

# PDP11

UNIBUS TESTER  
MD-11-D8A-B

EP-D8A-B-DL-A  
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The left side of the page contains a grid of 40 small technical diagrams or test patterns, arranged in 10 rows and 4 columns. Each diagram appears to be a schematic or a test pattern related to the Unibus Tester. The diagrams are too small to read in detail but show various electrical symbols, lines, and data structures. The right side of the page is mostly blank, with some faint, illegible markings.





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6. ERRORS

6.1 ERROR PRINTOUT

NONE

6.2 ERROR RECOVERY

THE PROGRAM WILL HALT ON AN ERROR, TO REPEAT THE SEQUENCE THAT CAUSED THE FAILURE PRESS "CONTINUE" OR RESTART AT 200. IF IT IS DESIRED TO REPEAT THE ERROR SEQUENCE ON A CONTINUOUS BASIS THE OPERATOR CAN REPLACE THE HALT INSTRUCTION WITH A NOP (240).

6.3 ERROR DESCRIPTION

REFER TO THE PROGRAM LISTING FOR THE DESCRIPTION OF THE CAUSE OF THE ERROR.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

NONE

7.2 OPERATING RESTRICTIONS

NONE

8. MISCELLANEOUS

THIS PROGRAM ASSUMES THE OPERATOR IS FAMILIAR WITH THE ENGINEERING SPECIFICATION OF THE PDP-11 BUS TESTER WRITTEN BY STEVE ROTHMAN.

9. PROGRAM DESCRIPTION

THE PROGRAM CONSISTS OF A SERIES OF SHORT STRAIGHT LINE TESTS THAT CHECK EACH OF THE OPERATIONAL FEATURES OF THE UNIBUS TESTER.

| TEST NAME | DESCRIPTION   |
|-----------|---|
| T0        | TEST THAT CONTROL REGISTER MAY BE SET WITH ALL 1'S. |
| T1        | TEST RUN (BIT 15) TO BE CLEARED IF DEVICE OFF       |
| T2        | TEST RUN (BIT 15) TO BE SET IF DEVICE ON            |
| T3        | TEST FOR PROPER VECTOR ADDRESS INTERRUPT            |

# E01

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- T4 TEST THAT DEVICE CANNOT INTERRUPT WITH PROCESSOR AT PRIORITY 7
- T5 TEST THAT DEVICE CANNOT INTERRUPT WITH SAME OR LOWER PRIORITY AS PROCESSOR
- T6 TEST THAT DEVICE MUST INTERRUPT WHEN PROCESSOR PRIORITY IS LOWER THAN DEVICE
- T7 TEST THAT DATA REGISTER MAY BE CLEARED
- T8 TEST THAT DATA REGISTER MAY BE SET TO ALL 1'S
- T9 TEST THAT DATA REGISTER WILL ACCEPT A COUNT PATTERN
- T10 TEST THAT ADDRESS REGISTER MAY BE CLEARED
- T11 TEST THAT ADDRESS REGISTER MAY BE SET WITH ALL 1'S
- T12 TEST THAT ADDRESS REGISTER WILL ACCEPT A COUNT PATTERN
- T13 TEST THAT BYTE COUNT MAY BE CLEARED
- T14 TEST THAT BYTE COUNT MAY BE SET TO ALL 1'S
- T15 TEST THAT BYTE COUNT WILL ACCEPT A COUNT PATTERN
- T16 DO A DATOB-NPR SEQUENCE TO CHECK THAT BYTE COUNT WILL DECREMENT BY 1 FROM 177777 TO 0.
- T17 SAME AS T16 EXCEPT SEQUENCE IS A DATO-NPR AND EXPECT BYTE COUNT TO DECREMENT BY 2 FROM 177776 TO 0.
- T18 DO A DATOB TO CHECK FOR PROPER DATA TRANSFER FROM BYTE COUNT
- T19 SAME AS T18 WITH A DATO SEQUENCE.
- T20 DO A DATOB TO CHECK FOR PROPER DATA TRANSFER FROM DATA REGISTER
- T21 SAME AS T20 WITH A DATO SEQUENCE



|     |        |        |        |        |                 |           |  |
|-----|--------|--------|--------|--------|-----------------|-----------|--|
| 262 | 000066 | 000000 |        |        | HALT            |           |  |
| 263 | 000070 | 000072 |        |        | .+2             |           |  |
| 264 | 000072 | 000000 |        |        | HALT            |           |  |
| 265 | 000074 | 000076 |        |        | .+2             |           |  |
| 266 | 000076 | 000000 |        |        | HALT            |           |  |
| 267 |        |        |        |        |                 |           |  |
| 268 |        | 000046 |        |        | =46             |           |  |
| 269 | 000046 | 011426 |        |        | \$ENDAD         |           |  |
| 270 |        | 000052 |        |        | .=52            |           |  |
| 271 | 000052 | 040000 |        |        | 40000           |           |  |
| 272 |        |        |        |        |                 |           |  |
| 273 |        | 000200 |        |        | .=200           |           |  |
| 274 | 000200 | 000167 | 000574 |        | JMP             | START     |  |
| 275 |        |        |        |        |                 |           |  |
| 276 | 000204 | 000510 |        |        | DEV1A:          | 510       |  |
| 277 | 000206 | 000512 |        |        | DS1A:           | 512       |  |
| 278 | 000210 | 000514 |        |        | DEV1B:          | 514       |  |
| 279 | 000212 | 000516 |        |        | DS1B:           | 516       |  |
| 280 | 000214 | 000520 |        |        | DEV2A:          | 520       |  |
| 281 | 000216 | 000522 |        |        | DS2A:           | 522       |  |
| 282 | 000220 | 000524 |        |        | DEV2B:          | 524       |  |
| 283 | 000222 | 000526 |        |        | DS2B:           | 526       |  |
| 284 | 000224 | 170000 |        |        | DATA1:          | 170000    | ::SECTION 1 DATA REGISTER              |
| 285 | 000226 | 170002 |        |        | ADRS1:          | 170002    | ::SECTION 1 ADDRESS REGISTER           |
| 286 | 000230 | 170004 |        |        | BC1:            | 170004    | ::SECTION 1 BYTE COUNTER               |
| 287 | 000232 | 170006 |        |        | CR1A:           | 170006    | ::SECTION 1 CONTROL DEVICE 1A          |
| 288 | 000234 | 170016 |        |        | CR1B:           | 170016    | ::SECTION 1 CONTROL DEVICE 1B          |
| 289 | 000236 | 170020 |        |        | DATA2:          | 170020    | ::SECTION 2 DATA REGISTER              |
| 290 | 000240 | 170022 |        |        | ADRS2:          | 170022    | ::SECTION 2 ADDRESS REGISTER           |
| 291 | 000242 | 170024 |        |        | BC2:            | 170024    | ::SECTION 2 BYTE COUNTER               |
| 292 | 000244 | 170026 |        |        | CR2A:           | 170026    | ::SECTION 2 CONTROL REGISTER DEVICE 2A |
| 293 | 000246 | 170036 |        |        | CR2B:           | 170036    | ::SECTION 2 CONTROL REGISTER DEVICE 2B |
| 294 |        |        |        |        |                 |           |  |
| 295 |        | 012034 |        |        | BUFF1=LAST      |           | ::BUFFER STORAGE AREA 1                |
| 296 |        | 014034 |        |        | BUFF2=LAST+2000 |           | ::BUFFER STORAGE AREA 2                |
| 297 |        | 177570 |        |        | SWREG=177570    |           | ::SWITCH REGISTER                      |
| 298 |        | 177776 |        |        | CC=177776       |           | ::CONDITION CODES                      |
| 299 |        | 000240 |        |        | NOP=240         |           | ::NO OPERATION                         |
| 300 |        | 000776 |        |        | STACK=776       |           |  |
| 301 |        |        |        |        |                 |           |  |
| 302 |        | 001000 |        |        | .=1000          |           |  |
| 303 | 001000 | 012706 | 000776 |        | START: MOV      | #STACK,%6 |  |
| 304 | 001004 | 012767 | 000340 | 176764 | MOV             | #340,CC   | ;SET PRIORITY 7                        |
| 305 | 001012 | 005077 | 177170 |        | CLR             | @DS1A     |  |
| 306 | 001016 | 005077 | 177170 |        | CLR             | @DS1B     |  |
| 307 | 001022 | 005077 | 177170 |        | CLR             | @DS2A     |  |
| 308 | 001026 | 005077 | 177170 |        | CLR             | @DS2B     |  |
| 309 | 001032 | 000005 |        |        | RESET           |           |  |

# H01

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310
311
312 001034 012777 077776 177170 ;TEST THAT CONTROL REGISTER MAY BE SET WITH ALL 1'S
313 001042 022777 077776 177162 T0:  MOV  #77776, @CR1A
314 001050 001402          BEQ  TOA
315 001052 000000          HALT
316 001054 000767          BR   TOA
317 001056 012777 077776 177150 TOA:  MOV  #77776, @CR1B
318 001064 022777 077776 177142          CMP  #77776, @CR1B
319 001072 001402          BEQ  TOB
320 001074 000000          HALT
321 001076 000767          BR   TOA
322 001100 012777 077776 177136 TOB:  MOV  #77776, @CR2A
323 001106 022777 077776 177130          CMP  #77776, @CR2A
324 001114 001402          BEQ  TOC
325 001116 000000          HALT
326 001120 000767          BR   TOB
327 001122 012777 077776 177116 TOC:  MOV  #77776, @CR2B
328 001130 022777 077776 177110          CMP  #77776, @CR2B
329 001136 001402          BEQ  T1
330 001140 000000          HALT
331 001142 000767          BR   TOC
332
333 001144 005077 177062 ;TEST RUN (BIT 15) TO BE CLEARED IF DEVICE OFF
334 001150 005777 177056 T1:  CLR  @CR1A
335 001154 001402          TST  @CR1A
336 001156 000000          BEQ  T1A
337 001160 000771          HALT
338 001162 005077 177046          BR   T1
339 001166 005777 177042          CLR  @CR1B
340 001172 001402          TST  @CR1B
341 001174 000000          BEQ  T1B
342 001176 000771          HALT
343 001200 005077 177040          BR   T1A
344 001204 005777 177034          CLR  @CR2A
345 001210 001402          TST  @CR2A
346 001212 000000          BEQ  T1C
347 001214 000771          HALT
348 001216 005077 177024          BR   T1B
349 001222 005777 177020          CLR  @CR2B
350 001226 001402          TST  @CR2B
351 001230 000000          BEQ  T2
352 001232 000771          HALT
353          BR   T1C
354 001234 012777 000031 176770 ;TEST RUN (BIT 15) TO BE SET IF DEVICE ON
355 001242 005777 176764 T2:  MOV  #31, @CR1A
356 001246 000005          TST  @CR1A
357 001250 100402          RESET
358 001252 000000          BMI  T2A
359 001254 000767          HALT
360 001256 012777 000031 176750 T2A:  BR   T2
361 001264 005777 176744          MOV  #31, @CR1B
362 001270 000005          TST  @CR1B
363 001272 100402          RESET
364 001274 000000          BMI  T2B
365 001276 000767          HALT
          BR   T2A

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;ERROR, CONTROL REGISTER 1A NOT SET

;ERROR, CONTROL REGISTER 1B NOT SET

;ERROR, CONTROL REGISTER 2A NOT SET

;ERROR, CONTROL REGISTER 2B NOT SET

;STOP DEVICE 1A  
 ;TEST FOR STOPPED  
 ;WAS DEVICE STOPPED  
 ;ERROR, DEVICE IS RUNNING - BIT 15 SET

;STOP DEVICE 1B

;ERROR, DEVICE IS RUNNING - BIT 15 SET

;STOP DEVICE 2A

;ERROR, DEVICE IS RUNNING - BIT 15 SET

;STOP DEVICE 2B

;ERROR, DEVICE IS RUNNING - BIT 15 SET

;START DEVICE 1A  
 ;TEST FOR RUNNING  
 ;STOP DEVICE  
 ;WAS DEVICE RUNNING  
 ;ERROR, DEVICE NOT RUNNING - BIT 15 NOT SET  
 ;LOOP ON TEST  
 ;START DEVICE 1B

;ERROR, DEVICE NOT RUNNING - BIT 15 NOT SET

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366 001300 012777 000031 176736 T2B:  MOV  #31,@CR2A          ;START DEVICE 2A
367 001306 005777 176732          TST  @CR2A
368 001312 000005          RESET
369 001314 100402          BMI  T2C
370 001316 000000          HALT          ;ERROR, DEVICE NOT RUNNING - 15 NOT SET
371 001320 000767          BR   T2B
372 001322 012777 000031 176716 T2C:  MOV  #31,@CR2B          ;START DEVICE 2B
373 001330 005777 176712          TST  @CR2B
374 001334 000005          RESET
375 001336 100402          BMI  T3
376 001340 000000          HALT          ;ERROR, DEVICE NOT RUNNING - BIT 15 NOT SET
377 001342 000767          BR   T2C
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379
380 001344 005067 176426          :TEST FOR PROPER VECTOR ADDRESS INTERRUPT
381 001350 012777 001412 176632 T3: CLR CC ;SET PROCESSOR PRIORITY TO 0
382 001356 012777 001412 176630 MOV #T3A,@DEV1B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1B
383 001364 012777 001412 176626 MOV #T3A,@DEV2A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2A
384 001372 012777 001420 176604 MOV #T3A,@DEV2B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2B
385 001400 000005          RESET ;INITIALIZE RETURN FOR PROPER VECTOR FOR DEVICE 1A
386 001402 012777 000021 176622 MOV #21,@CR1A ;INTERRUPT ON BECOMING BUS MASTER
387 001410 000001          WAIT
388 001412 000000          T3A: HALT ;ERROR, DEVICE 1A DID NOT VECTOR TO PROPER ADDRESS
389 001414 022626          CMP (6)+,(6)+
390 001416 000752          BR T3
391 001420 012777 001462 176556 T3B: MOV #T3C,@DEV1A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1A
392 001426 012777 001462 176560 MOV #T3C,@DEV2A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2A
393
394 001434 012777 001462 176556 MOV #T3C,@DEV2B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2B
395 001442 012777 001470 176540 MOV #T3D,@DEV1B ;INITIALIZE RETURN FOR PROPER VECTOR FOR DEVICE 1B
396 001450 000005          RESET
397 001452 012777 000021 176554 MOV #21,@CR1B ;INTERRUPT ON BECOMING BUS MASTER
398 001460 000001          WAIT
399 001462 000000          T3C: HALT ;ERROR, DEVICE 1B DID NOT VECTOR TO PROPER ADDRESS
400 001464 022626          CMP (6)+,(6)+
401 001466 000754          BR T3B
402 001470 012777 001532 176506 T3D: MOV #T3E,@DEV1A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1A
403 001476 012777 001532 176504 MOV #T3E,@DEV1B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1B
404 001504 012777 001532 176506 MOV #T3E,@DEV2B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2B
405 001512 012777 001540 176474 MOV #T3F,@DEV2A ;INITIALIZE RETURN FOR PROPER VECTOR FOR DEVICE 2A
406 001520 000005          RESET
407 001522 012777 000021 176514 MOV #21,@CR2A ;INTERRUPT ON BECOMING BUS MASTER
408 001530 000001          WAIT
409 001532 000000          T3E: HALT ;ERROR, DEVICE 2A DID NOT VECTOR TO PROPER ADDRESS
410 001534 022626          CMP (6)+,(6)+
411 001536 000754          BR T3D
412 001540 012777 001602 176436 T3F: MOV #T3G,@DEV1A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1A
413 001546 012777 001602 176434 MOV #T3G,@DEV1B ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 1B
414 001554 012777 001602 176432 MOV #T3G,@DEV2A ;INITIALIZE RETURN FOR INCORRECT VECTOR FOR DEVICE 2A
415 001562 012777 001610 176430 MOV #T4,@DEV2B ;INITIALIZE RETURN FOR PROPER VECTOR FOR DEVICE 2B
416 001570 000005          RESET
417 001572 012777 000021 176446 MOV #21,@CR2B ;INTERRUPT ON BECOMING BUS MASTER
418 001600 000001          WAIT
419 001602 000000          T3G: HALT ;ERROR, DEVICE 2B DID NOT VECTOR TO PROPER ADDRESS
420 001604 022626          CMP (6)+,(6)+
421 001606 000754          BR T3F

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## K01

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422
423
424 001610 012767 000340 176160 T4:  MOV #340,CC ;SET PROCESSOR PRIORITY TO 7
425 001616 012706 000776          MOV #STACK,%6
426 001622 012777 001642 176354          MOV #T4A,@DEV1A ;INITIALIZE VECTOR RETURN ADDRESS
427 001630 000005          RESET
428 001632 012777 000161 176372          MOV #161,@CR1A ;ENABLE DEVICE AT PRIORITY 7 TO ATTEMPT INTERRUPT
429 001640 000403          BR T4B
430 001642 000000          T4A:  HALT ;ERROR, DEVICE 1A SHOULD NOT HAVE INTERRUPTED
431 001644 022626          CMP (6)+,(6)+ ;KEEP STACK OUT OF THE WAY
432 001646 000760          BR T4
433 001650 000005          T4B:  RESET
434 001652 012767 000340 176116          MOV #340,CC ;SET PROCESSOR PRIORITY TO 7
435 001660 012777 001676 176322          MOV #T4C,@DEV1B ;INITIALIZE VECTOR RETURN
436 001666 012777 000161 176340          MOV #161,@CR1B ;ENABLE DEVICE AT PRIORITY 7 TO ATTEMPT INTERRUPT
437 001674 000403          BR T4D
438 001676 000000          T4C:  HALT ;ERROR, DEVICE 1B SHOULD NOT HAVE INTERRUPTED
439 001700 022626          CMP (6)+,(6)+ ;KEEP STACK OUT OF THE WAY
440 001702 000762          BR T4B
441 001704 000005          T4D:  RESET
442 001706 012767 000340 176062          MOV #340,CC ;SET PROCESSOR PRIORITY TO 7
443 001714 012777 001732 176272          MOV #T4E,@DEV2A ;INITIALIZE VECTOR RETURN
444 001722 012777 000161 176314          MOV #161,@CR2A ;ENABLE DEVICE AT PRIORITY 7 TO ATTEMPT INTERRUPT
445 001730 000403          BR T4F
446
447 001732 000000          T4E:  HALT ;ERROR, DEVICE 2A SHOULD NOT HAVE INTERRUPTED
448 001734 022626          CMP (6)+,(6)+ ;KEEP STACK OUT OF THE WAY
449 001736 000762          BR T4D
450 001740 000005          T4F:  RESET
451 001742 012767 000340 176026          MOV #340,CC ;SET PROCESSOR PRIORITY TO 7
452 001750 012777 001766 176242          MOV #T4G,@DEV2B ;INITIALIZE VECTOR RETURN
453 001756 012777 000161 176262          MOV #161,@CR2B ;ENABLE DEVICE AT PRIORITY LEVEL 7 TO ATTEMPT INTERRUPT
454 001764 000403          BR T5
455 001766 000000          T4G:  HALT ;ERROR, DEVICE 2B SHOULD NOT HAVE INTERRUPTED
456 001770 022626          CMP (6)+,(6)+ ;KEEP STACK OUT OF THE WAY
457 001772 000762          BR T4F

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458
459
460
461 001774 012706 000776
462 002000 012777 002546 176176
463 002006 012777 002552 176174
464 002014 012777 002556 176172
465 002022 012777 002562 176170
466 002030 000005
467 002032 012767 000340 175736
468 002040 012777 000161 176164
469 002046 012777 000161 176160
470 002054 012777 000161 176162
471 002062 012777 000161 176156
472 002070 000240
473 002072 000240
474 002074 000005
475 002076 012777 000121 176126
476 002104 012777 000121 176122
477 002112 012777 000121 176124
478 002120 012777 000121 176120
479 002126 000240
480 002130 000240
481 002132 000005
482 002134 012777 000061 176070
483 002142 012777 000061 176064
484 002150 012777 000061 176066
485 002156 012777 000061 176062
486 002164 000240
487 002166 000240
488 002170 000005
489 002172 012777 000021 176032
490 002200 012777 000021 176026
491 002206 012777 000021 176030
492 002214 012777 000021 176024
493 002222 000240
494 002224 000240
495 002226 000005

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;TEST THAT DEVICE CANNOT INTERRUPT WITH SAME OR LOWER PRIORITY AS PROCESSOR
;PROCESSOR PRIORITY 7
TS:  MOV    #STACK,%6
      MOV    #T5A,@DEV1A
      MOV    #T5B,@DEV1B
      MOV    #T5C,@DEV2A
      MOV    #T5D,@DEV2B
      RESET
      MOV    #340,CC           ;SET PROCESSOR PRIORITY 7
      MOV    #161,@CR1A       ;SET DEVICE 1A PRIORITY 7
      MOV    #161,@CR1B       ;SET DEVICE 1B PRIORITY 7
      MOV    #161,@CR2A       ;SET DEVICE 2A PRIORITY 7
      MOV    #161,@CR2B       ;SET DEVICE 2B PRIORITY 7
      NOP
      NOP
      RESET
      MOV    #121,@CR1A       ;CLEAR ALL INTERRUPT REQUESTS
      MOV    #121,@CR1B       ;SET DEVICE 1A PRIORITY 6
      MOV    #121,@CR1B       ;SET DEVICE 1B PRIORITY 6
      MOV    #121,@CR2A       ;SET DEVICE 2A PRIORITY 6
      MOV    #121,@CR2B       ;SET DEVICE 2B PRIORITY 6
      NOP
      NOP
      RESET
      MOV    #61,@CR1A        ;CLEAR ALL INTERRUPT REQUESTS
      MOV    #61,@CR1B        ;SET DEVICE 1A PRIORITY 5
      MOV    #61,@CR1B        ;SET DEVICE 1B PRIORITY 5
      MOV    #61,@CR2A        ;SET DEVICE 2A PRIORITY 5
      MOV    #61,@CR2B        ;SET DEVICE 2B PRIORITY 5
      NOP
      NOP
      RESET
      MOV    #21,@CR1A        ;CLEAR ALL INTERRUPT REQUESTS
      MOV    #21,@CR1B        ;SET DEVICE 1A PRIORITY 4
      MOV    #21,@CR1B        ;SET DEVICE 1B PRIORITY 4
      MOV    #21,@CR2A        ;SET DEVICE 2A PRIORITY 4
      MOV    #21,@CR2B        ;SET DEVICE 2B PRIORITY 4
      NOP
      NOP
      RESET

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;CLEAR ALL INTERRUPT REQUESTS

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# MO1

|     |        |        |        |        |       |            |                           |
|-----|--------|--------|--------|--------|-------|------------|---------------------------|
| 496 |        |        |        |        |       |            |                           |
| 497 |        |        |        |        |       |            |                           |
| 498 | 002230 | 012767 | 000300 | 175540 |       |            |                           |
|     |        |        |        |        | MOV   | #300,CC    | ;SET PROCESSOR PRIORITY 6 |
| 499 | 002236 | 000005 |        |        | RESET |            |                           |
| 500 | 002240 | 012777 | 000121 | 175764 | MOV   | #121,DCR1A | ;SET DEVICE 1A PRIORITY 6 |
| 501 | 002246 | 012777 | 000121 | 175760 | MOV   | #121,DCR1B | ;SET DEVICE 1B PRIORITY 6 |
| 502 | 002254 | 012777 | 000121 | 175762 | MOV   | #121,DCR2A | ;SET DEVICE 2A PRIORITY 6 |
| 503 | 002262 | 012777 | 000121 | 175756 | MOV   | #121,DCR2B | ;SET DEVICE 2B PRIORITY 6 |
| 504 | 002270 | 000240 |        |        | NOP   |            |                           |
| 505 | 002272 | 000240 |        |        | NOP   |            |                           |
| 506 | 002274 | 000005 |        |        | RESET |            |                           |
| 507 | 002276 | 012777 | 000061 | 175726 | MOV   | #61,DCR1A  | ;SET DEVICE 1A PRIORITY 5 |
| 508 | 002304 | 012777 | 000061 | 175722 | MOV   | #61,DCR1B  | ;SET DEVICE 1B PRIORITY 5 |
| 509 | 002312 | 012777 | 000061 | 175724 | MOV   | #61,DCR2A  | ;SET DEVICE 2A PRIORITY 5 |
| 510 | 002320 | 012777 | 000061 | 175720 | MOV   | #61,DCR2B  | ;SET DEVICE 2B PRIORITY 5 |
| 511 | 002326 | 000240 |        |        | NOP   |            |                           |
| 512 | 002330 | 000240 |        |        | NOP   |            |                           |
| 513 | 002332 | 000005 |        |        | RESET |            |                           |
| 514 | 002334 | 012777 | 000021 | 175670 | MOV   | #21,DCR1A  | ;SET DEVICE 1A PRIORITY 4 |
| 515 | 002342 | 012777 | 000021 | 175664 | MOV   | #21,DCR1B  | ;SET DEVICE 1B PRIORITY 4 |
| 516 | 002350 | 012777 | 000021 | 175666 | MOV   | #21,DCR2A  | ;SET DEVICE 2A PRIORITY 4 |
| 517 | 002356 | 012777 | 000021 | 175662 | MOV   | #21,DCR2B  | ;SET DEVICE 2B PRIORITY 4 |
| 518 | 002364 | 000240 |        |        | NOP   |            |                           |
| 519 | 002366 | 000240 |        |        | NOP   |            |                           |
| 520 | 002370 | 000005 |        |        | RESET |            |                           |

```

521
522
523 002372 012767 000240 175376 ;PROCESSOR PRIORITY 5
524 002400 000005 MOV #240,CC ;SET PROCESSOR PRIORITY 5
525 002402 012777 000061 175622 RESET
526 002410 012777 000061 175616 MOV #61,DCR1A ;SET DEVICE 1A PRIORITY 5
527 002416 012777 000061 175620 MOV #61,DCR1B ;SET DEVICE 1B PRIORITY 5
528 002424 012777 000061 175614 MOV #61,DCR2A ;SET DEVICE 2A PRIORITY 5
529 002432 000240 MOV #61,DCR2B ;SET DEVICE 2B PRIORITY 5
530 002434 000240 NOP
531 002436 000005 RESET
532 002440 012777 000021 175564 MOV #21,DCR1A ;SET DEVICE 1A PRIORITY 4
533 002446 012777 000021 175560 MOV #21,DCR1B ;SET DEVICE 1B PRIORITY 4
534 002454 012777 000021 175562 MOV #21,DCR2A ;SET DEVICE 2A PRIORITY 4
535 002462 012777 000021 175556 MOV #21,DCR2B ;SET DEVICE 2B PRIORITY 4
536 002470 000240 NOP
537 002472 000240 NOP
538 002474 000005 RESET
539
540 002476 012767 000200 175272 ;PROCESSOR PRIORITY 4
541 002504 000005 MOV #200,CC ;SET PROCESSOR PRIORITY 4
542 002506 012777 000021 175516 RESET
543 002514 012777 000021 175512 MOV #21,DCR1A ;SET DEVICE 1A PRIORITY 4
544 002522 012777 000021 175514 MOV #21,DCR1B ;SET DEVICE 1B PRIORITY 4
545 002530 012777 000021 175510 MOV #21,DCR2A ;SET DEVICE 2A PRIORITY 4
546 002536 000240 MOV #21,DCR2B ;SET DEVICE 2B PRIORITY 4
547 002540 000240 NOP
548 002542 000005 NOP
549 002544 000412 RESET
550 002546 000000 BR T6
551 002550 000401 TSA: HALT T6 ;ERROR, DEVICE 1A INTERRUPTED WHEN PROCESSOR HAD PRIORIT
552 002552 000000 BR .+4
553 002554 000401 TSB: HALT .+4 ;ERROR, DEVICE 1B INTERRUPTED WHEN PROCESSOR HAD PRIORIT
554 002556 000000 BR .+4
555 002560 000401 TSC: HALT .+4 ;ERROR, DEVICE 2A INTERRUPTED WHEN PROCESSOR HAD PRIORIT
556 002562 000000 BR .+4
557 002564 022626 TSD: HALT .+4 ;ERROR, DEVICE 2B INTERRUPTED WHEN PROCESSOR HAD PRIORIT
558 002566 000167 177202 CMP (6)+,(6)+
JMP T5

```

|     |        |        |        |        |  |  |
|-----|--------|--------|--------|--------|--|--|
| 559 |        |        |        |        |  |  |
| 560 |        |        |        |        |  | : TEST THAT DEVICE MUST INTERRUPT WHEN PROCESSOR PRIORITY IS LOWER THAN DEVICE |
| 561 |        |        |        |        |  | : PROCESSOR PRIORITY 6   |
| 562 | 002572 | 012706 | 000776 |        |  | T6: MOV #STACK,%5  |
| 563 | 002576 | 012767 | 000300 | 175172 |  | MOV #300,CC  |
| 564 | 002604 | 012777 | 000300 | 175374 |  | MOV #300,@DS1A   |
| 565 | 002612 | 012777 | 000300 | 175372 |  | MOV #300,@DS1B   |
| 566 | 002620 | 012777 | 000300 | 175370 |  | MOV #300,@DS2A   |
| 567 | 002626 | 012777 | 000300 | 175366 |  | MOV #300,@DS2B   |
| 568 | 002634 | 000005 |        |        |  | RESET  |
| 569 | 002636 | 012777 | 002660 | 175340 |  | MOV #.+22,@DEV1A   |
| 570 | 002644 | 012777 | 000161 | 175360 |  | MOV #161,@CR1A   |
| 571 | 002652 | 000240 |        |        |  | NOP  |
| 572 | 002654 | 000000 |        |        |  | HALT   |
| 573 | 002656 | 000745 |        |        |  | BR T6  |
| 574 | 002660 | 012777 | 002702 | 175322 |  | MOV #.+22,@DEV1B   |
| 575 | 002666 | 012777 | 000161 | 175340 |  | MOV #161,@CR1B   |
| 576 | 002674 | 000240 |        |        |  | NOP  |
| 577 | 002676 | 000000 |        |        |  | HALT   |
| 578 | 002700 | 000734 |        |        |  | BR T6  |
| 579 | 002702 | 012777 | 002724 | 175304 |  | MOV #.+22,@DEV2A   |
| 580 | 002710 | 012777 | 000161 | 175326 |  | MOV #161,@CR2A   |
| 581 | 002716 | 000240 |        |        |  | NOP  |
| 582 | 002720 | 000000 |        |        |  | HALT   |
| 583 | 002722 | 000723 |        |        |  | BR T6  |
| 584 | 002724 | 012777 | 002746 | 175266 |  | MOV #.+22,@DEV2B   |
| 585 | 002732 | 012777 | 000161 | 175306 |  | MOV #161,@CR2B   |
| 586 | 002740 | 000240 |        |        |  | NOP  |
| 587 | 002742 | 000000 |        |        |  | HALT   |
| 588 | 002744 | 000712 |        |        |  | BR T6  |



|     |        |        |        |        |  |  |
|-----|--------|--------|--------|--------|--|--|
| 639 |        |        |        |        |  |  |
| 640 |        |        |        |        |  |  |
| 641 | 003234 | 012706 | 000776 |        |  |  |
| 642 | 003240 | 012767 | 000200 | 174530 |  |  |
| 643 | 003246 | 012777 | 000200 | 174732 |  |  |
| 644 | 003254 | 012777 | 000200 | 174730 |  |  |
| 645 | 003262 | 012777 | 000200 | 174726 |  |  |
| 646 | 003270 | 012777 | 000200 | 174724 |  |  |
| 647 | 003276 | 000005 |        |        |  |  |
| 648 | 003300 | 012777 | 003322 | 174676 |  |  |
| 649 | 003306 | 012777 | 000161 | 174716 |  |  |
| 650 | 003314 | 000240 |        |        |  |  |
| 651 | 003316 | 000000 |        |        |  |  |
| 652 | 003320 | 000745 |        |        |  |  |
| 653 |        |        |        |        |  |  |
| 654 | 003322 | 012777 | 003344 | 174660 |  |  |
| 655 | 003330 | 012777 | 000161 | 174676 |  |  |
| 656 | 003336 | 000240 |        |        |  |  |
| 657 | 003340 | 000000 |        |        |  |  |
| 658 | 003342 | 000734 |        |        |  |  |
| 659 | 003344 | 012777 | 003366 | 174642 |  |  |
| 660 | 003352 | 012777 | 000161 | 174664 |  |  |
| 661 | 003360 | 000240 |        |        |  |  |
| 662 | 003362 | 000000 |        |        |  |  |
| 663 | 003364 | 000723 |        |        |  |  |
| 664 | 003366 | 012777 | 003410 | 174624 |  |  |
| 665 | 003374 | 012777 | 000161 | 174644 |  |  |
| 666 | 003402 | 000240 |        |        |  |  |
| 667 | 003404 | 000000 |        |        |  |  |
| 668 | 003406 | 000712 |        |        |  |  |
| 669 | 003410 | 000005 |        |        |  |  |
| 670 | 003412 | 012777 | 003434 | 174564 |  |  |
| 671 | 003420 | 012777 | 000121 | 174604 |  |  |
| 672 | 003426 | 000240 |        |        |  |  |
| 673 | 003430 | 000000 |        |        |  |  |
| 674 | 003432 | 000700 |        |        |  |  |
| 675 | 003434 | 012777 | 003456 | 174546 |  |  |
| 676 | 003442 | 012777 | 000121 | 174564 |  |  |
| 677 | 003450 | 000240 |        |        |  |  |
| 678 | 003452 | 000000 |        |        |  |  |
| 679 | 003454 | 000667 |        |        |  |  |
| 680 | 003456 | 012777 | 003500 | 174530 |  |  |
| 681 | 003464 | 012777 | 000121 | 174552 |  |  |
| 682 | 003472 | 000240 |        |        |  |  |
| 683 | 003474 | 000000 |        |        |  |  |
| 684 | 003476 | 000656 |        |        |  |  |
| 685 | 003500 | 012777 | 003522 | 174512 |  |  |
| 686 | 003506 | 012777 | 000121 | 174532 |  |  |
| 687 | 003514 | 000240 |        |        |  |  |
| 688 | 003516 | 000000 |        |        |  |  |
| 689 | 003520 | 000645 |        |        |  |  |
| 690 | 003522 | 000005 |        |        |  |  |
| 691 | 003524 | 012777 | 003546 | 174452 |  |  |
| 692 | 003532 | 012777 | 000061 | 174472 |  |  |
| 693 | 003540 | 000240 |        |        |  |  |
| 694 | 003542 | 000000 |        |        |  |  |

:PROCESSOR PRIORITY 4

```

T6B:  MOV      #STACK,%6
      MOV      #200,CC
      MOV      #200,@DS1A
      MOV      #200,@DS1B
      MOV      #200,@DS2A
      MOV      #200,@DS2B
      RESET
      MOV      #.+22,@DEV1A
      MOV      #161,@CR1A
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 1A FAILED TO INTERRUPT

      MOV      #.+22,@DEV1B
      MOV      #161,@CR1B
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 1B FAILED TO INTERRUPT

      MOV      #.+22,@DEV2A
      MOV      #161,@CR2A
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 2A FAILED TO INTERRUPT

      MOV      #.+22,@DEV2B
      MOV      #161,@CR2B
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 2B FAILED TO INTERRUPT

      RESET
      MOV      #.+22,@DEV1A
      MOV      #121,@CR1A
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 1A FAILED TO INTERRUPT

      MOV      #.+22,@DEV1B
      MOV      #121,@CR1B
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 1B FAILED TO INTERRUPT

      MOV      #.+22,@DEV2A
      MOV      #121,@CR2A
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 2A FAILED TO INTERRUPT

      MOV      #.+22,@DEV2B
      MOV      #121,@CR2B
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 2B FAILED TO INTERRUPT

      RESET
      MOV      #.+22,@DEV1A
      MOV      #61,@CR1A
      NOP
      HALT
      BR       T6B          ;ERROR, DEVICE 1A FAILED TO INTERRUPT
    
```

E02

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695 003544 000633

BR T68

|     |        |        |        |        |       |               |                                       |
|-----|--------|--------|--------|--------|-------|---------------|---------------------------------------|
| 696 | 003546 | 012777 | 003570 | 174434 | MOV   | #.+22, @DEV1B |                                       |
| 697 | 003554 | 012777 | 000061 | 174452 | MOV   | #61, @CR1B    |                                       |
| 698 | 003562 | 000240 |        |        | NOP   |               |                                       |
| 699 | 003564 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1B FAILED TO INTERRUPT |
| 700 |        |        |        |        |       |               |                                       |
| 701 | 003566 | 000622 |        |        | BR    | T6B           |                                       |
| 702 | 003570 | 012777 | 003612 | 174416 | MOV   | #.+22, @DEV2A |                                       |
| 703 | 003576 | 012777 | 000061 | 174440 | MOV   | #61, @CR2A    |                                       |
| 704 | 003604 | 000240 |        |        | NOP   |               |                                       |
| 705 | 003606 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2A FAILED TO INTERRUPT |
| 706 | 003610 | 000611 |        |        | BR    | T6B           |                                       |
| 707 | 003612 | 012777 | 003636 | 174400 | MOV   | #T6C, @DEV2B  |                                       |
| 708 | 003620 | 012777 | 000061 | 174420 | MOV   | #61, @CR2B    |                                       |
| 709 | 003626 | 000240 |        |        | NOP   |               |                                       |
| 710 | 003630 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2B FAILED TO INTERRUPT |
| 711 | 003632 | 000167 | 177376 |        | JMP   | T6B           |                                       |
| 712 |        |        |        |        |       |               |                                       |
| 713 | 003636 | 012706 | 000776 |        | MOV   | #STACK, %6    |                                       |
| 714 | 003642 | 012767 | 000140 | 174126 | MOV   | #140, CC      |                                       |
| 715 | 003650 | 012777 | 000140 | 174330 | MOV   | #140, @DS1A   |                                       |
| 716 | 003656 | 012777 | 000140 | 174326 | MOV   | #140, @DS1B   |                                       |
| 717 | 003664 | 012777 | 000140 | 174324 | MOV   | #140, @DS2A   |                                       |
| 718 | 003672 | 012777 | 000140 | 174322 | MOV   | #140, @DS2B   |                                       |
| 719 | 003700 | 000005 |        |        | RESET |               |                                       |
| 720 | 003702 | 012777 | 003724 | 174274 | MOV   | #.+22, @DEV1A |                                       |
| 721 | 003710 | 012777 | 000161 | 174314 | MOV   | #161, @CR1A   |                                       |
| 722 | 003716 | 000240 |        |        | NOP   |               |                                       |
| 723 | 003720 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1A FAILED TO INTERRUPT |
| 724 | 003722 | 000745 |        |        | BR    | T6C           |                                       |
| 725 | 003724 | 012777 | 003746 | 174256 | MOV   | #.+22, @DEV1B |                                       |
| 726 | 003732 | 012777 | 000161 | 174274 | MOV   | #161, @CR1B   |                                       |
| 727 | 003740 | 000240 |        |        | NOP   |               |                                       |
| 728 | 003742 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1B FAILED TO INTERRUPT |
| 729 | 003744 | 000734 |        |        | BR    | T6C           |                                       |
| 730 | 003746 | 012777 | 003770 | 174240 | MOV   | #.+22, @DEV2A |                                       |
| 731 | 003754 | 012777 | 000161 | 174262 | MOV   | #161, @CR2A   |                                       |
| 732 | 003762 | 000240 |        |        | NOP   |               |                                       |
| 733 | 003764 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2A FAILED TO INTERRUPT |
| 734 | 003766 | 000723 |        |        | BR    | T6C           |                                       |
| 735 | 003770 | 012777 | 004012 | 174222 | MOV   | #.+22, @DEV2B |                                       |
| 736 | 003776 | 012777 | 000161 | 174242 | MOV   | #161, @CR2B   |                                       |
| 737 | 004004 | 000240 |        |        | NOP   |               |                                       |
| 738 | 004006 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2B FAILED TO INTERRUPT |
| 739 | 004010 | 000712 |        |        | BR    | T6C           |                                       |
| 740 | 004012 | 000005 |        |        | RESET |               |                                       |
| 741 | 004014 | 012777 | 004036 | 174162 | MOV   | #.+22, @DEV1A |                                       |
| 742 | 004022 | 012777 | 000121 | 174202 | MOV   | #121, @CR1A   |                                       |
| 743 | 004030 | 000240 |        |        | NOP   |               |                                       |
| 744 | 004032 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1A FAILED TO INTERRUPT |
| 745 | 004034 | 000700 |        |        | BR    | T6C           |                                       |
| 746 | 004036 | 012777 | 004060 | 174144 | MOV   | #.+22, @DEV1B |                                       |
| 747 | 004044 | 012777 | 000121 | 174162 | MOV   | #121, @CR1B   |                                       |
| 748 | 004052 | 000240 |        |        | NOP   |               |                                       |
| 749 | 004054 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1B FAILED TO INTERRUPT |
| 750 | 004056 | 000667 |        |        | BR    | T6C           |                                       |
| 751 | 004060 | 012777 | 004102 | 174126 | MOV   | #.+22, @DEV2A |                                       |

PROCESSOR PRIORITY 3  
 T6C:

G02

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|     |        |        |        |        |      |            |
|-----|--------|--------|--------|--------|------|------------|
| 752 | 004066 | 012777 | 000121 | 174150 | MOV  | #121,2CR2A |
| 753 | 004074 | 000240 |        |        | NOP  |            |
| 754 | 004076 | 000000 |        |        | HALT |            |

;ERROR, DEVICE 2A FAILED TO INTERRUPT

|     |        |        |        |        |       |               |                                       |
|-----|--------|--------|--------|--------|-------|---------------|---------------------------------------|
| 755 |        |        |        |        |       |               |                                       |
| 756 | 004100 | 000656 |        |        | BR    | T6C           |                                       |
| 757 | 004102 | 012777 | 004124 | 174110 | MOV   | #.+22, @DEV2B |                                       |
| 758 | 004110 | 012777 | 000121 | 174130 | MOV   | #121, @CR2B   |                                       |
| 759 | 004116 | 000240 |        |        | NOP   |               |                                       |
| 760 | 004120 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2B FAILED TO INTERRUPT |
| 761 | 004122 | 000645 |        |        | BR    | T6C           |                                       |
| 762 | 004124 | 000005 |        |        | RESET |               |                                       |
| 763 | 004126 | 012777 | 004150 | 174050 | MOV   | #.+22, @DEV1A |                                       |
| 764 | 004134 | 012777 | 000061 | 174070 | MOV   | #61, @CR1A    |                                       |
| 765 | 004142 | 000240 |        |        | NOP   |               |                                       |
| 766 | 004144 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1A FAILED TO INTERRUPT |
| 767 | 004146 | 000633 |        |        | BR    | T6C           |                                       |
| 768 | 004150 | 012777 | 004172 | 174032 | MOV   | #.+22, @DEV1B |                                       |
| 769 | 004156 | 012777 | 000061 | 174050 | MOV   | #61, @CR1B    |                                       |
| 770 | 004164 | 000240 |        |        | NOP   |               |                                       |
| 771 | 004166 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1B FAILED TO INTERRUPT |
| 772 | 004170 | 000622 |        |        | BR    | T6C           |                                       |
| 773 | 004172 | 012777 | 004214 | 174014 | MOV   | #.+22, @DEV2A |                                       |
| 774 | 004200 | 012777 | 000061 | 174036 | MOV   | #61, @CR2A    |                                       |
| 775 | 004206 | 000240 |        |        | NOP   |               |                                       |
| 776 | 004210 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2A FAILED TO INTERRUPT |
| 777 | 004212 | 000611 |        |        | BR    | T6C           |                                       |
| 778 | 004214 | 012777 | 004240 | 173776 | MOV   | #.+24, @DEV2B |                                       |
| 779 | 004222 | 012777 | 000061 | 174016 | MOV   | #61, @CR2B    |                                       |
| 780 | 004230 | 000240 |        |        | NOP   |               |                                       |
| 781 | 004232 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2B FAILED TO INTERRUPT |
| 782 | 004234 | 000167 | 177376 |        | JMP   | T6C           |                                       |
| 783 | 004240 | 000005 |        |        | RESET |               |                                       |
| 784 | 004242 | 012777 | 004266 | 173734 | MOV   | #.+24, @DEV1A |                                       |
| 785 | 004250 | 012777 | 000021 | 173754 | MOV   | #21, @CR1A    |                                       |
| 786 | 004256 | 000240 |        |        | NOP   |               |                                       |
| 787 | 004260 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1A FAILED TO INTERRUPT |
| 788 | 004262 | 000167 | 177350 |        | JMP   | T6C           |                                       |
| 789 | 004266 | 012777 | 004312 | 173714 | MOV   | #.+24, @DEV1B |                                       |
| 790 | 004274 | 012777 | 000021 | 173732 | MOV   | #21, @CR1B    |                                       |
| 791 | 004302 | 000240 |        |        | NOP   |               |                                       |
| 792 | 004304 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 1B FAILED TO INTERRUPT |
| 793 | 004306 | 000167 | 177324 |        | JMP   | T6C           |                                       |
| 794 | 004312 | 012777 | 004336 | 173674 | MOV   | #.+24, @DEV2A |                                       |
| 795 | 004320 | 012777 | 000021 | 173716 | MOV   | #21, @CR2A    |                                       |
| 796 | 004326 | 000240 |        |        | NOP   |               |                                       |
| 797 | 004330 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2A FAILED TO INTERRUPT |
| 798 | 004332 | 000167 | 177300 |        | JMP   | T6C           |                                       |
| 799 | 004336 | 012777 | 004362 | 173654 | MOV   | #.+24, @DEV2B |                                       |
| 800 | 004344 | 012777 | 000021 | 173674 | MOV   | #21, @CR2B    |                                       |
| 801 | 004352 | 000240 |        |        | NOP   |               |                                       |
| 802 | 004354 | 000000 |        |        | HALT  |               | ;ERROR, DEVICE 2B FAILED TO INTERRUPT |
| 803 | 004356 | 000167 | 177254 |        | JMP   | T6C           |                                       |

```

804
805          ;TEST THAT DATA REGISTER MAY BE CLEARED
806 004362 005077 173636 T7: CLR  @DATA1
807 004366 005777 173632 T7: TST  @DATA1
808 004372 001402          BEQ   T7A
809 004374 000000          HALT          ;ERROR, DATA REG 1 NOT CLEARED
810 004376 000771          BR    T7
811 004400 005077 173632 T7A: CLR  @DATA2
812 004404 005777 173626 T7A: TST  @DATA2
813 004410 001402          BEQ   T8
814 004412 000000          HALT          ;ERROR, DATA REG 2 NOT CLEARED
815 004414 000771          BR    T7A
816          ;TEST THAT DATA REG CAN BE SET WITH ALL ONES
817 004416 012777 177777 173600 T8: MOV  #-1,@DATA1
818 004424 022777 177777 173572 T8: CMP  #-1,@DATA1
819 004432 001402          BEQ   T8A
820 004434 000000          HALT          ;ERROR, DATA REG 1 NOT = -1
821 004436 000767          BR    T8
822 004440 012777 177777 173570 T8A: MOV  #-1,@DATA2
823 004446 022777 177777 173562 T8A: CMP  #-1,@DATA2
824 004454 001402          BEQ   T9
825 004456 000000          HALT          ;ERROR, DATA REG 2 NOT = -1
826 004460 000767          BR    T8A
827          ;TEST THAT DATA REG WILL ACCEPT A COUNT PATTERN
828 004462 005077 173536 T9: CLR  @DATA1          ;INITIALIZE DATA REG
829 004466 005000          CLR  %0              ;INITIALIZE COMPARISON REGISTER
830 004470 005277 173530 T9A: INC  @DATA1          ;+1 TO DATA REG 1
831 004474 005200          INC  %0              ;+1 TO COMPARISON
832 004476 020077 173522          CMP  %0,@DATA1      ;DOES DATA REG 1 COMPARE FAVORABLY
833 004502 001402          BEQ   T9B
834 004504 000000          HALT          ;ERROR, DATA REG 1 DIDN'T INCREMENT PROPERLY
835 004506 000765          BR    T9
836 004510 005700          T9B: TST  %0              ;COMPLETED COUNT PATTERN?
837 004512 001366          BNE  T9A              ;NO
838 004514 005077 173516 T9C: CLR  @DATA2          ;INITIALIZE DATA REG
839 004520 005000          CLR  %0              ;INITIALIZE COMPARISON REGISTER
840 004522 005277 173510 T9D: INC  @DATA2          ;+1 TO DATA REG2
841 004526 005200          INC  %0              ;+1 TO COMPARISON
842 004530 020077 173502          CMP  %0,@DATA2      ;DOES DATA REG 2 COMPARE FAVORABLY
843 004534 001402          BEQ   T9E
844 004536 000000          HALT          ;ERROR, DATA REG 2 DIDN'T INCREMENT PROPERLY
845 004540 000765          BR    T9C
846 004542 005700          T9E: TST  %0              ;COMPLETED COUNT PATTERN?
847 004544 001366          BNE  T9D              ;NO

```

```

848      ;TEST THAT ADDRESS REG MAY BE CLEARED
849      T10: CLR      @ADRS1
850      004546 005077 173454      TST      @ADRS1
851      004552 005777 173450      BEQ      T10A
852      004556 001402      HALT
853      004560 000000      ;ERROR, ADDRESS REG 1 NOT CLEARED
854      004562 000771      BR       T10
855      004564 005077 173450      T10A: CLR      @ADRS2
856      004570 005777 173444      TST      @ADRS2
857      004574 001402      BEQ      T11
858      004576 000000      HALT
859      004600 000771      BR       T10A
860      ;TEST THAT ADDRESS REG CAN BE SET WITH ALL ONES
861      T11: MOV      #-1,@ADRS1
862      004602 012777 177777 173416  CMP      #-1,@ADRS1
863      004610 022777 177777 173410  BEQ      T11A
864      004616 001402      HALT
865      004620 000000      ;ERROR, ADDRESS REG 1 NOT = -1
866      004622 000767      BR       T11
867      004624 012777 177777 173406  T11A: MOV      #-1,@ADRS2
868      004632 022777 177777 173400  CMP      #-1,@ADRS2
869      004640 001402      BEQ      T12
870      004642 000000      HALT
871      004644 000767      BR       T11A
872      ;TEST THAT ADDRESS REG WILL ACCEPT A COUNT PATTERN
873      T12: CLR      @ADRS1      ;INITIALIZE ADDRESS REG
874      004646 005077 173354      CLR      %0      ;INITIALIZE COMPARISON REGISTER
875      004652 005000      T12A: INC      @ADRS1      ;+1 TO ADDRESS REG 1
876      004654 005277 173346      INC      %0      ;+1 TO COMPARISON
877      004660 005200      CMP      %0,@ADRS1 ;DOES ADDRESS REG 1 COMPARE FAVORABLY
878      004662 020077 173340      BEQ      T12B
879      004666 001402      HALT
880      004670 000000      ;ERROR, ADDRESS REG 1 DIDN'T INCREMENT PROPERLY
881      004672 000765      BR       T12
882      004674 005700      T12B: TST      %0
883      004676 001366      ;COMPLETED COUNT PATTERN?
884      004700 005077 173334      BNE     T12A
885      004704 005000      ;NO
886      004706 005277 173326      T12C: CLR      @ADRS2
887      004712 005200      ;INITIALIZE ADDRESS REG
888      004714 020077 173320      CLR      %0      ;INITIALIZE COMPARISON REGISTER
889      004720 001402      T12D: INC      @ADRS2
890      004722 000000      ;+1 TO ADDRESS REG 2
891      004724 000765      INC      %0      ;+1 TO COMPARISON
892      004726 005700      CMP      %0,@ADRS2 ;DOES ADDRESS REG 2 COMPARE FAVORABLY
893      004730 001366      BEQ      T12E
894      004732 000000      HALT
895      004734 000765      BR       T12C
896      004736 005700      T12E: TST      %0
897      004738 001366      BNE     T12D
898      ;COMPLETED COUNT PATTERN?
899      ;NO
  
```

```

891          :TEST THAT BYTE COUNTER MAY BE CLEARED
892 004732 005077 173272  †13: CLR  @BC1
893 004736 005777 173266      TST  @BC1
894 004742 001402          BEQ  T13A
895 004744 000000          HALT
896 004746 000771          BR   T13
897 004750 005077 173266  T13A: CLR  @BC2
898 004754 005777 173262      TST  @BC2
899 004760 001402          BEQ  T14
900 004762 000000          HALT
901 004764 000771          BR   T13A
902
903          :TEST THAT BYTE COUNTER CAN BE SET WITH ALL ONES
904 004766 012777 177777 173234 †14: MOV  #-1,@BC1
905 004774 022777 177777 173226      CMP  #-1,@BC1
906 005002 001402          BEQ  T14A
907 005004 000000          HALT
908 005006 000767          BR   T14
909 005010 012777 177777 173224  T14A: MOV  #-1,@BC2
910 005016 022777 177777 173216      CMP  #-1,@BC2
911 005024 001402          BEQ  T15
912 005026 000000          HALT
913 005030 000767          BR   T14A
914          :TEST THAT BYTE COUNTER WILL ACCEPT A COUNT PATTERN
915 005032 005077 173172  †15: CLR  @BC1
916 005036 005000          CLR  %0
917 005040 005277 173164  T15A: INC  @BC1
918 005044 005200          INC  %0
919 005046 020077 173156      CMP  %0,@BC1
920 005052 001402          BEQ  T15B
921 005054 000000          HALT
922 005056 000765          BR   T15
923 005060 005700          T15B: TST  %0
924 005062 001366          BNE  T15A
925 005064 005077 173152  T15C: CLR  @BC2
926 005070 005000          CLR  %0
927 005072 005277 173144  T15D: INC  @BC2
928 005076 005200          INC  %0
929 005100 020077 173136      CMP  %0,@BC2
930 005104 001402          BEQ  T15E
931 005106 000000          HALT
932 005110 000765          BR   T15C
933 005112 005700          T15E: TST  %0
934 005114 001366          BNE  T15D
935 005116 000005          RESET

```

;ERROR, BYTE COUNTER 1 NOT CLEARED

;ERROR, BYTE COUNTER 2 NOT CLEARED

;ERROR, BYTE COUNTER 1 NOT = -1

;ERROR, BYTE COUNTER 2 NOT = -1

;INITIALIZE BYTE COUNTER

;INITIALIZE COMPARISON REGISTER

;+1 TO BYTE COUNTER 1

;+1 TO COMPARISON

;DOES BYTE COUNTER 1 COMPARE FAVORABLY

;ERROR, BYTE COUNTER 1 DIDN'T INCREMENT PROPERLY

;COMPLETED COUNT PATTERN?

;NO

;INITIALIZE BYTE COUNTER

;INITIALIZE COMPARISON REGISTER

;+1 TO BYTE COUNTER 2

;+1 TO COMPARISON

;DOES BYTE COUNTER 2 COMPARE FAVORABLY

;ERROR, BYTE COUNTER 2 DIDN'T INCREMENT PROPERLY

;COMPLETED COUNT PATTERN?

;NO

```

936
937
938 ;DO A DATOB-NPR SEQUENCE TO CHECK THAT BYTE COUNTER WILL DECREMENT
939 ;BY ONE FROM 177777 TO 0 NOT EXPECTING NOR CHECKING FOR PROPER
940 ;DATA TRANSFER ADDRESS. REGISTER IS RE-INITIALIZED AFTER EACH
941 ;DECREMENT TO KEEP IT OUT OF THE WAY.
941 005120 012767 000200 172650 T16: MOV #200,CC ;SET PROCESSOR PRIORITY 4
942 005126 005077 173074 CLR @ADRS1 ;CLEAR ADDRESS REGISTER 1
943 005132 012777 177777 173070 MOV #-1,@BC1 ;SET BYTE COUNT 1 TO -1
944 005140 012700 177776 MOV #-2,%0 ;INITIALIZE BYTE COUNT COMPARISON
945 005144 012777 074341 173060 T16A1: MOV #74341,@CR1A ;DATOB-XFER FROM DATA REG-BLOCK XFER-PRIORITY 7-NPR-GO
946 005152 005777 173050 T16A: TST @ADRS1
947 005156 001775 BEQ T16A ;WAIT FOR ADDRESS REGISTER TO CHANGE
948 005160 020077 173044 CMP %0,@BC1 ;DID BYTE COUNT 1 DECREMENT?
949 005164 001402 BEQ T16B ;YES
950 005166 000000 HALT ;ERROR, BYTE COUNT 1 DIDN'T DECREMENT BY 1 ON NPR.
951 005170 000753 BR T16
952 005172 005077 173030 T16B: CLR @ADRS1 ;RE-INITIALIZE ADDRESS REGISTER
953 005176 005300 DEC %0 ;DECREMENT COMPARISON COUNTER
954 005200 005777 173024 TST @BC1 ;TEST FOR BYTE COUNT 1 EQUAL TO ZERO
955 005204 001357 BNE T16A1
956 005206 000005 RESET
957 005210 005077 173024 T16C: CLR @ADRS2 ;CLEAR ADDRESS REGISTER 2
958 005214 012777 177777 173020 MOV #-1,@BC2 ;SET BYTE COUNT 2 TO -1
959 005222 012700 177776 MOV #-2,%0 ;INITIALIZE BYTE COUNT COMPARISON
960 005226 012777 074341 173010 T16D1: MOV #74341,@CR2A ;DATOB-XFER FROM DATA REG-BLOCK XFER-PRIORITY 7-NPR-GO
961 005234 005777 173000 T16D: TST @ADRS2
962 005240 001775 BEQ T16D ;WAIT FOR ADDRESS REGISTER TO CHANGE
963 005242 020077 172774 CMP %0,@BC2 ;DID BYTE COUNT 2 DECREMENT?
964 005246 001402 BEQ T16E ;YES
965 005250 000000 HALT ;ERROR, BTYE COUNT 2 DIDN'T DECREMENT BY 1 ON NPR
966 005252 000756 BR T16C
967 005254 005077 172760 T16E: CLR @ADRS2 ;REINITIALIZE ADDRESS REGISTER
968 005260 005300 DEC %0 ;DECREMENT COMPARISON COUNT
969 005262 005777 172754 TST @BC2 ;TEST FOR BYTE COUNT 2 EQUAL TO ZERO
970 005266 001357 BNE T16D1
971 005270 000005 RESET

```

```

972
973
974
975
976
977 005272 012767 000200 172476 T17: MOV #200,CC ;SET PROCESSOR PRIORITY 4
978 005300 005077 172722 CLR @ADRS1 ;CLEAR ADDRESS REGISTER 1
979 005304 012777 177776 172716 MOV #-2,@BC1 ;SET BYTE COUNT 1 TO -2
980 005312 012700 177774 MOV #-4,%0 ;INITIALIZE BYTE COUNT COMPARISON
981 005316 012777 050341 172706 T17A1: MOV #50341,@CR1A ;DTAO-XFER FROM DATA REG-BLOCK XFER-PRIORITY 7-NPR-GO
982 005324 005777 172676 T17A: TST @ADRS1
983 005330 001775 BEQ T17A ;WAIT FOR ADDRESS REGISTER TO CHANGE
984 005332 020077 172672 CMP %0,@BC1 ;DID BYTE COUNT 1 DECREMENT?
985 005336 001402 BEQ T17B ;YES
986 005340 000000 HALT ;ERROR, BYTE COUNT 1 DIDN'T DECREMENT BY 1 ON NPR.
987 005342 000753 BR T17
988 005344 005077 172656 T17B: CLR @ADRS1 ;RE-INITIALIZE ADDRESS REGISTER
989 005350 162700 000002 SUB #2,%0 ;DECREMENT COMPARISON COUNTER
990 005354 005777 172650 TST @BC1 ;TEST FOR BYTE COUNT 1 EQUAL TO ZERO
991 005360 001356 BNE T17A1
992 005362 000005 RESET
993 005364 005077 172650 T17C: CLR @ADRS2 ;CLEAR ADDRESS REGISTER 2
994 005370 012777 177776 172644 MOV #-2,@BC2 ;SET BYTE COUNT 2 TO -1
995 005376 012700 177774 MOV #-4,%0 ;INITIALIZE BYTE COUNT COMPARISON
996 005402 012777 050341 172634 T17D1: MOV #50341,@CR2A ;DTAO-XFER FROM DATA REG-BLOCK-XFER-PRIORITY 7-NPR-GO
997 005410 005777 172624 T17D: TST @ADRS2
998 005414 001775 BEQ T17D ;WAIT FOR ADDRESS REGISTER TO CHANGE
999 005416 020077 172620 CMP %0,@BC2 ;DID BYTE COUNT 2 DECREMENT?
1000 005422 001402 BEQ T17E ;YES
1001 005424 000000 HALT ;ERROR, BYTE COUNT 2 DIDN'T DECREMENT BY 1 ON NPR
1002 005426 000756 BR T17C
1003 005430 005077 172604 T17E: CLR @ADRS2 ;REINITIALIZE ADDRESS REGISTER
1004 005434 162700 000002 SUB #2,%0 ;DECREMENT COMPARISON COUNT
1005 005440 005777 172576 TST @BC2 ;TEST FOR BYTE COUNT 2 EQUAL TO ZERO
1006 005444 001356 BNE T17D1
1007 005446 000005 RESET

```

```

1008
1009
1010 005450 012767 000200 172320
1011 005456 012777 177777 172544
1012 005464 012700 177777
1013 005470 012777 005614 172530
1014 005476 012777 076341 172526
1015 005504 005527 000000
1016 005510 126700 000100
1017 005514 001402
1018 005516 000000
1019 005520 000753
1020 005522 005300
1021 005524 005777 172500
1022 005530 001357
1023 005532 000005
1024 005534 012777 177777 172500
1025 005542 012700 177777
1026 005546 012777 005614 172464
1027 005554 012777 076341 172462
1028 005562 000240
1029 005564 000240
1030 005566 126700 000022
1031 005572 001402
1032 005574 000000
1033 005576 000756
1034 005600 005300
1035 005602 005777 172434
1036 005606 001357
1037 005610 000005
1038 005612 000401
1039 005614 000000

:DO A DATOB SEQUENCE TO CHECK FOR PROPER DATA TRANSFER FROM BYTE COUNT
T18: MOV #200,CC ;SET PROCESSOR PRIORITY 4
MOV #-1,BBC1 ;SET BYTE COUNT 1 TO -1.
MOV #-1,%0 ;INITIALIZE BYTE COUNT COMPARISON
T18A: MOV #T18DAT,ADR1 ;INITIALIZE ADDRESS POINTER
MOV #76341,ACR1A ;DATOB-XFER FROM BC1-PRIORITY 7-NPR-GO
ADC #0
CMPB T18DAT,%0 ;DID DATA TRANSFER FROM BC1 TO DATA ADDRESS
BEQ T18B ;YES
HALT ;ERROR, DATA DIDN'T TRANSFER FROM BC1 PROPERLY
BR T18
T18B: DEC %0 ;DECREMENT COMPARISON COUNT
TST BBC1 ;TEST FOR BC=0
BNE T18A
RESET
T18C: MOV #-1,BBC2 ;SET BC1 TO -1
MOV #-1,%0 ;INITIALIZE BC COMPARISON
T18D: MOV #T18DAT,ADR2 ;INITIALIZE ADDRESS POINTER
MOV #76341,ACR2A ;DATOB - XFER FROM BC2-PRIORITY 7-NPR-GO
NOP
NOP
CMPB T18DAT,%0 ;DID DATA TRANSFER FROM BC2 PROPERLY
BEQ T18E ;YES
HALT ;ERROR, DATA DIDN'T TRANSFER FROM BC2 PROPERLY
BR T18C
T18E: DEC %0 ;DECREMENT COMPARISON COUNT
TST BBC2 ;TEST FOR BC=0
BNE T18D
RESET
BR T19
T18DAT: 0
    
```

```

1040
1041
1042 005616 012767 000200 172152 :DO A DATA SEQUENCE TO CHECK FOR PROPER DATA TRANSFER FROM BYTE COUNT
1043 005624 012777 177776 172376 T19: MOV #200,CC ;SET PROCESSOR PRIORITY 4
1044 005632 012700 177776 : MOV #-2,BC1 ;SET BYTE COUNT 1 TO -1
1045 005636 012777 005766 172362 T19A: MOV #-2,%0 ;INITIALIZE BYTE COUNT COMPARISON
1046 005644 012777 052341 172360 : MOV #T19DAT,ADRS1 ;INITIALIZE ADDRESS POINTER
1047 005652 005527 000000 : MOV #52341,ACR1A ;DATO-XFER FROM BC1-PRIORITY 7-NPR-GO
1048 005656 026700 000104 : ADC #0
1049 005662 001402 : CMP T19DAT,%0 ;DID DATA TRANSFER FROM BC1 TO DATA ADDRESS
1050 005664 000000 : BEQ T19B ;YES
1051 005666 000753 : HALT ;ERROR, DATA DIDN'T TRANSFER FROM BC1 PRPERLY
1052 005670 162700 000002 T19B: BR T19
1053 005674 005777 172330 : SUB #2,%0 ;DECREMENT COMPARISON COUNT
1054 005700 001356 : TST BC1 ;TEST FOR BC=0
1055 005702 000005 : BNE T19A
1056 005704 012777 177776 172330 T19C: MOV #-2,BC2 ;SET BC1 TO -1
1057 005712 012700 177776 : MOV #-2,%0 ;INITIALIZE BC COMPARISON
1058 005716 012777 005766 172314 T19D: MOV #T19DAT,ADRS2 ;INITIALIZE ADDRESS POINTER
1059 005724 012777 052341 172312 : MOV #52341,ACR2A ;DATO-XFER FROM BC2-PRIORITY 7-NPR-GO
1060 005732 000240 : NOP
1061 005734 000240 : NOP
1062 005736 026700 000024 : CMP T19DAT,%0 ;DID DATA TRANSFER FROM BC2 PROPERLY
1063 005742 001402 : BEQ T19E ;YES
1064 005744 000000 : HALT ;ERROR, DATA DIDN'T TRANSFER FROM BC2 PROPERLY
1065 005746 000756 : BR T19C
1066 005750 162700 000002 T19E: SUB #2,%0 ;DECREMENT COMPARISON COUNT
1067 005754 005777 172262 : TST BC2 ;TEST FOR BC=0
1068 005760 001356 : BNE T19D
1069 005762 000005 : RESET
1070 005764 000401 : BR T20
1071 005766 000000 T19DAT: 0

```

```

1072
1073
1074 005770 012767 000200 172000 :DO A DATOB SEQUENCE TO CHECK FOR PROPER DATA TRANSFER FROM DATA REG
1075 005776 012777 177777 172224 T20: MOV #200,CC ;SET PROCESSOR PRIORITY 4
1076 006004 012777 177777 172212 MOV #-1,BC1 ;SET BYTE COUNT 1 TO -1
1077 006012 012700 177777 MOV #-1,DATA1 ;INITIALIZE DATA REGISTER 1
1078 006016 012777 006160 172202 T20A: MOV #T20DAT,ADRS1 ;INITIALIZE BYTE COUNT COMPARISON
1079 006024 012777 074341 172200 MOV #74341,CR1A ;INITIALIZE ADDRESS POINTER
1080 006032 005527 000000 ADC #0 ;DATOB-XFER FROM DATA1-PRIORITY 7-NPR-GO
1081 006036 126700 000116 CMPB T20DAT,%0 ;DID DATA TRANSFER FROM DATA REG 1 TO DATA ADDRESS
1082 006042 001402 BEQ T20B ;YES
1083 006044 000000 HALT ;ERROR, DATA DIDN'T TRANSFER FROM DATA REG 1 PROPERLY
1084 006046 000750 BR T20
1085 006050 005300 T20B: DEC %0 ;DECREMENT COMPARISON COUNT
1086 006052 005377 172146 DEC DATA1 ;DECREMENT DATA REG
1087 006056 005777 172146 TST BC1 ;TEST FOR BC=0
1088 006062 001355 BNE T20A
1089 006064 000005 RESET
1090 006066 012777 177777 172146 T20C: MOV #-1,BC2 ;SET BC1 TO -1
1091 006074 012777 177777 172134 MOV #-1,DATA2 ;INITIALIZE DATA REGISTER 2
1092 006102 012700 177777 MOV #-1,%0 ;INITIALIZE BC COMPARISON
1093 006106 012777 006160 172124 T20D: MOV #T20DAT,ADRS2 ;INITIALIZE ADDRESS POINTER
1094 006114 012777 074341 172122 MOV #74341,CR2A ;DATOB-XFER FROM DATA1-PRIORITY 7-NPR-GO
1095 006122 000240 NOP
1096 006124 000240 NOP
1097 006126 126700 000026 CMPB T20DAT,%0 ;DID DATA TRANSFER FROM DATA REG 2 PROPERLY
1098 006132 001402 BEQ T20E ;YES
1099 006134 000000 HALT ;ERROR, DATA DIDN'T TRANSFER FROM DATA REG 2 PROPERLY
1100 006136 000753 BR T20C
1101 006140 005300 T20E: DEC %0 ;DECREMENT COMPARISON COUNT
1102 006142 005377 172070 DEC DATA2 ;DECREMENT DATA REG
1103 006146 005777 172070 TST BC2 ;TEST FOR BC=0
1104 006152 001355 BNE T20D
1105 006154 000005 RESET
1106 006156 000401 BR T21
1107 006160 000000 T20DAT: 0

```

```

1108
1109
1110 006162 012767 000200 171606 :DO A DATO SEQUENCE TO CHECK FOR PROPER DATA TRANSFER FROM DATA REGISTER
1111 006170 012777 177776 172032 T21:  MOV      #200,CC           ;SET PROCESSOR PRIORITY 4
1112 006176 012777 177776 172020      MOV      #-2,BC1          ;SET BYTE COUNT 1 TO -2
1113 006204 012700 177776      MOV      #-2,DATA1       ;INITIALIZE DATA REG 1
1114 006210 012777 006362 172010 T21A:  MOV      #T21DAT,ADRS1    ;INITIALIZE ADDRESS POINTER
1115 006216 012777 050341 172006      MOV      #50341,ACR1A     ;DATOB-XFER FROM DATA1 PRIORITY 7-NPR-GO
1116 006224 005527 000000      ADC      #0
1117 006230 026700 000126      CMP      T21DAT,%0        ;DID DATA TRANSFER FROM DATA REG 1 TO DATA ADDRESS
1118 006234 001402      BEQ      T21B             ;YES
1119 006236 000000      HALT
1120 006240 000750      BR       T21              ;ERROR, DATA DIDN'T TRANSFER FROM DATA REG 1 PROPERLY
1121 006242 162700 000002 171750 T21B:  SUB      #2,%0            ;DECREMENT COMPARISON COUNT
1122 006246 162777 000002      SUB      #2,DATA1
1123 006254 005777 171750      TST      BC1              ;TEST FOR BC=0
1124 006260 001353      BNE      T21A
1125 006262 000005      RESET
1126 006264 012777 177776 171750 T21C:  MOV      #-2,BC2          ;SET BC1 TO -1
1127 006272 012777 177776 171736      MOV      #-2,DATA2       ;INITIALIZE DATA REG 2
1128 006300 012700 177776      MOV      #-2,%0          ;INITIALIZE BC COMPARISON
1129 006304 012777 006362 171726 T21D:  MOV      #T21DAT,ADRS2    ;INITIALIZE ADDRESS POINTER
1130 006312 012777 050341 171724      MOV      #50341,ACR2A     ;DATAB - XFER FROM DATA2 - PRIORITY 7 - NPR - 60
1131 006320 000240      NOP
1132 006322 000240      NOP
1133 006324 026700 000032      CMP      T21DAT,%0        ;DID DATA TRANSFER FROM DATA REG 2 PROPERLY
1134 006330 001402      BEQ      T21E             ;YES
1135 006332 000000      HALT
1136 006334 000753      BR       T21C              ;ERROR, DATA DIDN'T TRANSFER FROM DATA REG 2 PROPERLY
1137 006336 162700 000002 171666 T21E:  SUB      #2,%0            ;DECREMENT COMPARISON COUNT
1138 006342 162777 000002      SUB      #2,DATA2
1139 006350 005777 171666      TST      BC2              ;TEST FOR BC=0
1140 006354 001353      BNE      T21D
1141 006356 000005      RESET
1142 006360 000401      BR       T22
1143 006362 000000      T21DAT: 0

```

```

1144
1145      :DO A DATI SEQUENCE TO CHECK FOR PROPER DATA TRANSFER TO DATA REGISTER
1146 006364 012767 000200 171404 T22:  MOV      #200,CC      ;SET PROCESSOR PRIORITY 4
1147 006372 012777 177776 171630      MOV      #-2,ABC1      ;SET BYTE COUNT 1 TO -2
1148 006400 012767 177776 000142      MOV      #-2,T22DAT     ;INITIALIZE DATA ADDRESS
1149 006406 012777 006550 171612 T22A:  MOV      #T22DAT,ADRS1  ;INITIALIZE ADDRESS POINTER
1150 006414 012777 000341 171610      MOV      #341,ACR1A     ;DATI-XFER TO DATA1-PRIORITY 7-NPR-GO
1151 006422 000240
1152 006424 000240
1153 006426 026777 000116 171570      CMP      T22DAT,ADATA1  ;DID DATA TRANSFER FROM ADDRESS TO DATA REG 1
1154 006434 001402
1155 006436 000000
1156 006440 000751
1157 006442 162767 000002 000100 T22B:  SUB      #2,T22DAT     ;DECREMENT DATA PATTERN
1158 006450 005777 171554
1159 006454 001354
1160 006456 000005
1161 006460 012777 177776 171554 T22C:  MOV      #-2,ABC2      ;SET BYTE COUNT 2 TO -2
1162 006466 012767 177776 000054      MOV      #-2,T22DAT     ;INITIALIZE DATA ADDRESS
1163 006474 012777 006550 171536 T22D:  MOV      #T22DAT,ADRS2  ;INITIALIZE ADDRESS POINTER
1164 006502 012777 000341 171534      MOV      #341,ACR2A     ;DATI-XFER TO DATA2-PRIORITY 7-NPR-GO
1165 006510 000240
1166 006512 000240
1167 006514 026777 000030 171514      CMP      T22DAT,ADATA2  ;DID DATA TRANSFER FROM ADDRESS TO DATA REG 2
1168 006522 001402
1169 006524 000000
1170 006526 000754
1171 006530 162767 000002 000012 T22E:  SUB      #2,T22DAT     ;DECREMENT DATA PATTERN
1172 006536 005777 171500
1173 006542 001354
1174 006544 000005
1175 006546 000401
1176 006550 000000
      T22DAT: 0

```

```

1177
1178
1179 006552 012767 000340 171216 ;DO A DATIP TO CHECK FOR DATA SHIFT IN DATA REGISTER
1180 006560 012777 000002 171442 T23: MOV #340,CC ;SET PROCESSOR PRIORITY 7
1181 006566 012777 006706 171432 MOV #2,ABC1 ;SET BYTE COUNT 1 FOR ONE WORD TRANSFER
1182 006574 012767 125252 000104 MOV #T23DAT,ADRS1 ;INITIALIZE ADDRESS POINTER
1183 006602 012777 045341 171422 MOV #125252,T23DAT ;INITIALIZE DATA TO BE TRANSFERRED
1184 006610 005777 171414 MOV #45341,ACR1A ;DATIP-DATO-XFER UNTIL BC=0-PRIORITY 7-NPR-6
1185 006614 001375 TST ABC1 ;WAIT FOR BC=0
1186 006616 026727 000064 052524 BNE -4
1187 006624 001402 CMP T23DAT,#52524 ;DID DATA REG SHIFT
1188 006626 000000 BEQ T23A
1189 006630 000750 HALT ;ERROR, DATA REG1 FAILED TO SHIFT ON A DATIP
1190 006632 000005 BR T23
1191 006634 012777 000002 171400 T23A: RESET
1192 006642 012777 006706 171370 MOV #2,ABC2 ;SET BYTE COUNT 2 FOR ONE WORD TRANSFER
1193 006650 012767 125252 000030 MOV #T23DAT,ADRS2 ;INITIALIZE ADDRESS POINTER
1194 006656 012777 045341 171360 MOV #125252,T23DAT ;INITIALIZE DATA TO BE TRANSFERRED
1195 006664 005777 171352 MOV #45341,ACR2A ;DATIP-DATO-XFER UNTIL BC=0-PRIORITY7-NPR-GO
1196 006670 001375 TST ABC2 ;WAIT FOR BC=0
1197 006672 026727 000010 052524 BNE -4
1198 006700 001403 CMP T23DAT,#52524 ;DID DATA REG SHIFT
1199 006702 000000 BEQ T24
1200 006704 000752 HALT ;ERROR, DATA REG2 FAILED TO SHIFT ON A DATIP
1201 006706 000000 BR T23A
T23DAT: 0

```

```

1202
1203
1204 006710 012767 000200 171060 T24:  MOV      #200,CC           ;SET PROCESSOR PRIORITY 4
1205 006716 012700 012034          MOV      #BUFF1,%0       ;INITIALIZE TO CLEAR BUFFER
1206 006722 010001          MOV      %0,%1           ;INITIALIZE DATA BUFFER POINTER
1207 006724 010077 171276          MOV      %0,%ADRS1      ;
1208 006730 005020          CLR      (0)+            ;CLEAR DATA BUFFER
1209 006732 020027 014034          CMP      %0,#BUFF2      ;
1210 006736 001374          BNE      -6              ;
1211 006740 012777 002000 171262          MOV      #2000,%BC1     ;INITIALIZE BYTE COUNT
1212 006746 012702 002000          MOV      #2000,%2       ;INITIALIZE EXPECTED DATA
1213 006752 012777 006770 171224          MOV      #T24B,%DEV1A   ;INITIALIZE INTERRUPT RETURN
1214 006760 012777 052743 171244          MOV      #52743,%CR1A   ;DATO-XFER FROM BC-MULTI XFER-PRI 7-NPR-BR AFTER LAST-GO
1215 006766 000001          WAIT
1216 006770 021102          T24B:  CMP      %1,%2       ;RETURN HERE AFTER INTERRUPT
1217 006772 001402          BEQ      T24C           ;
1218 006774 000000          HALT
1219 006776 000744          BR      T24             ;ERROR, DATA NOT TRANSFERRED PROPERLY
1220 007000 022142          T24C:  CMP      (1)+,-(2)   ;JUST INCREMENTING DATA POINTER AND DATA
1221 007002 020127 014032          CMP      %1,#BUFF2-2   ;DONE ALL OF BUFFER AREA
1222 007006 001370          BNE      T24B           ;NO
1223 007010 000005          T24D:  RESET
1224 007012 012767 000200 170756          MOV      #200,CC
1225
1226 007020 012700 012034          MOV      #BUFF1,%0       ;INITIALIZE TO CLEAR BUFFER
1227 007024 010001          MOV      %0,%1           ;INITIALIZE DATA BUFFER POINTER
1228 007026 010077 171174          MOV      %0,%ADRS1      ;
1229 007032 005020          CLR      (0)+            ;CLEAR DATA BUFFER
1230 007034 020027 014034          CMP      %0,#BUFF2      ;
1231 007040 001374          BNE      -6              ;
1232 007042 012777 002000 171160          MOV      #2000,%BC1     ;INITIALIZE BYTE COUNT
1233 007050 012702 002000          MOV      #2000,%2       ;INITIALIZE EXPECTED DATA
1234 007054 012777 007072 171126          MOV      #T24F,%DEV1B   ;INITIALIZE INTERRUPT RETURN
1235 007062 012777 052743 171144          MOV      #52743,%CR1B   ;DATO-XFER FROM BC-MULTI XFER-PRI 7-NPR-BR AFTER LAST-GO
1236 007070 000001          WAIT
1237 007072 021102          T24F:  CMP      %1,%2       ;RETURN HERE AFTER INTERRUPT
1238 007074 001402          BEQ      T24G           ;
1239 007076 000000          HALT
1240 007100 000743          BR      T24D           ;ERROR, DATA NOT TRANSFERRED PROPERLY
1241 007102 022142          T24G:  CMP      (1)+,-(2)   ;JUST INCREMENTING DATA POINTER AND DATA
1242 007104 020127 014032          CMP      %1,#BUFF2-2   ;DONE ALL OF BUFFER AREA
1243 007110 001370          BNE      T24F           ;NO

```

|      |        |        |        |        |       |       |              |  |   |
|------|--------|--------|--------|--------|-------|-------|--------------|--|---|
| 1244 |        |        |        |        |       |       |              |  |   |
| 1245 | 007112 | 000005 |        |        | T24H: | RESET |              |  |   |
| 1246 | 007114 | 012767 | 000200 | 170654 |       | MOV   | #200,CC      |  |   |
| 1247 | 007122 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    |  | ; INITIALIZE TO CLEAR BUFFER                              |
| 1248 | 007126 | 010001 |        |        |       | MOV   | %0,%1        |  | ; INITIALIZE DATA BUFFER POINTER                          |
| 1249 | 007130 | 010077 | 171104 |        |       | MOV   | %0,%ADRS2    |  |   |
| 1250 | 007134 | 005020 |        |        |       | CLR   | (0)+         |  | ; CLEAR DATA BUFFER                                       |
| 1251 | 007136 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |   |
| 1252 | 007142 | 001374 |        |        |       | BNE   | .-6          |  |   |
| 1253 | 007144 | 012777 | 002000 | 171070 |       | MOV   | #2000,%BC2   |  | ; INITIALIZE BYTE COUNT                                   |
| 1254 | 007152 | 012702 | 002000 |        |       | MOV   | #2000,%2     |  | ; INITIALIZE EXPECTED DATA                                |
| 1255 | 007156 | 012777 | 007174 | 171030 |       | MOV   | #T24K,%DEV2A |  | ; INITIALIZE INTERRUPT RETURN                             |
| 1256 | 007164 | 012777 | 052743 | 171052 |       | MOV   | #52743,%CR2A |  | ; DATO-XFER FROM BC-MULTI XFER-PRI 7-NPR-BR AFTER LAST-GO |
| 1257 | 007172 | 000001 |        |        |       | WAIT  |              |  |   |
| 1258 | 007174 | 021102 |        |        | T24K: | CMP   | %1,%2        |  | ; RETURN HERE AFTER INTERRUPT                             |
| 1259 | 007176 | 001402 |        |        |       | BEQ   | T24L         |  |   |
| 1260 | 007200 | 000000 |        |        |       | HALT  |              |  | ; ERROR, DATA NOT TRANSFERRED PROPERLY                    |
| 1261 | 007202 | 000743 |        |        |       | BR    | T24H         |  |   |
| 1262 | 007204 | 022142 |        |        | T24L: | CMP   | (1)+,-(2)    |  | ; JUST INCREMENTING DATA POINTER AND DATA                 |
| 1263 | 007206 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  |  | ; DONE ALL OF BUFFER AREA                                 |
| 1264 | 007212 | 001370 |        |        |       | BNE   | T24K         |  | ; NO  |
| 1265 | 007214 | 000005 |        |        | T24M: | RESET |              |  |   |
| 1266 | 007216 | 012767 | 000200 | 170552 |       | MOV   | #200,CC      |  |   |
| 1267 | 007224 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    |  | ; INITIALIZE TO CLEAR BUFFER                              |
| 1268 | 007230 | 010001 |        |        |       | MOV   | %0,%1        |  | ; INITIALIZE DATA BUFFER POINTER                          |
| 1269 | 007232 | 010077 | 171002 |        |       | MOV   | %0,%ADRS2    |  |   |
| 1270 | 007236 | 005020 |        |        |       | CLR   | (0)+         |  | ; CLEAR DATA BUFFER                                       |
| 1271 | 007240 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |   |
| 1272 | 007244 | 001374 |        |        |       | BNE   | .-6          |  |   |
| 1273 | 007246 | 012777 | 002000 | 170766 |       | MOV   | #2000,%BC2   |  | ; INITIALIZE BYTE COUNT                                   |
| 1274 | 007254 | 012702 | 002000 |        |       | MOV   | #2000,%2     |  | ; INITIALIZE EXPECTED DATA                                |
| 1275 | 007260 | 012777 | 007276 | 170732 |       | MOV   | #T24P,%DEV2B |  | ; INITIALIZE INTERRUPT RETURN                             |
| 1276 | 007266 | 012777 | 052743 | 170752 |       | MOV   | #52743,%CR2B |  | ; DATO-XFER FROM BC-MULTI XFER-PRI 7-NPR-BR AFTER LAST-GO |
| 1277 | 007274 | 000001 |        |        |       | WAIT  |              |  |   |
| 1278 | 007276 | 021102 |        |        | T24P: | CMP   | %1,%2        |  | ; RETURN HERE AFTER INTERRUPT                             |
| 1279 | 007300 | 001402 |        |        |       | BEQ   | T24R         |  |   |
| 1280 | 007302 | 000000 |        |        |       | HALT  |              |  | ; ERROR, DATA NOT TRANSFERRED PROPERLY                    |
| 1281 | 007304 | 000743 |        |        |       | BR    | T24M         |  |   |
| 1282 | 007306 | 022142 |        |        | T24R: | CMP   | (1)+,-(2)    |  | ; JUST INCREMENTING DATA POINTER AND DATA                 |
| 1283 | 007310 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  |  | ; DONE ALL OF BUFFER AREA                                 |
| 1284 | 007314 | 001370 |        |        |       | BNE   | T24P         |  | ; NO  |
| 1285 | 007316 | 000005 |        |        |       | RESET |              |  |   |

```

1286
1287
1288 007320 012767 000340 170450 ;BLOCK TRANSFER UNTIL BYTE COUNT=0
1289 007326 012700 012034 T25: MOV #340,CC ;SET PROCESSOR PRIORITY 7
1290 007332 010001 MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
1291 007334 010077 170666 MOV %0,%1 ;INITIALIZE DATA BUFFER POINTER
1292 007340 005020 CLR (0)+ ;CLEAR DATA BUFFER
1293 007342 020027 014034 CMP %0,#BUFF2
1294 007346 001374 BNE .-6
1295 007350 012777 002000 170652 MOV #2000,@BC1 ;INITIALIZE BYTE COUNT.
1296 007356 012702 002000 MOV #2000,%2 ;INITIALIZE EXPECTED DATA
1297 007362 012777 053341 170642 MOV #53341,@CR1A ;DATO-BLK XFER FROM BC-PRIORITY 7-NPR-GO
1298 007370 005777 170634 TST @BC1
1299 007374 001375 BNE .-4 ;WAIT FOR BC=0
1300 007376 021102 T25B: CMP @%1,%2
1301 007400 001402 BEQ T25C
1302 007402 000000 HALT ;ERROR, DATA NOT TRANSFERRED PROPERLY
1303 007404 000745 BR T25
1304 007406 022142 T25C: CMP (1)+,-(2) ;JUST INCREMENTING DATA POINTER AND DATA
1305 007410 020127 014032 CMP %1,#BUFF2-2 ;DONE ALL BUFFER AREA
1306 007414 001370 BNE T25B ;NO
1307 007416 000005 T25D: RESET
1308 007420 012700 012034 MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
1309 007424 010001 MOV %0,%1 ;INITIALIZE DATA BUFFER POINTER
1310 007426 010077 170574 MOV %0,@ADRS1
1311 007432 005020 CLR (0)+ ;CLEAR DATA BUFFER
1312 007434 020027 014034 CMP %0,#BUFF2
1313 007440 001374 BNE .-6
1314 007442 012777 002000 170560 MOV #2000,@BC1 ;INITIALIZE BYTE COUNT
1315 007450 012702 002000 MOV #2000,%2 ;INITIALIZE EXPECTED DATA
1316 007454 012777 053341 170552 MOV #53341,@CR1B ;DATO-BLK XFER FROM BC-PRIORITY 7-NPR-GO
1317 007462 005777 170542 TST @BC1
1318 007466 001375 BNE .-4 ;WAIT FOR BC=0
1319 007470 021102 T25F: CMP @%1,%2
1320 007472 001402 BEQ T25G
1321 007474 000000 HALT ;ERROR, DATA NOT TRANSFERRED PROPERLY
1322 007476 000747 BR T25D
1323 007500 022142 T25G: CMP (1)+,-(2) ;JUST INCREMENTING DATA POINTER AND DATA
1324 007502 020127 014032 CMP %1,#BUFF2-2 ;DONE ALL BUFFER AREA
1325 007506 001370 BNE T25F ;NO
  
```

|      |        |        |        |        |       |       |              |  |
|------|--------|--------|--------|--------|-------|-------|--------------|--|
| 1326 | 007510 | 000005 |        |        | T25H: | RESET |              |  |
| 1327 | 007512 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    | ;INITIALIZE TO CLEAR BUFFER              |
| 1328 | 007516 | 010001 |        |        |       | MOV   | %0,%1        | ;INITIALIZE DATA BUFFER POINTER          |
| 1329 | 007520 | 010077 | 170514 |        |       | MOV   | %0,%ADRS2    |  |
| 1330 |        |        |        |        |       |       |              |  |
| 1331 | 007524 | 005020 |        |        |       | CLR   | (0)+         | ;CLEAR DATA BUFFER                       |
| 1332 | 007526 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |
| 1333 | 007532 | 001374 |        |        |       | BNE   | .-6          |  |
| 1334 | 007534 | 012777 | 002000 | 170500 |       | MOV   | #2000,%BC2   | ;INITIALIZE BYTE COUNT                   |
| 1335 | 007542 | 012702 | 002000 |        |       | MOV   | #2000,%2     | ;INITIALIZE EXPECTED DATA                |
| 1336 | 007546 | 012777 | 053341 | 170470 |       | MOV   | #53341,%CR2A | ;DATO-BLK XFER FROM BC-PRIORITY 7-NPR-GO |
| 1337 | 007554 | 005777 | 170462 |        |       | TST   | %BC2         |  |
| 1338 | 007560 | 001375 |        |        |       | BNE   | .-4          | ;WAIT FOR BC=0                           |
| 1339 | 007562 | 021102 |        |        | T25K: | CMP   | %1,%2        |  |
| 1340 | 007564 | 001402 |        |        |       | BEQ   | T25L         |  |
| 1341 | 007566 | 000000 |        |        |       | HALT  |              | ;ERROR, DATA NOT TRANSFERRED PROPERLY    |
| 1342 | 007570 | 000747 |        |        |       | BR    | T25H         |  |
| 1343 | 007572 | 022142 |        |        | T25L: | CMP   | (1)+,-(2)    | ;JUST INCREMENTING DATA POINTER AND DATA |
| 1344 | 007574 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  | ;DONE ALL BUFFER AREA                    |
| 1345 | 007600 | 001370 |        |        |       | BNE   | T25K         | ;NO                                      |
| 1346 | 007602 | 000005 |        |        | T25M: | RESET |              |  |
| 1347 | 007604 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    | ;INITIALIZE TO CLEAR BUFFER              |
| 1348 | 007610 | 010001 |        |        |       | MOV   | %0,%1        | ;INITIALIZE DATA BUFFER POINTER          |
| 1349 | 007612 | 010077 | 170422 |        |       | MOV   | %0,%ADRS2    |  |
| 1350 | 007616 | 005020 |        |        |       | CLR   | (0)+         | ;CLEAR DATA BUFFER                       |
| 1351 | 007620 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |
| 1352 | 007624 | 001374 |        |        |       | BNE   | .-6          |  |
| 1353 | 007626 | 012777 | 002000 | 170406 |       | MOV   | #2000,%BC2   | ;INITIALIZE BYTE COUNT                   |
| 1354 | 007634 | 012702 | 002000 |        |       | MOV   | #2000,%2     | ;INITIALIZE EXPECTED DATA                |
| 1355 | 007640 | 012777 | 053341 | 170400 |       | MOV   | #53341,%CR2B | ;DATO-BLK XFER FROM BC-PRIORITY 7-NPR-GO |
| 1356 | 007646 | 005777 | 170370 |        |       | TST   | %BC2         |  |
| 1357 | 007652 | 001375 |        |        |       | BNE   | .-4          | ;WAIT FOR BC=0                           |
| 1358 | 007654 | 021102 |        |        | T25P: | CMP   | %1,%2        |  |
| 1359 | 007656 | 001402 |        |        |       | BEQ   | T25Q         |  |
| 1360 | 007660 | 000000 |        |        |       | HALT  |              | ;ERROR, DATA NOT TRANSFERRED PROPERLY    |
| 1361 | 007662 | 000747 |        |        |       | BR    | T25M         |  |
| 1362 | 007664 | 022142 |        |        | T25Q: | CMP   | (1)+,-(2)    | ;JUST INCREMENTING DATA POINTER AND DATA |
| 1363 | 007666 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  | ;DONE ALL BUFFER AREA                    |
| 1364 | 007672 | 001370 |        |        |       | BNE   | T25P         | ;NO                                      |
| 1365 | 007674 | 000005 |        |        |       | RESET |              |  |

```

1366
1367
1368 007676 000005
1369 007700 012767 000200 170070
1370 007706 012706 000776
1371 007712 012700 012034
1372 007716 010001
1373 007720 010077 170302
1374 007724 005020
1375 007726 020027 014034
1376 007732 001374
1377 007734 012777 002000 170266
1378 007742 012702 002000
1379 007746 012777 007764 170230
1380 007754 012777 053541 170250
1381 007762 000001
1382 007764 021102 T26A:
1383 007766 001402
1384 007770 000000
1385 007772 000741
1386 007774 022142 T26B:
1387 007776 020127 014032
1388 010002 001370
1389 010004 000005 T26C:
1390 010006 012767 000200 167762
1391 010014 012706 000776
1392 010020 012700 012034
1393 010024 010001
1394 010026 010077 170174
1395 010032 005020
1396 010034 020027 014034
1397 010040 001374
1398 010042 012777 002000 170160
1399 010050 012702 002000
1400 010054 012777 010072 170126
1401 010062 012777 053541 170144
1402 010070 000001
1403 010072 021102 T26D:
1404 010074 001402
1405 010076 000000
1406 010100 000741
1407 010102 022142 T26E:
1408 010104 020127 014032
1409 010110 001370

```

;BLOCK TRANSFER UNTIL BC=0, THEN INTERRUPT

```

T26: RESET
MOV #200,CC ;SET PROCESSOR PRIORITY 4
MOV #STACK,%6 ;INITIALIZE STACK
MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
MOV %0,%1 ;INITIALIZE DATA
MOV %0,%ADRS1
CLR (0)+
CMP %0,#BUFF2
BNE -6
MOV #2000,%BC1 ;INITIALIZE BVTE COUNT
MOV #2000,%2 ;INITIALIZE EXPECTED DATA
MOV #T26A,%DEV1A ;INITIALIZE INTERRUPT RETURN
MOV #53541,%CR1A ;DATA-XFER TIL BC=0 INTERRUPT-PRI 7-NPR-GO
WAIT
T26A: CMP %1,%2 ;COMPARE DATA
BEQ T26B
HALT ;ERROR, DATA NOT TRANSFERRED PROPERLY
BR T26
T26B: CMP (1)+,-(2) ;JUST INCREMENTING
CMP %1,#BUFF2-2 ;TEST FOR DONE ALL BUFFER AREA
BNE T26A ;NO
T26C: RESET
MOV #200,CC ;SET PROCESSOR PRIORITY 4
MOV #STACK,%6 ;INITIALIZE STACK
MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
MOV %0,%1 ;INITIALIZE DATA
MOV %0,%ADRS1
CLR (0)+
CMP %0,#BUFF2
BNE -6
MOV #2000,%BC1 ;INITIALIZE BVTE COUNT
MOV #2000,%2 ;INITIALIZE EXPECTED DATA
MOV #T26D,%DEV1B ;INITIALIZE INTERRUPT RETURN
MOV #53541,%CR1B ;DATA-XFER TIL BC=0 INTERRUPT-PRI 7-NPR-GO
WAIT
T26D: CMP %1,%2 ;COMPARE DATA
BEQ T26E
HALT ;ERROR, DATA NOT TRANSFERRED PROPERLY
BR T26C
T26E: CMP (1)+,-(2) ;JUST INCREMENTING
CMP %1,#BUFF2-2 ;TEST FOR DONE ALL BUFFER AREA
BNE T26D ;NO

```

|      |        |        |        |        |       |       |              |  |  |  |
|------|--------|--------|--------|--------|-------|-------|--------------|--|--|--|
| 1410 |        |        |        |        |       |       |              |  |  |  |
| 1411 | 010112 | 000005 |        |        | T26F: | RESET |              |  |  |  |
| 1412 | 010114 | 012767 | 000200 | 167654 |       | MOV   | #200,CC      |  | ;SET PROCESSOR PRIORITY 4                  |  |
| 1413 | 010122 | 012706 | 000776 |        |       | MOV   | #STACK,%6    |  | ;INITIALIZE STACK                          |  |
| 1414 | 010126 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    |  | ;INITIALIZE TO CLEAR BUFFER                |  |
| 1415 | 010132 | 010001 |        |        |       | MOV   | %0,%1        |  | ;INITIALIZE DATA                           |  |
| 1416 | 010134 | 010077 | 170100 |        |       | MOV   | %0,%ADRS2    |  |  |  |
| 1417 | 010140 | 005020 |        |        |       | CLR   | (0)+         |  |  |  |
| 1418 | 010142 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |  |  |
| 1419 | 010146 | 001374 |        |        |       | BNE   | .-6          |  |  |  |
| 1420 | 010150 | 012777 | 002000 | 170064 |       | MOV   | #2000,%BC2   |  | ;INITIALIZE BYTE COUNT                     |  |
| 1421 | 010156 | 012702 | 002000 |        |       | MOV   | #2000,%2     |  | ;INITIALIZE EXPECTED DATA                  |  |
| 1422 | 010162 | 012777 | 010200 | 170024 |       | MOV   | #T26G,%DEV2A |  | ;INITIALIZE INTERRUPT RETURN               |  |
| 1423 | 010170 | 012777 | 053541 | 170046 |       | MOV   | #53541,%CR2A |  | ;DATO-XFER TIL BC=0 INTERRUPT-PRI 7-NPR-GO |  |
| 1424 | 010176 | 000001 |        |        |       | WAIT  |              |  |  |  |
| 1425 | 010200 | 021102 |        |        | T26G: | CMP   | %1,%2        |  | ;COMPARE DATA                              |  |
| 1426 | 010202 | 001402 |        |        |       | BEQ   | T26H         |  |  |  |
| 1427 | 010204 | 000000 |        |        |       | HALT  |              |  | ;ERROR, DATA NOT TRANSFERRED PROPERLY      |  |
| 1428 | 010206 | 000741 |        |        |       | BR    | T26F         |  |  |  |
| 1429 | 010210 | 022142 |        |        | T26H: | CMP   | (1)+,-(2)    |  | ;JUST INCREMENTING                         |  |
| 1430 | 010212 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  |  | ;TEST FOR DONE ALL BUFFER AREA             |  |
| 1431 | 010216 | 001370 |        |        |       | BNE   | T26G         |  | ;NO  |  |
| 1432 | 010220 | 000005 |        |        | T26J: | RESET |              |  |  |  |
| 1433 | 010222 | 012767 | 000200 | 167546 |       | MOV   | #200,CC      |  | ;SET PROCESSOR PRIORITY 4                  |  |
| 1434 | 010230 | 012706 | 000776 |        |       | MOV   | #STACK,%6    |  | ;INITIALIZE STACK                          |  |
| 1435 | 010234 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0    |  | ;INITIALIZE TO CLEAR BUFFER                |  |
| 1436 | 010240 | 010001 |        |        |       | MOV   | %0,%1        |  | ;INITIALIZE DATA                           |  |
| 1437 | 010242 | 010077 | 167772 |        |       | MOV   | %0,%ADRS2    |  |  |  |
| 1438 | 010246 | 005020 |        |        |       | CLR   | (0)+         |  |  |  |
| 1439 | 010250 | 020027 | 014034 |        |       | CMP   | %0,#BUFF2    |  |  |  |
| 1440 | 010254 | 001374 |        |        |       | BNE   | .-6          |  |  |  |
| 1441 | 010256 | 012777 | 002000 | 167756 |       | MOV   | #2000,%BC2   |  | ;INITIALIZE BYTE COUNT                     |  |
| 1442 | 010264 | 012702 | 002000 |        |       | MOV   | #2000,%2     |  | ;INITIALIZE EXPECTED DATA                  |  |
| 1443 | 010270 | 012777 | 010306 | 167722 |       | MOV   | #T26K,%DEV2B |  | ;INITIALIZE INTERRUPT RETURN               |  |
| 1444 | 010276 | 012777 | 053541 | 167742 |       | MOV   | #53541,%CR2B |  | ;DATO-XFER TIL BC=0 INTERRUPT-PRI 7-NPR-GO |  |
| 1445 | 010304 | 000001 |        |        |       | WAIT  |              |  |  |  |
| 1446 | 010306 | 021102 |        |        | T26K: | CMP   | %1,%2        |  | ;COMPARE DATA                              |  |
| 1447 | 010310 | 001402 |        |        |       | BEQ   | T26L         |  |  |  |
| 1448 | 010312 | 000000 |        |        |       | HALT  |              |  | ;ERROR, DATA NOT TRANSFERRED PROPERLY      |  |
| 1449 | 010314 | 000741 |        |        |       | BR    | T26J         |  |  |  |
| 1450 | 010316 | 022142 |        |        | T26L: | CMP   | (1)+,-(2)    |  | ;JUST INCREMENTING                         |  |
| 1451 | 010320 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2  |  | ;TEST FOR DONE ALL BUFFER AREA             |  |
| 1452 | 010324 | 001370 |        |        |       | BNE   | T26K         |  | ;NO  |  |

```

1453
1454
1455 010326 000005
1456 010330 012767 000300 167440
1457 010336 012700 012034
1458 010342 010001
1459 010344 010077 167656
1460 010350 005020
1461 010352 020027 014034
1462 010356 001374
1463 010360 012777 001776 167642
1464 010366 012702 001776
1465 010372 012777 010424 167604
1466 010400 012777 010430 167602
1467 010406 012777 052605 167616
1468 010414 012777 052745 167612
1469 010422 000001
1470 010424 000000
1471 010426 000737
1472 010430 021102
1473 010432 001402
1474 010434 000000
1475 010436 000733
1476 010440 022142
1477 010442 020127 014032
1478 010446 001370
1479 010450 000005
1480 010452 012767 000300 167316
1481 010460 012700 012034
1482 010464 010001
1483 010466 010077 167546
1484 010472 005020
1485 010474 020027 014034
1486 010500 001374
1487 010502 012777 001776 167532
1488 010510 012702 001776
1489 010514 012777 010546 167472
1490 010522 012777 010552 167470
1491 010530 012777 052605 167506
1492 010536 012777 052745 167502
1493 010544 000001
1494 010546 000000
1495 010550 000737
1496 010552 021102
1497 010554 001402
1498 010556 000000
1499 010560 000662
1500 010562 022142
1501 010564 020127 014032
1502 010570 001370

;DO MULTI DATA TRANSFERS, ALTERNATING BETWEEN SECTIONS
T30: RESET
MOV #300,CC ;SET PRIORITY 6
MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
MOV %0,%1 ;INITIALIZE DATA BUFFER POINTER
MOV %0,%ADRS1
CLR (0)+ ;CLEAR DATA BUFFER
CMP %0,#BUFF2
BNE -6
MOV #1776,%BC1 ;INITIALIZE BYTE COUNT
MOV #1776,%2 ;INITIALIZE EXPECTED DATA
MOV #T30A,%DEV1A ;INITIALIZE DEVICE 1A INTERRUPT RETURN
MOV #T30B,%DEV1B ;INITIALIZE DEVICE 1B INTERRUPT RETURN
MOV #52605,%CR1A ;DATO-MULTI XFER FROM BC-PRIORITY 4-NPR-BR AFTER OTHER-G
MOV #52745,%CR1B ;DATO-MULTI XFER FROM BC-PRIORITY 7-NPR-BR AFTER OTHER-G
WAIT
T30A: HALT ;ERROR, DEVICE 1A SHOULDN'T HAVE INTERRUPTED
BR T30
T30B: CMP %1,%2 ;WAS DATA TRANSFERED
BEQ T30C
HALT
BR T30 ;ERROR, DATA NOT TRANSFERRED PROPERLY
T30C: CMP (1)+,-(2) ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA
CMP %1,#BUFF2-2 ;DONE ALL OF BUFFER AREA?
BNE T30B ;NO
T30D: RESET
MOV #300,CC ;SET PRIORITY 6
MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFER
MOV %0,%1 ;INITIALIZE DATA BUFFER POINTER
MOV %0,%ADRS2
CLR (0)+ ;CLEAR DATA BUFFER
CMP %0,#BUFF2
BNE -6
MOV #1776,%BC2 ;INITIALIZE BYTE COUNT
MOV #1776,%2 ;INITIALIZE EXPECTED DATA
MOV #T30E,%DEV2A ;INITIALIZE DEVICE 2A INTERRUPT RETURN
MOV #T30F,%DEV2B ;INITIALIZE DEVICE 2B INTERRUPT RETURN
MOV #52605,%CR2A ;DATO-MULTI XFER FROM BC-PRIORITY 4-NPR-BR AFTER OTHER-G
MOV #52745,%CR2B ;DATO-MULTI XFER FROM BC-PRIORITY 7-NPR-BR AFTER OTHER-G
WAIT
T30E: HALT ;ERROR, DEVICE 2A SHOULDN'T HAVE INTERRUPTED
BR T30D
T30F: CMP %1,%2 ;WAS DATA TRANSFERED
BEQ T30G
HALT
BR T30 ;ERROR, DATA NOT TRANSFERRED PROPERLY
T30G: CMP (1)+,-(2) ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA
CMP %1,#BUFF2-2 ;DONE ALL OF BUFFER AREA?
BNE T30F ;NO

```

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1503
1504
1505 010572 000005
1506 010574 012767 000200 167174
1507 010602 012700 012034
1508 010606 010001
1509 010610 010077 167412
1510 010614 012777 014034 167416
1511 010622 005020
1512 010624 020027 016034
1513 010630 001374
1514 010632 012777 002000 167370
1515 010640 012777 002000 167374
1516 010646 012702 002000
1517 010652 012777 010704 167324
1518 010660 012777 010706 167326
1519 010666 012777 052743 167336
1520 010674 012777 052743 167342
1521 010702 000001
1522 010704 000001
1523 010706 021102
1524 010710 001402
1525 010712 000000
1526 010714 000726
1527 010716 022142
1528 010720 020127 014032
1529 010724 001370
1530 010726 012702 002000
1531 010732 005721
1532 010734 021102
1533 010736 001402
1534 010740 000000
1535 010742 000713
1536 010744 022142
1537 010746 020127 016032
1538 010752 001370

;DO MULTI DATA TRANSFERS, ALTERNATING BETWEEN DEVICES
T31: RESET
MOV #200,CC ;SET PRIORITY 4
MOV #BUFF1,%0 ;INITIALIZE TO CLEAR BUFFERS
MOV %0,%1 ;INITIALIZE DATA BUFFER POINTER
MOV %0,@ADRS1
MOV #BUFF2,@ADRS2
CLR (0)+ ;CLEAR BUFFER
CMP %0,#BUFF2+2000
BNE -.6
MOV #2000,@BC1 ;INITIALIZE BYTE COUNT 1
MOV #2000,@BC2 ;INITIALIZE BYTE COUNT 2
MOV #2000,%2
MOV #T31A,@DEV1A ;INITIALIZE FIRST INTERRUPT RETURN
MOV #T31B,@DEV2A ;INITIALIZE SECOND INTERRUPT RETURN
MOV #52743,@CR1A ;DATO-MULTI XFER FROM BC-PRI 7-NPR-BR AFTER LAST-GO
MOV #52743,@CR2A ;DATO-MULTI XFER FROM BC-PRI 7-NPR-BR AFTER LAST-GO
WAIT ;WAIT FOR FIRST DEVICE TO INTERRUPT
T31A: WAIT ;WAIT FOR SECOND DEVICE TO INTERRUPT
T31B: CMP @%1,%2 ;WAS DATA TRANSFERRED
BEQ T31C
HALT ;ERROR, DEVICE 1 DATA NOT TRANSFERRED PROPERLY
BR T31
T31C: CMP (1)+,-(2) ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA
CMP %1,#BUFF2-2 ;DONE ALL OF FIRST BUFFER AREA?
BNE T31B ;NO
MOV #2000,%2
TST (1)+ ;JUST INCREMENT BUFFER POINTER
T31D: CMP @%1,%2 ;WAS DATA TRANSFERRED
BEQ T31E
HALT ;ERROR, DEVICE 2 DATA NOT TRANSFERRED PROPERLY
BR T31
T31E: CMP (1)+,-(2) ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA
CMP %1,#BUFF2+1776 ;DONE ALL OF SECOND BUFFER AREA
BNE T31D ;NO
  
```

|      |        |        |        |        |       |       |                |  |   |
|------|--------|--------|--------|--------|-------|-------|----------------|--|---|
| 1539 |        |        |        |        |       |       |                |  |   |
| 1540 | 010754 | 000005 |        |        | T31F: | RESET |                |  |   |
| 1541 | 010756 | 012767 | 000200 | 167012 |       | MOV   | #200,CC        |  | ;SET PRIORITY 4                                     |
| 1542 | 010764 | 012700 | 012034 |        |       | MOV   | #BUFF1,%0      |  | ;INITIALIZE TO CLEAR BUFFERS                        |
| 1543 | 010770 | 010001 |        |        |       | MOV   | %0,%1          |  | ;INITIALIZE DATA BUFFER POINTER                     |
| 1544 | 010772 | 010077 | 167230 |        |       | MOV   | %0,@ADRS1      |  |   |
| 1545 | 010776 | 012777 | 014034 | 167234 |       | MOV   | #BUFF2,@ADRS2  |  |   |
| 1546 | 011004 | 005020 |        |        |       | CLR   | (0)+           |  | ;CLEAR BUFFER                                       |
| 1547 | 011006 | 020027 | 016034 |        |       | CMP   | %0,#BUFF2+2000 |  |   |
| 1548 | 011012 | 001374 |        |        |       | BNE   | .-6            |  |   |
| 1549 | 011014 | 012777 | 002000 | 167206 |       | MOV   | #2000,@BC1     |  | ;INITIALIZE BYTE COUNT 1                            |
| 1550 | 011022 | 012777 | 002000 | 167212 |       | MOV   | #2000,@BC2     |  | ;INITIALIZE BYTE COUNT 2                            |
| 1551 | 011030 | 012702 | 002000 |        |       | MOV   | #2000,%2       |  |   |
| 1552 | 011034 | 012777 | 011066 | 167146 |       | MOV   | #T31G,@DEV1B   |  | ;INITIALIZE FIRST INTERRUPT RETURN                  |
| 1553 | 011042 | 012777 | 011070 | 167150 |       | MOV   | #T31H,@DEV2B   |  | ;INITIALIZE SECOND INTERRUPT RETURN                 |
| 1554 | 011050 | 012777 | 052743 | 167156 |       | MOV   | #52743,@CR1B   |  | ;DATO-MULTI XFER FROM BC-PRI 7-NPR-BR AFTER LAST-GO |
| 1555 | 011056 | 012777 | 052743 | 167162 |       | MOV   | #52743,@CR2B   |  | ;DATO-MULTI XFER FROM BC-PRI 7-NPR-BR AFTER LAST-GO |
| 1556 | 011064 | 000001 |        |        |       | WAIT  |                |  | ;WAIT FOR FIRST DEVICE TO INTERRUPT                 |
| 1557 | 011066 | 000001 |        |        | T31G: | WAIT  |                |  | ;WAIT FOR SECOND DEVICE TO INTERRUPT                |
| 1558 | 011070 | 021102 |        |        | T31H: | CMP   | @%1,%2         |  | ;WAS DATA TRANSFERRED                               |
| 1559 | 011072 | 001402 |        |        |       | BEQ   | T31J           |  |   |
| 1560 | 011074 | 000000 |        |        |       | HALT  |                |  | ;ERROR, DEVICE 1 DATA NOT TRANSFERRED PROPERLY      |
| 1561 | 011076 | 000726 |        |        |       | BR    | T31F           |  |   |
| 1562 | 011100 | 022142 |        |        | T31J: | CMP   | (1)+,-(2)      |  | ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA     |
| 1563 | 011102 | 020127 | 014032 |        |       | CMP   | %1,#BUFF2-2    |  | ;DONE ALL OF FIRST BUFFER AREA?                     |
| 1564 | 011106 | 001370 |        |        |       | BNE   | T31H           |  | ;NO   |
| 1565 | 011110 | 012702 | 002000 |        |       | MOV   | #2000,%2       |  |   |
| 1566 | 011114 | 005721 |        |        |       | TST   | (1)+           |  | ;JUST INCREMENT BUFFER POINTER                      |
| 1567 | 011116 | 021102 |        |        | T31K: | CMP   | @%1,%2         |  | ;WAS DATA TRANSFERRED                               |
| 1568 | 011120 | 001402 |        |        |       | BEQ   | T31L           |  |   |
| 1569 | 011122 | 000000 |        |        |       | HALT  |                |  | ;ERROR, DEVICE 2 DATA NOT TRANSFERRED PROPERLY      |
| 1570 | 011124 | 000713 |        |        |       | BR    | T31F           |  |   |
| 1571 | 011126 | 022142 |        |        | T31L: | CMP   | (1)+,-(2)      |  | ;INCREMENT DATA POINTER-DECREMENT EXPECTED DATA     |
| 1572 | 011130 | 020127 | 016032 |        |       | CMP   | %1,#BUFF2+1776 |  | ;DONE ALL OF SECOND BUFFER AREA                     |
| 1573 | 011134 | 001370 |        |        |       | BNE   | T31K           |  | ;NO   |

```

1574
1575
1576
1577
1578
1579 011136 000005
1580 011140 012767 000340 166630
1581 011146 012767 011442 167334
1582 011154 012767 000240 167330
1583 011162 012767 011546 167324
1584 011170 012767 000340 167320
1585 011176 012767 011564 167314
1586 011204 012767 000300 167310
1587 011212 012767 011674 167304
1588 011220 012767 000200 167300
1589 011226 012777 000002 166774
1590 011234 012777 011542 166764
1591 011242 005067 000274
1592 011246 005067 000266
1593 011252 005067 000266
1594 011256 012777 045451 166746
1595 011264 005067 000270
1596 011270 005067 000266
1597 011274 012777 000173 166732
1598 011302 012777 000200 166732
1599 011310 012777 014034 166722
1600 011316 012767 014034 000502
1601 011324 012767 177600 000476
1602 011332 016777 000472 000466 ST9A:
1603 011340 062767 000002 000460
1604 011346 062767 000002 000454
1605 011354 001366
1606 011356 005077 000444
1607 011362 005067 000444
1608 011366 012777 000511 166650
1609 011374 012777 012613 166644
1610 011402 042767 000340 166366
1611 011410 005000
1612 011412 005200
1613 011414 001376
1614 011416 013700 000042
1615 011422 001405
1616 011424 000005
1617 011426 004710
1618 011430 000240
1619 011432 000240
1620 011434 000240
1621 011436 000167 167336
1622
1623 011442 005777 166564
1624 011446 100001
1625 011450 000000
1626 011452 026767 000064 000064
1627 011460 001401
1628 011462 000000
1629 011464 005267 000050

:FACTORY TEST PROGRAM
:JOHN HITTELL
RESET
MOV #340,CC ;SET PRIORITY 7
MOV #BDEV1A,510
MOV #240,512
MOV #BDEV1B,514
MOV #340,516
MOV #BDEV2A,520
MOV #300,522
MOV #BDEV2B,524
MOV #200,526
MOV #2,ABC1 ;BUS TESTER 1
MOV #REC1A,ADRS1 ;DEVICE 1 TAPES WORD IN REC1A
CLR REC1A ;AND MULTIPLIES IT BY TWO
CLR SEND1A
CLR EXP1A
MOV #45451,ACR1A ;DEVICE 1-NPR-DATIP-DATO-PRIORITY 5-DELAY 1 MSEC
CLR CNT1B1 ;DEVICE 2 INTERRUPTS, A COUNT IS KEPT
CLR CNT1B2 ;OF NUMBER OF TIMES
MOV #173,ACR1B ;DEVICE 2-PRIORITY7-DELAY 100 USEC
MOV #200,ABC2 ;BUS TESTER 2
MOV #BUFF2,ADRS2
MOV #BUFF2,DEV2B3 ;SET UP BUFFER
MOV #-200,DEV2B4 ;SO IT LOOKS LIKE
MOV DEV2B4,DEV2B3 ;INTERRUPT SERVICE ROUTINE
ADD #2,DEV2B3 ;HAS ALREADY RUN
ADD #2,DEV2B4 ;THIS IS NECESSARY FOR
BNE ST9A ;DEVICE 3
CLR DEV2B3
CLR DEV2B5
MOV #511,ACR2A ;DEVICE 3-NPR-DATI-PRIORITY 6-DELAY 1 MSEC
MOV #12613,ACR2B ;DEVICE 4-NPR-DATO-PRIORITY 4-DELAY 50 USEC
BIC #340,CC
CLR %0
INC %0
BNE .-2
MOV #42,%0
BEQ SDOAGN
RESET
SENDAD: JSR %7,(%0)
NOP
NOP
NOP
SDOAGN: JMP START
:DEVICE ONE NPR-DATIP-DATO-PRIORITY 5-DELAY 1 MSEC
BDEV1A: TST ACR1A ;TEST FOR BUSY
BPL .+4
HALT ;BUSY NOT DOWN
CMP REC1A,EXP1A ;TRANSFER DONE CORRECTLY?
BEQ .+4
HALT ;DATIP-DATO ERROR
INC SEND1A ;NEW DATA

```

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|      |        |        |        |        |     |               |                    |
|------|--------|--------|--------|--------|-----|---------------|--------------------|
| 1630 | 011470 | 016767 | 000044 | 000044 | MOV | SEND1A,REC1A  |                    |
| 1631 | 011476 | 016767 | 000036 | 000040 | MOV | SEND1A,EXP1A  | ;SET UP DATA       |
| 1632 | 011504 | 006367 | 000034 |        | ASL | EXP1A         | ;EXPECTED BACK     |
| 1633 | 011510 | 012777 | 000002 | 166512 | MOV | #2,@BC1       | ;SET UP BYTE COUNT |
| 1634 | 011516 | 012777 | 011542 | 166502 | MOV | #REC1A,@ADRS1 |                    |
| 1635 | 011524 | 005077 | 166502 |        | CLR | @CR1A         |                    |
| 1636 | 011530 | 012777 | 045451 | 166474 | MOV | #45451,@CR1A  |                    |
| 1637 | 011536 | 000002 |        |        | RTI |               |                    |
| 1638 | 011540 | 000000 |        |        |     |               | ;SENT              |
| 1639 | 011542 | 000000 |        |        |     |               | ;RECEIVED          |
| 1640 | 011544 | 000000 |        |        |     |               | ;EXPECTED          |

SEND1A: 0  
 REC1A: 0  
 EXP1A: 0

# E04

```

1641
1642
1643 011546 005267 000006 ;DEVICE TWO-PRIORITY 7-DELAY 100 USEC
1644 011552 005567 000004 BDEV1B: INC CNT1B1 ;DOUBLE WORD COUNTS OF
1645 011556 000002 ADC CNT1B2 ;NUMBER OF INTERRUPTS
1646 011560 000000 RTI
1647 011562 000000 CNT1B1: 0
1648 CNT1B2: 0
1649
1650 ;DEVICE THREE-NPR-DATI-PRIORITY 6-DELAY 1 MSEC
1651
1652 011564 005777 166454 BDEV2A: TST @CR2A ;TEST FOR BUSY DOWN
1653 011570 100001 BPL .+4
1654 011572 000000 HALT ;BUSY NOT DOWN
1655 011574 005077 166444 CLR @CR2A
1656 011600 005767 000226 TST DEV2B5
1657 011604 001401 BEQ .+4 ;RETURN IF DEV 4 BEING SERVICED
1658 011606 000002 RTI
1659 011610 017767 166422 000054 MOV @DATA2,DEV2A2 ;FIND OUT WHERE DATA
1660 011616 062767 014234 000046 ADD #BUFF2+200,DEV2A2 ;SHOULD HAVE COME FROM
1661 011624 027777 000042 166404 CMP @DEV2A2,@DATA2 ;AND CHECK IT
1662 011632 001401 BEQ .+4
1663 011634 000000 HALT ;DATI FAILURE
1664 011636 005477 000030 NEG @DEV2A2 ;SET UP FOR DEVICE 4
1665 011642 027727 166370 177776 CMP @DATA2,#-2
1666 011650 001405 BEQ DEV2A3 ;BRANCH IF 4 DONE
1667 011652 100003 BPL DEV2A4 ;BRANCH IF 4 IS WAITING TO BE SERVICED
1668 011654 012777 000511 166362 MOV #511,@CR2A ;RESTART 3
1669 011662 000002 DEV2A4: RTI ;TO MAINLINE
1670 011664 005077 166356 DEV2A3: CLR @CR2B ;TURN OFF 4
1671 011670 000405 BR DEV2B1 ;SERVICE 4
1672 011672 000000 DEV2A2: 0
1673 ;DEVICE 4-NPR-DATO-PRIORITY 4-DELAY=50 USEC
1674 011674 005777 166346 BDEV2B: TST @CR2B ;TEST FOR BUSY DOWN
1675 011700 100001 BPL .+4
1676 011702 000000 HALT ;BUSY NOT DOWN
1677 011704 005167 000122 DEV2B1: COM DEV2B5 ;FLAG FOR DEVICE 3
1678 011710 012767 014034 000110 MOV #BUFF2,DEV2B3 ;CHECK COMPLETE
1679 011716 012767 000200 000104 MOV #200,DEV2B4 ;COUNT PATTERN
1680 011724 027767 000076 000076 DEV2B2: CMP @DEV2B3,DEV2B4
1681 011732 001401 BEQ .+4
1682 011734 000000 HALT ;DATA ERROR
1683 011736 005477 000064 NEG @DEV2B3 ;CHANGE DATA
1684 011742 062767 000002 000056 ADD #2,DEV2B3
1685 011750 162767 000002 000052 SUB #2,DEV2B4
1686 011756 001362 BNE DEV2B2
1687 011760 005077 000042 CLR @DEV2B3
1688 011764 012777 000200 166250 MOV #200,@BC2 ;SET UP DEVICE AGAIN
1689 011772 012777 014034 166240 MOV #BUFF2,@ADRS2
1690 012000 012777 000511 166236 MOV #511,@CR2A ;RESTART DEVICE 3
1691 012006 005077 166234 CLR @CR2B
1692 012012 012777 012613 166226 MOV #12613,@CR2B
1693 012020 005067 000006 CLR DEV2B5
1694 012024 000002 RTI
1695 012026 000000 DEV2B3: 0
1696 012030 000000 DEV2B4: 0
  
```

F04

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1697 012032 000000  
1698 012034 000000  
1699 000001

DEV285: 0  
LAST: 0  
.END





|        |        |       |       |      |       |       |      |       |             |
|--------|--------|-------|-------|------|-------|-------|------|-------|-------------|
| T17B   | 005344 | 985   | 988#  |      |       |       |      |       |             |
| T17C   | 005364 | 993#  | 1002  |      |       |       |      |       |             |
| T17D   | 005410 | 997#  | 998   |      |       |       |      |       |             |
| T17D1  | 005402 | 996#  | 1006  |      |       |       |      |       |             |
| T17E   | 005430 | 1000  | 1003# |      |       |       |      |       |             |
| T18    | 005450 | 1010# | 1019  |      |       |       |      |       |             |
| T18A   | 005470 | 1013# | 1022  |      |       |       |      |       |             |
| T18B   | 005522 | 1017  | 1020# |      |       |       |      |       |             |
| T18C   | 005534 | 1024# | 1033  |      |       |       |      |       |             |
| T18D   | 005546 | 1026# | 1036  |      |       |       |      |       |             |
| T18DAT | 005614 | 1013  | 1016  | 1026 | 1030  | 1039# |      |       |             |
| T18E   | 005600 | 1031  | 1034# |      |       |       |      |       |             |
| T19    | 005616 | 1038  | 1042# | 1051 |       |       |      |       |             |
| T19A   | 005636 | 1045# | 1054  |      |       |       |      |       |             |
| T19B   | 005670 | 1049  | 1052# |      |       |       |      |       |             |
| T19C   | 005704 | 1056# | 1065  |      |       |       |      |       |             |
| T19D   | 005716 | 1058# | 1068  |      |       |       |      |       |             |
| T19DAT | 005766 | 1045  | 1048  | 1058 | 1062  | 1071# |      |       |             |
| T19E   | 005750 | 1063  | 1066# |      |       |       |      |       |             |
| T2     | 001234 | 350   | 354#  | 359  |       |       |      |       |             |
| T2A    | 001256 | 357   | 360#  | 365  |       |       |      |       |             |
| T2B    | 001300 | 363   | 366#  | 371  |       |       |      |       |             |
| T2C    | 001322 | 369   | 372#  | 377  |       |       |      |       |             |
| T2D    | 005770 | 1070  | 1074# | 1084 |       |       |      |       |             |
| T2DA   | 006016 | 1078# | 1088  |      |       |       |      |       |             |
| T2DB   | 006050 | 1082  | 1085# |      |       |       |      |       |             |
| T2DC   | 006066 | 1090# | 1100  |      |       |       |      |       |             |
| T2DD   | 006106 | 1093# | 1104  |      |       |       |      |       |             |
| T2DDAT | 006160 | 1078  | 1081  | 1093 | 1097  | 1107# |      |       |             |
| T2DE   | 006140 | 1098  | 1101# |      |       |       |      |       |             |
| T21    | 006162 | 1106  | 1110# | 1120 |       |       |      |       |             |
| T21A   | 006210 | 1114# | 1124  |      |       |       |      |       |             |
| T21B   | 006242 | 1118  | 1121# |      |       |       |      |       |             |
| T21C   | 006264 | 1126# | 1136  |      |       |       |      |       |             |
| T21D   | 006304 | 1129# | 1140  |      |       |       |      |       |             |
| T21DAT | 006362 | 1114  | 1117  | 1129 | 1133  | 1143# |      |       |             |
| T21E   | 006336 | 1134  | 1137# |      |       |       |      |       |             |
| T22    | 006364 | 1142  | 1146# | 1156 |       |       |      |       |             |
| T22A   | 006406 | 1149# | 1159  |      |       |       |      |       |             |
| T22B   | 006442 | 1154  | 1157# |      |       |       |      |       |             |
| T22C   | 006460 | 1161# | 1170  |      |       |       |      |       |             |
| T22D   | 006474 | 1163# | 1173  |      |       |       |      |       |             |
| T22DAT | 006550 | 1148# | 1149  | 1153 | 1157* | 1162* | 1163 | 1167  | 1171* 1176# |
| T22E   | 006530 | 1168  | 1171# |      |       |       |      |       |             |
| T23    | 006552 | 1175  | 1179# | 1189 |       |       |      |       |             |
| T23A   | 006632 | 1187  | 1190# | 1200 |       |       |      |       |             |
| T23DAT | 006706 | 1181  | 1182# | 1186 | 1192  | 1193* | 1197 | 1201# |             |
| T24    | 006710 | 1198  | 1204# | 1219 |       |       |      |       |             |
| T24B   | 006770 | 1213  | 1216# | 1222 |       |       |      |       |             |
| T24C   | 007000 | 1217  | 1220# |      |       |       |      |       |             |
| T24D   | 007010 | 1223# | 1240  |      |       |       |      |       |             |
| T24F   | 007072 | 1234  | 1237# | 1243 |       |       |      |       |             |
| T24G   | 007102 | 1238  | 1241# |      |       |       |      |       |             |
| T24H   | 007112 | 1245# | 1261  |      |       |       |      |       |             |
| T24K   | 007174 | 1255  | 1258# | 1264 |       |       |      |       |             |
| T24L   | 007204 | 1259  | 1262# |      |       |       |      |       |             |

|      |        |       |       |      |      |
|------|--------|-------|-------|------|------|
| T24M | 007214 | 1265# | 1281  |      |      |
| T24P | 007276 | 1275  | 1278# | 1284 |      |
| T24R | 007306 | 1279  | 1282# |      |      |
| T25  | 007320 | 1288# | 1303  |      |      |
| T25B | 007376 | 1300# | 1306  |      |      |
| T25C | 007406 | 1301  | 1304# |      |      |
| T25D | 007416 | 1307# | 1322  |      |      |
| T25F | 007470 | 1319# | 1325  |      |      |
| T25G | 007500 | 1320  | 1323# |      |      |
| T25H | 007510 | 1326# | 1342  |      |      |
| T25K | 007562 | 1339# | 1345  |      |      |
| T25L | 007572 | 1340  | 1343# |      |      |
| T25M | 007602 | 1346# | 1361  |      |      |
| T25P | 007654 | 1358# | 1364  |      |      |
| T25Q | 007664 | 1359  | 1362# |      |      |
| T26  | 007676 | 1368# | 1385  |      |      |
| T26A | 007764 | 1379  | 1382# | 1388 |      |
| T26B | 007774 | 1383  | 1386# |      |      |
| T26C | 010004 | 1389# | 1406  |      |      |
| T26D | 010072 | 1400  | 1403# | 1409 |      |
| T26E | 010102 | 1404  | 1407# |      |      |
| T26F | 010112 | 1411# | 1428  |      |      |
| T26G | 010200 | 1422  | 1425# | 1431 |      |
| T26H | 010210 | 1426  | 1429# |      |      |
| T26J | 010220 | 1432# | 1449  |      |      |
| T26K | 010306 | 1443  | 1446# | 1452 |      |
| T26L | 010316 | 1447  | 1450# |      |      |
| T3   | 001344 | 375   | 380#  | 390  |      |
| T3A  | 001412 | 381   | 382   | 383  | 388# |
| T3B  | 001420 | 384   | 391#  | 401  |      |
| T3C  | 001462 | 391   | 392   | 394  | 399# |
| T3D  | 001470 | 395   | 402#  | 411  |      |
| T3E  | 001532 | 402   | 403   | 404  | 409# |
| T3F  | 001540 | 405   | 412#  | 421  |      |
| T3G  | 001602 | 412   | 413   | 414  | 419# |
| T3H  | 010326 | 1455# | 1471  | 1475 | 1499 |
| T3A  | 010424 | 1465  | 1470# |      |      |
| T3B  | 010430 | 1466  | 1472# | 1478 |      |
| T3C  | 010440 | 1473  | 1476# |      |      |
| T3D  | 010450 | 1479# | 1495  |      |      |
| T3E  | 010546 | 1489  | 1494# |      |      |
| T3F  | 010552 | 1490  | 1496# | 1502 |      |
| T3G  | 010562 | 1497  | 1500# |      |      |
| T3I  | 010572 | 1505# | 1526  | 1535 |      |
| T31A | 010704 | 1517  | 1522# |      |      |
| T31B | 010706 | 1518  | 1523# | 1529 |      |
| T31C | 010716 | 1524  | 1527# |      |      |
| T31D | 010734 | 1532# | 1538  |      |      |
| T31E | 010744 | 1533  | 1536# |      |      |
| T31F | 010754 | 1540# | 1561  | 1570 |      |
| T31G | 011066 | 1552  | 1557# |      |      |
| T31H | 011070 | 1553  | 1558# | 1564 |      |
| T31J | 011100 | 1559  | 1562# |      |      |
| T31K | 011116 | 1567# | 1573  |      |      |
| T31L | 011126 | 1568  | 1571# |      |      |
| T4   | 001610 | 415   | 424#  | 432  |      |



.MAIN. MACY11 27(732) 14-OCT-76 15:48 PAGE 53  
DBAB.P11 CROSS REFERENCE TABLE -- MACRO NAMES

|        |    |
|--------|----|
| 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* |
| SSESCA | 1* |
| SSNEWT | 1* |
| SSSKIP | 1* |
| .EQUAT | 1* |
| .HEADE | 1* |
| .KT11  | 1* |
| .SETUP | 1* |
| .SWRHI | 1* |
| .SACT1 | 1* |
| .SAPT8 | 1* |
| .SAPTH | 1* |
| .SAPTY | 1* |
| .SASTA | 1* |
| .SCATC | 1* |
| .SCHTA | 1* |
| .SDB2D | 1* |
| .SDB20 | 1* |
| .SDIV  | 1* |
| .SEOP  | 1* |
| .SERRO | 1* |
| .SERRT | 1* |
| .SMULT | 1* |
| .SPOWE | 1* |
| .SRAND | 1* |
| .SRDDE | 1* |
| .SRDOC | 1* |
| .SREAD | 1* |
| .SR2AZ | 1* |
| .SSAVE | 1* |
| .SSB2D | 1* |
| .SSB20 | 1* |
| .SSCOP | 1* |
| .SSIZE | 1* |

|        |    |
|--------|----|
| .SSUPR | 1* |
| .STRAP | 1* |
| .STYPB | 1* |
| .STYPD | 1* |
| .STYPE | 1* |
| .STYPO | 1* |
| .S4OCA | 1* |
| .1170  | 1* |

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ADC  | 1015 | 1047 | 1080 | 1116 | 1644 |      |      |      |      |      |      |      |      |      |      |
| ADD  | 1603 | 1604 | 1660 | 1684 |      |      |      |      |      |      |      |      |      |      |      |
| ASL  | 1632 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BEQ  | 314  | 319  | 324  | 329  | 335  | 340  | 345  | 350  | 808  | 813  | 819  | 824  | 833  | 843  | 851  |
|      | 856  | 862  | 867  | 876  | 886  | 894  | 899  | 906  | 911  | 920  | 930  | 947  | 949  | 962  | 964  |
|      | 983  | 985  | 998  | 1000 | 1017 | 1031 | 1049 | 1063 | 1082 | 1098 | 1118 | 1134 | 1154 | 1168 | 1187 |
|      | 1198 | 1217 | 1238 | 1259 | 1279 | 1301 | 1320 | 1340 | 1359 | 1383 | 1404 | 1426 | 1447 | 1473 | 1497 |
|      | 1524 | 1533 | 1559 | 1568 | 1615 | 1627 | 1657 | 1662 | 1666 | 1681 |      |      |      |      |      |
| BIC  | 1610 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| BMI  | 357  | 363  | 369  | 375  |      |      |      |      |      |      |      |      |      |      |      |
| BNE  | 837  | 847  | 880  | 890  | 924  | 934  | 955  | 970  | 991  | 1006 | 1022 | 1036 | 1054 | 1068 | 1088 |
|      | 1104 | 1124 | 1140 | 1159 | 1173 | 1185 | 1196 | 1210 | 1222 | 1231 | 1243 | 1252 | 1264 | 1272 | 1284 |
|      | 1294 | 1299 | 1306 | 1313 | 1318 | 1325 | 1333 | 1338 | 1345 | 1352 | 1357 | 1364 | 1376 | 1388 | 1397 |
|      | 1409 | 1419 | 1431 | 1440 | 1452 | 1462 | 1478 | 1486 | 1502 | 1513 | 1529 | 1538 | 1548 | 1564 | 1573 |
|      | 1605 | 1613 | 1686 |      |      |      |      |      |      |      |      |      |      |      |      |
| BPL  | 1624 | 1653 | 1667 | 1675 |      |      |      |      |      |      |      |      |      |      |      |
| BR   | 316  | 321  | 326  | 331  | 337  | 342  | 347  | 352  | 359  | 365  | 371  | 377  | 390  | 401  | 411  |
|      | 421  | 429  | 432  | 437  | 440  | 445  | 449  | 454  | 457  | 549  | 551  | 553  | 555  | 573  | 578  |
|      | 583  | 588  | 602  | 607  | 612  | 617  | 623  | 628  | 633  | 638  | 652  | 658  | 663  | 668  | 674  |
|      | 679  | 684  | 689  | 695  | 701  | 706  | 724  | 729  | 734  | 739  | 745  | 750  | 756  | 761  | 767  |
|      | 772  | 777  | 810  | 815  | 821  | 826  | 835  | 845  | 853  | 858  | 864  | 869  | 878  | 888  | 896  |
|      | 901  | 908  | 913  | 922  | 932  | 951  | 966  | 987  | 1002 | 1019 | 1033 | 1038 | 1051 | 1065 | 1070 |
|      | 1084 | 1100 | 1106 | 1120 | 1136 | 1142 | 1156 | 1170 | 1175 | 1189 | 1200 | 1219 | 1240 | 1261 | 1281 |
|      | 1303 | 1322 | 1342 | 1361 | 1385 | 1406 | 1428 | 1449 | 1471 | 1475 | 1495 | 1499 | 1526 | 1535 | 1561 |
|      | 1570 | 1671 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| CLR  | 305  | 306  | 307  | 308  | 333  | 338  | 343  | 348  | 380  | 806  | 811  | 828  | 829  | 838  | 839  |
|      | 849  | 854  | 871  | 872  | 881  | 882  | 892  | 897  | 915  | 916  | 925  | 926  | 942  | 952  | 957  |
|      | 967  | 978  | 988  | 993  | 1003 | 1208 | 1229 | 1250 | 1270 | 1292 | 1311 | 1331 | 1350 | 1374 | 1395 |
|      | 1417 | 1438 | 1460 | 1484 | 1511 | 1546 | 1591 | 1592 | 1593 | 1595 | 1596 | 1606 | 1607 | 1611 | 1635 |
|      | 1655 | 1670 | 1687 | 1691 | 1693 |      |      |      |      |      |      |      |      |      |      |
| CMP  | 313  | 318  | 323  | 328  | 389  | 400  | 410  | 420  | 431  | 439  | 448  | 456  | 557  | 818  | 823  |
|      | 832  | 842  | 861  | 866  | 875  | 885  | 905  | 910  | 919  | 929  | 948  | 963  | 984  | 999  | 1048 |
|      | 1062 | 1117 | 1133 | 1153 | 1167 | 1186 | 1197 | 1209 | 1216 | 1220 | 1221 | 1230 | 1237 | 1241 | 1242 |
|      | 1251 | 1258 | 1262 | 1263 | 1271 | 1278 | 1282 | 1283 | 1293 | 1300 | 1304 | 1305 | 1312 | 1319 | 1323 |
|      | 1324 | 1332 | 1339 | 1343 | 1344 | 1351 | 1358 | 1362 | 1363 | 1375 | 1382 | 1386 | 1387 | 1396 | 1403 |
|      | 1407 | 1408 | 1418 | 1425 | 1429 | 1430 | 1439 | 1446 | 1450 | 1451 | 1461 | 1472 | 1476 | 1477 | 1485 |
|      | 1496 | 1500 | 1501 | 1512 | 1523 | 1527 | 1528 | 1532 | 1536 | 1537 | 1547 | 1558 | 1562 | 1563 | 1567 |
|      | 1571 | 1572 | 1626 | 1661 | 1665 | 1680 |      |      |      |      |      |      |      |      |      |
| CMPB | 1016 | 1030 | 1081 | 1097 |      |      |      |      |      |      |      |      |      |      |      |
| COM  | 1677 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| DEC  | 953  | 968  | 1020 | 1034 | 1085 | 1086 | 1101 | 1102 |      |      |      |      |      |      |      |
| HALT | 236  | 238  | 240  | 242  | 244  | 246  | 248  | 250  | 252  | 254  | 256  | 258  | 260  | 262  | 264  |
|      | 266  | 315  | 320  | 325  | 330  | 336  | 341  | 346  | 351  | 358  | 364  | 370  | 376  | 388  | 399  |
|      | 409  | 419  | 430  | 438  | 447  | 455  | 550  | 552  | 554  | 556  | 572  | 577  | 582  | 587  | 601  |
|      | 606  | 611  | 616  | 622  | 627  | 632  | 637  | 651  | 657  | 662  | 667  | 673  | 678  | 683  | 688  |
|      | 694  | 699  | 705  | 710  | 723  | 728  | 733  | 738  | 744  | 749  | 754  | 760  | 766  | 771  | 776  |
|      | 781  | 787  | 792  | 797  | 802  | 809  | 814  | 820  | 825  | 834  | 844  | 852  | 857  | 863  | 868  |
|      | 877  | 887  | 895  | 900  | 907  | 912  | 921  | 931  | 950  | 965  | 986  | 1001 | 1018 | 1032 | 1050 |
|      | 1064 | 1083 | 1099 | 1119 | 1135 | 1155 | 1169 | 1188 | 1199 | 1218 | 1239 | 1260 | 1280 | 1302 | 1321 |
|      | 1341 | 1360 | 1384 | 1405 | 1427 | 1448 | 1470 | 1474 | 1494 | 1498 | 1525 | 1534 | 1560 | 1569 | 1625 |
|      | 1628 | 1654 | 1663 | 1676 | 1682 |      |      |      |      |      |      |      |      |      |      |
| INC  | 830  | 831  | 840  | 841  | 873  | 874  | 883  | 884  | 917  | 918  | 927  | 928  | 1612 | 1629 | 1643 |
| JMP  | 274  | 558  | 711  | 782  | 788  | 793  | 798  | 803  | 1621 |      |      |      |      |      |      |
| JSR  | 1617 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| MOV  | 303  | 304  | 312  | 317  | 322  | 327  | 354  | 360  | 366  | 372  | 381  | 382  | 383  | 384  | 386  |
|      | 391  | 392  | 394  | 395  | 397  | 402  | 403  | 404  | 405  | 407  | 412  | 413  | 414  | 415  | 417  |



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DBAB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

ERRORS DETECTED: 0  
DEFAULT GLOBALS GENERATED: 0

\*.DBAB.SEQ/SOL/CRF/NL:TOC/PAGNUM=SYSMAC.CO,DBAB.P11  
RUN-TIME: 23 29 3 SECONDS  
RUN-TIME RATIO: 144/56=2.5  
CORE USED: 32K (63 PAGES)

