

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DJMSA-A-D
PRODUCT NAME: 1-4K MS8-A MOS MEMORY TEST
DATE CREATED: SEPTEMBER 1974
MAINTAINER: PDP-8 DIAGNOSTICS
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1. ABSTRACT

THE 1-4K MS8-A MOS MEMORY TEST IS A PROGRAM THAT WILL TEST MOS MEMORIES FROM 1K UP TO 4K. IT CONSISTS OF AN ADDRESS SELECTION TEST, A FLOATING ONE'S AND ZEROS TEST AND A WORST CASE DATA TEST. THIS PROGRAM PROVIDES CPU-XOR, ACT-8/A, ACT-8/E AND STAND ALONE FRAME CAPABILITIES.

2. REQUIREMENTS

2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED FOR THE EXECUTION OF THIS PROGRAM.

PROCESSOR(S): PDP8A

MEMORY: AT LEAST 1K OF MOS RAM

OPTIONS: MS8-A MOS RAM MEMORY

2.2 STORAGE

PROGRAM REQUIRES 4 PAGES OF A 1K RANGE.

2.3 PREREQUISITE SOFTWARE

PRIOR TO RUNNING THIS PROGRAM, THE PDP8A CENTRAL PROCESSOR TEST (MAINDEC-08-DJKKA) MUST HAVE BEEN SUCCESSFULLY RUN.

3. RESTRICTIONS

- A. ASSUMPTION IS MADE THAT RAM WILL NEVER GO BEFORE ROM MEMORY.
- B. THE 1K RAM IN WHICH THE DIAGNOSTIC IS LOADED WILL BE CONSIDERED THE LOWEST 1K SEGMENT WHEN TEST BEGINS.
- C. THE PROGRAM WILL HAVE TO BE RELOADED WHENEVER THE USER WISHES TO CHANGE TO ANOTHER TEST ENVIRONMENT (STAND ALONE, CPU-XOR, ACT-8/A, ACT-8/E).

STANDARD TEST PROCEDURE

THE MODIFIED RIM LOADER IN 4.3 IS TOGGLED IN. THEN THE DIAGNOSTIC IS READ IN TO THE DESIRED 1K RANGE FROM THE RIM FORMAT TAPE THE PROGRAM STARTS AT LOCATION 200 OF THE CHOSEN RANGE. THE TOP HALF OF THIS RANGE AND ALL 1K SEGMENTS ABOVE IT WILL BE TESTED. THE ADDRESS OF THE LAST ADDRESS OF THE HIGHEST RANGE TO BE TESTED WILL BE IN LOCATION 23 OF THE CHOSEN LOWEST RANGE INITIALLY. AFTER THE 3 TESTS ARE COMPLETED THE PROGRAM WILL FLIP TO THE TOP HALF OF IT'S RANGE AND THE BOTTOM HALF AND ALL HIGHER RANGES WILL BE TESTED. THE PROGRAM WILL FLIP BACK AND THE PROCESS WILL CONTINUE FROM THE BEGINNING. ONE FULL PASS FOR 4K OF MEMORY REQUIRES ABOUT 23 SECONDS.

- A. THE DIAGNOSTIC IS IN RIM FORMAT. TOGGLE IN THE RIM LOADER MODIFIED AS DESCRIBED IN 4.2.
- B. READ IN THE 1-4K MS8-A MOS MEMORY TEST FROM THE TAPE. DEPOSIT THE LAST ADDRESS OF THE HIGHEST ADDRESS RANGE TO BE TESTED INTO LOCATION 23 OF THE RANGE THE DIAGNOSTIC WAS LOADED INTO. THE DEFAULT IS 1777 WHICH SIGNIFIES A 1K MEMORY STARTING AT LOCATION 0.
- C. SET SWITCH REGISTER TO LOCATION 200 OF THE RANGE THE DIAGNOSTIC WAS LOADED INTO. PRESS LOAD ADDRESS, SET SWITCH REGISTER ACCORDING TO 6.2. IN ADDITION TO THE ERROR RELATED SWITCHES IN 6.2 SET SW3 TO A ONE IF THE CPU IS TO HALT AFTER ONE FULL PASS. IF SW3=0 THE DIAGNOSTIC WILL LOOP INDEFINITELY.
- D. PRESS CLEAR AND THEN CONTINUE
- E. PROGRAM WILL HALT ON ERROR OR ON PASS COMPLETION IF SW3 IS UP. OTHERWISE IT WILL RUN INDEFINITELY.

CHANGING DEVICE IOT CODES

NOT APPLICABLE

MODIFIED RIM LOADER

IN ORDER TO LOAD THE DIAGNOSTIC INTO A
1K RANGE OTHER THAN 0-1777 THE MODIFIED
RIM LOADER IS USED OTHERWISE THE STANDARD
RIM LOADER IS SATISFACTORY,

LOW MOD. RIM LOADER
-----HIGH MOD. RIM LOADER

X753/	6032 KCC	6014	RCF
X754/	0375 AND X775	0375	AND X775
X755/	1377 TAD X777	1377	TAD X777
X756/	3376 DCA X776	3376	DCA X776
X757/	6031 KSF	6011	RSF
X760/	5357 JMP .-1	5357	JMP .-1
X761/	6036 KRB	6016	RCC
X762/	7106 CLL RTL	7106	CLL RTL
X763/	7006 RTL	7006	RTL
X764/	6031 SPA	7510	SPA
X765/	5367 JMP X757	5354	JMP X754
X766/	6034 RTL	7006	RTL
X767/	7420 KSF	6011	RSF
X770/	5367 JMP .-1	5367	JMP .-1
X771/	6034 KRS	6016	RCC
X772/	7420 SNL	7420	SNL
X773/	3776 DCA I X776	3776	DCA I X776
X774/	5353 JMP X753	5354	JMP X754
X775/	1777 /MASK	1777	/MASK
X776/	0	0	
X777/	0 /ADDRESS RANGE	0	/ADDRESS RANGE

THE USER WILL MODIFY X777 TO ADDRESS RANGE
DESIRED: (0000,2000,4000,6000),

5.

ERRORS

ALL ERRORS ARE REPORTED BY ERROR HALTS.

5.1

ERROR HALTS/INDICATIONS

ALL TESTS USE THE SAME ERROR REPORTER ROUTINE.
ERROR HALTS WILL OCCUR AT EITHER LOCATION 737 OR
LOCATION 1737, DEPENDING ON WHICH PORTION OF MOS RAM
THE PROGRAM HAS ENTERED.

ERRORS SHOULD BE HANDLED IN THE FOLLOWING SEQUENCE:

- A. AC WILL DISPLAY PC OF TEST IN ERROR.
- B. HIT CONTINUE
- C. AC WILL DISPLAY LOCATION BEING TESTED
- D. HIT CONTINUE
- E. AC WILL DISPLAY CONTENTS OF LOCATION
- F. HIT CONTINUE
- G. AC WILL DISPLAY EXPECTED CONTENTS.
- H. SET SWITCH REGISTER FOR RECOVERY AS DESIRED ACCORDING TO 6.2.

PROGRAM SWAP OR PROGRAM RELOCATION ERRORS WILL HALT AT EITHER LOCATION 264 OR LOCATION 1264. THIS TYPE OF ERROR IS FATAL AND INDICATES THAT THE MOS RAM IS FAULTY AND THAT THE PROGRAM SHOULD NOT BE CONTINUED.

5.2 ERROR PRINTOUTS

THERE ARE NO ERROR PRINTOUTS

6. SWITCH REGISTER SETTINGS

IF YOU DO NOT HAVE A FRONT PANEL DEPOSIT THE DESIRED SWITCH REGISTER CONTENTS IN LOCATION 21 OF THE RANGE THE PROGRAM IS USING BY OS/8 ODT ETC. IF YOU DO HAVE A FRONT PANEL DEPOSIT 4000 IN LOCATION 21 OF THAT SAME 1K SEGMENT.

6.1 NORMAL OPERATING SWITCHES

SW3=0 RUN DIAGNOSTIC INDEFINITELY
SW3=1 HALT ON PASS COMPLETION

6.2 ERROR RELATED SWITCHES

SW0=0 HALT ON ERROR
SW0=1 INHIBIT ERROR HALT

SW1=0 DO NEXT LOCATION AFTER ERROR
SW1=1 LOOP ON ERROR

SW2=0 DO ALL 3 TESTS
SW2=1 LOOP ON TEST

7. REVISIONS

NONE

PROGRAM DESCRIPTION

THIS DIAGNOSTIC FITS IN 4 PAGES OF A 1K SEGMENT. IT WILL TEST THE UPPER 4 PAGES PLUS UP TO 3K OF RAM MEMORY ABOVE THE 1K SEGMENT. THEN THE PROGRAM RELOCATES TO THE UPPER 4 PAGES AND TESTS THE LOWER 4 PAGES PLUS UP TO 3K OF RAM MEMORY ABOVE. THE PROGRAM THEN RELOCATES BACK TO REPEAT THE CYCLE CONTINUOUSLY. THE MODIFIED RIM LOADER IN 4.2 LOADS THE DIAGNOSTIC INTO THE DESIRED 1K SEGMENT. THIS BECOMES THE LOWEST 1K SEGMENT TO BE TESTED. BEFORE RUNNING THE PROGRAM THE LAST ADDRESS TO BE TESTED IS DEPOSITED IN LOCATION 23. THE PROGRAM WRITES OVER THE RIM LOADER IN OPERATION, SO IT MUST BE TOGGLED IN AGAIN IF DESIRED AFTER THE PROGRAM RUNS 3 TESTS ON THE RAM MEMORY.

A. TEST1 ADDRESS SELECTION TEST

EACH LOCATION BEING TESTED HAS IT'S ADDRESS WRITTEN INTO IT'S SELF. THEY ARE THEN ALL TESTED SCANNING BACKWARDS. THEN SCANNING BACKWARDS EACH LOCATION HAS THE COMPLEMENT OF IT'S ADDRESS WRITTEN INTO ITSELF. THE MEMORY IS THEN TESTED SCANNING FORWARDS.

B. TEST2 FLOATING ONES AND ZEROS TEST

THROUGH EACH LOCATION BEING TESTED A WORD IS WRITTEN THEN TESTED. THE WORD CONSISTS OF THE TWELVE WAYS TO A 1 CAN BE FLOATED (FROM 1,2,4---4096) AND THE TWELVE WAYS A ZERO CAN BE FLOATED OR THE COMPLEMENT OF THE LAST 12 WORDS. THIS TEST CHECKS FOR INTRA-ADDRESS BIT SHORTS.

C. TEST3 WORST CASE DATA PATTERN TEST

1. WRITE WORST CASE DATA PATTERN THROUGH RAM AND TEST EACH LOCATION
2. REPEAT WITH COMPLEMENT OF PATTERN
3. VARY PATTERN AND CONTINUE AT STEP 1. AFTER A MAXIMUM OF 12 PATTERNS FALL OUT OF TEST. THE PATTERN WILL BE VARIED FROM X,X',X,X'... TO X,X,X',X',... TO X,X,X,X,X',X',X',X' TO ETC. THE LAST PATTERN IN THIS PROGRESSION WILL HAVE THE FIRST HALF OF THE RAM CONTAIN X AND THE REST CONTAIN X'. THE DEFAULT FOR THIS TEST IS X=2525 AND X'=5252.

D. ACT-8A CAPABILITY

ACT-8A HOOKS HAVE BEEN PROVIDED IN THE PROGRAM WHICH WILL REPLACE ALL ERROR HALTS WITH EXIT RETURNS TO HOST WHEN RUNNING PROGRAM ON THE ACT-8A SYSTEM.

E. CPU-XOR CAPABILITY

XOR HOOKS HAVE BEEN PROVIDED IN THE PROGRAM TO LOOP ON XOR ERRORS WHEN RUNNING ON THE CPU-XOR TESTER.

F. ACT-8E CAPABILITY

ACT-8E HOOKS HAVE BEEN PROVIDED IN THE PROGRAM TO ALLOW IT TO BE RUN ON THE ACT-8E SYSTEM.

9. FLOWCHARTS

NONE

10. PROGRAM LISTING

1950

Dear Mr. [Name],

I am writing to you regarding the [Topic]

As you know, the [Topic] is a very important [Topic]

I am sure that you will find this [Topic]

Very truly yours,

[Signature]

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/1-4K MSB-A MOS MEMORY TEST
 /MAINDEC-09-DJMSA-A-L
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      0010 *10
      7501 MQA=7501
      7421 MQL=7421
      7521 SWP=7521
      6170 XRON=6170
      6171 SKXR=6171
      6173 STIP=6173
      6176 XRTO=6176
      0010 0000 FLCPAT, 0 /TWO'S COMP. OF TEST PATTERN
      0011 7777 FLMCNT, -1
      0012 0000 LEMN2, 0
      0013 0777 K0777, 0777 /TEST PATTERN FOR TST2
      0014 0000 FLTPAT, 0
      0015 4000 FLPAT, 4000
      0016 7776 FLCNT, -2 /DO TWICE, ONCE WITH COMP.

      0020 *20
      0020 0000 SWR, 0
      0021 0000 OP1, 0
      0022 0000 OP2, 0
      0023 1777 MEMLM, 1777
    /
    /ROUTINE TO TEST EACH ADDRESS WITH FLOATING ONES AND ZEROS
    /
    TST2, 0
      200+ TAD I AMEMB2
      200+ DCA FLADR /BEGINNING ADDRESS
      200+ TAD I AMEMB2
      200+ TAD K0777
      200+ CMA
      200+ DCA LEMN2 /END OF FIRST SEGMENT ADDRESS
      200+ CMA
      200+ DCA FLMCNT
      200+ CLA CLL CMA RAL /TAD (-2)
      200+ DCA FLCNT
      200+ CLL CML RAR /TAD (4000)
      200+ DCA FLPAT /SAVE INITIAL PATTERN
      200+ TAD FLCNT
      200+ CLL CMA RAR /SET UP LINK FOR TEST,
      200+ TAD FLPAT
      MQL
      MQA
      CMA
      SNL /SKIP THE FIRST TIME AROUND,
      SWP /SWAPS PATTERN WITH COMPLEMENT
      200+ IAC
      200+ DCA FLCPAT /SAVE TWO'S COMP. OF TEST PATTERN,
      MQA
      200+ DCA FLTPAT /SAVE TEST PATTERN

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      0055 1214 FL2, 200+ TAD FLPAT
      0056 3754 200+ DCA I FLADR /STORE PATTERN IN LOC. TO BE TESTED.
      200+ TAD I FLADR
      200+ TAD FLCPAT
      200+ SNA CLA /WAS PATTERN STORED CORRECTLY?
      200+ JMP FL3
      200+ TAD FLPAT /SAVE EXPECTED PATTERN,
      MQL
      200+ TAD FLADR /SAVE CURRENT ADDRESS,
      200+ JMS I AERR2
      200+ JMP FL2 /ERROR RETRY RETURN,
      200+ JMS I AREPT2 /CHECK FOR XOR ERROR,
      200+ JMP TST2+1 /ERROR RETURN
      200+ TAD FLPAT
      200+ CLL RAR
      200+ DCA FLPAT /ROTATE PATTERN
      SNL /ARE WE OFF THE END?
      200+ JMP FL1 /NO DO NEXT PATTERN
      200+ ISZ FLCNT /RETEST ADDRESS WITH COMP. OF PATTERN?
      200+ JMP FL0
      200+ ISZ FLADR /BUMP ADDRESS POINTER
      200+ TAD FLADR
      200+ AND (377)
      200+ SNA CLA
      200+ JMS I AREPT2 /IT IS TIME TO REPORT TO AUTO ACCEPTANCE
      200+ TAD FLADR
      200+ TAD LEMN2
      200+ SZA CLA /IS SEGMENT FINISHED?
      200+ JMP FL0 /NO DO NEXT ADDRESS
      200+ ISZ FLMCNT /SKIP IF FIRST SEGMENT,
      200+ JMP FL4
      200+ TAD I AFLIP2
      SPA /IS THERE A GAP TO CROSS?
      CLA /DO NOT SKIP A 1000 WORD GAP.
      200+ TAD FLADR
      200+ DCA FLADR
      200+ TAD I AMEMB2
      200+ CMA
      200+ DCA LEMN2 /SET TO END OF SECOND SEGMENT
      200+ JMP FL35
      200+ JMS MYLAS /GET SWR
      RTL
      SPA CLA /LOOP ON TEST?
      200+ JMP TST2+1
      200+ JMP I TST2 /RETJRN
    /
    /ROUTINE TO GET SWR INTO AC
    MYLAS, 0
      200+ TAD OP1 /GET OPTIONS
      SPA CLA /SKIP ON NO FRONT PANEL
      200+ JMP +3
      200+ TAD SWR /GET PSEUDO SWR

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111 0137 5732
112 0140 7404
113 0141 5732
114
115
116
117
118
119 0142 0000
120 0143 7240
121 0144 3763
122 0145 1755
123 0146 1213
124 0147 7040
125 0150 3762
126 0151 1755
127 0152 3761
128 0153 5742
129 0154 0000
130
131 0155 0351
132 0156 0023
133 0157 0355
134 0160 0731
135 0161 0761
136 0162 0756
137 0163 0757
138 0164 0334
139 0165 0000
140
141 0200
142 0203 5206
143 0201 6170
144 0202 6173
145 0203 5201
146 0204 7344
147 0205 3353
148 0206 4207
149 0207 7402
150 0210 1355
151 0211 0207
152 0212 3207
153 0213 1207
154 0214 1377
155 0215 3341
156 0216 1741
157 0217 1207
158 0220 3350
159 0221 1750
160 0222 7450
161 0223 5231
162 0224 0354
163 0225 1207
164 0226 3750
165 0227 2350

/Routine to initialize for beginning of pass for TST3
/
MINT3, 0
          CLA CMA
          DCA I ANSMCT /SET UP TO PASS TWICE THROUGH MSET3
          TAD I AMEMB2
          TAD K0777
          CMA
          DCA I ALEMN /SET TO END OF FIRST SEGMENT,
          TAD I AMEMB2
          DCA I ANSADR /SET TO BEGINNING OF SEGMENT,
          JMP I MINT3
FLADR, 0
/RELOCATABLE CONSTANTS
AMEMB2, MEMBG /START ADDRESS OF MEMORY
AMEML2, MEMLM
AFLIP2, FLIPCN
AERR2, ERR
ANSADR, NSADR
ALEMN, LEMN
ANSMCT, NSMCNT
AREPT2, REPT
          0
          /END RELOCATABLE CONSTANTS
*200
START, JMP ,+6 /FIRST XRON
          XRON
          STIP
          JMP ,=2 /LOOP UNTIL READY
          CLA CMA CLL RAL /TAD -2
          DCA XCNT
          JMS RELOC
RELOC, HLT /WILL CONTAIN IT'S ADRESS
          TAD FLIPCN
          AND RELOC
          DCA RELOC /SAVE ORIGIN
REL0, TAD RELOC
          TAD (LNK0)
          DCA LNKPOS /POINT TO PAGE ZERO TABLE
REL1, TAD I LNKPOS
          TAD RELOC
          DCA LNKIDX /POINT TO FIRST ENTRY IN TABLE
REL2, TAD I LNKIDX /GET TAG
          SNA
          JMP REL3 /IF ZERO DO NEXT PAGE
          AND RELAN /MAKE RELATIVE TO LOC 0
          TAD RELOC
          DCA I LNKIDX /FIX TAG
          ISZ LNKIDX /BUMP TAG POINTER

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166 0230 5221
167 0231 2341
168 0232 1341
169 0233 7041
170 0234 1357
171 0235 7640
172 0236 5216
173 0237 5771
174 0240 1355
175 0241 7041
176 0242 1207
177 0243 3351
178 0244 4762
179 0245 4763
180 0246 4764
181 0247 1355
182 0250 7041
183 0251 3355
184 0252 1207
185 0253 3352
186 0254 1351
187 0255 3207
188 0256 1752
189 0257 3751
190 0260 1752
191 0261 7041
192 0262 1751
193 0263 7640
194 0264 7402
195 0265 2352
196 0266 2351
197 0267 1352
198 0270 0376
199 0271 7640
200 0272 5256
201 0273 1355
202 0274 7700
203 0275 5306
204 0276 4760
205 0277 0375
206 0300 7640
207 0301 7402
208 0302 6170
209 0303 2756
210 0304 5306
211 0305 5767
212 0306 1374
213 0307 1207
214 0310 3352
215 0311 5752
216
217
218 0312 0000
219 0313 3352
220 0314 2766

REL3, JMP REL2 /DO NEXT TAG ON PAGE
          ISZ LNKPOS //BUMP PAGE TABLE POINTER
          TAD LNKPOS
          CIA
          TAD ALEND
          SZA CLA /ARE ALL 4 PAGES DONE?
          JMP REL1 /DO NEXT PAGE,
GINT, JMP I AINT /DO INITIALIZATION CODE,
          TAD FLIPCN
          CIA
          TAD RELOC
          DCA MEMBG /SAVE MEMORY TEST BEGIN
          JMS I ATST1
          JMS I ATST2
          JMS I ATST3
          TAD FLIPCN
          CIA
          DCA FLIPCN /SET UP TO FLIP PROGRAM LATER,
          TAD RELOC
          DCA RTEMP
          TAD MEMBG
          DCA RELOC /SET UP NEW ORIGIN
          TAD I RTEMP
          DCA I MEMBG
          TAD I RTEMP
          CIA
          TAD I MEMBG
          SZA CLA /IS INSTRUCTION CORRECT?
          HLT /ERROR IN RELOCATING,
          ISZ RTEMP
          ISZ MEMBG
          TAD RTEMP
          AND (0777)
          SZA CLA /IS ALL CODE MOVED?
          JMP FLIP
          TAD FLIPCN
          SZA CLA /SKIP IF FULL PASS COMPLETED
          JMP SWCH
          JMS I AMYLAS /GET SWR
          AND (400) /HALT AT END OF PASS?
          SZA CLA
          HLT
X1, XRON /SECOND OR THIRD XRON FOR XOR,
          ISZ I AXCNT1
          JMP SWCH
          CT1, JMP I AOFF /DISABLE MODULE UNDER TEST
          SWCH, TAD (RELOC)
          TAD RELOC
          DCA RTEMP
          JMP I RTEMP /FLIP PROGRAM
MSET1, 0
          DCA RTEMP
          ISZ I ASEMCH /SAVE DIRECTION OF SCAN
          /FALL OUT ON THIRD PASS

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201	0315	5712	JMP I	MSET1	
202	0316	1355	TAD	FLIPCN	
203	0317	7510	SPA		
204	0320	7200	CLA		
225	0321	2352	ISZ	RTEMP	
226	0322	7041	CIA		
227	0323	1765	TAD I	ASELDR	
228	0324	3765	DCA I	ASELDR	
229	0325	7501	YQA		
230	0326	7041	CIA		
231	0327	3761	DCA I	ALEMN1	
232	0330	1312	TAD	MSET1	
233	0331	1373	TAD	(-14)	
234	0332	3352	DCA	RTEMP	
235	0333	5752	JMP I	RTEMP	
236					
237					
238	0334	0000	REPT,	0	
239	0335	6171	SKXR		/SKIP ON XOR ERROR,
240	0336	2334	ISZ	REPT	
241	0337	5734	JMP I	REPT	
242	0340	5734	JMP I	REPT	/FOR AUTO ACCEPTANCE,
243					
244	0341	0000	LNKPOS,	0	/POINTS TO A PAGE TABLE POINTER
245	0342	0155	LNK0,	AMEMB2	/PAGE 0 TABLE START
246	0343	0356	LNK1,	AXCNT1	/PAGE 1 TABLE START
247	0344	0565	LNK2,	AF-IP1	/PAGE 2 TABLE START
248	0345	0766	LNK3,	AMEMB3	/PAGE 3 TABLE START
249	0346	1126	LNK4,	AMA1	/PAGE 4 TABLE START
250	0347	1257	LNK5,	AA-END	/PAGE 5 TABLE START
251	0350	0000	LNKIDX,	0	/INDIVIDUAL TABLE POINTER
252	0351	0000	MEMBG,	0	/BEG. OF MEMORY FOR TEST
253	0352	0000	RTEMP,	0	
254	0353	0000	XCNT,	0	/XOR COUNTER,
255	0354	1777	RELAN,	1777	/RELOCATION MASK
256	0355	7000	FLIPCN,	-1000	/CONSTANT TO FLIP PROGRAM,
257					/THESE CONSTANTS WILL BE RELOCATED
258					
259	0356	0353	AXCNT1,	XCNT	
260	0357	0350	ALEND,	LNK5+1	
261	0360	0132	AMYLAS,	MY-LAS	/ADRES OF ROUTINE TO GET SWR
262	0361	0564	ALEMN1,	LEMN1	
263	0362	0400	ATST1,	TST1	/ADRES SELECTION TEST,
264	0363	0024	ATST2,	TST2	/FLOATING ONES AND ZEROS TEST,
265	0364	0600	ATST3,	TST3	/DATA TEST,
266	0365	0554	ASELDR,	SE-ADR	
267	0366	0562	ASEMCZ,	SEMCNT	
268	0367	0544	AOFF,	OFF	
269	0370	0731	AERR,	ERR	
270	0371	1000	AINTE,	INT	
271	0372	0000		0	/END OF RELOCATABLE CONSTANTS
272	0373	7764			
273	0374	0213			
274	0375	0400			
275	0376	0777			

276	0377	0342			
		0400			
277					
278					
279	0400	0000	TST1,	0	
280	0401	7344	CLA CMA	CLL RAL	/TAD(-2)
281	0402	3357	DCA	SELCNT	
282	0403	1377	TAD	(NOP)	
283	0404	3226	DCA	SWL1	
284	0405	1341	TAD	LCIA	
285	0406	3251	DCA	SWL2	
286	0407	1772	TAD I	AMEMB1	
287	0410	3355	DCA	SELOP1	/SAVE BEGIN ADRES
288	0411	1766	TAD I	AMEML1	
289	0412	3356	DCA	SELOP2	/SAVE END ADRES
290	0413	7001	LIAC,	IAC	
291	0414	3360	DCA	SELINC	/INIT, INC,
292	0415	7040	LCMA,	CMA	
293	0416	3361	DCA	SELDEC	/INIT, DECR,
294	0417	1226	SEL0,	TAD	SWL1
295	0420	3256	DCA	SWL3	
296	0421	1355	TAD	SELOP1	
297	0422	3354	DCA	SELADR	/SAVE BEG, ADRES
298	0423	1360	TAD	SELINC	
299	0424	4325	JMS	MINT1	
300	0425	1354	SEL1,	TAD	SELADR
301	0426	7402	SWL1,	HLT	
302	0427	3754	DCA I	SELADR	/STORE ADRES IN SELF
303	0430	4774	JMS I	AREPT1	/CHECK FOR XOR ERROR,
304	0431	5201	JMP	TST1+1	/ERROR RETURN,
305	0432	1354	TAD	SELADR	
306	0433	1364	TAD	LEMN1	
307	0434	7650	SNA CLA		/IS FIRST SEGMENT FINISHED?
308	0435	5242	JMP	SEL15	
309	0436	1354	TAD	SELADR	
310	0437	1360	TAD	SELINC	
311	0440	3354	DCA	SELADR	/BUMP ADRES
312	0441	5225	JMP	SEL1	
313	0442	1356	SEL15,	TAD	SELOP2
314	0443	7421	MQL		
315	0444	1361	TAD	SELDEC	
316	0445	4771	JMS I	AMSET1	/BUMP LEMN
317	0446	1361	TAD	SELDEC	
318	0447	4325	JMS	MINT1	
319	0450	1754	SEL3,	TAD I	SELADR
320	0451	7402	SWL2,	HLT	
321	0452	1354	TAD	SELADR	
322	0453	7650	SNA CLA		/IS THERE AN ERROR
323	0454	5263	JMP	SEL35	/SAVE EXPECTED PATTERN
324	0455	1354	TAD	SELADR	
325	0456	7402	SWL3,	HLT	
326	0457	7421	MQL		
327	0460	1354	TAD	SELADR	/SAVE CURRENT ADRES
328	0461	4767	JMS I	AERR1	
329	0462	5250	JMP	SEL3	/ERROR RETRY ADRES

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330 0463 4774 SEL35, JMS I AREPT1 /CHECK FOR XOR ERROR,
331 0464 5201 JMP TST1+1 /ERROR RETURN,
332 0465 1354 TAJ SELADR
333 0466 1364 TAJ LEMN1
334 0467 7650 SNA CLA /IS FIRST SEGMENT FINISHED?
335 0470 5275 JMP SEL4
336 0471 1354 TAJ SELADR
337 0472 1361 TAJ SELDEC
338 0473 3354 DCA SELADR /BUMP ADDRESS
339 0474 5250 JMP SEL3
340 0475 1355 SEL4, TAJ SELOP1
341 0476 7421 MQL
342 0477 1360 TAJ SELINC
343 0500 4771 JMS I AMSET1 /BUMP LEMN1
344 0501 7201 CLA IAC /TAD(1)
345 0502 3361 DCA SELDEC /SCAN IN OPP. DIRECTION
346 0503 7240 CLA CMA /TAD(*1)
347 0504 3360 DCA SELINC /SCAN IN OPP. DIRECTION
348 0505 1215 TAJ LCMA
349 0506 3226 DCA SWL1
350 0507 1213 TAJ LIAC
351 0510 3251 DCA SWL2
352 0511 1766 TAJ I AMEML1
353 0512 3355 DCA SELOP1
354 0513 1772 TAJ I AMEMB1
355 0514 3356 DCA SELOP2 /SWAP END POINTS,
356 0515 2357 ISZ SELCNT
357 0516 5217 JMP SEL0 /DO TEST IN OPP. DIRECTION
358 0517 4774 MA1, JMS I AREPT1 /TIME TO REPORT IN A GOOD PASS.
359
360 0520 4770 JMS I AMLAS1 /GET SWR
361 0521 7006 RT_
362 0522 7710 SPA CLA /LOOP ON TEST?
363 0523 5201 JMP TST1+1
364 0524 5600 JMP I TST1 /RETURN
365 /
366
367 /ROUTINE TO SET LOCAL END OF SEGMENT POINTER
368 /
369 /ROUTINE TO INITIALIZE FOR TST1
370 /
371
372 0525 0000 MINT1, 0
373 0526 3363 DCA TMP2
374 0527 7240 MK1, CLA CMA
375 0530 3362 DCA SEMCNT
376 0531 2363 ISZ TMP2
377 0532 5337 JMP MNT2
378 0533 1765 MK2, TAJ I AFLIP1
379 0534 7510 SPA
380 0535 7200 CLA
381 0536 7001 IAC
382 0537 1353 MNT2, TAJ K0777A
383 0540 1772 TAJ I AMEMB1
384 0541 7041 LCIA, CIA

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385 0542 3364 DCA LEMN1
386 0543 5725 JMP I MINT1
387 /
388
389 /ISSUE TIMEOUT FOR XOR AND EXIT.
390
391 0544 1776 OFF, TAJ I (START+1)
392 0545 1773 TAJ I ARELOC /RELOCATE START POINTER,
393 0546 3363 DCA TMP2
394 0547 6176 XRTO /TIMEOUT
395 0551 6173 STIP
396 0551 5763 JMP I TMP2 /DO NEXT MODULE,
397 0552 5354 JMP .+2 /WAIT TILL MODULE IS OFF.
398
399 /CONSTANTS
400
401 0553 0777 K0777A, 0777
402 0554 0000 SELADR, 0 /CURRENT ADDRESS IN TST1,
403 0555 0000 SELOP1, 0 /DELIMITS SCAN RANGE
404 0556 0000 SELOP2, 0 /DELIMITS SCAN RANGE
405 0557 7776 SELCNT, -2 /DO TEST TWICE ,ONCE IN EACH DIRECTION,
406 0560 0001 SELINC, 1
407 0561 7777 SELDEC, -1
408 0562 0000 SEMCNT, 0
409 0563 0000 TMP2, 0 /TEMPORARY
410 0564 0000 LEMN1, 0 /LOCAL END OF MEMORY,
411
412 /RELOCATABLE CONSTANTS
413
414 0565 0355 AFLIP1, FLIPCN
415 0566 0023 AMEML1, MEMLM
416 0567 0731 AERR1, ERR
417 0570 0132 AMLAS1, MYLAS
418 0571 0312 AMSET1, MSET1
419 0572 0351 AMEMB1, MEMBG /BEGIN ADDRESS
420 0573 0207 ARELOC, RELOC
421 0574 0334 AREPT1, REPT
422 0575 0000 0 /END OF CONSTANTS
423
424 0576 0201
425 0577 7000
426 0600
427 /THIS ROUTINE CHECKS FOR INTER-ADDRESS DATA BIT SHORTS
428 / AND ATTEMPTS TO SET UP A WORST CASE DATA PATTERN
429
430 0600 0000 TST3, 0
431 0601 7301 CLA CLL IAC /TAD (1)
432 0602 3362 DCA NSMASK /INITIAL MASK
433 0603 7344 NS0, CLA CLL CMA RAL /TAD (-2)
434 0604 3360 DCA NSCNT
435 0605 1363 NS1, TAJ NSPAT1
436 0606 7104 CLL RAL
437 0607 7001 IAC
438 0610 3364 DCA NSPAT2 /SET UP COMPLEMENT
439 0611 1363 TAJ NSPAT1

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439 0612 7040 CMA
440 0613 3363 DCA NSPAT1
441 0614 4772 JMS I AMINT3
442 0615 1361 NS2, TAJ NSADR
443 0616 3362 ANJ NSMASK
444 0617 7640 SZA CLA /CHOOSE NSPAT1 OR NSPAT2 + NSPAT1
445 0620 1364 TAJ NSPAT2
446 0621 1363 TAJ NSPAT1
447 0622 3761 DCA I NSADR /STORE CHOSEN WORD
448 0623 4773 NSX1, JMS I AREPT3 /CHECK FOR XOR ERROR,
449 0624 5601 JMP I TST3+1 /ERROR RETURN,
450 0625 2361 ISZ NSADR
451 0626 1361 NS3, TAJ NSADR
452 0627 1356 TAJ LEMN
453 0630 7640 SZA CLA /ARE WE AT THE END?
454 0631 5215 JMP NS2
455 0632 4313 JMS MSET3
456 0633 5226 JMP NS3 /DO NEXT ADR
457 0634 4772 JMS I AMINT3
458 0635 1361 NS4, TAJ NSADR
459 0636 3362 ANJ NSMASK
460 0637 7640 SZA CLA /CHOOSE COMP. OF PATTERN
461 0640 1364 TAJ NSPAT2
462 0641 1363 TAJ NSPAT1
463 0642 7041 CIA
464 0643 1761 TAJ I NSADR
465 0644 7650 SNA CLA /IS IT CORRECT?
466 0645 5257 JMP NS5
467 0646 1361 TAJ NSADR
468 0647 3362 ANJ NSMASK
469 0650 7640 SZA CLA /CHOOSE PAT.
470 0651 1364 TAJ NSPAT2
471 0652 1363 TAJ NSPAT1
472 0653 7421 MQL /SAVE EXPECTED PAT,
473 0654 1361 TAJ NSADR /SAVE CURRENT ADDRESS,
474 0655 4331 JMS ERR
475 0656 5235 JMP NS4 /ERROR RETRY RETURN,
476 0657 4773 NS5, JMS I AREPT3 /CHECK FOR XOR ERROR,
477 0660 5201 JMP I TST3+1
478 0661 2361 ISZ NSADR
479 0662 1361 NS6, TAJ NSADR
480 0663 1356 TAJ LEMN
481 0664 7640 SZA CLA /ARE WE AT THE END?
482 0665 5235 JMP NS4
483 0666 4313 JMS MSET3
484 0667 5262 JMP NS6
485 0670 2360 ISZ NSCNT /DO TWICE
486 0671 5205 JMP NS1
487 0672 1766 TAJ I AMEMB3
488 0673 7041 CIA
489 0674 1767 TAJ I AMEML3
490 0675 7170 CLL CML CMA RAR /DIVIDE BY *2
491 0676 1362 TAJ NSMASK
492 0677 7700 SMA CLA
493 0700 5336 JMP NS7

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494 0701 1362 TAJ NSMASK
495 0702 7104 RA CLL /ROTATE MASK
496 0703 3362 DCA NSMASK
497 0704 4773 MA3, JMS I AREPT3 /REPORT A GOOD PASS TO AUTO ACCEPTANCE,
498 0705 5203 JMP NS0
499 0706 4770 NS7, JMS I AMLAS3
500 0707 7006 RTL
501 0710 7710 SPA CLA /LOOP ON TEST?
502 0711 5201 JMP TST3+1
503 0712 5600 JMP I TST3
504 /
505 /ROUTINE TO BRIDGE GAP IN MEMORY FOR TST3
506 /
507 0713 0000 MSET3, 0
508 0714 2357 ISZ NSMCNT
509 0715 5327 JMP MS31
510 0716 1771 TAJ I AFLIP3
511 0717 7510 SPA
512 0720 7200 CLA
513 0721 1361 TAJ NSADR
514 0722 3361 DCA NSADR
515 0723 1767 TAJ I AMEML3
516 0724 7040 CMA
517 0725 3356 DCA LEMN
518 0726 5713 JMP I MSET3
519 0727 2313 MS31, ISZ MSET3
520 0730 5713 JMP I MSET3
521 /
522 /ERROR REPORTER ROUTINE
523 /
524 0731 0000 ERR, 0
525 0732 3365 DCA ERRTMP /SAVE CURRENT ADDRESS
526 0733 4770 JMS I AMLAS3 /GET SWR
527 0734 7710 SPA CLA /INHIBIT ERROR HALT?
528 0735 5351 JMP ERR1
529 0736 1331 TAJ ERR
530 0737 7402 HLT /DISPLAY PC
531 0740 7200 CLA
532 0741 1365 TAJ ERRTMP
533 0742 7402 HLT /DISPLAY CURRENT ADDRESS
534 0743 7200 CLA
535 0744 1765 TAJ I ERRTMP /DISPLAY CONTENTS OF CURRENT ADDRESS
536 0745 7402 HLT
537 0746 7701 CLA MQA
538 0747 7402 HLT /DISPLAY EXPECTED CONTENTS
539 0750 7200 CLA
540 0751 4770 ERR1, JMS I AMLAS3
541 0752 7004 RA
542 0753 7700 SMA CLA /LOOP ON ERROR?
543 0754 2331 ISZ ERR
544 0755 5731 JMP I ERR
545 /
546 /CONSTANTS
547 /
548 0756 0000 LEMN, 0 /LOCAL END OF MEMORY

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549 0757 7777 NSMCNT, -1
550 0760 7776 NSCNT, -2
551 0761 0000 NSADR, 0
552 0762 0000 NSMASK, 0
553 0763 2525 NSPAT1, 2525
554 0764 2525 NSPAT2, 2525
555 0765 0000 ERRTMP, 0
556
557 /RELOCATABLE CONSTANTS
558 0766 0351 AMEMB3, MEMBG
559 0767 0023 AMEML3, MEMLM
560 0770 0132 AMLAS3, MYLAS
561 0771 0355 AFLIP3, FLIPCN
562 0772 0142 AMINT3, MINT3
563 0773 0334 AREPT3, REPT
564 0774 0000
565 1000
566 *1000
567 /THIS CODE IS FOR INITIALIZATION OF LOCATION 23 FOR AUTO-ACCEPTANCE
568 /FROM MEMORY SIZE IN LOCATION 21 AND THE INSTRUCTION FIELD.
569
570 1000 1751 INT, TAD I AOP2
571 1001 7700 SMA CLA
572 1002 5254 JMP NAUTO
573 1003 1750 TAD I AOP1
574 1004 0377 AND (37)
575 1005 3352 DCA I TMP
576 1006 6224 RIF
577 1007 7110 CLL RAR
578 1010 7041 CIA
579 1011 1352 TAD I TMP
580 1012 3352 DCA I TMP
581 1013 1352 TAD I TMP
582 1014 0376 AND (34)
583 1015 7650 SNA CLA
584 1016 5221 JMP ,+3
585 1017 7325 CLA CLL CML IAC RAL
586 1020 7410 SKP
587 1021 1352 TAD I TMP
588 1022 7110 CLL RAR
589 1023 7012 RTI
590 1024 1375 TAD (1777)
591 1025 3746 DCA I AMEML4
592
593 /SET UP ROJINE TO REPORT A GOOD PASS.
594
595
596 1026 1374 TAD (CIF 70)
597 1027 3740 DCA I AREPT4
598 1030 2340 ISZ AREPT4
599 1031 1373 TAD (REPT&177+4603) /JMS I REPT+3
600 1032 3740 DCA I AREPT4
601 1033 2340 ISZ AREPT4
602 1034 1372 TAD (6900)
603 1035 3740 DCA I AREPT4

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604 1036 1371 TAD (ERR&177+1200)
605 1037 3744 DCA I AERR4
606 1040 2344 ISZ AERR4
607 1041 1374 TAD (CIF 70)
608 1042 3744 DCA I AERR4
609 1043 2344 ISZ AERR4
610 1044 1370 TAD (ERR&177+5605) /JMP I ERR+5
611 1045 3744 DCA I AERR4
612 1046 2344 ISZ AERR4
613 1047 1367 TAD (6920)
614 1050 3744 DCA I AERR4
615 1051 1366 TAD (AERR&177+4600)
616 1052 3736 DCA I ARLERR
617
618 1053 5262 JMP CHXXOR
619 1054 1365 NAUTO, TAD (NOP)
620 1055 3726 DCA I AMA1
621 1056 1364 TAD (FL35&177+9200) /JMP FL35
622 1057 3727 DCA I AMA2
623 1060 1365 TAD (NOP)
624 1061 3730 DCA I AMA3
625 1062 1747 CHXXOR, TAD I AXCNT
626 1063 7640 SEA CLA
627 1064 5301 JMP LFIX
628 1065 1363 TAD (SKP)
629 1066 3731 DCA I AX1
630 1067 1363 TAD (SKP)
631 1070 3732 DCA I AFL3
632 1071 1363 TAD (SKP)
633 1072 3733 DCA I ASLX1
634 1073 1363 TAD (SKP)
635 1074 3741 DCA I ASEL35
636 1075 1363 TAD (SKP)
637 1076 3742 DCA I ANSX1
638 1077 1363 TAD (SKP)
639 1100 3743 DCA I ANS5
640
641 /CHECK IF ONLY 1K OF MEMORY IS PRESENT AND FIX MINT1 IF NECESSARY,
642
643 1101 7331 LFIX, CLA CLL CML IAC RAR
644 1102 0745 AND I AMEMB4
645 1103 1375 TAD (1777)
646 1104 7041 CIA
647 1105 1746 TAD I AMEML4
648 1106 7640 SEA CLA
649 1107 5325 JMP
650 1110 1365 TAD (NOP)
651 1111 3734 DCA I AMK1
652 1112 1362 TAD (AMEMB1&177+1600)
653 1113 3735 DCA I AMK2
654 1114 2335 ISZ AMK2
655 1115 1361 TAD (K0777A&177+1200)
656 1116 3735 DCA I AMK2
657 1117 2335 ISZ AMK2
658 1120 1360 TAD (SELADR&177+3200)

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659 1121 3735 DCA I AMK2
660 1122 2335 ISZ AMK2
661 1123 1363 TAD (SKP)
662 1124 3735 DCA I AMK2
663
664
665
666 1125 5737 NXINT, JMP I AINT2 /JMP TO NEXT INITIALIZATION PAGE
667
668
669 /RELOCATABLE CONSTANTS START HERE.
670
671 1126 0517 AMA1, MA1
672 1127 0105 AMA2, MA2
673 1130 0704 AMA3, MA3
674 1131 0302 AX1, X1
675 1132 0070 AFL3, FL3
676 1133 0430 ASLX1, SLX1
677 1134 0527 AMK1, MK1
678 1135 0533 AMK2, MK2
679 1136 0264 ARLERR, RLERR
680 1137 1200 AINT2, INT2
681 1140 0335 AREPT4, REPT+1
682 1141 0463 ASEL35, SEL35
683 1142 0623 ANSX1, VSX1
684 1143 0657 ANS5, VS5
685 1144 0733 AERR4, ERR+2
686 1145 0351 AMEMB4, MEMBG
687 1146 0023 AMEML4, MEMLM
688 1147 0353 AXCNT, XCNT
689 1150 0021 AOP1, OP1
690 1151 0022 AOP2, OP2
691 1152 0000 ITMP, 0
692 1160 3354
693 1161 1353
694 1162 1772
695 1163 7410
696 1164 5306
697 1165 7000
698 1166 4770
699 1167 6520
700 1170 5736
701 1171 1331
702 1172 6500
703 1173 4737
704 1174 6272
705 1175 1777
706 1176 0034
707 1177 0037
708 1200
709
710
711
712 1200 1660 INT2, TAD I AOP2B

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*1200
 /THIS PAGE IS THE INITIALIZATION THAT DID NOT FIT ON THE LAST PAGE.
 /IT SETS UP THE ACT 8/E HOOKS AND CUTS THE UMBILICAL CORD BETWEEN
 / THESE TWO PAGES AND THE MAIN CODE

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713 1201 7004 RA
714 1202 7700 SMA CLA /SKIP IF ACT 8/E
715 1203 5233 JMP NFIX
716 1204 1660 TAD I AOP2B
717 1205 7006 RTL
718 1206 7700 SMA CLA /SKIP ON QUICK VERIFY
719 1207 1377 TAD (-33) /10 MINUTES RUN TIME
720 1210 1376 TAD (-1) /ONE PASS FOR G.V.
721 1211 3661 DCA I AXCNT5 /SET UP ISZ LOOP
722 1212 1375 TAD (NOP)
723 1213 3663 DCA I AX1B
724 1214 7040 CMA /TAD (7777)
725 1215 3664 DCA I AMEML5 /SET UP FOR 4K OF MEMORY
726 1216 1270 TAD ADONE
727 1217 3665 DCA I AAOFF /SET UP COMPLETION RETURN TO ACT 8/E
728 1220 1374 TAD (AERR&177+4600) /TAD (JMS I AERR)
729 1221 3671 DCA I ARLERS /REPORT TO ACT 8/E RELOC. ERR.
730
731
732 /MOVE IN CODE FOR ACT8/E ERROR REPORTER AND COMPLETION RETRN
733
734 1222 1666 ACLOOP, TAD I ACT8E /GET INSTRUCTION
735 1223 3672 DCA I AERR5 /MOVE IT IN PLACE
736 1224 2272 ISZ AERR5 /BUMP POINTERS
737 1225 2266 ISZ ACT8E
738 1226 1266 TAD ACT8E
739 1227 7041 CIA
740 1230 1267 TAD ACTND
741 1231 7640 SZA CLA /ARE ALL INSTRUCTIONS MOVED?
742 1232 5222 JMP ACLOOP
743
744
745 /REMOVE THESE PAGES FROM PAGE RELOCATION TABLE BEFORE
746 / THIS PAGE GOES BYE BYE.
747
748 1233 7344 NFIX, CLA CLL CMA RAL /TAD (-2)
749 1234 1657 TAD I AALEND
750 1235 3657 DCA I AALEND
751 1236 1375 TAD (NOP)
752 1237 3673 DCA I AGINT /REMOVE JMP TO THIS PAGE.
753 1240 1373 TAD (0777)
754 1241 3674 DCA I ARELAN /FIX UP MASK FOR SWAPING
755 1242 2662 ISZ I ALNK1 /DO NOT RELOCATE AXCNT1 ANY MORE.
756 1243 5673 JMP I AGINT /RETURN
757
758
759 /THE FOLLOWING IS CODE TO BE MOVED IN FOR ACT 8/E ERROR
760 / REPORTER AND COMPLETION RETURN HOOKS.
761
762 1244 6731 CT8E, 6731 /SET DIAGNOSTIC ERROR
763 1245 7410 SKP
764 1246 6734 6734 /SET PROGRAM DONE
765 1247 7240 CLA CMA /TAD (7777)
766 1250 3003 3003 /DCA 3
767 1251 7240 CLA CMA

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4000
4100

4200
4300

4400
4500

4600
4700

5000
5100

5200
5300

5400
5500

5600
5700

6000
6100

6200
6300

6400
6500

6600
6700

7000
7100

7200
7300

7400
00

7600
7700

AALEND	1257	AREPT1	0574	LNK0	0342	RLI	0256
AAOFF	1265	AREPT2	0164	LNK1	0343	RLERR	0264
ACLOOP	1222	AREPT3	0773	LNK2	0344	RTEMP	0352
ACT0E	1266	AREPT4	1140	LNK3	0345	RUN	0244
ACTND	1267	ARLER5	1271	LNK4	0346	SEL0	0417
ADONE	1270	ARLERR	1136	LNK5	0347	SEL1	0425
AERR	0370	ASEL35	1141	LNKIDX	0350	SEL15	0442
AERR1	0567	ASELDR	0365	LNKPOS	0341	SEL3	0450
AERR2	0160	ASEMCZ	0366	MA1	0517	SEL35	0463
AERR4	1144	AS_LX1	1133	MA2	0105	SEL4	0475
AERR5	1272	ATST1	0362	MA3	0704	SELAOR	0554
AFL3	1132	ATST2	0363	MEMBG	0351	SELCNT	0557
AFLIP1	0565	ATST3	0364	MEMLM	0023	SELDEC	0561
AFLIP2	0157	AX1	1131	MINT1	0525	SELINC	0560
AFLIP3	0771	AX1B	1263	MINT3	0142	SELOP1	0555
AGINT	1273	AXCNT	1147	MK1	0527	SELOP2	0556
AINT	0371	AXCNT1	0356	MK2	0533	SEMCNT	0562
AINT2	1137	AXCNT5	1261	MNT2	0537	SKXR	6171
ALEMN	0162	CHXOR	1062	HQA	7501	SLX1	0430
ALEMN1	0361	CT1	0305	HQL	7421	START	0200
ALEND	0357	CTBE	1244	MS31	0727	STIP	6173
ALNK1	1262	CTND	1256	MSET1	0312	SWL1	0426
AMA1	1126	ERR	0731	MSET3	0743	SWL2	0451
AMA2	1127	ERR1	0751	MYLAS	0132	SWL3	0456
AMA3	1130	ERRTMP	0765	NAUTO	1054	SWP	7521
AMEMB1	0572	FL0	0037	NFIX	1233	SWR	0020
AMEMB2	0155	FL00	0035	NS0	0603	SWTCH	0306
AMEMB3	0766	FL1	0041	NS1	0605	TMP2	0563
AMEMB4	1145	FL2	0055	NS2	0615	TSF1	0400
AMEML1	0566	FL3	0070	NS3	0626	TSF2	0024
AMEML2	0156	FL35	0106	NS4	0635	TSF3	0600
AMEML3	0767	FL4	0125	NS5	0657	X1	0302
AMEML4	1146	FLADR	0154	NS6	0662	XCNT	0353
AMEML5	1264	FLCNT	0016	NS7	0706	XRON	6170
AMINT3	0772	FLCPAT	0010	NSADR	0761	XRT0	6176
AMK1	1134	FLIPCN	0355	NSCNT	0760		
AMK2	1135	FLVCNT	0011	NSMASK	0762		
AMLAS1	0570	FLPAT	0015	NSMCNT	0757		
AMLAS3	0770	FLTPAT	0014	NSPAT1	0763		
AMLAS5	1275	GINT	0237	NSPAT2	0764		
AMSET1	0571	INT	1000	NSX1	0623		
AMYLAS	0360	INT2	1200	NXINT	1125		
ANS5	1143	ITMP	1152	OFF	0544		
ANSADR	0161	K0777	0013	OP1	0021		
ANSMCT	0163	K0777A	0553	OP2	0022		
ANSX1	1142	LCIA	0541	REL0	0213		
AOFF	0367	LC4A	0415	REL1	0216		
AOP1	1150	LEMN	0756	REL2	0221		
AOP2	1151	LEMN1	0564	REL3	0231		
AOP2B	1260	LEMN2	0012	RELAN	0354		
ARELAN	1274	LFIK	1101	RELOC	0207		
ARELOC	0573	LIAC	0413	REPT	0334		

ERRORS DETECTED: 0
 LINKS GENERATED: 0
 RUN-TIME: 5 SECONDS
 3K CORE USED

AALEND	252	749	750	776#					
AAOFF	727	782#							
ACLOOP	734#	742							
ACT8E	734	737	738	783#					
ACTND	743	784#							
ADONE	726	785#							
AERR	269#	615	728						
AERR1	328	416#							
AERR2	66	134#							
AERR4	605	606	608	609	611	612	614	685#	
AERR5	735	736	787#						
AFL3	631	675#							
AFLIP1	247	378	414#						
AFLIP2	88	133#							
AFLIP3	510	561#							
AGINT	752	756	788#						
AIN1	173	270#							
AIN2	666	680#							
ALEMN	125	136#							
ALEMN1	231	262#							
ALEND	173	260#	776						
ALNK1	755	779#							
AMA1	249	620	671#						
AMA2	622	672#							
AMA3	624	673#							
AMEMB1	286	354	383	419#	652				
AMEMB2	32	34	122	126	131#	245			
AMEMB3	248	487	558#						
AMEMB4	644	686#							
AMEML1	288	352	415#						
AMEML2	93	132#							
AMEML3	489	515	559#						
AMEML4	591	647	687#						
AMEML5	725	781#							
AMINT3	441	457	562#						
AMK1	651	677#							
AMK2	653	654	656	657	659	660	662	678#	
AMLAS1	360	417#							
AMLAS3	499	526	540	560#					
AMLAS5	790#								
AMSET1	316	343	418#						
AMYLAS	204	261#							
ANS5	639	684#							
ANSADR	127	135#							
ANSMCT	121	137#							
ANSX1	637	683#							
AOFF	211	268#	782						
AOP1	573	689#							
AOP2	570	690#							
AOP2B	712	716	777#						
ARELAN	754	789#							
ARELOC	392	420#							
AREPT1	303	330	358	421#					

AREPT2	68	81	138#											
AREPT3	448	476	497	553#										
AREPT4	597	598	600	671	603	681#								
ARLER5	729	786#												
ARLERR	616	679#												
ASEL35	635	682#												
ASELDR	227	228	266#											
ASEMCZ	220	267#												
ASLX1	633	676#												
ATST1	178	263#												
ATST2	179	264#												
ATST3	180	265#												
AX1	629	674#												
AX1R	723	780#												
AXCNT	625	688#												
AXCNT1	209	246	259#											
AXCNT5	721	778#												
CHKXDR	618	625#												
CT1	211#													
CT8E	762#	783												
CTND	772#	784												
ERR	134	269	416	474	524#	529	543	544	604	610	685	769	785	787
ERR1	528	540#												
ERRTMP	525	532	535	555#										
FL0	42#	76												
FL00	40#	85												
FL1	44#	74												
FL2	56#	67												
FL3	62	68#	675											
FL35	82#	96	621											
FL4	87	97#												
FLADR	33	57	59	65	77	78	82	91	92	129#				
FLCNT	21#	41	44	75										
FLCPAT	15#	53	60											
FLIPCN	133	150	174	181	183	201	222	256#	414	561				
FLMCNT	16#	39	86											
FLPAT	20#	43	46	70	72									
FLTPAT	19#	55	56	63										
GINT	173#	788												
INT	270	570#												
INT2	680	712#												
ITMP	575	579	580	581	587	691#								
K0777	18#	35	123											
K0777A	382	401#	655											
LCIA	284	384#												
LCMA	292#	348												
LEMN	136	452	480	517	548#									
LEMN1	262	306	333	385	410#									
LEMN2	17#	37	83	95										
LFIX	627	643#												
LIAC	290#	350												
LNK0	154	245#												
LNK1	246#	779												

LNK2	247#													
LNK3	248#													
LNK4	249#													
LNK5	250#	260												
LNKIDX	158	159	164	165	251#									
LNKPOS	155	156	167	168	244#									
MA1	358#	671												
MA2	81#	672												
MA3	497#	673												
MEMBG	131	177	186	189	192	196	252#	419	558	686				
MEMLM	27#	132	415	559	687	781								
MINT1	299	318	372#	386										
MINT3	119#	128	562											
MK1	374#	677												
MK2	378#	678												
MNT2	377	382#												
MQA	8#	48	54	229	537									
SQL	9#	47	64	314	326	341	472							
MS31	509	519#												
MSET1	218#	221	232	418										
MSET3	455	483	507#	518	519	520								
MYLAS	97	106#	111	113	261	417	560	790						
NAUTO	572	619#												
NFIX	715	748#												
NS0	432#	498												
NS1	434#	486												
NS2	442#	454												
NS3	451#	456												
NS4	458#	475	482											
NS5	466	476#	684											
NS6	479#	484												
NS7	493	499#												
NSADR	135	442	447	450	451	458	464	467	473	478	479	513	514	551#
NSCNT	433	485	550#											
NSMASK	431	443	459	468	491	494	496	552#						
NSMCNT	137	508	549#											
NSPAT1	434	438	440	446	462	471	553#							
NSPAT2	437	445	461	470	554#									
NSX1	448#	683												
NXINT	649	666#												
OFF	268	391#												
OP1	25#	107	689											
OP2	26#	690	777											
REL0	153#	212												
REL1	156#	172												
REL2	159#	166												
REL3	161	167#												
RELAN	162	255#	789											
RELOC	148	149#	151	152	153	157	163	176	184	187	213	420		
REPT	138	238#	240	241	242	421	563	599	681					
RL1	188#	200												
RLERR	194#	679	786											
RTEMP	185	188	190	195	197	214	215	219	225	234	235	253#		

