The University of Alabama in Huntsville ECE Department CPE 221 01 Spring 2019 Homework #7 Solution

Consider the code given below for a function that calculates a recursive sum, both the C++ and the ARM assembly language versions. Trace the values of the registers shown as they change during program execution. Also, trace the changes to the stack by showing the instruction that affects the stack, the location of the stack and frame pointers, and the full contents of the stack after the instruction has been executed. You may use the file given for tracking or do it on your own paper.

```
int sum (int);
int main()
{
   int x;
   x = sum(5);
}
int sum(int i)
{
   if (i<=1)
      return 1;
   else
      return i + sum(i-1);
}</pre>
```

```
RECURSIVE_SUM, CODE, READONLY
     AREA
     ENTRY
main
               lr, #60
                                                ; (0)
      mov
               sp, #0
      mov
                                                 (4)
               fp, #0x0000C000;
                                                 (8)
      mov
                                                 (12)
      push
               {lr}
      push
               {fp}
                                                 (16)
                                                 (20)
      add
               fp, sp, #4
      sub
               sp, sp, #8
                                                ; (24)
      mov
               r0, #5
                                                ; (28)
      bl
                                                ; (32)
               sum
      str
               r0, [fp, #-8]
                                                 (36)
               r3, #0
                                                 (40)
      mov
      mov
               r0, r3
                                                 (44)
               sp, fp, #4
                                                 (48)
      sub
               {fp}
                                                ; (52)
      pop
                                                ; (56)
               {pc}
      pop
stop
      b
                stop
                                                ; (60)
sum
               {lr}
                                                 (64)
      push
      push
               {fp}
                                                ; (68)
      add
               fp, sp, #4
                                                 (72)
               sp, sp, #8
                                                 (76)
      sub
      str
               r0, [fp, #-8]
                                                 (80)
      ldr
               r3, [fp, #-8]
                                                ; (84)
      cmp
               r3, #1
                                                ; (88)
               L2
      bgt
                                                 (92)
      mov
               r3, #1
                                                 (96)
               L3
                                                ; (100)
      b
L2
               r3, [fp, #-8]
      ldr
                                                ; (104)
      sub
               r3, r3, #1
                                                 (108)
      mov
               r0, r3
                                                ; (112)
      bl
               sum
                                                ; (116)
               r2, r0
                                                ; (120)
      mov
      ldr
               r3, [fp, #-8]
                                                ; (124)
      add
               r3, r2, r3
                                                ; (128)
L3
               r0, r3
      mov
                                                ; (132)
      sub
               sp, fp, #4
                                                ; (136)
      pop
               {fp}
                                                ; (140)
                                                ; (144)
      pop
               {pc}
      END
```

1	Address	Value
1	1	value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	
	FFFF FFFC	
4 mov	sp, #0, sp	= 0

2	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
·	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	
	FFFF FFFC	
3 mov	fp, #0x000	000000
5	Δddress	Value

3	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	
sp	FFFF FFFC	60
12 pus	sh {lr}	

4	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
	FFFF FFF0	
	FFFF FFF4	
sp	FFFF FFF8	0xC000
	FFFF FFFC	60
16	<pre>push {fp}</pre>	

-	A -l -l	1/-1
5	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
	FFFF FFF0	
	FFFF FFF4	
sp	FFFF FFF8	0xC000
fp	FFFF FFFC	60
20 add	l fp, sp, #4	4

6	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
	FFFF FFEC	
sp	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xc000
fp	FFFF FFFC	60
24 suk	sp, sp #8	3

7	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	
sp	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
fp	FFFF FFFC	60

64 push {lr}

		1
10	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
sp	FFFF FFEO	
	FFFF FFE4	
	FFFF FFE8	0xFFFC
fp	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
76 sub	sp, sp,	#8

FFFF FFB0
FFFF FFB8
FFFF FFBC
FFFF FFC0

Address

FFFF FFA4 FFFF FFA8 FFFF FFAC Value

FFFF FFEA

FFFF FFEA

FFFF FFCA

FFFF FFCC

FFFF FFCC

FFFF FFDO

FFFF FFDA

FFFF FFDB

FFFF FFDC

SP

FFFF FFEA

FFFF FFEA

FFFF FFEA

FFFF FFEA

SNFFFC

FFFF FFF8 0xC000
FFFF FFFC 60
80 str r0, [fp, #-8]

FFFF FFEC

FFFF FFF0 FFFF FFF4 36

fp

Address Value FFFF FFA0 FFFF FFA4 FFFF FFA8 FFFF FFAC FFFF FFB0 FFFF FFB4 FFFF FFB8 FFFF FFBC FFFF FFC0 FFFF FFC4 FFFF FFC8 FFFF FFCC FFFF FFD0 FFFF FFD4 FFFF FFD8 FFFF FFDC FFFF FFE0 FFFF FFE4 FFFF FFE8 **OxFFFC** sp FFFF FFEC 36 FFFF FFF0 FFFF FFF4 FFFF FFF8 0xC000 FFFF FFFC **60**

68 push {fp}

9	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
	FFFF FFDC	
	FFFF FFEO	
	FFFF FFE4	
sp	FFFF FFE8	0xFFFC
fp	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

72 add fp, sp, #4

12	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	
sp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
fp	FFFF FFEC	3 6
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

64 push {lr}

13	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
sp	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	OxFFFC
fp	FFFF FFEC	3 6
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

68 push {fp}

16	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
sp	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
80 str	r0, [fp,	#-8]

14	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
	FFFF FFD0	
	FFFF FFD4	
sp	FFFF FFD8	OxFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	3 6
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

72 add fp, sp #4

17	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
sp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
64 pus	h (lr)	

64 push {lr}

	1	1
15	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	
	FFFF FFCC	
sp	FFFF FFD0	
	FFFF FFD4	
	FFFF FFD8	OxFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
761		40

76 sub sp, sp, #8

18	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
sp	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
68 pus	sh {fp}	

68 push {fp}

19	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
	FFFF FFC0	
	FFFF FFC4	
sp	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
72 add	l fp, sp,	#4

	I	
22	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
sp	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

64 push {lr}

20	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
sp	FFFF FFC0	
	FFFF FFC4	
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
76 euh	en en #8	2

76	sub	sp,	sp,	#8
----	-----	-----	-----	----

23	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
sp	FFFF FFB8	OxFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
68 pus	sh (fp)	

68 push (fp)

	1	1
21	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
	FFFF FFAC	
	FFFF FFB0	
	FFFF FFB4	
	FFFF FFB8	
	FFFF FFBC	
sp	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
80 sti	r0, [fp,	#-8]

FFFF FFA0 FFFF FFA4 FFFF FFA8 FFFF FFAC FFFF FFB0 FFFF FFB4 FFFF FFB8 **OxFFCC** sp fp FFFF FFBC 120 FFFF FFC0 FFFF FFC4 3 FFFF FFC8 0xFFDC 120 FFFF FFCC FFFF FFD0 FFFF FFD4 4 FFFF FFD8 **OxFFEC** FFFF FFDC 120 FFFF FFE0 FFFF FFE4 FFFF FFE8 0xFFFC FFFF FFEC **36** FFFF FFF0 FFFF FFF4 FFFF FFF8 0xC000

Address

Value

24

72 add fp, sp, #4

FFFF FFFC

60

Address

FFFF FFA0 FFFF FFA4 FFFF FFA8 FFFF FFAC

26

Value

25 Address Value FFFF FFA0 FFFF FFA4 FFFF FFA4 FFFF FFA8 FFFF FFAC FFFF FFAC Sp FFFF FFB0 FFFF FFB4 FFFF FFB4 FFFF FFB6 120 FFFF FFC0 FFFF FFC FFFF FFC4 3 FFFF FFC6 120 FFFF FFCC 120 FFFF FFD0 FFFF FFD0 FFFF FFD0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFF0 FFFF FFF0 FFFF FFF0 FFFF FFF0 FFFF FFFC 60 76 Sub Sp, Sp #8		•	
FFFF FFE S OXFFFC FFFF FFE S OXFFFC FFFF FFE S OXFFC FFFF FFE S OXFFC FFFF FFC S OXFFFC FFFF FFC S OXFFC FFFF FFC S OXCOOO FFFF FFFC G O	25	Address	Value
FFFF FFE S OXCOOO FFFF FFF C 120 FFFF FF FF C 120 FFFF FF FF C 120 FFFF FF C 120 FFFF FF C 120 FFFF FF C 120 FFFF FF C		FFFF FFA0	
### FFF FF		FFFF FFA4	
SP FFFF FFB0 FFFF FFB4 FFFF FFB4 FFFF FFB4 FFFF FFB0 FFFF FFBC 120 FFFF FFC0 FFFF FFC4 FFFF FFC8 OxFFDC FFFF FFCC 120 FFFF FFD0 FFFF FFD4 FFFF FFD0 120 FFFF FFD0 120 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFF0 FFFF FFF0 FFFF FFF4 FFFF FFF6 FFFF FFFC 60		FFFF FFA8	
FFFF FFE S OXFFCC fp FFFF FFF S OXFFCC FFFF FFC S OXFFDC FFFF FFD S OXFFEC FFFF FFD S OXFFEC FFFF FFD S OXFFC FFFF FFE S OXFFFC FFFF FFE S OXFFFC FFFF FFE S OXFFFC FFFF FFF S OXCOOO FFFF FFF S OXCOOO FFFF FFFC GO		FFFF FFAC	
fp FFFF FFBC 120 FFFF FFBC 120 FFFF FFCO FFFF FFCO FFFF FFCA 3 FFFF FFCA 0xFFDC FFFF FFCC 120 FFFF FFDO 0xFFEC FFFF FFDA 0xFFEC FFFF FFDC 120 FFFF FFEO FFFF FFEO FFFF FFEO FFFF FFE FFFF FFEC 36 FFFF FFFO FFFF FFFO FFFF FFFA FFFF FFFA FFFF FFFC 60	sp	FFFF FFB0	
fp FFFF FFBC 120 FFFF FFC0 FFFF FFC0 3 FFFF FFC4 3 FFFF FFC4 3 FFFF FFC8 0xFFDC 120 FFFF FFD0 FFFF FFD4 4 4 FFFF FFD8 0xFFFC FFFF FFD 120 FFFF FFE0 FFFF FFE4 5 FFFF FFE FFFF FFC FFFF FFE0 FFFF FFFC 36 FFFF FFFC 36 FFFF FFFC FFFF FFFA FFFF FFFC 60 60 FFFF FFFC 60		FFFF FFB4	
FFFF FFC		FFFF FFB8	0xFFCC
FFFF FFC	fp	FFFF FFBC	120
FFFF FFC		FFFF FFC0	
FFFF FFC 120		FFFF FFC4	3
FFFF FFF FFF FFF FFF FFF FFF FFF FFF F		FFFF FFC8	0xFFDC
FFFF FFF 60 FFFF FFF 60 FFFF FFE 60 FFFF FFE 60 FFFF FFE 70 FFFF FFE 70 FFFF FFE 70 FFFF FFF 70 FFFF 70 FFFF FFF 70 FFFF 7		FFFF FFCC	120
FFFF FFD8		FFFF FFD0	
FFFF FFFC 120 FFFF FFE0 FFFF FFE4 5 FFFF FFE8 0xFFFC FFFF FFEC 36 FFFF FFFO FFFF FFF4 FFFF FFF8 0xC000 FFFF FFFC 60		FFFF FFD4	4
FFFF FFE 0 FFFF FFE 4 5 FFFF FFE 8 0xFFFC FFFF FFE 7 36 FFFF FFF 7 56 FFFF FFF 7 60 FFFF FFF 7 60 FFFF FFF 7 60		FFFF FFD8	0xFFEC
FFFF FFE4 5 FFFF FFE8 0xFFFC FFFF FFFC 36 FFFF FFF0 FFFF FFF4 FFFF FFF8 0xC000 FFFF FFFC 60		FFFF FFDC	120
FFFF FFE8		FFFF FFEO	
FFFF FFFC 36 FFFF FFF0 FFFF FFF4 FFFF FFF8 0xC000 FFFF FFFC 60		FFFF FFE4	5
FFFF FFF		FFFF FFE8	0xFFFC
FFFF FFF		FFFF FFEC	36
FFFF FFFC 60		FFFF FFF0	
FFFF FFFC 60		FFFF FFF4	
		FFFF FFF8	0xC000
76 sub sp, sp #8		FFFF FFFC	60
	76 sub	sp, sp #8	8

		TITITIAC	
	sp	FFFF FFB0	
		FFFF FFB4	2
		FFFF FFB8	0xFFCC
	fp	FFFF FFBC	120
		FFFF FFC0	
		FFFF FFC4	3
		FFFF FFC8	0xFFDC
		FFFF FFCC	120
		FFFF FFD0	
		FFFF FFD4	4
		FFFF FFD8	OxFFEC
		FFFF FFDC	120
		FFFF FFEO	
		FFFF FFE4	5
		FFFF FFE8	OxFFFC
		FFFF FFEC	36
		FFFF FFF0	
		FFFF FFF4	
		FFFF FFF8	0xC000
		FFFF FFFC	60
80	str	r0, [fp,	#-8]
	29	Address	Value
		FFFF FFA0	
		FFFF FFA4	
	sp	FFFF FFA8	0xFFBC
	fp	FFFF FFAC	120
		FFFF FFB0	
		FFFF FFB4	2
		FFFF FFB8	0xFFCC
		FFFF FFBC	120
		FFFF FFC0	

0 str	r0, [fp,	#-8]
29	Address	Value
	FFFF FFA0	
	FFFF FFA4	
sp	FFFF FFA8	0xFFBC
fp	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
72 add	d fp, sp,	#4

27	Address	Value
	FFFF FFA0	
	FFFF FFA4	
	FFFF FFA8	
sp	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	OxFFCC
fp	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
·	FFFF FFE8	0xFFFC
·	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
_	FFFF FFFC	60

04 push (III)	64	push	(lr)
---------------	----	------	------

30	Address	Value	
sp	FFFF FFA0		
	FFFF FFA4	FFFF FFA4	
	FFFF FFA8	0xFFBC	
fp	FFFF FFAC	120	
	FFFF FFB0		
	FFFF FFB4	2	
	FFFF FFB8	OxFFCC	
	FFFF FFBC	120	
	FFFF FFC0		
	FFFF FFC4	3	
	FFFF FFC8 OxFFDC		
	FFFF FFCC	120	
	FFFF FFD0		
	FFFF FFD4	4	
	FFFF FFD8	OxFFEC	
	FFFF FFDC	120	
	FFFF FFEO		
	FFFF FFE4	5	
	FFFF FFE8	0xFFFC	
	FFFF FFEC	36	
	FFFF FFF0		
	FFFF FFF4		
	FFFF FFF8	0xC000	
	FFFF FFFC	60	
76 su	b sp, sp,	#8	

sub sp, sp, #8

Address

Value

28

3	31	Address	Value	
		FFFF FFA0	value	
3	р	FFFF FFA4	1	
			_	
		FFFF FFA8	0xFFBC	
Ţ	p	FFFF FFAC	120	
		FFFF FFB0		
		FFFF FFB4	2	
		FFFF FFB8	0xFFCC	
		FFFF FFBC	120	
		FFFF FFC0		
		FFFF FFC4	3	
		FFFF FFC8	0xFFDC	
		FFFF FFCC	120	
		FFFF FFD0		
		FFFF FFD4	4	
		FFFF FFD8	OxFFEC	
		FFFF FFDC	120	
		FFFF FFEO		
		FFFF FFE4	5	
		FFFF FFE8	0xFFFC	
		FFFF FFEC	36	
		FFFF FFF0		
		FFFF FFF4		
		FFFF FFF8	0xC000	
		FFFF FFFC	60	
30	str	r0, [fp,	#-8]	

34	Address Value		
	FFFF FFA0		
	FFFF FFA4 1		
	FFFF FFA8	OxFFBC	
	FFFF FFAC	120	
sp	FFFF FFB0		
	FFFF FFB4	2	
	FFFF FFB8	OxFFCC	
fp	FFFF FFBC	120	
	FFFF FFC0		
	FFFF FFC4	3	
	FFFF FFC8	0xFFDC	
	FFFF FFCC	120	
	FFFF FFD0		
	FFFF FFD4	4	
	FFFF FFD8	0xFFEC	
	FFFF FFDC	120	
	FFFF FFEO		
	FFFF FFE4	5	
	FFFF FFE8	0xFFFC	
·	FFFF FFEC	36	
	FFFF FFFO		
	FFFF FFF4		
	FFFF FFF8	0xC000	
	FFFF FFFC	60	

22	A ddracc	Value
32	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
sp	FFFF FFA8	0xFFBC
fp	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4 2	
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

136	sub	sp,	fp,	#4
-----	-----	-----	-----	----

35 Address Value FFFF FFA0 FFFF FFA0 FFFF FFA4 1 FFFF FFA4 1 1 2 FFFF FFAC 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 120 <th></th> <th></th> <th></th>			
FFFF FFE FFFF FFF FFFF FFF FFFF FFFFF FFFFFF	35	Address	Value
FFFF FFE S OXFFEC FFFF FFF FFF S OXFFCC FFFF FFF FF S OXFFCC FFFF FF FF S OXCOOO FFFF FFF S OXCOOO	FFFF FFA0		
FFFF FFE SOXFFFC FFFF FFF FFF FFF FFF FFF FFF FFF FF		FFFF FFA4 1	
FFFF FFE S OXFFC SFFFF FFF S OXFFF SFFF SFF S OXFFF SFFF S		FFFF FFA8	0xFFBC
sp FFFF FFB8 OxFFCC fp FFFF FFBC 120 FFFF FFC0 FFFF FFC 120 FFFF FFC4 3 FFFF FFC FFFF FFC8 OxFFDC 120 FFFF FFD0 FFFF FFD 120 FFFF FFD0 FFFF FFD 120 FFFF FFE0 FFFF FFE0 FFFF FFE FFFF FFE4 FFFF FFE 36 FFFF FFF0 FFFF FFF0 FFFF FFF4 FFFF FFF8 OxC000 FFFF FFFC 60 FFFF FFFC 60		FFFF FFAC	120
Sp FFFF FFB8 OxFFCC fp FFFF FFBC 120 FFFF FFC0 FFFF FFC 120 FFFF FFC4 3 FFFF FFC FFFF FFC6 120 FFFF FFDC FFFF FFD0 FFFF FFD0 FFFF FFD FFFF FFD0 FFFF FFE 120 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFF0 FFFF FFF0 FFFF FFF0 FFFF FFF4 FFFF FFF8 OxC000 FFFF FFFC 60		FFFF FFB0	
fp FFFF FFBC 120 FFFF FFC0 FFFF FFC0 3 FFFF FFC4 3 FFFF FFC4 3 FFFF FFC8 0xFFDC 120 FFFF FFDQ 120 FFFF FFD0 120 FFFF FFEQ FFFF FFFQ FFFF FFFC 60		FFFF FFB4	2
FFFF FFC	sp	FFFF FFB8	0xFFCC
FFFF FFC	fp	FFFF FFBC	120
FFFF FFC		FFFF FFC0	
FFFF FFC		FFFF FFC4	3
FFFF FFD0 FFFF FFD4 FFFF FFD8 OXFFEC FFFF FFDC FFFF FFE0 FFFF FFE4 FFFF FFE8 FFFF FFEC FFFF FFFC FFFFF FFFC FFFF FFF		FFFF FFC8	0xFFDC
FFFF FFF FFF FFF FFF FFF FFF FFF FFF F		FFFF FFCC	120
FFFF FFF S OXFFEC FFFF FFDC 120 FFFF FFEC 120 FFFF FFEC 5 FFFF FFEC 36 FFFF FFFC 560 FFFF FFFC 60		FFFF FFD0	
FFFF FFFC 120		FFFF FFD4	4
FFFF FFE0 FFFF FFE4 FFFF FFE8 OXFFFC FFFF FFEC FFFF FFF0 FFFF FFF4 FFFF FFF8 OXCOOO FFFF FFFC 60		FFFF FFD8	OxFFEC
FFFF FFF		FFFF FFDC	120
FFFF FFE		FFFF FFEO	
FFFF FFEC 36 FFFF FFF0 FFFF FFF4 FFFF FFF8 0xC000 FFFF FFFC 60		FFFF FFE4	5
FFFF FFF0 FFFF FFF8 FFFF FFFC FFFF FFFC 60		FFFF FFE8	0xFFFC
FFFF FFF4 FFFF FFF8		FFFF FFEC	36
FFFF FFF 60		FFFF FFF0	
FFFF FFFC 60		FFFF FFF4	
		FFFF FFF8	0xC000
136 sub sp, fp, #4		FFFF FFFC	60
	136 su	sp, fp,	#4

33 Address Value FFFF FFA0 FFFF FFA4 1 FFFF FFA8 **OxFFBC** FFFF FFAC 120 sp FFFF FFB0 FFFF FFB4 2 FFFF FFB8 **OxFFCC** 120 fp FFFF FFBC FFFF FFC0 3 FFFF FFC4 FFFF FFC8 **0xFFDC** FFFF FFCC 120 FFFF FFD0 FFFF FFD4 4 FFFF FFD8 **OxFFEC** 120 FFFF FFDC FFFF FFE0 FFFF FFE4 5 FFFF FFE8 **OxFFFC** FFFF FFEC **36** FFFF FFF0 FFFF FFF4 0xC000 FFFF FFF8 FFFF FFFC 60

140 pop (fp)

36	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
sp	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
140 pc	n (fn)	

140 pop {fp}

37	Address	Value
37	FFFF FFA0	value
		4
	FFFF FFA4 1	
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
sp	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
144 p	{pq} qo	

		FFFF FFF8
		FFFF FFFC
144	pc	op {pc}

40	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	OxFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
sp	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	3 6
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

144 pop {pc}

38	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
sp	FFFF FFC8	0xFFDC
fp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
136 su	ib sp, fp,	#4

136	sub	sp,	fp,	#4

41	Address	Value
71	FFFF FFA0	value
	_	4
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
sp	FFFF FFD8	0xFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
136 sı	ıb sp. fp.	#4

136 sub sp, fp, #4

39	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
sp	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
fp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

140 pop {fp}

42	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
sp	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
fp	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
140 pc	fg}}	

140 pop {fp}

43	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	OxFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
sp	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
fp	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60
1// 200	n (nc)	

144	pop +	[pc]

Address	Value
FFFF FFA0	
FFFF FFA4	1
FFFF FFA8	0xFFBC
FFFF FFAC	120
FFFF FFB0	
FFFF FFB4	2
FFFF FFB8	0xFFCC
FFFF FFBC	120
FFFF FFC0	
FFFF FFC4	3
FFFF FFC8	0xFFDC
FFFF FFCC	120
FFFF FFD0	
FFFF FFD4	4
FFFF FFD8	0xFFEC
FFFF FFDC	120
FFFF FFEO	
FFFF FFE4	5
FFFF FFE8	0xFFFC
FFFF FFEC	36
FFFF FFFO	
FFFF FFF4	15
FFFF FFF8	0xC000
FFFF FFFC	60
r0, [fp,	#-8]
	FFFF FFA0 FFFF FFA4 FFFF FFA8 FFFF FFAC FFFF FFB0 FFFF FFB4 FFFF FFBC FFFF FFC0 FFFF FFD0 FFFF FFD0 FFFF FFD0 FFFF FFD0 FFFF FFD0 FFFF FFC0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFE0 FFFF FFFE

4.4	A -l -l	1/-1
44	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
sp	FFFF FFE8	0xFFFC
fp	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

136	sub	sp,	fp,	#4
-----	-----	-----	-----	----

47	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
sp	FFFF FFF8	0xC000
fp	FFFF FFFC	60
48 sub	sp, fp,	#4

45	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
sp	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
fp	FFFF FFFC	60
140	pop {fp}	

48	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	OxFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFF0	
	FFFF FFF4	
	FFFF FFF8	0xC000
sp	FFFF FFFC	60
52 por	{fp}, fp :	$= 0 \times C000$

49	Address	Value
	FFFF FFA0	
	FFFF FFA4	1
	FFFF FFA8	0xFFBC
	FFFF FFAC	120
	FFFF FFB0	
	FFFF FFB4	2
	FFFF FFB8	0xFFCC
	FFFF FFBC	120
	FFFF FFC0	
	FFFF FFC4	3
	FFFF FFC8	0xFFDC
	FFFF FFCC	120
	FFFF FFD0	
	FFFF FFD4	4
	FFFF FFD8	0xFFEC
	FFFF FFDC	120
	FFFF FFEO	
	FFFF FFE4	5
	FFFF FFE8	0xFFFC
	FFFF FFEC	36
	FFFF FFFO	
	FFFF FFF4	
	FFFF FFF8	0xC000
	FFFF FFFC	60

56 pop {pc} sp = 0

Register Contents

r0	5	4	3	2	1	3	6	10	15	0			
r2	1	3	6	10									
r3	5	4	3	2	1	2	3	6	4	10	5	15	0
lr	60	36	120	120	120	120	120						

sp	0x0000 0000	OxFFFF FFFC	0xFFFF FFF8	0xFFFF FFF0	OxFFFF FFEC	0xFFFF FFE8
sp	OxFFFF FFEO	0xFFFF FFDC	0xFFFF FFD8	0xFFFF FFD0	0xFFFF FFCC	0xFFFF FFC8
sp	0xFFFF FFC0	0xFFFF FFBC	0xFFFF FFB8	0xFFFF FFB0	0xFFFF FFAC	0xFFFF FFA8
sp	0xFFFF FFA0	0xFFFF FFA8	0xFFFF FFAC	0xFFFF FFB0	0xFFFF FFB8	OxFFFF FFBC
sp	0xFFFF FFC0	0xFFFF FFC8	OxFFFF FFCC	0xFFFF FFD0	0xFFFF FFD8	0xFFFF FFDC
sp	0xFFFF FFE0	0xFFFF FFE8	OxFFFF FFEC	0xFFFF FFF0	0xFFFF FFF8	OxFFFF FFFC
sp	0x0000 0000					

fp	0x0000 C000	OxFFFF FFFC	OxFFFF FFEC	OxFFFF FFDC	0xFFFF FFCC	OxFFFF FFBC
fp	OxFFFF FFAC	OxFFFF FFBC	OxFFFF FFCC	OxFFFF FFDC	OxFFFF FFEC	OxFFFF FFFC
fp	0x0000 C000					
fp						