

```

1 * THIS IS A COPYRIGHTED PROGRAM, COPYRIGHT 1972 BY VARIAN DATA MACHINES
2 *
3 * V.D.M. PART NO. 92L0107-003H
4 *
5 *
6 *
7 * INSTRUCTION TEST (PART 2)
8 *
9 *
10 * 620 INSTRUCTIONS TEST PROGRAM
11 *
12 *
13 *
14 *
15 *
16 *
17 *
18 *
19 *
20 *
21 *
22 *
23 *
24 *
25 *
26 *
27 *
28 *
29 *
30 *
31 *
32 *
33 *
34 *
35 *
36 *
37 *
38 *
39 *
40 * THIS TEST PROGRAM IS A PART OF THE MAINTAIN
41 * TEST PROGRAM SYSTEM
42 *
43 *
44 *
45 * THE INSTRUCTION TEST CONSIST OF TWO PARTS, EACH PART IS FREE
46 * STANDING AND NOT FUNCTIONALLY DEPENDENT UPON THE OTHER.
47 * THIS IS PART 2, NORMALLY PART 1 IS EXECUTED FIRST,
48 * PART 2 TESTS THE EXTENDED ADDRESSING INSTRUCTIONS, I/O
49 * INSTRUCTIONS AND THE OPTIONAL INSTRUCTIONS.
50 *
51 *
52 *
53 *
54 *
55 *
56 *
57 *
58 *
59 *
60 *
61 *
62 *
63 * * AREAS RESERVED BY EXECUTIVE *
64 *
65 *
66 *
67 *
68 *
69 *
70 *
71 *
72 *
73 *
74 *
75 *
76 *
77 *
78 *
79 *
80 *
81 *
82 *
83 *
84 *
85 *
86 *
87 *
88 *
89 *
90 *
91 *
92 *
93 *
94 *
95 *

```

000400	ORG	0400			
000400	83 OUTA	BSS	1	OUTPUT ONE CHAR ROUTINE	
000401	84 OUTB	BSS	1	OUTPUT TWO CHAR ROUTINE	
000402	85 OUTC	BSS	1	OUTPUT CR/LF ROUTINE	
000403	86 OUTD	BSS	1	OUTPUT MESSAGE ROUTINE	
000404	87 OUTE	BSS	1	OUTPUT OCTAL WORD ROUTINE	
000405	88 OUTF	BSS	1	OUTPUT OCTAL ADDR ROUTINE	
000406	89 OUTG	BSS	1	OUTPUT ERROR MSG ROUTINE	
000407	90 OUTH	BSS	1	OUTPUT CONTROL CHAR TO TTY ROUTINE	
000410	91 INPA	BSS	1	INPUT ONE CHAR ROUTINE	
000411	92 INPB	BSS	1	INPUT AND PRINT ONE CHAR ROUTINE	
000412	93 INPC	BSS	1	INPUT ONE CHAR EDITED ROUTINE	
000413	94 INPD	BSS	1	INPUT ONE ALPHA CHAR ROUTINE	
000414	95 INPE	BSS	1	INPUT TWO ALPHA CHAR ROUTINE	

000415	96	INPF	BSS	1	INPUT COMMA/PERIOD TERMINATION ROUTINE	00	00096
000416	97	INPG	BSS	1	INPUT OCTAL NUMBER ROUTINE	00	00097
000417	98	TOUT	BSS	1	TIME-OUT ROUTINE	00	00098
000420	99	TDLY	BSS	1	TIME DELAY ROUTINE	00	00099
000421	100	SSWT	BSS	1	STANDARD SENSE SWITCH ROUTINE	00	00100
000422	101	SLWE	BSS	1	LOWEST WORD USED BY EXEC	00	00101
000423	102	ESZC	BSS	1	MEMORY SIZE DETERMINATION ROUTINE	00	00102
000424	103	SMSM	BSS	1	MEMORY SIZE MESSAGE	00	00103
000425	104	INPH	BSS	1	SENSE TTY BUFFER READY	00	00104
000426	105	INPI	BSS	1	INIT TTY (INPUT CHAR W/O SENSE BUF READY)	00	00105
	106	*				00	00106
	107	*				00	00107
000440	108		ORG	0440		00	00108
	109	*				00	00109
	110	*		EXECUTIVE DATA TABLE		00	00110
	111	*				00	00111
000440	112	SFLG	BSS	1	LOOP ON ERROR FLAG, 0=DON'T LOOP 1=LOOP	00	00112
000441	113	SMEM	BSS	1	MEMORY SIZE (HIGHEST AVAIL CORE)	00	00113
000442	114	SCON	BSS	1	0=CONSOLE MODE 1=TTY MODE	00	00114
000443	115		BSS	22		00	00115
000471	116	SDCT	BSS	1	DIGIT COUNTER FOR INPG	00	00116
	117	*				00	00117
	118	*				00	00118
	119	*				00	00119
	120	*				00	00120
	121	*				00	00121
	122	*				00	00122
	123	*				00	00123
007370 A	124	STTY	SET	07370	STTY IS SET BY THE TEST EXECUTIVE AND	00	00124
	125	*			CONTAINS THE TTY DEVICE ADDRESS	00	00125
	126	*				00	00126
000473 A	127	STY3	SET	0473		E	00 00127
	128	*				00	00128
	129	*				00	00129
	130	*				00	00130
	131	*				00	00131
	132	*				00	00132
000600	133		ORG	0600	STARTING ADDRESS OF INSTRUCTION TEST	00	00133
	134	*				00	00134
	135	*				00	00135
	136	*				00	00136
000600 010442 A	137	IBGN	LDA	SCON	TTY/CONSOLE MODE FLAG	00	00137
000601 001010 A	138		JAZ	IBG4	CONSOLE MODE ? , YES	00	00138
000602 000735 A							
000603 006030 A	139		LDXI	MSG1	THIS IS THE 620 INSTRUCTION TEST	00	00139
000604 001115 A							
000605 002000 A	140		CALL*	OUTD		00	00140
000606 100403 A							
000607 006030 A	141	IBG1	LDXI	MSG2	'CPU TYPE='	00	00141
000610 001145 A							
000611 002000 A	142		CALL*	OUTD		00	00142
000612 100403 A							
000613 002000 A	143		CALL*	INPG	INPUT CPU TYPE (1-6),	00	00143
000614 100416 A							
000615 001000 A	144		JMP	IBGN	883 EXIT	00	00144
000616 000600 A							
000617 001000 A	145		JMP	IBG1	BACK SLASH EXIT	00	00145
000620 000607 A							
000621 001000 A	146		JMP	**2	, EXIT	00	00146
000622 000623 A							
000623 051174 A	147		STA	STYP		00	00147
000624 006030 A	148	IBG2	LDXI	MSG3	'CYCLES = '	00	00148
000625 001155 A							
000626 002000 A	149		CALL*	OUTD		00	00149
000627 100403 A							
000630 005301 A	150		DECR	01	INPUT #CYCLES (\$CYC), AND TERMINATING	00	00150
000631 051175 A	151		STA	SECY	CHARACTER (\$ECY), SECY PRESET TO ,	00	00151
000632 002000 A	152		CALL*	INPG		00	00152
000633 100416 A							
000634 001000 A	153		JMP	IBGN	883 EXIT	00	00153
000635 000600 A							
000636 001000 A	154		JMP	IBG2	BACK SLASH EXIT	00	00154
000637 000624 A							
000640 001000 A	155		JMP	**4	, EXIT	00	00155
000641 000644 A							
	156	*		PERIOD RETURN FROM INPG		00	00156
000642 005002 A	157		TZB			00	00157
000643 061175 A	158		STR	SECY		00	00158
000644 051176 A	159		STA	SCYC		00	00159
000645 011174 A	160	IBG3	LDA	STYP	GET CPU TYPE	00	00160
000646 006140 A	161		SUBI	7		G	00 00161
000647 000007 A							
000650 001002 A	162		JAP	IBG9	,GE, 7	G	00 00162
000651 000675 A							
000652 006120 A	163		ADDI	7		G	00 00163
000653 000007 A							
000654 006140 A	164		SUBI	3		00	00164
000655 000003 A							
000656 051174 A	165		STA	STYP	SET CPU TYPE FOR INTERNAL USE: =2=620/I;	00	00165
000657 006140 A	166		SUBI	2	=1=620/I WITH OPTION INST, 1 0=622/F 1	00	00166
000660 000002 A							
	167	*			+1=622/F WITH OPTION INSTRUCTIONS	00	00167
000661 001010 A	168		JAZ	IBGH		00	00168
000662 000702 A							
000663 001002 A	169		JAP	IBGD		00	00169

000664	000716	A									
000665	006130	A	170	ERAI	0100000					00	00170
000666	100000	A									
000667	001002	A	171	JAP	**4					00	00171
000670	000673	A									
000671	001000	A	172	JMP	IBG1	RETURN FOR CORRECT CPU TYPE INPUT				00	00172
000672	000607	A									
000673	001000	A	173	JMP	IBGF					00	00173
000674	000731	A									
000675	006010	A	174	IBG9	LDAI	4	JUST LIKE			G	00 00174
000676	000004	A									
000677	051174	A	175	STA	STYP	620F WITH				G	00 00175
000700	001000	A	176	JMP	IBG3	OPTIONAL INST.				G	00 00176
000701	000645	A									
000702	005311	A	177	IBGH	DAR	SET STYP=#3 FOR INTERNAL USE, #3 REPRESENTS				00	00177
000703	006140	A	178	SUBI	2	622/I WITHOUT OPTION INSTRUCTIONS				00	00178
000704	000002	A									
000705	051174	A	179	STA	STYP					00	00179
000706	006130	A	180	ERAI	0100000					00	00180
000707	100000	A									
000710	001004	A	181	JAN	**4					00	00181
000711	000714	A									
000712	001000	A	182	JMP	IBG1	RETURN FOR CORRECT CPU TYPE INPUT				00	00182
000713	000607	A									
000714	001000	A	183	JMP	IBGF					00	00183
000715	000731	A									
			184 *								
000716	006140	A	185	IBGD	SUBI	5	SET STYP=#4 FOR 622/I W/O			00	00184
000717	000005	A								00	00185
000720	051174	A	186	STA	STYP					00	00186
000721	006130	A	187	ERAI	0100000					00	00187
000722	100000	A									
000723	001004	A	188	JAN	**4					00	00188
000724	000727	A									
000725	001000	A	189	JMP	IBG1	RETURN FOR CORRECT CPU TYPE INPUT				00	00189
000726	000607	A									
000727	002000	A	190	IBGE	JMPM	IBGG	PROGRAM OVERLAY FOR 18-BIT 622/I TESTING			00	00190
000730	000743	A									
000731	011176	A	191	IBGF	LDA	SCYC				00	00191
000732	051177	A	192	STA	CCTR	SET INTERNAL CYCLE COUNTER				00	00192
000733	001000	A	193	JMP	IBGA					00	00193
000734	001004	A									
000735	005003	A	194	IBG4	ZERO	03	PRESET A&B FOR CPU TYPE# 620F AND			00	00194
000736	000000	A	195	HLT		CYCLES# TO CONTINUOUS				00	00195
000737	051174	A	196	STA	STYP					00	00196
000740	061176	A	197	STB	SCYC					00	00197
000741	001000	A	198	JMP	IBG3					00	00198
000742	000645	A									
			199 *							00	00199
			200 *							00	00200
			201 *							00	00201
			202 *							00	00202
			203 *							00	00203
			204 *							00	00204
			205 *							00	00205
			206 *							00	00206
000743	000000	A	206	IBGG	ENTR	0				00	00206
000744	005002	A	207	TZB						00	00207
000745	005001	A	208	TZA						00	00208
000746	005311	A	209	DAR		A=#1				00	00209
000747	052425	A	210	STA	KMON					00	00210
000750	052030	A	211	STA	K402+2					00	00211
000751	052032	A	212	STA	K402+4					00	00212
000752	052053	A	213	STA	K434+2					00	00213
000753	052055	A	214	STA	K434+4					00	00214
000754	053072	A	215	STA	EXNG					00	00215
000755	006140	A	216	SUBI	4					00	00216
000756	000004	A									
000757	052420	A	217	STA	KMFV					00	00217
000760	006010	A	218	LDAI	0100000					00	00218
000761	100000	A									
000762	004442	A	219	LLRL	2	A#400000				00	00219
000763	052417	A	220	STA	KMXN	MAX NEGATIVE NUMBER				00	00220
000764	053073	A	221	STA	EMXN	MAX NEG				00	00221
000765	005211	A	222	CPA		A#377777				00	00222
000766	052416	A	223	STA	KMXP	MAX POSITIVE NUMBER				00	00223
000767	006130	A	224	ERAI	0777	A#377000				00	00224
000770	000777	A									
000771	052724	A	225	STA	EX76+1					00	00225
000772	006010	A	226	LDAI	052525					00	00226
000773	052525	A									
000774	004443	A	227	LLRL	3					00	00227
000775	006130	A	228	ERAI	2					00	00228
000776	000002	A									
000777	053062	A	229	STA	EXK	#525252				00	00229
001000	005211	A	230	CPA						00	00230
001001	053066	A	231	STA	EXK2	#252525				00	00231
001002	001000	A	232	JMP*	IBGG	RETURN				00	00232
001003	100743	A									
			233 *							00	00233
			234 *							00	00234
			235 *							00	00235
			236 *							0223000	00236
			237 *							00	00237
			238 *							00	00238
			239 *							00	00239

001004	011174	A	240	IBGA	LDA	STYP	620/F ?	00	00240
001005	001002	A	241		JAP	IBGC	YES	00	00241
001006	001053	A							
001007	005211	A	242		CPA			00	00242
001010	001010	A	243		JAZ	IBGB	620 WITH OPTION INSTRUCTIONS	00	00243
001011	001020	A							
001012	006130	A	244		ERAI	3		00	00244
001013	000003	A							
001014	001010	A	245		JAZ	IBGB	622 WITH OPTION INSTRUCTIONS	00	00245
001015	001020	A							
001016	001000	A	246		JMP	IOTE+2	620/622 WITHOUT OPTIONS	00	00246
001017	001044	A							
001020	002000	A	247	IBGB	JMPM	EXEN	EXTENDED ADDRESSING TEST	00	00247
001021	002435	A							
001022	002000	A	248		JMPM	KENT	OPTIONAL INSTRUCTIONS TEST	00	00248
001023	001257	A							
001024	002000	A	249		CALL	IBGX	CHECK FOR PRINTING 'END INST #2' MESSAGE	00	00249
001025	001100	A							
001026	001400	A	250	IBG7	JSS3	IOTEST		00	00250
001027	001042	A							
001030	011176	A	251		LDA	SCYC	CONTINUOUS RUN ?	00	00251
001031	001010	A	252		JAZ	IBGB	YES==EXECUTE ANOTHER CYCLE	00	00252
001032	001020	A							
001033	011177	A	253		LDA	CCTR	INTERNAL CYCLE COUNTER	00	00253
001034	005311	A	254		DAR			00	00254
001035	001010	A	255		JAZ	IOTEST	RUN I/O TEST IF NOT IN CONSOLE MODE	00	00255
001036	001042	A							
001037	051177	A	256		STA	CCTR		00	00256
001040	001000	A	257		JMP	IBGB	EXECUTE ANOTHER CYCLE	00	00257
001041	001020	A							
	001042	A	258	IOTEST	EQU	*		E	00 00258
001042	001400	A	259	IOTE	JSS3	*	RESET 883 TO CONTIOUE	E	00 00259
001043	001042	A							
001044	010442	A	260		LDA	SCON	CONSOLE MODE ?	00	00260
001045	001010	A	261		JAZ	IBG4	YES==RETURN TO CONSOLE MODE STARTING POINT	00	00261
001046	000735	A							
001047	002000	A	262		JMPM	IONT	I/O TEST	00	00262
001050	003100	A							
001051	001000	A	263		JMP	IBG1	RETURN TO TTY MODE STARTING POINT	00	00263
001052	000607	A							
	264 *								
001053	002000	A	265	IBGC	JMPM	EXEN	EXTENDED ADDRESSING TEST	00	00264
001054	002435	A						00	00265
001055	011174	A	266		LDA	STYP	620/F WITHOUT OPTION INSTRUCTIONS ?	00	00266
001056	001010	A	267		JAZ	**4	YES	00	00267
001057	001062	A							
001060	002000	A	268		JMPM	KENT	OPTIONAL INSTRUCTIONS TEST	00	00268
001061	001257	A							
001062	002000	A	269		CALL	IBGX	CHECK FOR PRINTING 'END INST #2' MESSAGE	00	00269
001063	001100	A							
001064	001400	A	270		JSS3	IOTEST		00	00270
001065	001042	A							
001066	011176	A	271		LDA	SCYC	CONTINUOUS RUN ?	00	00271
001067	001010	A	272		JAZ	IBGC	YES	00	00272
001070	001053	A							
001071	011177	A	273		LDA	CCTR	INTERNAL CYCLE COUNTER	00	00273
001072	005311	A	274		DAR			00	00274
001073	001010	A	275		JAZ	IOTEST	RUN I/O TEST IF NOT IN CONSOLE MODE	00	00275
001074	001042	A							
001075	051177	A	276		STA	CCTR		00	00276
001076	001000	A	277		JMP	IBGC		00	00277
001077	001053	A							
	278 *								
001100	000000	A	279	IBGX	ENTR	0		00	00278
001101	010442	A	280		LDA	SCON	CONSOLE MODE ?	00	00279
001102	001010	A	281		JAZ*	IBGX	YES	00	00281
001103	101100	A							
001104	011175	A	282		LDA	SECY	PRINT 'END INST #2'	00	00282
001105	001010	A	283		JAZ*	IBGX	NO	00	00283
001106	101100	A							
001107	006030	A	284		LXI	MSG4	MESSAGE1 END INST #2	00	00284
001110	001164	A							
001111	002000	A	285		CALL*	OUTD	PRINT MESSAGE	00	00285
001112	100403	A							
001113	001000	A	286		RETY*	IBGX		00	00286
001114	101100	A							
	287 *								
	288 *								
001115	106612	A	289	MSG1	DATA	0106612,0106612,'THIS IS THE 620 INSTRUCTION TEST, '		00	00287
001116	106612	A						00	00288
001117	152310	A						00	00289
001120	144723	A							
001121	120311	A							
001122	151640	A							
001123	152310	A							
001124	142640	A							
001125	133262	A							
001126	130240	A							
001127	144716	A							
001130	151724	A							
001131	151325	A							
001132	141724	A							
001133	144717	A							
001134	147240	A							
001135	152305	A							



```

341 * 00 00341
342 * OPTIONAL INSTRUCTIONS TEST 00 00342
343 * 00 00343
344 * 620/6221 & 620/F: MUL, DIV, MULTI, DIVI, MULT, DIVE, 00 00344
345 * 620/F ONLY: BT & SRE 00 00345
346 * V70 SERIES: PIPELINE H 00 00346
347 * 00 00347
348 * 00 00348
349 * *** NOTE *** 00 00349
350 * THE FOLLOWING CONSTANTS AND PARAMETERS ARE ALTERED AT START-UP 00 00350
351 * IF 6221 TESTING IS SPECIFIED: KMON, K400+2, K400+4, K434+2, K434+4, 00 00351
352 * KMFV, KMXN AND KMXP, EACH OCTAL IS SET TO THE 18-BIT EQUIV. 00 00352
353 * 00 00353
354 * 00 00354
355 * 00 00355
356 * ***** 00 00356
357 * 00 00357
001257 000000 A 358 KENT ENTR TEST ENTRY 00 00358
359 * 00 00359
360 * 00 00360
361 * TEST =MUL= BY ZERO 00 00361
362 * 00 00362
001260 005001 A 363 K200 TZA A=0 00 00363
001261 005302 A 364 DECR 002 B=1 00 00364
001262 162423 A 365 MUL KZRO EXECUTE 00 00365
001263 001010 A 366 JAZ K201 A SHUD=0 00 00366
001264 001267 A
001265 002000 A 367 JMPM K09 ERROR 00 00367
001266 002413 A
001267 001020 A 368 K201 JBZ K210 B SHUD=0 00 00368
001270 001273 A
001271 002000 A 369 JMPM K09 ERROR 00 00369
001272 002413 A
001273 005101 A 370 K210 INCR 001 A=+1 00 00370
001274 005302 A 371 DECR 002 B=1 00 00371
001275 162423 A 372 MUL KZRO EXECUTE 00 00372
001276 001010 A 373 JAZ K211 A SHUD=0 00 00373
001277 001302 A
001300 002000 A 374 JMPM K09 ERROR 00 00374
001301 002413 A
001302 005322 A 375 K211 DBR B=B-1 00 00375
001303 001020 A 376 JBZ K220 B SHUD=+1 00 00376
001304 001307 A
001305 002000 A 377 JMPM K09 ERROR 00 00377
001306 002413 A
001307 005303 A 378 K220 DECR 003 A=B=1 00 00378
001310 162423 A 379 MUL KZRO EXECUTE 00 00379
001311 005111 A 380 IAR A=A+1 00 00380
001312 001010 A 381 JAZ K221 A SHUD=-1 00 00381
001313 001316 A
001314 002000 A 382 JMPM K09 ERROR 00 00382
001315 002413 A
001316 007400 A 383 K221 ROF INIT OFLO 00 00383
001317 005122 A 384 IBR B=B+1 00 00384
001320 001001 A 385 JOF K230 SHUD OFLO 00 00385
001321 001324 A
001322 002000 A 386 JMPM K09 ERROR 00 00386
001323 002413 A
387 * 00 00387
388 * TEST =MUL= BY PLUS ONE 00 00388
389 * 00 00389
001324 005001 A 390 K230 TZA A=0 00 00390
001325 005302 A 391 DECR 002 B=1 00 00391
001326 162424 A 392 MUL KONE EXECUTE 00 00392
001327 005111 A 393 IAR A=A+1 00 00393
001330 001010 A 394 JAZ K231 A SHUD=-1 00 00394
001331 001334 A
001332 002000 A 395 JMPM K09 ERROR 00 00395
001333 002413 A
001334 007400 A 396 K231 ROF INIT OFLO 00 00396
001335 005122 A 397 IBR B=B+1 00 00397
001336 001001 A 398 JOF K240 SHUD OFLO 00 00398
001337 001342 A
001340 002000 A 399 JMPM K09 ERROR 00 00399
001341 002413 A
001342 005301 A 400 K240 DECR 001 A=+1 00 00400
001343 005002 A 401 TZA B=0 00 00401
001344 162424 A 402 MUL KONE EXECUTE 00 00402
001345 005111 A 403 IAR A=A+1 00 00403
001346 001010 A 404 JAZ K241 A SHUD=-1 00 00404
001347 001352 A
001350 002000 A 405 JMPM K09 ERROR 00 00405
001351 002413 A
001352 007400 A 406 K241 ROF INIT OFLO 00 00406
001353 005122 A 407 IBR B=B+1 00 00407
001354 001001 A 408 JOF K250 SHUD OFLO 00 00408
001355 001360 A
001356 002000 A 409 JMPM K09 ERROR 00 00409
001357 002413 A
410 * 00 00410
411 * TEST =MUL= BY MINUS ONE 00 00411
412 * 00 00412
001360 005001 A 413 K250 TZA A=0 00 00413
001361 005102 A 414 INCR 002 B=+1 00 00414
001362 162425 A 415 MUL KMON EXECUTE 00 00415

```

001363	005111	A	416	IAR			AAA+1	00	00416
001364	001010	A	417	JAZ	K251		A SHUD=1	00	00417
001365	001370	A							
001366	002000	A	418	JMPM	K09		ERROR	00	00418
001367	002413	A							
001370	007400	A	419	K251	ROF		INIT OFLO	00	00419
001371	005122	A	420	IBR			B=B+1	00	00420
001372	001001	A	421	JOF	K260		SHUD OFLO	00	00421
001373	001376	A							
001374	002000	A	422	JMPM	K09		ERROR	00	00422
001375	002413	A							
001376	005303	A	423	K260	DECR	003	AAA=1	00	00423
001377	162425	A	424	MUL	KMON		EXECUTE	00	00424
001400	001010	A	425	JAZ	K261		A SHUD=0	00	00425
001401	001404	A							
001402	002000	A	426	JMPM	K09		ERROR	00	00426
001403	002413	A							
001404	001020	A	427	K261	JBZ	K270	B SHUD=0	00	00427
001405	001410	A							
001406	002000	A	428	JMPM	K09		ERRQR	00	00428
001407	002413	A							
			429 *					00	00429
			430 * TEST =MUL= BY MAX POSITIVE					00	00430
			431 *					00	00431
001410	005001	A	432	K270	TZA		A=0	00	00432
001411	022416	A	433	LDB	KMXP		B=MAX POS	00	00433
001412	162416	A	434	MUL	KMXP		EXECUTE	00	00434
001413	007400	A	435	ROF			INIT OFLO	00	00435
001414	005111	A	436	IAR				00	00436
001415	005111	A	437	IAR			AAA+2	00	00437
001416	001001	A	438	JOF	K271		SHUD OFLO	00	00438
001417	001422	A							
001420	002000	A	439	JMPM	K09		ERROR	00	00439
001421	002413	A							
001422	005322	A	440	K271	DBR		B=B-1	00	00440
001423	001020	A	441	JBZ	K280		B SHUD=1	00	00441
001424	001427	A							
001425	002000	A	442	JMPM	K09		ERROR	00	00442
001426	002413	A							
001427	012416	A	443	K280	LDA	KMXP		00	00443
001430	005012	A	444	TAB			AAA=MAX POS	00	00444
001431	162416	A	445	MUL	KMXP		EXECUTE	00	00445
001432	007400	A	446	ROF			INIT OFLO	00	00446
001433	005111	A	447	IAR			AAA+1	00	00447
001434	001001	A	448	JOF	K281		SHUD OFLO	00	00448
001435	001440	A							
001436	002000	A	449	JMPM	K09		ERROR	00	00449
001437	002413	A							
001440	001020	A	450	K281	JBZ	K290	B SHUD=0	00	00450
001441	001444	A							
001442	002000	A	451	JMPM	K09		ERROR	00	00451
001443	002413	A							
			452 *					00	00452
			453 * TEST =MUL= BY MAX NEGATIVE					00	00453
			454 *					00	00454
001444	005001	A	455	K290	TZA		A=0	00	00455
001445	005302	A	456	DECR	002		B=1	00	00456
001446	162417	A	457	MUL	KMXN		EXECUTE	00	00457
001447	005311	A	458	DAR			AAA=1	00	00458
001450	001010	A	459	JAZ	K291		A SHUD=+1	00	00459
001451	001454	A							
001452	002000	A	460	JMPM	K09		ERROR	00	00460
001453	002413	A							
001454	001020	A	461	K291	JBZ	K292	B SHUD = 0	00	00461
001455	001460	A							
001456	002000	A	462	JMPM	K09		ERROR	00	00462
001457	002413	A							
001460	005001	A	463	K292	TZA		A=0	00	00463
001461	005102	A	464	INCR	002		B=+1	00	00464
001462	162417	A	465	MUL	KMXN		EXECUTE	00	00465
001463	005111	A	466	IAR			AAA+1	00	00466
001464	001010	A	467	JAZ	K293		A SHUD=1	00	00467
001465	001470	A							
001466	002000	A	468	JMPM	K09		ERROR	00	00468
001467	002413	A							
001470	001020	A	469	K293	JBZ	K294	B SHUD=0	00	00469
001471	001474	A							
001472	002000	A	470	JMPM	K09		ERROR	00	00470
001473	002413	A							
001474	005301	A	471	K294	DECR	001	A=1	00	00471
001475	022417	A	472	LDB	KMXN		B=MAX NEG	00	00472
001476	162417	A	473	MUL	KMXN		EXECUTE	00	00473
001477	007400	A	474	ROF			INIT OFLO	00	00474
001500	005111	A	475	IAR			AAA+1	00	00475
001501	001001	A	476	JOF	K295		SHUD OFLO	00	00476
001502	001505	A							
001503	002000	A	477	JMPM	K09		ERROR	00	00477
001504	002413	A							
001505	005122	A	478	K295	IBR		B=B+1	00	00478
001506	001001	A	479	JOF	K300		SHUD OFLO	00	00479
001507	001512	A							
001510	002000	A	480	JMPM	K09		ERROR	00	00480
001511	002413	A							
			481 *					00	00481
			482 * TEST =DIV= FOR OFLO DETECTION					00	00482

001512	007400	A	483	K300	ROF		INIT OFLO	00	00483
001513	005103	A	484		INCR	003	A#B#1	00	00484
001514	172423	A	485		DIV	KZRO	EXECUTE	00	00485
001515	001001	A	486		JOF	K302	OK	00	00486
001516	001521	A							
001517	002000	A	487		JMPM	K09	ERROR	00	00487
001520	002413	A							
001521	005101	A	488	K302	INCR	001	A#1	00	00488
001522	005002	A	489		TZB			00	00489
001523	172424	A	490		DIV	KONE	#+1	00	00490
001524	001001	A	491		JOF	K403	CONTINUE	00	00491
001525	001530	A							
001526	002000	A	492		JMPM	K09	ERROR	00	00492
001527	002413	A							
			493	*				00	00493
			494	*	TEST	-DIV-	BY MAX POSITIVE	00	00494
			495	*				00	00495
001530	012416	A	496	K403	LDA	KMXP		00	00496
001531	005311	A	497		DAR			00	00497
001532	005002	A	498		TZB			00	00498
001533	172416	A	499		DIV	KMXP		00	00499
001534	005111	A	500		IAR			00	00500
001535	007400	A	501		ROF			00	00501
001536	005111	A	502		IAR			00	00502
001537	001001	A	503		JOF	K404		00	00503
001540	001543	A							
001541	002000	A	504		JMPM	K09		00	00504
001542	002413	A							
001543	005122	A	505	K404	IBR			00	00505
001544	007400	A	506		ROF			00	00506
001545	005122	A	507		IBR			00	00507
001546	001001	A	508		JOF	K405		00	00508
001547	001552	A							
001550	002000	A	509		JMPM	K09		00	00509
001551	002413	A							
001552	012416	A	510	K405	LDA	KMXP		00	00510
001553	005311	A	511		DAR			00	00511
001554	005211	A	512		CPA			00	00512
001555	005111	A	513		IAR			00	00513
001556	005002	A	514		TZB			00	00514
001557	172416	A	515		DIV	KMXP		00	00515
001560	007400	A	516		ROF			00	00516
001561	005311	A	517		DAR			00	00517
001562	005311	A	518		DAR			00	00518
001563	005311	A	519		DAR			00	00519
001564	001001	A	520		JOF	K406		00	00520
001565	001570	A							
001566	002000	A	521		JMPM	K09		00	00521
001567	002413	A							
001570	005322	A	522	K406	DBR			00	00522
001571	005322	A	523		DBR			00	00523
001572	005322	A	524		DBR			00	00524
001573	001001	A	525		JOF	K407		00	00525
001574	001577	A							
001575	002000	A	526		JMPM	K09		00	00526
001576	002413	A							
			527	*				00	00527
			528	*	TEST	-DIV-	+16,=15 BY =5	00	00528
			529	*				00	00529
001577	005001	A	530	K407	TZA			00	00530
001600	022421	A	531		LDB	KSTN		00	00531
001601	172420	A	532		DIV	KMFV		00	00532
001602	005311	A	533		DAR			00	00533
001603	001010	A	534		JAZ	K408		00	00534
001604	001607	A							
001605	002000	A	535		JMPM	K09		00	00535
001606	002413	A							
001607	005122	A	536	K408	IBR			00	00536
001610	005122	A	537		IBR			00	00537
001611	005122	A	538		IBR			00	00538
001612	001020	A	539		JBZ	K411		00	00539
001613	001616	A							
001614	002000	A	540		JMPM	K09		00	00540
001615	002413	A							
001616	011174	A	541	K411	LDA	STYP	620F ?	00	00541
001617	001002	A	542		JAP	K412	YES	00	00542
001620	001650	A							
			543	*				00	00543
			544	*	620/I ONLY			00	00544
001621	005301	A	545	K409	DECR	001		00	00545
001622	022421	A	546		LDB	KSTN		00	00546
001623	005222	A	547		CPB			00	00547
001624	005122	A	548		IBR			00	00548
001625	005122	A	549		IBR			00	00549
001626	172420	A	550		DIV	KMFV		00	00550
001627	005111	A	551		IAR			00	00551
001630	005111	A	552		IAR			00	00552
001631	005111	A	553		IAR			00	00553
001632	005111	A	554		IAR			00	00554
001633	005111	A	555		IAR			00	00555
001634	001010	A	556		JAZ	K410		00	00556
001635	001640	A							
001636	002000	A	557		JMPM	K09		00	00557
001637	002413	A							
001640	005322	A	558	K410	DBR			00	00558



001641	005322	A	559	DBR				00	00559
001642	001020	A	560	JBZ	K310			00	00560
001643	001667	A							
001644	002000	A	561	JMPM	K09			00	00561
001645	002413	A							
001646	001000	A	562	JMP	K310	CONTINUE		00	00562
001647	001667	A							
			563 *						00 00563
			564 *	620/F ONLY					00 00564
001650	005301	A	565	K412	DECR	001	A=-1	00	00565
001651	006020	A	566		LDBI	0177761	B=-15	00	00566
001652	177761	A							
001653	172420	A	567		DIV	KMFV	B=5	00	00567
001654	001010	A	568		JAZ	K414	OK	00	00568
001655	001660	A							
001656	002000	A	569		JMPM	K09	ERROR	00	00569
001657	002413	A							
001660	005322	A	570	K414	DBR			00	00570
001661	005322	A	571		DBR			00	00571
001662	005322	A	572		DBR			00	00572
001663	001020	A	573		JBZ	K310	OK	00	00573
001664	001667	A							
001665	002000	A	574		JMPM	K09	ERROR	00	00574
001666	002413	A							
			575 *						00 00575
			576 *	TEST	=DIV=	BY ONE			00 00576
			577 *						00 00577
001667	005001	A	578	K310	TZA		A=0	00	00578
001670	005102	A	579		INCR	002	B=1	00	00579
001671	172424	A	580		DIV	KONE	EXECUTE	00	00580
001672	001010	A	581		JAZ	K311	A SHUD=0	00	00581
001673	001676	A							
001674	002000	A	582		JMPM	K09	ERROR	00	00582
001675	002413	A							
001676	005322	A	583	K311	DBR		B=B-1	00	00583
001677	001020	A	584		JBZ	K315	CONTINUE	00	00584
001700	001703	A							
001701	002000	A	585		JMPM	K09	ERROR	00	00585
001702	002413	A							
001703	011174	A	586	K315	LDA	STYP	620F ?	00	00586
001704	001002	A	587		JAP	K324	YES	00	00587
001705	001723	A							
			588 *						00 00588
			589 *	620/I ONLY					00 00589
001706	005303	A	590	K320	DECR	003	A=B=-1	00	00590
001707	172424	A	591		DIV	KONE	EXECUTE	00	00591
001710	005111	A	592		IAR		A=A+1	00	00592
001711	001010	A	593		JAZ	K321	A SHUD=-1	00	00593
001712	001715	A							
001713	002000	A	594		JMPM	K09	ERROR	00	00594
001714	002413	A							
001715	001020	A	595	K321	JBZ	K330	B SHUD=0	00	00595
001716	001736	A							
001717	002000	A	596		JMPM	K09	ERROR	00	00596
001720	002413	A							
001721	001000	A	597		JMP	K330	CONTINUE	00	00597
001722	001736	A							
			598 *						00 00598
			599 *	620/F ONLY					00 00599
001723	005303	A	600	K324	DECR	003	A=B=-1	00	00600
001724	172424	A	601		DIV	KONE	+1	00	00601
001725	005122	A	602		IBR			00	00602
001726	001020	A	603		JBZ	**4	OK	00	00603
001727	001732	A							
001730	002000	A	604		JMPM	K09	ERROR	00	00604
001731	002413	A							
001732	001010	A	605		JAZ	K330	OK	00	00605
001733	001736	A							
001734	002000	A	606		JMPM	K09	ERROR	00	00606
001735	002413	A							
			607 *						00 00607
			608 *	TEST	=DIV=	BY MINUS ONE			00 00608
			609 *						00 00609
001736	005001	A	610	K330	TZA		A=0	00	00610
001737	005102	A	611		INCR	002	B=+1	00	00611
001740	172425	A	612		DIV	KMON	EXECUTE	00	00612
001741	001010	A	613		JAZ	K331	A SHUD=0	00	00613
001742	001745	A							
001743	002000	A	614		JMPM	K09	ERROR	00	00614
001744	002413	A							
001745	005122	A	615	K331	IBR		B=B+1	00	00615
001746	001020	A	616		JBZ	K345	CONTINUE	00	00616
001747	001752	A							
001750	002000	A	617		JMPM	K09	ERROR	00	00617
001751	002413	A							
001752	011174	A	618	K345	LDA	STYP	620F ?	00	00618
001753	001002	A	619		JAP	K430	YES	00	00619
001754	001772	A							
			620 *						00 00620
			621 *	620/I ONLY					00 00621
001755	005303	A	622	K340	DECR	003	A=B=-1	00	00622
001756	172425	A	623		DIV	KMON	EXECUTE	00	00623
001757	005111	A	624		IAR		A=A+1	00	00624
001760	001010	A	625		JAZ	K341	A SHUD=-1	00	00625
001761	001764	A							

001762	002000	A	626	JMPM	K09	ERROR	00	00626	
001763	002413	A							
001764	001020	A	627	K341	JBZ	K400	B SHUD=0	00 00627	
001765	002005	A							
001766	002000	A	628	JMPM	K09	ERROR	00	00628	
001767	002413	A							
001770	001000	A	629	JMP	K400	CONTINUE	00	00629	
001771	002005	A							
			630 *					00 00630	
			631 *	620/F ONLY==TEST DIV BY MINUS ONE					00 00631
			632 *					00 00632	
001772	005303	A	633	K430	DECR	003	A#B#=-1	00 00633	
001773	172425	A	634		DIV	KMON	=1	00 00634	
001774	005322	A	635		DBR			00 00635	
001775	001020	A	636		JBZ	**4	OK	00 00636	
001776	002001	A							
001777	002000	A	637	JMPM	K09	ERROR	00	00637	
002000	002413	A							
002001	001010	A	638	JAZ	K400	CONTINUE	00	00638	
002002	002005	A							
002003	002000	A	639	JMPM	K09	ERROR	00	00639	
002004	002413	A							
			640 *					00 00640	
			641 *	DIVIDE =7 BY +4 ; B=-1, A=3					00 00641
			642 *					00 00642	
002005	005301	A	643	K400	DECR	001		00 00643	
002006	006020	A	644		LDBI	6		00 00644	
002007	000006	A							
002010	005222	A	645		CPB		B=-7	00 00645	
002011	172434	A	646		DIV	KFOR	B+4	00 00646	
002012	005122	A	647		IBR			00 00647	
002013	001020	A	648		JBZ	**4	OK	00 00648	
002014	002017	A							
002015	002000	A	649	JMPM	K09	ERROR	00	00649	
002016	002413	A							
002017	005111	A	650		IAR			00 00650	
002020	005111	A	651		IAR			00 00651	
002021	005111	A	652		IAR			00 00652	
002022	001010	A	653	JAZ	K402	CONTINUE	00	00653	
002023	002026	A							
002024	002000	A	654	JMPM	K09	ERROR	00	00654	
002025	002413	A							
			655 *					00 00655	
			656 *					00 00656	
			657 *	TEST DIVI AND MULI IN SEQUENCE (620/I AND 620/F)					00 00657
			658 *					00 00658	
			659 *					00 00659	
002026	005303	A	660	K402	DECR	003	A#B#=-1	00 00660	
002027	006170	A	661		DIVI	=-1	DIV BY =1	00 00661	
002030	177777	A							
002031	006160	A	662		MULI	=1	MUL BY =1	00 00662	
002032	177777	A							
002033	005111	A	663		IAR		A#A+1	00 00663	
002034	001010	A	664		JAZ	K401	A SHUD=-1	00 00664	
002035	002040	A							
002036	002000	A	665	JMPM	K09	ERROR	00	00665	
002037	002413	A							
002040	007400	A	666	K401	ROF		INIT OFLO	00 00666	
002041	005122	A	667		IBR		B#B+1	00 00667	
002042	001001	A	668		JOF	K432	CONTINUE	00 00668	
002043	002046	A							
002044	002000	A	669	JMPM	K09	ERROR	00	00669	
002045	002413	A							
			670 *					00 00670	
002046	011174	A	671	K432	LDA	STYP	620/F ?	00 00671	
002047	001004	A	672		JAN	K450	NO	00 00672	
002050	002071	A							
			673 *	620/F ONLY: DIVI/MULI					00 00673
002051	005303	A	674	K434	DECR	003	A#B#=-1	00 00674	
002052	006170	A	675		DIVI	=-1	A#01B#+1	00 00675	
002053	177777	A							
002054	006160	A	676		MULI	=-1	A#=-1;B#0	00 00676	
002055	177777	A							
002056	005111	A	677		IAR			00 00677	
002057	001010	A	678		JAZ	**4		00 00678	
002060	002063	A							
002061	002000	A	679	JMPM	K09	ERROR	00	00679	
002062	002413	A							
002063	005021	A	680		TBA			00 00680	
002064	132416	A	681		ERA	KMXP	*077777	00 00681	
002065	001010	A	682		JAZ	K450	CONTINUE	00 00682	
002066	002071	A							
002067	002000	A	683	JMPM	K09			00 00683	
002070	002413	A							
			684 *					00 00684	
			685 *	TEST MULE AND DIVE (EXTENDED ADDRESSING)					00 00685
			686 *					00 00686	
			687 *					00 00687	
002071	005001	A	688	K450	TZA			00 00688	
002072	006020	A	689		LDBI	3		00 00689	
002073	000003	A							
002074	006167	A	690		MULE	KTEN	3X10=30	00 00690	
002075	002433	A							
002076	006177	A	691		DIVE	KMFV	030 DIV BY =5# =4,R#4	00 00691	
002077	002420	A							

002100	006130	A	692	ERA1	4			00	00692
002101	000004	A							
002102	001010	A	693	JAZ	**4			00	00693
002103	002106	A							
002104	002000	A	694	JMPM	K09	ERROR		00	00694
002105	002413	A							
002106	005021	A	695	TBA				00	00695
002107	005311	A	696	DAR				00	00696
002110	142420	A	697	SUB	KMFV	-5		00	00697
002111	001010	A	698	JAZ	K452			00	00698
002112	002115	A							
002113	002000	A	699	JMPM	K09	ERROR		00	00699
002114	002413	A							
002115	005102	A	700	K452 INCR	002	B=1		00	00700
002116	006166	A	701	MULE	KEXK=1,2	INDEXED BY B		00	00701
002117	002430	A							
002120	001010	A	702	JAZ	**4			00	00702
002121	002124	A							
002122	002000	A	703	JMPM	K09			00	00703
002123	002413	A							
002124	005021	A	704	TBA				00	00704
002125	132431	A	705	ERA	KEXK			00	00705
002126	001010	A	706	JAZ	K454			00	00706
002127	002132	A							
002130	002000	A	707	JMPM	K09	ERROR		00	00707
002131	002413	A							
002132	005001	A	708	K454 TZA				00	00708
002133	022431	A	709	LDB	KEXK	B=025252		00	00709
002134	006177	A	710	DIVE*	KEXK+1			00	00710
002135	102432	A							
002136	001010	A	711	JAZ	**4			00	00711
002137	002142	A							
002140	002000	A	712	JMPM	K09	ERROR		00	00712
002141	002413	A							
002142	005322	A	713	DBR				00	00713
002143	001020	A	714	JBZ	K677	CONTINUE		00	00714
002144	002147	A							
002145	002000	A	715	JMPM	K09			00	00715
002146	002413	A							
002147	011174	A	716	K677 LDA	STYP	620/F?		00	00716
002150	001002	A	717	JAP	**4			00	00717
002151	002154	A							
002152	001000	A	718	JMP*	KENT	EXIT OPTIONS TEST IF 620/I		00	00718
002153	101257	A							
002154	001010	A	719	JAZ*	KENT	EXIT OPTIONS TEST IF 620/F WITHOUT OPTIONS		00	00719
002155	101257	A							
002156	001000	A	720	JMP	K700	EXECUTE 620/F OPTIONS: BT & SRE		00	00720
002157	002160	A							
			721 *					00	00721
			722 *					00	00722
			723 *					00	00723
			724 *	620/F TEST: BT INSTRUCTION				00	00724
			725 *					00	00725
002160	012427	A	726	K700 LDA	KD01			00	00726
002161	006440	A	727	BT	040,K702	TEST BIT 0 OF A FOR 0		00	00727
002162	002165	A							
002163	001000	A	728	JMP	K726	ERROR JUMP		00	00728
002164	002244	A							
002165	006401	A	729	K702 BT	01,K704	TEST BIT 1 OF A FOR 1		00	00729
002166	002171	A							
002167	001000	A	730	JMP	K726	ERROR JUMP		00	00730
002170	002244	A							
002171	006446	A	731	K704 BT	046,K706	TEST BIT 6 OF A FOR 0		00	00731
002172	002175	A							
002173	001000	A	732	JMP	K726	ERROR JUMP		00	00732
002174	002244	A							
002175	006407	A	733	K706 BT	07,K708	TEST BIT 7 OF A FOR 1		00	00733
002176	002201	A							
002177	001000	A	734	JMP	K726	ERROR JUMP		00	00734
002200	002244	A							
002201	006456	A	735	K708 BT	056,K710	TEST BIT 14 OF A FOR 0		00	00735
002202	002205	A							
002203	001000	A	736	JMP	K726	ERROR JUMP		00	00736
002204	002244	A							
002205	006417	A	737	K710 BT	017,K712	TEST BIT 15 OF A FOR 1		00	00737
002206	002211	A							
002207	001000	A	738	JMP	K726	ERROR JUMP		00	00738
002210	002244	A							
002211	006442	A	739	K712 BT*	042,KIND	TEST BIT 2 OF A FOR 0, JUMP INDIRECT		00	00739
002212	102426	A							
002213	001000	A	740	JMP	K726	ERROR JUMP		00	00740
002214	002244	A							
002215	022430	A	741	K714 LDB	KD02			00	00741
002216	006420	A	742	BT	020,K716	TEST BIT 7 OF B FOR 1		00	00742
002217	002222	A							
002220	001000	A	743	JMP	K726	ERROR JUMP		00	00743
002221	002244	A							
002222	006421	A	744	K716 BT	021,K718	TEST BIT 1 OF B FOR 1		00	00744
002223	002226	A							
002224	001000	A	745	JMP	K726	ERROR JUMP		00	00745
002225	002244	A							
002226	006466	A	746	K718 BT	066,K720	TEST BIT 6 OF B FOR 0		00	00746
002227	002232	A							
002230	001000	A	747	JMP	K726	ERROR JUMP		00	00747
002231	002244	A							

002232	006467	A	748	K720	BT	067,K722	TEST BIT 7 OF B FOR 0	00	00748
002233	002236	A							
002234	001000	A	749		JMP	K726	ERROR JUMP	00	00749
002235	002244	A							
002236	006435	A	750	K722	BT	035,K724	TEST BIT 13 OF B FOR 1	00	00750
002237	002242	A							
002240	001000	A	751		JMP	K726	ERROR JUMP	00	00751
002241	002244	A							
002242	006476	A	752	K724	BT	076,K730	TEST BIT 14 OF B FOR 0	00	00752
002243	002253	A							
002244	001100	A	753	K726	JSS1	***		00	00753
002245	002252	A							
002246	002000	A	754		JMPM	IQ80	PRINT ERROR DATA	00	00754
002247	004002	A							
002250	001000	A	755		JMP	K730	CONTINUE	00	00755
002251	002253	A							
002252	000000	A	756		HLT		ERROR==BT	00	00756
	757	*						00	00757
	758	*						00	00758
	759	*						00	00759
	760	*				620/F TEST; SRE INSTRUCTION		00	00760
	761	*						00	00761
002253	012427	A	762	K730	LDA	KD01		00	00762
002254	006617	A	763		SRE	KD01,7,010	NO SKIP	H	00 00763
002255	002427	A							
002256	001000	A	764		JMP	K746	ERROR JUMP	00	00764
002257	002331	A							
002260	006617	A	765		SRE	KD02,7,010	SKIP OK	H	00 00765
002261	002430	A							
002262	001000	A	766		JMP	K732		00	00766
002263	002266	A							
002264	001000	A	767		JMP	K746	ERROR JUMP	00	00767
002265	002331	A							
002266	022425	A	768	K732	LDB	KMON		00	00768
002267	006030	A	769		LDXI	100		00	00769
002270	000144	A							
002271	006625	A	770		SRE	KMON=100,1,020	COMPARE WITH B,INDEXED BY X,SKIP OK	00	00770
002272	002261	A							
002273	001000	A	771		JMP	K746	ERROR JUMP	00	00771
002274	002331	A							
002275	005000	A	772		NOP			00	00772
002276	005004	A	773		TZX			00	00773
002277	006020	A	774	K734	LDBI	200		00	00774
002300	000310	A							
002301	006646	A	775		SRE	KZRO=200,2,040	COMPARE WITH X, INDEXED BY B, SKIP OK	00	00775
002302	002113	A							
002303	001000	A	776		JMP	K746	ERROR JUMP	00	00776
002304	002331	A							
002305	005000	A	777		NOP			00	00777
002306	022424	A	778	K742	LDB	KONE		00	00778
002307	006627	A	779		DATA	006627	CODE FOR SRE,COMPARE WITH B,INDIRECT,SKIP	00	00779
002310	102356	A	780		MZE	K752	INDIRECT ADDRESS	00	00780
002311	001000	A	781		JMP	K746	ERROR JUMP	00	00781
002312	002331	A							
002313	006627	A	782	K738	DATA	006627	SRE==COMPARE WITH B,INDIRECT,NO SKIP	00	00782
002314	102355	A	783		MZE	K750		00	00783
002315	001000	A	784		JMP	K748		00	00784
002316	002321	A							
002317	001000	A	785		JMP	K746	ERROR JUMP	00	00785
002320	002331	A							
002321	012427	A	786	K748	LDA	KD01	*125252	00	00786
002322	006614	A	787		DATA	006614	SRE=COMPARE WITH A,RELATIVE,SKIP	00	00787
002323	000005	A	788		DATA	5	RELATIVE ADDRESS	00	00788
002324	001000	A	789		JMP	K746	ERROR JUMP	00	00789
002325	002331	A							
002326	001000	A	790		JMP	PI00	CONTINUE WITH PIPELINE TEST	H	00 00790
002327	002342	A							
002330	125252	A	791		DATA	0125252		00	00791
002331	001100	A	792	K746	JSS1	***		00	00792
002332	002337	A							
002333	002000	A	793		JMPM	IQ80	PRINT ERROR DATA	00	00793
002334	004002	A							
002335	001000	A	794		JMP	PI00	CONTINUE WITH PIPELINE TEST	H	00 00794
002336	002342	A							
002337	000000	A	795		HLT		ERROR==SRE	00	00795
002340	001000	A	796		JMP	PI00	CONTINUE WITH PIPELINE TEST	H	00 00796
002341	002342	A							
	797	*						00	00797
002342	006010	A	798	PI00	LDAI	01000	GET JUMP INST IN A	H	00 00798
002343	001000	A							
002344	006057	A	799		STAE	PI01	PUT IN PIPELINE TEST	H	00 00799
002345	002351	A							
002346	006010	A	800		LDAI	01006	LDA WITH TWO WORD NOP INST.	H	00 00800
002347	001006	A							
002350	052351	A	801		STA	***	STORE AT P REG, PLUS ONE	H	00 00801
002351	001000	A	802	PI01	JMP	PI10	THIS JUMP WILL BE O'LAYO IF PIPELINE OK	H	00 00802
002352	002357	A							
002353	001000	A	803		JMP*	KENT	EXIT	00	00803
002354	101257	A							
002355	002430	A	804	K750	DATA	KD02	INDIRECT ADDRESS FOR K738	00	00804
002356	002424	A	805	K752	DATA	KONE	INDIRECT ADDRESS FOR K742	00	00805
	806	*						H	00 00806
002357	001100	A	807	PI10	JSS1	PI11	BYPASS PRINT	H	00 00807
002360	002365	A							
002361	006030	A	808		LDXI	PIMS	*PIPELINE ERROR*	H	00 00808

002362	003763	A										
002363	002000	A	809	CALL*	OUTD				H	00 00809		
002364	100403	A										
002365	001200	A	810	PI11	JSS2	PI12	HALT ON ERROR		H	00 00810		
002366	002371	A										
002367	001000	A	811	JMP*	KENT		EXIT		H	00 00811		
002370	101257	A										
002371	000000	A	812	PI12	HLT				H	00 00812		
002372	001200	A	813	JSS2*	KENT		CONTINUE		H	00 00813		
002373	101257	A										
002374	001000	A	814	JMP	PI00		LOOP BACK		H	00 00814		
002375	002342	A										
			815 *							00 00815		
			816 *							00 00816		
			817 *							00 00817		
			818 *	KENT--ERROR CONTROL ROUTINE.							00 00818	
			819 *	MAINTAINS CONTENTS OF A AND B AND PLACES							00 00819	
			820 *	ERROR ENTRANCE ADDRESS IN X, ORIGINAL							00 00820	
			821 *	CONTENTS OF X SAVED AT KSVX.							00 00821	
			822 *	CONTINUE CHECKING AFTER ERROR HALT/PRINTOUT.							00 00822	
			823 *							00 00823		
002376	072422	A	824	K10	STX	KSVX	SAVE X REG			00 00824		
002377	032413	A	825		LDX	K09	ERROR ADDR			00 00825		
002400	005344	A	826		DXR					00 00826		
002401	005344	A	827		DXR					00 00827		
002402	001100	A	828		JSS1	K23				00 00828		
002403	002410	A										
002404	002000	A	829		JMPM	I080	PRINT ERROR DATA			00 00829		
002405	004002	A										
002406	001000	A	830		JMP	K33	RETURN			00 00830		
002407	002411	A										
002410	000300	A	831	K23	HLT	0300				00 00831		
002411	032422	A	832	K33	LDX	KSVX	RESTOR X REG			00 00832		
002412	001000	A	833		JMP	K09	RETURN			00 00833		
002413	002413	A										
002413			834	K09	BES	0				00 00834		
002414	001000	A	835		JMP	K10				00 00835		
002415	002376	A										
			836 *							00 00836		
			837 *							00 00837		
002416	077777	A	838	KMXP	DATA	077777	MAX POS. *ALTERED TO 377777 FOR 622/I TEST			00 00838		
002417	100000	A	839	KMXN	DATA	0100000	MAX NEG. *ALTERED TO 400000 FOR 622/I TEST			00 00839		
002420	177773	A	840	KMPV	DATA	=5				00 00840		
002421	000020	A	841	KSTN	DATA	16				00 00841		
002422	000000	A	842	KSVX	DATA	0	X REG STOR			00 00842		
002423	000000	A	843	KZRO	DATA	0				00 00843		
002424	000001	A	844	KONE	DATA	1				00 00844		
002425	177777	A	845	KMON	DATA	=1				00 00845		
002426	002215	A	846	KIND	DATA	K714	INDIRECT ADDRESS FOR K712			00 00846		
002427	125252	A	847	KD01	DATA	0125252				00 00847		
002430	031463	A	848	KD02	DATA	031463				00 00848		
002431	025252	A	849	KEXK	DATA	025252, (KEXK)				00 00849		
002432	002431	A										
002433	000010	A	850	KTEN	DATA	010				00 00850		
002434	000004	A	851	KFOR	DATA	4				00 00851		
			852 *							00 00852		
			853 *							00 00853		
			854 *							00 00854		
			855 *							00 00855		
			856 *							00 00856		
			857 *							00 00857		
			858 *	*****								00 00858
			859 *							00 00859		
			860 *	EXTENDED ADDRESSING INSTRUCTIONS TEST								00 00860
			861 *							00 00861		
			862 *	*** NOTE ***								00 00862
			863 *							00 00863		
			864 *	THE FOLLOWING CONSTANTS AND PARAMETERS ARE ALTERED AT START-UP.								00 00864
			865 *	IF 622/I TESTING IS SPECIFIED: EXNG,EMXN AND EX76+1,								00 00865
			866 *	EACH OCTAL IS SET TO THE 16-BIT EQUIV.								00 00866
			867 *							00 00867		
			868 *							00 00868		
			869 *							00 00869		
			870 *	*****								00 00870
			871 *							00 00871		
002435	000000	A	872	EXEN	ENR	0				00 00872		
002436	006017	A	873		LDAE	EXK	=125252 (DIRECT)			00 00873		
002437	003062	A										
002440	133062	A	874		ERA	EXK				00 00874		
002441	001010	A	875		JAZ	**4	CONTINUE			00 00875		
002442	002445	A										
002443	001000	A	876		JMP	EX01	ERROR JUMP			00 00876		
002444	002462	A										
002445	006027	A	877		LDBE	EXR0	=0			00 00877		
002446	003074	A										
002447	005021	A	878		TBA					00 00878		
002450	001010	A	879		JAZ	**4	CONTINUE			00 00879		
002451	002454	A										
002452	001000	A	880		JMP	EX01	ERROR JUMP			00 00880		
002453	002462	A										
002454	006037	A	881		LDXE	EXK				00 00881		
002455	003062	A										
002456	005041	A	882		TXA					00 00882		
002457	133062	A	883		ERA	EXK				00 00883		
002460	001010	A	884		JAZ	EX02	CONTINUE			00 00884		

002461	002471	A							
002462	001100	A	885	EX01	JSS1	++6			00 00885
002463	002470	A							
002464	002000	A	886		JMPM	IG80	PRINT ERROR DATA		00 00886
002465	004002	A							
002466	001000	A	887		JMP	EX02			00 00887
002467	002471	A							
002470	000000	A	888		HLT		ERROR==LDAE/LDBE/LDXE (DIRECT ADDRESSING)		00 00888
			889 *						00 00889
002471	013066	A	890	EX02	LDA	EXK2	#052525		00 00890
002472	006057	A	891		STAE	EXK3	DIRECT		00 00891
002473	003067	A							
002474	013067	A	892		LDA	EXK3			00 00892
002475	133066	A	893		ERA	EXK2			00 00893
002476	001010	A	894		JAZ	++4	CONTINUE		00 00894
002477	002502	A							
002500	001000	A	895		JMP	EX03	ERRQR JUMP		00 00895
002501	002516	A							
002502	006030	A	896		LDXI	100			00 00896
002503	000144	A							
002504	023062	A	897		LDB	EXK			00 00897
002505	006065	A	898		STBE	EXK3=100,1	INDEXED WITH X		00 00898
002506	002723	A							
002507	005021	A	899		TBA				00 00899
002510	006055	A	900		STAE	EXK3=99,1	INDEXED WITH X, STORE AT EXK3+1		00 00900
002511	002724	A							
002512	013067	A	901		LDA	EXK3			00 00901
002513	143070	A	902		SUB	EXK3+1			00 00902
002514	001010	A	903		JAZ	EX04	CONTINUE		00 00903
002515	002525	A							
002516	001100	A	904	EX03	JSS1	++6			00 00904
002517	002524	A							
002520	002000	A	905		JMPM	IG80	PRINT ERROR DATA		00 00905
002521	004002	A							
002522	001000	A	906		JMP	EX04			00 00906
002523	002525	A							
002524	000000	A	907		HLT		ERROR==STAE/STBE/STXE (DIRECT,X=INDEXED)		00 00907
			908 *						00 00908
002525	006020	A	909	EX04	LDBI	EXNG			00 00909
002526	003072	A							
002527	006016	A	910		LDAE	0,2	INDEXED BY B		00 00910
002530	000000	A							
002531	001002	A	911		JAP	EX05	ERROR JUMP		00 00911
002532	002550	A							
002533	006147	A	912		SUBE	EXNG	DIRECT		00 00912
002534	003072	A							
002535	001010	A	913		JAZ	++4			00 00913
002536	002541	A							
002537	001000	A	914		JMP	EX05	ERROR JUMP		00 00914
002540	002550	A							
002541	005002	A	915		TZB				00 00915
002542	006126	A	916		ADDE	EXK,2	INDEXED BY B		00 00916
002543	003062	A							
002544	006146	A	917		SUBE	EXK,2	INDEXED BY B		00 00917
002545	003062	A							
002546	001010	A	918		JAZ	EX06	CONTINUE		00 00918
002547	002557	A							
002550	001100	A	919	EX05	JSS1	++6			00 00919
002551	002556	A							
002552	002000	A	920		JMPM	IG80	PRINT ERROR DATA		00 00920
002553	004002	A							
002554	001000	A	921		JMP	EX06			00 00921
002555	002557	A							
002556	000000	A	922		HLT		ERROR==LDAE/ADDE/SUBE (DIRECT/INDEXED B)		00 00922
			923 *						00 00923
002557	006017	A	924	EX06	LDAE*	EXK+1	INDIRECT		00 00924
002560	103063	A							
002561	006147	A	925		SUBE*	EXK+1	INDIRECT		00 00925
002562	103063	A							
002563	001010	A	926		JAZ	++4	CONTINUE		00 00926
002564	002567	A							
002565	001000	A	927		JMP	EX07	ERROR JUMP		00 00927
002566	002605	A							
002567	006126	A	928		ADDE*	EXK+1,2	INDIRECT/PREINDEXING		00 00928
002570	103063	A							
002571	006137	A	929		ERAE	EXK	DIRECT		00 00929
002572	003062	A							
002573	001010	A	930		JAZ	++4	CONTINUE		00 00930
002574	002577	A							
002575	001000	A	931		JMP	EX07	ERROR JUMP		00 00931
002576	002605	A							
002577	006037	A	932		LDXE*	EXKA+2	DOUBLE INDIRECT		00 00932
002600	103077	A							
002601	005041	A	933		TXA				00 00933
002602	133075	A	934		ERA	EXKA	EXKA=123456		00 00934
002603	001010	A	935		JAZ	EX10	CONTINUE		00 00935
002604	002614	A							
002605	001100	A	936	EX07	JSS1	++6			00 00936
002606	002613	A							
002607	002000	A	937		JMPM	IG80	PRINT ERROR DATA		00 00937
002610	004002	A							
002611	001000	A	938		JMP	EX10			00 00938
002612	002614	A							
002613	000000	A	939		HLT		ERROR==LDAE/ADDE/SUBE/LDXE (INDIRECT)		00 00939
			940 *						00 00940

002614	013072	A	941	EX10	LDA	EXNG	A=1	00	00941
002615	006117	A	942		ORAE	EXNG	A=1	00	00942
002616	003072	A							
002617	006157	A	943		ANAE	EXNG	A=1	00	00943
002620	003072	A							
002621	006137	A	944		ERAE	EXNG	A=0	00	00944
002622	003072	A							
002623	001010	A	945		JAZ	**4	CONTINUE	00	00945
002624	002627	A							
002625	001000	A	946		JMP	EX11	ERROR JUMP	00	00946
002626	002642	A							
002627	006117	A	947		ORAE*	EXK41	#125252	00	00947
002630	103063	A							
002631	006117	A	948		ORAE	EXK	#125252	00	00948
002632	003062	A							
002633	006137	A	949		ERAE	EXK2	#177777	00	00949
002634	003066	A							
002635	006157	A	950		ANAE	EXNG	#177777	00	00950
002636	003072	A							
002637	133072	A	951		ERA	EXNG	EXNG=1	00	00951
002640	001010	A	952		JAZ	EX12		00	00952
002641	002651	A							
002642	001100	A	953	EX11	JSS1	**6		00	00953
002643	002650	A							
002644	002000	A	954		JMPM	IQ80	PRINT ERROR DATA	00	00954
002645	004002	A							
002646	001000	A	955		JMP	EX12		00	00955
002647	002651	A							
002650	000000	A	956		HLT		ERROR==ERAE/ORAE/ANAE (DIRECT/INDIRECT)	00	00956
			957	*				00	00957
002651	006014	A	958	EX12	DATA	0006014	CODE FOR LDAE==RELATIVE ADDRESSING	00	00958
002652	000007	A	959		DATA	07	RELATIVE ADDRESS FOR LDAE	00	00959
002653	006130	A	960		ERAI	0177777		00	00960
002654	177777	A							
002655	001010	A	961		JAZ	EX14	CONTINUE	H 00	00961
002656	002671	A							
002657	001000	A	962		JMP	EX13	ERROR JUMP	00	00962
002660	002662	A							
002661	177777	A	963		DATA	0177777	USED WITH RELATIVE LDAE ABOVE	00	00963
002662	001100	A	964	EX13	JSS1	**6		00	00964
002663	002670	A							
002664	002000	A	965		JMPM	IQ80	PRINT ERROR DATA	00	00965
002665	004002	A							
002666	001000	A	966		JMP	EX14	CONTINUE	00	00966
002667	002671	A							
002670	000000	A	967		HLT		ERROR==LDAE/LDBI (RELATIVE/IMMEDIATE)	00	00967
			968	*				00	00968
002671	013072	A	969	EX14	LDA	EXNG	A=1	00	00969
002672	053067	A	970		STA	EXK3		00	00970
002673	006047	A	971		INRE	EXK3	CHECK INRE FOR -1 TO +1	00	00971
002674	003067	A							
002675	013067	A	972		LDA	EXK3		00	00972
002676	001010	A	973		JAZ	**4	CONTINUE	00	00973
002677	002702	A							
002700	001000	A	974		JMP	EX73	ERROR JUMP	00	00974
002701	002765	A							
002702	005004	A	975		TZX			00	00975
002703	006020	A	976		LDBI	01000		00	00976
002704	001000	A							
002705	006047	A	977	EX70	INRE	EXK3	CHECK INCREMENT FROM 0 TO 01000	00	00977
002706	003067	A							
002707	005322	A	978		DBR			00	00978
002710	005144	A	979		IXR			00	00979
002711	001020	A	980		JBZ	**4		00	00980
002712	002715	A							
002713	001000	A	981		JMP	EX70	INCREMENT AGAIN	00	00981
002714	002705	A							
002715	005041	A	982		TXA			00	00982
002716	143067	A	983		SUB	EXK3		00	00983
002717	001010	A	984		JAZ	**4	CONTINUE	00	00984
002720	002723	A							
002721	001000	A	985		JMP	EX73	ERROR JUMP	00	00985
002722	002765	A							
002723	006010	A	986	EX76	LDAI	077000	ALTERED TO 377000 FOR 622/I TESTING	00	00986
002724	077000	A							
002725	053067	A	987		STA	EXK3		00	00987
002726	005004	A	988		TZX			00	00988
002727	006020	A	989		LDBI	01000		00	00989
002730	001000	A							
002731	007400	A	990		ROP			00	00990
002732	006047	A	991	EX71	INRE	EXK3	INCR FROM 077000/377000(622I) TO OVFL	00	00991
002733	003067	A							
002734	005322	A	992		DBR			00	00992
002735	005144	A	993		IXR			00	00993
002736	001020	A	994		JBZ	**4		00	00994
002737	002742	A							
002740	001000	A	995		JMP	EX71	INCREMENT AGAIN	00	00995
002741	002732	A							
002742	001001	A	996		JOF	**4		00	00996
002743	002746	A							
002744	001000	A	997		JMP	EX73	ERROR JUMP	00	00997
002745	002765	A							
002746	001001	A	998		JOF	EX73	ERROR JUMP	00	00998
002747	002765	A							
002750	013067	A	999		LDA	EXK3		00	00999

002751	133073	A	1000	EX72	ERA	EMXN	MAX NEG	00	01000
002752	001010	A	1001		JAZ	**4		00	01001
002753	002756	A							
002754	001000	A	1002		JMP	EX73	ERROR JUMP	00	01002
002755	002765	A							
002756	013072	A	1003	EX77	LDA	EXNG	=1	00	01003
002757	053067	A	1004		STA	EXK3		00	01004
002760	006047	A	1005		INRE	EXK3		00	01005
002761	003067	A							
002762	013067	A	1006		LDA	EXK3		00	01006
002763	001010	A	1007		JAZ	EX75	CHECK IF POSTINDEXING TO BE TESTED	00	01007
002764	002774	A							
002765	001100	A	1008	EX73	JSS1	**6		00	01008
002766	002773	A							
002767	002000	A	1009		JMPM	IQ80	PRINT ERROR DATA	00	01009
002770	004002	A							
002771	001000	A	1010		JMP	EX75	CHECK IF POSTINDEXING TO BE TESTED	00	01010
002772	002774	A							
002773	000000	A	1011		HLT		ERROR==INRE	00	01011
			1012	*				00	01012
002774	011174	A	1013	EX75	LDA	STYP	620F ?	00	01013
002775	001002	A	1014		JAP	EX15	YES	00	01014
002776	003001	A							
002777	001000	A	1015		JMP*	EXEN	RETURN	00	01015
003000	102435	A							
			1016	*				00	01016
			1017	*				00	01017
			1018	*	620/F TEST: POSTINDEX EXTENDED ADDRESSING			00	01018
			1019	*				00	01019
003001	005004	A	1020	EX15	TZX			00	01020
003002	006215	A	1021		LDAE	EXK,1,0200	POSTINDEXING WITH X REG	00	01021
003003	003062	A							
003004	133062	A	1022		ERA	EXK		00	01022
003005	001010	A	1023		JAZ	EX16	CONTINUE	00	01023
003006	003011	A							
003007	001000	A	1024		JMP	EX20	ERROR	00	01024
003010	003027	A							
003011	006020	A	1025	EX16	LDBI	100		00	01025
003012	000144	A							
003013	006216	A	1026		LDAE	EXK=100,2,0200	POSTINDEXING WITH B REG	00	01026
003014	002716	A							
003015	133062	A	1027		ERA	EXK		00	01027
003016	001010	A	1028		JAZ	EX17	CONTINUE	00	01028
003017	003022	A							
003020	001000	A	1029		JMP	EX20	ERROR	00	01029
003021	003027	A							
003022	006215	A	1030	EX17	LDAE*	EXK+1,1,0200	INDIRECT/POSTINDEXING	00	01030
003023	103063	A							
003024	133062	A	1031		ERA	EXK		00	01031
003025	001010	A	1032		JAZ	EX30	CONTINUE	00	01032
003026	003036	A							
003027	001100	A	1033	EX20	JSS1	**6		00	01033
003030	003035	A							
003031	002000	A	1034		JMPM	IQ80	PRINT ERROR	00	01034
003032	004002	A							
003033	001000	A	1035		JMP	EX30	CONTINUE	00	01035
003034	003036	A							
003035	000000	A	1036		HLT		ERROR==LDAE/POSTINDEXING	00	01036
			1037	*				00	01037
003036	013062	A	1038	EX30	LDA	EXK		00	01038
003037	006257	A	1039		DATA	006257	CODE FOR STAE, INDIRECT	00	01039
003040	103065	A	1040		MZE	EXK1+1	INDIRECT ADDRESS	00	01040
003041	013064	A	1041		LDA	EXK1		00	01041
003042	133062	A	1042		ERA	EXK		00	01042
003043	006326	A	1043		ADDE	EXK=100,2,0200	POSTINDEXING WITH B	00	01043
003044	002716	A							
003045	006347	A	1044		DATA	006347	CODE FOR SUBE, DIRECT	00	01044
003046	003062	A	1045		DATA	EXK	ADDRESS FOR SUBE	00	01045
003047	001010	A	1046		JAZ	EX32	CONTINUE	00	01046
003050	003060	A							
003051	001100	A	1047		JSS1	**6		00	01047
003052	003057	A							
003053	002000	A	1048		JMPM	IQ80		00	01048
003054	004002	A							
003055	001000	A	1049		JMP	EX32		00	01049
003056	003060	A							
003057	000000	A	1050		HLT			00	01050
			1051	*				00	01051
003060	001000	A	1052	EX32	JMP*	EXEN	RETURN	00	01052
003061	102435	A							
			1053	*				00	01053
			1054	*				00	01054
003062	125252	A	1055	EXK	DATA	0125252, (EXK)		00	01055
003063	003062	A							
003064	000000	A	1056	EXK1	DATA	0, (EXK1)		00	01056
003065	003064	A							
003066	052525	A	1057	EXK2	DATA	052525		00	01057
003067		A	1058	EXK3	BSS	3	STORAGE CELLS	00	01058
003072	177777	A	1059	EXNG	DATA	=1	ALTERED TO 177777 FOR 622/I TESTING	00	01059
003073	100000	A	1060	EMXN	DATA	0100000	MAX NEG, ALTERED TO 0400000 FOR 622/I	00	01060
003074	000000	A	1061	EXRO	DATA	0		00	01061
003075	123456	A	1062	EXKA	DATA	0123456, (EXKA), (EXKA+1)*		00	01062
003076	003075	A							
003077	103076	A							
			1063	*****				00	01063



1064 *					*		00 01064
1065 *		I/O TEST			*		00 01065
1066 *					*		00 01066
1067	*****						00 01067
003100	000000	A 1068	IONT	ENTR	0	I/O TEST ENTRY AND EXIT	00 01068
003101	006020	A 1069		LDBI	STTY		00 01069
003102	007370	A					
003103	010422	A 1070		LDA	SLWE	LOWEST EXEC LOCATION	F 00 01070
003104	006150	A 1071		ANAT	010000		F 00 01071
003105	010000	A					
003106	001010	A 1072		JAZ	**4	USING MAINTAIN II	F 00 01072
003107	003112	A					
003110	006020	A 1073		LDBI	STY3	USING MAINTAIN III	E 00 01073
003111	000473	A					
003112	006030	A 1074		LDXI	IO1	UPDATE I/O INSTRUCTIONS TO CURRENT	00 01074
003113	003561	A					
003114	015000	A 1075		LDA	0,1	* DEVICE ADDR (STTY)	00 01075
003115	001010	A 1076		JAZ	ION1	* JMP IF DONE	00 01076
003116	003126	A					
003117	004346	A 1077		LSRA	6	*	00 01077
003120	004246	A 1078		LRLA	6	*	00 01078
003121	116000	A 1079		ORA	0,2	*	00 01079
003122	055000	A 1080		STA	0,1	*	00 01080
003123	005144	A 1081		IXR		*	00 01081
003124	001000	A 1082		JMP	IONT+12	*****	F 00 01082
003125	003114	A					
003126	006030	A 1083	ION1	LDXI	MSG5	OUTPUT 'THIS IS INST TEST' VIA OBR	00 01083
003127	003604	A					
003130	005301	A 1084		DECR	01	* (A)=1 FOR POSSIBLE INTERFERENCE	00 01084
003131	025000	A 1085		LDB	0,1	* WITH (B)	00 01085
003132	001020	A 1086		JBZ	ION2	* DONE?,YES *** EXIT ***	00 01086
003133	003145	A					
003134	004150	A 1087		LSRB	8	* HIGH ORDER 8 BITS	00 01087
003135	002000	A 1088		CALL	IONA	* OUTPUT	00 01088
003136	003453	A					
003137	025000	A 1089		LDB	0,1	* LOW ORDER 8 BITS	00 01089
003140	002000	A 1090		CALL	IONA	* OUTPUT	00 01090
003141	003453	A					
003142	005144	A 1091		IXR		*	00 01091
003143	001000	A 1092		JMP	ION1+3	*****	00 01092
003144	003131	A					
003145	006030	A 1093	ION2	LDXI	MSG6	OUTPUT 'PLEASE TYPE IN ' VIA OAR	00 01093
003146	003626	A					
003147	005302	A 1094		DECR	02	* (B) = 1 FOR POSSIBLE INTERFERENCE	00 01094
003150	002000	A 1095		CALL	(OUTD)*	***** WITH (A)	00 01095
003151	100403	A					
003152	013565	A 1096		LDA	IO5	OUTPUT 'A LOWER CASE CHAR' VIA OME	00 01096
003153	053170	A 1097		STA	ION3	* UPDATE I/O INSTRUCTION	00 01097
003154	006010	A 1098		LDAI	MSG7=1	* *	00 01098
003155	003637	A					
003156	053171	A 1099		STA	ION3+1	* *	00 01099
003157	006030	A 1100		LDXI	24+1	* SET OUTPUT CTR (24 CHAR)	00 01100
003160	000031	A					
003161	005303	A 1101		DECR	03	* (A)=(B)=1 FOR POSSIBLE INTERFERENCE	00 01101
003162	043171	A 1102		INR	ION3+1	*	00 01102
003163	005344	A 1103		DXR		* DONE ?	00 01103
003164	001040	A 1104		JXZ	ION4	* YES *** EXIT ***	00 01104
003165	002174	A					
003166	002000	A 1105		CALL	ION8	* NO,SEN BFR RDY	00 01105
003167	003465	A					
003170	103000	A 1106	ION3	OME	0	* YES,OUTPUT,CONTINUE	00 01106
003171	000000	A					
003172	001000	A 1107		JMP	**8	*****	00 01107
003173	003162	A					
003174	013566	A 1108	ION4	LDA	IO6	EXECUTE INIT FUNCTION	00 01108
003175	053176	A 1109		STA	**1	* CLEAR RDR BFR	00 01109
003176	102500	A 1110		CIA		* *	00 01110
003177	002000	A 1111		CALL	IONC	* SEN BFR RDY	00 01111
003200	003507	A					
003201	013561	A 1112		LDA	IO1	* EXC INIT INSTRUCTION	00 01112
003202	053203	A 1113		STA	**1	* *	00 01113
003203	100000	A 1114		EXC	0	* *	00 01114
003204	013576	A 1115		LDA	IO14	* BFR STILL RDY?	00 01115
003205	053206	A 1116		STA	**1	* *	00 01116
003206	101000	A 1117		SEN	0,**4	* * YES = ERROR	00 01117
003207	003212	A					
003210	001000	A 1118		JMP	**6	* * NO	00 01118
003211	003216	A					
003212	006030	A 1119		LDXI	MSG8	* 'EXC 04XX,01004XX,DOES NOT WORK'	00 01119
003213	003677	A					
003214	001000	A 1120		JMP	**4	*	00 01120
003215	003220	A					
003216	006030	A 1121		LDXI	MSG9	* 'THANKYOU'	00 01121
003217	003671	A					
003220	002000	A 1122		CALL	(OUTD)*	***** WRITE MSG (X),EXIT *****	00 01122
003221	100403	A					
003222	003000	A 1123		XEC	IO1	INITIALIZE TTY	00 01123
003223	003561	A					
003224	006020	A 1124		LDBI	0200	OUTPUT 'NOW TYPE ASDP' VIA OAB	00 01124
003225	000200	A					
003226	006030	A 1125		LDXI	MSG0	* (R)=0200 , 'A'=CHAR 'X)=0200	00 01125
003227	003716	A					
003230	013563	A 1126		LDA	IO3	* UPDATE OAB INSTRUCTION	00 01126
003231	053241	A 1127		STA	**8	* *	00 01127
003232	015000	A 1128		LDA	0,1	* 'A)=(X)	00 01128

003233	001010	A	1129	JAZ	ION5=5	* DONE?,YES *** EXIT ***	00	01129	
003234	003245	A							
003235	006130	A	1130	ERAI	0200	* REMOVE BIT 0200	00	01130	
003236	000200	A							
003237	002000	A	1131	CALL	ION8	* SEN BFR RDY	00	01131	
003240	003465	A							
003241	103300	A	1132	OAB		* OUTPUT	00	01132	
003242	005144	A	1133	IXR		*	00	01133	
003243	001000	A	1134	JMP	**9	*****	00	01134	
003244	003232	A							
003245	006010	A	1135	LDAI	IOWA	INPUT	00	01135	
003246	003417	A							
003247	053603	A	1136	STA	IO21	* 'AS' VIA CIA	00	01136	
003250	006030	A	1137	LDXI	IO6	* 'DF' VIA CIAB	00	01137	
003251	003566	A							
003252	005041	A	1138	ION5	TXA	* 'AS' VIA INA	00	01138	
003253	006140	A	1139	SUBI	IO10	* 'DF' VIA INAB	00	01139	
003254	003572	A							
003255	001010	A	1140	JAZ	ION6	*	00	01140	
003256	003270	A							
003257	002000	A	1141	CALL	IOND,(OUTA)*	*	00	01141	
003260	003550	A							
003261	100400	A							
003262	002000	A	1142	CALL	IOND,(OUTA)*	*	00	01142	
003263	003550	A							
003264	100400	A							
003265	005144	A	1143	IXR		*	00	01143	
003266	001000	A	1144	JMP	ION5	*****	00	01144	
003267	003252	A							
003270	002000	A	1145	ION6	CALL	IOND,IONE	INPUT	00	01145
003271	003550	A							
003272	003553	A							
003273	002000	A	1146	CALL	IOND,IONE	* 'AS' VIA CIB	00	01146	
003274	003550	A							
003275	003553	A							
003276	005144	A	1147	IXR		* 'DF' VIA INB	00	01147	
003277	002000	A	1148	CALL	IOND,IONE	*	00	01148	
003300	003550	A							
003301	003553	A							
003302	002000	A	1149	CALL	IOND,IONE	*****	00	01149	
003303	003550	A							
003304	003553	A							
003305	002000	A	1150	CALL	IONC	INPUT	SEN BFR RDY	00	01150
003306	003507	A							
003307	033603	A	1151	LDX	IO21	* 'AS' VIA IME	00	01151	
003310	005301	A	1152	DECR	01	* (X) PTS TO INPUT AREA	00	01152	
003311	055000	A	1153	STA	0,1	* INPUT SET TO =1	00	01153	
003312	073316	A	1154	STX	ION7+1	* GET UPDATE INSTRUCTION	00	01154	
003313	013574	A	1155	LDA	IO12	*	00	01155	
003314	053315	A	1156	STA	ION7	*	00	01156	
003315	102000	A	1157	ION7	IME	0	* INPUT	00	01157
003316	000000	A							
003317	015000	A	1158	LDA	0,1	* PRINT CHARACTER	00	01158	
003320	002000	A	1159	CALL	(OUTA)*	*	00	01159	
003321	100400	A							
003322	005144	A	1160	IXR		* INC PTR	00	01160	
003323	005301	A	1161	DECR	01	* INPUT SET TO =1	00	01161	
003324	055000	A	1162	STA	0,1	*	00	01162	
003325	013574	A	1163	LDA	IO12	* GET UPDATED INSTRUCTION	00	01163	
003326	053332	A	1164	STA	ION8	*	00	01164	
003327	073333	A	1165	STX	ION8+1	*	00	01165	
003330	002000	A	1166	CALL	IONC	* SEN BFR RDY	00	01166	
003331	003507	A							
003332	102000	A	1167	ION8	IME	0	* INPUT	00	01167
003333	000000	A							
003334	015000	A	1168	LDA	0,1	* PRINT CHARACTER	00	01168	
003335	002000	A	1169	CALL	(OUTA)*	*****	00	01169	
003336	100400	A							
003337	006030	A	1170	LDXI	IOWE=1	COMPARE ACTUAL INPUT TO EXPECTED	00	01170	
003340	003364	A							
003341	005145	A	1171	ION9	INCR	045	* END OF TBL ?	00	01171
003342	006140	A	1172	SUBI	IOWE+26	*	00	01172	
003343	003417	A							
003344	001010	A	1173	JAZ	(ION7)*	* * YES **** EXIT ****	00	01173	
003345	103100	A							
003346	015000	A	1174	LDA	0,1	* ERROR ?	00	01174	
003347	135032	A	1175	ERA	26,1	*	00	01175	
003350	001010	A	1176	JAZ	ION9	* * NO	00	01176	
003351	003341	A							
003352	015000	A	1177	LDA	0,1	* * YES	00	01177	
003353	025032	A	1178	LDB	26,1	* (A)=ACTUAL (B)=EXP	00	01178	
003354	001100	A	1179	JSS1	**6	* PRINT?,NO	00	01179	
003355	003362	A							
003356	002000	A	1180	CALL	IO80	* * YES	00	01180	
003357	004002	A							
003360	001000	A	1181	JMP	ION9	*	00	01181	
003361	003341	A							
003362	000200	A	1182	HLT	0200		00	01182	
003363	001000	A	1183	JMP	ION9	*****	00	01183	
003364	003341	A							
			1184 *		I/O INPUT EXPECTED DATA		00	01184	
			1185 *		ENTRIES =(A),(B) AFTER INPUT,BEFORE INPUT (A)=(B)=077600		00	01185	
	077600	A	1186	IP	SET	077600	IP=INTERFERENCE PATTERN	00	01186
003365	000301	A	1187	IONE	DATA	0301,IP	CIA A	00	01187
003366	077600	A							

003367	000323	A	1188	DATA	0323,IP	CIA S	00	01188	
003370	077600	A							
003371	000304	A	1189	DATA	0304,0304	CIAB D	00	01189	
003372	000304	A							
003373	000306	A	1190	DATA	0306,0306	CIAB F	00	01190	
003374	000306	A							
003375	077701	A	1191	DATA	077701,IP	INA A	00	01191	
003376	077600	A							
003377	077723	A	1192	DATA	077723,IP	INA S	00	01192	
003400	077600	A							
003401	077704	A	1193	DATA	077704,077704	INAB D	00	01193	
003402	077704	A							
003403	077706	A	1194	DATA	077706,077706	INAB F	00	01194	
003404	077706	A							
003405	077600	A	1195	DATA	IP,0301	CIB A	00	01195	
003406	000301	A							
003407	077600	A	1196	DATA	IP,0323	CIB S	00	01196	
003410	000323	A							
003411	077600	A	1197	DATA	IP,077704	INB D	00	01197	
003412	077704	A							
003413	077600	A	1198	DATA	IP,077706	INB F	00	01198	
003414	077706	A							
003415	000301	A	1199	DATA	0301	IME A	00	01199	
003416	000323	A	1200	DATA	0323	IME S	00	01200	
003417	1201	IOWA		BSS	28	TABLE OF ACTUAL INPUTS	00	01201	
	1202	*			OUTPUT B REG		00	01202	
003453	000000	A	1203	IOWA	ENTR	0	OUT (B) ENTRY AND EXIT	00	01203
003454	002000	A	1204	IONA	CALL	IONB	* SEN WRITE BFR RDY	00	01204
003455	003465	A							
003456	053602	A	1205	STA	I020	*	GET UPDATE INSTRUCTION	00	01205
003457	013564	A	1206	LDA	I04	*	*	00	01206
003460	053462	A	1207	STA	**2	*	*	00	01207
003461	013602	A	1208	LDA	I020	*	*	00	01208
003462	103200	A	1209	OBR		*	OUTPUT (B)	00	01209
003463	001000	A	1210	JMP	(IONA)*	*****		00	01210
003464	103453	A							
	1211	*				SENSE WRITE BFR RDY		00	01211
003465	000000	A	1212	IONB	ENTR	0	SEN WRITE BFR RDY ENTRY AND EXIT	00	01212
003466	073602	A	1213	STX	I020	*	SAVE (X)	00	01213
003467	033575	A	1214	LDX	I013	*	GET UPDATE INSTRUCTION	00	01214
003470	073472	A	1215	STX	**2	*	*	00	01215
003471	033600	A	1216	LDX	I015	*	(X) = TIME OUT CONSTANT 077777	00	01216
003472	101000	A	1217	SEN	0,IONC=3	*	BFR RDY?	00	01217
003473	003504	A							
003474	002000	A	1218	CALL	(TOUT)*	*	NO, TOO MUCH TIME?	00	01218
003475	100417	A							
003476	005304	A	1219	DECR	04	*	YES HALT	00	01219
003477	000000	A	1220	HLT		*	*	00	01220
003500	001400	A	1221	JSS3	(IONT)*	**** 883 EXIT ****		00	01221
003501	103100	A							
003502	001000	A	1222	JMP	**8	*	*	00	01222
003503	003472	A							
003504	033602	A	1223	LDX	I020	*	RESTORE (X)	00	01223
003505	001000	A	1224	JMP	(IONB)*	*****		00	01224
003506	103465	A							
	1225	*				SENSE READ BFR RDY, NO TIME OUT		00	01225
003507	000000	A	1226	IONC	ENTR	0	SEN READ BFR RDY ENTRY AND EXIT	00	01226
003510	073602	A	1227	STX	I020	*	SAVE (X)	00	01227
003511	033576	A	1228	LDX	I014	*	GET UPDATED INSTRUCTION	00	01228
003512	073514	A	1229	STX	**2	*	*	00	01229
003513	033602	A	1230	LDX	I020	*	RESTORE (X)	00	01230
003514	101000	A	1231	SEN	0,(IONC)*	*	BFR RDY? YES=RETURN	00	01231
003515	103507	A							
003516	001400	A	1232	JSS3	(IONT)*	**** 883 EXIT ****		00	01232
003517	103100	A							
003520	001000	A	1233	JMP	**4	*****		00	01233
003521	003514	A							
	1234	*				INPUT VIA INST(X), AND PRINT VIA ROUTINE IN PARAMETER 1		00	01234
003522	002000	A	1235	IOND	CALL	IONC	INPUT, SEN READ BFR RDY	00	01235
003523	003507	A							
003524	015000	A	1236	LDA	0,1	*	GET UPDATED INSTRUCTION	00	01236
003525	053530	A	1237	STA	**3	*	*	00	01237
003526	013601	A	1238	LDA	I016	*	(A)=(B)=INTERFERENCE PATTERN	00	01238
003527	005012	A	1239	TAB		*	*	00	01239
003530	102500	A	1240	CIA		*	INPUT VIA INST(X)	00	01240
003531	073602	A	1241	STX	I020	*	SAVE (X)	00	01241
003532	033603	A	1242	LDX	I021	*	(X) PTS TO IOWA	00	01242
003533	055000	A	1243	STA	0,1	*	PUT (A),(B) INTO ACTUAL TBL	00	01243
003534	005144	A	1244	IXR		*	*	00	01244
003535	065000	A	1245	STR	0,1	*	*	00	01245
003536	005144	A	1246	IXR		*	*	00	01246
003537	073603	A	1247	STX	I021	*	*	00	01247
003540	033550	A	1248	LDX	IOND	*	CALL OUTPUT ROUTINE (PARAMETER 1)	00	01248
003541	035000	A	1249	LDX	0,1	*	*	00	01249
003542	073545	A	1250	STX	**3	*	*	00	01250
003543	033602	A	1251	LDX	I020	*	*	00	01251
003544	002000	A	1252	CALL	0	*	*	00	01252
003545	000000	A							
003546	043550	A	1253	INR	IOND	*	SET RETURN	00	01253
003547	001000	A	1254	JMP	0	*	*** EXIT ***	00	01254
003550	000000	A							
003550	1255	IOND		BES	0		INPUT VIA INSTR(X) ENTRY AND EXIT	00	01255
003551	001000	A	1256	JMP	IOND			00	01256
003552	003522	A							
	1257	*				OUTPUT (B)		00	01257

003553	000000	A	1258	IONE	ENTR	0	OUTPUT (B) ENTRY AND EXIT	00	01258
003554	005021	A	1259		TBA		* (A) = (B)	00	01259
003555	002000	A	1260		CALL	(OUTA)*	* OUTPUT (A)	00	01260
003556	100400	A							
003557	001000	A	1261		JMP	(IONE)*	*****	00	01261
003560	103553	A							
			1262 *			DATA FOR IONT			
003561	100400	A	1263	I01	DATA	0100400	EXC INIT TTY	00	01262
003562	103100	A	1264	I02	DATA	0103100	OAR	00	01263
003563	103300	A	1265	I03	DATA	0103300	OAB	00	01264
003564	103200	A	1266	I04	DATA	0103200	OBR	00	01265
003565	103000	A	1267	I05	DATA	0103000	OME	00	01266
003566	102500	A	1268	I06	DATA	0102500	CIA	00	01267
003567	102700	A	1269	I07	DATA	0102700	CIAB	00	01268
003570	102100	A	1270	I08	DATA	0102100	INA	00	01269
003571	102300	A	1271	I09	DATA	0102300	INAB	00	01270
003572	102600	A	1272	I010	DATA	0102600	CIB	00	01271
003573	102200	A	1273	I011	DATA	0102200	INB	00	01272
003574	102000	A	1274	I012	DATA	0102000	IME	00	01273
003575	101100	A	1275	I013	DATA	0101100	SEN WRITE BFR RDY	00	01274
003576	101200	A	1276	I014	DATA	0101200	SEN READ BFR RDY	00	01275
003577	000000	A	1277		DATA	0	END OF IO INSTR TABLE *****	00	01276
003600	077777	A	1278	I015	DATA	077777	TIME OUT CONSTANT	00	01277
003601	077600	A	1279	I016	DATA	077600	INTERFERENCE PATTERN	00	01278
003602			1280	I020	BSS	1	TEMP	00	01279
003603			1281	I021	BSS	1	TEMP	00	01280
			1282 *				MESSAGES	00	01281
003604	106612	A	1283	MSG5	DATA	0106612,'THIS IS THE I/O INSTRUCTION TEST',0		00	01282
003605	152310	A							
003606	144723	A							
003607	120311	A							
003610	151640	A							
003611	152310	A							
003612	142640	A							
003613	144657	A							
003614	147640	A							
003615	144716	A							
003616	151724	A							
003617	151325	A							
003620	141724	A							
003621	144717	A							
003622	147240	A							
003623	152305	A							
003624	151724	A							
003625	000000	A							
003626	106612	A	1284	MSG6	DATA	0106612,'PLEASE TYPE IN ',0		00	01284
003627	150314	A							
003630	142701	A							
003631	151705	A							
003632	120324	A							
003633	154720	A							
003634	142640	A							
003635	144716	A							
003636	120240	A							
003637	000000	A							
003640	120301	A	1285	MSG7	DATA	' A LOWER CASE CHARACTER',0215,0212		00	01285
003641	120240	A							
003642	120314	A							
003643	120317	A							
003644	120327	A							
003645	120305	A							
003646	120322	A							
003647	120240	A							
003650	120303	A							
003651	120301	A							
003652	120323	A							
003653	120305	A							
003654	120240	A							
003655	120303	A							
003656	120310	A							
003657	120301	A							
003660	120322	A							
003661	120301	A							
003662	120303	A							
003663	120324	A							
003664	120305	A							
003665	120322	A							
003666	000215	A							
003667	000212	A							
003670	000000	A	1286		DATA	0		00	01286
003671	152310	A	1287	MSG9	DATA	'THANK YOU',0		00	01287
003672	140716	A							
003673	145640	A							
003674	154717	A							
003675	152640	A							
003676	000000	A							
003677	142730	A	1288	MSG8	DATA	'EXEC (1004XX) DOES NOT WORK',0		00	01288
003700	142703	A							
003701	120250	A							
003702	130660	A							
003703	130264	A							
003704	154330	A							
003705	124640	A							
003706	142317	A							
003707	142723	A							

```

003710 120316 A
003711 147724 A
003712 120327 A
003713 147722 A
003714 145640 A
003715 000000 A
003716 000215 A 1289 MSGO DATA 0215,0212,'NOW TYPE ASDFA SDFASDF' 00 01269
003717 000212 A
003720 120316 A
003721 120317 A
003722 120327 A
003723 120240 A
003724 120324 A
003725 120331 A
003726 120320 A
003727 120305 A
003730 120240 A
003731 120301 A
003732 120323 A
003733 120304 A
003734 120306 A
003735 120301 A
003736 120323 A
003737 120304 A
003740 120306 A
003741 120301 A
003742 120323 A
003743 120304 A
003744 120306 A
003745 120301 A 1290 DATA 'A S',0215,0212,0240,0240,0240,0240,0240,0240,0240 00 01290
003746 120323 A
003747 000215 A
003750 000212 A
003751 000240 A
003752 000240 A
003753 000240 A
003754 000240 A
003755 000240 A
003756 000240 A
003757 000240 A
003760 000240 A 1291 DATA 0240,0240,0 00 01291
003761 000240 A
003762 000000 A
003763 106612 A 1292 PIMS DATA 0106612,'FAILURE OF PIPELINE LOGIC',0 H 00 01292
003764 143301 A
003765 144714 A
003766 152722 A
003767 142640 A
003770 147706 A
003771 120320 A
003772 144720 A
003773 142714 A
003774 144716 A
003775 142640 A
003776 146317 A
003777 143711 A
004000 141640 A
004001 000000 A
1293 * 00 01293
1294 * 00 01294
1295 * 00 01295
1296 * 00 01296
* ERROR PRINT ROUTINE
004002 000000 A 1297 IQ80 ENTR 0 00 01297
004003 054032 A 1298 STA ITMP+1 01999000 01298
004004 064032 A 1299 STB ITMP+2 02000000 01299
004005 074032 A 1300 STX ITMP+3 02001000 01300
004006 002000 A 1301 CALL* OUTC DO CARRIAGE RETURN AND LINE FEED 00 01301
004007 100402 A
004010 006020 A 1302 LDBI (IQ80) 02006000 01302
004011 004002 A
004012 016000 A 1303 LDA 0,2 00 01303
004013 005311 A 1304 DAR 00 01304
004014 005311 A 1305 DAR 00 01305
004015 002000 A 1306 CALL* OUTF PRINT ERROR REFERENCE ADDRESS 00 01306
004016 100405 A
004017 014016 A 1307 LDA ITMP+1 00 01307
004020 002000 A 1308 CALL* OUTE PRINT A REG CONTENTS 00 01308
004021 100404 A
004022 014014 A 1309 LDA ITMP+2 00 01309
004023 002000 A 1310 CALL* OUTE PRINT B REG CONTENTS 00 01310
004024 100404 A
004025 014012 A 1311 LDA ITMP+3 00 01311
004026 002000 A 1312 CALL* OUTE PRINT X REG CONTENTS 00 01312
004027 100404 A
004030 014005 A 1313 LDA ITMP+1 RESTORE STATUS 00 01313
004031 024005 A 1314 LDB ITMP+2 00 01314
004032 034005 A 1315 LDX ITMP+3 00 01315
004033 001000 A 1316 JMP* IQ80 02016000 01316
004034 104002 A
004035 1317 * 00 01317
1318 ITMP BSS 4 02065000 01318
1319 * 00 01319
000600 A 1320 END IBGN 00 01320
ENTRY NAMES
EXTERNAL NAMES
    
```









