

# DR11A

DR11A DEV REG TST  
CZDRIB0

AH-8669B-MC

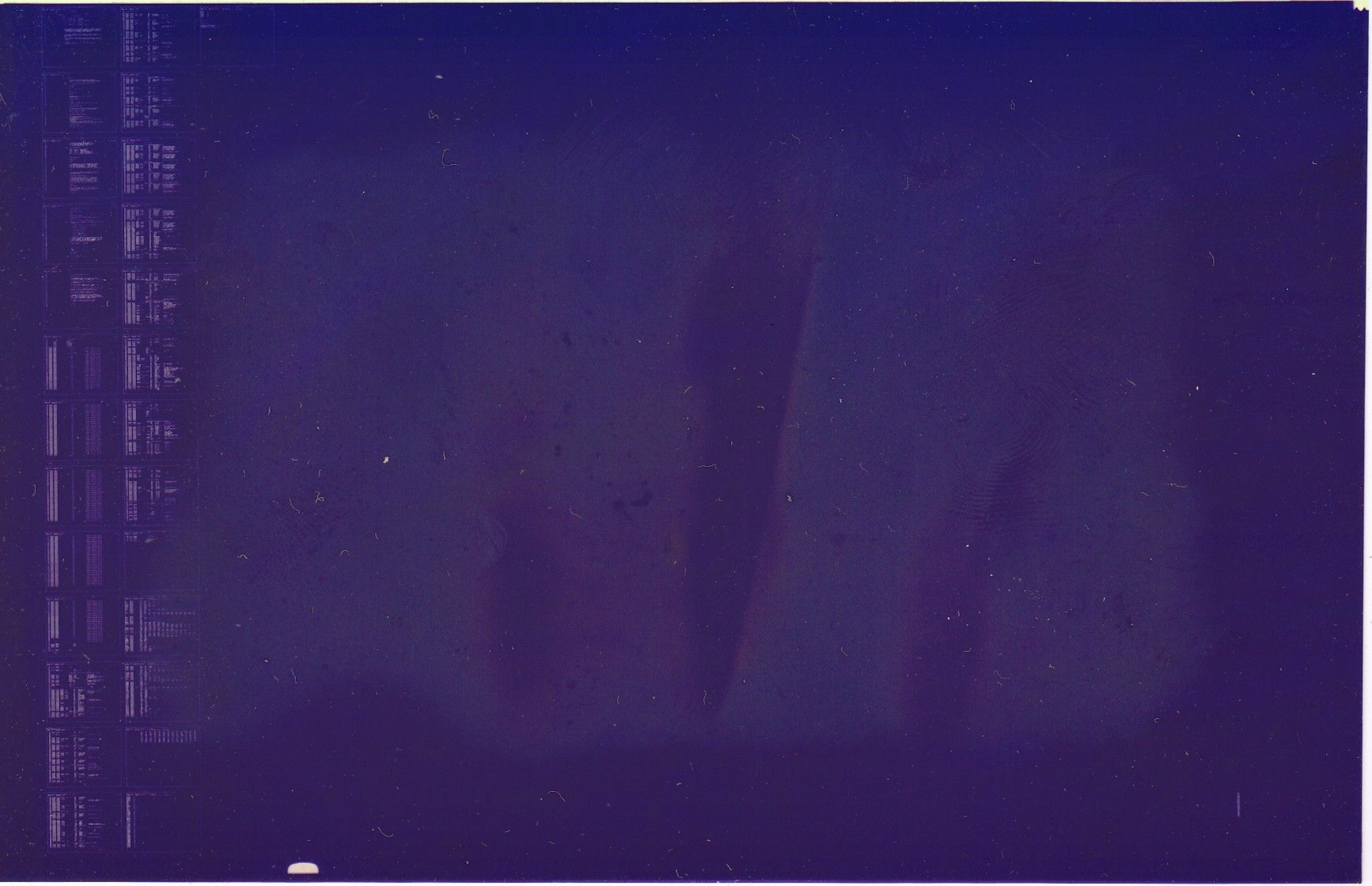
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IDENTIFICATION

PRODUCT CODE: AC-8668B-MC  
PRODUCT NAME: CZDRIBO DR11A DEV REG TEST  
DATE: MARCH 1979  
MAINTAINER: DIAGNOSTIC GROUP

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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  
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DEPRESS CONTINUE TO RESTART SECTION

7. RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

THE DR11A MUST HAVE THE M980 MAINTENANCE MODULE TO RUN THIS TEST.

NOTE THAT THE DR11A HAS FLOATING VECTORS:

THE BELOW IS THE ASSIGNMENT OF FLOATING VECTORS, THE ASSIGNED SEQUENCES ARE:

1. STARTING AT 300 ALL DC11'S WILL BE ASSIGNFD.
2. THEN ANY KL11 CALLED FOR (VT05, VT06, LC11)
3. THEN ANY DP11 CALLED FOR.
4. THEN ANY DM11 CALLED FOR.
5. THEN ANY DN11 CALLED FOR.
6. THEN ANY DM11BB CALLED FOR.
7. THEN ANY DR11A CALLED FOR.

THE DR11A DEVICE ADDRESS WILL BE ASSIGNED IN THE USER AREA OF 767776 TO 764000. THE ASSIGNMENT OF ADDRESS WILL START AT THE HIGH ADDRESS LIMIT AND PROCEED DOWNWARD. USERS AND SPECIAL SYSTEMS SHOULD START THEIR ASSIGNMENT OF SPECIAL DEVICES AT THE LOW ADDRESS LIMIT AND WORK UP.

767776 TO 767770	DR11A #0
767766 TO 767760	DR11A #1
:	:
767706 TO 767700	DR11A #7
:	:
767606 TO 767600	DR11A #15

8. MISCELLANEOUS

8.1 EXECUTION TIME

FOR EACH DR11A ABOUT 2 MINUTES

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 PFEVIOUS LOCATION
255 000010      000012      .+2
256 000012      000000      HALT          ;TRAPPED TO PREVIOUS LOCATION
257 000014      000016      .+2
258 000016      000000      HALT          ;TRAPPED TO PPREVIOUS 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 PREVICUS 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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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	000774	000000	HALT	;TRAPPED TO PREVIOUS LOCATION
505	000776	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	SENDAD	
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          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      #BFIN,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 001202 104400 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
```

```

578 001234 017700 177550      MOV    @GRDAIO,%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
596 001316 005777 177466      TST    @GRDAIO         ;SET DATA TO ALL ONES
597 001322 001401              BEQ    .+4             ;SHOULD CLEAR REGISTER
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

```

```
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 CLR @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 CLR @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 CLR @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 CLR @GRDIO
688 001756 017777 177022 177016 MOV @GRDAI,@GRDIO ;TEST TRANSFER OF ZERO
689 001764 001401 BEQ .+4
```

```
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  TST6:  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  TST7:  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  ABC:   BIT          #200,@GRDIO
723 002136 001001          BNE          .+4
724 002140 104000          HLT
725 002142 000002          RTI          ;INTERRUPT A FAILED
726 ;CHECK - WORD OR BYTE
727
728 002144 104400          SCOPE
729 002146 005077 176630          CLR          @GRDIO
730 002152 012777 002176 176636  TST8:  MOV          #DEF,@GRIVB ;TEST INTERRUPT B
731 002160 012777 000040 176612  MOV          #40,@GRSTAT
732 002166 105277 176614          INCB        @GRBHIO
733 002172 001375          BNE          .-4
734 002174 000406          BR          TST9
735
736 002176 005777 176600          DEF:   TST          @GRDIO
737 002202 100401          BMI          .+4
738 002204 104000          HLT
739 002206 000002          RTI          ;INTERRUPT B FAILED
740 ;CHECK WORD OR BYTE
741
742 002210 104400          SCOPE
743 002212 005077 176564          CLR          @GRDIO
744 002216 012777 000140 176554  TST9:  MOV          #140,@GRSTAT ;TEST COMBINED INTERRUPTS
745 002224 005277 176552          INC          @GRDIO
746 002230 001375          BNE          .-4
747 002232 005077 176542          CLR          @GRSTAT
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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                                     IVA=GRIVA
790                                     CSR=GRSTAT
791                                     IVS=GRIVSA
792
793                                     ;TEST FOR INTERRUPT FROM DEVICE
794 002434 016777 176362 176352      MOV      PL,@IVS
795 002442 042767 000340 175326      BIC      #340,STATUS ;PROCESSOR LEVEL ZERO
796 002450 012777 002502 176334      MOV      #TINT1,@IVA
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,@CSP ;SET INTERRUPT ENABLE-
800 002476 000240      NOP
801 002500 104000      HLT ;NO DEVICE INTERRUPT OCCURED
    
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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
848 ;TEST FOR NO INTERRUPT FROM DEVICE (HIGHEST PROCESSOR PRIORITY)
849 002754 052767 000340 175014 BIS #340,STATUS ;RAISE PROCESSOR PRIORITY TO HIGHEST LEVEL
850 002762 012777 003022 176022 MOV #TINT6,@IVA ;IN CASE OF INTERRUPT
851 002770 012706 004650 MOV #BUFF,%6 ;SET STACK POINTER
852 002774 052777 000100 175776 BIS #100,@CSR ;CLEAR INTERRUPT ENABLE
853 003002 042777 000100 175770 BIC #100,@CSR
854 003010 042777 000100 175762 BIC #100,@CSR ;DON'T LEAVE IT SET
855 003016 000240 NOP
856 003020 000401 BR .+4 ;WITH NO INTERRUPT, BRANCH OVER HALT
857 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 GRIVSA,@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 #PFMAIL,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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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      MOV    #2,YESRT      ;TRAP OCCURED
921 003420 012767 000012 174362      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			:HALT ON ERROR SET
978	003672	000002				RTI			:RETURN TO MAIN STREAM
979									
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	STAR	
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	WRTOC	: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	STAR	:NX SEVEN SET GET NX OCTAL
1022	004120	012767	000005	000044		XLIST:	MOV	#5,ASCNT	:SEND 5 CHAR TO TTY
1023	004126	105777	177552			WAIT2:	TSTB	@TCSR	
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          TODDLE: 0
1034 004162 000000          SEVEN:  0
1035 004164 000000          DECML:  0
1036 004166 000000          WGTCT:  0
1037 004170 000000          BINCT:  J
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,%ICOUNT
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          ;PRINT DEVICE ADDRESS AND VECTOR
1079 004340 012777 000240 177334          MOREID:  MOV     #240,%TDBR
1080 004346 105777 177332          TSTB    @TCSR
1081 004352 100375          BPL     .-4

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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    24,-(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)+,%25        ;WHEN POWERING UP
1108 004462 012604      MOV    (6)+,%24
1109 004464 012603      MOV    (6)+,%23
1110 004466 012602      MOV    (6)+,%22
1111 004470 012601      MOV    (6)+,%21
1112 004472 012600      MOV    (6)+,%20
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
1120 004510 052525      052525                ;ADDRESS OF B
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
  
```

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





CROSS REFERENCE TABLE -- USER SYMBOLS

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			

CROSS REFERENCE TABLE -- USER SYMBOLS

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#		

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#
.\$DB20	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#
.\$SB20	1#
.\$SCOP	1#
.\$SIZE	1#

.\$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)