

PDP11/45

MULTIPLY

MD-11-DCKBK-A

EP DCKBK A DL A

OCT 1976

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FICHE 1 OF 1

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.REM x

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DCKBK-A1-D
PRODUCT NAME: MUL INSTRUCTION TEST
DATE CREATED: 15 MAR 1972
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: BOB BRAIN

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MAYNARD, MASS

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1.0 ABSTRACT

THIS PROGRAM WILL INCREMENTLY TEST AND ISOLATE SIMPLE MALFUNCTIONS
RELATED TO THE MUL INSTRUCTION

2.0 REQUIREMENTS

2.1 EQUIPMENT

BASIC 11/45 SYSTEM OR
11/40 WITH KE11-E OPTION

2.2 STORAGE

THIS PROGRAM USES 0 THRU 17500

2.3 PRELIMINARY PROGRAMS

DOAA THRU DONA

3.0 LOADING PROCEDURE

LOAD PROGRAM USING ABS LOADER

4.0 STARTING PROCEDURE

LOAD ADDRESS 200. PRESS START. THE PROGRAM WILL LOOP
AND RING BELL ON PASS COMPLETION.

5.0 OPERATING PROCEDURE

5.1 SWITCH SETTINGS

NONE

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

SCOPE IS A MOVE PC,R1 AND STORES THE PC+2 IN R1.

5.2.2 HLT

HLT IS A HALT INSTRUCTION.

6.0 ERRORS

ALL ERRORS WILL CAUSE A HALT
TRAP AND INTERRUPT ERRORS WILL CAUSE A HALT AT VECTOR+2.

6.1 ERROR RECOVERY

PRESS CONTINUE TO PROCEED TO NEXT TEST

6.2 ERROR LOOPING

TO LOOP ON AN ERROR, PLACE A BRANCH TO THE PREVIOUS SCOPE
INSTRUCTION IN PLACE OF THE HALT INSTRUCTION.

NOTE THAT IF THE ERROR IS INTERMITTANT THAT THE TEST WILL
DROP THRU THE HALT AND PROCEED TO THE NEXT TEST.

THEREFORE, TO LOOP THE TEST CONTINUOUSLY REPLACE THE BEQ .+4
INSTRUCTION IMMEDIATELY PRECEDING THE HALT WITH A BRANCH
BACK TO THE PREVIOUS SCOPE.

TO LOOP ON TRAP FAILURES, PATCH IN THE FOLLOWING ROUTINE
AT THE ADDRESS OF THE TRAP VECTOR.

TRAPVEC: TRAPVEC+4
TRAPVEC+2: 0

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TRAPVEC+4: 012716 ; MOVE SCOPE ADDRESS TO STACK
TRAPVEC+6: ADDRESS ; ADDRESS OF PREVIOUS SCOPE
TRAPVEC+10: 000006 ; RETURN TO TEST AT SCOPE

RESTORE ALL LOCATIONS BEFORE PROCEEDING TO NEXT TEST.

7.0 RESTRICTIONS
NONE

8.0 MISCELLANEOUS
ON TRAP ERRORS THE STACK POINTER(R6) WILL CONTAIN THE
ADDRESS WHERE THE TRAP OCCURED.

8.1 EXECUTION TIME
THE PROGRAM TAKES ABOUT 1 MINUTE.

8.2 STACK POINTER
THE PROGRAM INITIALLY SETS THE STACK POINTER AT 500.

9.0 PROGRAM DESCRIPTIONS

THIS IS A TEST OF THE MUL INSTRUCTION. IT TESTS MUL ON
DIFFERENT NUMBER PATTERNS IN ALL REGISTERS
X

.TITLE MAINDEC-11-DCKBK-A MUL TEST
;COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;PROGRAM BY BOB BRAIN

.ABS

.=0

;TRAP CATCHER 0 - 776

HLT=HALT
SCOPE= 10701
N=1
SP=X6
PC=X7
SWR=177570
DISPLAY=SWR
PS=177776
M=0

.=200

JMP BEG

.=1000

ICNT: 0

;PASS COUNT

BEG:

MOV #500,X6
CLR #PS
BIT #1000,#SWR
BEQ .+10
MOV #4000,#PS
BIT #400,SWR
BEQ .+10
MOVB SWR,177770

;** STACK AT 500 **

;WHICH REGISTER SET?

;ALTERNATE!

000000
000000
010701
000001
000006
000007
177570
177570
177776
000000
000200
000167 000576
001000 001000
001000 000000
001002 012706 000500
001006 005037 177776
001012 032737 001000 177570
001020 001403
001022 012737 004000 177776
001030 032767 000400 176532
001036 001403
001040 116767 176524 176722

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```

*****
:TEST 1  MUL  0 * #0 = 0 0  PS = 4
*****

```

001046	010701			SCOPE		:TEST OF MULTIPLY
001050	012700	000000		MOV	#0,X0	:LOAD MULTIPICAN WITH 0
001054	070027	000000		MUL	#0,X0	:MULTIPLY 0 * #0
001060	013767	177776	013370	MOV	2#PS,PSW	:SAVE PS
001066	122767	000004	013362	CHPB	#4,PSW	:IS PS = 4
001074	001401			BEG	.+4	
001076	000000			HLT		:PS IS WRONG
001100	000000	000000		CHP	#0,X0	:IS HIGH ORDER = 0
001104	001401			BEG	.+4	
001106	000000			HLT		:HIGH ORDER IS WRONG
001110	022701	000000		CHP	#0,X0!1	:IS LOW ORDER = 0
001114	001401			BEG	.+4	
001116	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 2  MUL  0 * #1 = 0 0  PS = 4
*****

```

001120	010701			SCOPE		:TEST OF MULTIPLY
001122	012700	000000		MOV	#0,X0	:LOAD MULTIPICAN WITH 0
001126	070027	000001		MUL	#1,X0	:MULTIPLY 0 * #1
001132	013767	177776	013316	MOV	2#PS,PSW	:SAVE PS
001140	122767	000004	013310	CHPB	#4,PSW	:IS PS = 4
001146	001401			BEG	.+4	
001150	000000			HLT		:PS IS WRONG
001152	022700	000000		CHP	#0,X0	:IS HIGH ORDER = 0
001156	001401			BEG	.+4	
001160	000000			HLT		:HIGH ORDER IS WRONG
001162	022701	000000		CHP	#0,X0!1	:IS LOW ORDER = 0
001166	001401			BEG	.+4	
001170	000000			HLT		:LOW ORDER IS WRONG

```
*****
:TEST 3 MUL 1 * 80 = 0 0 PS = 4
*****
```

001172	010701			SCOPE		:TEST OF MULTIPLY
001174	012700	000001		MOV	#1,X0	:LOAD MULTIPLICAN WITH 1
001200	070027	000000		MUL	#0,X0	:MULTIPLY 1 * 80
001204	013767	177776	013244	MOV	2#PS,PSW	:SAVE PS
001212	122767	000004	013236	CHPB	#4,PSW	:IS PS = 4
001220	001401			BEQ	.+4	
001222	000000			HLT		:PS IS WRONG
001224	022700	000000		CHP	#0,X0	:IS HIGH ORDER = 0
001230	001401			BEQ	.+4	
001232	000000			HLT		:HIGH ORDER IS WRONG
001234	022701	000000		CHP	#0,X0!1	:IS LOW ORDER = 0
001240	001401			BEQ	.+4	
001242	000000			HLT		:LOW ORDER IS WRONG

```
*****
:TEST 4 MUL -1 * 81 = -1 -1 PS = 10
*****
```

001244	010701			SCOPE		:TEST OF MULTIPLY
001246	012700	177777		MOV	#-1,X0	:LOAD MULTIPLICAN WITH -1
001252	070027	000001		MUL	#1,X0	:MULTIPLY -1 * 81
001256	013767	177776	013172	MOV	2#PS,PSW	:SAVE PS
001264	122767	000010	013164	CHPB	#10,PSW	:IS PS = 10
001272	001401			BEQ	.+4	
001274	000000			HLT		:PS IS WRONG
001276	022700	177777		CHP	#-1,X0	:IS HIGH ORDER = -1
001302	001401			BEQ	.+4	
001304	000000			HLT		:HIGH ORDER IS WRONG
001306	022701	177777		CHP	#-1,X0!1	:IS LOW ORDER = -1
001312	001401			BEQ	.+4	
001314	000000			HLT		:LOW ORDER IS WRONG

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```
*****
;TEST 5  MUL  1 * 0-1 = -1 -1  PS = 10
;*****
```

001316	010701			SCOPE		;TEST OF MULTIPLY
001320	012700	000001		MOV	#1,X0	;LOAD MULTIPLICAN WITH 1
001324	070027	177777		MUL	#-1,X0	;MULTIPLY 1 * 0-1
001330	013767	177776	013120	MOV	0#PS,PSW	;SAVE PS
001336	122767	000010	013112	CMPS	#10,PSW	;IS PS = 10
001344	001401			BEQ	.+4	
001346	000000			HLT		;PS IS WRONG
001350	022700	177777		CMPS	#-1,X0	;IS HIGH ORDER = -1
001354	001401			BEQ	.+4	
001356	070027			HLT		;HIGH ORDER IS WRONG
001360	022701	177777		CMPS	#-1,X0!1	;IS LOW ORDER = -1
001364	001401			BEQ	.+4	
001366	000000			HLT		;LOW ORDER IS WRONG

```
*****
;TEST 6  MUL  1 * 02 = 0 2  PS = 0
;*****
```

001370	010701			SCOPE		;TEST OF MULTIPLY
001372	012700	000001		MOV	#1,X0	;LOAD MULTIPLICAN WITH 1
001376	070027	000002		MUL	#2,X0	;MULTIPLY 1 * 02
001402	013767	177776	013046	MOV	0#PS,PSW	;SAVE PS
001410	122767	000000	013040	CMPS	#0,PSW	;IS PS = 0
001416	001401			BEQ	.+4	
001420	070027			HLT		;PS IS WRONG
001422	022700	000000		CMPS	#0,X0	;IS HIGH ORDER = 0
001426	001401			BEQ	.+4	
001430	000000			HLT		;HIGH ORDER IS WRONG
001432	022701	000002		CMPS	#2,X0!1	;IS LOW ORDER = 2
001436	001401			BEQ	.+4	
001440	000000			HLT		;LOW ORDER IS WRONG


```

;*****
;TEST 7  MUL  2 * #2 = 0 4  PS = 0
;*****

```

001442	010701			SCOPE		:TEST OF MULTIPLY
001444	012700	000002		MOV	#2,X0	:LOAD MULTIPICAN WITH 2
001450	070027	000002		MUL	#2,X0	:MULTIPLY 2 * #2
001454	013767	177776	012774	MOV	2#PS,PSW	:SAVE PS
001462	122767	000000	012766	CHPB	#0,PSW	:IS PS = 0
001470	001401			BEQ	.+4	
001472	000000			HLT		:PS IS WRONG
001474	022700	000000		CMP	#0,X0	:IS HIGH ORDER = 0
001570	001401			BEQ	.+4	
001572	000000			HLT		:HIGH ORDER IS WRONG
001504	022701	000004		CMP	#4,X0!1	:IS LOW ORDER = 4
001510	001401			BEQ	.+4	
001512	000000			HLT		:LOW ORDER IS WRONG

```

;*****
;TEST 10  MUL  1000 * #200 = 1 0  PS = 1
;*****

```

001514	010701			SCOPE		:TEST OF MULTIPLY
001516	012700	001000		MOV	#1000,X0	:LOAD MULTIPICAN WITH 1000
001522	070027	000200		MUL	#200,X0	:MULTIPLY 1000 * #200
001576	013767	177776	012722	MOV	2#PS,PSW	:SAVE PS
001574	122767	000001	012714	CHPB	#1,PSW	:IS PS = 1
001542	001401			BEQ	.+4	
001544	000000			HLT		:PS IS WRONG
001546	022700	000001		CMP	#1,X0	:IS HIGH ORDER = 1
001552	001401			BEQ	.+4	
001554	000000			HLT		:HIGH ORDER IS WRONG
001556	022701	000000		CMP	#0,X0!1	:IS LOW ORDER = 0
001562	001401			BEQ	.+4	
001564	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 11  MUL  200 * 01000 = 1 0  PS = 1
*****

```

001566	010701			SCOPE		:TEST OF MULTIPLY
001570	012700	000200		MOV	#200,%0	:LOAD MULTIPLICAND WITH 200
001574	070027	001000		MUL	#1000,%0	:MULTIPLY 200 * 01000
001600	013767	177776	012650	MOV	@PS,PSW	:SAVE PS
001606	122767	000001	012642	CMPS	#1,PSW	:IS PS = 1
001614	011401			BEQ	.+4	
001616	010000			HLT		:PS IS WRONG
001620	012700	000001		CMPS	#1,%0	:IS HIGH ORDER = 1
001624	011401			BEQ	.+4	
001626	010000			HLT		:HIGH ORDER IS WRONG
001630	012701	000000		CMPS	#0,%0!1	:IS LOW ORDER = 0
001634	001401			BEQ	.+4	
001636	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 12  MUL  77777 * 02 = 0 177776  PS = 1
*****

```

001640	010701			SCOPE		:TEST OF MULTIPLY
001642	012700	077777		MOV	#77777,%0	:LOAD MULTIPLICAND WITH 77777
001646	070027	000002		MUL	#2,%0	:MULTIPLY 77777 * 02
001652	013767	177776	012576	MOV	@PS,PSW	:SAVE PS
001660	122767	000001	012570	CMPS	#1,PSW	:IS PS = 1
001666	001401			BEQ	.+4	
001670	010000			HLT		:PS IS WRONG
001672	012700	000000		CMPS	#0,%0	:IS HIGH ORDER = 0
001676	001401			BEQ	.+4	
001700	010000			HLT		:HIGH ORDER IS WRONG
001702	012701	177776		CMPS	#177776,%0!1	:IS LOW ORDER = 177776
001706	001401			BEQ	.+4	
001710	000000			HLT		:LOW ORDER IS WRONG

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```
*****
;TEST 13  MUL  2 * 877777 = 0 177776  PS = 1
;*****
```

001712	010701		SCOPE		;TEST OF MULTIPLY
001714	012700	000002	MOV	#2,XD	;LOAD MULTIPLICAN WITH 2
001720	070027	077777	MUL	#77777,XD	;MULTIPLY 2 * 877777
001724	013767	177776	MOV	#PS,PSW	;SAVE PS
001732	122767	000001	CMPB	#1,PSW	;IS PS = 1
001740	001401		BEQ	.+4	
001742	000000		HLT		;PS IS WRONG
001744	000000	000000	CMP	#0,XD	;IS HIGH ORDER = 0
001750	001401		BEQ	.+4	
001752	000000		HLT		;HIGH ORDER IS WRONG
001754	022701	177776	CMP	#177776,XD!1	;IS LOW ORDER = 177776
001760	001401		BEQ	.+4	
001762	000000		HLT		;LOW ORDER IS WRONG

```
*****
;TEST 14  MUL  7777 * #10 = 0 77770  PS = 0
;*****
```

001764	010701		SCOPE		;TEST OF MULTIPLY
001766	012700	007777	MOV	#7777,XD	;LOAD MULTIPLICAN WITH 7777
001772	070027	000010	MUL	#10,XD	;MULTIPLY 7777 * #10
001776	013767	177776	MOV	#PS,PSW	;SAVE PS
002004	122767	000000	CMPB	#0,PSW	;IS PS = 0
002012	001401		BEQ	.+4	
002014	000000		HLT		;PS IS WRONG
002016	022700	000000	CMP	#0,XD	;IS HIGH ORDER = 0
002022	001401		BEQ	.+4	
002024	000000		HLT		;HIGH ORDER IS WRONG
002026	022701	077770	CMP	#77770,XD!1	;IS LOW ORDER = 77770
002032	001401		BEQ	.+4	
002034	000000		HLT		;LOW ORDER IS WRONG

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```

:*****
:TEST 15  MUL  10 * 87777 = 0 77770  PS = 0
:*****

```

002036	010701			SCOPE		:TEST OF MULTIPLY
002040	012700	000010		MOV	#10,%0	:LOAD MULTIPLICAN WITH 10
002044	070027	007777		MUL	87777,%0	:MULTIPLY 10 * 87777
002050	013767	177776	012400	MOV	2#PS,PSH	:SAVE PS
002056	122767	000000	012372	CMPS	#0,PSH	:IS PS = 0
002064	001401			BEQ	.+4	
002066	000000			HLT		:PS IS WRONG
002070	022700	000000		CMPS	#0,%0	:IS HIGH ORDER = 0
002074	001401			BEQ	.+4	
002076	000000			HLT		:HIGH ORDER IS WRONG
002100	022701	077770		CMPS	877770,%0!1	:IS LOW ORDER = 77770
002104	001401			BEQ	.+4	
002106	000000			HLT		:LOW ORDER IS WRONG

```

:*****
:TEST 16  MUL  77777 * 87777 = 37777 1  PS = 1
:*****

```

002110	010701			SCOPE		:TEST OF MULTIPLY
002112	012700	077777		MOV	877777,%0	:LOAD MULTIPLICAN WITH 77777
002116	070027	077777		MUL	877777,%0	:MULTIPLY 77777 * 87777
002122	013767	177776	012326	MOV	2#PS,PSH	:SAVE PS
002130	122767	000001	012320	CMPS	#1,PSH	:IS PS = 1
002136	001401			BEQ	.+4	
002140	000000			HLT		:PS IS WRONG
002142	022700	037777		CMPS	837777,%0	:IS HIGH ORDER = 37777
002146	001401			BEQ	.+4	
002150	000000			HLT		:HIGH ORDER IS WRONG
002152	022701	000001		CMPS	#1,%0!1	:IS LOW ORDER = 1
002156	001401			BEQ	.+4	
002160	000000			HLT		:LOW ORDER IS WRONG

```

*****
;TEST 17  MUL  77777 * #1 = 0 77777  PS = 0
*****

```

002162	010701			SCOPE					
002164	012700	077777		MOV	#77777,%0				;TEST OF MULTIPLY
002170	070027	000001		MUL	#1,%0				;LOAD MULTIPLICAN WITH 77777
002174	013767	177776	012254	MOV	@#PS,PSW				;MULTIPLY 77777 * #1
002202	122767	000000	012246	CMPB	#0,PSW				;SAVE PS
002210	001401			BEQ	.+4				;IS PS = 0
002212	000000			HLT					
002214	022700	000000		CMP	#0,%0				;PS IS WRONG
002220	001401			BEQ	.+4				;IS HIGH ORDER = 0
002222	000000			HLT					
002224	022701	(77777		CMP	#77777,%0!1				;HIGH ORDER IS WRONG
002230	001401			BEQ	.+4				;IS LOW ORDER = 77777
002232	000000			HLT					;LOW ORDER IS WRONG

```

*****
;TEST 20  MUL  1 * #77777 = 0 77777  PS = 0
*****

```

002234	010701			SCOPE					
002236	012700	000001		MOV	#1,%0				;TEST OF MULTIPLY
002242	070027	077777		MUL	#77777,%0				;LOAD MULTIPLICAN WITH 1
002246	013767	177776	012202	MOV	@#PS,PSW				;MULTIPLY 1 * #77777
002254	122767	000000	012174	CMPB	#0,PSW				;SAVE PS
002262	001401			BEQ	.+4				;IS PS = 0
002264	000000			HLT					
002266	022700	000000		CMP	#0,%0				;PS IS WRONG
002272	001401			BEQ	.+4				;IS HIGH ORDER = 0
002274	000000			HLT					
002276	022701	077777		CMP	#77777,%0!1				;HIGH ORDER IS WRONG
002302	001401			BEQ	.+4				;IS LOW ORDER = 77777
002304	000000			HLT					;LOW ORDER IS WRONG

NO1

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```
*****
;TEST 21  MUL  77777 * 8-1 = -1 100001  PS = 10
;*****
```

002306	010701		SCOPE		;TEST OF MULTIPLY
002310	012700	077777	MOV	#77777,%0	;LOAD MULTIPLICAN WITH 77777
002314	070027	177777	MUL	#-1,%0	;MULTIPLY 77777 * 8-1
002320	013767	177776	MOV	@#PS,PSW	;SAVE PS
002326	122767	000010	CMPS	#10,PSW	;IS PS = 10
002334	001401		BEQ	.+4	
002336	000000		HLT		;PS IS WRONG
002340	022700	177777	CMPS	#-1,%0	;IS HIGH ORDER = -1
002344	001401		BEQ	.+4	
002346	000000		HLT		;HIGH ORDER IS WRONG
002350	022701	100001	CMPS	#100001,%0!1	;IS LOW ORDER = 100001
002354	001401		BEQ	.+4	
002356	000000		HLT		;LOW ORDER IS WRONG

```
*****
;TEST 22  MUL  -1 * 877777 = -1 100001  PS = 10
;*****
```

002360	010701		SCOPE		;TEST OF MULTIPLY
002362	012700	177777	MOV	#-1,%0	;LOAD MULTIPLICAN WITH -1
002366	070027	077777	MUL	#77777,%0	;MULTIPLY -1 * 877777
002372	013767	177776	MOV	@#PS,PSW	;SAVE PS
002400	122767	000010	CMPS	#10,PSW	;IS PS = 10
002406	001401		BEQ	.+4	
002410	000000		HLT		;PS IS WRONG
002412	022700	177777	CMPS	#-1,%0	;IS HIGH ORDER = -1
002416	001401		BEQ	.+4	
002420	000000		HLT		;HIGH ORDER IS WRONG
002422	022701	100001	CMPS	#100001,%0!1	;IS LOW ORDER = 100001
002426	001401		BEQ	.+4	
002430	000000		HLT		;LOW ORDER IS WRONG


```

*****
:TEST 23 MUL -2 * 877777 = -1 2 PS = 11
*****

```

002432	010701			SCOPE		:TEST OF MULTIPLY
002434	012700	177776		MOV	8-2,XD	:LOAD MULTIPLICAN WITH -2
002440	070027	077777		MUL	877777,XD	:MULTIPLY -2 * 877777
002444	013767	177776	012004	MOV	8PS,PSW	:SAVE PS
002452	122767	000011	011776	CHPB	811,PSW	:IS PS = 11
002460	001401			BEQ	.+4	
002462	000000			HLT		:PS IS WRONG
002464	022700	177777		CHP	8-1,XD	:IS HIGH ORDER = -1
002470	001401			BEQ	.+4	
002472	000000			HLT		:HIGH ORDER IS WRONG
002474	022701	000002		CHP	82,XD!1	:IS LOW ORDER = 2
002500	001401			BEQ	.+4	
002502	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 24 MUL 77777 * 8-2 = -1 2 PS = 11
*****

```

002504	010701			SCOPE		:TEST OF MULTIPLY
002506	012700	077777		MOV	877777,XD	:LOAD MULTIPLICAN WITH 77777
002512	070027	177776		MUL	8-2,XD	:MULTIPLY 77777 * 8-2
002516	013767	177776	011732	MOV	8PS,PSW	:SAVE PS
002524	122767	000011	011724	CHPB	811,PSW	:IS PS = 11
002532	001401			BEQ	.+4	
002534	000000			HLT		:PS IS WRONG
002536	022700	177777		CHP	8-1,XD	:IS HIGH ORDER = -1
002542	001401			BEQ	.+4	
002544	000000			HLT		:HIGH ORDER IS WRONG
002546	022701	000002		CHP	82,XD!1	:IS LOW ORDER = 2
002552	001401			BEQ	.+4	
002554	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 25  MUL  125252 * 02 = -1 52524  PS = 11
*****

```

```

002626 010701 125252
002627 012700 000002
002628 070027 177776 011660
002629 013767 000011 011652
002630 177776
002631 01401
002632 000000
002633 177777
002634 01401
002635 000000
002636 052524
002637 001401
002638 000000

```

```

SCOPE
MOV 0125252,X0
MUL 02,X0
MOV 00PS,PSW
CMPB 011,PSW
BEQ .+4
HLT
CMP 0-1,X0
BEQ .+4
HLT
CMP 052524,X0!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 125252
:MULTIPLY 125252 * 02
:SAVE PS
:IS PS = 11

:PS IS WRONG
:IS HIGH ORDER = -1

:HIGH ORDER IS WRONG
:IS LOW ORDER = 52524

:LOW ORDER IS WRONG

```

```

*****
:TEST 26  MUL  2 * 0125252 = -1 52524  PS = 11
*****

```

```

002639 010701 000002
002640 012700 125252
002641 070027 177776 011606
002642 013767 000011 011600
002643 122767
002644 001401
002645 000000
002646 000000
002647 022700 177777
002648 001401
002649 000000
002650 052524
002651 022701
002652 001401
002653 000000

```

```

SCOPE
MOV 02,X0
MUL 0125252,X0
MOV 00PS,PSW
CMPB 011,PSW
BEQ .+4
HLT
CMP 0-1,X0
BEQ .+4
HLT
CMP 052524,X0!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 2
:MULTIPLY 2 * 0125252
:SAVE PS
:IS PS = 11

:PS IS WRONG
:IS HIGH ORDER = -1

:HIGH ORDER IS WRONG
:IS LOW ORDER = 52524

:LOW ORDER IS WRONG

```

```

*****
:TEST 27  MUL  52525 * 02 = 0 125252  PS = 1
*****

```

002702	010701			SCOPE		:TEST OF MULTIPLY
002704	012700	052525		MOV	#52525,X0	:LOAD MULTIPICAN WITH 52525
002710	070027	000002		MUL	02,X0	:MULTIPLY 52525 * 02
002714	013767	177776	011534	MOV	0#PS,PSW	:SAVE PS
002722	122767	000001	011526	CHPB	01,PSW	:IS PS = 1
002730	001401			EQ	.+4	
002732	000000			HLT		:PS IS WRONG
002734	022700	000000		CHP	00,X0	:IS HIGH ORDER = 0
002740	001401			BEQ	.+4	
002742	000000			HLT		:HIGH ORDER IS WRONG
002744	022701	125252		CHP	0125252,X0!1	:IS LOW ORDER = 125252
002750	001401			BEQ	.+4	
002752	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 30  MUL  2 * 052525 = 0 125252  PS = 1
*****

```

002754	010701			SCOPE		:TEST OF MULTIPLY
002756	012700	000002		MOV	02,X0	:LOAD MULTIPICAN WITH 2
002762	070027	052525		MUL	052525,X0	:MULTIPLY 2 * 052525
002766	013767	177776	011462	MOV	0#PS,PSW	:SAVE PS
002774	122767	000001	011454	CHPB	01,PSW	:IS PS = 1
003002	001401			BEQ	.+4	
003004	000000			HLT		:PS IS WRONG
003006	022700	000000		CHP	00,X0	:IS HIGH ORDER = 0
003012	001401			BEQ	.+4	
003014	000000			HLT		:HIGH ORDER IS WRONG
003016	022701	125252		CHP	0125252,X0!1	:IS LOW ORDER = 125252
003022	001401			BEQ	.+4	
003024	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 31  MUL  125252 * #40000 = 165252 100000  PS = 11
*****

```

```

003026 010701
003030 012700 125252
003034 070027 040000
003040 013767 177776 011410
003046 122767 000011 011402
003054 001401
003056 000000
003060 022700 165252
003064 001401
003066 000000
003070 022701 100000
003074 001401
003076 000000

```

```

SCOPE
MOV  #125252,X0
MUL  #40000,X0
MOV  @PS,PSW
CMPB #11,PSW
BEQ  .+4
HLT
CMP  #165252,X0
BEQ  .+4
HLT
CMP  #100000,X0!1
BEQ  .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH 125252
:MULTIPLY 125252 * #40000
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 165252
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 32  MUL  40000 * #125252 = 165252 100000  PS = 11
*****

```

```

003100 010701
003102 012700 040000
003106 070027 125252
003112 013767 177776 011336
003120 122767 000011 011330
003126 001401
003130 000000
003132 022700 165252
003136 001401
003140 000000
003142 022701 100000
003146 001401
003150 000000

```

```

SCOPE
MOV  #40000,X0
MUL  #125252,X0
MOV  @PS,PSW
CMPB #11,PSW
BEQ  .+4
HLT
CMP  #165252,X0
BEQ  .+4
HLT
CMP  #100000,X0!1
BEQ  .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH 40000
:MULTIPLY 40000 * #125252
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 165252
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 33  MUL  100000 * 100000 = 40000 0  PS = 1
*****

```

003152	010701			SCOPE		:TEST OF MULTIPLY
003154	012700	100000		MOV	#100000,X0	:LOAD MULTIPLICAND WITH 100000
003160	070027	100000		MUL	#100000,X0	:MULTIPLY 100000 * 100000
003164	013767	177776	011264	MOV	2,X0,PSW	:SAVE PS
003172	122767	000001	011256	CHPB	01,PSW	:IS PS = 1
003200	001401			EQ	.+4	
003202	000000			HLT		:PS IS WRONG
003204	022700	040000		CHP	#40000,X0	:IS HIGH ORDER = 40000
003210	001401			EQ	.+4	
003212	000000			HLT		:HIGH ORDER IS WRONG
003214	022701	000000		CHP	00,X0!1	:IS LOW ORDER = 0
003220	001401			BEO	.+4	
003222	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 34  MUL  70707 * 70707 = 31221 44261  PS = 1
*****

```

003224	010701			SCOPE		:TEST OF MULTIPLY
003226	012700	070707		MOV	#70707,X0	:LOAD MULTIPLICAND WITH 70707
003232	070027	070707		MUL	#70707,X0	:MULTIPLY 70707 * 70707
003236	013767	177776	011212	MOV	2,X0,PSW	:SAVE PS
003244	122767	000001	011204	CHPB	01,PSW	:IS PS = 1
003252	001401			BEO	.+4	
003254	000000			HLT		:PS IS WRONG
003256	022700	031221		CHP	#31221,X0	:IS HIGH ORDER = 31221
003262	001401			BEO	.+4	
003264	000000			HLT		:HIGH ORDER IS WRONG
003266	022701	044261		CHP	#44261,X0!1	:IS LOW ORDER = 44261
003272	001401			BEO	.+4	
003274	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 35  MUL  107070 * #107070 = 31222 26100  PS = 1
*****

```

003276	010701			SCOPE		:TEST OF MULTIPLY
003300	012700	107070		MOV	#107070,XD	:LOAD MULTIPICAN WITH 107070
003304	070027	107070		MUL	#107070,XD	:MULTIPLY 107070 * #107070
003310	013767	177776	011140	MOV	2#PS,PSW	:SAVE PS
003316	122767	000001	011132	CHPB	#1,PSW	:IS PS = 1
003324	001401			BEQ	.+4	
003326	000000			HLT		:PS IS WRONG
003330	022700	031222		CHP	#31222,XD	:IS HIGH ORDER = 31222
003334	001401			BEQ	.+4	
003336	000000			HLT		:HIGH ORDER IS WRONG
003340	022701	026100		CHP	#26100,XD!1	:IS LOW ORDER = 26100
003344	001401			BEQ	.+4	
003346	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 36  MUL  100000 * #77777 = 140000 100000  PS = 11
*****

```

003350	010701			SCOPE		:TEST OF MULTIPLY
003352	012700	100000		MOV	#100000,XD	:LOAD MULTIPICAN WITH 100000
003356	070027	077777		MUL	#77777,XD	:MULTIPLY 100000 * #77777
003362	013767	177776	011066	MOV	2#PS,PSW	:SAVE PS
003370	122767	000011	011060	CHPB	#11,PSW	:IS PS = 11
003376	001401			BEQ	.+4	
003400	000000			HLT		:PS IS WRONG
003402	022700	140000		CHP	#140000,XD	:IS HIGH ORDER = 140000
003406	001401			BEQ	.+4	
003410	000000			HLT		:HIGH ORDER IS WRONG
003412	022701	100000		CHP	#100000,XD!1	:IS LOW ORDER = 100000
003416	001401			BEQ	.+4	
003420	000000			HLT		:LOW ORDER IS WRONG


```

*****
:TEST 37  MUL  77777 * 0100000 = 140000 100000  PS = 11
*****

```

003422	010701			SCOPE		:TEST OF MULTIPLY
003424	012700	077777		MOV	077777,XD	:LOAD MULTIPICAN WITH 77777
003430	070027	100000		MUL	0100000,XD	:MULTIPLY 77777 * 0100000
003434	013767	177776	011014	MOV	00PS,PSW	:SAVE PS
003442	122767	000011	011006	CHPB	011,PSW	:IS PS = 11
003450	001401			BEQ	.+4	
003452	000000			HLT		:PS IS WRONG
003454	022700	140000		CHP	0140000,XD	:IS HIGH ORDER = 140000
003460	001401			BEQ	.+4	
003462	000000			HLT		:HIGH ORDER IS WRONG
003464	022701	100000		CHP	0100000,XD!1	:IS LOW ORDER = 100000
003470	001401			BEQ	.+4	
003472	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 40  MUL  157634 * 0104031 = 7453 133074  PS = 1
*****

```

003474	010701			SCOPE		:TEST OF MULTIPLY
003476	012700	157634		MOV	0157634,XD	:LOAD MULTIPICAN WITH 157634
003502	070027	104031		MUL	0104031,XD	:MULTIPLY 157634 * 0104031
003506	013767	177776	010742	MOV	00PS,PSW	:SAVE PS
003514	122767	000001	010734	CHPB	01,PSW	:IS PS = 1
003522	001401			BEQ	.+4	
003524	000000			HLT		:PS IS WRONG
003526	022700	007453		CHP	07453,XD	:IS HIGH ORDER = 7453
003532	001401			BEQ	.+4	
003534	000000			HLT		:HIGH ORDER IS WRONG
003536	022701	133074		CHP	0133074,XD!1	:IS LOW ORDER = 133074
003542	001401			BEQ	.+4	
003544	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 41  MUL  104031 * 0157634 = 7453 133074  PS = 1
*****

```

003546	010701			SCOPE		:TEST OF MULTIPLY
003550	012700	104031		MOV	#104031,X0	:LOAD MULTIPLICAN WITH 104031
003554	070027	157634		MUL	#157634,X0	:MULTIPLY 104031 * 0157634
003560	013767	177776	010670	MOV	@PS,PSW	:SAVE PS
003566	122767	000001	010662	CHPB	#1,PSW	:IS PS = 1
003574	001401			BEO	.+4	
003576	000000			HLT		:PS IS WRONG
003600	022700	007453		CHP	#7453,X0	:IS HIGH ORDER = 7453
003604	001401			BEO	.+4	
003606	000000			HLT		:HIGH ORDER IS WRONG
003610	022701	133074		CHP	#133074,X0!1	:IS LOW ORDER = 133074
003614	001401			BEO	.+4	
003616	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 42  MUL  15 210 * 00 = 0 0  PS = 4
*****

```

003620	010701			SCOPE		:TEST OF MULTIPLY
003622	012700	152210		MOV	#152210,X0	:LOAD MULTIPLICAN WITH 152210
003626	070027	000000		MUL	#0,X0	:MULTIPLY 152210 * 00
003632	013767	177776	010616	MOV	@PS,PSW	:SAVE PS
003640	122767	000004	010610	CHPB	#4,PSW	:IS PS = 4
003646	001401			BEO	.+4	
003650	000000			HLT		:PS IS WRONG
003652	022700	000000		CHP	#0,X0	:IS HIGH ORDER = 0
003656	001401			BEO	.+4	
003660	000000			HLT		:HIGH ORDER IS WRONG
003662	022701	000000		CHP	#0,X0!1	:IS LOW ORDER = 0
003666	001401			BEO	.+4	
003670	000000			HLT		:LOW ORDER IS WRONG


```

;*****
;TEST 43  MUL  0 * #152210 = 0 0  PS = 4
;*****

```

003672	010701			SCOPE		;TEST OF MULTIPLY
003674	012700	000000		MOV	#0,X0	;LOAD MULTIPLICAND WITH 0
003700	070027	152210		MUL	#152210,X0	;MULTIPLY 0 * #152210
003704	013767	177776	010544	MOV	2#PS,PSW	;SAVE PS
003712	122767	000004	010536	CMPB	#4,PSW	;IS PS = 4
003720	001401			BEQ	.+4	
003722	000000			HLT		;PS IS WRONG
003724	022700	000000		CMP	#0,X0	;IS HIGH ORDER = 0
003730	001401			BEQ	.+4	
003732	000000			HLT		;HIGH ORDER IS WRONG
003734	022701	000000		CMP	#0,X0!1	;IS LOW ORDER = 0
003740	001401			BEQ	.+4	
003742	000000			HLT		;LOW ORDER IS WRONG

```

;*****
;TEST 44  MUL  -1 * #0 = 0 0  PS = 4
;*****

```

003744	010701			SCOPE		;TEST OF MULTIPLY
003746	012700	177777		MOV	#-1,X0	;LOAD MULTIPLICAND WITH -1
003752	070027	000000		MUL	#0,X0	;MULTIPLY -1 * #0
003756	013767	177776	010472	MOV	2#PS,PSW	;SAVE PS
003764	122767	000004	010464	CMPB	#4,PSW	;IS PS = 4
003772	001401			BEQ	.+4	
003774	000000			HLT		;PS IS WRONG
003776	022700	000000		CMP	#0,X0	;IS HIGH ORDER = 0
004002	001401			BEQ	.+4	
004004	000000			HLT		;HIGH ORDER IS WRONG
004006	022701	000000		CMP	#0,X0!1	;IS LOW ORDER = 0
004012	001401			BEQ	.+4	
004014	000000			HLT		;LOW ORDER IS WRONG

K02

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:TEST 45 MUL 0 * 8-1 = 0 0 PS = 4
:*****

004016	010701			SCOPE		:TEST OF MULTIPLY
004020	012700	000000		MOV	80,X0	:LOAD MULTIPLICAN WITH 0
004024	070127	177777		MUL	8-1,X0	:MULTIPLY 0 * 8-1
004028	013767	177776	010420	MOV	8,PS,PSW	:SAVE PS
004032	122767	000004	010412	CMPS	8,X0,PSW	:IS PS = 4
004036	001401			BEQ	.+4	
004040	000000			HLT		:PS IS WRONG
004044	000000			CMPS	80,X0	:IS HIGH ORDER = 0
004048	001401			BEQ	.+4	
004052	000000			HLT		:HIGH ORDER IS WRONG
004056	001401			CMPS	80,X0!1	:IS LOW ORDER = 0
004060	000000			BEQ	.+4	
004064	000000			HLT		:LOW ORDER IS WRONG

:TEST 46 MUL -1 * 81 = -1 -1 PS = 10
:*****

004070	010701			SCOPE		:TEST OF MULTIPLY
004074	012701	177777		MOV	8-1,X1	:LOAD MULTIPLICAN WITH -1
004078	070127	000001		MUL	81,X1	:MULTIPLY -1 * 81
004082	013767	177776	010346	MOV	8,PS,PSW	:SAVE PS
004086	122767	000010	010340	CMPS	810,PSW	:IS PS = 10
004090	001401			BEQ	.+4	
004094	000000			HLT		:PS IS WRONG
004098	001401	177777		CMPS	8-1,X1	:IS HIGH ORDER = -1
004102	001401			BEQ	.+4	
004106	000000			HLT		:HIGH ORDER IS WRONG
004110	022701	177777		CMPS	8-1,X1!1	:IS LOW ORDER = -1
004114	001401			BEQ	.+4	
004118	000000			HLT		:LOW ORDER IS WRONG

```

*****
;TEST 47  MUL  -1 * #0 = 0 0  PS = 4
*****

```

004142	010701			SCOPE		:TEST OF MULTIPLY
004144	012701	177777		MOV	#-1,%1	:LOAD MULTIPLICAND WITH -1
004150	070127	000000		MUL	#0,%1	:MULTIPLY -1 * #0
004154	013767	177776	010274	MOV	2#PS,PSW	:SAVE PS
004162	122767	000004	010266	CMPB	#4,PSW	:IS PS = 4
004170	001401			BEQ	.+4	
004172	000000			HLT		:PS IS WRONG
004174	022701	000000		CMP	#0,%1	:IS HIGH ORDER = 0
004176	001401			BEQ	.+4	
004178	000000			HLT		:HIGH ORDER IS WRONG
004204	022701	000000		CMP	#0,%1:1	:IS LOW ORDER = 0
004210	001401			BEQ	.+4	
004212	000000			HLT		:LOW ORDER IS WRONG

```

*****
;TEST 50  MUL  77777 * #100000 = 100000 100000  PS = 11
*****

```

004214	010701			SCOPE		:TEST OF MULTIPLY
004216	012701	077777		MOV	#77777,%1	:LOAD MULTIPLICAND WITH 77777
004222	070127	100000		MUL	#100000,%1	:MULTIPLY 77777 * #100000
004226	013767	177776	010222	MOV	2#PS,PSW	:SAVE PS
004234	122767	000011	010214	CMPB	#11,PSW	:IS PS = 11
004242	001401			BEQ	.+4	
004244	000000			HLT		:PS IS WRONG
004246	022701	100000		CMP	#100000,%1	:IS HIGH ORDER = 100000
004252	001401			BEQ	.+4	
004254	000000			HLT		:HIGH ORDER IS WRONG
004256	022701	100000		CMP	#100000,%1:1	:IS LOW ORDER = 100000
004262	001401			BEQ	.+4	
004264	000000			HLT		:LOW ORDER IS WRONG

MO2

MAINDEC-11-DCKBK-A MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 25
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```
*****
:TEST 51  MUL  -1 * 877777 = 100001 100001  PS = 10
*****
```

004266	010701			SCOPE		:TEST OF MULTIPLY
004270	012701	177777		MOV	8-1,%1	:LOAD MULTIPICAN WITH -1
004274	070127	077777		MUL	877777,%1	:MULTIPLY -1 * 877777
004300	013767	177776	010150	MOV	2#PS,PSW	:SAVE PS
004306	122767	000010	010142	CMPB	810,PSW	:IS PS = 10
004314	001401			BEQ	.+4	
004316	001400			HLT		:PS IS WRONG
004320	012701	100001		CMP	8100001,%1	:IS HIGH ORDER = 100001
004324	001401			BEQ	.+4	
004326	001400			HLT		:HIGH ORDER IS WRONG
004330	022701	100001		CMP	8100001,%1!1	:IS LOW ORDER = 100001
004334	001401			BEQ	.+4	
004336	000000			HLT		:LOW ORDER IS WRONG

```
*****
:TEST 52  MUL  77777 * 877777 = 1 1  PS = 1
*****
```

004340	010701			SCOPE		:TEST OF MULTIPLY
004342	012701	077777		MOV	877777,%1	:LOAD MULTIPICAN WITH 77777
004346	070127	077777		MUL	877777,%1	:MULTIPLY 77777 * 877777
004352	013767	177776	010076	MOV	2#PS,PSW	:SAVE PS
004360	122767	000001	010070	CMPB	81,PSW	:IS PS = 1
004366	001401			BEQ	.+4	
004370	000000			HLT		:PS IS WRONG
004372	022701	000001		CMP	81,%1	:IS HIGH ORDER = 1
004376	001401			BEQ	.+4	
004400	000000			HLT		:HIGH ORDER IS WRONG
004402	022701	000001		CMP	81,%1!1	:IS LOW ORDER = 1
004406	001401			BEQ	.+4	
004410	000000			HLT		:LOW ORDER IS WRONG

;TEST 53 MUL 2 * #2 = 4 4 PS = 0

004412	010701			SCOPE		;TEST OF MULTIPLY
004414	012701	000002		MOV	#2,%1	;LOAD MULTIPLICAN WITH 2
004420	070127	000002		MUL	#2,%1	;MULTIPLY 2 * #2
004424	013767	177776	010024	MOV	2#PS,PSW	;SAVE PS
004432	122767	000000	010016	CMPB	#0,PSW	;IS PS = 0
004440	001401			BEQ	.+4	
004442	000000			HLT		;PS IS WRONG
004444	022701	000004		CMP	#4,%1	;IS HIGH ORDER = 4
004450	001401			BEQ	.+4	
004452	000000			HLT		;HIGH ORDER IS WRONG
004454	022701	000004		CMP	#4,%1!1	;IS LOW ORDER = 4
004460	001401			BEQ	.+4	
004462	000000			HLT		;LOW ORDER IS WRONG

;TEST 54 MUL 0 * #0 = 0 0 PS = 4

004464	010701			SCOPE		;TEST OF MULTIPLY
004466	012702	000000		MOV	#0,%2	;LOAD MULTIPLICAN WITH 0
004472	070227	000000		MUL	#0,%2	;MULTIPLY 0 * #0
004476	013767	177776	007752	MOV	2#PS,PSW	;SAVE PS
004504	122767	000004	007744	CMPB	#4,PSW	;IS PS = 4
004512	001401			BEQ	.+4	
004514	000000			HLT		;PS IS WRONG
004516	022702	000000		CMP	#0,%2	;IS HIGH ORDER = 0
004522	001401			BEQ	.+4	
004524	000000			HLT		;HIGH ORDER IS WRONG
004526	022703	000000		CMP	#0,%2!1	;IS LOW ORDER = 0
004532	001401			BEQ	.+4	
004534	000000			HLT		;LOW ORDER IS WRONG

```

*****
:TEST 55  MUL  0 * 01 = 0 0  PS = 4
*****

```

```

004536 010701
004540 012702 000000
004544 070227 000001
004550 013767 177776 007700
004556 122767 000004 007672
004564 001401
004566 000000
004570 022702 000000
004574 001401
004576 000000
004600 022703 000000
004604 001401
004606 000000

```

```

SCOPE
MOV  00,X2
MUL  01,X2
MOV  20PS,PSW
CMPB 04,PSW
BEQ  .+4
HLT
CMP  00,X2
BEQ  .+4
HLT
CMP  00,X2!1
BEQ  .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH 0
:MULTIPLY 0 * 01
:SAVE PS
:IS PS = 4

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 0

:LOW ORDER IS WRONG

```

```

*****
:TEST 56  MUL  1 * 00 = 0 0  PS = 4
*****

```

```

004610 010701
004612 012702 000001
004616 070227 000000
004622 013767 177776 007626
004630 122767 000004 007620
004636 001401
004640 000000
004642 022702 000000
004646 001401
004650 000000
004652 022703 000000
004656 001401
004660 000000

```

```

SCOPE
MOV  01,X2
MUL  00,X2
MOV  20PS,PSW
CMPB 04,PSW
BEQ  .+4
HLT
CMP  00,X2
BEQ  .+4
HLT
CMP  00,X2!1
BEQ  .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH 1
:MULTIPLY 1 * 00
:SAVE PS
:IS PS = 4

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 0

:LOW ORDER IS WRONG

```



```

*****
:TEST 57 MUL -1 * 01 = -1 -1 PS = 10
*****

```

004662	010701			SCOPE		:TEST OF MULTIPLY
004664	012702	177777		MOV	0-1,x2	:LOAD MULTIPICAN WITH -1
004670	070227	000001		MUL	01,x2	:MULTIPLY -1 * 01
004674	013767	177776	007554	MOV	00PS,PSW	:SAVE PS
004702	122767	000010	007546	CHPB	010,PSW	:IS PS = 10
004710	001401			BEQ	.+4	
004712	000000			HLT		:PS IS WRONG
004714	022702	177777		CHP	0-1,x2	:IS HIGH ORDER = -1
004720	001401			BEQ	.+4	
004722	000000			HLT		:HIGH ORDER IS WRONG
004724	022703	177777		CHP	0-1,x2!1	:IS LOW ORDER = -1
004730	001401			BEQ	.+4	
004732	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 60 MUL 1 * 0-1 = -1 -1 PS = 10
*****

```

004734	010701			SCOPE		:TEST OF MULTIPLY
004736	012702	000001		MOV	01,x2	:LOAD MULTIPICAN WITH 1
004742	070227	177777		MUL	0-1,x2	:MULTIPLY 1 * 0-1
004746	013767	177776	007502	MOV	00PS,PSW	:SAVE PS
004754	122767	000010	017474	CHPB	010,PSW	:IS PS = 10
004762	001401			BEQ	.+4	
004764	000000			HLT		:PS IS WRONG
004766	022702	177777		CHP	0-1,x2	:IS HIGH ORDER = -1
004772	001401			BEQ	.+4	
004774	000000			HLT		:HIGH ORDER IS WRONG
004776	022703	177777		CHP	0-1,x2!1	:IS LOW ORDER = -1
005002	001401			BEQ	.+4	
005004	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 61  MUL  1 * #2 = 0 2  PS = 0
*****

```

005006	010701			SCOPE		:TEST OF MULTIPLY
005010	012702	000001		MOV	#1,X2	:LOAD MULTIPLICAN WITH 1
005014	070227	000002		MUL	#2,X2	:MULTIPLY 1 * #2
005020	013767	177776	007430	MOV	#PS,PSH	:SAVE PS
005026	122767	000000	007422	CHPB	#0,PSH	:IS PS = 0
005034	001401			BEO	.+4	
005036	000000			HLT		:PS IS WRONG
005040	022702	000000		CHP	#0,X2	:IS HIGH ORDER = 0
005044	001401			BEO	.+4	
005046	000000			HLT		:HIGH ORDER IS WRONG
005050	022703	000002		CHP	#2,X2!1	:IS LOW ORDER = 2
005054	001401			BEO	.+4	
005056	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 62  MUL  2 * #2 = 0 4  PS = 0
*****

```

005060	010701			SCOPE		:TEST OF MULTIPLY
005062	012702	000002		MOV	#2,X2	:LOAD MULTIPLICAN WITH 2
005066	070227	000002		MUL	#2,X2	:MULTIPLY 2 * #2
005072	013767	177776	007356	MOV	#PS,PSH	:SAVE PS
005100	122767	000000	007350	CHPB	#0,PSH	:IS PS = 0
005106	001401			BEO	.+4	
005110	000000			HLT		:PS IS WRONG
005114	022702	000000		CHP	#0,X2	:IS HIGH ORDER = 0
005116	001401			BEO	.+4	
005120	000000			HLT		:HIGH ORDER IS WRONG
005122	022703	000004		CHP	#4,X2!1	:IS LOW ORDER = 4
005126	001401			BEO	.+4	
005130	000000			HLT		:LOW ORDER IS WRONG


```

*****
:TEST 63 MUL 1000 * #200 = 1 0 PS = 1
*****

```

005132	010701			SCOPE		:TEST OF MULTIPLY
005134	012702	001000		MOV	#1000,x2	:LOAD MULTIPLICAND WITH 1000
005140	070227	000200		MUL	#200,x2	:MULTIPLY 1000 * #200
005144	013767	177776	007304	MOV	#PS,PSW	:SAVE PS
005152	122767	000001	007276	CHPB	#1,PSW	:IS PS = 1
005160	001401			BEQ	.+4	
005162	000000			HLT		:PS IS WRONG
005164	000001			CHP	#1,x2	:IS HIGH ORDER = 1
005170	001401			BEQ	.+4	
005172	000000			HLT		:HIGH ORDER IS WRONG
005174	022703	000000		CHP	#0,x2!1	:IS LOW ORDER = 0
005200	001401			BEQ	.+4	
005202	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 64 MUL 200 * #1000 = 1 0 PS = 1
*****

```

005204	010701			SCOPE		:TEST OF MULTIPLY
005206	012702	000200		MOV	#200,x2	:LOAD MULTIPLICAND WITH 200
005212	070227	001000		MUL	#1000,x2	:MULTIPLY 200 * #1000
005216	013767	177776	007232	MOV	#PS,PSW	:SAVE PS
005224	122767	000001	007224	CHPB	#1,PSW	:IS PS = 1
005232	001401			BEQ	.+4	
005234	000000			HLT		:PS IS WRONG
005236	022702	000001		CHP	#1,x2	:IS HIGH ORDER = 1
005242	001401			BEQ	.+4	
005244	000000			HLT		:HIGH ORDER IS WRONG
005246	022703	000000		CHP	#0,x2!1	:IS LOW ORDER = 0
005252	001401			BEQ	.+4	
005254	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 65 MUL 77777 * 82 = 0 177776 PS = 1
*****

```

```

005326 010701
005327 012702 077777
005328 070227 000002
005329 013767 177776 007160
005330 122767 000001 007152
005331 001401
005332 010000
005333 022702 000000
005334 001401
005335 000000
005336 002703 177776
005337 001401
005338 000000

```

```

SCOPE
MOV 877777,X2
MUL 82,X2
MOV 2*PS,PSW
CMPB 81,PSW
BEQ .+4
HLT
CMP 80,X2
BEQ .+4
HLT
CMP 8177776,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 82
:SAVE PS
:IS PS = 1

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 177776

:LOW ORDER IS WRONG

```

```

*****
:TEST 66 MUL 2 * 877777 = 0 177776 PS = 1
*****

```

```

005339 010701
005340 012702 000002
005341 013767 077777
005342 013767 177776 007106
005343 000001 007100
005344 000000
005345 000000
005346 000000
005347 000000
005348 000000
005349 000000
005350 000000
005351 000000
005352 000000
005353 000000
005354 000000
005355 000000
005356 000000
005357 000000
005358 000000
005359 000000
005360 000000
005361 000000
005362 000000
005363 000000
005364 000000
005365 000000
005366 000000
005367 000000
005368 000000
005369 000000
005370 000000
005371 000000
005372 000000
005373 000000
005374 000000
005375 000000
005376 000000
005377 000000
005378 000000
005379 000000
005380 000000
005381 000000
005382 000000
005383 000000
005384 000000
005385 000000
005386 000000
005387 000000
005388 000000
005389 000000
005390 000000
005391 000000
005392 000000
005393 000000
005394 000000
005395 000000
005396 000000
005397 000000
005398 000000
005399 000000
005400 000000

```

```

SCOPE
MOV 82,X2
MUL 877777,X2
MOV 2*PS,PSW
CMPB 81,PSW
BEQ .+4
HLT
CMP 80,X2
BEQ .+4
HLT
CMP 8177776,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 2
:MULTIPLY 2 * 877777
:SAVE PS
:IS PS = 1

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 177776

:LOW ORDER IS WRONG

```

```

*****
:TEST 67  MUL  7777 * 810 = 0 77770  PS = 0
*****

```

005402	010701			SCOPE		:TEST OF MULTIPLY
005404	012702	007777		MOV	87777,x2	:LOAD MULTIPLICAN WITH 7777
005410	070227	000010		MUL	810,x2	:MULTIPLY 7777 * 810
005414	013767	177776	007034	MOV	28PS,PSW	:SAVE PS
005422	122767	000000	007026	CMPS	80,PSW	:IS PS = 0
005430	001401			BEQ	.+4	
005432	000000			HLT		:PS IS WRONG
005434	022702	000000		CMPS	80,x2	:IS HIGH ORDER = 0
005440	001401			BEQ	.+4	
005442	000000			HLT		:HIGH ORDER IS WRONG
005444	022703	077770		CMPS	877770,%2!1	:IS LOW ORDER = 77770
005450	001401			BEQ	.+4	
005452	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 70  MUL  10 * 87777 = 0 77770  PS = 0
*****

```

005454	010701			SCOPE		:TEST OF MULTIPLY
005456	012702	000010		MOV	810,x2	:LOAD MULTIPLICAN WITH 10
005462	070227	007777		MUL	87777,x2	:MULTIPLY 10 * 87777
005466	013767	177776	006762	MOV	28PS,PSW	:SAVE PS
005474	122767	000000	006754	CMPS	80,PSW	:IS PS = 0
005502	001401			BEQ	.+4	
005504	000000			HLT		:PS IS WRONG
005506	022702	000000		CMPS	80,x2	:IS HIGH ORDER = 0
005512	001401			BEQ	.+4	
005514	000000			HLT		:HIGH ORDER IS WRONG
005516	022703	077770		CMPS	877770,%2!1	:IS LOW ORDER = 77770
005522	001401			BEQ	.+4	
005524	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 71  MUL  77777 * 877777 = 37777 1  PS = 1
*****

```

005526	010701			SCOPE		:TEST OF MULTIPLY
005530	012702	077777		MOV	877777,x2	:LOAD MULTIPICAN WITH 77777
005534	070227	077777		MUL	877777,x2	:MULTIPLY 77777 * 877777
005540	013767	177776	006710	MOV	28PS,PSW	:SAVE PS
005546	122767	000001	006702	CMPB	81,PSW	:IS PS = 1
005552	001401			BEQ	.+4	
005558	001000			HLT		:PS IS WRONG
005560	022702	037777		CMP	837777,x2	:IS HIGH ORDER = 37777
005564	001401			BEQ	.+4	
005566	000000			HLT		:HIGH ORDER IS WRONG
005570	022703	000001		CMP	81,x2!1	:IS LOW ORDER = 1
005574	001401			BEQ	.+4	
005576	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 72  MUL  77777 * 81 = 0 77777  PS = 0
*****

```

005580	010701			SCOPE		:TEST OF MULTIPLY
005584	012702	077777		MOV	877777,x2	:LOAD MULTIPICAN WITH 77777
005588	070227	000001		MUL	81,x2	:MULTIPLY 77777 * 81
005592	013767	177776	006636	MOV	28PS,PSW	:SAVE PS
005596	122767	000000	006630	CMPB	80,PSW	:IS PS = 0
005600	001401			BEQ	.+4	
005604	001000			HLT		:PS IS WRONG
005608	022702	000000		CMP	80,x2	:IS HIGH ORDER = 0
005612	001401			BEQ	.+4	
005616	000000			HLT		:HIGH ORDER IS WRONG
005620	022703	077777		CMP	877777,x2!1	:IS LOW ORDER = 77777
005624	001401			BEQ	.+4	
005628	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 73  MUL  1 * 877777 = 0 77777  PS = 0
*****

```

```

005724 010701 000001
005725 01367 077777
005726 01367 177776 DCK564
005727 01367 000000 DL556
005728 001401 000000
005729 001401 077777
005730 001401 000000

```

```

SCOPE
MOV 81,X2
MUL 877777,X2
MOV 28PS,PSW
CMPB 80,PSW
BEQ .+4
HLT
CMP 80,X2
BEQ .+4
HLT
CMP 877777,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 1
:MULTIPLY 1 * 877777
:SAVE PS
:IS PS = 0

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 77777

:LOW ORDER IS WRONG

```

```

*****
:TEST 74  MUL  77777 * 8-1 = -1 100001  PS = 10
*****

```

```

005734 010701 077777
005735 01367 177777
005736 01367 177776 DCK512
005737 01367 000010 DL504
005738 001401 177777
005739 001401 100001
005740 001401 000000

```

```

SCOPE
MOV 877777,X2
MUL 8-1,X2
MOV 28PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8-1,X2
BEQ .+4
HLT
CMP 8100001,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 8-1
:SAVE PS
:IS PS = 10

:PS IS WRONG
:IS HIGH ORDER = -1

:HIGH ORDER IS WRONG
:IS LOW ORDER = 100001

:LOW ORDER IS WRONG

```

J03

:TEST 75 MUL -1 * 877777 = -1 100001 PS = 10

```
005776 010701
0 000 012702 177777
0 000 070227 077777
006010 013767 177776 006440
0 016 17 767 000010 006432
0 000 01401
0 000 01401
006030 012702 177777
006034 01401
0 036 0
006040 012703 100001
006044 001401
006046 000000
```

```
SCOPE
MOV 8-1,x2
MUL 877777,x2
MOV 2*PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8-1,x2
BEQ .+4
HLT
CMP 8100001,x2!1
BEQ .+4
HLT
```

```
:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH -1
:MULTIPLY -1 * 877777
:SAVE PS
:IS PS = 10
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100001
:LOW ORDER IS WRONG
```

:TEST 76 MUL -2 * 877777 = -1 2 PS = 11

```
006050 010701
006052 012702 177776
006056 070227 077777
006062 013767 177776 006366
006070 122767 000011 006360
006076 001401
006100 000000
006102 022702 177777
006106 001401
006110 000000
006112 022703 000002
006116 001401
006120 000000
```

```
SCOPE
MOV 8-2,x2
MUL 877777,x2
MOV 2*PS,PSW
CMPB 811,PSW
BEQ .+4
HLT
CMP 8-1,x2
BEQ .+4
HLT
CMP 82,x2!1
BEQ .+4
HLT
```

```
:TEST OF MULTIPLY
:LOAD MULTIPLICAN WITH -2
:MULTIPLY -2 * 877777
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 2
:LOW ORDER IS WRONG
```


K03

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```
*****
;TEST 77 MUL 77777 * 0-2 = -1 2 PS = 11
*****
```

006122	010701			SCOPE		;TEST OF MULTIPLY
006124	012702	077777		MOV	#77777,%2	;LOAD MULTIPLICAN WITH 77777
006130	070227	177776		MUL	#2,%2	;MULTIPLY 77777 * 0-2
006134	013767	177776	006314	MOV	2#PS,PSW	;SAVE PS
006142	122767	000011	006306	CMPB	#11,PSW	;IS PS = 11
006150	001401			BEQ	.+4	
006152	000000			HLT		;PS IS WRONG
006154	022702	177777		CMP	#-1,%2	;IS HIGH ORDER = -1
006160	001401			BEQ	.+4	
006162	000000			HLT		;HIGH ORDER IS WRONG
006164	022703	000002		CMP	#2,%2!1	;IS LOW ORDER = 2
006170	001401			BEQ	.+4	
006172	000000			HLT		;LOW ORDER IS WRONG

```
*****
;TEST 100 MUL 125252 * #2 = -1 52524 PS = 11
*****
```

006174	010701			SCOPE		;TEST OF MULTIPLY
006176	012702	125252		MOV	#125252,%2	;LOAD MULTIPLICAN WITH 125252
006202	070227	000002		MUL	#2,%2	;MULTIPLY 125252 * #2
006206	013767	177776	006242	MOV	2#PS,PSW	;SAVE PS
006214	122767	000011	006234	CMPB	#11,PSW	;IS PS = 11
006222	001401			BEQ	.+4	
006224	000000			HLT		;PS IS WRONG
006226	022702	177777		CMP	#-1,%2	;IS HIGH ORDER = -1
006228	001401			BEQ	.+4	
006234	000000			HLT		;HIGH ORDER IS WRONG
006236	022703	052524		CMP	#52524,%2!1	;IS LOW ORDER = 52524
006242	001401			BEQ	.+4	
006244	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 101  MUL  2 * #125252 = -1 52524  PS = 11
*****

```

006246	010701		SCOPE		:TEST OF MULTIPLY
006250	012702	000002	MOV	#2,%2	:LOAD MULTIPICAN WITH 2
006254	070227	125252	MUL	#125252,%2	:MULTIPLY 2 * #125252
006260	013767	177776	MOV	2#PS,PSW	:SAVE PS
006266	122767	000011	CMPB	#11,PSW	:IS PS = 11
006274	001401		BEQ	.+4	
006276	000000		HLT		:PS IS WRONG
006300	000702	177777	CMP	#-1,%2	:IS HIGH ORDER = -1
006304	0001401		BEQ	.+4	
006306	000000		HLT		:HIGH ORDER IS WRONG
006310	0002703	052524	CMP	#52524,%2!1	:IS LOW ORDER = 52524
006314	0001401		BEQ	.+4	
006316	000000		HLT		:LOW ORDER IS WRONG

```

*****
;TEST 102  MUL  52525 * #2 = 0 125252  PS = 1
*****

```

006320	010701		SCOPE		:TEST OF MULTIPLY
006322	012702	052525	MOV	#52525,%2	:LOAD MULTIPICAN WITH 52525
006326	070227	000002	MUL	#2,%2	:MULTIPLY 52525 * #2
006332	013767	177776	MOV	2#PS,PSW	:SAVE PS
006340	122767	000001	CMPB	#1,PSW	:IS PS = 1
006346	001401		BEQ	.+4	
006350	000000		HLT		:PS IS WRONG
006352	000702	000000	CMP	#0,%2	:IS HIGH ORDER = 0
006356	0001401		BEQ	.+4	
006360	000000		HLT		:HIGH ORDER IS WRONG
006362	022703	125252	CMP	#125252,%2!1	:IS LOW ORDER = 125252
006366	0001401		BEQ	.+4	
006370	000000		HLT		:LOW ORDER IS WRONG

MO3

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```

*****
:TEST 103  MUL  2 * #52525 = 0 125252  PS = 1
*****

```

006372	010701			SCOPE		:TEST OF MULTIPLY
006374	012702	000002		MOV	#2,%2	:LOAD MULTIPLICAN WITH 2
006400	070227	052525		MUL	#52525,%2	:MULTIPLY 2 * #52525
006404	013767	177776	006044	MOV	@PS,PSW	:SAVE PS
006412	122767	000001	006036	CMPB	#1,PSW	:IS PS = 1
006420	001401			BEQ	.+4	
006422	000000			HLT		:PS IS WRONG
006424	012702	000000		CMP	#0,%2	:IS HIGH ORDER = 0
006430	001401			BEQ	.+4	
006432	000000			HLT		:HIGH ORDER IS WRONG
006434	022703	125252		CMP	#125252,%2!1	:IS LOW ORDER = 125252
006440	001401			BEQ	.+4	
006442	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 104  MUL  125252 * #40000 = 165252 100000  PS = 11
*****

```

006444	010701			SCOPE		:TEST OF MULTIPLY
006446	012702	125252		MOV	#125252,%2	:LOAD MULTIPLICAN WITH 125252
006452	070227	040000		MUL	#40000,%2	:MULTIPLY 125252 * #40000
006456	013767	177776	005772	MOV	@PS,PSW	:SAVE PS
006464	122767	000011	005764	CMPB	#11,PSW	:IS PS = 11
006472	001401			BEQ	.+4	
006474	000000			HLT		:PS IS WRONG
006476	022702	165252		CMP	#165252,%2	:IS HIGH ORDER = 165252
006502	001401			BEQ	.+4	
006504	000000			HLT		:HIGH ORDER IS WRONG
006506	022703	100000		CMP	#100000,%2!1	:IS LOW ORDER = 100000
006512	001401			BEQ	.+4	
006514	000000			HLT		:LOW ORDER IS WRONG

```
*****
;TEST 105 MUL 40000 * #125252 = 165252 100000 PS = 11
*****
```

006516	010701			SCOPE		:TEST OF MULTIPLY
006520	012702	040000		MOV	#40000,%2	:LOAD MULTIPICAN WITH 40000
006524	070227	125252		MUL	#125252,%2	:MULTIPLY 40000 * #125252
006530	013767	177776	005720	MOV	@#PS,PSW	:SAVE PS
006536	122767	000011	005712	CMPB	#11,PSW	:IS PS = 11
006544	001401			BEQ	.+4	
006546	000000			HLT		:PS IS WRONG
006550	022702	165252		CMP	#165252,%2	:IS HIGH ORDER = 165252
006554	001401			BEQ	.+4	
006556	000000			HLT		:HIGH ORDER IS WRONG
006560	02703	100000		CMP	#100000,%2!1	:IS LOW ORDER = 100000
006564	001401			BEQ	.+4	
006566	000000			HLT		:LOW ORDER IS WRONG

```
*****
;TEST 106 MUL 100000 * #100000 = 40000 0 PS = 1
*****
```

006570	010701			SCOPE		:TEST OF MULTIPLY
006572	012702	100000		MOV	#100000,%2	:LOAD MULTIPICAN WITH 100000
006576	070227	100000		MUL	#100000,%2	:MULTIPLY 100000 * #100000
006580	013767	177776	005646	MOV	@#PS,PSW	:SAVE PS
006584	122767	000001	005640	CMPB	#1,PSW	:IS PS = 1
006588	001401			BEQ	.+4	
006592	000000			HLT		:PS IS WRONG
006596	000000	040000		CMP	#40000,%2	:IS HIGH ORDER = 40000
006600	001401			BEQ	.+4	
006604	000000			HLT		:HIGH ORDER IS WRONG
006608	000000	000000		CMP	#0,%2!1	:IS LOW ORDER = 0
006612	000000			BEQ	.+4	
006616	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 107  MUL  70707 * 870707 = 31221 44261  PS = 1
*****

```

006642	010701			SCOPE		:TEST OF MULTIPLY
006644	012702	070707		MOV	870707,X2	:LOAD MULTIPICAN WITH 70707
006650	070227	070707		MUL	870707,X2	:MULTIPLY 70707 * 870707
006654	013767	177776	005574	MOV	28PS,PSW	:SAVE PS
006662	122767	000001	005566	CMPS	81,PSW	:IS PS = 1
006670	001401			BEQ	.+4	
006672	000000			HLT		:PS IS WRONG
006674	022702	031221		CMPS	831221,X2	:IS HIGH ORDER = 31221
006700	001401			BEQ	.+4	
006702	000000			HLT		:HIGH ORDER IS WRONG
006704	022703	044261		CMPS	844261,X2!1	:IS LOW ORDER = 44261
006710	001401			BEQ	.+4	
006712	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 110  MUL  107070 * 8107070 = 31222 26100  PS = 1
*****

```

006714	010701			SCOPE		:TEST OF MULTIPLY
006716	012702	107070		MOV	8107070,X2	:LOAD MULTIPICAN WITH 107070
006722	070227	107070		MUL	8107070,X2	:MULTIPLY 107070 * 8107070
006726	013767	177776	005522	MOV	28PS,PSW	:SAVE PS
006734	122767	000001	005514	CMPS	81,PSW	:IS PS = 1
006742	001401			BEQ	.+4	
006744	000000			HLT		:PS IS WRONG
006746	022702	031222		CMPS	831222,X2	:IS HIGH ORDER = 31222
006752	001401			BEQ	.+4	
006754	000000			HLT		:HIGH ORDER IS WRONG
006756	022703	026100		CMPS	826100,X2!1	:IS LOW ORDER = 26100
006762	001401			BEQ	.+4	
006764	000000			HLT		:LOW ORDER IS WRONG

C04

MAINDEC-11-DCKBK-A MUL TEST
DCKBK.A.P11

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```

*****
:TEST 111 MUL 100000 * 877777 = 140000 100000 PS = 11
*****

```

```

006766 010701
006770 012702 100000
006774 07 37 077777
007000 013767 177776 005450
007006 122767 000011 005442
007014 001401
007016 07 00
007020 0 02 140000
007024 001401
007026 07 00
007030 001403 100000
007034 001401
007036 000000

```

```

SCOPE
MOV 8100000,x2
MUL 877777,x2
MOV 2#PS,PSW
CMPB 811,PSW
BEQ .+4
HLT
MOV 8140000,x2
CMPB 811,PSW
BEQ .+4
HLT
MOV 8100000,x2!1
CMPB 811,PSW
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 100000
:MULTIPLY 100000 * 877777
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 140000
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 112 MUL 77777 * 8100000 = 140000 100000 PS = 11
*****

```

```

007040 010701
007042 012702 077777
007046 070 27 100000
007052 013767 177776 005376
007056 122767 000011 005370
007060 001401
007062 000000
007064 022702 140000
007066 001401
007068 07 00
007070 022703 100000
007072 001401
007074 000000

```

```

SCOPE
MOV 877777,x2
MUL 8100000,x2
MOV 2#PS,PSW
CMPB 811,PSW
BEQ .+4
HLT
MOV 8140000,x2
CMPB 811,PSW
BEQ .+4
HLT
MOV 8100000,x2!1
CMPB 811,PSW
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 8100000
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 140000
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 113  MUL  157634 * 0104031 = 7453 133074  PS = 1
*****

```

```

007112 010701
007114 012702 157634
007120 070227 104031
007124 013767 177776 005324
007130 122767 000001 005316
007140 001401
007142 000000
007144 022702 007453
007150 001401
007152 000000
007154 022703 133074
007160 001401
007162 000000

```

```

SCOPE
MOV 0157634,X2
MUL 0104031,X2
MOV 2*PS,PSW
CMPB 01,PSW
BEQ .+4
HLT
CMP 07453,X2
BEQ .+4
HLT
CMP 0133074,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 157634
:MULTIPLY 157634 * 0104031
:SAVE PS
:IS PS = 1
:PS IS WRONG
:IS HIGH ORDER = 7453
:HIGH ORDER IS WRONG
:IS LOW ORDER = 133074
:LOW ORDER IS WRONG

```

```

*****
:TEST 114  MUL  104031 * 0157634 = 7453 133074  PS = 1
*****

```

```

007164 010701
007166 012702 104031
007172 070227 157634
007176 013767 177776 005252
007204 122767 000001 005244
007212 001401
007214 000000
007216 022702 007453
007222 001401
007224 000000
007226 022703 133074
007232 001401
007234 000000

```

```

SCOPE
MOV 0104031,X2
MUL 0157634,X2
MOV 2*PS,PSW
CMPB 01,PSW
BEQ .+4
HLT
CMP 07453,X2
BEQ .+4
HLT
CMP 0133074,X2!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 104031
:MULTIPLY 104031 * 0157634
:SAVE PS
:IS PS = 1
:PS IS WRONG
:IS HIGH ORDER = 7453
:HIGH ORDER IS WRONG
:IS LOW ORDER = 133074
:LOW ORDER IS WRONG

```

```

*****
:TEST 115 MUL 152210 * 00 = 0 0 PS = 4
*****

```

007235	010701			SCOPE		:TEST OF MULTIPLY
007236	010702	152210		MOV	#152210,X2	:LOAD MULTIPLICAND WITH 152210
007237	010703	000000		MUL	#0,X2	:MULTIPLY 152210 * 00
007238	013767	177776	005200	MOV	2#PS,PSH	:SAVE PS
007239	122767	000004	005172	CHPB	#4,PSH	:IS PS = 4
007240	001401			BEQ	.+4	
007241	000000			HLT		:PS IS WRONG
007242	000000			CHP	#0,X2	:IS HIGH ORDER = 0
007243	001401			BEQ	.+4	
007244	000000			HLT		:HIGH ORDER IS WRONG
007245	022703	000000		CHP	#0,X2!1	:IS LOW ORDER = 0
007246	001401			BEQ	.+4	
007247	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 116 MUL 0 * #152210 = 0 0 PS = 4
*****

```

007310	010701			SCOPE		:TEST OF MULTIPLY
007311	012702	000000		MOV	#0,X2	:LOAD MULTIPLICAND WITH 0
007312	070227	152210		MUL	#152210,X2	:MULTIPLY 0 * #152210
007313	013767	177776	005126	MOV	2#PS,PSH	:SAVE PS
007314	122767	000004	005120	CHPB	#4,PSH	:IS PS = 4
007315	001401			BEQ	.+4	
007316	000000			HLT		:PS IS WRONG
007317	000000			CHP	#0,X2	:IS HIGH ORDER = 0
007318	001401			BEQ	.+4	
007319	000000			HLT		:HIGH ORDER IS WRONG
007320	022703	000000		CHP	#0,X2!1	:IS LOW ORDER = 0
007321	001401			BEQ	.+4	
007322	000000			HLT		:LOW ORDER IS WRONG


```

*****
:TEST 117 MUL -1 * 80 = 0 0 PS = 4
*****

```

007362	010701			SCOPE		:TEST OF MULTIPLY
007364	012702	177777		MOV	8-1 X2	:LOAD MULTIPLICAN WITH -1
007370	070 37	000000		MUL	80 X2	:MULTIPLY -1 * 80
007374	013767	177776	000054	MOV	2-PS PSW	:SAVE PS
007402	122767	000004	000046	C 8	84 PSW	:IS PS = 4
007410	001401			E 0	.+4	
007412	0 0			HLT		:PS IS WRONG
007414	0 2	000000		CHP	80 X2	:IS HIGH ORDER = 0
007420	001401			BEQ	.+4	
007422	0 0			HLT		:HIGH ORDER IS WRONG
007424	0 0	000000		CHP	80 X2!1	:IS LOW ORDER = 0
007430	001401			BEQ	.+4	
007432	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 120 MUL 0 * 8-1 = 0 0 PS = 4
*****

```

007434	010701			SCOPE		:TEST OF MULTIPLY
007436	012702	000000		MOV	80 X2	:LOAD MULTIPLICAN WITH 0
007442	0 7	177777		MUL	8-1 X2	:MULTIPLY 0 * 8-1
007446	013767	177776	000002	MOV	2-PS PSW	:SAVE PS
007454	1 767	000004	000074	CHP8	84 PSW	:IS PS = 4
007462	0 0			E 0	.+4	
007464	0 0			HLT		:PS IS WRONG
007466	0 2	000000		CHP	80 X2	:IS HIGH ORDER = 0
007472	0 401			BEQ	.+4	
007474	0 0			HLT		:HIGH ORDER IS WRONG
007476	0 2703	000000		CHP	80 X2!1	:IS LOW ORDER = 0
007502	001401			BEQ	.+4	
007504	000000			HLT		:LOW ORDER IS WRONG

:TEST 121 MUL -1 * 01 = -1 -1 PS = 10
:*****

007506 010701
007510 012703 177777
007514 070327 000001
007520 013767 177776 004730
007526 122767 000010 004722
007534 001401
007540 000000
007546 000000
007550 022703 177777
007554 001401
007556 000000

SCOPE
MOV 0-1,X3
MUL 01,X3
MOV 00PS,PSW
CMPB 010,PSW
BEQ .+4
HLT
CMP 0-1,X3
BEQ .+4
HLT
CMP 0-1,X3!1
BEQ .+4
HLT
:TEST OF MULTIPLY
:LOAD MULTIPICAN WITH -1
:MULTIPLY -1 * 01
:SAVE PS
:IS PS = 10
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = -1
:LOW ORDER IS WRONG

:TEST 122 MUL -1 * 00 = 0 0 PS = 4
:*****

007560 010701
007566 012703 177777
007572 070327 000000
007578 013767 177776 004656
007584 122767 000004 004650
007590 001401
007596 000000
007602 000000
007608 022703 000000
007614 001401
007620 000000
007626 022703 000000
007632 001401
007638 000000

SCOPE
MOV 0-1,X3
MUL 00,X3
MOV 00PS,PSW
CMPB 04,PSW
BEQ .+4
HLT
CMP 00,X3
BEQ .+4
HLT
CMP 00,X3!1
BEQ .+4
HLT
:TEST OF MULTIPLY
:LOAD MULTIPICAN WITH -1
:MULTIPLY -1 * 00
:SAVE PS
:IS PS = 4
:PS IS WRONG
:IS HIGH ORDER = 0
:HIGH ORDER IS WRONG
:IS LOW ORDER = 0
:LOW ORDER IS WRONG

H04

MAINDEC-11-DCKBK-A MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 46
DCKBK.A.P11

:TEST 123 MUL 77777 * #100000 = 100000 100000 PS = 11
:*****

007632 010701
007634 012703 077777
007640 070027 100000
007644 013767 177776 004604
007653 177767 000011 004576
007654 000000
007654 000000
007670 000000 100000
007672 000000
007674 000000 100000
007700 001401
007702 000000

SCOPE
MOV #77777,x3
MUL #100000,x3
MOV @PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
C P
R L
HLT
CMP #100000,x3!
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * #100000
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 100000
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

:TEST 124 MUL -1 * #77777 = 100001 100001 PS = 10
:*****

007704 010701
007706 012703 177777
007712 070027 077777
007716 013767 177776 004532
007724 177767 000010 004524
007732 000000
007734 000000
007736 000000 100001
007742 000000
007744 000000
007746 000000 100001
007752 001401
007754 000000

SCOPE
MOV #-1,x3
MUL #77777,x3
MOV @PS,PSW
CMPB #10,PSW
BEQ .+4
HLT
C P
R L
HLT
CMP #100001,x3!
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH -1
:MULTIPLY -1 * #77777
:SAVE PS
:IS PS = 10
:PS IS WRONG
:IS HIGH ORDER = 100001
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100001
:LOW ORDER IS WRONG

```

*****
:TEST 125 MUL 77777 * 877777 = 1 1 PS = 1
*****

```

```

007756 010701 077777
07760 012703 077777
07764 070327 077777
007770 013767 177776 004460
007776 013767 000001 004452
010774 070327
010776 070327
010010 012703 000001
010014 001401
010016 070327
010020 012703 000001
010024 001401
010026 000000

```

```

SCOPE
MOV 877777,X3
MUL 877777,X3
MOV 2*PS,PSW
CMB 81,PSW
EQU .+4
HLT
CMP 81,X3
EQU .+4
HLT
CMP 81,X3!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 877777
:SAVE PS
:IS PS = 1
:PS IS WRONG
:IS HIGH ORDER = 1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 1
:LOW ORDER IS WRONG

```

```

*****
:TEST 126 MUL 2 * 82 = 4 4 PS = 0
*****

```

```

010030 010701 000002
010032 012703 000002
010036 070327 000002
010042 013767 177776 004406
010050 122767 000000 004400
010056 001401
010060 070327
010062 012703 000004
010066 001401
010070 000000
010072 012703 000004
010076 001401
010100 000000

```

```

SCOPE
MOV 82,X3
MUL 82,X3
MOV 2*PS,PSW
CMB 80,PSW
BEQ .+4
HLT
CMP 84,X3
BEQ .+4
HLT
CMP 84,X3!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 2
:MULTIPLY 2 * 82
:SAVE PS
:IS PS = 0
:PS IS WRONG
:IS HIGH ORDER = 4
:HIGH ORDER IS WRONG
:IS LOW ORDER = 4
:LOW ORDER IS WRONG

```

```

*****
;TEST 127  MUL  0 * 80 = 0 0  PS = 4
*****

```

010102	010701			SCOPE		;TEST OF MULTIPLY
010104	012704	000000		MOV	80,X4	;LOAD MULTIPLICAN WITH 0
010110	070427	000000		MUL	80,X4	;MULTIPLY 0 * 80
010114	013767	177776	004334	MOV	2*PS,PSW	;SAVE PS
010122	122767	000004	004326	CMPB	84,PSW	;IS PS = 4
010130	001401			BEQ	.+4	
010138	000000			HLT		;PS IS WRONG
010134	022704	000000		CMP	80,X4	;IS HIGH ORDER = 0
010140	001401			BEQ	.+4	
010148	000000			HLT		;HIGH ORDER IS WRONG
010144	022705	000000		CMP	80,X4!1	;IS LOW ORDER = 0
010150	001401			BEQ	.+4	
010152	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 130  MUL  0 * 81 = 0 0  PS = 4
*****

```

010154	010701			SCOPE		;TEST OF MULTIPLY
010156	012704	000000		MOV	80,X4	;LOAD MULTIPLICAN WITH 0
010162	070427	000001		MUL	81,X4	;MULTIPLY 0 * 81
010166	013767	177776	004262	MOV	2*PS,PSW	;SAVE PS
010174	122767	000004	004254	CMPB	84,PSW	;IS PS = 4
010172	001401			BEQ	.+4	
010176	000000			HLT		;PS IS WRONG
010180	000000	000000		CMP	80,X4	;IS HIGH ORDER = 0
010212	001401			BEQ	.+4	
010214	000000			HLT		;HIGH ORDER IS WRONG
010216	022705	000000		CMP	80,X4!1	;IS LOW ORDER = 0
010222	001401			BEQ	.+4	
010224	000000			HLT		;LOW ORDER IS WRONG

K04

MAINDEC-11-DCKBK-A MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 49
DCKBK.A.P11

:TEST 131 MUL 1 * 80 = 0 0 PS = 4

010226 010701
010230 012704 000001
010234 070427 000000
010240 013767 177776 004210
010246 122767 000004 004202
010250 001401
010254 000000
010260 000000
010264 001401
010266 000000
010270 022705 000000
010274 001401
010276 000000

SCOPE
MOV 81,X4
MUL 80,X4
MOV 28PS,PSW
CMPB 84,PSW
BEQ .+4
HLT
CMP 80,X4
BEQ .+4
HLT
CMP 80,X4!1
BEQ .+4
HLT

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 1
;MULTIPLY 1 * 80
;SAVE PS
;IS PS = 4

;PS IS WRONG
;IS HIGH ORDER = 0

;HIGH ORDER IS WRONG
;IS LOW ORDER = 0

;LOW ORDER IS WRONG

:TEST 132 MUL -1 * 81 = -1 -1 PS = 10

010300 010701
010302 012704 177777
010306 070427 000001
010312 013767 177776 004136
010320 122767 000010 004130
010326 001401
010330 000000
010332 022704 177777
010336 001401
010340 000000
010342 022705 177777
010346 001401
010350 000000

SCOPE
MOV 8-1,X4
MUL 81,X4
MOV 28PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8-1,X4
BEQ .+4
HLT
CMP 8-1,X4!1
BEQ .+4
HLT

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH -1
;MULTIPLY -1 * 81
;SAVE PS
;IS PS = 10

;PS IS WRONG
;IS HIGH ORDER = -1

;HIGH ORDER IS WRONG
;IS LOW ORDER = -1

;LOW ORDER IS WRONG

```

;*****
;TEST 133  MUL  1 * 8-1 = -1 -1  PS = 10
;*****

```

```

010352 010701
010354 012704 000001
010360 070427 177777
010364 013767 177776 004064
010372 122767 000010 004056
010400 001401
010402 000000
010404 022704 177777
010410 001401
010412 000000
010414 022705 177777
010420 001401
010422 000000

```

```

SCOPE
MOV  #1,%4
MUL  #-1,%4
MOV  2#PS,PSW
CMPB #10,PSW
BEQ  .+4
HLT
CMP  #-1,%4
BEQ  .+4
HLT
CMP  #-1,%4!1
BEQ  .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAN WITH 1
;MULTIPLY 1 * 8-1
;SAVE PS
;IS PS = 10
;PS IS WRONG
;IS HIGH ORDER = -1
;HIGH ORDER IS WRONG
;IS LOW ORDER = -1
;LOW ORDER IS WRONG

```

```

;*****
;TEST 134  MUL  1 * 82 = 0 2  PS = 0
;*****

```

```

010424 010701
010426 012704 000001
010432 070427 000002
010436 013767 177776 004012
010444 122767 000000 004004
010452 001401
010454 000000
010456 022704 000000
010462 001401
010464 000000
010466 022705 000002
010472 001401
010474 000000

```

```

SCOPE
MOV  #1,%4
MUL  #2,%4
MOV  2#PS,PSW
CMPB #0,PSW
BEQ  .+4
HLT
CMP  #0,%4
BEQ  .+4
HLT
CMP  #2,%4!1
BEQ  .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAN WITH 1
;MULTIPLY 1 * 82
;SAVE PS
;IS PS = 0
;PS IS WRONG
;IS HIGH ORDER = 0
;HIGH ORDER IS WRONG
;IS LOW ORDER = 2
;LOW ORDER IS WRONG

```

```

*****
;TEST 135  MUL  2 * #2 = 0 4  PS = 0
*****

```

010476	010701			SCOPE		;TEST OF MULTIPLY
010500	012704	000002		MOV	#2,%4	;LOAD MULTIPLICAN WITH 2
010504	070427	000002		MUL	#2,%4	;MULTIPLY 2 * #2
010510	013767	177776	003740	MOV	2#PS,PSW	;SAVE PS
010516	122767	000000	003732	CMPB	#0,PSW	;IS PS = 0
010524	001401			BEQ	.+4	
010526	000000			HLT		;PS IS WRONG
010530	022704	000000		CMP	#0,%4	;IS HIGH ORDER = 0
010534	001401			BEQ	.+4	
010536	000000			HLT		;HIGH ORDER IS WRONG
010540	022705	000004		CMP	#4,%4!1	;IS LOW ORDER = 4
010544	001401			BEQ	.+4	
010546	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 136  MUL  1000 * #200 = 1 0  PS = 1
*****

```

010550	010701			SCOPE		;TEST OF MULTIPLY
010552	012704	001000		MOV	#1000,%4	;LOAD MULTIPLICAN WITH 1000
010556	070427	000200		MUL	#200,%4	;MULTIPLY 1000 * #200
010562	013767	177776	003666	MOV	2#PS,PSW	;SAVE PS
010570	122767	000001	003660	CMPB	#1,PSW	;IS PS = 1
010576	001401			BEQ	.+4	
010600	000000			HLT		;PS IS WRONG
010602	000704	000001		CMP	#1,%4	;IS HIGH ORDER = 1
010606	001401			BEQ	.+4	
010610	000000			HLT		;HIGH ORDER IS WRONG
010612	002705	000000		CMP	#0,%4!1	;IS LOW ORDER = 0
010616	001401			BEQ	.+4	
010620	000000			HLT		;LOW ORDER IS WRONG

;TEST 137 MUL 200 * #1000 = 1 0 PS = 1

010622	010701			SCOPE		;TEST OF MULTIPLY
010624	012704	000200		MOV	#200,%4	;LOAD MULTIPLICAN WITH 200
010630	070427	001000		MUL	#1000,%4	;MULTIPLY 200 * #1000
010634	013767	177776	003614	MOV	2#PS,PSW	;SAVE PS
010642	122767	000001	003606	CMPB	#1,PSW	;IS PS = 1
010650	001401			BEQ	.+4	
010652	000000			HLT		;PS IS WRONG
010654	022704	000001		CMP	#1,%4	;IS HIGH ORDER = 1
010660	001401			BEQ	.+4	
010662	000000			HLT		;HIGH ORDER IS WRONG
010664	022705	000000		CMP	#0,%4!1	;IS LOW ORDER = 0
010670	001401			BEQ	.+4	
010672	000000			HLT		;LOW ORDER IS WRONG

;TEST 140 MUL 77777 * #2 = 0 177776 PS = 1

010674	010701			SCOPE		;TEST OF MULTIPLY
010676	012704	077777		MOV	#77777,%4	;LOAD MULTIPLICAN WITH 77777
010702	070427	000002		MUL	#2,%4	;MULTIPLY 77777 * #2
010706	013767	177776	003542	MOV	2#PS,PSW	;SAVE PS
010714	122767	000001	003534	CMPB	#1,PSW	;IS PS = 1
010722	001401			BEQ	.+4	
010724	000000			HLT		;PS IS WRONG
010726	022704	000000		CMP	#0,%4	;IS HIGH ORDER = 0
010732	001401			BEQ	.+4	
010734	000000			HLT		;HIGH ORDER IS WRONG
010736	022705	177776		CMP	#177776,%4!1	;IS LOW ORDER = 177776
010742	001401			BEQ	.+4	
010744	000000			HLT		;LOW ORDER IS WRONG

```

*****
:TEST 141  MUL  2 * 077777 = 0 177776  PS = 1
*****

```

```

010746 010701
010750 012704 000002
010754 070427 077777
010760 013767 177776 003470
010766 122767 000001 003462
010774 001401
010776 000000
011000 000000
011004 001401
011006 000000
011010 022705 177776
011014 001401
011016 000000

```

```

SCOPE
MOV 02,X4
MUL 077777,X4
MOV 2*PS,PSW
CMPB 01,PSW
BEQ .+4
HLT
CMP 00,X4
BEQ .+4
HLT
CMP 0177776,X4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 2
:MULTIPLY 2 * 077777
:SAVE PS
:IS PS = 1
:PS IS WRONG
:IS HIGH ORDER = 0
:HIGH ORDER IS WRONG
:IS LOW ORDER = 177776
:LOW ORDER IS WRONG

```

```

*****
:TEST 142  MUL  7777 * 010 = 0 77770  PS = 0
*****

```

```

011020 010701
011022 012704 007777
011026 070427 000010
011032 013767 177776 003416
011040 122767 000000 003410
011046 001401
011050 000000
011052 022704 000000
011056 001401
011060 000000
011062 022705 077770
011066 001401
011070 000000

```

```

SCOPE
MOV 07777,X4
MUL 010,X4
MOV 2*PS,PSW
CMPB 00,PSW
BEQ .+4
HLT
CMP 00,X4
BEQ .+4
HLT
CMP 077770,X4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 7777
:MULTIPLY 7777 * 010
:SAVE PS
:IS PS = 0
:PS IS WRONG
:IS HIGH ORDER = 0
:HIGH ORDER IS WRONG
:IS LOW ORDER = 77770
:LOW ORDER IS WRONG

```



```

*****
:TEST 143 MUL 10 * 87777 = 0 77770 PS = 0
*****

```

011072	010701			SCOPE		:TEST OF MULTIPLY
011074	012704	000010		MOV	810,x4	:LOAD MULTIPLICAND WITH 10
011100	070427	007777		MUL	87777,x4	:MULTIPLY 10 * 87777
011104	013767	177776	003344	MOV	28PS,PSH	:SAVE PS
011112	122767	000000	003336	CHPB	80,PSH	:IS PS = 0
011120	001401			BEQ	.+4	
011122	000000			HLT		:PS IS WRONG
011124	012704	000000		CHPB	80,x4	:IS HIGH ORDER = 0
011130	001401			BEQ	.+4	
011132	000000			HLT		:HIGH ORDER IS WRONG
011134	022705	077770		CHPB	877770,x4!1	:IS LOW ORDER = 77770
011140	001401			BEQ	.+4	
011142	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 144 MUL 77777 * 877777 = 37777 1 PS = 1
*****

```

011144	010701			SCOPE		:TEST OF MULTIPLY
011146	012704	077777		MOV	877777,x4	:LOAD MULTIPLICAND WITH 77777
011152	012704	077777		MUL	877777,x4	:MULTIPLY 77777 * 877777
011156	013767	177776	003272	MOV	28PS,PSH	:SAVE PS
011164	122767	000001	003264	CHPB	81,PSH	:IS PS = 1
011172	001401			BEQ	.+4	
011174	000000			HLT		:PS IS WRONG
011176	012704	037777		CHPB	837777,x4	:IS HIGH ORDER = 37777
011202	001401			BEQ	.+4	
011204	000000			HLT		:HIGH ORDER IS WRONG
011206	022705	000001		CHPB	81,x4!1	:IS LOW ORDER = 1
011212	001401			BEQ	.+4	
011214	000000			HLT		:LOW ORDER IS WRONG

:TEST 145 MUL 77777 * 81 = 0 77777 PS = 0

011216 010701
011219 012704 077777
011224 077777 077777
011230 013767 177776 003220
011236 122767 000000 003212
011241 001401
011246 000000
011250 022704 000000
011254 001401
011256 000000
011258 022705 077777
011264 001401
011266 000000

SCOPE
MOV 877777,X4
MUL 81,X4
MOV 2#PS,PSW
CMPB 80,PSW
BEQ .+4
HLT
CMP 80,X4
BEQ .+4
HLT
CMP 877777,X4!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 81
:SAVE PS
:IS PS = 0
:
:PS IS WRONG
:IS HIGH ORDER = 0
:
:HIGH ORDER IS WRONG
:IS LOW ORDER = 77777
:
:LOW ORDER IS WRONG

:TEST 146 MUL 1 * 877777 = 0 77777 PS = 0

011270 010701
011272 012704 000001
011276 070427 077777
011302 013767 177776 003146
011310 122767 000000 003140
011316 001401
011320 000000
011322 022704 000000
011326 001401
011330 000000
011332 022705 077777
011336 001401
011340 000000

SCOPE
MOV 81,X4
MUL 877777,X4
MOV 2#PS,PSW
CMPB 80,PSW
BEQ .+4
HLT
CMP 80,X4
BEQ .+4
HLT
CMP 877777,X4!1
BEQ .+4
HLT

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 1
:MULTIPLY 1 * 877777
:SAVE PS
:IS PS = 0
:
:PS IS WRONG
:IS HIGH ORDER = 0
:
:HIGH ORDER IS WRONG
:IS LOW ORDER = 77777
:
:LOW ORDER IS WRONG

```

*****
:TEST 147  MUL  77777 * 8-1 = -1 100001  PS = 10
*****

```

```

011342 010701
011344 012704 077777
011346 070427 177777
011354 013767 177776 003074
011356 122767 000010 003066
011358 001401
011372 000000
011374 012704 177777
011376 001401
011378 000000
011404 000000 100001
011410 001401
011412 000000

```

```

SCOPE
MOV 877777,X4
MUL 8-1,X4
MOV 28PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8-1,X4
BEQ .+4
HLT
CMP 8100001,X4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 8-1
:SAVE PS
:IS PS = 10
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100001
:LOW ORDER IS WRONG

```

```

*****
:TEST 150  MUL  -1 * 877777 = -1 100001  PS = 10
*****

```

```

011414 010701
011416 012704 177777
011418 070427 077777
011420 013767 177776 003022
011422 122767 000010 003014
011424 001401
011426 000000
011446 012704 177777
011448 001401
011450 000000
011452 000000 100001
011454 001401
011456 000000

```

```

SCOPE
MOV 8-1,X4
MUL 877777,X4
MOV 28PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8-1,X4
BEQ .+4
HLT
CMP 8100001,X4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH -1
:MULTIPLY -1 * 877777
:SAVE PS
:IS PS = 10
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100001
:LOW ORDER IS WRONG

```

```

*****
:TEST 151  MUL  -2 * 877777 = -1 2  PS = 11
*****

```

```

011465 010701
011470 012704 177776
011474 013727 077777
011500 013767 177776 002750
011506 122767 000011 002742
011514 001401
011516 002704 177777
011524 001401
011530 000002
011534 001401
011536 000000

```

```

SCOPE
MOV 8-2,x4
MUL 877777,x4
MOV 28PS,PSW
CMPB 811,PSW
BEQ .+4
HLT
CMP 8-1,x4
BEQ .+4
HLT
CMP 82,x4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH -2
:MULTIPLY -2 * 877777
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 2
:LOW ORDER IS WRONG

```

```

*****
:TEST 152  MUL  77777 * 8-2 = -1 2  PS = 11
*****

```

```

011540 010701
011542 012704 077777
011546 070427 177776
011552 013767 177776 002676
011560 122767 000011 002670
011566 001401
011570 000000
011572 002704 177777
011576 001401
011600 000000
011602 002705 000002
011606 001401
011610 000000

```

```

SCOPE
MOV 877777,x4
MUL 8-2,x4
MOV 28PS,PSW
CMPB 811,PSW
BEQ .+4
HLT
CMP 8-1,x4
BEQ .+4
HLT
CMP 82,x4!1
BEQ .+4
HLT

```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 77777
:MULTIPLY 77777 * 8-2
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = -1
:HIGH ORDER IS WRONG
:IS LOW ORDER = 2
:LOW ORDER IS WRONG

```

```

*****
:TEST 153 MUL 125252 * 02 = -1 52524 PS = 11
*****

```

011612	010701			SCOPE		:TEST OF MULTIPLY
011614	012704	125252		MOV	#125252,X4	:LOAD MULTIPLICAND WITH 125252
011620	070427	000002		MUL	#2,X4	:MULTIPLY 125252 * 02
011624	013767	177776	002624	MOV	0#PS,PSW	:SAVE PS
011632	122767	000011	002616	CMPS	#11,PSW	:IS PS = 11
011640	001401			BEQ	.+4	
011642	000000			HLT		:PS IS WRONG
011644	000004	177777		CMPS	#-1,X4	:IS HIGH ORDER = -1
011650	001401			BEQ	.+4	
011652	000000			HLT		:HIGH ORDER IS WRONG
011654	022705	052524		CMPS	#52524,X4!1	:IS LOW ORDER = 52524
011660	001401			BEQ	.+4	
011662	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 154 MUL 2 * #125252 = -1 52524 PS = 11
*****

```

011664	010701			SCOPE		:TEST OF MULTIPLY
011666	012704	000002		MOV	#2,X4	:LOAD MULTIPLICAND WITH 2
011672	070427	125252		MUL	#125252,X4	:MULTIPLY 2 * #125252
011676	013767	177776	002552	MOV	0#PS,PSW	:SAVE PS
011704	122767	000011	002544	CMPS	#11,PSW	:IS PS = 11
011712	001401			BEQ	.+4	
011714	000000			HLT		:PS IS WRONG
011716	022704	177777		CMPS	#-1,X4	:IS HIGH ORDER = -1
011722	001401			BEQ	.+4	
011724	000000			HLT		:HIGH ORDER IS WRONG
011726	022705	052524		CMPS	#52524,X4!1	:IS LOW ORDER = 52524
011732	001401			BEQ	.+4	
011734	000000			HLT		:LOW ORDER IS WRONG

```

*****
TEST 155  MUL  52525 * 02 = 0 125252  PS = 1
*****

```

011736	010701			SCOPE			
011740	012704	052525		MOV	052525,X4		:TEST OF MULTIPLY
011744	070427	000002		MUL	02,X4		:LOAD MULTIPICAN WITH 52525
011750	013767	177776	002500	MOV	00PS,PSW		:MULTIPLY 52525 * 02
011756	122767	000001	002472	CHPB	01,PSW		:SAVE PS
011764	001401			BLO	.+4		:IS PS = 1
011766	000000			HLT			:PS IS WRONG
011770	000000			CHP	00,X4		:IS HIGH ORDER = 0
011774	001401			BEQ	.+4		
011776	000000			HLT			:HIGH ORDER IS WRONG
012000	000000	125252		CHP	0125252,X4!1		:IS LOW ORDER = 125252
012004	001401			ELO	.+4		
012006	000000			HLT			:LOW ORDER IS WRONG

```

*****
TEST 156  MUL  2 * 1  PS = 0 125252  PS = 1
*****

```

012010	010701			SCOPE			
012012	012704	000002		MOV	02,X4		:TEST OF MULTIPLY
012016	070427	052525		MUL	0525,X4		:LOAD MULTIPICAN WITH 2
012020	013767	177776	002426	MOV	00PS,PSW		:MULTIPLY 2 * 052525
012024	122767	000001	002420	CHPB	01,PSW		:SAVE PS
012028	001401			BLO	.+4		:IS PS = 1
012032	000000			HLT			:PS IS WRONG
012036	000000			CHP	00,X4		:IS HIGH ORDER = 0
012040	001401			BEQ	.+4		
012044	000000			HLT			:HIGH ORDER IS WRONG
012048	000000	125252		CHP	0125252,X4!1		:IS LOW ORDER = 125252
012052	001401			BEQ	.+4		
012056	000000			HLT			:LOW ORDER IS WRONG


```

*****
TEST 157 MUL 125252 * #40000 = 165252 100000 PS = 11
*****

```

```

012062 010701 125252
012064 012704 000000
012074 013767 177776 002354
012102 125252 000011 002346
012110 013767 177776
012112 013767 177776
012114 013767 177776 165252
012116 013767 177776
012118 013767 177776
012120 013767 177776 100000
012122 013767 177776
012124 013767 177776
012126 013767 177776
012128 013767 177776
012130 013767 177776
012132 013767 177776

```

```

SCOPE
MOV #125252,X4
MUL #40000,X4
MOV #PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
CMP #165252,X4
BEQ .+4
HLT
CMP #100000,X4!1
BEQ .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 125252
;MULTIPLY 125252 * #40000
;SAVE PS
;IS PS = 11
;PS IS WRONG
;IS HIGH ORDER = 165252
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000
;LOW ORDER IS WRONG

```

```

*****
TEST 160 MUL 40000 * #125252 = 165252 100000 PS = 11
*****

```

```

012134 010701 040000
012136 012704 125252
012142 070427 125252 002302
012146 013767 177776 002274
012154 122767 000011
012162 013767 177776
012164 013767 177776
012166 013767 177776 165252
012172 013767 177776
012174 013767 177776
012176 013767 177776 100000
012202 001401
012204 000000

```

```

SCOPE
MOV #40000,X4
MUL #125252,X4
MOV #PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
CMP #165252,X4
BEQ .+4
HLT
CMP #100000,X4!1
BEQ .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 40000
;MULTIPLY 40000 * #125252
;SAVE PS
;IS PS = 11
;PS IS WRONG
;IS HIGH ORDER = 165252
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000
;LOW ORDER IS WRONG

```

```

*****
;TEST 161  MUL  100000 * #100000 = 40000 0  PS = 1
*****

```

012206	010701			SCOPE		:TEST OF MULTIPLY
012210	012704	100000		MOV	#100000,X4	:LOAD MULTIPLICAND WITH 100000
012214	070427	100000		MUL	#100000,X4	:MULTIPLY 100000 * #100000
012220	013767	177776	002230	MOV	2#PS,PSW	:SAVE PS
012226	122767	000001	002222	CMPS	#1,PSW	:IS PS = 1
012230	001401			BEQ	.+4	
012236	000000			HLT		:PS IS WRONG
012240	000000	040000		CMP	#40000,X4	:IS HIGH ORDER = 40000
012246	001401			BEQ	.+4	
012250	000000			HLT		:HIGH ORDER IS WRONG
012256	002705	000000		CMP	#0,X4!1	:IS LOW ORDER = 0
012260	001401			BEQ	.+4	
012266	000000			HLT		:LOW ORDER IS WRONG

```

*****
;TEST 162  MUL  70707 * #70707 = 31221 44261  PS = 1
*****

```

012260	010701			SCOPE		:TEST OF MULTIPLY
012266	012704	070707		MOV	#70707,X4	:LOAD MULTIPLICAND WITH 70707
012270	070427	070707		MUL	#70707,X4	:MULTIPLY 70707 * #70707
012276	013767	177776	002156	MOV	2#PS,PSW	:SAVE PS
012280	122767	000001	002150	CMPS	#1,PSW	:IS PS = 1
012286	001401			BEQ	.+4	
012290	000000			HLT		:PS IS WRONG
012296	002704	031221		CMP	#31221,X4	:IS HIGH ORDER = 31221
012300	001401			BEQ	.+4	
012306	000000			HLT		:HIGH ORDER IS WRONG
012310	002705	044261		CMP	#44261,X4!1	:IS LOW ORDER = 44261
012316	001401			BEQ	.+4	
012320	000000			HLT		:LOW ORDER IS WRONG


```

*****
;TEST 163 MUL 107070 * #107070 = 31222 26100 PS = 1
*****

```

012332	010701			SCOPE		;TEST OF MULTIPLY
012334	012704	107070		MOV	#107070,X4	;LOAD MULTIPLICAN WITH 107070
012340	070427	107070		MUL	#107070,X4	;MULTIPLY 107070 * #107070
012344	013767	177776	002104	MOV	#PS,PSW	;SAVE PS
012346	013767	000001	002076	CMPS	#1,PSW	;IS PS = 1
012348	000000			BEQ	.+4	
012350	000000			HLT		
012352	000000					;PS IS WRONG
012354	000000	031222		CMP	#31222,X4	;IS HIGH ORDER = 31222
012356	000000			BEQ	.+4	
012358	000000			HLT		
012360	000000					;HIGH ORDER IS WRONG
012362	000000	026100		CMP	#26100,X4!1	;IS LOW ORDER = 26100
012400	001401			BEQ	.+4	
012402	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 164 MUL 100000 * #77777 = 140000 100000 PS = 11
*****

```

012404	010701			SCOPE		;TEST OF MULTIPLY
012406	012704	100000		MOV	#100000,X4	;LOAD MULTIPLICAN WITH 100000
012412	070427	077777		MUL	#77777,X4	;MULTIPLY 100000 * #77777
012416	013767	177776	002032	MOV	#PS,PSW	;SAVE PS
012424	122767	000011	002024	CMPS	#11,PSW	;IS PS = 11
012432	001401			BEQ	.+4	
012434	000000			HLT		
012436	022704	140000		CMP	#140000,X4	;PS IS WRONG
012442	001401			BEQ	.+4	;IS HIGH ORDER = 140000
012444	000000			HLT		
012446	022705	100000		CMP	#100000,X4!1	;HIGH ORDER IS WRONG
012452	001401			BEQ	.+4	;IS LOW ORDER = 100000
012454	000000			HLT		;LOW ORDER IS WRONG

```
*****
;TEST 165 MUL 77777 * #100000 = 140000 100000 PS = 11
;*****
```

```
012456 010701
012460 012704 077777
012464 070427 100000
012470 013767 177776 001760
012476 122767 000011 001752
012504 001401
012506 000000
012510 022704 140000
012514 001401
012516 000000
012520 022705 100000
012524 001401
012526 000000
```

```
SCOPE
MOV #77777,X4
MUL #100000,X4
MOV @#PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
CMP #140000,X4
BEQ .+4
HLT
CMP #100000,X4!1
BEQ .+4
HLT
```

```
;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 77777
;MULTIPLY 77777 * #100000
;SAVE PS
;IS PS = 11
;PS IS WRONG
;IS HIGH ORDER = 140000
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000
;LOW ORDER IS WRONG
```

```
*****
;TEST 166 MUL 157634 * #104031 = 7453 133074 PS = 1
;*****
```

```
012530 010701
012532 012704 157634
012536 070427 104031
012540 013767 177776 001706
012544 122767 000001 001700
012548 001401
012550 000000
012552 022704 007453
012556 001401
012570 000000
012572 022705 133074
012576 001401
012600 000000
```

```
SCOPE
MOV #157634,X4
MUL #104031,X4
MOV @#PS,PSW
CMPB #1,PSW
BEQ .+4
HLT
CMP #7453,X4
BEQ .+4
HLT
CMP #133074,X4!1
BEQ .+4
HLT
```

```
;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 157634
;MULTIPLY 157634 * #104031
;SAVE PS
;IS PS = 1
;PS IS WRONG
;IS HIGH ORDER = 7453
;HIGH ORDER IS WRONG
;IS LOW ORDER = 133074
;LOW ORDER IS WRONG
```

```

*****
;TEST 167  MUL  104031 * 0157634 = 7453 133074  PS = 1
*****

```

012602	010701			SCOPE		;TEST OF MULTIPLY
012604	012704	104031		MOV	#104031,X4	;LOAD MULTIPLICAN WITH 104031
012610	070427	157634		MUL	#157634,X4	;MULTIPLY 104031 * 0157634
012614	013767	177776	001634	MOV	@PS,PSW	;SAVE PS
012622	122767	000001	001626	CMPS	#1,PSW	;IS PS = 1
012630	001401			BEQ	.+4	
012632	000000			HLT		;PS IS WRONG
012634	022704	007453		CMP	#7453,X4	;IS HIGH ORDER = 7453
012640	001401			BEQ	.+4	
012642	000000			HLT		;HIGH ORDER IS WRONG
012644	022705	133074		CMP	#133074,X4!1	;IS LOW ORDER = 133074
012650	001401			BEQ	.+4	
012652	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 170  MUL  152210 * 00 = 0 0  PS = 4
*****

```

012654	010701			SCOPE		;TEST OF MULTIPLY
012656	012704	152210		MOV	#152210,X4	;LOAD MULTIPLICAN WITH 152210
012662	070427	000000		MUL	#0,X4	;MULTIPLY 152210 * 00
012666	013767	177776	001562	MOV	@PS,PSW	;SAVE PS
012674	122767	000004	001554	CMPS	#4,PSW	;IS PS = 4
012702	001401			BEQ	.+4	
012704	000000			HLT		;PS IS WRONG
012706	002704	000000		CMP	#0,X4	;IS HIGH ORDER = 0
012712	001401			BEQ	.+4	
012714	000000			HLT		;HIGH ORDER IS WRONG
012716	022705	000000		CMP	#0,X4!1	;IS LOW ORDER = 0
012722	001401			BEQ	.+4	
012724	000000			HLT		;LOW ORDER IS WRONG

:TEST 171 MUL 0 * #152210 = 0 0 PS = 4
:*****

012726 010701
012730 012704 000000
012734 070427 152210
012740 013767 177776 001510
012746 122767 000004 001502
012754 001401
012756 000000
012760 022704 000000
012764 001401
012766 000000
012770 022705 000000
012774 001401
012776 000000

SCOPE
MOV #0,%4
MUL #152210,%4
MOV @#PS,PSW
CMPB #4,PSW
BEQ .+4
HLT
CMP #0,%4
BEQ .+4
HLT
CMP #0,%4!1
BEQ .+4
HLT
;TEST OF MULTIPLY
;LOAD MULTIPLICAN WITH 0
;MULTIPLY 0 * #152210
;SAVE PS
;IS PS = 4
;PS IS WRONG
;IS HIGH ORDER = 0
;HIGH ORDER IS WRONG
;IS LOW ORDER = 0
;LOW ORDER IS WRONG

:TEST 172 MUL -1 * #0 = 0 0 PS = 4
:*****

013000 010701
013002 012704 177777
013006 070427 000000
013012 013767 177776 001436
013020 122767 000004 001430
013026 001401
013030 000000
013032 022704 000000
013036 001401
013040 000000
013042 022705 000000
013046 001401
013050 000000

SCOPE
MOV #-1,%4
MUL #0,%4
MOV @#PS,PSW
CMPB #4,PSW
BEQ .+4
HLT
CMP #0,%4
BEQ .+4
HLT
CMP #0,%4!1
BEQ .+4
HLT
;TEST OF MULTIPLY
;LOAD MULTIPLICAN WITH -1
;MULTIPLY -1 * #0
;SAVE PS
;IS PS = 4
;PS IS WRONG
;IS HIGH ORDER = 0
;HIGH ORDER IS WRONG
;IS LOW ORDER = 0
;LOW ORDER IS WRONG

013052	010701		
013054	012704	000000	
013060	070427	177777	
013064	013767	177776	001364
013072	123767	000004	001356
013100	001401		
013102	000000		
013104	012704	000000	
013110	001401		
013112	000000		
013114	000000	000000	
013120	001401		
013122	000000		

```
SCOPE
MOV      80, X4
MUL      8-1, X4
MOV      2*PS, PSW
CMPB     84, PSW
BEQ      .+4
HLT
CMP      80, X4
BEQ      .+4
HLT
CMP      80, X4!1
BEQ      .+4
HLT
```

```

:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 0
:MULTIPLY 0 * 0-1
:SAVE PS
:IS PS = 4

:PS IS WRONG
:IS HIGH ORDER = 0

:HIGH ORDER IS WRONG
:IS LOW ORDER = 0

:LOW ORDER IS WRONG

```

013124	010701		
013125	012705	17777	
013126	012707	00001	
013127	012707	17777	001312
013128	012707	000010	001304
013129	012707		
013130	012707		
013131	012707	17777	
013132	012707		
013133	012707	17777	
013134	012707		
013135	012707		
013136	012707		
013137	012707		
013138	012707		
013139	012707		
013140	012707		
013141	012707		
013142	012707		
013143	012707		
013144	012707		
013145	012707		
013146	012707		
013147	012707		
013148	012707		
013149	012707		
013150	012707		
013151	012707		
013152	012707		
013153	012707		
013154	012707		
013155	012707		
013156	012707		
013157	012707		
013158	012707		
013159	012707		
013160	012707		
013161	012707		
013162	012707		
013163	012707		
013164	012707		
013165	012707		
013166	012707		
013167	012707		
013168	012707		
013169	012707		
013170	012707		
013171	012707		
013172	012707		
013173	012707		
013174	012707		
013175	012707		
013176	012707		
013177	012707		
013178	012707		
013179	012707		
013180	012707		
013181	012707		
013182	012707		
013183	012707		
013184	012707		
013185	012707		
013186	012707		
013187	012707		
013188	012707		
013189	012707		
013190	012707		
013191	012707		
013192	012707		
013193	012707		
013194	012707		
013195	012707		
013196	012707		
013197	012707		
013198	012707		
013199	012707		
013200	012707		

```
SCOPE
MOV      0-1,XS
MUL      01,XS
MUL      2*AS,PSW
CMPB     010,PSW
BEQ      .+4
HLT
CMP      0-1,XS
BEQ      .+4
HLT
CMP      0-1,XS!1
BEQ      .+4
HLT
```

```

;TEST OF MULTIPLY
;LOAD MULTIPICAN WITH -1
;MULTIPLY -1 * 81
;SAVE PS
;IS PS = 10

;PS IS WRONG
;IS HIGH ORDER = -1

;HIGH ORDER IS WRONG
;IS LOW ORDER = -1

;LOW ORDER IS WRONG

```

```

;*****
;TEST 175  MUL  -1 + 00 = 0 0  PS = 4
;*****

```

013178	010701		
013179	010702	177777	
013180	010703	000000	
013181	013167	177776	001240
013182	013167	000004	001232
013183	010704		
013184	010705		
013185	010706	000000	
013186	010707		
013187	010708	000000	
013188	010709		
013189	010710		
013190	010711		
013191	010712		
013192	010713		
013193	010714		
013194	010715		
013195	010716		
013196	010717		
013197	010718		
013198	010719		
013199	010720		

```

SCOPE
MOV      0-1, XS
MUL      00, XS
MOV      2, AS, PSW
CMPB     04, PSW
BEQ      .+4
HLT
CMP      00, XS
BEQ      .+4
HLT
CMP      00, XS!1
BEQ      .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH -1
;MULTIPLY -1 * 80
;SAVE PS
;IS PS = 4

;PS IS WRONG
;IS HIGH ORDER = 0

;HIGH ORDER IS WRONG
;IS LOW ORDER = 0

;LOW ORDER IS WRONG

```

```

;*****
;TEST 176  P L  77777 * 8100000 = 100000 100000  PS = 11
;*****

```

013250	010701		
013252	012705	077777	
013256	070527	100000	
013262	013767	177776	001166
013270	122767	000011	001160
013276	001401		
013300	007000		
013302	022705	100000	
013306	001401		
013310	007000		
013312	022705	100000	
013316	001401		
013320	000000		

```

SCOPE
MOV      077777,X5
MUL      010000,X5
MOV      3MPS,PSM
CMPB     011,PSM
BEQ      .+4
HLT
CMP      010000,X5
BEQ      .+4
HLT
CMP      010000,X5:1
BEQ      .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAN WITH 77777
;MULTIPLY 77777 * 8100000
;SAVE PS
;IS PS = 11

;PS IS WRONG
;IS HIGH ORDER = 100000

;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000

;LOW ORDER IS WRONG

```



```

*****
;TEST 177  MUL  -1 * 877777 = 100001 100001  PS = 10
*****

```

```

013322 010701
013324 012705 177777
013326 070527 077777
013328 013367 177776 001114
013330 122767 000010 001106
013332 001401
013334 001401
013336 001401 100001
013338 001401
013340 001401 100001
013342 001401
013370 001401
013372 000000

```

```

SCOPE
MOV 8-1,XS
MUL 877777,XS
MOV 28PS,PSW
CMPB 810,PSW
BEQ .+4
HLT
CMP 8100001,XS
BEQ .+4
HLT
CMP 8100001,XS!1
BEQ .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH -1
;MULTIPLY -1 * 877777
;SAVE PS
;IS PS = 10
;PS IS WRONG
;IS HIGH ORDER = 100001
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100001
;LOW ORDER IS WRONG

```

```

*****
;TEST 200  MUL  77777 * 877777 = 1 1  PS = 1
*****

```

```

013374 010701
013376 012705 077777
013378 070527 077777
013380 013767 177776 001042
013382 122767 000001 001034
013384 001401
013386 001401
013388 001401 000001
013390 001401
013392 000000
013394 000000
013396 022705 000001
013398 001401
013400 000000

```

```

SCOPE
MOV 877777,XS
MUL 877777,XS
MOV 28PS,PSW
CMPB 81,PSW
BEQ .+4
HLT
CMP 81,XS
BEQ .+4
HLT
CMP 81,XS!1
BEQ .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 77777
;MULTIPLY 77777 * 877777
;SAVE PS
;IS PS = 1
;PS IS WRONG
;IS HIGH ORDER = 1
;HIGH ORDER IS WRONG
;IS LOW ORDER = 1
;LOW ORDER IS WRONG

```

```

*****
:TEST 201 MUL 2 * 82 = 44 PS = 0
*****

```

013446	010701	000002	SCOPE		:TEST OF MULTIPLY
013447	010702	000002	MOV	82,X5	:LOAD MULTIPICAN WITH 2
013448	010703	000002	MUL	82,X5	:MULTIPLY 2 * 82
013450	013767	177776 000770	MOV	28PS,PSW	:SAVE PS
013451	013767	000000 000762	CHPB	80,PSW	:IS PS = 0
013452	001401		BEQ	.+4	
013476	010000		HLT		:PS IS WRONG
013477	010000		CHP	84,X5	:IS HIGH ORDER = 4
013478	001401	000004	BEQ	.+4	
013479	010000		HLT		:HIGH ORDER IS WRONG
013510	012705	000004	CHP	84,X5!1	:IS LOW ORDER = 4
013514	001401		BEQ	.+4	
013516	000000		HLT		:LOW ORDER IS WRONG

013520	012702	040000	MOV	840000,X2
013524	012703	014462	MOV	851,X3
013530	012704	014464	MOV	852,X4

```

*****
:TEST 202 MUL 125252 * S1 = 165252 100000 PS = 11
*****

```

013534	010701		SCOPE		:TEST OF MULTIPLY
013536	012700	125252	MOV	8125252,X0	:LOAD MULTIPICAN WITH 125252
013542	070067	000714	MUL	S1,X0	:MULTIPLY 125252 * S1
013546	013767	177776 000702	MOV	28PS,PSW	:SAVE PS
013554	122767	000011 000674	CHPB	811,PSW	:IS PS = 11
013555	001401		BEQ	.+4	
013556	000000		HLT		:PS IS WRONG
013557	022700	165252	CHP	8165252,X0	:IS HIGH ORDER = 165252
013572	001401		BEQ	.+4	
013574	000000		HLT		:HIGH ORDER IS WRONG
013576	022701	100000	CHP	8100000,X0!1	:IS LOW ORDER = 100000
013602	001401		BEQ	.+4	
013604	000000		HLT		:LOW ORDER IS WRONG


```

*****
:TEST 203 MUL 125252 * 252 = 165252 100000 PS = 11
*****

```

```

013706 010701 125252
013707 000000 000000
013708 000000 000000
013709 000000 000000
013710 000000 000000
013711 000000 000000
013712 000000 000000
013713 000000 000000
013714 000000 000000
013715 000000 000000
013716 000000 000000
013717 000000 000000
013718 000000 000000
013719 000000 000000
013720 000000 000000
013721 000000 000000
013722 000000 000000
013723 000000 000000
013724 000000 000000
013725 000000 000000
013726 000000 000000
013727 000000 000000
013728 000000 000000
013729 000000 000000
013730 000000 000000

```

```

SCOPE
MOV #125252,X0
MUL #252,X0
MOV #PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 125252
:MULTIPLY 125252 * 252
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 165252
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 204 MUL 125252 * 251 = 165252 100000 PS = 11
*****

```

```

013660 010701 125252
013661 000000 000000
013662 000000 000000
013663 000000 000000
013664 000000 000000
013665 000000 000000
013666 000000 000000
013667 000000 000000
013668 000000 000000
013669 000000 000000
013670 000000 000000
013671 000000 000000
013672 000000 000000
013673 000000 000000
013674 000000 000000
013675 000000 000000
013676 000000 000000
013677 000000 000000
013678 000000 000000
013679 000000 000000
013680 000000 000000
013681 000000 000000
013682 000000 000000
013683 000000 000000
013684 000000 000000
013685 000000 000000
013686 000000 000000
013687 000000 000000
013688 000000 000000
013689 000000 000000
013690 000000 000000
013691 000000 000000
013692 000000 000000
013693 000000 000000
013694 000000 000000
013695 000000 000000
013696 000000 000000
013697 000000 000000
013698 000000 000000
013699 000000 000000
013700 000000 000000

```

```

SCOPE
MOV #125252,X0
MUL #251,X0
MOV #PS,PSW
CMPB #11,PSW
BEQ .+4
HLT
:TEST OF MULTIPLY
:LOAD MULTIPLICAND WITH 125252
:MULTIPLY 125252 * 251
:SAVE PS
:IS PS = 11
:PS IS WRONG
:IS HIGH ORDER = 165252
:HIGH ORDER IS WRONG
:IS LOW ORDER = 100000
:LOW ORDER IS WRONG

```

```

*****
:TEST 205 MUL 125252 * X2 = 165252 100000 PS = 11
*****

```

013732	010701			SCOPE		:TEST OF MULTIPLY
013734	012700	125252		MOV	#125252,X0	:LOAD MULTIPLICAND WITH 125252
013740	070023			MUL	X2,X0	:MULTIPLY 125252 * X2
013742	013767	177776	000506	MOV	2#PS,PSW	:SAVE PS
013750	122767	000011	000500	CMPS	#11,PSW	:IS PS = 11
013755	001401			BEQ	.+4	
013760	000000			HLT		:PS IS WRONG
013762	000000	165252		CMPS	#165252,X0	:IS HIGH ORDER = 165252
013765	001401			BEQ	.+4	
013770	000000			HLT		:HIGH ORDER IS WRONG
013772	000001	100000		CMPS	#100000,X0!1	:IS LOW ORDER = 100000
013775	001401			BEQ	.+4	
014000	000000			HLT		:LOW ORDER IS WRONG

```

*****
:TEST 206 MUL 125252 * (3)+ = 165252 100000 PS = 11
*****

```

014002	010701			SCOPE		:TEST OF MULTIPLY
014004	012700	125252		MOV	#125252,X0	:LOAD MULTIPLICAND WITH 125252
014010	070023			MUL	(3)+,X0	:MULTIPLY 125252 * (3)+
014012	013767	177776	000436	MOV	2#PS,PSW	:SAVE PS
014020	122767	000011	000430	CMPS	#11,PSW	:IS PS = 11
014025	001401			BEQ	.+4	
014030	000000			HLT		:PS IS WRONG
014032	022700	165252		CMPS	#165252,X0	:IS HIGH ORDER = 165252
014035	001401			BEQ	.+4	
014040	000000			HLT		:HIGH ORDER IS WRONG
014042	022701	100000		CMPS	#100000,X0!1	:IS LOW ORDER = 100000
014045	001401			BEQ	.+4	
014050	000000			HLT		:LOW ORDER IS WRONG

```

*****
;TEST 207  MUL  125252 * -(3) = 165252 100000  PS = 11
*****

```

```

014052 010701
014054 012700 125252
014056 070043
014062 013767 177776 000366
014070 122767 000011 000360
014076 001401
014100 000000
014102 000000 165252
014106 001401
014110 000000
014112 000000 100000
014116 001401
014120 000000

```

```

SCOPE
MOV  #125252,X0
MUL  -(3),X0
MOV  2*PS,PSW
CMPB #11,PSW
BLO  .+4
HLT
CMP  #165252,X0
BEQ  .+4
HLT
CMP  #100000,X0!1
BEQ  .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 125252
;MULTIPLY 125252 * -(3)
;SAVE PS
;IS PS = 11
;PS IS WRONG
;IS HIGH ORDER = 165252
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000
;LOW ORDER IS WRONG

```

```

*****
;TEST 210  MUL  125252 * 2(4) = 165252 100000  PS = 11
*****

```

```

014122 010701
014124 012700 125252
014130 070064 000002
014134 013767 177776 000314
014142 122767 000011 000306
014150 001401
014152 000000
014154 000000 165252
014160 001401
014162 000000
014164 000000 100000
014170 001401
014172 000000

```

```

SCOPE
MOV  #125252,X0
MUL  2(4),X0
MOV  2*PS,PSW
CMPB #11,PSW
BLO  .+4
HLT
CMP  #165252,X0
BEQ  .+4
HLT
CMP  #100000,X0!1
BEQ  .+4
HLT

```

```

;TEST OF MULTIPLY
;LOAD MULTIPLICAND WITH 125252
;MULTIPLY 125252 * 2(4)
;SAVE PS
;IS PS = 11
;PS IS WRONG
;IS HIGH ORDER = 165252
;HIGH ORDER IS WRONG
;IS LOW ORDER = 100000
;LOW ORDER IS WRONG

```

```

*****
;TEST 211  MUL  125252 * 2(4) = 165252 100000  PS = 11
*****

```

014174	010701			SCOPE		;TEST OF MULTIPLY
014176	012700	125252		MOV	#125252,X0	;LOAD MULTIPLICAND WITH 125252
014202	070074	000000		MUL	2(4),X0	;MULTIPLY 125252 * 2(4)
014206	013767	177776	000242	MOV	2#PS,PSW	;SAVE PS
014214	122767	000011	000234	CMPS	11,PSW	;IS PS = 11
014222	001401			BEQ	.+4	
014224	000000			HLT		;PS IS WRONG
014226	022700	165252		CMPS	#165252,X0	;IS HIGH ORDER = 165252
014232	001401			BEQ	.+4	
014234	000000			HLT		;HIGH ORDER IS WRONG
014236	022701	100000		CMPS	#100000,X0!1	;IS LOW ORDER = 100000
014242	001401			BEQ	.+4	
014244	000000			HLT		;LOW ORDER IS WRONG

```

*****
;TEST 212  MUL  125252 * 2(4)+ = 165252 100000  PS = 11
*****

```

014246	010701			SCOPE		;TEST OF MULTIPLY
014250	012700	125252		MOV	#125252,X0	;LOAD MULTIPLICAND WITH 125252
014254	070034			MUL	2(4)+,X0	;MULTIPLY 125252 * 2(4)+
014256	013767	177776	000172	MOV	2#PS,PSW	;SAVE PS
014264	122767	000011	000164	CMPS	11,PSW	;IS PS = 11
014272	001401			BEQ	.+4	
014274	000000			HLT		;PS IS WRONG
014276	022700	165252		CMPS	#165252,X0	;IS HIGH ORDER = 165252
014302	001401			BEQ	.+4	
014304	000000			HLT		;HIGH ORDER IS WRONG
014306	022701	100000		CMPS	#100000,X0!1	;IS LOW ORDER = 100000
014312	001401			BEQ	.+4	
014314	000000			HLT		;LOW ORDER IS WRONG

```

*****
TEST 213 MUL 125252 * 2-(4) = 165252 100000 PS = 11
*****

```

014316	010701			SCOPE			
014317	012700	125252		MOV	#125252,X0		;TEST OF MULTIPLY
014318	07054			MUL	2-(4),X0		;LOAD MULTIPLICAND WITH 125252
014326	013767	177776	000122	MOV	2#PS,PSW		;MULTIPLY 125252 * 2-(4)
014334	122767	000011	000114	CMPB	#11,PSW		;SAVE PS
014343	001401			BEQ	.+4		;IS PS = 11
014344	000000			HLT			
014346	000000	165252		CMP	#165252,X0		;PS IS WRONG
014372	001401			BEQ	.+4		;IS HIGH ORDER = 165252
014374	000000			HLT			
014376	000000	100000		CMP	#100000,X0!1		;HIGH ORDER IS WRONG
014362	001401			BEQ	.+4		;IS LOW ORDER = 100000
014364	000000			HLT			;LOW ORDER IS WRONG

014366	005267	164406		INC	ICNT		
014372	016737	164402	177570	MOV	ICNT,2#DISPLAY		
014400	022767	020000	164372	CMP	#20000,ICNT		
014406	001402			BEQ	.+6		
014410	000167	164366		JMP	BEG		
014414	000067	164360		CLR	ICNT		
014420	100737	177564		TSTB	2#177564		
014424	100375			BPL	.-4		
014426	112737	000007	177566	MOVB	#7,2#177566		
014434	013700	000042		MOV	2#42,X0		;GET MONITOR RETURN ADDRESS
014440	001404			BEQ	1\$		;SKIP IF NONE
014442	004710			JSR	7,(0)		;GO BACK TO THE MONITOR
014444	000240			NOP			
014446	000240			NOP			
014450	000240			NOP			
014452	000137	000200		JMP	2#200		;RESTART THE PROGRAM

014456	000000			PSW:	0
014460	177777			S0:	-1
014462	040000			S1:	40000
014464	014462			S2:	S1
014466	040000			S3:	40000

000001

.END

K06

 MAINDEC-11-DCKBK-A MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 76
 DCKBKA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

 BEG 001002
 DISPLA= 177570
 HLT = 000000

137	141#	2800											
132#	2797#												
126#	160	163	166	179	182	185	198	201	204	217	220	223	
236	239	242	255	258	261	274	277	280	293	296	299	312	
315	318	331	334	337	340	353	356	369	372	375	368	391	
394	407	410	413	416	419	432	445	448	451	464	467	470	
483	416	489	502	505	508	521	524	527	540	543	546	559	
562	565	578	581	584	597	600	603	616	619	622	635	638	
641	654	657	660	673	676	679	692	695	698	711	714	717	
730	733	736	749	752	755	768	771	774	787	790	793	806	
819	812	815	818	831	834	847	850	853	866	869	882	885	
838	901	904	907	920	923	926	939	942	955	958	961	964	
977	910	983	986	999	1002	1015	1018	1021	1034	1037	1040	1053	
1056	1019	1072	1075	1078	1091	1094	1097	1110	1113	1116	1129	1132	
1135	1148	1151	1154	1167	1170	1173	1186	1189	1192	1205	1208	1211	
1224	1227	1230	1243	1246	1249	1262	1265	1268	1281	1284	1287	1300	
1303	1316	1319	1322	1325	1338	1341	1344	1357	1360	1363	1376	1379	
1322	1395	1353	1401	1414	1417	1420	1433	1436	1439	1452	1455	1458	
1471	1474	1477	1490	1493	1496	1509	1512	1515	1528	1531	1534	1547	
1550	1553	1556	1569	1572	1575	1588	1591	1604	1607	1610	1623	1626	
1629	1642	1645	1648	1661	1664	1667	1680	1683	1686	1699	1702	1705	
1718	1721	1724	1737	1740	1743	1756	1759	1762	1775	1778	1781	1794	
1797	1800	1813	1816	1819	1832	1835	1838	1851	1854	1857	1870	1873	
1876	1879	1892	1895	1908	1911	1914	1917	1930	1933	1946	1949	1952	
1965	1968	1971	1984	1987	1990	1993	1996	2009	2012	2025	2028	2041	
2044	2047	2060	2063	2066	2079	2082	2085	2098	2101	2104	2117	2120	
2123	2136	2139	2142	2155	2158	2161	2174	2177	2180	2193	2196	2199	
2212	2215	2218	2231	2234	2237	2240	2243	2246	2259	2262	2275	2278	
2291	2294	2297	2310	2313	2316	2319	2322	2325	2338	2341	2344	2357	
2370	2373	2376	2389	2392	2395	2398	2401	2404	2417	2420	2423	2436	
2459	2462	2465	2478	2481	2484	2497	2500	2503	2516	2519	2522	2535	
2538	2541	2544	2557	2560	2563	2576	2579	2582	2595	2598	2611	2614	
2621	2634	2637	2640	2653	2656	2669	2672	2675	2688	2691	2704	2707	
2710	2713	2716	2729	2732	2735	2748	2751	2754	2767	2770	2773	2786	
2789	2792	2795	2798	2801#	2804#	2807#	2810#	2813#	2816#	2819#	2822#	2825#	
139#	2796#	2797	2798	2801#	2804#	2807#	2810#	2813#	2816#	2819#	2822#	2825#	
134#	150	169	183	207	226	245	264	283	302	321	340	359	
378	397	416	435	454	473	492	511	530	549	568	587	606	
625	644	663	682	701	720	739	758	777	796	815	834	853	
872	891	910	929	948	967	986	1005	1024	1043	1062	1081	1100	
1119	1138	1157	1176	1195	1214	1233	1252	1271	1290	1309	1328	1347	
1366	1385	1404	1423	1442	1461	1480	1499	1518	1537	1556	1575	1594	
1613	1632	1651	1670	1689	1708	1727	1746	1765	1784	1803	1822	1841	
1860	1879	1898	1917	1936	1955	1974	1993	2012	2031	2050	2069	2088	
2107	2126	2145	2164	2183	2202	2221	2240	2259	2278	2297	2316	2335	
2354	2373	2392	2411	2430	2449	2468	2487	2506	2525	2544	2563	2582	
2601#													
128#	150	169#	188#	207#	226#	245#	264#	283#	302#	321#	340#	359#	
378#	397#	416#	435#	454#	473#	492#	511#	530#	549#	568#	587#	606#	
625#	644#	663#	682#	701#	720#	739#	758#	777#	796#	815#	834#	853#	
872#	891#	910#	929#	948#	967#	986#	1005#	1024#	1043#	1062#	1081#	1100#	
1119#	1138#	1157#	1176#	1195#	1214#	1233#	1252#	1271#	1290#	1309#	1328#	1347#	
1366#	1385#	1404#	1423#	1442#	1461#	1480#	1499#	1518#	1537#	1556#	1575#	1594#	
1613#	1632#	1651#	1670#	1689#	1708#	1727#	1746#	1765#	1784#	1803#	1822#	1841#	
1860#	1879#	1898#	1917#	1936#	1955#	1974#	1993#	2012#	2031#	2050#	2069#	2088#	
2107#	2126#	2145#	2164#	2183#	2202#	2221#	2240#	2259#	2278#	2297#	2316#	2335#	

 ICNT 001000
 M = 000006

N = 000214

L06

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DCKBKA.P1: CROSS REFERENCE TABLE -- USER SYMBOLS

		2354#	2373#	2392#	2411#	2430#	2449#	2468#	2487#	2506#	2525#	2544#	2563#	2582#
PC	=%000007	2601#	2605	2624#	2643#	2662#	2681#	2700#	2719#	2738#	2757#	2776#	2795#	
PS	= 177776	130#	142#	145#	157	176	195	214	233	252	271	290	309	328
		347	366	385	404	423	442	461	480	499	518	537	556	575
		594	613	632	651	670	689	709	727	746	765	784	803	822
		841	860	879	898	917	936	955	974	993	1012	1031	1050	1069
		1088	1107	1126	1145	1164	1183	1202	1221	1240	1259	1278	1297	1316
		1335	1354	1373	1392	1411	1430	1449	1468	1487	1506	1525	1544	1563
		1582	1601	1620	1639	1658	1677	1696	1715	1734	1753	1772	1791	1810
		1829	1848	1867	1886	1905	1924	1943	1962	1981	2000	2019	2038	2057
		2076	2095	2114	2133	2152	2171	2190	2209	2228	2247	2266	2285	2304
		2323	2342	2361	2380	2399	2418	2437	2456	2475	2494	2513	2532	2551
PSM	014456	2570	2589	2608	2627	2646	2665	2684	2703	2722	2741	2760	2779	2798
		157#	169#	176#	177	177	177	214#	215	233#	234	234	234	271#
		272	291	291	309#	310	310	329	347#	348	366#	367	367	386
		404#	423#	423#	424	442#	443	461#	462	480#	481	499#	500	518#
		519	537#	537	556#	557	575#	576	594#	595	613#	614	632#	633
		651#	670#	670#	671	689#	690	708#	709	727#	728	746#	747	765#
		766	784#	785	803#	804	822#	841#	842	860#	861	879#	898	917
		858#	879	897#	918	936#	955	974#	975	993#	994	1012#	1031	1050
		1013	1031#	1032	1050#	1051	1069#	1070	1089	1107#	1108	1126#	1145	1164
		1145#	1146	1164#	1165	1183#	1184	1202#	1221#	1222	1240#	1241	1259#	1278
		1260	1278#	1279	1297#	1298	1316#	1317	1335#	1354#	1355	1373#	1392	1411
		1392#	1393	1411#	1412	1430#	1431	1449#	1468#	1487#	1506#	1525#	1544#	1563#
		1507	1525#	1526	1544#	1545	1563#	1564	1582#	1601#	1620#	1639#	1658#	1677#
		1639#	1640	1658#	1659	1677#	1678	1696#	1715#	1734#	1753#	1772#	1791#	1810#
		1754	1772#	1773	1791#	1792	1810#	1811	1829#	1848#	1867#	1886#	1905#	1924#
		1886#	1887	1905#	1906	1924#	1925	1943#	1962#	1981#	2000#	2019#	2038#	2057#
		2001	2019#	2020	2038#	2039	2057#	2058	2076#	2095#	2114#	2133#	2152#	2171#
		2133#	2134	2152#	2153	2171#	2172	2190#	2209#	2228#	2247#	2266#	2285#	2304#
		2248	2266#	2267	2285#	2286	2304#	2305	2323#	2342#	2361#	2380#	2399#	2418#
		2323#	2342#	2361#	2380#	2399#	2418#	2437#	2456#	2475#	2494#	2513#	2532#	2551#
		2495	2513#	2514	2532#	2533	2551#	2552	2570#	2589#	2608#	2627#	2646#	2665#
		2631#	2632	2650#	2651	2669#	2670	2688#	2707#	2726#	2745#	2764#	2783#	2802#
SCOPE = 010701		2746	2764#	2765	2783#	2784	2802#	2821#	2840#	2859#	2878#	2897#	2916#	2935#
		127#	154	173	192	211	230	249	268	287	306	325	344	363
		382	401	420	439	458	477	496	515	534	553	572	591	610
		629	648	667	686	705	724	743	762	781	800	819	838	857
		876	895	914	933	952	971	990	1009	1028	1047	1066	1085	1104
		1123	1142	1161	1180	1199	1218	1237	1256	1275	1294	1313	1332	1351
		1370	1389	1408	1427	1446	1465	1484	1503	1522	1541	1560	1579	1598
		1617	1636	1655	1674	1693	1712	1731	1750	1769	1788	1807	1826	1845
		1864	1883	1902	1921	1940	1959	1978	1997	2016	2035	2054	2073	2092
		2111	2130	2149	2168	2187	2206	2225	2244	2263	2282	2301	2320	2339
		2358	2377	2396	2415	2434	2453	2472	2491	2510	2529	2548	2567	2586
		2609	2628	2647	2666	2685	2704	2723	2742	2761	2780	2799	2818	2837
SP	=%000006	129#	132	143	146	148								
SWR	= 177570	131#												
SO	014460	2814#												
SI	014462	2602	2611	2649	2815#	2816								
SS	014464	2603	2630	2816#										
SS	014466	2817#												
.	= 014470	124#	125	136#	138#	144	147	159	162	165	178	181	184	197
		200	203	216	219	222	235	238	241	254	257	260	273	276
		279	292	295	298	311	314	317	330	333	336	349	352	355

MO6

MAINDEC-11-DCKB 2 MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 78
DCKBKA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

356	371	374	387	390	393	406	409	412	425	428	431	444
450	463	466	469	482	485	495	501	504	507	509	523	523
539	542	545	558	561	564	577	577	583	583	583	583	583
618	621	634	637	640	653	656	659	672	675	678	691	691
697	710	713	716	729	732	735	748	751	754	767	770	770
786	789	792	805	808	811	824	827	830	843	846	849	849
855	858	881	884	897	900	913	916	919	922	935	938	938
944	957	960	963	976	979	992	995	998	1001	1014	1017	1017
1033	1036	1039	1052	1055	1058	1071	1074	1077	1090	1093	1096	1096
1112	1115	1128	1131	1134	1147	1150	1153	1166	1169	1172	1185	1185
1191	1204	1207	1210	1223	1226	1229	1242	1245	1248	1261	1264	1264
1267	1280	1283	1296	1299	1302	1315	1321	1324	1337	1340	1343	1343
1356	1359	1362	1375	1378	1391	1394	1397	1400	1413	1416	1419	1432
1435	1438	1451	1454	1457	1470	1473	1476	1489	1492	1495	1508	1511
1514	1527	1530	1533	1546	1549	1552	1565	1568	1571	1584	1587	1590
1603	1606	1609	1622	1625	1628	1641	1644	1647	1660	1663	1676	1679
1682	1685	1698	1701	1704	1717	1720	1723	1736	1739	1742	1755	1758
1761	1774	1777	1780	1793	1796	1799	1812	1815	1818	1831	1834	1837
1850	1853	1856	1869	1872	1875	1888	1891	1894	1907	1910	1913	1926
1929	1932	1945	1948	1951	1964	1967	1970	1983	1986	1989	2002	2005
2019	2021	2024	2027	2040	2043	2046	2059	2062	2065	2078	2081	2084
2097	2100	2103	2116	2119	2122	2135	2138	2141	2154	2157	2160	2173
2176	2179	2192	2195	2198	2211	2214	2217	2230	2233	2236	2249	2252
2255	2258	2271	2274	2287	2290	2293	2306	2309	2312	2325	2328	2331
2344	2347	2350	2363	2366	2369	2382	2385	2398	2401	2404	2407	2420
2423	2426	2439	2442	2445	2458	2461	2464	2477	2480	2483	2496	2499
2502	2515	2518	2521	2534	2537	2540	2553	2556	2559	2572	2575	2578
2591	2594	2597	2614	2617	2620	2633	2636	2639	2652	2655	2658	2671
2674	2677	2690	2693	2696	2709	2712	2715	2728	2731	2734	2747	2750
2753	2766	2769	2772	2785	2788	2791	2799	2803				

MAINDEC-11-DCKBK-A MUL TEST MACY11 27(732) 07-SEP-76 09:41 PAGE 80
DCKBKA.P11 CROSS REFERENCE TABLE -- MACRO NAMES

[illegible]

BCO

BIT
BPL
CLR
CMP

CMPB

CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

LIST	NOP	TSTB	IFNO	IF	TOP	END	END
701	117	2719	2145	2186	1575	1203	1033
416	455	2730	2145	2186	1575	1203	1033
720	125	2738	2145	2186	1575	1203	1033
435	169	2738	2145	2186	1575	1203	1033
739	154	2757	2183	2183	1613	1043	1033
454	188	2757	2183	2183	1613	1043	1033
758	473	2776	2202	2202	1632	1062	1033
492	207	2776	2202	2202	1632	1062	1033
777	511	2776	2202	2202	1632	1062	1033
492	226	2776	2202	2202	1632	1062	1033
796	511	2776	2202	2202	1632	1062	1033
815	530	2776	2202	2202	1632	1062	1033
834	559	2776	2202	2202	1632	1062	1033
853	587	2776	2202	2202	1632	1062	1033
872	606	2776	2202	2202	1632	1062	1033
891	625	2776	2202	2202	1632	1062	1033
910	644	2776	2202	2202	1632	1062	1033
929	663	2776	2202	2202	1632	1062	1033
948	682	2776	2202	2202	1632	1062	1033
967	701	2776	2202	2202	1632	1062	1033

	986 1271 1556 1841 2126 2411 2700	1005 1270 1556 1841 2145 2430 2719	1024 1309 1594 1879 2164 2449 2738	1043 1328 1613 1898 2183 2468 2757	1062 1347 1632 1917 2202 2487 2776	1081 1366 1651 1936 2221 2506 2795	1100 1385 1670 1955 2240 2525 2814	1119 1404 1689 1974 2259 2544 2833	1138 1423 1708 1993 2278 2563 2852	1157 1442 1727 2012 2297 2582 2871	1176 1461 1746 2031 2316 2601 2890	1195 1480 1765 2050 2335 2624 2909	1214 1499 1784 2069 2354 2643 2928	1233 1518 1803 2088 2373 2662 2947	1252 1537 1822 2107 2392 2681 2966
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RUN-TIME RATIO: 102/37=2.7
CORE USED: 7K (14 PAGES)

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~~Speaker, meeting @ 8 weeks, 90-95% SWR. Next week, 2 first visits, 10 pages~~