	SAME	YES	CMT20143
0144	00155	0 02 00170		LDA	SAVE		CMT20144
0145	00156	0 01 00161		JMP	**3		CMT20145
0146	00157	0 02 00170	SAME	LDA	SAVE	SIGNS ARE THE SAME,	CMT20146
0147	00160	-0 07 00141		SUB*	CAS	WHICH IS	CMT20147
0148	00161	100400		SPL		GREATER	CMT20148

0149	00162	0 01 00164	JMP	EXIL	MEMORY GREATER	CMT20149
0150	00163	0 01 00166	JMP	EXIG	ACCUMULATOR GREATER	CMT20150
0151	00164	0 12 00171	EXIL	IRS		CMT20151
0152	00165	0 12 00171	EXIE	IRS		CMT20152
0153	00166	0 02 00170	EXIG	LDA	SAVE	CMT20153
0154	00167	-0 01 00171	JMP*	EXIT	RETURN	CMT20154
0155	00170		SAVE	BSS	1	CMT20155
0156	00171		EXIT	BSS	1	CMT20156
0157	00172	100001	END	WRIT		CMT20157

NO ERRORS IN ABOVE ASSEMBLY.

DAP-16 REV. BX 1-30-67 OPR



H O N E Y W E L L

COMPUTER CONTROL DIVISION

PROGRAM DOCUMENTATION

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0002	*			PFT10002
0003	*			PFT10003
0004	*			PFT10004
0005	* DDP-416, DDP-516			PFT10005
0006	*			PFT10006
0007	*			PFT10007
0008	*			PFT10008
0009	*			PFT10009
0010	* TEST AND MAINTENANCE			PFT10010
0011	*			PFT10011
0012	*			PFT10012
0013	*			PFT10013
0014	*			PFT10014
0015	* X16-PRT1			PFT10015
0016	*			PFT10016
0017	*			PFT10017
0018	*			PFT10018
0019	*			PFT10019
0020	* POWER FAILURE INTERRUPT TEST FOR THE DDP-416 AND DDP-516			PFT10020
0021	*			PFT10021
0022	*			PFT10022
0023	*			PFT10023
0024	*			PFT10024
0025	*	APPROVAL	DATE	PFT10025
0026	*			PFT10026
0027	*			PFT10027
0028	*			PFT10028
0029	*	P/S <i>RP</i> / <i>JM Butler</i> QA	5-10-67	PFT10029
0030	*			PFT10030
0031	*			PFT10031
0032	*	D/M <i>RP</i> / <i>JM Lenny</i>	5-11-67	PFT10032
0033	*			PFT10033
0034	*			PFT10034
0035	*			PFT10035
0036	*			PFT10036
0037	*			PFT10037

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REV. B

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0039	*	REVISIONS		PFT10039
0040	*			PFT10040
0041	*	REV. B	ECO 4577	PFT10041
0042	*	REV. A	10-07-66	PFT10042
0043	*			PFT10043
0044	*			PFT10044
0045	*			PFT10045
0046	*	AUTHOR		PFT10046
0047	*			PFT10047
0048	*	HONEYWELL INC.,	COMPUTER CONTROL DIVISION	PFT10048
0049	*			PFT10049
0050	*			PFT10050
0051	*	PURPOSE		PFT10051
0052	*			PFT10052
0053	*	TO ENSURE THAT THE CONTENTS OF REGISTER CAN BE		PFT10053
0054	*	PRESERVED, AND THAT THE CONTENTS OF MEMORY ARE NOT		PFT10054
0055	*	DISTURBED, SO LONG AS APPROPRIATE ACTION IS TAKEN		PFT10055
0056	*	WITHIN FIVE MILLISECONDS OF POWER FAILURE INTERRUPT.		PFT10056
0057	*			PFT10057
0058	*			PFT10058
0059	*	RESTRICTIONS		PFT10059
0060	*			PFT10060
0061	*	THIS PROGRAM WILL OPERATE ON ANY DDP-X16. LOCATION LA (LAST		PFT10061
0062	*	ADDRESS) SHOULD BE CHANGED IF THE MEMORY IS OF ANY SIZE OTHER		PFT10062
0063	*	THAN 4K.		PFT10063
0064	*			PFT10064
0065	*			PFT10065
0066	*	STORAGE		PFT10066
0067	*			PFT10067
0068	*	122 (OCTAL) LOCATIONS		PFT10068
0069	*	82 (DECIMAL) LOCATIONS		PFT10069
0070	*			PFT10070
0071	*			PFT10071
0072	*	USE		PFT10072
0073	*			PFT10073
0074	*	AFTER THE PROGRAM IS LOADED, CHANGE LOCATION LA IF IT IS DESIRED		PFT10074



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0075 * TO TEST A MEMORY WHICH IS NOT 4K. THEN START AT LOCATION WRIT PFT10075
0076 * (100). WHEN THE PROGRAM STOPS IN LOCATION (147) EACH OF THE PFT10076
0077 * TESTED LOCATIONS WILL CONTAIN ITS OWN ADDRESS. PUSHING START WILL PFT10077
0078 * NOW CAUSE THE PROGRAM TO READ AND CHECK THESE ADDRESSES. PFT10078
0079 * AC POWER CAN NOW BE DISCONNECTED. AFTER IT IS REAPPLIED, MASTER PFT10079
0080 * CLEAR, AND PUSH START. THE PROGRAM THEN TESTS TO PFT10080
0081 * DETERMINE ERRORS, AND INDICATES AS FOLLOWS. PFT10081
0082 * PFT10082
0083 * HLT LOCATION ERROR TYPE WAS SHOULD BE PFT10083
0084 * PFT10084
0085 * 000000 INTERRUPT NOT CALLED N.A. N.A. PFT10085
0086 * 000156 A-REG NOT PRESERVED SEE (163) SEE (164) PFT10086
0087 * 000133 MEMORY WORD BAD SEE (165) SEE (166) PFT10087
0088 * PFT10088
0089 * IF NOT HLT OCCURS, ANOTHER TEST MAY BE PERFORMED PFT10089
0090 * BY DISCONNECTING AC POWER AGAIN PFT10090
0091 * PFT10091
0092 * ***** PFT10092
0093 * PFT10093
0094 * PFT10094
0095 * CF4 PFT10095
0096 * ORG *60 PFT10096
0097 00060 0 000135 DAC INTR PFT10097
0098 * ORG *100 PFT10098
0099 00100 0 02 00170 WRIT LDA FA DECREMENT FIRST ADDRESS BY 1 BECAUSE IT PFT10099
0100 00101 0 07 00161 SUB ONE WILL BE INCREMENTED BEFORE BEING USED PFT10100
0101 00102 0 04 00166 STA CLOC * PFT10101
0102 00103 0 12 00166 B IRS CLOC INCREMENT COUNTER PFT10102
0103 00104 0 02 00166 LDA CLOC GET WORD TO STORE PFT10103
0104 00105 0 10 00172 JST CAS IS IT GREATER PFT10104
0105 00106 0 000171 DAC LA THAN LAST ADDRESS (CAS LA). PFT10105
0106 00107 0 01 00113 JMP C YES, GO TO C PFT10106
0107 00110 101000 NOP PFT10107
0108 00111 -0 04 00166 STA* CLOC FILL LOCATION WITH OWN ADDRESS PFT10108
0109 00112 0 01 00103 JMP B GO BACK FOR NEXT LOCATION PFT10109
0110 00113 0 10 00135 C JST INTR SIMULATE INTERRUPT PFT10110
0111 00114 0 02 00170 READ LDA FA * PFT10111
    
```

0112	00115	0 04 00166	STA	CLOC	*	PFT10112	
0113	00116	0 01 00120	JMP	**2		PFT10113	
0114	00117	0 12 00166	D	IRS	CLOC	INCREMENT COUNTER	PFT10114
0115	00120	0 02 00166	LDA	CLOC		GET CONTENTS OF COUNTER	PFT10115
0116	00121	0 10 00172	JST	CAS		IS IT GREATER	PFT10116
0117	00122	0 000171	DAC	LA		THAN LAST ADDRESS (CAS LA)	PFT10117
0118	00123	0 01 00114	JMP	READ		YES, GO BACK TO START OF READ SECTION	PFT10118
0119	00124	101000	NOP			NO	PFT10119
0120	00125	-0 02 00166	LDA*	CLOC		NO, GET MEMORY WORD	PFT10120
0121	00126	0 10 00172	JST	CAS		DOES IT EQUAL	PFT10121
0122	00127	0 000166	DAC	CLOC		ADDRESS (CAS CLOC).	PFT10122
0123	00130	0 01 00132	JMP	**2		NO	PFT10123
0124	00131	0 01 00117	JMP	D		YES, GO BACK TO CHECK NEXT LOCATION	PFT10124
0125	00132	0 04 00165	STA	AMEM		SAVE ERROR WORD	PFT10125
0126	00133	000000	HLT			STOP	PFT10126
0127	00134	0 01 00117	JMP	D		GO BACK TO CHECK NEXT LOCATION	PFT10127
0128	00135	0 000000	INTR	DAC	**		PFT10128
0129	00136	0 04 00165	STA	AMEM		SAVE A	PFT10129
0130	00137	0 02 00167	LDA	TIME		SET UP TIMER	PFT10130
0131	00140	0 04 00162	STA	CNTR	*		PFT10131
0132	00141	0 02 00164	LDA	ACON		RESTORE A FOR WAIT	PFT10132
0133	00142	0 12 00162	IRS	CNTR		STALL	PFT10133
0134	00143	0 01 00142	JMP	*-1	*		PFT10134
0135	00144	0 04 00163	STA	AREG		SAVE A-REG	PFT10135
0136	00145	0 02 00150	LDA	JMP			PFT10136
0137	00146	0 04 00000	STA	0			PFT10137
0138	00147	000000	E	HLT		STOP WAIT FOR POWER OFF.	PFT10138
0139	00150	0 01 00151	JMP	JMP	**1	RESTART AFTER POWER ON	PFT10139
0140	00151	140040	CRA			RESET RESTART ENTRY	PFT10140
0141	00152	0 04 00000	STA	0	*		PFT10141
0142	00153	0 02 00163	LDA	AREG		TEST STORED A	PFT10142
0143	00154	0 05 00164	ERA	ACUN	*		PFT10143
0144	00155	100040	SZE		*		PFT10144
0145	00156	000000	HLT			A-REG BAD	PFT10145
0146	00157	0 02 00165	LDA	AMEM		RESTORE A-REG	PFT10146
0147	00160	-0 01 00135	JMP*	INTR		* AND RETURN TO SCAN	PFT10147
0148	00161	000001	ONE	OCT	1	CONSTANT	PFT10148

0149	00162	0 000000	CNTR DAC	**	TIMING COUNTER	PFT10149
0150	00163	0 000000	AREG DAC	**	A-REG STORAGE	PFT10150
0151	00164	125252	ACON OCT	125252		PFT10151
0152	00165	0 000000	AMEM DAC	**	SPECIAL A-REG STORAGE	PFT10152
0153	00166	0 000000	CLOC DAC	**	LOCATION COUNTER	PFT10153
0154	00167	176346	TIME OCT	176346	TIMING LIMIT	PFT10154
0155	00170	0 000224	FA DAC	SAVE+2		PFT10155
0156	00171	007777	LA OCT	7777	LAST ADDRESS (OF 4K CORE) - CHANGE IF NEEDED	PFT10156
0157	00172	-0 000000	CAS DAC*	**	CAS ROUTINE	PFT10157
0158	00173	0 04 00222	STA	SAVE		PFT10158
0159	00174	0 02 00172	LDA	CAS		PFT10159
0160	00175	0 06 00223	ADD	=*100001		PFT10160
0161	00176	0 04 00221	STA	EXIT		PFT10161
0162	00177	0 02 00222	LDA	SAVE		PFT10162
0163	00200	-0 05 00172	ERA*	CAS		PFT10163
0164	00201	100040	SZE			PFT10164
0165	00202	0 01 00204	JMP	**+2		PFT10165
0166	00203	0 01 00216	JMP	EXIE		PFT10166
0167	00204	101400	SMI			PFT10167
0168	00205	0 01 00210	JMP	SAME		PFT10168
0169	00206	0 02 00222	LDA	SAVE		PFT10169
0170	00207	0 01 00212	JMP	**+3		PFT10170
0171	00210	0 02 00222	SAME LDA	SAVE		PFT10171
0172	00211	-0 07 00172	SUB*	CAS		PFT10172
0173	00212	100400	SPL			PFT10173
0174	00213	0 01 00215	JMP	EXIL		PFT10174
0175	00214	0 01 00217	JMP	EXIG		PFT10175
0176	00215	0 12 00221	EXIL IRS	EXIT		PFT10176
0177	00216	0 12 00221	EXIE IRS	EXIT		PFT10177
0178	00217	0 02 00222	EXIG LDA	SAVE		PFT10178
0179	00220	-0 01 00221	JMP*	EXIT		PFT10179
0180	00221		EXIT BSS	1		PFT10180
0181	00222		SAVE BSS	1		PFT10181
0182	00223	100001	END	WRIT		PFT10182

NO ERRORS IN ABOVE ASSEMBLY.  
DAP-16 REV. BX 1-30-67 OPR



H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

\* N520-001-6772 (X16-PFT2)    C C D   N O   7 0 1 8 0 6 0 8 0 0 0      R E V .   C      P A G E    1

0001	*	N520-001-6772 (X16-PFT2)	C C D   N O   7 0 1 8 0 6 0 8 0 0 0	R E V .   C		P F T 2 0 0 0 1
0002	*					P F T 2 0 0 0 2
0003	*					P F T 2 0 0 0 3
0004	*					P F T 2 0 0 0 4
0005	*	COMPUTERS: H-316,DDP-416,DDP-516				P F T 2 0 0 0 5
0006	*					P F T 2 0 0 0 6
0007	*					P F T 2 0 0 0 7
0008	*	PROGRAM CATEGORY: TEST AND MAINTENANCE				P F T 2 0 0 0 8
0009	*					P F T 2 0 0 0 9
0010	*					P F T 2 0 0 1 0
0011	*	PROGRAM TITLE: X16-PFT2				P F T 2 0 0 1 1
0012	*	POWER FAILURE TEST NO, 2				P F T 2 0 0 1 2
0013	*					P F T 2 0 0 1 3
0014	*					P F T 2 0 0 1 4
0015	*					P F T 2 0 0 1 5
0016	*					P F T 2 0 0 1 6
0017	*					P F T 2 0 0 1 7
0018	*					P F T 2 0 0 1 8
0019	*					P F T 2 0 0 1 9
0020	*					P F T 2 0 0 2 0
0021	*					P F T 2 0 0 2 1
0022	*					P F T 2 0 0 2 2
0023	*					P F T 2 0 0 2 3
0024	*					P F T 2 0 0 2 4
0025	*					P F T 2 0 0 2 5
0026	*					P F T 2 0 0 2 6
0027	*					P F T 2 0 0 2 7
0028	*					P F T 2 0 0 2 8
0029	*					P F T 2 0 0 2 9
0030	*					P F T 2 0 0 3 0
0031	*					P F T 2 0 0 3 1
0032	*					P F T 2 0 0 3 2
0033	*					P F T 2 0 0 3 3
0034	*					P F T 2 0 0 3 4
0035	*					P F T 2 0 0 3 5
0036	*					P F T 2 0 0 3 6
0037	*					P F T 2 0 0 3 7

APPROVAL	DATE	
PROG. <i>Dale E. Korman</i>	<i>5-30-69</i>	
SUPR. <i>H. E. King</i>	<i>5/30/69</i>	
QUAL. <i>David M. Garcia</i>	<i>5/30/69</i>	
		NO. OF PAGES <i>21</i>

0038	*	REVISION		PFT20038
0039	*			PFT20039
0040	*	REV C	ECO 6902	PFT20040
0041	*	REV B	ECO 5970	PFT20041
0042	*	REV A	07-26-68	PFT20042
0043	*		04-01-68	PFT20043
0044	*			PFT20044
0045	*	AUTHOR		PFT20045
0046	*			PFT20046
0047	*	HONEYWELL INC.-COMPUTER CONTROL DIVISION		PFT20047
0048	*			PFT20048
0049	*			PFT20049
0050	*	PURPOSE		PFT20050
0051	*			PFT20051
0052	*	FACTORY TEST OF PFH AND PFI FEATURES		PFT20052
0053	*			PFT20053
0054	*			PFT20054
0055	*	RESTRICTIONS		PFT20055
0056	*			PFT20056
0057	*	NONE		PFT20057
0058	*			PFT20058
0059	*			PFT20059
0060	*	STORAGE		PFT20060
0061	*			PFT20061
0062	*	PFT2 USES ALL OF CORE		PFT20062
0063	*			PFT20063
0064	*			PFT20064
0065	*	USE		PFT20065
0066	*			PFT20066
0067	*	1) LOAD PROGRAM		PFT20067
0068	*	2) ENTER 100 OCT INTO P COUNTER		PFT20068
0069	*	3) PRESS START		PFT20069
0070	*	4) ENTER PARAMETERS WHEN REQUESTED BY AN ASR MESSAGE		PFT20070
0071	*			PFT20071
0072	*			PFT20072
0073	*	INPUT PARAMETERS		PFT20073
0074	*			PFT20074

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0075 * ASR MESSAGE TYPE IN PFT20075
0076 * PFT20076
0077 * CP NO 3,4, OR 5 PFT20077
0078 * PFT20078
0079 * TYPE I OR H I, OR H (I=INTERRUPT MODE) PFT20079
0080 * (H=HALT MODE) PFT20080
0081 * PFT20081
0082 * NOTE: BEFORE TYPING I OR H PFT20082
0083 * PFT20083
0084 * (1) DDP-4/516...SET PFH/PFI SWITCH TO APPROPRIATE MODE PFT20084
0085 * PFT20085
0086 * (2) H-316.....DETERMINE POWER FAILURE HARDWARE MODE PFT20086
0087 * PFT20087
0088 * AFTER ENTERING THE PARAMETERS, TURN OFF POWER, THEN TURN ON POWER PFT20088
0089 * AND START AT ZERO, OBSERVE IYPEOUTS (AND HALTS IN THE EVENT OF PFT20089
0090 * MEMORY ERRORS). PFT20090
0091 * A-PASS COUNT (00 TO 99) PFT20091
0092 * B-EVIDENCE OF ERRORS (SKIPPED IF NONE) PFT20092
0093 * C-COMPLETION MESSAGE, (INDICATES PGM MODE) PFT20093
0094 * AFTER SEQUENCE C THE PF MODE SELECTED CAN BE RECHECKED BY PFT20094
0095 * REPEATING THE "POWER OFF/ON, STARTING AT ZERO" STEPS. PFT20095
0096 * PFT20096
0097 * TO CHANGE PFH/PFI MODE, OR TO RESET PASS COUNTER, STOP AND RESTART PFT20097
0098 * AT 100 OCTAL . PFT20098
0099 * PFT20099
0100 * PFT20100
0101 * METHOD PFT20101
0102 * PFT20102
0103 * GENERAL ROUTINE-THE PFT2 PROGRAM FINDS MEMORY SIZE AND PFT20103
0104 * STORES A JMP INSTRUCTION AT LOCATION ZERO TO ENABLE A RETURN PFT20104
0105 * FROM A SIMULATED (POWER OFF) FAILURE, IT THEN LOADS EACH PFT20105
0106 * UPPER LOCATION NOT USED BY THE PROGRAM WITH ITS OWN PFT20106
0107 * ADDRESS (SETM) AND CHECKS FOR THE SAME (CHKM). IN THE IDLE PFT20107
0108 * (WAITING) STATE THE PROGRAM IS CYCLING THRU MEMORY. PFT20108
0109 * PFT20109
0110 * PFH-AFTER A PFH A CHECK IS MADE THAT NO INTERRUPT OCCURED, A PFT20110
0111 * MEMORY CHECK IS PERFORMED AND PFT2 RETURNS TO THE IDLE STATE. PFT20111

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0112	*		PFT20112
0113	*	PFI-WHEN POWER IS SHUT OFF, AND IF THE INTERRUPT OCCURS THE	PFT20113
0114	*	B AND C REGISTERS ARE LOADED (FOR 3/516 ONLY) AND THE PROGRAM	PFT20114
0115	*	CHECKS AN APPROPRIATE NUMBER OF LOCATIONS (96 FOR 4/516,	PFT20115
0116	*	59 FOR H-316) TO CONSUME 1,2 MILLISECONDS, THE B AND C	PFT20116
0117	*	REGISTERS ARE THEN SAVED (3/516 ONLY), A LOCATION	PFT20117
0118	*	CALLED THE "A" REGISTER IS SET, AND THE PROGRAM HALTS.	PFT20118
0119	*		PFT20119
0120	*	ON A PFI POWER-UP START THE FOLLOWING CHECKS ARE MADE:	PFT20120
0121	*	A-PROPER STORAGE OF A,B AND C CONTENTS	PFT20121
0122	*	B-MEMORY FAILURES INDICATED DURING 1,2 MS INTERVAL	PFT20122
0123	*	NOTE: IF NO INTERRUPT OCCURRED, CHECKS A AND B	PFT20123
0124	*	ARE NOT PERFORMED, INSTEAD A "NO INTERRUPT"	PFT20124
0125	*	(NO INTR) MESSAGE IS PRINTED THEN STEP C IS	PFT20125
0126	*	PERFORMED.	PFT20126
0127	*	C-MEMORY CHECK.	PFT20127
0128	*	THE PROGRAM THEN RETURNS TO AN IDLE STATE	PFT20128
0129	*		PFT20129
0130	*	HALTS ARE PERFORMED AFTER MOST ERROR INDICATIONS FOR FURTHER	PFT20130
0131	*	OPERATOR ANALYSIS, ON SUCH A HALT REFER TO THE LISTING PROPER	PFT20131
0132	*	FOR DETAILS, ALL FAILURE INDICATORS ARE RESET AFTER THE LAST ONE	PFT20132
0133	*	IS EXAMINED,	PFT20133
0134	*	*****	PFT20134
0135	*	EJCT	PFT20135



0136				LOAD			PFT20136
0137				ORG	'100	FIRST START HERE	PFT20137
0138				*			PFT20138
0139				*	FIND	DDP=X16 TYPE	PFT20139
0140				*			PFT20140
0141	00100	0	02	00207	LDA	TPNT	PFT20141
0142	00101	0	04	00000	STA	0	PFT20142
0143	00102	0	02	00613	LDA	M1	PFT20143
0144	00103	0	10	00717	JST	TYPE	PFT20144
0145	00104	0	02	00645	LDA	M3	PFT20145
0146	00105	0	10	00717	JST	TYPE	PFT20146
0147	00106	0	10	00545	JST	IPOC	PFT20147
0148	00107	0	00	00000	IPCH	DAC **	PFT20148
0149	00110	0	05	00761	ERA	LOC3	PFT20149
0150	00111	100040			SZE		PFT20150
0151	00112	0	01	00116	JMP	1PCJ	PFT20151
0152	00113	0	02	00776	LDA	*-58	PFT20152
0153	00114	0	04	00766	STA	TIME	PFT20153
0154	00115	0	01	00134	JMP	R345	PFT20154
0155	00116	0	02	00107	1PCJ LDA	IPCH	PFT20155
0156	00117	0	05	00762	ERA	LOC4	PFT20156
0157	00120	100040			SZE		PFT20157
0158	00121	0	01	00124	JMP	*+3	PFT20158
0159	00122	0	04	00746	STA	MT	PFT20159
0160	00123	0	01	00131	JMP	R416	PFT20160
0161	00124	0	02	00107	LDA	IPCH	PFT20161
0162	00125	0	05	00763	ERA	LOC5	PFT20162
0163	00126	100040			SZE		PFT20163
0164	00127	0	01	00106	JMP	IPCH-1	PFT20164
0165	00130	0	01	00134	JMP	R345	PFT20165
0166	00131	0	02	00221	R416 LDA	R50	PFT20166
0167	00132	0	06	00775	ADD	=4	PFT20167
0168	00133	0	04	00221	STA	R50	PFT20168
0169	00134	0	02	00217	R345 LDA	R30	PFT20169
0170	00135	0	04	00252	STA	R5+3	PFT20170
0171	00136	0	02	00207	R31 LDA	TPNT	PFT20171
0172	00137	0	04	00745	STA	LA	PFT20172

0173	00140	0 10	00222	JST	SETM	SET ALL OF MEMORY	PFT20173
0174	00141	0 12	00136	IRS	R31	RETURN IF MEMORY NOT	PFT20174
0175	00142	0 12	00221	IRS	R50		PFT20175
0176	00143	0 01	00136	JMP	R31	OVERFLOWED, TRY AGAIN	PFT20176
0177				*			PFT20177
0178	00144	0 02	00136	R32 LDA	R31	RETURN IF O'FLO	PFT20178
0179	00145	0 07	00774	SUB	=1	BACK UP ONE	PFT20179
0180	00146	0 04	00147	STA	**1		PFT20180
0181	00147	0 00	00000	***		EXECUTE A REG	PFT20181
0182	00150	0 04	00745	STA	LA	LA IS FIXED	PFT20182
0183	00151	0 02	00220	LDA	R33		PFT20183
0184	00152	0 04	00252	STA	R5+3	REPAIR CHKM	PFT20184
0185	00153	0 02	00745	LDA	LA	ENTER SIZE MSG	PFT20185
0186				*		FIX SIZE MSG	PFT20186
0187	00154	0404	67	LGR	9	LOW ORDER 777 IS THERE	PFT20187
0188	00155	0 03	00773	ANA	=7		PFT20188
0189	00156	0 06	00772	ADD	= '260	MAKE ASCII	PFT20189
0190	00157	0 04	00642	STA	M2+8		PFT20190
0191	00160	0 02	00745	LDA	LA		PFT20191
0192	00161	0404	64	LGR	12		PFT20192
0193	00162	0 03	00773	ANA	=7		PFT20193
0194	00163	0 06	00772	ADD	= '260		PFT20194
0195	00164	0414	70	LGL	8	FIRST CHAR DONE	PFT20195
0196	00165	0 06	00642	ADD	M2+8		PFT20196
0197	00166	0 04	00642	STA	M2+8		PFT20197
0198				*			PFT20198
0199				*		OUTPUT MESSAGES	PFT20199
0200				*			PFT20200
0201	00167	0 02	00632	LDA	M2	TOP ADDRESS	PFT20201
0202	00170	0 10	00717	JST	TYPE		PFT20202
0203	00171	0 02	00663	LDA	M6	OUTPUT	PFT20203
0204	00172	0 10	00717	JST	TYPE		PFT20204
0205				*			PFT20205
0206				*		FIX STARTS	PFT20206
0207				*			PFT20207
0208	00173	000021		RMP			PFT20208
0209	00174	0 10	00545	JST	IPOC		PFT20209

0210	00175	0 000000	IPCT	DAC	**		PFT20210
0211	00176	0 02 00175	LDA	IPCT			PFT20211
0212	00177	0 05 00764	ERA	LOCH			PFT20212
0213	00200	101040	SNZ				PFT20213
0214	00201	0 01 00307	JMP	PFHS			PFT20214
0215	00202	0 02 00175	LDA	IPCT			PFT20215
0216	00203	0 05 00765	ERA	LOCI			PFT20216
0217	00204	101040	SNZ				PFT20217
0218	00205	0 01 00341	JMP	PFIS			PFT20218
0219	00206	0 01 00174	JMP	IPCT-1			PFT20219
0220	00207	007777	TPNT	OCT	7777,17777,27777,37777,47777,57777,67777,77777		PFT20220
	00210	017777					
	00211	027777					
	00212	037777					
	00213	047777					
	00214	057777					
	00215	067777					
	00216	077777					
0221	00217	0 01 00144	R30	JMP	R32		PFT20221
0222	00220	0 10 00574	R33	JST	MFL		PFT20222
0223	00221	177770	R50	DEC	=8		PFT20223
0224			*				PFT20224
0225			*				PFT20225
0226			*				PFT20226
0227			*	SUBROUTINE TO FILL EACH LOCATION WITH ITS OWN ADDRESS			PFT20227
0228			*				PFT20228
0229	00222	0 00 00000	SETM	PZE	SET MEMORY		PFT20229
0230	00223	000013	EXA				PFT20230
0231	00224	0 02 00777	LDA	FA	FIRST ADDRESS		PFT20231
0232	00225	0 04 00743	STA	MEMP	MEMORY POINTER		PFT20232
0233	00226	0 06 00774	ADD	#1			PFT20233
0234	00227	0 07 00745	SUB	LA			PFT20234
0235	00230	0 04 00744	STA	MTI	MEMORY TOP INDICATOR		PFT20235
0236	00231	0 02 00743	R4	LDA	MEMP		PFT20236
0237	00232	-0 04 00743	STA*	MEMP			PFT20237
0238	00233	0 12 00743	IRS	MEMP	BUMP		PFT20238
0239	00234	0 12 00744	IRS	MTI	SKIPS AT TOP		PFT20239

0240	00235	0 01 00231	JMP	R4		PFT20240
0241	00236	0 10 00240	JST	CHKM	CHECK RESULT	PFT20241
0242	00237	-0 01 00222	JMP*	SETM		PFT20242
0243			*			PFT20243
0244			*		ROUTINE TO CHECK EACH LOCATION FOR ITS ADDRESS	PFT20244
0245			*			PFT20245
0246	00240	0 00 00000	CHKM	PZE	CHECK MEMORY	PFT20246
0247	00241	000013		EXA		PFT20247
0248	00242	0 02 00777	LDA	FA	FIRST ADDRESS	PFT20248
0249	00243	0 04 00743	STA	MEMP	MEMORY POINTER	PFT20249
0250	00244	0 06 00774	ADD	=1		PFT20250
0251	00245	0 07 00745	SUB	LA		PFT20251
0252	00246	0 04 00744	STA	MTI	MEMORY TOP INDICATOR	PFT20252
0253	00247	0 02 00743	R5	LDA	MEMP	SPECIAL ENTRY POINT
0254	00250	-0 07 00743	SUB*	MEMP		PFT20253
0255	00251	100040		SZE	ZERO IS GOOD, SKIPS	PFT20254
0256	00252	0 10 00574	JST	MFL	MEMORY (CHECK) FAILED	PFT20255
0257	00253	0 12 00743	IRS	MEMP	BUMP	PFT20256
0258	00254	0 12 00744	IRS	MTI	SKIPS AT TOP	PFT20257
0259	00255	0 01 00247	JMP	R5		PFT20258
0260	00256	-0 01 00240	JMP*	CHKM		PFT20259
0261			*			PFT20260
0262			*		SUBROUTINE TO SAVE B REG AND C BIT	PFT20261
0263			*			PFT20262
0264	00257	0 00 00000	SVEB	PZE	NOT ENTERED ON 416	PFT20263
0265	00260	140040		CRA	SU B ENDS CLEAR	PFT20264
0266	00261	000201		IAB		PFT20265
0267	00262	0 04 00750	STA	BSVE	B IS SAVED	PFT20266
0268	00263	140040		CRA		PFT20267
0269	00264	100001		SRC	SKIP IF ZERO	PFT20268
0270	00265	0 02 00774	LDA	=1		PFT20269
0271	00266	0 04 00751	STA	CSVE	C IS SAVED	PFT20270
0272	00267	-0 01 00257	JMP*	SVEB		PFT20271
0273				EJCT		PFT20272

0274			*						PFT20274
0275			*	SUBROUTINE TO SET B REG AND C BIT					PFT20275
0276			*						PFT20276
0277	00270	0 00 00000	SETB	PZE		NOT ENTERED ON 416			PFT20277
0278	00271	0 02 00771	LDA	=170707					PFT20278
0279	00272	000201	IAB						PFT20279
0280	00273	140600	SCB						PFT20280
0281	00274	-0 01 00270	JMP*	SETB					PFT20281
0282			*						PFT20282
0283			*	SUBROUTINE TO CHECK SAVED B REG AND C BIT					PFT20283
0284			*						PFT20284
0285	00275	0 00 00000	CHKB	PZE		NOT ENTERED ON 416			PFT20285
0286	00276	0 02 00750	LDA	BSVE					PFT20286
0287	00277	0 05 00771	ERA	=170707					PFT20287
0288	00300	100040	SZE		SKIP IF GOOD				PFT20288
0289	00301	0 10 00525	JST	BFL	B REG FAIL				PFT20289
0290	00302	0 02 00751	LDA	GSVE					PFT20290
0291	00303	0 07 00774	SUB	*1					PFT20291
0292	00304	100040	SZE		SKIP IF GOOD				PFT20292
0293	00305	0 10 00536	JST	CFL	C BIT FAIL				PFT20293
0294	00306	-0 01 00275	JMP*	CHKB					PFT20294
0295			EJCT						PFT20295

0296			*				PFT20296
0297			*	PFH MAIN ROUTINE			PFT20297
0298			*				PFT20298
0299	00307	0 02 00321	PFHS	LDA	SH	SPACE H (HALT)	PFT20299
0300	00310	0 04 00655		STA	M4+2	SET FOR "H-MODE DONE" MSG	PFT20300
0301	00311	0 02 00754		LDA	PFHI	SET RETURN AFTER	PFT20301
0302	00312	0 04 00000		STA	0	POWER OFF	PFT20302
0303	00313	0 02 00756		LDA	R35	ALLOW FOR INCORRECT	PFT20303
0304	00314	0 04 00060		STA	'60	INTERRUPT IN PFH MODE	PFT20304
0305	00315	0 10 00507		JST	RPC	RESET PASS COUNT	PFT20305
0306	00316	0 10 00222		JST	SETM	SET MEMORY	PFT20306
0307	00317	0 10 00240	R6	JST	CHKM	RUN THROUGH ALL OF	PFT20307
0308	00320	0 01 00317		JMP	*-1	MEMORY AND WAIT FOR	PFT20308
0309			*			POWER OFF,	PFT20309
0310	00321	120310	SH	BCI	1, H		PFT20310
0311			*				PFT20311
0312	00322	0 10 00457	PFHR	JST	PCNT	OUTPUT PASS COUNT	PFT20312
0313	00323	0 10 00240		JST	CHKM	CHECK MEMORY	PFT20313
0314	00324	0 02 00653		LDA	M4	PFH DONE MSG	PFT20314
0315	00325	0 10 00717		JST	TYPE		PFT20315
0316	00326	0 10 00222		JST	SETM	FIX ANY FAULTS	PFT20316
0317	00327	0 01 00317		JMP	R6	BACK TO WAIT	PFT20317
0318			*				PFT20318
0319			*	HERE IF UNEXPECTED INT			PFT20319
0320			*				PFT20320
0321	00330	0 00 00000	UEXI	PZE			PFT20321
0322	00331	0 02 00757		LDA	R36	FIX FOR POWER UP	PFT20322
0323	00332	0 04 00000		STA	0		PFT20323
0324	00333	000000		HLT		WAIT FOR POWER TO DIE	PFT20324
0325			*				PFT20325
0326			*	UNEXPECTED INT RETURN			PFT20326
0327			*				PFT20327
0328	00334	0 10 00457	UXIT	JST	PCNT	TYPE PASS COUNT	PFT20328
0329	00335	0 02 00674		LDA	M30		PFT20329
0330	00336	0 10 00717		JST	TYPE		PFT20330
0331	00337	000000		HLT			PFT20331
0332	00340	0 01 00337		JMP	*-1		PFT20332

0333			*					PFT20333
0334			*	PFI MAIN ROUTINE				PFT20334
0335			*					PFT20335
0336	00341	0 02 00364	PFIS	LDA	SI	SPACE I (INTERRUPT)		PFT20336
0337	00342	0 04 00655		STA	M4+2	SET FOR "I-MODE DONE" MSG		PFT20337
0338	00343	0 02 00755		LDA	PFI I	SET RETURN AFTER		PFT20340
0339	00344	0 04 00000		STA	0	POWER OFF		PFT20341
0340	00345	0 10 00507		JST	RPC	RESET PASS COUNT		PFT20342
0341	00346	0 10 00222		JST	SETM	SET MEMORY		PFT20343
0342	00347	0 02 00365	RB	LDA	SAVE	FIX PFI LOCATION		PFT20344
0343	00350	0 04 00060		STA	'60			PFT20345
0344	00351	140040		CRA				PFT20346
0345	00352	0 04 00366		STA	SAVE+1	RESET TO ZERO		PFT20347
0346	00353	0 02 00746		LDA	MT			PFT20348
0347	00354	100040		SZE		SKIP IF 416		PFT20349
0348	00355	0 10 00270		JST	SETB	SET B AND C		PFT20350
0349	00356	0 02 00770		LDA	*12525			PFT20351
0350	00357	0 04 00747		STA	ASVE	ZERO THE SAVE REGISTER		PFT20352
0351	00360	0 04 00750		STA	BSVE	LOCATIONS TO		PFT20353
0352	00361	0 04 00751		STA	CSVE	OCTAL 2525		PFT20354
0353	00362	0 10 00240		JST	CHKM	RUN THROUGH ALL OF MEMORY		PFT20355
0354	00363	0 01 00362		JMP	*=1	AND WAIT FOR		PFT20356
0355			*			POWER OFF		PFT20357
0356	00364	120311	SI	BCI	1, I			PFT20358
0357			*					PFT20359
0358	00365	0 000366	SAVE	DAC	*+1			PFT20360
0359	00366	0 00 00000		PZE		PFI GOES HERE		PFT20361
0360	00367	140040		CRA		ZERO ERROR COUNT		PFT20362
0361	00370	0 04 00753		STA	ENCT			PFT20363
0362	00371	0 02 00760		LDA	R40	IRS ECNT		PFT20364
0363	00372	0 04 00252		STA	R5+3	BUG MEM CHECK		PFT20365
0364	00373	0 02 00746		LDA	MT			PFT20366
0365	00374	100040		SZE		SKIP IF 416		PFT20367
0366	00375	0 10 00270		JST	SETB	SET B AND C		PFT20368
0367	00376	0 02 00766		LDA	TIME			PFT20369
0368	00377	0 04 00744		STA	MTI	1.0 MILLISEC PLUS 20		PFT20370
0369	00400	0 02 00745		LDA	LA	PERCENT (1.2 MS TOTAL)		PFT20371

0370	00401	0 07 00743	SUB	MEMP				PFT20372
0371	00402	0 06 00766	ADD	TIME				PFT20373
0372	00403	101400	SMI					PFT20374
0373	00404	0 01 00410	JMP	**4				PFT20375
0374	00405	0 02 00743	LDA	MEMP				PFT20376
0375	00406	0 06 00766	ADD	TIME				PFT20377
0376	00407	0 04 00743	STA	MEMP				PFT20378
0377	00410	0 02 00414	LDA	R7				PFT20379
0378	00411	0 04 00240	STA	CHKM				PFT20380
0379	00412	000013	EXA					PFT20381
0380	00413	0 01 00247	JMP	R5				PFT20382
0381	00414	0 000415	DAC	**1				PFT20383
0382								PFT20384
0383			*					PFT20385
0384			*					PFT20386
0385	00415	0 02 00746	LDA	MT				PFT20387
0386	00416	100040	SZE					PFT20388
0387	00417	140600	SCB					PFT20389
0388	00420	0 02 00746	LDA	MT				PFT20390
0389	00421	100040	SZE					PFT20391
0390	00422	0 10 00257	JST	SVEB				PFT20392
0391	00423	0 02 00767	LDA	'170707				PFT20393
0392	00424	0 04 00747	STA	ASVE				PFT20394
0393	00425	000000	HLT					PFT20395
0394			*					PFT20396
0395			*					PFT20397
0396			*					PFT20398
0397	00426	0 10 00457	PF IR JST	PCNT				PFT20399
0398	00427	0 02 00366	LDA	SAVE+1				PFT20400
0399	00430	101040	SNZ					PFT20401
0400	00431	-0 01 00456	JMP*	NIEL				PFT20402
0401	00432	0 02 00220	LDA	R33				PFT20403
0402	00433	0 04 00252	STA	R5+3				PFT20404
0403	00434	0 02 00747	LDA	ASVE				PFT20405
0404	00435	0 05 00767	ERA	'170707				PFT20406
0405	00436	100040	SZE					PFT20407
0406	00437	0 10 00514	JST	AFL				PFT20408

SORT OF RNADOM

SKIP IF LESS THAN 96 TO GO

FORCE ENOUGH TIME

FIX RETURN

SPECIAL ENTRY TO CHKM

\* HERE AFTER DELAY PER PRODUCT SPEC

SKIP IF 416

ORIG WIPED OUT

SKIP IF 416

ALL SAVED

WAIT FOR POWER TO DIE

\* HERE WHEN POWERED UP

PASS COUNT

PFI LOCATION

DID THE INTR OCCUR

NO, JMP NO INT ERROR ROUTINE

REPAIR MEM CHECK

SKIP IF GOOD

A REG FAIL





0444	00477	0 000500	M10	DAC	**+1		PFT20446
0445	00500	177776		DEC	-2		PFT20447
0446	00501	106612		OCT	106612		PFT20448
0447	00502	177660	MSD	OCT	177660	CRLF	PFT20449
0448			*			NULL AND ASCII ZERO	PFT20450
0449	00503	0 000504	M11	DAC	**+1		PFT20451
0450	00504	177776		DEC	-2		PFT20452
0451	00505	177660	LSD	OCT	177660	NULL AND ASCII ZERO	PFT20453
0452	00506	120240		OCT	120240	TWO SPACES	PFT20454
0453			*				PFT20455
0454	00507	0 00 00000	RPC	PZE		RESET PASS COUNTER	PFT20456
0455	00510	0 02 00476		LDA	DZ		PFT20457
0456	00511	0 04 00502		STA	MSD		PFT20458
0457	00512	0 04 00505		STA	LSD		PFT20459
0458	00513	-0 01 00507		JMP*	RPC		PFT20460
0459			*				PFT20461
0460			*			PFI FAILURE POINTS	PFT20462
0461			*				PFT20463
0462	00514	0 00 00000	AFL	PZE		A REG FAILED	PFT20464
0463	00515	0 04 00752		STA	TS1	SAVE BITS IN ERROR	PFT20465
0464	00516	0 02 00563		LDA	M13		PFT20466
0465	00517	0 10 00717		JST	TYPE	TYPE A	PFT20467
0466	00520	0 02 00556		LDA	M12		PFT20468
0467	00521	0 10 00717		JST	TYPE	TYPE BAD	PFT20469
0468	00522	0 02 00752		LDA	TS1	DISPLAY BAD BITS	PFT20470
0469	00523	000000		HLT			PFT20471
0470	00524	-0 01 00514		JMP*	AFL	CARRY ON	PFT20472
0471			*				PFT20473
0472	00525	0 00 00000	BFL	PZE		B REG FAILED	PFT20474
0473	00526	0 04 00752		STA	TS1	SAVE BITS IN ERROR	PFT20475
0474	00527	0 02 00566		LDA	M14		PFT20476
0475	00530	0 10 00717		JST	TYPE	TYPE B	PFT20477
0476	00531	0 02 00556		LDA	M12		PFT20478
0477	00532	0 10 00717		JST	TYPE	TYPE BAD	PFT20479
0478	00533	0 02 00752		LDA	TS1	DISPLAY BAD BITS	PFT20480
0479	00534	000000		HLT			PFT20481
0480	00535	-0 01 00525		JMP*	BFL	CARRY ON	PFT20482

0481			*						PFT20483
0482	00536	0 00 00000	CFL	PZE				C BIT FAILED,	PFT20484
0483	00537	0 02 00571		LDA	M15			ONLY FAILURE MODE IS	PFT20485
0484	00540	0 10 00717		JST	TYPE			C RESET	PFT20486
0485	00541	0 02 00556		LDA	M12				PFT20487
0486	00542	0 10 00717		JST	TYPE				PFT20488
0487	00543	000000		HLT					PFT20489
0488	00544	-0 01 00536		JMP*	CFL			CARRY ON	PFT20490
0489			*						PFT20491
0490			*	INPUT ONE CHARACTER					PFT20492
0491			*						PFT20493
0492	00545	0 000000	IPOC	DAC	**				PFT20494
0493	00546	34 0104		SKS	'104				PFT20495
0494	00547	0 01 00546		JMP	*-1				PFT20496
0495	00550	14 0004		OCP	4				PFT20497
0496	00551	54 1004		INA	'1004				PFT20498
0497	00552	0 01 00551		JMP	*-1				PFT20499
0498	00553	-0 04 00545		STA*	IPOC				PFT20500
0499	00554	0 12 00545		IRS	IPOC				PFT20501
0500	00555	-0 01 00545		JMP*	IPOC				PFT20502
0501			*						PFT20503
0502	00556	0 000557	M12	DAC	**1				PFT20504
0503	00557	177775		DEC	-3				PFT20505
0504	00560	141301		BCI	2,BAD				PFT20506
	00561	142240							
0505	00562	103607		OCT	103607			TWO BELLS	PFT20507
0506			*						PFT20508
0507	00563	0 000564	M13	DAC	**1				PFT20509
0508	00564	177777		DEC	-1				PFT20510
0509	00565	140640		OCT	140640			A+SPACE	PFT20511
0510			*						PFT20512
0511	00566	0 000567	M14	DAC	**1				PFT20513
0512	00567	177777		DEC	-1				PFT20514
0513	00570	141240		OCT	141240			B+SPACE	PFT20515
0514			*						PFT20516
0515	00571	0 000572	M15	DAC	**1				PFT20517
0516	00572	177777		DEC	-1				PFT20518

0517	00573	141640		OCT	141640	C+SPACE		PFT20519
0518			*					PFT20520
0519			*		MEMORY CHECK FAILURE			PFT20521
0520			*					PFT20522
0521	00574	0 00 00000	MFL	PZE				PFT20523
0522	00575	0 02 00606		LDA	M16			PFT20524
0523	00576	0 10 00717		JST	TYPE	TYPE MEMRY		PFT20525
0524	00577	0 02 00556		LDA	M12			PFT20526
0525	00600	0 10 00717		JST	TYPE	TYPE BAD		PFT20527
0526	00601	0 02 00743		LDA	MEMP			PFT20528
0527	00602	000000		HLT		A SHOWS LOCATION IN ERROR		PFT20529
0528	00603	-0 02 00743		LDA*	MEMP			PFT20530
0529	00604	000000		HLT		A SHOWS CONTENTS IN ERROR		PFT20531
0530	00605	-0 01 00574		JMP*	MFL	CARRY ON		PFT20532
0531			*					PFT20533
0532	00606	0 000607	M16	DAC	**1			PFT20534
0533	00607	177775		DEC	=3			PFT20535
0534	00610	146705		BCI	3, MEMRY			PFT20536
	00611	146722						
	00612	154640						
0535			*					PFT20537
0536			*					PFT20538
0537			*					PFT20539
0538	00613	0 000614	M1	DAC	**1	OPEN MSG		PFT20540
0539	00614	177763		DEC	=13			PFT20541
0540	00615	106612		OCT	106612			PFT20542
0541	00616	154261		BCI	12, X16-PFT2 12 MAY 69 REV, C			PFT20543
	00617	133255						
	00620	150306						
	00621	152262						
	00622	120261						
	00623	131240						
	00624	146701						
	00625	154640						
	00626	133271						
	00627	120322						
	00630	142726						

	00631	127303						
0542	00632	0 000635	M2	DAC	**1	TOP ADDRESS MSG		PFT20544
0543	00633	177767		DEC	-9			PFT20545
0544	00634	106612		OCT	106612			PFT20546
0545	00635	152317		BCI	8, TOP ADRS	XX777		PFT20547
	00636	150240						
	00637	140704						
	00640	151323						
	00641	120240						
	00642	154330						
	00643	133667						
	00644	133640						
0546			*					PFT20548
0547	00645	0 000646	M3	DAC	**1			PFT20549
0548	00646	177774		DEC	-4			PFT20550
0549	00647	106612		OCT	106612			PFT20551
0550	00650	141720		BCI	3, CP NO.			PFT20552
	00651	120316						
	00652	147656						
0551			*					PFT20553
0552	00653	0 000654	M4	DAC	**1			PFT20554
0553	00654	177772		DEC	-6			PFT20555
0554	00655	120240		BCI	6, -MODE DONE			PFT20556
	00656	126715						
	00657	147704						
	00660	142640						
	00661	142317						
	00662	147305						
0555	00663	0 000664	M6	DAC	**1			PFT20557
0556	00664	177771		DEC	-7			PFT20558
0557	00665	106612		OCT	106612			PFT20559
0558	00666	152331		BCI	6, TYPE I OR H			PFT20560
	00667	150305						
	00670	120311						
	00671	120317						
	00672	151240						
	00673	144240						

0559			*						PFT20561
0560	00674	0 000675	M30	DAC	**1				PFT20562
0561	00675	177771		DEC	-7				PFT20563
0562	00676	120240		OCT	120240		TWO SPACES		PFT20564
0563	00677	144716		BCI	5,INT ON PFH				PFT20565
	00700	152240							
	00701	147716							
	00702	120320							
	00703	143310							
0564			*						PFT20566
0565	00704	0 000705	M40	DAC	**1				PFT20567
0566	00705	177766		DEC	-10				PFT20568
0567	00706	120240		OCT	120240				PFT20569
0568	00707	142722		BCI	8,ERR IN 1 MS MCHK				PFT20570
	00710	151240							
	00711	144716							
	00712	120261							
	00713	120315							
	00714	151640							
	00715	146703							
	00716	144313							
0569			*						PFT20571
0570				EJCT					PFT20572



0597	00743	000000	MEMP	BSZ	1	MEMORY POINTER	PFT20599
0598	00744	000000	MTI	BSZ	1	MEMORY TOP INDICATOR	PFT20600
0599	00745	000000	LA	BSZ	1	LAST ADDRESS	PFT20601
0600	00746	000001	MT	OCT	1		PFT20602
0601	00747	000000	ASVE	BSZ	1	A REG SAVE STORE	PFT20603
0602	00750	000000	BSVE	BSZ	1	B REG SAVE STORE	PFT20604
0603	00751	000000	CSVE	BSZ	1	C BIT SAVE STORE	PFT20605
0604	00752	000000	TS1	BSZ	1	TEMP STORE	PFT20606
0605	00753	000000	ENCT	BSZ	1	ERR CNT LOC DURING PFI	PFT20607
0606	00754	0 01 00322	PFHI	JMP	PFHR	LOC 0 JMP, PFH RESTART	PFT20608
0607	00755	0 01 00426	PFII	JMP	PFIR	LOC 0 JMP, PFI	PFT20609
0608	00756	0 000330	R35	DAC	UEXI		PFT20610
0609	00757	0 01 00334	R36	JMP	UXIT	UNEXPECTED INTER	PFT20611
0610	00760	0 12 00753	R40	IRS	ENCT	BUMP ERROR COUNT	PFT20612
0611	00761	000263	LOC3	OCT	263		PFT20613
0612	00762	000264	LOC4	OCT	264		PFT20614
0613	00763	000265	LOC5	OCT	265		PFT20615
0614	00764	000310	LUCH	OCT	310		PFT20616
0615	00765	000311	LOCI	OCT	311		PFT20617
0616	00766	177640	TIME	DEC	-96		PFT20618
0617	00767	170707		FIN			PFT20619
	00770	002525					
	00771	070707					
	00772	000260					
	00773	000007					
	00774	000001					
	00775	000004					
	00776	177706					
0618	00777	0 001011	FA	DAC	FAL	START OF MEMORY	PFT20620
0619			*				PFT20621
0620				EJCT			PFT20622







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0002	*		0002
0003	*		0003
0004	*		0004
0005	* COMPUTERS: DDP-416, DDP-516		0005
0006	*		0006
0007	*		0007
0008	* CATEGORY: TEST AND MAINTENANCE		0008
0009	*		0009
0010	*		0010
0011	* PROGRAM TITLE: X16-RTC1		0011
0012	*                    REAL TIME CLOCK TEST FOR THE DDP-416 AND DDP-516		0012
0013	*		0013
0014	*		0014
0015	*		0015
0016	*		0016
0017	*		0017
0018	*		0018
0019	*		0019
0020	*		0020
0021	*		0021
0022	*		0022
0023	*		0023
0024	*		0024
0025	*	APPROVAL	0025
0026	*		0026
0027	*		0027
0028	*	PROG. <i>R. D. Lee</i>	0028
0029	*		0029
0030	*		0030
0031	*	SUPR. <i>R. D. Lee</i>	0031
0032	*		0032
0033	*		0033
0034	*	QUAL. <i>J. J. Egan</i>	0034
0035	*		0035
0036	*		0036
0037	*		0037
0038	*	NO. OF PAGES	0038

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0039	* REVISIONS	0039
0040	*	0040
0041	* REV. B ECO 4777	0041
0042	* REV. A 05-10-67	0042
0043	*	0043
0044	*	0044
0045	* AUTHOR	0045
0046	*	0046
0047	* HONEYWELL INC., COMPUTER CONTROL DIVISION	0047
0048	*	0048
0049	*	0049
0050	* PURPOSE	0050
0051	*	0051
0052	* TO TEST REAL TIME CLOCK	0052
0053	*	0053
0054	*	0054
0055	* USE	0055
0056	*	0056
0057	* 1) LOAD PROGRAM	0057
0058	* 2) PRESS MASTER CLEAR AND ENTER 1000 INTO THE P-REG.	0058
0059	* 3) ENTER ANY BIT INTO THE A-REG FOR 50CPS CLOCK.	0059
0060	* LEAVE A-REG CLEAR FOR 60 CPS CLOCK OR MODIFIED CLOCK	0060
0061	* 4) PRESS START AND AWAIT END MESSAGE.	0061
0062	* 5) THE ASR-33 IS USED FOR ALL MESSAGES	0062
0063	* 6) THE PROGRAM MAY BE RESTARTED AFTER ANY HALT BY PRESSING START	0063
0064	* 7) THE PROGRAM MAY BE USED WITH ANY RTC UP TO 20000 CPS	0064
0065	* BY MODIFYING LOP DLY1 WITH THE FORMULA	0065
0066	* $60 / \text{FREQ} \times -3000$ WHERE FREQ IS THE RTC FREQUENCY	0066
0067	* EXAMPLE FOR A 240 CPS CLOCK	0067
0068	* $60 / 240 \times -3000 = -750$ . THE TWO'S COMP OF	0068
0069	* $\text{DEC } 750 = \text{TWO'S COMP OF } 1212 = 176566$	0069
0070	*	0070
0071	*	0071
0072	* ACCURACY	0072
0073	*	0073
0074	* ALL TIMING LIMITS HAVE TOLERANCES OF TEN PERCENT.	0074
0075	*	0075
0076	*	0076

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0077 * METHOD 0077
0078 * 0078
0079 * 0079
0080 * THE INTERRUPT MASK FOR THE RTC IS SET AND LOCATION ('61) IS 0079
0081 * LOADED WITH '177777. INTERRUPT IS ENABLED AND A DELAY OF 0080
0082 * THE RTC INCREMENT TIME +10%(16.7 MS +10% FOR 60 CPS RTC, 20.0 MS 0081
0083 * +10% FOR A 50 CPS RTC, CORRESPONDING TIMES FOR A MODIFIED 0082
0084 * RTC) IS INITIATED. AN INTERRUPT SHOULD OCCUR DURING THIS 0083
0085 * DELAY. LOCATION '61 IS AGAIN LOADED WITH '177777 AND INTERRUPT 0084
0086 * IS ENABLED. A DELAY OF THE RTC INCREMENT -10% IS INITIATED 0085
0087 * DURING WHICH TIME NO INTERRUPT SHOULD OCCUR. A DELAY 0086
0088 * OF 20% OF THE INCREMENT TIME IS INITIATED DURING WHICH TIME 0087
0089 * THE RTC SHOULD INTERRUPT. A TEST IS MADE TO SEE THAT 0088
0090 * THE INTERRUPT WAS CAUSED BY THE RTC(SKS '20) AND THAT 0089
0091 * THE INTERRUPT CAN BE RESET (OCP '20). THIS PROCEDURE 0090
0092 * IS REPEATED 200 TIMES. 0091
0093 * LOCATION '61 IS LOADED WITH -4000 AND INTERRUPT 0092
0094 * IS ENABLED. A DELAY OF 4000 RTC INCREMENT TIMES -10% 0093
0095 * (APPROX 66.7 -10% SEC FOR 60 CPS RTC, 80.0 -10% SEC FOR 0094
0096 * 50 CPS RTC, CORRESPONDING TIMES FOR A MODIFIED RTC) IS 0095
0097 * INITIATED. INTERRUPT SHOULD NOT OCCUR. A DELAY OF 20% OF 0096
0098 * 4000 INCREMENT TIMES IS INITIATED DURING WHICH TIME THE 0097
0099 * RTC SHOULD INTERRUPT. 0098
0100 * 0099
0101 * 0100
0102 * ERROR MESSAGES 0101
0103 * 0102
0104 * ER1 INTERRUPT DID NOT OCCUR WITHIN RTC INCREMENT TIME 0103
0105 * ER2 INTERRUPT NOT CAUSED BY RTC 0104
0106 * ER3 INTERRUPT OCCURRED IN LESS THAN RTC INCREMENT TIME 0105
0107 * ER4 RTC RUNNING TOO FAST 0106
0108 * ER5 RTC RUNNING TOO SLOW 0107
0109 * ER6 INTERRUPT NOT RESET BY OCP '20 0108
0110 * ER7 CLOCK FAILED TO INCREMENT '61 * 0109
0111 * 0110
0112 * ***** 0111
0113 * CF4 0112
0114 * LOAD 0113
* ORG 512 0114

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0115	01000	101000	STRT	NOP				0115
0116	01001	14 0020	OCP	'20	RESET INTERRUPT IF ON			0116
0117	01002	0 10 01044	JST	INIT	INITIALIZATION			0117
0118	01003	0 10 01217	JST	PRTY	PRINT ROUTINE			0118
0119	01004	0 001317	DAC	SMSG	LOCATION OF STARTING MESSAGE			0119
0120	01005	0 02 01554	REST	LDA	=1			0120
0121	01006	74 0020	SMK	'20	SET RTC MASK			0121
0122	01007	0 10 01056	JST	FCSP	FIND CLOCK SETTING			0122
0123	01010	0 10 01076	JST	DP1I	DELAY ONE INCREMENT + 10 PERCENT			0123
0124	01011	0 10 01252	JST	ER1	ERROR-INTERRUPT DID NOT OCCUR			0124
0125	01012	0 10 01056	JST	FCSP	FIND CLOCK SETTING			0125
0126	01013	0 10 01114	JST	DM1I	DELAY ONE INCREMENT TIME - 10%			0126
0127	01014	0 01 01016	JMP	**2	NO INTERRUPT			0127
0128	01015	0 10 01266	JST	ER3	INTERRUPT TOO SOON-ERROR			0128
0129	01016	0 10 01132	JST	D10P	DELAY 20% OF ONE INCREMENT TIME			0129
0130	01017	0 10 01252	JST	ER1	ERROR-NO INTERRUPT AFTER INC TIME			0130
0131	01020	0 12 01212	IRS	CNTR	CYCLE THROUGH 200 TIMES			0131
0132	01021	0 01 01005	JMP	REST				0132
0133	01022	0 10 01056	JST	FCSP	FIND CLOCK SETTING			0133
0134	01023	0 10 01147	JST	D4TM	DELAY 4000 INCREMENT TIMES-10%.			0134
0135	01024	0 01 01026	JMP	**2	NO INTERRUPT			0135
0136	01025	0 10 01274	JST	ER4	INTERRUPT TOO SOON-ERROR			0136
0137	01026	0 10 01170	JST	D4TP	DELAY 20% OF 4000 INCREMENT TIMES			0137
0138	01027	0 10 01300	JST	ER5	NO INTERRUPT-ERROR			0138
0139	01030	0 10 01217	JST	PRTY	GENERAL TYPE ROUTINE			0139
0140	01031	0 001327	DAC	EMSG	LOC OF ENDING MESSAGE			0140
0141	01032	0 01 01256	JMP	ERRH	JMP TO HALT			0141
0142			*					0142
0143			* SUBROUTINES					0143
0144			*					0144
0145	01033	0 00 00000	INT	PZE	**			0145
0146	01034	34 0020	SKS	'20				0146
0147	01035	0 01 01037	JMP	**2	RTC INTERRUPT			0147
0148	01036	0 10 01261	JST	ER2	INTERRUPT NOT CAUSED BY RTC			0148
0149	01037	14 0020	OCP	'20	RESET INTERRUPT			0149
0150	01040	34 0020	SKS	'20				0150
0151	01041	0 10 01305	JST	ER6	INTERRUPT NOT RESET BY OCP 20			0151
0152	01042	0 12 01213	IRS	INT1	IF INTERRUPT RETURN 1+ LOCATION			0152

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0153	01043	-0 01 01213	JMP*	INT1		0153
0154			*			0154
0155	01044	0 000000	INIT	DAC	**	0155
0156	01045	101040	SNZ		FIND ANY BIT SET IN A-REG	0156
0157	01046	0 01 01051	JMP	++3	IF NOT SET USE 60 CPS CLOCK	0157
0158	01047	0 02 01553	LDA	=-3600	IF SET USE 50 CPS CLOCK	0158
0159	01050	0 04 01207	STA	DLY1		0159
0160	01051	0 02 01211	LDA	CNT	PROGRAM COUNTER	0160
0161	01052	0 04 01212	STA	CNTR		0161
0162	01053	0 02 01216	LDA	INTR	SET UP JUMP WHEN RTC	0162
0163	01054	0 04 00063	STA	'63	FOR INTERRUPT	0163
0164	01055	-0 01 01044	JMP*	INIT		0164
0165			*			0165
0166	01056	0 000000	FCSP	DAC	**	0166
0167	01057	0 02 01554	LDA	=1	FIND WHAT PART OF CYCLE CLOCK	0167
0168	01060	74 0020	SMK	'20	SET CLOCK MASK	0168
0169	01061	14 0020	OCF	'20	START CLOCK	0169
0170	01062	0 02 01207	LDA	DLY1	IS AT.	0170
0171	01063	0 04 01210	STA	DLY2		0171
0172	01064	0 02 01552	LDA	=-3		0172
0173	01065	0 04 00061	STA	'61		0173
0174	01066	0 02 00061	LDA	'61	SOME NUMBER IN '61	0174
0175	01067	0 05 01552	ERA	=-3		0175
0176	01070	101040	SNZ			0176
0177	01071	0 01 01073	JMP	++2		0177
0178	01072	-0 01 01056	JMP*	FCSP		0178
0179	01073	0 12 01210	IRS	DLY2		0179
0180	01074	0 01 01066	JMP	*-6		0180
0181	01075	0 10 01312	JST	ER7	ERROR- CLOCK FAILED TO INCREMENT '61	0181
0182			*			0182
0183			*			0183
0184			*	DELAY ROUTINES		0184
0185			*			0185
0186	01076	0 000000	DP11	DAC	**	0186
0187	01077	14 0020	OCF	'20	DELAY ONE INCREMENT + 10%	0187
0188	01100	0 02 01076	LDA	DP11	START CLOCK	0188
0189	01101	0 04 01213	STA	INT1	SET UP RETURN AFTER INTERRUPTS	0189
0190	01102	0 02 01551	LDA	=-1		0190

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0191	01103	0 04 00061	STA	'61			0191
0192	01104	0 02 01207	LDA	DLY1	-3000 FOR 60 CPS,-3600 FOR 50 CPS		0192
0193	01105	0 04 01210	STA	DLY2	DELAY COUNTER		0193
0194	01106	000401	ENB		ENABLE INTERRUPTS		0194
0195	01107	0404 75	LGR	3	DELAY APPROX 6.24 USEC X DLY2		0195
0196	01110	0 12 01210	IRS	DLY2	=18.72 MSEC FOR 60 CPS CLOCK		0196
0197	01111	0 01 01107	JMP	*-2			0197
0198	01112	001001	INH		INHIBIT INTERRUPTS		0198
0199	01113	-0 01 01076	JMP*	DP11			0199
0200							0200
0201	01114	0 000000	DM11 DAC	**	DELAY ONE INCREMENT -10%		0201
0202	01115	14 0020	OCP	'20	START CLOCK		0202
0203	01116	0 02 01114	LDA	DM11			0203
0204	01117	0 04 01213	STA	INT1	SET UP RETURN AFTER INTERRUPTS		0204
0205	01120	0 02 01551	LDA	=-1			0205
0206	01121	0 04 00061	STA	'61			0206
0207	01122	0 02 01207	LDA	DLY1	-3000 FOR 60 CPS,-3600 FOR 50 CPS		0207
0208	01123	0 04 01210	STA	DLY2	DELAY COUNTER		0208
0209	01124	000401	ENB		ENABLE INTERRUPTS		0209
0210	01125	101000	NOP		DELAY APPROX 5.0 USEC X DLY2		0210
0211	01126	0 12 01210	IRS	DLY2	=14.4 MSEC FOR 60 CPS CLOCK		0211
0212	01127	0 01 01125	JMP	*-2			0212
0213	01130	001001	INH		INHIBIT INTERRUPTS		0213
0214	01131	-0 01 01114	JMP*	DM11			0214
0215							0215
0216	01132	0 000000	D10P DAC	**	DELAY APPROX 20% OF ONE INCREMENT		0216
0217	01133	14 0020	OCP	'20	START CLOCK		0217
0218	01134	0 02 01132	LDA	D10P			0218
0219	01135	0 04 01213	STA	INT1	SET UP RETURN AFTER INTERRUPTS		0219
0220	01136	0 02 01207	LDA	DLY1			0220
0221	01137	0404 76	LGR	2	DIVIDE BY 4		0221
0222	01140	0 04 01210	STA	DLY2	DELAY COUNTER		0222
0223	01141	000401	ENB		ENABLE INTERRUPTS		0223
0224	01142	0404 76	LGR	2	DELAY APPROX 5.76 USEC X DLY2		0224
0225	01143	0 12 01210	IRS	DLY2	=4.34 MS FOR 60 CPS CLOCK		0225
0226	01144	0 01 01142	JMP	*-2			0226
0227	01145	001001	INH		INHIBIT INTERRUPTS		0227
0228	01146	-0 01 01132	JMP*	D10P			0228



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0229			*						0229
0230	01147	0 000000	D4TM	DAC	**		DELAY FOUR THOUSAND COUNTS-10%		0230
0231	01150	14 0020		OCP	'20		START CLOCK		0231
0232	01151	0 02 01147		LDA	D4TM				0232
0233	01152	0 04 01213		STA	INT1		SET UP RETURN AFTER INTERRUPTS		0233
0234	01153	0 02 01550		LDA	=-4000				0234
0235	01154	0 04 00061		STA	'61				0235
0236	01155	0 02 01207		LDA	DLY1		-3000 FOR 60 CPS, -3600 FOR 50 CPS		0236
0237	01156	0 04 01210		STA	DLY2		=60.1 SEC FOR 60 CPS CLOCK		0237
0238	01157	000401		ENB			ENABLE INTERRUPTS		0238
0239	01160	0 02 01547	D4A	LDA	=-5200				0239
0240	01161	0 04 00000		STA	0				0240
0241	01162	0 12 00000		IRS	0				0241
0242	01163	0 01 01162		JMP	*-1		11.52 USEC FOR 60 CPS CLOCK		0242
0243	01164	0 12 01210		IRS	DLY2		DELAY APPROX		0243
0244	01165	0 01 01160		JMP	D4A				0244
0245	01166	001001		INH			INHIBIT INTERRUPTS		0245
0246	01167	-0 01 01147		JMP*	D4TM				0246
0247			*						0247
0248	01170	0 000000	D4TP	DAC	**		DELAY APPROX 20% OF 4000 INCREMENTS		0248
0249	01171	14 0020		OCP	'20		START CLOCK		0249
0250	01172	0 02 01170		LDA	D4TP				0250
0251	01173	0 04 01213		STA	INT1		SET UP RETURN AFTER INTERRUPTS		0251
0252	01174	0 02 01207		LDA	DLY1		-3000 FOR 60 CPS, -3600 FOR 50 CPS		0252
0253	01175	0 04 01210		STA	DLY2		=15 SEC FOR 60 CPS CLOCK		0253
0254	01176	000401		ENB			ENABLE INTERRUPTS		0254
0255	01177	0 02 01546	D4B	LDA	=-1300				0255
0256	01200	0 04 00000		STA	0				0256
0257	01201	0 12 00000		IRS	0				0257
0258	01202	0 01 01201		JMP	*-1		DELAY 11.52 USEC FOR 60 CPS CLOCK		0258
0259	01203	0 12 01210		IRS	DLY2				0259
0260	01204	0 01 01177		JMP	D4B				0260
0261	01205	001001		INH			INHIBIT INTERRUPTS		0261
0262	01206	-0 01 01170		JMP*	D4TP				0262
0263			*						0263
0264				*CONSTANTS*					0264
0265			*						0265
0266	01207	172110		DLY1	DEC	-3000	-3000 FOR 60 CPS, -3600 FOR 50 CPS		0266

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0267	01210	0 000000	DLY2 DAC	**	DELAY COUNTER	0267
0268	01211	177470	CNT DEC	-200	MAX PROGRAM COUNTER	0268
0269	01212	0 000000	CNTR DAC	**	PROGRAM COUNTER	0269
0270	01213	0 000000	INT1 DAC	**	LOC FOR RETURN AFTER INTERRUPTS	0270
0271	01214	0 000000	MSG DAC	**	LOCATION OF WORD	0271
0272	01215	0 000000	COV DAC	**	NO. OF WORDS TO BE TYPED OUT	0272
0273	01216	0 001033	INTR DAC	INT	LOC OF INTERRUPT ROUTINE	0273
0274			*			0274
0275			*ASR-33 PRINT ROUTINE			0275
0276			*			0276
0277	01217	0 000000	PRTY DAC	**		0277
0278	01220	001001	INH		INHIBIT INTERRUPTS	0278
0279	01221	34 0104	SKS	'104	SKIP IF ASR NOT BUSY	0279
0280	01222	0 01 01221	JMP	*-1		0280
0281	01223	14 0104	UCP	'104	ENABLE OUTPUT MODE	0281
0282	01224	0 02 01545	LDA	= '105215	LINE FEED + CARRIAGE RETURN	0282
0283	01225	74 0004	OTA	4	OUTPUT CARRIAGE RETURN	0283
0284	01226	0 01 01225	JMP	*-1		0284
0285	01227	0416 70	ALR	8		0285
0286	01230	74 0004	OTA	4	OUTPUT LINE FEED	0286
0287	01231	0 01 01230	JMP	*-1		0287
0288	01232	-0 02 01217	TY LDA*	PRTY	LDA WITH THE LOCATION OF THE MESSAGE	0288
0289	01233	0 04 01214	STA	MSG		0289
0290	01234	0 12 01217	IRS	PRTY		0290
0291	01235	-0 02 01214	LDA*	MSG	LDA WITH THE NUMBER OF WORDS TO BE TYPED OUT	0291
0292	01236	0 04 01215	STA	COV		0292
0293	01237	0 12 01214	SK IRS	MSG	INCREMENT FOR NEXT WORD	0293
0294	01240	-0 02 01214	LDA*	MSG	LOAD A WITH WORD	0294
0295	01241	0416 70	ALR	8	POSITION WORD	0295
0296	01242	74 0004	OTA	'4	OUTPUT WORD	0296
0297	01243	0 01 01242	JMP	*-1		0297
0298	01244	0416 70	ALR	8	POSITION WORD	0298
0299	01245	74 0004	OTA	'4	OUTPUT WORD	0299
0300	01246	0 01 01245	JMP	*-1		0300
0301	01247	0 12 01215	IRS	COV		0301
0302	01250	0 01 01237	JMP	SK		0302
0303	01251	-0 01 01217	JMP*	PRTY		0303
0304			*			0304

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0305			* MESSAGE ROUTINES			0305
0306			*			0306
0307	01252	0 000000	ER1 DAC **		INTERRUPT DID NOT OCCUR WITHIN ONE	0307
0308	01253	14 0220	UCP '220		STOP CLOCK	0308
0309	01254	0 10 01217	JST PRTY		INCREMENT TIME + 10 PERCENT	0309
0310	01255	0 001336	DAC EM1		LOC OF EM1	0310
0311	01256	140040	ERRH CRA		CLEAR A FOR FOR RETURN AND	0311
0312	01257	000000	HLT		NOT SELECT 50 CPS	0312
0313	01260	0 01 01000	JMP STRT			0313
0314			*			0314
0315	01261	0 000000	ER2 DAC **		INTERRUPT NOT CAUSED BY RTC	0315
0316	01262	14 0220	UCP '220		STOP CLOCK	0316
0317	01263	0 10 01217	JST PRTY		GENERAL TYPE ROUTINE	0317
0318	01264	0 001372	DAC EM2		LOC. OF EM2	0318
0319	01265	0 01 01256	JMP ERRH		ERROR HALT	0319
0320			*			0320
0321	01266	0 000000	ER3 DAC **		INTERRUPT OCCURRED IN LESS THAN	0321
0322	01267	14 0220	JCP '220		STOP CLOCK	0322
0323	01270	0 10 01217	JST PRTY		ONE INCREMENT TIME-10 PERCENT	0323
0324	01271	0 001413	DAC EM3		LOC. OF EM3	0324
0325	01272	0 01 01256	JMP ERRH		ERROR HALT	0325
0326			*			0326
0327	01273	14 0220	UCP '220		STOP CLOCK	0327
0328	01274	0 000000	ER4 DAC **		INTERRUPT OCCURRED BEFORE	0328
0329	01275	0 10 01217	JST PRTY		4000 INCREMENT TIMES-10 PERCENT	0329
0330	01276	0 001447	DAC EM4		LOC OF EM4	0330
0331	01277	0 01 01256	JMP ERRH		ERROR HALT	0331
0332			*			0332
0333	01300	0 000000	ER5 DAC **		INTERRUPT DID NOT OCCUR AFTER	0333
0334	01301	14 0220	UCP '220		STOP CLOCK	0334
0335	01302	0 10 01217	JST PRTY		4000 INCREMENT TIMES + 10 PERCENT	0335
0336	01303	0 001464	DAC EM5		LOC OF EM5	0336
0337	01304	0 01 01256	JMP ERRH		ERROR HALT	0337
0338			*			0338
0339	01305	0 000000	ER6 DAC **		INTERRUPT NOT RESET BY OCP '20	0339
0340	01306	14 0220	UCP '220		STOP CLOCK	0340
0341	01307	0 10 01217	JST PRTY		GENERAL TYPE ROUTINE	0341
0342	01310	0 001501	DAC EM6		LOC OF EM6	0342

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0343	01311	0 01 01256	JMP	ERRH	ERROR HALT	0343	
0344			*			0344	
0345	01312	0 000000	ER7	DAC	**	CLOCK FAILED TO INCREMENT '61	0345
0346	01313	14 0220		OCP	'220	STOP CLOCK	0346
0347	01314	0 10 01217	JST	PRTY		GENERAL TYPE ROUTINE	0347
0348	01315	0 001523		DAC	EM7	LOC OF FM7	0348
0349	01316	0 01 01256	JMP	ERRH	ERROR HALT	0349	
0350			*			0350	
0351			*	MESSAGES		0351	
0352			*			0352	
0353	01317	177771	SMSG	DEC	-7		0353
0354	01320	151724		BCI	7,START X16-RTC1		0354
	01321	140722					
	01322	152240					
	01323	154261					
	01324	133255					
	01325	151324					
	01326	141661					
0355	01327	177772	EMSG	DEC	-6		0355
0356	01330	142716		BCI	6,END X16-RTC1		0356
	01331	142240					
	01332	154261					
	01333	133255					
	01334	151324					
	01335	141661					
0357	01336	177745	EM1	DEC	-27		0357
0358	01337	142722		BCI	27,ER1 INTERRUPT DID NOT OCCUR WITHIN RTC INCREMENT TIME		0358
	01340	130640					
	01341	144716					
	01342	152305					
	01343	151322					
	01344	152720					
	01345	152240					
	01346	142311					
	01347	142240					
	01350	147317					
	01351	152240					
	01352	147703					

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	01353	141725				
	01354	151240				
	01355	153711				
	01356	152310				
	01357	144716				
	01360	120322				
	01361	152303				
	01362	120311				
	01363	147303				
	01364	151305				
	01365	146705				
	01366	147324				
	01367	120324				
	01370	144715				
	01371	142640				
0359	01372	177760	EM2	DEC	-16	0359
0360	01373	142722		BCI	16,ER2 INTERRUPT NOT CAUSED BY RTC	0360
	01374	131240				
	01375	144716				
	01376	152305				
	01377	151322				
	01400	152720				
	01401	152240				
	01402	147317				
	01403	152240				
	01404	141701				
	01405	152723				
	01406	142704				
	01407	120302				
	01410	154640				
	01411	151324				
	01412	141640				
0361	01413	177745	EM3	DEC	-27	0361
0362	01414	142722		BCI	27,ER3 INTERRUPT OCCURRED IN LESS THAN RTC INCREMENT TIME	0362
	01415	131640				
	01416	144716				
	01417	152305				
	01420	151322				

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01421	152720					
01422	152240					
01423	147703					
01424	141725					
01425	151322					
01426	142704					
01427	120311					
01430	147240					
01431	146305					
01432	151723					
01433	120324					
01434	144301					
01435	147240					
01436	151324					
01437	141640					
01440	144716					
01441	141722					
01442	142715					
01443	142716					
01444	152240					
01445	152311					
01446	146705					
0363	01447	177764	EM4	DEC	-12	0363
0364	01450	142722		BCI	12,ER4 RTC RUNNING TOO FAST	0364
	01451	132240				
	01452	151324				
	01453	141640				
	01454	151325				
	01455	147316				
	01456	144716				
	01457	143640				
	01460	152317				
	01461	147640				
	01462	143301				
	01463	151724				
0365	01464	177764	EM5	DEC	-12	0365
0366	01465	142722		BCI	12,ER5 RTC RUNNING TOO SLOW	0366
	01466	132640				

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	01467	151324			
	01470	141640			
	01471	151325			
	01472	147316			
	01473	144716			
	01474	143640			
	01475	152317			
	01476	147640			
	01477	151714			
	01500	147727			
0367	01501	177757	EM6	DEC -17	0367
0368	01502	142722		BCI 17,ER6 INTERRUPT NOT RESET BY OCP '20	0368
	01503	133240			
	01504	144716			
	01505	152305			
	01506	151322			
	01507	152720			
	01510	152240			
	01511	147317			
	01512	152240			
	01513	151305			
	01514	151705			
	01515	152240			
	01516	141331			
	01517	120317			
	01520	141720			
	01521	120247			
	01522	131260			
0369	01523	177757	EM7	DEC -17	0369
0370	01524	142722		BCI 17,ER7 CLOCK FAILED TO INCREMENT '61	0370
	01525	133640			
	01526	141714			
	01527	147703			
	01530	145640			
	01531	143301			
	01532	144714			
	01533	142704			
	01534	120324			





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0001	*	E520-001-6705 (X16-TLT1)	J C N O . 1 8 0 2 6 9 0 0 0	R E V . B	TLT10001
0002	*				TLT10002
0003	*				TLT10003
0004	*				TLT10004
0005	*	COMPUTERS: DDP416, DDP516			TLT10005
0006	*				TLT10006
0007	*				TLT10007
0008	*				TLT10008
0009	*				TLT10009
0010	*	PROGRAM CATEGORY: TEST AND MAINTENANCE			TLT10010
0011	*				TLT10011
0012	*				TLT10012
0013	*				TLT10013
0014	*				TLT10014
0015	*	PROGRAM TITLE: X16-TLT1			TLT10015
0016	*	TELEPRINTER TEST PROGRAM FOR THE DDP416 AND DDP516			TLT10016
0017	*				TLT10017
0018	*				TLT10018
0019	*				TLT10019
0020	*				TLT10020
0021	*				TLT10021
0022	*				TLT10022
0023	*				TLT10023
0024	*				TLT10024
0025	*		APPROVAL	DATE	TLT10025
0026	*				TLT10026
0027	*				TLT10027
0028	*				TLT10028
0029	*		P/S <i>RPB</i> / <i>JM Butler QA.</i>	<i>5-10-67</i>	TLT10029
0030	*				TLT10030
0031	*				TLT10031
0032	*				TLT10032
0033	*		D/M <i>RPB</i> / <i>CG McJames</i>	<i>5-11-67</i>	TLT10033
0034	*				TLT10034
0035	*				TLT10035
0036	*				TLT10036
0037	*				TLT10037

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0038	*		TLT10038
0039	*	REVISIONS	TLT10039
0040	*		TLT10040
0041	*	REV. B ECO 4583	TLT10041
0042	*	REV. A 01-03-67	TLT10042
0043	*		TLT10043
0044	*		TLT10044
0045	*	AUTHOR	TLT10045
0046	*		TLT10046
0047	*	HONEYWELL INC., COMPUTER CONTROL DIVISION	TLT10047
0048	*		TLT10048
0049	*		TLT10049
0050	*	PURPOSE	TLT10050
0051	*		TLT10051
0052	*	TO TEST ASR33 AND ASR35 KEYBOARD, READER, PUNCH	TLT10052
0053	*		TLT10053
0054	*		TLT10054
0055	*	METHOD	TLT10055
0056	*		TLT10056
0057	*	1) SET MODE SWITCH TO "KT" FOR ASR-35	TLT10057
0058	*	2) LOAD PROGRAM	TLT10058
0059	*	3) ENTER 1000 OCT INTO P COUNTER	TLT10059
0060	*	4) PRESS START	TLT10060
0061	*	5) WHEN THE PROGRAM HALTS THE TEST SELECTION SHOULD BE MADE	TLT10061
0062	*	BY PRESSING ONE OF THE FOUR HIGH ORDER BITS OF THE	TLT10062
0063	*	A-REG. THE SETTINGS MAY BE CHANGED DURING THE COURSE OF	TLT10063
0064	*	THE PROGRAMS BY PRESSING THE START BUTTON. THIS WILL	TLT10064
0065	*	GENERATE AN INTERRUPT WHICH WILL ULTIMATELY CAUSE	TLT10065
0066	*	THE COMPUTER TO HALT. AFTER THE SETTING IS CHANGED,	TLT10066
0067	*	PRESS START, (SOMETIMES NECESSARY TO START TWICE)	TLT10067
0068	*	THE COMPUTER CONTINUES THE PROGRAM ACCORDING TO THE	TLT10068
0069	*	NEW SETTING.	TLT10069
0070	*		TLT10070
0071	*	KEYBOARD INPUT	TLT10071
0072	*		TLT10072
0073	*	AFTER PRINTING -KEYBOARD INPUT- THE PROGRAM	TLT10073
0074	*	WILL WAIT FOR THE ENTRY OF CHARACTERS	TLT10074

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0075	*	UP TO 72 ALPHANUMERIC CHARACTERS WILL BE	TLT10075
0076	*	ACCEPTED AS INPUT ALONG WITH BELL, LINE FEED AND	TLT10076
0077	*	CARRIAGE RETURN. INPUT MAY BE TERMINATED AFTER ANY	TLT10077
0078	*	ENTRY BY DEPRESSING CARRIAGE RETURN.	TLT10078
0079	*	THE CHARACTERS RECEIVED AS INPUT WILL BE PRINTED	TLT10079
0080	*	BACK OUT WHEN A FULL LINE OR CARRIAGE RETURN HAS BEEN	TLT10080
0081	*	RECEIVED.	TLT10081
0082	*	A1 SET - ENTER NEW LINE	TLT10082
0083	*	A2 SET - LOOP OUTPUT OF LAST LINE ENTERED	TLT10083
0084	*	A4 SET - TERMINATE OUTPUT	TLT10084
0085	*		TLT10085
0086	*	PRINTER OUT	TLT10086
0087	*		TLT10087
0088	*	ALL CHARACTERS FROM OCTAL 240 TO OCTAL 337	TLT10088
0089	*	WILL BE SEQUENTIALLY PRINTED ACROSS AN ENTIRE ROW.	TLT10089
0090	*	ALL SUCCEEDING LINES WILL BE SHIFTED LEFT ONE	TLT10090
0091	*	CHARACTER POSITION PER LINE.	TLT10091
0092	*	OUTPUT MUST BE TERMINATED MANUALLY.	TLT10092
0093	*	A4 SET - TERMINATE OUTPUT	TLT10093
0094	*		TLT10094
0095	*	ALL CHARACTERS IN ALL PRINT POSITIONS WILL BE OUTPUT	TLT10095
0096	*	FROM OCTAL 240 TO OCTAL 337. EACH CHARACTER WILL	TLT10096
0097	*	BE PRINTED ACROSS AN ENTIRE ROW.	TLT10097
0098	*	A2 SET - LOOP OUTPUT	TLT10098
0099	*	A4 SET - TERMINATE OUTPUT	TLT10099
0100	*		TLT10100
0101	*	PUNCH OUT	TLT10101
0102	*		TLT10102
0103	*	A MESSAGE IS PRINTED TO TURN ON THE PUNCH.	TLT10103
0104	*	220 CHARACTER OF ASCII WILL BE PUNCHED, AND 20	TLT10104
0105	*	CHARACTER OF BINARY CODE WILL BE PUNCHED. A READER STOP CODE	TLT10105
0106	*	(*223) AND DELETE CODE (*377) WILL BE PUNCHED AT THE END OF	TLT10106
0107	*	TAPE. THE TAPE HAS 32 BLANK LEAD AT THE BEGINNING AND	TLT10107
0108	*	END OF TAPE.	TLT10108
0109	*	THE INTERRUPT LOGIC WILL BE TESTED DURING	TLT10109
0110	*	THE PUNCHING OF THIS BLOCK.	TLT10110
0111	*		TLT10111

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0112	*	READER IN	TLT10112
0113	*		TLT10113
0114	*	A MESSAGE IS PRINTED TO LOAD THE READER.	TLT10114
0115	*	THE TAPE PRODUCED BY THE PUNCH TEST WILL BE	TLT10115
0116	*	READ AND A DATA COMPARISON MADE UNDER PROGRAM CONTROL.	TLT10116
0117	*		TLT10117
0118	*	ERROR DETECTION	TLT10118
0119	*		TLT10119
0120	*	ERROR MESSAGES	TLT10120
0121	*		TLT10121
0122	*	PUNCH OUT (BINARY)	TLT10122
0123	*		TLT10123
0124	*	ERR1    READY SHOULD BE SET AFTER 100 MS DELAY	TLT10124
0125	*	(READY NOT SET BY 100 MS AFTER LAST OTA)	TLT10125
0126	*	ERR2    NO INTERRUPT AFTER MASK SET	TLT10126
0127	*	(INTERRUPT DID NOT OCCUR WITH MASK SET,	TLT10127
0128	*	READY SET AND ENB)	TLT10128
0129	*	ERR3    INTERRUPT NOT CAUSED BY ASR	TLT10129
0130	*	(SKS *404 CAUSED SKIP AFTER INTERRUPT JUMP)	TLT10130
0131	*	ERR4    NO SKIP ON OTA WITH READY SET	TLT10131
0132	*	(OTA *204 DID NOT SKIP WITH READY SET)	TLT10132
0133	*	ERR5    READY SET AFTER OTA	TLT10133
0134	*	(SKS *204 CAUSED SKIP AFTER OTA)	TLT10134
0135	*		TLT10135
0136	*	READER IN	TLT10136
0137	*		TLT10137
0138	*	AFTER THE TAPE IS READ, A DATA COMPARISON IS MADE	TLT10138
0139	*	IF THE READER STOP CODE IS NOT SENSED TO BE	TLT10139
0140	*	ON AFTER THE TAPE IS READ, THE PROGRAM WILL HALT.	TLT10140
0141	*	RESTARTING WILL CAUSE THE JUMP TO THE "READ IN"	TLT10141
0142	*	SECTION	TLT10142
0143	*		TLT10143
0144	*	IF A DATA ERROR IS DETECTED, THE FOLLOWING	TLT10144
0145	*	MESSAGE WILL BE PRINTED.	TLT10145
0146	*	INPUT IS XXX SHOULD BE XXX	TLT10146
0147	*		TLT10147
0148	*		TLT10148

0149				*****TLT10149
0150			*	TLT10150
0151			*	TLT10151
0152			CF4	TLT10152
0153	001000	A	EQU 512	TLT10153
0154	002000	B	EQU 1024	TLT10154
0155	000004	C	EQU 4	TLT10155
0156	000104	D	EQU C+*100	TLT10156
0157	001004	E	EQU C+*1000	TLT10157
0158	000040	F	EQU *40	TLT10158
0159	000204	G	EQU C+*200	TLT10159
0160	000404	H	EQU C+*400	TLT10160
0161	000504	I	EQU C+*500	TLT10161
0162	001204	J	EQU C+*1200	TLT10162
0163			ORG *63	TLT10163
0164	00063	-0	000030 DAC* *30	TLT10164
0165			ORG 64	TLT10165
0166			ORG *70	TLT10166
0167	00070	SSW	BSS 1	TLT10167
0168	00071	SAVA	BSS 1	TLT10168
0169	00072	BLOX	BSS 1	TLT10169
0170	00073	BINX	BSS 1	TLT10170
0171	00074	NDXA	BSS 1	TLT10171
0172	00075	IND	BSS 1	TLT10172
0173	00076	0	002112 STRA DAC STOR	TLT10173
0174	00077	0	002000 BLCB DAC BLCA	TLT10174
0175	00100	0	002110 BLOC DAC BLCA+72	TLT10175
0176	00101	0	003000 CHIN DAC CHAR	TLT10176
0177	00102	0	003360 BINA DAC BIN+20	TLT10177
0178	00103	0	003000 CHRA DAC CHAR	TLT10178
0179	00104	0	001707 BUTN DAC BUT	TLT10179
0180	00105	0	003360 ARG1 DAC ARGA	TLT10180
0181	00106	0	003427 STPP DAC NSTM	TLT10181
0182	00107	0	003465 MSMG DAC MSG3	TLT10182
0183			*	TLT10183
0184			*MESSAGES	TLT10184
0185			*	TLT10185

CHANGE EFFECTIVE POSITION OF STANDARD INTERRUPT TO LOCATION \*30.

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0186		*START 116-TLT1		TLT10186
0187	00110	000215	MSG1 OCT 215,212,323,324,301,322,324,240,330,261,266,255	TLT10187
	00111	000212		
	00112	000323		
	00113	000324		
	00114	000301		
	00115	000322		
	00116	000324		
	00117	000240		
	00120	000330		
	00121	000261		
	00122	000266		
	00123	000255		
0188	00124	000324	OCT 324,314,324,261,215,212	TLT10188
	00125	000314		
	00126	000324		
	00127	000261		
	00130	000215		
	00131	000212		
0189		*KEYBOARD INPUT		TLT10189
0190	00132	000215	MSG2 OCT 215,212,212,313,305,331,302,317,301,322,304,240	TLT10190
	00133	000212		
	00134	000212		
	00135	000313		
	00136	000305		
	00137	000331		
	00140	000302		
	00141	000317		
	00142	000301		
	00143	000322		
	00144	000304		
	00145	000240		
0191	00146	000311	OCT 311,316,320,325,324,215,212,212	TLT10191
	00147	000316		
	00150	000320		
	00151	000325		
	00152	000324		

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	00153	000215
	00154	000212
	00155	000212

0192		*READER INPUT - TURN OFF PUNCH	TLT10192
0193	00156	MSG4 OCT 215,212,212,322,305,301,304,305,322,240,311,316,320,325,324	TLT10193

	00157	000212
	00160	000212
	00161	000322
	00162	000305
	00163	000301
	00164	000304
	00165	000305
	00166	000322
	00167	000240
	00170	000311
	00171	000316
	00172	000320
	00173	000325
	00174	000324

0194	00175	OCT 215,212,212,314,317,301,304,240,322,305,301,304,305,322,215	TLT10194
------	-------	-----------------------------------------------------------------	----------

	00176	000212
	00177	000212
	00200	000314
	00201	000317
	00202	000301
	00203	000304
	00204	000240
	00205	000322
	00206	000305
	00207	000301
	00210	000304
	00211	000305
	00212	000322
	00213	000215

0195	00214	OCT 212,212,250,324,325,322,316,240,317,306,306,240,320,325	TLT10195
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	00215	000212
	00216	000250

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	00217	000324		
	00220	000325		
	00221	000322		
	00222	000316		
	00223	000240		
	00224	000317		
	00225	000306		
	00226	000306		
	00227	000240		
	00230	000320		
	00231	000325		
0196	00232	000316	OCT    316,303,310,240,306,317,322,240,301,323,322,255,263,263,251	TLT10196
	00233	000303		
	00234	000310		
	00235	000240		
	00236	000306		
	00237	000317		
	00240	000322		
	00241	000240		
	00242	000301		
	00243	000323		
	00244	000322		
	00245	000255		
	00246	000263		
	00247	000263		
	00250	000251		
0197	00251	000215	OCT    215,212,212,320,322,305,323,323,240,323,324,301,322,324	TLT10197
	00252	000212		
	00253	000212		
	00254	000320		
	00255	000322		
	00256	000305		
	00257	000323		
	00260	000323		
	00261	000240		
	00262	000323		
	00263	000324		



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	00264	000301			
	00265	000322			
	00266	000324			
0198	00267	000215	OCT	215,212,212	TLT10198
	00270	000212			
	00271	000212			
0199			*PRINTER OUT		TLT10199
0200	00272	000215	MSG5 OCT	215,212,212,320,322,311,316,324,305,322,240	TLT10200
	00273	000212			
	00274	000212			
	00275	000320			
	00276	000322			
	00277	000311			
	00300	000316			
	00301	000324			
	00302	000305			
	00303	000322			
	00304	000240			
0201	00305	000317	OCT	317,325,324,215,212,212	TLT10201
	00306	000325			
	00307	000324			
	00310	000215			
	00311	000212			
	00312	000212			
0202			*END 116-TLT1		TLT10202
0203	00313	000215	MSG6 OCT	215,212,305,316,304,240,330,261,266,255,324,314	TLT10203
	00314	000212			
	00315	000305			
	00316	000316			
	00317	000304			
	00320	000240			
	00321	000330			
	00322	000261			
	00323	000266			
	00324	000255			
	00325	000324			
	00326	000314			

0204	00327	000324	OCT	324,261,215,212		TLT10204
	00330	000261				
	00331	000215				
	00332	000212				
0205			*INPUT IS	XXX SHOULD BE XXX		TLT10205
0206	00333	000215	MSG OCT	215,212,311,316,320,325,324,240,240,311,323,240,240		TLT10206
	00334	000212				
	00335	000311				
	00336	000316				
	00337	000320				
	00340	000325				
	00341	000324				
	00342	000240				
	00343	000240				
	00344	000311				
	00345	000323				
	00346	000240				
	00347	000240				
0207	00350	000000	ONE OCT	0		TLT10207
0208	00351	000000	TWO OCT	0		TLT10208
0209	00352	000000	THR OCT	0		TLT10209
0210	00353	000240	OCT	240,240		TLT10210
	00354	000240				
0211	00355	000323	OCT	323,310,317,325,314,304,240,302,305,240,240		TLT10211
	00356	000310				
	00357	000317				
	00360	000325				
	00361	000314				
	00362	000304				
	00363	000240				
	00364	000302				
	00365	000305				
	00366	000240				
	00367	000240				
0212	00370	000000	FOR OCT	0		TLT10212
0213	00371	000000	FIV OCT	0		TLT10213
0214	00372	000000	SIX OCT	0		TLT10214

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0215	00373	000215	OCT	215,212	TLT10215
	00374	000212			
0216			*READY SHOULD BE SET AFTER 100 MS DELAY		
0217	00375	000215	E1	OCT 215,212,305,322,322,261,240,240	TLT10216
	00376	000212			TLT10217
	00377	000305			
	00400	000322			
	00401	000322			
	00402	000261			
	00403	000240			
	00404	000240			
0218	00405	000322	OCT	322,305,301,304,331,240,323,310,317,325	TLT10218
	00406	000305			
	00407	000301			
	00410	000304			
	00411	000331			
	00412	000240			
	00413	000323			
	00414	000310			
	00415	000317			
	00416	000325			
0219	00417	000314	OCT	314,304,240,302,305,240,323,305,324,240,301,306,324	TLT10219
	00420	000304			
	00421	000240			
	00422	000302			
	00423	000305			
	00424	000240			
	00425	000323			
	00426	000305			
	00427	000324			
	00430	000240			
	00431	000301			
	00432	000306			
	00433	000324			
0220	00434	000305	OCT	305,322,240,261,260,260,315,323,240,304,305,314,301,331	TLT10220
	00435	000322			
	00436	000240			

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	00437	000261		
	00440	000260		
	00441	000260		
	00442	000315		
	00443	000323		
	00444	000240		
	00445	000304		
	00446	000305		
	00447	000314		
	00450	000301		
	00451	000331		
0221	00452	000215	OCT    215,212,212	TLT10221
	00453	000212		
	00454	000212		
0222			*NO INTERRUPT AFTER MASK SET	TLT10222
0223	00455	000215	E2    OCT    215,212,305,322,322,262,240,240	TLT10223
	00456	000212		
	00457	000305		
	00460	000322		
	00461	000322		
	00462	000262		
	00463	000240		
	00464	000240		
0224	00465	000316	OCT    316,317,240,311,316,324,305,322,322,325,320	TLT10224
	00466	000317		
	00467	000240		
	00470	000311		
	00471	000316		
	00472	000324		
	00473	000305		
	00474	000322		
	00475	000322		
	00476	000325		
	00477	000320		
0225	00500	000324	OCT    324,240,301,306,324,305,322,240,315,301,323,313,240	TLT10225
	00501	000240		
	00502	000301		

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	00503	000306		
	00504	000324		
	00505	000305		
	00506	000322		
	00507	000240		
	00510	000315		
	00511	000301		
	00512	000323		
	00513	000313		
	00514	000240		
0226	00515	000323	OCT    323,305,324,215,212,212	TLT10226
	00516	000305		
	00517	000324		
	00520	000215		
	00521	000212		
	00522	000212		
0227			* INTERRUPT NOT CAUSED BY ASR	TLT10227
0228	00523	000215	E3    OCT    215,212,305,322,322,263,240,240	TLT10228
	00524	000212		
	00525	000305		
	00526	000322		
	00527	000322		
	00530	000263		
	00531	000240		
	00532	000240		
0229	00533	000311	OCT    311,316,324,305,322,322,325,320,324,240	TLT10229
	00534	000316		
	00535	000324		
	00536	000305		
	00537	000322		
	00540	000322		
	00541	000325		
	00542	000320		
	00543	000324		
	00544	000240		
0230	00545	000316	OCT    316,317,324,240,303,301,325,323,305,304,240,302,331	TLT10230
	00546	000317		

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	00547	000324		
	00550	000240		
	00551	000303		
	00552	000301		
	00553	000325		
	00554	000323		
	00555	000305		
	00556	000304		
	00557	000240		
	00560	000302		
	00561	000331		
0231	00562	000240	OCT 240,301,323,322,215,215,212	TLT10231
	00563	000301		
	00564	000323		
	00565	000322		
	00566	000215		
	00567	000215		
	00570	000212		
0232			*NO SKIP ON OTA WITH READY SET	TLT10232
0233	00571	000215	E4 OCT 215,212,305,322,322,264,240,240	TLT10233
	00572	000212		
	00573	000305		
	00574	000322		
	00575	000322		
	00576	000264		
	00577	000240		
	00600	000240		
0234	00601	000316	OCT 316,317,240,323,313,311,320,240,317,316	TLT10234
	00602	000317		
	00603	000240		
	00604	000323		
	00605	000313		
	00606	000311		
	00607	000320		
	00610	000240		
	00611	000317		
	00612	000316		

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0235	00613	000240	OCT	240,317,324,301,240,327,311,324,310,240,322,305,301	TLT10235
	00614	000317			
	00615	000324			
	00616	000301			
	00617	000240			
	00620	000327			
	00621	000311			
	00622	000324			
	00623	000310			
	00624	000240			
	00625	000322			
	00626	000305			
	00627	000301			
0236	00630	000304	OCT	304,331,240,323,305,324,215,212,212	TLT10236
	00631	000331			
	00632	000240			
	00633	000323			
	00634	000305			
	00635	000324			
	00636	000215			
	00637	000212			
	00640	000212			
0237			•READY SET AFTER OTA		TLT10237
0238	00641	000215	E5 OCT	215,212,305,322,322,265,240,240	TLT10238
	00642	000212			
	00643	000305			
	00644	000322			
	00645	000322			
	00646	000265			
	00647	000240			
	00650	000240			
0239	00651	000322	OCT	322,305,301,304,331,240,323,305,324,240	TLT10239
	00652	000305			
	00653	000301			
	00654	000304			
	00655	000331			
	00656	000240			

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	00657	000323				
	00660	000305				
	00661	000324				
	00662	000240				
0240	00663	000301	OCT	301,306,324,305,322,240,317,324,301,215,212,212		TLT10240
	00664	000306				
	00665	000324				
	00666	000305				
	00667	000322				
	00670	000240				
	00671	000317				
	00672	000324				
	00673	000301				
	00674	000215				
	00675	000212				
	00676	000212				
0241			*			TLT10241
0242			*CONSTANTS			TLT10242
0243			*			TLT10243
0244	00677	000260	ASC	OCT	260	TLT10244
0245	00700	000261		OCT	261	TLT10245
0246	00701	000262		OCT	262	TLT10246
0247	00702	000263		OCT	263	TLT10247
0248	00703	000264		OCT	264	TLT10248
0249	00704	000265		OCT	265	TLT10249
0250	00705	000266		OCT	266	TLT10250
0251	00706	000267		OCT	267	TLT10251
0252	00707	0 05 00754	E205	ERA	=*205	TLT10252
0253	00710	0 05 00753	E311	ERA	=*311	TLT10253
0254	00711	0 05 00752	E340	ERA	=*340	TLT10254
0255	00712	0 05 00751	E375	ERA	=*375	TLT10255
0256	00713	0 002112	RTY2	DAC	STOR	TLT10256
0257	00714	-0 02 00103	CHR	LDA*	CHRA	TLT10257
0258	00715		STEM	BSS	1	TLT10258
0259	00716	000000	FLAG	OCT	0	TLT10259
0260	00717	000223	STOP	OCT	223,377	TLT10260
	00720	000377				



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0261	00721	177444	MOT4	OCT	177444		TLT10261
0262	00722	177444	MTT4	OCT	177444		TLT10262
0263	00723	177754	MTT3	OCT	177754		TLT10263
0264	00724	177754	MOT3	OCT	177754		TLT10264
0265	00725	177445	MTT2	OCT	177445		TLT10265
0266	00726	177445	MOT2	OCT	177445		TLT10266
0267	00727	000222	MOTT	OCT	222		TLT10267
0268	00730	177740	MOT1	OCT	177740		TLT10268
0269	00731	177670	M73	OCT	177670		TLT10269
0270	00732	177670	COUN	OCT	177670		TLT10270
0271	00733		TEMP	BSS	1		TLT10271
0272	00734	177777	ONES	OCT	177777		TLT10272
0273	00735	0 000000	ZROS	DAC	**		TLT10273
0274	00736	0 000040	MSK	DAC	F		TLT10274
0275	00737	102732	INTC	DEC	-31270		TLT10275
0276	00740		DELA	BSS	1		TLT10276
0277	00741	000240	CHRT	OCT	240		TLT10277
0278	00742	0 001240	RUPT	DAC	INTR		TLT10278
0279	00743		TSTB	BSS	1		TLT10279
0280	00744	100000	SB1	OCT	100000		TLT10280
0281	00745	000000	PWDC	DEC	0		TLT10281
0282	00746		PTEM	BSS	1		TLT10282
0283	00747		STRE	BSS	1		TLT10283
0284	00750	101000	NOPE	NOP			TLT10284
0285	00751	000375		FIN			TLT10285
	00752	000340					
	00753	000311					
	00754	000205					
0286			ORG		512		TLT10286
0287	01000	0 10 01371	JST	INIT		INITIALIZE	TLT10287
0288	01001	0 10 01425	JST	PRTY		START MESSAGE	TLT10288
0289	01002	0 02 00110	LDA	MSG1			TLT10289
0290	01003	000022	DEC	18			TLT10290
0291	01004	0 10 01425	JST	PRTY			TLT10291
0292	01005	-0 02 00105	LDA*	ARG1		ENTER A-REG SETTING	TLT10292
0293	01006	000031	DEC	25			TLT10293

0294	01007	140040		CRA			TLT10294
0295	01010	000000		HLT		INITIALIZE "SENSE SWITCHES"	TLT10295
0296	01011	0 04 00070		STA	SSW		TLT10296
0297	01012	0 02 00104		LDA	BUTN		TLT10297
0298	01013	0 04 00030		STA	*30		TLT10298
0299	01014	000401		ENB			TLT10299
0300				*****			TLT10300
0301				*KEYBOARD INPUT*			TLT10301
0302				*****			TLT10302
0303	01015	0 10 01425	KYIN	JST	PRTY	KEYBOARD INPUT MESSAGE	TLT10303
0304	01016	0 02 00132		LDA	MSG2		TLT10304
0305	01017	000024		DEC	20		TLT10305
0306	01020	0 02 01762		LDA	=*212	INITIALIZE	TLT10306
0307	01021	-0 04 00076		STA*	STRA		TLT10307
0308	01022	14 0004		OCF	C	ENABLE ASR INPUT	TLT10308
0309	01023	0 12 00076	MORE	IRS	STRA		TLT10309
0310	01024	54 1004		INA	E	WAIT FOR KEYBOARD INPUT	TLT10310
0311	01025	0 01 01024		JMP	*-1		TLT10311
0312	01026	0 04 00733		STA	TEMP	TEMPORARY STORAGE	TLT10312
0313	01027	0 05 01761		ERA	=*215		TLT10313
0314	01030	101040		SNZ			TLT10314
0315	01031	0 01 01040		JMP	OUT	JUMP IF CARRIAGE RETURN	TLT10315
0316	01032	0 02 00733		LDA	TEMP		TLT10316
0317	01033	-0 04 00076		STA*	STRA		TLT10317
0318	01034	0 05 01760		ERA	=*207		TLT10318
0319	01035	101040		SNZ			TLT10319
0320	01036	0 01 01023		JMP	MORE	JUMP IF BELL	TLT10320
0321	01037	0 02 00733		LDA	TEMP		TLT10321
0322	01040	0 05 01762		ERA	=*212		TLT10322
0323	01041	101040		SNZ			TLT10323
0324	01042	0 01 01023		JMP	MORE	JUMP IF LINE FEED	TLT10324
0325	01043	0 12 00732		IRS	COUN	SKIP IF 72 CHARACTERS INPUT	TLT10325
0326	01044	0 01 01023		JMP	MORE		TLT10326
0327	01045	0 12 00076		IRS	STRA		TLT10327
0328	01046	0 02 01761	OUT	LDA	=*215		TLT10328
0329	01047	-0 04 00076		STA*	STRA	STORE CARRIAGE RETURN	TLT10329
0330	01050	0 02 00713		LDA	RTY2		TLT10330

0331	01051	0 04 00076	STA	STRA		TLT10331
0332	01052	34 0104	SKS	D		TLT10332
0333	01053	0 01 01052	JMP	*-1		TLT10333
0334	01054	14 0104	OCP	D	ENABLE OUTPUT	TLT10334
0335	01055	0 02 01761	LDA	=*215		TLT10335
0336	01056	74 0004	OTA	C	OUTPUT CARRIAGE RETURN	TLT10336
0337	01057	0 01 01056	JMP	*-1		TLT10337
0338	01060	-0 02 00076	TY2 LDA*	STRA		TLT10338
0339	01061	74 0004	OTA	C	OUTPUT NEXT CHARACTER	TLT10339
0340	01062	0 01 01061	JMP	*-1		TLT10340
0341	01063	0 05 01761	ERA	=*215		TLT10341
0342	01064	101040	SNZ			TLT10342
0343	01065	0 01 01070	JMP	LSW1	JUMP IF CARRIAGE RETURN	TLT10343
0344	01066	0 12 00076	IRS	STRA		TLT10344
0345	01067	0 01 01060	JMP	TY2		TLT10345
0346	01070	0 02 00713	LSW1 LDA	RTY2	INITIALIZE	TLT10346
0347	01071	0 04 00076	STA	STRA		TLT10347
0348	01072	0 02 00731	LDA	M73		TLT10348
0349	01073	0 04 00732	STA	COUN		TLT10349
0350	01074	0 10 01712	JST	CHNG		TLT10350
0351	01075	0 02 00070	LDA	SSW		TLT10351
0352	01076	0414 75	LGL	3		TLT10352
0353	01077	101400	SMI			TLT10353
0354	01100	0 01 01102	JMP	*+2		TLT10354
0355	01101	0 01 01107	JMP	*+6		TLT10355
0356	01102	0 02 00070	LDA	SSW	SR1	TLT10356
0357	01103	100400	SPL			TLT10357
0358	01104	0 01 01015	JMP	KYIN	NEW INPUT IF SW1 ON	TLT10358
0359	01105	0 10 01701	JST	SR2		TLT10359
0360	01106	0 01 01050	JMP	OUT+2	LOOP OUTPUT IF SW2 ON	TLT10360
0361			*****			TLT10361
0362			*PRINTER OUT*			TLT10362
0363			*****			TLT10363
0364	01107	0 10 01425	JST	PRTY	PRINTER OUT MESSAGE	TLT10364
0365	01110	0 02 00272	LDA	MSG5		TLT10365
0366	01111	000021	DEC	17		TLT10366
0367			*ROTATING PATTERN			TLT10367

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0368	01112	0 02 00731	RT1	LDA	M73	SET INDEX TO 73 CHAR/LINE	TLT10368
0369	01113	0 04 00000		STA	0		TLT10369
0370	01114	0 02 00741		LDA	CHRT		TLT10370
0371	01115	0 10 01646	RT2	JST	NDX1	STA* BLOC	TLT10371
0372	01116	0 06 01757		ADD	=1		TLT10372
0373	01117	0 04 00743		STA	TSTB		TLT10373
0374	01120	0 05 01756		ERA	=*340		TLT10374
0375	01121	100040		SZE			TLT10375
0376	01122	0 01 01125		JMP	RT3		TLT10376
0377	01123	0 02 01755		LDA	=*240		TLT10377
0378	01124	0 01 01126		JMP	**2		TLT10378
0379	01125	0 02 00743	RT3	LDA	TSTB		TLT10379
0380	01126	0 12 00000		IRS	0		TLT10380
0381	01127	0 01 01115		JMP	RT2		TLT10381
0382	01130	0 10 01425		JST	PRTY	PRINT 1 LINE	TLT10382
0383	01131	-0 02 00077		LDA*	BLCB		TLT10383
0384	01132	000113		DEC	75		TLT10384
0385	01133	0 10 01712		JST	CHNG		TLT10385
0386	01134	0 02 00070		LDA	SSW	SR4	TLT10386
0387	01135	0414 75		LGL	3		TLT10387
0388	01136	100400		SPL			TLT10388
0389	01137	0 01 01146		JMP	RT4	END OUTPUT IF SW4 ON	TLT10389
0390	01140	0 02 00741		LDA	CHRT	ROTATE PATTERN	TLT10390
0391	01141	0 06 01757		ADD	=1		TLT10391
0392	01142	0 04 00741		STA	CHRT		TLT10392
0393	01143	0 05 01756		ERA	=*340		TLT10393
0394	01144	100040		SZE			TLT10394
0395	01145	0 01 01112		JMP	RT1	SET UP NEXT LINE	TLT10395
0396	01146	0 02 01755	RT4	LDA	=*240	INITIALIZE	TLT10396
0397	01147	0 04 00741		STA	CHRT		TLT10397
0398	01150	0 10 01673		JST	SS4	SS4	TLT10398
0399	01151	0 01 01112		JMP	RT1		TLT10399
0400	01152	140040		CRA			TLT10400
0401	01153	0 04 00070		STA	SSW		TLT10401
0402				*ALL CHARACTERS IN ALL PRINT POSITIONS			TLT10402
0403	01154	0 02 00731	LOAD	LDA	M73		TLT10403
0404	01155	0 04 00000		STA	0	CHARACTERS/LINE	TLT10404

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0405	01156	0 02 00741	LDA	CHRT		TLT10405
0406	01157	0 10 01646	JST	NDX1	STA* BLOC	TLT10406
0407	01160	0 12 00000	IRS	0	INCREMENT INDEX	TLT10407
0408	01161	0 01 01157	JMP	*-2		TLT10408
0409	01162	0 10 01425	JST	PRTY	PRINT BLOCK - 1 LINE	TLT10409
0410	01163	-0 02 00077	LDA*	BLCB		TLT10410
0411	01164	000113	DEC	75		TLT10411
0412	01165	0 10 01712	JST	CHNG		TLT10412
0413	01166	0 10 01673	JST	SS4		TLT10413
0414	01167	0 01 01171	JMP	*+2	A4 NOT SET	TLT10414
0415	01170	0 01 01207	JMP	DERU	A4 SET	TLT10415
0416	01171	0 10 01701	JST	SR2		TLT10416
0417	01172	0 01 01203	JMP	LOOP	A2 SET	TLT10417
0418	01173	0 02 00741	LDA	CHRT		TLT10418
0419	01174	0 05 01754	ERA	=*337		TLT10419
0420	01175	101040	SNZ			TLT10420
0421	01176	0 01 01203	JMP	LOOP	JUMP IF ALL PRINTED	TLT10421
0422	01177	0 02 00741	LDA	CHRT		TLT10422
0423	01200	0 06 01757	ADD	=1	SET UP NEXT CHARACTER	TLT10423
0424	01201	0 04 00741	STA	CHRT		TLT10424
0425	01202	0 01 01154	JMP	LOAD		TLT10425
0426	01203	0 02 01755	LOOP LDA	=*240		TLT10426
0427	01204	0 04 00741	STA	CHRT		TLT10427
0428	01205	0 10 01701	JST	SR2		TLT10428
0429	01206	0 01 01154	JMP	LOAD	LOOP OUTPUT IF SW2 ON	TLT10429
0430						TLT10430
0431					*PRINTER/PUNCH OUTPUT*	TLT10431
0432						TLT10432
0433	01207	0 10 01425	DERU JST	PRTY		TLT10433
0434	01210	-0 02 00107	LDA*	MSMG		TLT10434
0435	01211	000105	DEC	69		TLT10435
0436	01212	000000	HLT			TLT10436
0437					*ASCII OUTPUT	TLT10437
0438	01213	0 10 01602	JST	MOTO		TLT10438
0439	01214	0 10 01425	LPUN JST	PRTY		TLT10439
0440	01215	-0 02 00103	LDA*	CHRA		TLT10440
0441	01216	000334	DEC	220		TLT10441

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0442			*BINARY OUTPUT			TLT10442
0443	01217	0 02 01753	RINT LDA	=-20	SET INDEX TO 20 CHARACTERS	TLT10443
0444	01220	0 04 00000	STA	0		TLT10444
0445			*DELAY 100 MS			TLT10445
0446	01221	0 02 00737	DELP LDA	INTC		TLT10446
0447	01222	0 04 00740	STA	DELA		TLT10447
0448	01223	0 12 00740	IRS	DELA	DELAY 100 MS	TLT10448
0449	01224	0 01 01223	JMP	*-1		TLT10449
0450	01225	34 0204	SKS	G	SKIP IF READY	TLT10450
0451	01226	0 01 01622	JMP	ERR1	READY SHOULD BE SET	TLT10451
0452	01227	001001	INH			TLT10452
0453	01230	0 02 00736	LDA	MSK		TLT10453
0454	01231	74 0020	OTA	*20		TLT10454
0455	01232	0 02 00742	LDA	RUPT		TLT10455
0456	01233	0 04 00030	STA	*30		TLT10456
0457	01234	000401	ENB		ENABLE INTERRUPT	TLT10457
0458	01235	101000	NOP		INTERRUPT SHOULD OCCUR HERE	TLT10458
0459	01236	001001	INH			TLT10459
0460	01237	0 01 01626	JMP	ERR2	NO INTERRUPT	TLT10460
0461	01240	0 000000	INTR DAC	**		TLT10461
0462	01241	34 0404	SKS	H		TLT10462
0463	01242	0 01 01244	JMP	**2		TLT10463
0464	01243	0 01 01632	JMP	ERR3		TLT10464
0465	01244	140040	CRA			TLT10465
0466	01245	74 0020	OTA	*20		TLT10466
0467	01246	0 02 00104	LDA	BUTN		TLT10467
0468	01247	0 04 00030	STA	*30		TLT10468
0469	01250	0 10 01656	JST	NDX2	LDA* BINA	TLT10469
0470	01251	74 0204	OTA	G	OUTPUT CHARACTER	TLT10470
0471	01252	0 01 01636	JMP	ERR4	NO SKIP ON OTA WITH READY SET	TLT10471
0472	01253	34 0204	SKS	G	SKIP IF READY	TLT10472
0473	01254	0 01 01256	JMP	**2		TLT10473
0474	01255	0 01 01642	JMP	ERR5	READY SET AFTER OTA	TLT10474
0475	01256	0 12 00000	IRS	0	SKIP IF ALL PUNCHED	TLT10475
0476	01257	0 01 01221	JMP	DELP	GO TO DELAY	TLT10476
0477	01260	34 0104	SKS	D	WAIT UNTIL NOT BUSY	TLT10477
0478	01261	0 01 01260	JMP	*-1		TLT10478

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0479			*PRINT/PUNCH STOP CODE		TLT10479
0480	01262	0 10 01425	JST PRTY		TLT10480
0481	01263	0 02 00717	LDA STOP		TLT10481
0482	01264	000002	DEC 2		TLT10482
0483	01265	0 10 01602	JST MOTO		TLT10483
0484	01266	0 10 01425	JST PRTY		TLT10484
0485	01267	0 02 00717	LDA STOP		TLT10485
0486	01270	000002	DEC 2		TLT10486
0487			*****		TLT10487
0488			*READER INPUT*		TLT10488
0489			*****		TLT10489
0490	01271	0 10 01425	READ JST PRTY	LOAD READER MESSAGE	TLT10490
0491	01272	0 02 00156	LDA MSG4		TLT10491
0492	01273	000114	DEC 76		TLT10492
0493	01274	000000	HLT		TLT10493
0494			*		TLT10494
0495			*		TLT10495
0496			* START READER		TLT10496
0497	01275	34 0104	SKS D	WAIT UNTIL NOT BUSY	TLT10497
0498	01276	0 01 01275	JMP *-1		TLT10498
0499	01277	14 0104	OCF D	ENABLE OUTPUT	TLT10499
0500	01300	0 02 01752	LDA *-221	START CODE	TLT10500
0501	01301	74 0004	OTA C		TLT10501
0502	01302	0 01 01301	JMP *-1		TLT10502
0503	01303	34 0104	SKS D	WAIT UNTIL NOT BUSY	TLT10503
0504	01304	0 01 01303	JMP *-1		TLT10504
0505	01305	14 0004	OCF C		TLT10505
0506			* READ ZEROS		TLT10506
0507	01306	54 1004	INA E		TLT10507
0508	01307	0 01 01306	JMP *-1		TLT10508
0509	01310	101040	SNZ	SKIP IF INPUT IS NOT ZERO	TLT10509
0510	01311	0 01 01306	JMP *-3		TLT10510
0511	01312	-0 04 00076	STA* STRA		TLT10511
0512	01313	0 05 00727	ERA MOTT		TLT10512
0513	01314	101040	SNZ	SKIP IF INPUT IS NOT *222	TLT10513
0514	01315	0 01 01306	JMP *-7		TLT10514
0515			*READ ASCII PATTERN		TLT10515

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0516	01316	0 12 00076	MOR1	IRS	STRA	INPUT 220 CHARACTER	TLT10516
0517	01317	54 1004		INA	E		TLT10517
0518	01320	0 01 01317		JMP	*-1		TLT10518
0519	01321	-0 04 00076		STA*	STRA		TLT10519
0520	01322	0 12 00726		IRS	MOT2		TLT10520
0521	01323	0 01 01316		JMP	MOR1		TLT10521
0522	01324	0 02 00725		LDA	MTT2	INITIALIZE	TLT10522
0523	01325	0 04 00726		STA	MOT2		TLT10523
0524				*READ BINARY PATTERN			TLT10524
0525	01326	0 12 00076	MOR2	IRS	STRA	BINARY INPUT.	TLT10525
0526	01327	54 1204		INA	J		TLT10526
0527	01330	0 01 01327		JMP	*-1		TLT10527
0528	01331	-0 04 00076		STA*	STRA		TLT10528
0529	01332	0 12 00724		IRS	MOT3		TLT10529
0530	01333	0 01 01326		JMP	MOR2		TLT10530
0531	01334	0 02 00723		LDA	MTT3	INITIALIZE	TLT10531
0532	01335	0 04 00724		STA	MOT3		TLT10532
0533	01336	54 1004		INA	E		TLT10533
0534	01337	0 01 01336		JMP	*-1		TLT10534
0535	01340	34 0504		SKS	I	SKIP IF NOT STOP CODE	TLT10535
0536	01341	0 01 01343		JMP	*+2		TLT10536
0537	01342	0 01 01364		JMP	STPO		TLT10537
0538	01343	54 1004		INA	E		TLT10538
0539	01344	0 01 01343		JMP	*-1		TLT10539
0540	01345	0 02 00713		LDA	RTY2		TLT10540
0541	01346	0 04 00076		STA	STRA		TLT10541
0542	01347	0 02 00101		LDA	CHIN	INITIALIZE	TLT10542
0543	01350	0 04 00103		STA	CHRA		TLT10543
0544	01351	0 10 01566		JST	COMP	DATA COMPARISON	TLT10544
0545	01352	0 02 00101		LDA	CHIN		TLT10545
0546	01353	0 04 00103		STA	CHRA		TLT10546
0547	01354	0 02 00713		LDA	RTY2		TLT10547
0548	01355	0 04 00076		STA	STRA		TLT10548
0549	01356	34 0104		SKS	D		TLT10549
0550	01357	0 01 01356		JMP	*-1		TLT10550
0551	01360	0 10 01425		JST	PRTY		TLT10551
0552	01361	0 02 00313		LDA	MSG6	END X16 TLT1	TLT10552



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0553	01362	000020	DEC	16		TLT10553
0554	01363	000000	HLT		END OF PROGRAM	TLT10554
0555	01364	0 10 01425	STPO	JST	PRTY	TLT10555
0556	01365	-0 02 00106	LDA*	STPP	NO STOP CODE RECOGNIZED	TLT10556
0557	01366	000035	DEC	29		TLT10557
0558	01367	000000	HLT		START READ AGAIN	TLT10558
0559	01370	0 01 01271	JMP	READ		TLT10559
0560			*			TLT10560
0561			*SUBROUTINES			TLT10561
0562			*			TLT10562
0563			*INITIALIZE*			TLT10563
0564	01371	0 000000	INIT	DAC	**	TLT10564
0565	01372	0 02 01755	LDA	=*240		TLT10565
0566	01373	0 04 00741	STA	CHRT		TLT10566
0567	01374	0 02 00725	LDA	MTT2		TLT10567
0568	01375	0 04 00726	STA	MOT2		TLT10568
0569	01376	0 02 00723	LDA	MTT3		TLT10569
0570	01377	0 04 00724	STA	MOT3		TLT10570
0571	01400	0 02 00722	LDA	MTT4		TLT10571
0572	01401	0 04 00721	STA	MOT4		TLT10572
0573	01402	0 02 00713	LDA	RTY2		TLT10573
0574	01403	0 04 00076	STA	STRA		TLT10574
0575	01404	0 02 00731	LDA	M73		TLT10575
0576	01405	0 04 00732	STA	COUN		TLT10576
0577	01406	0 02 00101	LDA	CHIN		TLT10577
0578	01407	0 04 00103	STA	CHRA		TLT10578
0579	01410	0 02 01503	LDA	RESR		TLT10579
0580	01411	0 05 01751	ERA	=*101000		TLT10580
0581	01412	101040	SNZ		SKIP IF INDIRECT ADDRESSING OF LAST MESSAGE	TLT10581
0582	01413	-0 01 01371	JMP*	INIT		TLT10582
0583	01414	0 02 00746	LDA	PTM		TLT10583
0584	01415	0 04 01473	STA	ITPT		TLT10584
0585	01416	0 02 01503	LDA	RESR		TLT10585
0586	01417	0 04 01421	STA	**2		TLT10586
0587	01420	0 02 00747	LDA	STRE	RESTORE INDIRECT ADDRESS	TLT10587
0588	01421	0 000000	DAC	**		TLT10588
0589	01422	0 02 00750	LDA	NOPE		TLT10589

0590	01423	0 04	01503	STA	RESR		TLT10590
0591	01424	-0 01	01371	JMP*	INIT		TLT10591
0592				*			TLT10592
0593				*TELEPRINTER PRINT ROUTINE			TLT10593
0594	01425	0 00	00000	PRTY	PZE	**	TLT10594
0595	01426	0 02	01473	LDA	ITPT		TLT10595
0596	01427	0 04	00746	STA	PTEM	SAVE CONTENTS OF ITPT	TLT10596
0597	01430	0 02	01425	LDA	PRTY	RETURN ADDRESS	TLT10597
0598	01431	0 06	01750	ADD	=2		TLT10598
0599	01432	0 04	01425	STA	PRTY		TLT10599
0600	01433	0 07	01750	SUB	=2		TLT10600
0601	01434	0 05	01747	ERA	=*4000		TLT10601
0602	01435	0 04	01436	STA	**1		TLT10602
0603	01436	0 00	00000	DAC	**		TLT10603
0604	01437	0 04	01470	STA	PMSG		TLT10604
0605	01440	101400		SMI		SKIP IF INDIRECT ADDRESSING OF MESSAGE	TLT10605
0606	01441	0 01	01455	JMP	NOIN	CONTINUE	TLT10606
0607	01442	0 03	01746	ANA	=*77777	RESET SIGN BIT	TLT10607
0608	01443	0 06	01745	ADD	=*20000		TLT10608
0609	01444	0 04	01473	STA	ITPT		TLT10609
0610	01445	0 07	01745	SUB	=*20000		TLT10610
0611	01446	0 04	01447	STA	**1		TLT10611
0612	01447	0 00	00000	DAC	**		TLT10612
0613	01450	0 04	00747	STA	STRE	SAVE INDIRECT ADDRESS	TLT10613
0614	01451	0 02	01447	LDA	**2	LDA LOC OF INDIRECT ADDRESS	TLT10614
0615	01452	0 03	01744	ANA	=*777		TLT10615
0616	01453	0 06	01743	ADD	=*10000	STA LOC OF INDIRECT ADDRESS	TLT10616
0617	01454	0 04	01503	STA	RESR		TLT10617
0618	01455	0 02	01425	NOIN LDA	PRTY		TLT10618
0619	01456	0 07	01757	SUB	=1		TLT10619
0620	01457	0 05	01747	ERA	=*4000		TLT10620
0621	01460	0 04	01461	STA	**1		TLT10621
0622	01461	0 00	00000	DAC	**		TLT10622
0623	01462	0 07	01757	SUB	=1	TAKE	TLT10623
0624	01463	0 05	00734	ERA	ONES	TWO'S	TLT10624
0625	01464	0 04	00745	STA	PWDC	COMPLEMENT	TLT10625
0626	01465	34 01	0164	SKS	D		TLT10626

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0627	01466	0 01 01465	JMP	*-1		TLT10627
0628	01467	14 0104	OCF	D	ENABLE ASR OUT	TLT10628
0629	01470	0 000000	MSG	DAC	**	TLT10629
0630	01471	74 0004	OTA	C	OUTPUT ASCII	TLT10630
0631	01472	0 01 01471	JMP	*-1		TLT10631
0632	01473	0 12 01470	ITPT	IRS	PMSG	TLT10632
0633	01474	0 12 00745		IRS	PWDC	TLT10633
0634	01475	0 01 01470	JMP	PMSG		TLT10634
0635	01476	34 0104	SKS	D	WAIT UNTIL NOT BUSY	TLT10635
0636	01477	0 01 01476	JMP	*-1		TLT10636
0637	01500	0 02 00746	LDA	PTEM		TLT10637
0638	01501	0 04 01473	STA	ITPT		TLT10638
0639	01502	0 02 00747	LDA	STRE	RESTORE INDIRECT ADDRESS	TLT10639
0640	01503	101000	RESR	NOP		TLT10640
0641	01504	0 02 00750	LDA	NOPE		TLT10641
0642	01505	0 04 01503	STA	RESR		TLT10642
0643	01506	-0 01 01425	JMP*	PRTY		TLT10643
0644		*				TLT10644
0645		*				TLT10645
0646		*ERROR ROUTINE				TLT10646
0647		*				TLT10647
0648	01507	0 000000	ERR	DAC	**	TLT10648
0649					*CONVERT INPUT CHARACTER TO ASCII	TLT10649
0650					*STORE AS THREE ASCII CHARACTERS IN ONE, TWO, THR	TLT10650
0651	01510	-0 02 00076	LDA*	STRA		TLT10651
0652	01511	0405 72	ARS	6		TLT10652
0653	01512	0 03 01742	ANA	=3		TLT10653
0654	01513	0 04 00000	STA	0		TLT10654
0655	01514	0 10 01664	JST	NDX4	LDA ASC,1	TLT10655
0656	01515	0 000677	DAC	ASC		TLT10656
0657	01516	0 04 00350	STA	ONE		TLT10657
0658	01517	-0 02 00076	LDA*	STRA		TLT10658
0659	01520	0405 75	ARS	3		TLT10659
0660	01521	0 03 01741	ANA	=7		TLT10660
0661	01522	0 04 00000	STA	0		TLT10661
0662	01523	0 10 01664	JST	NDX4	LDA ASC,1	TLT10662
0663	01524	0 000677	DAC	ASC		TLT10663

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0664	01525	0 04 00351	STA	TWO		TLT10664
0665	01526	-0 02 00076	LDA*	STRA		TLT10665
0666	01527	0 03 01741	ANA	=7		TLT10666
0667	01530	0 04 00000	STA	0		TLT10667
0668	01531	0 10 01664	JST	NDX4	LDA ASC,1	TLT10668
0669	01532	0 000677	DAC	ASC		TLT10669
0670	01533	0 04 00352	STA	THR		TLT10670
0671			*CONVERT KNOWN CHARACTER TO ASCII			TLT10671
0672			*STORE AS THREE ASCII CHARACTERS IN FOR, FIV, SIX			TLT10672
0673	01534	-0 02 00103	LDA*	CHRA		TLT10673
0674	01535	0405 72	ARS	6		TLT10674
0675	01536	0 03 01742	ANA	=3		TLT10675
0676	01537	0 04 00000	STA	0		TLT10676
0677	01540	0 10 01664	JST	NDX4	LDA ASC,1	TLT10677
0678	01541	0 000677	DAC	ASC		TLT10678
0679	01542	0 04 00370	STA	FOR		TLT10679
0680	01543	-0 02 00103	LDA*	CHRA		TLT10680
0681	01544	0405 75	ARS	3		TLT10681
0682	01545	0 03 01741	ANA	=7		TLT10682
0683	01546	0 04 00000	STA	0		TLT10683
0684	01547	0 10 01664	JST	NDX4	LDA ASC,1	TLT10684
0685	01550	0 000677	DAC	ASC		TLT10685
0686	01551	0 04 00371	STA	FIV		TLT10686
0687	01552	-0 02 00103	LDA*	CHRA		TLT10687
0688	01553	0 03 01741	ANA	=7		TLT10688
0689	01554	0 04 00000	STA	0		TLT10689
0690	01555	0 10 01664	JST	NDX4	LDA ASC,1	TLT10690
0691	01556	0 000677	DAC	ASC		TLT10691
0692	01557	0 04 00372	STA	SIX		TLT10692
0693	01560	34 0104	SKS	D	WAIT UNTIL NOT BUSY	TLT10693
0694	01561	0 01 01560	JMP	*-1		TLT10694
0695			*PRINT ERROR MESSAGE			TLT10695
0696	01562	0 10 01425	JST	PRTY		TLT10696
0697	01563	0 02 00333	LDA	EMSG		TLT10697
0698	01564	000040	DEC	32		TLT10698
0699	01565	-0 01 01507	JMP*	ERR		TLT10699
0700						TLT10700

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0701			*DATA COMPARISON ROUTINE		TLT10701
0702			*		TLT10702
0703	01566	0 000000	COMP DAC **		TLT10703
0704	01567	-0 02 00103	MOR LDA* CHRA		TLT10704
0705	01570	-0 05 00076	ERA* STRA		TLT10705
0706	01571	100040	SZE		TLT10706
0707	01572	0 10 01507	JST ERR		TLT10707
0708	01573	0 12 00103	IRS CHRA		TLT10708
0709	01574	0 12 00076	IRS STRA		TLT10709
0710	01575	0 12 00721	IRS MOT4		TLT10710
0711	01576	0 01 01567	JMP MOR		TLT10711
0712	01577	0 02 00722	LDA MTT4		TLT10712
0713	01600	0 04 00721	STA MOT4		TLT10713
0714	01601	-0 01 01566	JMP* COMP	RETURN-HALT	TLT10714
0715			*START PUNCH ROUTINE		TLT10715
0716	01602	0 000000	MOTO DAC **		TLT10716
0717	01603	34 0104	SKS D		TLT10717
0718	01604	0 01 01603	JMP *-1		TLT10718
0719	01605	14 0104	OCF D		TLT10719
0720	01606	0 02 00727	LDA MOTT	TAPE	TLT10720
0721	01607	74 0004	OTA C		TLT10721
0722	01610	0 01 01607	JMP *-1		TLT10722
0723	01611	0 10 01731	JST BCHD		TLT10723
0724	01612	0 02 00730	LDA MOT1	SET INDEX TO 32	TLT10724
0725	01613	0 04 00000	STA 0		TLT10725
0726	01614	0 02 00735	LDA ZROS		TLT10726
0727	01615	74 0004	OTA C		TLT10727
0728	01616	0 01 01615	JMP *-1		TLT10728
0729	01617	0 12 00000	IRS 0		TLT10729
0730	01620	0 01 01614	JMP *-4		TLT10730
0731	01621	-0 01 01602	JMP* MOTO		TLT10731
0732			*READY SHOULD BE SET AFTER 100 MS DELAY		TLT10732
0733	01622	0 10 01425	ERR1 JST PRTY		TLT10733
0734	01623	0 02 00375	LDA E1		TLT10734
0735	01624	000060	DEC 48		TLT10735
0736	01625	0 01 01000	JMP *1000		TLT10736
0737			*NO INTERRUPT AFTER MASK SET		TLT10737

0738	01626	0 10 01425	ERR2	JST	PRTY		TLT10738
0739	01627	0 02 00455		LDA	E2		TLT10739
0740	01630	000046		DEC	30		TLT10740
0741	01631	0 01 01000		JMP	*1000		TLT10741
0742				*INTERRUPT NOT CAUSED BY ABR			TLT10742
0743	01632	0 10 01425	ERR3	JST	PRTY		TLT10743
0744	01633	0 02 00523		LDA	E3		TLT10744
0745	01634	000046		DEC	30		TLT10745
0746	01635	0 01 01000		JMP	*1000		TLT10746
0747				*NO SKIP ON OTA WITH READY SET			TLT10747
0748	01636	0 10 01425	ERR4	JST	PRTY		TLT10748
0749	01637	0 02 00571		LDA	E4		TLT10749
0750	01640	000050		DEC	40		TLT10750
0751	01641	0 01 01000		JMP	*1000		TLT10751
0752				*READY SET AFTER OTA			TLT10752
0753	01642	0 10 01425	ERR5	JST	PRTY		TLT10753
0754	01643	0 02 00641		LDA	E5		TLT10754
0755	01644	000036		DEC	30		TLT10755
0756	01645	0 01 01000		JMP	*1000		TLT10756
0757	01646	0 000000	NDX1	DAC	**		TLT10757
0758	01647	0 04 00071		STA	SAVA	STA* BLOC ROUTINE	TLT10758
0759	01650	0 02 00100		LDA	BLOC		TLT10759
0760	01651	0 06 00000		ADD	0		TLT10760
0761	01652	0 04 00072		STA	BLOX		TLT10761
0762	01653	0 02 00071		LDA	SAVA		TLT10762
0763	01654	-0 04 00072		STA*	BLOX		TLT10763
0764	01655	-0 01 01646		JMP*	NDX1		TLT10764
0765	01656	0 000000	NDX2	DAC	**		TLT10765
0766	01657	0 02 00102		LDA	BINA		TLT10766
0767	01660	0 06 00000		ADD	0		TLT10767
0768	01661	0 04 00073		STA	BINX		TLT10768
0769	01662	-0 02 00073		LDA*	BINX		TLT10769
0770	01663	-0 01 01656		JMP*	NDX2		TLT10770
0771	01664	0 000000	NDX4	DAC	**	LDA X.1 ROUTINE	TLT10771
0772	01665	-0 02 01664		LDA*	NDX4		TLT10772
0773	01666	0 06 00000		ADD	0		TLT10773
0774	01667	0 04 00074		STA	NDXA		TLT10774

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0775	01670	-0 02 00074	LDA*	NDXA		TLT10775
0776	01671	0 12 01664	IRS	NDX4		TLT10776
0777	01672	-0 01 01664	JMP*	NDX4		TLT10777
0778	01673	0 000000	SS4 DAC	**		TLT10778
0779	01674	0 02 00070	LDA	SSW		TLT10779
0780	01675	0414 75	LGL	3		TLT10780
0781	01676	100400	SPL			TLT10781
0782	01677	0 12 01673	IRS	SS4		TLT10782
0783	01700	-0 01 01673	JMP*	SS4		TLT10783
0784	01701	0 000000	SR2 DAC	**		TLT10784
0785	01702	0 02 00070	LDA	SSW		TLT10785
0786	01703	0414 77	LGL	1		TLT10786
0787	01704	101400	SMI			TLT10787
0788	01705	0 12 01701	IRS	SR2		TLT10788
0789	01706	-0 01 01701	JMP*	SR2		TLT10789
0790	01707	0 000000	BUT DAC	**	IF INTERRUPT OCCURS,	TLT10790
0791	01710	0 12 00075	IRS	IND	INCREMENT IND	TLT10791
0792	01711	-0 01 01707	JMP*	BUT		TLT10792
0793	01712	0 000000	CHNG DAC	**	IF IND IS FLAGGED, RESET	TLT10793
0794	01713	0 02 00075	LDA	IND	IT, LOAD SENSE SWITCH	TLT10794
0795	01714	101040	SNZ		REGISTER, AND HALT SO THAT	TLT10795
0796	01715	-0 01 01712	JMP*	CHNG	"SENSE SWITCHES" MAY BE CHANGED.	TLT10796
0797	01716	140040	CRA		IF IND IS NOT SET,	TLT10797
0798	01717	0 04 00075	STA	IND	RETURN TO PROGRAM	TLT10798
0799	01720	0 10 01425	JST	PRTY	ENTER A-REG SETTING.	TLT10799
0800	01721	-0 02 00105	LDA*	ARG1		TLT10800
0801	01722	000047	DEC	39		TLT10801
0802	01723	0 02 00070	LDA	SSW		TLT10802
0803	01724	000000	HLT			TLT10803
0804	01725	000000	HLT			TLT10804
0805	01726	0 04 00070	STA	SSW		TLT10805
0806	01727	000401	ENB			TLT10806
0807	01730	-0 01 01712	JMP*	CHNG		TLT10807
0808			* BUFFER CHARACTER DELAY			TLT10808
0809	01731	0 000000	BCHD DAC	**		TLT10809
0810	01732	0 02 01740	LDA	=*30000		TLT10810
0811	01733	0 04 01737	STA	LEGN		TLT10811





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	03006	000240		
	03007	000240		
	03010	000240		
	03011	000240		
	03012	000240		
	03013	000240		
	03014	000240		
	03015	000324		
	03016	000310		
0825	03017	000311	OCT 311,323,240,311,323	TLT10825
	03020	000323		
	03021	000240		
	03022	000311		
	03023	000323		
0826	03024	000240	OCT 240,324,310,305,240,324,305,314,305,324,331,320,305,327,322	TLT10826
	03025	000324		
	03026	000310		
	03027	000305		
	03030	000240		
	03031	000324		
	03032	000305		
	03033	000314		
	03034	000305		
	03035	000324		
	03036	000331		
	03037	000320		
	03040	000305		
	03041	000327		
	03042	000322		
0827	03043	000311	OCT 311,324,305,322,257	TLT10827
	03044	000324		
	03045	000305		
	03046	000322		
	03047	000257		
0828	03050	000320	OCT 320,325,316,303,310,240,317,325,324,320,325,324,240,324,305	TLT10828
	03051	000325		
	03052	000316		

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	03053	000303		
	03054	000310		
	03055	000240		
	03056	000317		
	03057	000325		
	03060	000324		
	03061	000320		
	03062	000325		
	03063	000324		
	03064	000240		
	03065	000324		
	03066	000305		
0829	03067	000323	OCT 323,324,240,240,240	TLT10829
	03070	000324		
	03071	000240		
	03072	000240		
0830	03073	000240		
	03074	000000	OCT 0,0,0,0,0,0,0,0,0,0,0,0,0,0,215,212,240	TLT10830
	03075	000000		
	03076	000000		
	03077	000000		
	03100	000000		
	03101	000000		
	03102	000000		
	03103	000000		
	03104	000000		
	03105	000000		
	03106	000000		
	03107	000000		
	03110	000215		
	03111	000212		
0831	03112	000240		
	03113	000240	OCT 240,240,240,240,240	TLT10831
	03114	000240		
	03115	000240		
	03116	000240		
	03117	000240		

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0832	03120	000240	OCT	240,324,310,305,240,304,301,324,301,240,316,317,327,240,302	TLT10832
	03121	000324			
	03122	000310			
	03123	000305			
	03124	000240			
	03125	000304			
	03126	000301			
	03127	000324			
	03130	000301			
	03131	000240			
	03132	000316			
	03133	000317			
	03134	000327			
	03135	000240			
	03136	000302			
0833	03137	000305	OCT	305,311,316,307,240	TLT10833
	03140	000311			
	03141	000316			
	03142	000307			
	03143	000240			
0834	03144	000320	OCT	320,325,316,303,310,305,304,240,327,311,314,314,240,302,305	TLT10834
	03145	000325			
	03146	000316			
	03147	000303			
	03150	000310			
	03151	000305			
	03152	000304			
	03153	000240			
	03154	000327			
	03155	000311			
	03156	000314			
	03157	000314			
	03160	000240			
	03161	000302			
	03162	000305			
0835	03163	000240	OCT	240,322,305,301,304	TLT10835
	03164	000322			

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	03165	000305		
	03166	000301		
	03167	000304		
0836	03170	000240	OCT	240,302,301,303,313,240,301,316,304,240,303,317,319,320,301 TLT10836
	03171	000302		
	03172	000301		
	03173	000303		
	03174	000313		
	03175	000240		
	03176	000301		
	03177	000316		
	03200	000304		
	03201	000240		
	03202	000303		
	03203	000317		
	03204	000315		
	03205	000320		
	03206	000301		
0837	03207	000322	OCT	322,305,304,240,240 TLT10837
	03210	000305		
	03211	000304		
	03212	000240		
	03213	000240		
0838	03214	000240	OCT	240,240,240,240,240,240,215,212,301,302,303,304,305,306,307 TLT10838
	03215	000240		
	03216	000240		
	03217	000240		
	03220	000240		
	03221	000240		
	03222	000215		
	03223	000212		
	03224	000301		
	03225	000302		
	03226	000303		
	03227	000304		
	03230	000305		
	03231	000306		

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	03232	000307			
0839	03233	000310	OCT	310,311,312,313,314	TLT10839
	03234	000311			
	03235	000312			
	03236	000313			
	03237	000314			
0840	03240	000315	OCT	315,316,317,320,321,322,323,324,325,326,327,330,331,332,260	TLT10840
	03241	000316			
	03242	000317			
	03243	000320			
	03244	000321			
	03245	000322			
	03246	000323			
	03247	000324			
	03250	000325			
	03251	000326			
	03252	000327			
	03253	000330			
	03254	000331			
	03255	000332			
	03256	000260			
0841	03257	000261	OCT	261,262,263,264,265	TLT10841
	03260	000262			
	03261	000263			
	03262	000264			
	03263	000265			
0842	03264	000266	OCT	266,267,270,271,271,270,267,266,265,264,263,262,261,260,332	TLT10842
	03265	000267			
	03266	000270			
	03267	000271			
	03270	000271			
	03271	000270			
	03272	000267			
	03273	000266			
	03274	000265			
	03275	000264			
	03276	000263			

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	03277	000262			
	03300	000261			
	03301	000260			
	03302	000332			
0843	03303	000331	OCT	331,330,327,326,325	TLT10843
	03304	000330			
	03305	000327			
	03306	000326			
	03307	000325			
0844	03310	000324	OCT	324,323,322,321,320,317,316,315,314,313,312,311,310,307,306	TLT10844
	03311	000323			
	03312	000322			
	03313	000321			
	03314	000320			
	03315	000317			
	03316	000316			
	03317	000315			
	03320	000314			
	03321	000313			
	03322	000312			
	03323	000311			
	03324	000310			
	03325	000307			
	03326	000306			
0845	03327	000305	OCT	305,304,303,215,212	TLT10845
	03330	000304			
	03331	000303			
	03332	000215			
	03333	000212			
0846	03334	000077	BIN OCT	77,0,77,0,76,1,75,2,73,4,67,10,57,20,37	TLT10846
	03335	000000			
	03336	000077			
	03337	000000			
	03340	000076			
	03341	000001			
	03342	000075			
	03343	000002			

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	03344	000073			
	03345	000004			
	03346	000067			
	03347	000010			
	03350	000057			
	03351	000020			
	03352	000037			
0847	03353	000040	OCT	40,77,25,52,77	TLT10847
	03354	000077			
	03355	000025			
	03356	000052			
	03357	000077			
0848	03360	000215	ARGA OCT	215,212,212,305,316,324,305,322,240,301,255,322,305,307,240	TLT10848
	03361	000212			
	03362	000212			
	03363	000305			
	03364	000316			
	03365	000324			
	03366	000305			
	03367	000322			
	03370	000240			
	03371	000301			
	03372	000255			
	03373	000322			
	03374	000305			
	03375	000307			
	03376	000240			
0849	03377	000323	OCT	323,305,324,324,311,316,307,215,212,212	TLT10849
	03400	000305			
	03401	000324			
	03402	000324			
	03403	000311			
	03404	000316			
	03405	000307			
	03406	000215			
	03407	000212			
	03410	000212			

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0850	03411	000320	OCT	320,322,305,323,323,240,323,324,301,322,324,215,212,212	TLT10850
	03412	000322			
	03413	000305			
	03414	000323			
	03415	000323			
	03416	000240			
	03417	000323			
	03420	000324			
	03421	000301			
	03422	000322			
	03423	000324			
	03424	000215			
	03425	000212			
	03426	000212			
0851	03427	000215	NSTM OCT	215,212,212,316,317,240,323,324,317,320,240,303,317,304,305,	TLT10851
	03430	000212			
	03431	000212			
	03432	000316			
	03433	000317			
	03434	000240			
	03435	000323			
	03436	000324			
	03437	000317			
	03440	000320			
	03441	000240			
	03442	000303			
	03443	000317			
	03444	000304			
	03445	000305			
	03446	000000			
0852	03447	000240	OCT	240,322,305,303,317,307,316,311,332,305,304,215,212,212	TLT10852
	03450	000322			
	03451	000305			
	03452	000303			
	03453	000317			
	03454	000307			
	03455	000316			



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	03456	000311		
	03457	000332		
	03460	000305		
	03461	000304		
	03462	000215		
	03463	000212		
	03464	000212		
0853			*PRINTER-PUNCH OUTPUT - TURN ON PUNCH	TLT10853
0854	03465	000215	MSG3 OCT 215,212,212,320,322,311,316,324,305,322,257	TLT10854
	03466	000212		
	03467	000212		
	03470	000320		
	03471	000322		
	03472	000311		
	03473	000316		
	03474	000324		
	03475	000305		
	03476	000322		
	03477	000257		
0855	03500	000320	OCT 320,325,316,303,310,240,317,325,324,320,325,324	TLT10855
	03501	000325		
	03502	000316		
	03503	000303		
	03504	000310		
	03505	000240		
	03506	000317		
	03507	000325		
	03510	000324		
	03511	000320		
	03512	000325		
	03513	000324		
0856	03514	000215	OCT 215,212,212,250,324,325,322,316,240,317,316,240,320,325,316	TLT10856
	03515	000212		
	03516	000212		
	03517	000250		
	03520	000324		
	03521	000325		

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	03522	000322		
	03523	000316		
	03524	000240		
	03525	000317		
	03526	000316		
	03527	000240		
	03530	000320		
	03531	000325		
	03532	000316		
0857	03533	000303	OCT 303,310,240,306,317,322,240,301,323,322,255,263,263,251	TLT10857
	03534	000310		
	03535	000240		
	03536	000306		
	03537	000317		
	03540	000322		
	03541	000240		
	03542	000301		
	03543	000323		
	03544	000322		
	03545	000255		
	03546	000263		
	03547	000263		
0858	03550	000251		
	03551	000215	OCT 215,212,212,320,322,305,323,323,240,323,324,301,322,324	TLT10858
	03552	000212		
	03553	000212		
	03554	000320		
	03555	000322		
	03556	000305		
	03557	000323		
	03560	000323		
	03561	000240		
	03562	000323		
	03563	000324		
	03564	000301		
	03565	000322		
	03566	000324		

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0859 03567 000215  
03570 000212  
03571 000212

OCT 215,212,212

TLT10859

0860  
0861

FIN  
END

TLT10860  
TLT10861

NO ERRORS IN ABOVE ASSEMBLY.  
DAP-16 REV. BX 1-30-67 OPR



038	*			TPT10038
039	*			TPT10039
040	*	REVISIONS		TPT10040
041	*	REV. B	ECO 4586	TPT10041
042	*	REV. A	10-28-66	TPT10042
043	*			TPT10043
044	*			TPT10044
045	*			TPT10045
046	*	AUTHOR		TPT10046
047	*			TPT10047
048	*	HONEYWELL INC., COMPUTER CONTROL DIVISION		TPT10048
049	*			TPT10049
050	*			TPT10050
051	*	PURPOSE		TPT10051
052	*			TPT10052
053	*	TO TEST THE DDP-416 OR DDP-516 PAPER TAPE PUNCH		TPT10053
054	*			TPT10054
055	*	USE		TPT10055
056	*			TPT10056
057	*	1) LOAD PROGRAM		TPT10057
058	*	2) ENTER 1000 OCT INTO P COUNTER		TPT10058
059	*	3) PRESS START		TPT10059
060	*	4) WHEN THE COMPUTER HALTS, LOAD THE "SENSE SWITCH"		TPT10060
061	*	SETTINGS INTO THE FOUR HIGH ORDER BITS OF REGISTER A.		TPT10061
062	*	A 1 CORRESPONDS TO A SET SWITCH, WHILE A 0		TPT10062
063	*	CORRESPONDS TO A RESET SWITCH. THESE SETTINGS WILL, WHEN THE		TPT10063
064	*	START BUTTON IS PUSHED, BE LOADED INTO LOCATION SSW, AND THE		TPT10064
065	*	PROGRAM WILL CONTINUE. THE SETTINGS MAY BE CHANGED DURING THE		TPT10065
066	*	COURSE OF THE PROGRAM BY PRESSING THE START BUTTON. THIS WILL		TPT10066
067	*	GENERATE AN INTERRUPT WHICH WILL ULTIMATELY CAUSE THE PROGRAM TO		TPT10067
068	*	HALT WITH SSW DISPLAYED IN REGISTER A. WHEN START IS PRESSED		TPT10068
069	*	AGAIN, A WILL BE RELOADED INTO SSW, AND THE PROGRAM WILL RESUME.		TPT10069
070	*	5) SW2 ON-LOOP OUTPUT/SW2 OFF -1 PASS		TPT10070
071	*	IF SW2 IS SET, THE NUMBER OF PASSES THE PROGRAM IS TO RUN		TPT10071
072	*	MUST BE ENTERED (IN OCTAL) INTO THE LOWER 12 BITS OF REGISTER A.		TPT10072
073	*			TPT10073
074	*	THE ASR-33 IS ASSUMED TO BE AVAILABLE FOR MESSAGE		TPT10074





0112	00100	000001	ONE	OCT	1		TPT10112
0113	00101	177754	M20	OCT	177754		TPT10113
0114	00102	177753	WBCN	OCT	177753		TPT10114
0115	00103	177753	M21	OCT	177753		TPT10115
0116	00104	170263	INTC	OCT	170263		TPT10116
0117	00105	000001	DELA	BSZ	1		TPT10117
0118	00106	000000	TEMP	BSZ	1		TPT10118
0119	00107	0 001103	RUPT	BAC	INTR		TPT10119
0120	00110	100000	SR1	OCT	100000		TPT10120
0121	00111	0 001327	BUTN	BAC	BUT		TPT10121
0122	00112	000000	IND	BSZ	1		TPT10122
0123	00113	000000	SSW	BSZ	1		TPT10123
0124				ORG	012		TPT10124
0125	01000	0 02 01767	STRT	LDA	=1	INITIALIZE	TPT10125
0126	01001	0 04 00112		STA	IND	IND	TPT10126
0127	01002	0 10 01332		JST	CHNG	INITIALIZE SENSE SWITCHES	TPT10127
0128	01003	140040		CRA			TPT10128
0129	01004	0 07 00113		SUB	SSW		TPT10129
0130	01005	0 03 01766		ANA	=*7777		TPT10130
0131	01006	0 05 01765		ERA	=*170000		TPT10131
0132	01007	0 04 01137		STA	CNTR		TPT10132
0133	01010	0 10 01234		JST	INIT		TPT10133
0134	01011	0 02 00111		LDA	BUTN	LOAD POINTER TO	TPT10134
0135	01012	0 04 00030		STA	*30	START BUTTON ROUTINE	TPT10135
0136	01013	000401		ENB		AND ENABLE INTERRUPT	TPT10136
0137	01014	0 02 00113		LDA	SSW	SR1	TPT10137
0138	01015	101400		SMI			TPT10138
0139	01016	0 01 01020		JMP	*+2		TPT10139
0140	01017	0 01 01023		JMP	PLDR	JUMP IF NO ASR-33	TPT10140
0141						* PRINT START MESSAGE	TPT10141
0142	01020	0 10 01150		JST	PRTY		TPT10142
0143	01021	0 02 01354		LDA	MSG1		TPT10143
0144	01022	000023		DEC	19		TPT10144
0145						* PUNCH PAPER TAPE	TPT10145
0146							TPT10146
0147							TPT10147
0148	01023	34 0104		PLDR	SKS *104	WAIT	TPT10148



H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

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0149	01024	0 01 01025	JMP	*-1	UNTIL ASR IS FINISHED	TPT10149
0150	01025	14 0002	OCP	2	ENABLE PUNCH	TPT10150
0151	01026	0 10 01244	JST	LDR	PUNCH LEADER	TPT10151
0152			*			TPT10152
0153			*	PUNCH 0-377		TPT10153
0154			*			TPT10154
0155	01027	0 02 01722	MSG LDA	PAT	NEXT CHARACTER	TPT10155
0156	01030	74 0002	OTA	2	OUTPUT TO PUNCH	TPT10156
0157	01031	0 01 01030	JMP	*-1		TPT10157
0158	01032	0 06 00100	ADD	CNE		TPT10158
0159	01033	0 04 01722	STA	PAT		TPT10159
0160	01034	0 05 01764	ERA	=400		TPT10160
0161	01035	100040	SZE		SKIP IF 377 PUNCHED	TPT10161
0162	01036	0 01 01027	JMP	MSG		TPT10162
0163			*			TPT10163
0164			*	PUNCH SPECIAL CONFIGURATION		TPT10164
0165			*			TPT10165
0166	01037	0 02 01723	PUNS LDA	PAT+1		TPT10166
0167	01040	74 0002	OTA	2		TPT10167
0168	01041	0 01 01040	JMP	*-1		TPT10168
0169	01042	0 12 01037	IRS	PUNS		TPT10169
0170	01043	0 12 00102	IRS	WDCN	SKIP IF PUNCHED	TPT10170
0171	01044	0 01 01037	JMP	PUNS		TPT10171
0172			*			TPT10172
0173			*	PUNCH 377-0		TPT10173
0174			*			TPT10174
0175	01045	0 07 01767	CON SUB	=1	SET UP NEXT CHARACTER	TPT10175
0176	01046	101040	SNZ			TPT10176
0177	01047	0 01 01123	JMP	STP	JUMP IF ALL PUNCHED	TPT10177
0178	01050	0 04 00100	STA	TEMP		TPT10178
0179			*	DELAY 15 MS TO WAIT FOR READY		TPT10179
0180	01051	0 02 00104	DELP LDA	INTC		TPT10180
0181	01052	0 04 00105	STA	DELA		TPT10181
0182	01053	0 12 00105	IRS	DELA	DELAY 15 MS	TPT10182
0183	01054	0 01 01053	JMP	*-1		TPT10183
0184	01055	34 0002	SKS	2		TPT10184
0185	01056	0 01 01255	JMP	ERR1	READY SHOULD BE SET	TPT10185

0186	01057	001001		INH			TPT10186
0187	01060	0 02 01067		LDA	NINT	SET UP ENTRY FOR	TPT10187
0188	01061	0 04 00030		STA	*30	IMPROPER INTERRUPT	TPT10188
0189	01062	140040		CRA		MASK OFF INTERRUPT	TPT10189
0190	01063	74 0020		OTA	*20	ASSOCIATED WITH DEVICE	TPT10190
0191	01064	000401		ENB		TEST FOR NO INTERRUPT	TPT10191
0192	01065	101000		NOP		*	TPT10192
0193	01066	0 01 01072		JMP	**4	*	TPT10193
0194	01067	0 001070	NINT	LAC	**1	*	TPT10194
0195	01070	0 000000		BAC	**	*	TPT10195
0196	01071	000000		HLT		INTERRUPT NOT MASKED OFF	TPT10196
0197	01072	001001		INH		INTERRUPT MASKED OFF	TPT10197
0198	01073	0 02 00107		LDA	RUPT	*	TPT10198
0199	01074	0 04 00030		STA	24	RESET INTERRUPT ENTRY	TPT10199
0200	01075	0 02 01753		LDA	=*100	*	TPT10200
0201	01076	74 0020		OTA	*20	*	TPT10201
0202	01077	000401		ENB		ENABLE INTERRUPT	TPT10202
0203	01100	101000		NOP		INTERRUPT SHOULD OCCUR HERE	TPT10203
0204	01101	001001		INH			TPT10204
0205	01102	0 01 01261		JMP	ERR2	NO INTERRUPT WITH MASK SET	TPT10205
0206	01103	0 000000	INTR	BAC	**		TPT10206
0207	01104	0 02 00111		LDA	BTIN	LOAD START BUTTON	TPT10207
0208	01105	0 04 00030		STA	*30	INTERRUPT	TPT10208
0209	01106	34 0402		SKS	*402		TPT10209
0210	01107	0 01 01111		JMP	**2		TPT10210
0211	01110	0 01 01265		JMP	ERR3	INTERRUPT NOT CAUSED BY PUNCH	TPT10211
0212	01111	140040		CRA			TPT10212
0213	01112	74 0020		OTA	*20		TPT10213
0214	01113	000401		ENB			TPT10214
0215	01114	0 02 00100		LDA	TEMP		TPT10215
0216	01115	74 0012		OTA	*2	OUTPUT TO PUNCH	TPT10216
0217	01116	0 01 01271		JMP	ERR4	NO SKIP ON OTA WITH READY SET	TPT10217
0218	01117	34 0002		SKS	2	SKIP IF READY	TPT10218
0219	01120	0 01 01122		JMP	**2		TPT10219
0220	01121	0 01 01275		JMP	ERR5	READY SET AFTER OTA	TPT10220
0221	01122	0 01 01045		JMP	CON	CONTINUE PUNCHING	TPT10221
0222						* INITIALIZE	TPT10222

0223	01123	0 10 01244	STP	JST	LDR		TPT10223
0224	01124	14 0102		OCP	*102	TURN OFF PUNCH AND	TPT10224
0225	01125	0 10 01332		JST	CHNG	CHECK FOR SENSE SWITCH CHANGE	TPT10225
0226	01126	0 02 00113		LDA	SSW	SS2	TPT10226
0227	01127	0414 77		LGL	1		TPT10227
0228	01130	101400		SMI			TPT10228
0229	01131	0 01 01140		JMP	TOFF		TPT10229
0230	01132	0 12 01137		IRS	CNTR		TPT10230
0231	01133	0 01 01135		JMP	**2		TPT10231
0232	01134	0 01 01140		JMP	TOFF		TPT10232
0233	01135	0 10 01234		JST	INIT		TPT10233
0234	01136	0 01 01023		JMP	PLDR		TPT10234
0235	01137	0 00 00000		CNTR	PZE		TPT10235
0236					* PRINT END MESSAGE		TPT10236
0237	01140	0 02 00113		TOFF	LDA	SSW	TPT10237
0238	01141	100400		SPL			TPT10238
0239	01142	0 01 01146		JMP	END		TPT10239
0240	01143	0 10 01150		JST	PRTY		TPT10240
0241	01144	0 02 01377		LDA	MSG2		TPT10241
0242	01145	000021		DEC	17		TPT10242
0243	01146	000000	END	HLT		END OF PROGRAM	TPT10243
0244	01147	0 01 01000		JMP	STRT	RESTART PROGRAM	TPT10244
0245				*			TPT10245
0246				*	ASR-33 PRINT ROUTINE		TPT10246
0247				*			TPT10247
0248	01150	0 000000	PRTY	DAC	**		TPT10248
0249	01151	0 02 01214		LDA	ITPT		TPT10249
0250	01152	0 04 01231		STA	PTEM	SAVE CONTENTS OF ITPT	TPT10250
0251	01153	0 02 01150		LDA	PRTY		TPT10251
0252	01154	0 06 01762		ADD	=2	RETURN ADDRESS	TPT10252
0253	01155	0 04 01150		STA	PRTY		TPT10253
0254	01156	0 07 01762		SUB	=2		TPT10254
0255	01157	0 05 01761		ERA	=*4000		TPT10255
0256	01160	0 04 01161		STA	**1		TPT10256
0257	01161	0 000000		DAC	**	LDA WITH LOC OF INDIRECT ADDRESS	TPT10257
0258	01162	0 04 01211		STA	PMSG		TPT10258
0259	01163	101400		SMI		SKIP IF INDIRECT ADDRESSING OF MESSAGE	TPT10259

0260	01164	0 01 01200	JMP	NOIN	CONTINUE	TPT10260
0261	01165	0 03 01760	ANA	=*77777	RESET SIGN BIT	TPT10261
0262	01166	0 06 01757	ADD	=*20000		TPT10262
0263	01167	0 04 01214	STA	ITPT		TPT10263
0264	01170	0 07 01757	SUB	=*20000		TPT10264
0265	01171	0 04 01172	STA	**+1		TPT10265
0266	01172	0 00000	DAC	**	LDA WDC OF MSG	TPT10266
0267	01173	0 04 01232	STA	STRE	SAVE INDIRECT ADDRESS	TPT10267
0268	01174	0 02 01172	LDA	*-2	LDA LOC OF INDIRECT ADDRESS	TPT10268
0269	01175	0 03 01756	ANA	=*777		TPT10269
0270	01176	0 06 01755	ADD	=*10000	STA LOC OF INDIRECT ADDRESS	TPT10270
0271	01177	0 04 01224	STA	RESR		TPT10271
0272	01200	0 02 01150	NOIN LDA	PRTY		TPT10272
0273	01201	0 07 01767	SUB	=1		TPT10273
0274	01202	0 05 01761	ERA	=*4000		TPT10274
0275	01203	0 04 01204	SIA	**+1		TPT10275
0276	01204	0 00000	DAC	**	LDA STARTING LOC OF MSG	TPT10276
0277	01205	0 07 01767	SUB	=1	TAKE	TPT10277
0278	01206	0 05 01754	ERA	=*177777	TWO'S	TPT10278
0279	01207	0 04 01230	STA	PWDC	COMPLEMENT	TPT10279
0280	01210	14 0104	DCP	*104	ENABLE ASR OUT	TPT10280
0281	01211	0 00000	PMSG DAC	**	LDA NEXT WORD	TPT10281
0282	01212	74 0004	OTA	*4	OUTPUT ASCII	TPT10282
0283	01213	0 01 01212	JMP	*-1		TPT10283
0284	01214	0 12 01211	ITPT IRS	PMSG		TPT10284
0285	01215	0 12 01230	IRS	PWDC		TPT10285
0286	01216	0 01 01211	JMP	PMSG		TPT10286
0287	01217	34 0104	SKS	*104	WAIT UNTIL NOT BUSY	TPT10287
0288	01220	0 01 01217	JMP	*-1		TPT10288
0289	01221	0 02 01231	LDA	PTEM		TPT10289
0290	01222	0 04 01214	STA	ITPT		TPT10290
0291	01223	0 02 01232	LDA	STRE	RESTORE INDIRECT ADDRESS	TPT10291
0292	01224	101000	RESR NOP			TPT10292
0293	01225	0 02 01233	LDA	NOPE		TPT10293
0294	01226	0 04 01224	STA	RESR		TPT10294
0295	01227	-0 01 01150	JMP*	PRTY		TPT10295
0296	01230	000000	PWDC DEC	0		TPT10296

297	01231		PTEM BSS	1		TPT10297
298	01232		STRE BSS	1		TPT10298
299	01233	101000	NOPE NOP			TPT10299
300			*			TPT10300
301	01234	0 000000	INIT DAC	**		TPT10301
302	01235	0 02 00100	LDA ONE			TPT10302
303	01236	0 04 01722	STA PAT		PAT TO ZERO	TPT10303
304	01237	0 02 00100	LDA M21			TPT10304
305	01240	0 04 00102	STA WDCN			TPT10305
306	01241	0 02 01353	LDA IPUN			TPT10306
307	01242	0 04 01037	STA PUNS			TPT10307
308	01243	-0 01 01234	JMP* INIT			TPT10308
309			* PUNCH LEADER			TPT10309
310	01244	0 000000	LDR DAC	**		TPT10310
311	01245	0 02 00101	LDA M20			TPT10311
312	01246	0 04 00000	STA 0			TPT10312
313	01247	0 02 01753	LDA =0			TPT10313
314	01250	74 0002	MOR OTA	2	OUTPUT ZERO	TPT10314
315	01251	0 01 01250	JMP *-1			TPT10315
316	01252	0 12 00000	IRS 0			TPT10316
317	01253	0 01 01250	JMP *-3			TPT10317
318	01254	-0 01 01244	JMP* LDR			TPT10318
319	01255	0 10 01346	ERR1 JST	SS1		TPT10319
320	01256	0 01 01303	JMP ER1			TPT10320
321	01257	0 02 01767	LDA =1			TPT10321
322	01260	0 01 01301	JMP EHLT			TPT10322
323	01261	0 10 01346	ERR2 JST	SS1		TPT10323
324	01262	0 01 01307	JMP ER2			TPT10324
325	01263	0 02 01762	LDA =2			TPT10325
326	01264	0 01 01301	JMP EHLT			TPT10326
327	01265	0 10 01346	ERR3 JST	SS1		TPT10327
328	01266	0 01 01313	JMP ER3			TPT10328
329	01267	0 02 01752	LDA =3			TPT10329
330	01270	0 01 01301	JMP EHLT			TPT10330
331	01271	0 10 01346	ERR4 JST	SS1		TPT10331
332	01272	0 01 01317	JMP ER4			TPT10332
333	01273	0 02 01751	LDA =4			TPT10333

0334	01274	0 01 01301	JMP	EHLT		TPT10334
0335	01275	0 10 01340	ERR5	JST	SS1	TPT10335
0336	01276	0 01 01323	JMP	ER5		TPT10336
0337	01277	0 02 01750	LDA	=5		TPT10337
0338	01300	0 01 01301	JMP	EHLT		TPT10338
0339			* CATASTROPHIC ERROR			TPT10339
0340	01301	000000	EHLT	HLT		TPT10340
0341	01302	0 01 01000	JMP	STRT	RESTART IF DESIRED	TPT10341
0342			* READY SHOULD BE SET AFTER 15 MS DELAY			TPT10342
0343	01303	0 10 01150	ER1	JST	PRTY	TPT10343
0344	01304	0 02 01420	LDA	E1		TPT10344
0345	01305	000060	DEC	48		TPT10345
0346	01306	0 01 01301	JMP	EHLT		TPT10346
0347			* NO INTERRUPT AFTER MASK SET			TPT10347
0348	01307	0 10 01150	ER2	JST	PRTY	TPT10348
0349	01310	0 02 01500	LDA	E2		TPT10349
0350	01311	000046	DEC	38		TPT10350
0351	01312	0 01 01301	JMP	EHLT		TPT10351
0352			* INTERRUPT NOT CAUSED BY PUNCH			TPT10352
0353	01313	0 10 01150	ER3	JST	PRTY	TPT10353
0354	01314	0 02 01546	LDA	E3		TPT10354
0355	01315	000046	DEC	38		TPT10355
0356	01316	0 01 01301	JMP	EHLT		TPT10356
0357			* NO SKIP ON OTA WITH READY SET			TPT10357
0358	01317	0 10 01150	ER4	JST	PRTY	TPT10358
0359	01320	0 02 01614	LDA	E4		TPT10359
0360	01321	000050	DEC	40		TPT10360
0361	01322	0 01 01301	JMP	EHLT		TPT10361
0362			* READY SET AFTER OTA			TPT10362
0363	01323	0 10 01150	ER5	JST	PRTY	TPT10363
0364	01324	0 02 01664	LDA	E5		TPT10364
0365	01325	000036	DEC	30		TPT10365
0366	01326	0 01 01301	JMP	EHLT		TPT10366
0367			*			TPT10367
0368	01327	0 000000	BUT	DAC	**	TPT10368
0369	01330	0 12 00112	IRS	IND	FLAG	TPT10369
0370	01331	-0 01 01327	JMP*	BUT	IND FOR HALT	TPT10370

0371	01332	0 00000	CHNG DAC	**	IF IND IS	TPT10371
0372	01333	0 02 00112	LDA	IND	FLAGGED, THEN	TPT10372
0373	01334	101040	SNZ		HALT COMPUTER SO	TPT10373
0374	01335	-0 01 01332	JMP*	CHNG	THAT SENSE SWITCHES	TPT10374
0375	01336	140040	CRA		MAY BE CHANGED	TPT10375
0376	01337	0 04 00112	STA	IND	IF NOT, RETURN TO PROGRAM.	TPT10376
0377	01340	0 02 00113	LDA	SSW		TPT10377
0378	01341	000000	HLT			TPT10378
0379	01342	000000	HLT			TPT10379
0380	01343	0 04 00113	STA	SSW		TPT10380
0381	01344	000401	ENB			TPT10381
0382	01345	-0 01 01332	JMP*	CHNG		TPT10382
0383	01346	0 000000	SSI DAC	**		TPT10383
0384	01347	0 02 00113	LDA	SSW		TPT10384
0385	01350	100400	SPL			TPT10385
0386	01351	0 12 01346	IRS	SSI		TPT10386
0387	01352	-0 01 01346	JMP*	SSI		TPT10387
0388	01353	0 02 01723	IPUN LDA	PAT+1		TPT10388
0389			* START X16-TPT1			TPT10389
0390	01354	000215	MSG1 OCT	215,212,212,323,324,301,322,324,240,330,261,266,255		TPT10390
	01355	000212				
	01356	000212				
	01357	000323				
	01360	000324				
	01361	000301				
	01362	000322				
	01363	000324				
	01364	000240				
	01365	000330				
	01366	000261				
	01367	000266				
	01370	000255				
0391	01371	000324	OCT	324,320,324,261,215,212		TPT10391
	01372	000320				
	01373	000324				
	01374	000261				
	01375	000215				

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	01376	000212		
0392			* END X16-TPT1	TPT10392
0393	01377	000215	MSG2 OCT 215,212,212,305,316,304,240,330,261,266,255,324,320,324	TPT10393
	01400	000212		
	01401	000212		
	01402	000305		
	01403	000316		
	01404	000304		
	01405	000240		
	01406	000330		
	01407	000261		
	01410	000266		
	01411	000255		
	01412	000324		
	01413	000320		
	01414	000324		
0394	01415	000261	OCT 261,215,212	TPT10394
	01416	000215		
	01417	000212		
0395			* READY SHOULD BE SET AFTER 15 MS DELAY	TPT10395
0396	01420	000215	E1 OCT 215,212,305,322,322,261,240,240	TPT10396
	01421	000212		
	01422	000305		
	01423	000322		
	01424	000322		
	01425	000261		
	01426	000240		
	01427	000240		
0397	01430	000322	OCT 322,305,301,304,331,240,323,310,317,325	TPT10397
	01431	000305		
	01432	000301		
	01433	000304		
	01434	000331		
	01435	000240		
	01436	000323		
	01437	000310		
	01440	000317		



	01441	000325			
0398	01442	000314	OCT	314,304,240,302,305,240,323,305,324,240,301,306,324	TPT10398
	01443	000304			
	01444	000240			
	01445	000302			
	01446	000305			
	01447	000240			
	01450	000323			
	01451	000305			
	01452	000324			
	01453	000240			
	01454	000301			
	01455	000306			
	01456	000324			
0399	01457	000305	OCT	305,322,240,261,265,240,315,323,240,304,305	TPT10399
	01460	000322			
	01461	000240			
	01462	000261			
	01463	000265			
	01464	000240			
	01465	000315			
	01466	000323			
	01467	000240			
	01470	000304			
	01471	000305			
0400	01472	000314	OCT	314,301,331,215,212,212	TPT10400
	01473	000301			
	01474	000331			
	01475	000215			
	01476	000212			
	01477	000212			
0401					TPT10401
0402	01500	000215	* NO INTERRUPT AFTER MASK SET		
	01501	000212	E2 OCT	215,212,305,322,322,262,240,240	TPT10402
	01502	000305			
	01503	000322			
	01504	000322			

	01505	000262			
	01506	000240			
	01507	000240			
0403	01510	000316	OCT	316,317,240,311,316,324,305,322,322,325,320	TPT10403
	01511	000317			
	01512	000240			
	01513	000311			
	01514	000316			
	01515	000324			
	01516	000305			
	01517	000322			
	01520	000322			
	01521	000325			
	01522	000320			
0404	01523	000324	OCT	324,240,301,306,324,305,322,240,315,301,323,313,240	TPT10404
	01524	000240			
	01525	000301			
	01526	000306			
	01527	000324			
	01530	000305			
	01531	000322			
	01532	000240			
	01533	000315			
	01534	000301			
	01535	000323			
	01536	000313			
	01537	000240			
0405	01540	000323	OCT	323,305,324,215,212,212	TPT10405
	01541	000305			
	01542	000324			
	01543	000215			
	01544	000212			
	01545	000212			
0406					TPT10406
0407	01546	000215	E3 OCT	215,212,305,322,322,263,240,240	TPT10407
	01547	000212			
	01550	000305			

\* INTERRUPT NOT CAUSED BY PUNCH

	01551	000322			
	01552	000322			
	01553	000263			
	01554	000240			
	01555	000240			
0408	01556	000311	OCT	311,316,324,305,322,322,325,320,324,240	TPT10408
	01557	000316			
	01560	000324			
	01561	000305			
	01562	000322			
	01563	000322			
	01564	000325			
	01565	000320			
	01566	000324			
	01567	000240			
0409	01570	000316	OCT	316,317,324,240,303,301,325,325,305,304,240,302,331	TPT10409
	01571	000317			
	01572	000324			
	01573	000240			
	01574	000303			
	01575	000301			
	01576	000325			
	01577	000323			
	01600	000305			
	01601	000304			
	01602	000240			
	01603	000302			
	01604	000331			
0410	01605	000240	OCT	240,320,324,320,215,212,212	TPT10410
	01606	000320			
	01607	000324			
	01610	000320			
	01611	000215			
	01612	000212			
	01613	000212			
0411					TPT10411
0412	01614	000215	E4 OCT	* NO SKIP ON OTA WITH READY SET 215,212,305,322,322,264,240,240	TPT10412

	01615	000212		
	01616	000305		
	01617	000322		
	01620	000322		
	01621	000264		
	01622	000240		
	01623	000240		
413	01624	000316	OCT 316,317,240,323,313,311,320,240,317,316	TPT10413
	01625	000317		
	01626	000240		
	01627	000323		
	01630	000313		
	01631	000311		
	01632	000320		
	01633	000240		
	01634	000317		
	01635	000316		
414	01636	000240	OCT 240,317,324,301,240,327,311,324,310,240,322,305,301	TPT10414
	01637	000317		
	01640	000324		
	01641	000301		
	01642	000240		
	01643	000327		
	01644	000311		
	01645	000324		
	01646	000310		
	01647	000240		
	01650	000322		
	01651	000305		
415	01652	000301	OCT 304,331,240,323,305,324,215,212,212	TPT10415
	01653	000304		
	01654	000331		
	01655	000240		
	01656	000323		
	01657	000305		
	01650	000324		
	01661	000215		

H O N E Y W E L L      C O M P U T E R   C O N T R O L   D I V I S I O N      P R O G R A M   D O C U M E N T A T I O N

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	01662	000212		
	01663	000212		
0416			* READY SET AFTER OTA	TPT10416
0417	01664	000215	ES OCT 215,212,305,322,322,265,240,240	TPT10417
	01665	000212		
	01666	000305		
	01667	000322		
	01670	000322		
	01671	000265		
	01672	000240		
	01673	000240		
0418	01674	000322	OCT 322,305,301,304,331,240,323,305,324,240	TPT10418
	01675	000305		
	01676	000301		
	01677	000304		
	01700	000331		
	01701	000240		
	01702	000323		
	01703	000305		
	01704	000324		
	01705	000240		
0419	01706	000301	OCT 301,306,324,305,322,240,317,324,301,215,212,212	TPT10419
	01707	000306		
	01710	000324		
	01711	000305		
	01712	000322		
	01713	000240		
	01714	000317		
	01715	000324		
	01716	000301		
	01717	000215		
	01720	000212		
	01721	000212		
0420	01722	000001	PAT OCT 1	TPT10420
0421	01723	000001	OCT 001,376,002,375,004,373,010,367,020,357	TPT10421
	01724	000376		
	01725	000002		

	01726	000375			
	01727	000004			
	01730	000373			
	01731	000010			
	01732	000367			
	01733	000020			
	01734	000357			
0422	01735	000040	OCT	040,337,100,277,200,177,000,377,252,125,377	TPT10422
	01736	000337			
	01737	000100			
	01740	000277			
	01741	000200			
	01742	000177			
	01743	000000			
	01744	000377			
	01745	000252			
	01746	000125			
	01747	000377			
0423	01750	000005	FIN		TPT10423
	01751	000004			
	01752	000003			
	01753	000000			
	01754	177777			
	01755	010000			
	01756	000777			
	01757	020000			
	01760	077777			
	01761	004000			
	01762	000002			
	01763	000100			
	01764	000400			
	01765	170000			
	01766	007777			
	01767	000001			
0424			END	STRT	TPT10424
NO ERRORS IN ABOVE ASSEMBLY.					

\* E520-001-6616 (x16-TPT1)

J C N O . 180261000

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