5.9.3. Flash Memory Commands

5.9.3.1. cp - memory copy

```
=> help cp

cp - memory copy


Usage:

cp [.b, .w, .l] source target count

=> help cp

cp - memory copy


Usage:

cp [.b, .w, .l] source target count

=>
```

The `cp` command "knows" about flash memory areas and will automatically invoke the necessary flash programming algorithm when the target area is in flash memory.

```
=> cp.b 0x100000 0xFF900000 0x40000

Copy to Flash... done

=>
```

⚠ Writing to flash memory may fail when the target area has not been erased (see `erase` below), or if it is write-protected (see `protect` below).

```
=> cp.b 0x100000 0xFF900000 0x40000

Copy to Flash... Can't write to protected Flash sectors

=>
```

⚠ Remember that the *count* argument specifies the number of items to copy. If you have a "length" instead (= byte count) you should use `cp.b` or you will have to calculate the correct number of items.

5.9.3.2. flinfo - print FLASH memory information

The command `flinfo` (short: `fli`) can be used to get information about the available flash memory. The number of flash banks is printed with information about the size and organization into flash "sectors" or *erase units*. For all sectors the start addresses are printed; write-protected sectors are marked as read-only `(RO)`. Some configurations of U-Boot also mark empty sectors with an `(E)`.

```
=> fli
```

```
Bank # 1: CFI conformant FLASH (16 x 16)  Size: 64 MB in 512 Sectors

  AMD Standard command set, Manufacturer ID: 0x01, Device ID: 0x227E

  Erase timeout: 16384 ms, write timeout: 2 ms

  Buffer write timeout: 5 ms, buffer size: 32 bytes


  Sector Start Addresses:

  FC000000     FC020000     FC040000     FC060000     FC080000

  FC0A0000     FC0C0000     FC0E0000     FC100000     FC120000

  FC140000     FC160000     FC180000     FC1A0000     FC1C0000 E

  FC1E0000     FC200000     FC220000     FC240000     FC260000

  FC280000     FC2A0000     FC2C0000     FC2E0000     FC300000

  FC320000     FC340000     FC360000     FC380000     FC3A0000

  FC3C0000 E    FC3E0000 E    FC400000 E    FC420000 E    FC440000 E

  FC460000 E    FC480000 E    FC4A0000 E    FC4C0000 E    FC4E0000 E

  FC500000 E    FC520000 E    FC540000 E    FC560000 E    FC580000 E

  FC5A0000 E    FC5C0000 E    FC5E0000 E    FC600000 E    FC620000 E

  FC640000 E    FC660000 E    FC680000 E    FC6A0000 E    FC6C0000 E

  FC6E0000 E    FC700000 E    FC720000 E    FC740000 E    FC760000 E

  FC780000 E    FC7A0000 E    FC7C0000 E    FC7E0000 E    FC800000 E

  FC820000 E    FC840000 E    FC860000 E    FC880000 E    FC8A0000 E

  FC8C0000 E    FC8E0000 E    FC900000 E    FC920000 E    FC940000 E

  FC960000 E    FC980000 E    FC9A0000 E    FC9C0000 E    FC9E0000 E

  FCA00000 E    FCA20000 E    FCA40000 E    FCA60000 E    FCA80000 E

  FCAA0000 E    FCAC0000 E    FCAE0000 E    FCB00000 E    FCB20000 E

  FCB40000 E    FCB60000 E    FCB80000 E    FCBA0000 E    FCBC0000 E

  FCBE0000 E    FCC00000 E    FCC20000 E    FCC40000 E    FCC60000 E

  FCC80000 E    FCCA0000 E    FCCC0000 E    FCCE0000 E    FCD00000 E

  FCD20000 E    FCD40000 E    FCD60000 E    FCD80000 E    FCDA0000 E

  FCDC0000 E    FCDE0000 E    FCE00000 E    FCE20000 E    FCE40000 E

  FCE60000 E    FCE80000 E    FCEA0000 E    FCEC0000 E    FCEE0000 E

  FCF00000 E    FCF20000 E    FCF40000 E    FCF60000 E    FCF80000 E

  FCFA0000 E    FCFC0000 E    FCFE0000 E    FD000000 E    FD020000 E

  FD040000 E    FD060000 E    FD080000 E    FD0A0000 E    FD0C0000 E

  FD0E0000 E    FD100000 E    FD120000 E    FD140000 E    FD160000 E

  FD180000 E    FD1A0000 E    FD1C0000 E    FD1E0000 E    FD200000 E
```

FD220000 E	FD240000 E	FD260000 E	FD280000 E	FD2A0000 E
FD2C0000 E	FD2E0000 E	FD300000 E	FD320000 E	FD340000 E
FD360000 E	FD380000 E	FD3A0000 E	FD3C0000 E	FD3E0000 E
FD400000 E	FD420000 E	FD440000 E	FD460000 E	FD480000 E
FD4A0000 E	FD4C0000 E	FD4E0000 E	FD500000 E	FD520000 E
FD540000 E	FD560000 E	FD580000 E	FD5A0000 E	FD5C0000 E
FD5E0000 E	FD600000	FD620000 E	FD640000 E	FD660000 E
FD680000 E	FD6A0000 E	FD6C0000 E	FD6E0000 E	FD700000 E
FD720000 E	FD740000 E	FD760000 E	FD780000 E	FD7A0000 E
FD7C0000 E	FD7E0000 E	FD800000 E	FD820000 E	FD840000 E
FD860000 E	FD880000 E	FD8A0000 E	FD8C0000 E	FD8E0000 E
FD900000 E	FD920000 E	FD940000 E	FD960000 E	FD980000 E
FD9A0000 E	FD9C0000 E	FD9E0000 E	FDA00000 E	FDA20000 E
FDA40000 E	FDA60000 E	FDA80000 E	FDAA0000 E	FDAC0000 E
FDAE0000 E	FDB00000 E	FDB20000 E	FDB40000 E	FDB60000 E
FDB80000 E	FDBA0000 E	FDBC0000 E	FDBE0000 E	FDC00000 E
FDC20000 E	FDC40000 E	FDC60000 E	FDC80000 E	FDCA0000 E
FDCC0000 E	FDCE0000 E	FDD00000 E	FDD20000 E	FDD40000 E
FDD60000 E	FDD80000 E	FDDA0000 E	FDDC0000 E	FDDE0000 E
FDE00000 E	FDE20000 E	FDE40000 E	FDE60000 E	FDE80000 E
FDEA0000 E	FDEC0000 E	FDEE0000 E	FDF00000 E	FDF20000 E
FDF40000 E	FDF60000 E	FDF80000 E	FDFA0000 E	FDFC0000 E
FDFE0000 E	FE000000 E	FE020000 E	FE040000 E	FE060000 E
FE080000 E	FE0A0000 E	FE0C0000 E	FE0E0000 E	FE100000 E
FE120000 E	FE140000 E	FE160000 E	FE180000 E	FE1A0000 E
FE1C0000 E	FE1E0000 E	FE200000 E	FE220000 E	FE240000 E
FE260000 E	FE280000 E	FE2A0000 E	FE2C0000 E	FE2E0000 E
FE300000 E	FE320000 E	FE340000 E	FE360000 E	FE380000 E
FE3A0000 E	FE3C0000 E	FE3E0000 E	FE400000 E	FE420000 E
FE440000 E	FE460000 E	FE480000 E	FE4A0000 E	FE4C0000 E
FE4E0000 E	FE500000 E	FE520000 E	FE540000 E	FE560000 E
FE580000 E	FE5A0000 E	FE5C0000 E	FE5E0000 E	FE600000 E
FE620000 E	FE640000 E	FE660000 E	FE680000 E	FE6A0000 E
FE6C0000 E	FE6E0000 E	FE700000 E	FE720000 E	FE740000 E
FE760000 E	FE780000 E	FE7A0000 E	FE7C0000 E	FE7E0000 E
FE800000 E	FE820000 E	FE840000 E	FE860000 E	FE880000 E

FE8A0000 E	FE8C0000 E	FE8E0000 E	FE900000 E	FE920000 E
FE940000 E	FE960000 E	FE980000 E	FE9A0000 E	FE9C0000 E
FE9E0000 E	FEA00000 E	FEA20000 E	FEA40000 E	FEA60000 E
FEA80000 E	FEAA0000 E	FEAC0000 E	FEAE0000 E	FEB00000 E
FEB20000 E	FEB40000 E	FEB60000 E	FEB80000 E	FEBA0000 E
FEBC0000 E	FEBE0000 E	FEC00000 E	FEC20000 E	FEC40000 E
FEC60000 E	FEC80000 E	FECA0000 E	FECC0000 E	FECE0000 E
FED00000 E	FED20000 E	FED40000 E	FED60000 E	FED80000 E
FEDA0000 E	FEDC0000 E	FEDE0000 E	FEE00000 E	FEE20000 E
FEE40000 E	FEE60000 E	FEE80000 E	FEEA0000 E	FEEC0000 E
FEEE0000 E	FEF00000 E	FEF20000 E	FEF40000 E	FEF60000 E
FEF80000 E	FEFA0000 E	FEFC0000 E	FEFE0000 E	FF000000 E
FF020000 E	FF040000 E	FF060000 E	FF080000 E	FF0A0000 E
FF0C0000 E	FF0E0000 E	FF100000 E	FF120000 E	FF140000 E
FF160000 E	FF180000 E	FF1A0000 E	FF1C0000 E	FF1E0000 E
FF200000 E	FF220000 E	FF240000 E	FF260000 E	FF280000 E
FF2A0000 E	FF2C0000 E	FF2E0000 E	FF300000 E	FF320000 E
FF340000 E	FF360000 E	FF380000 E	FF3A0000 E	FF3C0000 E
FF3E0000 E	FF400000 E	FF420000 E	FF440000 E	FF460000 E
FF480000 E	FF4A0000 E	FF4C0000 E	FF4E0000 E	FF500000 E
FF520000 E	FF540000 E	FF560000 E	FF580000 E	FF5A0000 E
FF5C0000 E	FF5E0000 E	FF600000 E	FF620000 E	FF640000 E
FF660000 E	FF680000 E	FF6A0000 E	FF6C0000 E	FF6E0000 E
FF700000 E	FF720000 E	FF740000 E	FF760000 E	FF780000 E
FF7A0000 E	FF7C0000 E	FF7E0000 E	FF800000 E	FF820000 E
FF840000 E	FF860000 E	FF880000 E	FF8A0000 E	FF8C0000 E
FF8E0000 E	FF900000 E	FF920000 E	FF940000 E	FF960000 E
FF980000 E	FF9A0000 E	FF9C0000 E	FF9E0000 E	FFA00000 E
FFA20000 E	FFA40000 E	FFA60000 E	FFA80000 E	FFAA0000 E
FFAC0000 E	FFAE0000 E	FFB00000 E	FFB20000 E	FFB40000 E
FFB60000 E	FFB80000 E	FFBA0000 E	FFBC0000 E	FFBE0000 E
FFC00000 E	FFC20000 E	FFC40000 E	FFC60000 E	FFC80000 E
FFCA0000 E	FFCC0000 E	FFCE0000 E	FFD00000 E	FFD20000 E
FFD40000 E	FFD60000 E	FFD80000 E	FFDA0000 E	FFDC0000 E
FFDE0000 E	FFE00000 E	FFE20000 E	FFE40000 E	FFE60000 E
FFE80000 E	FFEA0000 E	FFEC0000 E	FFEE0000 E	FFF00000 E

```
   FFF20000 E       FFF40000 E       FFF60000   RO       FFF80000    RO       FFFA0000    RO

   FFFC0000   RO       FFFE0000    RO

=>
```

5.9.3.3. erase - erase FLASH memory

```
=> help era

erase - erase FLASH memory


Usage:

erase start end

    - erase FLASH from addr 'start' to addr 'end'

erase start +len

    - erase FLASH from addr 'start' to the end of sect w/addr 'start'+'len'-1

erase N:SF[-SL]

    - erase sectors SF-SL in FLASH bank # N

erase bank N

    - erase FLASH bank # N

erase all

    - erase all FLASH banks

=>
```

The `erase` command (short: `era`) is used to erase the contents of one or more sectors of the flash memory. It is one of the more complex commands; the `help` output shows this.

Probably the most frequent usage of this command is to pass the start and end addresses of the area to be erased:

```
=> era 0xFF900000 0xFF95FFFF



... done

Erased 3 sectors

=>
```

⚠ Note that both the start and end addresses for this command must point **exactly** at the start resp. end addresses of flash sectors. Otherwise the command will not be executed.

Another way to select certain areas of the flash memory for the `erase` command uses the notation of flash *banks* and *sectors*:

Technically speaking, a *bank* is an area of memory implemented by one or more memory chips that are connected to the same *chip select* signal of the CPU, and a flash *sector* or *erase unit* is the smallest area that can be erased in one operation.

For practical purposes it is sufficient to remember that with flash memory a bank is something that eventually may be erased as a whole in a single operation. This may be more efficient (faster) than erasing the same area sector by sector.

[It depends on the actual type of flash chips used on the board if such a fast bank erase algorithm exists, and on the implementation of the flash device driver if is actually used.]

In U-Boot, flash banks are numbered starting with 1, while flash sectors start with 0.

To erase the same flash area as specified using start and end addresses in the example above you could also type:

```
=> era 1:455-456

Erase Flash Sectors 455-456 in Bank # 1

.. done

=>
```

To erase a whole bank of flash memory you can use a command like this one:

```
=> era bank 1

Erase Flash Bank # 1 - Warning: 5 protected sectors will not be erased!

...............................................................................................
...............................................................................................
...............................................................................................
...............................................................................................
...............................................................................................
.............................................................. done

=>
```

⚠ Note that a warning message is printed because some *write protected* sectors exist in this flash bank which were not erased.

With the command:

```
=> era all

Erase Flash Bank # 1 - Warning: 5 protected sectors will not be erased!

...............................................................................................
...............................................................................................
...............................................................................................
...............................................................................................
...............................................................................................
.............................................................. done

=>
```

the whole flash memory (except for the write-protected sectors) can be erased.

5.9.3.4. protect - enable or disable FLASH write protection

```
=> help protect

protect - enable or disable FLASH write protection


Usage:

protect on  start end

    - protect FLASH from addr 'start' to addr 'end'

protect on start +len

    - protect FLASH from addr 'start' to end of sect w/addr 'start'+'len'-1

protect on  N:SF[-SL]

    - protect sectors SF-SL in FLASH bank # N

protect on  bank N

    - protect FLASH bank # N

protect on  all

    - protect all FLASH banks

protect off start end

    - make FLASH from addr 'start' to addr 'end' writable

protect off start +len

    - make FLASH from addr 'start' to end of sect w/addr 'start'+'len'-1 wrtable

protect off N:SF[-SL]

    - make sectors SF-SL writable in FLASH bank # N

protect off bank N

    - make FLASH bank # N writable

protect off all

    - make all FLASH banks writable

=>
```

The `protect` command is another complex one. It is used to set certain parts of the flash memory to read-only mode or to make them writable again. Flash memory that is "protected" (= read-only) cannot be written (with the `cp` command) or erased (with the `erase` command). Protected areas are marked as `(RO)` (for "read-only") in the output of the `flinfo` command:

```
=> fli



Bank # 1: CFI conformant FLASH (16 x 16)  Size: 64 MB in 512 Sectors
```

```
AMD Standard command set, Manufacturer ID: 0x01, Device ID: 0x227E

Erase timeout: 16384 ms, write timeout: 2 ms

Buffer write timeout: 5 ms, buffer size: 32 bytes


Sector Start Addresses:

FC000000 E     FC020000 E     FC040000 E     FC060000 E     FC080000 E

FC0A0000 E     FC0C0000 E     FC0E0000 E     FC100000 E     FC120000 E

FC140000 E     FC160000 E     FC180000 E     FC1A0000 E     FC1C0000 E

FC1E0000 E     FC200000 E     FC220000 E     FC240000 E     FC260000 E

FC280000 E     FC2A0000 E     FC2C0000 E     FC2E0000 E     FC300000 E

FC320000 E     FC340000 E     FC360000 E     FC380000 E     FC3A0000 E

FC3C0000 E     FC3E0000 E     FC400000 E     FC420000 E     FC440000 E

FC460000 E     FC480000 E     FC4A0000 E     FC4C0000 E     FC4E0000 E

FC500000 E     FC520000 E     FC540000 E     FC560000 E     FC580000 E

FC5A0000 E     FC5C0000 E     FC5E0000 E     FC600000 E     FC620000 E

FC640000 E     FC660000 E     FC680000 E     FC6A0000 E     FC6C0000 E

FC6E0000 E     FC700000 E     FC720000 E     FC740000 E     FC760000 E

FC780000 E     FC7A0000 E     FC7C0000 E     FC7E0000 E     FC800000 E

FC820000 E     FC840000 E     FC860000 E     FC880000 E     FC8A0000 E

FC8C0000 E     FC8E0000 E     FC900000 E     FC920000 E     FC940000 E

FC960000 E     FC980000 E     FC9A0000 E     FC9C0000 E     FC9E0000 E

FCA00000 E     FCA20000 E     FCA40000 E     FCA60000 E     FCA80000 E

FCAA0000 E     FCAC0000 E     FCAE0000 E     FCB00000 E     FCB20000 E

FCB40000 E     FCB60000 E     FCB80000 E     FCBA0000 E     FCBC0000 E

FCBE0000 E     FCC00000 E     FCC20000 E     FCC40000 E     FCC60000 E

FCC80000 E     FCCA0000 E     FCCC0000 E     FCCE0000 E     FCD00000 E

FCD20000 E     FCD40000 E     FCD60000 E     FCD80000 E     FCDA0000 E

FCDC0000 E     FCDE0000 E     FCE00000 E     FCE20000 E     FCE40000 E

FCE60000 E     FCE80000 E     FCEA0000 E     FCEC0000 E     FCEE0000 E

FCF00000 E     FCF20000 E     FCF40000 E     FCF60000 E     FCF80000 E

FCFA0000 E     FCFC0000 E     FCFE0000 E     FD000000 E     FD020000 E

FD040000 E     FD060000 E     FD080000 E     FD0A0000 E     FD0C0000 E

FD0E0000 E     FD100000 E     FD120000 E     FD140000 E     FD160000 E

FD180000 E     FD1A0000 E     FD1C0000 E     FD1E0000 E     FD200000 E

FD220000 E     FD240000 E     FD260000 E     FD280000 E     FD2A0000 E

FD2C0000 E     FD2E0000 E     FD300000 E     FD320000 E     FD340000 E
```

FD360000 E	FD380000 E	FD3A0000 E	FD3C0000 E	FD3E0000 E
FD400000 E	FD420000 E	FD440000 E	FD460000 E	FD480000 E
FD4A0000 E	FD4C0000 E	FD4E0000 E	FD500000 E	FD520000 E
FD540000 E	FD560000 E	FD580000 E	FD5A0000 E	FD5C0000 E
FD5E0000 E	FD600000 E	FD620000 E	FD640000 E	FD660000 E
FD680000 E	FD6A0000 E	FD6C0000 E	FD6E0000 E	FD700000 E
FD720000 E	FD740000 E	FD760000 E	FD780000 E	FD7A0000 E
FD7C0000 E	FD7E0000 E	FD800000 E	FD820000 E	FD840000 E
FD860000 E	FD880000 E	FD8A0000 E	FD8C0000 E	FD8E0000 E
FD900000 E	FD920000 E	FD940000 E	FD960000 E	FD980000 E
FD9A0000 E	FD9C0000 E	FD9E0000 E	FDA00000 E	FDA20000 E
FDA40000 E	FDA60000 E	FDA80000 E	FDAA0000 E	FDAC0000 E
FDAE0000 E	FDB00000 E	FDB20000 E	FDB40000 E	FDB60000 E
FDB80000 E	FDBA0000 E	FDBC0000 E	FDBE0000 E	FDC00000 E
FDC20000 E	FDC40000 E	FDC60000 E	FDC80000 E	FDCA0000 E
FDCC0000 E	FDCE0000 E	FDD00000 E	FDD20000 E	FDD40000 E
FDD60000 E	FDD80000 E	FDDA0000 E	FDDC0000 E	FDDE0000 E
FDE00000 E	FDE20000 E	FDE40000 E	FDE60000 E	FDE80000 E
FDEA0000 E	FDEC0000 E	FDEE0000 E	FDF00000 E	FDF20000 E
FDF40000 E	FDF60000 E	FDF80000 E	FDFA0000 E	FDFC0000 E
FDFE0000 E	FE000000 E	FE020000 E	FE040000 E	FE060000 E
FE080000 E	FE0A0000 E	FE0C0000 E	FE0E0000 E	FE100000 E
FE120000 E	FE140000 E	FE160000 E	FE180000 E	FE1A0000 E
FE1C0000 E	FE1E0000 E	FE200000 E	FE220000 E	FE240000 E
FE260000 E	FE280000 E	FE2A0000 E	FE2C0000 E	FE2E0000 E
FE300000 E	FE320000 E	FE340000 E	FE360000 E	FE380000 E
FE3A0000 E	FE3C0000 E	FE3E0000 E	FE400000 E	FE420000 E
FE440000 E	FE460000 E	FE480000 E	FE4A0000 E	FE4C0000 E
FE4E0000 E	FE500000 E	FE520000 E	FE540000 E	FE560000 E
FE580000 E	FE5A0000 E	FE5C0000 E	FE5E0000 E	FE600000 E
FE620000 E	FE640000 E	FE660000 E	FE680000 E	FE6A0000 E
FE6C0000 E	FE6E0000 E	FE700000 E	FE720000 E	FE740000 E
FE760000 E	FE780000 E	FE7A0000 E	FE7C0000 E	FE7E0000 E
FE800000 E	FE820000 E	FE840000 E	FE860000 E	FE880000 E
FE8A0000 E	FE8C0000 E	FE8E0000 E	FE900000 E	FE920000 E
FE940000 E	FE960000 E	FE980000 E	FE9A0000 E	FE9C0000 E

```
FE9E0000  E        FEA00000  E        FEA20000  E        FEA40000  E        FEA60000  E

FEA80000  E        FEAA0000  E        FEAC0000  E        FEAE0000  E        FEB00000  E

FEB20000  E        FEB40000  E        FEB60000  E        FEB80000  E        FEBA0000  E

FEBC0000  E        FEBE0000  E        FEC00000  E        FEC20000  E        FEC40000  E

FEC60000  E        FEC80000  E        FECA0000  E        FECC0000  E        FECE0000  E

FED00000  E        FED20000  E        FED40000  E        FED60000  E        FED80000  E

FEDA0000  E        FEDC0000  E        FEDE0000  E        FEE00000  E        FEE20000  E

FEE40000  E        FEE60000  E        FEE80000  E        FEEA0000  E        FEEC0000  E

FEEE0000  E        FEF00000  E        FEF20000  E        FEF40000  E        FEF60000  E

FEF80000  E        FEFA0000  E        FEFC0000  E        FEFE0000  E        FF000000  E

FF020000  E        FF040000  E        FF060000  E        FF080000  E        FF0A0000  E

FF0C0000  E        FF0E0000  E        FF100000  E        FF120000  E        FF140000  E

FF160000  E        FF180000  E        FF1A0000  E        FF1C0000  E        FF1E0000  E

FF200000  E        FF220000  E        FF240000  E        FF260000  E        FF280000  E

FF2A0000  E        FF2C0000  E        FF2E0000  E        FF300000  E        FF320000  E

FF340000  E        FF360000  E        FF380000  E        FF3A0000  E        FF3C0000  E

FF3E0000  E        FF400000  E        FF420000  E        FF440000  E        FF460000  E

FF480000  E        FF4A0000  E        FF4C0000  E        FF4E0000  E        FF500000  E

FF520000  E        FF540000  E        FF560000  E        FF580000  E        FF5A0000  E

FF5C0000  E        FF5E0000  E        FF600000  E        FF620000  E        FF640000  E

FF660000  E        FF680000  E        FF6A0000  E        FF6C0000  E        FF6E0000  E

FF700000  E        FF720000  E        FF740000  E        FF760000  E        FF780000  E

FF7A0000  E        FF7C0000  E        FF7E0000  E        FF800000  E        FF820000  E

FF840000  E        FF860000  E        FF880000  E        FF8A0000  E        FF8C0000  E

FF8E0000  E        FF900000  E        FF920000  E        FF940000  E        FF960000  E

FF980000  E        FF9A0000  E        FF9C0000  E        FF9E0000  E        FFA00000  E

FFA20000  E        FFA40000  E        FFA60000  E        FFA80000  E        FFAA0000  E

FFAC0000  E        FFAE0000  E        FFB00000  E        FFB20000  E        FFB40000  E

FFB60000  E        FFB80000  E        FFBA0000  E        FFBC0000  E        FFBE0000  E

FFC00000  E        FFC20000  E        FFC40000  E        FFC60000  E        FFC80000  E

FFCA0000  E        FFCC0000  E        FFCE0000  E        FFD00000  E        FFD20000  E

FFD40000  E        FFD60000  E        FFD80000  E        FFDA0000  E        FFDC0000  E

FFDE0000  E        FFE00000  E        FFE20000  E        FFE40000  E        FFE60000  E

FFE80000  E        FFEA0000  E        FFEC0000  E        FFEE0000  E        FFF00000  E

FFF20000  E        FFF40000  E        FFF60000  RO       FFF80000  RO       FFFA0000  RO

FFFC0000  RO       FFFE0000  RO
```

```
=> prot on 0xFF900000 0xFF97FFFF

Protected 4 sectors
=> fli



Bank # 1: CFI conformant FLASH (16 x 16)  Size: 64 MB in 512 Sectors

  AMD Standard command set, Manufacturer ID: 0x01, Device ID: 0x227E

  Erase timeout: 16384 ms, write timeout: 2 ms

  Buffer write timeout: 5 ms, buffer size: 32 bytes



  Sector Start Addresses:

  FC000000 E      FC020000 E      FC040000 E      FC060000 E      FC080000 E

  FC0A0000 E      FC0C0000 E      FC0E0000 E      FC100000 E      FC120000 E

  FC140000 E      FC160000 E      FC180000 E      FC1A0000 E      FC1C0000 E

  FC1E0000 E      FC200000 E      FC220000 E      FC240000 E      FC260000 E

  FC280000 E      FC2A0000 E      FC2C0000 E      FC2E0000 E      FC300000 E

  FC320000 E      FC340000 E      FC360000 E      FC380000 E      FC3A0000 E

  FC3C0000 E      FC3E0000 E      FC400000 E      FC420000 E      FC440000 E

  FC460000 E      FC480000 E      FC4A0000 E      FC4C0000 E      FC4E0000 E

  FC500000 E      FC520000 E      FC540000 E      FC560000 E      FC580000 E

  FC5A0000 E      FC5C0000 E      FC5E0000 E      FC600000 E      FC620000 E

  FC640000 E      FC660000 E      FC680000 E      FC6A0000 E      FC6C0000 E

  FC6E0000 E      FC700000 E      FC720000 E      FC740000 E      FC760000 E

  FC780000 E      FC7A0000 E      FC7C0000 E      FC7E0000 E      FC800000 E

  FC820000 E      FC840000 E      FC860000 E      FC880000 E      FC8A0000 E

  FC8C0000 E      FC8E0000 E      FC900000 E      FC920000 E      FC940000 E

  FC960000 E      FC980000 E      FC9A0000 E      FC9C0000 E      FC9E0000 E

  FCA00000 E      FCA20000 E      FCA40000 E      FCA60000 E      FCA80000 E

  FCAA0000 E      FCAC0000 E      FCAE0000 E      FCB00000 E      FCB20000 E

  FCB40000 E      FCB60000 E      FCB80000 E      FCBA0000 E      FCBC0000 E

  FCBE0000 E      FCC00000 E      FCC20000 E      FCC40000 E      FCC60000 E

  FCC80000 E      FCCA0000 E      FCCC0000 E      FCCE0000 E      FCD00000 E

  FCD20000 E      FCD40000 E      FCD60000 E      FCD80000 E      FCDA0000 E

  FCDC0000 E      FCDE0000 E      FCE00000 E      FCE20000 E      FCE40000 E

  FCE60000 E      FCE80000 E      FCEA0000 E      FCEC0000 E      FCEE0000 E

  FCF00000 E      FCF20000 E      FCF40000 E      FCF60000 E      FCF80000 E

  FCFA0000 E      FCFC0000 E      FCFE0000 E      FD000000 E      FD020000 E

=> fli
```

FD040000 E	FD060000 E	FD080000 E	FD0A0000 E	FD0C0000 E
FD0E0000 E	FD100000 E	FD120000 E	FD140000 E	FD160000 E
FD180000 E	FD1A0000 E	FD1C0000 E	FD1E0000 E	FD200000 E
FD220000 E	FD240000 E	FD260000 E	FD280000 E	FD2A0000 E
FD2C0000 E	FD2E0000 E	FD300000 E	FD320000 E	FD340000 E
FD360000 E	FD380000 E	FD3A0000 E	FD3C0000 E	FD3E0000 E
FD400000 E	FD420000 E	FD440000 E	FD460000 E	FD480000 E
FD4A0000 E	FD4C0000 E	FD4E0000 E	FD500000 E	FD520000 E
FD540000 E	FD560000 E	FD580000 E	FD5A0000 E	FD5C0000 E
FD5E0000 E	FD600000 E	FD620000 E	FD640000 E	FD660000 E
FD680000 E	FD6A0000 E	FD6C0000 E	FD6E0000 E	FD700000 E
FD720000 E	FD740000 E	FD760000 E	FD780000 E	FD7A0000 E
FD7C0000 E	FD7E0000 E	FD800000 E	FD820000 E	FD840000 E
FD860000 E	FD880000 E	FD8A0000 E	FD8C0000 E	FD8E0000 E
FD900000 E	FD920000 E	FD940000 E	FD960000 E	FD980000 E
FD9A0000 E	FD9C0000 E	FD9E0000 E	FDA00000 E	FDA20000 E
FDA40000 E	FDA60000 E	FDA80000 E	FDAA0000 E	FDAC0000 E
FDAE0000 E	FDB00000 E	FDB20000 E	FDB40000 E	FDB60000 E
FDB80000 E	FDBA0000 E	FDBC0000 E	FDBE0000 E	FDC00000 E
FDC20000 E	FDC40000 E	FDC60000 E	FDC80000 E	FDCA0000 E
FDCC0000 E	FDCE0000 E	FDD00000 E	FDD20000 E	FDD40000 E
FDD60000 E	FDD80000 E	FDDA0000 E	FDDC0000 E	FDDE0000 E
FDE00000 E	FDE20000 E	FDE40000 E	FDE60000 E	FDE80000 E
FDEA0000 E	FDEC0000 E	FDEE0000 E	FDF00000 E	FDF20000 E
FDF40000 E	FDF60000 E	FDF80000 E	FDFA0000 E	FDFC0000 E
FDFE0000 E	FE000000 E	FE020000 E	FE040000 E	FE060000 E
FE080000 E	FE0A0000 E	FE0C0000 E	FE0E0000 E	FE100000 E
FE120000 E	FE140000 E	FE160000 E	FE180000 E	FE1A0000 E
FE1C0000 E	FE1E0000 E	FE200000 E	FE220000 E	FE240000 E
FE260000 E	FE280000 E	FE2A0000 E	FE2C0000 E	FE2E0000 E
FE300000 E	FE320000 E	FE340000 E	FE360000 E	FE380000 E
FE3A0000 E	FE3C0000 E	FE3E0000 E	FE400000 E	FE420000 E
FE440000 E	FE460000 E	FE480000 E	FE4A0000 E	FE4C0000 E
FE4E0000 E	FE500000 E	FE520000 E	FE540000 E	FE560000 E
FE580000 E	FE5A0000 E	FE5C0000 E	FE5E0000 E	FE600000 E
FE620000 E	FE640000 E	FE660000 E	FE680000 E	FE6A0000 E

FE6C0000 E	FE6E0000 E	FE700000 E	FE720000 E	FE740000 E
FE760000 E	FE780000 E	FE7A0000 E	FE7C0000 E	FE7E0000 E
FE800000 E	FE820000 E	FE840000 E	FE860000 E	FE880000 E
FE8A0000 E	FE8C0000 E	FE8E0000 E	FE900000 E	FE920000 E
FE940000 E	FE960000 E	FE980000 E	FE9A0000 E	FE9C0000 E
FE9E0000 E	FEA00000 E	FEA20000 E	FEA40000 E	FEA60000 E
FEA80000 E	FEAA0000 E	FEAC0000 E	FEAE0000 E	FEB00000 E
FEB20000 E	FEB40000 E	FEB60000 E	FEB80000 E	FEBA0000 E
FEBC0000 E	FEBE0000 E	FEC00000 E	FEC20000 E	FEC40000 E
FEC60000 E	FEC80000 E	FECA0000 E	FECC0000 E	FECE0000 E
FED00000 E	FED20000 E	FED40000 E	FED60000 E	FED80000 E
FEDA0000 E	FEDC0000 E	FEDE0000 E	FEE00000 E	FEE20000 E
FEE40000 E	FEE60000 E	FEE80000 E	FEEA0000 E	FEEC0000 E
FEEE0000 E	FEF00000 E	FEF20000 E	FEF40000 E	FEF60000 E
FEF80000 E	FEFA0000 E	FEFC0000 E	FEFE0000 E	FF000000 E
FF020000 E	FF040000 E	FF060000 E	FF080000 E	FF0A0000 E
FF0C0000 E	FF0E0000 E	FF100000 E	FF120000 E	FF140000 E
FF160000 E	FF180000 E	FF1A0000 E	FF1C0000 E	FF1E0000 E
FF200000 E	FF220000 E	FF240000 E	FF260000 E	FF280000 E
FF2A0000 E	FF2C0000 E	FF2E0000 E	FF300000 E	FF320000 E
FF340000 E	FF360000 E	FF380000 E	FF3A0000 E	FF3C0000 E
FF3E0000 E	FF400000 E	FF420000 E	FF440000 E	FF460000 E
FF480000 E	FF4A0000 E	FF4C0000 E	FF4E0000 E	FF500000 E
FF520000 E	FF540000 E	FF560000 E	FF580000 E	FF5A0000 E
FF5C0000 E	FF5E0000 E	FF600000 E	FF620000 E	FF640000 E
FF660000 E	FF680000 E	FF6A0000 E	FF6C0000 E	FF6E0000 E
FF700000 E	FF720000 E	FF740000 E	FF760000 E	FF780000 E
FF7A0000 E	FF7C0000 E	FF7E0000 E	FF800000 E	FF820000 E
FF840000 E	FF860000 E	FF880000 E	FF8A0000 E	FF8C0000 E
FF8E0000 E	FF900000 E RO	FF920000 E RO	FF940000 E RO	FF960000 E RO
FF980000 E	FF9A0000 E	FF9C0000 E	FF9E0000 E	FFA00000 E
FFA20000 E	FFA40000 E	FFA60000 E	FFA80000 E	FFAA0000 E
FFAC0000 E	FFAE0000 E	FFB00000 E	FFB20000 E	FFB40000 E
FFB60000 E	FFB80000 E	FFBA0000 E	FFBC0000 E	FFBE0000 E
FFC00000 E	FFC20000 E	FFC40000 E	FFC60000 E	FFC80000 E
FFCA0000 E	FFCC0000 E	FFCE0000 E	FFD00000 E	FFD20000 E

```
   FFD40000 E      FFD60000 E      FFD80000 E      FFDA0000 E      FFDC0000 E

   FFDE0000 E      FFE00000 E      FFE20000 E      FFE40000 E      FFE60000 E

   FFE80000 E      FFEA0000 E      FFEC0000 E      FFEE0000 E      FFF00000 E

   FFF20000 E      FFF40000 E      FFF60000  RO     FFF80000  RO     FFFA0000  RO

   FFFC0000  RO     FFFE0000  RO
=> era 0xFF900000 0xFF97FFFF
- Warning: 4 protected sectors will not be erased!
 done
Erased 4 sectors
=> prot off 1:455
Un-Protect Flash Sectors 455-455 in Bank # 1
=> fli


Bank # 1: CFI conformant FLASH (16 x 16)  Size: 64 MB in 512 Sectors
  AMD Standard command set, Manufacturer ID: 0x01, Device ID: 0x227E
  Erase timeout: 16384 ms, write timeout: 2 ms
  Buffer write timeout: 5 ms, buffer size: 32 bytes


  Sector Start Addresses:
  FC000000 E      FC020000 E      FC040000 E      FC060000 E      FC080000 E

  FC0A0000 E      FC0C0000 E      FC0E0000 E      FC100000 E      FC120000 E

  FC140000 E      FC160000 E      FC180000 E      FC1A0000 E      FC1C0000 E

  FC1E0000 E      FC200000 E      FC220000 E      FC240000 E      FC260000 E

  FC280000 E      FC2A0000 E      FC2C0000 E      FC2E0000 E      FC300000 E

  FC320000 E      FC340000 E      FC360000 E      FC380000 E      FC3A0000 E

  FC3C0000 E      FC3E0000 E      FC400000 E      FC420000 E      FC440000 E

  FC460000 E      FC480000 E      FC4A0000 E      FC4C0000 E      FC4E0000 E

  FC500000 E      FC520000 E      FC540000 E      FC560000 E      FC580000 E

  FC5A0000 E      FC5C0000 E      FC5E0000 E      FC600000 E      FC620000 E

  FC640000 E      FC660000 E      FC680000 E      FC6A0000 E      FC6C0000 E

  FC6E0000 E      FC700000 E      FC720000 E      FC740000 E      FC760000 E

  FC780000 E      FC7A0000 E      FC7C0000 E      FC7E0000 E      FC800000 E

  FC820000 E      FC840000 E      FC860000 E      FC880000 E      FC8A0000 E

  FC8C0000 E      FC8E0000 E      FC900000 E      FC920000 E      FC940000 E

  FC960000 E      FC980000 E      FC9A0000 E      FC9C0000 E      FC9E0000 E

  FCA00000 E      FCA20000 E      FCA40000 E      FCA60000 E      FCA80000 E
```

FCAA0000 E	FCAC0000 E	FCAE0000 E	FCB00000 E	FCB20000 E
FCB40000 E	FCB60000 E	FCB80000 E	FCBA0000 E	FCBC0000 E
FCBE0000 E	FCC00000 E	FCC20000 E	FCC40000 E	FCC60000 E
FCC80000 E	FCCA0000 E	FCCC0000 E	FCCE0000 E	FCD00000 E
FCD20000 E	FCD40000 E	FCD60000 E	FCD80000 E	FCDA0000 E
FCDC0000 E	FCDE0000 E	FCE00000 E	FCE20000 E	FCE40000 E
FCE60000 E	FCE80000 E	FCEA0000 E	FCEC0000 E	FCEE0000 E
FCF00000 E	FCF20000 E	FCF40000 E	FCF60000 E	FCF80000 E
FCFA0000 E	FCFC0000 E	FCFE0000 E	FD000000 E	FD020000 E
FD040000 E	FD060000 E	FD080000 E	FD0A0000 E	FD0C0000 E
FD0E0000 E	FD100000 E	FD120000 E	FD140000 E	FD160000 E
FD180000 E	FD1A0000 E	FD1C0000 E	FD1E0000 E	FD200000 E
FD220000 E	FD240000 E	FD260000 E	FD280000 E	FD2A0000 E
FD2C0000 E	FD2E0000 E	FD300000 E	FD320000 E	FD340000 E
FD360000 E	FD380000 E	FD3A0000 E	FD3C0000 E	FD3E0000 E
FD400000 E	FD420000 E	FD440000 E	FD460000 E	FD480000 E
FD4A0000 E	FD4C0000 E	FD4E0000 E	FD500000 E	FD520000 E
FD540000 E	FD560000 E	FD580000 E	FD5A0000 E	FD5C0000 E
FD5E0000 E	FD600000 E	FD620000 E	FD640000 E	FD660000 E
FD680000 E	FD6A0000 E	FD6C0000 E	FD6E0000 E	FD700000 E
FD720000 E	FD740000 E	FD760000 E	FD780000 E	FD7A0000 E
FD7C0000 E	FD7E0000 E	FD800000 E	FD820000 E	FD840000 E
FD860000 E	FD880000 E	FD8A0000 E	FD8C0000 E	FD8E0000 E
FD900000 E	FD920000 E	FD940000 E	FD960000 E	FD980000 E
FD9A0000 E	FD9C0000 E	FD9E0000 E	FDA00000 E	FDA20000 E
FDA40000 E	FDA60000 E	FDA80000 E	FDAA0000 E	FDAC0000 E
FDAE0000 E	FDB00000 E	FDB20000 E	FDB40000 E	FDB60000 E
FDB80000 E	FDBA0000 E	FDBC0000 E	FDBE0000 E	FDC00000 E
FDC20000 E	FDC40000 E	FDC60000 E	FDC80000 E	FDCA0000 E
FDCC0000 E	FDCE0000 E	FDD00000 E	FDD20000 E	FDD40000 E
FDD60000 E	FDD80000 E	FDDA0000 E	FDDC0000 E	FDDE0000 E
FDE00000 E	FDE20000 E	FDE40000 E	FDE60000 E	FDE80000 E
FDEA0000 E	FDEC0000 E	FDEE0000 E	FDF00000 E	FDF20000 E
FDF40000 E	FDF60000 E	FDF80000 E	FDFA0000 E	FDFC0000 E
FDFE0000 E	FE000000 E	FE020000 E	FE040000 E	FE060000 E
FE080000 E	FE0A0000 E	FE0C0000 E	FE0E0000 E	FE100000 E

FE120000 E	FE140000 E	FE160000 E	FE180000 E	FE1A0000 E
FE1C0000 E	FE1E0000 E	FE200000 E	FE220000 E	FE240000 E
FE260000 E	FE280000 E	FE2A0000 E	FE2C0000 E	FE2E0000 E
FE300000 E	FE320000 E	FE340000 E	FE360000 E	FE380000 E
FE3A0000 E	FE3C0000 E	FE3E0000 E	FE400000 E	FE420000 E
FE440000 E	FE460000 E	FE480000 E	FE4A0000 E	FE4C0000 E
FE4E0000 E	FE500000 E	FE520000 E	FE540000 E	FE560000 E
FE580000 E	FE5A0000 E	FE5C0000 E	FE5E0000 E	FE600000 E
FE620000 E	FE640000 E	FE660000 E	FE680000 E	FE6A0000 E
FE6C0000 E	FE6E0000 E	FE700000 E	FE720000 E	FE740000 E
FE760000 E	FE780000 E	FE7A0000 E	FE7C0000 E	FE7E0000 E
FE800000 E	FE820000 E	FE840000 E	FE860000 E	FE880000 E
FE8A0000 E	FE8C0000 E	FE8E0000 E	FE900000 E	FE920000 E
FE940000 E	FE960000 E	FE980000 E	FE9A0000 E	FE9C0000 E
FE9E0000 E	FEA00000 E	FEA20000 E	FEA40000 E	FEA60000 E
FEA80000 E	FEAA0000 E	FEAC0000 E	FEAE0000 E	FEB00000 E
FEB20000 E	FEB40000 E	FEB60000 E	FEB80000 E	FEBA0000 E
FEBC0000 E	FEBE0000 E	FEC00000 E	FEC20000 E	FEC40000 E
FEC60000 E	FEC80000 E	FECA0000 E	FECC0000 E	FECE0000 E
FED00000 E	FED20000 E	FED40000 E	FED60000 E	FED80000 E
FEDA0000 E	FEDC0000 E	FEDE0000 E	FEE00000 E	FEE20000 E
FEE40000 E	FEE60000 E	FEE80000 E	FEEA0000 E	FEEC0000 E
FEEE0000 E	FEF00000 E	FEF20000 E	FEF40000 E	FEF60000 E
FEF80000 E	FEFA0000 E	FEFC0000 E	FEFE0000 E	FF000000 E
FF020000 E	FF040000 E	FF060000 E	FF080000 E	FF0A0000 E
FF0C0000 E	FF0E0000 E	FF100000 E	FF120000 E	FF140000 E
FF160000 E	FF180000 E	FF1A0000 E	FF1C0000 E	FF1E0000 E
FF200000 E	FF220000 E	FF240000 E	FF260000 E	FF280000 E
FF2A0000 E	FF2C0000 E	FF2E0000 E	FF300000 E	FF320000 E
FF340000 E	FF360000 E	FF380000 E	FF3A0000 E	FF3C0000 E
FF3E0000 E	FF400000 E	FF420000 E	FF440000 E	FF460000 E
FF480000 E	FF4A0000 E	FF4C0000 E	FF4E0000 E	FF500000 E
FF520000 E	FF540000 E	FF560000 E	FF580000 E	FF5A0000 E
FF5C0000 E	FF5E0000 E	FF600000 E	FF620000 E	FF640000 E
FF660000 E	FF680000 E	FF6A0000 E	FF6C0000 E	FF6E0000 E
FF700000 E	FF720000 E	FF740000 E	FF760000 E	FF780000 E

```
   FF7A0000 E      FF7C0000 E     FF7E0000 E     FF800000 E     FF820000 E

   FF840000 E      FF860000 E     FF880000 E     FF8A0000 E     FF8C0000 E

   FF8E0000 E      FF900000 E RO    FF920000 E RO   FF940000 E RO   FF960000 E RO

   FF980000 E      FF9A0000 E     FF9C0000 E     FF9E0000 E     FFA00000 E

   FFA20000 E      FFA40000 E     FFA60000 E     FFA80000 E     FFAA0000 E

   FFAC0000 E      FFAE0000 E     FFB00000 E     FFB20000 E     FFB40000 E

   FFB60000 E      FFB80000 E     FFBA0000 E     FFBC0000 E     FFBE0000 E

   FFC00000 E      FFC20000 E     FFC40000 E     FFC60000 E     FFC80000 E

   FFCA0000 E      FFCC0000 E     FFCE0000 E     FFD00000 E     FFD20000 E

   FFD40000 E      FFD60000 E     FFD80000 E     FFDA0000 E     FFDC0000 E

   FFDE0000 E      FFE00000 E     FFE20000 E     FFE40000 E     FFE60000 E

   FFE80000 E      FFEA0000 E     FFEC0000 E     FFEE0000 E     FFF00000 E

   FFF20000 E      FFF40000 E     FFF60000   RO    FFF80000   RO    FFFA0000   RO

   FFFC0000   RO    FFFE0000   RO
=> era 1:455

Erase Flash Sectors 455-455 in Bank # 1

. done

=>
```

⚠ The actual level of protection depends on the flash chips used on your hardware, and on the implementation of the flash device driver for this board. In most cases U-Boot provides just a simple software-protection, i. e. it prevents you from erasing or overwriting important stuff by accident (like the U-Boot code itself or U-Boot's environment variables), but it cannot prevent you from circumventing these restrictions - a nasty user who is loading and running his own flash driver code cannot and will not be stopped by this mechanism. Also, in most cases this protection is only effective while running U-Boot, i. e. any operating system will not know about "protected" flash areas and will happily erase these if requested to do so.

5.9.3.5. mtdparts - define a Linux compatible MTD partition scheme

U-Boot implements two different approaches to define a MTD partition scheme that can be shared easily with the linux kernel.

The first one is to define a single, static partition in your board config file, for example:

```
#undef CONFIG_JFFS2_CMDLINE

#define CONFIG_JFFS2_DEV            "nor0"

#define CONFIG_JFFS2_PART_SIZE        0xFFFFFFFF    /* use whole device */

#define CONFIG_JFFS2_PART_SIZE        0x00100000    /* use 1MB */

#define CONFIG_JFFS2_PART_OFFSET      0x00000000
```

The second method uses the Linux kernel's `mtdparts` command line option and dynamic partitioning:

```
#define CONFIG_JFFS2_CMDLINE

#define MTDIDS_DEFAULT      "nor1=zuma-1,nor2=zuma-2"

#define MTDPARTS_DEFAULT    "mtdparts=zuma-1:-(jffs2),zuma-2:-(user)"
```

Command line of course produces bigger images, and may be inappropriate for some targets, so by default it's off.

The `mtdparts` command offers an easy to use and powerful interface to define the contents of the environment variable of the same name that can be passed as boot argument to the Linux kernel:

```
=> help mtdparts

mtdparts

    - list partition table

mtdparts delall

    - delete all partitions

mtdparts del part-id

    - delete partition (e.g. part-id = nand0,1)

mtdparts add <mtd-dev> <size>[@<offset>] [<name>] [ro]

    - add partition

mtdparts default

    - reset partition table to defaults


-----


this command uses three environment variables:


'partition' - keeps current partition identifier


partition  := <part-id>

<part-id>  := <dev-id>,part_num


'mtdids' - linux kernel mtd device id <-> u-boot device id mapping


mtdids=<idmap>[,<idmap>,...]


<idmap>    := <dev-id>=<mtd-id>
```

```
<dev-id>    := 'nand'|'nor'<dev-num>

<dev-num>   := mtd device number, 0...

<mtd-id>    := unique device tag used by linux kernel to find mtd device (mtd->name)



'mtdparts' - partition list



mtdparts=mtdparts=<mtd-def>[;<mtd-def>...]



<mtd-def>   := <mtd-id>:<part-def>[,<part-def>...]

<mtd-id>    := unique device tag used by linux kernel to find mtd device (mtd->name)

<part-def> := <size>[@<offset>][<name>][<ro-flag>]

<size>      := standard linux memsize OR '-' to denote all remaining space

<offset>    := partition start offset within the device

<name>      := '(' NAME ')'

<ro-flag>  := when set to 'ro' makes partition read-only (not used, passed to kernel)
```

For example, on some target system the `mtdparts` command might display this information:

```
=> mtdparts


device nor0 <TQM5200-0>, # parts = 4
 #: name                      size            offset          mask_flags
 0: firmware          0x00100000      0x00000000      1
 1: kernel            0x00180000      0x00100000      0
 2: small-fs          0x00d80000      0x00280000      0
 3: big-fs            0x01000000      0x01000000      0


active partition: nor0,0 - (firmware) 0x00100000 @ 0x00000000


defaults:

mtdids   : nor0=TQM5200-0

mtdparts:                     mtdparts=TQM5200-0:1m(firmware),1536k(kernel),3584k(small-
fs),2m(initrd),8m(misc),16m(big-fs)
```

The partition table printed here obviously differs from the default value for
the `mtdparts` variable printed in the last line. To verify this, we can check the current
content of this variable:

```
=> print mtdparts
```

```
mtdparts=mtdparts=TQM5200-0:1024k(firmware)ro,1536k(kernel),13824k(small-fs),16m(big-fs)
```

and we can see that it exactly matches the partition table printed above.

Now let's switch back to the default settings:

```
=> mtdparts default

=> mtdparts


device nor0 <TQM5200-0>, # parts = 6
 #: name                        size            offset          mask_flags
 0: firmware            0x00100000      0x00000000      0

 1: kernel              0x00180000      0x00100000      0

 2: small-fs            0x00380000      0x00280000      0

 3: initrd              0x00200000      0x00600000      0

 4: misc                0x00800000      0x00800000      0

 5: big-fs              0x01000000      0x01000000      0


active partition: nor0,0 - (firmware) 0x00100000 @ 0x00000000


defaults:

mtdids  : nor0=TQM5200-0

mtdparts:                   mtdparts=TQM5200-0:1m(firmware),1536k(kernel),3584k(small-
fs),2m(initrd),8m(misc),16m(big-fs)

=> print mtdparts

mtdparts=mtdparts=TQM5200-0:1m(firmware),1536k(kernel),3584k(small-
fs),2m(initrd),8m(misc),16m(big-fs)
```

Then we delete the last 4 partitions ("small-fs", "initrd", "misc" and "big-fs") ...

```
=> mtdparts del small-fs

=> mtdparts del initrd

=> mtdparts del misc

=> mtdparts del big-fs

=> mtdparts


device nor0 <TQM5200-0>, # parts = 2
 #: name                        size            offset          mask_flags
 0: firmware            0x00100000      0x00000000      0

 1: kernel              0x00180000      0x00100000      0
```

```
active partition: nor0,0 - (firmware) 0x00100000 @ 0x00000000


defaults:

mtdids  : nor0=TQM5200-0

mtdparts:                     mtdparts=TQM5200-0:1m(firmware),1536k(kernel),3584k(small-
fs),2m(initrd),8m(misc),16m(big-fs)
```

... and combine the free space into a singe big partition:

```
=> mtdparts add nor0 - new-part

=> mtdparts


device nor0 <TQM5200-0>, # parts = 3
 #: name                       size            offset          mask_flags
 0: firmware             0x00100000      0x00000000      0
 1: kernel               0x00180000      0x00100000      0
 2: new-part             0x01d80000      0x00280000      0


active partition: nor0,0 - (firmware) 0x00100000 @ 0x00000000


defaults:

mtdids  : nor0=TQM5200-0

mtdparts:                     mtdparts=TQM5200-0:1m(firmware),1536k(kernel),3584k(small-
fs),2m(initrd),8m(misc),16m(big-fs)

=> print mtdparts

mtdparts=mtdparts=TQM5200-0:1m(firmware),1536k(kernel),30208k(new-part)
```