

PDP11/45

CONSOLE TEST
MD-11-DCKBQ-B

EP-DCKBQ-B-DL-A
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FICHE 1 OF 1

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This block contains a vertical column of 15 small, illegible test panels or data displays on the left side of the console. Each panel appears to be a separate window or screen showing various data points, possibly related to the system's performance or configuration. The text within these panels is too small and faded to be read.

1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112

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1 J ABSTPACT

THIS PROGRAM IS DESIGNED TO TEST THE PDP11/45 CONSOLE SWITCHES. IN ORDER TO RUN, MEMORY MANAGEMENT MUST BE AVAILABLE. DUE TO THE NATURE OF THE PROGRAM, EXTENSIVE OPERATOR INTERVENTION IS REQUIRED. THE OPERATOR INSTRUCTIONS ARE FULLY DESCRIBED IN THE LISTINGS. THE SECOND PHASE OF THIS PROGRAM ALLOWS THE OPERATOR TO TEST THE MICRO-BREAK REGISTER AND THE PDP11/45 MAINTENANCE CARD.

2.0 REQUIREMENTS

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168

- 2.1 EQUIPMENT
PDP11/45 WITH MEMORY MANAGEMENT.
- 2.2 STORAGE
PROGRAM REQUIRES 4K OF STORAGE.
- 2.3 PRELIMINARY PROGRAMS
NONE.
- 3.0 LOADING PROCEDURE
USE STANDARD PROCEDURE FOR ABS TAPE.
- 4.0 STARTIN PROCEDURE
- 4.1 CONTROL SWITCH SETTINGS
NONE.
- 4.2 STARTING ADDRESS

THE PROGRAM SHOULD ALWAYS BE STARTED AT 200.
- 4.3 PROGRAM AND/OR OPERATOR ACTION
 - 1. LOAD PROGRAM INTO MEMORY USING ABS LOADER.
 - 2. LOAD ADDRESS 200.
 - 3. PRESS START.
 - 4. WHEN PROGRAM HALTS REFER TO THE LISTING FOR OPERATOR INSTRUCTIONS.

169
170
171
172
173
174
175
176
177
178
179
180
181
182
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5.0 ERRORS

5.1 DETECTION OF AN ERROR RESULTS IN A HALT

6.0 PROGRAM DESCRIPTION

CHECKS OUT THE USE OF THE PDP11/45 CONSOLE SWITCHES ALONG WITH THE MICRO-BREAK REGISTER AND THE MAINTENANCE CARD. ONCE STARTED THE PROGRAM SETS UP MEMORY MANAGEMENT AND HALTS. REFER TO THE LISTING FOR OPERATOR INSTRUCTIONS.

!

.NLIST SEQ
.LIST ME
.ABS
.TITLE TEST DCKBQ-B CONSOLE TEST
;CONSOLE TEST- THIS TEST CHECKS CONSOLE OPERATIONS WITH MEMORY
;MANAGEMENT

;GENERAL REGISTER ASSIGNMENTS

000000 R0=X0
000001 R1=X1
000002 R2=X2
000003 R3=X3
000004 R4=X4
000005 R5=X5
000006 SP=X6
000007 PC=X7
000008 R10=X0
000001 R11=X1
000002 R12=X2
000003 R13=X3
000004 R14=X4
000005 R15=X5

;FLOATING POINT REGISTERS

000000 AC0=X0
000001 AC1=X1
000002 AC2=X2
000003 AC3=X3
000004 AC4=X4
000005 AC5=X5

;STACK POINTER REGISTERS

000006 KSP=X6 ;KERNEL STACK POINTER
000006 SSP=X6 ;SUPERVISOR STACK POINTER
000006 USP=X6 ;USER STACK POINTER

;STATUS REGISTER BIT ASSIGNMENTS

000001 C=1
000002 V=2
000004 Z=4
000010 N=10
000020 T=20
000340 PRTY7=340 ;'T' BIT
000200 PRTY4=200 ;PRIORITY LEVEL 7
004000 REG=4000 ;PRIORITY LEVEL 4
000000 KH=000000 ;SELECTS R10-R15
040000 SH=040000 ;KERNEL MODE
140000 UM=140000 ;SUPERVISORY MODE
000000 PKM=000000 ;USER MODE
010000 PSM=010000 ;PREVIOUS KERNEL MODE
030000 PUM=030000 ;PREVIOUS SUPERVISORY MODE
004000 REG=004000 ;PREVIOUS USER MODE
;SELECT R10-R15

;VECTOR ADDRESSES

000004 ERRVEC=4 ;ADDRESS OF ERROR VECTOR
000010 RESVEC=10 ;ADDRESS OF RESERVED INST. TRAP VECTOR

000014
000020
000024
000030
000034
000064
000240
000244
000250

TBITVEC=14
IOTVEC=20
PFVEC=24
ENTVEC=30
TRAPVEC=34
TPVEC=64
PIRVEC=240
FPVEC=244
MMVEC=250

:ADDRESS OF 'T' BIT TRAP VECTOR
:ADDRESS OF IOT TRAP VECTOR
:ADDRESS OF POWER FAIL TRAP VECTOR
:ADDRESS OF ENT VECTOR
:ADDRESS OF TRAP VECTOR
:ADDRESS OF TTY PRINTER INTERRUPT VECTOR
:ADDRESS OF PIRQ VECTOR
:ADDRESS OF FLOATING POINT INT. VECTOR
:ADDRESS OF MEMORY MGMT ERROR TRAP VECTOR

;REGISTER ADDRESSES

177776
177774
177772
177770
177560
177562
177564
177566
177570
177570

PSW=177776
SLR=177774
PIRQ=177772
LK EAK=177770
TKS=177560
TKB=177562
TPS=177564
TPB=177566
SWR=177570
DISPLAY=177570

:ADDRESS OF STATUS REGISTER
:ADDRESS OF STACK LIMIT REGISTER
:ADDRESS OF PROGRAM INTERRUPT REQUEST
:ADDRESS OF MICRO BREAK REGISTER
:ADDRESS OF KEYBOARD CSR
:ADDRESS OF KEYBOARD BUFFER
:ADDRESS OF TELEPRINTER CSR
:ADDRESS OF TELEPRINTER BUFFER
:ADDRESS OF CONSOL SWITCH REGISTER
:ADDRESS OF CONSOL DISPLAY REGISTER

;INITIAL STACK POINTER SETTINGS

001060
000700
000600
000740

KPTR=1060
SPTR=700
LPTR=600
REDPTR=740

:BOTTOM OF KERNEL STACK
:SUPERVISORY STACK SETTING
:USER STACK SETTING
:RED STACK PTR

;MISCELLANEOUS BIT ASSIGNMENTS

100000
040000
020000
000400
000100
010000

BIT15=100000
BIT14=40000
BIT13=20000
BIT8=400
BIT6=100
PIR4=10000

;LEVEL 4 PROGRAM INT. ROST.

;MEMORY MANAGEMENT REGISTER SRO BIT ASSIGNMENTS

000001
000000
000002
000004
000006
000010
000012
000014
000016
000020
000000
000140
000040
000000
000200
000400
001000
004000
010000

EMM=1
VS0=0
VS1=2
VS2=4
VS3=6
VS4=10
VS5=12
VS6=14
VS7=16
DS=20
IS=00
UPG=140
SPG=40
KPG=000
IC=200
DA=400
TE=1000
OST=4000
MMT=10000

;ENABLE MEMORY MANAGEMENT

:INSTRUCTION COMPLETE
:DESTINATION MODE
:TRAP ENABLE
:OST ABORT FLAG
:MEMORY MANAGEMENT TRAP

020000
040000
100000

AVA=20000
PLA=40000
NRA=100000

;ACCESS VIOLATION ABORT
;PAGE LENGTH ABORT
;NON-RESIDENT ABORT

000010
000000
000010
000200
000100

;PAGE DESCRIPTOR REGISTER (PDR)

ED=10
UP=0
DMN=10
A=200
M=100

BIT ASSIGMENTS
;EXPANSION DIRECTION BIT IN PDR
;EXPAND UP
;EXPAND DOWN
;'A' BIT IN PDR
;'M' BIT IN PDR

000010
000020
000040
000060
000100
000370
000360
000340
000320
000300
000000
004000
010000
174000
170000
000000
000400
001000
001400
002000
002400
003000
003400

;SR1 BIT ASSIGNMENTS

S1=10
S2=20
S4=40
S6=60
S8=100
SM1=370
SM2=360
SM4=340
SM6=320
SM8=300
D0=0
D1=4000
D2=10000
DM1=174000
DM2=170000
DR0=000
DR1=400
DR2=1000
DR3=1400
DR4=2000
DR5=2400
DR6=3000
DR7=3400

000001
000002
000004

;SR3 BIT ASSIGNMENTS

UDE=1
SIE=2
KDE=4

;USER 'D' SPACE ENABLE
;SUPERVISOR 'D' SPACE ENABLE
;KERNEL 'D' SPACE ENABLE

177572
177574
177576
172516

;MEMORY MANAGEMENT REGISTER ADDRESS ASSIGNMENTS

SR0=177572
SR1=177574
SR2=177576
SR3=172516

;ADDRESS OF MEMORY MGMT REGISTER SR0
;SR1
;SR2
;ADDRESS OF MEMORY MGMT REGISTER SR3

177600
177602
177604
177606
177610
177612
177614
177616

UIPDR0=177600
UIPDR1=177602
UIPDR2=177604
UIPDR3=177606
UIPDR4=177610
UIPDR5=177612
UIPDR6=177614
UIPDR7=177616

;ADDRESS OF USER 'I' PDR'S

;ADDRESS 00 USER 'D' PDR'S

177620
177622
177624
177626
177630
177632
177634
177636

UDPDR0=177620
UDPDR1=177622
UDPDR2=177624
UDPDR3=177626
UDPDR4=177630
UDPDR5=177632
UDPDR6=177634
UDPDR7=177636

177640
177642
177644
177646
177650
177652
177654
177656

UIPDR0=177640
UIPDR1=177642
UIPDR2=177644
UIPDR3=177646
UIPDR4=177650
UIPDR5=177652
UIPDR6=177654
UIPDR7=177656

177660
177662
177664
177666
177670
177672
177674
177676

UDPAR0=177660
UDPAR1=177662
UDPAR2=177664
UDPAR3=177666
UDPAR4=177670
UDPAR5=177672
UDPAR6=177674
UDPAR7=177676

172200
172202
172204
172206
172210
172212
172214
172216

SIPDR0=172200
SIPDR1=172202
SIPDR2=172204
SIPDR3=172206
SIPDR4=172210
SIPDR5=172212
SIPDR6=172214
SIPDR7=172216

172220
172222
172224
172226
172230
172232
172234
172236

SDPDR0=172220
SDPDR1=172222
SDPDR2=172224
SDPDR3=172226
SDPDR4=172230
SDPDR5=172232
SDPDR6=172234
SDPDR7=172236

172240
172242
172244
172246
172250
172252
172254
172256

SIPAR0=172240
SIPAR1=172242
SIPAR2=172244
SIPAR3=172246
SIPAR4=172250
SIPAR5=172252
SIPAR6=172254
SIPAR7=172256

172260
172262

SDPAR0=172260
SDPAR1=172262

172264
172266
172270
172272
172274
172276

SDPP02=172264
SDP 3=172266
SDP 4=172270
SDP 5=172272
SDP 6=172274
SDPAR7=172276

172300
172302
172304
172306
172310
172312
172314
172316

KIPDR0=172300
KIPDR1=172302
KIPDR2=172304
KIPDR3=172306
KIPDR4=172310
KIPDR5=172312
KIPDR6=172314
KIPDR7=172316

172320
172322
172324
172326
172330
172332
172334
172336

KDPDR0=172320
KDPDR1=172322
KDPDR2=172324
KDPDR3=172326
KDPDR4=172330
KDPDR5=172332
KDPDR6=172334
KDPDR7=172336

172340
172342
172344
172346
172350
172352
172354
172356

KIPAR0=172340
KIPAR1=172342
KIPAR2=172344
KIPAR3=172346
KIPAR4=172350
KIPAR5=172352
KIPAR6=172354
KIPAR7=172356

172360
172362
172364
172366
172370
172372
172374
172376

KDP00=172360
KDP 1=172362
KDP 2=172364
KDP 3=172366
KDP 4=172370
KDP 5=172372
KDP 6=172374
KDP 7=172376

;ACCESS CONTROL FIELD DEFINITIONS (IN PDR)

000000
000001
000002
000003
000004
000005
000006
000007

NR0=0
R00=1
R00=2
NR3=3
RWT=4
RWT=5
RW=6
NR7=7

;NON-RESIDENT ABORT ALL REFS.
;TRAP ON READ,ABORT ON WRITE
;READ,ABORT ON WRITE
;UNUSED ABORT ALL
;TRAP ON READ & WRITE
;READ,TRAP ON WRITE
;READ & WRITE
;ABORT ALL

;INSTRUCTION EQUATES

000000
104000

HLT=HALT
SCOPE=EMT

;SCOPE IS AN EMT TRAP

000004

TYPE=IOT

;TYPE IS AN IOT TRAP

.LIST ME
.NLIST MC,MD,SEQ

;FILL TRAP AND INTERRUPT VECTOR AREA WITH

..+2
:HALT

;UNEXPECTED TRAPS/INTERRUPTS WILL HALT AT VECTOR ADDRESS +2
;AND DISPAY IN THE ADDRESS LIGHTS THE VECTOR ADDRESS +4

.NLIST MC,SEQ
.=ERRVEC
.MCRO SHLT
.=EMTVEC
.WORD SCOPEA

000004 000004
000030 000434

000176 000176
000176 000000

.=176
:HALT

;EXAMINE R1(R11), THE CONTENTS OF WHICH IS THE PC OF THE LAST TEST SUC-
;CESSFULLY COMPLETED. THE TOP WORD ON THE KERNEL STACK CONTAINS THE VIRTUAL
;ADDRESS OF THE HLT INSTRUCTION IN THE TEST THAT FAILED.

:ERROR! TO IDENTIFY WHICH TEST FAILED

000200 000200
000167 000704

.=200
:JMP

START

;GO START TEST

000400

.=400

:SUPERVISOR/USER HLT (HALT) TRAP SERVICE ROUTINE

000400 042737 000001 177572
000406 162716 000002
000412 005776 000000
000416 001404
000420 062716 000002
000424 000137 000006
000430 000137 000176

SHLT: BIC #1,@#SR0
SUB #2,(KSP)
TST @ (KSP)
BEQ SHLTA
ADD #2,(KSP)
JMP @#ERRVEC+2
SHLTA: JMP @#176

;TURN MEM MGMT OFF
;POINT PC TO TRAPPING INST.
;WAS IT A HLT (HALT)
;RESTORE PC TO TRAPPING INST.
;GO HALT AT 6
;GO HALT AT ADDRESS 176

:SCOPE (EMT) SERVICE ROUTINE

000434
000434 005037 177572
000440 011601
000442 012706 001060
000446 005046
000450 010146
000452 012746 000700
000456 012746 000600
000462 012737 030000 177776
000470 106606
000472 006237 177776
000476 106606
000500 032737 000400 177570
000506 001403
000510 113737 177570 177770
000516 000006

SCOPEA:
CLR @#SR0
MOV (KSP),R1
MOV #KPTR,KSP
CLR -(KSP)
MOV R1,-(KSP)
MOV #SPTR,-(KSP)
MOV #UPTR,-(KSP)
MOV #PUM,@#PSW
MTPD USP
ASR @#PSW
MTPD SSP
BIT #BITS,@#SWR
BEQ SCOPEX
SCOPEX: MOVB @#SWR,@#UBREAK
RTT

;DISABLE MEMORY MGMT
;SAVE PC IN R1
;SET KERNEL STACK PTR
;SET UP FOR KERNEL MODE ON RETURN
;RETURN IN LINE
;SUPER STACK PTR ON KERNEL STACK
;USER STACK PTR ON KERNEL STACK
;PREVIOUS USER MODE
;SET USER STACK PTR
;PREV SUPER MODE
;SET SUPER STACK PTR
;LOAD MICRO BREAK REG?
;LOAD SR0-7 INTO MICRO BREAK REG.
;RETURN TO NEXT TEST IN KERNEL MODE
;WITH ALL STACK PTRS SET UP

001000

.=1000

TEST DCKBQ-B CONSOLE TEST
DCKBQA.SRC

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001000 000000
001002 000000
001004
001012

:TAGS
:CNT: 0
:SROT: 0
TEMP=.
.=.+6

:CONTAINS PASS COUNT
:CONTAINS SRO CONTENTS ON ERROR

001110

.=1110

MO1

TEST DCKBQ-B CONSOLE TEST
DCKBQA.SRC

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;START CONSOLE TEST

001110 000240
001112 005067 177662
001116 016737 177656 177570
001124 012706 001060
001130 104000
001132 012737 000400 177774
001140 005037 000252
001144 012737 000007 172516

START: NOP
CLR ICNT ;CLEAR PASS COUNT
BEGIN: MOV ICNT,@#DISPLAY ;DISPLAY PASS COUNT
MOV @#KPTR,KSP ;SET KERNEL STACK PTR
SCOPE ;SCOPE SETS ALL STACK PTRS
MOV @#400,@#SLR ;SET STACK LIMIT = 1000
CLR @#MMVEC+2 ;KERNEL MODE ON ABORT
MOV @#KDE+SDE+UDE,@#SR3

;ROUTINE TO CLEAR MEMORY MANAGEMENT REGISTERS.

001152 000240
001154 005037 177572
001160 012702 177600
001164 012703 000040
001170 005022
001172 077302
001174 012702 172200
001200 012703 000100
001204 005022
001206 077302

MMD: NOP
CLR @#SR0 ;DISABLE MEM MGMT
MOV @#UIPDR0,R2
MOV @#40,R3
CLR (R2)+
SOB R3,-2
MOV @#SIPDR0,R2
MOV @#100,R3
CLR (R2)+
SOB R3,-2

001210
001210 012737 073006 172300
001216 012737 077406 172320
001224 012737 177406 172200
001232 012737 177406 172220
001240 012737 177406 177600
001246 012737 177406 177620
001254 012737 177406 172336
001262 012737 000006 172322
001270 012737 000006 172302
001276 012737 000006 172202
001304 012737 000006 172222
001312 012737 000006 177602
001320 012737 000006 177622

MWK: MOV @#167*256,-400+UP+RW,@#KIPDR0 ;SET KIPDR0=RW UP 167 BLOCKS
MOV @#200*256,-400+UP+RW,@#KOPDR0 ;SET KOPDR0=RW UP 200 BLOCKS
MOV @#400*256,-400+UP+RW,@#SIPDR0 ;SET SIPDR0=RW UP 400 BLOCKS
MOV @#400*256,-400+UP+RW,@#SDPDR0 ;SET SDPDR0=RW UP 400 BLOCKS
MOV @#400*256,-400+UP+RW,@#UIPDR0 ;SET UIPDR0=RW UP 400 BLOCKS
MOV @#400*256,-400+UP+RW,@#UOPDR0 ;SET UOPDR0=RW UP 400 BLOCKS
MOV @#400*256,-400+UP+RW,@#KOPDR7 ;SET KOPDR7=RW UP 400 BLOCKS
MOV @#1*256,-400+UP+RW,@#KOPDR1 ;SET KOPDR1=RW UP 1 BLOCKS
MOV @#1*256,-400+UP+RW,@#KIPDR1 ;SET KIPDR1=RW UP 1 BLOCKS
MOV @#1*256,-400+UP+RW,@#SIPDR1 ;SET SIPDR1=RW UP 1 BLOCKS
MOV @#1*256,-400+UP+RW,@#SDPDR1 ;SET SDPDR1=RW UP 1 BLOCKS
MOV @#1*256,-400+UP+RW,@#UIPDR1 ;SET UIPDR1=RW UP 1 BLOCKS
MOV @#1*256,-400+UP+RW,@#UOPDR1 ;SET UOPDR1=RW UP 1 BLOCKS

001326 005037 172340
001332 005037 172360
001336 012767 007600 171032

CLR @#KIPAR0 ;VA=PA=0000-16677
CLR @#KOPAR0 ;VA=PA=0-1077
MOV @#7600,KOPAR7 ;VA=160000-177776,PA=760000-777776
;(I/O PAGE)

001344 012737 000167 172362
001352 012737 000170 172342
001360 012737 000171 172262
001366 012737 000172 172242
001374 012737 000173 177662
001402 012737 000174 177642

MOV @#167,@#KOPAR1 ;PA=16700-16777,VA=20000-20077
MOV @#170,@#KIPAR1 ;PA=17000-17077,VA=20000-20077
MOV @#171,@#SDPAR1 ;PA=17100-17177,VA=20000-20077
MOV @#172,@#SIPAR1 ;PA=17200-17277,VA=20000-20077
MOV @#173,@#UOPAR1 ;PA=17300-17377,VA=20000-20077
MOV @#174,@#UIPAR1 ;PA=17400-17477,VA=20000-20077

;LOAD PHYSICAL ADDRESSES INTO MEMORY TO BE EXAMINED

```

001410 012737 016700 016700      MOV      #16700, @16700
001416 012737 017002 017002      MOV      #17002, @17002
001424 012737 017104 017104      MOV      #17104, @17104
001432 012737 017210 017210      MOV      #17210, @17210
001440 012737 017320 017320      MOV      #17320, @17320
001446 012737 017440 017440      MOV      #17440, @17440

001454 000167 000172                JMP      CHK1          ;GO START TEST
:TELEPRINTER MANAGER
001460 032737 000100 177564 PRINT: BIT      #100, @TPS      ;IS TELEPRINTER AVAILABLE
001466 001374                BNE     PRINT
001470 013667 000046                MOV     @SP+, CHARPTR    ;GET START OF MESSAGE ADDRESS
001474 062746 000002                ADD     #2, -(SP)        ;ADJUST RETURN PC
001500 052737 000100 177564        BIS     #100, @TPS      ;SET IE
001506 000207                RTS      PC             ;RETURN

:TELEPRINTER INTERRUPT SERVICE ROUTINE
001510 016700 000026 TPISR: MOV     CHARPTR, R0    ;GET CHARACTER ADDRESS
001514 105710                TSTB   (R0)             ;VALID CHAR?
001516 001006                BNE     TPA
001520 042737 000100 177564        BIC     #100, @TPS      ;DISABLE IE
001526 062716 000002                ADD     #2, (SP)        ;ADJUST RETURN PC
001532 000002                RTI
001534 112037 177566 TPA:   MOV     (R0)+, @TPB    ;LOAD CHARACTER
001540 010027                MOV     R0, (PC)+       ;RESTORE PTR
001542 000000                CHARPTR: 0              ;CONTAINS ADDRESS OF CHAR TO BE PRINTED
001544 000002                RTI

:OCTAL TO ASCII TYPE ROUTINE
001546 013746 177564 D2A:  MOV     @TPS, -(SP)    ;SAVE TELEPRINTER STATUS
001552 010246                MOV     R2, -(SP)      ;AND REGISTERS ON THE
001554 010146                MOV     R1, -(SP)      ;STACK
001556 010046                MOV     R0, -(SP)
001560 012700                MOV     (PC)+, R0      ;GET DATA TO BE TYPED
001562 000000                D2BTYP: .WORD 0        ;CONTAINS OCTAL
;VALUE TO BE TYPED
;CHARACTER COUNT
;WORKING REGISTER
;GET FIRST OCTAL DIGIT
; & PUT INTO R2
;FORM ASCII
;WAIT FOR TELEPRINTER

001564 012701 000006                MOV     #6, R1
001570 005002                CLR     R2
001572 006100                ROL     R0
001574 006102                ROL     R2
001576 062702 000260 1S:  ADD     #260, R2        ;TYPE DIGIT
001602 105737 177564        TSTB   @TPS           ;CLEAR WORKING REGISTER
001606 100375                BPL     -4              ;GET NEXT DIGIT
001610 010237 177566        MOV     R2, @TPB
001614 005002                CLR     R2
001616 006100                ROL     R0
001620 006102                ROL     R2
001622 006100                ROL     R0
001624 006102                ROL     R2
001626 006100                ROL     R0
001630 006102                ROL     R2
001632 005301                DEC     R1
001634 001360                BNE     1S
;IS IN R2 NOW
;DECREMENT DIGIT COUNT
;TYPE DIGIT IF NOT DONE

```

001636 012600
001640 012601
001642 012602
001644 012637 177564
001650 000207

000000

MOV (SP)+,R0 ;RESTORE REGISTERS
MOV (SP)+,R1
MOV (SP)+,R2
MOV (SP)+,@TPS ;AND TELEPRINTER STATUS
RTS PC ;AND RETURN

Y=0

:CONSOLE DEPOSIT/EXAMINE TEST
:*****

001652 012737 000001 177572 CHK1: MOV 01,28SD ;ENABLE MEMORY MANAGEMENT
001660 000000 HALT ;PERFORM THE FOLLOWING TESTS

:CONSOLE TEST 0
:SET ADDRESS SELECTOR SWITCH TO KD POSITION
:LOAD ADDRESS 20000
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 16700
:DEPOSIT 20002
:*****

:CONSOLE TEST 1
:SET ADDRESS SELECTOR SWITCH TO KI POSITION
:LOAD ADDRESS 20002
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 17002
:DEPOSIT 20004
:*****

:CONSOLE TEST 2
:SET ADDRESS SELECTOR SWITCH TO SD POSITION
:LOAD ADDRESS 20004
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 17104
:DEPOSIT 20010
:*****

:CONSOLE TEST 3
:SET ADDRESS SELECTOR SWITCH TO SI POSITION
:LOAD ADDRESS 20010
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 17210
:DEPOSIT 20020
:*****

:CONSOLE TEST 4
:SET ADDRESS SELECTOR SWITCH TO UD POSITION
:LOAD ADDRESS 20020
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 17320
:DEPOSIT 20040
:*****

:CONSOLE TEST 5
:SET ADDRESS SELECTOR SWITCH TO UI POSITION
:LOAD ADDRESS 20040
:*****

TEST DCKBQ-B CONSOLE TEST
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: EXAMINE
: DATA LIGHTS SHOULD DISPLAY 17440
: DEPOSIT 20100
: *****
: *****
: PRESS CONTIUE
: *****

:ROUTINE TO CHECK DEPOSITS AS REQUESTED IN CONSOLE TESTS 1-5
:*****

001662	005037	177572		CLR	28SR0	;DISABLE MEMORY MGMT
001666	022737	020002	016700	CMP	20002,2016700	
001674	001401			BEG	.+4	
001676	000000			HLT		;INCORRECT DEPOSIT TEST 0
001700	022737	020004	017002	CMP	20004,2017002	
001706	001401			BEG	.+4	
001710	000000			HLT		;INCORRECT DEPOSIT TEST 1
001712	022737	020010	017104	CMP	20010,2017104	
001720	001401			BEG	.+4	
001722	000000			HLT		;INCORRECT DEPOSIT TEST 2
001724	022737	020020	017210	CMP	20020,2017210	
001732	001401			BEG	.+4	
001734	000000			HLT		;INCORRECT DEPOSIT TEST 3
001736	022737	020040	017320	CMP	20040,2017320	
001744	001401			BEG	.+4	
001746	000000			HLT		;INCORRECT DEPOSIT TEST 4
001750	022737	020100	017440	CMP	20100,2017440	
001756	001401			BEG	.+4	
001760	000000			HLT		;INCORRECT DEPOSIT TEST 5

:CHECK THAT AN ADDRESS WHICH IS NOT MAPPED RESIDENT WILL
:NOT ABORT WHEN EXAMINED VIA THE CONSOLE
:*****

001762 012737 020100 020100
001770 005237 177572
001774 000000

MOV 020100,020100 ;ADDRESS 20100 IS OUTSIDE THE
;MAPPED AREA (PAGE LENGTH ERROR)
INC 020SRO ;ENABLE MEMORY MGMT
HALT ;PERFORM THE FOLLOWING OPERATIONS

:SET ADDRESS SELECT SWITCH TO "USER I" POSITION
:LA=20100
:EXAMINE
:ADDRESS ERROR LIGHT SHOULD LIGHT
:LA=20100
:ADDRESS ERROR LIGHT SHOULD GO OUT
:SET ADDRESS SELECT SWITCH TO CONSOLE PHYSICAL POSITION
:EXAMINE
:DATA LIGHTS SHOULD DISPLAY 20100
:PRESS CONTINUE
:*****

THIS NEXT SET OF TESTS DEMONSTRATES THAT THE CONSOLE WILL DISPLAY
THE PHYSICAL ADDRESS WHEN THE PROGRAM IS RUNNING, IF THE ADDRESS
SELECTION SWITCH IS IN THE CONSOLE PHYSICAL POSITION, AND THAT THE
CONSOLE WILL DISPLAY THE PROGRAM ADDRESS WHEN THE PROGRAM IS RUNNING, IF
THE ADDRESS SELECTION SWITCH IS IN THE PROGRAM PHYSICAL POSITION.

001776 012737 001510 000064
002004 012737 000200 000066

MOV @TPISR,@TPVEC ;SET TELEPRINTER INTERRUPT VECTOR
MOV @PARTY4,@TPVEC+2;AND STATUS ON INTERRUPT

;SETUP KERNEL MEMORY MANAGEMENT REGISTERS

002012 012737 002272 000060
002020 005037 000062
002024 012737 077406 172304
002032 012737 077406 172324
002040 000167 040000

MOV @TTYINT,@#60 ;SETUP READER INTERRUPT VECTOR
CLR @#62
MOV @200+256,-400+UP+R4,@KIP002 ;SET KIP002=RW UP 200 BLOCKS
MOV @200+256,-400+UP+R4,@KOP002 ;SET KOP002=RW UP 200 BLOCKS
JMP .+40004 ;EXECUTES THE FOLLOWING INSTRUCTIONS
;AT VIRTUAL ADDRESS 40000+

002044 012702 002310
002050 062702 000002
002054 012703 001562
002060 004767 177374
002064 002370
002066 004767 000212
002072 010213
002074 004767 177446
002100 004767 177354

MOV @WAIT,R2 ;GET ADDRESS OF WAIT LOOP
ADD @2,R2
MOV @02,TYP,R3
JSR PC,PRINT ;GO TO PRINT MANAGER
INST2 ;PRINT INSTRUCTIONS
JSR PC,LOOP ;GO EXECUTE BR
MOV R2,(R3) ;GET PHYSICAL ADDRESS OF WAIT INSTRUCTION
JSR PC,@R ;PRINT PHYSICAL ADDRESS
JSR PC,PRINT

002104 002444
002106 004767 000172
002112 004767 177342
002116 002521
002120 004767 000160
002124 005037 177562 177560
002130 012737 000100
002136 004767 000146
002142 004767 177312

LIGHTS
JSR PC,LOOP ;EXECUTE BR . WHILE PRINTING
JSR PC,PRINT
MES1
JSR PC,LOOP ;WAIT FOR MESSAGE TO GO OUT
CLR @#TKB ;CLEAR KEYBOARD BUFFER
MOV @100,@#TKS ;ENABLE TELETYPE INTERRUPT
JSR PC,WAIT ;WAIT FOR TELETYPE INTERRUPT
JSR PC,PRINT

002146 002314
002150 004767 000130
002154 010213
002156 062713 040000
002162 004767 177350
002166 004767 177266
002172 002444
002174 004767 000104
002176 004767 177254
002178 002314

INST1
JSR PC,LOOP ;EXECUTE BR . WHILE PRINTING
MOV R2,(R3) ;GET PHYSICAL ADDRESS OF LOOP
ADD @400,(R3) ;FORM PROGRAM ADDRESS
JSR PC,@R ;TYPE PROGRAM ADDRESS OF LOOP
JSR PC,PRINT
LIGHTS
JSR PC,LOOP ;GO EXECUTE BR . WHILE PRINTING
JSR PC,PRINT

002206 004767 000072
002212 005037 177562 177560
002216 012737 000100
002224 004767 000060
002230 162707 040000

MES1
JSR PC,LOOP ;WAIT FOR MESSAGE TO GO OUT
CLR @#TKB ;CLEAR THE KEYBOARD BUFFER
MOV @100,@#TKS ;ENABLE TELETYPE INTERRUPT
JSR PC,WAIT ;WAIT FOR TELETYPE INTERRUPT
SUB @40000,PC ;RETURN EXECUTES FOLLOWING INSTRUCTION

002234 000000

HALT

THE CONSOLE SWITCH TEST IS NOW FINISHED. IF YOU WISH TO CHECK
THE MICRO-BREAK LOGIC ON THE MAINTENANCE CARD PERFORM THE
FOLLOWING STEPS.

NOTE: IF FLOATING POINT OPTION DOES NOT EXIST THE CONTENTS
OF THE MICRO-BREAK REGISTER WILL DISPLAY ONLY THE LOWER BYTE.
EXAMPLE- 37374=000374

INSERT THE MAINTENANCE CARD.
ENABLE THE MICRO-BREAK STOP SWITCH ON THE MAINTENANCE CARD.
SWITCHES 2, 3, AND 4 SHOULD BE TO THE LEFT POSITION.
PRESS CONTINUE.
DISPLAY THE MICRO-BREAK REGISTER ON THE CONSOLE.
THE PROCESSOR SHOULD HAVE HALTED WITH 37374 DISPLAYED.
STEP THE MAINT STEP SWITCH THREE TIMES.
37003 SHOULD NOW BE DISPLAYED.
STEP THE MAINT STEP SWITCH ONE MORE TIME.
THE ADDRESS DISPLAYED SHOULD BE OF THE NEXT HALT INSTRUCTION +2.
CLEAR THE MICRO-BREAK SWITCH.
THE PROGRAM IS FINISHED.

002236 012737 000374 177770
002244 000005
002246 012737 000003 177770
002254 012701 004000
002260 012737 004004 004000
002266 010031
002270 000000

MOV 8374,2#BUBREAK ;LOAD 374 INTO THE MICRO-BREAK REGISTER
RESET ;PROCESSOR SHOULD STOP DURING THIS INSTRUCTION
MOV 83,2#BUBREAK ;LOAD 3 INTO THE MICRO-BREAK REGISTER
MOV #4000,R1
MOV #4004,2#4000
MOV R0,2(R1)+ ;PROCESSOR SHOULD HALT DURING THIS INSTRUCTION
HALT ;TEST IS COMPLETE

002272 005037 177560
002276 005037 177562
002302 000002

TTYINT: CLR @TKS ;CLEAR THE INTERRUPT
CLR @TKB ;CLEAR KEYBOARD BUFFER
RTI

002304 000777
002306 000207

LOOP: BR PC
RTS

002310 000001
002312 000207

WAIT: WAIT ;WAIT FOR TELETYPE INTERRUPT
RTS PC

002314 042523 020124 042101
002322 051522 051440 046105
002330 051440 044527 041524
002336 020110 047524 041440
002344 047117 047523 042514
002352 050040 054510 020123
002360 047520 044523 006524
002366 000012

:MESSAGES
INST1: .ASCIZ 'SET ADRS SEL SWITCH TO CONSOLE PHYS POSIT'<15><12>

002370 042523 020124 042101
002376 051522 051440 046105
002404 051440 044527 041524
002412 020110 047524 050040
002420 047522 051107 046501
002428 050040 054510 020123
002436 047520 044523 006524
002440 000012

INST2: .ASCIZ 'SET ADRS SEL SWITCH TO PROGRAM PHYS POSIT'<15><12>

002444 051440 047510 046125
002452 020104 042502 042040
002460 051511 046120 054501
002466 042105 044440 020116
002474 044124 020105 042101
002502 051104 051505 020123
002510 044514 044107 051524
002516 005015 000

LIGHTS: .ASCIZ ' SHOULD BE DISPLAYED IN THE ADDRESS LIGHTS'<15><12>

002521 000 123 051124 045511
002526 020105 047101 020131
002534 042524 042514 054524
002542 042520 045440 054505
002550 053440 042510 020116
002556 042522 042101 020131
002564 047524 051040 047522
002572 042503 042504 005015
002600 000

MES1: .ASCIZ /STRIKE ANY TELETYPE KEY WHEN READY TO PROCEED/<15><12>

002601 015 000012
000001

CRLF: .ASCIZ <15><12>
.END

R	=	000200	304							
RCD	=	2000000	208							
RCD1	=	2000001	209							
RCD2	=	2000002	210							
RCD3	=	2000003	211							
RCD4	=	2000004	212							
RCS	=	2000005	213							
RVA	=	020000	296							
BEGIN	=	001116	274							
BIT113	=	020000	271							
BIT114	=	040000	270							
BIT15	=	100000	269							
BIT6	=	000100	273							
BIT8	=	000400	272							513
C	=	000001	221							
CHARPT	=	001542	597							603
CHK	=	000000	593							651
DIS	=	172370	260							534
PLA	=	000400	282							
PR	=	172370	321							
PR1	=	172370	322							
PR2	=	000400	323							
PR3	=	000400	324							
PR4	=	000400	325							
PR5	=	000400	326							
PR6	=	000400	327							
PR7	=	000400	328							
PR8	=	000400	329							
PR9	=	000400	330							
PR10	=	000400	285							
PR11	=	000400	303							
PR12	=	000400	318							
PR13	=	000400	319							
PR14	=	000400	320							
PR15	=	001542	621							782
PR16	=	000400	301							
PR17	=	000400	243							479
PR18	=	000400	277							
PR19	=	000400	238							477
PR20	=	000400	247							497
PR21	=	000400	462							719
PR22	=	000400	291							722
PR23	=	000400	521							725
PR24	=	2314	798							728
PR25	=	370	784							731
PR26	=	000400	241							734
IS	=	000400	287							
KOE	=	000400	335							533
KOP00	=	172370	442							534
KOP01	=	172370	443							858
KOP02	=	172370	444							866
KOP03	=	172370	445							
KOP04	=	172370	446							
KOP05	=	172372	447							
KOP06	=	172374	448							

ADD	496	598	607	627	781	801											
ASR	511																
BEO	495	514	718	721	724	727	730	733									
BIC	492	606															
BIS	599																
BIT	513	595															
BNE	598	605	639														
BPL	629																
BR	852																
CLR	522	505	533	538	546	549	553	571	572	624	631	716	775	794	809		
	848	849															
CMP	717	720	723	726	729	732											
DEC	638																
ENT	463																
HALT	462	476	483	652	744	813	844										
INC	743																
IOT	464																
JMP	488	497	498	593	778												
JSR	783	785	787	788	790	791	793	796	797	799	802	803	805	806	808		
	811																
MOV	503	504	506	507	508	509	534	535	537	539	547	548	551	552	557		
	558	559	560	561	562	563	564	565	566	567	568	569	573	575	576		
	577	578	579	580	586	587	588	589	590	591	597	603	610	616	617		
	618	619	620	623	630	640	641	642	643	651	741	767	768	774	776		
	777	780	782	786	795	800	810	838	840	841	842	843					
MOV8	515	609															
MTPD	510	512															
NOP	532	545															
RESET	839																
ROL	625	626	632	633	634	635	636	637									
RTI	608	612	850														
RTS	600	644	853	856													
RTT	516																
SOB	550	554															
SUB	483	812															
TST	494																
TSTB	604	628															
WAIT	855																
.ABS	186																
.ASCIZ	858	866	874	882	992												
.END	893																
.LIST	185	467	476	663	672	681	690	699	708								
.MACR	467																
.MLIST	184	467	468	476	663	672	681	690	699	708							
.PAGE	528	647	712	736	759	813	848										
.REM	1																
.REPT	476																
.TITLE	187																
.WORD	478	480	621														

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0

TEST DCKBQ-B CONSOLE TEST MACY11 27(732) 05-MAR-76 13:37 PAGE 33
DCKBQA.SRC CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

D03

* DCKBQB/CRF/SOL/PAGNUM:1=DCKBQB.DOC,DCKBQA.SRC
RUN-TIME: 3 4 1 SECONDS
RUN-TIME RATIO: 75/9=7.7
CORE USED: 8K (15 PAGES)

