

DR11A

DR11A DEV REG TST
CZDRIB0

AH-8669B-MC

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SEP 1979

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IDENTIFICATION

PRODUCT CODE: AC-8668B-MC

PRODUCT NAME: CZDRIB0 DR11A DEV REG TEST

DATE: MARCH 1979

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1. ABSTRACT

THIS IS A LOGIC TEST OF THE DR11A. FOR THIS TEST
TO OPERATE A SPECIAL MAINTENANCE MODULE MUST BE CONNECTED
(M980). THIS TEST WILL CHECK UP TO 32 SEQUENTIAL DR11A'S.

THIS PROGRAM HAS BEEN RENAMED FROM D8L TO DZDRI.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER

DR11A

M980 FOR EACH DR11A

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE ROUTINE USES MEMORY
FROM 0000 TO 5000.

3. LOADING PROCEDURE

3.1 METHOD

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

STARTING AT SA 200 ALL SWITCHES SHOULD BE DOWN OR ZERO.
(IF NOT ZERO, BIT 0 TO 8 WILL BE STARTING VECTOR.)

4.2 STARTING ADDRESS OR ADDRESSES

(A) 200 = START OF TEST

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY.
SET SWITCH REGISTER TO STARTING ADDRESS.
LOAD ADDRESS.
SET SWITCH REGISTER EQUAL TO FIRST DR11A INTERRUPT VECTOR.
PRESS START.
THE PROGRAM WILL STAY IN SECTION AND LOOP.
IF SWITCH REGISTER EQUALS ZERO, 300 IS SELECTED AS THE VECTOR.
ON A RESTART, THE PREVIOUSLY SELECTED VECTOR WILL BE USED.

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

93 5.1.1 AT SA 200..THE INSTRUCTION AND LOGIC TEST.
94 WITH ALL SWITCHES DOWN THE PROGRAM WILL PRINT
95 OUT ON ERRORS AND CONTINUE IN TEST. (BELL
96 WILL RING AT COMPLETION OF A PASS)
97
98 5.1.2 SWITCH SETTINGS ARE
99
100 SW15 = 1 OR UP ... HALT ON ERROR
101 SW14 = 1 OR UP ... SCOPE LOOP
102 SW13 = 1 OR UP ... INHIBIT PRINTOUT
103 SW12 = 1 OR UP ... INHIBIT TRACE TRAPPING
104 SW11 = 1 OR UP ... INHIBIT ITERATION LOOP
105 SW8 TO 0 WILL BE USED AS VECTOR ADDRESS IF NOT ZERO.
106
107 5.1.3
108
109 5.2 SUBROUTINE ABSTRACTS
110
111 5.2.1 BEGIN SA 200
112
113 5.2.2 SCOPE
114 -----
115
116 THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST
117 IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING
118 ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED.
119 IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
120 START OF THE SUBTEST THAT THE SCOPE LOOP IS REQUESTED FOR.
121
122 5.2.3 HALT
123 -----
124
125 IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS
126 THE FAILING SUBTEST, AND THE INCORRECT DATA AT THE
127 TIME OF THE FAILURE.
128
129 5.3 PROGRAM AND/OR OPERATOR ACTION
130
131 5.3.1 LOADING AND STARTING AT 200 WITH ALL SWITCHES DOWN
132 IS THE INSTRUCTION AND LOGIC TEST. IF AN ERROR
133 IS DETECTED HERE, THERE WILL BE A PRINTOUT. WHEN
134 AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE
135 ON IT, PLACE SW15 UP TO HALT ON ERROR, THEN SW14
136 UP TO LOOP ON ERROR, THEN SW13 UP TO DELETE PRINTOUTS.
137
138 6. ERRORS
139
140 6.1 ERROR PRINTOUT
141
142 ARE IN A FOUR WORD FORMAT. THE 1ST IS THE PC+2 OF
143 THE DETECTED ERROR. THE 2ND IS THE PROCESSOR STATUS
144 REGISTER. THE 3RD IS DEVICE ADDRESS. THE 4TH IS
145 VECTOR ADDRESS.
146
147 6.2 ERROR RECOVERY
148

149 DEPRESS CONTINUE TO RESTART SECTION
 150
 151 7. RESTRICTIONS
 152
 153 7.1 STARTING RESTRICTION
 154
 155 NONE
 156
 157 7.2 OPERATIONAL RESTRICTION
 158
 159 THE DR11A MUST HAVE THE M980 MAINTENANCE MODULE TO RUN
 160 THIS TEST.
 161
 162 NOTE THAT THE DR11A HAS FLOATING VECTORS:
 163
 164 THE BELOW IS THE ASSIGNMENT OF FLOATING VECTORS, THE ASSIGNED
 165 SEQUENCES ARE:
 166
 167 1. STARTING AT 300 ALL DC11'S WILL BE ASSIGNED.
 168
 169 2. THEN ANY KL11 CALLED FOR (VT05, VT06, LC11)
 170
 171 3. THEN ANY DP11 CALLED FOR.
 172
 173 4. THEN ANY DM11 CALLED FOR.
 174
 175 5. THEN ANY DN11 CALLED FOR.
 176
 177 6. THEN ANY DM11BB CALLED FOR.
 178
 179 7. THEN ANY DR11A CALLED FOR.
 180
 181 THE DR11A DEVICE ADDRESS WILL BE ASSIGNED IN THE USER AREA
 182 OF 767776 TO 764000. THE ASSIGNMENT OF ADDRESS WILL START
 183 AT THE HIGH ADDRESS LIMIT AND PROCEED DOWNWARD. USERS AND
 184 SPECIAL SYSTEMS SHOULD START THEIR ASSIGNMENT OF SPECIAL
 185 DEVICES AT THE LOW ADDRESS LIMIT AND WORK UP.
 186
 187 767776 TO 767770 DR11A #0
 188 767766 TO 767760 DR11A #1
 189 :
 190 :
 191 :
 192 767706 TO 767700 DR11A #7
 193 :
 194 :
 195 :
 196 767606 TO 767600 DR11A #15
 197
 198 8. MISCELLANEOUS
 199
 200 8.1 EXECUTION TIME
 201
 202 FOR EACH DR11A ABOUT 2 MINUTES
 203
 204 8.2 UNTESTED LOGIC

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THERE ARE TWO FUNCTIONS NOT TESTED.

9. PROGRAM DESCRIPTION

THIS PROGRAM WHEN STARTED AT 200 CHECKS THE SWITCH REGISTER FOR ALL ZEROS, IF NOT ZEROS THE BITS 0-8 ARE USED AS THE FIRST VECTOR ADDRESS OF THE DR11A'S.

THE PROGRAM THEN PERFORMS AN INCREMENTAL LOGIC CHECK FOR THE SELECTED DR11A.

THE DATA REGISTER IS TESTED TO SEE IF 'RESET' CLEARS IT. IF IT WILL HOLD ALL COMBINATIONS OF NUMBERS.

THE READ/WRITE BITS OF THE STATUS REGISTER ARE ALSO TESTED.

BOTH THE 'A' AND 'B' INTERRUPTS ARE TESTED TO SEE IF THEY INTERRUPT AT THE CORRECT BUS REQUEST LEVEL BR-5.

ONE FULL TEST OF THE DR11A IS MADE WITH THE T BIT OFF. THE SECOND PASS IS MADE WITH THE T BIT ON.

AT THE END OF THE SECOND PASS THE DEVICE ADDRESS IS INCREMENTED BY 10, AND THE VECTOR POINTER IS DECREMENTED BY 10. THEN A TEST IS MADE TO SEE IF THERE ARE ANY MORE DR11A'S AND THE PROGRAM WILL RESTART AND RESET THE VECTOR AND ADDRESS FOR RETESTING THE SERIES OF DR11A'S.

IF A POWER FAIL OCCURS THE PROGRAM WILL REPORT IT AND RESTART AT THE BEGINNING OF THE PROGRAM.

10. LISTING

11. FLOW CHART(S)

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242          ;GENERAL REGISTER LOGIC TEST
243
244          177776      STATUS=177776
245          000240      NOP=240
246          104400      SCOPE=104400
247          104000      HLT=104000
248          177776      CC=STATUS
249          177570      SR=177570
250          167770      CSR=167770
251 000000      000002      .+2
252 000002      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
253 000004      000006      .+2
254 000006      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
255 000010      000012      .+2
256 000012      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
257 000014      000016      .+2
258 000016      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
259 000020      000022      .+2
260 000022      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
261 000024      000026      .+2
262 000026      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
263 000030      000032      .+2
264 000032      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
265 000034      000036      .+2
266 000036      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
267 000040      000042      .+2
268 000042      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
269 000044      000046      .+2
270 000046      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
271 000050      000052      .+2
272 000052      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
273 000054      000056      .+2
274 000056      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
275 000060      000062      .+2
276 000062      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
277 000064      000066      .+2
278 000066      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
279 000070      000072      .+2
280 000072      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
281 000074      000076      .+2
282 000076      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
283 000100      000102      .+2
284 000102      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
285 000104      000106      .+2
286 000106      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
287 000110      000112      .+2
288 000112      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
289 000114      000116      .+2
290 000116      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
291 000120      000122      .+2
292 000122      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
293 000124      000126      .+2
294 000126      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
295 000130      000132      .+2
296 000132      000000      HALT      ;TRAPPED TO PREVIOUS LOCATION
297 000134      000136      .+2

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SEQ 0007

298	000136	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
299	000140	000142	.+2	
300	000142	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
301	000144	000146	.+2	
302	000146	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
303	000150	000152	.+2	
304	000152	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
305	000154	000156	.+2	
306	000156	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
307	000160	000162	.+2	
308	000162	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
309	000164	000166	.+2	
310	000166	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
311	000170	000172	.+2	
312	000172	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
313	000174	000176	.+2	
314	000176	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
315	000200	000202	.+2	
316	000202	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
317	000204	000206	.+2	
318	000206	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
319	000210	000212	.+2	
320	000212	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
321	000214	000216	.+2	
322	000216	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
323	000220	000222	.+2	
324	000222	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
325	000224	000226	.+2	
326	000226	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
327	000230	000232	.+2	
328	000232	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
329	000234	000236	.+2	
330	000236	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
331	000240	000242	.+2	
332	000242	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
333	000244	000246	.+2	
334	000246	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
335	000250	000252	.+2	
336	000252	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
337	000254	000256	.+2	
338	000256	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
339	000260	000262	.+2	
340	000262	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
341	000264	000266	.+2	
342	000266	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
343	000270	000272	.+2	
344	000272	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
345	000274	000276	.+2	
346	000276	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
347	000300	000302	.+2	
348	000302	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
349	000304	000306	.+2	
350	000306	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
351	000310	000312	.+2	
352	000312	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
353	000314	000316	.+2	

354	000316	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
355	000320	000322	.+2	
356	000322	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
357	000324	000326	.+2	
358	000326	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
359	000330	000332	.+2	
360	000332	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
361	000334	000336	.+2	
362	000336	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
363	000340	000342	.+2	
364	000342	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
365	000344	000346	.+2	
366	000346	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
367	000350	000352	.+2	
368	000352	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
369	000354	000356	.+2	
370	000356	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
371	000360	000362	.+2	
372	000362	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
373	000364	000366	.+2	
374	000366	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
375	000370	000372	.+2	
376	000372	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
377	000374	000376	.+2	
378	000376	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
379	000400	000402	.+2	
380	000402	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
381	000404	000406	.+2	
382	000406	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
383	000410	000412	.+2	
384	000412	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
385	000414	000416	.+2	
386	000416	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
387	000420	000422	.+2	
388	000422	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
389	000424	000426	.+2	
390	000426	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
391	000430	000432	.+2	
392	000432	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
393	000434	000436	.+2	
394	000436	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
395	000440	000442	.+2	
396	000442	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
397	000444	000446	.+2	
398	000446	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
399	000450	000452	.+2	
400	000452	000454	HALT	; TRAPPED TO PREVIOUS LOCATION
401	000454	000456	.+2	
402	000456	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
403	000460	000462	.+2	
404	000462	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
405	000464	000466	.+2	
406	000466	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
407	000470	000472	.+2	
408	000472	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
409	000474	000476	.+2	

410	000476	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
411	000500	000502	.+2	
412	000502	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
413	000504	000506	.+2	
414	000506	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
415	000510	000512	.+2	
416	000512	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
417	000514	000516	.+2	
418	000516	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
419	000520	000522	.+2	
420	000522	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
421	000524	000526	.+2	
422	000526	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
423	000530	000532	.+2	
424	000532	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
425	000534	000536	.+2	
426	000536	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
427	000540	000542	.+2	
428	000542	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
429	000544	000546	.+2	
430	000546	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
431	000550	000552	.+2	
432	000552	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
433	000554	000556	.+2	
434	000556	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
435	000560	000562	.+2	
436	000562	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
437	000564	000566	.+2	
438	000566	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
439	000570	000572	.+2	
440	000572	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
441	000574	000576	.+2	
442	000576	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
443	000600	000602	.+2	
444	000602	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
445	000604	000606	.+2	
446	000606	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
447	000610	000612	.+2	
448	000612	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
449	000614	000616	.+2	
450	000616	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
451	000620	000622	.+2	
452	000622	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
453	000624	000626	.+2	
454	000626	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
455	000630	000632	.+2	
456	000632	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
457	000634	000636	.+2	
458	000636	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
459	000640	000642	.+2	
460	000642	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
461	000644	000646	.+2	
462	000646	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
463	000650	000652	.+2	
464	000652	000000	HALT	; TRAPPED TO PREVIOUS LOCATION
465	000654	000656	.+2	

466	000656	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
467	000660	000662	.+2	
468	000662	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
469	000664	000666	.+2	
470	000666	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
471	000670	000672	.+2	
472	000672	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
473	000674	000676	.+2	
474	000676	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
475	000700	000702	.+2	
476	000702	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
477	000704	000706	.+2	
478	000706	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
479	000710	000712	.+2	
480	000712	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
481	000714	000716	.+2	
482	000716	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
483	000720	000722	.+2	
484	000722	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
485	000724	000726	.+2	
486	000726	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
487	000730	000732	.+2	
488	000732	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
489	000734	000736	.+2	
490	000736	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
491	000740	000742	.+2	
492	000742	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
493	000744	000746	.+2	
494	000746	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
495	000750	000752	.+2	
496	000752	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
497	000754	000756	.+2	
498	000756	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
499	000760	000762	.+2	
500	000762	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
501	000764	000766	.+2	
502	000766	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
503	000770	000772	.+2	
504	000772	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
505	000774	000776	.+2	
506	000776	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
507				
508				;TRAPPED TO PREVIOUS LOCATION
509				
510				;TRAPPED TO PREVIOUS LOCATION
511				
512		000030	.=30	
513	000030	003510	PRINT	
514	000032	000340	340	
515	000034	004220	SCOPEC	
516	000036	000340	340	
517				
518				
519		000046	.=46	
520	000046	003464	\$ENDAD	
521				

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522      000052 000052      =52
523      000052 040000      40000
524
525      000200 000200      =200
526      000200 000167 000620 JMP BEGINA
527      000100 001000      =1000
528
529      ;THESE ADDRESSES AND VECTORS ARE MODIFIED BY THE PROGRAM.
530
531      001000 167770 GRSTAT: 167770 ;STATUS (DONE)
532      001002 167772 GRDIO: 167772 ;DATA REGISTER
533      001004 167774 GRDAI: 167774 ;FROM OUTSIDE WORLD TO DATA REGISTER
534      001006 167773 GRBHIO: 167773 ;HIGH BYTE OF DATA REGISTER
535      001010 167772 GRDAIO: 167772 ;DATA REGISTER
536
537      001012 000300 GRIVA: 300 ;INTERRUPT VECTOR OF UNIT UNDER TEST
538      001014 000302 GRIVSA: 302 ;INTERRUPT STATUS ADDRESS
539      001016 000304 GRIVB: 304 ;INTERRUPT VECTOR
540
541      001020 000000 COUNT: 0 ;COUNT LOCATION
542      001022 000240 PL: 240 ;PRIORITY LEVEL
543      001024 BEGINA:
544
545      ;INITIALIZE ADDRESS AND VECTORS
546
547      001024 012706 004650 MOV #BUFF,%6 ;SET UP STACK
548      001030 012767 001202 003236 MOV #BFGIN,RETURN
549      001036 010667 003404 MOV %6,SAVR6 ;SAVE OLD STACK ON OVERLAY
550      001042 012767 000012 176740 MOV #12,10 ;FOR T TRAP
551      001050 012767 000006 176726 MOV #6,4 ;FOR TIME OUT
552      001056 005067 002420 CLR TRPB ;'T' FLAG
553      001062 012767 167770 177710 MOV #CSR,GRSTAT
554      001070 012767 167772 177704 MOV #CSR+2,GRDIO
555      001076 012767 167774 177700 MOV #CSR+4,GRDAI
556      001104 012767 167773 177674 MOV #CSR+3,GRBHIO
557      001112 012767 167772 177670 MOV #CSR+2,GRDAIO
558      001120 013700 177570 MOV @#SR,%0 ;VECTOR ADDRESS FROM SR
559      001124 105700 TSTB %0 ;IF ZERO USE 300 ON PREVIOUS VALUE
560      001126 001412 BEQ DR11B
561      001130 042700 177000 BIC #177000,%0 ;USE ONLY BIT 0 TO 8
562      001134 010067 000016 MOV %0,DR11B+2
563      001140 005720 TST (0)+
564      001142 010067 000016 MOV %0,DR11B+10
565      001146 005720 TST (0)+
566      001150 010067 000016 MOV %0,DR11B+16
567      001154 012767 000300 177630 DR11B: MOV #300,GRIVA ;SET L> FROM SWITCH REGISTER
568      001162 012767 000302 177624 MCV #302,GRIVSA
569      001170 012767 000304 177620 MOV #304,GRIVB
570      001176 012706 004650 DR11C: MOV #EJFF,%6 ;SET UP STACK
571      ;DOES RESET CLEAR REGISTER?
572      BEGIN: SCOPE
573      001204 016777 177604 177600 MOV GRIVSA,@GRIVA ;SET UP FOR FALSE INTERRUPT
574      001212 005077 177576 CLR @GRIVSA
575      001216 012767 000006 176560 MOV #6,4
576      001224 012767 000100 003036 MOV #100,ICOUNT
577      001232 000005 RESET ;CLEAR DATA REGISTER

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578 001234 017700 177550      MOV    @GRDA10,%0
579 001240 001401      BEQ     .+4
580
581 001242 104000      HLT             ;DATA REGISTER NOT CLEAR
582                      ;REGISTER NOT ZERO
583
584 001244 104400      SCOPE
585 001246 012767 004000 003014  MOV    #4000,ICOUNT
586 001254 012777 177777 177520  MOV    #-1,@GRDIO      ;ALL ONES TO REGISTER
587 001262 017700 177514      MOV    @GRDIO,%0
588 001266 022700 177777      CMP     #-1,%0
589 001272 001401      BEQ     .+4
590 001274 104000      HLT             ;REG WILL NOT HOLD ONES
591
592 001276 104400      SCOPE
593 001300 012767 000100 002762  MOV    #100,ICOUNT
594 001306 012777 177777 177466  MOV    #-1,@GRDIO
595 001314 000005      RESET          ;SET DATA TO ALL ONES
596 001316 005777 177466      TST     @GRDA10      ;SHOULD CLEAR REGISTER
597 001322 001401      BEQ     .+4
598 001324 104000      HLT             ;REG FAILED TO CLEAR
599
600 001326 104400      SCOPE
601 001330 012767 004000 002732  MOV    #4000,ICOUNT
602 001336 012777 052525 177436  MOV    #52525,@GRDIO
603 001344 017700 177432      MOV    @GRDIO,%0
604 001350 022700 052525      CMP     #52525,%0
605 001354 001401      BEQ     .+4
606 001356 104000      HLT             ;DATA NOT-52525
607
608 001360 104400      SCOPE
609 001362 012777 125252 177412  MOV    #125252,@GRDIO
610 001370 017700 177406      MOV    @GRDIO,%0
611 001374 022700 125252      CMP     #125252,%0
612 001400 001401      BEQ     .+4
613 001402 104000      HLT             ;DATA NOT=125252
614                      ;INTERRUPT ENABLE BIT TEST
615 001404 052767 000340 176364  BIS     #340,STATUS      ;LOCK OUT INTERRUPTS
616 001412 104400      SCOPE
617 001414 012777 000140 177356  MOV     #140,@GRSTAT      ;INTERRUPT ENABLE FOR A+B
618 001422 017700 177352      MOV     @GRSTAT,%0
619 001426 022700 100340      CMP     #100340,%0      ;ENABLE BITS PLUS READY BITS
620 001432 001401      BEQ     .+4
621 001434 104000      HLT
622
623 001436 104400      SCOPE
624 001440 012767 000010 002622  MOV     #10,ICOUNT
625 001446 012777 000140 177324  MOV     #140,@GRSTAT      ;SET INTERRUPT ENABLE FLOPS
626 001454 000005      RESET          ;CLEAR THOSE FLOPS
627 001456 017700 177316      MOV     @GRSTAT,%0      ;TST % OR
628 001462 001401      BEQ     .+4
629 001464 104000      HLT             ;RESET DID NOT CLEAR INTERRUPT ENABLE BITS
630
631 001466 104400      SCOPE
632 001470 005067 002574      CLR     ICOUNT
633 001474 005067 177320      CLR     COUNT

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634 001500 016777 177314 177302 TST1: MOV COUNT,@GRDAIO
635 001506 017700 177270 MOV @GRDIO,%0
636 001512 020067 177302 CMP %0,COUNT
637 001516 001401 BEQ .+4 ;TEST FOR ALL NUMBERS (WORD)
638 001520 104000 HLT ;GOOD=COUNT, BAD=%0
639 001522 005267 177272 INC COUNT
640 001526 001401 BEQ .+4
641 001530 000763 BR TST1
642 001532 104400 SCOPE
643 001534 012777 177777 177240 MOV #-1,@GRDIO
644 001542 105077 177234 CLRB @GRDIO ;CLEAR LOW BYTE
645 001546 017700 177230 MOV @GRDIO,%0
646 001552 022700 177400 CMP #177400,%0
647 001556 001401 BEQ .+4
648 001560 104000 HLT ;BYTE LOW FAILED TO CLEAR
649 001562 012767 004000 002500 MOV #4000,ICOUNT
650
651 001570 104400 SCOPE
652 001572 012777 177777 177202 MOV #-1,@GRDIO
653 001600 105077 177202 CLRB @GRBHIO ;CLEAR HIGH BYTE
654 001604 017700 177172 MOV @GRDIO,%0
655 001610 022700 000377 CMP #377,%0
656 001614 001401 BEQ .+4
657 001616 104000 HLT ;HIGH BYTE CLEAR FAILED
658
659 001620 104400 SCOPE
660 001622 005067 002442 CLR ICOUNT
661 001626 005067 177166 CLR COUNT
662 001632 005077 177144 CLR @GRDIO
663 001636 105277 177140 TST2: INCB @GRDIO ;INCREMENT LOW ORDER BYTE
664 001642 105267 177152 INCB COUNT ;INCREMENT REFERENCE BYTE COUNT
665 001646 027767 177130 177144 CMP @GRDIO,COUNT
666 001654 001401 BEQ .+4
667 001656 104000 HLT ;BAD DATA IN DATA REGISTER
668 001660 105767 177134 TSTB COUNT
669 001664 001401 BEQ .+4
670 001666 000763 BR TST2
671 001670 104400 SCOPE
672 001672 005067 177122 CLR COUNT
673 001676 105077 177104 CLRB @GRBHIO
674 001702 105277 177100 TST3: INCB @GRBHIO ;INCREMENT HIGH BYTE
675 001706 105267 177107 INCB COUNT+1
676 001712 027767 177064 177100 CMP @GRDIO,COUNT
677 001720 001401 BEQ .+4
678 001722 104000 HLT ;HIGH BYTE HAS BAD DATA
679 001724 105767 177071 TSTB COUNT+1
680 001730 001401 BEQ .+4
681 001732 000763 BR TST3
682 001734 052767 000340 176034 BIS #340,STATUS
683
684 ;TEST EXTERNAL TRANSFERS - CABLE MUST BE CONNECTED
685 001742 104400 SCOPE
686 001744 012767 004000 002316 MOV #4000,ICOUNT
687 001752 005077 177024 CLRB @GRDIO
688 001756 017777 177022 177016 MOV @GRDAI,@GRDIO ;TEST TRANSFER OF ZERO
689 001764 001401 BEQ .+4

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690	001766	104000			HLT		:PICKED UP A BIT
691							
692	001770	104400			SCOPE		
693	001772	012777	177777	177002	MOV	#-1,@GRDIO	
694	002000	017777	177000	176774	MOV	@GRDAI,@GRDIO	:MOV ALL ONES
695	002006	022777	177777	176766	CMP	#-1,@GRDIO	
696	002014	001401			BEQ	+.4	
697	002016	104000			HLT		:DROPPED A BIT
698							
699	002020	104400			SCOPE		
700	002022	005067	002242		CLR	ICOUNT	
701	002026	005000			CLR	%0	
702	002030	010077	176746		MOV	%0,@GRDIO	:TEST ALL NUMBERS
703	002034	017777	176744	176740	MOV	@GRDAI,@GRDIO	
704	002042	020077	176734		CMP	%0,@GRDIO	
705	002046	001401			BEQ	+.4	
706	002050	104000			HLT		:ERROR - CHECK %0 FOR GOOD
707	002052	005200			INC	%0	:GRDIO FOR BAD
708	002054	001407			BEQ	TST7	
709	002056	005077	176720		CLR	@GRDIO	
710	002062	000762			BR	TST6	
711							
712	002064	104400			SCOPE		
713	002066	012767	004000	002174	MOV	#4000,ICOUNT	
714	002074	005077	176702		CLR	@GRDIO	
715	002100	005067	175672		CLR	STATUS	:TEST INTERRUPT A
716	002104	012777	002130	176700	MOV	#ABC,@GRIVA	
717	002112	012777	000100	176660	MOV	#100,@GRSTAT	
718	002120	105277	176656		INCB	@GRDIO	
719	002124	001375			BNE	-.4	
720	002126	000407			BR	TST8	
721							
722	002130	032777	000200	176644	BIT	#200,@GRDIO	
723	002136	001001			BNE	+.4	
724	002140	104000			HLT		:INTERRUPT A FAILED
725	002142	000002			RTI		:CHECK - WORD OR BYTE
726							
727	002144	104400			SCOPE		
728	002146	005077	176630		CLR	@GRDIO	
729	002152	012777	002176	176636	MOV	#DEF,@GRIVB	:TEST INTERRUPT B
730	002160	012777	000040	176612	MOV	#40,@GRSTAT	
731	002166	105277	176614		INCB	@GRBHIO	
732	002172	001375			BNE	-.4	
733	002174	000406			BR	TST9	
734							
735	002176	005777	176600		TST	@GRDIO	
736	002202	100401			BMI	+.4	
737	002204	104000			HLT		:INTERRUPT B FAILED
738	002206	000002			RTI		:CHECK WORD OR BYTE
739							
740	002210	104400			SCOPE		
741	002212	005077	176564		CLR	@GRDIO	:TEST COMBINED INTERRUPTS
742	002216	012777	000140	176554	MOV	#140,@GRSTAT	
743	002224	005277	176552		INC	@GRDIO	
744	002230	001375			BNE	-.4	
745	002232	005077	176542		CLR	@GRSTAT	

Address	Hex Address 1	Hex Address 2	Hex Address 3	Hex Address 4	Assembly Code	Comments
746	002236	012777	177777	176536	MOV #1, @GRDIO	
747					;TEST DATA FROM BLACK BOX (NOT CONNECTED)	
748	002244	104400			SCOPE	
749	002246	017777	176532	176534	MOV @GRDAI, @GRDAIO	;STATIC LINES EQUAL ONES
750	002254	017700	176530		MOV @GRDAIO, %0	;DATA REGISTER TO %0
751	002260	022700	177777		CMP #1, %0	
752	002264	001401			BEQ .+4	
753	002266	104000			HLT	;REG 0 SHOULD = ALL ONES
754						
755					;READY BIT IS IN A ONE STATE	
756						
757	002270	104400			SCOPE	
758	002272	005777	176502		TST @GRSTAT	;TEST BIT 15
759	002276	100401			BMI .+4	
760	002300	104000			HLT	;NO READY BIT 0
761						
762	002302	104400			SCOPE	
763	002304	105777	176470		TSTB @GRSTAT	;TEST BIT 7
764	002310	100401			BMI .+4	
765	002312	104000			HLT	;NO READY BIT A
766						
767					;CAN WE RAISE INTERRUPT 'A'	
768	002314	104400			SCOPE	
769	002316	052767	000340	175452	BIS #340, STATUS	;LOCK OUT INTERRUPTS
770	002324	012706	004650		MOV #BUFF, %6	
771	002330	012777	002354	176454	MOV #TST4, @GRIVA	;INTERRUPT RETURN POINTER
772	002336	012777	000100	176434	MOV #100, @GRSTAT	;INTERRUPT ENABLE
773	002344	005067	175426		CLR STATUS	
774	002350	000240			NOP	
775	002352	104000			HLT	;NO 'A' INTERRUPT
776						
777	002354	005077	176420		TST4: CLR @GRSTAT	
778	002360	016777	176430	176424	MOV GRIVSA, @GRIVA	;MOV .+2 TO 'A' INTERRUPT VECTOR
779					;RAISE INTERRUPT 'B'	
780	002366	104400			SCOPE	
781	002370	012706	004650		MOV #BUFF, %6	
782	002374	052767	000340	175374	BIS #340, STATUS	
783	002402	012777	002430	176406	MOV #TST5, @GRIVB	
784	002410	012777	000040	176362	MOV #40, @GRSTAT	
785	002416	042737	000377	177776	BIC #377, @STATUS	
786	002424	000240			NOP	
787	002426	104000			HLT	;NO B INTERRUPT
788	002430	005077	176344		TST5: CLR @GRSTAT	
789		001012			IIV=GRIVA	
790		001000			CSR=GRSTAT	
791		001014			IIV=GRIVSA	
792						
793					;TEST FOR INTERRUPT FROM DEVICE	
794	002434	016777	176362	176352	MOV PL, @IIV	
795	002442	042767	000340	175326	BIC #340, STATUS	;PROCESSOR LEVEL ZERO
796	002450	012777	002502	176334	MOV #TINT1, @IIV	
797	002456	012706	004650		MOV #BUFF, %6	;STACK POINTER
798	002462	042777	000100	176310	BIC #100, @CSR	;CLEAR INTERRUPT ENABLE
799	002470	052777	000100	176302	BIS #100, @CSR	;SET INTERRUPT ENABLE-
800	002476	000240			NOP	
801	002500	104000			HLT	;NO DEVICE INTERRUPT OCCURED

802	002502	104400			TINT1: SCOPE	
803						
804					;TEST FOR INTERRUPT FROM THE DEVICE	
805	002504	042767	000340	175264	BIC	#340,STATUS
806	002512	052767	000040	175256	BIS	#040,STATUS ;SET TO PRIORITY LEVEL 1
807	002520	012777	002552	176264	MOV	#TINT2,@IVA ;INTERRUPT VECTOR ADDRESS
808	002526	012706	004650		MOV	#BUFF,%6 ;SET UP STACK POINTER
809	002532	042777	000100	176240	BIC	#100,@CSR ;CLEAR INTERRUPT ENABLE
810	002540	052777	000100	176232	BIS	#100,@CSR ;SET INTERRUPT ENABLE-
811	002546	000240			NOP	
812	002550	104000			HLT	;NO DEVICE INTERRUPT OCCURRED
813	002552	104400			TINT2: SCOPE	
814	002554	042767	000340	175214	BIC	#340,STATUS
815	002562	052767	000100	175206	BIS	#100,STATUS ;SET TO PRIORITY LEVEL 2
816	002570	012777	002622	176214	MOV	#TINT3,@IVA ;INTERRUPT VECTOR ADDRESS
817	002576	012706	004650		MOV	#BUFF,%6 ;SET UP STACK POINTER
818	002602	042777	000100	176170	BIC	#100,@CSR ;CLEAR INTERRUPT ENABLE
819	002610	052777	000100	176162	BIS	#100,@CSR ;SET INTERRUPT ENABLE-
820	002616	000240			NOP	
821	002620	104000			HLT	;NO DEVICE INTERRUPT OCCURED
822						
823	002622	104400			TINT3: SCOPE	
824					;TEST FOR INTERRUPT FROM THE DEVICE	
825	002624	042767	000340	175144	BIC	#340,STATUS
826	002632	052767	000140	175136	BIS	#140,STATUS ;SET TO PRIORITY LEVEL 3
827	002640	012777	002672	176144	MOV	#TINT4,@IVA ;INTERRUPT VECTOR ADDRESS
828	002646	012706	004650		MOV	#BUFF,%6 ;SET UP STACK POINTER
829	002652	042777	000100	176120	BIC	#100,@CSR ;CLEAR INTERRUPT ENABLE
830	002660	052777	000100	176112	BIS	#100,@CSR ;SET INTERRUPT ENABLE-
831	002666	000240			NOP	
832	002670	104000			HLT	;NO DEVICE INTERRUPT OCCURED
833	002672	104400			TINT4: SCOPE	
834						
835					;TEST FOR INTERRUPT FROM DEVICE	
836	002674	042767	000340	175074	BIC	#340,STATUS
837	002702	052767	000200	175066	BIS	#200,STATUS ;RAISE PROCESSOR PRIORITY TO LEVEL 4
838	002710	012777	002752	176074	MOV	#TINT5,@IVA ;IN CASE OF INTERRUPT
839	002716	012706	004650		MOV	#BUFF,%6 ;SET STACK POINTER
840	002722	042777	000100	176050	BIC	#100,@CSR ;CLEAR INTERRUPT ENABLE
841	002730	052777	000100	176042	BIS	#100,@CSR ;SET INTERRUPT ENABLE
842	002736	000240			NOP	;LET INTERRUPT OCCUR
843	002740	042777	000100	176032	BIC	#100,@CSR
844	002746	000240			NOP	
845	002750	104000			HLT	;NO DEVICE INTERRUPT OCCURED
846	002752	104400			TINT5: SCOPE	
847					;TEST FOR NO INTERRUPT FROM DEVICE (HIGHEST PROCESSOR PRIORITY)	
848	002754	052767	000340	175014	BIS	#340,STATUS ;RAISE PROCESSOR PRIORITY TO HIGHEST LEVEL
849	002762	012777	003022	176022	MOV	#TINT6,@IVA ;IN CASE OF INTERRUPT
850	002770	012706	004650		MOV	#BUFF,%6 ;SET STACK POINTER
851	002774	052777	000100	175776	BIS	#100,@CSR ;CLEAR INTERRUPT ENABLE
852	003002	042777	000100	175770	BIC	#100,@CSR
853	003010	042777	000100	175762	BIC	#100,@CSR ;DON'T LEAVE IT SET
854	003016	000240			NOP	
855	003020	000401			BR	.*4 ;WITH NO INTERRUPT, BRANCH OVER HALT
856	003022	104000			HLT	;INTERRUPT OCCURED
857	003024	104400			TINT6: SCOPE	

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858
859 ;TEST FOR NO INTERRUPT FROM DEVICE
860 003026 042767 000340 174742 BIC #340,STATUS
861 003034 052767 000240 174734 BIS #240,STATUS ;RAISE PROCESSOR PRIORITY TO LEVEL 5
862 003042 012777 003102 175742 MOV #TINT7,@IVA ;IN CASE OF INTERRUPT
863 003050 012706 004650 MOV #BUFF,%6 ;SET STACK POINTER
864 003054 042777 000100 175716 BIC #100,@CSR ;CLEAR INTERRUPT ENABLE
865 003062 052777 000100 175710 BIS #100,@CSR ;SET INTERRUPT ENABLE
866 003070 042777 000100 175702 BIC #100,@CSR ;DON'T LEAVE IT SET
867 003076 000240 NOP
868 003100 000401 BR .+4 ;WITH NO INTERRUPT, BRANCH OVER HALT
869 003102 104000 TINT7: HLT ;INTERRUPT OCCURED
870 003104 104400 SCOPE
871
872 ;TEST FOR NO INTERRUPT FROM DEVICE
873 003106 042767 000340 174662 BIC #340,STATUS
874 003114 052767 000300 174654 BIS #300,STATUS ;RAISE PROCESSOR PRIORITY TO LEVEL 6
875 003122 012777 003162 175662 MOV #TINT8,@IVA ;IN CASE OF INTERRUPT
876 003130 012706 004650 MOV #BUFF,%6 ;SET STACK POINTER
877 003134 042777 000100 175636 BIC #100,@CSR ;CLEAR INTERRUPT ENABLE
878 003142 052777 000100 175630 BIS #100,@CSR ;SET INTERRUPT ENABLE
879 003150 042777 000100 175622 BIC #100,@CSR ;DON'T LEAVE IT SET
880 003156 000240 NOP
881 003160 000401 BR .+4 ;WITH NO INTERRUPT, BRANCH OVER HALT
882 003162 104000 TINT8: HLT ;INTERRUPT OCCURED
883 003164 104400 SCOPE
884 003166 016777 175622 175616 MOV GRIVA,@GRIVA ;FOR FALSE INTERRUPT
885 003174 005077 175612 CLR @GRIVA
886 003200 012767 003504 174606 MOV #YESRT,14
887 003206 005767 000270 TST TRPB
888 003212 001452 BEQ BELL
889 003214 012737 001024 000004 MOV #BEGINA,@#4 ;GO TO BEGIN ON TIME OUT
890 003222 162767 000010 175550 SUB #10,GRSTAT
891 003230 162767 000010 175544 SUB #10,GRSTAT+2
892 003236 162767 000010 175540 SUB #10,GRSTAT+4
893 003244 162767 000010 175534 SUB #10,GRSTAT+6
894 003252 162767 000010 175530 SUB #10,GRSTAT+10
895 003260 062767 000010 175524 ADD #10,GRIVA
896 003266 062767 000010 175520 ADD #10,GRIVSA
897 003274 062767 000010 175514 ADD #10,GRIVB
898 003302 026727 175504 000000 CMP GRIVA,#0 ;CHANGE TO LAST VECTOR FOR OVERLAY
899 003310 001004 BNE .+12
900 003312 000137 001024 JMP @#BEGINA
901 003316 016706 001124 MOV SAVR6,%6 ;RESTORE OLD STACK
902 003322 000240 NOP ;CHANGE TO RTI ON OVERLAY
903 003324 005777 175450 TST @GRSTAT ;TIME OUT IF NON EXISTENT-RESTART PROGRAM
904 003330 012767 004412 174466 MOV #PFAIL,24 ;FOR POWER FAIL SET UP
905 003336 000414 BR SBELL
906
907 003340 BELL:
908 ;BELL ON PASS COMPLETE
909 003340 012777 000207 000334 MOV #207,@TDBR
910 003346 105777 000332 TSTB @TCSR
911 003352 100375 BPL .-4
912 003354 012777 000000 000320 MOV #0,@TDBR
913 003362 105777 000316 TSTB @TCSR

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SEQ 0018

914	003366	100375			BPL	.-4		
915	003370	012767	003412	174412	SBELL: MOV	#BEG20,10		;SET UP RESERVED INSTRUCTION
916	003376	006701			6701			;ATTEMPT TO EXECUTE SIGN EXTEND
917	003400	000240			NOP			
918	003402	012767	000006	000074	MOV	#6,YESRT		;NO TRAP, PROCESSOR IS NO =20
919	003410	000403			BR	BEGANY		
920	003412	012767	000002	000064	BEG20: MOV	#2,YESRT		;TRAP OCCURED
921	003420	012767	000012	174362	BEGANY: MOV	#12,10		;RESTORE HALT FOR RESERVED INC
922								;ROUTINE TO CHECK FOR TRACE TRAP TO BE RUN WITH PROGRAM
923								
924								;SAVE OLD CONTENTS, SET UP FOR TRACE TRAP
925	003426	005046			YESTR: CLR	-(6)		
926	003430	032767	010000	174132	BIT	#10000,SR		
927	003436	001016			BNE	YFSTR1		
928	003440	005167	000036		COM	TRPB		
929	003444	100003			BPL	.-+10		
930	003446	012716	000020		MOV	#20,(6)		;SET TRACE TRAP
931	003452	000410			BR	YESTR1		
932	003454	013700	000042		MOV	@#42,R0		
933	003460	001405			BEQ	YESTR1		
934	003462	000005			RESET			
935	003464	004710			\$ENDAD: JSR	7,(R0)		
936	003466	000240			NOP			
937	003470	000240			NOP			
938	003472	000240			NOP			
939	003474	012746	001202		YESTR1: MOV	#BEGIN,-(6)		;START OF TEST WITH TRACE ON
940	003500	000002			YESTR2: RTI			
941	003502	000000			TRPB: 0			
942	003504	000002			YESRT: RTI			;RETURN TO PROGRAM FROM TRAP
943	003506	000000			HALT			;RTI FAILED
944								;ENTERED WITH SYSTEM TRAP CALL(HLT)
945								;PRINT OUT THE ERROR PC AND STATUS REGISTER
946	003510	036727	174054	020000	PRINT: BIT	SR,#20000		;TEST FOR INHIBIT PRINT OUT
947	003516	001401			BEQ	.-+4		;BRANCH TO PRINT
948	003520	000002			RTI			;INHIBIT, RETURN TO MAIN STREAM
949	003522	012667	000160		MOV	(6)+,SAVPC		;PC OF FAILING ROUTINE
950	003526	012667	000156		MOV	(6)+,SAVCC		;CC OF ERROR CONDITION
951	003532	024646			CMP	-(6),-(6)		;REPOSITION THE STACK
952	003534	105777	000144		TSTB	@TCSR		;WAIT FOR FLAG
953	003540	100375			BPL	.-4		;IF NOT UP.
954	003542	012777	000215	000132	MOV	#215,@TDBR		;CR
955	003550	105777	000130		TSTB	@TCSR		
956	003554	100375			BPL	.-4		
957	003556	012777	000212	000116	MOV	#212,@TDBR		;LINE FEED
958	003564	105777	000114		TSTB	@TCSR		
959	003570	100375			BPL	.-4		
960	003572	010267	000076		MOV	%2,SAVR2		;SAVE R2
961	003576	010367	000074		MOV	%3,SAVR3		;SAVE R3
962	003602	010467	000072		MOV	%4,SAVR4		;SAVE R4
963	003606	016702	000074		MOV	SAVPC,%2		
964	003612	004767	000074		JSR	%7,PRTAB		;PRINT OCTAL NUMBER
965	003616	012777	000240	000056	MOV	#240,@TDBR		
966	003624	105777	000054		TSTB	@TCSR		;SPACE BETWEEN WORDS
967	003630	100375			BPL	.-4		
968	003632	016702	000052		MOV	SAVCC,%2		
969	003636	004767	000050		JSR	%7,PRTAB		;PRINT OCTAL NUMBER

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970 003642 004767 000472      JSR    %7,MOREID      ;DEVICE ADDRESS AND VECTORS
971 003646 016702 000022      MOV    SAVR2,%2      ;RESTORE REGISTERS
972
973 003652 016703 000020      MOV    SAVR3,%3
974 003656 016704 000016      MOV    SAVR4,%4
975 003662 005767 173702      TST    SR              ;TEST FOR HALT SWITCH
976 003666 100001      BPL    .+4
977 003670 000000      HALT
978 003672 000002      RTI          ;HALT ON ERROR SET
979                                ;RETURN TO MAIN STREAM
980 003674 000000      SAVR2: 0
981 003676 000000      SAVR3: 0
982 003700 000000      SAVR4: 0
983 003702 177566      TDBR: 177566      ;DATA
984 003704 177564      TCSR: 177564      ;STATUS
985 003706 000000      SAVPC: 0
986 003710 000000      SAVCC: 0
987
988 003712 005067 000252      PRTAB: CLR    BINCT
989 003716 005067 000244      CLR    WGTCT
990 003722 012704 004174      MOV    #LIST,%4      ;GET LIST ADDRESS
991 003726 012767 000005 000236      MOV    #5,ASCNT
992 003734 012767 000007 000220      MOV    #7,SEVEN
993 003742 012767 000001 000214      MOV    #1,DECML
994 003750 105777 177730      WAIT1: TSTB  @TCSR
995 003754 100375      BPL    WAIT1
996 003756 005702      TST    %2
997 003760 100404      BMI    MINUS      ;NEG SIGN PRINT 1
998 003762 012777 000260 177712      MOV    #260,@TDBR      ;POS SIGN PRINT 0
999 003770 000403      BR
1000 003772 012777 000261 177702      MINUS: MOV    #261,@TDBR
1001 004000 016703 000156      STAR: MOV    SEVEN,%3      ;PUT MASK IN R3
1002 004004 010267 000150      MOV    %2,TOODLE      ;GET READY TO DOODLE NUMBER IN TOODLE
1003 004010 005167 000144      COM    TOODLE      ;COMPENSATES FOR COMPLEMENT DURING BIC
1004 004014 046703 000140      BIC    TOODLE,%3      ;AND IN OCTAL CHARACTER
1005 004020 001410      BEQ    WRTCC      ;ZERO,WRITE 0 IN LIST
1006 004022 066767 000136 000136      MKNUM: ADD    DECML,WGTCT      ;COUNT UP TO
1007 004030 005267 000134      INC    BINCT      ;AND RECORD
1008 004034 026703 000126      CMP    WGTCT,%3      ;SAME BINARY WEIGHT
1009 004040 001370      BNE    MKNUM      ;KEEP COUNTN
1010 004042 062767 000260 000120      WRTCC: ADD    #260,BINCT      ;ADD ASCII PREFIX
1011 004050 016724 000114      MOV    BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
1012 004054 066767 000102 000102      ADD    SEVEN,DECML      ;EXPAND BINARY WEIGHT
1013 004062 005067 000100      CLR    WGTCT
1014 004066 005067 000076      CLR    BINCT
1015 004072 005367 000074      DEC    ASCNT
1016 004076 001410      BEQ    XLIST      ;5 CHAR IN LIST
1017 004100 012703 000003      MOV    #3,%3      ;SET X3 FOR ADD LOOP
1018 004104 066767 000052 000050      MOADD: ADD    SEVEN,SEVEN      ;MAKING SEVENTY BY SEVEN
1019 004112 005303      DEC    %3
1020 004114 001373      BNE    MOADD
1021 004116 000730      BR
1022 004120 012767 000005 000044      XLIST: MOV    #5,ASCNT      ;NX SEVEN SET GET NX OCTAL
1023 004126 105777 177552      WAIT2: TSTB  @TCSR      ;SEND 5 CHAR TO TTY
1024 004132 100375      BPL    WAIT2
1025 004134 014477 177542      MOV    -(4),@TDBR

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1026 004140 005367 000026          DEC      ASCNT
1027 004144 001401          BEQ      HDFHM          ;FINISH PRINTING GET NXT NUM
1028 004146 000767          BR        WAIT2
1029
1030 004150 105777 177530      HDFHM: TSTB @TCSR
1031 004154 100375          BPL      .-4
1032 004156 000207          RTS      %7          ;HEAD FOR HOME
1033 004160 000000          TOODLE: 0
1034 004162 000000          SEVEN: 0
1035 004164 000000          DECML: 0
1036 004166 000000          WGTCT: 0
1037 004170 000000          BINCT: 0
1038 004172 000000          ASCNT: 0
1039 004174 000000          LIST: 0
1040 004176 000000          0
1041 004200 000000          0
1042 004202 000000          0
1043 004204 000000          0
1044          ;SCOPE LOOP ROUTINE ENTERED BY USER TRAP
1045 004206 022606          SCOPEB: CMP      (6)+,%6          ;REPOSITION THE STACK
1046 004210 012667 173562          MOV      (6)+,%CC
1047 004214 000177 000054          JMP      @RETURN          ;SCOPE RETURN
1048
1049          ;SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
1050 004220 032767 040000 173342 SCOPEC: BIT      #4000,SR          ;TEST SR FOR SCOPE
1051 004226 001367          BNE          SCOPEB          ;YES SCOPE
1052 004230 032767 004000 173332 BIT      #4000,SR          ;NO - TEST FOR ITERATION
1053 004236 001011          BNE          SCOPEA          ;INHIBIT ITERATION
1054 004240 026767 000026 000022 CMP      SCOPEF,%COUNT
1055 004246 001403          BEQ          SCOPEG          ;EXIT - DONE
1056 004250 005267 000016          INC      SCOPEF          ;INCREMENT COUNT
1057 004254 000754          BR        SCOPEB          ;LOOP SOME MORE
1058 004256 005067 000010          SCOPEG: CLR      SCOPEF          ;CLEAR COUNT
1059 004262 011667 000006          SCOPEA: MOV      @%6,%RETURN          ;SAVE SCOPE RETURN POINTER
1060 004266 000002          RTI          ;RETURN INLINE-NEXT TEST
1061 004270 004000          ICOUNT: 4000
1062 004272 000000          SCOPEF: 0          ;COUNT LOCATION FOR ITERATION LOOP
1063 004274 001202          RETURN: BEGIN          ;ADDRESS OF LAST TEST
1064 004276 000167 173676          JMP      200
1065
1066          ;GROUP OF NESTED SUBROUTINES
1067 004302 000207          SUBR1: RTS      %7          ;ONE INSTRUCTION
1068 004304 000277          SUBR2: SCC          ;ONE DEEP
1069 004306 000207          RTS      %7
1070 004310 004767 177770          SUBR3: JSR      %7,SUBR2          ;TWO DEEP
1071 004314 000207          RTS      %7
1072 004316 004767 177766          SUBR4: JSR      %7,SUBR3          ;THREE DEEP
1073 004322 000207          RTS      %7
1074 004324 004767 177766          SUBR5: JSR      %7,SUBR4          ;FOUR DEEP
1075 004330 000207          RTS      %7
1076 004332 004767 177766          SUBR6: JSR      %7,SUBR5          ;FIVE DEEP
1077 004336 000207          RTS      %7
1078
1079 004340 012777 000240 177334 ;PRINT DEVICE ADDRESS AND VECTOR
1080 004346 105777 177332 MOREID: MOV      #240,@TDBR
1081 004352 100375          TSTB      @TCSR
          BPL      .-4

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SEQ 0021

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1082 004354 016702 174420      MOV    GRSTAT,%2
1083 004360 004767 177326      JSR    %7,PRTAB
1084 004364 012777 000240 177310  MOV    #240,@TDBR
1085
1086 004372 105777 177306      TSTB   @TCSR
1087 004376 100375             BPL    .-4
1088 004400 016702 174406      MOV    GRIVA,%2
1089 004404 004767 177302      JSR    %7,PRTAB
1090 004410 000207             RTS     %7      ;BACK TO PRINT
1091
1092             ;ENTER HERE OR POWER FAIL
1093
1094 004412 010046      PFAIL:  MOV    %0,-(6)      ;SAVE REGISTER OR STACK
1095 004414 010146      MOV    %1,-(6)      ;WHEN POWERING DOWN
1096 004416 010246      MOV    %2,-(6)
1097 004420 010346      MOV    %3,-(6)
1098 004422 010446      MOV    %4,-(6)
1099 004424 010546      MOV    %5,-(6)
1100 004426 016746 173372      MOV    %6,-(6)
1101 004432 010667 000010      MOV    %6,SAVR6
1102 004436 012767 004450 173360  MOV    #RESTART,24      ;STORE STACK POSITION
1103 004444 000000      HALT
1104 004446 000000      SAVR6:  0      ;HALT ON POWER DOWN NORMAL
1105 004450 016706 177772      RESTART:MOV    SAVR6,%6      ;STACK IS SAVED HERE
1106 004454 012667 173344      MOV    (6)+,%24      ;RESTORE REGISTER OFF STACK
1107 004460 012605      MOV    (6)+,%5      ;WHEN POWERING UP
1108 004462 012604      MOV    (6)+,%4
1109 004464 012603      MOV    (6)+,%3
1110 004466 012602      MOV    (6)+,%2
1111 004470 012601      MOV    (6)+,%1
1112 004472 012600      MOV    (6)+,%0
1113 004474 104000      HLT
1114 004476 000167 174500      JMP     BEGIN      ;POWER FAIL OCCURRED
1115 004502 000002      RTI      ;RETURN TO MAIN LINE
1116
1117 004504 125252      B:      125252
1118             ;FIXED VALUES FOR USE IN TEST
1119 004506 004504      B      052525      ;ADDRESS OF B
1120 004510 052525
1121
1122             .=B+10
1123 004514 177777      A:      -1
1124 004516 004520      A+4
1125
1126             .=A+4
1127 004520 125252      125252
1128 004522 004524      A+10
1129 004524 052525      052525      ;ADDRESS OF A+10
1130             ;FOR STORAGE
1131 004526 000000      C:      0
1132 004530 004526      C
1133             ;ADDRESS OF C
1134             .=C+10
1135 004536 000000      TEMP:  0
1136 004540 004536      TEMP
1137             ;ADDRESS OF TEMP

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SEQ 0022

1138		004544	. = TEMP+6	
1139	004544	004546	TEMP+10	; ADDRESS OF TEMP+10 OR 'D'
1140	004546	000000	D: 0	
1141		004650	. = .+100	
1142	004650		BUFF:	
1143	004650	000000	FIN: 0	; BUFFER FOR SP
1144		000001	.END	

A		004514	1123#	1124	1126	1128														
ABC		002130	716	722#																
ASCNT		004172	991*	1015*	1022*	1026*	1038#													
B		004504	1117#	1119	1122															
BEGANY		003420	919	921#																
BEGIN		001202	548	572#	939	1063	1114													
BEGINA		001024	526	543#	889	900														
BEG20		003412	915	920#																
BELL		003340	888	907#																
BINCT		004170	988*	1007*	1010*	1011	1014*	1037#												
BUFF		004650	547	570	770	781	797	808	817	828	839	850	863	876	1142#					
C		004526	1131#	1132	1134															
CC	=	177776	248#	1046*																
COUNT		001020	541#	633*	634	636	639*	661*	664*	665	668	672*	675*	676	679					
CSR	=	001000	250#	553	554	555	556	557	790#	798*	799*	809*	810*	818*	819*					
			829*	830*	840*	841*	843*	851*	852*	853*	864*	865*	866*	877*	878*					
			879*																	
D		004546	1140#																	
DECML		004164	993*	1006	1012*	1035#														
DEF		002176	729	735#																
DR11B		001154	560	562*	564*	566*	567#													
DR11C		001176	570#																	
FIN		004650	1143#																	
GRBHIO		001006	534#	556*	653*	673*	674*	731*												
GRDAI		001004	533#	555*	688	694	703	749												
GRDAIO		001010	535#	557*	578	596	634*	749*	750											
GRDIO		001002	532#	554*	586*	587	594*	602*	603	609*	610	635	643*	644*	645					
			652*	654	662*	663*	665	676	687*	688*	693*	694*	695	702*	703*					
			704	709*	714*	718*	722	728*	735	741*	743*	746*								
GRIVA		001012	537#	567*	573*	716*	771*	778*	789	884*	885*	895*	898	1088						
GRIVB		001016	539#	569*	729*	783*	897*													
GRIVSA		001014	538#	568*	573	574*	778	791	884	896*										
GRSTAT		001000	531#	553*	617*	618	625*	627	717*	730*	742*	745*	758	763	772*					
			777*	784*	788*	790														

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0024

SAVR3	003676	961*	973	981#													
SAVR4	003700	962*	974	982#													
SAVR6	004446	549*	901	1101*	1104#	1105											
SBELL	003370	905	915#														
SCOPE =	104400	246#	572	584	592	600	608	616	623	631	642	651	659	671			
		685	692	699	712	727	740	748	757	762	768	780	802	813			
		823	833	846	857	870	883										
SCOPEA	004262	1053	1059#														
SCOPEB	004206	1045#	1051	1057													
SCOPEC	004220	515	1050#														
SCOPEF	004272	1054	1056*	1058*	1062#												
SCOPEG	004256	1055	1058#														
SEVEN	004162	992*	1001	1012	1018*	1034#											
SR =	177570	249#	558	926	946	975	1050	1052									
STAR	004000	999	1001#	1021													
STATUS=	177776	244#	248	615*	682*	715*	769*	773*	782*	785*	795*	805*	806*	814*			
		815*	825*	826*	836*	837*	848*	860*	861*	873*	874*						
SUBR1	004302	1067#															
SUBR2	004304	1068#	1070														
SUBR3	004310	1070#	1072														
SUBR4	004316	1072#	1074														
SUBR5	004324	1074#	1076														
SUBR6	004332	1076#															
TCSR	003704	910	913	952	955	958	966	984#	994	1023	1030	1080	1086				
TDBR	003702	909*	912*	954*	957*	965*	983#	998*	1000*	1025*	1079*	1084*					
TEMP	004536	1135#	1136	1138	1139												
TINT1	002502	796	802#														
TINT2	002552	807	813#														
TINT3	002622	816	823#														
TINT4	002672	827	833#														
TINT5	002752	838	846#														
TINT6	003022	849	856#														
TINT7	003102	862	859#														
TINT8	003162	875	882#														
TOODLE	004160	1002*	1003*	1004	1033#												
TRPB	003502	552*	887	928*	941#												
Ts1	001500	634#	641														
TST2	001636	663#	670														
TST3	001702	674#	681														
TST4	002354	771	777#														
TST5	002430	783	788#														
TST6	002030	702#	710														
TST7	002074	708	714#														
TST8	002146	720	728#														
TST9	002212	733	741#														
WAIT1	003750	994#	995														
WAIT2	004126	1023#	1024	1028													
WGTCT	004166	989*	1006*	1008	1013*	1036#											
WRTOC	004042	1005	1010#														
XLIST	004120	1016	1022#														
YESRT	003504	886	918*	920*	942#												
YESTR	003426	925#															
YESTR1	003474	927	931	933	939#												
YESTR2	003500	940#															
SENDAD	003464	520	935#														
.	= 004652	251	253	255	257	259	261	263	265	267	269	271	273	275			

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0025

277	279	281	283	285	287	289	291	293	295	297	299	301
303	305	307	309	311	313	315	317	319	321	323	325	327
329	331	333	335	337	339	341	343	345	347	349	351	353
355	357	359	361	363	365	367	369	371	373	375	377	379
381	383	385	387	389	391	393	395	397	399	401	403	405
407	409	411	413	415	417	419	421	423	425	427	429	431
433	435	437	439	441	443	445	447	449	451	453	455	457
459	461	463	465	467	469	471	473	475	477	479	481	483
485	487	489	491	493	495	497	499	501	503	505	512#	519#
522#	525#	527#	579	589	597	605	612	620	628	637	640	647
656	666	669	677	680	689	696	705	719	723	732	736	744
752	759	764	855	868	881	899	911	914	929	947	953	956
959	967	976	1031	1081	1087	1122#	1126#	1134#	1138#	1141#		

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SEQ 0026

COMMEN	1#
ENDCOM	1#
ESCAPE	1#
GETPRI	1#
GETSWR	1#
MULT	1#
NEWTST	1#
POP	1#
PUSH	1#
REPORT	1#
SETPRI	1#
SETUP	1#
SKIP	1#
SLASH	1#
STARS	1#
SWRSU	1#
TYPBIN	1#
TYPDEC	1#
TYPNAM	1#
TYPNUM	1#
TYPOCS	1#
TYPOCT	1#
TYPTXT	1#
\$\$FSCA	1#
\$\$NEWT	1#
\$\$SKIP	1#
.EQUAT	1#
.HEADE	1#
.KT11	1#
.SETUP	1#
.SWRHI	1#
.\$ACT1	1#
.\$APT8	1#
.\$APTH	1#
.\$APTY	1#
.\$ASTA	1#
.\$CATC	1#
.\$CMTA	1#
.\$DB2D	1#
.\$DB2O	1#
.\$DIV	1#
.\$EOP	1#
.\$ERRO	1#
.\$ERRT	1#
.\$MULT	1#
.\$POWE	1#
.\$RAND	1#
.\$RDDE	1#
.\$RDOC	1#
.\$READ	1#
.\$R2AZ	1#
.\$SAVE	1#
.\$SB2D	1#
.\$SB2O	1#
.\$SCOP	1#
.\$SIZE	1#

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SEQ 0027

.\$SUPR 1#
.\$STRAP 1#
.\$STYPB 1#
.\$STYPD 1#
.\$STYPE 1#
.\$STYPO 1#
.\$4OCA 1#
.\$1170 1#

. ABS. 004652 000

ERRORS DETECTED: 0

CZDRIB.BIN,CZDRIB.SEQ/CRF/SOL/NL:TOC=SYSMAC.SML,CZDRIB.P11
RUN-TIME: 8 9 .4 SECONDS
RUN-TIME RATIO: 359/18=19.8
CORE USED: 31K (61 PAGES)