

## How to restore original firmware/NAND

imagine you screwed something up and wish to restore the firmware to the original version **(which you of course saved before with the backup tools from this thread ... you don't? Well do it now. If it's already too late then send me PM, i can help you to restore your DSO)**

There are two ways :

- over JTAG
- over UART/USB

As most ppl don't have a nice H-JTAG USB (or whatever ARM JTAG) i will skip here the restore over JTAG part, because if you have one you know how to use it (all you need in principle is to flash in raw mode, so with OOB blocks the combined backup file fw\_backup.bin and reboot)

### Restore over UART/USB

You need some tools:

- dnw.exe
- supervivi.bin
- vivi.bin (just in case, see later why)

These tools are attached already here:

<http://www.eevblog.com/forum/index.php?action=dlattach;topic=1571.0;attach=4153>

The dnw.exe need a device driver and inf file, you can find them here:

(from <http://www.friendlyarm.net/downloads> page)

[http://www.friendlyarm.net/dl.php?file=usb-downloadaddr-setup\\_20090421.zip](http://www.friendlyarm.net/dl.php?file=usb-downloadaddr-setup_20090421.zip)

[http://www.friendlyarm.net/dl.php?file=usb-downloadaddr\\_20090421.zip](http://www.friendlyarm.net/dl.php?file=usb-downloadaddr_20090421.zip)

The first one is complete setup program, the second just inf/device drive, use the one you like, both works

For Win64 users: i know there are some dnw.exe/drivers out there for Win64, search for them or use Win32 to restore

Now the first step is to create a complete restore file, the backup tool from this thread is creating 3 dumps:

boot.bin

kernel.bin

root.bin

They are only MTD partitions backups (with NAND OOB blocks), what missing is some empty space

which has been not saved during backup and NAND MTD endblock.

You can find them here:

(<http://www.eevblog.com/forum/index.php?topic=1571.msg26930#msg26930>)

<http://www.eevblog.com/forum/index.php?action=dlattach;topic=1571.0;attach=4903>

<http://www.eevblog.com/forum/index.php?action=dlattach;topic=1571.0;attach=4904>

Download these two files, put them into a folder with boot.bin, root.bin and kernel.bin and run from dos prompt following:

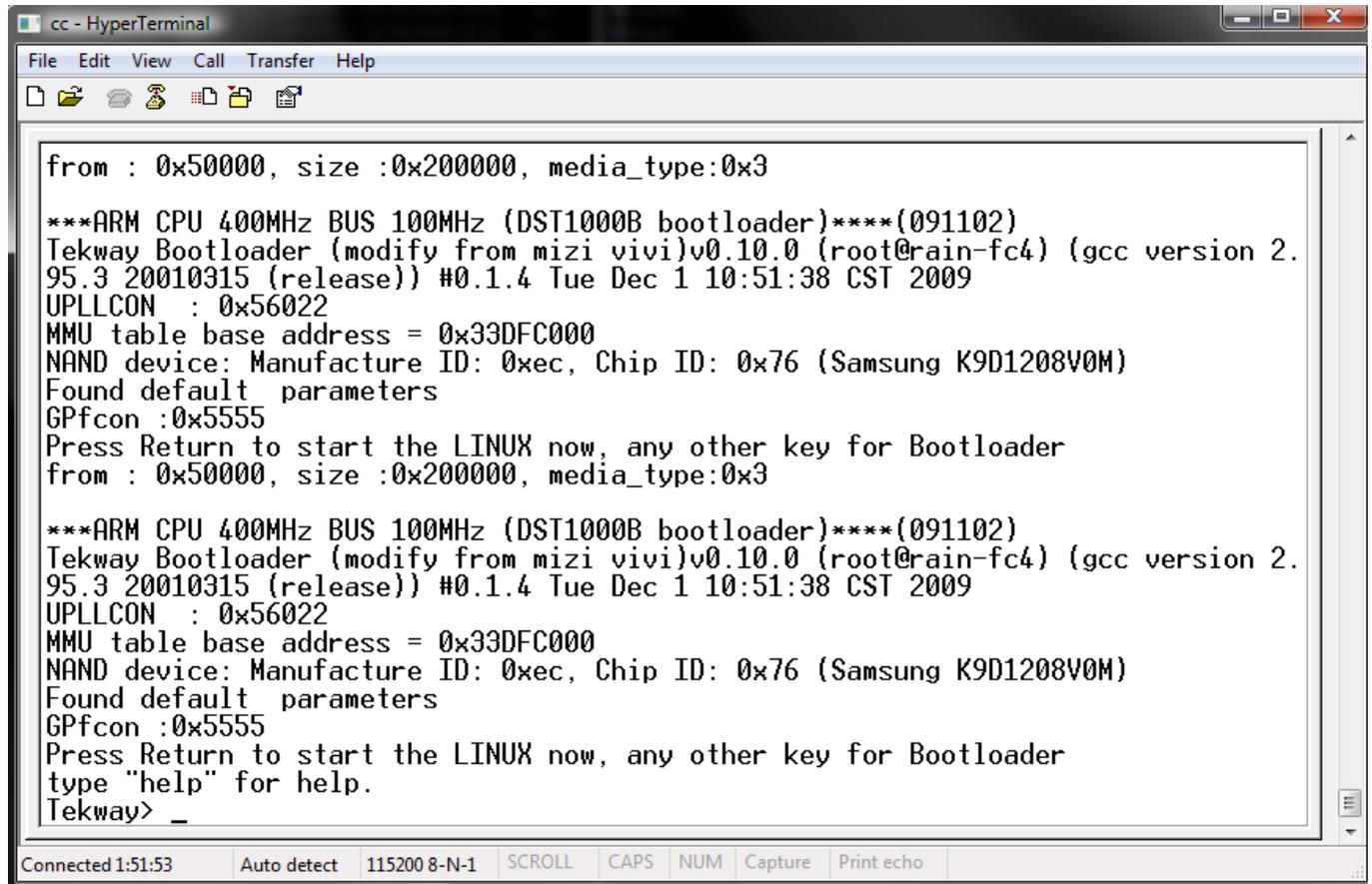
copy /B boot.bin + blank.bin + kernel.bin + root.bin + mizi\_tag.bin fw\_backup.bin

The resulting **fw\_backup.bin** is the full backup wich we need to proceed with restore.

Now connect your DSO over UART to your PC, open the terminal application, connect to whatever com port your

DSO is connected to (set 115200, 8n1) and power up your DSO.

While powering up try multiple times to hit space key, if the boot process have not stopped at following screen power off DSO and try again until you see something like that :



```
cc - HyperTerminal
File Edit View Call Transfer Help
from : 0x50000, size :0x200000, media_type:0x3
***ARM CPU 400MHz BUS 100MHz (DST1000B bootloader)****(091102)
Tekway Bootloader (modify from mizi vivi)v0.10.0 (root@rain-fc4) (gcc version 2.
95.3 20010315 (release)) #0.1.4 Tue Dec 1 10:51:38 CST 2009
UPLLCON : 0x56022
MMU table base address = 0x33DFC000
NAND device: Manufacture ID: 0xec, Chip ID: 0x76 (Samsung K9D1208V0M)
Found default parameters
GPfcon :0x5555
Press Return to start the LINUX now, any other key for Bootloader
from : 0x50000, size :0x200000, media_type:0x3
***ARM CPU 400MHz BUS 100MHz (DST1000B bootloader)****(091102)
Tekway Bootloader (modify from mizi vivi)v0.10.0 (root@rain-fc4) (gcc version 2.
95.3 20010315 (release)) #0.1.4 Tue Dec 1 10:51:38 CST 2009
UPLLCON : 0x56022
MMU table base address = 0x33DFC000
NAND device: Manufacture ID: 0xec, Chip ID: 0x76 (Samsung K9D1208V0M)
Found default parameters
GPfcon :0x5555
Press Return to start the LINUX now, any other key for Bootloader
type "help" for help.
Tekway> _
Connected 1:51:53 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo
```

This is the bootload prompt. Unfortunately the original Tekway/Hantek bootloaders have NO USB support so we have first to upload another one bootloader (with USB support) - that's the supervivi.bin

IMPORTANT: use only the supervivi.bin provided by me, if you use different version the restore might not work properly or you screw up the MTD partitions.

To do this type in the bootloader prompt following:

### load flash vivi x

and click enter. Now in your terminal application (i'm using hyperterm, sure not the best solution but it works) chose "Transfer->send file", select the supervivi.bin, select Xmodem as protocol (the x in what you typed in bootloader prompt means Xprotocol too).

Now you should see something like this picture:

```
cc - HyperTerminal
File Edit View Call Transfer Help
[Icons]

reset -- Reset the system
param [eval|show|save [-n]|reset] -- set/get parameter
part [add|del|show|reset] -- Manage MTD partitions
mem [{cmds}] -- Manage Memory
load [{cmds}] -- Load a file to RAM/Flash
go <addr> <a0> <a1> <a2> <a3> -- jump to <addr>
dump <addr> <length> -- Display (hex dump) a range of memory.

call <addr> <a0> <a1> <a2> <a3> -- jump_with_return to <addr>
boot [{cmds}] -- Booting linux kernel
help [{cmds}] -- Help about help?
load [{cmds}] -- Load a file to RAM/Flash
load [{cmds}] -- Load a file to RAM/Flash
loadyaffs {...} -- to Flash
Tekway> load
invaild 'load' command: too few arguments
Usage:
load help -- x = xmodem, ...
load flash <mtd_part_name|addr length> <x|y|z> -- Load a file to Flash
load ram [addr [length]] <x|y|z> -- Load a file to RAM
Tekway> load flash vivi x
Ready for downloading using xmodem...
Waiting...
$$$$$$$$$
```

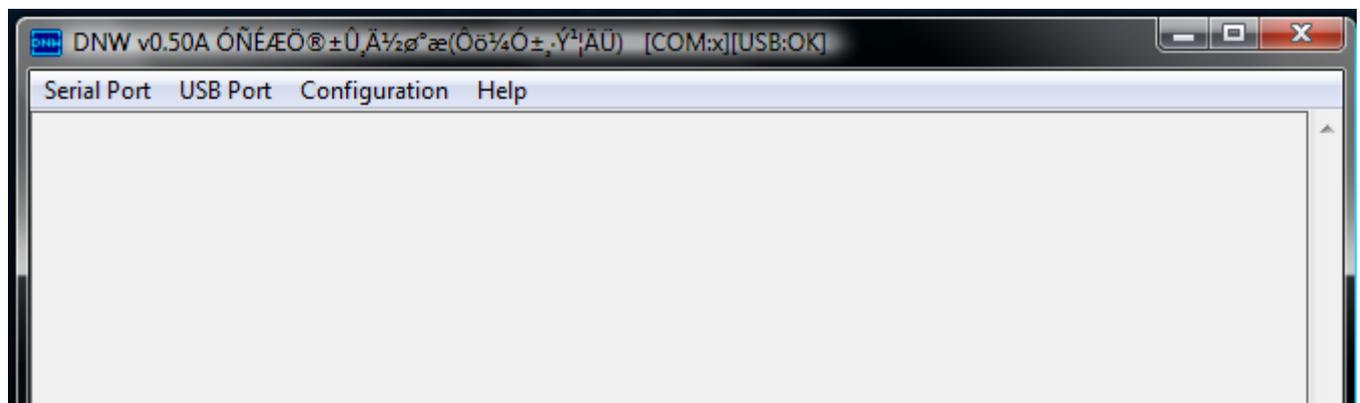
Connected 0:01:30 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

After this step reboot your DSO, hit again during boot multiple times space key until the DSO stop at such screen:

```
##### FriendlyARM BIOS for 2440 #####
[x] bon part 0 320k 2368k
[v] Download vivi
[k] Download linux kernel
[y] Download root_yaffs image
[c] Download root_cramfs image
[a] Absolute User Application
[n] Download Nboot
[e] Download Eboot
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: _
```

Connected 0:10:32   Auto detect   115200 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo

The next step is to connect the DSO over USB and to install the device drivers to allow dnw.exe to communicate with DSO. After you installed drivers run the dnw.exe, if everything worked you should see in the dnw.exe top status line something like USB:OK



If you see this you can continue with fw/NAND restore, if not close dnw.exe, reconnect USB cable and try again.

Now type in the supervivi bootloader menu "r" - this means restore, immediately after that in dnw.exe menu

chose "Usb Port->Transmit/Restore" and chose the previously created full backup

**fw\_backup.bin**

Don't wait too long, dnw.exe is sometimes really bitchy with timeouts.

You should see now in the dnw.exe and your terminal application the transfer/flashing progress:

```

[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[ul] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: r
USB host is connected. Waiting a download.

Now, Downloading [ADDRESS:30000000h,TOTAL:69206026]
Flash params: oobsize = 16, oobblock = 512, erasesize = 16384, partition size =
67108864
Erasing and programming NAND with image get from USB
Block erasing(addr/count) --- Block bad(addr/count) --- Block processed/All(%)
-----
_      0x001bc000/00112                0x00000000/00000                00112/04096=02%

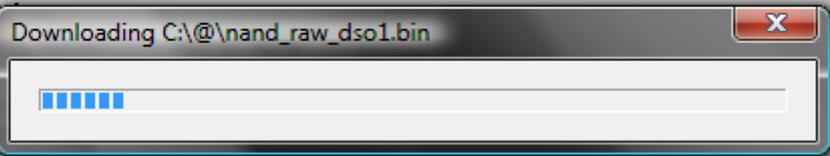
```

Connected 0:15:24    Auto detect    115200 8-N-1    SCROLL    CAPS    NUM    Capture    Print echo

```

===== USB Backup Start =====
Nand Flash Information:
  type       : 0x4
  flags      : 0xc5
  size       : 64MB
  erasesize  : 16KB
  oobblock   : 512
  oobsize    : 16
  ecctype    : 0x2
  eccsize    : 256
Backup Informa
Sta
End
bBa
bCh
dwBackupTotalLen : 0x4200000
dwReservedBlks   : 20
dwEPInPktSize    : 32
dnw.exe read data 65536 bytes a time, has to read 1056 times
===== USB Backup End =====

```



After the supervivi bootloader flashed the NAND with your fw\_backup.bin the menu will be shown again, just scroll back to see the flashing status, here my example (note, my NAND have one bad block, not a bog deal):

```
[i] Download WinCE NK.nb0
[w] Download WinCE NK.bin
[d] Download & Run
[z] Download zImage into RAM
[g] Boot linux from RAM
[f] Format the nand flash
[p] Partition for Linux
[b] Boot the system
[s] Set the boot parameters
[t] Print the TOC struct of wince
[u] Backup NAND Flash to HOST through USB(upload)
[r] Restore NAND Flash from HOST through USB
[q] Goto shell of vivi
Enter your selection: r
USB host is connected. Waiting a download.

Now, Downloading [ADDRESS:30000000h,TOTAL:69206026]
Flash params: oobsize = 16, oobblock = 512, erasesize = 16384, partition size =
67108864
Erasing and programming NAND with image get from USB
  Block erasing(addr/count) --- Block bad(addr/count) --- Block processed/All(%)
-----
Wait the finish of usb transferring ...c000/00001          04096/04096=100%

Load image OK:
Blocks scanned: 4096, Blocks erased: 4095, Blocks are bad: 1
RECEIVED and Wrote FILE SIZE:69206026 (536KB/S, 126S)
```

Connected 0:18:59   Auto detect   115200 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo

That's all, now close dnw.exe, disconnect USB cable from DSO and reboot DSO - you will have now your original firmware restored.

Note: if you have too many bad NAND sectors the restore might not work, then you will have to buy new empty NAND chip, solder it and replace the broken one and of course use ARM JTAG to program the NAND backup (or at least the bootloader).

Extra note: after restore the bootloader is again the original HanTekway vivi.bin (the same as the attached), if you lazy you can remove it of course by the supervivi.bin - the DSO will still work and you will have nice way (over USB/dnw.exe) to backup/restore NAND (if you hacking often and have no JTAG cable this is the fastest way)