Installing OpenWRT on D-link DWL-2100AP rev A4 trough only serial & lan
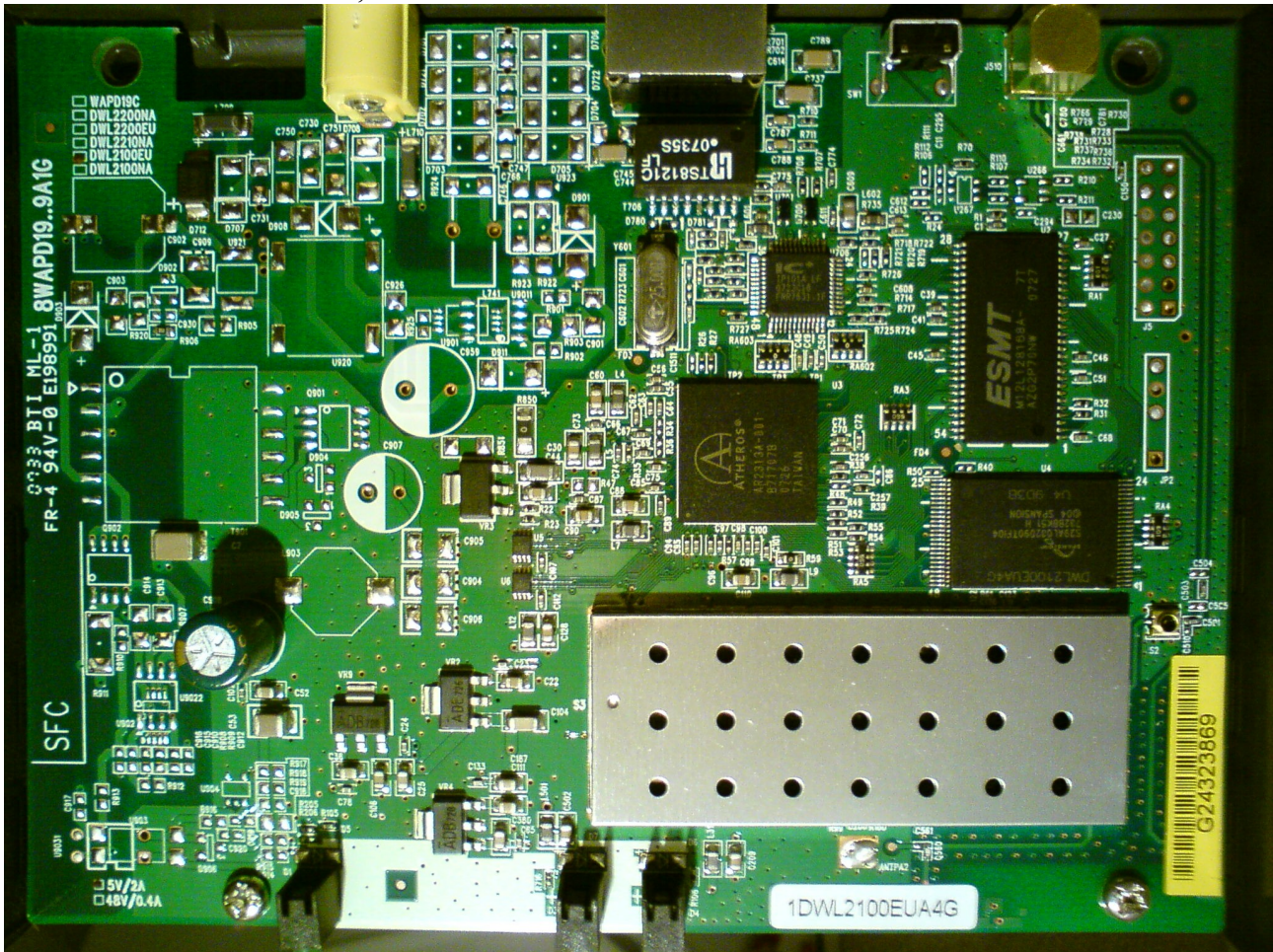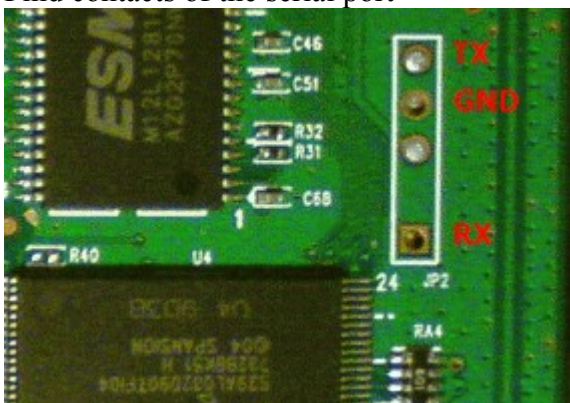
1) Please check that your access point is rev A4. This technique has been developed for A4, but may work for other revisions too, be careful!
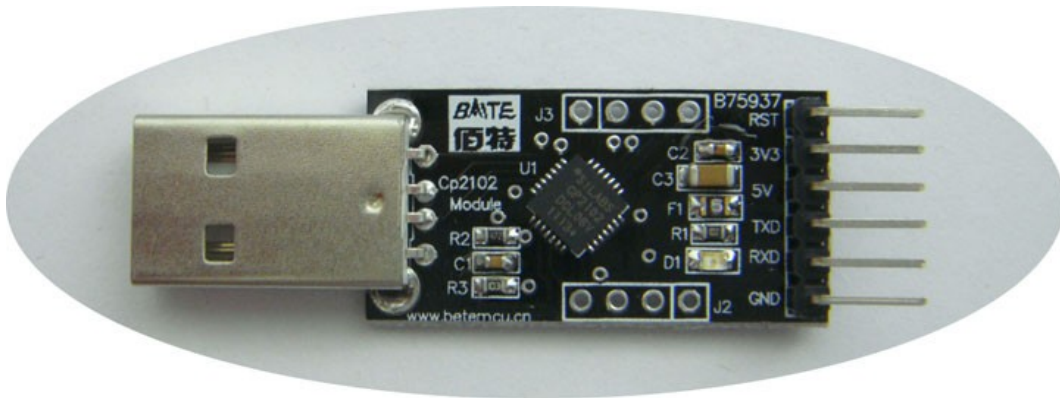

2) Connect serial.
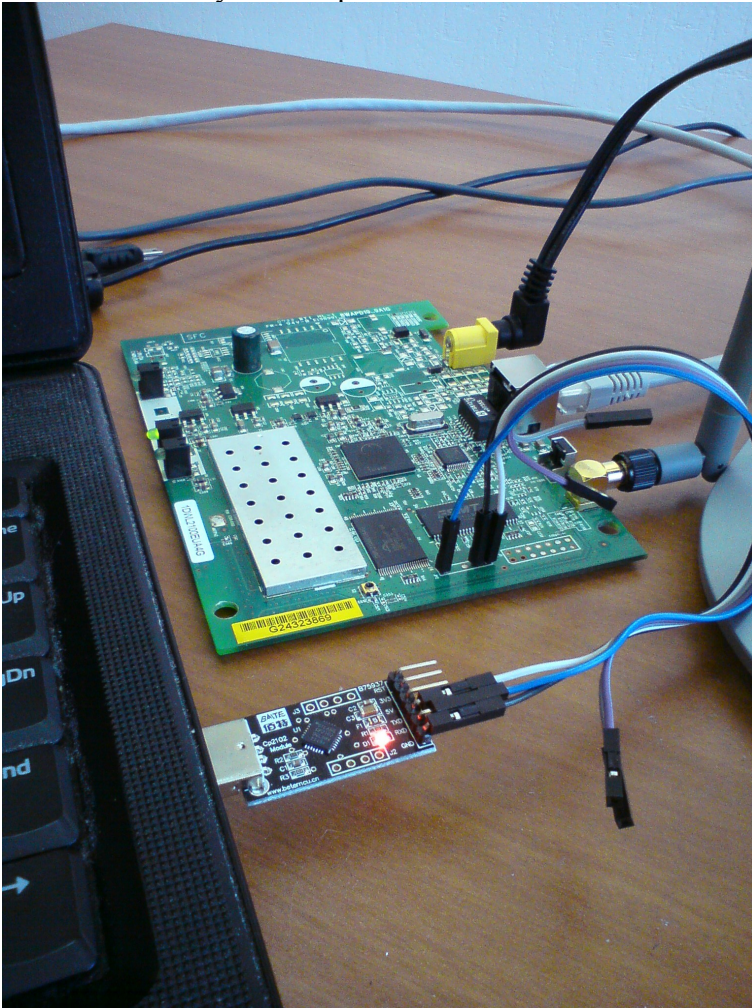Find contacts of the serial port

this serial UART port uses 3.3V TTL, do NOT connect directly to the RS232

using cp2102 (drivers) like this:

connect it to the your computer:

3) run a console program like putty and connect to access point at 9600-8N1. Turn on access point and press ESC to break boot process.

```
ar531x rev 0x00005850 firmware startup...
SDRAM TEST...PASSED


  WAP-G02A  Boot Procedure                    V1.0
-------------------------------------------------------
  Start ..Boot.B14..

Atheros AR5001AP default version 3.0.0.43A


 1
oot]: ?

 ?                       - print this list
 @                       - boot (load and go)
```

```
p                       - print boot params
c                       - change boot params
e                       - print fatal exception
v                       - print version
B                       - change board data
S                       - show board data
n netif                 - print network interface device address
$dev(0,procnum)host:/file h=# e=# b=# g=# u=usr [pw=passwd] f=#
                        tn=targetname s=script o=other
boot device: tffs=drive,removable      file name: /tffs0/vxWorks
Boot flags:
  0x02  - load local system symbols
  0x04  - don't autoboot
  0x08  - quick autoboot (no countdown)
  0x20  - disable login security
  0x40  - use bootp to get boot parameters
  0x80  - use tftp to get boot image
  0x100 - use proxy arp

available boot devices:Enhanced Network Devices
 ae1 tffs
[Boot]: p

boot device          : tffs:
unit number          : 0
processor number     : 0
file name            : /fl/APIMG1
inet on ethernet (e) : 192.168.1.51:ffffff00
gateway inet (g)     : 192.168.1.1
flags (f)            : 0x0
other (o)            : ae

[Boot]: v
CPU: Atheros AR5001AP default
BSP version: 3.0.0.43A
Creation date: Mar 25 2005, 14:24:55

[Boot]: S
name:    Atheros AR5001AP default
magic:   35333131
cksum:   1f94
rev:     4
major:   1
minor:   0
pciid:   0013
wlan0:   no  00:1c:f0:89:79:82
wlan1:   yes 00:1c:f0:89:79:82
enet0:   no  00:1c:f0:89:79:82
enet1:   yes 00:1c:f0:89:79:82
uart0:   yes
sysled:  yes, gpio 7
factory: yes, gpio 6
serclk:  internal
cpufreq: calculated 184000000 Hz
sysfreq: calculated 46000000 Hz
memcap:  disabled
watchdg: enabled
[Boot]:
```
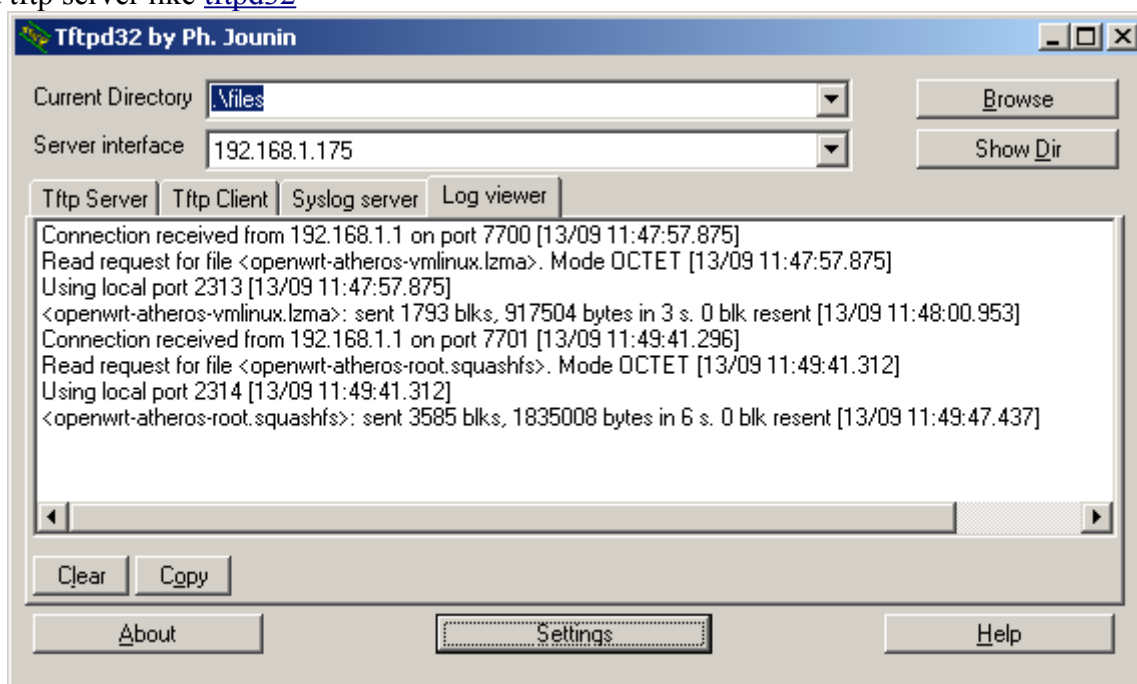
4) Run TftpD server:
connect LAN interface of the AP to your computer, set computer ip to 192.168.1.175 mask
255.255.255.0
run a tftp server like tftpd32

put OpenWRT and RedBoot files to TftpD server root.
You need:
http://narod.ru/disk/15900141000/RB.7z.html (mirror) which contain:
redboot220.img (RAM version)
redboot220.bin (ROM version)
Caution: this RedBoot is for S29AL032D ONLY, check for A4 reviosion! If you have another
revision please do not write it on flash! Test before flashing.
openwrt-atheros-root.squashfs
openwrt-atheros-vmlinux.lzma
from http://downloads.openwrt.org/backfire/10.03.1-rc5/atheros/

5) Load RedBoot to RAM:
type in boot prompt:

```
[Boot]: $ae(1,0)hai:redboot220.img h=192.168.1.175 e=192.168.1.1:0xffffff00 f=0x80
Attached TCP/IP interface to ae1.
Attaching network interface lo0... done.
Loading... 279808
Starting at 0x80010000...


+
RedBoot startup
FLASH configuration checksum error or invalid key
Can't get BOOTP info, using default IP address
Ethernet eth1: MAC address 00:1c:f0:89:79:82
IP: 192.168.1.1, Default server: 0.0.0.0

RedBoot(tm) bootstrap and debug environment [RAM]
Non-certified release, version v2_0 - built 17:10:53, Nov 22 2009
With changes made by Artur Korobov <elgenius@yandex.ru>


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RAM: 0x80010000-0x80800000, 0x80054500-0x807e1000 available
FLASH: 0xbe000000 - 0xbe3e0000, 62 blocks of 0x00010000 bytes each.
RedBoot>
```

6) Write RedBoot to ROM:
Warning! The next command will format your router's flash so you will not be able to boot the
original firmware anymore.

```
RedBoot> fis init -f
About to initialize [format] FLASH image system - continue (y/n)? y
*** Initialize FLASH Image System
RedBoot> fis list
Name              FLASH addr  Mem addr    Length      Entry point
RedBoot           0xBE000000  0xBE000000  0x00050000  0x00000000
RedBoot config    0xBE3C0000  0xBE3C0000  0x00001000  0x00000000
FIS directory     0xBE3D0000  0xBE3D0000  0x00010000  0x00000000
RedBoot> ip_address -l 192.168.1.1 -h 192.168.1.175
RedBoot> load -r -b 0x80041000 redboot220.bin
Specified address (0x80041000) is not believed to be in RAM - continue (y/n)? y
Raw file loaded 0x80041000-0x800413ff, assumed entry at 0x80041000
RedBoot> reset
+.. Resetting.
RedBoot startup
Ethernet eth1: MAC address 00:1c:f0:89:79:82
IP: 192.168.1.1, Default server: 0.0.0.0

RedBoot(tm) bootstrap and debug environment [ROM]
Non-certified release, version v2_0 - built 16:44:47, Nov 22 2009
With changes made by Artur Korobov <elgenius@yandex.ru>


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RAM: 0x80000400-0x80800000, 0x80000400-0x807e1000 available
FLASH: 0xbe000000 - 0xbe3e0000, 62 blocks of 0x00010000 bytes each.
RedBoot>
```

7) Flashing OpenWRT:

```
RedBoot> ip_address -l 192.168.1.1 -h 192.168.1.175
RedBoot> load -r -b 0x80041000 openwrt-atheros-vmlinux.lzma
Raw file loaded 0x80041000-0x80120fff, assumed entry at 0x80041000
RedBoot> fis create -r 0x80041000 -e 0x80041000 linux
RedBoot> load -r -b 0x80041000 openwrt-atheros-root.squashfs
Raw file loaded 0x80041000-0x80200fff, assumed entry at 0x80041000
RedBoot> fis create -r 0x80041000 -e 0x00000000 -l 0x001C0000 rootfs
RedBoot> fconfig bootp false
bootp: Setting to false
Update RedBoot non-volatile configuration - continue (y/n)? y
RedBoot> fconfig boot_script true
boot_script: Setting to true
Update RedBoot non-volatile configuration - continue (y/n)? y
RedBoot> fconfig boot_script_timeout 4
boot_script_timeout: Setting to 4
Update RedBoot non-volatile configuration - continue (y/n)? y
RedBoot> fconfig
Run script at boot: true
Boot script:
Enter script, terminate with empty line
>> fis load -l linux
>> exec
>>
Boot script timeout (1000ms resolution): 4
Use BOOTP for network configuration: false
Local IP address:
Default server IP address:
Console baud rate: 9600
GDB connection port: 9000
Force console for special debug messages: false
Network debug at boot time: false
Update RedBoot non-volatile configuration - continue (y/n)? y
RedBoot> reset
+.. Resetting.
```

8) Wait until OpenWRT is loaded and configure it via SSH or web interface.
Thats all!

PS:// sorry for mistakes and hello from Russian Siberia)

Best regards,
  n-di

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