Petit FatFs Module Application Note

Basic Considerations

The FatFs module is assuming following conditions on portability.

- ANSI C
  The FatFs module is a middleware written in ANSI C (C89). There is no platform dependence, so long as the compiler is in compliance with ANSI C.
- Size of integer types
  The FatFs module assumes that size of char/short/long are 8/16/32 bit and int is 16 or 32 bit. These correspondence are defined in `integer.h`. This will not be a problem on most compilers. When any conflict with existing definitions is occured, you must resolve it with care.

Memory Usage (R0.03)

	AVR	x86
Compiler	gcc(WinAVR)	VC6
_WORD_ACCESS	1	1
Code (default)	2020	1589
Code (!_USE_READ)	-428	-236
Code (_USE_DIR)	+564	+415
Code (_USE_LSEEK)	+490	+228
Code (_USE_WRITE)	+516	+323
RAM (bss)	2	4
RAM (work)	42	44

`_FS_FAT16` is 1. `_FS_FAT12`, `_FS_FAT32` and `_USE_LCC` are 0. This is the size of the Petit FatFs module itself. In addition to this, a low level disk I/O module will be required for a complete function. The size of MMC/SDC module on AVR becomes approximate 620 bytes without write function and 840 bytes with write function.

Module Size Reduction

Follwing table shows which function is removed by configuration options for the module size reduction.

Function	_USE_READ 0	_USE_DIR 0	_USE_LSEEK 0	_USE_WRITE 0
pf_mount				
pf_open				
pf_read	x			
pf_lseek			x	
pf_opendir		x		
pf_readdir		x		
pf_write				x

Performance effective file access

For good performance on reading a file on the small embedded system, application programmer should consider what process is done in the file system module.

The Petit FatFs reads the disk sectors without a sector buffer. This means the file system reads a part of the sector contains the required data every reference point even if they are in the same sector. However the generic storage device are not byte addressable so that the disk I/O layer will read the entire sector and pick up the data bytes from the read data steram.

When read 512 byte data from a file at a time, the data sector will be read only a time. When read that data in byte-by-byte, the data sector will be read 512 times. Therefore the byte-by-byte read request will drastically decrease the read performance. To avoid this stupid read controls, the file data should be read in long block as possible. Sector alignment access is not impotant on the Petit FatFs.

The tiny microcontrollers targeted by Petit FatFs has a limited size of RAM. It may not able to allocate a certain size of read buffer and most type of text processing will require byte-by-byte read operation. The Petit FatFs supports data forwarding feature for such purpose.

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```
/*----------------------------------------------------------------------------/
/  Petit FatFs - FAT file system module  R0.03                  (C)ChaN, 2014
/-----------------------------------------------------------------------------/
/ Petit FatFs module is a generic FAT file system module for small embedded
/ systems. This is a free software that opened for education, research and
/ commercial developments under license policy of following trems.
/
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```

```
/
/----------------------------------------------------------------------------/
```

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